MITSUBISHI ELECTRIC
HYDRONICS & IT COOLING SYSTEMS S.p.A.

SMART HP PF

Packaged air/water reversible heat pumps for indoor installation.
Cooling Capacity: 19 ÷ 36 kW
Heating Capacity: 22 ÷ 42 kW

Scroll compressor
EC Plug Fans
EER up to 2,63
COP up to 3,47
ESEER up to 3,23

SMART HP PF: Air / water reversible heat pumps
for indoor installation, equipped with scroll compressors and plug fan
Cooling Capacity: **19 ÷ 36 kW**
Heating Capacity: **22 ÷ 42 kW**

SMART HP PF

R410A PLATE EC

MAIN FEATURES

- Air / water reversible heat pump.
- 6 models available, for a wide selection opportunity..
- Average step of 3kW.
- EER up to 2,63.
- COP up to 3,47.
- ESEER up to 3,23.
- Scroll compressor.
- R410A Refrigerant charge.
- Single refrigerant circuit.
- Plate type heat exchanger.
- Plug fans EC.
- Single air circuit.
- Suitable for indoor installation.

MAIN BENEFITS

- Availability of kit for the reduction of the noise.
- Availability of pumping groups.
- Availability of partial heat recovery system.
- Plug fans EC for an high efficiency.
- Easily of maintenance.
- Eurovent Certification.
- Up to A+ class. ErP 2015.

FANS WITH BRUSHLESS TYPE EC MOTOR

These electric motors are ensuring high performances, minimum energy consumption and total absence of electromagnetic noise.

INDOOR INSTALLATION

The machines are designed for indoor installation and ducting for air suction and discharge.
For outdoor installation the use of the dedicated optional kit is mandatory.
The machine must be installed under a cover or anyway protected against atmospherics agent.

WORKING LIMITS IN COOLING MODE

Chilled water outlet temperature: -8÷18°C
Ambient temperature: -10÷46°C

WORKING LIMITS IN HEATING MODE

Hot water outlet temperature: 25÷50°C
Ambient temperature: -7÷20°C

MAIN COMPONENTS

FRAMEWORK
- Base, self supporting frame and panelling in steel plate with protective surfaces treatment in compliance with UNI ISO 9227/ASTMB117 and ISO 7253, and painted with epoxy powders.
- Colour: RAL 9002

COMPRESSORS
- Orbiting spiral (SCROLL) hermetic compressors with spiral profile optimized for R410A refrigerant.
- ON / OFF capacity control (0 / 100% each compressor).
- 2-pole 3-phase electric motor with direct on line starting.
- Crankcase heater.
- Electric motor thermal protection via internal winding temperature sensors.
- Terminal box with IP54 enclosure class.
- Rubber supports.

EVAPORATOR
- Copper brazed plate type with cover plates, plates and connections in AISI 316 stainless steel:
- Anticondensate insulation made of neoprene.
- Temperature sensors on water inlet and outlet.
- Differential water pressure switch for water flow control.
- Antifreeze heater.

CONDENSING COIL
- Heat exchanger coil with copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.
- Frame in galvanized steel.

FANS SECTION
- Centrifugal fans with backward curved blades, single suction and without scroll housings (Plug-fan).
- Brushless type synchronous EC motor with integrated electronic commutated system and continuous variation of the rotation speed. The motor rotation control is obtained with the EC system (Electronic Commutation) that manage the motor according to the 0÷10V proportional signal coming from the microprocessor control.
- Maintenance-free bearings
- IP54 enclosure class.

REFRIGERANT CIRCUIT
- Reversing valve for refrigerant circuit inversion.
- Double thermostatic expansion valve.
- Liquid receiver.
- Check valve.
- Sight glass.
- Filter dryer on liquid line.
- Safety valve on high and low pressure side.
- Pressure transducers with indication, control and protection functions, on low and high refrigerant pressure.
- R410A refrigerant charge.

