

# Product Range



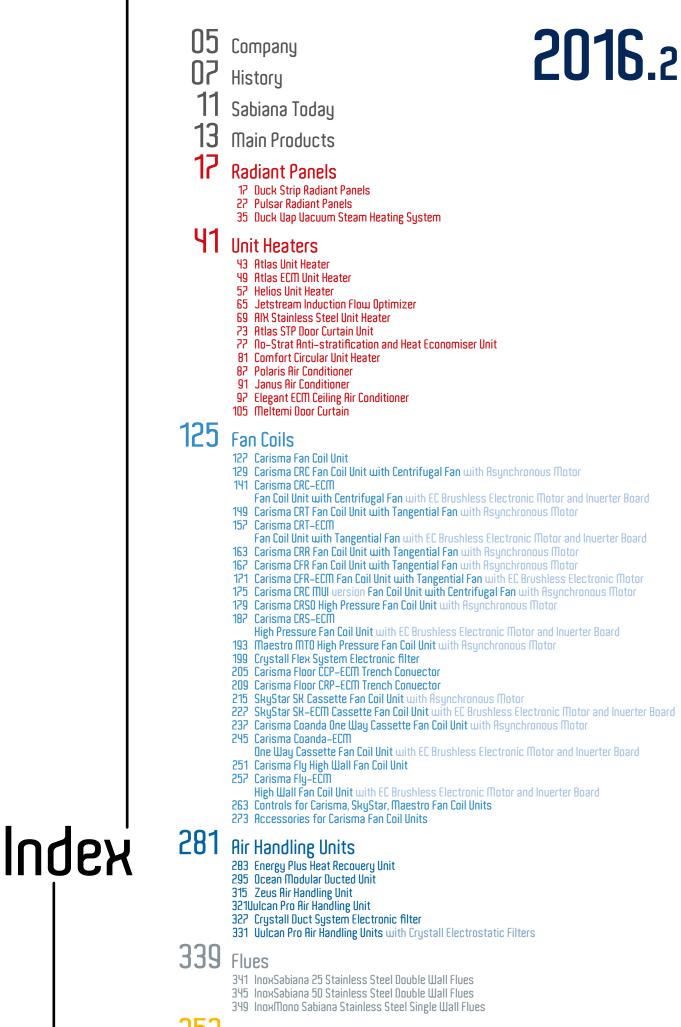








for 80 Years a Leading Position in the Air Conditioning



#### Other Products

353 Electra 90 / ElectraMatic Electric Unit Heater
 357 FSE Electric Fan Conuector
 361 Primula Miniconuector

Dabiana is the Italian company that has been designing, producing and selling innovative heating and air conditioning products for over 80 years. All of the products use the best existing natural liquid that has always stood side-by-side with humans in all of their activities: **Water**.

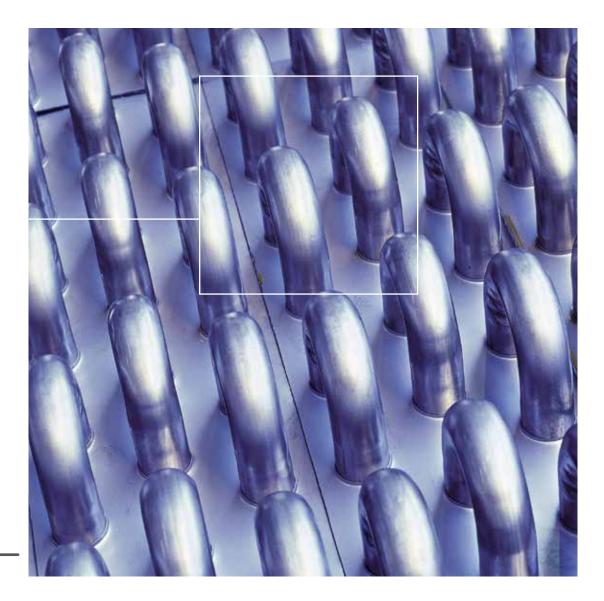
In fact, by heating and cooling water, the climate of any work environment can be controlled with great precision and a high degree of comfort.

Sabiana has paid a great deal of attention to the **NOISE IEUEI** of its products (it was the first Italian company to introduce radiant ceiling panels in industrial environments in 1973, providing heating without any noise), their **Electrical CONSUMPTION** (it was the first company to introduce Cassette fan coil units with electronic motors and low power consumption on the Italian market in 2009) and indoor **air quality** (it was the first company to adopt a patented electronic filter on a wide range of air conditioners in 1993).

Company



Consistent with the great Italian ability to produce products with **Sophisticated design**, Sabiana offers products that can be harmoniously added to any building's architectural structure.



### The main product lines are:

- Radiant panels
- Unit heaters
- Fan Coils
- Air handling units
- Stainless steel flues
- Electric units

Uver 50% of turnover is in foreign markets, especially in Europe, North and South America and the Middle East, with over 50 exclusive distributors. In Italy there are 45 Sales Agents who can recommend the Sabiana product that best fits your climate control needs. Dabiana was founded in **1929** by Franco Binaghi and Benvenuto Anatrella. From Lombardy, passionate about mechanics and a man at home in the workshop, Binaghi sensed Anatrella's great entrepreneurial and commercial talents as soon as he moved from Tuscany to the Lombard capital. Starting with a handshake, like so many other Italian companies, 83 years later the heirs of the two founders are still passionately involved in this partnership. The objective remains, as it was then, to produce and sell reliable products that improve comfort levels in all work environments.

The first electrical unit heater was offered in **1935**, and right after the second world war, production started on hot water unit heaters which, with 7 different types, still heat and sometimes air condition thousand of establishments throughout the world today.

At the beginning **of the POs**, when the first worldwide energy crisis occurred, an innovative heating system was proposed for the Alfa Romeo factory in Arese which used radiant panels installed 12 meters high.

# History



Office in Via Aprica - the 40s

Ithough not yet in production, Sabiana accepted the order and delivered the first 10 km of radiant panels to the customer's great satisfaction, with another 20 km to follow in subsequent years.



Jince then, over 30.000 systems in all types of environments (small, medium, large industry, shopping centres, aircraft hangars, sports and recreational centres and zootechnical facilities) are proof of the product's reliability, with new and highly innovative applications, like the new plant in Toulouse (France) where the most prestigious European product is built, the new Airbus A380 that seats 800.

Towards the end **of the Pos**, with the first demands for office air conditioning, the heat convector, designed and sold mainly for domestic use, was gradually replaced by what would later become one of the most popular air conditioning systems and the most important Sabiana product: the fan coil. These were the years when Italian design was starting to take hold through-out the world and it was this period that saw the beginning of the company's collaboration with one of the leading industrial designers and winner of the Compasso d'Oro (Golden Compass), Lorenzo Bonfanti. Together we designed the Helios unit heater, which is still a symbol of how a highly elegant product aimed at heating industrial environments can be built. With the Futura fan coil, Sabiana, moving away from traditional style patterns, drew the attention not only of the most important designers, but also of many architects, which have always been strict regarding any air-conditioning apparatus. The beautiful design along with the traditional reliability and quietness of Sabiana products, led to the company's success in the ever more competitive air conditioning market, where large international groups operate.

Since 1995, every Sabiana fan coil can be installed with an innovative electrostatic filter named Crystall, patented throughout the world by Luigi Bontempi, which considerably improves air quality in work environments, capturing numerous pollutants from the air such as cigarette smoke, dusts, fibres or microbiological substances such as bacteria or fungi. The filter was then extended to other products. There were numerous technical meetings organized by Sabiana dedicated to internal air quality (IAQ) and they are still receiving a large amount of interest for the prevalence of the problem and the solutions proposed.

During **the 90s** there were two other strategic decisions made for the company's future: the choice to produce flues in stainless steel which soon allowed Sabiana to become one of the most important companies in the Italian market and the completion of the range of water-based air conditioning products with the start of production of a complete series of air handling units, some in series and some upon specific customer request. They are very flexible units, with high technical quality, capable of satisfying the ever-increasing need for environmental comfort.

# History



Sabiana manufacturing plant in Corbetta

#### March 2004.

Mostra-Convegno Expo Comfort in Milan: Sabiana presents another jewel in their crown: the SkyStar Cassette fan coil unit, the result of great technical and stylistic research aimed at offering cutting edge products in terms of performance, quietness and control flexibility. The intake grille and air diffuser has an absolutely innovative appearance and is capable of ensuring excellent performance thanks to extensive computer and laboratory tests. It is the definitive statement in the fan coil industry and places the company at the pinnacle of European production.

### May 2009.

Sabiana is the first company in the world to introduce Cassette fan coil units on the market with inverter, permanent magnet, sensorless and brushless synchronous electronic motors. Electrical consumption decreases by over 50% and continuous adjustment of the air flow rate improves the precision of the ambient temperature control, at the same time reducing the average noise level. Market success was immediate and within two years resulted in 10% of sales having this technology.



#### March 2010.

Mostra-Convegno Expo Comfort in Milan: Sabiana presents the new Carisma fan coil unit with a beautiful design that gives continuity to the style proposed with the Futura product as its noteworthy successor but with a more current and modern shape. It is produced in the new factory in Magenta (MI) that was recently inaugurated and dedicated to fan coil units, an extremely modern structure with over 9,000 m<sup>2</sup>.

Its performance in relation to electrical consumption and noise levels is particularly interesting as they are among the lowest in the market.

#### March 2011.

All Sabiana fan coil units are also offered with inverter electronic motors, the only one capable of satisfying the class A requirements that were just introduced by Eurovent, the main European performance certification society.

#### November 2012.

We start the production of the new Carisma Fly high wall fan coil.

Designed with simple and essential lines, it is entirely manufactured in the Sabiana plants and it is supplied in several versions including with EC low power consumption motors.



#### July 2014.

From 1 July, Sabiana has become a member of **AFG Group, Arbonia-Forster-Holding AG,** an international

group, technological leader in the production of construction materials.

The company has now the chance to play a bigger role in the international market.

#### February 2015.

At the beginning of 2015 is launched the new range of Meltemi door curtains, fully designed and manufactured in Sabiana. With new and improved design and performance in accordance with European Regulation N° 327/2011 - ERP 2015, the Meltemi door curtain is proposed as a break-through for the protection of entrances such as doors and gates for industrial, commercial, sport halls and supermarkets, shops etc... oday Sabiana is an Italian company that directly employs more than 180 people, with three factories near Milan for an overall 50.000 m<sup>2</sup> of surface area and turnouer of more than 80 Million Euros, over 50% of which is in foreign markets.

In the last 5 years, on average, 6% of turnover was directed towards investments in new production technologies and in research and development. 85% of the electrical energy consumed is produced by three photovoltaic systems for an overall 1.36 Megawatts, perfectly integrated in the architectural structure of the buildings.

- Sabiana Today



B design and testing and inspection laboratories, besides allowing for the creation of reliable products that are long-lasting, also allows for rapid development of new products and existing ones, to bring them up to date with the continuously evolving reference standards, quality of comfort and the lower energy consumption required for the buildings.





arge manufacturing companies (Airbus), large hotel chains (Sheraton), large banks (Intesa San Paolo) and large distribution chains (Ikea), to name only a few, which have always been accustomed to carefully choosing every component in the air conditioning system, show their approval for the Sabiana brand.

**Iso 9001** certified since **1996** with all products in compliance with European standards and directives and, where existing, with quality and control certifications for declared performance, Sabiana is faithful to the deep-rooted promise of its two founders: we will always be beside you, those who design or distribute or install our products every day, to help you professionally and so that you can take priceless satisfaction in having done a good job.

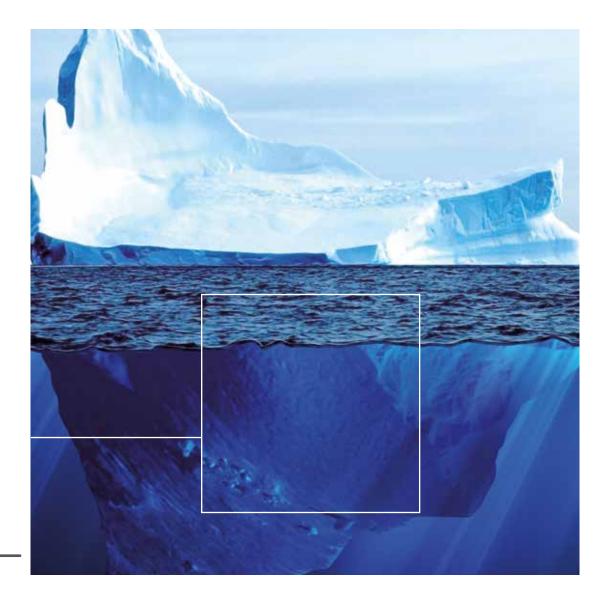
**S**ince 1973, over **30.000 installations** of Sabiana **radiant panels** in every work and education environment, are proof of the quality of this system, which allows absolutely silent heating and cooling, with no air movement, with a uniform temperature throughout the environment, with no danger of fire and great energy savings. There are two main product lines, one for industrial environments and the other for the service sector.

Since 1950 Sabiana has been producing hot water and steam **Unit** heaters for heating industrial and commercial environments, with proprietary production technology and with a wide range of solutions.

# Main Products



Seven product lines, three of which are also suitable for cooling, allow every designer to find the ideal solution for any system, taking advantage of the experience and range of a leading company in Europe.



Since 1980 Sabiana has been producing fan coils featuring a beautiful design and very low noise levels and electrical consumption, in line with the great attention currently towards energy savings. Every fan coil is available with the latest **inverter** driven brushless and sensorless electronic motors.

Performance is certified by an independent institution (Eurovent).

**C**ight product lines are available with a wide range of accessories and controls, among which is an electrostatic filter and a control system with wireless technology, both patented, for comfortable climate control of the most varied work and living environments.

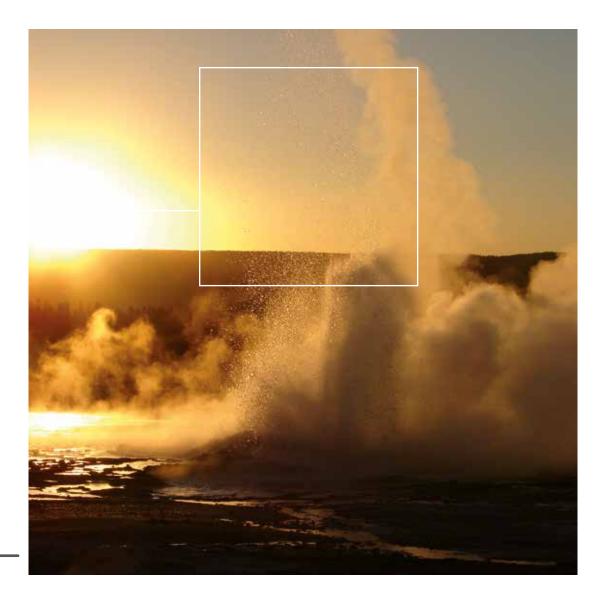
The Sabiana fan coil is one of the reference products in Europe and is constantly growing in a particularly competitive market.

**S**ince 1990 Sabiana has been producing **air handling units** with an air flow of 1.000 to 80.000 m<sup>3</sup>/h, made to measure according to individual customer specifications using efficient configuration and selection software.

here are three product lines with single and double panels able to satisfy air ventilation and climate control needs for practically all environments were people work and live, with interesting technical solutions capable of reducing a building's energy consumption (heat recovery units, inverter-driven motors, electronic filters).

# Main Products





Since 1985 Sabiana has been selling single or double wall stainless steel flues for removing gas from boilers.

There are **8 product lines**, **3 of which are made of plastic material**, suitable for the latest generation of condensing boilers.



# Duck Strip Radiant Panels

Sabiana is the leading European manufactuer in the design, production and sale of **radiant panels** operating on hot water, high temperature hot water and steam.

Since 1971, **OUER 30.000 installations** have been made in all types of environments (small, medium and large industry, shopping centres, aircraft hangars, sporting and recreation facilities, zootechnical facilities), demonstrating the soundness of the product and in new and highly innovative applications, such as the increasingly widespread air-conditioning of production areas that guarantees maximum comfort and consistent productivity all year round, even in the hotter summer months.



eating by radiation means absolute silence, no forced movement of the air, uniform temperatures throughout the environment, and no risk of fire. It means energy savings, as people, the walls



and the floor are heated directly, while the air is only heated indirectly, with consequent minimum stratification of the heat. It means constant operation over time and no routine maintenance on the product, with the peace of mind that, year after year, at the start of each season, this product will continue to provide incomparable comfort.

different models are available in 2 standard colours and other colours upon request. The heating emission values have been certified by the leading European certification laboratory, the University of Stuttgart in Germany. The values have been obtained by applying the harmonised European standard EN 14037.



# Duck Strip Radiant Panels

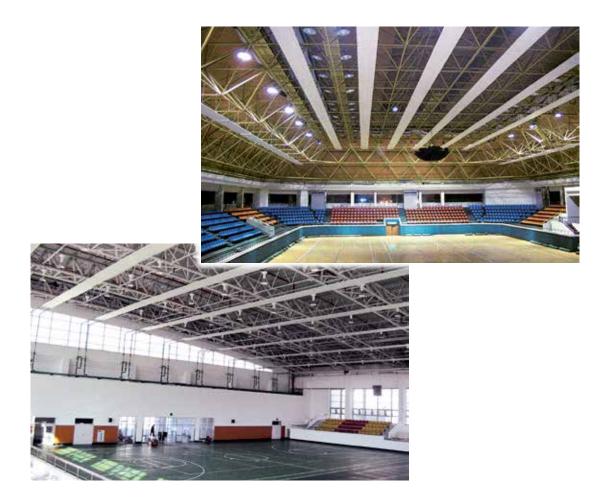
## **Technical specifications:**

Quality steel radiant panel, 0.8 mm thick, cold formed by mechanical forming procedure. The 300, 600, 900 and 1200 mm wide panels in 6 and 4 m lengths (3 and 5 m upon request), have semicircular self-locking sockets, spaced 100 or 150 mm apart depending on the models that are used to hold the pipes that carry the hot water. • Steel pipes pressed

into the semicircular sockets on the panel.

Standard Uersion:	panels fitted with 1.5mm thick pipes,
	outside diameter 1/2", made by electric welding
	from high-quality cold rolled steel strips.
	The pipes are electronically tested by the manufacturer.
	The standard version panels are suitable
	for operating pressures up to 10 bars
	and maximum hot water temperature up to 120°C.
Special Uersion:	panels fitted with 2.35mm thick
	seamless pipes (or with equivalent features),
	outside diameter 1/2", suitable
	for use in systems with operating pressures
	up to 16 bars and high temperature hot water temperatures
	from 120°C to 180°C.

The pipes have belled ends at one side to ease the longitudinal connection of the strips with welding. Alternatively, the pipes can be supplied without belled ends for connections using pressfittings.



- Angle brackets for hanging the panel.
- First header and end header, made by connecting the various pipes in parallel into welded headers, factory welded and tested to the required operating pressure.
- Sized fibreglass insulation (thickness 30-50 mm) protected at the top by aluminium sheet (\*). Other thickness or configurations upon request.
- Side edging strips made from pre-painted plate sections, to retain the edges of the insulation (\*).
- Pre-painted retaining clips (one each metre) to hold the insulation (\*).
- Shaped and painted make-up joints, with fastening bars, to cover the joint areas (\*).
- Protection with special phosphate de-greasing procedure and epoxy polyester coat, dried in a furnace at 180°C (paint thick ≅ 80 µm).
   Colour RAL 9002 (light grey) or RAL 9016 (white). Other RAL colours upon request.
   The treatment is not suitable for the outdoor installation of the radiant panels.
- Reaction to fire class: A1.
- Emission of the radiant surface  $\mathbf{E} = 0,96$ .
- The painting complies to the European Standard 76/769/EEC.

(\*) with separate packaging.

### Characteristics of the insulation

#### Description

Mineral wool insulation treated with heat setting resins, coated on the outside face with 25 micron aluminium foil.

#### Reaction to fire

Class A1 according to EN 13501-1 standards.

Thickness	30 mm	50 mm
Thermal conductivity according to UNI CTI 7745 and UNI FA 112 standard	0,037 W/mK	0,037 W/mK
Density	14 kg/m <sup>3</sup>	14 kg/m <sup>3</sup>
Resistance	0,81 m²K/W	1,35 m²K/W

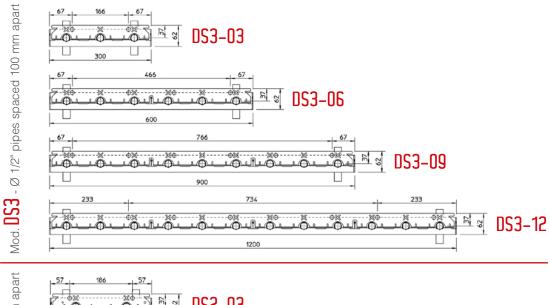
#### **Technical specifications**

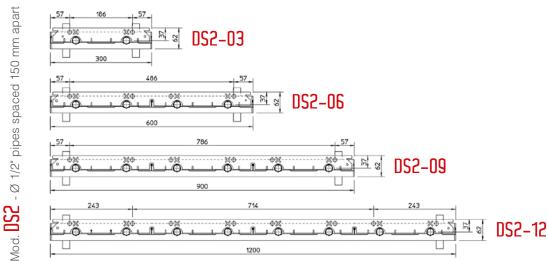
The totally inorganic nature of the mineral wool ensures the following characteristics: maintenance of the performance over time, resistance to parasites and rodents, not hygroscopic, rot-proof.



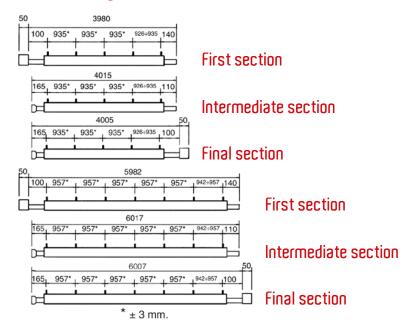
### **Models and Dimensions**

#### Modular widths



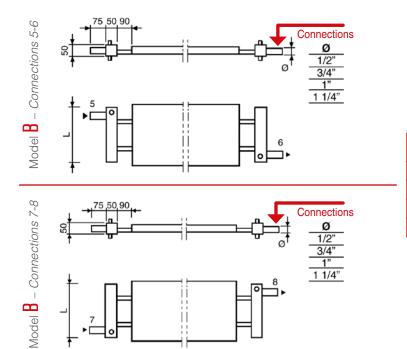


#### Modular lengths (odd lengths are available on request)

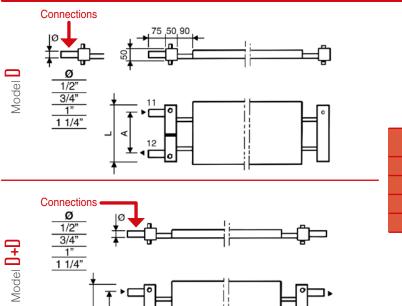


Inck Stri

### **Headers and Connections**



MODEL	L
03	300
06	600
09	900
12	1200



MODEL	L	А
03	300	200
06	600	500
09	900	800
12	1200	1100

#### D and D+D headers:

4

Distance between the connectionsmod. 03 = 200 mmmod. 06 = 500 mmmod. 09 = 800 mmmod. 12 = 1100 mm

D and D+D headers are not suitable for high temperature hot water or steam.

Header "D" should be used with hot water supply

for strips up to 50 m (with slow and gradual opening of the water valve).

For strips longer than 50 m a special "D" header

is recommended, please contact Sabiana Technical Department.



## Weight and Water content

MODEL	STANDARD	SPECIAL	WATER C	ONTENT	VOLUME ONE HEADER	WEIGHT FULL HEADER
MODEL	kg/m	kg/m	Standard I/m	Special I/m	I	kg
DS2-03	4,6	5,6	0,53	0,43	0,63	1,9
DS2-06	9,2	11,2	1,05	0,87	1,27	3,7
DS2-09	13,8	16,8	1,58	1,30	1,90	5,1
DS2-12	18,4	22,4	2,10	1,74	2,54	6,5
DS3-03	5,6	7,1	0,79	0,65	0,63	2,1
DS3-06	11,2	14,2	1,58	1,30	1,27	3,9
DS3-09	16,8	21,3	2,37	1,95	1,90	5,3
DS3-12	22,4	28,4	3,16	2,60	2,54	6,7



### THERMAL EMISSION OF THE PANELS

Table of thermal emission for each meter of the different models of **radiant panels** in accordance to the European Standard EN 14037

∆tm	DS2-03	<b>DS2-06</b>	DS2-09	DS2-12	∆tm	DS3-03	DS3-06	DS3-09	<b>DS3-12</b>
(K)	W/m	W/m	W/m	W/m	(K)	W/m	W/m	W/m	W/m
20	51	90	126	170	20	59	105	152	194
22	57	100	141	189	22	66	117	170	217
24	63	111	155	209	24	73	130	188	241
26	69	122	171	229	26	80	142	207	265
28 30	75 81	133 144	186 201	250 270	28 30	88 95	155 169	226 245	289 313
30	87	155	201	291	30	103	182	245	338
34	93	166	233	312	34	110	195	284	363
36	100	177	249	333	36	118	209	304	388
38	106	189	265	355	38	126	223	324	413
40	112	200	281	376	40	134	237	344	439
42	119	212	297	398	42	141	251	365	465
44	125	223	314	420	44	149	265	385	491
46 48	132 139	235 247	330 347	442 464	46 48	157 165	279 293	406	518 544
40 50	139	259	364	404 486	40 50	174	308	427	571
52	143	271	380	509	52	182	323	469	598
54	159	283	397	531	54	190	337	491	625
55	162	289	406	543	55	194	345	501	639
56	165	295	415	554	56	198	352	512	652
58	172	307	432	577	58	207	367	534	680
60	179	319	449	600	60	215	382	556	707
62	186	331	466	623	62	224	397	578	735
64	193	344	484	646	64	232	412	600	763
65 66	196 200	350 356	493 501	<u>657</u> 669	65 66	236 241	420 427	611 622	777 791
68	200	368	519	692	68	241	427	644	820
70	214	381	537	716	70	258	458	667	848
72	221	394	555	739	72	267	473	689	877
74	228	406	572	763	74	275	489	712	905
76	235	419	590	787	76	284	504	735	934
78	242	432	608	810	78	293	520	757	963
80	249	444	627	834	80	302	536	780	992
82	256	457	645	858	82	311	552	803	1021
84 86	263 271	470 483	663 681	883 907	84 86	320 329	568 584	827 850	1051 1080
88	278	405	700	931	88	338	600	873	1110
90	285	509	718	955	90	347	616	897	1139
92	292	522	737	980	92	356	632	920	1169
94	300	535	755	1004	94	365	648	944	1199
96	307	548	774	1029	96	374	664	968	1229
98	314	561	792	1054	98	383	681	992	1259
100	322	575	811	1078	100	393	697	1016	1290
102 104	329 336	588 601	830 849	1103 1128	102 104	402 411	714 730	1040 1064	1320 1351
104	344	614	868	1153	104	411	747	1088	1381
108	351	628	887	1178	108	430	763	1112	1412
110	359	641	906	1203	110	439	780	1137	1443
112	366	655	925	1228	112	449	797	1161	1474
114	374	668	944	1253	114	458	813	1186	1505
116	381	682	963	1279	116	468	830	1210	1536
118	389	695	983	1304	118	477	847	1235	1567
120 122	396 404	709 723	1002 1021	1330 1355	120 122	487 496	864 881	1260 1284	1598 1629
122	404	736	1021	1335	122	490 506	898	1204	1661
124	412	750	1041	1406	124	515	915	1334	1692
128	427	764	1080	1432	128	525	932	1359	1724
130	435	777	1099	1458	130	535	950	1384	1756
132	442	791	1119	1483	132	544	967	1410	1788
134	450	805	1138	1509	134	554	984	1435	1819
136	458	819	1158	1535	136	564	1001	1460	1851
138	465	833	1178	1561	138	574	1019	1486	1883
140	473	847	1198	1587	140	583	1036	1511	1916

 $\Delta tm$  = difference between the mean water temperature and the room temperature.



### THERMAL EMISSION OF THE HEADERS

Table of thermal emission of a **couple of headers** of the different models in accordance to the European Standard EN 14037

∆tm	DS2-03	DS2-06	DS2-09	DS2-12	∆tm	DS3-03	DS3-06	DS3-09	DS3-12
(K)	W	W	W	W	(K)	W	W	W	W
20	29	57	86	108	20	32	57	91	115
22	33	64	96	121	22	35	64	101	129
24 26	37 40	71 78	107 118	135 148	24 26	39 44	71 78	113 124	144 158
20	40	86	129	140	20	44	86	135	173
30	48	93	140	176	30	52	93	147	189
32	52	101	152	191	32	56	101	158	204
34	56	109	163	205	34	60	109	170	220
36 38	60 64	117 125	175 187	220 235	36 38	65 69	116 124	182 194	236 252
40	68	133	199	250	40	74	132	206	268
42	72	141	211	266	42	78	140	218	285
44	76	150	224	281	44	83	149	231	301
46	80	158	236	297	46	87	157	243	318
48 50	85 89	167 175	249 261	313 328	48 50	92 97	165 174	256 268	335 353
50 52	93	184	201	344	50	101	182	200	370
54	97	193	287	361	54	106	191	294	387
55	100	197	294	369	55	109	195	301	396
56	102	202	300	377	56	111	199	307	405
58	106	211	313	393	58	116	208	320	423
60 62	111 115	220 229	327 340	410 427	60 62	121 126	217 226	333 346	441 459
62 64	115	229	340	427	62 64	120	226	346	459
65	120	242	360	452	65	133	239	366	486
66	124	247	367	460	66	136	244	373	495
68	129	256	380	477	68	141	253	386	514
70	133	266	394	495	70	146	262	400	532
72	138	275	408	512	72	151	271	414	551
74 76	142 147	284 294	422 436	529 547	74 76	156 161	280 289	427 441	570 588
78	152	303	450	564	78	167	209	455	607
80	156	313	464	582	80	172	308	469	627
82	161	323	478	599	82	177	318	482	646
84	166	333	492	617	84	182	327	496	665
86 88	171 175	342 352	507 521	635 653	86 88	188 193	337 346	510 525	685 704
90	175	362	536	671	 	193	356	539	704
92	185	372	550	689	92	204	365	553	743
94	190	382	565	708	94	209	375	567	763
96	195	392	579	726	96	215	385	581	783
98	200	402	594	745	98	220	395	596	803
100 102	204 209	412 423	609 624	763 782	100 102	226 231	405 414	610 625	823 843
102	209	423	639	800	102	237	414	639	864
106	219	443	654	819	106	242	434	654	884
108	224	454	669	838	108	248	444	669	905
110	229	464	684	857	110	254	454	683	925
112 114	234 239	474 485	699 714	876 895	112 114	259 265	464 475	398 713	946 966
114	239	485	714	914	114	200	475	713	966
118	250	506	745	933	118	276	495	743	1008
120	255	517	761	952	120	282	505	757	1029
122	260	527	776	972	122	288	516	772	1050
124	265	538	792	991	124	294	526	788	1071
126 128	270 275	549 560	807 823	1011 1030	126 128	299 305	536 547	803 818	1092 1114
120	275	570	839	1050	120	305	557	833	1114
132	286	581	854	1069	130	317	568	848	1156
134	291	592	870	1089	134	323	578	863	1178
136	296	603	886	1109	136	329	589	879	1199
138	301	614	902	1129	138	335	599	894	1221
140	307	625	918	1149	140	340	610	909	1243

 $\Delta tm$  = difference between the mean water temperature and the room temperature.

**Duck Strip** 



# Pulsar Radiant Panels

The **PULSAR Sabiana** ceiling mounted radiant panels are produced in 4 sizes, with a width of 600 mm and a length between 1.2 and 3 m, in 2 standard colours, and others upon request. The panel has a very elegant design, perfectly matching the false ceiling (it is also available in a free hanging version identified by the letter "W"), features simple maintenance, very long life and can be connected in series or in parallel to others panels using flexible pipes supplied upon request.

he panels feature a very interesting construction: modern welding units, without leaving any visible traces, press the galvanized steel pipes into the thick electrogalvanised steel panel, guaranteeing an optimum heat output and a uniform temperature across the entire radiating surface. The product is ideal for many types of environment, especially schools and hospitals.



he panel can be supplied with hot or cold water: in the summer, it should be used together with a primary air system, as only sensible cooling is provided.

he heating capacity values have been certified by the leading European laboratory in the sector (University of Stuttgart), applying the European EN 14037 standard.

he painting process, using an epoxypolyester resin powder coat dried in a furnace at 180°C, ensures high resistance over time, in compliance with the international standard ISO 2409, certified by tests performed at the Milan Polytechnic University.



# Pulsar Radiant Panels

## **Technical description:**

- The radiant panels are supplied in four sizes, which can be perfectly integrated into any false ceiling.
- Indeed, the lengths of 1.20, 1.80, 2.40 and 3.00 m ensure optimum integration into 600 x 600 mm modular ceilings, the standard dimension for false ceiling panels in Europe.
- The visible side is perfectly flat, meaning that the Pulsar radiant panels can match all types of false ceiling panels available on the market.
- As standard, the panels are supplied in the colour RAL 9016, with a satin finish created by an epoxy-polyester coat dried in a furnace at 180°C.
   Other RAL colours are also available for the architect to choose from.
- The radiant panels are made of a radiating galvanized steel plate, 1 mm thick.

Pulsar

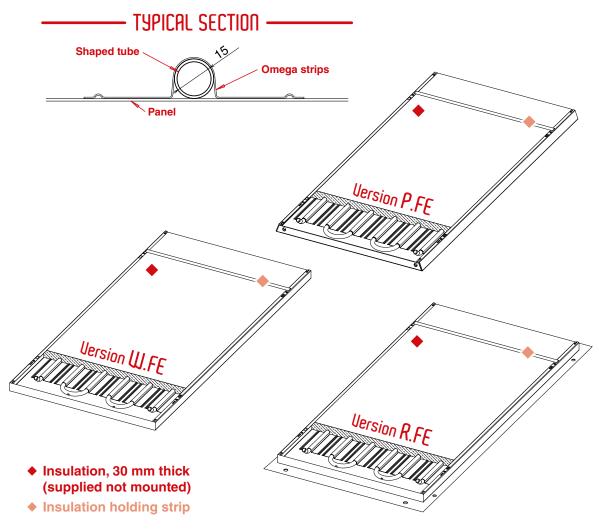
On the panel is fixed a galvanized steel pipe with 15 mm of external diameter, 1.2 mm thick. The galvanized omega strips welded to the panels hold the correct spacing of the tubes and secure the best surface contact between the tube and the panel.

- The dimensional tolerances of the panels are in accordance with standard EN 14037-1 (radiant panel length ± 3,00 mm, radiant panel width ± 2,00 mm).
- The paint complies with the European Standard 76/769/EEC.
- Fire reaction class: A1.
- Emission of the radiant surface  $\mathcal{E} = 0,96$ .
- The radiant panels are supplied with an insulating layer of mineral wool (30 mm thick) protected by an aluminium sheet (25 m



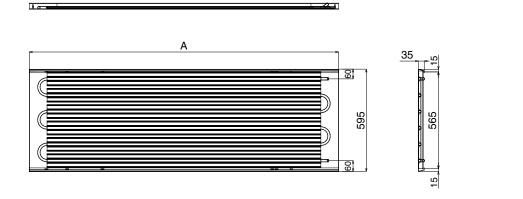
thick) protected by an aluminium sheet (25 micron thick) to be mounted on the top of the panel.The insulation is in Class A1 according to EN 13501-1 standard.

- Thermal conductivity 0,037 W/mK (according to UNI CTI 7745 and UNI FA 112 standard).
- Density 14 kg/m<sup>3</sup>.
- Thermal resistance 0,81 m<sup>2</sup>K/W.

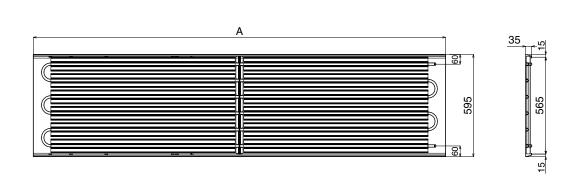


### **Dimensions, Weight, Water content**

Models 1 and 2



#### Models 3 and 4



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MODEL	WIDTH	WEIGHT	WATER CONTENT
MUDEL	A (mm)	kg	Litres
P.FE 1	1195	13,8	1,3
<b>P.FE 2</b>	1795	20,7	2,0
P.FE 3	2395	27,6	2,8
P.FE 4	2995	34,5	3,5
W.FE 1	1234	13,8	1,3
W.FE 2	1858	20,7	2,0
W.FE 3	2482	27,6	2,8
W.FE 4	3106	34,5	3,5



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### THERMAL EMISSIONS IN ACCORDANCE WITH THE EUROPEAN STANDARD EN 14037-1

∆tm	EMISSION								
°C	W/ml								
89	582	75	478	61	376	47	279	33	185
88	574	74	470	60	369	46	272	32	179
87	567	73	463	59	362	45	265	31	172
86	559	72	456	58	355	44	258	30	166
85	552	71	448	57	348	43	251	29	160
84	544	70	441	56	341	42	245	28	153
83	537	69	434	55	334	41	238	27	147
82	529	68	427	54	327	40	231	26	141
81	522	67	419	53	320	39	225	25	134
80	515	66	412	52	313	38	218	24	128
79	507	65	405	51	306	37	211	23	122
78	500	64	398	50	299	36	205	22	116
77	492	63	391	49	292	35	198	21	110
76	485	62	383	48	285	34	192	20	104

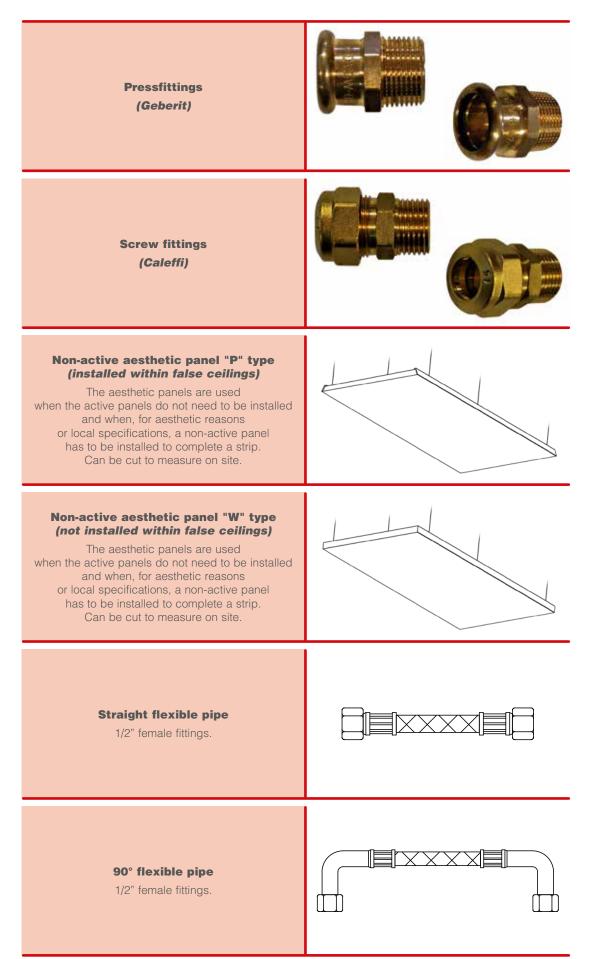
### COOLING EMISSIONS IN ACCORDANCE WITH THE EUROPEAN STANDARD EN 14037-4

∆tm –	COOLING EMISSION						
Δum	WITH INS	SULATION	WITHOUT INSULATION				
°C	W/ml	W/m <sup>2</sup>	W/ml	W/m <sup>2</sup>			
5	24	40	33	56			
6	29	49	40	68			
7	35	58	48	80			
8	40	68	55	92			
9	46	77	62	105			
10	52	87	70	118			
11	57	96	78	130			
12	63	106	85	143			
13	69	116	93	156			
14	75	126	101	169			
15	81	136	108	182			

 $\Delta tm$  = difference between the average water temperature and the room temperature.



#### Accessories





### Accessories



90° / Straight flexible pipe 1/2" female fittings. Hanging systems ا گ λ Δ P.FE WFE

33



# Duck Uap Uacuum Steam Heating System

The **Duck Uap** radiant heating panels have been designed to respond to the need to ensure optimum comfort from a radiant system in all industrial environments where a traditional heating plant is not feasible.

Une or more steam generators under vacuum, or VAS, installed in a sheltered location outside, cause the steam to expand inside the suitably modified pipes of the radiant heating panels, with condensate return by gravity. The circuit is closed and sealed, there is no consumption of steam and consequently no need to top up the water.

he vacuum system allows steam to be produced at a maximum temperature of 110°C corresponding to a relative pressure of 0.45 bar (1.45 bar absolute).



he main advantages involve exceptionally uniform temperature in the environment, fast stabilisation of the operating conditions, and a particularly simple and long lasting system with reduced energy consumption (almost no power consumption).

he **Duck Uap** radiant panels are produced in 6 different models, with 2 standard colours, and others upon request. Each model features elements measuring 4 and 6 metres in length (3 and 5 metres upon request). Each element can be easily connected by welding the pipes supplied with belled ends.

he first and last elements are fitted with welded headers and tested in the factory using advanced automated processes.

he painting process, using an epoxypolyester resin powder coat dried in a furnace at 180°C, ensures high resistance over time, in compliance with the international standard ISO 2409, certified by tests performed at the Milan Polytechnic University.



# Duck Uap Uacuum Steam Heating System

# Technical characteristics of the main components:

• Duck Vap series radiant heating panels:



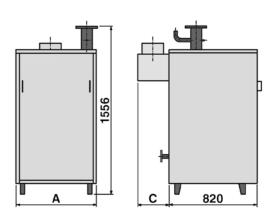
MODEL	EMISSION
MODEL	Ambient temperature 18°C
VAP 203	304
VAP 206	543
VAP 209	766

MODEL	EMISSION
WUDEL	Ambient temperature 18°C
VAP 303	374
VAP 306	665
VAP 309	966

Duck Uap

• VAS series steam generators:

	RATED FLOW-RATE	RATED	MAXIMUM	MAX. STEAM	DIMEN	ISIONS
MODEL	Qn Hi	OUTPUT	PRESSURE	TEMPERATURE	А	С
	kW	kW	bar	О°	mm	mm
<b>VAS 63</b>	70	63,7	0,45	110	590	245
VAS 95	105	95,5	0,45	110	750	295
VAS 143	157,5	143,3	0,45	110	994	320





- ASA air venting device:
  - 1) Level sensor
  - 2) Air vent solenoid valve
  - 3) System pressure indicator light
  - 4) Vent in progress indicator light
  - 5) Box for the control equipment
  - 6) Temperature probe
  - **7)** 3/4" gas fitting
- Control panel

with black bulb probe:

- 1) Control unit for wall mounting
- 2) Main on/off switch
- Button with indicator light to signal burner shutdown and reset
- 4) Digital weekly on/off timer
- Digital electronic thermostat with two temperature thresholds, "day" (comfort) and "night" (reduced)



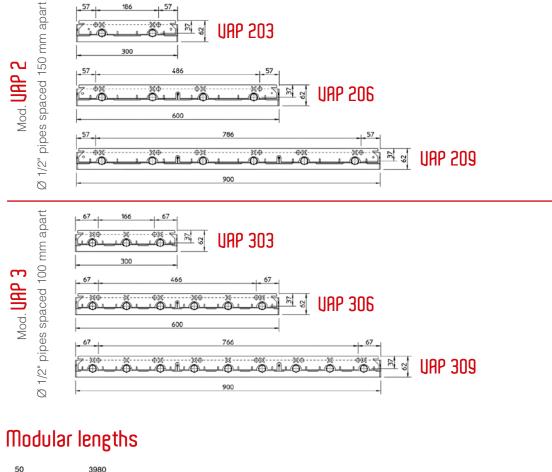


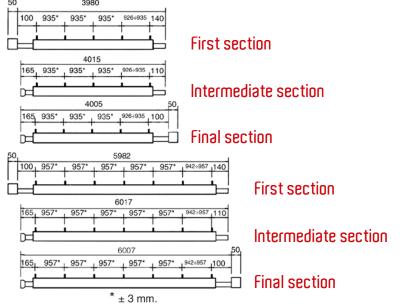


Black bulb probe

#### **Models and Dimensions**

#### Modular widths



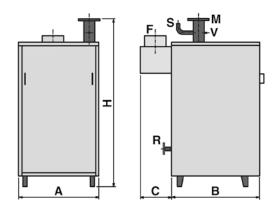


#### **Unit weights**

MODEL		VAP 203	VAP 206	VAP 209	VAP 303	VAP 306	VAP 309
UNIT WEIGHT	kg/m	4,6	9,2	13,8	5,6	11,2	16,8
UNIT WEIGHT FINAL SECTION	kg/m	5,6	11,2	16,8	7,1	14,2	21,3



#### **VAS series steam generators**



MODEL		VAS 63	VAS 95	VAS 143
Overall dimensions: A	mm	590	750	994
В	mm	820	820	820
С	mm	245	295	320
Н	mm	1556	1556	1556
Steam outlet: ØM		DN65 PN16	DN100 PN16	DN100 PN16
Condensate return: ØR		DN25 PN16	DN25 PN16	DN32 PN16
Safety valve attachment: ØS		M 3/4" G	M 1" G	M 1 1⁄2 G
Vacuum valve attachment: ØV		F 1/4" G	F 1/4" G	F 1/4" G
Rated flue diameter: ØF	mm	180	200	250
Gas supply attachment		F 1/2" G	F 1" G	F 1 1⁄4° G
Empty weight	kg	225	290	385
Water content	lt	115	140	180

Due to the special constructional characteristics, these steam generators can be configured as modules to achieve higher heat outputs.

#### THERMAL EMISSION OF THE PANELS

	CARRIER F	LUID: STEAM AT 110°C (P	= 0,45 bar)
MODEL	<b>T</b> room = 16°C	<b>T</b> room = 18°C	<b>T</b> room = 20°C
	W/m	W/m	W/m
VAP 203	312	304	296
VAP 206	556	543	529
VAP 209	785	766	747
VAP 303	383	374	364
VAP 306	680	664	647
VAP 309	991	966	942

## Since 1950 Sabiana has been manufacturing hot water, superheated water and steam air heaters for heating

industrial and commercial work environments,

with proprietary manufacturing technology and a wide range of solutions.

Both in Germany and Italy, the countries where the European manufacturing industry is most developed, above all regarding machinery, the **most common** heating system for industrial environments uses hot water air heaters connected to a central heating system. The excellent ratio of indoor comfort to system cost, continual improvements in efficiency of hot water production, using both condensing boilers and heat pumps,

the use of specific solutions such as flow optimisers on the terminal units,

# Unit Heaters





as well as flexible installation and easy adaptation to new production plant layouts even after installation, mean that still today thousands of designers and businesses propose and adopt this heating solution.

for low-cost cooling in summer, a **new generation** of air heaters fitted with coils designed for use with cold water, has joined the traditional series of hot water air heaters, with the result that a complete range of solutions can now be offered to meet all needs.

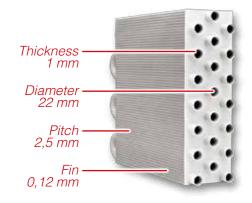
Il range is compliant with the new ERP 2015 Regulation (EU) No. 327/2011 which requires very low electric consumption ratings



in relation to performances provided.

Sabiana is currently the leading Italian manufacturer of air heaters, and every day competes with its eternal German rivals, helping spread Italian know-how throughout Europe.





# Atlas Uniț Heater

The **ATLAS Sabiana** unit heaters have a big "heart": a coil, which has been developed, studied and constructed expressly for heating industrial environments. The increased thickness of the tubes (1 mm steel tube, 0,7 mm copper tube), their large diameter (Ø 22 mm) and the excellent ratio between the air flow and the output guarantee a long life and a high environmental comfort. The Atlas unit heaters are produced in 10 sizes from 5 to 120 kW and are available with a 1-row coil for steam and high temperature hot water installations, a 2-row coil for hot water installations and a 3-row coil for low temperature hot water installations.

SABIANA

he coil of Sabiana Atlas unit heaters with steel tubes Ø 22 mm and aluminium fins has the following advantages compared with the copper-aluminium small diameter tube coils: the material used for the steel tube, which is very thick (1 mm instead of 0,3 - 0,4 mm), makes the Sabiana coil extremely sturdy and long lasting. The tube's large diameter reduces the water pressure



drop: this means that reduced power pumps are installed and a very rapid heating capacity is provided. The Sabiana coil for unit heaters uses a reduced number of tubes to give the same yield: this determines a low resistance to the air flow and consequently an optimum leaving air temperature and a very high throw. The greater spacing between the fins as well as their thickness facilitate cleaning and maintenance operations, which is essential to keep the unit heater efficient.

he steel tube coil is the ideal choice for plants where all tubes and equipment are made of steel because it avoids physical and chemical unbalance due to the interaction of different metals. The special painting coat makes the coil long lasting and increases the thermal output.

he Sabiana coil can be used with hot water, high temperature hot water or steam, even with a high working pressure. As a matter of fact each coil is submitted to two tests at 30 bars. However Sabiana, in order to meet any design and installation need, can offer a complete set of unit heaters with copper tubes and aluminium fins.



his coil has the same features (tube diameter, fin pitch, etc.) of the steel coil but it is built with copper tube 0,7 mm thick, of higher quality and with a total weight which is double compared with the coils normally used for unit heaters. The wide range of products includes

10 different sizes with 1, 2 or 3 rows each.

Upon request, sizes 1 to 6 are available with the **innouatiue electronic motors** with extremely low energy consumption, controlled by an inverter board and identified by ECM. The ECM motors allow to decrease electric consumption compared to traditional asynchronous motors and they enable to adjust the air flow continuously and control the ambient temperature



with precision, with further benefits in terms of very low noise levels.



# Technical characteristics of the main components:

- The main casing is manufactured from galvanized prepainted steel finished in a light grey colour (RAL 9002) and is assembled from three component parts.
- The coil is manufactured from the highest quality steel or copper tube. The fins are pressed from aluminium sheet, bonded onto the tubes facilitating the maximum transfer contact available.
- The fan and motor assembly is made up of three components: the fan, the motor and the safety guard, which also acts as the main support. The standard motor fitted is a hermetically sealed motor which is maintenance free. The motors are supplied as standard for a three phase 230/400V 50Hz supply, and they are available, according to the size, with 4/6 or 6/8 pole two speed (protection IP55) and with 4 or 6 pole one speed (protection IP44).

R wide range of air boxes and accessories is available.

On request: special voltages and special air boxes.

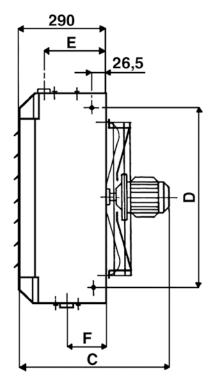
### **ATLAS identification code**

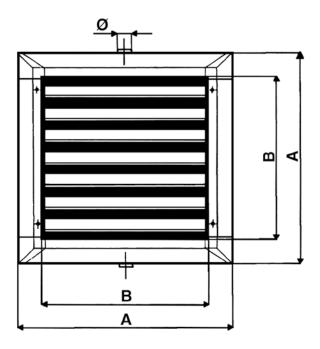
Reference: 46A42 SX

46	Α	4	2	SX	SP
MOTOR 4/6 POLE	RANGE ATLAS	SIZE	ROWS		COIL
(1350/1000 r.p.m.)		4	2	STEEL TUBE	COPPER TUBE



### Dimensions, Weight, Water content





SIZE	А	В	C (C-ATEX)	D	Ε	F	Ø
1	472	336	465 <i>(595)</i>	375	220	130	1 1⁄4"
2	526	390	465 <i>(595)</i>	429	220	130	1 1⁄4"
3	580	444	465 <i>(595)</i>	483	220	130	1 1⁄4"
4	634	498	488 <i>(618)</i>	537	220	130	1 1⁄4"
5	688	552	488 <i>(618)</i>	591	220	130	1 1⁄4'
6	742	606	513 <i>(643)</i>	645	220	130	1 1⁄4"
7	793	657	560 (740)	696	210	140	1 1⁄2"
8	900	764	575 <i>(755)</i>	803	210	140	1 1⁄2"
9	1010	874	595 <i>(775)</i>	913	210	140	1 1⁄2"
10	1117	980	640 <i>(820)</i>	1020	210	140	2"

WEI	GHT Kg <i>(A</i> i	TEX)	WATER	R CONTEN	T Liters
1R	2R	3R	1R	2R	3R
19 <i>(32)</i>	22 <i>(35)</i>	24 <i>(37)</i>	1,3	2,6	3,9
22 (35)	25 <i>(37)</i>	27 (40)	1,6	3,2	4,8
26 <i>(38)</i>	30 <i>(42)</i>	33 <i>(45)</i>	1,9	3,8	5,7
30 <i>(42)</i>	34 <i>(46)</i>	38 <i>(50)</i>	2,3	4,6	6,9
33 (47)	40 <i>(54)</i>	44 <i>(58)</i>	3,0	6,0	9,0
38 <i>(52)</i>	46 <i>(60)</i>	51 <i>(65)</i>	3,5	7,0	10,5
46 <i>(63)</i>	55 <i>(72)</i>	61 <i>(78)</i>	4,3	8,2	12,3
55 (71)	66 <i>(82)</i>	73 <i>(89)</i>	5,8	11,1	16,6
65 <i>(86)</i>	79 (100)	88 (109)	7,6	14,5	21,8
79 <i>(98)</i>	95 (114)	106 (125)	9,6	18,2	27,3

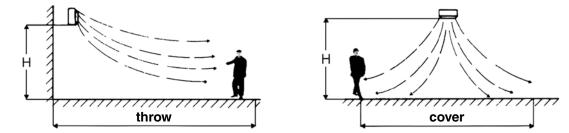
### ATLAS TECHNICAL Specifications 4/6

**4/6 POLE MODELS** – WATER TEMPERATURE 85-75°C Drop 10°C - Δtm 65°C - Entering air temperature 15°C

		M0 SPE	TOR EED	AIR F	LOW	NO LEV AT :		EMIS	SION	A	VING IR MP.		MO	UNTING	NG HEIGHTS:	
SIZE	MODEL	r.p	.m.	m	³/h	(; dB	-	V	V		C	POLES	HORIZ DISCH	ONTAL IARGE	VERT DISCH	
						PO	LES						HEIGHT	THROW	HEIGHT	COVER
		4	6	4	6	4	6	4	6	4	6		m	m	max m	m <sup>2</sup>
	46A11	1350	1000	1415	1055	56	50	-	-	-	-	4	2,5÷3,5	7,5	3,5	50
	46A12	1350	1000	1340	990	56	50	10,24	8,79	37,4	41,0		05.0		0	
	46A13	1350	1000	1195	885	56	50	11,39	9,62	42,9	46,8	6	2,5÷3	5	3	36
	46A21	1350	1000	2190	1680	59	53	-	-	-	-	4	3÷4	10	4	60
2	46A22	1350	1000	2010	1570	59	53	13,95	12,36	35,3	38,0					
	46A23	1350	1000	1875	1420	59	53	17,52	15,07	42,4	46,0	6	2,5÷3,5	7	3,5	45
	46A31	1350	1000	3325	2510	61	55	-	-	-	-	4	3÷4	13,5	5	70
3	46A32	1350	1000	2915	2255	61	55	20,85	18,44	35,9	38,9					
	46A33	1350	1000	2610	2040	61	55	25,68	22,41	43,8	47,1	6	2,5÷3,5	10	4	50
	46A41	1350	1000	4415	3305	64	57	-	-	-	-	4	3,5÷4,5	16	5,5	75
4	46A42	1350	1000	3725	2745	64	57	27,86	24,06	36,9	40,6					
	46A43	1350	1000	3210	2390	64	57	32,03	27,14	44,2	48,2	6	3÷4	12	4,5	55
	46A51	1350	1000	5770	4250	66	59	-	-	-	-	4	4÷5	18	6	90
5	46A52	1350	1000	4800	3500	66	59	34,89	29,94	36,3	40,0					
	46A53	1350	1000	4325	3110	66	59	43,06	35,90	44,1	48,8	6	3,5÷4,5	13	5	70
	46A61	1350	1000	6590	5065	69	62	-	-	-	-	4	4÷5,5	22	7	120
6	46A62	1350	1000	5515	4160	69	62	41,76	36,36	37,2	40,6					
	46A63	1350	1000	4900	3620	69	62	50,96	42,98	45,4	49,7	6	4÷5	16	6	100

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.







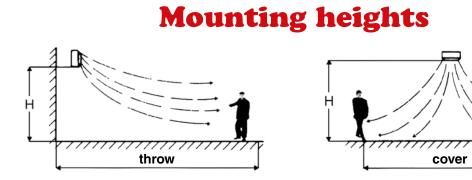
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#### ATLAS TECHNICAL Specifications

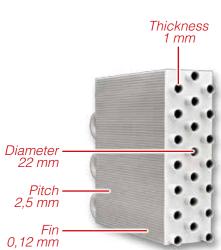
**6/8 POLE MODELS** – WATER TEMPERATURE 85-75°C Drop 10°C - Δtm 65°C - Entering air temperature 15°C

		M0 <sup>°</sup> SPE		AIR F	LOW		ISE /EL 5 m.	EMIS	SION	A	ving Ir Mp.		MO	UNTING	HEIGH	TS:
SIZE	MODEL	r.p.	.m.	m <sup>a</sup>	/h	(; dB	<b>F)</b> (A)	V	V		C	POLES	HORIZ Disch		VERT DISCH	
						PO	. ,						HEIGHT	THROW	HEIGHT	COVER
		6	8	6	8	6	8	6	8	6	8		m	m	max m	m <sup>2</sup>
	68A11	900	750	970	860	48	44	-	-	-	-	6	2,5÷3	5	3	36
	68A12	900	750	935	830	48	44	8,54	8,01	41,7	43,2		-			
	68A13	900	750	835	740	48	44	9,29	8,65	47,5	49,2	8	2,5÷3	4,5	-	-
	68A21	900	750	1495	1170	50	46	-	-	-	-	6	2,5÷3,5	7	3,5	45
2	68A22	900	750	1410	1100	50	46	11,70	10,26	39,3	42,3					
	68A23	900	750	1290	1025	50	46	14,23	12,41	47,3	50,4	8	2,5÷3,5	5,5	-	-
	68A31	900	750	2100	1620	52	48	-	-	-	-	6	2,5÷3,5	10	4	50
3	68A32	900	750	1880	1470	52	48	16,83	14,74	41,2	44,3		05.05	7		
	68A33	900	750	1735	1320	52	48	20,39	17,28	49,4	53,3	8	2,5÷3,5	7	-	-
	68A41	900	750	2795	2195	54	50	-	-	-	-	6	3÷4	12	4,5	55
4	68A42	900	750	2345	1755	54	50	22,14	18,91	42,6	46,5	•	0.4	0		
	68A43	900	750	2010	1535	54	50	24,47	20,70	50,6	54,4	8	3÷4	8	-	_
	68A51	900	750	3685	2865	56	51	-	-	-	-	6	3,5÷4,5	13	5	70
5	68A52	900	750	3050	2335	56	51	27,87	24,17	,	45,3	8	3,5÷4,5	9,5		
	68A53	900	750	2785	2100	56	51	33,58	27,27	50,3	54,4	0	3,3-4,3	9,0	-	_
	68A61	900	750	4445	3550	59	54	-	-	-	-	6	4÷5	16	6	100
	68A62	900	750	3710	2960	59	54	34,33	30,37	,	45,0	8	4÷5	12	_	
	68A63	900	750	3270	2610	59	54	40,43	35,19	51,2	54,4	<u> </u>	470	12	_	
7	68A71	900	750	5100	3960	65	59	-	-	-	-	6	4÷5	24	7	120
	68A72	900	750	4800	3650	65	59	44,20	38,13	,	45,6	8	3,5÷4	18	6	100
	68A73	900	750	4600	3500	65	59	52,35	44,50		52,2		0,0		~	
0	68A81 68A82	900	750	7650	5400	67	61	-	-	- 20.4	-	6	4÷5,5	26	9	160
0	68A82	900	750	6900	4950	67	61	57,57	48,47	,	43,6	8	3,5÷4,5	20	7	130
	68A91	900	750	6300 10600	4500	67	61 62	70,23	57,52	,	52,4					
	68A91	900 900	750	10200	7600	68 68		- 82,12	-	- 28 6	-	6	4÷6	28	11	200
J	68A93	900	750	9400	6400	68		101,49		-		8	3,5÷5	21	8	150
	68A101	900		12250		71	65	-	-				4.0	0.0	40	000
10	68A102	900		11800		71		- 101,20				6	4÷6	30	12	220
	68A103			11000		71		124,93				8	4÷5	22	9	160
	UNIDU	300	100	1000	1000	11	00	124,30	102,33	- <del>1</del> 0,2	J <u>L</u> ,J					

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.







## Atlas ECM Unit Heater with EC Brushless Electronic Motor and Inverter Board

**Sabiana ATLAS** series is available, for the first 6 sizes, in version with electronic motor and inverter board.

# Technical characteristics of the main components:

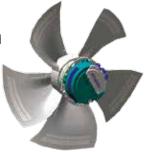
#### For the technical characteristics of the various components refer to ATLAS Unit Heater, excluding the Electronic motor: single phase permanent magnet

brushless electronic motor (protection IP54). The inverter board that controls the motor operation is powered by single-phase and it generates a frequency modulated wave form power supply. The electric power supply required for the machine is therefore single-phase with voltage of 200 - 240 V and frequency of 50 - 60 Hz.

#### <u>Helicoidal fan</u>

DEORD

The fan is made with statically and dynamically balanced plastic or aluminium blades. Its rational high-capacity profile provides the maximum air volume with the minimum energy consumption. The fan hub is secured onto the motor shaft and it is protected by a safety guard.



## Atlas ECM Technical

#### **S**pecifications

WATER TEMPERATURE 85-75°C Drop 10°C - ∆tm 65°C - Entering air temperature 15°C **Atlas ECM** 

MODEL		A	tla	s A-	-EC	M1 <sup>•</sup>	1	A	tla	s A-	-EC	M1	2	Atlas A-ECM13					3
Inverter Power	V	10	9	8	7	6	5	10	9	8	7	6	5	10	9	8	7	6	5
Speed	r.p.m.	1126	1047	945	852	736	623	1126	1047	945	852	736	623	1126	1047	945	852	736	623
Air flow	m³/h	1260	1100	965	835	695	580	1155	1060	915	800	665	565	1100	1010	870	760	640	545
Thermal emission	kW	5,67	5,35	5,04	4,72	4,33	3,96	9,12	8,74	8,10	7,53	6,81	6,19	11,39	10,83	9,94	9,16	8,23	7,41
Leaving air temperature	°C	28	29	30	32	33	35	38	39	41	43	45	47	45	46	48	50	53	55
Fan	W	78,2	62,0	45,5	33,0	22,5	14,3	78,2	62,0	45,5	33,0	22,5	14,3	78,2	62,0	45,5	33,0	22,5	14,3
Sound pressure	dB(A)	42,0	40,5	38,5	35,5	31,7	27,5	42,0	40,5	38,5	35,5	31,7	27,5	42,0	40,5	38,5	35,5	31,7	27,5
Horizontal discharge: Height	m			2,5 -	÷ 3,5					2,5 -	- 3,5					2,5 -	÷ 3,5		
Horizontal discharge: Throw	m	6,5	6,0	5,5	5,0	4,5	4,0	6,0	5,5	5,0	5,0	4,5	4,0	6,0	5,5	5,0	4,5	4,5	4,0
Vertical discharge: Height max.	m	3,5	3,0	2,5	-	-	-	3,0	3,0	2,5	-	-	-	3,0	3,0	2,6	-	-	-
Vertical discharge: Cover	m <sup>2</sup>	40	40	35	-	-	-	40	40	35	-	-	-	40	40	35	-	-	-

MODEL		A	tla	s A-	-EC	M2	1	A	tla	s A-	-EC	M2	2	A	<b>Itla</b>	s A-	-EC	<b>M2</b>	3
Inverter Power	V	10	9	8	7	6	5	10	9	8	7	6	5	10	9	8	7	6	5
Speed r	r.p.m.	1124	1023	918	823	713	601	1124	1023	918	823	713	601	1124	1023	918	823	713	601
Air flow	m³/h	1790	1545	1350	1190	980	780	1650	1450	1255	1080	890	735	1580	1390	1205	1035	855	705
Thermal emission	kW	8,26	7,74	7,29	6,88	6,29	5,61	13,34	12,47	11,58	10,68	9,57	8,55	16,73	15,56	14,31	13,04	11,55	10,15
Leaving air temperature	°C	29	30	31	32	34	36	39	40	42	44	46	49	46	48	50	52	55	57
Fan	W	122	92,5	67	49	34	21,5	122	92,5	67	49	34	21,5	122	92,5	67	49	34	21,5
Sound pressure d	dB(A)	47,0	45,5	43,5	40,5	36,7	32,5	47,0	45,5	43,5	40,5	36,7	32,5	47,0	45,5	43,5	40,5	36,7	32,5
Horizontal discharge: Height	m			2,5 -	- 3,5					2,5 -	- 3,5					2,5 -	÷ 3,5		
Horizontal discharge: Throw	m	8,0	7,0	6,5	6,0	5,5	5,0	7,5	7,0	5,7	5,5	5,0	4,5	7,0	6,5	6,0	5,5	5,0	4,5
Vertical discharge: Height max.	m	4,0	3,5	3,0	-	-	-	3,5	3,5	3,0	-	-	-	3,5	3,0	3,0	-	-	-
Vertical discharge: Cover	m <sup>2</sup>	50	45	45	-	-	-	45	45	45	-	-	-	40	40	40	-	-	-

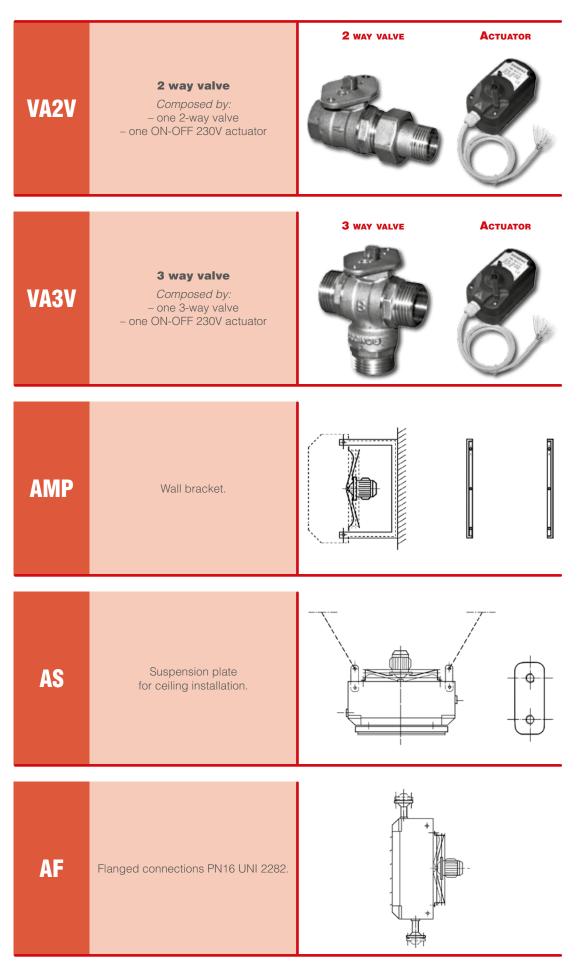
MODEL		A	tla	s A-	-EC	M3	1	A	tla	s A-	-EC	M3	2	A	tla	s A-	-EC	M3	3
Inverter Power	V	10	9	8	7	6	5	10	9	8	7	6	5	10	9	8	7	6	5
Speed	r.p.m.	1126	1047	945	852	736	623	1126	1047	945	852	736	623	1126	1047	945	852	736	623
Air flow	m³/h	2620	2340	2050	1740	1475	1180	2235	2040	1830	1610	1315	1090	2075	1895	1700	1500	1220	1015
Thermal emission	kW	11,76	11,21	10,59	9,82	9,10	8,16	18,36	17,54	16,59	15,50	13,86	12,43	22,60	21,48	20,14	18,68	16,42	14,56
Leaving air temperature	°C	28	29	30	32	33	35	39	40	42	43	46	48	47	48	50	51	54	57
Fan	W	166	136	101	73	50	31,5	166	136	101	73	50	31,5	166	136	101	73	50	31,5
Sound pressure	dB(A)	44,0	44,0	41,5	39,0	35,7	31,0	44,0	44,0	42,0	40,0	36,0	32,0	44,0	44,0	42,0	40,0	36,0	32,0
Horizontal discharge: Height	m			2,5 -	- 3,5					2,5 -	- 3,5					2,5 -	- 3,5		
Horizontal discharge: Throw	m	12,0	11,0	10,0	8,5	7,5	6,5	10,5	10,0	9,0	8,0	7,0	6,5	10,0	9,5	8,5	8,0	7,0	6,0
Vertical discharge: Height max.	m	4,5	4,0	4,0	3,5	-	-	4,0	4,0	3,5	3,5	-	-	4,0	3,5	3,5	-	-	-
Vertical discharge: Cover	m <sup>2</sup>	60	60	55	50	-	-	60	55	50	50	-	-	55	50	50	-	-	-

MODEL		A	tla	s A-	-EC	M4	1	A	tla	s A-	-EC	M4	2	A	<b>tla</b>	s A-	-EC	M4	3
Inverter Power	V	10	9	8	7	6	5	10	9	8	7	6	5	10	9	8	7	6	5
Speed	r.p.m.	1059	979	893	798	692	588	1059	979	893	798	692	588	1059	979	893	798	692	588
Air flow	m³/h	3440	3210	2875	2460	2075	1680	2815	2395	2040	1710	1390	1150	2490	2120	1805	1515	1230	1020
Thermal emission	kW	15,48	15,04	14,34	13,39	12,37	11,19	23,68	21,83	20,02	18,18	16,11	14,35	28,40	25,81	23,41	20,96	18,22	16,02
Leaving air temperature	°C	28	29	30	31	32	34	40	42	44	46	49	52	48	51	53	55	58	61
Fan	W	166	131	98,5	70	48	30	166	131	98,5	70	48	30	166	131	98,5	70	48	30
Sound pressure	dB(A)	45,0	45,0	42,5	40,0	36,7	32,0	45,0	45,0	42,5	40,0	36,7	32,0	45,0	45,0	42,5	40,0	36,7	32,0
Horizontal discharge: Height	m			3 ÷	4,5					3 ÷	4,5					3 ÷	4,5		
Horizontal discharge: Throw	m	14,5	14,0	12,5	11,0	9,5	8,5	12,5	11,0	9,6	8,5	7,0	6,5	11,0	10,0	9,0	8,0	6,5	6,0
Vertical discharge: Height max.	m	5,0	5,0	4,5	4,0	-	-	4,5	4,0	4,0	3,5	-	-	4,0	4,0	3,5	-	-	-
Vertical discharge: Cover	m <sup>2</sup>	70	70	65	60	-	-	65	60	55	50	_	-	60	55	50	-	-	-

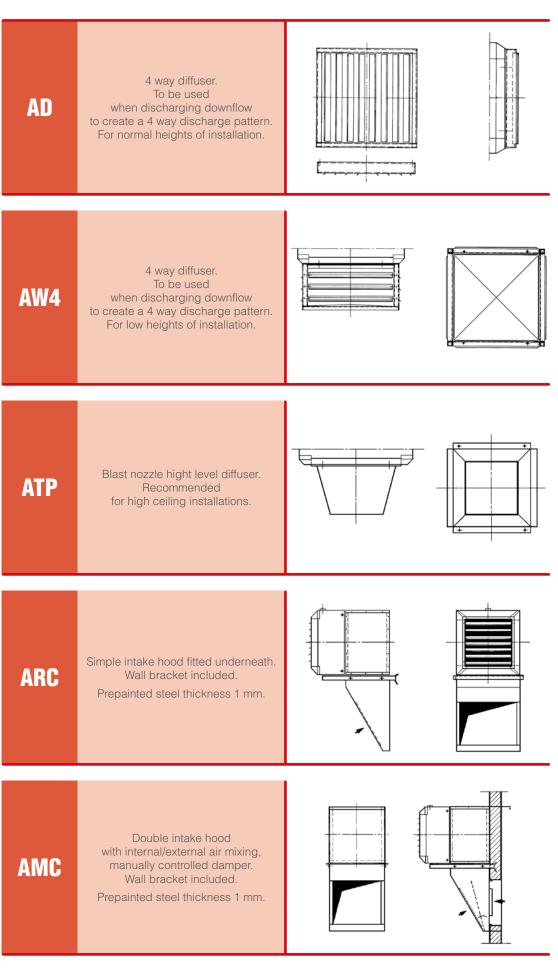
MODEL		A	tla	s A-	-EC	M5	1	ļ	tla	s A-	-EC	M5	2	ļ	tla	s A-	-EC	M5	3
Inverter Power	V	10	9	8	7	6	5	10	9	8	7	6	5	10	9	8	7	6	5
Speed	r.p.m.	1108	1108	1044	924	800	650	1108	1108	1044	924	800	650	1108	1108	1044	924	800	650
Air flow	m³/h	5130	5130	4600	4045	3340	2575	4010	4010	3695	3185	2705	2060	3455	3455	3185	2745	2330	1775
Thermal emission	kW	21,10	21,10	20,18	19,14	17,60	15,62	32,00	32,00	30,74	28,51	26,17	22,53	38,11	38,11	36,40	33,36	30,17	25,34
Leaving air temperature	°C	27	27	28	29	30	33	38	38	39	41	43	47	47	47	48	51	53	57
Fan	W	265	265	219	156	104	59	265	265	219	156	104	59	265	265	219	156	104	59
Sound pressure	dB(A)	47,0	47,0	46,5	44,0	40,0	35,0	47,0	47,0	46,5	44,0	40,0	35,0	47,0	47,0	46,5	44,0	40,0	35,0
Horizontal discharge: Height	m			3 ÷	4,5					3÷	4,5					3÷	4,5		
Horizontal discharge: Throw	m	19,0	19,0	17,0	15,0	12,6	10,0	15,0	15,0	14,0	12,0	10,5	8,0	13,0	13,0	12,0	10,5	9,0	7,0
Vertical discharge: Height max.	m	6,0	6,0	5,5	5,0	-	-	5,0	5,0	5,0	4,5	-	-	5,0	5,0	4,5	4,0	-	-
Vertical discharge: Cover	m <sup>2</sup>	85	85	80	80	-	-	80	80	75	70	-	-	75	75	70	65	-	-

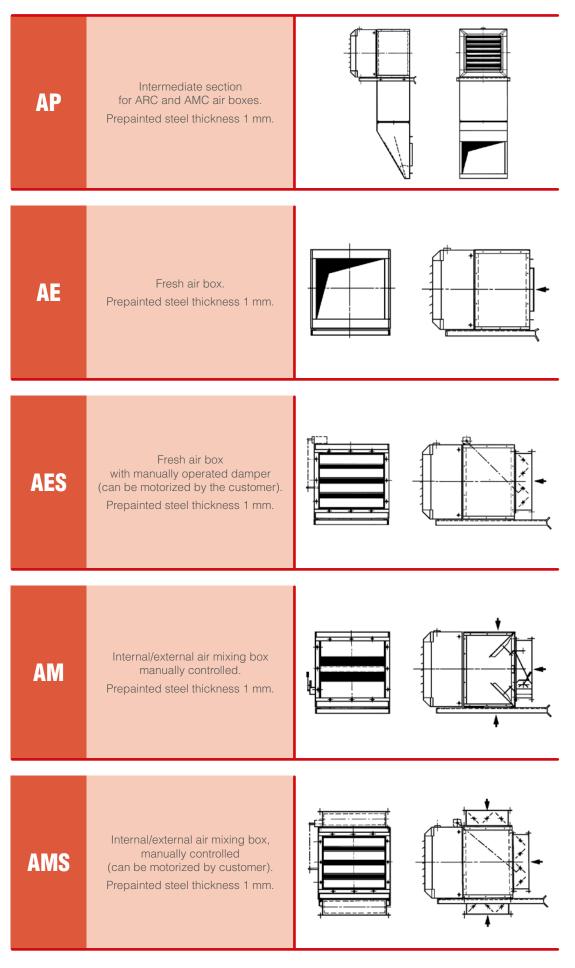
MODEL		A	tla	s A-	-EC	M6	1	ļ	tla	s A-	-EC	M6	2	A	tla	s A-	-EC	M6	3
Inverter Power	V	10	9	8	7	6	5	10	9	8	7	6	5	10	9	8	7	6	5
Speed	r.p.m.	1107	1107	1053	930	798	653	1107	1107	1053	930	798	653	1107	1107	1053	930	798	653
Air flow	m³/h	5895	5895	5355	4585	3765	2910	4535	4535	4260	3590	2975	2375	3845	3845	3610	3040	2520	2010
Thermal emission	kW	25,35	25,35	24,34	22,77	20,90	18,53	38,05	38,05	36,83	33,73	30,45	26,86	44,48	44,48	42,86	38,65	34,39	29,69
Leaving air temperature	°C	28	28	28	30	31	34	40	40	40	42	45	48	49	49	50	52	55	58
Fan	W	246	246	211	148	96	59	246	246	211	148	96	59	246	246	211	148	96	59
Sound pressure	dB(A)	48,0	48,0	47,5	45,0	41,0	36,0	48,0	48,0	47,5	45,0	41,0	36,0	48,0	48,0	47,5	45,0	41,0	36,0
Horizontal discharge: Height	m			3 -	- 5					3.	÷ 5					3 -	- 5		
Horizontal discharge: Throw	m	22,0	22,0	20,0	17,0	14,0	11,0	17,0	17,0	16,0	13,5	11,5	9,0	14,5	14,5	13,5	11,5	9,5	8,0
Vertical discharge: Height max.	m	6,5	6,5	6,0	5,5	-	-	5,5	5,5	5,0	5,0	-	-	5,0	5,0	5,0	4,5	-	-
Vertical discharge: Cover	m <sup>2</sup>	100	100	95	90	-	-	90	90	90	85	-	-	85	85	85	80	-	-

 $\label{eq:measurement} Measurement performed at 5 meter from the source \\ Room volume of 500 \ m^3$  - Reverberation period of 2 s - Directional factor Q=2 (hemisphere sound emission). \\



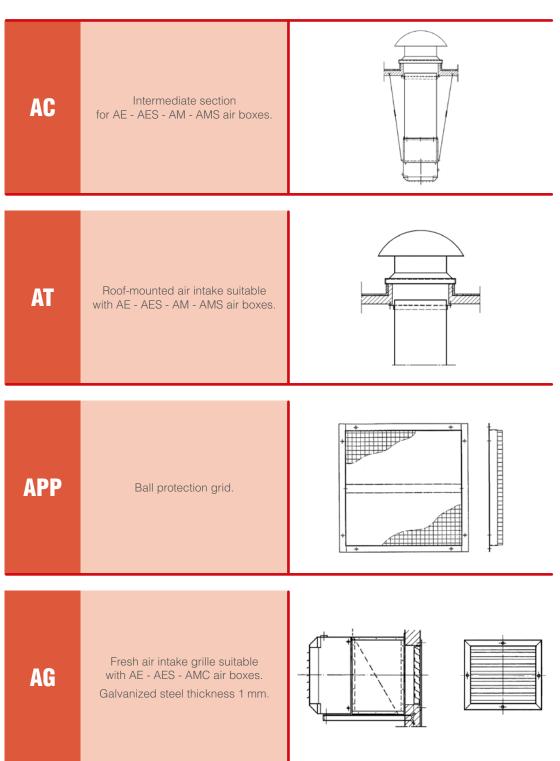












#### **Controls and Special motors for <u>Atlas Unit Heaters sizes 1+10</u>**

• Two speed Delta-Star motors, 4/6 or 6/8 poles, three phase, IP 55, with klixon thermic protection



• Single speed flame proof motor II2GEExd IIBT4 - compliant with the ATEX Standard

• Capacitor for single phase motor (not mounted)



#### <u>Wall</u> electronic controls for <u>Atlas ECM Unit Heaters sizes 1÷6</u>

#### For each unit must be prouided - the ADC conuerter for wall controls -

ADCA-M	ADC signal converter for wall controls fitted on the unit
ADC-S	ADC signal converter for wall controls supplied with separate packaging
WM-3V	3 speed control
WM-T	3 speed control with electronic thermostat and manual summer/winter switch



WM-T



### **Remote control** for <u>industrial applications</u>

For each unit must be prouided - the 4–20 mA / 0–10U signal conuerter -

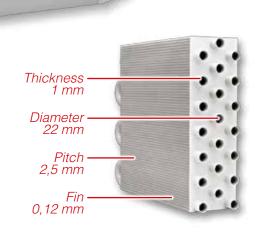
UH-ECM	EC Base Control
UH-ECM-CNV	4-20 mA / 0-10V signal converter
UH-ECM-RLP	Potentiometer to control the speed of the motor
UH-ECM-NTC	NTC probe with box

UH-ECM



**UH-ECM-RLP** 





# Helios Uniț Heater

The **HELIOS Sabiana** unit heaters, built with the same criteria of sturdiness and safety that define all Sabiana products, stand out for the splendid design of the casing, made using anodised aluminium bars and polished die-cast corners. They have the same big heart as the Atlas unit heaters: a coil that has been conceived, designed and manufactured specifically for heating industrial environments. The thickness of the pipes, standard in steel, the diameter (Ø 22 mm) and the excellent ratio between the flow-rate of air and the heat output guarantee long life and exceptional comfort.

