



NEW
Wall controls
Compliant with ERP 2015 Regulation (EU) No. 327/2011



HPO High Pressure Fan Coil Units

INTRODUCTION

CONTENTS

• Presentation	Page 3
• Construction features	Page 3
• Dimensions, Weight, Water content	Page 4
• Technical features	Page 6
• Main performance and technical characteristics	Page 7
• Cooling emission tables	Page 8
• Heating emission tables	Page 12
• Correction factors table	Page 14
• Operation limits	Page 16
• Water pressure drop	Page 17
• Accessories	Page 18
• Wall electronic controls	Page 28
• Free wireless control system	Page 33
• Controls and units MB version	Page 36
• Management system for a network of fan coils	Page 40
• PSM-DI and NET electronic boards	Page 42

In line with innovative trends and modern industrial design, the **HPO** fan coil range meets today's demanding requirements of performance, size, acoustics, low energy, ease of installation and maintenance.

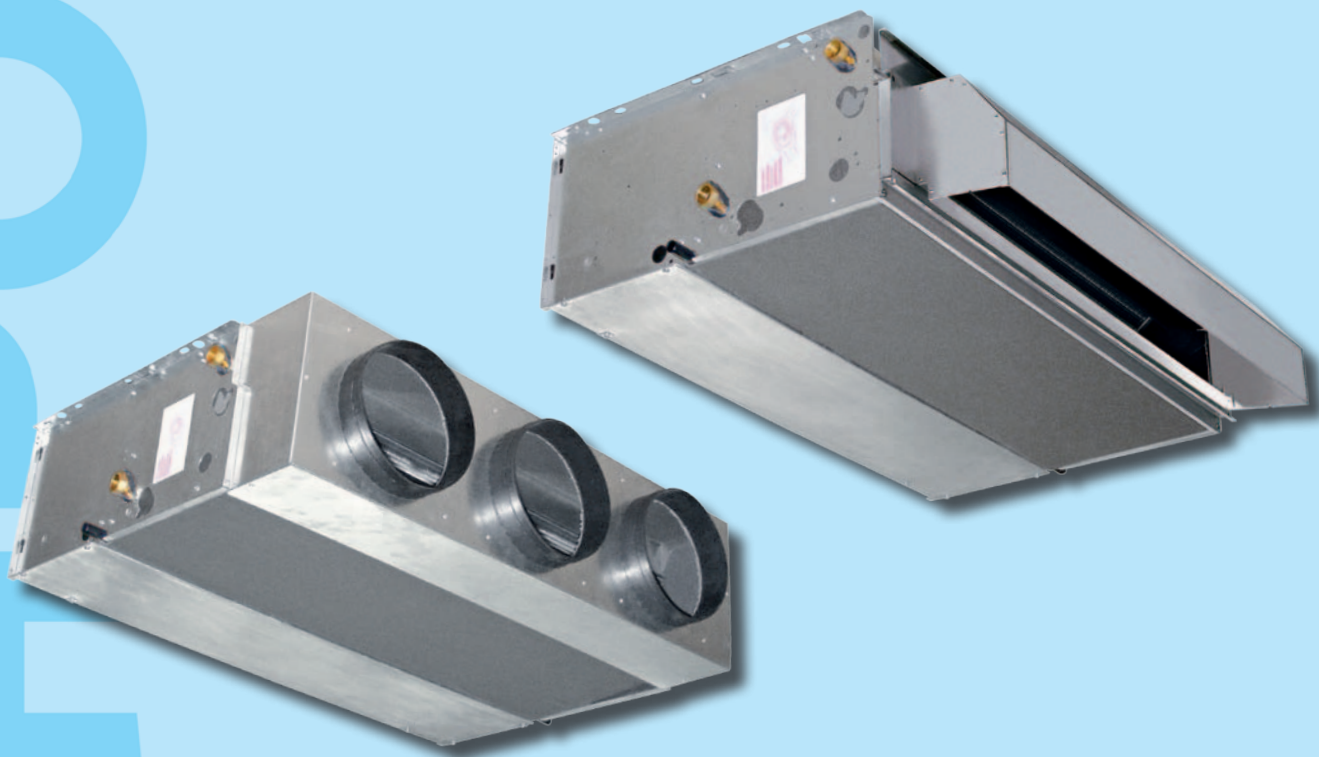
The **HPO** fan coil unit has been designed around a platform of models, versions and accessories.

All **HPO** fan coils with centrifugal fans are equipped with electric motors which reduce electrical consumption comparative to previous models, with 5 speed motors as standard offering greater flexibility in the selection of products.

New market trends have also led to an extension of the four pipe model which now has a two row LTHW coil giving improved outputs at lower flow and return temperatures.

A full range of control options is available including the Free patented wire-less control offering greater flexibility in the installation of units, with the highest precision in monitoring and maintaining the desired comfort conditions.

The **HPO** model is complemented with a full range of accessories: various types of adjustment valves, additional electric heater, auxiliary condensate pump, air inlet/outlet diffusers for fitted installations.

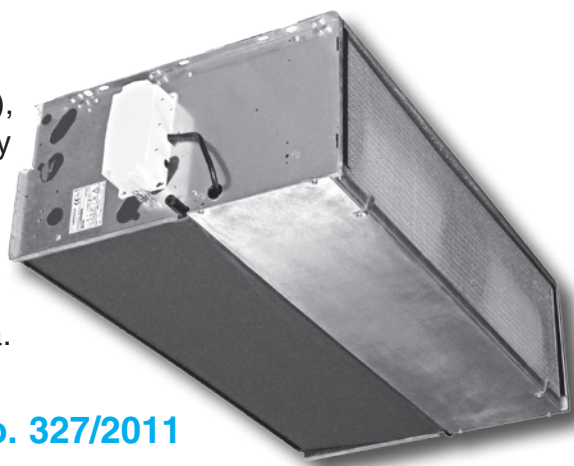


Presentation

HPO version with centrifugal fan

Range includes 4 air flow rates (from 375 to 2220 m³/h), each equipped with 3 or 4 row coil and with the possibility to add a 1 or 2 row coil for 4 pipe systems.

It is the most comprehensive range, perfect 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.



Compliant with ERP 2015 Regulation (EU) No. 327/2011

Construction features

Casing

Made from 1 mm 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.

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 1/2 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 connections are on the left hand side looking from the air outlet of the unit (see picture).

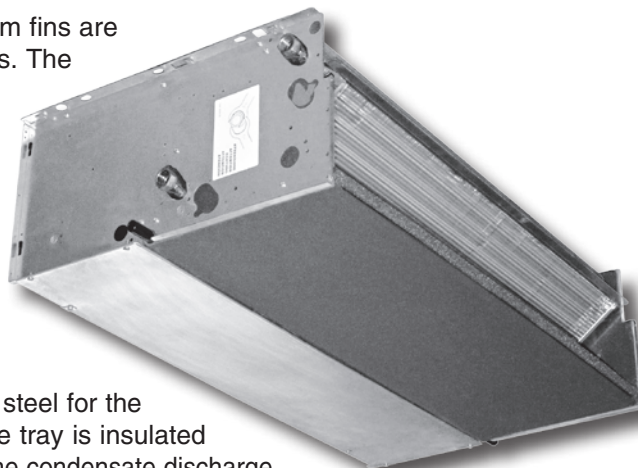
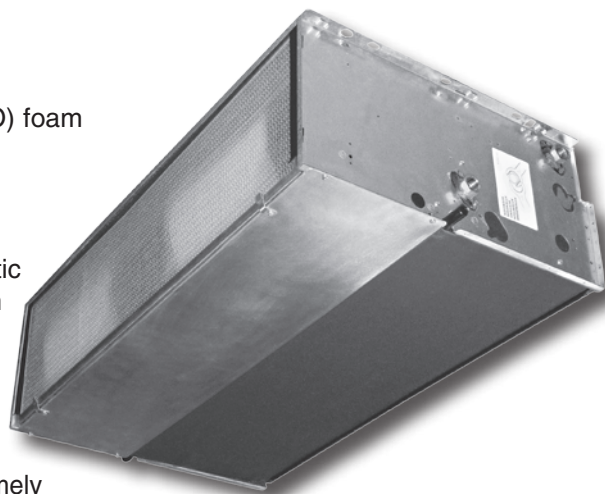
On request or on site the connections can be moved to the other side.

Condensate collection tray

Made from plastic (ABS UL94 HB) for sizes 1÷3 and painted steel for the size 4 with a "L"-shaped 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 15mm.

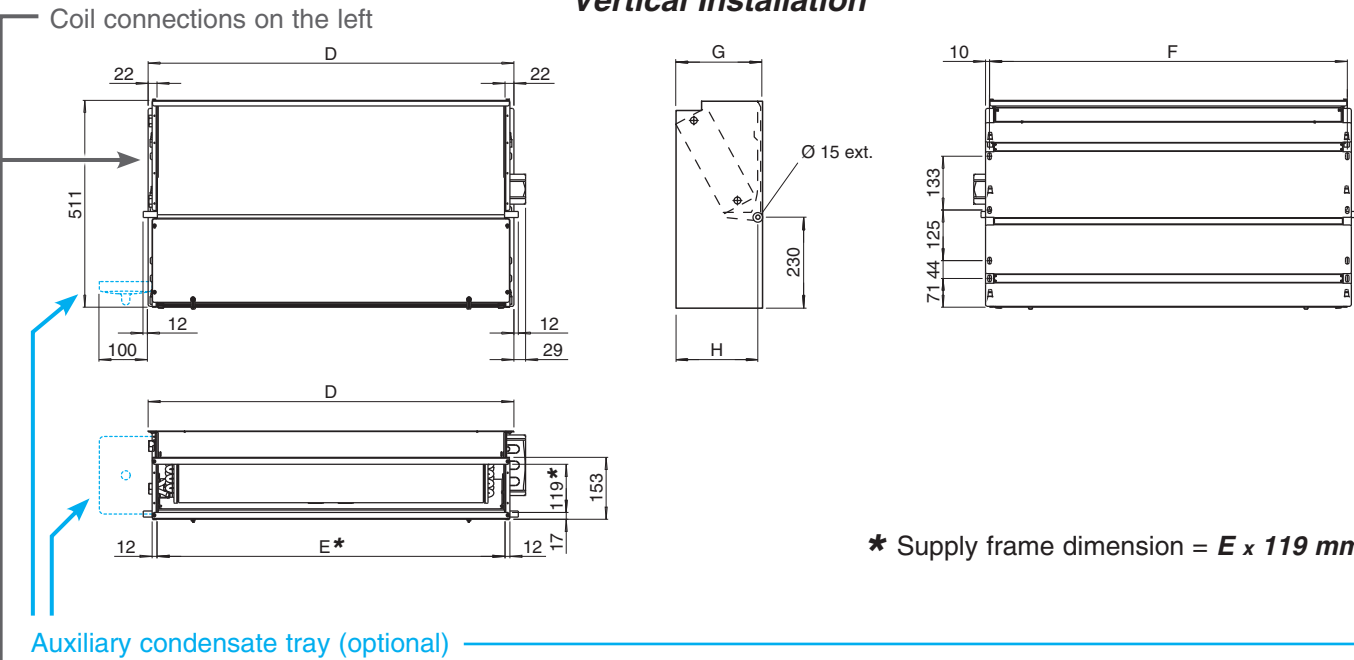
Accessories and Controls

See pages 18 - 28.

