

**SABIANA**  
IL CLIMA AMICO



A leading brand of **AFG**



# 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 controllers (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.



**T**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 advantages 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 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.

# Technical characteristics of the main components:

## Air diffuser:

intake grid, frame and adjustable air distribution louvers on each side, made from ABS.



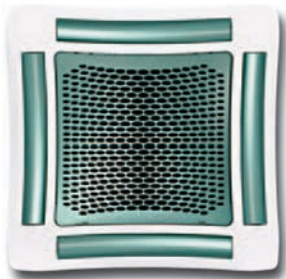
### HTA version

white ABS, RAL 9003



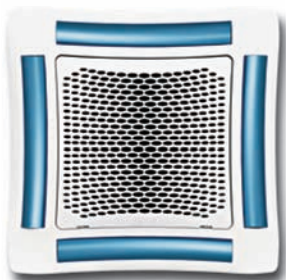
### HTB version

intake grid, frame and louvers in a colour of choice



### HTC version

intake grid and louvers in a colour of choice, plus white ABS frame RAL 9003



### HTD version

louvers in a colour of choice, while the grid and frame are made from ABS, RAL 9003



### MD-600 version

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.

**Air filter:** synthetic washable filter, easily removable.

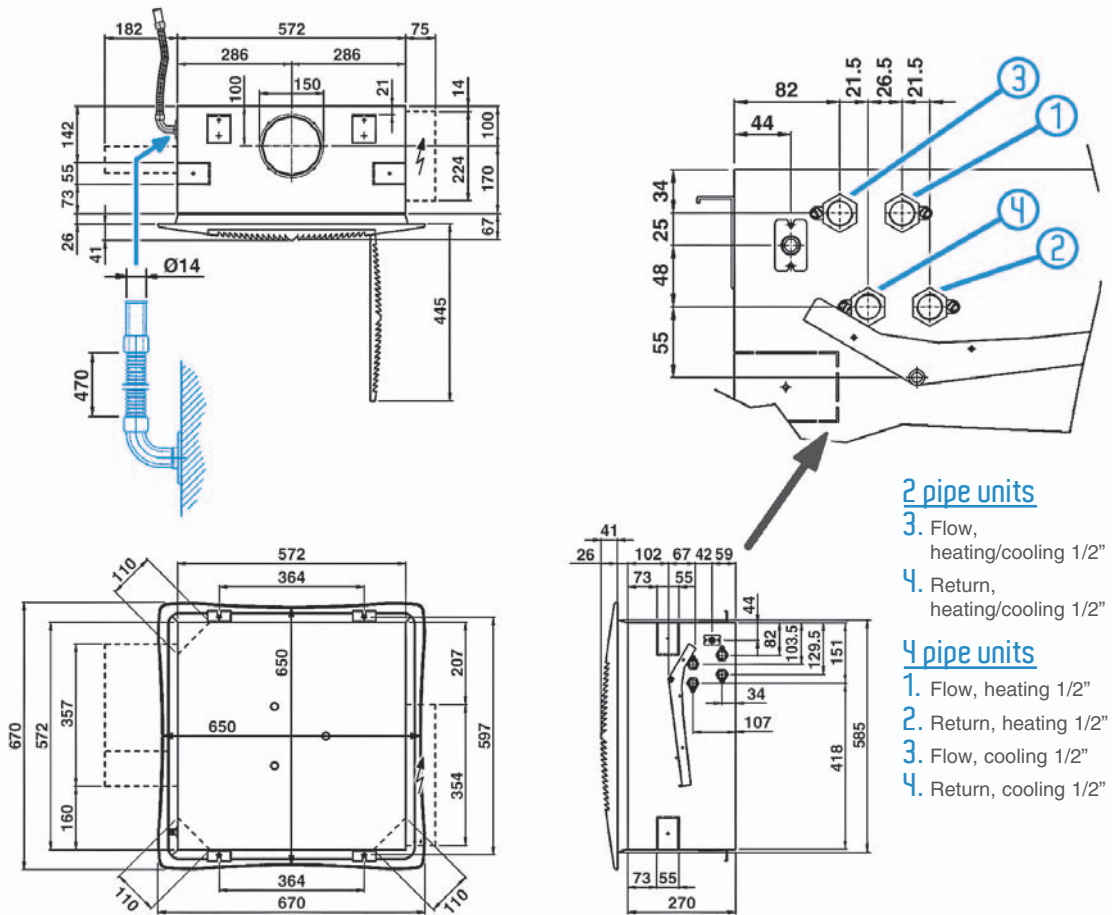
**Condensate pump:** float switch centrifugal pump with 650 mm of maximum head, built into the unit and wired to the control panel on the outside of the casing.