SABIANA

elios unit heaters are produced in **6** sizes from **5** to **60** kW and are available with a 1-row coil for steam and high temperature hot water installations, a 2-row coil for hot water installations and a 3-row coil for low temperature hot water installations.

he coil of Sabiana Helios unit heaters with steel tubes Ø 22 mm and aluminium fins has the following **aduantages** compared with the copperaluminium small diameter tube coils: the material used for the steel tube, which is very thick (1 mm instead of 0,3 - 0,4 mm), makes the



Sabiana coil extremely sturdy and long lasting. The tube's big diameter reduces the water pressure drop: this means that reduced power pumps are installed and a very rapid heating capacity is provided. The Sabiana coil for unit heaters uses a reduced number of tubes to give the same yield: this determines a low resistance to the air flow and consequently an optimum leaving air temperature and a very high throw.

The greater spacing between the fins as well as their thickness facilitate cleaning and maintenance operations, which is essential to keep the unit heater efficient.

he steel tube coil is **the ideal choice for plants** where all tubes and equipment are made of steel because it avoids physical and chemical unbalance due to the interaction of different metals.

he special painting coat makes the coil long lasting and increases the thermal output. The Sabiana coil can be used with hot water, high temperature hot water or steam, even with a high working pressure. As a matter of fact each coil is submitted to two tests at 30 bars.



owever Sabiana, in order to meet any design and installation need, can offer a complete set of unit heaters with copper tubes and aluminium fins. This coil has the same features (tube diameter, fin pitch, etc.) of the steel coil but it is built with copper tube 0,7 mm thick, of higher quality and with a total weight which is double compared with the coils normally used for unit heaters. Upon request, all sizes are available with the **innouatiue electronic motors** with extremely low energy consumption, controlled by an inverter board and identified by ECM. The ECM motors allow to decrease electric consumption compared to traditional asynchronous motors and they enable to adjust the air flow continuously and control the ambient temperature



with precision, with further benefits in terms of very low noise levels.

# Technical characteristics of the main components:

- The main casing is manufactured from 4 angular diecast aluminium components and lateral elements made of extruded, anodized aluminium in a silver colour.
- The coil is manufactured from the highest quality steel or copper tube. The fins are pressed from aluminium sheet and bonded onto the tubes facilitating the maximum transfer contact available.
- The fan and motor assembly consists of three components: the fan, the motor and the safety guard, which also acts as the main support. The standard motor is a hermetically sealed motor which is maintenance free. The motors are supplied as standard for a three phase 230/400V 50Hz supply, and they are available, according to the size, with 4/6 or 6/8 pole two speed (protection IP55) and with 4 or 6 pole one speed (protection IP44).

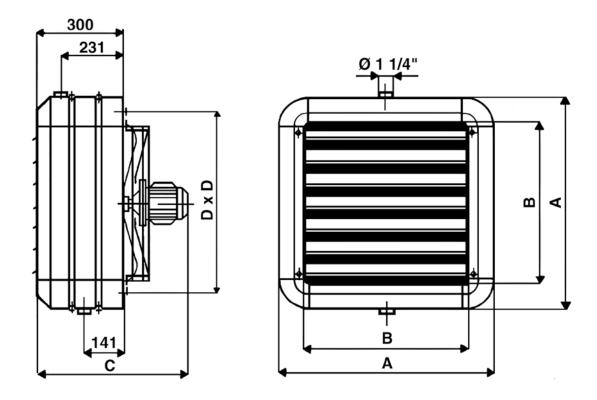
#### **HELIOS identification code**

Reference: 46H53 SX

46	Н	5	3	SX
MOTOR 4/6 POLE	RANGE HELIOS	SIZE	ROWS	COIL STEEL TUBE
(1350/1000 r.p.m.)		5	3	
				SP



### Dimensions, Weight, Water content



017E	٨	D	С	D	
SIZE	A	В	U	D	1
1	486	330	477	406	1
2	540	384	477	460	2
3	594	438	477	514	2
4	648	492	500	568	3
5	702	546	500	622	3
6	756	600	525	676	3

١	NEIGHT K	g	WATER	CONTEN	T Liters
1R	2R	3R	1R	2R	3R
19	22	24	1,3	2,6	3,9
22	25	27	1,6	3,2	4,8
26	30	33	1,9	3,8	5,7
30	34	38	2,3	4,6	6,9
33	40	44	3,0	6,0	9,0
38	46	51	3,5	7,0	10,5

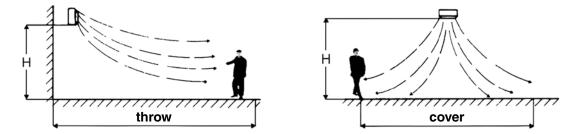
#### HELIOS TECHNICAL Specifications

**4/6 POLE MODELS** – WATER TEMPERATURE 85-75°C Drop 10°C - Δtm 65°C - Entering air temperature 15°C

			TOR EED	AIR F	LOW	LE	ISE /EL 5 m.	EMIS	SION		VING IR		MO	UNTING	HEIGH	TS:
SIZE	MODEL	r.p	.m.	m	³/h	(; dB	<b>*)</b> (A)	V	V	0		POLES	HORIZ Disch	ONTAL IARGE	VERT DISCH	
						PO	LES						HEIGHT	THROW	HEIGHT	COVER
		4	6	4	6	4	6	4	6	4	6		m	m	max m	m <sup>2</sup>
	46H11	1350	1000	1415	1055	56	50	-	-	-	-	4	2,5÷3,5	7,5	3,5	50
	46H12	1350	1000	1340	990	56	50	10,24	8,79	37,4	41,0	•	0.5.0		0	
	46H13	1350	1000	1195	885	56	50	11,39	9,62	42,9	46,8	6	2,5÷3	5	3	36
	<b>46H21</b>	1350	1000	2190	1680	59	53	-	-	-	-	4	3÷4	10	4	60
2	46H22	1350	1000	2010	1570	59	53	13,95	12,36	35,3	38,0		05.05	_	0.5	
	46H23	1350	1000	1875	1420	59	53	17,52	15,07	42,4	46,0	6	2,5÷3,5	7	3,5	45
	<b>46H31</b>	1350	1000	3325	2510	61	55	-	-	-	-	4	3÷4	13,5	5	70
3	46H32	1350	1000	2915	2255	61	55	20,85	18,44	35,9	38,9			10		
	46H33	1350	1000	2610	2040	61	55	25,68	22,41	43,8	47,1	6	2,5÷3,5	10	4	50
	<b>46H41</b>	1350	1000	4415	3305	64	57	-	-	-	-	4	3,5÷4,5	16	5,5	75
	46H42	1350	1000	3725	2745	64	57	27,86	24,06	36,9	40,6					
	46H43	1350	1000	3210	2390	64	57	32,03	27,14	44,2	48,2	6	3÷4	12	4,5	55
	<b>46H5</b> 1	1350	1000	5770	4250	66	59	-	-	-	-	4	4÷5	18	6	90
5	46H52	1350	1000	4800	3500	66	59	34,89	29,94	36,3	40,0					
	46H53	1350	1000	4325	3110	66	59	43,06	35,90	44,1	48,8	6	3,5÷4,5	13	5	70
	<b>46H61</b>	1350	1000	6590	5065	69	62	-	-	-	-	4	4÷5,5	22	7	120
6	46H62	1350	1000	5515	4160	69	62	41,76	36,36	37,2	40,6					
	46H63	1350	1000	4900	3620	69	62	50,96	42,98	45,4	49,7	6	4÷5	16	6	100

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.

#### **Mounting heights**





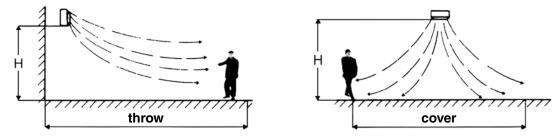
#### HELIOS TECHNICAL Specifications 6/8 P

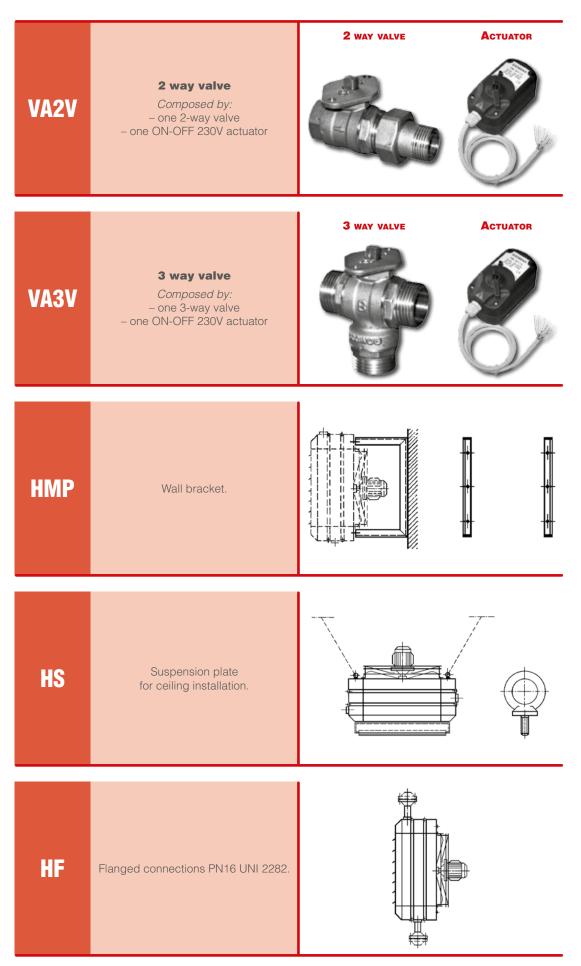
**6/8 POLE MODELS** – WATER TEMPERATURE 85-75°C Drop 10°C - Δtm 65°C - Entering air temperature 15°C

		M0 SPE	TOR EED	AIR F	LOW	LE	ISE VEL 5 m.	EMIS	SION		VING IR		MO	UNTING	HEIGH	TS:
SIZE	MODEL	r.p	.m.	m	³/h		<b>*)</b> (A)	V	V		C	POLES		ONTAL IARGE	VERT DISCH	
						PO	LES						HEIGHT	THROW	HEIGHT	COVER
		6	8	6	8	6	8	6	8	6	8		m	m	max m	m <sup>2</sup>
1	68H11	900	750	970	860	48	44	-	-	-	-	6	2,5÷3	5	3	36
	68H12	900	750	935	830	48	44	8,54	8,01	41,7	43,2					
	68H13	900	750	835	740	48	44	9,29	8,65	47,5	49,2	8	2,5÷3	4,5	-	-
	68H21	900	750	1495	1170	50	46	-	-	-	-	6	2,5÷3,5	7	3,5	45
12	68H22	900	750	1410	1100	50	46	11,70	10,26	39,3	42,3					
	68H23	900	750	1290	1025	50	46	14,23	12,41	47,3	50,4	8	2,5÷3,5	5,5	-	-
	68H31	900	750	2100	1620	52	48	-	-	-	-	6	2,5÷3,5	10	4	50
3	68H32	900	750	1880	1470	52	48	16,83	14,74	41,2	44,3					
	68H33	900	750	1735	1320	52	48	20,39	17,28	49,4	53,3	8	2,5÷3,5	7	-	-
	<b>68H41</b>	900	750	2795	2195	54	50	-	-	-	-	6	3÷4	12	4,5	55
	68H42	900	750	2345	1755	54	50	22,14	18,91	42,6	46,5					
	68H43	900	750	2010	1535	54	50	24,47	20,70	50,6	54,4	8	3÷4	8	-	-
	68H51	900	750	3685	2865	56	51	-	-	-	-	6	3,5÷4,5	13	5	70
5	68H52	900	750	3050	2335	56	51	27,87	24,17	41,7	45,3			-	-	
	68H53	900	750	2785	2100	56	51	33,58	27,27	50,3	54,4	8	3,5÷4,5	9,5	-	-
	68H61	900	750	4445	3550	59	54	-	-	-	-	6	4÷5	16	6	100
6	68H62	900	750	3710	2960	59	54	34,33	30,37	42,1	45,0					
	68H63	900	750	3270	2610	59	54	40,43	35,19	51,2	54,4	8	4÷5	12	-	-

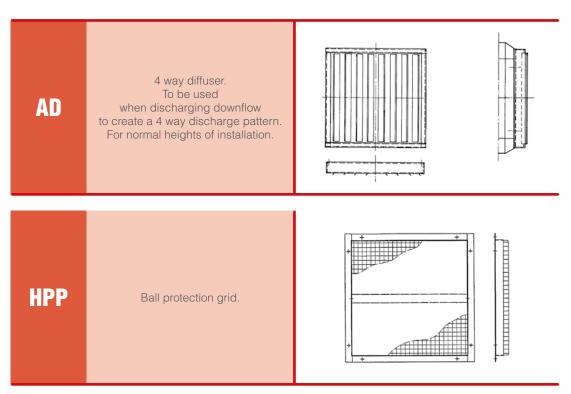
(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.



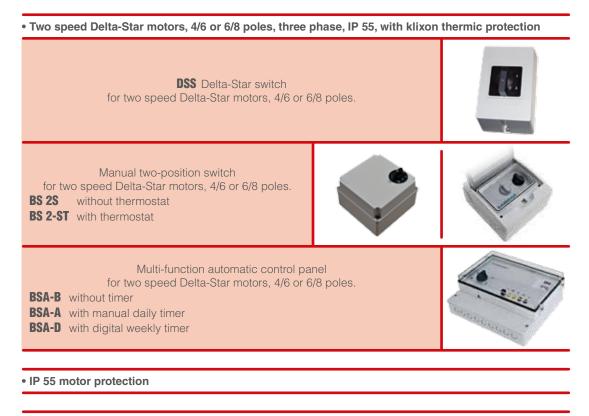








#### **Controls and Special motors**



Capacitor for single phase motor (not mounted)



## Jetstream Induction Flow Optimizer

The Atlas, Helios, Atlas ECM and Janus 05 unit heaters can be supplied with the innovative **JETSTREAM** induction flow optimiser, in the manual version or the motorised version for wall-hung or ceiling installation. The lower outlet temperature of the air from the units means less stratification of the hot air in the building and less operating time for the same ambient temperature. In addition, the increased air throw means greater uniformity of the temperature at floor level, with an expansion of the comfort zone, and consequently the possibility to install smaller and more silent appliances.

## **Technical characteristics:**

The use of the **JETSTREAM** induction flow optimizer

has the following advantages:

#### a) Energy saving:

- reduced hot air stratification within the building.
- reduced operating time of the units with the same ambient temperature.

Energy saving varies

between a minimum of 5%

and a maximum of 15%,

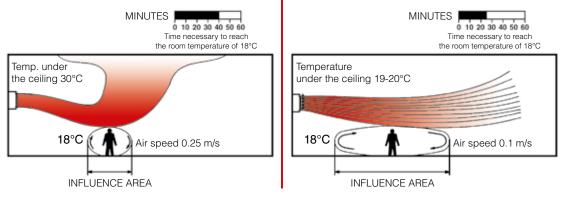
with maximum amortization in two seasons.

#### b) Environment comfort advantages:

- increased floor-temperature uniformity with greater comfort area.
- possibility to install smaller and quieter units, due to the increase of the throw.

#### Air flow produced by a unit heater <u>WITHOUT</u> induction flow optimizer

#### Air flow produced by a unit heater <u>WITH</u> induction flow optimizer



Four versions are available:

- Manual for wall installation (all sizes)
- Manual for ceiling installation (all sizes)
- Motorized for wall installation (sizes 1÷7 only)
- Motorized for ceiling installation (all sizes)

The manually controlled version calls for manual orientation

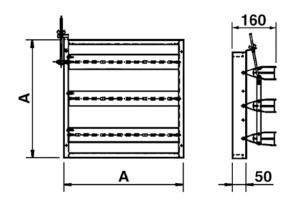
of the fins and for them to be locked using a special threaded rod.

The motorized version is supplied

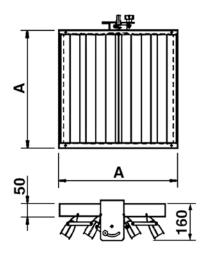
with single phase motor that can be controlled by the remote switch.

#### **Dimensions and Weight**

• (HORIZONTAL DISCHARGE)



▼ (UERTICAL DISCHARGE)



MO	DEL	А	WEIGHT
		mm	Kg
0 - 1	<b>V</b> - 1	368	1,4
<b>O</b> - 2	<b>V</b> - 2	422	1,7
<b>O</b> - 3	<b>V</b> - 3	476	1,8
<b>O</b> - 4	<b>V - 4</b>	530	2,0
<b>O</b> - 5	<b>V</b> - 5	584	2,2
<b>O</b> - 6	<b>V</b> - 6	638	2,4
0 - 7	<b>V</b> - 7	793	2,6
<b>O - 8</b>	<b>V - 8</b>	900	3,0
<b>O</b> - 9	<b>V</b> - 9	1010	3,4
<b>O</b> - 10	<b>V</b> - 10	1117	3,7

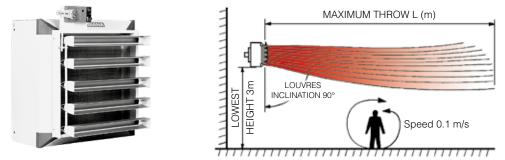
#### Controls





#### Mounting heights and Air throw

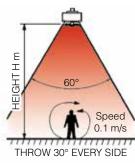
#### a) Wall installation for horizontal discharge:

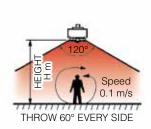


SABIANA			MAXIMUM T	HROW L (m)		
UNIT HEATER	W	ITHOUT JETSTRE	AM		WITH JETSTREAN	I
SIZE	4P	6P	8P	4P	6P	8P
1	7,5	5	4,5	12	8	-
2	10	7	5,5	16	11	-
3	13,5	10	7	18	14	-
4	16	12	8	20	15	-
5	18	13	8	23	16	-
6	22	16	12	28	20	-
7	-	24	18	-	28	22
8	-	26	20	-	32	25
9	-	28	21	-	34	26
10	-	30	22	-	37	28

#### b) Ceiling installation for vertical discharge:







SABIANA				INSTAL	LATION HEIGH	HT H (m)				
UNIT HEATER	WITH	IOUT JETSTI	REAM	WITH	JETSTREAM	AT 60°	WITH JETSTREAM AT 120°			
SIZE	4P	6P	8P	4P	6P	8P	4P	6P	8P	
1	4	3	-	5,5	4	-	4	3	-	
2	4,5	3,5	-	8	6,5	-	5	4	-	
3	5	4	-	11	8	-	6,5	5,5	-	
4	5,5	4,5	-	12	9	-	6,5	5,5	-	
5	6	5	-	13	10	-	7	6	-	
6	7	6	-	14	12	-	8	7	-	
7	-	7	6	-	13	11	-	8	7	
8	-	9	7	-	15	12	-	10	8	
9	-	11	8	-	18	13	-	13	9	
10	-	12	9	-	19	14	-	14	10	



# AIX Stainless Steel Unit Heater

**Control Control Contr** 

hey are especially suitable for working environments in which these types of system configurations are required.



# Technical characteristics of the main components:

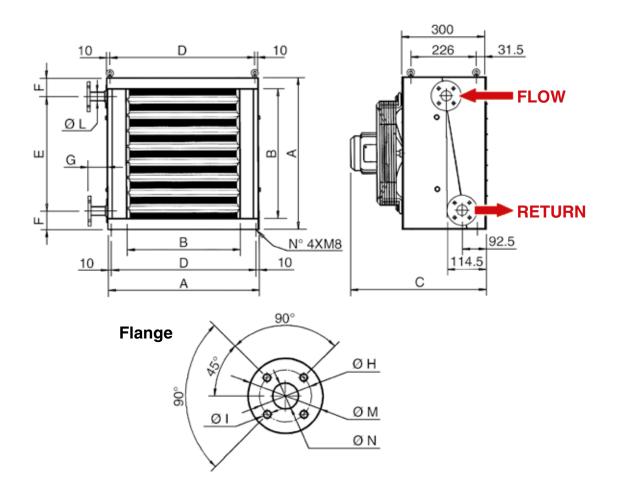
- The main casing is manufactured from AISI 304 stainless steel, 1 mm thick.
- The adjustable louvres are held firm by spring loaded pivots and they are mounted in horizontal position on the front part of the unit.
- Coil: the fins are pressed from aluminium sheet, bonded onto the AISI 304 stainless steel tubes facilitating the maximum transfer contact. The AIX units are supplied with flanged connections.
- The standard motor is hermetically sealed and is maintenance free. The motor is 2 speeds, 3 phase, single voltage, 400V 50Hz, protection IP55, with klixon thermal protection.

#### **AIX identification code**

Reference: 46142

46	l.	4	2
MOTOR 4/6 POLE	RANGE	SIZE	ROWS
(1350/1000 r.p.m.)	AIX	4	2

### **Dimensions, Weight, Water content**



MODEL	٨	В	C	П	г	г	GØ	αц	מו מו	Ø	(ALA	ØN	W	WEIGHT Kg WATER CONTENT Liters			
INIUDEL	A	D	U	D	С	Г	G	חש	ØI	ØL	UIVI		1	R	2R	1R	2R
46   21-22	526	393	468	506	330	98	66	65	14	1 ½	95	15	2	6	30	1,7	2,5
46   41-42	636	501	468	616	497	69.5	66	85	14	1"	115	25	3	3	38	2,9	4,2
46   61-62	743	609	468	723	588	44.5	56	100	18	1 1⁄4"	140	32	4	5	51	5,3	5,9
68   91-92	1011	877	576	991	832	89.5	87	110	18	1 1⁄2"	150	40	8	2	92	8,2	12



### **AIX TECHNICAL SPECIFICATIONS**

m

dB(A)

kW

Leaving air

temp. °C

kW

Leaving air

temp. °C

11

59

13

33.2

18.9

41.5

HEATING EMISSION

Throw

Noise level at 5 m (\*)

Water temperature 85/75°C

Entering air temperature +15°C

Water temperature 130/100°C

Entering air temperature +15°C

MODEL	46	I 21	46	I 41	46	I 61	68 I 91		
Mounting height	m	2.5 ÷ 4		3 ÷	4.5	3 -	÷ 5	3.5 ÷ 5.5	
Speed	r.p.m.	1350	1000	1350	1000	1350	1000	900	700
Air flow	m³/h	2300	1500	3900	2600	6900	4400	10200	7600
Throw	m	11	7.5	16	12	25	18	28	21
Noise level at 5 m (*)	dB(A)	59	51	64	54	69	60	68	62
Steam 3 bars	kW	14.3	11.9	23.4	19.8	37	31	68.4	60.5
Entering air temperature +15°C	Leaving air temp. °C	33.3	38.3	32.6	37.4	30.8	35.7	34.7	38.4
Steam 6 bars	kW	16.5	13.8	27	22.9	42.7	35.9	79	70
Entering air temperature +15°C	Leaving air temp. °C	36.1	42	35.4	40.9	33.2	39	37.8	42.1
MODEL		46	I 22	46	42	46	l 62	68	92
ounting height m		2.5 ÷ 4		3 ÷ 4.5		3 -	÷ 5	3.5 ÷ 5.5	
Speed	r.p.m.	1350	1000	1350	1000	1350	1000	900	700
Air flow	m³/h	2100	1400	3600	2400	6300	4100	9200	7000

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.

7.5

51

10.6

37.3

15.4

47.3

16

64

21.1

32.2

30.2

39.7

12

54

17.2

36.1

24.7

45.3

25

69

36.5

32

53.3

39.9

18

60

29.3

36

43

45.8

28

68

59.2

33.9

84.1

41.9

21

62

51.4

36.6

74

46.1



<b>DSS</b> Delta-Star switch for two speed Delta-Star motors, 4/6 or 6/8 poles.
Manual two-position switch for two speed Delta-Star motors, 4/6 or 6/8 poles. BS 2-ST without thermostat with thermostat
Multi-function automatic control panel for two speed Delta-Star motors, 4/6 or 6/8 poles. BSA-B without timer BSA-A with manual daily timer

BSA-D with digital weekly timer



# Atlas STP Door Curtain Unit

The **Atlas STP** door curtain units, supplied with hot water, are fitted with special diffusers that create a curtain of hot air. Installed above the door, they deliver a constant vertical flow of air, representing a barrier that, by thermodynamic effect, stops the infiltration of air from the outside, and mixes the residual cold currents. Available in three sizes, with two speed and 1, 2, 3 row coils.

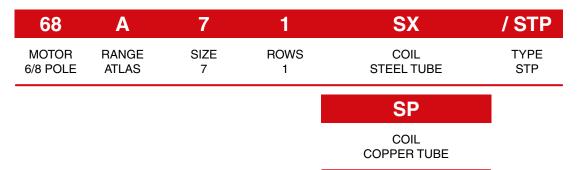


# Technical characteristics of the main components:

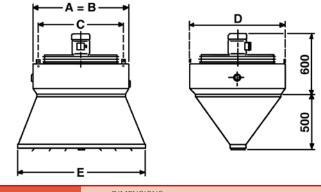
- The main casing is manufactured from galvanized prepainted steel finished in light grey colour (RAL 9002), and is assembled from three component parts, which are assembled using self-tapping screws in order to allow quick maintenance on the coil.
- Fishtail diffuser produced from steel sheet with manually adjustable louvres for individual requirements.
- Coil manufactured from high quality steel or copper tube 22 mm of diameter to reduce resistance with mechanically bonded aluminium fins for high efficient heat transfer. Available in 1, 2 or 3 rows.
- Consists of aluminium helicoidal blades statically and dynamically balanced with a cast alloy hub, keyed into the motor shaft and mounted onto the casing with antivibration rubber mounting blocks. The motor is supplied as standard for a three phase, 400V 50Hz, class B, IP55, 6/8 poles two speed: 900 r.p.m. (6 poles) or 700 r.p.m. (8 poles).

#### **Identification code**

Reference: 68A71 SX / STP



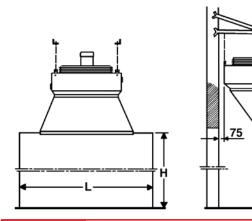
#### **Dimensions, Weight, Water content**



		DIMEN	ISIONS		ROWS	WEIGHT	WATER
SIZE	A=B	С	D	E	10003	WLIGHT	CONTENT
		n	าท			kg	Liters
_				1000	1	62	4.3
7	793	696	793		2	70	8.2
_					3	76	12.3
		803			1	75	5.8
8	900		900	1200	2	86	11.1
					3	93	16.6
					1	90	7.6
9	1010	913	1010	1400	2	104	14.5
					3	113	21.8

#### **Correct selection of the door curtain**

0



SIZE	MOTOR POLE	DOOR HEIGHT H (m)	DOOR WIDTH L (m)
7	6	3.0 ÷ 4.0	1.5
8	6	3.5 ÷ 4.5	2.0
9	6	4.5 ÷ 5.5	2.5
7	8	2.5 ÷ 3.0	1.5
8	8	3.0 ÷ 3.5	1.8
9	8	3.5 ÷ 4.5	2.0



#### **Atlas STP T**ECHNICAL **S**PECIFICATIONS

ENTERING AIR TEMPERATURE 15°C

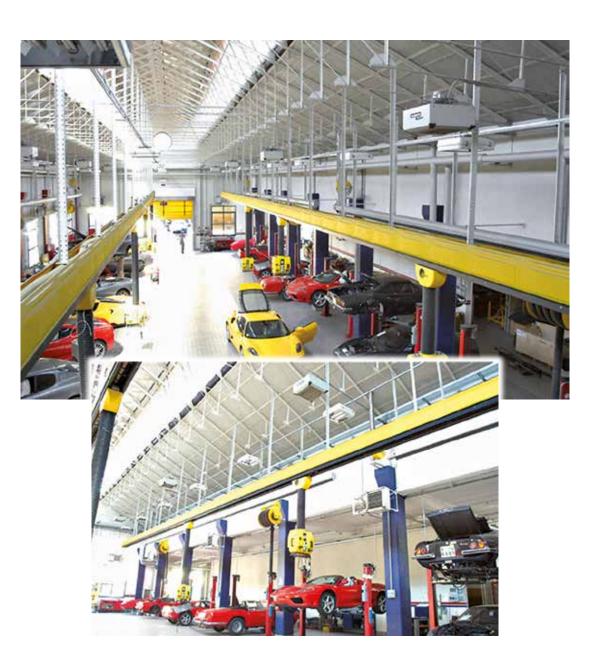
		MO	TOR				)ISE VEL				EMIS	SION				
		SPI	SPEED		LOW		5 m. <b>*)</b>	W		MPERATUI 70°C	RE	W	WATER TEMPERATURE 140-100°C			
SIZE	MODEL	r.p	.m.	m	³/h	dB	8(A)	k	W	LEAVIN TEMPERA		k'	N	LEAVI TEMPER/	NG AIR ATURE °C	
									POLE	S						
		6	8	6	8	6	8	6	8	6	8	6	8	6	8	
	68A71/STP	900	750	4435	3440	69	63	-	-	-	-	39,42	35,03	41,0	44,8	
7	68A72/STP	900	750	4175	3175	69	63	38,15	32,87	41,7	45,3	62,72	54,06	59,0	64,8	
	68A73/STP	900	750	4000	3045	69	63	44,87	38,06	47,8	51,5	-	-	-	-	
	68A81/STP	900	750	6655	4700	69	64	-	-	-	-	50,62	43,35	37,2	42,0	
8	68A82/STP	900	750	6000	4300	69	64	49,08	41,20	38,9	43,0	80,12	67,29	54,1	60,8	
	68A83/STP	900	750	5480	3915	69	64	59,42	48,49	46,7	51,2	-	-	-	-	
	68A91/STP	900	750	9220	6610	70	65	-	-	-	-	70,80	61,10	37,5	42,0	
9	68A92/STP	900	750	8870	6260	70	65	70,79	59,10	38,3	42,6	116,23	96,92	53,3	60,3	
	68A93/STP	900	750	8170	5560	70	65	86,68	69,00	46,0	51,3	-	-	-	-	

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.



### No-Strat Anti-stratification and Heat Economiser Unit

**O-STRAT**, an anti-air-stratification unit, recirculates the hot air downwards, hot air that in large spaces heated with warm air (for example, using hot air generators) tends to stratify towards the top. The temperature controller fitted on the appliance can be used to set the air temperature at which the **NO-STRAT** starts operation. In addition, it can be used to increase the recirculation air rate and improve the uniformity of the ambient temperature. The series includes 8 models, with flow-rates from 3.500 to 14.000 m<sup>3</sup>/h.

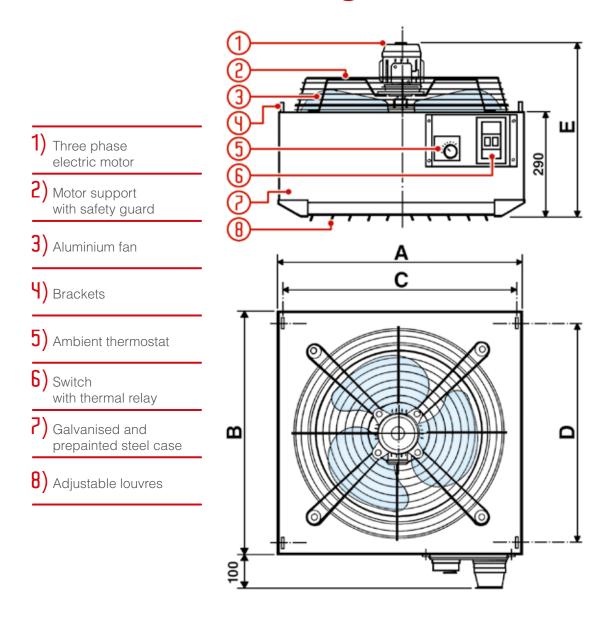


## Technical characteristics of the main components:

- The casing is manufactured from galvanised prepainted steel sheet (1 mm thick) finished in light grey colour (RAL 9002).
   The adjustable louvres are held firm by spring loaded pivots.
- The fan assembly is made up of the aluminium helicoidal fan, the safety guard support and the three phase V400/3 electric motor with 4 or 6 poles, protection IP44.
- A room thermostat is mounted on the unit for the automatic on/off switching of the motor in accordance with the temperature under the ceiling.
- 3-phase power switch V400/3 with built-in overload protection.

1<mark>10-Stra</mark>

#### **Dimensions and Weight**



MO	DEL	А	В	С	D	E	WEIGHT Kg
DNS-450/4	DNS-450/6	634	634	629	537	488	20
DNS-500/4	DNS-500/6	688	688	683	591	488	23
DNS-550/4	DNS-550/6	742	742	737	645	513	25
—	DNS-650/6	900	900	895	803	575	33
-	DNS-750/6	1010	1010	1005	913	595	42



#### **NO-STRAT Technical Specifications**

MODEL	MOTOR SPEED r.p.m.	AIR FLOW m³/h	INSTALLATION HEIGHT m	SURFACE m <sup>2</sup>	NOISE LEVEL AT 5 m. <b>(*)</b> dB(A)
DNS-450/4	1400	4.300	4,5 ÷ 6,5	100	61
DNS-450/6	900	2.800	3,5 ÷ 6	60	52
DNS-500/4	1400	5.500	5 ÷ 8	150	66
DNS-500/6	900	3.750	4÷8	90	56
DNS-550/4	1400	6.300	6,5 ÷ 9	200	69
DNS-550/6	900	4.600	5 ÷ 8,5	120	60
DNS-650/6	900	9.100	6,5 ÷ 11	300	67
DNS-750/6	900	13.200	7 ÷ 13	400	68

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.

**No-Strat** 



## Comfort Circular Unit Heater

**COMFORT Sabiana** circular unit heaters, for ceiling installation only, are especially suitable for high rooms, even if the optimum ratio between the air flow-rate and the heat output make them suitable for any manufacturing environment. The large coil and the fan downstream of the coil ensure optimum mixing of the air in the environment, meaning less stratification of the hot air than with traditional unit heaters. Two different diffusers ensure perfect control of the air flow, with the possibility on the more common diffusers to tilt each louvre in the desired direction.

he Comfort unit heaters are made in 10 sizes, with heat outputs from 17 to 107 kW, and one or two speeds motors.





# Technical characteristics of the main components:

- The casing is made of spun steel on both top and bottom sections which is designed to give greater strength and quieter operation. The casing is then finished with an epoxy, polyester powder coating of light grey, RAL 9002.
- The circular coil is constructed of copper tubes with aluminium fins.
- The helicoidal fan is statically and dynamically balanced, the rational high-capacity profile provides maximum air volume with a minimum power consumption.



• Standard motors are three phase 400 V, closed frame, flange mounted, pre-greased bearings. Available with single speed at 4 and 6 pole (IP44), with double speed double wiring at 4/6 pole (IP44) or with two speed Delta-Star motors at 6/8 pole (IP55).

On request: • Flanged connections.

• Steam execution.

#### **COMFORT** identification code

Reference: 6Z-415

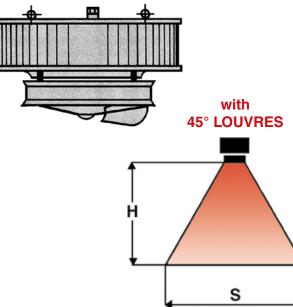
6	Z	4	15
MOTOR 6 POLE (900 r.p.m.)	RANGE COMFORT	SIZE	N° OF CIRCUITS

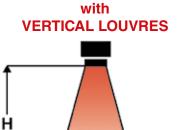
#### —— "DRA" radial diffuser



This is the most commonly used model; made of eight separately adjustable large louvres, shaped so as to be able to cover the whole outlet area and therefore adaptable for minimum to maximum heights. This diffuser allows the air to be directed more easily to the areas where it is required most, or conversely, if you do not require air to one particular corner you can close down one, two or three vanes and restrict the distribution.

#### Mounting heights and area of air distribution





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		•									
		1400 r.p.m. N	IOTOR SPEED		900 r.p.m. MOTOR SPEED						
SIZE	45° LC	UVRES	VERTICAL	LOUVRES	45° LOUVRES VERTICAL LOUVRES						
	H suggested m	S diameter m	H suggested m	S diameter m	H suggested S diameter H suggested S diameter m m m						
0	3 ÷ 5	15 ÷ 21	4 ÷ 6	7.5 ÷ 10.5	2.5 ÷ 4 10.5 ÷ 16.5 3.5 ÷ 5 6 ÷ 9						
1	3.5 ÷ 5.5	16.5 ÷ 21	4.5 ÷ 6.5	9 ÷ 12	3 ÷ 4.5 12 ÷ 18 4 ÷ 5.5 7.5 ÷ 10.5						
2	4 ÷ 6	18 ÷ 25.5	5 ÷ 7	10.5 ÷ 13.5	3 ÷ 5 12 ÷ 19.5 4.5 ÷ 6.5 9 ÷ 12						
3	4 ÷ 6.5	18 ÷ 27	5.5 ÷ 8	10.5 ÷ 15	3.5 ÷ 5.5 15 ÷ 22.5 5 ÷ 7 9 ÷ 13.5						
4	4 ÷ 7	18 ÷ 28.5	6 ÷ 9	10.5 ÷ 16.5	3.5 ÷ 6 15 ÷ 24 5.5 ÷ 8 10.5 ÷ 15						
5	-	-	-	-	4 ÷ 6.5 16.5 ÷ 25.5 5.5 ÷ 8.5 10.5 ÷ 15						
6	-	-	-	-	4 ÷ 8 16.5 ÷ 28.5 6 ÷ 10 12 ÷ 18						
7	-	-	_	-	4 ÷ 8 16.5 ÷ 28.5 6 ÷ 10 12 ÷ 18						
8	-	_	_	-	5 ÷ 11 18 ÷ 31.5 6.5 ÷ 14 13.5 ÷ 19.5						
9	-	-	-	-	5 ÷ 11 18 ÷ 33 6.5 ÷ 14 13.5 ÷ 21						



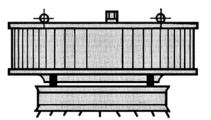


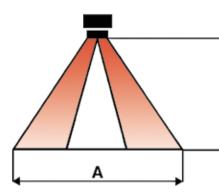
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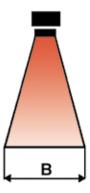
It is designed to give a two way or corridor distribution, suitable for corridor or gangway areas, between storage racks etc., generally mounted at any height depending upon the length of corridor required.

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#### Mounting heights and area of air distribution



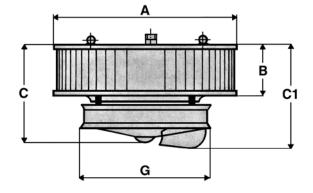


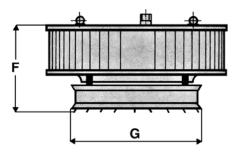


	1400 r.p.m. I	NOTOR SPEED	900 r.p.m. MOTOR SPEED						
SIZE	H suggested	ZONE m	H suggested	ZONE m					
	m	A B	m	A B					
0	3 ÷ 6	15x6 ÷ 10x4	2.5 ÷ 5	13x5 ÷ 9x4					
1	3 ÷ 6	16x7 ÷ 10x5	2.5 ÷ 5	14x6 ÷ 10x4					
2	3.5 ÷ 7	18x8 ÷ 14x5	3 ÷ 6	16x7 ÷ 10x4					
3	3.5 ÷ 8	20x10 ÷ 14x6	3 ÷ 6.5	17x8 ÷ 13x5					
4	4 ÷ 9	22x10 ÷ 15x7	3.5 ÷ 7	20x10 ÷ 15x5					
5	-	-	4 ÷ 8	22x10 ÷ 16x5					
6	-	-	4 ÷ 10	24x10 – 18x6					
7	-	-	4 ÷ 11	24x11 – 20x8					
8	_	_	6 ÷ 15	26x12 – 22x10					
9	_	_	6 ÷ 15	26x12 – 22x10					

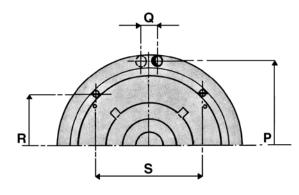
#### **Dimensions, Weight, Water content**

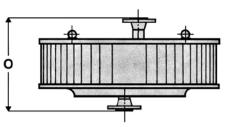
#### <u>DRA</u>





**T2** 





Version with PN 16 flanges

SIZE	А	В	С	C1	F	G	0	Р	Q	R	S	CONNECTIONS Ø	WEIGHT Kg	WATER CONTENT Liters
0	680	180	430	560	380	560	331	612	62	350	350	1 1⁄4"	31	1,20
1	780	180	430	560	380	560	331	702	62	421	421	1 1⁄4"	36	1,30
2	780	280	530	660	480	560	431	702	62	421	421	1 1⁄4"	42	1,90
3	880	280	530	700	480	660	435	802	68	491	491	1 1⁄2"	52	2,40
4	880	380	630	760	580	660	535	802	68	491	491	1 1⁄2"	58	3,20
5	1080	380	630	870	580	760	539	1005	80	755	440	2"	75	4,30
6	1080	455	705	945	655	760	614	1005	80	755	440	2"	85	5,20
7	1080	555	805	1045	755	760	714	1005	80	755	440	2"	95	5,90
8	1080	555	815	1055	765	760	714	1005	80	755	440	2"	97	5,90
9	1080	605	865	1105	815	760	765	1005	80	755	440	2"	106	6,50

The units with steam coils are supplied with connections for welding; on request they can be supplied with flanges.



### **COMFORT TECHNICAL**

#### **Specifications**

WATER TEMPERATURE 85-75°C Drop 10°C - Entering air temperature 15°C

SIZE	MOTOR SPEED	MODEL REF.	AIR FLOW	NOISE LEVEL AT 5 m. <b>(*)</b>	EMISSION	LEAVING AIR TEMPERATURE
	r.p.m.		m³/h	dB(A)	W	°C
Û	1400	4Z-007	3.000	56	24.400	39
1	1400	4Z-107	3.400	60	28.400	39
2	1400	4Z-211	5.100	63	41.800	39
3	1400	4Z-311	6.000	65	48.800	39
4	1400	4Z-415	7.800	66	64.400	39
0	900	6Z-007	2.000	48	19.100	43
1	900	<i>6Z-107</i>	2.400	52	22.100	42
2	900	6Z-211	3.700	54	32.700	41
3	950	6Z-311	4.400	55	38.000	40
4	950	6Z-415	5.700	56	50.200	41
5	930	6Z-515	7.100	63	61.500	40
6	930	6Z-618	9.000	64	77.800	40
7	930	6Z-722	9.900	65	92.000	42
8	930	6Z-822	11.000	65	107.000	44
9	930	<i>6Z-924</i>	12.000	66	115.100	44

Thermal emission with motor running at 700 r.p.m.: Watt = 0.85 x Watt with motor at 900 r.p.m.

Air = 0.70 x air flow with motor at 900 r.p.m.

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.

On request: double speed motor, single tension.



## Polaris Air Conditioner

**POLARIS Sabiana** circular unit heaters, for ceiling installation only, are especially suitable for high rooms, even if the optimum ratio between the air flow-rate and the heat / cool output make them suitable for any manufacturing environment.

The large coil and the fan downstream of the coil ensure optimum mixing of the air in the environment, meaning less stratification of the hot air than with traditional unit heaters.

When supplied with cold water they can also be used in the summer months, thus allowing cooling at very reasonable costs.

he Polaris unit heaters are made in 9 sizes, all fitted with very silent two speeds motors, heat outputs from 17 to 107 kW and cooling capacities from 2 to 20 kW.







## Technical characteristics of the main components:

- The casing is made of spun steel on both top and bottom sections which is designed to give greater strength and quieter operation. The casing is then finished with an epoxy, polyester powder coating of light grey, RAL 9002.
- The circular coil is constructed of copper tubes with aluminium fins.
- The helicoidal fan is statically and dynamically balanced, the rational high-capacity profile provides maximum air volume with a minimum power consumption.
- Standard motors are three phase 400 V, closed frame, flange mounted, pre-greased bearings, protection IP 55. Available with two speed Delta-Star motors at 6/8 pole.

On request: • Delta-Star switch for two speed Delta-Star motors, 6/8 poles, with klixon thermic protection.

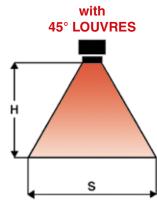


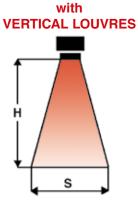
#### —— "DRA" radial diffuser

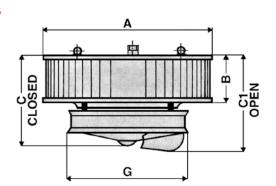
Made of eight separately adjustable large louvres, shaped so as to be able to cover the whole outlet area and therefore adaptable for minimum to maximum heights. This diffuser allows the air to be directed more easily to the areas where it is required most, or conversely, if you do not require air to one particular corner you can close down one, two or three vanes and restrict the distribution.

#### Mounting heights and area of air distribution

#### **Dimensions, Weight, Water content**







SIZE	45° L0	900 r.p.m. M UVRES	OTOR SPEED VERTICAL		DIMENSIONS					WEIGHT	WATER CONTENT	
	H suggested m	S diameter m	H suggested m	S diameter m	Amm	B mm	C mm	C1 mm	G mm	CONNECTIONS Ø	ka	Liters
0	2.5 ÷ 4	10.5 ÷ 16.5	3.5 ÷ 5	6 ÷ 9	680	180	430	560	560	1 1⁄4"	31	1,20
1	3 ÷ 4.5	12 ÷ 18	4 ÷ 5.5	7.5 ÷ 10.5	780	180	430	560	560	1 1⁄4"	36	1,30
3	3.5 ÷ 5.5	15 ÷ 22.5	5 ÷ 7	9 ÷ 13.5	880	280	530	700	660	1 1⁄2"	52	2,40
4	3.5 ÷ 6	15 ÷ 24	5.5 ÷ 8	10.5 ÷ 15	880	380	630	760	660	1 1⁄2"	58	3,20
5	4 ÷ 6.5	16.5 ÷ 25.5	5.5 ÷ 8.5	10.5 ÷ 15	1080	380	630	870	760	2"	75	4,30
6	4 ÷ 8	16.5 ÷ 28.5	6 ÷ 10	12 ÷ 18	1080	455	705	945	760	2"	85	5,20
7	4 ÷ 8	16.5 ÷ 28.5	6 ÷ 10	12 ÷ 18	1080	555	805	1045	760	2"	95	5,90
8	5 ÷ 11	18 ÷ 31.5	6.5 ÷ 14	13.5 ÷ 19.5	1080	555	815	1055	760	2"	97	5,90
9	5 ÷ 11	18 ÷ 33	6.5 ÷ 14	13.5 ÷ 21	1080	605	865	1105	760	2"	106	6,50



#### **POLARIS T**ECHNICAL SPECIFICATIONS

SIZE	SIZE MOD.	NOISE LEVEL AT 5 m. <b>(*)</b>		AIR FLOW		<b>HEATING:</b> Water temperature 85/70°C - Entering air temperature 15°C					
		dB	(A)	m³/h			W	Leaving air temp. °C			
		930 r.p.m.	800 r.p.m.	930 r.p.m.	800 r.p.m.	930 r.p.m.	800 r.p.m.	930 r.p.m.	800 r.p.m.		
0	P.007	48	46	2.000	1.400	17.600	15.100	41	47		
1	P.107	52	49	2.400	1.680	20.400	17.400	40	46		
3	P.311	55	52	4.400	3.080	35.300	30.000	38	44		
4	P.415	56	53	5.700	4.000	46.700	39.600	39	44		
5	P.515	63	58	7.100	4.970	57.100	48.500	39	44		
6	P.618	64	59	9.000	6.300	72.200	61.400	38	44		
7	P.722	65	60	9.900	6.930	85.600	72.700	40	46		
8	P.822	65	60	11.000	7.700	99.500	84.500	43	48		
9	P.924	66	61	12.000	8.400	106.700	90.700	42	47		

SIZE	MOD.	AT §	LEVEL 5 m. <b>*)</b>	AIR F	LOW	Relative Hu	<b>LING:</b> ımidity 55% · Entering air temperature 28°C
		dB	(A)	m	³/h	1	N
		930 r.p.m.	800 r.p.m.	930 r.p.m.	800 r.p.m.	930 r.p.m.	800 r.p.m.
0	P.007	48	46	2.000	1.400	3.100	2.700
1	P.107	52	49	2.400	1.680	4.000	3.500
3	P.311	55	52	4.400	3.080	7.500	6.600
4	P.415	56	53	5.700	4.000	10.900	9.500
5	P.515	63	58	7.100	4.970	13.600	11.900
6	P.618	64	59	9.000	6.300	17.200	15.000
7	P.722	65	60	9.900	6.930	18.900	16.500
8	P.822	65	60	11.000	7.700	22.000	19.000
9	P.924	66	61	12.000	8.400	23.700	20.600

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.



### Janus Air Conditioner

**JANUS** unit heaters can be used to economically cool industrial, commercial and sporting facilities, transforming a traditional heating system using unit heaters into a system that can also be used in the summer months, significantly improving the working conditions. The condensate collection tray is built into the appliance, while two-speed motors are fitted as standard. Upon request, controls with thermostat can also be supplied. The Janus unit heaters are made in 4 sizes, each with 3 and 4 row coils, for a total of 8 models, with heat outputs from 16 to 104 kW and cooling capacities from 5 to 28 kW.

Upon request, all sizes are available with the **innouatiue electronic motors** with extremely low energy consumption, controlled by an inverter board and identified by ECM. The ECM motors allow to decrease electric consumption compared to traditional asynchronous motors and they enable to adjust the air flow continuously and control the ambient temperature with precision, with further benefits in terms of very low noise levels.



## Technical characteristics of the main components:

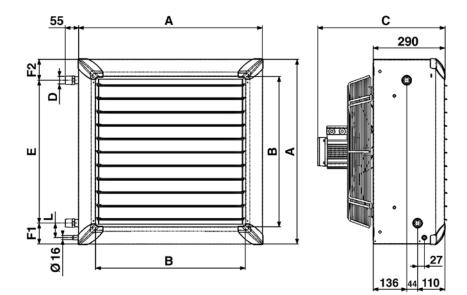
- The main casing is manufactured from galvanized prepainted steel (1 mm thick) finished in light grey (RAL 9002), and it is assembled from three component parts, assembled with self-tapping screws for quick maintenance on the heat coil. The use of hot dip galvanised and pre-painted steel ensures consistency and excellent protection against corrosion.
- The standard motor fitted is a hermetically sealed and is maintenance free. The motor is 2 speeds, 3 phase, single voltage 400V/50Hz, protection IP55, class B, with klixon thermal protection that is triggered in the event of overheating. The rotation speed can be reduced by passing from delta to star connection.
- Coil with large heating surfaces with copper pipe and in aluminium fins.
- The condensate collection tray is fitted inside the unit. Made from galvanized steel insulated with polyolefin (PO) foam (class M1).

#### **JANUS identification code**

Reference: 46F43

46	F	4	3
MOTOR 4/6 POLE (1350/1000 r.p.m.)	RANGE JANUS	SIZE	ROWS

#### **Dimensions, Weight, Water content**



**CONTENT** Liters

4R 2,2 3,4 5,1 9,8

MODEL	А	В	С	D	F	F1	F2	I	WEIG	HT Kg	WATER
MUDEL	A	D	U	D	E	ГІ	ГΖ	L	3R	4R	3R
46 F 23/24	526	390	500	1"	376	78	71	58	25,0	26,0	1,7
46 F 43/44	634	498	500	1"	476	76	83	58	32,5	34,0	2,7
68 F 63/64	742	606	525	1"	576	83	83	58	42,5	44,5	4,0
68 F 93/94	1010	874	650	1 1⁄4"	818	90	100	67	77,0	81,0	7,6

#### **JANUS TECHNICAL SPECIFICATIONS**

HEATING EMISSION

MODEL			6 23		6 24		6 43		6 44		8 63	6 F	8 64		8 93		8 94
Mounting height m		2.5 ÷ 4			3 ÷ 4.5			3 ÷ 5				3.5 ÷ 5.5					
Speed	r.p.m.	1350	1000	1350	1000	1350	1000	1350	1000	950	750	950	750	950	750	950	750
Air flow	m³/h	2000	1365	1800	1270	3450	2290	3100	2000	3930	3050	3510	2650	7500	5800	6800	5100
Throw	m	11	7,5	10	6,5	16	12	15	11	16	12	15	11	26	20	25	19
Noise level at 5 m <b>(*)</b>	dB(A)	59	51	59	51	64	54	64	54	60	52	60	52	66	60	66	60
Water temperature 45/40°C ∆t 5°C	kW	8,47	6,65	9,66	7,62	14,44	11,15	16,55	12,27	18,81	15,77	20,67	16,95	37,97	32,04	42,29	34,43
Entering air temp. +15°C	Leaving air temp. °C	27,4	29,3	30,7	32,6	27,3	29,2	30,6	32,9	29,0	30,4	32,2	33,7	29,8	31,2	33,2	34,8
Water temperature 85/75°C ∆t 10°C	kW	20,75	16,23	23,58	18,52	35,15	27,08	40,14	29,66	45,46	38,07	49,79	40,75	92,37	77,80	102,66	83,31
Entering air temp. +15°C	Leaving air temp. °C	43,4	49,8	53,3	57,7	44,8	49,6	52,9	58,4	48,8	52,1	56,5	60,0	51,0	54,2	59,2	62,8
Water temperature 90/70°C ∆t 20°C	kW	19,86	15,63	22,76	18,00	33,86	26,26	39,04	29,10	44,38	37,26	48,95	40,28	89,39	75,66	100,11	81,73
Entering air temp. +15°C	Leaving air temp. °C	44,0	48,5	52,0	56,5	43,7	48,5	51,8	57,6	48,0	51,3	55,8	59,5	49,9	53,2	58,1	61,9

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.



### **JANUS TECHNICAL SPECIFICATIONS**

COOLING EMISSION

MODEL		46 F 23	46 F 24	46 F 43	46 F 44	68 F 63	68 F 64	68 F 93	68 F 94
Mounting height	m	2.5	÷ 4	3 ÷	4.5	3 -	÷ 5	3.5 -	÷ 5.5
Speed	r.p.m.	1000	1000	1000	1000	750	750	750	750
Air flow	m³/h	1365	1270	2290	2000	3050	2650	5800	5100
Throw	m	7,5	6,5	12	11	12	11	20	19
Noise level at 5 m <b>(*)</b>	dB(A)	51	51	54	54	52	52	60	60
Water	kW Total	5,00	6,08	8,62	10,28	13,08	15,28	23,24	26,89
temperature 7/12°C ∆t 5°C	kW Sensible	3,57	4,14	6,05	6,78	8,79	9,78	16,09	17,75
Entering air temp. +28°C R.H. 55%	Leaving air temp. °C	20,1	18,1	20,0	17,7	19,9	16,8	19,6	17,4
Water	kW Total	3,57	4,27	6,21	7,32	9,33	10,89	16,56	19,08
temperature 11/15°C ∆t 4°C	kW Sensible	3,25	3,62	5,43	5,86	7,61	8,28	14,28	15,38
Entering air temp. +28°C R.H. 55%	Leaving air temp. °C	20,8	19,4	20,8	19,1	20,3	18,5	20,5	18,9
Water	kW Total	4,02	4,90	6,93	8,34	10,62	12,51	18,76	21,74
temperature 9/14°C ∆t 5°C	kW Sensible	3,31	3,79	5,51	6,11	7,91	8,75	14,66	16,07
Entering air temp. +28°C R.H. 55%	Leaving air temp. °C	20,6	19,0	20,7	18,7	20,0	18,0	20,3	18,4

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.

#### Accessories

		2 WAY VALVE	ACTUATOR
VA2V	<b>2 way valve</b> Composed by: – one 2-way valve – one ON-OFF 230V actuator		8
VA3V	<b>3 way valve</b> Composed by: – one 3-way valve – one ON-OFF 230V actuator	3 WAY VALVE	ACTUATOR

#### Accessories

KIT-VA	<b>Extension kit</b> To be used with water valves (mandatory).	
AMP	Wall bracket.	
AD	4 way diffuser. To be used when discharging downflow to create a 4 way discharge pattern.	
ARC	Simple intake hood fitted underneath. Wall bracket included. Prepainted steel thickness 1 mm.	
AE	Fresh air box. Prepainted steel thickness 1 mm.	
AES	Fresh air box with manually operated damper (can be motorized by the customer). Prepainted steel thickness 1 mm.	



#### Accessories

AM	Internal/external air mixing box manually controlled. Prepainted steel thickness 1 mm.	
AMS	Internal/external air mixing box, manually controlled (can be motorized by customer). Prepainted steel thickness 1 mm.	
APP	Ball protection grid.	
AG	External air intake grille suitable with AE and AES air boxes. Prepainted steel thickness 1 mm.	

#### Controls





## Élegant ECM Ceiling Air Conditioner

to heat and cool very economically small and medium areas, like shops, show rooms, workshops, supermarkets.

he range is made up of 12 models: **RE–ECM** version, for heating only, is made up of **8 models**, and **PE–ECM** version, for heating and cooling, is made up of **4 models**. All models are for ceiling installation and for hot/chilled water supply.



The **Elegant ECM** series uses an innovative brushless synchronous permanent magnet electric motor controlled by an inverter card that is directly installed on the unit.

The intake of the air is from the bottom side of the unit and the air supply is from the 4 lateral grids which have individually controllable louvres for the best distribution of the air.

The condensate drain is made through an electronically controlled micro-pump, supplied on every standard PE–ECM model.

Different remote controls of the air flow and of the room temperature are available and it is possible to control up to 10 units with only one remote control.

All the **Elegant ECM** units can be supplied with a wide range of controls using the **Modbus RTU – RS 485** communication protocol.

Beside the low installation and running cost, the Elegant ECM Sabiana air conditioners offer the following advantages:

- they take up a small amount of the valuable space in the room, there is not any ducting system and the walls are free.
- they are versatile and provide flexibility of installation: also where there is no false ceiling it is possible to distribute the air evenly.
- they provide easy control and are easily installed.

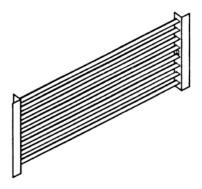
#### **Construction features**

**Casing** made of steel on both top and bottom sections and it is then finished with an epoxy-polyester powder coating dried at 180°, in white RAL 9016. The lower casing is also the condensate collection tray. The components are assembled with screws and so it is possible

to quickly dismantle it for inspection when needed.

<u>Outlet grids</u>

The discharge of the air is obtained through 4 grids on the 4 lateral sides. They are comprised by a frame in which the louvres are individually adjustable. It is very easy to take off these grids, allowing for easy maintenance of the coil and of the condensate tray.



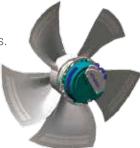
#### Electronic motor

Three phase permanent magnet brushless electronic motor.

The inverter board that controls the motor operation is powered by 230 Volt, single-phase and it generates a frequency modulated wave form power supply. The electric power supply required for the machine is therefore single-phase with voltage of 230-240V and frequency of 50-60Hz.

#### <u>Helicoidal fan</u>

The fan is made with statically and dynamically balanced plastic blades. Its rational high-capacity profile provides the maximum air volume with the minimum energy consumption. The fan hub is secured onto the motor shaft and it is protected by a safety guard.

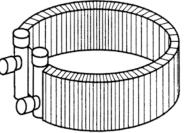


#### <u>Coil</u>

The coil is constructed of copper tubes with aluminium fins and steel headers.

The supply and return connections have a female threading, 1" diameter, and they allow the connection either vertically from above or horizontally from a side.

The coil is supplied in two versions: with 1 row and with 2 rows. The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

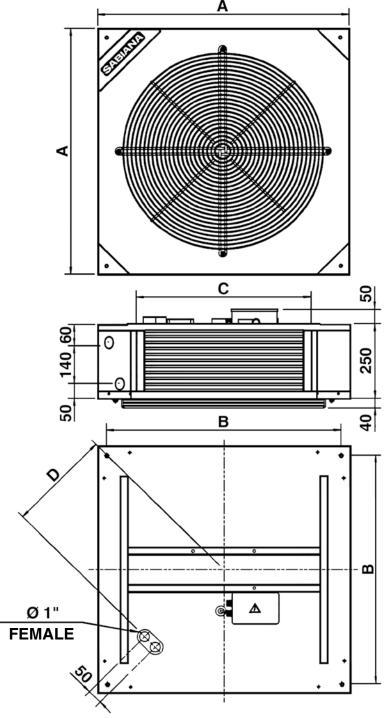


#### Condensate micro-pump

The PE–ECM model for cooling is always supplied with an integral micropump (discharge head 3m, water flow 6l/h). The pump is installed in the condensate collected tray. This pump controls the level of the condensate collected in the tray and drain it when necessary.



#### **Dimensions, Weight, Water content**



With 2 ROW COIL (heating and cooling)											
MODEL		RE-ECM / PE-ECM									
MUDEL	(heating and a second s		22	32	42						
	А	600	750	750	830						
	В	540	690	690	770						
DIMENSIONS (mm)	С	330	480	480	560						
	D	220	287	300	344						
WEIGHT (kg)		28	34	35	40						
WATER CONTENT (Li	ters)	1.8	2.4	2.4	2.7						

L		ROW I heatin			
MODEL			RE-	ECM	
MODEL		11	21	31	41
	А	600	750	750	830
DIMENSIONS (mm)	В	540	690	690	770
	С	330	480	480	560
	D	220	287	300	344
WEIGHT (kg)		26	31	32	38
WATER CONTENT (Lit	iers)	0.8	1.1	1.1	1.3

Elegant ECII

#### **ELEGANT TECHNICAL SPECIFICATIONS**

– RE-ECM units (heating only) —

The following standard rating conditions are used:

#### HEATING (winter mode)

Entering air temperature: +20°C Water temperature: +70/60°C

MODEL				RE—E(	CM 1 <sup>.</sup>	1	RE-ECM 12						
Inverter Power (V)		5	6	7	8	9	10	5	6	7	8	9	10
Air flow	m³/h	1045	1265	1465	1635	1805	1890	1005	1215	1410	1570	1735	1820
Heating	kW	5,88	6,60	7,20	7,67	8,14	8,36	9,56	10,88	12,01	12,88	13,74	14,15
Dp Heating	kPa	11,2	13,8	16,2	18,1	20,2	21,1	6,9	8,8	10,5	11,9	13,3	14,1
Sound power Lw	dB(A)	44	48	52	54	56	57	44	48	52	54	56	57
Sound pressure Lp (*)	dB(A)	35	39	43	45	47	48	35	39	43	45	47	48
Sound pressure Lp (**)	dB(A)	31	35	39	41	43	44	31	35	39	41	43	44
Fan	W	16	24	37	51	69	81	16	24	37	51	69	81

MODEL				RE-E	CM 2 <sup>.</sup>	1	RE-ECM 22						
Inverter Power (V)		5	6	7	8	9	10	5	6	7	8	9	10
Air flow	m³/h	1380	1645	1925	2175	2415	2600	1325	1580	1850	2090	2320	2500
Heating	kW	7,59	8,46	9,32	10,03	10,68	11,18	12,64	14,26	15,81	17,13	18,31	19,20
Dp Heating	kPa	7,9	9,6	11,4	13,0	14,6	15,9	13,0	16,2	19,5	22,5	25,4	27,7
Sound power Lw	dB(A)	48	51	54	57	60	62	48	51	54	57	60	62
Sound pressure Lp (*)	dB(A)	39	42	45	48	51	53	39	42	45	48	51	53
Sound pressure Lp (**)	dB(A)	35	38	41	44	47	49	35	38	41	44	47	49
Fan	W	23	36	55	75	104	136	23	36	55	75	104	136

MODEL			RE-ECM 31				RE-ECM 32						
Inverter Power (V)		5	6	7	8	9	10	5	6	7	8	9	10
Air flow	m³/h	1880	2245	2560	2890	3140	3180	1810	2160	2460	2780	3020	3060
Heating	kW	8,70	9,71	10,50	11,29	11,85	11,95	14,97	16,80	18,24	19,68	20,71	20,89
Dp Heating	kPa	10,5	12,7	14,7	16,7	18,2	18,5	14,2	17,5	20,2	23,2	25,4	25,8
Sound power Lw	dB(A)	50	53	56	59	61	61	50	53	56	59	61	61
Sound pressure Lp (+)	dB(A)	41	44	47	50	52	52	41	44	47	50	52	52
Sound pressure Lp (**)	dB(A)	37	40	43	46	48	48	37	40	43	46	48	48
Fan	W	37	59	86	121	162	164	37	59	86	121	162	164

MODEL			RE-ECM 41				RE-ECM 42						
Inverter Power (V)		5	6	7	8	9	10	5	6	7	8	9	10
Air flow	m³/h	2475	3090	3515	3995	4450	4680	2380	2970	3380	3840	4280	4500
Heating	kW	10,40	11,84	12,75	13,72	14,57	14,99	17,49	20,08	21,71	23,44	25,00	25,73
Dp Heating	kPa	6,4	8,1	9,2	10,5	11,7	12,4	4,8	6,2	7,1	8,2	9,2	9,7
Sound power Lw	dB(A)	47	51	54	57	59	60	47	51	54	57	59	60
Sound pressure Lp (*)	dB(A)	38	42	45	48	50	51	38	42	45	48	50	51
Sound pressure Lp (**)	dB(A)	34	38	41	44	46	47	34	38	41	44	46	47
Fan	W	32	54	77	108	150	174	32	54	77	108	150	174

(\*) = Measurement performed at 3 meter from the source,

room volume of  $500m^3$ , reverberation period of 2 s, directional factor Q=2 (hemisphere sound emission) (**\*\***) = Measurement performed at 3 meter from the source,

room volume of 1500m<sup>3</sup>, reverberation period of 2 s, directional factor Q=2 (hemisphere sound emission)



#### **ELEGANT TECHNICAL SPECIFICATIONS**

#### - PE-ECM units (heating and cooling) -

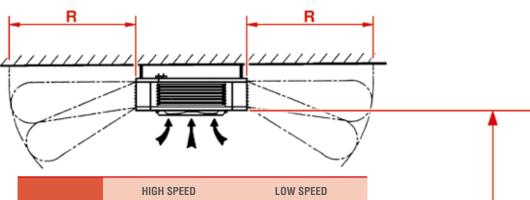
#### <u>COOLING</u> (summer mode)

Entering air temperature:+27°C d.b.R.H. 50%Water temperature:+ 7°C E.W.T.+12°C L.W.T.