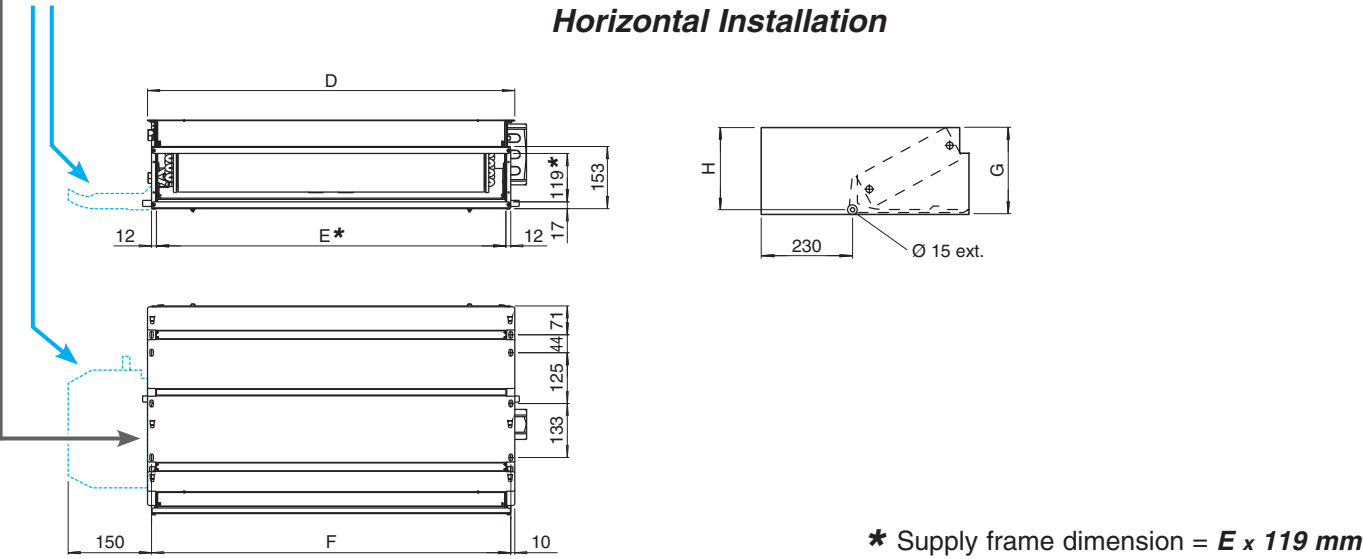


Dimension, Weight, Water content

Vertical Installation

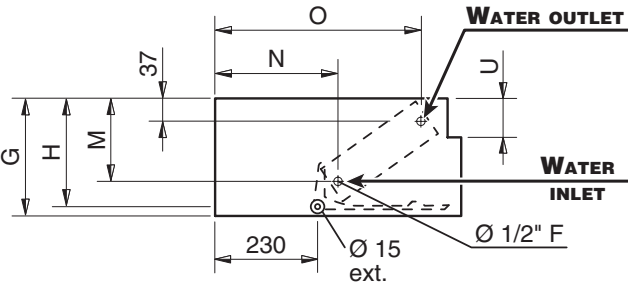


Horizontal Installation

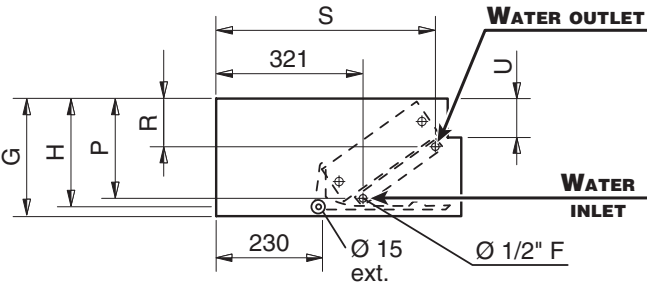


COIL CONNECTIONS

3 or 4 row coils

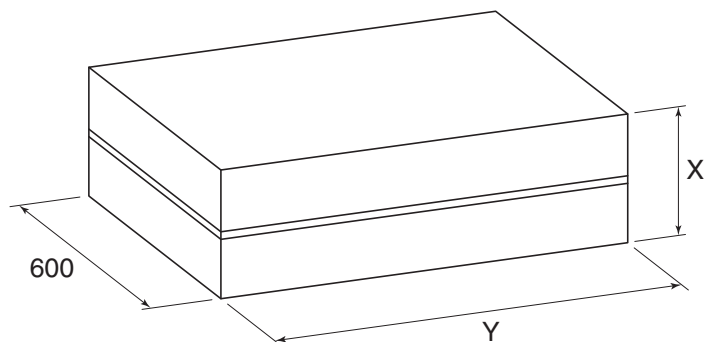


Heating additional coil (1 or 2 rows)



Dimension, Weight, Water content

PACKAGING



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
H	205	235	235	235
M	145	170	170	170
N	260	270	270	270
O	460	450	450	450
P	185	210	210	210
R	105	110	110	110
S	475	465	465	465
U	65	95	95	95
X	260	290	290	290
Y	820	1035	1250	1790

Weight (kg)

		Weight with packaging				Weight without packaging			
MODEL		1	2	3	4	1	2	3	4
Rows	3	19,1	26,1	30,4	47,7	17,3	23,5	27,3	43,3
	3+1	20,3	27,6	32,2	50,0	18,5	25,0	29,1	45,6
	3+2	21,0	28,5	33,3	–	19,2	25,9	30,2	–
	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)

MODEL	1	2	3	4
Rows	3	0,9	1,6	1,9
	4	1,3	2,2	2,8
	+1	0,3	0,5	0,9
	+2	0,6	1,0	–

Technical features

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

COOLING

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

HEATING

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

MODEL		HPO 13			HPO 23			HPO 33			HPO 43		
Speed		2	3	4	2	3	4	2	3	4	1	2	3
Air flow	m³/h	240	285	310	470	525	580	760	885	960	945	1155	1285
Available pressure	Pa	40	50	60	40	50	60	40	50	60	35	50	60
Cooling total emission	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	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	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	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	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	W	40	46	55	82	90	97	107	121	134	140	148	158
Sound power outlet	dB(A)	44	47	50	46	49	51	51	54	57	52	56	58
Sound power inlet + radiated	dB(A)	52	54	57	52	54	57	57	60	63	59	62	64
Sound pressure level outlet (*)	dB(A)	35	38	41	37	40	42	42	45	48	43	47	49
Sound pressure level inlet + radiated (*)	dB(A)	43	45	48	43	45	48	48	51	54	50	53	55
Plenum code		9066363			9069222			9066368			9069224		

MODEL		HPO 14			HPO 24			HPO 34			HPO 44		
Speed		2	3	4	2	3	4	2	3	4	1	2	3
Air flow	m³/h	240	285	310	470	525	580	760	885	960	945	1155	1285
Available pressure	Pa	40	50	60	40	50	60	40	50	60	35	50	60
Cooling total emission	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	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	kW	1,90	2,22	2,40	3,90	4,30	4,69	6,00	6,83	7,31	7,85	9,39	10,30
Dp Cooling	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	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	W	40	46	55	82	90	97	107	121	134	140	148	158
Sound power outlet	dB(A)	44	47	50	46	49	51	51	54	57	52	56	58
Sound power inlet + radiated	dB(A)	52	54	57	52	54	57	57	60	63	59	62	64
Sound pressure level outlet (*)	dB(A)	35	38	41	37	40	42	42	45	48	43	47	49
Sound pressure level inlet + radiated (*)	dB(A)	43	45	48	43	45	48	48	51	54	50	53	55
Plenum code		9066363			9069222			9066368			9069224		

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

COOLING

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

HEATING

Entering air temperature +20°C
Water temperature +70°C E.W.T. +60°C L.W.T.

MODEL		HPO 13+1			HPO 23+1			HPO 33+1			HPO 43+1		
Speed		2	3	4	2	3	4	2	3	4	1	2	3
Air flow	m³/h	240	285	310	470	525	580	760	885	960	945	1155	1285
Available pressure	Pa	40	50	60	40	50	60	40	50	60	35	50	60
Cooling total emission	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	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	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	kPa	9,0	11,5	12,9	11,2	13,0	14,7	11,4	13,7	15,1	8,9	11,5	13,1
Dp Heating	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	W	40	46	55	82	90	97	107	121	134	140	148	158
Sound power outlet	dB(A)	44	47	50	46	49	51	51	54	57	52	56	58
Sound power inlet + radiated	dB(A)	52	54	57	52	54	57	57	60	63	59	62	64
Sound pressure level outlet (*)	dB(A)	35	38	41	37	40	42	42	45	48	43	47	49
Sound pressure level inlet + radiated (*)	dB(A)	43	45	48	43	45	48	48	51	54	50	53	55
Plenum code		9066363			9069222			9066368			9069224		

(*) = 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..