HYDRAULIC ASSEMBLY
- Pumping group with 1 pump, 2 poles electric motor.
- Expansion tank.
- Safety valve.
- Manual filling assembly.
- Pressure gauge.

ELECTRICAL PANEL
In accordance with EN60204-1 norms, suitable for outdoor installation, complete with:
- Main switch with door lock safety from model T19 included.
- Contactors for compressor..
- Transformer for auxiliary circuit and microprocessor supply.
- Panel with machine controls.
- Power supply: 230/1/50 for M models
- Power supply: 400/3/50+N for T models

CONTROL SYSTEM
- Microprocessor control. The system includes:
  - Display for the visualization of the alarm codes, set values and temperature values.
  - Dynamic set point.
  - Compressor running hour meter.
  - Contact for general alarm remotization.
  - “Low Temperature” set for operation with chilled water production up to -10°C.
  - Menu with protection password.

OPTIONAL ACCESSORIES

SMART HP PF	T 13 P1	T 15 P1	T 18 P1	T 22 P1	T 24 P1	T 28 P1	T 32 P1	T 36 P1	T 42 P1
SIZE	C0	C0	C0	C1	C1	C1	C1	C1	C1
733 - Water pump	●	●	●	●	●	●	●	●	●
150 - LNO kit (noise reduction)	●	●	●	●	●	●	●	●	●
172 - Rubber support (kit)	●	●	●	●	●	●	●	●	●
450 - Partial heat recovery	●	●	●	●	●	●	●	●	●
251 - Coils protection nets	●	●	●	●	●	●	●	●	●
920 - Remote control kit	●	●	●	●	●	●	●	●	●
923 - RC-Com MBUS/JBUS Serial board	●	●	●	●	●	●	●	●	●
460 - Kit for outdoor installation	●	●	●	●	●	●	●	●	●
962 - Kit modem GSM	●	●	●	●	●	●	●	●	●
957 - Plantwatch without modem	●	●	●	●	●	●	●	●	●
930 - Remote graphic terminal kit	●	●	●	●	●	●	●	●	●
889 - Master plant SEQUENCER	●	●	●	●	●	●	●	●	●
RC CLOUD PLATFORM	●	●	●	●	●	●	●	●	●