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Water temperature: +70°C E.W.T. +60°C L.W.T.

MODEL				PE-E	CM 12	2				PE-E(	6,74         7,13         7,38           5,68         6,12         6,44           1         17,13         18,31         19,20           1         19,4         21,5         22,9			
Inverter Power (V)		5	6	7	8	9	10	5	6	7	8	9	10	
Air flow	m³/h	1005	1215	1410	1570	1735	1820	1325	1580	1850	2090	2320	2500	
Cooling total emission	kW	3,89	4,30	4,65	4,80	5,17	5,20	5,31	5,83	6,33	6,74	7,13	7,38	
Cooling sensible emission	kW	3,14	3,58	3,98	4,23	4,61	4,71	4,14	4,68	5,22	5,68	6,12	6,44	
Heating	kW	9,56	10,88	12,01	12,88	13,74	14,15	12,64	14,26	15,81	17,13	18,31	19,20	
Dp Cooling	kPa	6,3	7,6	8,8	9,3	10,6	10,7	12,7	15,0	17,4	19,4	21,5	22,9	
Dp Heating	kPa	6,9	8,8	10,5	11,9	13,3	14,1	13,0	16,2	19,5	22,5	25,4	27,7	
Sound power Lw	dB(A)	44	48	52	54	56	57	48	51	54	57	60	62	
Sound pressure Lp (+)	dB(A)	35	39	43	45	47	48	39	42	45	48	51	53	
Sound pressure Lp (**)	dB(A)	31	35	39	41	43	44	35	38	41	44	47	49	
Fan	W	16	24	37	51	69	81	23	36	55	75	104	136	

MODEL				PE-E	CM 32	2		b         F					
Inverter Power (V)		5	6	7	8	9	10	5	6	7	8	9	10
Air flow	m³/h	1810	2160	2460	2780	3020	3060	2380	2970	3380	3840	4280	4500
Cooling total emission	kW	6,43	7,01	7,51	7,99	8,41	8,52	7,19	8,09	8,84	9,32	9,83	10,07
Cooling sensible emission	kW	5,21	5,87	6,44	7,02	7,50	7,60	6,40	7,53	8,40	9,15	9,83	10,07
Heating	kW	14,97	16,80	18,24	19,68	20,71	20,89	17,49	20,08	21,71	23,44	25,00	25,73
Dp Cooling	kPa	16,3	19,0	21,5	24,1	26,4	27,0	7,6	9,4	11,0	12,1	13,4	14,0
Dp Heating	kPa	14,2	17,5	20,2	23,2	25,4	25,8	4,8	6,2	7,1	8,2	9,2	9,7
Sound power Lw	dB(A)	50	53	56	59	61	61	47	51	54	57	59	60
Sound pressure Lp (*)	dB(A)	41	44	47	50	52	52	38	42	45	48	50	51
Sound pressure Lp (**)	dB(A)	37	40	43	46	48	48	34	38	41	44	46	47
Fan	W	37	59	86	121	162	164	32	54	77	108	150	174



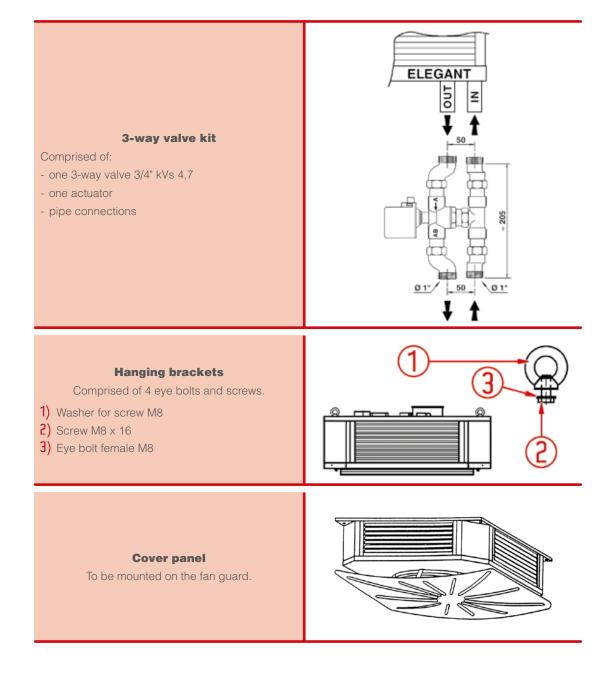
	HIGH S	SPEED	LOW S	PEED
MODEL	Maximum height	Surface	Maximum height	Surface
	(m)	(m)	(m)	(m)
	Н	R	Н	R
1	3.5	3.5	3.0	2.5
2	3.5	3.8	3.0	2.6
3	4.0	4.0	3.5	3.0
4	4.5	4.5	4.0	3.5

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#### Accessories





### <u>Wall</u> electronic controls

For each unit must be prouided the ADC converter — or the UPE-AU power unit for wall controls —

WM-3V	3 speed control (to be used with ADC-M or ADC-S only)
WM-T	3 speed control with electronic thermostat and summer/winter switch (to be used with ADC-M or ADC-S only)
WM-TQR	3 speed control with electronic thermostat and centralized/manual summer/winter switch (to be used with ADC-M or ADC-S only)
WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPEM-AU or UPE-AU only)
T-MB	Wall control (to be used with UPEM-AU or UPE-AU only)
TM0-503-SV2	Automatic speed control with electronic thermostat to be mounted in the DIN 503 box (to be used with ADC-M or ADC-S only)
T2T	Electromechanical thermostat with summer/winter switch (only for 2 pipe units) (to be used with ADC-M or ADC-S only)
ADC-M	ADC signal converter for wall controls fitted on the unit, for WM-3V, WM-T, WM-TQR, TMO-503-SV2 and T2T controls
ADC-S	ADC signal converter for wall controls supplied with separate packaging, for WM-3V, WM-T, WM-TQR, TMO-503-SV2 and T2T controls
UPEM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UPE-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

#### **Electronic controls for MBE boards**

MBE-M	MBE electronic board fitted on the unit
MBE-S	MBE electronic board supplied with separate packaging
T-MB	Wall control (to be used with MBE board only)
PSM-DI	Multifunction control (to be used with MBE board only)

#### — Sabianet management system for a network of Elegant ECM —

Sabianet	Hardware/software supervisory system (to be used with MBE board only)						
<b>ROUTER-S</b>	Router for Sabianet						
SIOS	Relay output board for Sabianet						



## Meltemi Door Curtain

The range of **Meltemi Sabiana** door curtains offers the maximum flexibility in the protection of doors and open access compartments. The door curtains are available in the air ventilation version, with hot water coil and with electric resistance, the **3 different uersions** are supplied in **35 different models** with lengths from 1125 mm to 2185 mm that are suitable for door heights from 2,5 m to 4,5 m in commercial installations.

hanks to their modularity, the door curtain units **can be connected together** to give a continual air barrier of the desidered length to protect large doors.

# Technical characteristics of the main components:

**<u>Cabinet:</u>** it consists of cold galvanised steel plate panels painted with oven-dried epoxy powders, colour RAL 9003. The side closures are made of plastic.

#### <u>Fan assembly:</u> LU/LU-ECM Models:



made up of plastic tangential

fans installed on a rubber support with rolling bearing and coupled with the electric motor mounted on the structure side.

**LC/LI Models:** it consists of double inlet centrifugal fans directly fitted on the motor shaft.

#### Electric motor: U/LC/LI Models: single-phase motor with capacitor inserted permanently, automatic reset internal thermal protection, class of protection IP 20. Power supply 230V - 50Hz. Two speeds are available.

**LU–ECM Model:** three phase permanent magnet brushless electronic motor that is controlled with reconstructed current 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 unit is therefore single-phase 230 - 240 V and 50 - 60 Hz

Coil (W uersions with hot water): the "W series" units are complete with a water coil (for heating only), made with copper pipes with aluminium fins bonded to the pipes by mechanical expansion. U/LU-ECM models are equipped with 1 row coil, LC/LI models are equipped with 2 row coils. Maximum water temperature 80°C, maximum operating pressure 10 bar.

Electric resistance (E uersions): the "E series" units come with filament electric resistances supported by mica spacers, with external bearing structure made of galvanised sheet.

**<u>Electronic controls</u>**: the units come with integrated control system specifically designed for every type of operation (see Page 115).

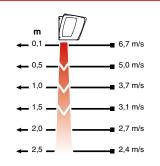
#### LU Model

The LU series door curtains have been designed for installation near small entrances of offices and commercial enuironments.

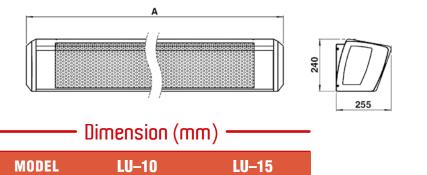
The unit comes with integrated control system specifically designed for every type of operation: **LU–A:** air ventilation only, it is equipped with a control located on board, which can be easily accessed from the bottom. This includes a step-by-step control button to switch the device on and off and select the air speed.

**LU–W/E:** operation with hot water or electric coil. It is equipped with a remote control system (supplied with the unit) or it can be combined with a wall mounted T-MB control with display (optional).

Recommended installation height: 2.5 metres Installation: horizontal Lengths available: 1 and 1.5 metres Electric resistance: **LU-10E** 3 kW 230V 1Ph or 400V 3Ph **LU-15E** 6 kW 400V 3Ph 1 row hot water coil Complete with electrical connection cable with Schuko CEE 7/7 plug



#### **Dimensions, Weight, Water content**



	Weight (kg)									
	WEIGHT WITI	H PACKAGING	WEIGHT WITHO	WEIGHT WITHOUT PACKAGING						
MODEL	LU–10	LU–15	LU–10	LU–15						
LU–A	16,4	23,1	14	20						
LU–W	18,4	26,1	16	23						
LU–E	18,4	26,1	16	23						

1644

Water content (litres)								
MODEL	LU-10	LU–15						
	0,65	0,95						

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#### **TECHNICAL SPECIFICATIONS**

#### **UENTILATION only**

MODEL		LU-	10A	LU-15A		
Speed		max	min	max	min	
Installation height	m	2,5	2,5	2,5	2,5	
Length	mm	1144	1144	1644	1644	
Air flow	m³/h	1260	760	1900	1090	
Sound pressure (***)	dB(A)	49	39	50	39	
Motor voltage	V	230 V ~	230 V ~	230 V ~	230 V ~	
Motor absorption	W	86	63	134	86	
Motor absorption	А	0,37	0,27	0,58	0,39	
Weight	kg	14	14	20	20	

#### with HOT WATER COIL

MODEL		LU-	10W	LU–15W		
Speed		max	min	max	min	
Installation height	m	2,5	2,5	2,5	2,5	
Length	mm	1144	1144	1644	1644	
Air flow	m³/h	1150	740	1750	1050	
Heating (*)	kW	5,87	4,56	8,94	6,65	
Heating (**)	kW	3,36	2,63	5,06	3,79	
Sound pressure (***)	dB(A)	49	39	50	39	
Motor voltage	V	230 V ~	230 V ~	230 V ~	230 V ~	
Motor absorption	W	86	63	134	86	
	А	0,37	0,27	0,58	0,39	
Weight	kg	16	16	23	23	

#### with ELECTRIC RESISTANCE

MODEL		LU-10E-230		LU-10E-400		LU–15E	
Speed		max	min	max	min	max	min
Installation height	m	2,5	2,5	2,5	2,5	2,5	2,5
Length	mm	1144	1144	1144	1144	1644	1644
Air flow	m³/h	1260	760	1260	760	1900	1090
Electric resistance - 1 <sup>st</sup> stage	kW	2	2	2	2	3	3
Electric resistance - 2 <sup>nd</sup> stage	kW	3	3	3	3	6	6
Sound pressure (***)	dB(A)	49	39	49	39	50	39
Motor voltage	V	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~
Electric resistance voltage	V	230 V ~	230 V ~	400 V 3 Ph			
Motor absorption	W	86	63	86	63	134	86
	A	0,37	0,27	0,37	0,27	0,58	0,39
Electric resistance absorption – 1 <sup>st</sup> stage	А	8,7	8,7	3,0	3,0	4,5	4,5
Electric resistance absorption – 2 <sup>nd</sup> stage	А	13,1	13,1	4,5	4,5	9,0	9,0
Weight	kg	16	16	16	16	23	23

- (\*) = Air temperature 18°C Water temperature 80/60°C.
   (\*\*) = Air temperature 18°C Water temperature 60/40°C.
   (\*\*\*) = The sound pressure levels dB(A) are measured at a distance of 3m, directional factor Q = 2, according to EN 3744.

### LU-ECM Model

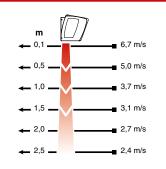
The LU-ECM series door curtains have been designed for installation **near small** entrances of offices and commercial enuironments.



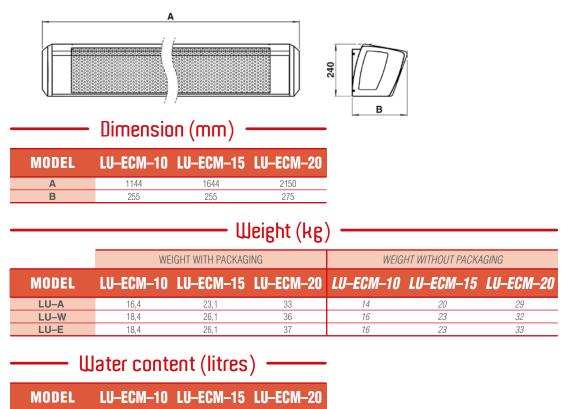
The unit comes with integrated control system specifically designed for every type of operation: **LU–ECM–A**: air ventilation only. It is equipped with a remote control system (supplied with the unit) or it can be combined with a wall mounted T-MB control with display (optional). **LU–ECM–UJ/E**: operation with hot water or electric coil. It is equipped with a remote control system (supplied with the unit) or it can be combined with a wall mounted T-MB control with display (optional).

Recommended installation height: 2.5 metres Installation: horizontal Lengths available: 1 and 1.5 and 2 metres Electric resistance: LU-ECM-10E 3 kW 230V 1Ph or 400V 3Ph LU-ECM-15E/LU-ECM-20E 6 kW 400V 3Ph 1 row hot water coil Complete with electrical connection cable

with Schuko CEE 7/7 plug



#### **Dimensions, Weight, Water content**



1.30



0.65

0.95

#### **TECHNICAL SPECIFICATIONS**

#### **UENTILATION only**

MODEL	MODEL LU-ECM-		M–10A	–10A LU–ECM–15A			M–20A
Speed		max	min	max	min	max	min
Installation height	m	2,5	2,5	2,5	2,5	2,5	2,5
Length	mm	1144	1144	1644	1644	2150	2150
Air flow	m³/h	1260	760	1900	1090	2560	1450
Sound pressure (***)	dB(A)	49	39	50	39	52	41
Motor voltage	V	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~
Motor absorption	W	64,8	25,5	113	49,8	165	53,5
	А	0,55	0,22	0,92	0,42	1,3	0,46
Weight	kg	14	14	20	20	29	29

#### with HOT WATER COIL

MODEL		LU–EC	M–10W	LU–EC	M–15W	LU–ECI	M–20W
Speed		max	min	max	min	max	min
Installation height	m	2,5	2,5	2,5	2,5	2,5	2,5
Length	mm	1144	1144	1644	1644	2150	2150
Air flow	m³/h	1150	740	1750	1050	2250	1310
Heating (+)	kW	5,87	4,56	8,94	6,65	12,19	8,81
Heating (++)	kW	3,36	2,63	5,06	3,79	7,02	5,11
Sound pressure (***)	dB(A)	49	39	50	39	52	41
Motor voltage	V	230 V ~					
Motor observisor	W	46,9	19,8	81,2	36,4	120,5	38,5
Motor absorption	A	0,39	0,18	0,69	0,32	0,97	0,35
Weight	kg	16	16	23	23	32	32

#### with ELECTRIC RESISTANCE

MODEL		LU-ECM-	-10 <b>E</b> -230	LU-ECM-	-10 <b>E</b> -400	LU-EC	M–15E	LU-EC	M-20E
Speed		max	min	max	min	max	min	max	min
Installation height	m	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5
Length	mm	1144	1144	1144	1144	1644	1644	2150	2150
Air flow	m³/h	1260	760	1260	760	1900	1090	2310	1305
Electric resistance - 1st stage	kW	2	2	2	2	3	3	3	3
Electric resistance - 2nd stage	kW	3	3	3	3	6	6	6	6
Sound pressure (***)	dB(A)	49	39	49	39	50	39	52	41
Motor voltage	V	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~
Electric resistance voltage	V	230 V ~	230 V ~	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph
Motor absorption	W	52	22	52	22	89	40	132	42,4
	А	0,43	0,19	0,43	0,19	0,75	0,35	1,06	0,39
Electric resistance absorption 1st stage	А	8,7	8,7	3,0	3,0	4,5	4,5	4,5	4,5
Electric resistance absorption 2 <sup>nd</sup> stage	А	13,1	13,1	4,5	4,5	9,0	9,0	9,0	9,0
Weight	kg	16	16	16	16	23	23	33	33

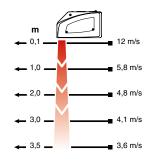
(\*) = Air temperature 18°C - Water temperature 80/60°C.
 (\*\*) = Air temperature 18°C - Water temperature 60/40°C.
 (\*\*\*) = The sound pressure levels dB(A) are measured at a distance of 3m, directional factor Q = 2, according to EN 3744.

#### LC Model

The LC door curtains are intended to be installed **near entrances of shops** or shopping centres.

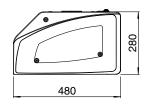
The unit comes with integrated control system specifically designed for every type of operation: LC-A: air ventilation only, it is provided with wall mounted remote control. The control allows to switch the door barrier on and off and to set the speed required (high or low) by pressing a step-by-step button. LC-U/E: operation with hot water or electric coil. The unit comes with remote control with T-MB wall mounted display.

Recommended installation height: 3.5 metres Installation: horizontal Lengths available: 1, 1.5, and 2 metres Electric resistance: **LC-10E** 8 kW 400V 3Ph **LC-15E** 12 kW 400V 3Ph **LC-20E** 16 kW 400V 3Ph 2 row hot water coil



#### **Dimensions, Weight, Water content**

	Dimensio	Dimension (mm)				
MODEL	LC-10	LC–15	LC-20			
Α	1125	1625	2160			



	WEIGHT WITH PACKAGING WEIGHT WITHOUT PACK								
MODEL	LC-10	LC–15	LC-20	LC-10	LC-15	LC-20			
LC–A	34,5	45,6	78,5	31	41	60			
LC–W	39,5	51,6	86,5	36	47	68			
LC–E	37,5	49,6	83,5	34	45	65			





#### **TECHNICAL SPECIFICATIONS**

#### **UENTILATION only**

MODEL	LC-	LC–10A		LC-15A		20A
Speed	max	min	max	min	max	min
Installation height m	3,5	3,5	3,5	3,5	3,5	3,5
Length mm	1125	1125	1625	1625	2160	2160
Air flow m <sup>3</sup> /h	2100	1200	3150	1500	4200	2400
Sound pressure (***) dB(A)	52	38	56	38	54	38
Motor voltage V	230 V ~					
Water character W	330	230	400	200	660	460
Motor absorption A	1,57	1,15	1,80	1,00	3,14	2,30
Weight kg	31	31	41	41	60	60

#### with HOT WATER COIL

MODEL	LC-	10W	LC-	15W	LC-:	20W
Speed	max	min	max	min	max	min
Installation height m	3,5	3,5	3,5	3,5	3,5	3,5
Length mm	1125	1125	1625	1625	2160	2160
Air flow m <sup>3</sup> /h	1900	1100	3000	1500	4000	2200
Heating (*) kW	18,46	12,44	27,59	17,49	38,59	26,21
Heating (**) kW	10,29	7,07	15,51	10,04	22,26	15,34
Sound pressure ( <b>***</b> ) dB(A)	52	38	56	38	54	38
Motor voltage V	230 V ~					
Weter elegentian W	330	230	400	200	660	460
Motor absorption A	1,57	1,15	1,80	1,00	3,14	2,30
Weight kg	36	36	47	47	68	68

#### with ELECTRIC RESISTANCE

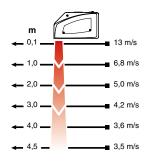
MODEL		LC-	10E	LC-	15 <b>E</b>	LC-	20E
Speed		max	min	max	min	max	min
Installation height	m	3,5	3,5	3,5	3,5	3,5	3,5
Length	mm	1125	1125	1625	1625	2160	2160
Air flow	m³/h	2100	1200	3150	1500	4200	2400
Electric resistance - 1 <sup>st</sup> stage	kW	4	4	6	6	8	8
Electric resistance - 2 <sup>nd</sup> stage	kW	8	8	12	12	16	16
Sound pressure (***)	dB(A)	52	38	56	38	54	38
Motor voltage	V	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~
Electric resistance voltage	V	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph			
Motor observice	W	330	230	400	200	660	460
Motor absorption	А	1,57	1,15	1,80	1,00	3,14	2,30
Electric resistance absorption – 1 <sup>st</sup> stage	А	6	6	9	9	12	12
Electric resistance absorption – 2 <sup>nd</sup> stage	А	12	12	18	18	24	24
Weight	kg	34	34	45	45	65	65

- (\*) = Air temperature 18°C Water temperature 80/60°C.
   (\*\*) = Air temperature 18°C Water temperature 60/40°C.
   (\*\*\*) = The sound pressure levels dB(A) are measured at a distance of 3m, directional factor Q = 2, according to EN 3744.

#### LI Model

The UI door curtains are intended to be installed **near industrial entrances** or doors, i.e. wherever the installation height must be up to 4.5 metres (maximum). The unit comes with integrated control system specifically designed for every type of operation: UI-R: air ventilation only, it is provided with wall mounted remote control. The control allows to switch the door barrier on and off and to set the speed required (high or low) by pressing a step-by-step button. UI-W/E: operation with hot water or electric coil. The unit comes with remote control with T-MB wall mounted display.

Recommended installation height: 4.5 metres Installation: horizontal Lengths available: 1, 1.5, and 2 metres Electric resistance: LI-10E 11 kW 400V 3Ph LI-15E 18 kW 400V 3Ph LI-20E 22 kW 400V 3Ph 2 row hot water coil



#### **Dimensions, Weight, Water content**

	A			
	Dimensio		410	
	DIFICISIO			
MODEL	LI-10	LI-15	<b>LI-20</b>	
A	1150	1650	2185	

	410
650	

		U	leight (kg)	) ———			
	WEIGHT WITH PACKAGING WEIGHT WITHOUT PACKAGING						
MODEL	LI–10	LI–15	LI-20	LI-10	LI-15	LI-20	
LI–A	45,9	67,1	110,0	42	62	88	
LI–W	51,9	74,1	120,0	48	69	98	
LI–E	50,9	73,1	118,0	47	68	96	

<u> </u>	ater cont	ent (litres	) ——										
MODEL	MODEL LI-10 LI-15 LI-20												
	1,65	2,55	3,40										



#### **TECHNICAL SPECIFICATIONS**

#### **UENTILATION only**

MODEL	LI-	10A	u-	15A	u-	20A
Speed	max	min	max	min	max	min
Installation height m	4,5	4,5	4,5	4,5	4,5	4,5
Length mm	1150	1150	1650	1650	2185	2185
Air flow m <sup>3</sup> /h	3500	2600	5500	3250	7000	5200
Sound pressure ( <b>***</b> ) dB(A)	58	49	58	50	60	51
Motor voltage V	230 V ~					
Motor absorption W	600	400	940	520	1200	800
A A	2,63	1,80	4,20	2,40	5,26	3,60
Weight kg	42	42	62	62	88	88

#### with HOT WATER COIL

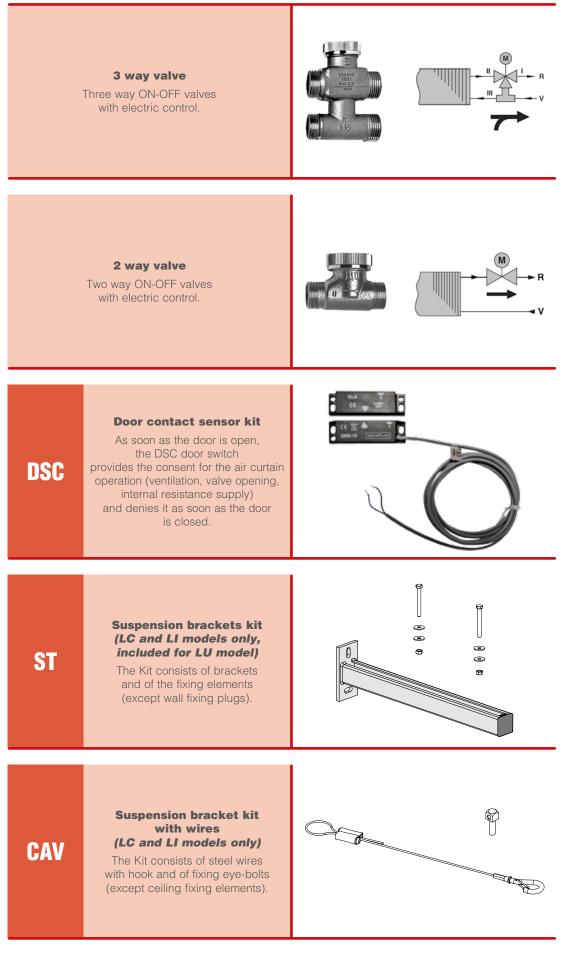
MODEL	LI-	10W	LI-	15W	LI-2	20W
Speed	max	min	max	min	max	min
Installation height m	4,5	4,5	4,5	4,5	4,5	4,5
Length mm	1150	1150	1650	1650	2185	2185
Air flow m <sup>3</sup> /h	3500	2600	5500	3250	7000	5200
Heating (*) kW	27,32	23,06	42,03	30,96	57,65	48,47
Heating (**) kW	15,25	12,95	22,94	17,16	32,49	27,57
Sound pressure (***) dB(A)	58	49	58	50	60	51
Motor voltage V	230 V ~					
Motor absorption	600	400	940	520	1200	800
A A	2,63	1,80	4,20	2,40	5,26	3,60
Weight kg	48	48	69	69	98	98

#### with ELECTRIC RESISTANCE

MODEL		u-	10 <b>E</b>	LI-	15E	LI-	20E
Speed		max	min	max	min	max	min
Installation height	m	4,5	4,5	4,5	4,5	4,5	4,5
Length	mm	1150	1150	1650	1650	2185	2185
Air flow	m³/h	3500	2600	5500	3250	7000	5200
Electric resistance - 1 <sup>st</sup> stage	kW	7	7	12	12	14	14
Electric resistance - 2 <sup>nd</sup> stage	kW	11	11	18	18	22	22
Sound pressure (***)	dB(A)	58	49	58	50	60	51
Motor voltage	V	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~	230 V ~
Electric resistance voltage	V	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph	400 V 3 Ph
Matar abaaratian	W	600	400	940	520	1200	800
Motor absorption -	А	2,63	1,80	4,20	2,40	5,26	3,60
Electric resistance absorption – 1 <sup>st</sup> stage	А	10,2	10,2	17,5	17,5	20,5	20,5
Electric resistance absorption – 2 <sup>nd</sup> stage	А	16	16	26,1	26,1	32	32
Weight	kg	47	47	68	68	96	96

- (\*) = Air temperature 18°C Water temperature 80/60°C.
   (\*\*) = Air temperature 18°C Water temperature 60/40°C.
   (\*\*\*) = The sound pressure levels dB(A) are measured at a distance of 3m, directional factor Q = 2, according to EN 3744.

#### Accessories





#### **Electronic controls**



The units can be managed by the **T-MB** control.





#### LC-A and LI-A Control systems

Wall-mounted remote control (provided as standard):

- High/Low speed-Standby ON button.
- ON indication or Standby LED.
- "Door Contact" external connection terminals.
- Terminals for connecting a remote ON/OFF switch.
- Dip switch to set the post-ventilation delay time of the door closure fan.

LC and Ll models



#### LC-W/E and LI-W/E Control systems

The units are equipped, as standard.

with electronic board and T-MB control to manage: • ON/OFF unit.

- Fan speed selection.
- Operating mode selection.
- (ventilation only or with heating coil).
- Air temperature set-point configuration.
- Water valve ON/OFF actuator ("W" version).
- Activation of the electric resistance
- 1<sup>st</sup> and 2<sup>nd</sup> stage ("E" version). • Door interlock.
- Remote ON/OFF interlock.

Several units can be controlled in Master/Slave mode.













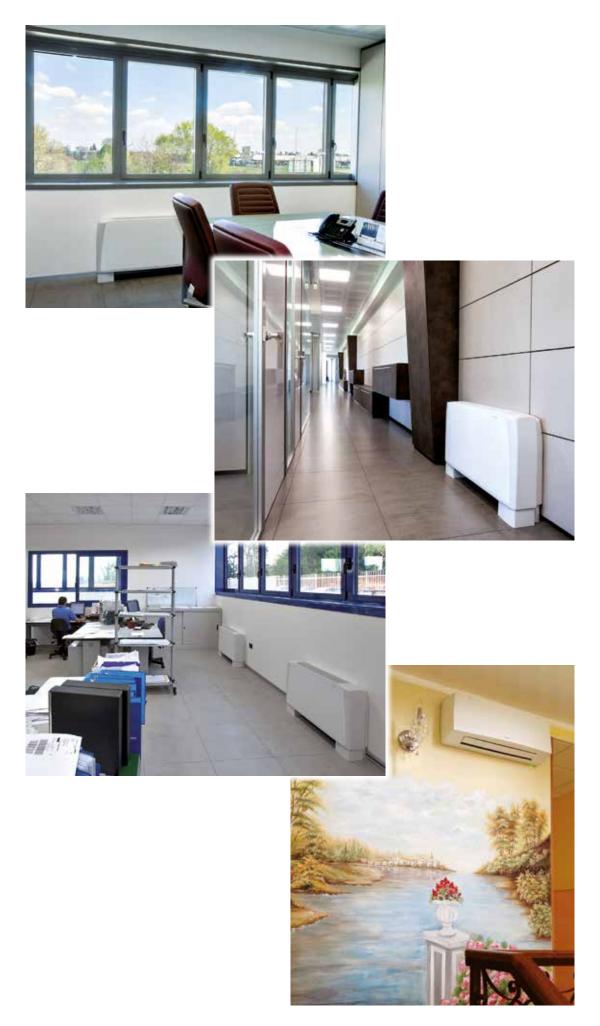




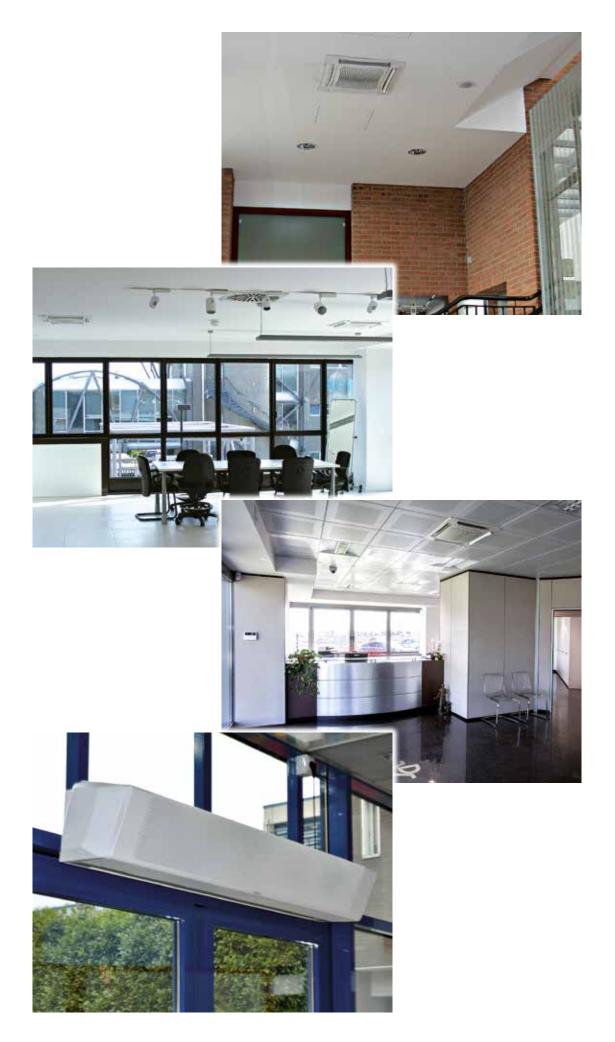


















Sabiana has been making fan coils since 1980, units that stand out for their attractive design and very low noise and power consumption, responding to current demand for energy sauing and indoor comfort.

In 1994 the company acquired the patent to exclusively manufacture one of the most innovative components ever developed for hydronic terminal units, one that is still widely used today and is part of a product designed to air-condition a wide variety of different environments, with the result of significantly improving **indoor air quality (IRQ)** and, by reducing the amount of outside air needed in the system, decreasing air-conditioning costs. The name of this electronic filter – **Crystall** – is quite symbolic, and is used to identify this specific type of solution.

Fan Coils

n 2004 a new generation of cassettes was introduced, designed for installation in false ceilings, featuring a modern design, different colours and different aesthetic solutions, leading the company to soon become one of the European leaders in the production of fan coils and helping it **Expand** its market to other continents.

In 2009, Sabiana was the first company in the world to introduce **inuerter-driuen** brushless motors in its cassette units, with power consumption below 10 watts in the most common operating conditions. Continuous adjustment of air flow-rate also means much more precise control over indoor temperature.

The following pages illustrate all the solutions that are currently available, both featuring traditional asynchronous motors and electronically controlled motors, with performance certified by the independent institute **EUROUENT.** 



#### **Eurovent Certification**

Sabiana obtained the Eurovent certification in 1996. Eurovent is an independent body recognized in all Europe that ensures total reliability and transparency of performances.

## Carisma Fan Coil Unit

**CARISMA** is the result of a great commitment of energy and resources, with the aim of offering an innovative product in terms of design, performance, low noise, energy saving and functionality.

#### pon request, **innovative electronic motors** with

extremely low energy consumption, controlled by an inverter board and identified by ECM, are available with centrifugal and tangential fan. The ECM motors allow electrical consumption to be decreased by more than 50% compared to traditional asynchronous motors. They enable continuous air flow control and precise control over the ambient temperature, with further benefits in terms of very low noise levels thanks to the reduced average working speed.

#### he 5 models

(for wall and ceiling installation, with casing and concealed) and the different available coils (with three or four rows for two pipe systems, one or two rows for four pipe systems) offer great installation flexibility and allow the use of low temperature hot water, in line with the development of modern boilers and heat pumps.

R s a special option, the Carisma range can be fitted with the Crystall patented electronic filter featuring a class D rating according to Standard UNI 11254, with similar performances to the initial ones of a traditional mechanical filter featuring a class F9 rating according to Standard UNI EN 779.

R full range of controls is available, including the innovative Free patented wireless system, for rapidly obtaining correct ambient temperature and desired performances and comfort.

he Carisma model is complemented with a full range of accessories: various types of adjustment valves, sturdy support feet, rear covering panel for glass installation, additional electric heater, auxiliary condensate pump, fresh air intake louver, air inlet/outlet diffusers for concealed systems.



## Carisma CRC Fan Coil Unit with Centrifugal Fan with Asynchronous Motor

Range includes **9 air flow rates** (from 105 to 1500 m<sup>3</sup>/h) and **5 models** (for wall and ceiling installation, with casing and concealed), each equipped with 3 or 4 row coil and with the possibility to add a 1 or 2 row coil for 4 pipe systems.

t is the most comprehensive range, perfectly suited to meet all of the climate control needs of work environments such as offices, shops, restaurants and hotel rooms featuring ducted installations with available pressure **Up to 50 Pa**.

## Technical characteristics of the main components:

**Outer casing:** made with strong synthetic lateral corners and from galvanized and prepainted front steel panel. The plastic top grid has fixed louvres and is reversible in order to distribute the air in two different directions.

#### Standard colours:

- Lateral corners and top grid: Pantone Cool Grey 1C (light grey)
- Front panel: RAL 9003 (white)
- Other colours on request.

Inner casing: made from galvanized steel insulated with polyolefin (PO) foam (class M1).

**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. Filter presence is highlighted by a plastic front cover featuring the same colour as the top grid.

**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 six speeds, three of which are connected, 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.

Flow and return pipe connections are situated at the same end on the left side looking at

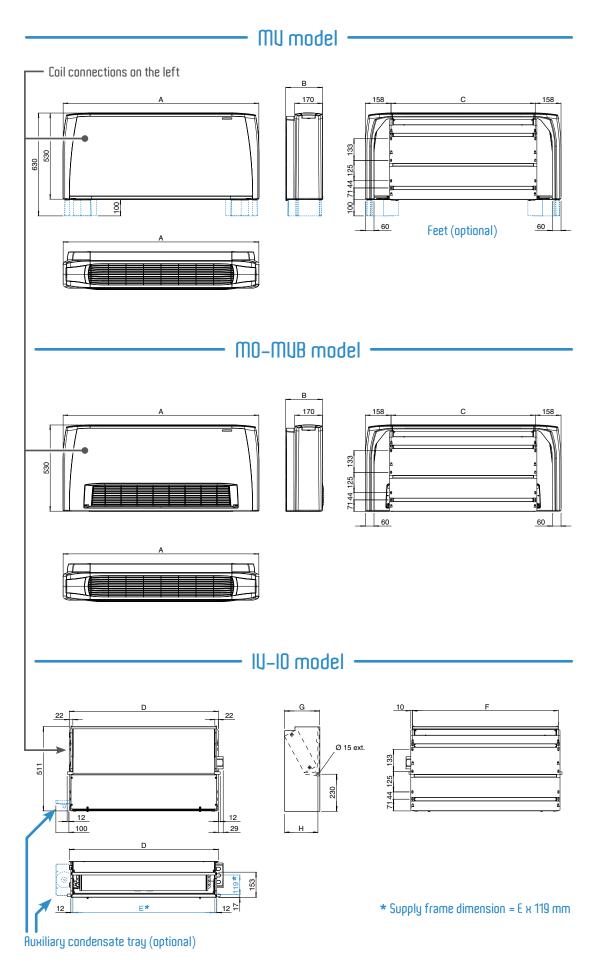
the unit. On request we can deliver the unit with the connections on the right end side. This operation can also be easily carried out on site during installation.

**Condensate collection tray:** made from plastic with an "L"-shaped plastic fitted on the inner casing; in the MO-MVB and IV-IO model the tray is insulated with polyolefin (PO) foam (class M1).

The outside diameter of the condensate discharge pipe is 15 mm.



#### **Dimensions, Weight, Water content**



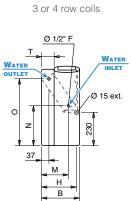


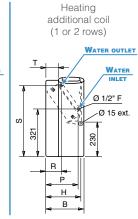
## Carisma CRC

#### **Dimensions, Weight, Water content**

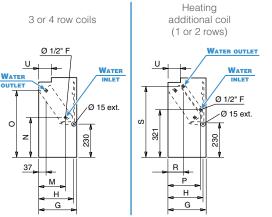
#### - Coil connections

#### MU and MO-MUB model





#### IU-IO model



#### Dimension (mm) ·

MODEL	1	2	3	4	5	6	7	8	9
A	670	770	985	985	1200	1200	1415	1415	1415
В	225	225	225	225	225	225	225	255	255
С	354	454	669	669	884	884	1099	1099	1099
D	374	474	689	689	904	904	1119	1119	1119
E	330	430	645	645	860	860	1075	1075	1075
F	354	454	669	669	884	884	1099	1099	1099
G	218	218	218	218	218	218	218	248	248
Н	205	205	205	205	205	205	205	235	235
M	145	145	145	145	145	145	145	170	170
N	260	260	260	260	260	260	260	270	270
0	460	460	460	460	460	460	460	450	450
Р	185	185	185	185	185	185	185	210	210
R	105	105	105	105	105	105	105	110	110
S	475	475	475	475	475	475	475	465	465
Т	55	55	55	55	55	55	55	85	85
U	65	65	65	65	65	65	65	95	95

#### - Weight (kg) -

					WEI	GHT W	/ITH P.	ACKAC	GING					WEIGH	IT WIT	HOUT	PACK	AGING	ì	
	N	IODEL	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	<b>g</b>
ШВ		3	15,5	17,2	21,4	22,5	26,9	27,7	32,1	35,7	35,9	13,9	15,4	19,1	20,2	24,1	24,9	28,8	32,0	32,2
	S	3+1	16,2	18,0	22,6	23,7	28,4	29,2	33,9	37,5	37,7	14,6	16,2	20,3	21,4	25,6	26,4	30,6	33,8	34,0
	ROWS	3+2	16,7	18,6	23,3	24,4	29,3	30,1	35,0	38,6	38,8	15,1	16,8	21,0	22,1	26,5	27,3	31,7	34,9	35,1
ģ	£	4	16,0	18,0	22,4	23,5	28,1	29,0	33,6	37,2	37,4	14,4	16,2	20,1	21,2	25,3	26,2	30,3	33,5	33,7
		4+1	16,7	18,8	23,6	24,7	29,6	30,5	35,4	39,0	39,2	15,1	17,0	21,3	22,4	26,8	27,7	32,1	35,3	35,5
		3	12,2	13,6	17,1	18,1	21,9	22,8	27,0	30,2	30,4	10,6	11,8	15,3	16,3	19,6	20,5	24,2	27,1	27,3
0	S	3+1	12,9	14,4	18,3	19,3	23,4	24,3	28,8	32,0	32,2	11,3	12,6	16,5	17,5	21,1	22,0	26,0	28,9	29,1
0 -1	ROWS	3+2	13,4	15,0	19,0	20,0	24,3	25,2	29,9	33,1	33,3	11,8	13,2	17,2	18,2	22,0	22,9	27,1	30,0	30,2
2	œ	4	12,7	14,4	18,1	19,1	23,1	24,1	28,5	31,7	31,9	11,1	12,6	16,3	17,3	20,8	21,8	25,7	28,6	28,8
		4+1	13,4	15,2	19,3	20,3	24,6	25,6	30,3	33,5	33,7	11,8	13,4	17,5	18,5	22,3	23,3	27,5	30,4	30,6

#### - Water content (litres) -

N	IODEL	1	2	3	4	5	6	7	8	9
	3	0,5	0,6	0,9	0,9	1,3	1,6	1,7	1,9	1,9
NS	4	0,7	0,8	1,3	1,3	1,7	2,2	2,4	2,8	2,8
ROW	+1	0,2	0,2	0,3	0,3	0,4	0,5	0,5	0,6	0,6
	+2	0,4	0,4	0,6	0,6	0,8	1,0	1,0	1,2	1,2





#### 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 **Entering water temperature:** +50°C Water flow rate as for the cooling conditions

MOD	EL			CRO	<b>C</b> 13					CRC	23	3				CRC	33	3	
Grand		1 <b>(E)</b>	2	3	4 <b>(E)</b>	5	6 <b>(E)</b>	1 (E)	2	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6
Speed		MIN			MED		MAX	MIN		MED		MAX			MIN	MED		MAX	
Air flow	m³/h	105	125	150	175	195	220	145	170	220	250	295	340	185	235	270	325	385	440
Cooling total emission	(E) kW	0,59	0,68	0,77	0,86	0,94	1,03	0,91	1,01	1,25	1,38	1,56	1,74	1,28	1,57	1,78	2,07	2,39	2,66
Cooling sensible emiss	ion <b>(E)</b> kW	0,47	0,54	0,62	0,71	0,78	0,86	0,69	0,77	0,97	1,08	1,24	1,40	0,94	1,15	1,32	1,55	1,80	2,02
Heating (E)	kW	0,76	0,90	1,02	1,15	1,26	1,39	1,12	1,27	1,59	1,77	2,02	2,28	1,52	1,87	2,15	2,52	2,92	3,27
Heating - Water 70-60°	C kW	1,31	1,53	1,75	1,99	2,18	2,42	1,90	2,14	2,70	3,00	3,44	3,89	2,54	3,14	3,61	4,24	4,92	5,52
Dp Cooling (E)	kPa	0,9	1,1	1,4	1,7	2,0	2,3	2,5	3,0	4,4	5,3	6,5	7,9	6,6	9,4	11,8	15,4	19,7	23,8
Dp Heating (E)	kPa	0,8	0,9	1,2	1,4	1,7	2,0	2,1	2,6	3,7	4,5	5,5	6,7	5,6	8,0	10,0	13,1	16,7	20,2
Fan (E)	W	16	19	21	25	29	33	14	16	22	26	32	40	15	20	25	32	41	49
Sound power (E)	dB(A)	32	34	36	39	42	45	30	33	40	43	47	51	31	36	40	45	49	52
Sound pressure (*)	dB(A)	23	25	27	30	33	36	21	24	31	34	38	42	22	27	31	36	40	43
1 row heating additional	Heating (E) kW	0,63	0,71	0,79	0,89	0,96	1,04	0,94	1,04	1,25	1,36	1,52	1,68	1,35	1,59	1,77	2,00	2,26	2,48
coil (Water 70/60°C)	Dp Heat. <b>(E)</b> kPa	0,7	0,9	1,0	1,3	1,5	1,7	1,7	2,0	2,8	3,3	4,0	4,8	3,9	5,2	6,3	7,8	9,7	11,4

MODEL				CRO	; 43	3				CR	C 53	}				CRC	63	3	
Cread		1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5 <b>(E)</b>	6	1 (E)	2	3 <b>(E)</b>	4	5 <b>(E)</b>	6
Speed			MIN	MED		MAX			MIN		MED		MAX	MIN		MED		MAX	
Air flow	m³/h	185	265	335	400	485	570	250	315	420	495	545	650	415	505	590	680	760	830
Cooling total emission (E)	kW	1,27	1,73	2,14	2,46	2,87	3,24	1,68	2,03	2,58	2,94	3,18	3,64	2,54	2,99	3,37	3,77	4,09	4,35
Cooling sensible emission (E)	kW	0,93	1,28	1,60	1,86	2,19	2,51	1,24	1,51	1,94	2,23	2,43	2,82	1,91	2,27	2,59	2,93	3,20	3,44
Heating (E)	kW	1,50	2,09	2,61	3,02	3,56	4,06	1,98	2,42	3,13	3,59	3,89	4,50	3,07	3,66	4,13	4,68	5,09	5,45
Heating - Water 70-60°C	kW	2,51	3,51	4,36	5,08	6,00	6,87	3,32	4,07	5,26	6,04	6,54	7,57	5,17	6,15	6,96	7,87	8,61	9,22
Dp Cooling (E)	kPa	6,5	11,2	16,2	20,8	27,2	33,8	4,1	5,8	8,8	11,1	12,7	16,2	8,6	11,4	14,1	17,2	19,8	22,1
Dp Heating (E)	kPa	5,5	9,5	13,8	17,7	23,1	28,7	3,5	4,9	7,5	9,4	10,8	13,8	7,3	9,7	12,0	14,6	16,8	18,8
Fan <b>(E)</b>	W	14	21	28	34	44	57	18	22	32	39	46	61	37	46	55	67	78	88
Sound power (E)	dB(A)	27	33	39	43	47	52	26	31	37	41	43	48	37	42	46	49	52	54
Sound pressure (+)	dB(A)	18	24	30	34	38	43	17	22	28	32	34	39	28	33	37	40	43	45
1 row heating additional Heating (E	) kW	1,34	1,73	2,06	2,32	2,65	2,88	1,77	2,07	2,53	2,83	3,03	3,42	2,50	2,87	3,19	3,54	3,81	4,04
coil (Water 70/60°C) Dp Heat. (	E) kPa	3,9	6,0	8,2	10,1	12,8	14,8	1,2	1,6	2,3	2,8	3,2	3,9	3,2	4,1	4,9	5,8	6,7	7,4

MODE	L			(	CRO	; 73				(	CRO	C 83					CR	C 93		
Speed			1	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6 <b>(E)</b>	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6 <b>(E)</b>	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6 <b>(E)</b>
Speed				MIN		MED		MAX		MIN		MED		MAX		MIN		MED		MAX
Air flow		m³/h	445	535	630	735	840	925	510	655	815	1020	1100	1200	735	830	980	1210	1365	1500
Cooling total emission (E	)	kW	2,87	3,34	3,80	4,29	4,76	5,11	3,06	3,74	4,41	5,19	5,47	5,82	4,08	4,47	5,06	5,87	6,36	6,74
Cooling sensible emission	n (E)	kW	2,13	2,50	2,87	3,27	3,66	3,95	2,32	2,88	3,44	4,12	4,37	4,68	3,16	3,49	4,00	4,73	5,19	5,55
Heating (E)		kW	3,41	4,01	4,60	5,19	5,80	6,27	3,84	4,80	5,61	6,74	7,15	7,66	5,21	5,71	6,54	7,72	8,47	9,06
Heating - Water 70-60°C		kW	5,71	6,72	7,67	8,73	9,76	10,55	6,49	8,11	9,67	11,63	12,36	13,25	8,87	9,82	11,29	13,39	14,70	15,74
Dp Cooling (E)		kPa	12,3	16,2	20,3	25,1	30,1	34,2	7,3	10,3	13,8	18,4	20,2	22,5	11,9	13,8	17,3	22,4	25,9	28,6
Dp Heating (E)		kPa	10,5	13,8	17,3	21,3	25,6	29,1	6,2	8,8	11,8	15,6	17,3	19,2	10,2	12,0	14,9	19,1	22,5	24,6
Fan (E)		W	44	54	66	79	92	103	47	62	81	105	116	130	78	92	108	134	152	176
Sound power (E)	(	dB(A)	38	42	47	51	54	56	39	45	50	56	58	60	47	50	54	58	62	64
Sound pressure (*)	(	dB(A)	29	33	38	42	45	47	30	36	41	47	49	51	38	41	45	49	53	55
1 row heating additional He	eating <b>(E)</b>	kW	2,89	3,29	3,68	4,09	4,49	4,79	3,03	3,60	4,17	4,86	5,11	5,41	3,89	4,22	4,74	5,46	5,90	6,23
coil (Water 70/60°C) Dj	p Heat. <b>(E)</b>	kPa	3,4	4,3	5,2	6,3	7,4	8,3	3,7	5,0	6,5	8,5	9,3	10,3	5,8	6,7	8,2	10,5	12,0	13,2

**(E)** = Eurovent certified performance.

**MIN-MED-MAX** = Standard connected speeds.

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.







www.certiflash.com

#### 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 Entering water temperature: +50°C Water flow rate as for the cooling conditions

Certification

MOD	EL				CRO	<b>C</b> 14	ļ				CRC	24	ļ				CRC	34	ļ	
Canad			1 <b>(E)</b>	2	3	4 <b>(E)</b>	5	6 <b>(E)</b>	1 <b>(E)</b>	2	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6
Speed			MIN			MED		MAX	MIN		MED		MAX			MIN	MED		MAX	
Air flow		m³/h	105	125	150	175	195	220	145	170	220	250	295	340	185	235	270	325	385	440
Cooling total emission (	E)	kW	0,67	0,78	0,89	1,02	1,11	1,23	1,01	1,13	1,43	1,59	1,81	2,04	1,34	1,65	1,89	2,21	2,57	2,88
Cooling sensible emission (E) kW		kW	0,51	0,60	0,68	0,79	0,87	0,97	0,74	0,83	1,07	1,19	1,38	1,57	0,96	1,20	1,38	1,62	1,90	2,14
Heating (E) kW		kW	0,82	0,96	1,10	1,27	1,39	1,55	1,18	1,34	1,72	1,92	2,20	2,50	1,56	1,94	2,23	2,63	3,07	3,46
Heating - Water 70-60°C	3	kW	1,38	1,62	1,86	2,15	2,36	2,63	1,98	2,24	2,88	3,22	3,69	4,19	2,60	3,23	3,73	4,40	5,14	5,80
Dp Cooling (E)		kPa	1,9	2,5	3,2	4,0	4,7	5,6	4,9	6,1	9,2	11,0	13,9	17,2	3,7	5,3	6,7	8,9	11,5	14,1
Dp Heating (E)		kPa	1,5	2,0	2,6	3,3	3,9	4,7	3,9	4,9	7,5	9,2	11,6	14,6	2,9	4,2	5,4	7,0	9,2	11,3
Fan (E)		W	16	19	21	25	29	33	14	16	22	26	32	40	15	20	25	32	41	49
Sound power (E) dB(A)		dB(A)	32	34	36	39	42	45	30	33	40	43	47	51	31	36	40	45	49	52
Sound pressure (*)		dB(A)	23	25	27	30	33	36	21	24	31	34	38	42	22	27	31	36	40	43
1 row heating additional	Heating <b>(E)</b>	kW	0,63	0,71	0,79	0,89	0,96	1,04	0,94	1,04	1,25	1,36	1,52	1,68	1,35	1,59	1,77	2,00	2,26	2,48
coil (Water 70/60°C)	Dp Heat. <b>(E)</b>	kPa	0,7	0,9	1,0	1,3	1,5	1,7	1,7	2,0	2,8	3,3	4,0	4,8	3,9	5,2	6,3	7,8	9,7	11,4

MODEL				CRO	; 44	)				CR	C 54					CRC	64		
Speed		1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5 <b>(E)</b>	6	1 (E)	2	3 <b>(E)</b>	4	5 <b>(E)</b>	6
			MIN	MED		MAX			MIN		MED		MAX	MIN		MED		MAX	
Air flow	m³/h	185	265	335	400	485	570	250	315	420	495	545	650	415	505	590	680	760	830
Cooling total emission (E) kW		1,32	1,83	2,28	2,65	3,12	3,56	1,79	2,19	2,83	3,25	3,54	4,09	2,83	3,38	3,86	4,38	4,79	5,13
Cooling sensible emission (E) kW		0,95	1,34	1,68	1,97	2,34	2,69	1,30	1,60	2,08	2,40	2,63	3,07	2,07	2,49	2,86	3,27	3,60	3,87
Heating (E) kW		1,54	2,16	2,72	3,17	3,76	4,34	2,06	2,53	3,30	3,81	4,17	4,83	3,39	4,07	4,69	5,35	5,88	6,35
Heating - Water 70-60°C	kW	2,57	3,62	4,56	5,32	6,33	7,30	3,44	4,23	5,51	6,37	6,97	8,07	5,66	6,81	7,85	8,98	9,90	10,68
Dp Cooling (E)	kPa	3,4	6,1	9,0	11,7	15,5	19,6	7,3	10,4	16,3	20,8	24,2	31,3	14,4	19,7	24,8	30,9	36,2	40,9
Dp Heating (E)	kPa	2,5	4,6	6,9	9,0	12,2	15,6	5,7	8,3	13,1	17,0	19,9	25,7	11,0	15,2	19,5	24,7	29,3	33,5
Fan <b>(E)</b>	W	14	21	28	34	44	57	18	22	32	39	46	61	37	46	55	67	78	88
Sound power (E) dB(A)		27	33	39	43	47	52	26	31	37	41	43	48	37	42	46	49	52	54
Sound pressure (*) dB(A)		18	24	30	34	38	43	17	22	28	32	34	39	28	33	37	40	43	45
1 row heating additional Heating (E)	kW	1,34	1,73	2,06	2,32	2,65	2,88	1,77	2,07	2,53	2,83	3,03	3,42	2,50	2,87	3,19	3,54	3,81	4,04
coil (Water 70/60°C) Dp Heat. (E)	kPa	3,9	6,0	8,2	10,1	12,8	14,8	1,2	1,6	2,3	2,8	3,2	3,9	3,2	4,1	4,9	5,8	6,7	7,4

MODEL				CR	C 74					CR	<b>C 8</b> 4					CRO	<b>;</b> 94		
Quand		1	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6 <b>(E)</b>	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6 <b>(E)</b>	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6 <b>(E)</b>
Speed			MIN		MED		MAX		MIN		MED		MAX		MIN		MED	<ul> <li><b>0</b> 1365</li> <li><b>4</b> 7,13</li> <li><b>1</b> 5,63</li> <li><b>3</b> 9,38</li> <li><b>3</b> 16,02</li> </ul>	MAX
Air flow	m³/h	445	535	630	735	840	925	510	655	815	1020	1100	1200	735	830	980	1210	1365	1500
Cooling total emission (E)	kW	3,03	3,56	4,08	4,64	5,17	5,58	3,27	4,03	4,80	5,73	6,06	6,47	4,42	4,88	5,57	6,54	7,13	7,60
Cooling sensible emission (E) kW		2,22	2,62	3,03	3,47	3,89	4,23	2,43	3,04	3,66	4,43	4,71	5,06	3,36	3,72	4,29	5,11	5,63	6,05
Heating (E) kW		3,55	4,20	4,86	5,55	6,19	6,71	4,03	5,06	6,11	7,36	7,84	8,43	5,59	6,22	7,14	8,53	9,38	10,08
Heating - Water 70-60°C	kW	5,93	7,02	8,12	9,30	10,38	11,26	6,78	8,55	10,37	12,52	13,34	14,36	9,47	10,55	12,13	14,52	16,02	17,23
Dp Cooling (E)	kPa	9,5	12,5	15,9	20,0	24,2	27,7	5,2	7,6	10,3	14,1	15,6	17,5	9,0	10,6	13,4	17,8	20,7	23,2
Dp Heating (E)	kPa	7,7	10,3	13,3	16,9	20,5	23,7	4,1	6,2	8,4	11,4	12,7	14,5	7,2	8,7	11,1	14,8	17,0	19,3
Fan <b>(E)</b>	W	44	54	66	79	92	103	47	62	81	105	116	130	78	92	108	134	152	176
Sound power (E) dB(A)		38	42	47	51	54	56	39	45	50	56	58	60	47	50	54	58	62	64
Sound pressure (+)	dB(A)	29	33	38	42	45	47	30	36	41	47	49	51	38	41	45	49	53	55
1 row heating additional Heating	<b>(E)</b> kW	2,89	3,29	3,68	4,09	4,49	4,79	3,03	3,60	4,17	4,86	5,11	5,41	3,89	4,22	4,74	5,46	5,90	6,23
coil (Water 70/60°C) Dp Hea	t. <b>(E)</b> kPa	3,4	4,3	5,2	6,3	7,4	8,3	3,7	5,0	6,5	8,5	9,3	10,3	5,8	6,7	8,2	10,5	12,0	13,2

**(E)** = Eurovent certified performance. **MIN-MED-MAX** = Standard connected speeds.

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.



## BREEZE Frame Kit for Wall Concealed Installation for Carisma CRC and CRR Fan Coil units

he Carisma Breeze frame kit is available in 3 sizes and allows the installation of **recessed** Carisma fan coils.

he kit includes a top closing panel that prevents the access to technical spaces and coil ensuring the safety of the end user.

## Technical characteristics of the main components:

The aesthetic frame includes: • the closing frame;

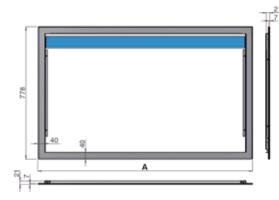
- air supply louvre;
- front panel;
- air intake grid.

The air supply louure is made of extruded aluminum with satin finish.

**Perimeter frame, front panel** and **intake grid** are made of steel painted with epoxy polyester coat, dried in a furnace at 180°, colour RAL 9003. It is possible to repaint the entire frame of the same color as the wall.

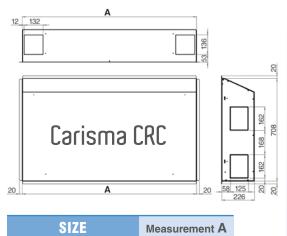
**The recessed box** is made of galvanized steel with opening for the electrical and hydraulic connections.

**Aesthetic frame dimensions** 



Measurement A
837
1052
1267

#### **Recessed box dimensions**



771

986

1201

2

3/4

5/6

	132	36 136 12
	Carisma CRR	162 168 162
20	Α	20 43,5 125 0 R
	SIZE	Measurement A
	2	771
	3	986
	4	1201



#### IAQ accessory (only for CRC/CRC-ECM version)

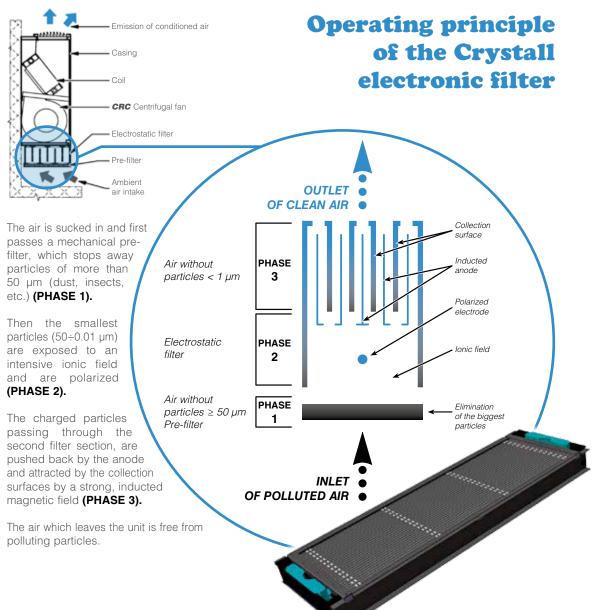
The **Crystall Sabiana** electrostatic filter matches the need for better air conditioning with the concepts of space and design.

With this filter the various stages of air treatment are combined in one appliance.

**Thanks to** this new patented filter (efficiency compliant with new Standard UNI 11254), air pollutants such as cigarette smoke, dust (PM10, PM2.5), pollen and most biological organisms **are eliminated.** 

In addition, as fresh air is not being introduced to obtain the best climatic conditions, there are consequential energy savings.







#### **Electronic controls** <u>included</u>

– Standard MU-MUB models –

CB	3 speed control
CB-T	3 speed control with electronic thermostat and manual summer/winter switch
CB-C	3 speed control with electronic thermostat and centralized summer/winter switch
<b>CB-AUT</b>	Automatic 3 speed control with electronic thermostat and centralized/manual summer/winter switch

N.B.: if the electrostatic filter or the electric heater is mounted, use the "IAQ" controls.

#### <u>Wall</u> electronic controls

#### — Standard MU, MO-MUB and IU-IO models —

WM-3V	3 speed control
WM-T	3 speed control with electronic thermostat and manual summer/winter switch
WM-TQR	3 speed control with electronic thermostat and centralized/manual summer/winter switch
WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
TM0-503-SV2	Automatic speed control with electronic thermostat to be mounted in the DIN 503 box
T2T	Electromechanical thermostat with summer/winter switch (only for 2 pipe units)
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

#### - FreeSabiana wireless control system -

Free-Com	Remote control to be used with electronic boards described at page 267
Free-Upm	Power unit fitted on the unit
Free-Ups	Power unit not fitted on the unit
Free-Sen	Temperature probe
<b>CB-Free</b>	ON/OFF control to be mounted on MV units

#### Electronic controls for <u>MB boards</u>

MB-M	MB electronic board fitted on the unit
MB-S	MB electronic board supplied with separate packaging
T-MB	Wall control (to be used with MB board only)
T-MB-M	Control fitted on the unit, for MV/MVB models with left connections (available with right connections, to be used with MB board and UP-AU board only)
T-MB-S	Control supplied with separate packaging, for MV/MVB models with left connections (available with right connections, to be used with MB board and UP-AU board only)
RM-RT03	RT03 infra-red remote control with fitted receiver, for MV/MO-MVB models (to be used with MB board only)
RS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RM	Ricevitore per telecomando RT03 montato in fabbrica, solo versioni MV / MO-MVB (utilizzabile solo con scheda MB)
RS	Receiver for RT03 infra-red remote control fitted on the unit, for MV/MO-MVB models (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

#### ------ Sabianet management system for a network of fan coils ------

Sabianet	Hardware/software supervisory system (to be used with MB board only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet

**NOTES:** for more details about the Controls, see Page 263. for full list of main Accessories, see Page 273.





#### Built-in electronic control

Carisma CRC

#### <u>Wall</u> electronic control



WM-TQR





## Carisma CRC–ECM Fan Coil Unit with Centrifugal Fan with EC Brushless Electronic Motor and Inverter Board

Range includes 5 air flow rates (from 115 to 1395 m<sup>3</sup>/h) and 5 models (for wall and ceiling installation, with casing and concealed), each equipped with 3 or 4 row coil and with the possibility to add a 1 or 2 row coil for 4 pipe systems.

This is the series with the **lowest electrical consumption** in relation to both heat performance as well as working static performance and is particularly suited to satisfying the strictest energy consumption needs **of class R** buildings, and to ensuring excellent acoustic comfort. **The ECM range** makes use of the excellent experience gained with the SkyStar 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 **brushless** and **sensorless** type 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.

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

The extreme efficiency, also at low speed, makes possible a great reduction in electric consumption (50% less in comparison to CRC AC motor) with absorption values under normal operating conditions that **do not exceed 16 Watt**. The excellent values of the CRC range in terms of sound levels have been maintained **in all working conditions**, without any resonance phenomenon at any frequency.

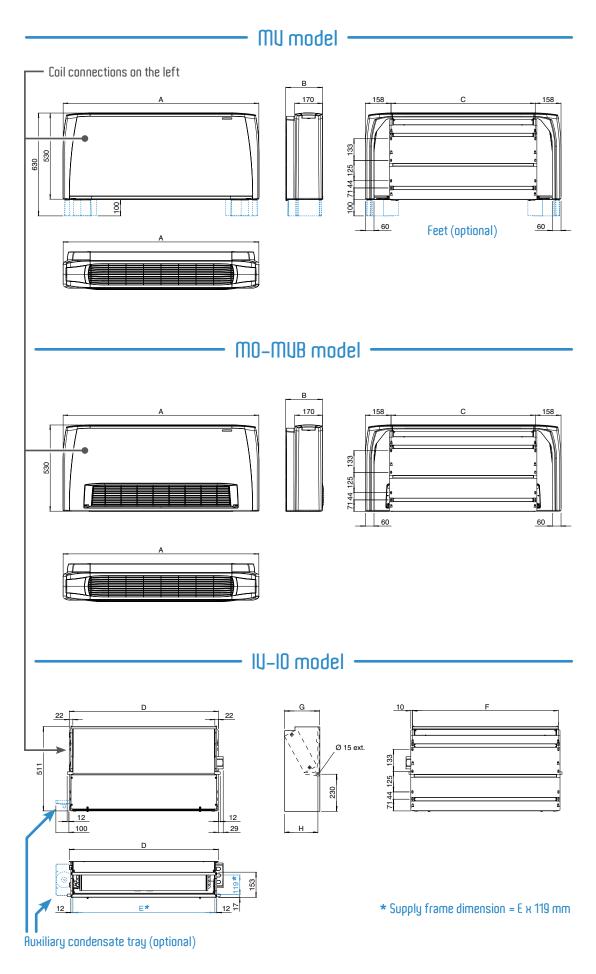
The full compliance with the Electromagnetic Compatibility Directive and with the other severe Standards in force is certified by an independent institute.

## Technical characteristics of the main components:

### For the technical characteristics of the various components refer to Carisma CRC Fan Coil Unit, except for

Electronic motor: three phase permanent magnet brushless 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 – 240 U** and frequency of **50 – 60 Hz**.

#### **Dimensions, Weight, Water content**





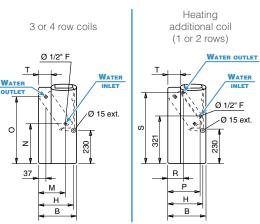
# **Carisma CRC-ECM**

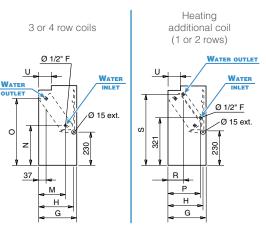
#### **Dimensions, Weight, Water content**

#### - Coil connections

#### MU and MO-MUB model







#### Dimension (mm)

MODEL	2	4	6	7	9
A	770	985	1200	1415	1415
В	225	225	225	225	255
С	454	669	884	1099	1099
D	474	689	904	1119	1119
E	430	645	860	1075	1075
F	454	669	884	1099	1099
G	218	218	218	218	248
Н	205	205	205	205	235
М	145	145	145	145	170
N	260	260	260	260	270
0	460	460	460	460	450
Р	185	185	185	185	210
R	105	105	105	105	110
S	475	475	475	475	465
Т	55	55	55	55	85
U	65	65	65	65	95

#### - Weight (kg)

				WEIGHT	WITH PAC	KAGING		WEIGHT WITHOUT PACKAGING						
	N	IODEL	2	4	6	7	9	2	4	6	7	9		
B		3	17,2	22,5	27,7	32,1	35,9	15,4	20,2	24,9	28,8	32,2		
_ 2	S	3+1	18,0	23,7	29,2	33,9	37,7	16,2	21,4	26,4	30,6	34,0		
	ROWS	3+2	18,6	24,4	30,1	35,0	38,8	16,8	22,1	27,3	31,7	35,1		
ģ	£	4	18,0	23,5	29,0	33,6	37,4	16,2	21,2	26,2	30,3	33,7		
		4+1	18,8	24,7	30,5	35,4	39,2	17,0	22,4	27,7	32,1	35,5		
		3	13,6	18,1	22,8	27,0	30,4	11,8	16,3	20,5	24,2	27,3		
	S	3+1	14,4	19,3	24,3	28,8	32,2	12,6	17,5	22,0	26,0	29,1		
1	ROWS	3+2	15,0	20,0	25,2	29,9	33,3	13,2	18,2	22,9	27,1	30,2		
2	æ	4	14,4	19,1	24,1	28,5	31,9	12,6	17,3	21,8	25,7	28,8		
		4+1	15,2	20,3	25,6	30,3	33,7	13,4	18,5	23,3	27,5	30,6		

#### - Water content (litres) -

MODEL		2	4	6	7	9
	3	0,6	0,9	1,6	1,7	1,9
WS	4	0,8	1,3	2,2	2,4	2,8
ROV	+1	0,2	0,3	0,5	0,5	0,6
	+2	0,4	0,6	1,0	1,0	1,2





#### Units with 3 row coil -

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

<u>COOLING</u> (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 **Entering water temperature:** +50°C Water flow rate as for the cooling conditions

MODEL			CRC–ECM 23				CRC–ECM 43				CRC-ECM 63					
Inverter Power (V)			3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 <b>(E)</b>	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>
Speed				MED		MAX	MIN		MED		MAX	MIN		MED		MAX
Air flow m³/h		120	170	220	270	330	210	280	350	430	515	305	395	495	610	735
Cooling total emission (E) kW		0,74	0,98	1,19	1,39	1,61	1,42	1,80	2,19	2,58	2,97	1,97	2,45	2,94	3,46	3,99
Cooling sensible emission (E) kW			0,75	0,93	1,10	1,30	1,04	1,34	1,65	1,96	2,28	1,47	1,84	2,23	2,67	3,11
Heating (E) kW		0,92	1,24	1,53	1,81	2,13	1,70	2,20	2,70	3,21	3,74	2,35	2,96	3,59	4,25	4,95
Heating - Water 70-60°C	1,55	2,10	2,61	3,09	3,64	2,85	3,70	4,55	5,43	6,33	3,95	4,97	6,04	7,17	8,37	
Dp Cooling (E)	2,2	3,7	5,0	6,6	8,6	7,9	12,0	17,0	22,6	28,9	5,5	8,0	11,1	14,8	19,0	
Dp Heating (E)	2,0	3,6	5,0	6,5	8,3	6,6	9,9	13,8	18,2	23,9	4,5	6,7	9,2	12,1	15,7	
Fan <b>(E)</b>	7,0	9,0	11,0	14,5	21,0	6,0	9,0	12,0	17,0	25,0	7,0	10,0	15,0	22,0	32,0	
Sound power (E) dB(A)		30	36	41	47	51	30	36	42	47	51	33	38	44	49	54
Sound pressure (*)	dB(A)	21	27	32	38	42	21	27	33	38	42	24	29	35	40	45
1 row heating additional Heating (	E) kW	0,81	1,04	1,23	1,42	1,63	1,47	1,79	2,11	2,42	2,74	2,00	2,40	2,80	3,24	3,68
coil (Water 70/60°C) Dp Heat.	E) kPa	1,3	1,9	2,6	3,4	4,3	4,5	6,4	8,5	10,9	13,6	1,5	2,1	2,8	3,6	4,5
Energy classification FCEER (**)			C					Α					Α			
Energy classification FCCOP (***			C					В					Α			

MODEL		CRC	-ECI	<b>VI 7</b> 3	3	CRC–ECM 93					
Inverter Power (V)	1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	
Speed	MIN		MED		MAX	MIN		MED		MAX	
Air flow m <sup>3</sup> /h			500	610	755	890	605	785	945	1175	1395
Cooling total emission (E) kW			3,14	3,70	4,39	4,98	3,47	4,25	4,86	5,67	6,36
Cooling sensible emission (E) kW			2,35	2,79	3,35	3,84	2,65	3,31	3,83	4,56	5,20
Heating (E) kW			3,76	4,47	5,32	6,09	4,45	5,53	6,41	7,62	8,69
Heating - Water 70-60°C	5,16	6,30	7,50	8,94	10,25	7,55	9,40	10,94	13,06	14,95	
Dp Cooling (E) kPa			14,5	19,4	26,1	32,6	8,9	12,7	16,1	21,1	25,9
Dp Heating (E) kPa			11,9	16,1	21,5	26,8	7,7	11,0	13,9	18,3	22,5
Fan (E)	9,0	13	18,5	28,5	41,0	16,0	25,0	41,0	65,0	99,0	
Sound power (E)	37	43	48	53	57	44	50	55	60	64	
Sound pressure (*) dB(A)			34	39	44	48	35	41	46	51	55
1 row heating additional Heating	<b>(E)</b> kW	2,65	3,10	3,56	4,13	4,63	3,40	4,08	4,62	5,35	5,98
coil (Water 70/60°C) Dp Heat.	<b>(E)</b> kPa	2,9	3,9	4,9	6,4	7,8	4,6	6,3	7,8	10,1	12,3
Energy classification FCEER (**			Α					В			
Energy classification FCCOP (**			А					В			

- (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<sup>3</sup> room and a reverberation time of 0.5 sec.