HPO version

Main performance and technical characteristics

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

COOLING

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

HEATING

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

AVAILABLE PRESSURE: 0 Pa

MODEL		HPO 13					HPO 23					HPO 33					HPO 43				
Speed		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Air flow	m³/h	375	410	470	540	595	580	665	765	870	1040	745	950	1150	1320	1415	1000	1360	1705	1980	2220
Cooling total emission	kW	2,22	2,36	2,59	2,84	3,02	3,42	3,75	4,12	4,48	5,01	4,38	5,16	5,85	6,38	6,68	6,21	7,69	8,94	9,84	10,59
Cooling sensible emission	kW	1,64	1,76	1,96	2,18	2,35	2,57	2,86	3,19	3,53	4,05	3,31	4,02	4,66	5,19	5,47	4,59	5,88	7,02	7,88	8,61
Heating	kW	3,62	3,91	4,37	4,89	5,28	5,50	6,15	6,89	7,63	8,76	7,19	8,78	10,23	11,40	12,04	9,90	12,78	15,35	17,31	18,91
Dp Cooling	kPa	16,6	18,5	21,8	25,7	28,7	13,9	16,4	19,4	22,6	27,7	11,1	14,9	18,7	21,9	23,8	9,6	14,1	18,5	22,0	25,1
Dp Heating	kPa	8,9	10,2	12,5	15,3	17,6	7,3	8,9	11,0	13,2	16,9	6,1	8,7	11,5	13,9	15,4	5,0	7,9	11,0	13,6	16,0
Fan	W	41	46	54	65	76	88	95	107	120	140	97	121	143	164	174	163	191	218	237	256
Sound power Lw	dB(A)	47	50	53	56	59	45	47	51	54	59	49	54	59	63	64	49	55	60	64	66
Sound pressure (*)	dB(A)	38	41	44	47	50	36	38	42	45	50	40	45	50	54	55	40	46	51	55	57

MODEL		HPO 14					HPO 24					HPO 34					HPO 44				
Speed		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Air flow	m³/h	375	410	470	540	595	580	665	765	870	1040	745	950	1150	1320	1415	1000	1360	1705	1980	2220
Cooling total emission	kW	2,50	2,68	2,96	3,27	3,50	3,85	4,27	4,72	5,16	5,83	4,73	5,64	6,44	7,06	7,40	6,81	8,56	10,07	11,16	12,05
Cooling sensible emission	kW	1,82	1,96	2,19	2,46	2,66	2,77	3,10	3,47	3,84	4,43	3,47	4,22	4,91	5,47	5,78	4,91	6,34	7,63	8,59	9,41
Heating	kW	3,98	4,31	4,86	5,48	5,95	6,06	6,83	7,71	8,59	9,97	7,64	9,43	11,08	12,41	13,13	10,40	13,57	16,43	18,61	20,40
Dp Cooling	kPa	10,4	11,7	14,1	16,8	19,0	24,3	29,2	35,0	41,2	51,2	9,5	13,0	16,5	19,5	21,2	12,9	19,4	26,0	31,2	35,9
Dp Heating	kPa	5,4	6,2	7,7	9,5	11,1	12,3	15,2	19,0	23,0	30,1	5,0	7,3	9,8	12,0	13,3	7,0	11,4	16,1	20,1	23,7
Fan	W	41	46	54	65	76	88	95	107	120	140	97	121	143	164	174	163	191	218	237	256
Sound power Lw	dB(A)	47	50	53	56	59	45	47	51	54	59	49	54	59	63	64	49	55	60	64	66
Sound pressure (*)	dB(A)	38	41	44	47	50	36	38	42	45	50	40	45	50	54	55	40	46	51	55	57

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

COOLING

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

HEATING

Entering air temperature +20°C
Water temperature +70°C E.W.T. +60°C L.W.T.

AVAILABLE PRESSURE: 0 Pa

MODEL		HPO 13+1					HPO 23+1					HPO 33+1					HPO 43+1				
Speed		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Air flow	m³/h	375	410	470	540	595	580	665	765	870	1040	745	950	1150	1320	1415	1000	1360	1705	1980	2220
Cooling total emission	kW	2,22	2,36	2,59	2,84	3,02	3,42	3,75	4,12	4,48	5,01	4,38	5,16	5,85	6,38	6,68	6,21	7,69	8,94	9,84	10,59
Cooling sensible emission	kW	1,64	1,76	1,96	2,18	2,35	2,57	2,86	3,19	3,53	4,05	3,31	4,02	4,66	5,19	5,47	4,59	5,88	7,02	7,88	8,61
Heating	kW	2,25	2,39	2,61	2,85	3,04	3,28	3,58	3,92	4,25	4,76	4,08	4,79	5,40	5,89	6,16	5,76	7,04	8,14	8,95	9,63
Dp Cooling	kPa	16,6	18,5	21,8	25,7	28,7	13,9	16,4	19,4	22,6	27,7	11,1	14,9	18,7	21,9	23,8	9,6	14,1	18,5	22,0	25,1
Dp Heating	kPa	9,2	10,3	12,0	14,1	15,8	4,8	5,7	6,7	7,7	9,4	6,0	8,0	10,0	11,7	12,7	14,5	20,8	27,0	32,0	36,6
Fan	W	41	46	54	65	76	88	95	107	120	140	97	121	143	164	174	163	191	218	237	256
Sound power Lw	dB(A)	47	50	53	56	59	45	47	51	54	59	49	54	59	63	64	49	55	60	64	66
Sound pressure (*)	dB(A)	38	41	44	47	50	36	38	42	45	50	40	45	50	54	55	40	46	51	55	57

(*) = 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..

Cooling emission of 3 row coil

Entering air temperature: 27°C – R. H.: 50% – Available pressure: 0 Pa

Mod.	Speed	WT: 7/12 °C						WT: 8/13 °C				WT: 10/15 °C				WT: 12/17 °C			
		Qv	Pc	Ps	Qw	Dp(c)	m³/h	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)
		m³/h	kW	kW	l/h	kPa		kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
HPO 13	5		595	3,25	2,32	559	32,8	2,92	2,19	502	26,9	2,26	2,01	389	16,8	1,70	1,70	292	10,0
	4	MAX	540	3,05	2,16	525	29,3	2,74	2,04	472	24,1	2,12	1,86	365	15,0	1,59	1,59	273	8,8
	3	MED	470	2,78	1,95	479	24,9	2,51	1,83	431	20,5	1,93	1,67	333	12,7	1,44	1,44	247	7,4
	2	MIN	410	2,54	1,75	437	21,0	2,29	1,65	393	17,3	1,76	1,49	303	10,7	1,30	1,30	224	6,2
	1		375	2,38	1,64	410	18,8	2,15	1,54	370	15,5	1,65	1,38	284	9,6	1,22	1,22	210	5,5
HPO 23	5		1040	5,42	3,96	931	31,8	4,84	3,78	833	25,9	3,77	3,48	649	16,4	2,85	2,85	489	9,8
	4	MAX	870	4,84	3,47	832	26,0	4,33	3,30	745	21,2	3,36	3,02	577	13,3	2,51	2,51	432	7,8
	3	MED	765	4,45	3,15	765	22,3	3,98	2,99	685	18,2	3,08	2,71	530	11,4	2,29	2,29	395	6,6
	2	MIN	665	4,05	2,83	696	18,8	3,63	2,68	624	15,4	2,80	2,42	481	9,6	2,07	2,07	357	5,5
	1		580	3,68	2,55	633	15,9	3,31	2,40	569	13,0	2,54	2,16	438	8,1	1,88	1,88	323	4,6
HPO 33	5		1415	7,21	5,32	1240	27,3	6,44	5,11	1108	22,2	5,02	4,72	863	14,0	3,79	3,79	651	8,4
	4	MAX	1320	6,91	5,06	1188	25,3	6,17	4,85	1061	20,5	4,80	4,46	825	12,9	3,61	3,61	621	7,7
	3	MED	1150	6,33	4,57	1089	21,6	5,66	4,36	973	17,5	4,38	3,98	754	11,0	3,28	3,28	564	6,5
	2	MIN	950	5,59	3,96	961	17,2	4,99	3,76	859	14,0	3,85	3,40	663	8,7	2,86	2,86	492	5,1
	1		745	4,73	3,28	814	12,8	4,23	3,10	728	10,4	3,26	2,78	560	6,4	2,40	2,40	413	3,7
HPO 43	5		2220	11,43	8,40	1966	28,8	10,21	8,03	1756	23,4	7,95	7,41	1368	14,8	6,00	6,00	1032	8,8
	4		1980	10,63	7,72	1829	25,3	9,51	7,36	1636	20,6	7,38	6,76	1270	12,9	5,54	5,54	953	7,6
	3	MAX	1705	9,66	6,91	1662	21,3	8,64	6,56	1487	17,3	6,68	5,98	1149	10,8	4,99	4,99	858	6,3
	2	MED	1360	8,31	5,82	1430	16,2	7,45	5,50	1281	13,3	5,73	4,96	985	8,2	4,24	4,24	729	4,7
	1	MIN	1000	6,69	4,57	1151	11,0	6,01	4,30	1034	9,0	4,61	3,83	792	5,5	3,38	3,38	581	3,1