● available accessory; - not available accessory

TECHNICAL DATA SMART HP PF

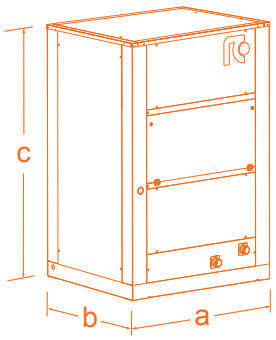
	SMART HP PF SIZE		T 13 P1 C0	T 15 P1 C0	T 18 P1 C0	T 22 P1 C1	T 24 P1 C1	T 28 P1 C1	T 32 P1 C1	T 36 P1 C1	T 42 P1 C1
	Seasonal energy efficiency class (*)	ErP	*	*	*	A+	A+	A	A+	A	A
STANDARD	**Summer working mode**										
	Cooling capacity (1)	**kW**	**12,4**	**14,5**	**16,5**	**18,9**	**21,5**	**25,0**	**26,3**	**31,6**	**35,9**
	Unit power input	kW	5,1	6,1	7,1	7,2	8,3	10,0	11,6	12,8	15,6
	Evaporator water flow rate	m³/h	2,1	2,5	2,8	3,3	3,7	4,3	4,5	5,4	6,2
	Evaporator pressure drop	kPa	25	37	27	27	35	37	29	35	36
	Winter working mode										
	Heating capacity (2)	**kW**	**14,8**	**17,3**	**19,4**	**22,0**	**24,4**	**31,7**	**32,9**	**36,9**	**42,2**
	Unit power input	kW	4,8	5,5	6,4	7,0	8,1	9,4	10,8	12,3	14,7
	Compressors		scroll	scroll	scroll	scroll	scroll	scroll	scroll	scroll	scroll
	Quantity	n.	1	1	1	1	1	1	1	1	1
	Capacity steps	n.	1	1	1	1	1	1	1	1	1
	Centrifugal fans	n.	1	1	1	1	1	1	1	1	1
	Total air flow	m³/h	4000	4800	5500	6500	7000	8500	10000	11000	12000
	External static pressure	Pa	50	50	50	50	50	50	50	50	50
	Air circuits	n.	1	1	1	1	1	1	1	1	1
	Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
	Total refrigerant charge (optional excluded)	kg	6,0	6,0	6,2	10,3	10,4	10,4	10,6	10,7	10,7
	Gas circuits	n.	1	1	1	1	1	1	1	1	1
	Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
	Max unit operating current (FLA)	A	14,1	17,4	17,4	21,3	26,6	27,6	31,4	37,7	40,8
	Unit starting current (LRA)	A	65,6	76,6	102,6	99,3	115,3	122,3	122,9	144,9	178,9
	EER (1)	kW/kW	2,43	2,38	2,34	2,64	2,60	2,50	2,26	2,47	2,30
	COP (2)	kW/kW	3,09	3,13	3,01	3,14	3,02	3,38	3,04	2,99	2,88
	ESEER		3,51	3,37	3,13	3,93	3,89	3,65	3,69	3,46	3,12
	Sound power level [Lw] (3)	dB(A)	85,2	89,2	92,2	87,1	88,7	92,9	92,1	94,2	96,0
	Average sound pressure level [Lpm] (4)	dB(A)	69,5	73,4	76,4	70,6	72,1	76,3	75,6	77,6	79,4
	Net weight	kg	259,8	259,8	279,8	381,5	381,5	386,5	396,5	401,5	406,5
	Hydraulic connections										
	Evaporator IN/OUT - ISO 7/1 – R	Ø	1"	1"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
OPTION	Partial heat recovery (5)										
	Heating capacity	**kW**	4,5	5,3	6,1	**6,9**	**7,9**	**9,2**	**9,7**	**11,6**	**13,2**
	Pumping group										
	1 pump - 2 poles electric motor	kW	0,55	0,55	0,55	0,75	0,75	0,75	0,75	0,75	0,75
LNO KIT 100%	**Summer working mode**										
	Cooling capacity (1)	**kW**	**12,4**	**14,5**	**16,5**	**18,9**	**21,5**	**25,0**	**26,3**	**31,6**	**35,9**
	Unit power input	kW	5,1	6,1	7,1	7,2	8,3	10,0	11,6	12,8	15,6
	Winter working mode										
	Heating capacity (2)	**kW**	**14,8**	**17,3**	**19,4**	**22,0**	**24,4**	**31,7**	**32,9**	**36,9**	**42,2**
	Unit power input	kW	4,8	5,5	6,4	7,0	8,1	9,4	10,8	12,3	14,7
	Total air flow	m³/h	4000	4800	5500	6500	7000	8500	10000	11000	12000
	External static pressure	Pa	50	50	50	50	50	50	50	50	50
	EER (1)	kW/kW	2,43	2,38	2,34	2,64	2,60	2,50	2,26	2,47	2,30
	COP (2)	kW/kW	3,09	3,13	3,01	3,14	3,02	3,38	3,04	2,99	2,88
	Sound power level [Lw] (3)	dB(A)	85,2	89,1	92,1	87,1	88,7	92,8	92,1	94,1	96,0
	Average sound pressure level [Lpm] (4)	dB(A)	69,4	73,4	76,4	70,5	72,1	76,2	75,5	77,5	79,4
LNO KIT 85%	**Summer working mode**										
	Cooling capacity (1)	**kW**	**12,0**	**14,1**	**16,0**	**18,4**	**20,8**	**24,3**	**25,6**	**30,7**	**34,8**
	Unit power input	kW	5,3	6,4	7,3	7,4	8,6	10,4	12,0	13,3	16,2
	Winter working mode										
	Heating capacity (2)	**kW**	**14,5**	**17,1**	**19,1**	**21,7**	**24,0**	**31,2**	**32,4**	**36,3**	**41,6**
	Unit power input	kW	4,8	5,5	6,5	7,0	8,1	9,4	10,8	12,4	14,6
	Total air flow	m³/h	3400	4080	4675	5525	5950	7225	8500	9350	10200
	External static pressure	Pa	36	36	36	36	36	36	36	36	36
	EER (1)	kW/kW	2,26	2,22	2,19	2,48	2,42	2,34	2,13	2,31	2,15
	COP (2)	kW/kW	3,02	3,10	2,96	3,10	2,97	3,32	3,00	2,92	2,84
	Sound power level [Lw] (3)	dB(A)	81,3	85,3	88,3	83,6	85,2	89,3	88,6	90,6	92,5
	Average sound pressure level [Lpm] (4)	dB(A)	65,6	69,5	72,5	67,0	68,6	72,7	72,0	74,0	75,9
LNO KIT 70%	**Summer working mode**										
	Cooling capacity (1)	**kW**	**11,4**	**13,4**	**15,3**	**17,6**	**19,9**	**23,2**	**24,4**	**29,3**	**33,3**
	Unit power input	kW	5,6	6,7	7,8	7,8	9,1	10,9	12,7	14,0	16,9
	Winter working mode										
	Heating capacity (2)	**kW**	**14,2**	**16,7**	**18,7**	**21,3**	**23,5**	**30,5**	**31,7**	**35,5**	**40,6**
	Unit power input	kW	4,8	5,5	6,4	7,0	8,1	9,4	10,8	12,4	14,6
	Total air flow	m³/h	2800	3360	3850	4550	4900	5950	7000	7700	8400
	External static pressure	Pa	25	25	25	25	25	25	25	25	25
	EER (1)	kW/kW	2,03	1,99	1,97	2,25	2,19	2,12	1,92	2,10	1,97
	COP (2)	kW/kW	2,95	3,03	2,90	3,04	2,91	3,24	2,93	2,86	2,78
	Sound power level [Lw] (3)	dB(A)	76,8	80,7	83,6	79,4	81,0	85,1	84,4	86,4	88,3
	Average sound pressure level [Lpm] (4)	dB(A)	61,0	64,9	67,9	62,8	64,4	68,5	67,8	69,8	71,7