(**\*\***) **FCEER** = Energy classification in Cooling.

(\*\*\*) FCCOP = Energy classification in Heating.







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#### Units with 4 row coil

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

<u>COOLING</u> (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 **Entering water temperature:** +50°C Water flow rate as for the cooling conditions

MODEL	MODEL				CRC-ECM 24						CRC-ECM 44					CRC-ECM 64					
Inverter Power (V)		1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 <b>(E)</b>	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>					
Speed		MIN		MED		MAX	MIN		MED		MAX	MIN		MED		MAX					
Air flow	m³/h	115	160	210	260	325	200	265	340	415	505	290	375	475	590	720					
Cooling total emission (E)	kW	0,78	1,07	1,33	1,59	1,88	1,44	1,84	2,28	2,73	3,19	2,06	2,61	3,20	3,86	4,54					
Cooling sensible emission (E)	kW	0,57	0,79	0,99	1,20	1,44	1,04	1,35	1,68	2,04	2,41	1,49	1,90	2,35	2,86	3,41					
Heating (E)	kW	0,94	1,30	1,63	1,98	2,37	1,70	2,19	2,75	3,31	3,91	2,43	3,12	3,87	4,71	5,60					
Heating - Water 70-60°C	kW	1,57	2,18	2,75	3,33	4,01	2,83	3,67	4,59	5,57	6,60	4,05	5,21	6,48	7,90	9,43					
Dp Cooling (E)	kPa	3,2	5,5	8,0	11,0	14,8	4,0	6,1	8,9	12,2	16,1	8,2	12,4	17,8	24,8	33,0					
Dp Heating (E)	kPa	2,6	4,6	6,5	9,1	12,6	3,0	4,8	7,2	10,0	13,5	6,5	10,2	14,9	20,4	26,9					
Fan (E)	W	7,0	9,0	11,0	14,5	21,0	6,0	9,0	12,0	17,0	25,0	7,0	10,0	15,0	22,0	32,0					
Sound power (E)	dB(A	) 30	36	41	47	51	30	36	42	47	51	33	38	44	49	54					
Sound pressure (*)	dB(A	) 21	27	32	38	42	21	27	33	38	42	24	29	35	40	45					
1 row heating additional Heating	g <b>(E)</b> kW	0,81	1,04	1,23	1,42	1,63	1,47	1,79	2,11	2,42	2,74	2,00	2,40	2,80	3,24	3,68					
coil (Water 70/60°C) Dp Hea	t. <b>(E)</b> kPa	1,3	1,9	2,6	3,4	4,3	4,5	6,4	8,5	10,9	13,6	1,5	2,1	2,8	3,6	4,5					
Energy classification FCEER (*			C					Α					Α								
Energy classification FCCOP (*			C					В					Α								

MODEL			CRC	-ECI	VI 74	4	CRC-ECM 94						
Inverter Power (V)		1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>		
Speed		MIN		MED		MAX	MIN		MED		MAX		
Air flow	m³/h	380	475	585	735	875	575	755	910	1145	1365		
Cooling total emission (E)	kW	2,62	3,21	3,84	4,64	5,34	3,61	4,52	5,25	6,25	7,14		
Cooling sensible emission (E)	kW	1,91	2,36	2,84	3,47	4,03	2,71	3,43	4,03	4,87	5,63		
Heating (E)	kW	3,09	3,82	4,61	5,61	6,51	4,50	5,73	6,70	8,12	9,39		
Heating - Water 70-60°C	kW	5,16	6,38	7,73	9,39	10,93	7,58	9,69	11,37	13,82	16,03		
Dp Cooling (E)	kPa	7,3	10,5	14,3	20,0	25,6	6,3	9,3	12,1	16,5	20,8		
Dp Heating (E)	kPa	6,0	8,5	11,8	16,7	21,0	5,2	7,7	9,9	13,5	17,0		
Fan <b>(E)</b>	W	9,0	13,0	18,5	28,5	41,0	16,0	25,0	41,0	65,0	99,0		
Sound power (E)	dB(A)	37	43	48	53	57	44	50	55	60	64		
Sound pressure (*)	dB(A)	28	34	39	44	48	35	41	46	51	55		
1 row heating additional Heating (E)	kW	2,65	3,10	3,56	4,13	4,63	3,40	4,08	4,62	5,35	5,98		
coil (Water 70/60°C) Dp Heat. (E)	kPa	2,9	3,9	4,9	6,4	7,8	4,6	6,3	7,8	10,1	12,3		
Energy classification FCEER (**) (I	E)			Α			В						
Energy classification FCCOP (***) (I	E)	A						В					

- (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<sup>3</sup> room and a reverberation time of 0.5 sec.

(\*\*) FCEER = Energy classification in Cooling.

(\*\*\*) FCCOP = Energy classification in Heating.

#### **Electronic controls** included

- MU-MUB models -

**CB-T-ECM** Continuous fan speed control with electronic thermostat and summer/winter switch

N.B.: if the electrostatic filter is mounted (CRC-ECM only), use the "IAQ" controls.

#### <u>Wall</u> electronic controls

#### – MU, MO-MUB and IU-IO models ———

WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
WM-S-ECM	Continuous fan speed control with electronic thermostat, summer/winter switch and liquid crystal display
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

#### **Electronic controls for <u>MB boards</u>**

MB-ECM-M	MB electronic board fitted on the unit
MB-ECM-S	MB electronic board supplied with separate packaging
T-MB	Wall control (to be used with MB board only)
T-MB-M	Control fitted on the unit, for MV/MVB models with left connections (available with right connections, to be used with MB board and UP-AU board only)
T-MB-S	Control supplied with separate packaging, for MV/MVB models with left connections (available with right connections, to be used with MB board and UP-AU board only)
RM-RT03	RT03 infra-red remote control with fitted receiver, for MV/MO-MVB models (to be used with MB board only)
RS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RM	Receiver for RT03 infra-red remote control fitted on the unit, for MV/MO-MVB models (to be used with MB board only)
RS	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

#### —— Sabianet management system for a network of fan coils —

Sabianet	Hardware/software supervisory system (to be used with MB board only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet

**NOTES:** for more details about the Controls, see Page 265. for full list of main Accessories, see Page 273.





#### CB-T-ECM control

Carisma CRC-ECM









## Carisma CRT Fan Coil Unit with Tangential Fan with Asynchronous Motor

Range includes **6 air flow rates** (from 90 to 945 m<sup>3</sup>/h) and **5 models** (for wall and ceiling installation, with casing and concealed), each equipped with 3 row coil and with the possibility to add a 1 row coil for 4 pipe systems.

Among fan coils with asynchronous motors, the CRT series is the one that offers the best compromise between electrical consumption, performance and cost. At minimum speed (Eurovent estimates that this is 65% of its operating time), electrical absorption ranges between 6 and 19W according to size and the sound pressure levels are between 19 and 23 dB(A). Therefore, it is the ideal solution for aesthetic systems, in areas with low background noise.

# Technical characteristics of the main components:

**Outer casing:** made with strong synthetic lateral corners and from galvanized and prepainted front steel panel. The plastic top grid has fixed louvres and is reversible in order to distribute the air in two different directions.

#### Standard colours:

- Lateral corners and top grid: Pantone Cool Grey 1C (light grey)
- Front panel: RAL 9003 (white)
- Other colours on request.

Inner casing: made from galvanized steel insulated with polyolefin (PO) foam (class M1).

**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. Filter presence is highlighted by a plastic front cover featuring the same colour as the top grid.

**Fan assembly:** the tangential fan assembly is composed of two fan shrouds: an external one in ABS and an internal one of perforated, shaped steel. The fan has an external diameter of 120mm and is the length of the coil. The fins are concave and are positioned in a spiral shape along the whole length of the fan.

**Electric motor:** the motor is wired for single phase and has six speeds, three of which are connected, 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.

**Coll:** 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.

Flow and return pipe connections are situated at the same end on the left side looking at the unit. On request we can deliver the unit with the connections on the right end side:

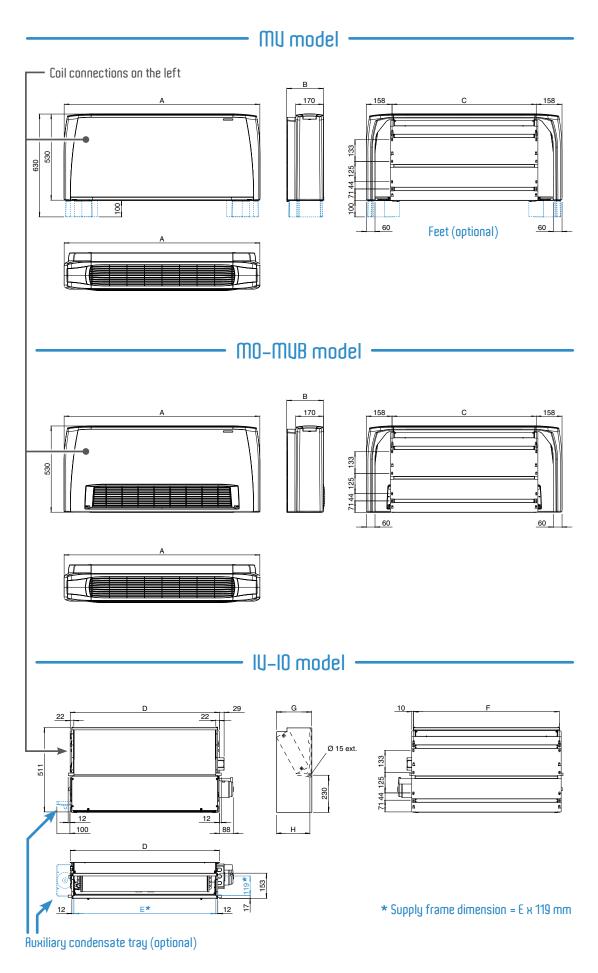
this must be specified on the order as this operation can not be carried out on site during installation.

**Condensate collection tray:** made from plastic with an "L"-shaped plastic fitted on the inner casing; in the MO-MVB and IV-IO model the tray is insulated with polyolefin (PO) foam (class M1).

The outside diameter of the condensate discharge pipe is 15 mm.



#### **Dimensions, Weight, Water content**





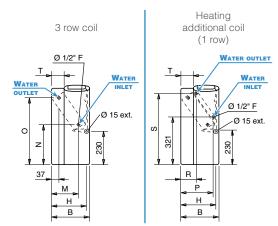
# **Carisma CRT**

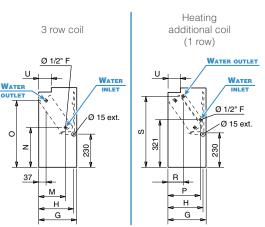
#### **Dimensions, Weight, Water content**

#### - Coil connections

#### MU and MO-MUB model







#### Dimension (mm) ·

MODEL	1	2	3	5	6	7
A	670	770	985	1200	1200	1415
В	225	225	225	225	225	225
С	354	454	669	884	884	1099
D	374	474	689	904	904	1119
E	330	430	645	860	860	1075
F	354	454	669	884	884	1099
G	218	218	218	218	218	218
Н	205	205	205	205	205	205
M	145	145	145	145	145	145
N	260	260	260	260	260	260
0	460	460	460	460	460	460
Р	185	185	185	185	185	185
R	105	105	105	105	105	105
S	475	475	475	475	475	475
Т	55	55	55	55	55	55
U	65	65	65	65	65	65

#### - Weight (kg) ·

				WEI	GHT WITH	H PACKA	GING		WEIGHT WITHOUT PACKAGING									
	M	ODEL	1	2	3	5	6	7	1	2	3	5	6	7				
-mub	ROWS	3	14,8	16,2	19,6	24,2	24,9	28,7	13,2	14,4	17,3	21,4	22,1	25,4				
	RO	3+1	15,5	17,0	20,8	25,7	26,4	30,5	13,9	15,2	18,5	22,9	23,6	27,2				
<u> </u>	ROWS	3	11,5	12,6	15,3	19,2	20,0	23,6	9,9	10,8	13,5	16,9	17,7	20,8				
01-U1	RO	3+1	12,2	13,4	16,5	20,7	21,5	25,4	10,6	11,6	14,7	18,4	19,2	22,6				

#### - Water content (litres) -

M	ODEL	1	2	3	5	6	7
NS	3	0,5	0,6	0,9	1,3	1,6	1,7
ROV	3+1	0,2	0,2	0,3	0,4	0,5	0,5





#### Units with 3 row coil •

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

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

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Entering water temperature: +50°C Water flow rate as for the cooling conditions

MODEL		CRT 13					CRT 23					CRT 33							
Croad		1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6
Speed			MIN	MED		MAX			MIN	MED		MAX			MIN	MED		MAX	
Air flow	m³/h	95	115	140	175	200	240	125	150	180	225	250	305	170	205	275	315	370	440
Cooling total emission (E)	kW	0,51	0,59	0,69	0,79	0,87	0,99	0,73	0,85	0,96	1,14	1,24	1,41	1,09	1,29	1,63	1,83	2,04	2,36
Cooling sensible emission (E)	kW	0,40	0,48	0,56	0,66	0,74	0,86	0,56	0,66	0,75	0,91	0,99	1,15	0,81	0,96	1,23	1,39	1,56	1,83
Heating <b>(E)</b>	kW	0,68	0,80	0,94	1,11	1,24	1,44	0,94	1,11	1,27	1,53	1,66	1,93	1,32	1,57	2,02	2,27	2,55	2,99
Heating - Water 70-60°C	kW	1,17	1,39	1,64	1,94	2,17	2,52	1,59	1,88	2,16	2,61	2,86	3,33	2,21	2,64	3,41	3,83	4,31	5,07
Dp Cooling <b>(E)</b>	kPa	0,7	0,9	1,2	1,5	1,8	2,2	1,6	2,1	2,6	3,6	4,1	5,2	5,0	6,7	10,1	12,3	15,2	20,0
Dp Heating <b>(E)</b>	kPa	0,5	0,7	0,9	1,2	1,5	1,9	1,3	1,8	2,2	3,0	3,3	4,3	4,1	5,3	8,3	10,2	12,5	15,6
Fan <b>(E)</b>	W	6	8	11	14	17	23	7	9	12	16	19	25	8	10	15	18	23	31
Sound power <b>(E)</b>	dB(A)	27	31	36	41	44	47	26	31	35	40	43	47	28	31	36	40	44	48
Sound pressure ( <b>*</b> )	dB(A)	18	22	27	32	35	38	17	22	26	31	34	38	19	22	27	31	35	39

MODEL		CRT 53							CRT 63					CRT 73					
Spood		1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6
Speed			MIN	MED		MAX			MIN	MED		MAX			MIN	MED		MAX	
Air flow	m³/h	225	285	360	440	495	610	305	370	475	560	635	780	360	445	570	680	780	945
Cooling total emission (E)	kW	1,46	1,77	2,17	2,53	2,76	3,23	1,88	2,19	2,67	3,02	3,33	3,87	2,29	2,72	3,32	3,77	4,18	4,82
Cooling sensible emission (E)	kW	1,08	1,32	1,64	1,93	2,12	2,52	1,41	1,66	2,05	2,34	2,61	3,07	1,70	2,04	2,52	2,89	3,23	3,78
Heating (E)	kW	1,77	2,17	2,69	3,16	3,47	4,13	2,31	2,73	3,34	3,83	4,26	5,03	2,78	3,33	4,10	4,71	5,27	6,16
Heating - Water 70-60°C	kW	2,97	3,65	4,54	5,34	5,87	6,98	3,89	4,59	5,66	6,49	7,23	8,55	4,66	5,62	6,91	7,96	8,91	10,44
Dp Cooling <b>(E)</b>	kPa	3,3	4,6	6,5	8,5	9,9	13,1	5,1	6,6	9,4	11,6	13,8	18,0	8,5	11,5	16,6	20,9	25,1	31,7
Dp Heating <b>(E)</b>	kPa	2,7	3,7	5,4	7,0	8,1	11,0	4,1	5,5	7,6	9,7	11,4	15,2	7,0	9,1	13,1	16,2	19,8	25,2
Fan <b>(E)</b>	W	12	15	22	27	33	46	15	20	28	35	44	60	19	24	34	43	53	72
Sound power (E)	dB(A)	26	31	37	41	43	48	31	36	43	47	50	54	32	36	43	47	50	55
Sound pressure (*)	dB(A)	17	22	28	32	34	39	22	27	34	38	41	45	23	27	34	38	41	46

(E) = Eurovent certified performance.

**MIN-MED-MAX** = Standard connected speeds.

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.







#### Units with 1 row additional coil

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

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: +70°C E.W.T. +60°C L.W.T.

MODEL		CRT 13+1							CRT 23+1						CRT 33+1					
Speed		1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	
Speeu			MIN	MED		MAX			MIN	MED		MAX			MIN	MED		MAX		
Air flow	m³/h	90	110	135	165	190	225	115	140	170	210	240	290	165	200	255	300	345	415	
Cooling total emission (E)	kW	0,49	0,57	0,67	0,76	0,84	0,95	0,68	0,80	0,92	1,08	1,20	1,36	1,05	1,25	1,54	1,73	1,94	2,22	
Cooling sensible emission (E)	kW	0,38	0,46	0,55	0,63	0,71	0,81	0,52	0,62	0,71	0,86	0,96	1,11	0,78	0,93	1,16	1,32	1,49	1,73	
Heating (E)	kW	0,60	0,69	0,80	0,91	1,01	1,13	0,82	0,95	1,07	1,25	1,38	1,56	1,25	1,45	1,74	1,93	2,14	2,43	
Dp Cooling <b>(E)</b>	kPa	0,6	0,8	1,1	1,4	1,6	2,0	1,4	1,9	2,4	3,3	3,9	4,9	4,5	6,1	8,8	10,8	13,2	16,8	
Dp Heating <b>(E)</b>	kPa	0,6	0,8	1,0	1,3	1,5	1,9	1,3	1,6	2,0	2,6	3,1	3,9	3,4	4,4	6,1	7,3	8,8	11,0	
Fan <b>(E)</b>	W	6	8	11	14	17	23	7	9	12	16	19	25	8	10	15	18	23	31	
Sound power (E)	dB(A)	27	31	36	41	44	47	26	31	35	40	43	47	28	31	36	40	44	48	
Sound pressure ( <b>*</b> )	dB(A)	18	22	27	32	35	38	17	22	26	31	34	38	19	22	27	31	35	39	

MODEL		CRT 53+1						CRT 63+1							CRT 73+1					
Speed		1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	
Speed			MIN	MED		MAX			MIN	MED		MAX			MIN	MED		MAX		
Air flow	m³/h	215	275	345	420	475	580	285	345	440	520	600	735	345	420	540	640	735	895	
Cooling total emission (E)	kW	1,41	1,72	2,09	2,44	2,67	3,11	1,77	2,09	2,53	2,87	3,19	3,70	2,21	2,59	3,17	3,62	4,04	4,63	
Cooling sensible emission <b>(E)</b>	kW	1,04	1,28	1,57	1,85	2,05	2,41	1,32	1,57	1,93	2,21	2,48	2,93	1,64	1,93	2,40	2,76	3,11	3,61	
Heating <b>(E)</b>	kW	1,64	1,95	2,31	2,65	2,87	3,30	2,00	2,31	2,74	3,07	3,39	3,90	2,52	2,89	3,46	3,90	4,31	4,91	
Dp Cooling <b>(E)</b>	kPa	3,0	4,3	6,1	8,0	9,4	12,2	4,6	6,1	8,5	10,6	12,8	16,6	10,3	13,0	18,7	24,0	28,6	35,5	
Dp Heating <b>(E)</b>	kPa	1,1	1,5	2,0	2,5	2,9	3,7	1,5	2,0	2,7	3,2	3,9	4,9	2,7	3,4	4,7	5,8	6,9	8,7	
Fan <b>(E)</b>	W	12	15	21	27	33	46	15	20	28	35	44	60	19	24	34	43	53	72	
Sound power (E)	dB(A)	26	31	37	41	43	48	31	36	43	47	50	54	32	36	43	47	50	55	
Sound pressure (*)	dB(A)	17	22	28	32	34	39	22	27	34	38	41	45	23	27	34	38	41	46	

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.

#### **Electronic controls** <u>included</u>

#### — Standard MU-MUB models ——

CB	3 speed control
CB-T	3 speed control with electronic thermostat and manual summer/winter switch
CB-C	3 speed control with electronic thermostat and centralized summer/winter switch
CB-AUT	Automatic 3 speed control with electronic thermostat and centralized/manual summer/winter switch

N.B.: if the electric heater is mounted, use the "IAQ" controls.

#### <u>Wall</u> electronic controls

#### — Standard MU, MO-MUB and IU-IO models —

WM-3V	3 speed control
WM-T	3 speed control with electronic thermostat and manual summer/winter switch
WM-TQR	3 speed control with electronic thermostat and centralized/manual summer/winter switch
WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
TM0-503-SV2	Automatic speed control with electronic thermostat to be mounted in the DIN 503 box
T2T	Electromechanical thermostat with summer/winter switch (only for 2 pipe units)
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

#### FreeSabiana wireless control system

Free-Com	Remote control to be used with electronic boards described at page 267
Free-Upm	Power unit fitted on the unit
Free-Ups	Power unit not fitted on the unit
Free-Sen	Temperature probe
<b>CB-Free</b>	ON/OFF control to be mounted on MV units



#### **Electronic controls for <u>MB boards</u>**

MB-M	MB electronic board fitted on the unit
MB-S	MB electronic board supplied with separate packaging
T-MB	Wall control (to be used with MB board only)
T-MB-M	Control fitted on the unit, for MV/MVB models with left connections (available with right connections, to be used with MB board and UP-AU board only)
T-MB-S	Control supplied with separate packaging, for MV/MVB models with left connections (available with right connections, to be used with MB board and UP-AU board only)
RM-RT03	RT03 infra-red remote control with fitted receiver, for MV/MO-MVB models (to be used with MB board only)
RS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RM	Ricevitore per telecomando RT03 montato in fabbrica, solo versioni MV / MO-MVB (utilizzabile solo con scheda MB)
RS	Receiver for RT03 infra-red remote control fitted on the unit, for MV/MO-MVB models (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

#### —— Sabianet management system for a network of fan coils ——

Sabianet	Hardware/software supervisory system (to be used with MB board only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet

### Carisma CRT–ECM Fan Coil Unit with Tangential Fan with EC Brushless Electronic Motor and Inverter Board

Range includes **5 air flow rates** (from 95 to 900 m<sup>3</sup>/h) and **5 models** (for wall and ceiling installation, with casing and concealed), each equipped with 3 row coil and with the possibility to add a 1 row coil for 4 pipe systems.

With electrical consumption less than 8 W on the entire range at the lowest speed, it can be considered to be **the best fan coil on the market** in electrical consumption. Therefore, it is particularly suited whenever there are low environmental thermal requirements and the focus is on consumption and acoustic comfort. **The ECM range** makes use of the excellent experience gained with the SkyStar 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 **brushless** and **sensorless** type

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.

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

The extreme efficiency, also at low speed, makes possible a great reduction in electric consumption (50% less in comparison to CRT AC motor) with absorption values under normal operating conditions that **do not exceed 8 Watt**. The excellent values of the CRT 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 strict Standards in force is certified by an independent institutee.

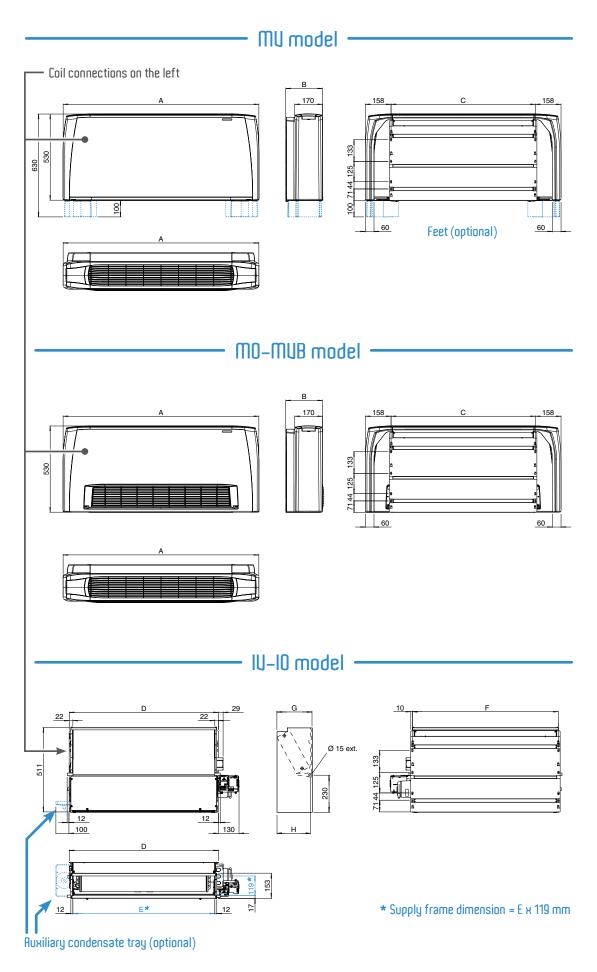


#### Technical characteristics of the main components:

### For the technical characteristics of the various components refer to Carisma CRC Fan Coil Unit, except for

Electronic motor: three phase permanent magnet brushless 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** – **240** U and frequency of **50** – **60** Hz.

#### **Dimensions, Weight, Water content**





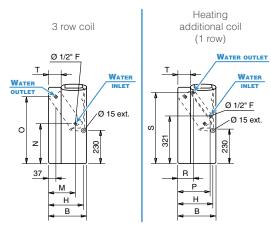
# Carisma CRT-ECM

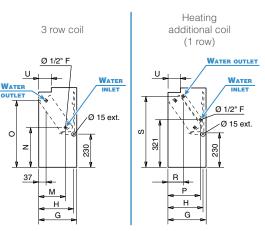
#### **Dimensions, Weight, Water content**

#### - Coil connections

#### MU and MO-MUB model







#### Dimension (mm)

MODEL	1	2	3	5	7
A	670	770	985	1200	1415
В	225	225	225	225	225
С	354	454	669	884	1099
D	374	474	689	904	1119
E	330	430	645	860	1075
F	354	454	669	884	1099
G	218	218	218	218	218
Н	205	205	205	205	205
М	145	145	145	145	145
N	260	260	260	260	260
0	460	460	460	460	460
Р	185	185	185	185	185
R	105	105	105	105	105
S	475	475	475	475	475
Т	55	55	55	55	55
U	65	65	65	65	65

#### - Weight (kg) ·

				WEIGHT	WITH PAC	KAGING		WEIGHT WITHOUT PACKAGING								
	M	ODEL	1	2	3	5	7	1	2	3	5	7				
BUM-	ROWS	3	14,8	16,2	19,6	24,2	28,7	13,2	14,4	17,3	21,4	25,4				
	ROV	3+1	15,5	17,0	20,8	25,7	30,5	13,9	15,2	18,5	22,9	27,2				
0-	ROWS	3	11,5	12,6	15,3	19,2	23,6	9,9	10,8	13,5	16,9	20,8				
01-U1	RO	3+1	12,2	13,4	16,5	20,7	25,4	10,6	11,6	14,7	18,4	22,6				

#### - Water content (litres) -

Μ	ODEL	1	2	3	5	7
NS	3	0,5	0,6	0,9	1,3	1,7
ROWS	3+1	0,2	0,2	0,3	0,4	0,5





#### 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 **Entering water temperature:** +50°C Water flow rate as for the cooling conditions

MODEL			CRT-ECM 13			CRT-ECM 23			CRT-ECM 33			Т-Е 53	CM	CRT–ECM 73		
Inverter Power (V)		1 <b>(E)</b>	5 <b>(E)</b>	10 <b>(E)</b>	1 <b>(E)</b>	5 <b>(E)</b>	10 <b>(E)</b>	1 (E)	5 <b>(E)</b>	10 <b>(E)</b>	1 <b>(E)</b>	5 <b>(E)</b>	10 <b>(E)</b>	1 <b>(E)</b>	5 <b>(E)</b>	10 <b>(E)</b>
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Air flow	m³/h	105	165	240	150	215	305	220	325	450	295	460	675	400	630	900
Cooling total emission (E)	kW	0,55	0,76	0,99	0,85	1,11	1,41	1,37	1,88	2,38	1,83	2,62	3,49	2,48	3,57	4,67
Cooling sensible emission (E)	kW	0,44	0,63	0,86	0,66	0,88	1,15	1,02	1,43	1,85	1,37	2,01	2,74	1,85	2,73	3,65
Heating (E)	kW	0,80	1,10	1,48	1,17	1,52	1,96	1,79	2,45	3,12	2,39	3,45	4,63	3,14	4,57	6,06
Heating - Water 70-60°C	kW	1,39	1,95	2,63	2,01	2,63	3,41	3,05	4,17	5,32	4,07	5,88	7,92	5,31	7,74	10,31
Dp Cooling <b>(E)</b>	kPa	0,8	1,4	2,2	2,1	3,4	5,2	7,4	12,9	19,7	4,8	9,1	15,0	9,6	18,2	29,1
Dp Heating <b>(E)</b>	kPa	0,7	1,1	1,8	1,7	2,7	4,2	6,2	10,4	16,0	3,9	7,4	12,1	7,7	15,0	24,0
Fan <b>(E)</b>	W	4,0	6,0	10,0	4,5	6,5	11,5	5,0	8,5	16,0	6,0	11,5	26,0	7,0	15,0	38,0
Sound power (E)	dB(A)	29	39	48	33	43	49	33	42	49	35	46	53	37	48	56
Sound pressure (*)	dB(A)	20	30	39	24	34	40	24	33	40	26	37	44	28	39	47
Energy classification FCEER (**)	(E)		В			В			Α			Α			Α	
Energy classification FCCOP (***	nergy classification FCCOP (***) (E)		В			В			А			А			А	

#### Units with 1 row additional coil -

4 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.

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Water temperature: +70°C E.W.T. +60°C L.W.T.

MODEL		CRT–ECM 13+1			CRT-ECM 23+1			CRT-ECM 33+1			CRT-ECM 53+1			<b>CRT-ECM</b> 73+1		
Inverter Power (V)		1 (E)	5 <b>(E)</b>	10 <b>(E)</b>	1 (E)	5 <b>(E)</b>	10 <b>(E)</b>	1 (E)	5 <b>(E)</b>	10 <b>(E)</b>	1 (E)	5 <b>(E)</b>	10 <b>(E)</b>	1 <b>(E)</b>	5 <b>(E)</b>	10 <b>(E)</b>
Speed		MIN	MED	MAX	MIN	MED	MAX									
Air flow	m³/h	95	150	225	135	195	285	200	295	415	270	420	640	355	565	820
Cooling total emission (E)	kW	0,51	0,72	0,95	0,78	1,02	1,34	1,25	1,71	2,22	1,69	2,44	3,35	2,26	3,29	4,35
Cooling sensible emission <b>(E)</b>	kW	0,40	0,60	0,81	0,60	0,81	1,09	0,93	1,30	1,73	1,26	1,85	2,62	1,68	2,50	3,37
Heating <b>(E)</b>	kW	0,62	0,85	1,09	0,98	1,23	1,57	1,54	2,00	2,51	2,05	2,76	3,67	2,67	3,68	4,72
Dp Cooling <b>(E)</b>	kPa	0,8	1,5	2,3	1,8	2,9	4,8	6,1	10,6	16,8	4,2	8,0	14,0	8,2	15,8	25,7
Dp Heating <b>(E)</b>	kPa	0,7	1,1	1,8	1,7	2,5	3,9	4,9	7,8	11,6	1,6	2,7	4,4	3,0	5,2	8,1
Fan <b>(E)</b>	W	4,0	6,0	10,0	4,5	6,5	11,5	5,0	8,5	16,0	6,0	11,5	26,0	7,0	15,0	38,0
Sound power (E)	dB(A)	31	39	48	33	43	49	33	42	49	35	46	53	37	48	56
Sound pressure (*)	dB(A)	22	30	39	24	34	40	24	33	40	26	37	44	28	39	47
Energy classification FCEER (**) (E)			В			В			Α			Α			А	
Energy classification FCCOP (***	) (E)		C			В			Α			Α			В	

#### (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<sup>3</sup> room and a reverberation time of 0.5 sec.

(\*\*) FCEER = Energy classification in Cooling.

(**\*\*\***) **FCCOP** = Energy classification in Heating.



#### **Electronic controls <u>included</u>**

- MU-MUB models -

**CB-T-ECM** Continuous fan speed control with electronic thermostat and summer/winter switch

#### <u>Wall</u> electronic controls

— MU, MO-MUB and IU-10 models –

WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
WM-S-ECM	Continuous fan speed control with electronic thermostat, summer/winter switch and liquid crystal display
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

#### **Electronic controls for <u>MB boards</u>**

MB-ECM-M	MB electronic board fitted on the unit
MB-ECM-S	MB electronic board supplied with separate packaging
T-MB	Wall control (to be used with MB board only)
T-MB-M	Control fitted on the unit, for MV/MVB models with left connections (available with right connections, to be used with MB board and UP-AU board only)
T-MB-S	Control supplied with separate packaging, for MV/MVB models with left connections (available with right connections, to be used with MB board and UP-AU board only)
RM-RT03	RT03 infra-red remote control with fitted receiver, for MV/MO-MVB models (to be used with MB board only)
RS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RM	Receiver for RT03 infra-red remote control fitted on the unit, for MV/MO-MVB models (to be used with MB board only)
RS	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

#### $\cdot$ Sabianet management system for a network of fan coils -

Sabianet         Hardware/software supervisory system (to be used with MB board only)							
<b>ROUTER-S</b>	Router for Sabianet						
SIOS	Relay output board for Sabianet						

## Carisma CRR Fan Coil Unit with Tangential Fan with Asynchronous Motor

Range includes **Y air flow rates** (from 110 to 500 m<sup>3</sup>/h) and **1 model**, vertical for wall installation, equipped with 2 row coil.

he **CRR** series was created to offer a **residential** fan coil with a sophisticated design and low depth (183 mm) and a specially silent tangential fan assembly.

# Technical characteristics of the main components:

**Duter casing:** made with strong synthetic lateral corners and from galvanized and pre-painted front steel panel. The plastic top grid has fixed louvres and is reversible in order to distribute the air in two different directions.

#### Standard colours:

- Lateral corners and top grid:
   Pantone Cool Grey 1C (light grey)
- Front panel: RAL 9003 (white)
- Other colours on request.

Inner Casing: made from galvanized steel insulated with polyolefin (PO) foam (class M1).



**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. Filter presence is highlighted by a plastic front cover featuring the same colour as the top grid.

**Fan assembly:** the tangential fan assembly is composed of two fan shrouds: an external one in ABS and an internal one of perforated, shaped steel. The fan has an external diameter of 120mm and is the length of the coil. The fins are concave and are positioned in a spiral shape along the whole length of the fan.

**Electric motor:** the motor is wired for single phase and has six speeds, three of which are connected, 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.



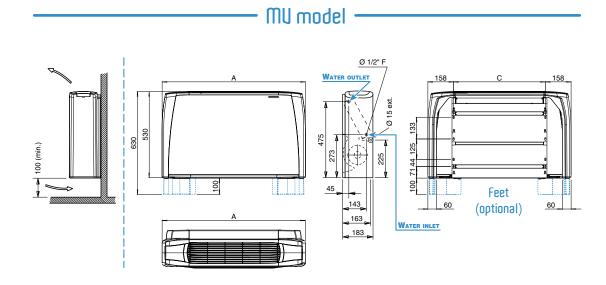
**Coil:** it is manufactured from drawn copper tube and the aluminium fins are mechanically bonded onto the tube by an expansion process. The coil has two 1/2inch BSP internal connections and 1/8 inch BSP air vent and drain. The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

Flow and return pipe connections are situated at the same end on the left side looking at the unit. On request we can deliver the unit with the connections on the right end side: this must be

specified on the order as this operation can not be carried out on site during installation.

**<u>Condensate collection tray:</u>** made from plastic fitted on the inner casing. The outside diameter of the condensate discharge pipe is 15 mm.

#### Dimensions, Weight, Water content



Dimension (mm)								
MODEL 1 2 3 4								
А	670	770	985	1200				
С	354	454	669	884				

	Weight (kg)										
		WEIGHT WITH	H PACKAGING		l	NEIGHT WITHO	UT PACKAGINO	2			
MODEL	1	2	3	4	1	2	3	4			
	13,8	14,7	17,6	22,2	12,6	13,2	15,6	19,7			

Water content (litres)								
MODEL	1	2	3	4				
	0,4	0,5	0,8	1,1				







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#### Units with 2 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 **Entering water temperature:** +50°C Water flow rate as for the cooling conditions

MODEL		CRR 1		CRR 2		CRR 3			CRR 4				
Croad		1 (E)	2 <b>(E)</b>	3 <b>(E)</b>	1 (E)	2 <b>(E)</b>	3 <b>(E)</b>	1 (E)	2 <b>(E)</b>	3 <b>(E)</b>	1 (E)	2 <b>(E)</b>	3 <b>(E)</b>
Speed		MIN	MED	MAX									
Air flow	m³/h	110	150	180	160	200	250	230	290	360	320	400	500
Cooling total emission (E)	kW	0,60	0,74	0,83	0,95	1,10	1,30	1,31	1,59	1,87	2,00	2,40	2,80
Cooling sensible emission (E)	kW	0,47	0,56	0,65	0,71	0,86	1,01	1,08	1,31	1,53	1,40	1,71	2,05
Heating (E)	kW	0,80	1,00	1,20	1,13	1,32	1,60	1,80	2,20	2,60	2,50	3,00	3,60
Heating - Water 70-60°C	kW	1,40	1,78	2,03	1,91	2,25	2,69	3,02	3,80	4,57	4,22	5,08	6,12
Dp Cooling (E)	kPa	6,0	9,0	11,0	11,5	15,5	20,0	4,4	6,3	7,8	11,0	14,5	20,0
Dp Heating (E)	kPa	4,0	5,5	7,0	9,5	12,5	16,5	4,0	5,0	7,0	10,5	14,1	18,8
Fan <b>(E)</b>	W	20	22	28	20	22	27	22	26	31	25	30	36
Sound power (E)	dB(A)	34	40	42	34	39	45	34	39	45	34	40	46
Sound pressure (*)	dB(A)	25	31	33	25	30	36	25	30	36	25	31	37

(E) = Eurovent certified performance. MIN-MED-MAX = Standard connected speeds.

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.

#### **Electronic controls** <u>included</u>

CB	3 speed control
CB-T	3 speed control with electronic thermostat and manual summer/winter switch
CB-C	3 speed control with electronic thermostat and centralized summer/winter switch
CB-AUT	Automatic 3 speed control with electronic thermostat and summer/winter switch

#### <u>Wall</u> electronic controls

FreeSabiana wireless control system

	•
Free-Com	Remote control to be used with electronic boards described at Page 267

**NOTES:** for more details about the Controls, see Page 263. for full list of main Accessories, see Page 273.



## Carisma CFR Fan Coil Unit with Tangential Fan with Asynchronous Motor

**Carisma CFR** fan coils are designed to meet the frequent requirement in homes of combining the typical qualities of radiators, such as reduced depth and quiet operation, with the typical quality of fan coils for controlling the climate in environments all year round with a high comfort air outlet temperature.

They are available into **two main uersions:** with front radial panel or with front panel for covering only. In winter, the first solution provides both a convective and radiant thermal exchange, **further improving the feeling of well being**.

On demand, recessed versions, horizontal ceiling mounted versions and 4 pipe systems are available for installation in non residential buildings.

# Carisma CFR

# Technical characteristics of the main components:

Carisma CFR fan coils are available in two models:

- with coil for MU and IU-I0 models;
- with coil coupled to a radiant element for MUR models.

MV and IV-IO models, aided by the water coil only, meet all the typical requirements of a fan coil with especially reduced size.

MVR model, in addition to the water coil, includes an integrated radiant element which enhances the efficiency of the unit, providing in winter both a convective and radiant static thermal exchange.

**Frontal panel and remouable lateral corners** (to inspect the compartment, electric or hydraulic connections) in galvanised steel painted with oven-dried epoxy powders RAL 9010.

**<u>Casing</u>** in high resistance galvanised steel.

#### <u>Coil:</u>

 Coil in copper pipes and aluminium fins with high efficiency turbulence. Eurokonus 3/4" threaded fittings, comply with the new requirements of EU standards; the headers are equipped with air vent and water drains. The coil is equipped with a sensor to detect water temperature. The standard position

of the hydraulic connections is on the left side looking at the unit from the front. However the coils are reversible: the side of the connections can therefore be inverted

on site. Right side connections are possible on demand.

The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

 Radiant element (MVR models only) connected in parallel to the coil and equipped with a thermostatic valve which opens when the water reaches a temperature of 29°C.

**Fan assembly** including tangential fan in synthetic material with offset fins (extremely silent) mounted on EPDM anti-vibration supports. Statically and dynamically balanced rotor, coupled directly on the motor shaft.

Single-phase resin pack **<u>electric motor</u>** mounted on EPDM anti-vibration supports with sensor for HALL effect.

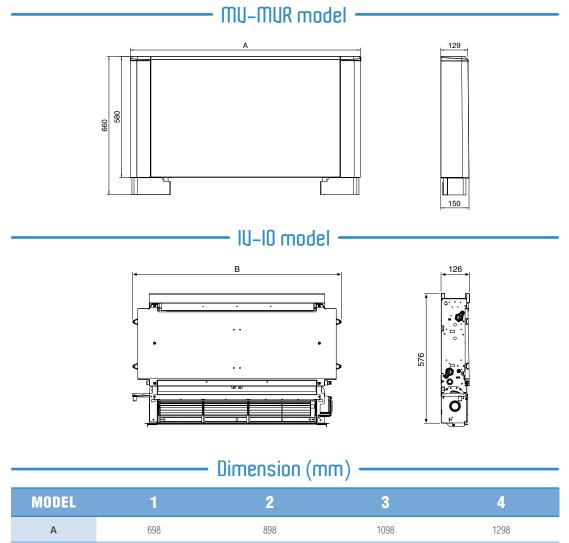
Reversible **Supply air grid** in galvanised steel painted with oven-dried epoxy powders RAL 9010. Large size with high mechanical resistance.

**Condensate collection tray** in shockproof PVC, easily removable for periodical cleaning. Condensate collection tray in shockproof ABS for horizontal installation (optional).





## Dimensions, Weight, Water content



	ight	
<b>W</b> E		(KE)
	0	

925

1125

725

		WEIGHT WITH	H PACKAGING		WEIGHT WITHOUT PACKAGING					
MODEL	1	2	3	4	1	2	3	4		
MV	15,0	17,0	20,0	23,0	12,5	14,0	16,5	19,5		
MVR	17,0	19,5	24,0	27,5	14,5	16,5	20,5	23,5		
IV-IO	11,5	15,0	18,5	22,0	9,0	12,0	15,0	18,0		

#### — Water content (litres) —

				×				
		С	OIL		RADIANT ELEMENT			
MODEL	1	2	3	4	1	2	3	4
MV	0,47	0,8	1,13	1,46	-	_	-	-
MVR	0,47	0,8	1,13	1,46	0,3	0,5	0,7	0,9
IV-IO	0,47	0,8	1,13	1,46	-	_	_	-



в

525





#### 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.

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Entering water temperature: +50°C

Water flow rate as for the cooling conditions

MODEL		CFR 1			CFR 2				CFR 3	}	CFR 4			
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	
Air flow	m³/h	100	125	160	170	230	320	180	270	460	370	450	575	
Cooling total emission (E)	kW	0,38	0,72	0,83	0,92	1,36	1,76	1,51	2,11	2,56	1,99	2,70	3,31	
Cooling sensible emission (E)	kW	0,26	0,51	0,65	0,66	1,04	1,27	1,11	1,57	1,96	1,55	2,10	2,56	
Heating (E)	kW	0,64	0,84	1,05	1,25	1,65	2,31	1,75	2,56	3,12	2,21	3,10	4,10	
Dp Cooling <b>(E)</b>	kPa	3,8	10,6	13,1	2,4	5,5	8,2	7,5	14,2	19,0	7,3	13,8	18,7	
Dp Heating <b>(E)</b>	kPa	3,2	8,8	10,9	2,0	4,6	6,8	6,2	11,8	15,8	6,1	11,5	15,5	
Fan <b>(E)</b>	W	6	10	17	9	18	28	9	21	35	17	27	38	
Sound power (E)	dB(A)	38	45	52	39	46	53	41	47	53	39	45	53	
Sound pressure (*)	dB(A)	29	36	43	30	37	44	32	38	44	30	36	44	

(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<sup>3</sup> room and a reverberation time of 0.5 sec.

## Carisma CFR–ECM Fan Coil Unit with Tangential Fan with EC Brushless Electronic Motor

**Carisma CFR–ECM** fan coils are designed to meet the frequent requirement in homes of combining the typical qualities of radiators, such as reduced depth and quiet operation, with the typical quality of fan coils for controlling the climate in environments all year round with a high comfort air outlet temperature.

They are available into two main versions: with front radial panel or with front panel for covering only. In winter, the first solution provides both a convective and radiant thermal exchange, further improving the feeling of well being. All models are supplied with **low energy consumption electronic motors**.

On demand, recessed versions, horizontal ceiling mounted versions and 4 pipe systems are available for installation in non residential buildings.

# Technical characteristics of the main components:

Carisma CFR-ECM fan coils are available in two models:

- with coil for **MU** models;
- with coil coupled to a radiant element for MUR models.

MV model, aided by the water coil only, meet all the typical requirements of a fan coil with especially reduced size.

MVR model, in addition to the water coil, includes an integrated radiant element which enhances the efficiency of the unit, providing in winter both a convective and radiant static thermal exchange.

**Frontal panel and remouable lateral corners** (to inspect the compartment, electric or hydraulic connections) in galvanised steel painted with oven-dried epoxy powders RAL 9010.

**<u>Casing</u>** in high resistance galvanised steel.

#### <u>Coil:</u>

 Coil in copper pipes and aluminium fins with high efficiency turbulence. Eurokonus 3/4" threaded fittings, comply with the new requirements of EU standards; the headers are equipped with air vent and water drains. The coil is equipped with a sensor to detect water temperature. The standard position

of the hydraulic connections is on the left side looking at the unit from the front. However the coils are reversible: the side of the connections can therefore be inverted

on site. Right side connections are possible on demand. The coil is not suitable for use in corrosive atmosphere or in

- Radiant element (MVR models only) connected in

parallel to the coil and equipped with a thermostatic valve which opens when the water reaches a temperature of 29°C.

**Fan assembly** including tangential fan in synthetic material with offset fins (extremely silent) mounted on EPDM anti-vibration supports. Statically and dynamically balanced rotor, coupled directly on the motor shaft.

High efficiency EC **<u>electric motor</u>** BLDC for speed continuous control, with resin pack mounted on EPDM antivibration supports.

Reversible **SUPPLY air grid** in galvanised steel painted with oven-dried epoxy powders RAL 9010. Large size with high mechanical resistance.

**Condensate collection tray** in shockproof PVC, easily removable for periodical cleaning. Condensate collection tray in shockproof ABS for horizontal installation (optional).





#### **Dimensions, Weight, Water content**

# 



Dimension (mm)									
MODEL	1	2	3	4					
А	698	898	1098	1298					
В	525	725	925	1125					

#### —— Weight (kg) —

		WEIGHT WITH	H PACKAGING		WEIGHT WITHOUT PACKAGING						
MODEL	1	2	3	4	1	2	3	4			
MV	15,0	17,0	20,0	23,0	12,5	14,0	16,5	19,5			
MVR	17,0	19,5	24,0	27,5	14,5	16,5	20,5	23,5			

#### — Water content (litres) —

		C	OIL		RADIANT ELEMENT						
MODEL	1	2	3	4	1	2	3	4			
MV	0,47	0,8	1,13	1,46	-	-	-	-			
MVR	0,47	0,8	1,13	1,46	0,3	0,5	0,7	0,9			





The following standard rating conditions are used:

#### **<u>COOLING</u>** (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 Entering water temperature: +50°C Water flow rate as for the cooling conditions

Certification

MODEL		CFR-ECM 1			CFR–ECM 2			CF	R–ECI	M 3	CFR-ECM 4		
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX
Air flow	m³/h	100	125	160	170	230	320	180	270	460	370	450	575
Cooling total emission (E)	kW	0,38	0,72	0,83	0,92	1,36	1,76	1,51	2,11	2,56	1,99	2,70	3,31
Cooling sensible emission (E)	kW	0,26	0,51	0,65	0,66	1,04	1,27	1,11	1,57	1,96	1,55	2,10	2,56
Heating (E)	kW	0,64	0,84	1,05	1,25	1,65	2,31	1,75	2,56	3,12	2,21	3,10	4,10
Dp Cooling <b>(E)</b>	kPa	3,8	10,6	13,1	2,4	5,5	8,2	7,5	14,2	19,0	7,3	13,8	18,7
Dp Heating <b>(E)</b>	kPa	3,2	8,8	10,9	2,0	4,6	6,8	6,2	11,8	15,8	6,1	11,5	15,5
Fan <b>(E)</b>	W	5	7	11	6	9	19	7	11	20	8	12	24
Sound power (E)	dB(A)	38	45	52	39	46	53	41	47	53	39	45	53
Sound pressure (*)	dB(A)	29	36	43	30	37	44	32	38	44	30	36	44

(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<sup>3</sup> room and a reverberation time of 0.5 sec.



## Carisma CRC MUI uersion Fan Coil Unit with Centrifugal Fan with Asynchronous Motor

Range includes **5 air flow rates** (from 145 to 925 m<sup>3</sup>/h) each equipped with 4 row coil and with the possibility to add a 1 row coil for 4 pipe systems.

t includes some models from the CRC series but with a **particularly sturdy casing**, suited for installation in public places where there is a high risk of damage and improper use of the fan coil.



# Technical characteristics of the main components:

**Casing:** in galvanised steel plate, pre-painted in RAL 9002 (light grey), thickness 1.2 mm with built-in safety closures and keys for opening the front panel.

**<u>Output grills:</u>** in grey-finished extruded aluminium.

Inner casing: made from galvanized steel insulated with polyolefin (PO) foam (class M1).

Filter: polypropylene cellular fabric regenerating 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.

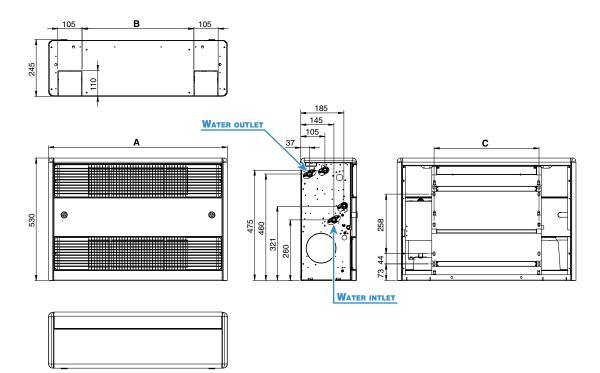
**Electric motor:** the motor is wired for single phase and has six speeds, three of which are connected, with capacitor. The motor is fitted on sealed for life bearings and is secured on anti-vibration and self-lubricating mountings. Internal thermal protection with automatic reset, protection IP 20, 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.

#### **Condensate collection tray:** made from plastic fitted

on the inner casing; the tray is insulated with polyolefin (PO) foam (class M1). The outside diameter of the condensate discharge pipe is 15 mm.

#### Dimensions, Weight, Water content



#### Dimension (mm) -

MODEL	CRC 24 MVI	CRC 44 MVI	CRC 54 MVI	CRC 64 MVI	CRC 74 MVI
Α	775	990	1205	1205	1420
В	487	702	917	917	1132
С	454	669	884	884	1099

#### —— Weight (kg) —

			WEIGH.	r with pac	KAGING		CKAGING				
N	IODEL	CRC 24 MVI	CRC 44 MVI	CRC 54 MVI	CRC 64 MVI	CRC 74 MVI	CRC 24 MVI	CRC 44 MVI	CRC 54 MVI	CRC 64 MVI	CRC 74 MVI
ROWS	4	25,0	32,5	39,1	40,0	46,6	23,0	29,5	36,1	37,0	42,6
RON	4+1	25,8	33,7	40,6	41,5	48,4	23,8	30,7	37,6	38,5	44,4

#### – Water content (litres) –

	MODEL	CRC 24 MVI	CRC 44 MVI	CRC 54 MVI	CRC 64 MVI	CRC 74 MVI		
ROWS	4	0,8	1,3	1,7	2,2	2,4		
ROV	4+1	0,2	0,3	0,4	0,5	0,5		





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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°CEntering water temperature:+50°CWater flow rate as for the cooling conditions

MODEI	L		CRC 24 MVI					CRC 44 MVI					CRC 54 MVI							
Canad			1 <b>(E)</b>	2	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5 <b>(E)</b>	6
Speed			MIN		MED		MAX			MIN	MED		MAX			MIN		MED		MAX
Air flow		m³/h	145	170	220	250	295	340	185	265	335	400	485	570	250	315	420	495	545	650
Cooling total emission (E)		kW	1,01	1,13	1,43	1,59	1,81	2,04	1,32	1,83	2,28	2,65	3,12	3,56	1,79	2,19	2,83	3,25	3,54	4,09
Cooling sensible emission	(E)	kW	0,74	0,83	1,07	1,19	1,38	1,57	0,95	1,34	1,68	1,97	2,34	2,69	1,30	1,60	2,08	2,40	2,63	3,07
Heating (E)		kW	1,18	1,34	1,72	1,92	2,20	2,50	1,54	2,16	2,72	3,17	3,76	4,34	2,06	2,53	3,30	3,81	4,17	4,83
Heating - Water 70-60°C		kW	1,98	2,24	2,88	3,22	3,69	4,19	2,57	3,62	4,56	5,32	6,33	7,30	3,44	4,23	5,51	6,37	6,97	8,07
Dp Cooling (E)		kPa	4,9	6,1	9,2	11,0	13,9	17,2	3,4	6,1	9,0	11,7	15,5	19,6	7,3	10,4	16,3	20,8	24,2	31,3
Dp Heating (E)		kPa	3,9	4,9	7,5	9,2	11,6	14,6	2,5	4,6	6,9	9,0	12,2	15,6	5,7	8,3	13,1	17,0	19,9	25,7
Fan (E)		W	14	16	22	26	32	40	14	21	28	34	44	57	18	22	32	39	46	61
Sound power (E)		dB(A)	30	33	40	43	47	51	27	33	39	43	47	52	26	31	37	41	43	48
Sound pressure (*)		dB(A)	21	24	31	34	38	42	18	24	30	34	38	43	17	22	28	32	34	39
	ating <b>(E)</b>	kW	0,94	1,04	1,25	1,36	1,52	1,68	1,34	1,73	2,06	2,32	2,65	2,88	1,77	2,07	2,53	2,83	3,03	3,42
coil (Water 70/60°C) Dp	Heat. <b>(E)</b>	kPa	1,7	2,0	2,8	3,3	4,0	4,8	3,9	6,0	8,2	10,1	12,8	14,8	1,2	1,6	2,3	2,8	3,2	3,9

MODEL		CRC 64 MVI						CRC 74 MVI					
Crossed	1 <b>(E</b>	) 2	3 <b>(E)</b>	4	5 <b>(E)</b>	6	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6 <b>(E)</b>	
Speed		I	MED		MAX			MIN		MED		MAX	
Air flow m <sup>3</sup> /l	415	505	590	680	760	830	445	535	630	735	840	925	
Cooling total emission (E) kW	2,83	3,38	3,86	4,38	4,79	5,13	3,03	3,56	4,08	4,64	5,17	5,58	
Cooling sensible emission (E) kW	2,07	2,49	2,86	3,27	3,60	3,87	2,22	2,62	3,03	3,47	3,89	4,23	
Heating (E) kW	3,39	4,07	4,69	5,35	5,88	6,35	3,55	4,20	4,86	5,55	6,19	6,71	
Heating - Water 70-60°C kW	5,66	6,81	7,85	8,98	9,90	10,68	5,93	7,02	8,12	9,30	10,38	11,26	
Dp Cooling (E) kPa	14,4	19,7	24,8	30,9	36,2	40,9	9,5	12,5	15,9	20,0	24,2	27,7	
Dp Heating (E) kPa	11,0	15,2	19,5	24,7	29,3	33,5	7,7	10,3	13,3	16,9	20,5	23,7	
Fan <b>(E)</b> W	37	46	55	67	78	88	44	54	66	79	92	103	
Sound power (E) dB(A	) 37	42	46	49	52	54	38	42	47	51	54	56	
Sound pressure (*) dB(A	) 28	33	37	40	43	45	29	33	38	42	45	47	
1 row heating additional Heating (E) kW	2,50	2,87	3,19	3,54	3,81	4,04	2,89	3,29	3,68	4,09	4,49	4,79	
coil (Water 70/60°C) Dp Heat. (E) kPa	3,2	4,1	4,9	5,8	6,7	7,4	3,4	4,3	5,2	6,3	7,4	8,3	

#### (E) = Eurovent

certified performance. **MIN-MED-MAX =** Standard connected speeds.

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.

#### Wall electronic controls

Can be connected only to wall controls for Fan Coil Units with asynchronous motors (infra-red remote control excluded). For the Characteristics, see Page 265.

<u>PSM-DI</u> multifunction control and <u>Sabianet</u> management system for a network of fan coils

For the Characteristics, see Page 269.

Auailable accessories: Plinth PLH



## Carisma CRSO High Pressure Fan Coil Unit with Asynchronous Motor

Range includes **Y air flow rates** (from 375 to 2220 m<sup>3</sup>/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**.

R II range is compliant with the new ERP 2015 Regulation (EU) No. 327/2011 which requires uery low electric consumption ratings in relation to performances provided.

# Technical characteristics of the main components:

**<u>Casing</u>**: made from galvanized steel insulated with polyolefin (PO) foam (class M1).

**<u>Filter</u>** 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.

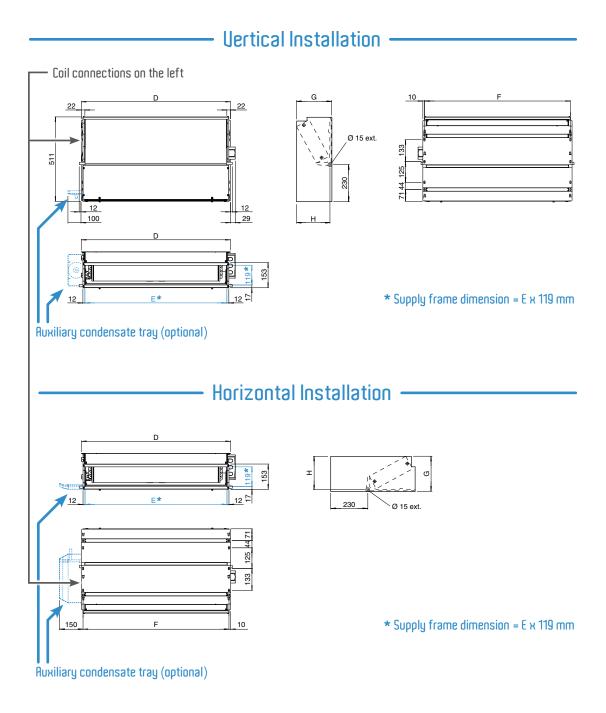
The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

Flow and return pipe connections are situated at the same end on the left side looking at the unit. On request we can deliver the unit with the connections on the right end side. This operation can also be easily carried out on site during installation.

**Condensate collection tray:** "L"-shaped, fitted on the inner casing, for size 1÷3 made of plastic and for size 4 made in painted steel; the tray is insulated with polyolefin (PO) foam (class M1). The outside diameter of the condensate discharge pipe is 15 mm.

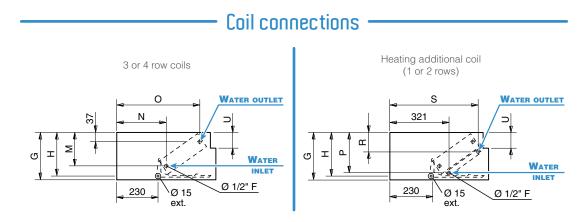


#### **Dimensions, Weight, Water content**





## **Dimensions, Weight, Water content**



#### Dimension (mm) -

MODEL	1	2	3	4
D	689	904	1119	1570
E	645	860	1075	1526
F	669	884	1099	1550
G	218	248	248	248
Н	205	235	235	235
М	145	170	170	170
N	260	270	270	270
0	460	450	450	450
Р	185	210	210	210
R	105	110	110	110
S	475	465	465	465
U	65	95	95	95

- Weight (kg) ·

			WEIGHT WITH	I PACKAGING		WEIGHT WITHOUT PACKAGING					
N	IODEL	1	2	3	4	1	2	3	4		
	3	19,1	26,1	30,4	47,7	17,3	23,5	27,3	43,3		
S	3+1	20,3	27,6	32,2	50,0	18,5	25,0	29,1	45,6		
ROWS	3+2	21,0	28,5	33,3	-	19,2	25,9	30,2	-		
æ	4	20,1	27,4	31,9	49,5	18,3	24,8	28,8	45,1		
	4+1	21,3	28,9	33,7	51,8	19,5	26,3	30,6	47,4		

- Water content (litres) -

N	IODEL	1	2	3	4
	3	0,9	1,6	1,9	3,2
NS	4	1,3	2,2	2,8	4,2
ROV	+1	0,3	0,5	0,6	0,9
	+2	0,6	1,0	1,2	-





#### • Units with 3 and 4 row coil •

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

<u>COOLING</u> (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.

#### <u>HEATING</u> (winter mode) Entering air temperature: +

**Entering air temperature:** +20°C **Entering water temperature:** +50°C Water flow rate as for the cooling conditions

MODEL		<b>CRSO 13</b>		C	RSO 2	23	C	RSO 33		<b>CRSO 43</b>			
Speed <b>(E)</b>		2	3	4	2	3	4	2	3	4	1	2	3
Air flow <b>(E)</b>	m³/h	240	285	310	470	525	580	760	885	960	945	1155	1285
Available pressure <b>(E)</b>	Pa	40	50	60	40	50	60	40	50	60	35	50	60
Cooling total emission (E)	kW	1,58	1,81	1,93	2,94	3,19	3,42	4,44	4,92	5,20	5,95	6,87	7,40
Cooling sensible emission (E)	kW	1,14	1,31	1,41	2,17	2,37	2,57	3,36	3,80	4,05	4,39	5,16	5,62
Heating <b>(E)</b>	kW	1,91	2,22	2,39	3,57	3,92	4,25	5,63	6,36	6,79	7,29	8,62	9,41
Dp Cooling <b>(E)</b>	kPa	9,0	11,5	12,9	10,6	12,3	13,9	11,4	13,7	15,1	8,9	11,5	13,1
Dp Heating <b>(E)</b>	kPa	6,9	9,0	10,3	8,3	9,8	11,4	9,0	11,0	11,9	6,8	9,2	10,8
Fan <b>(E)</b>	W	40	46	55	82	90	97	107	121	134	140	148	158
Sound power outlet (E)	dB(A)	44	47	50	46	49	51	51	54	57	52	56	58
Sound power inlet + radiated <b>(E)</b>	dB(A)	52	54	57	52	54	57	57	60	63	59	62	64
Sound pressure outlet (*)	dB(A)	35	38	41	37	40	42	42	45	48	43	47	49
Sound pressure inlet + radiated (*)	dB(A)	43	45	48	43	45	48	48	51	54	50	53	55
Plenum code <b>(E)</b>			9066363	}		9069222	) -		9066368	}		9069224	

MODEL		CRSO 14		C	RSO 2	24	C	RSO 3	34	<b>CRSO 44</b>			
Speed (E)		2	3	4	2	3	4	2	3	4	1	2	3
Air flow <b>(E)</b>	m³/h	240	285	310	470	525	580	760	885	960	945	1155	1285
Available pressure <b>(E)</b>	Pa	40	50	60	40	50	60	40	50	60	35	50	60
Cooling total emission (E)	kW	1,74	2,01	2,15	3,27	3,57	3,85	4,80	5,36	5,68	6,51	7,59	8,22
Cooling sensible emission (E)	kW	1,23	1,43	1,54	2,32	2,55	2,77	3,52	3,99	4,25	4,68	5,54	6,05
Heating (E)	kW	1,90	2,20	2,40	3,90	4,30	4,69	6,00	6,83	7,31	7,85	9,39	10,30
Dp Cooling <b>(E)</b>	kPa	5,4	7,0	7,9	18,1	21,2	24,3	9,7	11,9	13,2	11,8	15,6	18,0
Dp Heating <b>(E)</b>	kPa	4,2	5,6	6,4	14,3	17,1	20,1	8,0	9,3	10,5	11,0	13,8	17,0
Fan <b>(E)</b>	W	40	46	55	82	90	97	107	121	134	140	148	158
Sound power outlet (E)	dB(A)	44	47	50	46	49	51	51	54	57	52	56	58
Sound power inlet + radiated (E)	dB(A)	52	54	57	52	54	57	57	60	63	59	62	64
Sound pressure outlet (+)	dB(A)	35	38	41	37	40	42	42	45	48	43	47	49
Sound pressure inlet + radiated (*)	dB(A)	43	45	48	43	45	48	48	51	54	50	53	55
Plenum code <b>(E)</b>			9066363	}		9069222	)		9066368	}		9069224	1

(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<sup>3</sup> room and a reverberation time of 0.5 sec.





www.certiflash.com

#### Units with 1 row additional coil

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

COOLING	(summer	mode)
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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: +20 C +70°C E.W.T. +60°C L.W.T.

MODEL		CRS0 13+1		CR	SO 23	3+1	CRSO 33+1			CRS0 43+1			
Speed (E)		2	3	4	2	3	4	2	3	4	1	2	3
Air flow <b>(E)</b>	m³/h	240	285	310	470	525	580	760	885	960	945	1155	1285
Available pressure <b>(E)</b>	Pa	40	50	60	40	50	60	40	50	60	35	50	60
Cooling total emission (E)	kW	1,58	1,81	1,93	2,94	3,19	3,42	4,44	4,92	5,20	5,95	6,87	7,40
Cooling sensible emission (E)	kW	1,14	1,31	1,41	2,17	2,37	2,57	3,36	3,80	4,05	4,39	5,16	5,62
Heating (E)	kW	1,66	1,87	1,98	2,85	3,08	3,28	4,14	4,57	4,82	5,55	6,33	6,79
Dp Cooling <b>(E)</b>	kPa	9,0	11,5	12,9	11,2	13,0	14,7	13,9	17,7	19,0	8,9	11,5	13,1
Dp Heating <b>(E)</b>	kPa	5,3	6,6	7,3	3,8	4,3	4,8	6,2	7,4	8,1	13,5	17,2	19,5
Fan <b>(E)</b>	W	40	46	55	82	90	97	107	121	134	140	148	158
Sound power outlet (E)	dB(A)	44	47	50	46	49	51	51	54	57	52	56	58
Sound power inlet + radiated <b>(E)</b>	dB(A)	52	54	57	52	54	57	57	60	63	59	62	64
Sound pressure outlet (+)	dB(A)	35	38	41	37	40	42	42	45	48	43	47	49
Sound pressure inlet + radiated $(\star)$	dB(A)	43	45	48	43	45	48	48	51	54	50	53	55
Plenum code <b>(E)</b>			9066363	;		9069222		9066368			9069224		

## Wall electronic controls

#### — Standard models —

WM-3V	3 speed control
WM-T	3 speed control with electronic thermostat and manual summer/winter switch
WM-TQR	3 speed control with electronic thermostat and centralized/manual summer/winter switch
WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
TM0-503-SV2	Automatic speed control with electronic thermostat to be mounted in the DIN 503 box
T2T	Electromechanical thermostat with summer/winter switch (only for 2 pipe units)
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

#### - FreeSabiana wireless control system

**Free-Com** Remote control to be used with electronic boards described at page 267

## **Electronic controls for <u>MB boards</u>**

MB-M	MB electronic board fitted on the unit
MB-S	MB electronic board supplied with separate packaging
T-MB	Wall control (to be used with MB board only)
RS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RS	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

#### Sabianet management system for a network of fan coils

Sabianet	Hardware/software supervisory system (to be used with MB board only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet

**NOTES:** for more details about the Controls, see Page 265. for full list of main Accessories, see Page 273.







### <u>Wall</u> **Electronic controls**





### **<u>RT03</u>** infra-red remote control



Carisma CRSO



## Carisma CRS–ECM High Pressure Fan Coil Unit with EC Brushless Electronic Motor and Inverter Board

Range includes **3 air flow rates** (from 350 to 1450 m<sup>3</sup>/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 Uary** the air flow gives great regulation and control flexibility, at the same time **ensuring** excellent environmental conditions and extremely low electrical consumption. **The ECM range** makes use of the excellent experience gained with the SkyStar 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 **brushless** and **sensor**– **less** type 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.

The air flow rate can be varied **in Continuously** by means of a 1-10 V signal generated by Sabiana 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 (50% less in comparison to CRSO AC motor) with absorption values under normal operating conditions that **do not exceed 50 Watt**. The excellent values of the CRS-ECM 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.

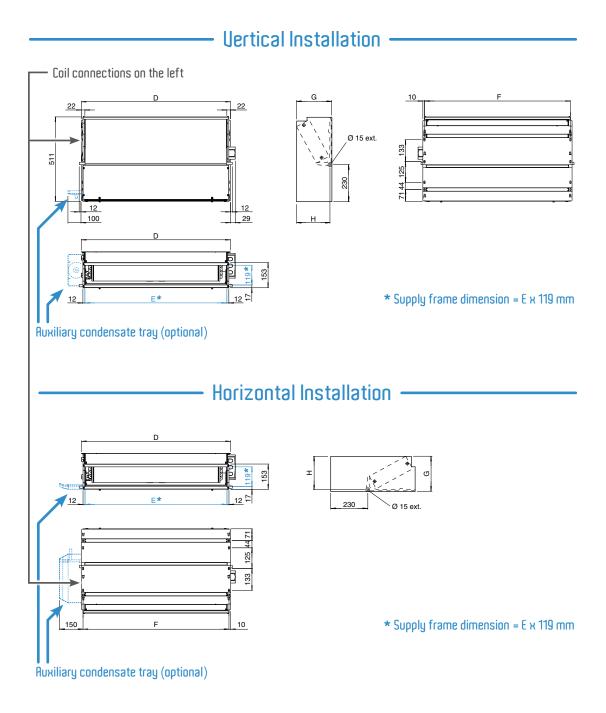


## Technical characteristics of the main components:

## For the technical characteristics of the various components refer to Carisma CRSO Fan Coil Unit, except for

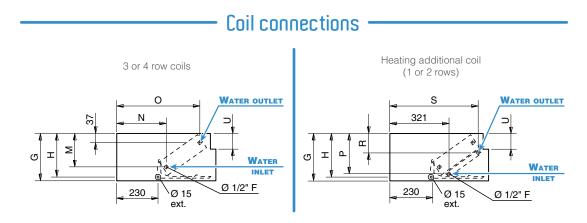
Electronic motor: three phase permanent magnet brushless electronic motor that is controlled with current reconstructed according to a **BLAC** sinusoidal wave. The inverter board that controls the motor operation is powered by 230 Volt, single-phase and, with a **Switching system**, it generates a three-phase frequency modulated, wave form power supply. The electric power supply required for the machine is therefore single-phase with voltage of **230** – **240** U and frequency of **50** – **60** Hz.

