



Air-air roof-top units



Cooling capacity: 21,9 to 276,6 kW
Heating capacity: 22,3 to 286,5 kW

- Scroll compressors
- R-410A refrigerant
- Flexibility of configuration
- Silent operation

DESCRIPTION

Space PF Heat pumps and Cooling units are Air-Air packaged units of monobloc construction, horizontal compact, Roof-Top type.

They are equipped with axial and centrifugal fans, air coils, hermetic scroll compressors and electronic control with microprocessor, components optimized for use with R-410A refrigerant.

These units have been designed for air conditioning large areas of commercial or industrial use, allowing a quick installation and a reliable operation. A wide range of options will allow to solve numerous requirements of operation.

All units are tested and checked at the factory.

SERIES

Space RPF Series

Air-air packaged **cooling units** of horizontal compact construction roof-top type.

Space IPF Series

Air-air reversible packaged **heat pumps** of horizontal compact construction roof-top type.

RANGE

- RPF - IPF Series: 1 cooling circuit, 1 compressor, 4 models: 90 / 120 / 160 / 180
- RPF - IPF Series: 1 cooling circuit, 2 compressors, 3 models: 240 / 320 / 360
- RPF - IPF Series: 2 cooling circuits, 2 compressors, 4 models: 420 / 485 / 540 / 600
- RPF - IPF Series: 2 cooling circuits, 4 compressors, 2 models: 650 / 720
- RPF - IPF Series: 4 cooling circuits, 4 compressors, 4 models: 840 / 960 / 1100 / 1200.

OPERATING LIMITS

Air inlet conditions		Cooling	Heating
<i>Internal coil</i>	Min.	14 °C WB	10 °C
	Max.	22 °C WB	27 °C
<i>External coil</i>	Min.	12 °C ①	-10 °C WB
	Max.	48 °C ②	15 °C WB

① With condensing pressure control, operating limit up to -10°C.

② With overpowered axial fan, operating limit up to 52°C.



UNITS COMPOSITION

Standard equipment

- Casing of galvanized metal plate with polyester lacquer, RAL 7024 grey graphite colour and white. Thermal insulation of 10 mm thickness with M1 class.
- Chassis support and access panels to the electrical panel, compressors, fans, etc.

External circuit

- Axial fan(s), 2 speeds, driven directly by motor. Leak-tight motor class F, IP55 and internal thermal protection. Dynamically balanced propellers and external protection grille.
- Coils of copper tubes and aluminium fins.

Internal circuit

- Centrifugal fan, driven by belts and pulleys. Electric motor with tensor, class F, IP55 and internal thermal protection. One, two or three turbines of dual intake with curved blades forward. Greased-for-life ball bearings.
- Regenerable air filters, mounted on frame.
- Coils of copper tubes and aluminium fins.
- Condensates drain pan.
- Thermostatic expansion valve(s) with external equalization.

Cooling circuit

- Hermetic compressors scroll type, with acoustic insulation, mounted on antivibratory supports. Control of phase equilibrium and rotation sense.
- Crankcase heater (heat pumps).
- Anti-acid dryer filters.
- Four-ways reverse valve(s) (heat pump units).

Protections

- High and low pressure pressostats.
- Control of compressor discharge temperature.
- Anti-return valve integrated in the compressor.
- Klixon in compressor.
- Main door switch.
- Motors with magnetothermal protection.
- Control circuit automatic switch.

Electrical panel

- Complete electrical panel, totally wired. Panel cover isolated to avoid condensations.
- Transformer for power supply without neuter.
- IP55 protection
- Grounding.
- Motor fans and compressors contactors.

Options

- Casing thermal insulation of 18 mm thick.
- Overpowered axial fans of external circuit.
- EC electronic axial fans with condensing pressure control, adapting its turn speed to the installation requirements, reducing electrical power consumption, the sound level to partial load and improving the seasonal performance rate of the unit.
- Internal circuit fan of high available pressure.
- Discharge position and/or air return in the internal circuit.
- Electronic control: GESCLIMA PRO.