Cooling emission of 3 row coil

Entering air temperature: 26°C – R. H.: 50% – Available pressure: 0 Pa

Mod.	Speed	WT: 7/12 °C						WT: 8/13 °C				WT: 10/15 °C				WT: 12/17 °C			
		Qv	Pc	Ps	Qw	Dp(c)	m³/h	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)
		m³/h	kW	kW	l/h	kPa		kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
HPO 13	5		595	2,90	2,20	499	26,8	2,57	2,10	442	21,4	1,97	1,93	339	13,1	1,46	1,46	251	7,6
	4	MAX	540	2,73	2,04	469	24,0	2,41	1,95	415	19,1	1,84	1,78	317	11,7	1,36	1,36	234	6,7
	3	MED	470	2,49	1,83	428	20,3	2,20	1,75	379	16,2	1,67	1,58	288	9,8	1,23	1,23	211	5,6
	2	MIN	410	2,27	1,65	391	17,3	2,01	1,57	346	13,8	1,52	1,41	262	8,3	1,11	1,11	191	4,6
	1		375	2,14	1,54	368	15,4	1,89	1,46	325	12,3	1,43	1,31	246	7,4	1,04	1,04	178	4,1
HPO 23	5		1040	4,82	3,78	829	25,8	4,28	3,63	736	20,7	3,29	3,29	566	12,8	2,45	2,45	422	7,5
	4	MAX	870	4,31	3,30	741	21,1	3,82	3,15	657	16,9	2,92	2,88	502	10,3	2,16	2,16	371	5,9
	3	MED	765	3,96	2,99	682	18,1	3,51	2,85	603	14,5	2,67	2,58	460	8,8	1,96	1,96	338	5,0
	2	MIN	665	3,61	2,68	622	15,4	3,19	2,54	549	12,2	2,42	2,30	417	7,4	1,77	1,77	304	4,2
	1		580	3,29	2,41	566	13,0	2,91	2,28	500	10,3	2,20	2,04	378	6,2	1,60	1,60	275	3,4
HPO 33	5		1415	6,41	5,11	1102	22,1	5,69	4,90	979	17,7	4,38	4,38	754	11,0	3,27	3,27	562	6,4
	4	MAX	1320	6,14	4,84	1056	20,4	5,44	4,64	936	16,4	4,18	4,18	719	10,1	3,11	3,11	535	5,9
	3	MED	1150	5,63	4,36	968	17,5	4,98	4,16	856	13,9	3,81	3,80	655	8,5	2,81	2,81	484	4,9
	2	MIN	950	4,97	3,76	854	13,9	4,39	3,57	755	11,1	3,34	3,24	574	6,7	2,45	2,45	421	3,8
	1		745	4,22	3,11	725	10,4	3,72	2,94	640	8,3	2,81	2,63	483	4,9	2,04	2,04	351	2,7
HPO 43	5		2220	10,17	8,04	1749	23,3	9,02	7,70	1551	18,7	6,94	6,94	1193	11,6	5,17	5,17	889	6,7
	4		1980	9,46	7,37	1628	20,5	8,38	7,04	1442	16,4	6,42	6,42	1105	10,1	4,76	4,76	819	5,8
	3	MAX	1705	8,60	6,57	1479	17,3	7,61	6,26	1309	13,8	5,80	5,69	998	8,4	4,27	4,27	735	4,8
	2	MED	1360	7,40	5,51	1273	13,2	6,54	5,22	1124	10,5	4,96	4,71	852	6,3	3,61	3,61	621	3,5
	1	MIN	1000	5,98	4,31	1028	9,0	5,27	4,07	907	7,1	3,97	3,62	683	4,2	2,86	2,86	492	2,3

Correction factors for different R.H.

R.H.	WT:	7/12°C	8/13°C	10/15°C	12/17°C
48%	Pc	0,95	0,94	1,00	1,00
	Ps	1,00	1,00	1,00	1,00
46%	Pc	0,90	0,88	1,00	1,00
	Ps	1,00	1,00	1,00	1,00

LEGEND

WT = Water temperature

Pc = Cooling total emission

Ps = Cooling sensible emission

Qw = Water flow

Dp(c) = Water pressure drop

Speed = Fan speed

MAX = High speed

MED = Medium speed

MIN = Low speed

Qv = Air flow

Cooling emission of 3 row coil

Entering air temperature: 25°C – R. H.: 50% – Available pressure: 0 Pa

			WT: 7/12 °C					WT: 8/13 °C				WT: 10/15 °C				WT: 12/17 °C			
Mod.	Speed		Qv	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)
			m³/h	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
HPO 13	5		595	2,56	2,10	441	21,4	2,26	2,01	388	16,9	1,71	1,71	294	10,2	1,24	1,24	214	5,7
	4	MAX	540	2,41	1,95	414	19,1	2,12	1,86	364	15,1	1,60	1,60	274	9,0	1,16	1,16	199	5,0
	3	MED	470	2,19	1,75	378	16,2	1,93	1,66	331	12,8	1,45	1,45	249	7,5	1,04	1,04	179	4,1
	2	MIN	410	2,00	1,57	344	13,7	1,76	1,49	302	10,8	1,31	1,31	225	6,3	0,94	0,94	161	3,4
	1		375	1,88	1,46	324	12,3	1,65	1,38	284	9,6	1,23	1,23	211	5,6	0,87	0,87	150	3,0
HPO 23	5		1040	4,27	3,62	734	20,7	3,76	3,47	647	16,5	2,86	2,86	492	10,0	2,24	2,24	385	6,3
	4	MAX	870	3,81	3,15	655	16,9	3,35	3,00	576	13,3	2,53	2,53	435	8,0	1,88	1,88	324	4,6
	3	MED	765	3,49	2,85	601	14,5	3,07	2,71	528	11,4	2,31	2,31	397	6,8	1,67	1,67	287	3,7
	2	MIN	665	3,18	2,55	547	12,2	2,79	2,41	480	9,6	2,09	2,09	359	5,7	1,50	1,50	257	3,1
	1		580	2,90	2,28	498	10,3	2,54	2,16	436	8,1	1,89	1,89	325	4,7	1,35	1,35	231	2,5
HPO 33	5		1415	5,68	4,90	976	17,7	5,01	4,69	861	14,1	3,81	3,81	656	8,5	3,17	3,17	545	6,1
	4	MAX	1320	5,43	4,63	934	16,4	4,78	4,44	823	13,0	3,63	3,63	625	7,8	2,96	2,96	510	5,4
	3	MED	1150	4,96	4,16	853	13,9	4,37	3,97	752	11,0	3,30	3,30	567	6,6	2,59	2,59	446	4,2
	2	MIN	950	4,38	3,58	753	11,1	3,84	3,40	661	8,8	2,88	2,88	496	5,2	2,16	2,16	371	3,0
	1		745	3,71	2,94	638	8,2	3,24	2,78	558	6,4	2,42	2,42	416	3,8	1,72	1,72	296	2,0
HPO 43	5		2220	9,00	7,70	1548	18,7	7,93	7,38	1365	14,9	6,03	6,03	1038	9,0	4,88	4,88	840	6,1
	4		1980	8,36	7,04	1437	16,4	7,36	6,73	1266	13,0	5,57	5,57	959	7,8	4,37	4,37	752	5,0
	3	MAX	1705	7,58	6,26	1304	13,8	6,67	5,96	1147	10,9	5,02	5,02	864	6,5	3,78	3,78	650	3,8
	2	MED	1360	6,51	5,23	1120	10,5	5,71	4,95	983	8,2	4,27	4,27	734	4,8	3,05	3,05	525	2,6
	1	MIN	1000	5,25	4,07	904	7,1	4,60	3,84	790	5,6	3,40	3,40	585	3,2	2,40	2,40	412	1,7

Correction factors for different R.H.

R.H.	WT:	7/12°C	8/13°C	10/15°C	12/17°C
48%	Pc	0,95	0,94	1,00	1,00
	Ps	1,00	1,00	1,00	1,00
46%	Pc	0,90	0,88	1,00	1,00
	Ps	1,00	1,00	1,00	1,00

LEGEND

WT = Water temperature
Pc = Cooling total emission
Ps = Cooling sensible emission
Qw = Water flow
Dp(c) = Water pressure drop

Speed = Fan speed
MAX = High speed
MED = Medium speed
MIN = Low speed
Qv = Air flow

Cooling emission of 4 row coil

Entering air temperature: 27°C – R. H.: 50% – Available pressure: 0 Pa

			WT: 7/12 °C					WT: 8/13 °C				WT: 10/15 °C				WT: 12/17 °C			
Mod.	Speed		Qv	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)
			m³/h	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
HPO 14	5		595	3,78	2,63	651	21,9	3,39	2,49	583	17,8	2,61	2,23	448	11,0	1,92	1,92	331	6,3
	4	MAX	540	3,53	2,44	607	19,3	3,17	2,30	544	15,8	2,43	2,05	418	9,7	1,79	1,79	308	5,6
	3	MED	470	3,19	2,18	549	16,1	2,87	2,05	493	13,2	2,20	1,83	378	8,1	1,61	1,61	277	4,6
	2	MIN	410	2,88	1,95	496	13,4	2,60	1,84	446	11,0	1,99	1,62	342	6,8	1,45	1,44	250	3,8
	1		375	2,69	1,81	463	11,8	2,43	1,70	418	9,8	1,86	1,50	320	6,0	1,35	1,33	233	3,4
HPO 24	5		1040	6,27	4,39	1078	58,3	5,64	4,14	970	48,0	4,37	3,75	751	30,0	3,25	3,25	559	17,5
	4	MAX	870	5,54	3,82	953	46,7	5,00	3,60	861	38,7	3,86	3,24	664	24,0	2,85	2,85	491	13,8
	3	MED	765	5,06	3,45	870	39,7	4,57	3,25	787	32,9	3,52	2,90	606	20,4	2,59	2,59	446	11,6
	2	MIN	665	4,57	3,09	786	33,0	4,13	2,91	711	27,4	3,18	2,58	548	17,0	2,33	2,30	402	9,6
	1		580	4,12	2,77	709	27,4	3,73	2,60	642	22,8	2,88	2,30	495	14,2	2,10	2,04	362	8,0
HPO 34	5		1415	8,00	5,69	1376	24,4	7,15	5,40	1230	19,8	5,51	4,92	948	12,3	4,11	4,11	707	7,2
	4	MAX	1320	7,64	5,40	1314	22,4	6,83	5,12	1174	18,3	5,26	4,65	905	11,3	3,91	3,91	673	6,6
	3	MED	1150	6,96	4,86	1197	19,0	6,22	4,59	1070	15,4	4,78	4,15	822	9,5	3,54	3,54	609	5,5
	2	MIN	950	6,09	4,19	1047	14,9	5,46	3,95	938	12,2	4,19	3,54	720	7,5	3,07	3,07	529	4,3
	1		745	5,10	3,45	876	10,8	4,58	3,24	789	8,9	3,50	2,88	603	5,4	2,56	2,56	440	3,1
HPO 44	5		2220	13,06	9,27	2246	41,4	11,67	8,80	2007	33,7	9,01	7,97	1549	20,9	6,70	6,70	1152	12,2
	4		1980	12,08	8,49	2078	36,0	10,80	8,04	1858	29,3	8,32	7,25	1431	18,1	6,17	6,17	1061	10,5
	3	MAX	1705	10,89	7,56	1873	29,9	9,75	7,14	1677	24,4	7,49	6,40	1289	15,0	5,53	5,53	950	8,6
	2	MED	1360	9,25	6,32	1592	22,3	8,30	5,94	1428	18,2	6,37	5,28	1095	11,2	4,66	4,66	801	6,3
	1	MIN	1000	7,32	4,90	1259	14,6	6,60	4,60	1136	12,1	5,05	4,05	869	7,4	3,67	3,57	631	4,1