## **Dimensions, Weight, Water content**





## **Dimensions, Weight, Water content**



#### Dimension (mm) -

MODEL	1	2	3
D	689	904	1119
E	645	860	1075
F	669	884	1099
G	218	248	248
Н	205	235	235
М	145	170	170
N	260	270	270
0	460	450	450
Р	185	210	210
R	105	110	110
S	475	465	465
U	65	95	95

- Weight (kg) ·

		WE	IGHT WITH PACKAG	ING	WEIGHT WITHOUT PACKAGING					
N	IODEL	1	2	3	1	2	3			
	3	19,1	26,1	30,4	17,3	23,5	27,3			
S	3+1	20,3	27,6	32,2	18,5	25,0	29,1			
ROWS	3+2	21,0	28,5	33,3	19,2	25,9	30,2			
ä	4	20,1	27,4	31,9	18,3	24,8	28,8			
	4+1	21,3	28,9	33,7	19,5	26,3	30,6			

Water content (litres) -

N	IODEL	1	2	3
	3	0,9	1,6	1,9
NS	4	1,3	2,2	2,8
ROV	+1	0,3	0,5	0,6
	+2	0,6	1,0	1,2





#### - Units with 3 and 4 row coil -

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

<u>COOLING</u> (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 **Entering water temperature:** +50°C Water flow rate as for the cooling conditions

MODEL		CR	S–ECM	13	CR	S–ECM	23	CR	S–ECM	33	
Inverter Power (V)		5 <b>(E)</b>	7 <b>(E)</b>	9 <b>(E)</b>	4 <b>(E)</b>	6 <b>(E)</b>	8 <b>(E)</b>	4,5 <b>(E)</b>	6,5 <b>(E)</b>	8,5 <b>(E)</b>	
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX	
Air flow (E)	m³/h	240	280	325	420	485	560	720	820	950	
Available pressure (E)	Ра	35	50	65	35	50	65	35	50	65	
Cooling total emission (E)	kW	1,55	1,76	1,98	2,66	2,98	3,33	4,21	4,64	5,16	
Cooling sensible emission (E)	kW	1,16	1,33	1,51	2,02	2,28	2,57	3,27	3,64	4,10	
Heating (E)	kW	1,91	2,18	2,48	3,25	3,46	4,10	5,33	5,94	6,68	
Dp Cooling (E)	kPa	8,9	11,1	13,7	9,0	11,0	13,4	10,5	12,4	15,0	
Dp Heating (E)	kPa	7,3	9,0	11,3	7,4	9,1	11,1	8,6	10,2	12,3	
Fan <b>(E)</b>	W	24	32	43	30	44	64	50	71	102	
Sound power outlet (E)	dB(A)	45	48	52	45	49	52	50	53	56	
Sound power inlet + radiated (E)	dB(A)	52	54	58	51	55	58	56	60	63	
Sound pressure outlet (*)	dB(A)	36	39	43	36	40	43	41	44	47	
Sound pressure inlet + radiated (*)	dB(A)	43	45	49	42	46	49	47	51	54	
Plenum code (E)			9066363			9069222		9066368			
Energy classification FCEER (**) (E)			C			В		В			
Energy classification FCCOP (***) (E)			В			Α		A			

MODEL		CR	S–ECM	14	CR	S–ECM	24	CR	S–ECM	34		
Inverter Power (V)		5 <b>(E)</b>	7 <b>(E)</b>	9 <b>(E)</b>	4 <b>(E)</b>	6 <b>(E)</b>	8 <b>(E)</b>	4,5 <b>(E)</b>	6,5 <b>(E)</b>	8,5 <b>(E)</b>		
Speed		MIN	MED	MAX	MIN	MED	MAX	MIN	MED	MAX		
Air flow (E)	m³/h	240	280	325	420	485	560	720	820	950		
Available pressure (E)	Ра	35	50	65	35	50	65	35	50	65		
Cooling total emission (E)	kW	1,69	1,93	2,19	2,91	3,29	3,70	4,49	4,98	5,58		
Cooling sensible emission (E)	kW	1,25	1,43	1,64	2,15	2,44	2,77	3,42	3,82	4,32		
Heating (E)	kW	2,05	2,36	2,69	3,52	3,99	4,53	5,72	6,40	7,21		
Dp Cooling (E)	kPa	5,4	6,8	8,5	15,1	18,7	23,0	9,1	10,9	13,3		
Dp Heating (E)	kPa	4,4	5,5	7,0	12,4	15,4	19,0	7,5	9,0	10,9		
Fan <b>(E)</b>	W	24	32	43	30	44	64	50	71	102		
Sound power outlet (E)	dB(A)	45	48	52	45	49	52	50	53	56		
Sound power inlet + radiated (E)	dB(A)	52	54	58	51	55	58	56	60	63		
Sound pressure outlet (*)	dB(A)	36	39	43	36	40	43	41	44	47		
Sound pressure inlet + radiated (*)	dB(A)	43	45	49	42	46	49	47	51	54		
Plenum code (E)			9066363			9069222		9066368				
Energy classification FCEER (**) (E)			В			Α		В				
Energy classification FCCOP (***) (E)			В			Α		A				

(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<sup>3</sup> room and a reverberation time of 0.5 sec.

(**\*\***) **FCEER** = Energy classification in Cooling.

(**\*\*\***) FCCOP = Energy classification in Heating.



## Wall electronic controls

— Standard models —

WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
WM-S-ECM	Continuous fan speed control with electronic thermostat, summer/winter switch and liquid crystal display
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

## **Electronic controls for <u>MB boards</u>**

MB-ECM-M	MB electronic board fitted on the unit
MB-ECM-S	MB electronic board supplied with separate packaging
T-MB	Wall control (to be used with MB board only)
RS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RS	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

#### Sabianet management system for a network of fan coils

Sabianet	Hardware/software supervisory system (to be used with MB board only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet



## Maestro High Pressure Fan Coil Unit with Asynchronous Motor

The Maestro high pressure fan coils are produced in 7 sizes.

Designed and built for concealed installations, they have small dimensions, are very silent and have a particularly interesting price in relation to their performance (all sizes, even at the lowest speed, have a residual pressure head of at least 160 Pa).

They are suitable for climate control for small and medium commercial and sports environments or for large civil environments and integrate perfectly in regular false ceilings. The sizes 1÷5 are equipped with **5** speed fans, 3 of which are connected to the terminal board while the sizes 6-7 are equipped with **3** speed fans. The base models call for a 4 row coil but upon request, units with 3 row coils or additional coils (for 4 pipe systems) with one or two rows can be provided. A complete set of accessories solves any type of system problem.

# Technical characteristics of the main components:

**Casing:** made with galvanized steel insulated with polyolefin (PO) foam (class M1).

**Fan assembly:** consists of quiet centrifugal fans with two impellers (made of plastic for sizes 1÷5 and made of aluminium for sizes 6÷7) and a directly driven single phase motor (230V 50Hz).



**Coil:** it is manufactured from drawn copper tube and the aluminium fins are mechanically bonded onto the tube by an expansion process. The Maestro Sabiana range is available with the combination of either 3 or 4 row coils (sizes  $1\div5$ ) with the possibility to add a 1 or 2 row coil (3+1, 4+1, 3+2, 4+2 versions for 4 pipe systems), and 4 or 6 row coils (sizes 6-7) with the possibility to add a 2 row coil (4+2, 6+2 versions for 4 pipe systems).

The connections are on the left hand side looking from the air inlet of the unit (see picture). On request or on site the connections can be moved to the other side.

The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

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



**<u>Condensate collection tray:</u>** made from galvanized steel insulated with polyolefin (PO) foam (class M1).

Il range is compliant with the new ERP 2015 Regulation (EU) No. 327/2011 which requires uery low electric consumption ratings in relation to performances provided.

## **Dimensions, Weight, Water content**

Left co	nnec	tions	(star	ndəri	d)											
Fan Side (c	z O O O	-	Fil	ter				50 140	nlet)	ļ		A E			- -	50 61
MODE MTO 1- MTO 6- Right con	÷5 -7	0 209 304	MENSIO P 103 154 (on r	Q 169 264 Eque	R 243 338			016 236	ϥ			G A E				
Filter Side (inle	-	0	90	_ل ع	Fan S	ide (c	outle					E				
Filter Side (inle	-	0	30	_ل ع	Fan S	<b>ide (c</b> Mensio						A		COIL		9
Filter	-	B	3 2 C	_ل ع	Fan S					M	N	A	(IAIN	ADD		9- <u>-</u>
Filter Side (inle	et)	B		_لر ۷	Fan S	MENSIO	INS	t)	E L mm	M	N	<b>A</b>	IAIN		)	
Filter Side (inle	et)		С	D	Fan S	MENSIO F	ONS G	t) Н				A 	IAIN	ADD	)	
Filter Side (inle	et)	mm	C	D	Fan S DI E mm	MENSIO F mm	ONS G mm	<b>t)</b> н тт	mm	mm	mm	A M . (1) IN	IAIN 2 OUT	ADD		
Filter Side (inle	t) A mm 1133	mm 698	C mm 310	D mm 255	Fan S DI E mm 991	MENSIO F mm 620	0NS G mm 1185	t) H mm 54 54	mm 245 245 295	mm 50	mm 249	A M . (1) IN 3/4"	IAIN OUT 3/4"	ADD 3/4 3/4 3/4	) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) )	IONAL (4) OUT 3/4" 3/4"
Filter Side (inle MODEL MTO 1 MTO 2 MTO 3 MTO 4	t) A mm 1133 1133	mm 698 698	C mm 310 310	D mm 2555 2555	Fan S DI E mm 991 991	MENSIO F mm 620 620	ONS G mm 1185 1185	t) H mm 54 54	mm 245 245	mm 50 50	mm 249 249	A M . (1) IN 3/4" 1"	IAIN <b>2</b> <b>0UT</b> 3/4" 1"	ADD 3/4 3/4 3/4	) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) )	IONAL (4) OUT 3/4"
Filter Side (inle MODEL MTO 1 MTO 2 MTO 3 MTO 4 MTO 5	A mm 1133 1133 1133	mm 698 698 698	C mm 310 310 360	D mm 255 255 305	Fan S DI E mm 991 991 991	MENSIO F mm 620 620 620	ONS G mm 1185 1185 1185	t) H mm 54 54 54	mm 245 245 295	mm 50 50 50	mm 249 249 299	A M . (1) IN 3/4" 1" 1"	IAIN <b>2000</b> 3/4" 1" 1"	ADD (3) IN 3/4 3/4 3/4 1"	27 27 27 27	IONAL (4) OUT 3/4" 3/4" 3/4" 1" 1"
Filter Side (inle MODEL MTO 1 MTO 2 MTO 3 MTO 4 MTO 5 MTO 6	A mm 1133 1133 1133 1445	mm 698 698 698 853	C mm 310 310 360 360	D mm 255 305 293	Fan S DI E mm 991 991 991 1302	MENSIO F mm 620 620 620 775	ONS G mm 1185 1185 1185 1497	t) H mm 54 54 54 54 58	mm 245 245 295 291	mm 50 50 50 50	mm 249 249 299 295	A M . (1) IN 3/4" 1" 1" 1 1/4"	IAIN 2 0 0 0 0 1 1 1 1 1 1 1/4"	ADD 3 1N 3/4 3/4 3/4 1"	22	IONAL () 0UT 3/4" 3/4" 1" 1" 1"
Filter Side (inle MODEL MTO 1 MTO 2 MTO 3 MTO 4 MTO 5	A mm 1133 1133 1445	mm 698 698 698 853 853	C mm 310 310 360 360 435	D mm 2555 2555 293 368	Fan S DI E mm 991 991 991 1302 1302	MENSIO F mm 620 620 620 775 775	ONS G mm 1185 1185 1185 1497 1497	t) H mm 54 54 54 58 58 58 59	mm 245 245 295 291 367	mm 50 50 50 54 54	mm 249 249 299 295 370	A M . (1) IN 3/4" 1" 1 1/4" 1 1/4"	IAIN 2000 3/4" 1" 1" 1 1/4" 1 1/4"	ADD 3 IN 3/4 3/4 3/4 1" 1"	237 237 237 237	IONAL (4) OUT 3/4" 3/4" 3/4" 1" 1"
Filter Side (inle MODEL MTO 1 MTO 2 MTO 3 MTO 4 MTO 5 MTO 6	A mm 1133 1133 1445 1535 1535	mm 698 698 853 853 1100 1100	C mm 310 310 360 435 488 588	D mm 255 255 305 293 368 421 521	Fan S DI E mm 991 991 1302 1302 1303 1393 (AGING	MENSIO F mm 620 620 620 775 775 1022 1022 (kg)	NS G mm 1185 1185 1185 1497 1497 1587	t) H mm 54 54 54 54 58 58 59 59 59	mm 245 245 295 291 367 416 516	mm 50 50 54 54 55 55 55	mm 249 299 295 370 421 521	A M 3/4" 1" 1 1/4" 1 1/4" 1 1/4" 1 1/4"	IAIN 2 OUT 3/4" 1" 1 1/4" 1 1/4" 1 1/4" 1 1/4" WATE	ADD 3/4 3/4 3/4 1" 1" 1" 1" 1"	) 	IONAL () 0UT 3/4" 3/4" 1" 1" 1" 1" liters)
Filter Side (inle MODEL MTO 1 MTO 2 MTO 3 MTO 4 MTO 5 MTO 6 MTO 7	A mm 1133 1133 1445 1535 1535	mm 698 698 853 853 1100 1100	C mm 310 310 360 435 488 588	D mm 255 255 305 293 368 421 521	Fan S DI E mm 991 991 1302 1302 1303 1393	MENSIO F mm 620 620 620 775 775 1022 1022 (kg)	NS G mm 1185 1185 1185 1497 1497 1587	t) H mm 54 54 54 54 58 58 59 59 59	mm 245 245 295 291 367 416 516	mm 50 50 54 54 55 55 55	mm 249 249 299 295 370 421 521	A M 3/4" 1" 1 1/4" 1 1/4" 1 1/4" 1 1/4"	IAIN 2 OUT 3/4" 1" 1 1/4" 1 1/4" 1 1/4" 1 1/4"	ADD 3/4 3/4 3/4 1" 1" 1" 1"	» »	IONAL () 0UT 3/4" 3/4" 3/4" 1" 1" 1"

53 49 53

62 57 61

86 79 84

98 89

6+2R

140

160

54

51

59 63

6R

133

151

55

63

87 82 87

98 92 98

4+2R

137

155

94

4R

127

143

56

65

90

102

6+2R

143

163

2,9

3,5

4,7

5,7

4R

7,6

9,7

3,7

4,6 1,4

6,0

7,1

6R

11,1

13,8

1,1

2,0

2,7

1,8

2,4

3,2

4,1

2R

4,1

5,5



**MTO 2** 

**MTO 3** 

**MTO 4** 

**MTO 5** 

**MTO 6** 

**MTO 7** 

46 50

54

75

85

4R

124

140

58

80

90

52 48 51

60

83

94 88 94

4+2R

134

152

56 60

78

6R

130

148

83



www.certiflash.com

#### 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. + 7°C E.W.T. +12°C L.W.T. Water temperature:

#### HEATING (winter mode)

Entering air temperature: +20°C Entering water temperature: +50°C Water flow rate as for the cooling conditions

Certification

MODEL MTO			14			24			34			44		5	4 (*	**)	6	4 (1	<b>**</b> )	7	4 (*	**)
Speed (E)		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air flow <b>(E)</b>	m³/h	790	1125	1410	840	1410	1825	1710	2075	2440	2070	2580	3020	2740	3280	3850	1880	3385	4800	3925	5070	7100
Available pressure (E)	Ра	25	50	75	15	50	80	30	50	70	35	50	67	35	50	70	150	150	150	150	150	150
Cooling total emission (E)	kW	4,28	5,36	6,11	5,16	7,24	8,44	9,06	10,18	11,18	11,33	12,98	14,23	15,04	16,81	18,52	12,99	19,51	24,19	23,06	27,09	33,09
Cooling sensible emission (E)	kW	3,36	4,41	5,22	3,83	5,71	6,90	7,02	8,10	9,12	8,69	10,25	11,49	11,71	13,42	15,13	9,45	14,94	19,28	17,57	21,22	26,99
Heating <b>(E)</b>	kW	5,80	7,55	8,86	6,58	9,79	11,78	12,04	13,87	15,54	14,92	17,55	19,64	19,39	22,12	24,79	20,86	33,52	43,6	39,34	47,85	61,14
Dp Cooling <b>(E)</b>	kPa	5,1	7,6	9,6	6,9	12,7	16,8	16,0	19,8	23,4	13,9	17,7	20,9	13,3	16,2	19,3	7,4	15,3	22,6	14,4	19,3	27,6
Dp Heating <b>(E)</b>	kPa	4,1	6,2	7,9	5,6	10,3	13,6	13,1	16,2	19,1	11,2	14,5	17,0	10,8	13,2	15,7	3,9	9,1	14,7	8,5	12,1	18,8
Fan <b>(E)</b>	W	115	154	191	170	230	285	350	420	470	445	550	630	500	617	760	574	778	1304	1518	1758	2460
Sound power outlet (E)	dB(A)	51	59	64	50	62	67	61	65	69	63	68	70	66	70	73	63	71	77	71	75	81
Sound power inlet + radiated (E)	dB(A)	52	60	65	51	63	68	62	66	70	64	69	71	67	71	74	-	-	-	-	-	-
Sound pressure outlet (*)	dB(A)	42	50	55	41	53	58	52	56	60	54	59	61	57	61	64	54	62	68	62	66	72
Sound pressure inlet + radiated (*)	) dB(A)	43	51	56	42	54	59	53	57	61	55	60	62	58	62	65	-	-	-	-	-	-
Plenum code <b>(E)</b>		9	0342	00	9	0342	00	9	03422	20	9	03423	30	9	03424	40	9	0342	80	9	03429	<del>3</del> 0

#### Units with additional coil -

COOLING (summer mode)

#### HEATING (winter mode)

Entering air temperature: +27°C d.b. +19°C w.b. Water temperature: + 7°C E.W.T. +12°C L.W.T. Entering air temperature: +20°C Water temperature: +70°C E.W.T. +60°C L.W.T.

MODEL MTO		1	4+	1	2	24+	1	3	34+	1	4	4+	1	54	+1	(**)	64	+2	(**)	74	+2	(**)
Speed (E)		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air flow (E)	m³/h	770	1090	1350	840	1390	1775	1680	2045	2390	2055	2545	2960	2700	3245	3800	1860	3330	4680	3920	5040	6980
Available pressure (E)	Ра	25	50	75	15	50	80	30	50	70	35	50	67	35	50	70	150	150	150	150	150	150
Cooling total emission (E)	kW	4,21	5,26	5,97	5,16	7,18	8,30	8,95	10,09	11,04	11,29	12,88	14,08	14,24	15,92	17,48	12,89	19,31	23,85	23,03	26,98	32,74
Cooling sensible emission <b>(E)</b>	kW	3,29	4,31	5,06	3,83	5,65	6,76	6,93	8,02	8,97	8,65	10,15	11,33	11,11	12,74	14,31	9,37	14,77	18,95	17,55	21,12	26,66
Heating (E)	kW	3,96	4,87	5,47	4,63	6,28	7,16	7,62	8,47	9,20	9,83	11,07	12,00	12,67	14,00	15,28	19,81	29,78	37,13	35,50	41,88	51,31
Dp Cooling <b>(E)</b>	kPa	4,9	7,3	9,2	6,9	12,5	16,3	15,7	19,4	22,9	13,8	17,4	20,5	12,0	14,7	17,4	7,3	15,0	22,0	14,4	19,1	27,1
Dp Heating <b>(E)</b>	kPa	11,7	17,0	21,0	14,5	25,2	31,9	15,9	19,3	22,3	27,6	34,1	39,5	26,0	31,1	36,3	11,9	24,9	37,0	23,8	32,0	46,1
Fan <b>(E)</b>	W	115	155	185	170	225	275	345	415	460	440	540	615	495	610	750	565	750	1327	1499	1727	2376
Sound power outlet (E)	dB(A)	51	59	64	50	62	67	61	65	69	63	68	70	66	70	73	63	71	77	71	75	81
Sound power inlet + radiated (E)	dB(A)	52	60	65	51	63	68	62	66	70	64	69	71	67	71	74	-	-	-	-	-	-
Sound pressure outlet (*)	dB(A)	42	50	55	41	53	58	52	56	60	54	59	61	57	61	64	54	62	68	62	66	72
Sound pressure inlet + radiated (*)	dB(A)	43	51	56	42	54	59	53	57	61	55	60	62	58	62	65	-	-	-	-	-	-
Plenum code <b>(E)</b>		9	0342(	00	9	03420	00	9	03422	20	9	03423	30	90	)3424	10	9	03428	30	9	03429	90

(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<sup>3</sup> room and a reverberation time of 0.5 sec.

(\*\*) = Models not covered by EUROVENT certification program.

### Accessories

Kit 230V	Main and auxiliary coil valve kit (to be used only with ON/OFF 230 V controls: QCV-MB, WM-T and WM-TQR) 230 V, ON-OFF valve.	
Kit 24V	Main and auxiliary coil valve kit (to be used only with QCV-MB modulating valve control board) Valve with 3 points - 24 Volt actuator.	
BCM	External auxiliary condensate collection tray	
BEM	<b>Electric coil</b> Consists of electric resistances and a security thermostat, which are inside a galvanized steel and insulated casing.	
PMM	Intake/supply spigot plenum Intake/supply spigot plenum with 3 spigots (Sizes 1 - 2 - 3) or 4 spigots (Sizes 4 - 5).	
SFM	<b>G3 synthetic filter</b> The filter is a washable synthetic fibre, flame-proof according to Class F1 DIN 53438. Efficiency of ASHRAE 84%, Eurovent EU3.	



### Accessories

SFM-F6	<b>F6 Synthetic Filter</b> (for sizes 6 ÷7 only) High efficiency compact filter in glass microfiber paper, Class F6 according to EN779.	
GAV	Antivibrating connection Intake/supply antivibrating connection, made of two galvanized frames and a PVC flexible connection.	

## **Electronic controls** <u>included</u>

COM	Speed selector with 4 positions: OFF, first speed, second speed, third speed	
WM-3V	3 speed control	
WM-T	3 speed control with electronic thermostat and manual summer/winter switch	
WM-TQR	3 speed control with electronic thermostat and centralized/manual summer/winter switch	
SEL-S	Receiving board for centralized control	

## **Electronic controls for <u>MB boards</u>**

QCV-MB MB version control board (T-MB wall control included)	
PSM-DI	Multifunction control (to be used with QCV-MB control board only)

#### —— Sabianet management system for a network of fan coils ———

Sabianet	Sabianet (to be used with QCV-MB control board only)	
<b>ROUTER-S</b>	Router for Sabianet	
SIOS	Relay output board for Sabianet	

NOTES: for more details about the Controls, see Page 265.

**Maestro-MTO** 



## **Crystall Flex System** Electronic Filter

#### The Crystall Flex System is an innovative

filtering system, designed to be easily installed downstream from horizontal concealed fan coils. Created especially for the hotel industry, it can be perfectly added to different structures such as nursing homes and retirement homes and, more generally, wherever a high level of comfort and air quality is needed.

#### t is made up of 3 elements:

- a) patented electronic plate filter ("Femec" type)
- b) electronic control and power board
- C) high voltage flexible connection cable

The system has been designed to reduce the indoor recirculation of various types of pollutants found in the ducting of air-conditioning systems. As a result, it is ideal for various types of environments, such as schools, hospitals and rest homes (corridors, waiting rooms, wards), doctors' surgeries, hotels and anywhere indoor air quality needs to be improved.

There are many reasons why pollutants can be found in ducts. The main one is the lack of cleaning and maintenance of the ducts, together with other factors such as incorrect equilibrium and/or pressurisation, the circulation of air between different rooms when the system is off, the lack of suitable filters or the air being bypassed around the filtering cells inside the air handling unit, the lack of attention paid when replacing the filters, the presence of favourable conditions in terms of temperature and humidity for the proliferation of bacterial organisms, etc.

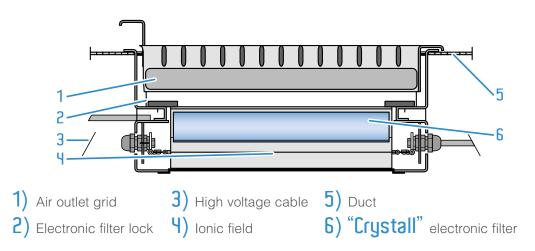
While pollution in ducts can be reduced through periodical maintenance, in reality this is rarely done due to the considerable costs, the difficulty in accessing the systems or the impossibility of shutting down the system for an extended period.

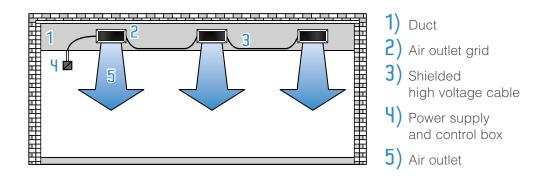
One possible alternative solution that significantly reduces the health risks and drastically cuts the costs of maintenance on ducts involves the installation of active electrostatic filters immediately before the air is introduced into the room.

Electronic filters are known to be very effective in trapping particles, fibres, biological substances, etc., even when these are very small in diameter (less than 1 micron), while only causing a moderate pressure drop in the passing air, both initially (when the filter is clean) and over time when there is dirt on the surfaces.

The bactericide action of electronic filters prevents the proliferation of biological substances (bacteria, mould, yeast, etc.) on the surfaces of the transiting dust, even if these are not trapped by the filter (other "mechanical" filtering systems may, on the other hand, represent a support that is favourable to the proliferation of biological substances).

The **Crystall Flex System** is consequently an effective, reliable and simple product. Furthermore, it has extremely low maintenance costs: it never needs replacing and can be washed and sanitised using ordinary detergents, without any decline in efficiency or product life.





#### Aduantages of the Crystall Flex System:

- Installation possible on existing systems
- Low impact on the thermal and aeraulic equilibrium of the system
- Reduced pressure drop even when the filter is dirty
- Significant bactericide action on biological pollutants
- No cost for replacing the filters (the filters are totally regenerable by simply washing them)
- Very low additional energy costs
- Simple and fast maintenance
- No system downtime
  - for the maintenance of the filtering units
- Remote power supply that can power multiple filtering units at the same time

#### **Tests and Certification:**

The Crystall system has been the subject of numerous trials and efficiency and effectiveness tests to assess the functions and performance of the systems in real conditions.

At the Turin Polytechnic Department of Energy, efficiency and load loss tests were performed using the EN779 international filter classification standards, where applicable.

The University of Ancona carried out over 180 laboratory tests on microbiological substances (total airborne microbiological load), including bacteria, mould, fungi, etc., which confirmed, through the statistical analysis of the data taken from the Fischer test, the effectiveness of the Crystall electronic filter in reducing the bacterial load.

Other tests have been carried out **in the SABIANA laboratories** on the flow-rate, pressure drop, electrical safety and instrumental efficiency of the filtration process on microparticles by numerically counting the most common particle size categories in various rooms. The particles monitored had the diameters specified by the WHO (World Health Organization) and the EPA (Environmental Protection Agency) as being the most harmful to our health (<2.5 micron PM 2.5), with volumetric counts (number/m<sup>3</sup>) being performed in a common living environment, using a laser particle counter (LPC).

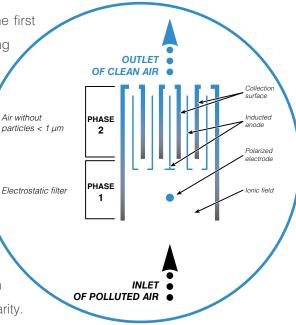


## **Construction features:**

The Crystall electronic filter is made up of two main elements. The first is comprised of an electronic plate filter and is inside a special bearing structure that is designed and shaped based on the type of intended application. The structural element, therefore defines the type of application, allowing its installation downstream of horizontal flushmounted fan coils (PM-CRY). The second element is the supply and control equipment that contains the circuit board and connection terminals.

#### Active plate electronic filter Femec type

The filter element is made up of two sections: the first is comprised of tungsten electrodes and insulating elements. The second section, meant for capturing polluting particles, is made of paired and suitably shaped special aluminium sheets, making up the collection manifold. This section can be easily removed for effortless maintenance. The filter's operating principle is extremely simple. Pollutants cross the first section made up of electrodes and electronically charged by the electrical field produced (ionization). The particles are then collected on the filter plates that are in opposite polarity. Due to the high voltage inside the filter an intense and



disparate electrical field is generated with an avalanche effect called a "corona discharge".

#### Electronics board

This mainly contains the filter circuit board. The equipment is supplied with 230V and is capable of generating a high voltage but low intensity current (max 3 mA) needed to produce the ionizing field. A single unit can supply several terminals based on the total filter surface used. The equipment is supplied with a remotable alarm status contact and, locally, with a failure indicator light.

#### **Connection cable**

It is made up of a special AWG-22 wire with external insulation suitable for high voltage use.

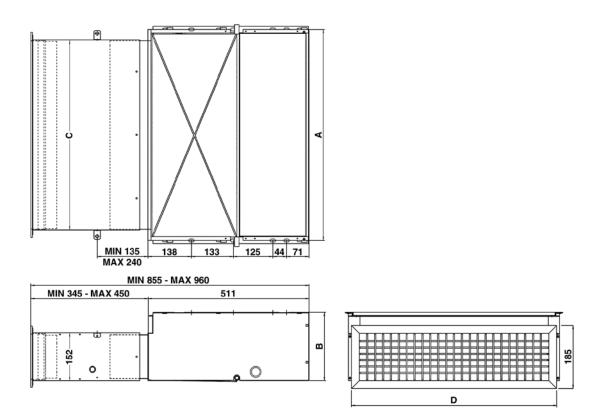
### **Dimensions**

This type of equipment was specifically created to be able to be inserted downstream of Sabiana Carisma CRC (ID model) horizontal concealed fan coils and Sabiana Carisma CRSO ducted fan coils.

By adapting the duct and/or the outlet grid, it can also be installed downstream of existing fan coils.

The structure is made of galvanised plate and is comprised of:

- an adjustable length of duct work;
- a Femec type electrostatic filter;
- an electronic filter control unit that can be installed on the side of the duct work or on the side of the fan coil;
- an aluminium outlet grill with a double row of fins.



SUITABLE FOR:		DIMENSIONS				
MODEL	Carisma CRC - IO Model	Carisma CRSO	А	В	С	D
	Size	Size	mm	mm	mm	mm
PM-CRY-2	2	-	454	218	400	435
PM-CRY-3-4	3 - 4	1	669	218	600	635
PM-CRY-5-6	5 - 6	-	884	218	800	835
PM-CRY-4S	-	2	884	248	800	835
PM-CRY-7	7	-	1099	218	1000	1035
<b>PM-CRY-8-9</b>	8 - 9	3	1099	248	1000	1035



## Accessories



## <u>Wall</u> electronic controls

FUNCTIONS	IDENTIFICATION		
	WM-TQR	WM-AU	
ON-OFF switch			
ON-OFF switch for Crystall electrostatic filter or electric heater			
Manual 3 speed switch			
Manual/Automatic 3 speed selection			
Summer/Winter switch			
Remote centralized Summer/Winter switch or by an automatic change-over fitted on the water pipe			
Automatic Summer/Winter switch with neutral zone for 4 pipe installation with 2 valves			
Room thermostat for fan control (ON-OFF)			
Room thermostat for 1 valve control (2 pipe installation)			
Room thermostat for 2 valve control (4 pipe installation)			
Simultaneous thermostatic control of the valves and fan			
Room thermostat for chilled water valve (SUMMER) and electric heater (WINTER) control (in winter only the electric heater is working)			
Installation of electronic low temperature cut-out thermostat (TME)			

#### WM-TQR









## Carisma Floor CCP–ECM Trench Convector

## **Cooling and Heating**

**Carisma Floor CCP–ECM** trench convectors represent a combination of innovative aesthetics and functionality in an air conditioning system. They are designed to **efficiently heat, cool** and **uentilate** 

buildings with large windows or doors.

The wide range of models includes **Solutions which** 

can be customised depending on architectural requirements

with diffusion grids in a variety of materials and colours.

All the units are supplied with low energy consumption electronic motors.

A large variety of control and regulation accessories is available. Floor trench convectors are used inside priuate homes, on uerandas, in public offices and buildings and in exhibition and commercial areas.

# Technical characteristics of the main components:

Walkable **floor casing,** in galvanised steel sheet, coated with Anthracite grey (RAL 7016) powder paint, with external height adjustable system preassembled with an antivibrating device.

**COII** consisting of copper pipes and aluminium fins, painted Anthracite grey (RAL 7016) and housed, with acoustic decoupling, in transversal galvanised and painted steel frame.

Euroconus connection, front or ambient side, with connection nut (int. thread <sup>3</sup>/<sub>4</sub>") and air venting.

**Tangential fan.** protective cover, 24V EC motors freely adjustable (0 – 10 V) pre-wired and ready for connection.





**Aluminium roll-up grid** consisting of stable profiles, anodised in natural colours, with 20 x 6 mm slats.

Grid with overall height of 20 mm and free 70% transversal section, inserted in floor casing and acoustically insulated by rubber gaskets. Perimeter listel with finish of cover grid.

**Mounting couer** with a **protective profile** of the perimeter listels to protect the fan coils during installation.





## **Construction features** CCP-ECM 2T version

#### **Standard uersions**

2 Widths: 310 and 360 mm. 2 Heights: 130 and 155 mm. 3 Lengths: 1250, 2000 and 2750 mm. Aluminium roll-up grid.

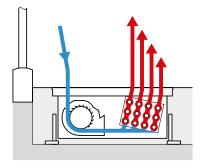
#### **Identifications and Models**

	DIMENSIONS		
Casing Length	<b>Casing Height</b>	Casing Width	MODEL
<b>L</b> (mm)	<b>H</b> (mm)	<b>T</b> (mm)	WODEL
	130	310	CCP-ECM 2T 1250-130-310
1250	130	360	CCP-ECM 2T 1250-130-360
1250	155	310	CCP-ECM 2T 1250-155-310
	155 -	360	CCP-ECM 2T 1250-155-360
	130 -	310	CCP-ECM 2T 2000-130-310
2000		360	CCP-ECM 2T 2000-130-360
2000	155 -	310	CCP-ECM 2T 2000-155-310
		360	CCP-ECM 2T 2000-155-360
	130	310	CCP-ECM 2T 2750-130-310
2750	130	360	CCP-ECM 2T 2750-130-360
2130	155 —	310	CCP-ECM 2T 2750-155-310
		360	CCP-ECM 2T 2750-155-360

#### **Operating principle**

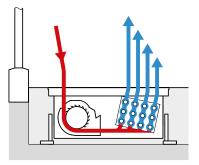
#### Forced heating convection

The cold air which skims the windows is suctioned and heated by the coil. The heated air rises, creating a shield to cold air.



#### Forced cooling convection

Installation in front of the window surfaces efficiently contrasts the diffusion of heat due to solar radiation.





## **Construction features** CCP-ECM 4T version

#### **Standard uersions**

2 Widths: 330 and 360 mm. 2 Heights: 130 and 155 mm. 3 Lengths: 1250, 2000 and 2750 mm. Aluminium roll-up grid.

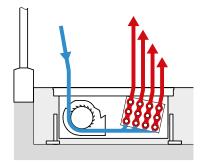
#### **Identifications and Models**

	DIMENSIONS		
Casing Length	Casing Height	Casing Width	MODEL
<b>L</b> (mm)	H (mm)	<b>T</b> (mm)	MODEL
	130	330	CCP-ECM 4T 1250-130-330
1250	130	360	CCP-ECM 4T 1250-130-360
1290	155	330	CCP-ECM 4T 1250-155-330
	100	360	CCP-ECM 4T 1250-155-360
	130 -	330	CCP-ECM 4T 2000-130-330
2000		360	CCP-ECM 4T 2000-130-360
2000	155 -	330	CCP-ECM 4T 2000-155-330
		360	CCP-ECM 4T 2000-155-360
	130	330	CCP-ECM 4T 2750-130-330
2750	130	360	CCP-ECM 4T 2750-130-360
2130	155 —	330	CCP-ECM 4T 2750-155-330
		360	CCP-ECM 4T 2750-155-360

#### **Operating principle**

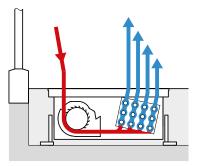
#### Forced heating convection

The cold air which skims the windows is suctioned and heated by the coil. The heated air rises, creating a shield to cold air.



#### Forced cooling convection

Installation in front of the window surfaces efficiently contrasts the diffusion of heat due to solar radiation.





## Carisma Floor CRP–ECM Trench Convector

## For Heating only

**Carisma Floor CRP–ECM** trench convectors represent a combination of innovative aesthetics and functionality in an heating system. They are designed to efficiently **heat and uentilate** buildings with large windows or doors.

The wide range of models includes **Solutions which can be customised** depending on architectural requirements with diffusion grids in a variety of materials and colours.

## All the units are supplied with low energy consumption electronic motors.

A large variety of control and regulation accessories is available. Floor trench convectors are used **inside private homes**, on **uerandas**, in public offices and buildings and in exhibition and commercial areas.

# Technical characteristics of the main components:

**Walkable floor casing**, in galvanised steel sheet, coated with Anthracite grey (RAL 7016) powder paint, with external height adjustable system preassembled with an antivibrating device.



**Coll** consisting of copper pipes and aluminium fins, painted Anthracite grey (RAL 7016) and housed,

with acoustic decoupling, in transversal galvanised and painted steel frame. Euroconus connection, front or ambient side, with connection nut (int. thread <sup>3</sup>/<sub>4</sub>") and air venting.

**Tangential fan**, protective cover, 24V EC motors freely adjustable (0 – 10 V) pre-wired and ready for connection.

**<u>Aluminium roll-up grid</u>** consisting of stable profiles, anodised in natural colours, with 20 x 6 mm slats.

Grid with overall height of 20 mm and free 70% transversal section, inserted in floor casing and acoustically insulated by rubber gaskets. Perimeter listel with finish of cover grid.

**<u>Mounting couer</u>** with a **<u>protective profile</u>** of the perimeter listels to protect the fan coils during installation.







### **Construction features CRP-ECM**

**Standard models** 

5 Widths: 185, 210, 260, 310 and 360 mm.

1 Height: 110 mm.

12 Lengths: 1250, 1500, 1750, 2000, 2250, 2500, 2750, 3000, 3250, 3500, 3750 and 4000 mm.

Aluminium roll-up grid.

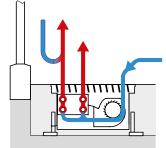
#### **Identifications and Models**

DIMENSION         DIMENSION           Casing Lenght         Casing Height         MODEL         Casing Lenght         Casing Height         MODEL           L (mm)         H (mm)         185         CRP-ECM 1250-110-185         10         CRP-ECM 2750-110-210           1250         260         CRP-ECM 1250-110-210         2750         260         CRP-ECM 2750-110-210           1310         CRP-ECM 1250-110-310         310         CRP-ECM 2750-110-260         310         CRP-ECM 2750-110-260           360         CRP-ECM 1500-110-260         310         CRP-ECM 2750-110-360         310         CRP-ECM 2750-110-360           185         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-210         3000         260         CRP-ECM 3000-110-210           1500         260         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-210         310         CRP-ECM 3000-110-210           310         CRP-ECM 1750-110-210         3250         260         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-310           360         CRP-ECM 1750-110-210         3250         260         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-310           360         CRP-ECM 2500-110-310         3500         260 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						
Lenght         Height         MODEL         Lenght         Height         MODEL           L(mm)         H (mm)         Itempht         Lenght         Height         MODEL           1200         CRP-ECM 1250-110-185         L(mm)         H (mm)         Itempht         Height         MODEL           1250         260         CRP-ECM 1250-110-210         2750         260         CRP-ECM 2750-110-260           310         CRP-ECM 1250-110-310         360         CRP-ECM 2750-110-260         310         CRP-ECM 2750-110-260           360         CRP-ECM 1250-110-360         310         CRP-ECM 2750-110-260         310         CRP-ECM 2750-110-260           310         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-210           360         CRP-ECM 1500-110-360         3000         260         CRP-ECM 3000-110-360           310         CRP-ECM 1750-110-360         360         CRP-ECM 3250-110-210         3250         260         CRP-ECM 3250-110-260           310         CRP-ECM 2000-110-310         360         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-210           3200         260         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-210         310         CRP-ECM 3250-110-210		DIMENSION			[	DIMENSION
L (mm)         H (mm)           185         CRP-ECM 1250-110-185           210         CRP-ECM 1250-110-210           1250         260         CRP-ECM 1250-110-210           310         CRP-ECM 1250-110-260         210         CRP-ECM 2750-110-210           360         CRP-ECM 1250-110-260         310         CRP-ECM 2750-110-310           360         CRP-ECM 1250-110-210         360         CRP-ECM 2750-110-360           185         CRP-ECM 1500-110-210         360         CRP-ECM 3000-110-210           360         CRP-ECM 1500-110-210         360         CRP-ECM 3000-110-210           360         CRP-ECM 1500-110-260         310         CRP-ECM 3000-110-210           360         CRP-ECM 1750-110-185         210         CRP-ECM 3000-110-310           360         CRP-ECM 1750-110-260         310         CRP-ECM 3250-110-260           310         CRP-ECM 1750-110-260         310         CRP-ECM 3250-110-260           310         CRP-ECM 1750-110-260         310         CRP-ECM 3250-110-310           360         CRP-ECM 1750-110-260         310         CRP-ECM 3250-110-310           360         CRP-ECM 2000-110-260         310         CRP-ECM 3250-110-310           360         CRP-ECM 2000-110-260         <	Casing	Casing		Casing	Casing	
185         CRP-ECM 1250-110-185         185         CRP-ECM 2750-110-185           210         CRP-ECM 1250-110-210         210         CRP-ECM 2750-110-210           1250         260         CRP-ECM 1250-110-300         310         CRP-ECM 2750-110-260           310         CRP-ECM 1250-110-310         310         CRP-ECM 2750-110-260           310         CRP-ECM 1500-110-185         210         CRP-ECM 2750-110-360           185         CRP-ECM 1500-110-210         360         CRP-ECM 3000-110-185           210         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-185           210         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-185           210         CRP-ECM 1750-110-210         3000         260         CRP-ECM 3000-110-185           210         CRP-ECM 1750-110-210         310         CRP-ECM 3250-110-210           310         CRP-ECM 1750-110-210         3250         260         CRP-ECM 3250-110-310           360         CRP-ECM 2000-110-185         210         CRP-ECM 3250-110-310         310           360         CRP-ECM 2000-110-210         3500         260         CRP-ECM 3500-110-210           2000         260         CRP-ECM 2250-110-310         360	Lenght	Height	MODEL	Lenght	Height	MODEL
210         CRP-ECM 1250-110-210         210         CRP-ECM 2750-110-210           1250         260         CRP-ECM 1250-110-260         310         CRP-ECM 1250-110-310           310         CRP-ECM 1250-110-310         360         CRP-ECM 2750-110-310           360         CRP-ECM 1250-110-360         310         CRP-ECM 2750-110-360           185         CRP-ECM 1500-110-185         185         CRP-ECM 3000-110-185           210         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-310           360         CRP-ECM 1500-110-310         3000         260         CRP-ECM 3000-110-310           310         CRP-ECM 1750-110-210         210         CRP-ECM 3000-110-310         310           310         CRP-ECM 1750-110-210         210         CRP-ECM 3250-110-185           210         CRP-ECM 1750-110-210         3250         260         CRP-ECM 3250-110-310           310         CRP-ECM 2000-110-185         210         CRP-ECM 3500-110-210         310           2000         260         CRP-ECM 2250-110-310         360         CRP-ECM 3500-110-210           310         CRP-ECM 2250-110-310         360         CRP-ECM 3500-110-210           310         CRP-ECM 2250-110-310         360         CRP-ECM 35	L (mm)	H (mm)		L (mm)	<b>H</b> (mm)	
1250         260         CRP-ECM 1250-110-260         2750         260         CRP-ECM 2750-110-260           310         CRP-ECM 1250-110-310         310         CRP-ECM 1250-110-360         310         CRP-ECM 2750-110-360           360         CRP-ECM 1500-110-210         360         CRP-ECM 3000-110-185         210         CRP-ECM 1500-110-260           310         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-260           310         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-260           310         CRP-ECM 1750-110-360         310         CRP-ECM 1750-110-360         310         CRP-ECM 3000-110-260           310         CRP-ECM 1750-110-210         3250         260         CRP-ECM 3250-110-260           310         CRP-ECM 1750-110-360         310         CRP-ECM 3250-110-260         310         CRP-ECM 3250-110-260           310         CRP-ECM 2000-110-210         3250         210         CRP-ECM 3500-110-360         360         CRP-ECM 3500-110-360           310         CRP-ECM 2000-110-210         3500         260         CRP-ECM 3500-110-310         360         CRP-ECM 3500-110-310           300         CRP-ECM 2250-110-310         3500         260         CRP-ECM 3500-110-310         360 </th <th></th> <th>185</th> <th>CRP-ECM 1250-110-185</th> <th></th> <th>185</th> <th>CRP-ECM 2750-110-185</th>		185	CRP-ECM 1250-110-185		185	CRP-ECM 2750-110-185
310         CRP-ECM 1250-110-310         310         CRP-ECM 2750-110-310           360         CRP-ECM 1250-110-360         360         CRP-ECM 2750-110-360           185         CRP-ECM 1500-110-185         210         CRP-ECM 1500-110-210           210         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-260           310         CRP-ECM 1500-110-310         3000         260         CRP-ECM 3000-110-260           310         CRP-ECM 1500-110-385         210         CRP-ECM 3000-110-310           360         CRP-ECM 1750-110-385         310         CRP-ECM 3000-110-385           210         CRP-ECM 1750-110-260         310         CRP-ECM 3250-110-385           210         CRP-ECM 1750-110-360         310         CRP-ECM 3250-110-380           310         CRP-ECM 1750-110-360         310         CRP-ECM 3250-110-210           360         CRP-ECM 2000-110-210         3500         260         CRP-ECM 3250-110-210           210         CRP-ECM 2000-110-260         310         CRP-ECM 3500-110-210         3500         185         CRP-ECM 3500-110-210           2000         100         CRP-ECM 2000-110-210         3500         185         CRP-ECM 3500-110-210           210         CRP-ECM 2000-110-210		210	CRP-ECM 1250-110-210		210	CRP-ECM 2750-110-210
360         CRP-ECM 1250-110-360         360         CRP-ECM 2750-110-360           185         CRP-ECM 1500-110-185         210         CRP-ECM 1500-110-210           1500         260         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-210           310         CRP-ECM 1500-110-310         3000         260         CRP-ECM 3000-110-260           310         CRP-ECM 1500-110-360         310         CRP-ECM 3000-110-260           310         CRP-ECM 1750-110-185         185         CRP-ECM 3000-110-260           210         CRP-ECM 1750-110-260         310         CRP-ECM 3250-110-210           210         CRP-ECM 1750-110-360         310         CRP-ECM 3250-110-210           360         CRP-ECM 1750-110-360         310         CRP-ECM 3250-110-210           310         CRP-ECM 2000-110-210         3250         260         CRP-ECM 3250-110-210           210         CRP-ECM 2000-110-260         310         CRP-ECM 3500-110-210         3500         185         CRP-ECM 3500-110-210           210         CRP-ECM 2000-110-210         3500         CRP-ECM 3500-110-210         3500         185         CRP-ECM 3500-110-210           2200         260         CRP-ECM 2250-110-210         3500         185         CRP-	1250	260	CRP-ECM 1250-110-260	2750	260	CRP-ECM 2750-110-260
185         CRP-ECM 1500-110-185           210         CRP-ECM 1500-110-210           260         CRP-ECM 1500-110-260           310         CRP-ECM 1500-110-310           360         CRP-ECM 1500-110-360           310         CRP-ECM 1500-110-360           310         CRP-ECM 1500-110-360           360         CRP-ECM 1750-110-360           185         CRP-ECM 1750-110-210           260         CRP-ECM 1750-110-210           210         CRP-ECM 1750-110-210           260         CRP-ECM 1750-110-260           310         CRP-ECM 2000-110-185           210         CRP-ECM 200-110-185           210         CRP-ECM 3500-110-210           260         CRP-ECM 200-110-360           310         CRP-ECM 2250-110-260           310         CRP-ECM 2250-110-210           210         CRP-ECM 250-110-210           210         CRP-ECM 250-110-210           210         CRP-ECM 3750-110-310 <td< td=""><th></th><td>310</td><td>CRP-ECM 1250-110-310</td><td></td><th>310</th><td>CRP-ECM 2750-110-310</td></td<>		310	CRP-ECM 1250-110-310		310	CRP-ECM 2750-110-310
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1500         260         CRP-ECM 1500-110-260         3000         260         CRP-ECM 3000-110-260         310         CRP-ECM 3000-110-260         310         CRP-ECM 3000-110-310         310         CRP-ECM 3000-110-310         360         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-210         3250         260         CRP-ECM 3250-110-260         310         CRP-ECM 3250-110-260         310         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-360         310         CRP-ECM 3250-110-360         310         CRP-ECM 3250-110-360         310         CRP-ECM 3250-110-360         3500         210         CRP-ECM 3250-110-360         3500         210         CRP-ECM 3500-110-260         310         CRP-ECM 3250-110-360         310         CRP-ECM 3750-110-360         310         CRP-ECM 3750-110-360         310         CRP-		185	CRP-ECM 1500-110-185		185	CRP-ECM 3000-110-185
310         CRP-ECM 1500-110-310         310         CRP-ECM 3000-110-310           360         CRP-ECM 1500-110-360         360         CRP-ECM 3000-110-310           185         CRP-ECM 1750-110-185         185         CRP-ECM 3250-110-185           210         CRP-ECM 1750-110-200         310         CRP-ECM 3250-110-210           310         CRP-ECM 1750-110-300         310         CRP-ECM 3250-110-210           310         CRP-ECM 1750-110-300         310         CRP-ECM 3250-110-260           310         CRP-ECM 1750-110-300         310         CRP-ECM 3250-110-260           310         CRP-ECM 2000-110-185         210         CRP-ECM 2000-110-210           2000         260         CRP-ECM 2000-110-260         3500         260         CRP-ECM 3500-110-210           2000         260         CRP-ECM 2000-110-310         3500         260         CRP-ECM 3500-110-210           2000         260         CRP-ECM 2250-110-310         310         CRP-ECM 3500-110-210           210         CRP-ECM 2250-110-185         210         CRP-ECM 2250-110-210           2250         260         CRP-ECM 3750-110-210         360         CRP-ECM 3750-110-210           2250         210         CRP-ECM 2500-110-310         310         CRP-ECM		210	CRP-ECM 1500-110-210		210	CRP-ECM 3000-110-210
360         CRP-ECM 1500-110-360         360         CRP-ECM 3000-110-360           185         CRP-ECM 1750-110-185         185         CRP-ECM 3250-110-185           210         CRP-ECM 1750-110-210         3250         260         CRP-ECM 3250-110-210           360         CRP-ECM 1750-110-260         310         CRP-ECM 1750-110-310         310         CRP-ECM 3250-110-210           360         CRP-ECM 1750-110-310         360         CRP-ECM 3250-110-260         310         CRP-ECM 3250-110-260           360         CRP-ECM 1750-110-360         360         CRP-ECM 3250-110-310         360         CRP-ECM 3250-110-260           2000         260         CRP-ECM 2000-110-210         3500         260         CRP-ECM 3500-110-210           2000         260         CRP-ECM 2000-110-310         3500         260         CRP-ECM 3500-110-210           210         CRP-ECM 2250-110-310         3500         260         CRP-ECM 3750-110-210           310         CRP-ECM 2250-110-210         3750         260         CRP-ECM 3750-110-210           2250         260         CRP-ECM 2500-110-210         3750         260         CRP-ECM 3750-110-210           2500         260         CRP-ECM 2500-110-210         3750         260         CRP-ECM 3750-110-	1500	260	CRP-ECM 1500-110-260	3000	260	CRP-ECM 3000-110-260
185         CRP-ECM 1750-110-185           210         CRP-ECM 1750-110-210           260         CRP-ECM 1750-110-260           310         CRP-ECM 1750-110-260           310         CRP-ECM 1750-110-310           360         CRP-ECM 1750-110-360           310         CRP-ECM 1750-110-360           310         CRP-ECM 1750-110-360           360         CRP-ECM 2000-110-185           210         CRP-ECM 3250-110-310           360         CRP-ECM 2000-110-210           2000         260         CRP-ECM 2000-110-210           2000         260         CRP-ECM 2000-110-210           2000         260         CRP-ECM 2000-110-210           310         CRP-ECM 2000-110-310         3500           310         CRP-ECM 2000-110-310           360         CRP-ECM 2250-110-310           360         CRP-ECM 2250-110-210           310         CRP-ECM 2250-110-210           2500         260         CRP-ECM 3750-110-210           360         CRP-ECM 2250-110-310           360         CRP-ECM 3750-110-310           360         CRP-ECM 3750-110-310           360         CRP-ECM 3750-110-310           360         CRP-ECM 3750-110-310		310	CRP-ECM 1500-110-310		310	CRP-ECM 3000-110-310
210         CRP-ECM 1750-110-210         210         CRP-ECM 3250-110-210           1750         260         CRP-ECM 1750-110-260         3250         260         CRP-ECM 3250-110-260           310         CRP-ECM 1750-110-310         360         CRP-ECM 1750-110-360         310         CRP-ECM 3250-110-260           360         CRP-ECM 2000-110-185         360         CRP-ECM 3250-110-360         360         CRP-ECM 3250-110-360           2000         260         CRP-ECM 2000-110-210         360         CRP-ECM 3500-110-260         310         CRP-ECM 3500-110-260           2000         260         CRP-ECM 2000-110-260         3500         260         CRP-ECM 3500-110-260           310         CRP-ECM 2000-110-310         3500         260         CRP-ECM 3500-110-260           310         CRP-ECM 2250-110-260         310         CRP-ECM 3500-110-260         360         CRP-ECM 3500-110-260           2250         260         CRP-ECM 2250-110-260         3750         260         CRP-ECM 3750-110-260           310         CRP-ECM 2250-110-360         3750         260         CRP-ECM 3750-110-260           310         CRP-ECM 2500-110-260         3750         260         CRP-ECM 3750-110-360           310         CRP-ECM 2500-110-260         3		360	CRP-ECM 1500-110-360		360	CRP-ECM 3000-110-360
1750         260         CRP-ECM 1750-110-260         3250         260         CRP-ECM 3250-110-260         310         CRP-ECM 3250-110-260         310         CRP-ECM 3250-110-310         360         CRP-ECM 1750-110-360         310         CRP-ECM 3250-110-360         360         CRP-ECM 3500-110-260         360         CRP-ECM 3500-110-260         360         CRP-ECM 3500-110-260         310         CRP-ECM 3500-110-260         310         CRP-ECM 3500-110-260         310         CRP-ECM 3500-110-260         310         CRP-ECM 3500-110-260         360         CRP-ECM 3750-110-260         310         CRP-ECM 3750-110-260         310         CRP-ECM 3750-110-260         310         CRP-ECM 3750-110-360         310         CRP-ECM 3750-110-360         310         CRP-ECM 3750-110-360         360         CRP-ECM 3750-110-360         310         CRP-ECM 3750-110-360         310         CRP-ECM 3750-110-360         360         CRP-ECM 3750-110-360         360         CRP-ECM 3750-110-360         360         CRP-ECM 375		185	CRP-ECM 1750-110-185		185	CRP-ECM 3250-110-185
310         CRP-ECM 1750-110-310         310         CRP-ECM 3250-110-310           360         CRP-ECM 1750-110-360         360         CRP-ECM 3250-110-360           185         CRP-ECM 2000-110-185         185         CRP-ECM 3250-110-360           2000         260         CRP-ECM 2000-110-210         210         CRP-ECM 3500-110-210           2000         260         CRP-ECM 2000-110-260         3500         260         CRP-ECM 3500-110-210           310         CRP-ECM 2000-110-310         3500         260         CRP-ECM 3500-110-260           310         CRP-ECM 2250-110-360         360         CRP-ECM 3500-110-310         360           310         CRP-ECM 2250-110-260         3750         260         CRP-ECM 3750-110-260           310         CRP-ECM 2250-110-360         3750         260         CRP-ECM 3750-110-260           310         CRP-ECM 2250-110-360         3750         260         CRP-ECM 3750-110-260           310         CRP-ECM 2250-110-360         310         CRP-ECM 3750-110-310         360           360         CRP-ECM 2250-110-360         310         310         CRP-ECM 3750-110-310           360         CRP-ECM 2500-110-210         210         CRP-ECM 3750-110-310           2500         260		210	CRP-ECM 1750-110-210	3250	210	CRP-ECM 3250-110-210
360         CRP-ECM 1750-110-360         360         CRP-ECM 3250-110-360           185         CRP-ECM 2000-110-185         185         CRP-ECM 3500-110-185           210         CRP-ECM 2000-110-210         210         CRP-ECM 3500-110-210           2000         260         CRP-ECM 2000-110-260         3500         260         CRP-ECM 3500-110-260           310         CRP-ECM 2000-110-310         3500         260         CRP-ECM 3500-110-260         310         CRP-ECM 3500-110-260           360         CRP-ECM 2250-110-360         360         CRP-ECM 3500-110-310         360         CRP-ECM 3500-110-360           2250         260         CRP-ECM 2250-110-260         3750         260         CRP-ECM 3750-110-210           2250         260         CRP-ECM 2250-110-360         3750         260         CRP-ECM 3750-110-210           2250         260         CRP-ECM 2250-110-360         3750         260         CRP-ECM 3750-110-310           360         CRP-ECM 2250-110-360         310         CRP-ECM 3750-110-360         360         CRP-ECM 3750-110-360           210         CRP-ECM 2500-110-310         360         CRP-ECM 4000-110-185         185         CRP-ECM 4000-110-210           2500         260         CRP-ECM 2500-110-260         4	1750	260	CRP-ECM 1750-110-260		260	CRP-ECM 3250-110-260
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2500         260         CRP-ECM 2500-110-260         4000         260         CRP-ECM 4000-110-260           310         CRP-ECM 2500-110-310         310         CRP-ECM 4000-110-310		185	CRP-ECM 2500-110-185		185	CRP-ECM 4000-110-185
<b>310</b> CRP-ECM 2500-110-310 <b>310</b> CRP-ECM 4000-110-310		210	CRP-ECM 2500-110-210	4000	210	CRP-ECM 4000-110-210
	2500	260	CRP-ECM 2500-110-260		260	CRP-ECM 4000-110-260
<b>360</b> CRP-ECM 2500-110-360 <b>360</b> CRP-ECM 4000-110-360		310	CRP-ECM 2500-110-310		310	CRP-ECM 4000-110-310
		360	CRP-ECM 2500-110-360		360	CRP-ECM 4000-110-360

#### **Operating principle**

#### Forced heating convection

The cold air is suctioned from the ambient and heated by the coil. The heated air rises, creating a shield to cold air among the window and the ambient.







VM/VS	Front connections valve kit Consisting of: • Lower valve body with kV factory preset: – DN 15 external thread with euroconus ¾" – M30 x 1,5 – Galvanised, protective cap. • Adjustable return lockshield: – DN 15 external thread with euroconus ¾" – Galvanised.	
V/VS	Side connection valve kit Consisting of: • Lower valve body with kV factory preset: - DN 15 external thread with euroconus ¾" - M30 x 1,5 - Galvanised, protective cap. • Adjustable return lockshield: - DN 15 external thread with euroconus ¾" - Galvanised.	
ATT-24V	Thermoelectric actuator Power supply: 24 V DC. Control signal: 0-10V DC. Absorption: 2 W. Absorbed current: 80 mA. Max inrush current: 350 mA (max. 2 min). Protection rating: IP 54. Adjustment stroke: 4 mm. Including VA80 valve adaptor and 5m connection cable. Normally closed in absence of current.	
CVSG	Empty casing The range and minimum and special lengths of the casings vary for the different models. Dimensions: • Heights: 130, 155 mm • Widths: 310, 330, 360 mm • Variable lengths: 200-3000 mm Material: galvanised steel painted Anthracite grey (RAL 7016 opaque) with natural anodised aluminium casing.	
TS1	<b>Casing sound absorbtion lining</b> 4 mm sound absorbtion lining installed in the factory on the outer surface of the casing.	Insulation against noise 4 mm
FVM	<b>Air intake filter</b> Intake filter PPI 30 dark 140 x 3 mm.	



#### **Top Grills**

They are attractively shaped, solid and robust. There are pratically no limits to how they can be integrated into the architectural design of the room. It is possible to choose between various profile forms, materials, colours and surface finishings. The grills can be easily removed for cleaning and then returned to their original positions.

GAA	Flexible aluminium roll-up grille Dimension: • Length up to 3000 mm • Height: 20 mm • Bar width: 6 mm • Bar spacing: 14 mm • Open cross-section: 70% Anodised in natural or colour, powder-coated in RAL colours (Bronze, Dark Silver, Brass, Black). Cut surfaces in aluminium colour if linear grille is in two pieces. Aluminium profiles.	
GAI	Stainless steel roll-up grille Dimensioni: • Length up to 3000 mm • Height: 20 mm • Bar width: 10 mm • Bar spacing: 16 mm • Open cross-section: 60%	
GLE	Wooden roll-up grille Dimensioni: • Length up to 3000 mm • Height: 20 mm • Bar width: 12 mm • Bar spacing: 16 mm • Open cross-section: 55% Light oak, ash and beech oiled versions.	
GLA	Aluminium linear grille Dimensioni: • Length up to 3000 mm • Height: 20 mm • Bar width: 6 mm • Bar spacing: 10 mm • Open cross-section: 60% Anodised in natural or colour, powder-coated in RAL colours (Bronze, Dark Silver, Brass, Black). Longitudinal profile bars are fixedly connected to aluminium angle profiles by means of a pressure process every 200-300 mm. Aluminium profiles.	



## Accessories

TAD	Digital ambient thermostat Programmable ambient thermostat, including fan control. With large LCD display to control up to6 trench convectors. Energy-saving backlighting. Configurable timing program. Temperature range from 9°C to 32°C. Antifreeze temperature 8°C. Adjustable thermal deviation +/5°C. Heating/cooling control. Power supply via BUS cable. Protection rating/class: IP30 / II Colour similar to RAL 9010.	Manana Manana Manana
KNX	<b>KNX board</b> To be integrated in a Sabiana control card for KNX network connection. 1 single board necessary for integrated group of trench convectors (up to 6).	
STAR	<b>Air temperature sensor</b> NTC 10 K ambient temperature sensor with plastic cap, including 3 m cable + installation material.	
STAC-2 Stac-5	<b>Minimum probe</b> To detect supply temperature, including cable + installation material.	Q
LPR	<b>Dew point detector</b> 24 V DC power supply. Max absorbed current 3 mA. Application range: from 10% to 100% R.H. Including cable gland and board connector.	
LCF	Contact detector for windows (must be coupled to transmission receiver) Power supply: 13 V lithium battery type CR2032. • Transmission type: X2D protocol. • Transmission frequency 868 MHz. • Signal coverage up to 300 m (in open field). • Protection rating IP 40.	
SPR	Presence sensor (must be coupled to transmission receiver) 230 V power supply with phase and neutral. Transmission frequency 868 MHz. 1 - 2 channels depending on function. 3 pre-installed cables to connect switches, ON/OFF buttons. 1 wired phase inlet for detector or button. Up to 16 two-way receivers and an optional number of one-way receivers. Operating temperature: from -5°C to 40°C.	
RTR	<b>Transmission receiver</b> For window contact detectors and presence sensors. Power supply by control card. Up to 2x20 recordable emitters. Signal coverage up to 100m (open field).	61



## SkyStar SK Cassette Fan Coil Unit with Asynchronous Motor

Innovating and beautiful design, **Seuen different sizes**, high control flexibility, easy maintenance: the **SkyStar chilled water Cassette** is the result of an extended technical and design development aimed at achieving the highest level in terms of performance, silent operation and control possibilities. The air diffuser has an highly attractive aesthetical appearance, very innovative, and is also able to offer the best air distribution performance thanks to in-depth computer studies and laboratory tests. The 4 smaller sizes are designed to fit into **600x600 mm false ceiling** standard modules. The 3 bigger sizes have a **dimension of 800x800 mm** which allows the best outcome in terms of quietness and of price/performance ratio for these high capacity models. n addition to temperature and speed standard controls,

#### automatic speed

selection is also available. More than one unit can be connected to a single control, and the unit control panel can be installed in a remote position that **facilitates** the maintenance operation. **All** the **SkyStar** units can be supplied in **MB uersion**. This version allows a wide range of controls, including the infra-red remote control, which can manage one single unit or several units by using the **Modbus RTU – RS 485** communication protocol.

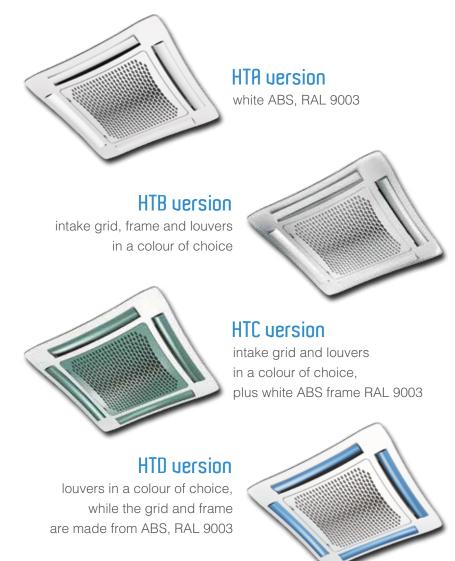
The units can be connected to the most common automatic building management systems.



# Technical characteristics of the main components:

**<u>Air diffuser:</u>** intake grid, frame and

adjustable air distribution louvers on each side, made from ABS.





#### MD-600 uersion

metal diffuser painted in RAL 9003 white colour with 600x600 dimension to perfectly fit into the false ceiling standard modules without overlapping parts (800x800 model is not available)

**Casing:** made from galvanized steel with internal thermal insulation with polyolefin (PO) foam (class M1) and external anti-condensate lining.

**Control panel:** made of an external metallic box with control electronic board and easily accessible terminal board.



Fan assembly: the fan assembly, which is mounted on anti-vibrating supports, is extremely silent. The radial fan has been designed to optimise performance, using wing profile blades with a shape that reduces turbulence, increasing efficiency and reducing noise. The single air inlet radial fan is connected to a δ speed electric motor with single phase 230 U / 50 Hz supply, class B insulation and integrated Klixon thermal contact for motor protection. The units are supplied



with 3 standard speeds connected and it is possible to change them on site if necessary.

**<u>Coil</u>**: made of copper tubes with bonded aluminium fins for maximum transfer contact.

The coils have 1, 2 or 3 rows for 2 pipe models

and 2+1 rows for 4 pipe models (the heating row is on the inside part of the coil).

For 4 pipe systems two versions are available:

SK 04, SK 14, SK 24, SK 34, SK 44, SK 54, SK 64 supply an higher heating emission,
SK 26, SK 36, SK 56, SK 66 supply an higher cooling emission.

The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

**Condensate collection tray:** high density ABS polystyrene foam condensate tray, shaped in order to optimize the air diffusion, fire retardant rating B1 to DIN 4102.

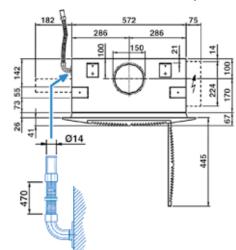
**<u>Air filter</u>**: synthetic washable filter, easily removable.

**<u>Condensate pump</u>**: float switch centrifugal pump with 650 mm of maximum head, built into the unit and wired to the control panel on the outside of the casing.

**<u>Ualue set</u>**: two or three way valves for ON/OFF operation, with pipe mounting kit and thermostatic actuator.

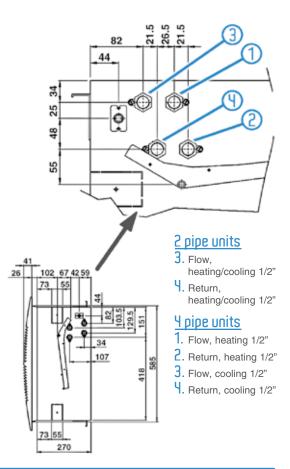
## **Dimensions and Weight**

SK 02-04 / SK 12-14 / SK 22-24-26 / SK 32-34-36 (Uersion 600 x 600)

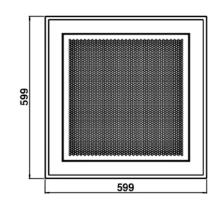


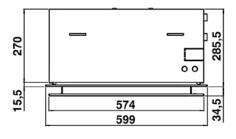
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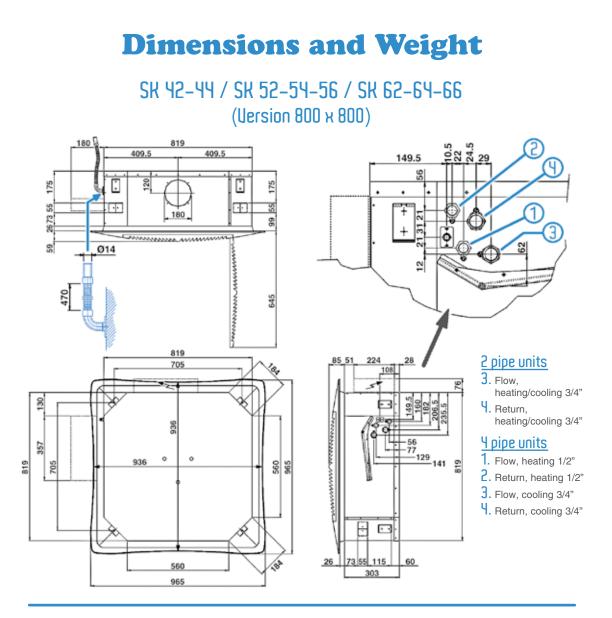
### MD-600 metal diffuser



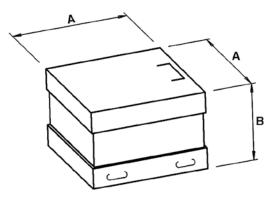


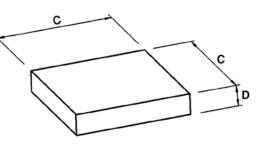
	Ur	nit	Diff					
MODEL	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT	PACKED UNIT DIMENSIONS (mm)			
	kg	kg	kg	kg	А	В	С	D
SK 02 - 12	28	22						
SK 04 - 14			C	3	700	350	75.0	150
SK 22 - 24 - 26	30	24	6	3	790	300	750	150
SK 32 - 34 - 36								





Diffuser





	Ur	nit	Diff					
MODEL	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT	PACKED UNIT T DIMENSIONS (m			
	kg	kg	kg	kg	А	В	С	D
SK 42	44	36						
SK 44			10	6	1050	400	1000	200
SK 52 - 54 - 56	47	39	10	0	1050	400	1000	200
SK 62 - 64 - 66								

SkyStar 9





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

#### <u>COOLING</u> (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.

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Entering water temperature: +50°C

Water flow rate as for the cooling conditions

MODEL			SK 02		SK 12			SK 22			SK 32		
Speed		1	2	3	1	2	3	1	2	3	1	2	3
Air flow	m³/h	310	420	610	310	420	520	320	500	710	430	610	880
Cooling total emission (E)	kW	1,27	1,63	1,98	1,84	2,34	2,68	2,25	3,34	4,33	2,94	3,88	5,02
Cooling sensible emission (E)	kW	1,01	1,32	1,64	1,35	1,75	2,04	1,57	2,39	3,18	2,08	2,81	3,74
Heating (E)	kW	1,62	2,12	2,64	2,22	2,90	3,35	2,56	3,93	5,23	3,43	4,63	6,17
Heating - Water 70-60°C	kW	2,80	3,66	4,56	4,19	4,91	5,68	4,83	6,96	9,25	6,10	8,25	10,63
Water flow	l/h	219	280	340	316	402	461	387	574	745	506	667	863
Dp Cooling <b>(E)</b>	kPa	4,5	7,0	10,0	4,9	7,6	9,7	4,6	9,4	15,1	7,5	12,4	19,7
Dp Heating <b>(E)</b>	kPa	4,0	6,0	9,0	4,1	6,3	8,2	3,5	7,3	11,4	6,7	11,2	17,7
Sound power Lw (E)	dB(A)	33	40	49	33	40	45	33	45	53	41	49	59
Sound pressure Lp (*)	dB(A)	24	31	40	24	31	36	24	36	44	32	40	50
Fan <b>(E)</b>	W	25	32	57	25	32	44	25	44	68	32	57	90
	А	0,11	0,15	0,27	0,11	0,15	0,20	0,11	0,20	0,32	0,15	0,27	0,45
Water content		0,8	0,8	0,8	1,4	1,4	1,4	2,1	2,1	2,1	2,1	2,1	2,1
Dimensions	mm						575 x 57	75 x 275					

MODEL			SK 42	2		SK 52	2	SK 62			
Speed		1	2	3	1	2	3	1	2	3	
Air flow	m³/h	630	820	1140	710	970	1500	710	1280	1820	
Cooling total emission (E)	kW	4,21	4,91	6,16	5,31	6,78	9,51	5,31	8,45	11,10	
Cooling sensible emission (E)	kW	3,03	3,58	4,59	3,46	4,48	6,48	3,71	6,09	8,25	
Heating (E)	kW	5,12	6,03	7,77	5,61	7,34	10,71	6,13	10,30	14,00	
Heating - Water 70-60°C	kW	8,61	10,16	13,14	10,25	13,43	19,76	10,25	17,26	23,68	
Water flow	l/h	724	845	1060	913	1166	1636	913	1453	1909	
Dp Cooling (E)	kPa	10,9	14,3	21,6	9,4	14,7	26,9	9,4	21,8	35,6	
Dp Heating (E)	kPa	6,7	9,9	15,1	7,9	12,4	23,0	7,9	18,6	30,6	
Sound power Lw (E)	dB(A)	33	40	48	34	40	53	34	48	58	
Sound pressure Lp (+)	dB(A)	24	31	39	25	31	44	25	39	49	
Fan <b>(E)</b>	W	33	48	77	42	63	120	42	95	170	
	А	0,15	0,23	0,36	0,18	0,28	0,53	0,18	0,42	0,74	
Water content		3,0	3,0	3,0	4,0	4,0	4,0	4,0	4,0	4,0	
Dimensions	mm				820	) x 820 x 3	303				

(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<sup>3</sup> room and a reverberation time of 0.5 sec.







## Certification

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

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Water temperature: +70°C E.W.T. +60°C L.W.T.