- Assemblies with mixing and free-cooling boxes:
 - 1 damper (non motorized):
 - MT: External air intake with damper.
 - 2 dampers (motorized):
 - MS: External air intake with damper, fitted with return damper.
 - 3 dampers (motorized):
 - MK: Air extraction with overpressure damper.
 - ME: Axial extractor fan with duct.
 - MA: Axial return fan and air extraction with duct (to avoid recirculation).
 - MC: Lower centrifugal return fan MC0 (radial) or in MC1 upper box.
- External coil protection grille.
- Coil of copper tubes and copper fins.
- Coil of copper tubes and aluminium fins with polyurethane coating or blygold polual.
- Hot water coil, with three-ways valve.
- Optional electrical heaters, except for models 90 to 180 with upper discharge.
- In periods with low outdoor temperatures, anti-frost protection of electrical panel with electric heater.
- External circuit condensates drain pan in galvanized steel.
- Internal circuit condensates drain pan in stainless steel.
- Stop-drop in the internal air coil (included in models 1100 and 1200). Recommended for those cases in which is foreseen a high level of humidity in the air or when the air flow is high.
- Stop-drop in the external air intake.
- G4 gravimetric filter.
- Opacimetric folded filters from F6 to F9 + G4 gravimetric filter.
- Fouled filters differential pressostat.
- Air flow control.
- Condensation pressure control by pressostat.
- Motor fans and compressor(s) line protection fuses (from model 90 to 960).
- Power supply with neuter.
- Soft starter of discharge fan, extend the commissioning time, for facilities with cloth ducts.
- Natural or propane gas burner with modulating actuator. 2 versions: heatin support burner and nominal capacity. It is compulsory to use the optional Smoke detection with the gas burner, so that in case of fire, the control stops the burner. It is also recommended to use the optional of fouled filters detector.
- Tropicalized unit. Includes varnish for the elements of electrical panel, internal and external tropicalized fans.
- Standard preassembly mounts of galvanized steel plate and thermally isolated. They are adjustable for height (see drawings). There are two types: *international* and *ERP France*.
- Rubber antivibratory supports.

MRC cooling recovery circuit (models 240 to 1200)

Circuit designed for recuperation, with independent control, adapted to the air renovation requirements to increase both COP and EER values of the whole unit.

- Lower centrifugal fan MRC0 (radial) or in upper box MRC1.
- Air circuit composed of coil of copper tubes and aluminium fins.
- Thermostatic expansion valve with external equalization.
- Hermetic compressor scroll type, with acoustic insulation, mounted on anti-vibratory supports.
- Crankcase heater (heat pumps).
- Four-ways reverse valves (heat pumps).
- Anti-acid dryer filters.
- Boiler tank in the main circuit (from model 240 to 720).