Cooling emission of 4 row coil

Entering air temperature: 26°C – R. H.: 50% – Available pressure: 0 Pa

			WT: 7/12 °C				WT: 8/13 °C				WT: 10/15 °C				WT: 12/17 °C				
Mod.	Speed		Qv	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)
			m³/h	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
HPO 14	5		595	3,37	2,49	580	17,8	2,98	2,36	512	14,2	2,25	2,11	388	8,5	1,64	1,64	281	4,7
	4	MAX	540	3,15	2,30	541	15,7	2,78	2,18	479	12,5	2,10	1,94	361	7,5	1,52	1,52	261	4,1
	3	MED	470	2,85	2,06	490	13,1	2,52	1,94	433	10,5	1,90	1,72	326	6,2	1,36	1,36	235	3,4
	2	MIN	410	2,58	1,84	444	11,0	2,28	1,73	392	8,7	1,71	1,53	294	5,2	1,23	1,23	211	2,8
	1		375	2,41	1,71	415	9,7	2,13	1,61	367	7,7	1,60	1,41	275	4,6	1,14	1,14	196	2,5
HPO 24	5		1040	5,62	4,15	966	47,9	4,97	3,94	856	38,3	3,79	3,57	652	23,3	2,78	2,78	478	13,2
	4	MAX	870	4,98	3,61	856	38,5	4,40	3,41	757	30,7	3,34	3,07	575	18,5	2,43	2,43	418	10,4
	3	MED	765	4,54	3,26	781	32,7	4,02	3,08	692	26,1	3,04	2,75	523	15,7	2,20	2,20	379	8,7
	2	MIN	665	4,10	2,91	706	27,2	3,64	2,74	626	21,8	2,74	2,44	472	13,0	1,97	1,97	340	7,1
	1		580	3,71	2,61	637	22,6	3,29	2,45	566	18,2	2,48	2,17	426	10,8	1,77	1,77	305	5,9
HPO 34	5		1415	7,12	5,41	1224	19,8	6,29	5,15	1081	15,7	4,79	4,70	824	9,5	3,52	3,52	606	5,4
	4	MAX	1320	6,80	5,13	1169	18,2	6,00	4,88	1032	14,5	4,56	4,43	785	8,8	3,35	3,35	576	5,0
	3	MED	1150	6,19	4,60	1065	15,4	5,46	4,37	940	12,2	4,14	3,94	712	7,4	3,02	3,02	520	4,1
	2	MIN	950	5,43	3,96	934	12,1	4,79	3,74	824	9,6	3,61	3,35	621	5,7	2,61	2,61	449	3,2
	1		745	4,56	3,25	784	8,9	4,02	3,06	691	7,0	3,02	2,72	519	4,2	2,16	2,16	372	2,3
HPO 44	5		2220	11,61	8,81	1996	33,5	10,27	8,38	1767	26,8	7,81	7,58	1343	16,2	5,73	5,73	986	9,2
	4		1980	10,74	8,05	1848	29,1	9,50	7,64	1635	23,3	7,21	6,88	1240	14,0	5,26	5,26	905	7,9
	3	MAX	1705	9,70	7,15	1668	24,2	8,57	6,76	1473	19,3	6,48	6,06	1114	11,6	4,70	4,70	808	6,4
	2	MED	1360	8,26	5,96	1420	18,1	7,29	5,61	1253	14,4	5,48	4,98	943	8,6	3,94	3,94	678	4,7
	1	MIN	1000	6,56	4,62	1128	12,0	5,79	4,33	996	9,5	4,34	3,81	746	5,6	3,09	3,09	531	3,0

Correction factors for different R.H.

R.H.	WT:	7/12°C	8/13°C	10/15°C	12/17°C
48%	Pc	0,95	0,94	1,00	1,00
	Ps	1,00	1,00	1,00	1,00
46%	Pc	0,90	0,88	1,00	1,00
	Ps	1,00	1,00	1,00	1,00

LEGEND

WT = Water temperature

Pc = Cooling total emission

Ps = Cooling sensible emission

Qw = Water flow

Dp(c) = Water pressure drop

Speed = Fan speed

MAX = High speed

MED = Medium speed

MIN = Low speed

Qv = Air flow

Cooling emission of 4 row coil

Entering air temperature: 25°C – R. H.: 50% – Available pressure: 0 Pa

			WT: 7/12 °C					WT: 8/13 °C				WT: 10/15 °C				WT: 12/17 °C			
Mod.	Speed		Qv	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)	Pc	Ps	Qw	Dp(c)
			m³/h	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa	kW	kW	l/h	kPa
HPO 14	5		595	2,97	2,36	510	14,1	2,60	2,23	447	11,1	1,94	1,94	333	6,5	1,38	1,38	237	3,5
	4	MAX	540	2,77	2,18	477	12,5	2,43	2,06	418	9,8	1,80	1,80	310	5,7	1,28	1,28	220	3,0
	3	MED	470	2,51	1,94	432	10,4	2,19	1,83	377	8,2	1,62	1,62	279	4,7	1,14	1,14	196	2,5
	2	MIN	410	2,27	1,73	390	8,7	1,98	1,63	341	6,8	1,46	1,44	252	3,9	1,02	1,02	176	2,0
	1		375	2,12	1,61	365	7,7	1,85	1,51	319	6,0	1,36	1,33	235	3,4	0,95	0,95	163	1,8
HPO 24	5		1040	4,96	3,94	853	38,2	4,36	3,75	749	30,1	3,27	3,27	563	17,9	2,35	2,35	405	9,8
	4	MAX	870	4,39	3,42	754	30,7	3,85	3,24	662	24,1	2,87	2,87	494	14,1	2,05	2,05	352	7,6
	3	MED	765	4,01	3,08	690	26,1	3,51	2,91	604	20,5	2,61	2,60	450	11,9	1,85	1,85	318	6,3
	2	MIN	665	3,62	2,75	623	21,8	3,17	2,59	546	17,1	2,35	2,30	405	9,9	1,65	1,65	284	5,2
	1		580	3,28	2,45	563	18,1	2,87	2,31	493	14,2	2,12	2,04	364	8,2	1,48	1,48	254	4,2
HPO 34	5		1415	6,27	5,16	1078	55,7	5,50	4,91	946	42,4	4,14	4,14	713	34,4	3,15	3,15	541	12,4
	4	MAX	1320	5,98	4,88	1028	52,4	5,25	4,64	903	41,4	3,94	3,94	678	31,7	2,94	2,94	506	11,9
	3	MED	1150	5,45	4,37	937	47,2	4,77	4,15	821	37,6	3,57	3,57	613	28,6	2,58	2,58	444	10,6
	2	MIN	950	4,77	3,75	820	39,6	4,17	3,54	717	32,5	3,10	3,10	533	24,4	2,20	2,20	378	9,3
	1		745	4,00	3,07	688	31,0	3,49	2,89	601	27,5	2,58	2,56	443	20,1	1,81	1,81	311	7,6
HPO 44	5		2220	10,23	8,37	1759	86,7	8,99	7,96	1546	74,0	6,75	6,75	1161	54,4	5,07	5,07	872	40,0
	4		1980	9,47	7,64	1629	78,2	8,30	7,24	1428	67,3	6,21	6,21	1068	50,7	4,54	4,54	781	36,0
	3	MAX	1705	8,53	6,77	1467	71,2	7,48	6,40	1286	60,1	5,57	5,57	957	44,8	3,95	3,95	680	31,4
	2	MED	1360	7,26	5,62	1248	60,4	6,35	5,29	1092	51,3	4,70	4,69	808	38,5	3,30	3,30	568	26,4
	1	MIN	1000	5,77	4,34	992	47,5	5,04	4,07	866	40,4	3,70	3,57	636	29,2	2,56	2,56	440	20,2

Correction factors for different R.H.