MODEL		S	K O	4	S	SK 14			SK 24		SK 26		SK 34			SK 36		6	
Speed		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air flow	m³/h	310	420	610	310	420	520	320	500	710	320	500	710	430	610	880	430	610	880
Cooling total emission (E)	kW	1,51	1,96	2,33	1,85	2,36	2,70	1,85	2,65	3,34	2,09	3,06	3,93	2,36	3,02	3,81	2,72	3,53	4,53
Cooling sensible emission (E)	kW	1,15	1,55	1,90	1,34	1,71	1,98	1,34	1,98	2,56	1,49	2,24	2,95	1,75	2,29	2,97	1,97	2,62	3,46
Water flow	l/h	260	337	401	318	406	464	318	456	574	359	526	676	406	519	655	468	607	779
Dp Cooling (E)	kPa	6,0	10,0	13,5	4,6	6,9	8,8	4,6	8,8	13,4	4,0	7,0	10,5	7,2	11,2	17,0	6,0	9,0	14,0
Heating (E)	kW	1,96	2,54	3,03	2,43	3,02	3,46	2,43	3,46	4,40	1,98	2,71	3,35	3,10	3,97	4,95	2,46	3,06	3,79
Water flow	l/h	169	219	261	209	260	298	209	298	378	170	233	288	267	341	426	212	263	326
Dp Heating (E)	kPa	6,5	10,5	14,5	5,7	8,5	10,8	5,7	10,8	16,6	3,6	6,0	9,0	8,8	13,8	20,5	5,0	7,8	11,0
Sound power Lw (E)	dB(A)	33	40	49	33	40	45	33	45	53	33	45	53	41	49	59	41	49	59
Sound pressure Lp (*)	dB(A)	24	31	40	24	31	36	24	36	44	24	36	44	32	40	50	32	40	50
Fan <b>(E)</b>	W	25	32	57	25	32	44	25	44	68	25	44	68	32	57	90	32	57	90
	А	0,11	0,15	0,27	0,11	0,15	0,20	0,11	0,20	0,32	0,11	0,20	0,32	0,15	0,27	0,45	0,15	0,27	0,45
Cooling water content		1,0	1,0	1,0	1,4	1,4	1,4	1,4	1,4	1,4	1,7	1,7	1,7	1,4	1,4	1,4	1,7	1,7	1,7
Heating water content		0,6	0,6	0,6	0,7	0,7	0,7	0,7	0,7	0,7	0,5	0,5	0,5	0,7	0,7	0,7	0,5	0,5	0,5
Dimensions	mm								5	75 x 57	75 x 27	'5							

MODEL		SK 44		SK 54		SK 56		SK 64			SK 66					
Speed		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air flow	m³/h	630	820	1140	710	970	1500	710	970	1500	710	1280	1820	710	1280	1820
Cooling total emission (E)	kW	4,14	5,03	6,34	4,52	5,66	7,71	4,99	6,33	8,77	4,52	6,93	8,89	4,99	7,84	10,20
Cooling sensible emission (E)	kW	2,96	3,65	4,69	3,25	4,15	5,83	3,53	4,55	6,49	3,25	5,18	6,84	3,53	5,73	7,68
Water flow	l/h	712	865	1090	777	974	1326	858	1089	1508	777	1192	1529	858	1348	1754
Dp Cooling (E)	kPa	8,8	12,5	18,9	10,3	15,4	26,9	9,0	14,0	25,0	10,3	22,1	34,7	9,0	20,0	32,0
Heating (E)	kW	5,91	7,19	9,10	6,45	8,10	11,00	5,23	6,42	8,56	6,45	9,98	12,70	5,23	7,74	9,80
Water flow	l/h	508	618	783	555	697	946	450	552	736	555	858	1092	450	666	843
Dp Heating (E)	kPa	9,8	14,0	21,4	11,5	17,4	29,9	6,5	9,2	15,3	11,5	25,3	38,8	6,5	13,0	19,5
Sound power Lw (E)	dB(A)	33	40	48	34	40	53	34	40	53	34	48	58	34	48	58
Sound pressure Lp (+)	dB(A)	24	31	39	25	31	44	25	31	44	25	39	49	25	39	49
Eap (E)	W	33	48	77	42	63	120	42	63	120	42	95	170	42	95	170
Fan <b>(E)</b>	А	0,15	0,23	0,36	0,18	0,28	0,53	0,18	0,28	0,53	0,18	0,42	0,74	0,18	0,42	0,74
Cooling water content		3,0	3,0	3,0	3,0	3,0	3,0	3,6	3,6	3,6	3,0	3,0	3,0	3,6	3,6	3,6
Heating water content		1,4	1,4	1,4	1,4	1,4	1,4	1,1	1,1	1,1	1,4	1,4	1,4	1,1	1,1	1,1
Dimensions	mm							820	x 820 x	303						

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.

## **Other available Versions**

SK-MB	All the SkyStar units can be supplied in MB version. This version allows a wide range of controls, including the infra-red remote control, which can manage one single unit or several units by using the Modbus RTU - RS 485 communication protocol.
SK-E	The Cassette 2 pipe models are available with electric resistance that is controlled in place of the heating battery valve.The electric resistance is controlled in place of the hot water valve and not as integration to it.The resistance is hermetically sealed and supplied inside the battery pipes and therefore can be only factory mounted.The electric resistances of the units are for single phase 230V supply.ModelSK 12-ESK 22-E / SK 32-ESK 42-E / SK 52-E / SK 62-EEmission1500 Watt2500 Watt3000 Watt
On are av	with remote electric board request the Skystar cassettes ailable with electric control panel reachable from below and with the electric board n be placed in a remote position.
MCT	The MCT version has been designed for all environments where false ceilings are not featured or cannot be constructed. The cover cabinet fits perfectly to the air intake and outlet diffuser, maintaining the appealing design that defines the SkyStar series. The water fittings can be turned to point upwards. The MCT series includes 7 models, with an installation height of up to 5 m, thanks to the highly flexible adjustment of the air distribution louvers. All the technical specifications described on the previous pages remain the same, while keeping in mind that the MCT series features one coil only (two pipe systems), there is no possibility of fresh air intake, there is no possibility of additional electric heater. The MCT version features a special casing delivered in separate packaging; this must only be fitted after having installed the SkyStar unit and completed the water and electrical connections.

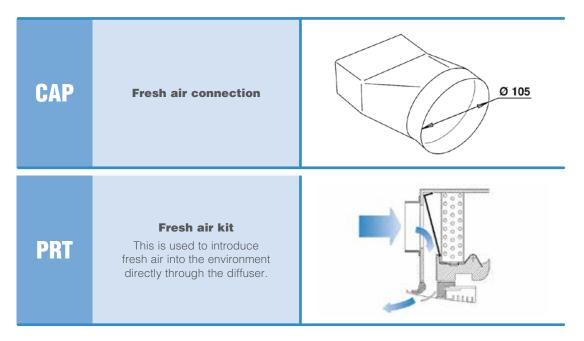


### Accessories 3 way ON-OFF valves with micrometric lockshield valve SK 02-04 / 12-14 24-26 / 32-34-36 Valve set, 3 ways, ON-OFF, with thermoelectric actuator. The set includes connection pipes and holders. SK 42-44 / 52-54-56 / 62-64-66 2 way ON-OFF valves with micrometric lockshield valve SK 02-04 / 12-14 / 22-24-26 / 32-34-36 Valve set, 2 ways, ON-OFF, with thermoelectric actuator. 00303-The set includes connection pipes and holders. SK 42-44 / 52-54-56 / 62-64-66 3 way ON-OFF valves with simplified kit SK 02-04 / 12-14 / 22-24-26 / 32-34-36 Valve set, 3 ways, ON-OFF, with thermoelectric actuator. The set includes connection pipes. SK 42-44 / 52-54-56 / 62-64-66 2 way ON-OFF valves with simplified kit SK 02-04 / 12-14 / 22-24-26 / 32-34-36 Valve set, 2 ways, ON-OFF, with thermoelectric actuator. The set includes connection pipes. <u>SK 42-44 / 52-54-56 / 62-64-66</u> **Balancing valves independent** from the system pressure (for main and additional coil) CDA **Air distribution connection**

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**ikuStar**<sup>1</sup>

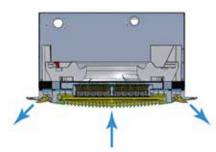
## Accessories



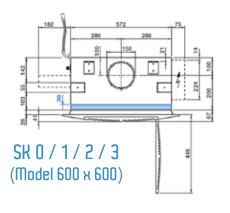
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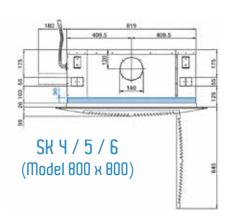
### IAQ accessory

SkyStar Cassette can be equipped with the innovative plate type electrostatic filter, **Crystall**, combining air treatment and purifying in a single product. The electronic filter is **patented and certified** according to Standard UNI 11254.



### Dimensions







## <u>Wall</u> electronic controls

———— SK version ————

WM-3V	3 speed control
WM-T	3 speed control with electronic thermostat and manual summer/winter switch
WM-TQR	3 speed control with electronic thermostat and centralized/manual summer/winter switch
WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
TM0-503-SV2	Automatic speed control with electronic thermostat to be mounted in the DIN 503 box
T2T	Electromechanical thermostat with summer/winter switch (only for 2 pipe units)
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

### —— FreeSabiana wireless control system ———

Free-Com	Remote control to be used with electronic boards described at page 267
Free-Usm	Power unit fitted on the unit
Free-Ups	Power unit not fitted on the unit
Free-Sen	Temperature probe

## **Electronic controls**

### —— SK-MB uersion ———

T-MB	Wall control (to be used with SK-MB version only)
RCS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with SK-MB version only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with SK-MB version only)
RCS	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with SK-MB version only)
RS	Receiver for RT03 infra-red remote control and MD-600 metal diffuser supplied with separate packaging (to be used with SK-MB version only)
PSM-DI	Multifunction control (to be used with SK-MB version only)

### —— Sabianet management system for a network of fan coils ——

Sabianet	Sabianet (to be used with SK-MB version only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet



# SkyStar SK–ECM Cassette Fan Coil Unit with EC Brushless Electronic Motor and Inverter Board

The **SkyStar SK-ECM** series, available in **5 models**, uses an innovative brushless synchronous permanent magnet electronic motor controlled by an inverter board that is directly installed on the unit. The air flow can be varied **continuously** with a 1-10 V signal from Sabiana controls or by independent contollers (programmable controllers with a 1-10 V output). The extreme efficiency, also at a low speed, makes it possible to greatly reduce in electric consumption (more **than 75% less** in comparison to a traditional motor) with absorption values, under normal operating conditions, that are **no greater than 10 Watt** in the entire range. he brushless motor is characterised by a constant synchronous speed, independently of the applied load, that depends only on the motor power supply frequency, which is modulated by the inverter.

### It consumes less because:

- The motor always works at its point of maximum efficiency.
- In the brushless motor, the rotor's permanent magnets generate the magnetising power autonomously.
- The motor always operates at the synchronous speed, as a result there are no induced currents that reduce efficiency.

### The main aduantages are:

- Large reduction in energy consumption, thanks to an optimal response to the thermal load of the environment during every moment of the day.
- Operating silence at all rotation speeds.
- Ability to operate at any rotation speed.

### All the SkyStar SK-ECM units can be supplied in MB uersion.

This version allows a wide range of controls, including the infra-red remote control,

which can manage one single unit or several units

by using the **Modbus RTU – RS 485** communication protocol.

# Technical characteristics of the main components:

### <u>Air diffuser:</u>

intake grid, frame and adjustable air distribution louvers on each side, made from ABS.





HTR uersion white ABS, RAL 9003

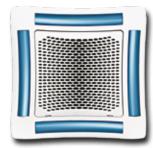


HTB uersion intake grid, frame and louvers in a colour of choice



## HTC uersion

intake grid and louvers in a colour of choice, plus white ABS frame RAL 9003



### **HTD uersion**

louvers in a colour of choice, while the grid and frame are made from ABS, RAL 9003



### MD-600 uersion

metal diffuser painted in RAL 9003 white colour with 600x600 dimension to perfectly fit into the false ceiling standard modules without overlapping parts (800x800 model is not available)



**Casing:** made from galvanized steel with internal thermal insulation with polyolefin (PO) foam (class M1) and external anti-condensate lining.

### Control equipment:

SK-ECM version: it consists of the pump control circuit board and the inverter circuit board. SK-ECM-MB version: it consists of the MB board

(that integrates pump control) and the inverter board.

### Fan assembly: the fan assembly, which

is mounted on anti-vibrating supports, is extremely silent.

The radial fan has been designed to optimise performance, using wing profile blades with a shape that reduces turbulence, increasing efficiency and reducing noise. The fans are connected to a three phase permanent magnet brushless electronic motor that is controlled with reconstructed current 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 systemg**, 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 – 240 U** and frequency of **50 – 60 Hz**.

**Coil:** made of copper tubes with bonded aluminium fins for maximum transfer contact. The coils have 2 or 3 rows for 2 pipe models and 2+1 rows for 4 pipe models (the heating row is on the inside part of the coil). For 4 pipe systems two versions

are available: • SK 14, SK 44 supply an higher heating emission,

• SK 26, SK 36, SK 56 supply an higher cooling emission.

The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

### Condensate collection tray:

high density ABS polystyrene foam condensate tray, shaped in order to optimize the air diffusion, fire retardant rating B1 to DIN 4102.



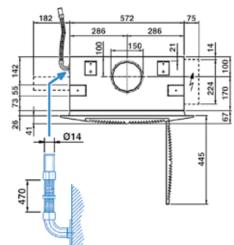
**<u>Air filter:</u>** synthetic washable filter, easily removable.

**<u>Condensate pump</u>**: float switch centrifugal pump with 650 mm of maximum head, built into the unit and wired to the control panel on the outside of the casing.

**<u>Ualue set:</u>** two or three way valves for ON/OFF operation, with pipe mounting kit and thermostatic actuator.

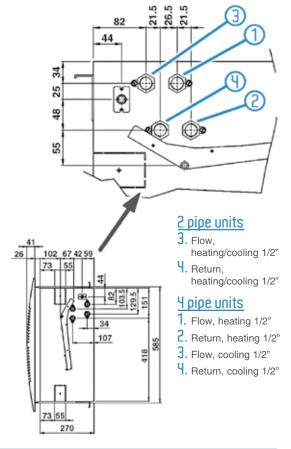
## **Dimensions and Weight**

SK 12-14 / SK 22-26 / SK 32-36 (Uersion 600 x 600)

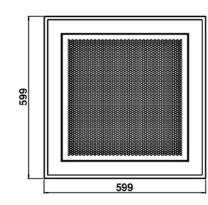


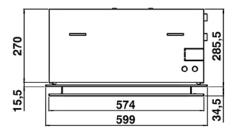
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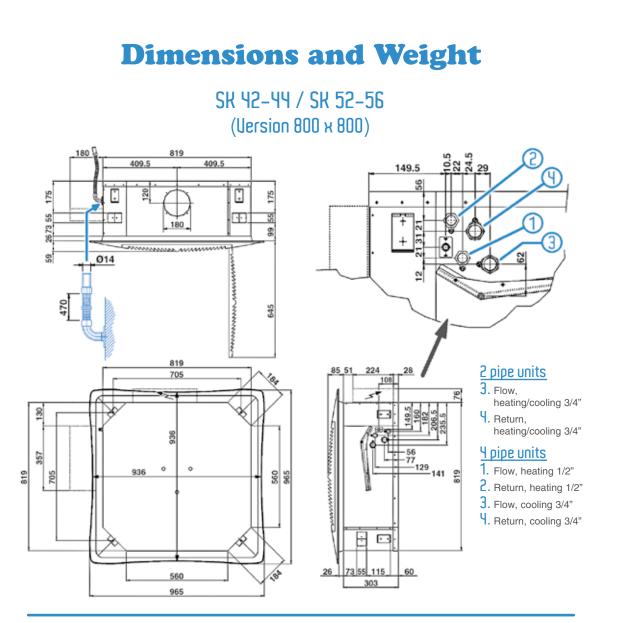
### MD-600 metal diffuser



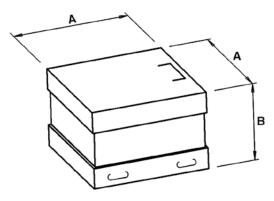


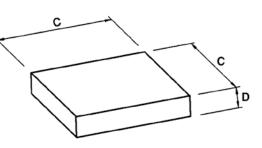
	Ur	nit	Diff					
MODEL	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT		PACKE MENSI		
	kg	kg	kg	kg	А	В	С	D
SK 12	28	22						
SK 14			C	0	700	25.0	75.0	150
SK 22 - 26	30	24	6	3	790	350	750	150
SK 32 - 36								





Diffuser





	Ur	nit	Diff					
MODEL	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT			D UNIT ONS (m	
	kg		kg	kg	А	В	С	D
SK 42	44	36						
SK 44 SK 52 - 56	47	39	10	6	1050	400	1000	200





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.

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Entering water temperature: +50°C Water flow rate as for the cooling conditions

MODEL		SK-	-ECM	12	SK-	-ECM	22	SK-	ECN	<b>  32</b>	SK-	-ECM	42	SK-	-ECN	l <b>5</b> 2
Inverter Power (V)		1	5	10	1	5	10	1	5	10	1	5	10	1	5	10
Speed		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air flow	m³/h	310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling total emission (E)	kW	1,84	2,17	2,75	2,24	3,05	4,33	2,56	3,87	5,02	4,21	5,15	6,33	5,29	7,72	10,75
Cooling sensible emission (E)	kW	1,35	1,61	2,09	1,57	2,17	3,18	1,81	2,81	3,74	3,03	3,77	4,72	3,69	5,53	7,94
Heating (E)	kW	2,22	2,67	3,44	2,55	3,58	5,24	2,96	4,63	6,2	5,11	6,35	8,01	5,89	8,83	12,73
Heating - Water 70-60°C	kW	3,75	4,51	5,82	4,28	6,01	8,81	4,96	7,79	10,42	8,61	10,72	13,54	9,87	14,82	21,37
Water flow	l/h	317	373	473	385	524	744	441	666	864	723	885	1089	909	1328	1848
Dp Cooling (E)	kPa	4,9	6,6	10,1	4,6	9,4	15,1	5,9	12,4	19,7	10,9	15,6	22,7	9,4	18,5	33,6
Dp Heating (E)	kPa	4	5,5	8,7	3,6	6,6	13,1	4,7	10,5	17,7	8,7	12,8	19,5	7,2	14,9	28,8
Sound power Lw (E)	dB(A)	33	39	47	33	43	54	37	50	60	33	39	48	34	47	57
Sound pressure Lp (*)	dB(A)	24	30	38	24	34	45	28	41	51	24	30	39	25	38	48
Fan <b>(E)</b>	W	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Water content		1,4	1,4	1,4	2,1	2,1	2,1	2,1	2,1	2,1	3,0	3,0	3,0	4,0	4,0	4,0
Dimensions	mm	575 x 575 x 27				275				820 x 8			320 x 303			
Energy classification FCEER (**)	(E)		Α			А			А		A			A		
Energy classification FCCOP (***	) (E)		Α		A			A		A			А			

#### 4 pipe units. The following standard rating conditions are used:

COOLING (summer mode)		HEATING (winter mode)	
Entering air temperature: +27°C d.b.	+19°C w.b.	Entering air temperature: +20°C	-
Water temperature: + 7°C E.W.T.	+12°C L.W.T.	Water temperature: +70°C E.W.T. +60°C L.W.T.	

MODEL		SK-	ECM	14	SK-	-ECM	26	SK-	-ECM	36	SK-	-ECM	44	SK-	-ECM	56
Inverter Power (V)		1	5	10	1	5	10	1	5	10	1	5	10	1	5	10
Speed		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air flow	m³/h	310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling total emission (E)	kW	1,85	2,18	2,77	2,09	2,81	3,93	2,38	3,53	4,53	4,3	5,28	6,51	4,98	7,17	9,87
Cooling sensible emission (E)	kW	1,34	1,6	2,08	1,49	2,04	2,95	1,71	2,62	3,46	3,08	3,84	4,83	3,52	5,2	7,4
Water flow	l/h	318	375	476	359	483	676	409	608	779	740	908	1120	856	1233	1697
Dp Cooling (E)	kPa	4,6	6,2	9,5	3,5	5,7	10,5	4,1	8,4	13,1	9,4	13,6	19,8	8,8	17	30,1
Heating (E)	kW	2,43	2,85	3,62	1,98	2,53	3,35	2,2	3,06	3,79	6,14	7,54	9,36	5,22	7,16	9,51
Water flow	l/h	209	245	311	170	217	288	189	263	326	528	649	805	449	616	818
Dp Heating (E)	kPa	5,7	7,6	11,7	3,5	5,5	9	4,5	7,5	11	10,5	15,5	22,5	6,5	11	18
Sound power Lw (E)	dB(A)	33	39	47	33	43	54	37	50	60	33	39	48	34	47	57
Sound pressure Lp (*)	dB(A)	24	30	38	24	34	45	28	41	51	24	30	39	25	38	48
Fan <b>(E)</b>	W	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Cooling water content		1,4	1,4	1,4	1,7	1,7	1,7	1,7	1,7	1,7	3,0	3,0	3,0	3,6	3,6	3,6
Heating water content		0,7	0,7	0,7	0,5	0,5	0,5	0,5	0,5	0,5	1,4	1,4	1,4	1,1	1,1	1,1
Dimensions	mm	575 x 575 x 275							820 x 8			320 x 303				
Energy classification FCEER (**)	(E)		Α		Α		A		A			A				
Energy classification FCCOP (***)	(E)		Α			А			В			А			Α	

#### (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<sup>3</sup> room and a reverberation time of 0.5 sec. (\*\*) FCEER = Energy classification in Cooling.

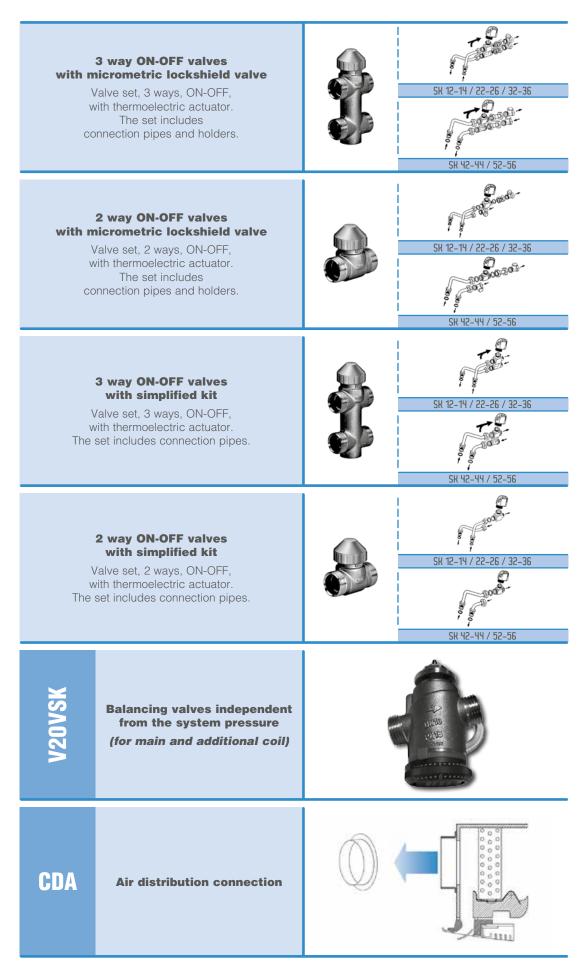
(\*\*\*) FCCOP = Energy classification in Heating.



## **Other available Versions**

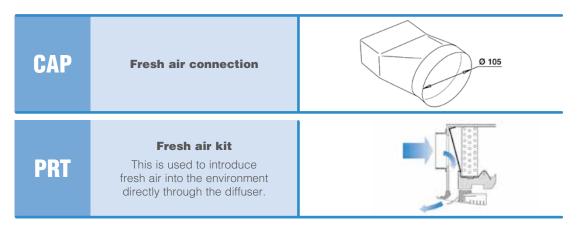
SK-ECM-MB	All the SkyStar ECM units can be supplied in MB version. This version allows a wide range of controls, including the infra-red remote control, which can manage one single unit or several units by using the Modbus RTU - RS 485 communication protocol.
SK-ECM-E	The Cassette 2 pipe models are available with electric resistance that is controlled in place of the heating battery valve.The electric resistance is controlled in place of the hot water valve and not as integration to it.The resistance is hermetically sealed and supplied inside the battery pipes and therefore can be only factory mounted.The electric resistances of the units are for single phase 230V supply.ECM ModelSK 12-ESK 22-E / SK 32-ESK 42-E / SK 52-EEmission1500 Watt3000 Watt
МСТ	<ul> <li>The MCT version has been designed for all environments where false ceilings are not featured or cannot be constructed.</li> <li>The cover cabinet fits perfectly to the air intake and outlet diffuser, maintaining the appealing design that defines the SkyStar series. The water fittings can be turned to point upwards.</li> <li>The MCT series includes 7 models, with an installation height of up to 5 m, thanks to the highly flexible adjustment of the air distribution louvers.</li> <li>All the technical specifications described on the previous pages remain the same, while keeping in mind that the MCT series features one coil only (two pipe systems), there is no possibility of fresh air intake, there is no possibility of additional electric heater.</li> <li>The MCT version features a special casing delivered in separate packaging; this must only be fitted after having installed the SkyStar unit and completed the water and electrical connections.</li> </ul>

### Accessories





## Accessories



## <u>Wall</u> electronic controls

- SK-ECM version -

WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
WM-S-ECM	Continuous fan speed control with electronic thermostat, summer/winter switch and liquid crystal display
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

## **Electronic controls**

### - SK-ECM-MB uersion -

T-MB	Wall control (to be used with SK-ECM-MB version only)
RCS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with SK-ECM-MB version only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with SK-ECM-MB version only)
RCS	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with SK-ECM-MB version only)
RS	Receiver for RT03 infra-red remote control and MD-600 metal diffuser supplied with separate packaging (to be used with SK-ECM-MB version only)
PSM-DI	Multifunction control (to be used with SK-ECM-MB version only)

### — Sabianet management system for a network of fan coils —

Sabianet	Sabianet (to be used with SK-ECM-MB version only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet

#### NOTES: for more details about the Controls, see Page 265.



## Carisma Coanda One Way Cassette Fan Coil Unit with Asynchronous Motor

he **Carisma Coanda** one way Cassette fan coil units are available in **3 sizes**. Thanks to the particular air handling section, the units generate an airflow **with a "coanda" effect**. The unit is suitable for installation in a suspended ceiling. Air intake is from the bottom while the air supply is parallel to the ceiling, through practical and functional intake and outlet grids.

he "coanda" effect creates excellent circulation of the air inside the room. Every unit can be supplied with 1 coil (2 pipe system) and possibly an electric heating element, or with 2 coils (4 pipe system) with one or two rows heating coil, for low temperature hot water. Fresh air may be mixed



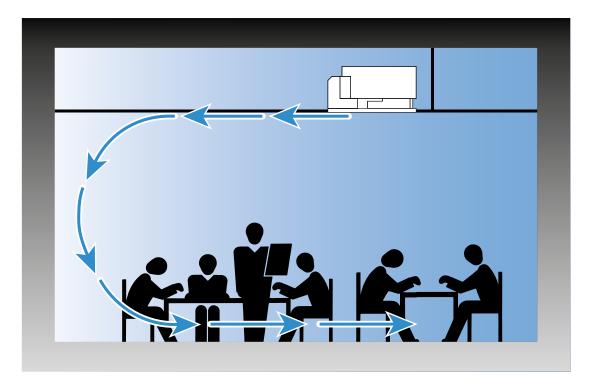


A condensate pump

may also be supplied as an accessory.

n addition to the conventional temperature and speed control systems, there is also the possibility of **automatic** speed selection and to control operation of each unit through a single remote control with central supervisor software installed on a PC (called Sabianet).

It is also possible to use the completely **Wireless** electronic control system based on radio communication, called **FreeSabiana**, with great advantages in terms of installation flexibility and maximum precision in measuring room temperature.



sma Loan

# Technical characteristics of the main components:

**Casing:** made from galvanized steel insulated with polyolefin (PO) foam (class M1).

### <u>Diffuser</u> with intake grid:

in prepainted metal sheet in RAL 9003 colour with intake grid that can be opened for inspection and maintenance of the air filter.

**<u>Air filter:</u>** polypropylene cellular fabric regenerating 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 **Six speeds**, **three of which are connected**, 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 1/2 inch 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 connection side cannot be changed on site.** 

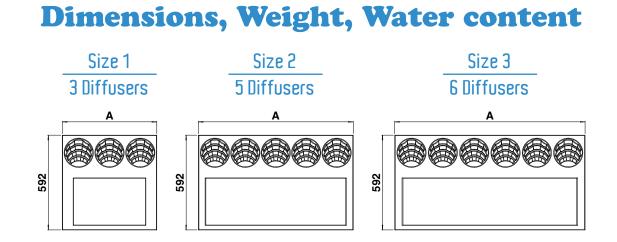
**Condensate collection tray:** made from plastic with an "L"-shape fitted on the inner casing; the tray is insulated with polyolefin (PO) foam (class M1). The outside diameter of the condensate discharge pipe is 15 mm.

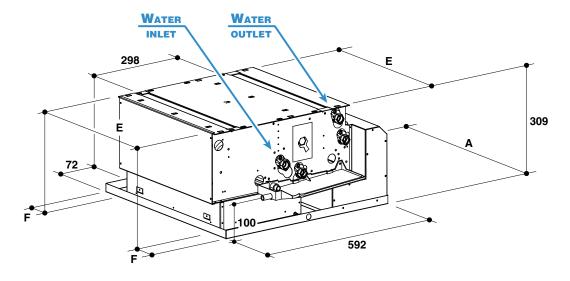
**Round diffuser:** the units are supplied with round diffusers suitably designed to generate an airflow with "coanda" effect.

The direction of diffuser air flow can be adjusted on site.









	Dimension (	(mm)	)
4		9	

MODEL	1	2	3
Α	592	970	1192
E	454	884	1099
F	78	43	46,5
W	750	1130	1350

### - Weight (kg) ·

		WE	IGHT WITH PACKAG	NG	WEIGHT WITHOUT PACKAGING							
N	IODEL	1	2	3	1	2	3					
	3	18	34	44	16	33	42					
S	3+1	20	40	51	19	38	48					
ROWS	3+2	23	46	58	22	43	54					
<u>مح</u>	4	20	37	48	18	35	45					
	4+1	23	42	54	21	40	51					

### - Water content (litres) -

N	NODEL	1	2	3
	3	0,6	1,3	1,7
NS	4	0,8	1,7	2,4
ROV	+1	0,2	0,4	0,5
	+2	0,4	0,8	1,0





### - Units with 3 and 4 row coil -

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

<u>COOLING</u> (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 Entering water temperature: +50°C

Water flow rate as for the cooling conditions

MODEL		CCN 13					CCN 23						CCN 33						
Crood		1 <b>(E)</b>	2 <b>(E)</b>	3	4	5 <b>(E)</b>	6	1 <b>(E)</b>	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6	1 <b>(E)</b>	2	3 <b>(E)</b>	4 <b>(E)</b>	5	6
Speed		MIN	MED			MAX		MIN	MED		MAX			MIN		MED	MAX		
Air flow	m³/h	140	180	220	245	280	305	200	240	305	380	470	560	290	360	440	540	620	680
Cooling total emission (E)	kW	0,88	1,06	1,26	1,35	1,50	1,60	1,37	1,62	1,97	2,37	2,81	3,23	1,97	2,37	2,84	3,34	3,75	4,05
Cooling sensible emission (E)	kW	0,66	0,81	0,98	1,06	1,18	1,27	1,00	1,19	1,47	1,77	2,13	2,47	1,44	1,74	2,11	2,51	2,83	3,07
Heating (E)	kW	1,08	1,33	1,59	1,73	1,93	2,08	1,60	1,91	2,35	2,86	3,43	3,95	2,30	2,79	3,37	4,02	4,53	4,88
Heating - Water 70-60°C	kW	1,84	2,26	2,71	2,94	3,29	3,54	2,68	3,20	3,95	4,79	5,77	6,64	3,85	4,67	5,65	6,73	7,61	8,20
Dp Cooling (E)	kPa	2,4	3,3	4,5	5,1	6,1	6,8	2,9	3,9	5,5	7,6	10,3	13,1	6,4	8,8	12,1	16,2	19,8	22,7
Dp Heating (E)	kPa	1,8	2,6	3,5	4,0	4,9	5,6	2,3	3,1	4,5	6,3	8,4	10,8	5,2	7,3	9,8	13,4	16,3	18,6
Fan <b>(E)</b>	W	16	22	32	38	49	66	24	27	34	44	57	71	27	33	42	59	72	84
Sound power (E)	dB(A)	35	41	46	49	52	55	33	36	42	48	54	57	35	41	46	52	55	57
Sound pressure (*)	dB(A)	26	32	37	40	43	46	24	27	33	39	45	48	26	32	37	43	46	48

MODEL		CCN 14 CCN 24							CCN 34										
Crood		1 (E)	2 <b>(E)</b>	3	4	5 <b>(E)</b>	6	1 <b>(E)</b>	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5 <b>(E)</b>	6
Speed		MIN	MED			MAX		MIN	MED		MAX				MIN		MED	MAX	
Air flow	m³/h	140	180	220	245	280	305	200	240	305	380	470	560	290	360	440	540	620	680
Cooling total emission (E)	kW	0,97	1,19	1,44	1,55	1,74	1,87	1,44	1,72	2,12	2,57	3,09	3,58	2,05	2,49	3,00	3,56	4,02	4,36
Cooling sensible emission (E)	kW	0,71	0,88	1,07	1,17	1,31	1,42	1,04	1,24	1,54	1,88	2,28	2,67	1,48	1,81	2,20	2,63	2,98	3,25
Heating (E)	kW	1,14	1,42	1,72	1,88	2,10	2,27	1,69	2,03	2,54	3,12	3,79	4,44	2,38	2,90	3,51	4,20	4,77	5,20
Heating - Water 70-60°C	kW	1,92	2,37	2,89	3,14	3,52	3,80	2,82	3,40	4,25	5,22	6,37	7,46	3,96	4,83	5,87	7,04	8,00	8,72
Dp Cooling (E)	kPa	4,7	6,7	9,2	10,6	12,9	14,6	4,4	6,0	8,6	12,1	16,8	21,7	4,7	6,7	9,3	12,6	15,5	17,9
Dp Heating (E)	kPa	3,7	5,4	7,6	8,8	10,7	12,3	3,5	4,8	7,1	10,2	13,6	17,9	3,9	5,5	7,3	10,0	12,6	14,6
Fan <b>(E)</b>	W	16	22	32	38	49	66	24	27	34	44	57	71	27	33	42	59	72	84
Sound power (E)	dB(A)	35	41	46	49	52	55	33	36	42	48	54	57	35	41	46	52	55	57
Sound pressure (*)	dB(A)	26	32	37	40	43	46	24	27	33	39	45	48	26	32	37	43	46	48

(E) = Eurovent certified performance. MIN-MED-MAX = Standard connected speeds.

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.





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### Units with 1 row additional coil

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

COOLING	(summer	mode)
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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)

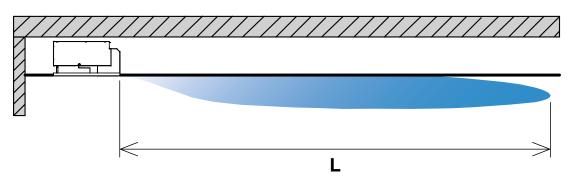
Entering air temperature: +20°C Water temperature: +70°C E.W.T. +60°C L.W.T.

MODEL		CCN 13+1					CCN 23+1						CCN 33+1						
Canad		1 <b>(E)</b>	2 <b>(E)</b>	3	4	5 <b>(E)</b>	6	1 (E)	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6	1 (E)	2	3 <b>(E)</b>	4 <b>(E)</b>	5	6
Speed		MIN	MED			MAX		MIN	MED		MAX			MIN		MED	MAX		
Air flow	m³/h	140	180	220	245	280	305	200	240	305	380	470	560	290	360	440	540	620	680
Cooling total emission (E)	kW	0,88	1,06	1,26	1,35	1,50	1,60	1,37	1,62	1,97	2,37	2,81	3,23	1,97	2,37	2,84	3,34	3,75	4,05
Cooling sensible emission (E)	kW	0,66	0,81	0,98	1,06	1,18	1,27	1,00	1,19	1,47	1,77	2,13	2,47	1,44	1,74	2,11	2,51	2,83	3,07
Heating (E)	kW	0,92	1,08	1,25	1,34	1,47	1,56	1,49	1,71	2,02	2,35	2,73	3,07	2,12	2,47	2,87	3,30	3,64	3,89
Dp Cooling (E)	kPa	2,4	3,3	4,5	5,1	6,1	6,8	2,9	3,9	5,5	7,6	10,3	13,1	6,4	8,8	12,1	16,2	19,8	22,7
Dp Heating (E)	kPa	1,6	2,1	2,7	3,1	3,6	4,0	0,9	1,2	1,6	2,0	2,6	3,2	2,0	2,6	3,4	4,3	5,1	5,8
Fan <b>(E)</b>	W	16	22	32	38	49	66	24	27	34	44	57	71	27	33	42	59	72	84
Sound power (E)	dB(A)	35	41	46	49	52	55	33	36	42	48	54	57	35	41	46	52	55	57
Sound pressure (+)	dB(A)	26	32	37	40	43	46	24	27	33	39	45	48	26	32	37	43	46	48

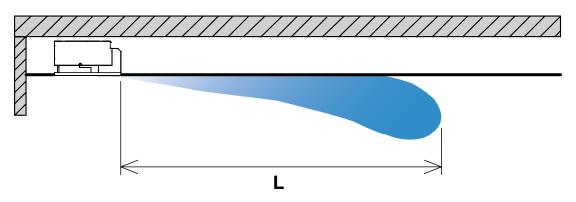
(E) = Eurovent certified performance.
 MIN-MED-MAX = Standard connected speeds.
 (\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.

## Installation Heights and Air throw

C1) Heating



## C2) Cooling



MODEL		CCN 1	CCN 2	CCN 3
INSTALLATION	Min.	2,6	2,6	2,6
HEIGHT (m)		3,2	3,2	3,5

MODEL CCN 1							CCN 2 CCN 3												
SPEED		1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
AIR THROW <b>L</b> (m)	C1	3,6	4,5	5,8	6,3	6,8	7,2	4	5	6,1	7	8	9	4,5	5,2	6,3	7,5	8,8	9,5
	C2	3	3,6	4,6	5	5,4	5,7	3,2	4	4,8	5,6	6,4	7,2	3,6	4,1	5	6	7	7,6



## <u>Wall</u> electronic controls

— Standard models —

WM-3V	3 speed control
WM-T	3 speed control with electronic thermostat and manual summer/winter switch
WM-TQR	3 speed control with electronic thermostat and centralized/manual summer/winter switch
WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
TM0-503-SV2	Automatic speed control with electronic thermostat to be mounted in the DIN 503 box
T2T	Electromechanical thermostat with summer/winter switch (only for 2 pipe units)
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

### - FreeSabiana wireless control system -

Free-Com	Remote control to be used with electronic boards described at page 267
Free-Upm	Power unit fitted on the unit
Free-Ups	Power unit not fitted on the unit
Free-Sen	Temperature probe

## **Electronic controls for <u>MB boards</u>**

MB-M	MB electronic board fitted on the unit
MB-S	MB electronic board supplied with separate packaging
T-MB	Wall control (to be used with MB board only)
RS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RS	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

### —— Sabianet management system for a network of fan coils ——

Sabianet	Sabianet (to be used with MB board only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet



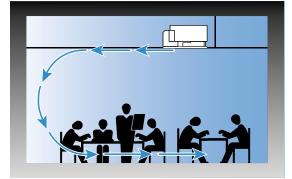
# Carisma Coanda–ECM One Way Cassette Fan Coil Unit with EC Brushless Electronic Motor and Inverter Board

he **Carisma Coanda–ECM** one way Cassette fan coil units are available in **3 sizes**. Thanks to the particular air handling section, the units generate an airflow **with a "coanda" effect**. The variable flow rate enhances the product's main virtues: **excellent air circulation**, with a high degree of comfort,

especially during the summer months.

very unit is supplied with an electronic motor with extremely low energy consumption, **brushless** and **sensorless** type,

controlled by an inverter board. By continuously varying the air flow, the ambient temperature can be



more precisely monitored and regulated, **Sauing ouer 50%** 

of the electricity used and reducing the average perceived noise level.

Every unit can be supplied with 1 coil (2 pipe system) and possibly an electric heating element, or with 2 coils (4 pipe system) with one or two rows heating coil, for low temperature hot water. Fresh air may be mixed with room air.

### A condensate pump

may also be supplied as an accessory.

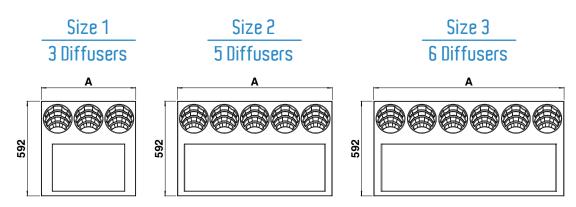
n addition to the conventional temperature and speed control systems, there is also the possibility to **control operation** of each unit through a single remote control with central supervisor software installed on a PC (called Sabianet).



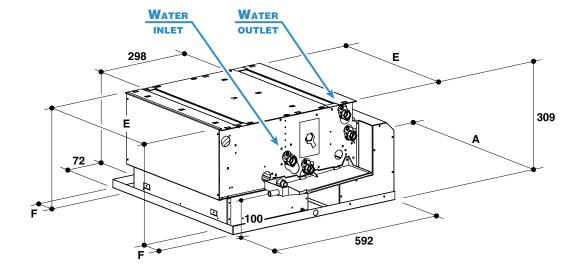
# Technical characteristics of the main components:

## For the technical characteristics of the various components refer to Carisma COANDA Fan Coil Unit, except for

Electronic motor: three phase permanent magnet brushless 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 suitching 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 – 240 U and frequency of 50 – 60 Hz.



## **Dimensions, Weight, Water content**



<b>D</b> '		/ \
llimo		(mm)
	nsion (	
DITICI		/
		( /

MODEL	1	2	3
Α	592	970	1192
E	454	884	1099
F	78	43	46,5
W	750	1130	1350

### - Weight (kg) ·

		WE	IGHT WITH PACKAG	ING	WEIGHT WITHOUT PACKAGING						
N	IODEL	1	2	3	1	2	3				
	3	18	34	44	16	33	42				
S	3+1	20	40	51	19	38	48				
ROWS	3+2	23	46	58	22	43	54				
æ	4	20	37	48	18	35	45				
	4+1	23	42	54	21	40	51				

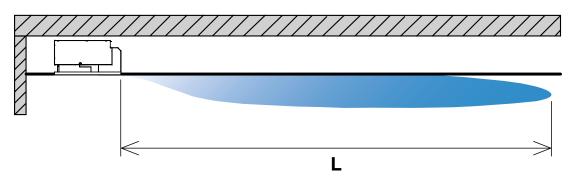
### - Water content (litres) -

N	MODEL 1		2	3
	3	0,6	1,3	1,7
NS	4	0,8	1,7	2,4
ROV	+1	0,2	0,4	0,5
	+2	0,4	0,8	1,0

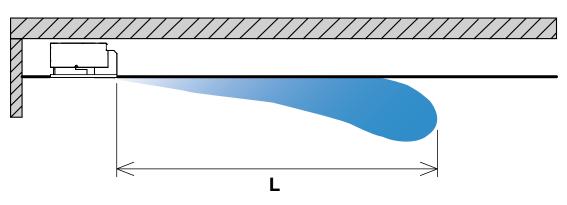


## Installation Heights and Air throw

C1) Heating



## C2) Cooling



MODEL		CCN 1	CCN 2	CCN 3				
INSTALLATION	Min.	2,6	2,6	2,6				
HEIGHT (m)	Max.	3,2	3,2	3,5				

MODEL				CC	N 1					CC	N 2		CCN 3						
SPEED		1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	C1	3,6	4,5	5,8	6,3	6,8	7,2	4	5	6,1	7	8	9	4,5	5,2	6,3	7,5	8,8	9,5
AIR THROW <b>∟</b> (m)	C2	3	3,6	4,6	5	5,4	5,7	3,2	4	4,8	5,6	6,4	7,2	3,6	4,1	5	6	7	7,6





### - Units with 3 and 4 row coil -

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

<u>COOLING</u> (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 **Entering water temperature:** +50°C Water flow rate as for the cooling conditions

MODEL			CCN	-ECI	VI 1:	3		-ECI	3	CCN–ECM 33						
Inverter Power (V)		1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 <b>(E)</b>	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>
Speed		MIN		MED		MAX	MIN		MED		MAX	MIN		MED		MAX
Air flow	m³/h	130	165	205	250	295	215	295	370	450	540	275	345	430	525	620
Cooling total emission (E)	kW	0,82	1,00	1,18	1,37	1,56	1,46	1,92	2,31	2,74	3,16	1,87	2,31	2,78	3,28	3,75
Cooling sensible emission (E)	kW	0,62	0,76	0,91	1,07	1,24	1,07	1,42	1,73	2,07	2,41	1,37	1,70	2,06	2,45	2,83
Heating (E)	kW	1,02	1,25	1,50	1,75	2,02	1,72	2,28	2,79	3,33	3,85	2,19	2,72	3,30	3,93	4,54
Heating - Water 70-60°C	kW	1,72	2,12	2,54	2,98	3,44	2,88	3,82	4,67	5,60	6,49	3,65	4,54	5,53	6,59	7,61
Dp Cooling (E)	kPa	2,1	3,0	4,0	5,2	6,5	3,2	5,2	7,3	9,8	12,6	5,8	8,4	11,7	15,7	19,8
Dp Heating (E)	kPa	1,7	2,4	3,3	4,3	5,3	2,6	4,2	6,0	8,0	10,4	4,7	6,9	9,4	12,9	16,6
Fan <b>(E)</b>	W	8	11	14	21	29	8	11	16	24	37	10	13	19	29	42
Sound power (E)	dB(A)	35	41	46	51	55	34	40	46	52	56	36	42	48	54	58
Sound pressure (*)	dB(A)	26	32	37	42	46	25	31	37	43	47	27	33	39	45	49
Energy classification FCEER (**)	(E)			C					В					В		
Energy classification FCCOP (***)	) (E)			C					В					В		

MODEL		(	CCN	-ECI	VI 14	4		CCN	-ECI	1	CCN–ECM 34					
Inverter Power (V)		1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 (E)	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>
Speed		MIN		MED		MAX	MIN		MED		MAX	MIN		MED		MAX
Air flow	m³/h	130	165	205	250	295	215	295	370	450	540	275	345	430	525	620
Cooling total emission (E)	kW	0,91	1,12	1,34	1,58	1,81	1,55	2,06	2,51	3,00	3,50	1,95	2,42	2,94	3,49	4,02
Cooling sensible emission (E)	kW	0,66	0,82	0,99	1,18	1,38	1,11	1,49	1,84	2,21	2,60	1,41	1,76	2,15	2,57	2,98
Heating (E)	kW	1,07	1,32	1,60	1,90	2,20	1,82	2,46	3,03	3,68	4,32	2,25	2,82	3,44	4,12	4,78
Heating - Water 70-60°C	kW	1,78	2,22	2,68	3,19	3,69	3,04	4,11	5,08	6,17	7,27	3,75	4,70	5,74	6,89	8,00
Dp Cooling (E)	kPa	4,1	5,9	8,1	10,9	13,9	5,0	8,2	11,6	15,9	20,8	4,3	6,4	8,9	12,1	15,5
Dp Heating (E)	kPa	3,3	4,8	6,6	9,0	11,6	4,1	6,7	9,4	13,2	17,1	3,5	5,2	7,4	10,0	13,0
Fan <b>(E)</b>	W	8	11	14	21	29	8	11	16	24	37	10	13	19	29	42
Sound power (E)	dB(A)	35	41	46	51	55	34	40	46	52	56	36	42	48	54	58
Sound pressure (*)	dB(A)	26	32	37	42	46	25	31	37	43	47	27	33	39	45	49
Energy classification FCEER (**)	(E)			C					В					В		
Energy classification FCCOP (***	) (E)			C					В					В		

(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<sup>3</sup> room and a reverberation time of 0.5 sec.

(**\*\***) **FCEER** = Energy classification in Cooling.

(**\*\*\***) **FCCOP** = Energy classification in Heating.



## Wall electronic controls

— Standard models —

WM-AU	Automatic speed control with electronic thermostat and summer/winter switch (to be used with UPM-AU or UP-AU only)
T-MB	Wall control (to be used with UPM-AU or UP-AU only)
WM-S-ECM	Continuous fan speed control with electronic thermostat, summer/winter switch and liquid crystal display
UPM-AU	Power unit for WM-AU and T-MB remote controls, fitted on the unit
UP-AU	Power unit for WM-AU and T-MB remote controls, not fitted on the unit

## **Electronic controls for <u>MB boards</u>**

MB-ECM-M	MB electronic board fitted on the unit			
MB-ECM-S	MB electronic board supplied with separate packaging			
T-MB	Wall control (to be used with MB board only)			
RS-RT03	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)			
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)			
RS	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)			
PSM-DI	Multifunction control (to be used with MB board only)			

### Sabianet management system for a network of fan coils —

Sabianet	Hardware/software supervisory system (to be used with MB board only)		
<b>ROUTER-S</b>	Router for Sabianet		
SIOS	Relay output board for Sabianet		



# Carisma Fly High Wall Fan Coil Unit

### Carisma Fly is the high wall fan coil unit **designed** and manufactured in Italy by Sabiana, in 4 sizes and many different

models. Fly is easy to install like a standard fan coil: without decreasing the emission and without any extra frame, 2 way or 3 way valves and condensate pump can be mounted into the casing.

The **modern and appealing** design of the unit in RAL 9003 colour allows the use of Fly in any environment.

### Fly is available with standard AC motors

**or low energy EC motors** and in the following versions: with wired wall control, infra-red remote control, MB electronic board for Modbus management and electric heating coil.

### The units are for 2 pipe installations only.

All the Fly models perform very low electric consumption and extremely quite sound levels according to the request of today's new projects.

# Technical characteristics of the main components:

### Uersions: all versions are available

without valves, with 2 way valve or with 3 way valve fitted in the unit.

There are four sizes available in the following versions:

**Casing:** made of auto-extinguishing ABS UL94 HB plastic with high specifications and great resistance to aging. The diffusion flap is adjusted manually in CVP model, with remote control in CVP-T model and with T-MB control in CVP-MB model.

Filter: washable-regenerable synthetic filter, readily accessible.

Fan assembly: made of plastic tangential fan.

Electric motor: the motor is for single phase supply and has six speeds, three of which are connected, 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. The speeds connected in the factory are indicated by "MIN, MED and MAX" in the following tables.

**<u>Coil</u>** 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 1/2 inch BSP internal connections and 1/8 inch BSP air vent and drain. The heat exchanger is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

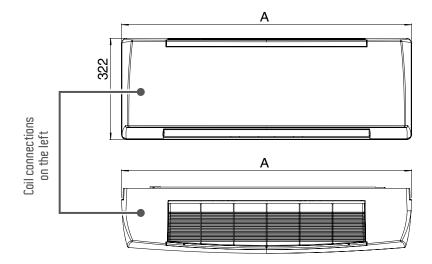
The connections are on the left side facing the unit only.

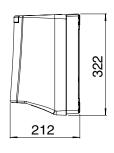
**Condensate collection tray:** made from polypropylene; the outside diameter of the condensate discharge pipe is 16mm.

**Installation template:** a cardboard installation template is supplied with every unit to help the mounting on the wall.

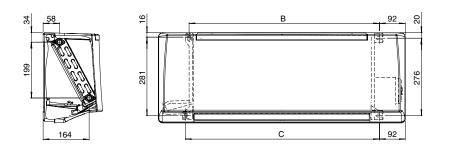
**Carisma F** 

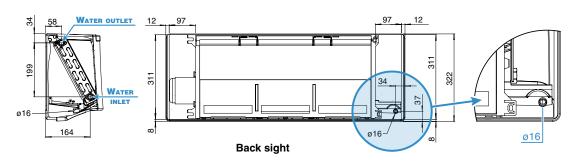
## **Dimensions, Weight, Water content**





### Mounting dimensions





MODEL	WEIGHT without valves Kg	WEIGHT with valves Kg	WATER CONTENT Litres	A mm	B mm	C mm
1	10	11	0,85	880	678	691
2	10	11	0,85	880	678	691
3	13	14	1,28	1185	983	996
4	13	14	1,28	1185	983	996







The following standard rating conditions are used:

### <u>COOLING</u> (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.

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Entering water temperature: +50°C

Certification

Water flow rate as for the cooling conditions

MODEL			1 2										
Speed		1 (E)	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6	1 (E)	2	3 <b>(E)</b>	4	5 <b>(E)</b>	6
		MIN	MED		MAX			MIN		MED		MAX	
Air flow	m³/h	205	270	340	375	470	500	250	305	365	400	480	545
Cooling total emission (E)	kW	1,24	1,50	1,76	1,87	2,15	2,23	1,43	1,63	1,84	1,95	2,18	2,35
Cooling sensible emission (E)	kW	0,92	1,14	1,36	1,46	1,72	1,80	1,07	1,25	1,43	1,53	1,75	1,92
Heating (E)	kW	1,60	2,00	2,39	2,58	3,04	3,17	1,88	2,20	2,39	2,70	3,09	3,38
Dp Cooling <b>(E)</b>	kPa	4,8	6,8	9,0	10,1	13,0	13,9	6,2	7,9	9,8	10,9	13,3	15,2
Dp Heating <b>(E)</b>	kPa	3,7	5,5	7,2	8,3	10,6	10,8	4,8	6,4	7,2	8,5	10,9	12,5
Fan <b>(E)</b>	W	12	14	17	18	24	30	12	14	18	20	24	32
Sound power Lw (E)	dB(A)	35	41	46	48	52	53	39	43	47	49	53	55
Sound pressure Lp (+)	dB(A)	26	32	37	39	43	44	30	34	38	40	44	46

MODEL			3 4										
Velocità		1 (E)	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6	1	2 <b>(E)</b>	3	4 <b>(E)</b>	5	6 <b>(E)</b>
VEIUGILA		MIN	MED		MAX				MED		MED		MAX
Portata aria	m³/h	280	375	480	545	730	780	300	440	500	610	675	790
Raffreddamento resa totale (E)	kW	1,89	2,32	2,78	3,03	3,63	3,78	1,99	2,62	2,86	3,26	3,46	3,81
Raffreddamento resa sensibile <b>(E)</b>	kW	1,35	1,69	2,06	2,27	2,81	2,95	1,43	1,93	2,12	2,47	2,66	2,98
Riscaldamento (E)	kW	2,26	2,84	3,49	3,86	4,79	5,03	2,40	3,26	3,61	4,20	4,53	5,07
Dp Raffreddamento <b>(E)</b>	kPa	11,2	16,2	22,5	26,2	36,4	39,1	12,3	20,2	23,6	29,9	33,4	39,7
Dp Riscaldamento (E)	kPa	8,7	12,6	17,7	21,2	29,3	31,9	9,7	15,9	19,1	23,7	27,2	31,5
Assorbimento Motore (E)	W	16	21	26	29	38	46	17	23	27	32	35	48
Potenza acustica Lw (E)	dB(A)	35	40	45	48	55	57	36	43	46	51	54	57
Pressione acustica Lp (+)	dB(A)	26	31	36	39	46	48	27	34	37	42	45	48

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.

### **Other available Versions**

### Fly models with electric heater: all versions

are available without valves, with 2 way valve or with 3 way valve fitted in the unit. There are four sizes available in the following versions:

<b>CUP-E</b> without infra-red remote control and without valve;
<b>CUP-E-2U</b> without infra-red remote control with fitted 2 way valve;
<b>CUP-E-3U</b> without infra-red remote control with fitted 3 way valve.
<b>CUP-T-E</b> with infra-red remote control and without valve;
<b>CUP-T-E-2U</b> with infra-red remote control with fitted 2 way valve;
<b>CUP-T-E-3U</b> with infra-red remote control with fitted 3 way valve.
<b>CUP-MB-E</b> with MB electronic board and without valve;
CUP-MB-E-2U with MB electronic board with fitted 2 way valve;
<b>CUP-MB-E-3U</b> with MB electronic board with fitted 3 way valve.

According to the control provided, the electrical heater can be used as an alternative or as a supplement to the hot water. The heater is hermetically sealed and supplied inside the battery pipes and therefore can be only factory mounted. The electric heaters of the **Fly** units are single phase 230V supply.

MODEL	CVP 1	CVP 2	CVP 3	CVP 4
NOMINAL INSTALLED POWER	1000 Watt	1000 Watt	1500 Watt	1500 Watt

### Accessories

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Condensate drain pump



### Wall electronic controls

### ------ CUP version -------

WM-3V	3 speed control
WM-T	3 speed control with electronic thermostat and manual summer/winter switch
WM-TQR	3 speed control with electronic thermostat and centralized/manual summer/winter switch
TM0-503-SV2	Automatic speed control with electronic thermostat to be mounted in the DIN 503 box
T2T	Electromechanical thermostat with summer/winter switch (only for 2 pipe units)

### **Electronic controls for <u>MB boards</u>**

------ CUP-MB version ------

T-MB	Wall control (to be used with MB board only)
RS-RT03-F	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RS-F	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

### — Sabianet management system for a network of fan coils ———

Sabianet	Hardware/software supervisory system (to be used with MB board only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	Relay output board for Sabianet

**NOTES:** for more details about the Controls, see Page 265.

Carisma -



### Carisma Fly–ECM High Wall Fan Coil Unit with EC Brushless Electronic Motor and Inverter Board

**Carisma Fly** is the high wall fan coil unit **designed and manufactured in Italy** by Sabiana, in 4 sizes and many different models. Fly is easy to install like a standard fan coil: without decreasing the emission and without any extra frame, 2 way or 3 way valves and condensate pump can be mounted into the casing. The **modern and appealing** design of the unit in RAL 9003 colour allows the use of Fly in any environment. Fly is **auailable with low energy EC motors** and in the following versions: with infra-red remote control, MB electronic board for Modbus management and electric heating coil. **The units are for 2 pipe installations only.** All the Fly models perform very low electric consumption and extremely quite sound levels according to the request of today's new projects.

### Technical characteristics of the main components:

### Uersions: all versions are available

without valves, with 2 way valve or with 3 way valve fitted in the unit.

There are four sizes available in the following versions:

CUP-ECMwithout infra-red remote control and without valve;CUP-ECM-2Uwithout infra-red remote control with fitted 2 way valve;CUP-ECM-3Uwithout infra-red remote control with fitted 3 way valve.CUP-ECM-Twith infra-red remote control and without valve;CUP-ECM-T-2Uwith infra-red remote control with fitted 2 way valve;CUP-ECM-T-3Uwith infra-red remote control with fitted 3 way valve;CUP-ECM-T-3Uwith infra-red remote control with fitted 3 way valve;CUP-ECM-T-3Uwith MB board and without valve;CUP-ECM-MB-2Uwith MB board with fitted 2 way valve;CUP-ECM-MB-3Uwith MB board with fitted 3 way valve;

**Casing:** made of auto-extinguishing ABS UL94 HB plastic with high specifications and great resistance to aging. The diffusion flap is adjusted manually in CVP model, with remote control in CVP-T model and with T-MB control in CVP-MB model.

Filter: washable-regenerable synthetic filter, readily accessible.

Fan assembly: made of plastic tangential fan.

Electronic motor: three phase permanent magnet brushless 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 – 240 U** and frequency of **50 – 60 Hz**.

**<u>Coil</u>** it is manufactured from drawn copper tube

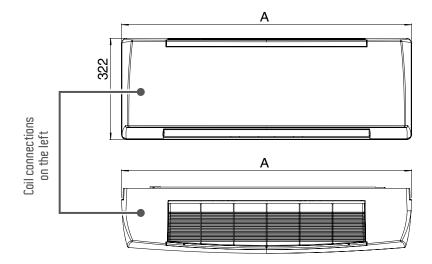
and the aluminium fins are mechanically bonded onto the tube by an expansion process. The coil has two 1/2 inch BSP internal connections and 1/8 inch BSP air vent and drain. The heat exchanger is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

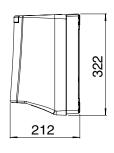
The connections are on the left side facing the unit only.

**<u>Condensate collection tray</u>**: made from polypropylene; the outside diameter of the condensate discharge pipe is 16mm.

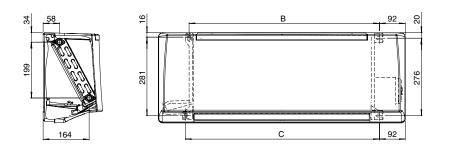
**Installation template:** a cardboard installation template is supplied with every unit to help the mounting on the wall.

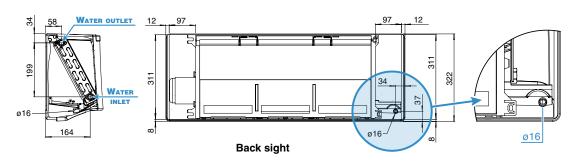
### **Dimensions, Weight, Water content**





### Mounting dimensions





MODEL	WEIGHT without valves Kg	WEIGHT with valves Kg	WATER CONTENT Litres	A mm	B mm	C mm
1	10	11	0,85	880	678	691
2	10	11	0,85	880	678	691
3	13	14	1,28	1185	983	996
4	13	14	1,28	1185	983	996







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.

<u>HEATING</u> (winter mode) Entering air temperature: +20°C Entering water temperature: +50°C

Water flow rate as for the cooling conditions

MODEL				1					2		
Inverter Power (V)		1 <b>(E)</b>	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 <b>(E)</b>	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>
Speed		MIN		MED		MAX	MIN		MED		MAX
Air flow	m³/h	190	240	290	355	415	260	315	375	440	510
Cooling total emission (E)	kW	1,17	1,39	1,58	1,81	2,00	1,47	1,67	1,87	2,07	2,26
Cooling sensible emissio <b>(E)</b>	kW	0,86	1,04	1,20	1,40	1,57	1,10	1,28	1,46	1,64	1,83
Heating (E)	kW	1,50	1,82	2,12	2,48	2,78	1,94	2,25	2,58	2,90	3,23
Dp Cooling <b>(E)</b>	kPa	5,0	6,3	7,7	9,5	11,2	6,9	8,4	10,1	11,8	13,7
Dp Heating <b>(E)</b>	kPa	4,2	5,4	6,5	8,2	9,3	5,6	6,9	8,5	9,7	11,6
Fan <b>(E)</b>	W	6	7	9	11	15	7	9	12	16	21
Sound power Lw (E)	dB(A)	35	39	46	48	52	40	44	47	51	55
Sound pressure Lp (*)	dB(A)	26	30	37	39	43	31	35	38	42	46

MODEL				3					4		
Inverter Power (V)		1 <b>(E)</b>	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>	1 <b>(E)</b>	3	5 <b>(E)</b>	7,5	10 <b>(E)</b>
Speed		MIN		MED		MAX	MIN		MED		MAX
Air flow	m³/h	270	345	420	520	620	375	465	550	665	770
Cooling total emission (E)	kW	1,83	2,20	2,53	2,93	3,29	2,34	2,72	3,05	3,43	3,75
Cooling sensible emissio <b>(E)</b>	kW	1,31	1,60	1,86	2,19	2,50	1,70	2,01	2,29	2,63	2,92
Heating (E)	kW	2,20	2,69	3,15	3,72	4,25	2,87	3,41	3,88	4,48	4,99
Dp Cooling <b>(E)</b>	kPa	10,7	14,8	19,0	24,8	30,4	16,5	21,6	26,6	32,9	38,7
Dp Heating <b>(E)</b>	kPa	8,5	11,7	15,1	19,9	24,2	12,6	17,2	21,2	26,6	31,4
Fan <b>(E)</b>	W	6	8	11	15	20	9	12	16	22	30
Sound power Lw (E)	dB(A)	37	42	45	49	53	43	46	49	53	57
Sound pressure Lp (+)	dB(A)	28	33	36	40	44	34	37	40	44	48

(\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.

### **Other available Versions**

### Fly-ECM models with electric heater: all versions

are available without valves, with 2 way valve or with 3 way valve fitted in the unit. There are four sizes available in the following versions:

<b>CUP-ECM-E</b> without infra-red remote control and without valve;
<b>CUP-ECM-E-2U</b> without infra-red remote control with fitted 2 way valve;
<b>CUP-ECM-E-3U</b> without infra-red remote control with fitted 3 way valve.
<b>CUP-ECM-T-E</b> with infra-red remote control and without valve;
<b>CUP-ECM-T-E-2U</b> with infra-red remote control with fitted 2 way valve;
<b>CUP-ECM-T-E-3U</b> with infra-red remote control with fitted 3 way valve.
<b>CUP-ECM-MB-E</b> with MB electronic board and without valve;
CUP-ECM-MB-E-2U with MB electronic board with fitted 2 way valve;
<b>CUP-ECM-MB-E-3U</b> with MB electronic board with fitted 3 way valve.

The heater is hermetically sealed and supplied inside the battery pipes and therefore can be only factory mounted. The electric heaters of the **Fly-ECM** units are single phase 230V supply.

MODEL	CVP-ECM 1	CVP-ECM 2	CVP-ECM 3	CVP-ECM 4
NOMINAL INSTALLED POWER	1000 Watt	1000 Watt	1500 Watt	1500 Watt

### Accessories

## Sway valveControl valve kit:<br/>3 way valve, 230V ON-OFF,<br/>with electric motor and mounting kit<br/>with micrometric lockshield valve.Land<br/>Control valve kit:<br/>2 way valve, ON-OFF,<br/>with electric motor and mounting kit.







**Condensate drain pump** 

### Electronic controls for <u>MB boards</u>

### ——— CUP-ECM-MB version ———

T-MB	Wall control (to be used with MB board only)
RS-RT03-F	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)
RT03	RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
RS-F	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)
PSM-DI	Multifunction control (to be used with MB board only)

### Sabianet management system for a network of fan coils

Sabianet	Hardware/software supervisory system (to be used with MB board only)				
<b>ROUTER-S</b>	Router for Sabianet				
SIOS	Relay output board for Sabianet				

NOTES: for more details about the Controls, see Page 267.

Carisma Fly-I

### **<u>Built-in</u>** electronic controls

for Fan Coils with Asynchronous Motor

- for Carisma CRC – CRT – CRR uersions with casing -

FUNCTIONS
ON-OFF switch
ON-OFF switch for Crystall electrostatic filter or electric heater
Manual 3 speed switch
Manual/Automatic 3 speed selection
Summer/Winter switch
Remote centralized Summer/Winter switch or by an automatic change-over fitted on the water pipe
Automatic Summer/Winter switch with neutral zone for 4 pipe installation with 2 valves
Room thermostat for fan control (ON-OFF)
Room thermostat for 1 valve control (2 pipe installation)
Room thermostat for 2 valve control (4 pipe installation)
Simultaneous thermostatic control of the valves and fan
Room thermostat for chilled water valve (SUMMER) and electric heater (WINTER) control (in winter only the electric heater is working)
Room thermostat for fan and electric heater control (not for Crystall)
Installation of electronic low temperature cut-out thermostat (TME)
Installation of bimetallic low temperature cut-out thermostat (TMM)
Installation of electronic low temperature cut-out thermostat (NTC)

CB



CB-T



CB-C



**CB-AUT** 







### IDENTIFICATION

-										
8	CB-T	CB-C CB-C		CB-C		CB-C CB-C CB-AUT		<b>CB-IAQ</b>	CB-R-IAQ	CB-AUT-IAQ

### **CB-AUT-IAQ**



**CB-R-IAQ** 



CB-IAQ



### Wall electronic controls

for Fan Coils with Asynchronous Motor

— for all Carisma – SkyStar – Maestro Range —

FUNCTIONS
ON-OFF switch
ON-OFF switch for Crystall electrostatic filter or electric heater
Manual 3 speed switch
Manual/Automatic 3 speed selection
Summer/Winter switch
Remote centralized Summer/Winter switch or by an automatic change-over fitted on the water pipe
Automatic Summer/Winter switch with neutral zone for 4 pipe installation with 2 valves
Room thermostat for fan control (ON-OFF)
Room thermostat for 1 valve control (2 pipe installation)
Room thermostat for 2 valve control (4 pipe installation)
Simultaneous thermostatic control of the valves and fan
Room thermostat for chilled water valve (SUMMER) and electric heater (WINTER) control (in winter only the electric heater is working)
Room thermostat for fan and electric heater control (not for Crystall)
Installation of bimetallic low temperature cut-out thermostat (TMM)
Installation of electronic low temperature cut-out thermostat (NTC)

### WM-AU



WM-3V



WM-T



WM-TQR





	IDENTIFICATION										
WM-3V	T-MW	WM-TQR	WM-AU	TM0-503-SV2	T-MB	T2T					

Controls

**T2T** 



TMO-503-SV2





NOTE: WM-AU and T-MB controls can be used with UP-AU power unit only.

### **Controls** for Fan Coils with Asynchronous Motor

### <u>FreeSabiana</u> wireless control system

### for all the Carisma and SkyStar Range



### FreeSabiana

is an innovative, **fully wireless**, electronic system for use with fan coil units, based on radio communication.

### Temperature probe



### his technology prouides installation flexibility and a more accurate measurement of the room temperature. The probe

can be moved until the most suitable position is found, without the worry of changes in the room layout and of its furniture and also without mounting it on a wall.

f a new fan coil unit is added, no electrical wiring for the control system is required: just define the control unit and the probe which regulates it. **The improued measurement accuracy** is a result of the possibility to position the probe near the user location: this enables to keep the temperature exactly at the required value with energy savings compared with a traditional measurement system.

ransmission is based on communication protocol IEE802.15.9, the most suitable way to transmit a relatively low amount of information with very low consumption and high reliability.

The system **has been certified** by a leading independent body, officially recognized by the EU authorities and its sale has been authorized in all the EU and EFTA countries.



### Main components:



### A remote control which features

a button panel and LCD display and can be wall mounted or positioned on a dedicated table support.It enables the control of all the operating variables of the fan coil units in different configurations.The control is battery powered.

The temperature and the operating speed of the fan coil unit are set with two large buttons featuring user friendly graphics.



A **power unit** to be installed on the fan coil (fan coil interface). It controls the fan and the valves of the fan coil. The power unit is connected to the electric supply. The power unit receives the information required to control the fan coil

both from the remote control and locally, such as the temperature of the coil.



A room **temperature probe**, which can be wall mounted or positioned on a dedicated table support. It is a battery powered device, able to measure the air temperature in the spot where it is positioned, generating temperature information which is communicated to the other devices.

### <u>RT03</u> infra-red remote control and <u>T-MB</u> wall mounted control

### for all the Carisma and SkyStar Range ·

All Carisma and SkyStar units can be supplied with a microprocessor management and control unit with **infra-red remote control** with liquid crystal display or with a **T-MB wall mounted control unit** combined with the **MB board**.

T-MB control





### **Controls for Fan Coil Units**

with Asynchronous Motor and with EC Brushless Electronic Motor and Inverter Board

### **<u>PSM-DI</u>** multifunction control panel

### for all the Carisma and SkyStar Range

Another option available for the serial communication between the units is the possibility to connect up to 60 Carisma and SkyStar units in series (the maximum length of the connection cable must not exceed 800 m) and manage them with just one **Wall mounted intelligent PSM-DI controller.** The wall mounted controller can be used to set the operating mode for each individual unit connected, display the operating conditions of each individual unit, and set the ON/OFF time sets for each day of the week. If more than 60 units need to be connected, two or more wall mounted intelligent controllers must be used.

Each unit must have a **MB board**.



### **PSM-DI** panel



### <u>Sabianet</u> management system for a network of fan coils

 $\cdot$  for all the Carisma and SkyStar Range  $\cdot$ 

Sabianet is a centralised control system for networks of MB fan coils, based on software that runs on Linux operating system (the program is provided pre-installed on a PC). The Sabianet software offers a practical and economical solution for managing the fan coils, with the simple click of the mouse.

The main characteristics include simplicity of use, an extremely complete and functional weekly program, and the possibility to access the historical operating data for each individual unit connected.



### Sabianet screenshot







### **Electronic controls for Fan Coil Units**

with EC Brushless Electronic Motor and Inverter Board

### FUNCTIONS

ON-OFF switch
Room thermostat for chilled water valve (SUMMER) and electric heater (WINTER) control (in winter only the electric heater is working)
Manual 3 speed switch or automatic continuous speed control
Summer/Winter switch
Continuous speed control based on the difference between ambient temperature and Set temperature (speed switch in Auto position)
Remote centralized Summer/Winter switch or by an automatic change-over fitted on the water pipe
Room thermostat for fan control (ON-OFF)
Room thermostat for 1 valve control (2 pipe installation)
Room thermostat for 2 valve control (4 pipe installation)
Simultaneous thermostatic control of the valves and fan
Room thermostat for fan and electric heater control (not for Crystall)
Installation of electronic low temperature cut-out thermostat (NTC)

### **CB-T-ECM**



**CB-T-ECM-IAQ** 







T-MB



### WM-S-ECM





# IDENTIFICATION Built-in Wall Wall Wall Wall Wall Built-in Representation Built-in <

**CB-T-ECM:** for **CRC–ECM** and **CRT–ECM** versions.

**CB-T-ECM-IAQ:** for **CRC-ECM** version.

**WM-AU:** for **CRC–ECM**, **CRT–ECM**, **CRS–ECM**, **CCN–ECM** and **SK–ECM** versions.

**T-MB:** for **CRC–ECM**, **CRT–ECM**, **CRS–ECM**, **CCN–ECM** and **SK–ECM** versions.

**WM-S-ECM:** for **CRC-ECM**, **CRT-ECM**, **CRS-ECM**, **CCN-ECM** and **SK-ECM** versions.

RT03 infra-red remote control,

**<u>T-MB</u>** wall mounted control,

**<u>PSM-DI</u>** multifunction control

and <u>Sabianet</u> management system for a network of fan coils

for all the Carisma ECM and SkyStar ECM Range

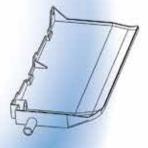
For the characteristics, see Pages 267, 268 and 269.

### Accessories for Carisma Fan Coil Units

Il Sabiana Carisma fan coils, whether with **Asynchronous Motor** or with **Electronic Motor and Inverter**, can be equipped with a **very large series of Accessories**,

such as, to name only the most common, numerous types of regulating valves, sturdy support feet, rear cover panel for installing against glass, additional electrical resistances, auxiliary condensation drain pump, outdoor air intake louvre, inlet and outlet ducts and grills for ducted installations.