Air-air roof-top units

Space PF

TECHNICAL CHARACTERISTICS

Space PF		90	120	160	180	240	320	360	420	485	
Cooling capacities	Cooling capacity ① (kW)	21,9	30,3	38,4	41,7	59,6	74,4	83,9	104,8	115,2	
	Power input ③ (kW)	8,1	11,1	13,6	16,1	20,3	27,0	31,0	31,9	36,5	
	EER Performance	2,9	3,0	3,0	2,8	3,3	3,0	2,9	3,6	3,4	
Heating capacities	Heating capacity ② (kW)	22,3	30,7	38,6	44,3	62,6	76,3	85,9	107,3	117,3	
	Power input ③ (kW)	6,7	9,5	12,3	13,7	19,5	24,1	30,5	33,6	37,6	
	COP Performance	3,5	3,4	3,3	3,4	3,4	3,3	2,9	3,4	3,3	
External circuit fan	Nominal air flow (m³/h)	8000	13000	19000	20000	22000	24000	30500	42000	42000	
	Avail. static pressure (mm.W.G.)	4									
	Type	Axial									
	Number	1				2					
	Diameter (mm)	630	800				630 + 800			2 x 800	
	Power (kW)	0,7 / 0,4	2,0 / 1,3				0,7 / 0,4 + 2,0 / 1,3			2 x 2,0 / 1,3	
	Speed (r.p.m.)	875 / 650	895 / 705				875 / 650 895 / 705			895 / 705	
Internal circuit discharge fan	Nominal air flow (m³/h)	4000	6000	8700	9000	12000	14300	15900	18000	18200	
	Avail. static pressure (mm.W.G.)	8,3	13,1	9,2	12,8	13,5	11,7	11,3	13,5	11,2	
	Type	Centrifugal									
	Number / n° turbines	1 / 1						1 / 3			
	Power (kW)	0,75	1,1	2,2 ⑤	2,2 ⑤	3	4	4	3	3	
	Speed (r.p.m.)	841	816	690	717	618	645	649	568	581	
Compressor	Type	Scroll									
	Number of compressors	1				2					
	Number of circuits	1						2			
	Number of stages	1				2					
	Type of oil	Copeland 3MAF 32 cST, Danfoss POE 160 SZ, ICI Emkarate RL 32 CF, Mobil EAL Artic 22 CC									
	Oil volume (l)	3	3,3	3,3	6,2	2 x 3,3	2 x 3,3	2 x 6,2	2 x 6,2	2 x 6,2	
Electrical characteristics	Voltage	400 V / III ph / 50 Hz (±5%)									
	Power supply	3 Wires + Ground									
Maximum power input	Compressor(s) (A)	22	29	35	36	58	70	72	87	102	
	External fan(s) (A)	1,3	4,3	4,3	4,3	4,3	5,6	5,6	8,6	8,6	
	Internal fan (A)	2,1	2,7	5,0	5,0	6,9	9,0	9,0	6,9	6,9	
	Control (A)	0,7	0,7	0,7	0,7	1,3	1,3	1,3	1,3	1,3	
	Total (A)	26,1	36,7	45,0	46,0	70,5	85,9	87,9	103,8	118,8	
Refrigerant	Type	R-410A									
	Climate warming potential (GWP) ④	1975									
	Load (kg)	7,6	8,6	9,8	12,9	14,0	16,4	18,5	32,6	33,0	
Dimensions	Length (mm)	2400	2400	2400	2400	2610	2610	2610	4816	4816	
	Width (mm)	1400	1400	1400	1400	2115	2115	2115	2205	2205	
	Height (mm)	1497	1497	1675	1675	1705	1705	2005	1795	1795	
Weight	(kg)	489	515	555	621	828	895	1050	1695	1659	
Condensates draining Ø		Diameter 1 1/4"									

① Cooling capacity for an indoor temperature of 27 °C, 50 % RH (19 °C WB) and 35 °C of outdoor temperature.

② Heating capacity for an indoor temperature of 20 °C and 6 °C WB of outdoor temperature.

③ Total power input by compressor(s) and motorfans in nominal conditions.

④ Climate warming potential of one kg of greenhouse-effect fluored gas relative to one kilogram of carbon dioxide over a period of 100 years.

⑤ In models 160 and 180 with upper discharge it is necessary to change the fan and it is also necessary to change to a 3 kW motor.