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

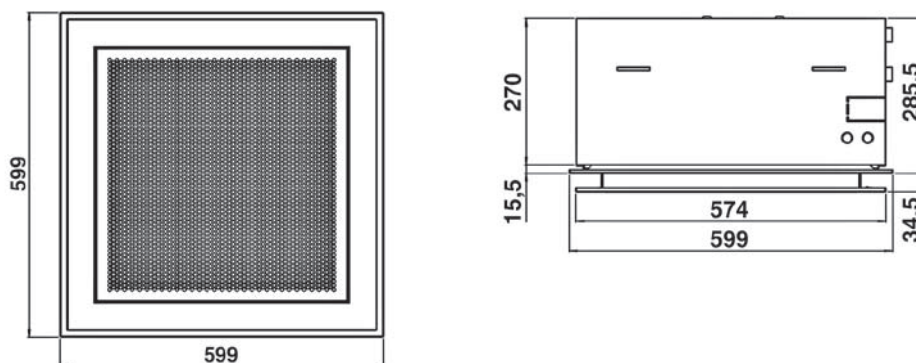


# Dimensions and Weight

SK 12-14 / SK 22-26 / SK 32-36  
(Version 600 x 600)



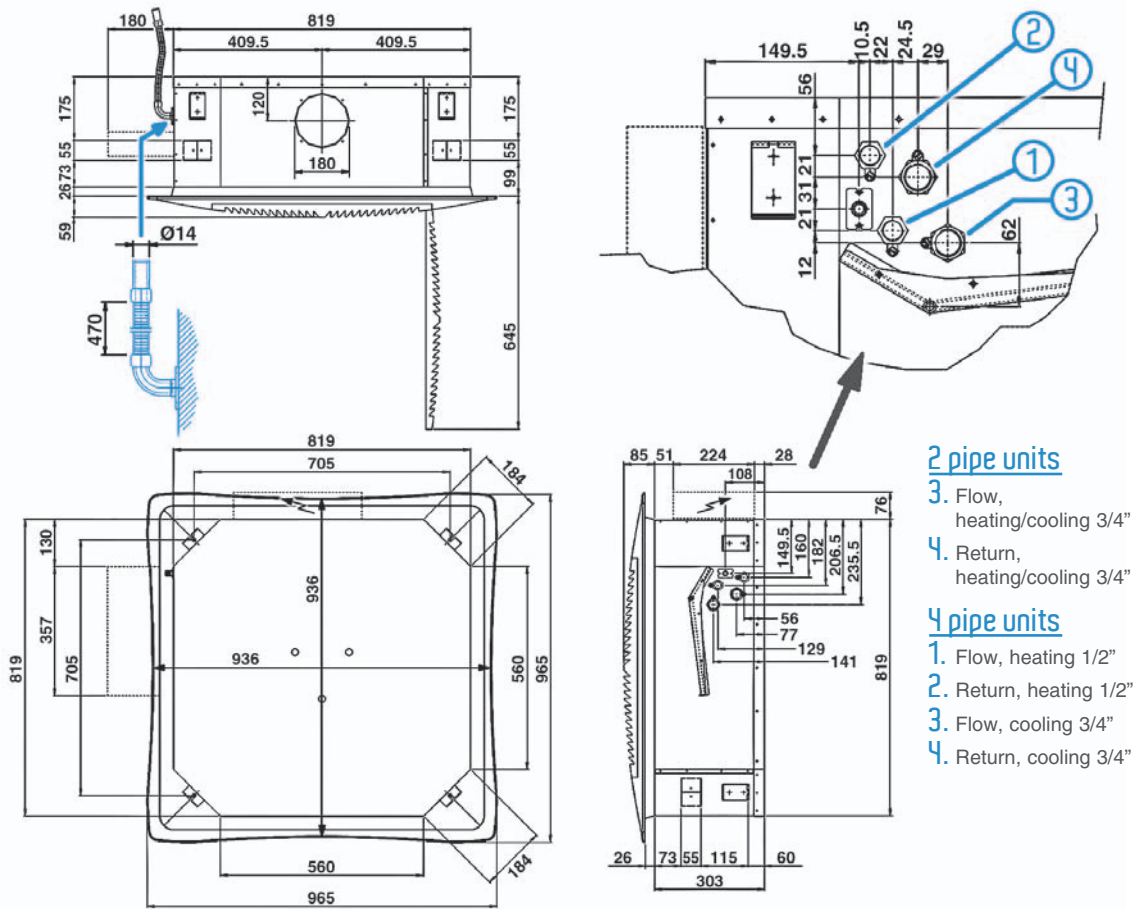
## MD-600 metal diffuser



MODEL	Unit		Diffuser					
	WEIGHTS PACKED UNIT kg	WEIGHTS UNPACKED UNIT kg	WEIGHTS PACKED UNIT kg	WEIGHTS UNPACKED UNIT kg	PACKED UNIT DIMENSIONS (mm)			
					A	B	C	D
SK 12	28	22	6	3	790	350	750	150
SK 14								
SK 22 - 26	30	24	6	3	790	350	750	150
SK 32 - 36								

# Dimensions and Weight

SK 42-44 / SK 52-56  
(Version 800 x 800)



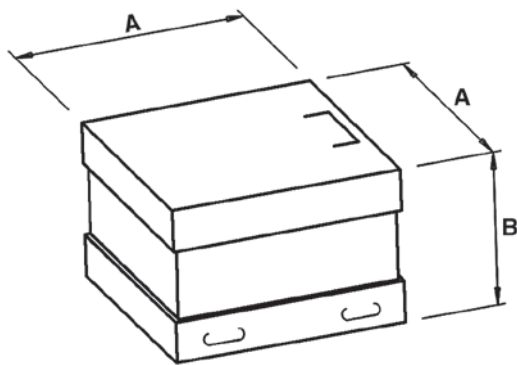
## 2 pipe units

- 3. Flow, heating/cooling 3/4"
- 4. Return, heating/cooling 3/4"

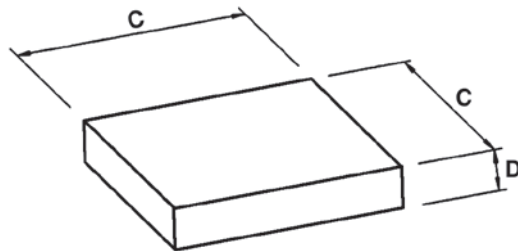
## 4 pipe units

- 1. Flow, heating 1/2"
- 2. Return, heating 1/2"
- 3. Flow, cooling 3/4"
- 4. Return, cooling 3/4"

## Unit



## Diffuser



MODEL	Unit		Diffuser		PACKED UNIT DIMENSIONS (mm)			
	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT	WEIGHTS PACKED UNIT	WEIGHTS UNPACKED UNIT	A	B	C	D
SK 42	44	36	10	6	1050	400	1000	200
SK 44	47	39						
SK 52 - 56								



# Certification

www.eurovent-certification.com  
www.certiflash.com

**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	SK-ECM 12			SK-ECM 22			SK-ECM 32			SK-ECM 42			SK-ECM 52			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																
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 (E)	W	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Water content	l	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 275						820 x 820 x 303								
Energy classification FCEER (**)(E)		A			A			A			A					
Energy classification FCCOP (***)(E)		A			A			A			A					

**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.

**HEATING (winter mode)**

Entering air temperature: +20°C  
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			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																
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 (E)	W	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Cooling water content	l	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	l	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 820 x 303								
Energy classification FCEER (**)(E)		A			A			A			A					
Energy classification FCCOP (***)(E)		A			A			B			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 m³ 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.