R.H.	WT:	7/12°C	8/13°C	10/15°C	12/17°C
48%	Pc	0,95	0,94	1,00	1,00
	Ps	1,00	1,00	1,00	1,00
46%	Pc	0,90	0,88	1,00	1,00
	Ps	1,00	1,00	1,00	1,00

LEGEND

WT = Water temperature

Pc = Cooling total emission

Ps = Cooling sensible emission

Qw = Water flow

Dp(c) = Water pressure drop

Speed = Fan speed

MAX = High speed

MED = Medium speed

MIN = Low speed

Qv = Air flow

Heating emission of 3 row coil

Entering air temperature: 20°C – Available pressure: 0 Pa

Mod.	Speed	Qv	WT: 70/60 °C				WT: 60/50 °C				WT: 55/45 °C				WT: 50/40 °C				WT: 50/45 °C				WT: 45/40 °C			
			Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	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	kW	l/h	kPa	kW	l/h	kPa
HPO 13	5		595	6,89	593	27,5	5,28	454	17,6	4,48	386	13,3	3,68	316	9,5	4,22	725	42,0	3,42	588	29,3					
	4	MAX	540	6,37	548	23,9	4,89	421	15,3	4,14	356	11,6	3,40	293	8,3	3,90	671	36,5	3,16	544	25,5					
	3	MED	470	5,69	489	19,5	4,37	376	12,5	3,71	319	9,5	3,04	262	6,8	3,49	600	29,9	2,83	487	20,9					
	2	MIN	410	5,09	437	15,9	3,91	336	10,2	3,32	285	7,8	2,72	234	5,5	3,12	536	24,4	2,53	434	17,0					
	1		375	4,71	405	13,9	3,62	312	8,9	3,08	264	6,8	2,53	217	4,9	2,89	497	21,2	2,34	403	14,9					
HPO 23	5		1040	11,43	983	26,4	8,76	754	16,9	7,42	638	12,8	6,08	523	9,1	7,00	1205	40,5	5,67	976	28,2					
	4	MAX	870	9,95	856	20,6	7,63	656	13,2	6,46	555	9,9	5,29	455	7,1	6,10	1049	31,5	4,94	850	22,0					
	3	MED	765	8,99	773	17,1	6,89	592	11,0	5,83	502	8,3	4,79	412	5,9	5,50	946	26,2	4,46	766	18,3					
	2	MIN	665	8,01	689	13,9	6,15	528	8,9	5,21	448	6,8	4,28	368	4,8	4,91	845	21,4	3,98	685	14,9					
	1		580	7,16	615	11,4	5,50	473	7,3	4,66	401	5,5	3,83	329	3,9	4,39	754	17,4	3,56	612	12,2					
HPO 33	5		1415	15,74	1354	24,1	12,04	1035	15,4	10,17	875	11,6	8,32	715	8,2	9,64	1658	36,8	7,80	1342	25,6					
	4	MAX	1320	14,90	1281	21,8	11,40	980	13,9	9,64	829	10,5	7,89	678	7,4	9,12	1569	33,4	7,39	1270	23,2					
	3	MED	1150	13,36	1149	17,9	10,23	880	11,5	8,66	745	8,7	7,09	609	6,1	8,19	1408	27,4	6,62	1139	19,1					
	2	MIN	950	11,47	987	13,6	8,78	755	8,7	7,44	640	6,6	6,10	524	4,7	7,01	1206	20,8	5,69	979	14,5					
	1		745	9,36	805	9,4	7,19	618	6,1	6,09	524	4,6	5,00	430	3,3	5,74	986	14,5	4,66	801	10,1					
HPO 43	5		2220	24,70	2124	24,9	18,91	1626	16,0	16,01	1377	12,0	13,09	1126	8,5	15,12	2601	38,2	–	–	–					
	4		1980	22,61	1945	21,3	17,31	1489	13,6	14,65	1259	10,2	11,99	1031	7,3	13,84	2380	32,5	–	–	–					
	3	MAX	1705	20,09	1727	17,2	15,35	1320	11,0	13,02	1120	8,3	10,68	918	5,9	12,29	2113	26,3	–	–	–					
	2	MED	1360	16,69	1435	12,3	12,78	1099	7,9	10,84	932	6,0	8,89	765	4,2	10,23	1759	18,9	–	–	–					
	1	MIN	1000	12,90	1109	7,7	9,90	851	5,0	8,38	721	3,8	6,89	593	2,7	7,90	1358	11,8	–	–	–					

Heating emission of 4 row coil

Entering air temperature: 20°C – Available pressure: 0 Pa

Mod.	Speed	Qv	WT: 70/60 °C				WT: 60/50 °C				WT: 55/45 °C				WT: 50/40 °C				WT: 50/45 °C				WT: 45/40 °C			
			Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	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	kW	l/h	kPa	kW	l/h	kPa
HPO 14	5		595	7,75	667	17,2	5,95	512	11,1	5,06	435	8,4	4,15	357	6,0	4,74	816	26,3	3,86	663	18,5					
	4	MAX	540	7,14	614	14,8	5,48	471	9,5	4,65	400	7,2	3,82	328	5,2	4,37	752	22,7	3,54	610	15,9					
	3	MED	470	6,32	544	11,9	4,86	418	7,7	4,12	355	5,8	3,39	291	4,2	3,87	665	18,2	3,14	540	12,7					
	2	MIN	410	5,60	481	9,6	4,31	370	6,2	3,65	314	4,7	3,01	259	3,4	3,43	590	14,7	2,79	479	10,3					
	1		375	5,17	444	8,3	3,98	342	5,4	3,38	290	4,1	2,78	239	2,9	3,17	545	12,7	2,57	442	8,9					
HPO 24	5		1040	12,97	1115	26,7	9,97	857	16,9	8,48	729	12,8	6,96	599	9,1	7,94	1367	36,8	5,67	976	28,2					
	4	MAX	870	11,16	960	20,6	8,59	739	13,2	7,30	628	10,5	6,01	517	7,4	6,83	1176	31,5	4,94	850	22,0					
	3	MED	765	10,02	861	17,1	7,71	663	11,0	6,55	564	8,7	5,39	464	6,1	6,13	1054	27,4	4,98	857	18,3					
	2	MIN	665	8,86	762	13,9	6,83	587	8,9	5,80	499	6,8	4,78	411	5,9	5,42	932	21,4	3,98	766	14,9					
	1		580	7,86	676	11,4	6,06	521	7,3	5,16	443	6,1	4,25	365	4,8	4,81	827	17,4	3,56	612	12,2					
HPO 34	5		1415	17,13	1474	20,8	13,13	1129	13,3	11,12	956	10,0	9,11	783	7,2	10,50	1807	31,9	8,50	1462	22,2					
	4	MAX	1320	16,20	1393	18,8	12,41	1067	12,0	10,51	904	9,1	8,60	740	6,5	9,93	1708	28,8	8,04	1382	20,1					
	3	MED	1150	14,45	1243	15,3	11,08	953	9,8	9,38	806	7,4	7,68	660	5,3	8,85	1523	23,4	7,17	1233	16,3					
	2	MIN	950	12,28	1056	11,4	9,43	811	7,3	7,99	687	5,5	6,55	563	3,9	7,52	1293	17,5	6,09	1048	12,2					
	1		745	9,95	856	7,8	7,64	657	5,0	6,49	558	3,8	5,32	458	2,7	6,09	1047	11,9	4,94	849	8,3					
HPO 44	5		2220	26,66	2293	24,9	18,91	1626	16,0	16,01	1377	12,0	13,09	1126	8,5	15,12	2601	38,2	–	–	–					
	4		1980	24,24	2084	21,3	17,31	1489	13,6	15,76	1259	10,2	12,90	1031	7,3	14,85	2555	32,5	–	–	–					
	3	MAX	1705	21,43	1843	17,2	16,43	1413	11,0	13,94	1199	8,3	11,41	982	5,9	13,13	2258	26,3	–	–	–					
	2	MED	1360	17,67	1520	12,3	13,57	1167	7,9	11,53	991	6,0	9,45	813	4,2	10,82	1861	18,9	–	–	–					
	1	MIN	1000	13,52	1163	10,9	10,40	894	5,0	8,82	759	3,8	7,25	623	2,7	8,27	1422	16,7	6,71	1154	11,7					

LEGEND

WT = Water temperature
Ph = Emission
Qw = Water flow

Dp(c) = Water pressure drop
Qv = Air flow
Speed = Fan speed

MAX = High speed
MED = Medium speed
MIN = Low speed

Heating emission of 1 row additional coil

Entering air temperature: 20°C – Available pressure: 0 Pa

			WT: 80/70 °C				WT: 75/65 °C			WT: 70/60 °C			WT: 65/55 °C			WT: 60/50 °C			WT: 55/45 °C		
Mod.	Speed		Qv	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	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
HPO 1	5		595	3,77	324	22,6	3,40	293	19,1	3,04	261	15,8	2,67	230	12,8	2,30	197	9,9	1,93	166	7,4
	4	MAX	540	3,55	305	20,3	3,20	275	17,1	2,85	245	14,1	2,51	216	11,4	2,16	186	8,9	1,82	156	6,6
	3	MED	470	3,24	279	17,2	2,93	252	14,5	2,61	224	12,0	2,29	197	9,7	1,98	170	7,6	1,66	143	5,6
	2	MIN	410	2,96	255	14,6	2,68	230	12,4	2,39	205	10,3	2,10	180	8,3	1,81	156	6,4	1,52	131	4,8
	1		375	2,79	240	13,1	2,52	217	11,2	2,25	194	9,2	1,98	170	7,4	1,71	147	5,8	1,43	123	4,3
HPO 2	5		1040	5,96	512	13,7	5,37	462	11,5	4,76	409	9,4	4,17	359	7,5	3,57	307	5,8	2,97	256	4,3
	4	MAX	870	5,32	457	11,1	4,79	412	9,4	4,25	366	7,7	3,73	320	6,2	3,19	274	4,7	2,66	229	3,5
	3	MED	765	4,90	421	9,6	4,41	379	8,1	3,92	337	6,7	3,43	295	5,3	2,94	253	4,1	2,46	211	3,0
	2	MIN	665	4,48	385	8,2	4,03	347	6,9	3,58	308	5,7	3,14	270	4,5	2,69	232	3,5	2,25	193	2,6
	1		580	4,09	352	7,0	3,68	317	5,8	3,28	282	4,8	2,87	247	3,9	2,47	212	3,0	2,06	177	2,2
HPO 3	5		1415	7,68	660	18,2	6,92	595	15,4	6,16	530	12,7	5,40	465	10,2	4,64	399	7,9	3,89	335	5,8
	4	MAX	1320	7,34	631	16,8	6,62	570	14,2	5,89	507	11,7	5,18	445	9,4	4,45	383	7,3	3,73	321	5,4
	3	MED	1150	6,72	578	14,4	6,06	521	12,1	5,40	464	10,0	4,74	407	8,0	4,08	351	6,2	3,41	294	4,6
	2	MIN	950	5,95	512	11,5	5,37	462	9,7	4,79	412	8,0	4,19	361	6,4	3,62	311	5,0	3,03	261	3,7
	1		745	5,08	437	8,7	4,59	394	7,3	4,08	351	6,0	3,59	308	4,9	3,09	266	3,8	2,59	223	2,8
HPO 4	5		2220	11,93	1026	52,0	10,78	927	44,0	9,63	829	36,6	8,47	729	29,5	7,31	629	23,0	6,17	531	17,3
	4		1980	11,11	956	45,8	10,02	862	38,6	8,95	770	32,0	7,88	678	25,9	6,81	586	20,2	5,73	493	15,1
	3	MAX	1705	10,07	866	38,3	9,11	783	32,5	8,14	700	27,0	7,16	616	21,8	6,19	532	17,0	5,21	448	12,7
	2	MED	1360	8,73	751	29,6	7,88	678	25,0	7,04	605	20,8	6,21	534	16,8	5,36	461	13,1	4,51	388	9,8
	1	MIN	1000	7,13	613	20,6	6,44	554	17,4	5,76	495	14,5	5,08	437	11,7	4,38	377	9,2	3,70	318	6,9