TECHNICAL CHARACTERISTICS

Space PF		540	600	650	720	840	960	1100	1200	
Cooling capacities	Cooling capacity ① (kW)	127,5	141,8	154,1	166,4	192,6	212,9	255,2	276,6	
	Power input ③ (kW)	42,4	49,1	50,4	57,5	71,6	84,6	98,1	112,8	
	EER Performance	3,2	3,1	3,3	3,2	3,0	2,8	2,7	2,6	
Heating capacities	Heating capacity ② (kW)	128,1	142,8	155,9	169,8	206,9	233,2	261,0	286,5	
	Power input ③ (kW)	43,0	44,6	50,0	57,1	71,0	81,8	95,9	109,0	
	COP Performance	3,1	3,4	3,3	3,1	3,1	3,0	3,0	2,9	
External circuit fan	Nominal air flow (m³/h)	42000	42000	55000	56000	75000	75000	112500	112500	
	Avail. static pressure(mm.W.G.)	4						2		
	Type	Axial								
	Number	2		4				6		
	Diameter (mm)	2 x 800		2 x 630 + 2 x 800		4 x 800		6 x 800		
	Power (kW)	2 x 2,0 / 1,3		2 x 0,7 / 0,4 + 2 x 2,0 / 1,3		4 x 2,0 / 1,3		6 x 2,0 / 1,3		
	Speed (r.p.m.)	895 / 705		875 / 650 895 / 705		895 / 705		895 / 705		
Internal circuit discharge fan	Nominal air flow (m³/h)	20400	24000	27500	30000	33000	37000	42000	46000	
	Avail. static pressure(mm.W.G.)	12,7	12,7	12,3	14,8	17,7	19,2	15,1	17,9	
	Type	Centrifugal								
	Number / n° turbines	1 / 3								
	Power (kW)	3	5,5	5,5	7,5	11	11	18,5	22	
	Speed (r.p.m.)	561	605	621	651	729	760	858	918	
Compressor	Type	Scroll								
	Number of compressors	2		4						
	Number of circuits	2				4				
	Number of stages	2		4						
	Oil type	Copeland 3MAF 32 cST, Danfoss POE 160 SZ, ICI Emkarate RL 32 CF, Mobil EAL Artic 22 CC								
	Oil volume (l)	2 x 6,2	2 x 6,2	4 x 3,3	4 x 6,2	4 x 6,2	4 x 6,2	4 x 6,2	4 x 6,2	
Electrical characteristics	Voltage	400 V / III ph / 50 Hz (±5%)								
	Power supply	3 Wires + Ground								
Maximum power input	Compressor(s) (A)	116	130	140	144	174	204	232	260	
	External fan(s) (A)	8,6	8,6	11,2	11,2	17,2	17,2	25,8	25,8	
	Internal fan (A)	6,9	11,6	11,6	14,7	22,0	22,0	37,0	42,0	
	Control (A)	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	
	Total (A)	132,8	151,5	164,1	171,2	214,5	244,5	296,1	329,1	
Refrigerant	Type	R-410A								
	Climate warming potential (GWP) ④	1975								
	Load (kg)	35,0	35,4	35,0	41,2	44,0	46,4	57,2	58,0	
Dimensions	Length (mm)	4816	4816	4816	4816	4816	4816	6316	6316	
	Width (mm)	2205	2205	2205	2205	2205	2205	2205	2205	
	Height (mm)	1795	1795	2095	2095	2095	2095	2095	2095	
Weight	(kg)	1732	1786	2071	2249	2335	2333	2803	2914	
Condensates draining Ø		Diameter 1 1/4"								

① Cooling capacity for an indoor temperature of 27 °C, 50 % RH (19 °C WB) and 35 °C of outdoor temperature.

② Heating capacity for an indoor temperature of 21 °C and 6 °C WB of outdoor temperature.

③ Total power input by compressor(s) and motorfans in nominal conditions.

④ Climate warming potential of one kg of greenhouse-effect fluored gas relative to one kilogram of carbon dioxide over a period of 100 years.