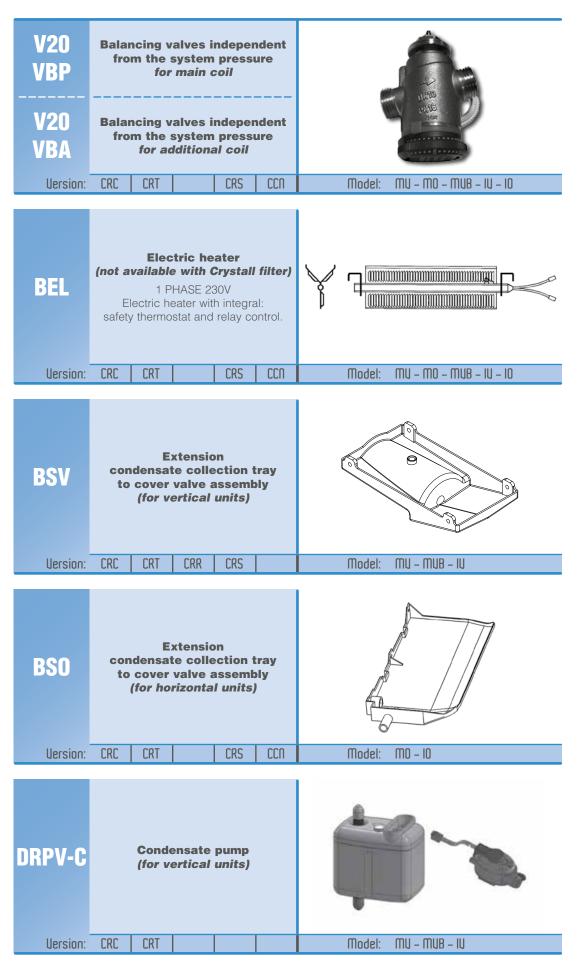






### **Accessories**

VBP Uersion:	with e	Con 3 way electric n	bil 3 wa trol valve, Ol notor and etric lock	e kit: N-OFF, d mount	ing kit	Model: MU – MO – MUB – IU – IO
VBA	with e with	Con 3 way v electric n microme	<b>coil 3</b> trol valve valve, Ol notor and etric lock	e kit: N-OFF, d mount sshield v	ing kit ralve.	Model: MU - M0 - MUB - IU - I0
Uersion:	CRC	CRT		CRS	CCN	Model: MU - MO - MUB - IU - IO
VS	with e withou	for 3 main a conceal 3 way v lectric m Valve wit ut micron	<b>plified</b> <b>addi</b> <b>led mo</b> valve, (O notor and th flat co netric loc	alve itional del onl N-OFF) d mounti nnectior ckshield	ng kit. n valve.	
Uersion:	CRC	CRT		CRS	CCN	Model: IV – 10
V3M4X2 (mounted) V3S4X2 (not mounted)	f The kit • 2 spo • 2 23 with • insul • exter	or 4 tu and consists ecial 3 w 0 Volt OI internal s ated pip rnal valve	vay valve N-OFF ad safety m	allation coil es ctuators icro swit	<b>n</b> tch ve.	
Uersion:	CRC	CRT		CRS	CCN	Model: MU - MO - MUB - IU - IO
V2	with e	<b>main a</b> Con 2 way v	way val nd addi trol valve valve, Ol notor and	itional e kit: N-OFF, d mounti	ng kit.	
Uersion:	CRC	CRT	CRR	CRS		Model: MU – MO – MUB – IU – IO

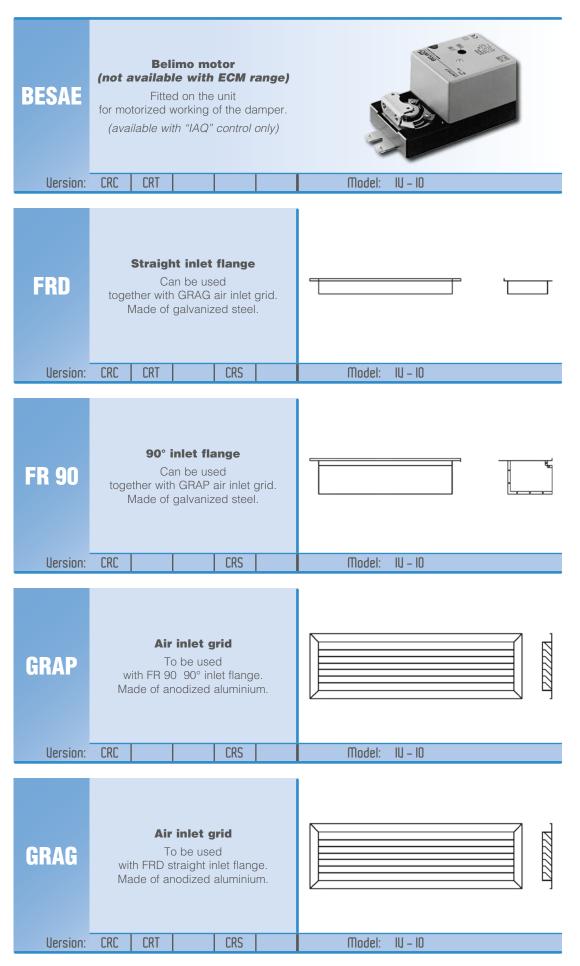




DRPO-C	(for ho	ensate pum rizontal uni		
Uersion:	CRC CRT			Model: MO – 10
SCR	conden: with fa	Plastic sate drain p ist connecti act condensate	ion	
Uersion:	CRC CRT			Model: MO – 10
SCR	conden: with fa	Plastic sate drain p st connecti act condensate	ion	
Uersion:		CRS	S CCN	Model: MO – 10
PAP		Feet		
Uersion:	CRC CRT	CRR		Model: MU
GAP	low	<b>luminium intake grid</b> alled with PAP	<sup>9</sup> feet.	
Uersion:	CRC CRT			Model: MU

PCV Rear closing panel (for vertical units)     Lersion: CR     PCO     Bottom closing panel for horizontal units)     PCO     Bottom closing panel for horizontal units)     Lersion:     CRC        CRC	KAF Uersion:	CRC		<b>al inta</b> n closing r sliding	g panel		Model: IU - IO
PCO       Bottom closing panel (for horizontal units)         Uersion:       CRC       CRT         Musted on the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Uersion:       CRC       CRT         Musted on the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted on the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted on the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted on the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted on the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted on the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted On the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted On the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted On the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted On the unit with feet and intake grid included. Can be motorized on request.       Image: CRC         Musted On the unit with feet and intake grid included. Can be motorized on request.       Image: CRC			(for vo				
Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)         Image: room (for horizontal units)       Image: room (for horizontal units)	Uersion:	CRC	CRT				Model: MU – MUB
SAEM         Fresh air mixing damper         Mounted on the unit         with feet and intake grid included.         Can be motorized on request.         Uersion:       CRC         CRC       CRT         Mounted.         SAER	PCO						
SAEM       Mounted on the unit with feet and intake grid included. Can be motorized on request.         Uersion:       CRC       CRT         Mounted CRE       CRT       Model:         Mounted CRE       CRT       Model:         Mounted CRE       CRT       Model:         Mounted CRE       CRT       Model:         Mounted CRE       Not mounted.       Can be motorized on request.	Uersion:	CRC	CRT				Model: MO – MUB
SAE       Fresh air mixing damper         Not mounted.       Can be motorized on request.	SAEM	with	Mount feet and	ted on th intake ថ្	ne unit grid inclu	uded.	
SAE Not mounted. Can be motorized on request.	Uersion:	CRC	CRT				Model: MU
Uersion: CRC CRT Model: IU – IO	SAE		No	ot mount	ed.		
	Uersion:	CRC	CRT				Model: IV – IO





**Accessories** 

						CRC 1÷9 / CRT 1÷7 / CRS 1÷3
FMD	9	Straigh	t outlet	flange	e	
	1	Made of	galvanize	ed steel	Ι.	
						only CRS 4
Uersion:	CRC	CRT		CRS		Model: IV – IO
FM 90		Made of	<b>putlet fla</b> galvanize h polyethy	ed stee		CRC 1÷9 / CRS 1÷3
Uersion:	CRC			CRS		Model: IV – IO
BMA	<b>Air outlet grid</b> Double louvre grid to be fitted to the duct, to the FMD straight outlet flange or to the FM 90 90° outlet flange. Made of anodized aluminium.					
Uersion:	CRC	CRT		CRS		Model: IV – 10
PRC		Made of	galvanize b polyethy	ed stee	•	All the plenums are supplied with spigots for the connection of flexible ducts.
Uersion:	CRC			CRS		Model: IV - IO
PMC	Spigot diffuser Made of galvanized steel insulated with polyethylene lining.					All the plenums are supplied with spigots for the connection of flexible ducts.
Uersion:	CRC			CRS		Model: IU – 10



<b>GRAFP</b> Uersion:	Air inlet grid with filter To be fitted to the FR 90 90° inlet flange. Made of anodized aluminium.		Торияния и портиски и порти И портиски и п		
<b>GRAFG</b> Uersion:	<b>Air inlet grid wi</b> To be fitted to the FRD straight in Made of anodized a	d nlet flange.	Торикана Подел: IV - ID		
PCC Uersion:	Condensate drain pump				
FRC Uersion:	Fresh air conn	ection CCN			

Since 1990 Sabiana has been making air handling units, with air flows from 1.000 to 80.000 m<sup>3</sup>/h. These include standard models, such as the Ocean and Zeus units, modular solutions available in a high number of versions that use standard components and consequently can be delivered with very short lead times, and **CUSTOM** made models for individual customer specifications, using effective configuration and selection software.

### **Air Handling Units**



he latter units, called Vulcan Pro, are made with double panels, 35 and 50 mm thick, and

use special aluminium profiles that ensure the entire inside surface is completely smooth, without angles and protrusions, so as to make cleaning easier and simplify removal of components from the side.

SABIANA

s well as typical solutions that allow greater energy saving, such as static and rotary heat recovery units and inverter-driven motors, Sabiana proposes **electronic filters** as alternatives to traditional mechanical bag filters, featuring a much lower pressure drop and hence low power consumption, and no need for replacement (they can be returned to as-new condition by simple cleaning).

II Air Handling Unit range are compliant with the new **ERP 2015 Regulation (EU) No. 327/2011** which requires **uery low electric consumption ratings** in relation to performances provided.







### Énergy Plus Heat Recovery Unit

he **Energy Plus** ducted units have been designed to allow energy savings in the ventilation systems of public and private environments, such as bars, restaurants, offices, shops, etc., **by recouering the heat** from the air discharged and transferring it to the fresh air introduced into the environment. The heat exchange between the extract air and the fresh air occurs via a static counter-flow exchanger, designed to recover **UP to 94%** of the heat.

The **Energy Plus** units are equipped with centrifugal fans with backward blades and **electronic motor with continuous speed** control which allows the control at a variable flow rate, in order to reduce the electric waste to the minimum need.

he **Energy Plus** range features **Y sizes** suitable for horizontal installation and covers a range of air flows **from 300 to 2,600 m<sup>3</sup>/h**. The Energy Plus units are **in compliance** with the mandatory standard according to the European Ecodesign Directive (UE 1253/14 Regulation and Erp 2018). The tests

regard the thermal efficiency in terms of heat recovery and the **SFPint** internal specific fan power of ventilation components under nominal conditions.

### Construction and Maintenance:

**External Panels:** external galvanised plate sandwich panels, 24 mm thick, filled with 45 kg/m3 of polyurethane foam.

**Heat Recourry Coil:** the Heat Recovery Coil are static counter flow aluminium plates heat-exchangers of high efficiency. The top of the performances over 90% efficiency can be obtained thanks to the heat transfer between two air flows due to the temperature difference. Being static, there are no moving parts. This is a guarantee of very high reliability and operating safety. In order to increase the heat-exchanger efficiency, the plates surfaces are fitted with special swirlers.

KLINGENBURG Heat Recovery Coil performances are certified by EUROVENT



**The centrifugal discharge and intake air plug fans** are with synchronous motor with permanent magnets and electronic control (EC), 230V power supply. The rotors are designed in order to guarantee an optimal air flow rate and the lowest noise level.

**<u>Air Filters</u>** Pleated cell filters, 98 mm thick, efficiency F7 for the intake air process and M6 for the discharge air, sized to minimize pressure loss. Filters can be removed from dedicated openings provided in the casing.

**Differential Pressure Switches** for filter cleaning and warning in case of run out filters.

### Electric Control Panel installed on the side of the unit.

The electric control panel is isolated from the air flow within a suitable box. The electric control panelincludes main fuses and the electronic power board for the manual or automatic control of the fan operation and of the air handling accessories. The wall control set is programmable with display and touch keypad.

**<u>Optional variable air flow operation</u>** depending on air quality (CO2 and Relative Humidity).

**Inspection openings** for maintenance, cleaning and filter change. Quick panels removal to access ventilation and heat recovery unit sections.

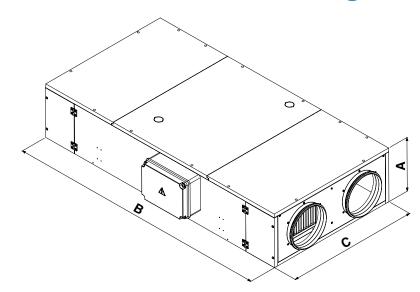
**BY-Pass Damper** freecooling function.

**Floor/ceiling installation.** Optional adjustable hanging systems according to the weight of the units.

### <u>Optional extra:</u>

- Post heating/cooling water coil.
- plenum connectors for the Sabiana OCEAN sections.
- Rainproof shelter for external installations.

### **Dimensions and Weight**



MODEL	ENY-P1	ENY-P2	ENY-P3	ENY-P4
Lenght <b>(B)</b> mm	1700	1750	2100	2355
Width (C) mm	850	1150	1250	1700
Height <b>(A)</b> mm	344	385	470	610
Weight kg	98	140	170	325

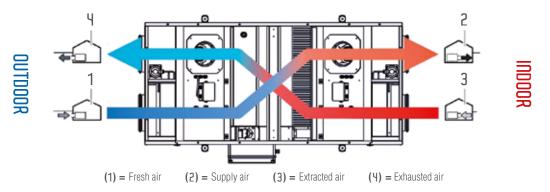


### **ENERGY PLUS NOMINAL TECHNICAL DATA**

MODEL		ENY-P1	ENY-P2	ENY-P3	ENY-P4
Nominal and maximum return/supply air flow	m³/h	720	1150	1700	2600
Nominal and maximum return/supply an now	m³/s	0,2	0,32	0,47	0,72
Available pressure		170	220	250	250
Minimum air flow m		270	300	600	690
Thermal efficiency UE 1253/14 <sup>(1)</sup> Regulation		80	80	80	85
Recovered Heat Power <sup>(1)</sup>	kW	3,9	6,2	9,1	14,8
Recovery efficiency <sup>(2)</sup>	%	90	90	90	94
Max Recovery efficiency <sup>(2)</sup>		6,5	10,5	15,4	24,5
Fan number		2	2	2	2
Nominal power absorption <sup>(3)</sup> W		332	646	974	1454
Max current input <sup>(3)</sup> A		2,76	5,16	4,26	6,42
Power voltage/frequency (3) V-Ph		230-1+N 50Hz	230-1+N 50Hz	230-1+N 50Hz	230-1+N 50Hz

(1) = Dry Conditions: TAE=5°C and E.A.T. =25°C. (2) = Air Conditions: TAE -10°C and E.A.T. =20°C, URi 50% UR. (3) = Basic version.

### **Typical Air flow rates Configuration**



### Installation

Floor Installation

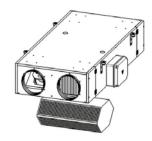
**Ceiling Installation** 

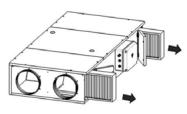


### **Inspection openings**

Heat-exchanger access

**Maintenance access** 



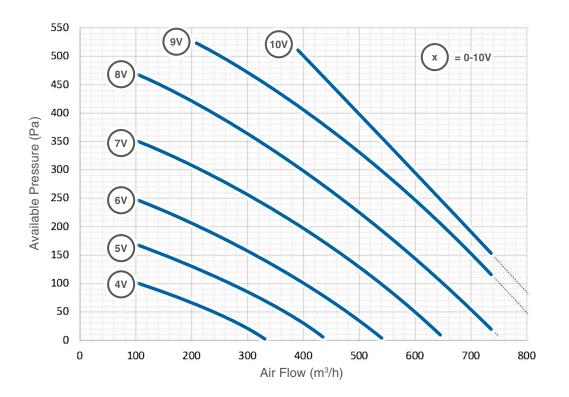


Filter

285

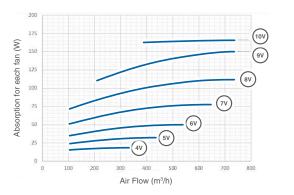
### **ENY-P1 performance**

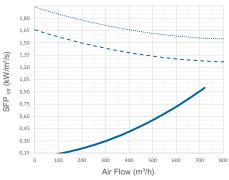




 $\frac{Power absorption}{for each fan^{(1)}}$ 





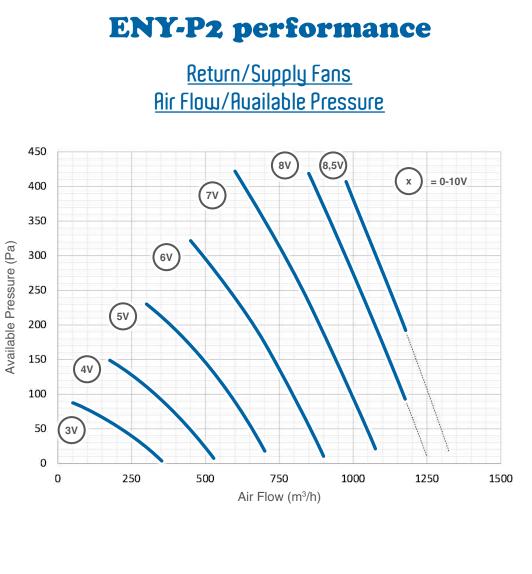


SFP int (kW/m<sup>3</sup>/s)

SFP <sub>int\_lim</sub> 2018 (kW/m³/s) SFP <sub>int\_lim</sub> 2016 (kW/m³/s)

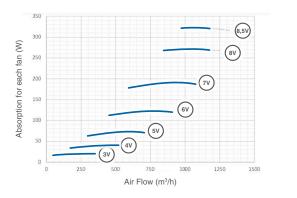
(1) = The power absorption for each fan is useful when fans are working in different conditions.

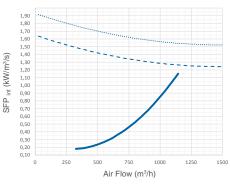




Power absorption for each fan<sup>(1)</sup>





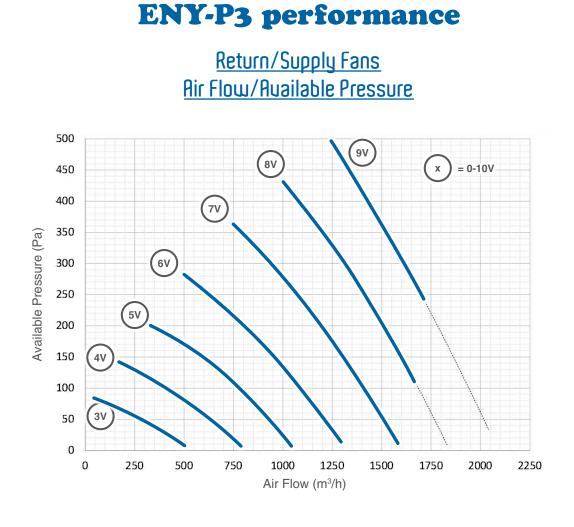


SFP int (W/m<sup>3</sup>/s)

SFP <sub>int\_lim</sub> 2018 (W/m<sup>3</sup>/s) SFP <sub>int\_lim</sub> 2016 (W/m<sup>3</sup>/s)

(1) = The power absorption for each fan is useful when fans are working in different conditions.

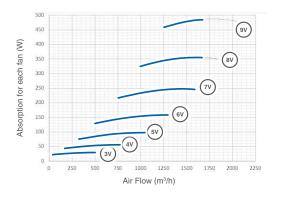
Energy Plus

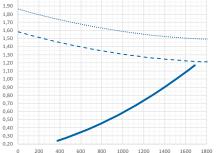


SFP int (W/m<sup>3</sup>/s)

 $\frac{Power absorption}{for each fan^{(1)}}$ 







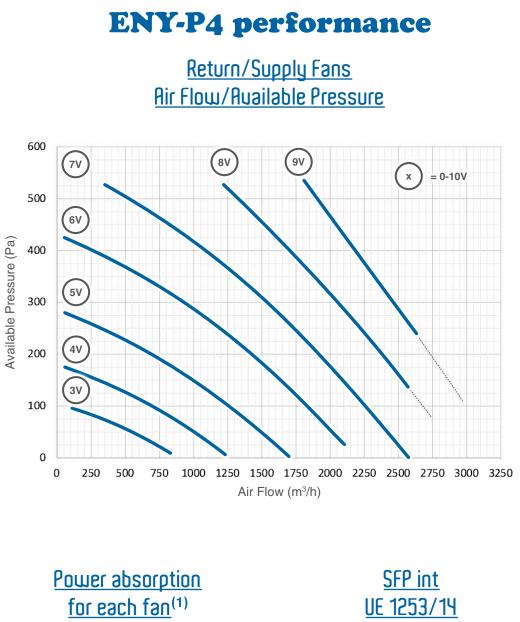
Air Flow (m<sup>3</sup>/h)

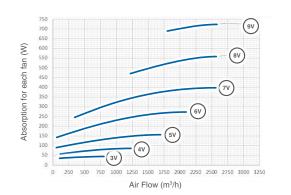
SFP int (kW/m<sup>3</sup>/s)

SFP <sub>int\_lim</sub> 2018 (kW/m³/s) SFP <sub>int\_lim</sub> 2016 (kW/m³/s)

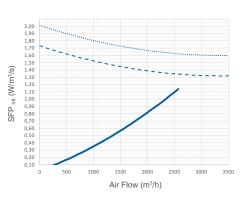
(1) = The power absorption for each fan is useful when fans are working in different conditions.











SFP int (W/m<sup>3</sup>/s)

SFP int lim 2018 (W/m<sup>3</sup>/s) int\_lim 2016 (W/m3/s) SFP • • • •

(1) = The power absorption for each fan is useful when fans are working in different conditions.

Energy Plus

## **ENERGY PLUS EFFICIENCY**

Supply air conditions: E.A.T.=20°C–R.H.=50%

		TAE: +10°C			TA	\E: +5	°C	T	AE: O°	°C	T/	\E: -5	°C	TA	E: -10	°C
MOD.	Qv	Ph	Et	m <sub>w</sub>	Ph	Et	m <sub>w</sub>	Ph	Et	m <sub>w</sub>	Ph	Et	m <sub>w</sub>	Ph	Et	m <sub>w</sub>
	m³/h	kW	%	kg/h	kW	%	kg/h	kW	%	kg/h	kW	%	kg/h	kW	%	kg/h
	100	0,30	90,4	0,00	0,46	90,5	0,15	0,62	91,7	0,26	0,79	94,3	0,36	0,97	96,5	0,44
	150	0,44	88,2	0,00	0,67	88,3	0,21	0,90	89,8	0,38	1,17	92,7	0,53	1,44	95,4	0,65
ENY-P1	300	0,85	84,6	0,00	1,28	84,7	0,42	1,74	86,4	0,72	2,26	90,0	1,03	2,81	93,2	1,25
ENT-FT	450	1,25	82,6	0,00	1,87	82,7	0,62	2,55	84,5	1,09	3,34	88,4	1,52	4,16	91,9	1,85
	600	1,63	81,2	0,00	2,45	81,3	0,81	3,35	83,2	1,43	4,39	87,3	2,01	5,49	90,9	2,47
	750	2,01	80,1	0,00	3,03	80,2	0,96	4,13	82,2	1,71	5,43	86,4	2,43	6,80	90,1	3,01
	200	0,60	89,4	0,00	0,90	89,5	0,29	1,22	90,8	0,51	1,57	93,5	0,70	1,93	96,0	0,86
	250	0,74	88,2	0,00	1,11	88,3	0,36	1,50	89,7	0,63	1,94	92,7	0,88	2,40	95,3	1,08
ENY-P2	500	1,42	84,6	0,00	2,13	84,7	0,69	2,90	86,4	1,20	3,77	90,0	1,72	4,69	93,2	2,08
	750	2,08	82,5	0,00	3,12	82,6	1,04	4,25	84,5	1,81	5,56	88,4	2,52	6,93	91,8	3,09
	1000	2,72	81,1	0,00	4,08	81,2	1,35	5,57	83,1	2,38	7,31	87,2	3,35	9,14	90,8	4,12
	1250	3,35	80,0	0,00	5,04	80,1	1,68	6,88	82,1	2,85	9,04	86,3	4,05	11,32	90,0	5,00
	300	0,89	88,4	0,00	1,34	88,5	0,43	1,81	89,9	0,76	2,34	92,9	1,06	2,88	95,5	1,31
	400	1,17	86,9	0,00	1,75	87,0	0,56	2,38	88,5	1,00	3,08	91,8	1,37	3,81	94,6	1,69
ENY-P3	800	2,24	83,4	0,00	3,36	83,5	1,10	4,57	85,2	1,91	5,97	89,0	2,66	7,44	92,4	3,36
	1200	3,27	81,4	0,00	4,92	81,5	1,64	6,71	83,4	2,88	8,79	87,4	3,90	10,99	91,0	4,97
	1650	4,42	79,8	0,00	6,63	79,9	2,20	9,06	81,9	3,88	11,91	86,1	5,31	14,92	89,9	6,57
	2000	5,29	78,9	0,00	7,95	79,0	2,53	10,87	81,0	4,54	14,31	85,4	6,49	17,95	89,2	8,05
	400	1,28	95,3	0,00	1,92	95,4	0,63	2,58	96,1	1,10	3,27	97,5	1,50	3,97	98,7	1,75
	550	1,72	93,5	0,00	2,59	93,6	0,84	3,49	94,5	1,49	4,44	96,4	1,98	5,42	98,0	2,43
ENY-P4	1100	3,31	89,7	0,00	4,97	89,8	1,61	6,72	91,1	2,82	8,65	93,8	3,89	10,64	96,1	4,74
	1700	4,98	87,4	0,00	7,48	87,5	2,45	10,14	89,0	4,34	13,13	92,1	5,87	16,23	94,9	7,25
	2300	6,62	85,8	0,00	9,94	85,9	3,22	13,50	87,5	5,77	17,53	90,9	7,90	21,74	93,9	9,83
	2900	8,23	84,6	0,00	12,36	87,4	4,02	16,81	86,4	6,97	21,88	90,0	9,99	27,19	93,2	12,09

#### LEGEND:

**TAE =** Outside air temperature.

 $\mathbf{Q}_{\mathbf{v}}$  = Supply air flow rate.

**Q**<sub>r</sub> = Fresh air.

 $\mathbf{P}_{\mathbf{h}}$  = Heat power recovered by supply air.

 $\epsilon_t$  = Heat recovery efficiency with balanced air flow rates.

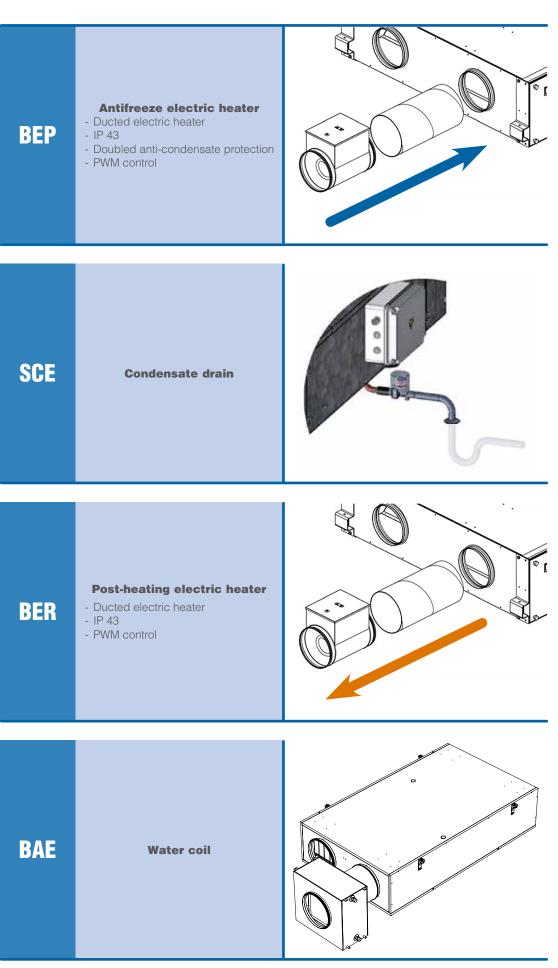
 $\mathbf{m}_{\mathbf{w}}$  = Condensate generation.

#### FORMULAS:

$$\mathcal{E}_{t} = \frac{2980 P_{h}}{Q_{v}(t_{i} - TAE)}$$

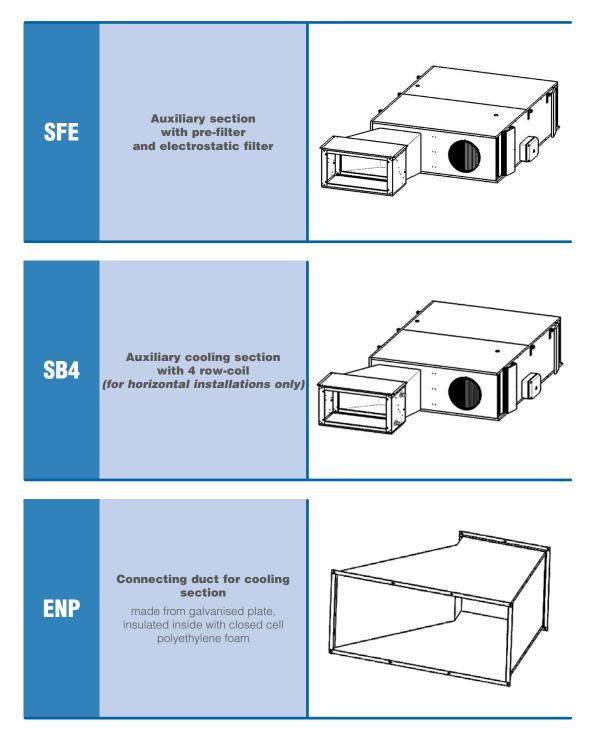


## Accessories



Energy Plus

### Accessories





## Controls

#### Display

- Nominal speed setting fan supplyNominal speed setting fan discharge
- Time setting
- Parameters of operationControl fan speed mode
- Manual setting

**T-EP** 

- Weekly program
  Automatic setting (in case of connection with a CO<sub>2</sub>-RH external sensor)
- Post heating/cooling setting modeVisualization of the operative
  - parameters





# Ocean Modular Ducted Unit

he **Ocean** modular ducted units are suitable for heating and cooling small and medium-sized environments. The compact dimensions of the unit and the modularity of the basic components simplify installation in small spaces. **Four basic models and 15 uersions** are available, both horizontal and vertical, with air flow-rates ranging from 600 to 5.300 m<sup>3</sup>/h, heat outputs **from 6 to 68 kW**, cooling capacities **from 3 to 30 kW**.

**R**s well as the traditional accessories, each unit can be supplied with **the innouatiue Crystall electronic filter** 

that significantly improves indoor air quality.

# Technical characteristics of the main components:

**Casing:** consists of self-supporting panels in hot dip galvanized, prepainted steel, which are completely insulated with a 20 mm. thick, thermoacustic, flame retardant lining.

#### Fan section with Asynchronous

Electric Motor: for the models 1, 2 and 3, it consists of centrifugal fans in galvanized steel with two impellers, and one directly coupled three speed motor. Model 4 consists of two motors with rotating stators directly coupled to the impeller. The power supply is permanent split capacitor **Single phase 230U – 50Hz**, insulation class F.

Fan Section with EC Motor and Inverter (Ocean-ECM range): it consists of centrifugal fan with two impellers, made of galvanized steel and **one single EC** motor directly coupled to the power supply single phase 230V - 50Hz, control input 0–10U.

**<u>Coil</u>** is mounted in a galvanized steel carrying frame and constructed in 3/8" dia expanded copper tubes with aluminium fins with a pitch of 2,1 mm.

The steel headers have tapping for air vent and male connectios.

#### The coils are tested to a pressure of 30 bars.

In normal operation the water temperature should not exceed 95°C

and the maximum working pressure 10 bars. Where a cooling coil is fitted the coil should always be fitted in a vertical position.

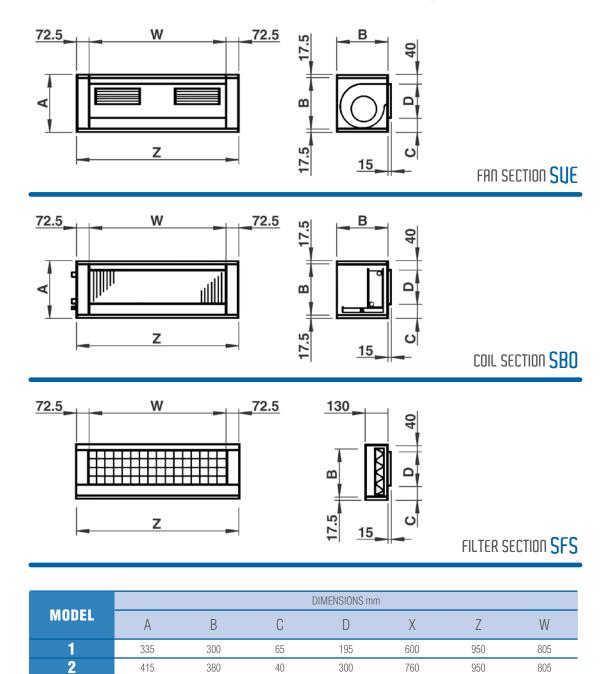
The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

Filter: available in the following versions:

- regenerable synthetic filter, 50 mm thick, **63** efficiency class.
- Synthetic micro-pleated cell filter, 98 mm, F? efficiency class.



## **Dimensions and Weight**

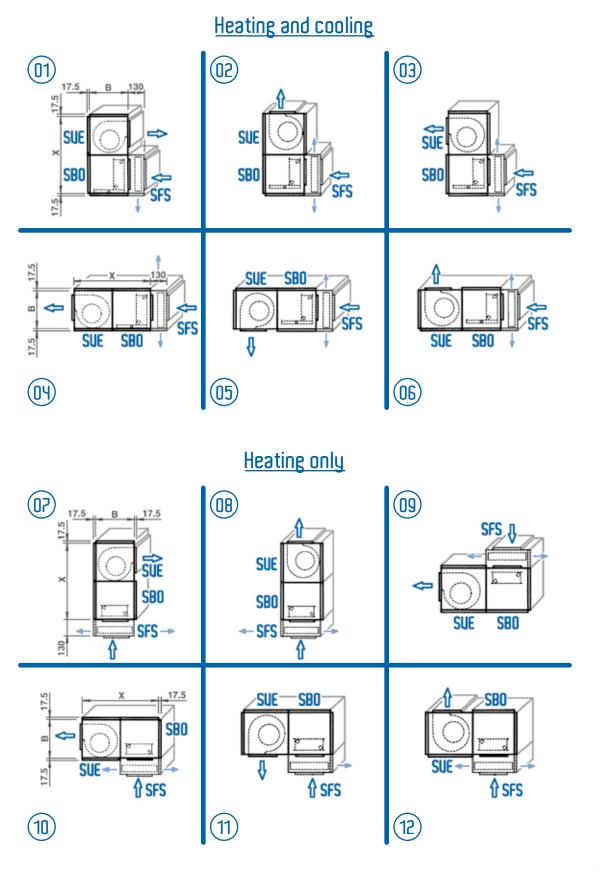


	4	515	480	40	400	960	1500	1355
			S	ection wei	GHTS (kg)			
	MO	DEL	1		2	3		4
FAN	I SECTION		2	3	28	32		52
-	2 ROWS		1	4	18	22		38
lion	3 ROWS		1	6	20	24		42
SECT	4 ROWS		1	8	22	26		45
S	6 ROWS		2	2	28	34		55
COIL	4 + 2 ROV	VS	-	-	26	30		52
0	6 + 2 ROV	VS	-	-	32	38		62



## **Combination possibilities**

In addition to the 12 versions available using standard components a wide range of **further combinations can be achieved** and for each of them you can choose between the four different types of coil.



llcean

### **OCEAN Performance**

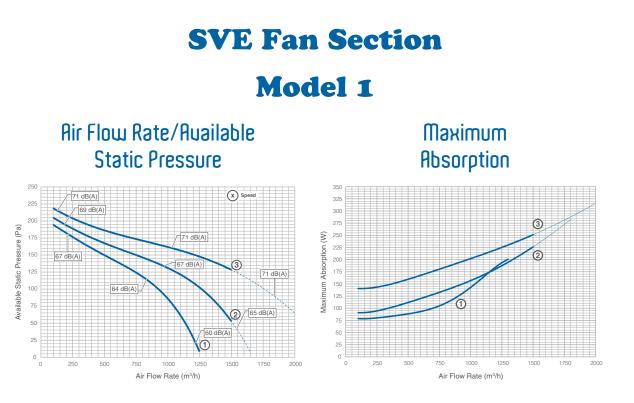
#### Selection Diagrams of SUE Fan Section with Asynchronous Motor.

The Fan Section is assembled with filtering and air handling sections. The typical curves for unit selection are provided below. Performance curves show fan section typical field of operation, in terms of air flow at specific external static pressures and motor speed. Absorbed electrical power curves are also provided to the operating air flow and motor speed. Maximum operating current and detailed information about sound power are also reported below for each model.

MODEL	AIR FLOW	AVAILABLE PRESSURE	POWER ABSORPTION
1	600 — 1400 m³/h	85 – 150 Pa	75 – 240 W
2	1000 – 2100 m³/h	65 – 170 Pa	135 – 375 W
3	1500 – 3000 m³/h	100 – 160 Pa	250 – 520 W
4	2400 – 4500 m³/h	100 – 350 Pa	600 – 1100 W
MODEL	RECOVERY EFFICIENCY	MAXIMUM ABSORPTION AMP	SOUND POWER
1	27%	2,2 A	60 – 70 dB(A)
2	30%	2,4 A	58 – 70 dB(A)
3	30%	2,7 A	60 – 80 dB(A)
4	35%	4,8 A	63 – 81 dB(A)

#### **Quick Selection Item**

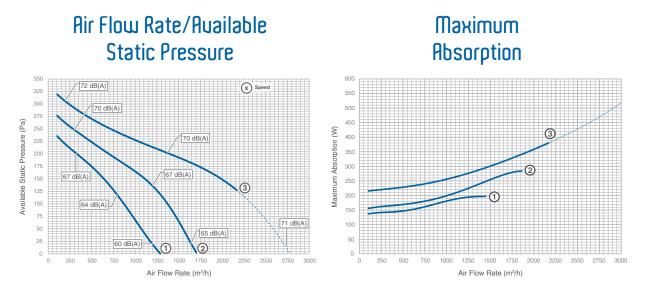




#### **Typical Operative Sector**

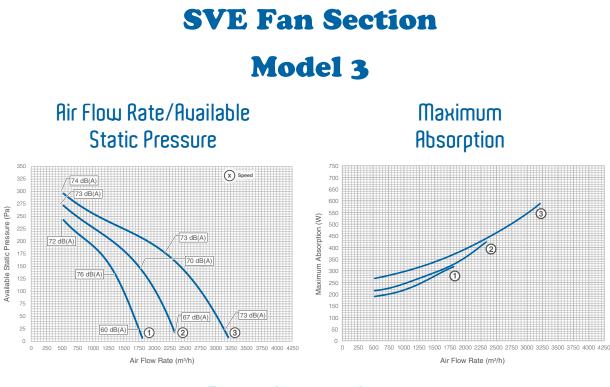
Air Flow Rate: 600 – 1400 m<sup>3</sup>/h Available Static Pressure: 85 – 150 Pa Sound Power: 60 – 70 dB(A) Power Supply: 75 – 240 W Massima Corrente: 2,2 A

## Model 2



#### **Typical Operative Sector**

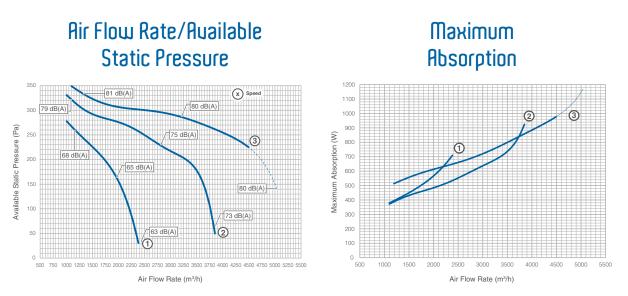
Air Flow Rate: 1000 – 2100 m<sup>3</sup>/h Available Static Pressure: 65 – 170 Pa Sound Power: 58 – 70 dB(A) Power Supply: 135 – 375 W Maximum Current Input: 2,4 A



#### **Typical Operative Sector**

Air Flow Rate: 1500 – 3000 m<sup>3</sup>/h Available Static Pressure: 100 – 160 Pa Sound Power: 60 – 80 dB(A) Power Supply: 250 – 520 W Maximum Current Input: 2,7 A

### Model 4



#### **Typical Operative Sector**

Air Flow Rate: 2400 – 4500 m<sup>3</sup>/h Available Static Pressure: 100 – 350 Pa Sound Power: 63 – 81 dB(A) Power Supply: 600 – 1100 W Maximum Current Input: 4,8 A



## OCEAN-ECM Performance

#### Selection Diagrams of SUE-ECM Fan Section with EC Motor and Inverter.

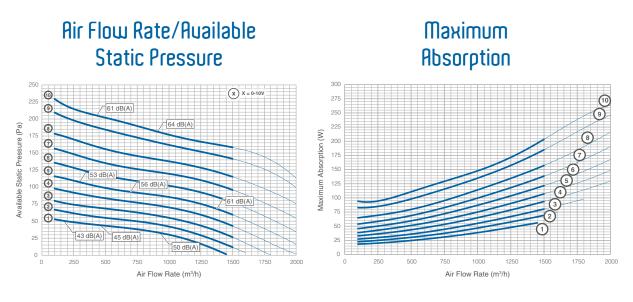
The Fan Section is assembled with filtering and air handling sections. The typical curves for unit selection are provided below. Performance curves show fan section typical field of operation, in terms of air flow at specific external static pressures and motor speed. Absorbed electrical power curves are also provided to the operating air flow and motor speed. Maximum operating current and detailed information about sound power are also reported below for each model.

MODEL	AIR FLOW RATE	AVAILABLE STATIC PRESSURE RATE	POWER ABSORPTION RATE
1	600 — 1400 m³/h	40 – 160 Pa	15 – 200 W
2	1000 – 2100 m³/h	40 – 200 Pa	25 – 370 W
3	1500 – 3000 m³/h	40 – 250 Pa	30 – 600 W
4	2400 – 4500 m³/h	30 – 270 Pa	30 – 950 W
MODEL	RECOVERY EFFICIENCY	MAXIMUM ABSORPTION AMP	SOUND POWER RATE
1	42%	1,9 A	45 – 70 dB(A)
2	36%	3,0 A	50 – 72 dB(A)
3	40%	4,4 A	50-82 dB(A)
4	44%	5,0 A	60 - 82 dB(A)

## **Quick Selection Item**

### **SVE-ECM** Fan Section

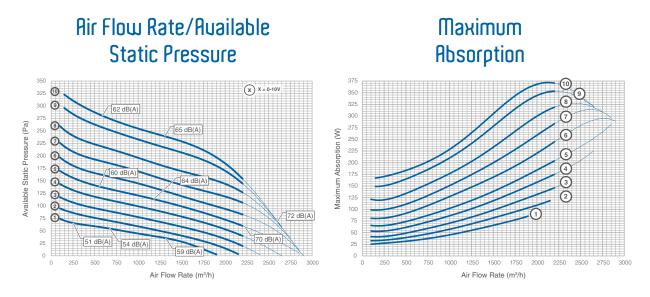
#### Model 1



#### **Typical Operative Sector**

Air Flow Rate: 600 – 1400 m<sup>3</sup>/h Available Static Pressure: 40 – 160 Pa Sound Power: 45 – 70 dB(A) Power Supply: 15 – 200 W Maximum Current Input: 1,9 A

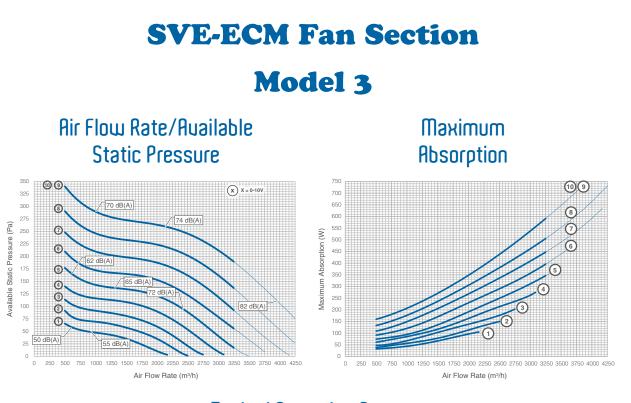
### Model 2



#### **Typical Operative Sector**

Air Flow Rate: 1000 – 2100 m<sup>3</sup>/h Available Static Pressure: 40 – 200 Pa Sound Power: 50 – 72 dB(A) Power Supply: 25 – 370 W Maximum Current Input: 3,0 A

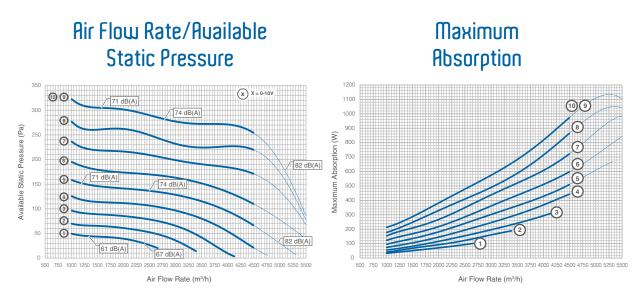




#### **Typical Operative Sector**

Air Flow Rate: 1500 – 3000 m<sup>3</sup>/h Available Static Pressure: 40 – 250 Pa Sound Power: 50 – 82 dB(A) Power Supply: 30 – 600 W Maximum Current Input: 4,4 A

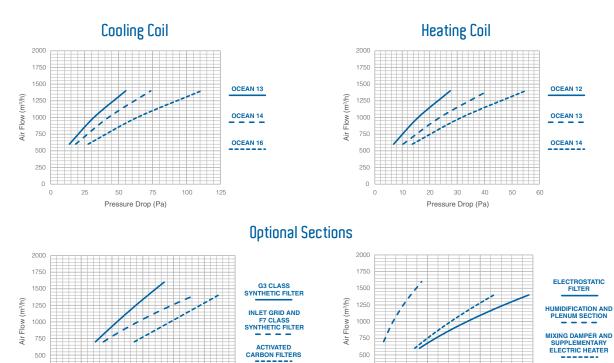
## Model 4



#### Typical Operative Sector

Air Flow Rate: 2400 – 4500 m<sup>3</sup>/h Available Static Pressure: 30 – 270 Pa Sound Power: 60 – 82 dB(A) Power Supply: 30 – 950 W Maximum Current Input: 5,0 A

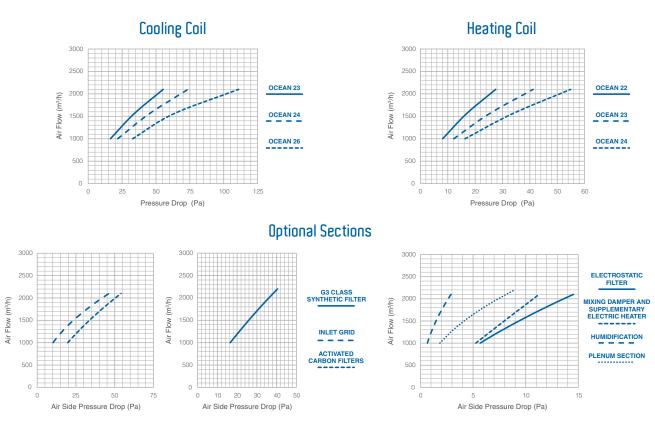
## OCEAN/OCEAN-ECM Air Side Pressure Drop Model 1



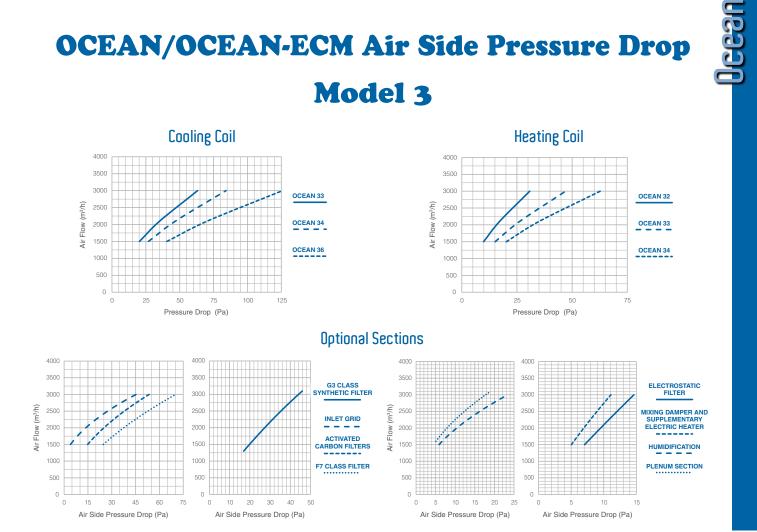
Air Side Pressure Drop (Pa)

Model 2

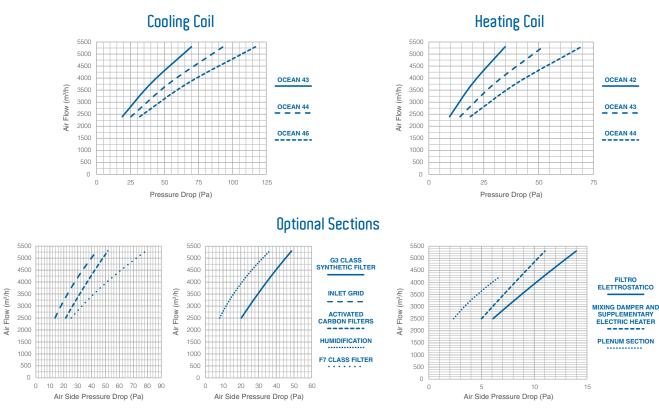
Air Side Pressure Drop (Pa)







Model 4



## **OCEAN/OCEAN-ECM**

		E	intering	Air Tei	mperat	ure 20°	C	Entering Air Temperature 20°C								
		W	<b>F: 45/4(</b>	)°C	W	r: 70/60	)°C	W	r: 45/40	)°C	W	T: 70/60	)°C			
MOD.	Qv	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)			
WUD.	m³/h	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa			
	600	2,75	472,3	6,5	5,59	480,8	6,2	4,86	836,5	18,2	7,81	671,5	11,3			
12	1000	3,86	664,5	12,0	7,87	676,5	11,4	6,86	1180,0	33,7	11,02	947,1	21,0			
	1400	4,77	819,6	17,5	9,72	835,4	16,7	8,47	1457,1	49,3	13,60	1169,0	30,6			
	600	3,45	592,5	4,7	7,00	601,8	4,5	6,07	1043,4	13,0	9,77	839,7	8,1			
13	1000	5,00	859,1	9,2	10,17	874,7	8,8	8,84	1520,2	25,6	14,23	1223,5	16,0			
	1400	6,29	1082,3	13,9	12,82	1102,1	13,3	11,16	1918,4	39,0	17,92	1541,1	24,3			
	600	3,91	672,1	3,5	-	-	-	6,85	1177,6	9,7	-	-	-			
14	1000	5,82	1000,2	7,2	-	-	-	10,25	1762,8	20,0	16,51	1419,7	12,5			
	1400	7,44	1279,8	11,2	15,14	1301,5	10,7	13,15	2261,5	31,2	21,15	1818,5	19,5			
	1000	4,43	761,8	7,4	9,02	775,2	7,0	7,84	1348,9	20,7	12,61	1084,4	12,9			
22	1550	5,91	1016,8	12,4	12,05	1036,5	11,9	10,51	1806,8	35,0	16,87	1450,1	21,8			
	2100	7,15	1229,4	17,5	14,57	1253,1	16,7	12,71	2185,7	49,3	20,39	1753,5	30,6			
	1000	5,60	962,1	5,4	11,36	976,9	5,2	9,86	1696,2	15,1	15,87	1364,6	9,4			
23	1550	7,67	1318,6	9,6	15,62	1342,6	9,1	13,57	2334,1	26,8	21,83	1877,0	16,7			
	2100	9,44	1623,5	13,9	19,23	1653,1	13,3	16,73	2877,6	39,0	26,89	2311,6	24,3			
	1000	6,38	1096,9	4,1	-	-	-	11,19	1924,6	11,3	-	-	-			
24	1550	8,94	1537,2	7,5	18,18	1563,5	7,2	15,76	2710,3	20,9	25,39	2182,6	13,0			
	2100	11,16	1919,7	11,2	22,71	1952,3	10,7	19,73	3392,1	31,2	31,72	2727,7	19,5			
	1500	6,53	1123,7	16,7	13,25	1139,5	15,8	11,50	1976,9	46,1	18,48	1588,9	28,7			
32	2100	8,15	1401,3	24,8	16,54	1422,0	23,5	14,37	2470,4	68,9	23,06	1982,9	42,8			
	3000	10,18	1750,0	37,0	20,67	1777,5	35,2	17,95	3086,7	102,8	28,80	2476,0	63,9			
	1500	8,26	1421,0	12,2	16,74	1439,0	11,5	14,48	2490,8	33,6	23,30	2003,5	21,0			
33	2100	10,52	1808,6	18,9	21,33	1833,8	17,9	18,48	3177,3	52,0	29,72	2555,2	32,5			
	3000	13,39	2302,3	29,1	27,17	2336,2	27,6	23,57	4053,7	80,6	37,90	3258,9	50,3			
	1500	9,47	1628,4	9,3	-	-	-	16,53	2842,3	25,4	-	-	-			
34	2100	12,26	2107,8	14,8	-	-	-	21,47	3691,9	40,6	34,56	2971,2	25,4			
	3000	15,89	2731,9	23,6	32,22	2770,0	22,4	27,89	4796,0	65,0	44,85	3856,1	40,6			
	2400	10,13	1742,0	5,1	20,67	1777,5	4,8	18,06	3106,0	14,3	29,03	2495,8	8,9			
42	3400	12,71	2184,8	7,6	26,00	2235,2	7,3	22,72	3906,7	21,7	36,50	3138,1	13,5			
	4500	15,14	2602,8	10,4	30,97	2663,1	10,0	27,08	4656,8	29,7	43,50	3740,2	18,5			
	2400	13,29	2285,4	9,5	26,93	2315,9	8,9	23,34	4013,8	26,1	37,55	3228,7	16,3			
43	3400	17,07	2935,4	14,8	34,64	2978,6	14,1	30,06	5168,5	41,1	48,31	4153,4	25,6			
	4500	20,71	3561,4	21,0	42,05	3615,4	19,9	36,48	6273,3	58,2	58,62	5040,5	36,3			
	2400	15,26	2624,0	8,3	-	-	-	26,65	4581,9	22,7	-	-	-			
44	3400	19,97	3434,3	13,5	-	-	-	34,97	6013,8	37,0	56,33	4843,5	23,2			
	4500	24,55	4221,6	19,6	49,76	4278,8	18,5	43,08	7408,1	53,9	69,30	5958,2	33,6			

Heating Emission (kW)

#### LEGEND:

- **WT** = Water Temperature.



## OCEAN/OCEAN-ECM

	Entering Air Temp. 27°C							Entering Air Temp. 26°C					°C	Entering Air Temp. 25°C					
			: 7/1	-		12/1			: 7/1	-		12/1			: 7/1	-		12/1	
	0	Pc			Pc			Pc			Pc	-		Pc			Pc		
MOD.	Qv	Ps	Qw	Dp (c)	Ps	Qw	Dp (c)	Ps	Qw	Dp (c)	Ps	Qw	Dp (c)	Ps	Qw	Dp (c)	Ps	Qw	Dp (c)
	m³/h	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa	kW	l/h	kPa
	600	3,07 2,21	527,5	4,7	1,60 1,53	275,3	1,4	2,71 2,12	466,8	3,8	1,41 1,34	243,2	1,1	2,39 2,04	410,8	3,0	1,40 1,32	241,5	1,1
13	1000	4,12 3,21	708,5	8,0	2,24 2,13	385,9	2,6	3,64 3,09	626,7	6,4	2,21 2,07	380,3	2,5	3,27 3,00	561,5	5,2	1,98 1,86	341,1	2,1
	1400	4,93 3,99	848,2	11,0	2,77 2,62	476,0	3,8	4,41 3,90	758,2	9,0	2,74 2,56	471,2	3,7	3,93 3,71	676,6	7,3	2,46 2,29	422,5	3,1
	600	3,63 2,56	624,9	3,8	1,85 1,78	317,4	1,1	3,21 2,42	551,3	3,0	1,59 1,54	273,6	0,8	2,81 2,30	484,1	2,4	1,63 1,55	280,6	0,9
14	1000	5,02 3,74	863,8	6,8	2,64 2,53	453,5	2,1	4,45 3,58	765,4	5,4	2,48 2,37	427,3	1,9	3,93 3,44	675,0	4,3	2,36 2,23	405,4	1,7
	1400	6,05 4,75	1040,7	9,5	3,28 3,14	564,7	3,1	5,42 4,60	931,3	7,8	3,30 3,10	566,9	3,1	4,80 4,44	825,1	6,2	2,96 2,78	509,0	2,6
	600	4,72 3,09	811,0	7,1	2,40 2,25	411,9	2,1	4,19 2,91	720,9	5,8	2,04 1,98	350,9	1,5	3,70 2,73	635,5	4,6	1,74 1,69	298,7	1,2
16	1000	6,84 4,64	1176,9	14,0	3,51 3,39	603,2	4,1	6,07 4,39	1043,8	11,2	3,01 2,92	518,1	3,1	5,35 4,15	919,4	8,9	2,81 2,72	483,4	2,7
	1400	8,53 5,98	1466,3	20,7	4,44 4,27	763,9	6,3	7,57 5,69	1302,2	16,7	3,84 3,70	660,3	4,8	6,68 5,41	1148,6	13,4	3,87 3,73	664,8	4,9
	1000	4,94 3,57	848,8	5,3	2,60 2,46	446,4	1,6	4,38 3,45	752,7	4,3	2,36 2,21	405,2	1,4	3,86 3,32	664,0	3,4	2,29 2,13	393,4	1,3
23	1550	6,35 4,85	1091,4	8,3	3,46 3,27	595,5	2,7	5,65 4,74	972,2	6,8	3,42 3,17	588,3	2,7	5,04 4,60	866,4	5,5	3,07 2,84	527,5	2,2
	2100	7,55 5,98	1297,8	11,4	4,19 3,93	720,1	3,9	6,87 5,85	1180,7	9,6	4,15 3,84	714,2	3,8	5,96 5,56	1025,5	7,5	3,72 3,44	639,9	3,1
	1000	5,88 4,15	1011,2	4,3	3,00 2,88	516,4	1,3	5,20 3,95	894,3	3,5	2,59 2,49	445,9	1,0	4,57 3,75	785,3	2,7	2,67 2,51	458,9	1,0
24	1550	7,75 5,74	1331,9	7,1	4,07 3,87	699,6	2,2	6,85 5,50	1178,2	5,7	3,87 3,66	665,1	2,0	6,04 5,29	1039,3	4,6	3,65 3,42	627,8	1,8
	2100	9,25 7,13	1591,0	9,8	4,96 4,71	853,2	3,1	8,18 6,90	1406,3	7,8	4,99 4,65	857,7	3,1	7,25 6,66	1247,3	6,3	4,48 4,17	769,7	2,6
	1000	7,70 5,06	1323,9	8,3	3,91 3,71	673,2	2,4	6,84 4,76	1177,0	6,7	3,34 3,23	574,0	1,8	6,02 4,47	1036,1	5,3	2,88 2,78	495,4	1,4
26	1550	10,54 7,14	1813,0	14,6	5,41 5,20	931,1	4,3	9,35 6,76	1608,4	11,8	4,65 4,48	800,1	3,3	8,24 6,39	1417,3	9,4	4,37 4,20	751,7	2,9
	2100	12,87 8,97	2213,2	21,0	6,70 6,41	1152,9	6,3	11,43 8,53	1965,5	16,9	5,79 5,55	996,2	4,9	10,09 8,11	1734,8	13,5	5,83 5,59	1002,5	4,9
	1500	7,61 5,27	1307,9	12,9	4,04 3,79	694,6	4,0	6,75 5,10	1160,8	10,4	3,52 3,31	605,6	3,2	5,97 4,92	1026,0	8,3	3,51 3,24	603,8	3,1
33	2100	9,20 6,62	1582,5	18,2	5,02 4,69	863,8	6,0	8,20 6,46	1409,5	14,8	4,43 4,13	761,1	4,8	7,29 6,28	1253,9	12,0	4,40 4,04	757,4	4,7
	3000	11,11 8,40	1910,2	25,5	6,27 5,82	1077,5	8,9	9,94 8,28	1708,7	20,9	6,14 5,60	1056,6	8,6	8,87 8,12	1525,8	17,0	5,53 5,06	951,2	7,1
	1500	9,11 6,21	1566,1	10,6	4,70 4,46	808,5	3,2	8,06 5,91	1385,9	8,5	4,06 3,86	698,7	2,4	7,11 5,63	1222,3	6,8	4,10 3,82	704,7	2,5
34	2100	11,22 7,90	1929,2	15,5	5,92 5,58	1017,9	4,8	9,96 7,59	1713,1	12,5	5,15 4,87	885,5	3,7	8,79 7,28	1511,7	10,0	5,22 4,84	897,9	3,8
	3000	13,73 10,12	2361,1	22,3	7,46 7,00	1282,8	7,3	12,25 9,82	2106,7	18,1	6,81 6,29	1171,5	6,2	10,86 9,50	1867,8	14,6	6,66 6,15	1145,3	5,9
	1500	11,75 7,59	2020,9	20,4	6,04 5,59	1039,1	6,0	10,46 7,15	1798,8	16,6	5,16 4,95	887,9	4,5	9,24 6,73	1589,5	13,3	4,40	757,0	3,4
36	2100	14,96 9,85	2572,2	31,5	7,74	1331,1	9,4	13,30 9,32	2286,4	25,5	6,65 6,35	1143,0	7,2	11,74 8,81	2019,1	20,4	5,71 5,46	981,2	5,4
	3000	18,89 12,82	3248,2	48,0	9,94 9,42	1709,5	14,8	16,82 12,22	2892,3	38,9	8,60 8,17	1478,2	11,4	14,88 11,63	2559,0	31,2	7,94 7,51	1365,7	9,9
	2400	9,61 7,90	1653,1	6,5	5,66 5,18	973,9	2,4	10,87 8,20	1868,8	8,1	5,65 5,29	970,8	2,4	12,24 8,49	2105,5	10,0	6,49 6,05	1115,3	3,1
43	3400	11,82 10,21	2033,0	9,4	7,17 6,51	1233,7	3,7	13,30 10,50	2287,4	11,6	7,40 6,73	1272,0	3,9	14,96 10,77	2572,1	14,3	8,14 7,56	1399,9	4,7
	4500	13,88 12,54	2386,2	12,5	8,58 7,78	1475,8	5,2	15,54 12,78	2672,9	15,4	9,54 8,65	1641,1	6,2	17,37 13,04	2987,0	18,8	9,69 8,96	1667,0	6,4
	2400	11,58 9,08	1991,2	6,2	6,63 6,18	1140,6	2,2	13,14 9,55	2259,8	7,8	6,59 6,25	1133,9	2,2	14,83 10,02	2549,5	9,7	7,65	1315,6	2,9
44	3400	14,47 11,86	2487,6	9,3	8,58 7,89	1476,0	3,5	16,38 12,38	2816,2	11,6	8,45 7,95	1452,3	3,4	18,48 12,88	3177,5	14,4	9,72 9,12	1670,8	4,4
	4500	17,12 14,62	2944,2	12,6	10,41 9,54	1790,0	5,0	19,34 15,15	3325,0	15,6	10,39 9,56	1786,1	5,0	21,71 15,68	3732,7	19,2	11,68 10,92	2008,6	6,2
	2400	13,90 10,28	2390,1	6,8	6,66 6,35	1146,1	1,8	15,76 10,90	2709,3	8,5	7,77	1336,3	2,3	17,73 11,55	3048,7	10,6	9,09 8,64	1563,2	3,1
46	3400	17,68 13,55	3041,0	10,5	9,27 8,76	1594,7	3,2	20,05 14,28	3447,5	13,2	10,07 9,54	1731,1	3,7	22,58 15,04	3882,2	16,3	11,70 11,05	2011,2	4,9
	4500	21,21 16,82	3648,1	14,6	12,10 11,40	2080,0	5,2	24,01 17,62	4129,2	18,2	12,28 11,60	2111,9	5,3	27,03 18,45	4648,6	22,6	14,19 13,36	2440,4	6,9

Cooling Emission (kW)-Relative Humidity 50%

**NB:** The complete list of Accessories is on Page 309.

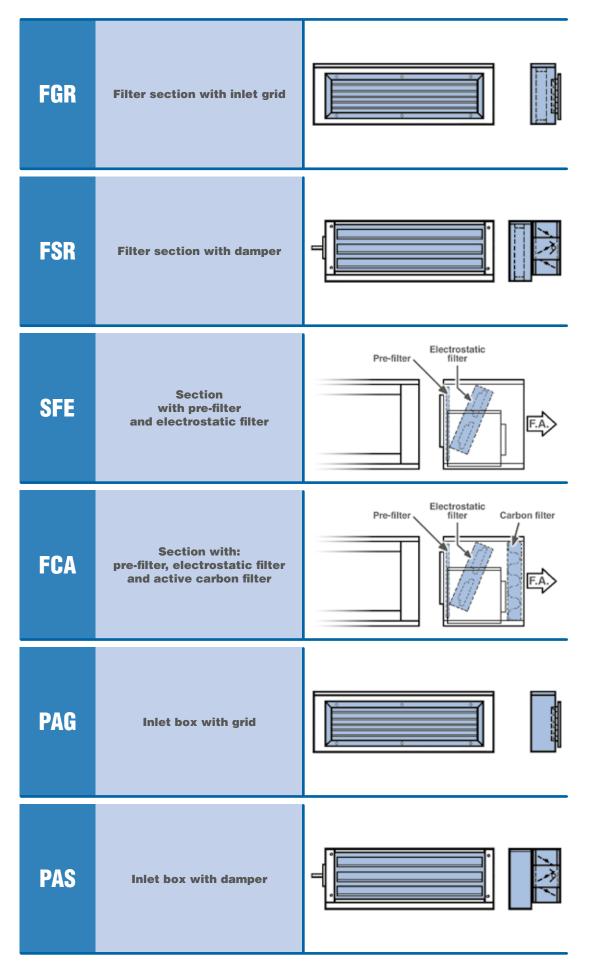
## Standard unit components

BRC	<b>Condensate collection tray</b> Always provided for 01 to 06 versions and in combination with "SUD" humidifying unit and with chilled water coils.	
SQS	<b>Suspension brackets</b> Galvanized steel angle brackets for ceiling mounting or wall mounting.	
SUD	Humidification section Deck fill humidification with 2 way valve, 230 V 50 Hz supply, with manual regulation of the water flow rate. The "BRC" drip tray must always be used.	
BEL	Electric heater incorporating a safety thermostat The electrical heaters must be installed downstream of the fan section.	//////////////////////////////////////
V2300PA	230V ON-OFF VALVE KIT for main and auxiliary coil	

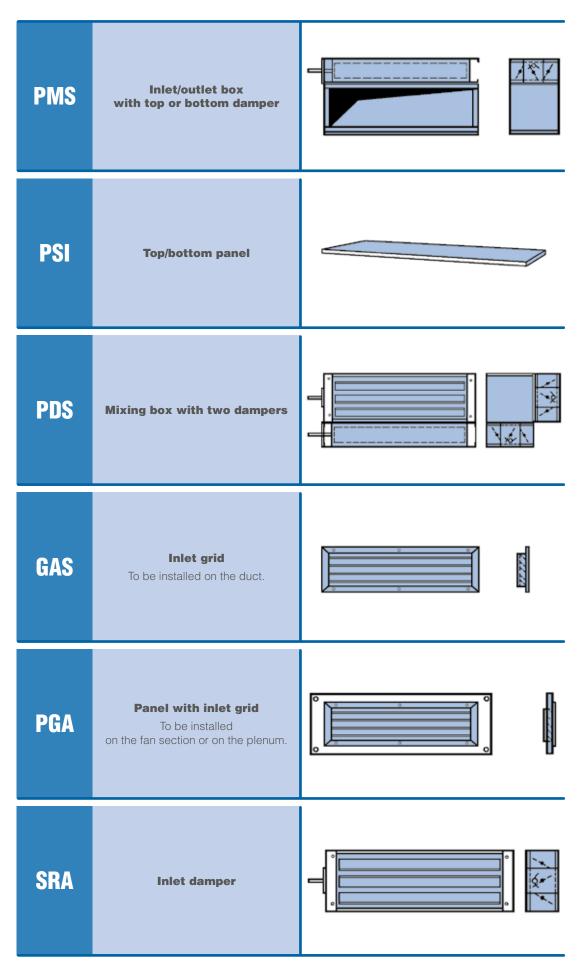


## Inlet accessories





## Inlet accessories

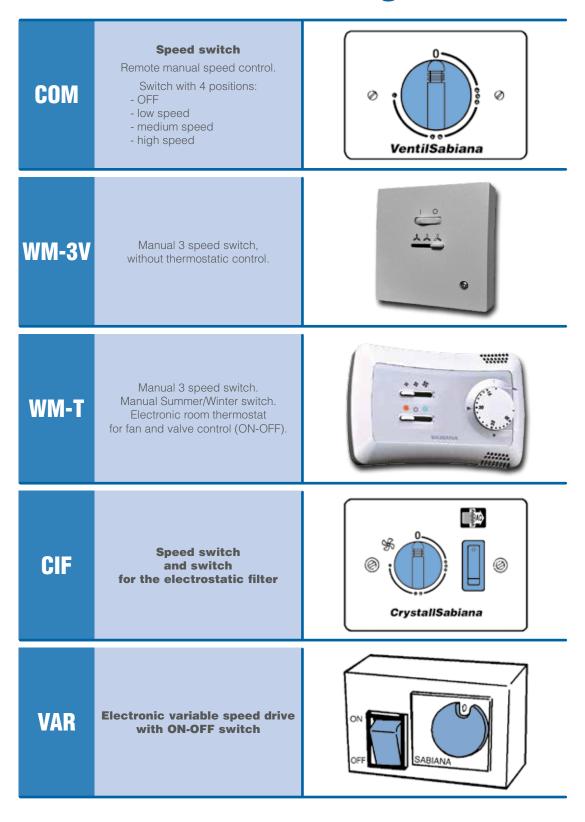




## Outlet accessories

PMB	Supply plenum with double louvres	
PMC	<b>Supply plenum with spigots</b> with 3 diffusers (sizes 1-2-3) with 4 diffusers (size 4)	
BMA	<b>Supply grid</b> with double louvres To be installed on the duct.	

## Electronic Wall Controls for Ocean Air Handling Units





## **Electronic Wall Controls for Ocean ECM Air Handling Units**

For each unit must be prouided a converter ADC or UP-AU power-unit for Wall Controls (except for WM-S-ECM)

WM-3V	3 speed switch control (to use with ADC-S only)
WM-T	3 speed switch control with electronic thermostat and manual summer/winter switch (to use with ADC-S only)
WM-AU	Automatic speed switch with electronic thermostat and summer/winter switch (to use with UP-AU power unit only)
T-MB	Wall Control (to use with UP-AU power unit only)
WM-S-ECM	Continuous speed control with electronic thermostat, summer/winter switch and LCD display
ADCO-S	ADC converter for wall controls separately delivered, for WM-3V and WM-T remote control.
UP-AU	UP-AU power unit separately delivered, for WM-AU and T-MB remote control.

#### T-MB



#### WM-S-ECM



### Electronic Controls <u>for MB Board</u>

QCV-MB	MB control panel version (T-MB wall control included)
PSM-DI	Up to 60 multifunction units (to use with QCV-MB control panel only)

#### Software/Hardware Control - of seueral Ocean-ECM Air Handling Units

Sabianet	Sabianet (to use with QCV-MB control panel only)
<b>ROUTER-S</b>	Router for Sabianet
SIOS	8 relay output electronic MB Board for Sabianet





# Żeus Air Handling Unit

he Zeus air handling units are suitable for cooling and heating commercial and industrial environments. They are available in **6 horizontal models** and **6 uertical models**, with air flow from 5.000 to 25.000 m<sup>3</sup>/h. Heating capacity **from 32 to 260 kW**, cooling capacity **from 17 to 160 kW**.

The units are made up of a extruded aluminium section bar frame, and **double panelling** filled with a 25 mm thick layer of high-density (90 kg/m<sup>3</sup>) rock wool insulation that guarantees, as well as high safety standards in the event of fires (**no toxic fumes are released**), excellent noise absorption and a very high degree of thermal insulation, minimising dispersions to the outside. he metal plate used to make the panels is galvanised and pre-painted blue on the outside of the panel.

Each unit can be **easily dismantled and reassembled on site**, changing the direction of air flow according to specific needs. The special construction allows the coil and the fan assembly to be easily inspected and removed.

# Technical characteristics of the main components:

**Casing:** made of an extruded aluminium frame with black fibreglass-reinforced nylon corner joints, and 25mm thick **sandwich panels**. The panels are made by joining two sheets: galvanised plate for the inner panel and galvanised plate painted blue **(RAL 5012)** for the outer panel. The sandwich panel is filled with a layer of high-density (90 kg/m<sup>3</sup>) rock wool, fire resistant class A1 according to DIN 4102 standards.

**Fan assembly:** is made up of fan, motor and transmission, fitted on a special mount suspended on rubber anti-vibrating elements, and with anti-vibrating joints at the fan outlet. The elements making up the assembly have **the following characteristics:** 

**Fans:** dual intake centrifugal fans with forward blades, single outlet for sizes 50-80-110, and double outlets for sizes 140-200-250. The fan shroud and impeller are made from galvanized steel.

**Electric motors:** are suitable for a three-phase 50Hz power supply, voltage 400V; constructional characteristics standardised according to UNEL-MEC form B3. Index of protection IP 55, insulation class F.