Heating emission of 2 row additional coil

Entering air temperature: 20°C – Available pressure: 0 Pa

			WT: 65/55 °C			WT: 60/50 °C			WT: 55/45 °C			WT: 50/40 °C			WT: 45/40 °C			WT: 45/35 °C			
Mod.	Speed		Qv	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	Qw	Dp(c)	Ph	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
HPO 1	5		595	4,59	394	6,0	3,96	341	4,7	3,33	286	3,5	2,69	232	2,4	2,57	442	7,9	2,06	178	1,5
	4	MAX	540	4,29	369	5,3	3,70	318	4,2	3,11	268	3,1	2,52	217	2,2	2,41	414	7,0	1,93	166	1,4
	3	MED	470	3,88	334	4,5	3,35	288	3,5	2,82	242	2,6	2,29	197	1,8	2,17	374	5,8	1,75	151	1,1
	2	MIN	410	3,51	302	3,7	3,04	261	2,9	2,55	219	2,2	2,07	178	1,5	1,97	339	4,9	1,59	137	1,0
	1		375	3,29	283	3,3	2,84	244	2,6	2,39	206	1,9	1,94	167	1,4	1,85	317	4,3	1,49	128	0,9
HPO 2	5		1040	7,60	654	20,2	6,58	566	15,8	5,55	478	11,9	4,53	389	8,4	4,27	734	26,4	3,49	300	5,3
	4	MAX	870	6,73	579	16,2	5,82	501	12,7	4,92	423	9,5	4,01	345	6,7	3,78	651	21,3	3,10	266	4,3
	3	MED	765	6,15	529	13,8	5,32	458	10,8	4,50	387	8,1	3,67	315	5,7	3,45	594	18,1	2,84	244	3,7
	2	MIN	665	5,56	478	11,5	4,82	414	9,0	4,06	349	6,8	3,32	285	4,8	3,12	537	15,1	2,57	221	3,1
	1		580	5,04	433	9,6	4,35	375	7,5	3,68	317	5,7	3,00	258	4,0	2,83	486	12,6	2,33	200	2,6
HPO 3	5		1415	10,26	882	46,2	8,90	765	36,4	7,52	647	27,4	6,16	530	19,4	5,77	992	60,8	4,77	410	12,5
	4	MAX	1320	9,79	842	42,4	8,49	730	33,4	7,19	618	25,2	5,87	505	17,9	5,50	946	55,8	4,56	392	11,5
	3	MED	1150	8,92	767	35,9	7,73	665	28,2	6,54	562	21,3	5,34	460	15,1	5,00	860	47,0	4,15	357	9,7
	2	MIN	950	7,79	670	28,1	6,76	581	22,2	5,72	492	16,7	4,68	402	11,8	4,38	753	37,0	3,63	312	7,7
	1		745	6,52	561	20,4	5,66	487	16,1	4,79	412	12,2	3,92	337	8,6	3,67	631	26,9	3,06	263	5,6

LEGEND

WT = Water temperature
 Ph = Emission
 Qw = Water flow

Dp(c) = Water pressure drop
 Qv = Air flow
 Speed = Fan speed

MAX = High speed
 MED = Medium speed
 MIN = Low speed

Air flow (m³/h)
depending on speed and requested available pressure

Mod.	Speed		Available pressure (Pa)								
			0	10	20	30	40	50	60	70	80
HPO 1	5		595	565	530	495	455	410	355	297	230
	4	MAX	540	507	475	435	395	348	300	245	185
	3	MED	470	437	403	365	327	285	237	187	130
	2	MIN	410	378	344	305	265	225	180	135	–
	1		375	340	302	260	220	178	137	–	–
HPO 2	5		1040	995	950	900	845	782	720	650	575
	4	MAX	870	825	780	730	680	630	575	515	450
	3	MED	765	710	665	620	572	530	480	430	360
	2	MIN	665	610	560	515	470	430	380	330	–
	1		580	535	495	455	410	370	320	270	–
HPO 3	5		1415	1375	1325	1270	1200	1120	1040	945	845
	4	MAX	1320	1280	1230	1170	1105	1030	950	860	780
	3	MED	1150	1115	1070	1020	960	890	810	730	650
	2	MIN	950	905	860	810	760	700	640	570	500
	1		745	685	640	600	550	505	460	400	340
HPO 4	5		2220	2130	2030	1930	1825	1720	1600	1495	1375
	4		1980	1900	1820	1740	1650	1550	1450	1340	1220
	3	MAX	1705	1650	1585	1520	1450	1380	1295	1200	1100
	2	MED	1360	1330	1300	1260	1215	1160	1090	1000	910
	1	MIN	1000	985	975	955	935	900	870	820	750

Power absorption (Watt)
depending on air flow and available pressure

Mod.	Speed		Available pressure (Pa)								
			0	10	20	30	40	50	60	70	80
HPO 1	5		76	123	121	119	117	115	112	110	107
	4	MAX	65	109	107	105	103	101	99	97	95
	3	MED	54	98	96	94	92	90	88	86	85
	2	MIN	46	89	87	85	83	81	80	78	—
	1		41	81	79	78	76	75	73	—	—
HPO 2	5		140	177	173	169	164	159	154	149	145
	4	MAX	120	144	139	135	130	126	122	118	114
	3	MED	107	125	121	118	114	111	108	105	101
	2	MIN	95	112	106	102	98	95	92	90	—
	1		88	104	99	95	91	88	86	84	—
HPO 3	5		174	326	320	314	306	296	287	276	266
	4	MAX	164	308	302	295	287	278	268	257	248
	3	MED	144	284	278	272	264	255	245	236	227
	2	MIN	122	250	244	238	231	224	218	212	207
	1		97	219	214	210	206	203	200	197	196
HPO 4	5		256	465	452	439	425	411	396	383	368
	4		237	420	409	399	387	374	361	346	330
	3	MAX	219	379	370	362	353	343	331	317	301
	2	MED	191	321	317	311	305	297	287	274	262
	1	MIN	164	274	272	269	266	260	256	248	238

Correction factors for Total cooling emission

Mod.	Speed		Available pressure (Pa)								
			0	10	20	30	40	50	60	70	80
HPO 1	5		1,00	0,97	0,94	0,91	0,86	0,81	0,74	0,66	0,56
	4	MAX	1,00	0,97	0,93	0,89	0,84	0,78	0,71	0,62	0,51
	3	MED	1,00	0,96	0,92	0,87	0,82	0,75	0,66	0,57	0,45
	2	MIN	1,00	0,96	0,91	0,85	0,78	0,70	0,61	0,50	–
	1		1,00	0,95	0,89	0,81	0,73	0,64	0,54	–	–
HPO 2	5		1,00	0,98	0,95	0,93	0,89	0,85	0,81	0,76	0,70
	4	MAX	1,00	0,97	0,94	0,91	0,87	0,84	0,79	0,74	0,67
	3	MED	1,00	0,96	0,93	0,89	0,85	0,81	0,76	0,71	0,63
	2	MIN	1,00	0,96	0,91	0,87	0,82	0,78	0,72	0,66	–
	1		1,00	0,96	0,92	0,88	0,82	0,77	0,70	0,63	–
HPO 3	5		1,00	0,98	0,97	0,94	0,92	0,88	0,84	0,80	0,74
	4	MAX	1,00	0,98	0,96	0,94	0,91	0,87	0,83	0,78	0,74
	3	MED	1,00	0,98	0,96	0,94	0,91	0,87	0,82	0,77	0,72
	2	MIN	1,00	0,97	0,95	0,92	0,89	0,84	0,80	0,74	0,68
	1		1,00	0,96	0,92	0,89	0,85	0,80	0,76	0,69	0,62
HPO 4	5		1,00	0,98	0,95	0,93	0,90	0,87	0,83	0,80	0,76
	4		1,00	0,98	0,96	0,93	0,91	0,88	0,84	0,80	0,76
	3	MAX	1,00	0,98	0,96	0,94	0,92	0,89	0,86	0,82	0,78
	2	MED	1,00	0,99	0,98	0,96	0,94	0,92	0,89	0,84	0,80
	1	MIN	1,00	0,99	0,99	0,98	0,96	0,95	0,93	0,90	0,85