TYPES OF POSSIBLE ASSEMBLIES

					<p>Internal air flow</p> <p>I = Air discharge R = Air return N = Fresh air inlet E = Air extraction</p> <p>Designation</p> <p>Mwxy</p> <ul style="list-style-type: none"> Discharge <ul style="list-style-type: none"> 0 = Standard 1 = Optional 2 = Optional Return <ul style="list-style-type: none"> 0 = Standard 1 = Optional 2 = Optional <p>0 = Standard T = External air intake S = 2 puertas K = Extraction with damper E = Extraction fan A = Axial return fan C = Centrifugal return fan RC = Cooling recovery</p> <p>(*) Available from model 240 to 1200</p>



OPTIONS FOR EXTERNAL CIRCUIT

■ Electronic axial fan

Space PF	90	120	160	180	240	320	360	420	485	
Nominal air flow (m ³ /h)	8000	13000	19000	20000	22000	24000	30500	42000	42000	
Max. avail. static pressure (mm.W.G.)	15	12,5								
Number	1					2				
Diameter (mm)	630	800					630 + 800	2 x 800		
Power (kW)	0,9	2,1					0,9 + 2,1	2 x 2,1		
Maximum speed (r.p.m.)	1000	1100					1000 1100	1100		
Max. power input (A)	2	3,4					5,4	6,8		

Space PF	540	600	650	720	840	960	1100	1200	
Nominal air flow (m ³ /h)	42000	42000	55000	56000	75000	75000	112500	112500	
Max. avail. static pressure (mm.W.G.)	12,5								
Number	2		4				6		
Diameter (mm)	2 x 800		2 x 630 + 2 x 800		4 x 800		6 x 800		
Power (kW)	2 x 2,1		2 x 0,9 + 2 x 2,1		4 x 2,1		6 x 2,1		
Maximum speed (r.p.m.)	1100		1000 / 1100		1100		1100		
Max. power input (A)	6,8		10,8		13,6		20,4		

■ Overpowered axial fan

Space PF	90	120	160	180	240	320	360	420	485	
Nominal air flow (m ³ /h)	8000	13000	19000	20000	22000	24000	30500	42000	42000	
Available static pressure (mm.W.G.)	12	7								
Number	1					2				
Diameter (mm)	800					2 x 800				
Power (kW)	2,0 / 1,3	2,2 / 1,5					2 x 2,0 / 1,3	2 x 2,2 / 1,5		
Speed (r.p.m.)	895 / 705	910 / 720					895 / 705	910 / 720		
Max. power input (A)	4,3	5,2					8,6	10,4		

Space PF	540	600	650	720	840	960	1100	1200	
Nominal air flow (m ³ /h)	42000	42000	55000	56000	75000	75000	112500	112500	
Available static pressure (mm.W.G.)	7						5		
Number	2		4				6		
Diameter (mm)	2 x 800		4 x 800				6 x 800		
Power (kW)	2 x 2,2 / 1,5		4 x 2,0 / 1,3		4 x 2,2 / 1,5		6 x 2,2 / 1,5		
Speed (r.p.m.)	910 / 720		895 / 705		910 / 720		910 / 720		
Max. power input (A)	10,4		17,2		20,8		31,2		

OPTIONS FOR INTERNAL CIRCUIT

■ Axial extractor fan (ME assembly)

Space PF		90	120	160	180	240	320	360	420	485
<i>Nominal air flow</i>	(m ³ /h)	2000	3000	4350	4500	6000	7150	7950	9000	9100
<i>Number</i>		1				2				
<i>Diameter</i>	(mm)	450								
<i>Voltage</i>		230 V / 1 ph / 50 Hz								
<i>Power</i>	(kW)	0,48				2 x 0,48				
<i>Speed</i>	(r.p.m.)	1350								
<i>Maximum power input</i>	(A)	2,1				4,2				

Space PF		540	600	650	720	840	960	1100	1200	
<i>Nominal air flow</i>	(m ³ /h)	10200	12000	13750	15000	16500	18500	21000	23000	
<i>Number</i>		2		3			4			
<i>Diameter</i>	(mm)	450								
<i>Voltage</i>		230 V / 1 ph / 50 Hz								
<i>Power</i>	(kW)	2 x 0,48		3 x 0,48			4 x 0,48			
<i>Speed</i>	(r.p.m.)	1350								
<i>Maximum power input</i>	(A)	4,2		6,3			8,4			