**Transmission:** is made up of a variable-pitch drive pulley, a fixed-pitch fan pulley and drive belt. The motor is fitted to a special slide system used to adjust the tension of the belt.

#### Coil and filter section: is ready to house the coil and filter.

The coil is supported by a frame and is easily removable and reversible, in terms of the side of the connections, even on site. The coils are with copper pipes and aluminium fins, and are made using 10mm diameter pipes with 25x22 pitch on sizes 50 - 80 - 110, and 16mm diameter pipes with 60mm pitch for sizes 140 - 200 - 250. The water connections are made from steel, with male gas threads. There are coils with 2-3-4 rows for heating only operation, and coils with 3-4-6 rows for cooling operation. The dimensions of the coil section depend on the type of operation. Configuration with horizontal coil for sections for heating only, and configuration with inclined coil and condensate collection tray for sections for cooling. The coil is not suitable for use in corrosive atmospheres

or in environments where aluminium may be subject to corrosion.

# <u>Hir filters:</u> the units are fitted with synthetic filters,

class G3 according to EN 779 standard, and class F1 as regards to resistance to fire, according to DIN 53438 standard. The filtering layer is designed with special pleating, 48mm thick, which reduces the overall dimensions of the filter for the same filtering surface. The filters are made from individual cells with a metal frame and galvanized protective mesh.

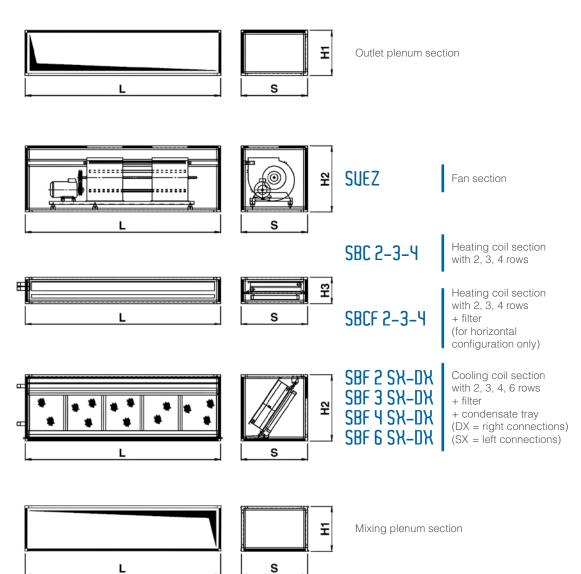


The filters are removed from the same side Of Water connections, so it will be necessary to keep at least 600 mm free on this side,

in order to allow cleaning and replacement of the filters.



## **Dimensions of the main sections**



MODEL			TZ 50	TZ 80	TZ 110	TZ 140	TZ 200	TZ 250
Width	L	mm	1250	1900	1900	2560	2580	2780
Depth	S	mm	740	740	870	870	1150	1270
Fan section height	H2	mm	740	740	870	870	1150	1270
Cooling coil section height	H2	mm	740	740	870	870	1150	1270
Heating coil section height	H3	mm	350	350	350	350	400	450
Intake plenum section height	H1	mm	490	490	590	590	810	810
Outlet plenum section height	H1	mm	490	490	590	590	810	810
Coil header diameter	2R	Ø	1"	1"	1" 1/4	1" 1/2	1" 1/2	2"
Coil header diameter	3R	Ø	1"	1" 1/4	1" 1/2	1" 1/2	2"	2"
Coil header diameter	4R	Ø	1"	1" 1/4	1" 1/2	1" 1/2	2"	2" 1/2
Coil header diameter	6R	Ø	1" 1/4	1" 1/2	1" 1/2	1" 1/2	2"	2" 1/2

## Weight and water content

MODEL	ROWS	WATER CONTENT liters	cooling coil section <b>SBF</b> kg	HEATING COIL SECTION SBC kg	FAN SECTION kg	PLENUM SECTION kg
	2	3,2	102	66		
T7 E0	3	4,6	105	69	440	50
TZ 50	4	6,2	109	72	112	53
	6	8,2	117	_		
	2	5,3	139	91		
T7 00	3	7,7	143	93	155	75
TZ 80	4	10,2	149	99	100	
	6	14,8	161	_		
TZ 110	2	7,2	174	107		92
	3	10,7	177	110	187	
	4	14,3	185	118		
	6	20,9	201	-		
	2	10,2	236	152		
TZ 140	3	15,3	241	157	248	118
12 140	4	20,4	256	172	240 11	110
	6	30,4	286	-		
	2	15,3	324	193		
T7 200	3	22,5	329	198	379	169
TZ 200	4	29,4	351	220	515	105
	6	44,5	388	_		
	2	18,4	376	225		
TZ 250	3	27,5	382	231	522	190
	4	37,5	408	257	JLL	150
	6	55,6	459	-		

## FAN SECTION Technical Specifications

MODEL		TZ 50	TZ 80	TZ 110	TZ 140	TZ 200	TZ 2	250
Type of fan		AT 12/12	AT 15/15	AT 18/18	AT 15/15	AT 18/18	AT 18/	18G2C
Single / Double outlet		S	S	S	D	D	[	)
Power consumption	kW	1,1	2,2	3,0	4,0	5,5	7	,5
Poles		4	4	4	4	4	4	
Tension 3 ~ 50Hz		400 V					400 V	690 V
Nominal current	А	2,6	4,8	6,6	8,3	11,0	14,6	9
Available static pressure Low / High Model <b>(1)</b> Pa		0 ÷ 191	0 ÷ 256	0 ÷ 298	0 ÷ 202	0 ÷ 164	0 ÷	166
Available static pressure Low / High Model <b>(2)</b>	Pa	108 ÷ 238	64 ÷ 303	87 ÷ 345	35 ÷ 257	32 ÷ 220	0 ÷	221

**Type (1)** = The values refer to a configuration with intake grill, filter, 6-row cooling coil, 2-row heating coil, fan section. **Type (2)** = The values refer to a configuration with filter, 4-row cooling coil, fan section.



## **ZEUS TECHNICAL SPECIFICATIONS**

Zeus

HEATING EMISSION: Water temperature 70/60°C – Entering air temperature +20°C

MODEL	AIR FLOW	ROWS	THERMAL POWER	LEAVING AIR TEMPERATURE	WATER FLOW
	m³/h		kW	С°	l/h
		2	32,35	41,9	2828
TZ 50	4400	3	42,37	48,6	3704
		4	49,77	53,6	4350
		2	54,38	41,9	4753
TZ 80	7400	3	71,22	48,6	6226
		4	83,66	53,6	7312
		2	76,13	41,9	6655
TZ 110	10400	3	99,70	48,6	8716
		4	117,12	53,6	10236
TT 440	14000	2	98,93	41,2	8688
TZ 140		3	129,05	47,5	11317
		4	151,28	52,7	13266
T7 000	20200	2	142,40	41,1	12506
TZ 200		3	186,88	47,5	16389
		4	219,08	52,7	19211
TT OFO		2	171,61	41,3	15071
TZ 250	24500	3	226,34	47,7	19849
		4	263,21	52,8	23082

COOLING EMISSION: Water temperature 7/12°C – Entering air temp. +27°C – Relative Humidity 50%

MODEL	AIR FLOW	ROWS	TOTAL THERMAL POWER	SENSIBLE THERMAL POWER	WATER FLOW
	m³/h		kW	kW	l/h
		3	17,04	14,00	2931
TZ 50	4400	4	20,82	16,40	3581
		6	26,68	19,36	2656
		3	28,93	23,77	4976
TZ 80	7400	4	35,52	27,98	6109
		6	45,47	33,00	7821
		3	39,98	32,85	6876
TZ 110	10400	4	50,46	39,36	8680
		6	63,85	46,01	10982
		3	54,40	41,60	9333
TZ 140	14000	4	72,10	51,10	12364
		6	92,50	62,70	15830
		3	78,78	60,24	13516
TZ 200	20200	4	104,41	74,00	17913
		6	133,95	90,80	22982
	24500	3	101,58	75,50	17428
TZ 250		4	126,45	89,62	21695
		6	160,94	109,09	27612



# Úulcan Pro Air Handling Unit

he **Uulcan Pro** air handling units are built in compliance with the European standards and directives, and are designed to satisfy all design requirements for air conditioning systems in which the reduction of noise levels, high air quality and minimum energy consumption are fundamental aspects in assessing the quality of the installation.

The main defining feature of this new series concerns the **Special design** of the aluminium frame that make up the structure, aimed at creating perfectly smooth inside walls, **without gaps or protrusions,** so as to simplify cleaning and allow access to the components from the side. he basic configuration is made of sandwich panels

in **two nominal thicknesses**, **35 and 50 mm**, with the outside surface made from pre-painted galvanised steel and the inside surface from galvanised steel, with high density polyurethane foam thermal insulation in between, making the unit suitable for indoor and outdoor installation.

The variants of the basic configuration include stainless steel or Peraluman inside panels, Peraluman outside panels and mineral wool insulation so as to guarantee maximum safety in the event of fires (**no toxic gases are released**) with effective sound absorption.

The units are available in **23 sizes, from 1.000 to 80.000 m<sup>3</sup>/h**.



## The casing of the Uulcan Pro units is made up as follows:

**<u>Supporting frame</u>** made from extruded aluminium alloy section bars, natural colour.

Joints made from reinforced nylon (for 35 mm thick) and cast aluminium (for 50 mm thick).

Sandwich panels available in two nominal thicknesses, 35 and 50 mm,

made from the following materials:

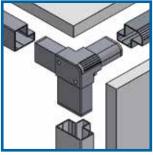
- standard outer: pre-painted galvanised steel, light grey colour.
  - *inner:* galvanised steel. *insulation:* injected polyurethane, density 45 Kg/m<sup>3</sup>.
- Upon request outer: AISI 304 stainless steel Peraluman.

*inner:* pre-painted galvanised steel - AISI 304 stainless steel -Peraluman.

*insulation:* mineral wool, density 90 Kg/m<sup>3</sup>.

 assembly using galvanised steel self-threading screws, with Neoprene self-adhesive gaskets inserted between the sections and the panels. The panels with mineral wool insulation are assembled using screws in bushes.





**Access doors:** same construction as the panels, fitted with reinforced hinges and locking device, complete with sealing gasket, safety switch for fan sections and, upon request, fitted with inspection window. For sections with high inside pressure (e.g. fan sections with plug fans or with absolute filters), the doors are completely removable and fixed with bars and screw knobs.

#### Base frame: made with galvanised steel "C" bars,

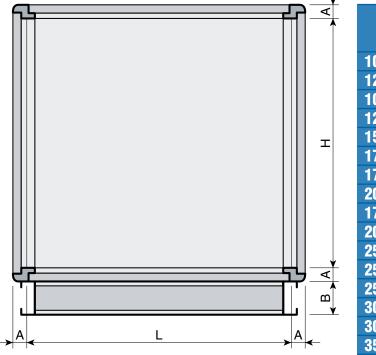
fitted with eyebolts for handling, arranged around the perimeter of each section.

Specifications of the casing according to UNI-EN 1886 Standard					
Casing strength	D1				
Casing air leakage at -400 Pa	L1				
Casing air leakage at +700 Pa	L1				
Filter bypass leakage	F9				
Thermal transmittance	Т3				
Thermal bridging factor	TB3				

Sound Attenuation					
Frequency (Hz)	35 mm and 50 mm thick panels with polyurethane				
125	dB 11,0				
250	dB 9,0				
500	dB 11,0				
1K	dB 12,0				
2K	dB 15,0				
4K	dB 27,0				
8K	dB 34,0				



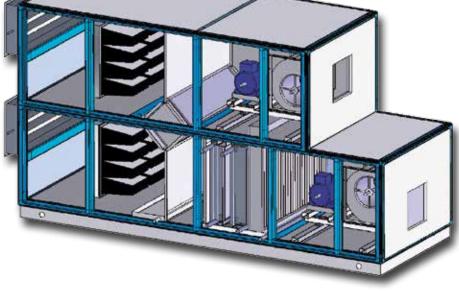
## **Front dimensions**



- $\mathbf{R}$  corresponds to the thickness of the panels
- Base: B = 80/120 mm
- Up to SiZe 250–175 the panels can be selected in two thicknesses, 35 and 50 mm
- From SiZe 250-200 ON the panels are 50 mm thick only

0175	MEASUREMENT (mm)		
SIZE	L	н	
100 - 75	650,0	457,5	
125 - 75	802,5	457,5	
100 - 100	650,0	610,0	
125 - 100	802,5	610,0	
150 - 100	955,0	610,0	
175 - 100	1107,5	610,0	
175 - 125	1107,5	762,5	
200 - 125	1260,0	762,5	
175 - 150	1107,5	915,0	
200 - 150	1260,0	915,0	
250 - 150	1565,0	915,0	
250 - 175	1565,0	1067,5	
250 - 200	1565,0	1220,0	
300 - 200	1870,0	1220,0	
300 - 250	1870,0	1525,0	
350 - 250	2175,0	1525,0	
400 - 250	2480,0	1525,0	
400 - 300	2480,0	1830,0	
450 - 300	2785,0	1830,0	
500 - 300	3090,0	1830,0	
550 - 350	3395,0	2135,0	
650 - 350	4005,0	2135,0	
650 - 400	4005,0	2440,0	



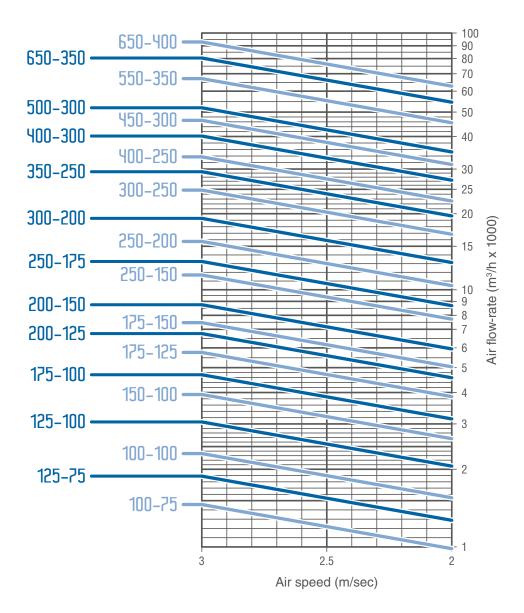




he **Uulcan Pro** air handling units are available in **23 sizes** that can be easily selected using the diagram shown below, based on the air speed through the coil.

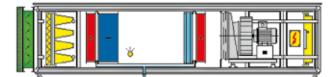
**To simplify selection,** it must be stressed that in both cooling/dehumidification and heating/humidification, the correct air speed is essential **to auoid entraining drops.** 

It is therefore recommended to use a **droplet separator** for humidification and dehumidification when the air speed exceeds 2.5 m/sec. In humidification and cooling/dehumidification, the maximum speed of 2.8 m/sec should **not be exceeded**.



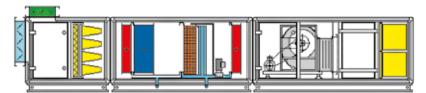


## **Examples of unit compositions**

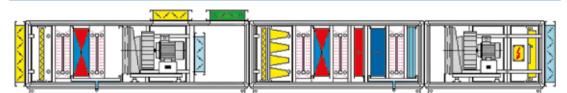


Outdoor monoblock unit with protective cover, rain protection grill with bird guards, louvre, G4+F7 pre-filters, treatment section with pre-heating, cooling and dehumidification coil, steam and post-heating coil.

Motor fan section with plug-fan unit and final filtration with SABIANA Crystall electrical filters.



Modular units in three sections with mixing chamber, 64+F9 pre-filters, treatment section with pre-heating, cooling and dehumidification coil, honeycomb pack humidifiers with recirculation and post-heating coil. Motor-fan section with centrifugal transmission uentilator and H13 absolute filtration.

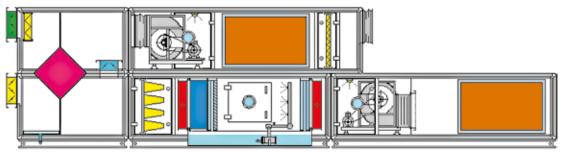


Units with ejection-recirculation section and exterior fresh air intake with G4 filter, heat recovery coil and fan-motor plug-fan assembly. Treatment section with G4+F7 pre-filters, heat recovery coil,

pre-heating coil and cooling coil and dehumidification with droplet separator.

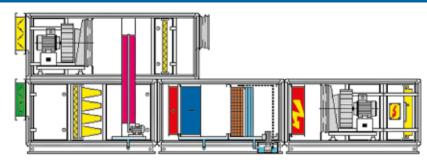
Outlet fan section with plug-fan assembly and SABIANA Crystal electrical filters.

The inlet and outlet of the unit is equipped with a louure with on-off action for interaction with the treated enuironment and germicidal lamps on the surfaces of the coils and mechanical filters.

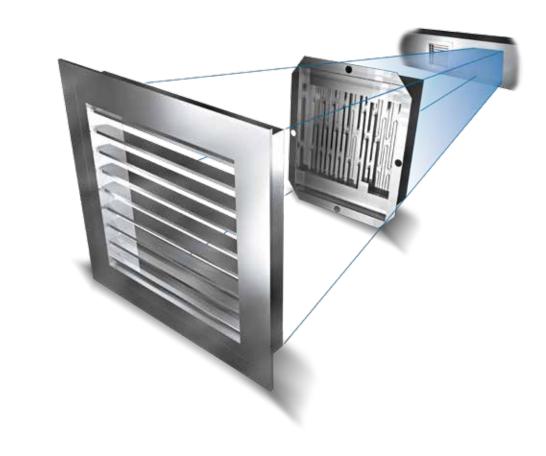


Double deck unit with section equipped with static heat recovery unit with cross flows and with recirculation louvre and GY pre-filters. Treatment section with F8 rigid bag filters, pre-heating, cooling and dehumidification coil, humidifier with nozzles and recirculation pump in a dual chamber with air director/splash guard and droplet separator and post-heating coil. Dutlet fan section with centrifugal transmission fan and silencer.

Duerdeck air intake section with GY filter, silencer and centrifugal transmission fan.



Double deck unit with section equipped with GY+F7 pre-filters and rotary heat recovery unit, treatment section with preheating coil and cooling and dehumidification coil, honeycomb pack humidifier with exterior recirculation pump kit. Motor-fan outlet section with post-heating electrical coil, plug-fan unit and final filtration with SABIANA Crystall electrical filters. Duerdeck air intake section with GY filter and motor-fan plug-fan unit.



## **Crystall Duct System** Electronic Filter

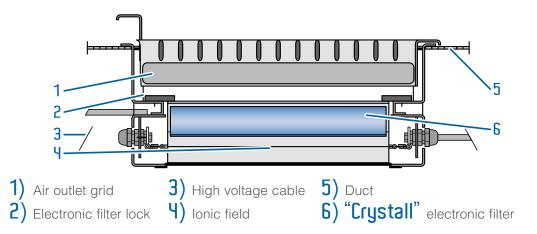
#### The Crystall Duct System is an innovative

filtering system to be mounted on air outlets or inside ducting. It is made up of **3 elements:** 

- a) patented electronic plate filter ("Femec" type)
- b) electronic control and power board
- C) high voltage flexible connection cable

#### he system has been designed

to reduce the indoors diffusion of various types of pollutants found in the ducting of air conditioning systems. As a result, it is ideal for various types of environments, such as schools, hospitals and rest homes (corridors, waiting rooms, wards), doctors' surgeries, hotels and anywhere indoor air quality needs to be improved.

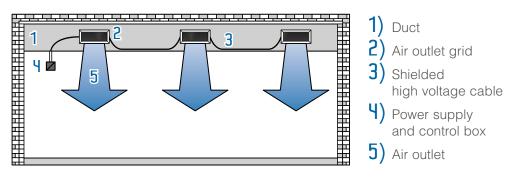


#### Aduantages of the Crystall Duct System:

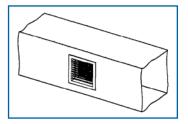
- Installation possible on existing systems
- Low impact on the thermal and aeraulic equilibrium of the installation
- Reduced pressure drop even when the filter is dirty
- Significant bactericide action on biological pollutants
- No cost for replacing the filters (the filters are totally regenerable by simply washing them)
- Very low additional energy costs
- Simple and fast maintenance
- No system downtime for the maintenance of the filter
- Remote power supply that can supply multiple filtering units at the same time

**Tests and Certification:** the Crystall Duct System has been the subject of numerous efficiency and effectiveness tests to assess the functions and performance of the systems in real conditions. At the Turin Polytechnic Department of Energy, efficiency and pressure drop tests were performed using the EN 779 international filter classification standards, where applicable. The University of Ancona carried out over 180 laboratory tests on microbiological substances (total airborne microbiological load), including bacteria, mould, fungi, etc., which confirmed, through the statistical analysis of the data taken from the Fischer test, the effectiveness of the Crystall electronic filter in reducing the bacterial load.

Other tests have been carried out **in the SABIANA laboratories** on the flow-rate, pressure drop, electrical safety and instrumental efficiency of the filtration process on microparticles by numerically counting the most common particle size categories in various rooms. The particles monitored had the diameters specified by the WHO (World Health Organization) and the EPA (Environmental Protection Agency) as being the most harmful to our health (<2.5 micron PM 2.5), with volumetric counts (number/m<sup>3</sup>) being performed in a common living environment, using a laser particle counter (LPC).



Contruction features: for more details, see "Crystall Flex System".

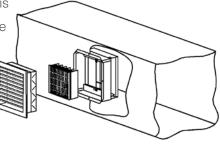


### "CDS-E" filter

The **CDS-E external duct filter** is equipped with a perimeter flange that allows to be mounted on standard openings currently on the market. Mounting is done using

the same flange that can be screwed or riveted to the outer wall of the duct. The design of the structure takes into account the fact that the air distribution terminals may or may not

be equipped with a damper. The filter collar, in fact, is of the telescopic type and therefore the depth can be varied during installation.



## 

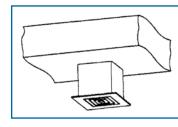
### **Dimensions**

MODEL	Nominal Dimensions <b>H X B</b>			NOMINAL SECTION <b>Sn</b>	FILTER Surface <b>Sf</b>
	mm	mm	mm	mq	mq
CDS.E	150 x 300	298,5	148,5	0,045	0,023
CDS.E	150 x 400	398,5	148,5	0,060	0,033
CDS.E	150 x 500	498,5	148,5	0,075	0,043
CDS.E	150 x 600	598,5	148,5	0,090	0,053
CDS.E	200 x 400	398,5	198,5	0,080	0,043
CDS.E	200 x 500	498,5	198,5	0,100	0,057
CDS.E	200 x 600	598,5	198,5	0,120	0,070
CDS.E	200 x 800	798,5	198,5	0,160	0,096
CDS.E	300 x 500	498,5	298,5	0,150	0,085
CDS.E	300 x 600	598,5	298,5	0,180	0,105
CDS.E	300 x 800	798,5	298,5	0,240	0,145
CDS.E	400 x 600	598,5	398,5	0,240	0,168
CDS.E	400 x 800	798,5	398,5	0,320	0,232
CDS.E	400 x 1000	998,5	398,5	0,400	0,296



## "CDS-I" filter

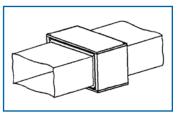
The **CDS-I internal duct filter** is equipped with a smooth containment frame to allow insertion in the terminal duct. It can be mounted using screws or rivets which must

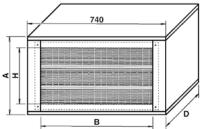


be inserted from inside.

## Dimensions

MODEL	NOMINAL DIMENSIONS <b>H X B</b>	L	A	NOMINAL SECTION <b>Sn</b>	FILTER SURFACE <b>Sf</b>
	mm	mm	mm	mq	mq
CDS.I	150 x 225	223	148	0,033	0,015
CDS.I	150 x 300	298	148	0,045	0,023
CDS.I	150 x 375	373	148	0,056	0,030
CDS.I	225 x 225	223	223	0,050	0,025
CDS.I	225 x 375	373	223	0,084	0,050
CDS.I	225 x 450	448	223	0,101	0,062
CDS.I	225 x 525	523	223	0,118	0,075
CDS.I	300 x 300	298	298	0,090	0,045
CDS.I	300 x 375	373	298	0,112	0,060
CDS.I	300 x 450	448	298	0,135	0,075
CDS.I	300 x 525	523	298	0,158	0,090
CDS.I	300 x 600	598	298	0,180	0,105
CDS.I	375 x 375	373	373	0,141	0,080
CDS.I	375 x 450	448	373	0,169	0,100
CDS.I	375 x 600	598	373	0,225	0,140



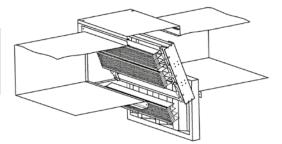


### "CDS-C" filter

This type of equipment was specifically created to be able to be inserted **ON the duct** upstream from the air handling units. The structure is in galvanised, prepainted plate and is ready for coupling to flanged ducts. Inside there is a mechanical filter section with a depth of 48mm and an electronic filter section. The unit has a closing panel that allows easy access for mounting and maintenance operations.

## Dimensions

MODEL	NOMINAL DIMENSIONS <b>H X B</b>	A	D	NOMINAL SECTION <b>Sn</b>	FILTER Surface <b>Sf</b>
	mm	mm mm r		mq	mq
CDS.C	600 x 300	415	380	0,18	0,207
CDS.C	600 x 600	715	680	0,36	0,414





## Uulcan Pro Air Handling Units with Crystall Electrostatic Filters for Air Quality and Energy Sauings

**Electrostatic filtration** is currently considered one of the most advanced systems for capturing particles in an air stream, capable of ensuring high and lasting efficiency and with major benefits in terms of quality-price ratio, considering their longer life compared to any other type of filter.

Cost analysis should also take into consideration the very low pressure drop rate and reduced running costs, **thanks to the simple washing** of the filters with water and detergent.

Their high filtration efficiency combines with considerable bacterial disinfection and viral inactivation, bringing the treated air to the highest quality levels defined by the relevant standards.

### **Operating principle**

The operating principle of these filters is based on applying a high potential difference between discharge and collecting electrodes, so as to create a strong electric field that reaches maximum intensity near the discharge electrodes.

The air around the surface of the discharge electrodes, which contains particle pollution, is thus ionised.

The resulting effect is called a **COFONO discharge**, as the ions tend to move from the corona or ring around the discharge electrodes towards the collecting electrodes.

During such movement, the ions generated collide with the particles of pollution suspended in the air, which become positively charged (each particle can be charged by many different ions, reaching very high electric charges).

The positively charged particles (+) are then drawn towards the collecting electrodes (-), where they are captured.

## SABIANA Crystall electrostatic filter FEMEC (patented)

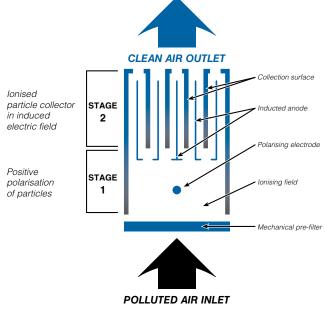
In designing and developing the **SABIANA Crystall modular electrostatic filter** ("FEMEC"), all the positive features of classic plate electrostatic precipitators have been retained. This new solution features two separate and distinct sections, each with different construction technology and with its own specific purpose.

The first section consists of electrodes and insulating parts, called the "active element section", while the second, subject to "loading" and consequently frequent handling for cleaning, is called the "passive element section".

The active components in the first section are secured to the holding structure, containing the actual filter that, not requiring regular maintenance and therefore handling, can be built to guarantee reliability and safety at low cost, as it does not contain special, delicate and expensive materials (insulators etc.).

The second section with passive elements (collector) is made from aluminium plates and is designed to be built in various different sizes, so as to satisfy a wide variety of needs in terms of construction and overall dimensions.

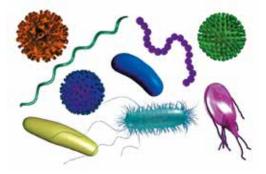
This second section is in turn divided into two parts, a grounded passive part designed to capture the dirt, and another active part, being subjected to the voltage induced by the polarising electrode.



This (patented) system allows electric fields to be created on the opposing surfaces without requiring additional power supplies, and also makes each part of the collector independent from the others, meaning short accidental circuits in one section do not affect operation of the filter as a whole.

All electrostatic filters / active electronic plate filters have the advantage of producing a limited amount of ozone.

The SABIANA Crystall electrostatic filter is rated as class B-PE, certified by Turin Polytechnic Energy Department.



### **Germicidal effect**

Electrostatic filters have considerable germicidal potential due to their ionising action and the consequent production of small amounts of ozone that, combined with UV radiation, stop the proliferation of biological substances and contaminants on the surfaces of the passing dust, oxidising and inactivating them.

It worth stressing the **inactivation** of these trapped pollutants by the system, as the same cannot be guaranteed by normal mechanical filtering, even high efficiency filters, meaning these latter systems accumulate live contaminants that form colonies and require the personnel performing maintenance and replacing the filters to adopt special precautions for their own protection and to protect the surrounding environment.

The following tables list the main pathogens, such as: viruses, pollen, mites and fungi, indicating the diseases and harm these can cause to the organism, their origin, shape and average diameter in microns.

Based on their dimensions, in fact, it can be easily seen that all pollen, mites and fungi listed in the tables can be captured, inactivated and trapped by electrostatic filters, in relation to their efficiency.

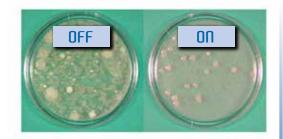
Cocerning **UIFUSES** even though these are very small in size, they can still be intercepted, trapped and **rendered inactive**, as they are always connected to and carried by larger particles.

One important experiment, until now the only one of its type conducted, was commissioned by Sabiana and carried out by the University of Ancona, Department of Physics and Materials Engineering and Territory, for the purpose of evaluating the bactericidal action of our **electrostatic filter** on biological pollutants.

A detailed description of the experiment and related certification are available upon request, however the results can be summarised as follows:

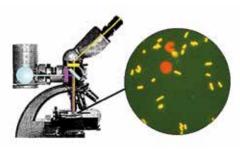


#### 1) Electrostatic filter efficiency in removing bacteria



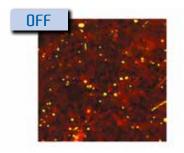
The figure shows **Rodac** plates with specific culture media following exposure to the air delivered into the environment by the ventilation system being tested.

On the right is the culture plate with the **electrostatic filter** operating, on the left the plate when the system is off.



Microscope measurement showed **85% efficiency in bacteria remoual** (EPI, Acridine Orange)

#### 2) Electrostatic filter effect on bacterial uitality



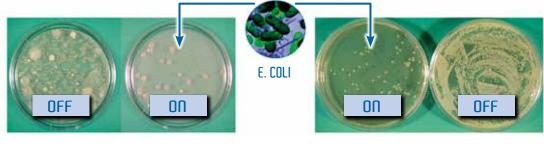
LIUE / DEAD = 2.7



LIUE / DEAD = 1.4

(EPI, propidium iodide-Sybr green I)

#### 3) Electrostatic filter effect on bacterial growth



in air



Confirming the importance of this topic, we can quote for example the **"Lombardy Region Local Hygiene Regulations"**, published in the official Regional Bulletin on 25/10/89 (also taken on by other Regions and Municipalities), specifically paragraph **3.Y.Y7 = Air-conditioning: system features** where, in point **c**), the text reads:

Air purity must be guaranteed by applying suitable measures (filtration and disinfection where necessary) aimed at ensuring that the air inside the environment does not contain particles exceeding 50 microns in size and there is no possibility of infectious diseases being transmitted uia the air-conditioning system.

### **Modular sizing**

The **SABIANA Crystall electrostatic filter** features the same modularity in terms of sizing as mechanical filters, and consequently the latter can be used both as pre-filters (G1-4) and as post-filters (absolute H10-14).

On the first 14 sizes of the **Uulcan Pro** air handling units, the electrostatic filters can be **remoued from the side** on slides, with maximum side dimensions of 600 mm, while on the next 9 sizes they can be **remoued from the front**, on the air supply side.

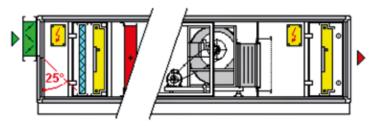


Diagram of the electrostatic filter with removal from the side, placed upstream and downstream of the fan.

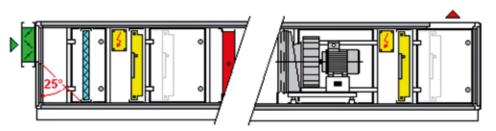
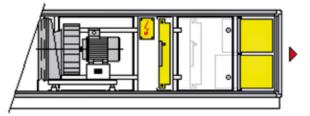
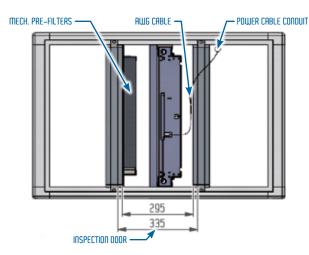


Diagram of the electrostatic filter with removal from the front, placed upstream and downstream of the fan.



Electrostatic filter and absolute post-filter removable from the front, through the inspection door.



Space occupied by the electrostatic filter with mechanical pre-filter and removal from the side.



### **Energy savings**

Air handling always requires high amounts of energy, mainly due to the pressure drop of the distribution ducts and the filters.

While for the ducting it is hard to imagine where considerable improvements can be made in the short term, as regards filters, on the other hand, energy consumption can be reduced quite significantly.

Staying within the scope of this report, which only concerns filtration, it can be seen how pressure drop is directly proportional to the efficiency of the filters installed, efficiency that depends on desired indoor air quality required and the quality of the incoming outside air, as well as naturally on how loaded the filters are.

It should be remembered that indoor air quality standards are becoming stricter all the time, while outside air quality is at alarming levels in terms of dust and harmful gas concentrations, especially in highly urbanised and industrial areas.

Consequently, there are two seemingly irreconcilable needs: the demand for better filtration combined with the need to minimise system energy consumption.

As we have seen previously, electrostatic filters represent a very good first response to reconciling these two needs, as they feature high efficiency and very low pressure drop, the latter remaining stable over filter operating life.

During operation the increased pressure drop of mechanical filters causes an increase in power consumption by fan motors, needed to ensure design air flow, or alternatively a progressive reduction in air flow when the system does not feature any form of automatic compensation. In electrostatic filters, the particulate in suspension is carried by the air stream until binding to the collector plates set out in the same direction as air flow; in this way, by ensuring suitable spacing between plates, even large particle deposits provide little resistance to the air stream, meaning very low pressure drop.

Thanks to this property, electrostatic filters feature a virtually constant pressure drop throughout their normal operating life, which ends when the thickness of the deposits begins to affect the electric field, rather than prevent the flow of air as occurs in mechanical filters.

Energy consumption can be calculated using the following expression: E = -----1000

- Where:  $\begin{bmatrix} E = energy consumption in kW per hour \\ Q = air flow in m<sup>3</sup>/s$ 

  - P = average pressure drop in Pa

To determine the difference in energy consumption in percentage terms between mechanical filters and electrostatic filters, a module made up of two standard rigid bag filters can be used as a reference, with design dimensions of 600 x 1200 x 300 mm, compared against an electrostatic filter cell measuring 600 x 1200 x 100 mm, with air flow at three reference frontal velocities, 2, 2.5 and 3 m/s, pressure drop values based on the difference between initial, at the various air flows, and final pressure of 300 Pa defined by legislation.

For each different efficiency, energy consumption will be as follows:

mechanical filters						
FRONTAL VELOCITY AIR FLOW ENERGY CONSUMPTION in Watt/h for FILTER CLASS						
m/s	m³/s	F7	F8	F9		
3	2.16	432	448	464		
2.5	1.80	338	350	364		
2	1.44	258	266	274		

SABIANA "CRYSTALL" ELECTROSTATIC FILTERS						
FRONTAL VELOCITY	AIR FLOW	ENERGY CONSUMPTION in Watt/h				
m/s	m³/s	ENERGY CONSOMPTION III Wall/II				
3	2.16	90.8 + 36 <b>(*)</b> = 126.8				
2.5	1.80	54.0 + 36 <b>(*)</b> = 90.0				
2	1.44	28.8 + 36 <b>(*)</b> = 64.8				

(\*) = filter electronic control device power consumption = 0.5 watt x dm2 of frontal surface

Comparing the above results,

## it can be concluded that "electrostatic filters" **CONSUME MUCH less power**

than mechanical filters, as shown below in percentage terms:

FRONTAL VELOCITY		COMPARED to FILTER CLASS							
m/s	F7	F8	F9						
3	-70,6%	-71,7%	-72,7%						
2.5	-73,4%	-74,3%	-75,3%						
2	-74,9%	-75,6%	-76,3%						

### Conclusions

**Electrostatic filters** certainly ensure high **real system efficiency** with considerable energy savings; in addition, as the difference in pressure drop between clean filter and loaded filter is virtually negligible, no special devices are required to compensate for pressure drop so as to maintain variation in air flow within the allowed limits, thus simplifying both system installation and management.

The economic comparison must also consider this feature and there will always be lower fan power consumption compared to mechanical filters as these have to be rated at the maximum pressure drop allowed, which is simulated, when the filters are clean, by the automatic compensation control.

The following table summarised the concepts described above, comparing each aspect for different filtration systems, and specifically highlighting the difference in initial efficiency for clean filters:



CON	COMPARISON BETWEEN DIFFERENT FILTRATION SYSTEMS									
Туре	Filter wit	h mechani	cal media	Electrostatic filter	Clean outside air					
Standard		UNI EN 779		UNI 11254	UNI EN 13779					
Class	F7	F8	F9	Classe D / B	ODA1					
Average efficiency (%)	80/90	90/95	>95	87/97,6	-					
Initial efficiency (%)	>35	>55	>70	>80/>95	-					
Final pressure drop		450 Pa		4/17 Pa	_					
Pressure drop for replacement		300 Pa		Non significativo	-					
Regenerable	I	Non possibil	е	Totale	-					
Disposal	R	ifiuto specia	le	Nessun smaltimento	-					
Maintenance costs	Sostitu	Sostituzione e smaltimento		Lavaggio	Filtrazione adeguata					
Total bacterial charge risk		Elevato		Molto limitato (Azione biocida)	Secondo la sua qualità					

The above table highlights the advantages, from a maintenance point of view, of using "Crystall electrostatic filters" compared to normal mechanical filters, which can be summarised as follows:

- Electrostatic filters, being made from aluminium plates, do not require replacement, rather they can simply be washed and repositioned in the special compartment, an operation that can even be carried out by non-specialist personnel.
- This is a significant advantage, as mechanical filters, being classified as special waste, require costly disposal procedures that must be carried out by specialist personnel, using special protection equipment to protect both themselves personally and the surrounding environment. With **Electrostatic filters**, maintenance is safe as the bacterial charge on the filter is inactivated by the electrostatic field generated.
- Even G2 metallic pre-filters, rated to trap coarse dust, can be regenerated by simple washing.

As an example, a table is shown below comparing annual power consumption between different types of filters, based on two hypothetical extremes of operating time:

- 12 hours/day for 210 days/year (e.g. offices)
- 24 hours/day for 365 days/year (e.g. hospitals)

ENERGY CONSUMPTION Ref.: rigid bag filter module 600 א 200 mm electrostatic filter module, nom. dim. 600 א 1200 א 100 mm									
FRONTAL VELOCITY	AL VELOCITY AIR FLOW FILTER TYPE 0PERATION and CLASSIFICATION 210 days/year								
m/s	m³/s		kW/h	kW/h					
		F7 mechanical filter	1088.64	3784.32					
3	2.16	F8 mechanical filter 1128.96		3924.48					
J	2.10	F9 mechanical filter	1169.28	4064.64					
		B.PE electrostatic filter	319.54	1110.77					
		F7 mechanical filter	851.76	2960.88					
2.5	1.80	F8 mechanical filter	882.00	3066.00					
2.3	1.00	F9 mechanical filter	917.28	3188.64					
		B.PE electrostatic filter	226.80	788.40					
		F7 mechanical filter	650.16	2260.08					
2	1.44	F8 mechanical filter	370.32	2330.16					
2	1.44	F9 mechanical filter	690.48	2400.24					
		B.PE electrostatic filter	B.PE electrostatic filter 163.29						

**S**ince 1985 Sabiana has been selling - and since **1997** manufacturing - **stainless steel flues**, single or double wall versions, for discharging flue gas from boilers.

Considering the intended use of these flues, the relevant European directive on Construction Products requires product certification by a notified body, with annual audits of the design, engineering, manufacturing and storage processes. Sabiana uses the services of the prestigious and demanding IMQ Italian Organisation, which has been checking and testing product quality since the Directive came into force.

## Flues



## Sabiana uses modern

electronic instruments to verify the chemical composition of all materials received, thus totally guaranteeing that the stainless steel used and declared complies with the required technical specifications.

The production processes are completely **automated** and allow the use of some of the thickest materials available on the market, significantly extending product life and resistance to corrosion by acid flue gas.

A highly advanced **Selection Software** can be used to check suitability of the chosen diameter for the type of installation.

**Light** product lines, including three in plastic, allow the best choice to be made based on the type of boiler and the flue installation site.





## InoxSabiana 25 Stainless Steel Double Wall Flues

The **InoxSabiana 25** series is the result of an innovative constructional design aimed at achieving a high quality product, versatility and ease of assembly. The choice of the materials, the use of the latest construction techniques, the care paid to every accessory, the conformity with the European EN 1856-1:2009 standard, the continuous checks on the products and the production process, and the quality mark issued by the prestigious **Italian Institute IMQ**, guarantee the absolute reliability of the Sabiana flues.

he inner wall is made from **AISI 316L** stainless steel, 0.5 mm thick, while the outer wall is made from **AISI 30Y** stainless steel, 0.5 mm thick, or alternatively **COPPEI**, 0.6 mm thick. The insulation is rock wool, with a minimum density of 90 kg/m<sup>3</sup>, 25 mm thick. Longitudinal microplasma welding is used on both

the inner and outer wall on each element, while the 90° T sections, flue gas monitoring and inspection module are made using the deep drawing process, thus avoiding welding. All the non-insulated elements are made from AISI 304 stainless steel (aluminium adjustable flashing and storm collar).



In addition, the use of an innovative fastening system means that the thermal bridge between the inner and outer wall is reduced to the minimum.

The InoxSabiana 25 series includes **8 different** inside **diameters** (from 100 to 350 mm) and a complete series of accessories for solving all problems relating to the discharge of the flue gas from heat generators.

## Main constructional characteristics:

• AISI 316 L stainless steel inner wall

(austenitic stainless steel 18/10 with low carbon content, grade UNI X 2, CrNiMo 1712). *Thickness:* 0,5 mm.

Properties: high resistance to intergranular corrosion and particularly aggressive products.

#### AISI 304 stainless steel outer wall

(austenitic stainless steel 18/10, grade UNI X 5, CrNi 1810).

Thickness: 0,5 mm.

Properties: good resistance to corrosion in air and water.

Upon request, copper outer wall is available.

#### <u>Rock wool insulation</u>

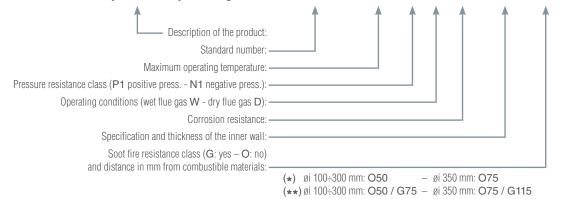
with basaltic composition, minimum density 90 kg/m<sup>3</sup>, thickness 25 mm.

*Properties:* the rock wool used is chemically neutral, is not hydrophilic nor hygroscopic, nor has a capillary action. It is free of asbestos and crystalline silica, has low conductivity values. The rock fibres making up the insulation can withstand temperatures exceeding 1000°C. The insulation is classified as incombustible by the French standard MO-CSTB n°92.34624-3.

- Longitudinal microplasma welding on both the inner and outer wall, in each element.
- All the non-insulated elements are made from AISI 304 stainless steel (storm collar and adjustable flashing are made in aluminium). The screws supplied are in stainless steel.
- Minimum thermal bridge between the inner and outer pipe, due to the adoption of an innovative fastening system.
- Special design of the inner wall so as to allow free expansion according to the flue gas temperature.
- Insulated individual cardboard packaging for each element.
- Wall brackets and supports with adjustable lengths.

## Designation of the product according to EN 1856-1:2009 standard

InoxSabiana 25/25R System Chimney with gasket EN 1856-1:2009 T200 - P1 - W - V2 - L50050 - O \* InoxSabiana 25/25R System Chimney without gasket EN 1856-1:2009 T450 - N1 - D - V2 - L50050 - O \*\* InoxSabiana 25/25R System Chimney without gasket EN 1856-1:2009 T450 - N1 - D - V2 - L50050 - G \*\*



#### **General characteristics:**

- Element locking bands.
- Resistance to condensate, even under pressure (provided by certified silicone gasket).
- Possibility to turn each element 360° while maintaining the tightness characteristics unaltered.

#### Universal double wall product for the construction of chimneys and flues

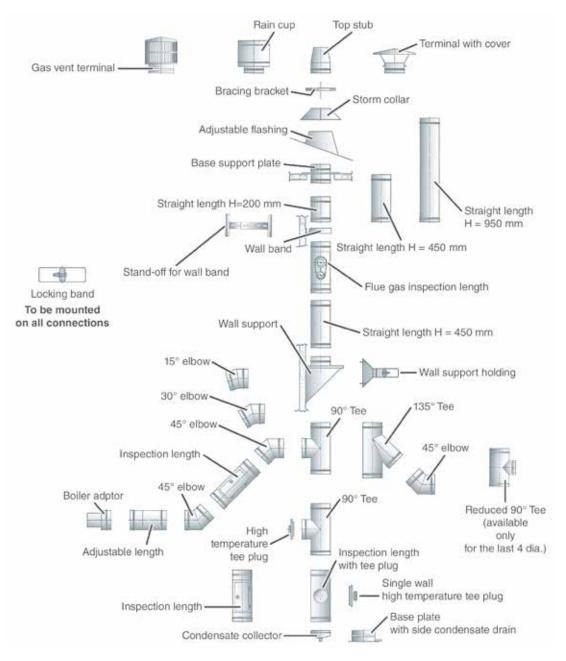
Its specifications are:

- Rapid installation.
- No thermal bridge between the inner wall and outer wall.
- Compact overall dimensions.
- Perfect mechanical resistance, guaranteed by the locking band.

Sun	nmary Table								
Inside diameters	mm	100	130	150	180	200	250	300	350
Outside diameters		150	180	200	230	250	300	350	400
Weight per linear metre, InoxSabiana 25	kg/m	4.4	5.5	6.1	7.3	7.9	9.7	11.4	13.2
Weight per linear metre, InoxSabiana 25R	kg/m	5.1	6.2	7.0	8.3	9.0	11.0	12.9	14.9
Inner wall		Al	SI 316L	steel, 28	3 finish,	nomina	l thickne	ess 0.5 m	าทา
Rock wool insulation		2	25 mm th	nick - Mi	n. dens	ity 90 kg	/m³ - Tc	ol. 0+309	%
InoxSabiana 25 outer wall		A	ISI 304 :	steel, BA	finish,	nominal	thicknes	ss 0.5 m	m
InoxSabiana 25R outer wall		Annealed DHP copper 99.9, nominal thickness 0.6 mm					mm		
Pressure class with gasket					P1 (2	00 Pa)			
Pressure class without gasket			N1	(40 Pa)	negative	e pressu	re opera	tion	
Max temperature of the flue gas with gasket	٦°				2	00			
Max temperature of the flue gas without gasket	٦°				4	50			
Gasket				Black c	oloured	silicone	rubber		
Thermal resistance of the wall R at 200°C	m²K/W	0.34	0.36	0.36	0.37	0.37	0.38	0.39	0.39
Minimum distance to combustible materials class O (flue serving a boiler on liquid or gas fuel)	mm				50				75
Minimum distance to combustible materials class G (flue serving a boiler on solid fuel)	mm	75 115					115		
Average roughness value for the straight length		According to EN 13384-1 : 2002							
Flow resistance coefficient of the insulated components		According to EN 13384-1 : 2002							
Metric screws and bolts		Stainless steel							



## **Typical composition of a chimney**



### Certification

The InoxSabiana 25/25R range is C C marked according to European Standard EN 1856-1:2009 with the following designations:

 InoxSabiana 25/25R
 with gasket
 T200 - P1 - W - V2 - L50050 - O \*

 InoxSabiana 25/25R
 without gasket
 T450 - N1 - D - V2 - L50050 - O \*\*

 InoxSabiana 25/25R
 without gasket
 T450 - N1 - D - V2 - L50050 - G \*\*

 (\*) øi 100÷300 mm: O50
 - øi 350 mm: O75

 (\*) øi 100÷300 mm: O50 / G75 - øi 350 mm: O75 / G115

In addition, the range has been subjected to further tests and has obtained the

voluntary mark

CIG



## InoxSabiana 50 Stainless Steel Double Wall Flues

The InoxSabiana 50 series is the result of an innovative constructional design aimed at achieving a high quality product, versatility and ease of assembly. The choice of the materials, the use of the latest construction techniques, the care paid to every accessory, the conformity with the European EN 1856–1:2009 standard, the continuous checks on the products and the production process guarantee the absolute reliability of the Sabiana flues.

he inner wall is made from **AISI 316L** stainless steel, 0.5 mm thick, while the outer wall is made from **AISI 304** stainless steel, 0.5 mm thick, or alternatively **COPPEI**, 0.6 mm thick. The insulation is rock wool, with a minimum density of 90 kg/m<sup>3</sup>, 50 mm thick. Longitudinal **microplasma** welding is used on both the inner and outer wall on each element. All the non-insulated elements are made from AISI 304 stainless steel (aluminium adjustable flashing and storm collar). In addition, the use of an innovative fastening system means that the thermal bridge between the inner and outer wall is reduced to the minimum.

The InoxSabiana 50 series includes **6 different** inside **diameters (from 350 to 600 mm)** and a complete series of accessories for solving all problems relating to the discharge of the flue gas from heat generators.



## Main constructional characteristics:

• AISI 316 L stainless steel inner wall

(austenitic stainless steel 18/10 with low carbon content, grade UNI X 2, CrNiMo 1712). *Thickness:* 0,5 mm.

Properties: high resistance to intergranular corrosion and particularly aggressive products.

<u>AISI 304 stainless steel outer wall</u>

(austenitic stainless steel 18/10, grade UNI X 5, CrNi 1810).

Thickness: 0,5 mm.

Properties: good resistance to corrosion in air and water.

Upon request, copper outer wall is available.

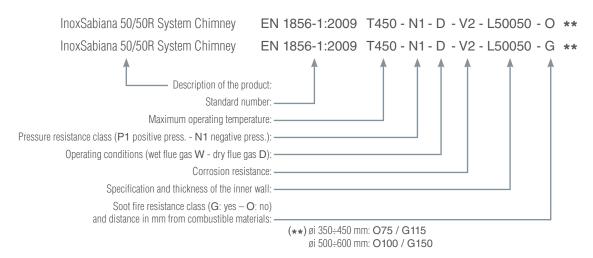
#### <u>Rock wool insulation</u>

with basaltic composition, minimum density 90 kg/m<sup>3</sup>, thickness 50 mm.

*Properties:* the rock wool used is chemically neutral, is not hydrophilic nor hygroscopic, nor has a capillary action. It is free of asbestos and crystalline silica, has low conductivity values. The rock fibres making up the insulation can withstand temperatures exceeding 1000°C. The insulation is classified as incombustible by the French standard MO-CSTB n°92.34624-3.

- Longitudinal microplasma welding on both the inner and outer wall, in each element.
- All the non-insulated elements are made from AISI 304 stainless steel (storm collar and adjustable flashing are made in aluminium). The screws supplied are in stainless steel.
- Minimum thermal bridge between the inner and outer pipe, due to the adoption of an innovative fastening system.
- Special design of the inner wall so as to allow free expansion according to the flue gas temperature.
- Insulated individual cardboard packaging for each element.
- Wall brackets and supports with adjustable lengths.

## Designation of the product according to EN 1856-1:2009 standard



#### **General characteristics:**

- Element locking bands.
- Possibility to turn each element 360° while maintaining the tightness characteristics unaltered.

#### <u>Uniuersal double wall product</u> for the construction of chimneys and flues

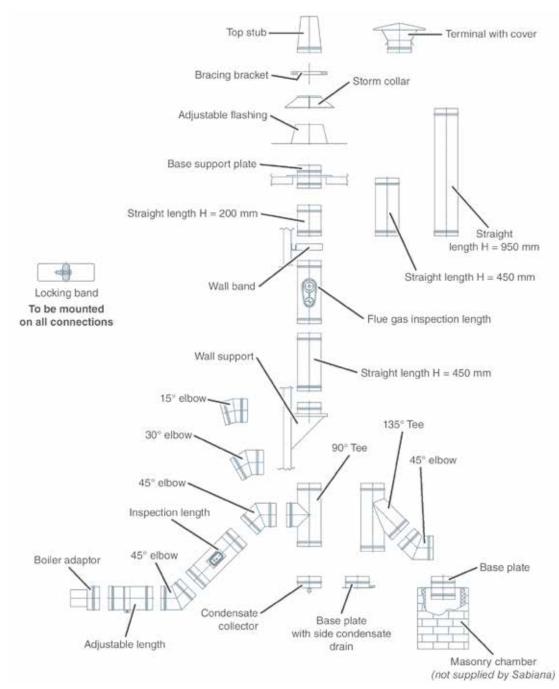
#### Its specifications are:

- Rapid installation.
- No thermal bridge between the inner wall and outer wall.
- Compact overall dimensions.
- Perfect mechanical resistance, guaranteed by the locking band.

Surr	nmary Table							
Inside diameters	mm	350 400 450 500 550 60						
Outside diameters		450	500	550	600	650	700	
Weight per linear metre, InoxSabiana 50	kg/m	17.5	19.5	22.0	24.0	26.0	28.0	
Weight per linear metre, InoxSabiana 50R	kg/m	19.5	22.0	24.5	26.5	29.0	31.5	
Inner wall		AISI	316L steel,	2B finish,	nominal th	ickness 0.	5 mm	
Rock wool insulation		50 r	nm thick -	Min. densi	ity 90 kg/m	<sup>3</sup> - Tol. 0+	30%	
InoxSabiana 50 outer wall		AISI	304 steel,	BA finish,	nominal th	ickness 0.5	i mm	
InoxSabiana 50R outer wall		Annea	aled DHP c	opper 99.9	, nominal t	hickness O	.6 mm	
Pressure class			N1 (40 F	a) negative	e pressure	operation		
Max temperature of the flue gas	°C			4	50			
Thermal resistance of the wall R at 200°C	m²K/W	0.74	0.75	0.76	0.77	0.77	0.78	
Minimum distance to combustible materials class O (flue serving a boiler on liquid or gas fuel)	mm		75			100		
Minimum distance to combustible materials class G (flue serving a boiler on solid fuel)	mm	115 150						
Average roughness value for the straight length		According to EN 13384-1 : 2002						
Flow resistance coefficient of the insulated components			Accor	ding to EN	13384-1 :	2002		
Metric screws and bolts				Stainle	ss steel			



## **Typical composition of a chimney**



## Certification

The InoxSabiana 50/50R range is CEmarked according to European Standard EN 1856-1:2009 with the following designations:

InoxSabiana 50/50R T450 - N1 - D - V2 - L50050 - O \*\* InoxSabiana 50/50R T450 - N1 - D - V2 - L50050 - G \*\* (\*\*) øi 350:450 mm: O75 / G115 øi 500:600 mm: O100 / G150



## InoxMono Sabiana Stainless Steel Single Wall Flues

The **InoxMono Sabiana** series has been designed to offer the maximum guarantee of safety and long life in the discharge of flue gas from heat generators. The choice of the materials, the use of the latest construction techniques, the care paid to every accessory, the continuous checks on the products and the production process, and the quality mark issued by the prestigious **Italian Institute IMQ**, guarantee the absolute reliability of the Sabiana flues.

**C**ach element in contact with the flue gas is made from **AISI 316L** stainless steel, 0.5 mm thick, with longitudinal **microplasma** welding. The 90° T sections, flue gas monitoring and inspection module are made using the **deep drawing process, thus avoiding welding.**  All the support and fastening elements are made from AISI 304 stainless steel (aluminium adjustable flashing and storm collar).

The male and female of each individual element are **Simultaneously** created by the same belling machine, in order to obtain a perfect coupling calibration with maximum tolerance equal to +/- 0.15 mm.

The InoxMono series includes **11 different** inside **diameters** (from 80 to 300 mm) and a complete series of accessories for satisfying all installation requirements.



## Main constructional characteristics:

• AISI 316 L Stainless steel wall

(austenitic stainless steel 18/10Mo with low carbon content UNI X 2 CrNiMo 1712). *Thickness:* 0,5 mm.

Properties: high resistance

to intergranular corrosion and particularly aggressive products.

- <u>Silicone</u>
   <u>rubber sealing gasket</u> resistant up to 200°C temperature.
- Longitudinal microplasma welding of each element.
- **<u>90°</u>** tee made using the deep drawing process.
- <u>all clamping elements</u> in stainless steel AISI 304 (flashing and storm collar in aluminium). The screws supplied are in stainless steel.

## Designation of the product according to EN 1856-2:2009 standard

InoxMono Duct		EN 1856-2:2009		
InoxMono Duct	without gasket	EN 1856-2:2009	T600 - N1 - D - \	/2 - L50050 - G
InoxMono Smoke Duct	with gasket	EN 1856-2:2009	T200 - P1 - W - \	/2 - L50050 - O50
InoxMono Smoke Duct	without gasket	EN 1856-2:2009	T600 - N1 - D - \	/2 - L50050 - G600M
Pressure resistance class (P1 positiv Operating conditions (we Specification Soot fire res	aximum operating te ve press N1 negat et flue gas W - dry fl Corrosion and thickness of the	ard number:		

#### General characteristics:

- Element locking bands.
- Resistance to condensate,

even under pressure (provided by certified silicone gasket).

• Possibility to turn each element 360°

while maintaining the tightness characteristics unaltered.

#### Universal single wall product for the realisation of relining and smoke ducts

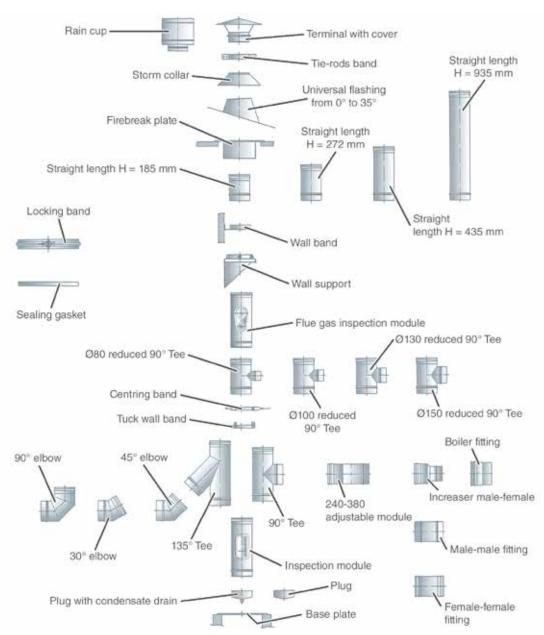
#### Its specifications are:

- Rapid installation.
- Compact overall dimensions.
- Perfect mechanical resistance, guaranteed by the locking band.

Summary Table												
Nominal diameters		80	100	120	130	140	150	160	180	200	250	300
Weight per linear metre	kg/m	1.1	1.4	1.7	1.8	2.0	2.1	2.3	2.5	2.8	3.5	4.2
Material		S	teel Al	SI 316	L 2B -	AISI 3	16L B/	A nomi	nal thi	ckness	0.5 m	IM
Pressure class with gasket						P1	(200	Pa)				
Pressure class without gasket				Ν	1 (40 F	Pa) ope	ration	under	pressu	ire		
Max temperature of the flue gas with gasket	О°						200					
Max temperature of the flue gas without gasket	С°						600					
Gasket					Black	colou	red sili	icone r	ubber			
Minimum distance to combustible materials class O (chimney serving a generator with liquid or gas fuel)	mm					Smo	ke duo	:t: 50				
Minimum distance to combustible materials class G (chimney serving a generator with solid fuel)	mm	Smoke duct: 600 Minimum distance obtained from test										
Average roughness value for the straight modules		According to EN 13384-1 : 2002										
Resistance coefficient to components flow		According to EN 13384-1 : 2002										
Metric screws and bolts						Stai	nless :	steel				



## **Typical composition of a duct**



### Certification

The InoxMono Sabiana range is C C marked according to European Standard EN 1856-2:2009 with the following designations: InoxMono Duct with gasket T200 - P1 - W - V2 - L50050 - O InoxMono Duct without gasket T600 - N1 - D - V2 - L50050 - G InoxMono Smoke duct with gasket T200 - P1 - W - V2 - L50050 - O InoxMono Smoke duct with gasket T200 - P1 - W - V2 - L50050 - O InoxMono Smoke duct with gasket T200 - P1 - W - V2 - L50050 - O InoxMono Smoke duct with gasket T200 - P1 - W - V2 - L50050 - O InoxMono Smoke duct with gasket T200 - P1 - W - V2 - L50050 - O50 InoxMono Smoke duct without gasket T600 - N1 - D - V2 - L50050 - G600M

In addition, the range has been subjected to further tests and has obtained the

voluntary mark

CIG



## Électra 90 / ElectraMatic Electric Unit Heater

The Electra 90 electric unit heaters for horizontal discharge are made in **7** sizes, with heat outputs form 6 to 36 kW. The electrical coil has two-stage sealed electrical resistance made of finned steel tubes, to allow two step operation. The power supply is three phase, 400 V - 50 Hz.

The **ElectraMatic** electric unit heaters for horizontal discharge are made in **5 sizes**, with heat outputs **from 6 to 24 kUJ**. The electrical coil has two-stage sealed electrical resistance made of finned steel tubes, to allow two step operation. The power supply is three phase, 400 V - 50 Hz. These units **come with** an electrical control panel that includes the auxiliary circuits, operating and safety thermostat, and terminal block ready for connection to the line, to the remote control panel and to the room thermostat.

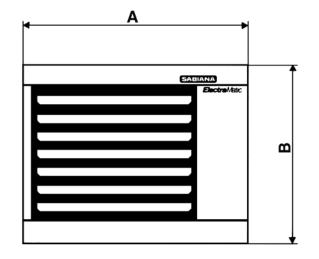
# Technical characteristics of the main components:

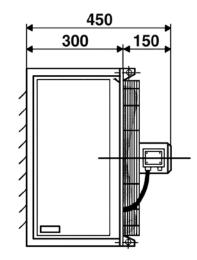
- Covering unit made out of stove-enamelled phosphated steel plate panels.
- Supporting frame in galvanised steel plate.
- Coil with protected electrical resistances, in finned steel pipe. The power is divided into two stages in order to allow it to operate at partialized load.
- Helicoidal fan with light alloy, anti-spark blades, directly connected to the motor axis.
- Asynchronous <u>400U</u> <u>3f</u> <u>50Hz</u>, <u>6</u>–<u>pole</u> motor, with closed construction, class B insulation and IP 44 protection.
- Electrical fan support with sturdy metal basket made of four radial arms and safety mesh basket in round steel pipe.
   The junction between the support and the rear wall of the casing is created by interposing neoprene anti-vibration supports that ensure operation without vibrations and resonance.
- Safety thermostat against overheating.
- Terminal board for electrical connections.

#### ElectraMatic Model:

- Electric motor equipped with thermal protection, incorporated in the wiring, with automatic re-insertion.
- Electrical control panel completely accessible by removing a side panel.
   It includes all control and protection automations, the auxiliary circuits with safety thermostats and the terminal boards ready to be connected to the supply, to the remote control panel, to room thermostat, etc.

## Dimensions, Weight and Technical data





MODEL Electra	06E	09E	11E	17E	24E	30E	36E			
MODEL ElectraMatic			EM6	EM9	EM11	EM17	EM24			
Output		W	6480	9720	11100	16650	24000	30000	36000	
Dowor stopp	1 <sup>st</sup>	W	3240	3240	5550	5550	6000	12000	12000	
Power steps	2 <sup>nd</sup>	W	3240	6480	5550	11100	18000	18000	24000	
Air flow		m³/h	1000	1000	1800	1800	3600	3500	3400	
Leaving air temp. (entering +15°C)	)	°C	33	44	35	44	36	42	47	
Throw		m	6	6	8	8	12	12	12	
Mounting height	Min.	m	2.5	2.5	3.0	3.0	3.0	3.0	3.0	
Mounting height	Max.	m	4.0	4.0	4.5	4.5	5.0	5.0	5.0	
Heliopidel fen		А	0.22	0.22	0.22	0.22	0.47	0.47	0.47	
Helicoidal fan		r.p.m.	900	900	900	900	900	900	900	
400 V - 3f - 50 Hz		W	110	110	110	110	230	230	230	
Noise level at 5 m <b>(*)</b>		dB(A)	43	43	48	48	50	50	50	
Dimensions	А	mm	570	570	650	650	730	730	730	
Dimensions	В	mm	470	470	570	570	670	670	670	
Air outlet eastion	L	mm	400	400	480	480	560	560	560	
Air outlet section	h	mm	320	320	420	420	520	520	520	
Fan		Ø	300	300	400	400	500	500	500	
Weight (approx.) <b>ElectraMatic</b> kg		kg	32	35	43	45	60	-	-	
Weight (approx.) <b>Electra 90</b>		kg	30	33	41	43	58	61	64	

(\*) = The sound pressure levels dB(A) are measured at a distance of 5m, directional factor Q = 2, compliant with the EN 3744 standard.



## Accessories

**Brackets** for wall installation

## 1 100

## Control

**Remote switch** (for ElectraMatic only)





## **FSE** Electric Fan Conuector

The FSE electric fan convectors are made in 5 sizes, with heat outputs from 3 to 8,5 kW.

he electric coil has two-stage sealed electrical resistance made of finned steel tubes to allow two step operation. The power supply is three phase, 400 V - 50 Hz. The first two sizes (**up to 4,5 kW**) can also be supplied in the single-phase version.

**As standard** they are fitted with two speed control, room thermostat and switch for electric heater two step operation.

# Technical characteristics of the main components:

**Uersion:** three-phase 400 V~ (3p + N) or single-phase 230 V~. Only for vertical installation.

**Casing:** in hot dip galvanised and pre-painted steel; it is easily removed for complete access to the unit. The air outlet grill, located on the upper part of the unit, **is reuersible**.

**Fan assembly:** made of ultra-silent double intake **centrifugal fans** with statically and dynamically balanced aluminium impellers keyed directly onto the motor shaft.

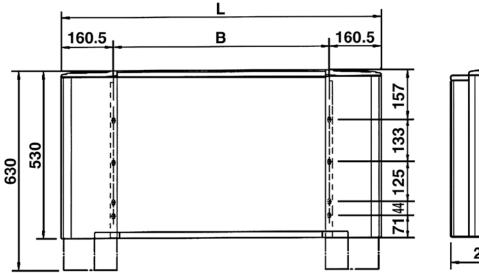
Electric motor: the motor has three speeds with capacitor, and is fitted on sealed for life bearings and is secured on anti-vibration and self-lubricating mountings. Protection IP 20, class B.

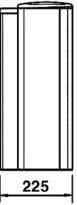
<u>Coil</u>: protected electrical resistances with firmed steel pipe. The power is divided into two stages in order to allow it to operate **at partialized load**.

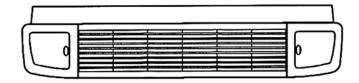
Electrical panel: includes all control and protection automations, auxiliary and safety circuits and the terminal board, ready for connections to the supply line.

**<u>Control</u>**: built-in control with ON-OFF switch, speed switch and room thermostat.

## **Dimensions**, Weight and Technical data







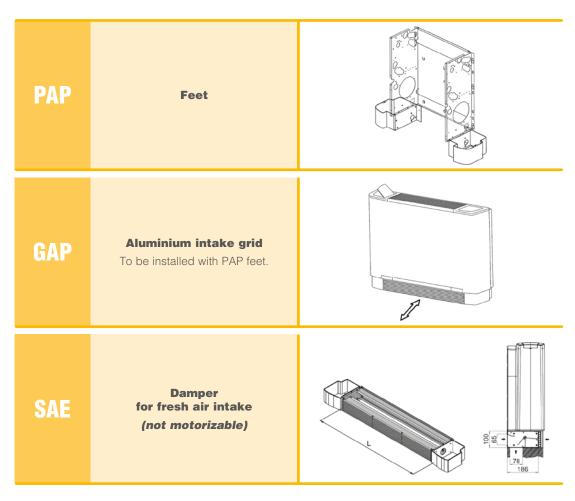
MODEL	DIMENSI	ONS (mm)	WEIGHT WITH PACKAGING					
	В	L	kg					
FSE 1	454	775	27					
FSE 2	669	990	31					
FSE 3	884	1205	39					
FSE 4	1099	1420	45					
FSE 5	1099	1420	45					

			230 U~						400 U~ (3p+N)														
MODEL		FSE 1		FSE 2		FSE 1		FSE 2		FSE 3		FSE 4			FSE 5								
Speed			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air flow		m³/h	190	240	300	290	360	450	190	240	300	290	360	450	380	480	600	650	800	1000	650	800	1000
Heat output		kW	-	1,90	3,00	-	2,90	4,50	-	1,90	3,00	-	2,90	4,50	-	4,00	6,00	-	5,00	7,50	-	5,60	8,50
Motor output		W	20	30	50	45	50	60	20	30	50	45	50	60	60	80	95	65	85	125	65	85	125
Absorbed power (*)		ampère		13,5			20,0			5,0			7,0			9,5			10,0			13,0	
Sound power	Lw	dB(A)	40	45	50	42	47	52	40	45	50	42	47	52	35	42	51	48	56	59	48	56	59
Sound pressure (**)	Lp	dB(A)	31	36	41	33	38	43	31	36	41	33	38	43	26	33	42	39	47	50	39	47	50

(\*) = Figures at high power and high speed.
 (\*\*) = The sound pressure levels are 9 dB(A) lower than the sound power levels and apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.



### Accessories



## Mounted fitted control

- ON-OFF switch.
- Manual 3 speed switch:
- Fan only at low speed.
- Low heating power at medium speed.
- High heating power at high speed.
- Simultaneous thermostatic control of the electric heater and fan.

The unit is equipped with a manually reset safety thermostat that stops power to the electrical coil.





## Primula Miniconvector

#### The **Primula** fan convectors

are units designed for heating residential and commercial environments in the place of traditional static radiators.

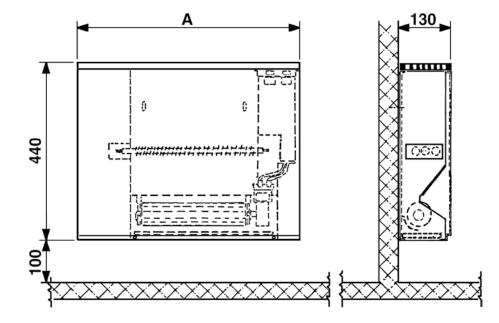
hey are available in **3 SIZES** with electric heaters.

# Technical characteristics of the main components:

- Case in stove-enamelled steel, in light gray RAL 7038.
- Switch controlled two speed silent electrical fan unit.
- Coil with single phase 230V electrical resistances in aluminium and finned to allow uniform heat exchange. The coil power is divided into two stages in order to allow it to operate at partialized load.

vailable upon request with **low temperature cut-out thermostat**.

## Dimensions, Weight and Technical data



1	MODEL		PE 10	PE 15	PE 20		
Electric heater output		W	1000	1500	2000		
Power steps		W	700/1000	1000/1500	1000/2000		
Air flow	High speed	m³/h	120	170	260		
All HOW	Low speed	m³/h	70	100	150		
Noise level at 2 m	High speed	dB(A)	43	43	44		
NUISE IEVEI al 2 III	Low speed	dB(A)	34	34	35		
Dimensions	(A)	mm	560	760	960		
Weight		kg	10	14	16		

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0545/6

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#### SABIANA S.p.A.

Sede e Unità Operativa Via Piave, 53 - 20011 Corbetta (MI) Direzione e uffici amministrativi, progettazione, assistenza, produzione di apparecchiature per il riscaldamento e il condizionamento dell'aria (aerotermi, termostrisce radianti, unità trattamento aria) e canne fumarie Unità Operativa Via Virgilio, 2 - 20013 Magenta (MI) Produzione di ventilconvettori, magazzino e logistica Italia

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#### UNI EN ISO 9001:2008

PER LE SEGUENTI ATTIVITA' FOR THE FOLLOWING ACTIVITIES

#### EA: 18

Progettazione, produzione e assistenza di apparecchiature per il riscaldamento e il condizionamento dell'aria (aerotermi, termostrisce radianti, ventilconvettori e unità trattamento aria) e canne fumarie.

Design, production and service of heating and air conditioning equipment (unit heaters, radiant panels, fan coil units and air handling units) and chimneys.

Riferirsi al Manuale della Qualità per l'applicabilità dei requisiti della norma di riferimento. Refer to Quality Manual for details of application to reference standard requirements.

Il presente certificato è soggetto al rispetto del regolamento per la certificazione del sistemi di gestione per la qualità delle aziende. The use and the validity of this certificate shall satisfy the requirements of the rules for the certification of company quality management systems.

Data emissione First issue 10/06/1996 Emissione corrente Current issue 10/04/2015

Data di scadenza Expiring date 09/04/2018

2 20

ICIM S.p.A. Piazza Don Enrico Mapelli, 75 - 20099 Sesto San Giovanti (MI)



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Sabiana s.p.a. • uia Piaue, 53 • 20011 Corbetta • Milano • Italy phone +39.02.97203.1 r.a. / +39.02.97270429 / +39.02.97270576 • fax +39.02.9777282 / +39.02.9772820 www.sabiana.it • info@sabiana.it