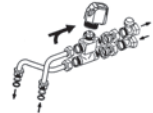





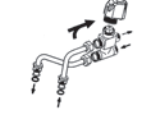
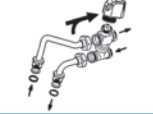



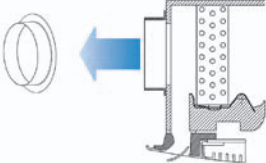
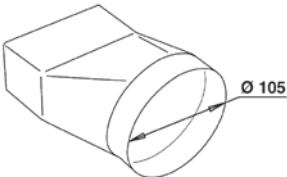
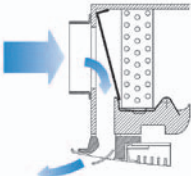
### MCT

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

<p><b>3 way ON-OFF valves with micrometric lockshield valve</b></p> <p>Valve set, 3 ways, ON-OFF, with thermoelectric actuator. The set includes connection pipes and holders.</p>		 <p>SK 12-14 / 22-26 / 32-36</p>  <p>SK 42-44 / 52-56</p>
<p><b>2 way ON-OFF valves with micrometric lockshield valve</b></p> <p>Valve set, 2 ways, ON-OFF, with thermoelectric actuator. The set includes connection pipes and holders.</p>		 <p>SK 12-14 / 22-26 / 32-36</p>  <p>SK 42-44 / 52-56</p>
<p><b>3 way ON-OFF valves with simplified kit</b></p> <p>Valve set, 3 ways, ON-OFF, with thermoelectric actuator. The set includes connection pipes.</p>		 <p>SK 12-14 / 22-26 / 32-36</p>  <p>SK 42-44 / 52-56</p>
<p><b>2 way ON-OFF valves with simplified kit</b></p> <p>Valve set, 2 ways, ON-OFF, with thermoelectric actuator. The set includes connection pipes.</p>		 <p>SK 12-14 / 22-26 / 32-36</p>  <p>SK 42-44 / 52-56</p>
<p><b>CDA</b></p>	<p><b>Air distribution connection</b></p>	
<p><b>CAP</b></p>	<p><b>Fresh air connection</b></p>	 <p>Ø 105</p>
<p><b>PRT</b></p>	<p><b>Fresh air kit</b></p> <p>This is used to introduce fresh air into the environment directly through the diffuser.</p>	

# Wall electronic controls

## SK-ECM version

<b>CR-T-ECM</b>	Continuous fan speed control with electronic thermostat and summer/winter switch
<b>CR-DI-ECM</b>	Continuous fan speed control with electronic thermostat and summer/winter switch
<b>UPM-ECM</b>	Power unit for CR-T-ECM and CR-DI-ECM remote control, fitted on the unit
<b>UPS-ECM</b>	Power unit for CR-T-ECM and CR-DI-ECM remote control, not fitted on the unit

# Electronic controls

## SK-ECM-MB version

<b>T-MB</b>	Wall control (to be used with SK-ECM-MB version only)
<b>RCS-RT03</b>	RT03 infra-red remote control with receiver supplied with separate packaging (to be used with SK-ECM-MB version only)
<b>RT03</b>	RT03 infra-red remote control supplied with separate packaging (to be used with SK-ECM-MB version only)
<b>RCS</b>	Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with SK-ECM-MB version only)
<b>RS</b>	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)
<b>PSM-DI</b>	Multifunction control (to be used with SK-ECM-MB version only)

## Sabianet management system for a network of fan coils

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

**T-MB**



**RT03**



The descriptions and illustrations provided in this publication are not binding: Sabiana reserves the right, whilst maintaining the essential characteristics of the types described and illustrated, to make, at any time, without the requirement to promptly update this piece of literature, any changes that it considers useful for the purpose of improvement or for any other manufacturing or commercial requirements.



**SABIANA**  
IL CLIMA AMICO

A leading brand of  **AFG**

Sabiana s.p.a. • via 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](http://www.sabiana.it) • [info@sabiana.it](mailto:info@sabiana.it)