■ Axial return fan (MA assembly)

Space PF		90	120	160	180	240	320	360	420	485
<i>Maximum air flow</i>	(m ³ /h)	4000	6000	8700	9000	12000	12400	12400	18000	18200
<i>Number</i>		2							4	
<i>Diameter</i>	(mm)	450							500	
<i>Voltage</i>		230 V / 1 ph / 50 Hz								
<i>Power</i>	(kW)	2 x 0,48							4 x 0,64	
<i>Speed</i>	(r.p.m.)	1350							1270	
<i>Maximum power input</i>	(A)	4,2							12	

Space PF		540	600	650	720	840	960	1100	1200	
<i>Maximum air flow</i>	(m ³ /h)	20400	24000	27500	30000	30000	30000	37500	37500	
<i>Number</i>		4						5		
<i>Diameter</i>	(mm)	450								
<i>Voltage</i>		230 V / 1 ph / 50 Hz								
<i>Power</i>	(kW)	4 x 0,64						5 x 0,64		
<i>Speed</i>	(r.p.m.)	1270								
<i>Maximum power input</i>	(A)	12						15		

■ Lower radial centrifugal return fan (MC0 assembly)

Space PF	90	120	160	180	240	320	360	420	485
Nominal air flow (m ³ /h)	4000	6000	8700	9000	12000	14300	14600	18000	18200
Available static pressure (mm.W.G.)	29	15	33	27	17	10	7	21	21
Number	1			2			4		
Diameter	1 x 500		1 x 560		2 x 500		4 x 500		
Power (kW)	2,7		2,3		2,7 + 1,4		2 x (2,7 + 1,4)		
Speed (r.p.m.)	1700		1350		1700 / 1375		2 x 1700 / 2 x 1375		
Max. power input (A)	4,3		3,6		7,3		14,6		

Space PF	540	600	650	720	840	960	1100	1200
Nominal air flow (m ³ /h)	20400	24000	27500	30000	33000	34600	42000	43500
Available static pressure (mm.W.G.)	19	17	21	12	21	12	11	8
Number	4						5	
Diameter	4 x 500		4 x 560				2 x 500 + 3 x 560	
Power (kW)	2 x (2,7 + 1,4)		2 x (2,3 + 2,4)				2 x 2,7 + 3 x 2,4	
Speed (r.p.m.)	2 x 1700 / 2 x 1375		2 x 1350 / 2 x 1365				2 x 1700 / 3 x 1365	
Max. power input (A)	14,6		17,2				23,6	

■ Centrifugal return fan in upper box (MC1 assembly)

Space PF	90	120	160	180	240	320	360	420	485
Nominal air flow (m ³ /h)	4000	6000	8700	9000	12000	14300	15900	18000	18200
Available static pressure (mm.W.G.)	4,7	7	10,2	7,8	7,7	6,9	7,9	7,9	6,9
Number / n° turbines	1 / 1						1 / 2		
Power (kW)	0,37	1,1	1,5	1,5	2,2	3	4	3	3
Speed (r.p.m.)	548	667	555	564	464	507	540	473	476
Max. power input (A)	1,1	2,7	3,6	3,6	5,0	6,9	9,0	6,9	6,9

Space PF	540	600	650	720	840	960	1100	1200
Nominal air flow (m ³ /h)	20400	24000	27500	30000	33000	37000	42000	46000
Available static pressure (mm.W.G.)	6,6	7,9	8,3	8,7	9,7	9,6	13	12
Number / n° turbines	1 / 2			1 / 3				
Power (kW)	3	4	5,5	7,5	7,5	11	15	15
Speed (r.p.m.)	508	487	492	533	570	612	699	729
Max. power input (A)	6,9	9,0	11,6	14,7	14,7	22,0	29,0	29,0

Note: Consult the performance curves of these fans on pages 101 to 115 of this brochure.