1. Referred to chilled water temperature 12/7°C – 0% glycol solution; air temperature to the air/gas heat exchanger 35°C. Fouling factor of the exchangers 0,043 m²°K/kW.
2. Referred to hot water outlet temperature 45°C; air temperature to the air/gas heat exchanger 7°C. Fouling factor of the exchangers 0,043 m²°K/kW.
3. Sound power level [Lw] according to ISO EN 9614 – 2.
4. Average sound pressure level [L_{Pm}] 1m far according to ISO EN 3744.
5. Referred to chilled water temperature 12/7°C – 0% glycol solution; air temperature to the air/gas heat exchanger 35°C; water temperature heat recovery 40/45°C – 0% glycol solution. Fouling factor of the exchangers 0,043 m²°K/kW.

(*) ErP Seasonal energy efficiency class according to energy label directive 2010/30/EU and EU regulation 811/2013.
* Not available for European Market according to EU 813/2013 regulation.

DIMENSIONS (mm)

SIZE C	a	b	c
C1	1250	890	1950



MITSUBISHI ELECTRIC HYDRONICS & IT COOLING SYSTEMS S.p.A.

RC Brand: Via Roma 5 -27010 Valle Salimbene (PV) - Italy
Tel +39 (0) 382 433 811 - Fax +39 (0) 382 587 148
www.rcgroup.it
www.melcohit.com