Correction factors for Sensible cooling emission and Heating emission

Mod.	Speed		Available pressure (Pa)								
			0	10	20	30	40	50	60	70	80
HPO 1	5		1,00	0,96	0,92	0,88	0,83	0,76	0,68	0,60	0,49
	4	MAX	1,00	0,96	0,91	0,86	0,80	0,73	0,65	0,55	0,45
	3	MED	1,00	0,95	0,90	0,83	0,77	0,69	0,60	0,50	0,38
	2	MIN	1,00	0,94	0,88	0,81	0,73	0,64	0,54	0,43	–
	1		1,00	0,93	0,86	0,77	0,68	0,57	0,47	–	–
HPO 2	5		1,00	0,97	0,94	0,90	0,86	0,82	0,77	0,71	0,65
	4	MAX	1,00	0,96	0,93	0,88	0,84	0,79	0,74	0,68	0,61
	3	MED	1,00	0,95	0,91	0,86	0,81	0,77	0,71	0,65	0,57
	2	MIN	1,00	0,94	0,89	0,83	0,78	0,73	0,66	0,59	–
	1		1,00	0,94	0,89	0,84	0,78	0,72	0,64	0,57	–
HPO 3	5		1,00	0,98	0,95	0,93	0,89	0,85	0,80	0,75	0,69
	4	MAX	1,00	0,98	0,95	0,92	0,88	0,84	0,79	0,73	0,68
	3	MED	1,00	0,98	0,95	0,92	0,88	0,83	0,78	0,72	0,66
	2	MIN	1,00	0,97	0,93	0,89	0,85	0,80	0,75	0,69	0,62
	1		1,00	0,94	0,90	0,86	0,80	0,75	0,70	0,63	0,56
HPO 4	5		1,00	0,97	0,94	0,91	0,87	0,83	0,79	0,75	0,70
	4		1,00	0,97	0,94	0,91	0,88	0,84	0,80	0,75	0,70
	3	MAX	1,00	0,98	0,95	0,92	0,89	0,86	0,82	0,78	0,73
	2	MED	1,00	0,98	0,97	0,95	0,92	0,89	0,85	0,80	0,75
	1	MIN	1,00	0,99	0,98	0,97	0,95	0,93	0,91	0,87	0,81

HPO version

Operation limits

Highest water inlet temperature.....+ 85 °C

Lowest water inlet temperature.....+ 5 °C

for entering water temperatures below + 5°C, contact the technical department

Highest working pressure..... 1000 kPa (10 bars)

Water flow limits for 3 row coil (l/h)

MODEL	HPO 13	HPO 23	HPO 33	HPO 43
Lowest	100	150	200	300
Highest	750	1000	2000	3000

Water flow limits for 4 row coil (l/h)

MODEL	HPO 14	HPO 24	HPO 34	HPO 44
Lowest	150	150	300	400
Highest	1000	1500	2250	3300

Water flow limits for 1 row additional coil (l/h)

MODEL	HPO 1	HPO 2	HPO 3	HPO 4
Lowest	50	100	100	100
Highest	350	500	750	750

Water flow limits for 2 row additional coil (l/h)

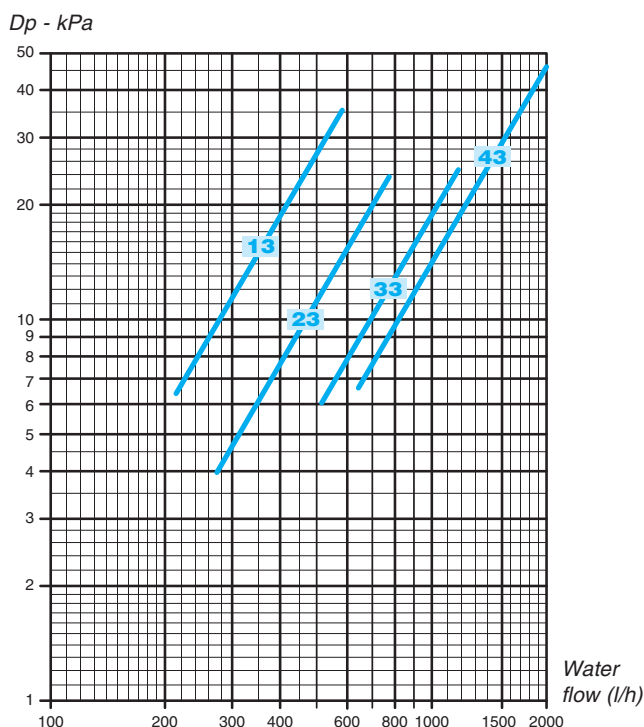
MODEL	HPO 1	HPO 2	HPO 3	HPO 4
Lowest	100	100	100	–
Highest	350	500	750	–

Motor electrical data (max. absorption)

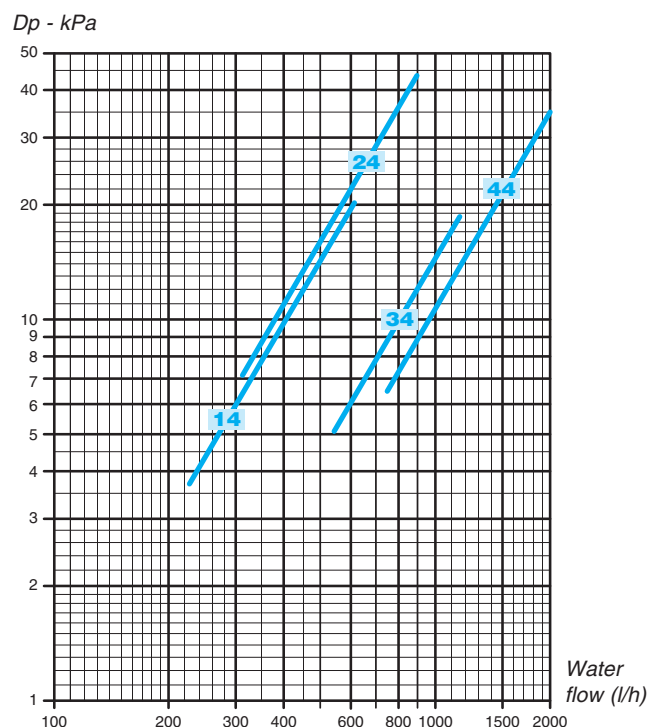
MODEL		HPO 1	HPO 2	HPO 3	HPO 4
230/1 50Hz	W	76	140	174	256
	A	0,33	0,64	0,81	1,22

Water pressure drop

3 row coil



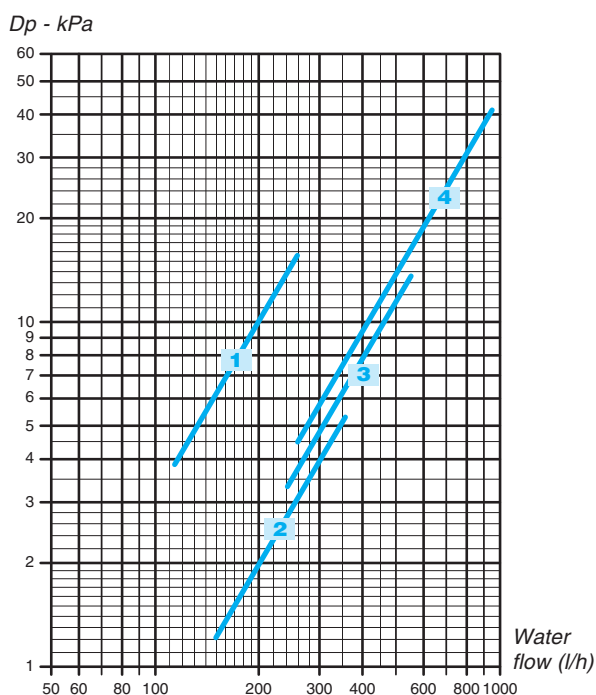
4 row coil



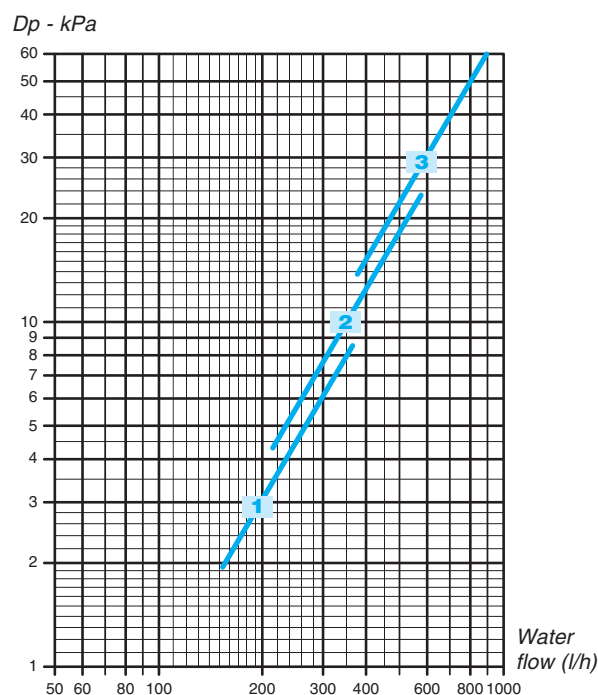
The water pressure drop figures refer to a mean water temperature of **10°C**; for different temperatures, multiply the pressure drop figures by the correction factors **K**.

°C	20	30	40	50	60	70	80
K	0,94	0,90	0,86	0,82	0,78	0,74	0,70

1 row additional coil



2 row additional coil

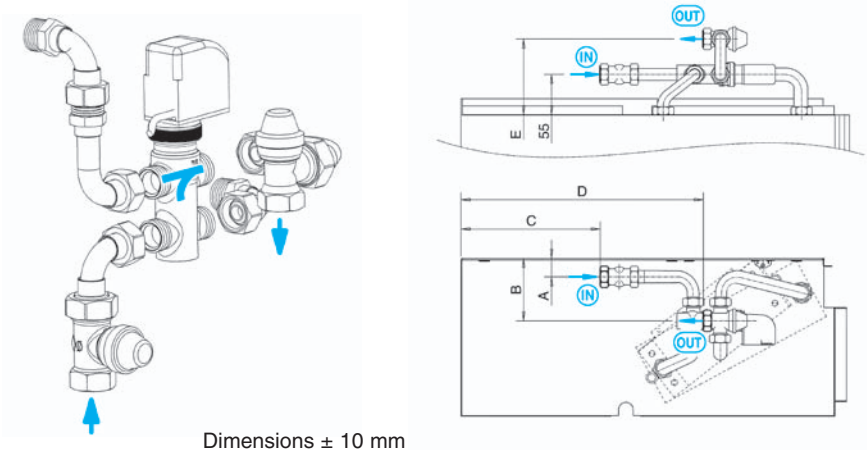


The water pressure drop figures refer to a mean water temperature of **65°C**; for different temperatures, multiply the pressure drop figures by the correction factors **K**.

°C	40	50	60	70	80
K	1,14	1,08	1,02	0,96	0,90

VBP
main coil 3 way valve

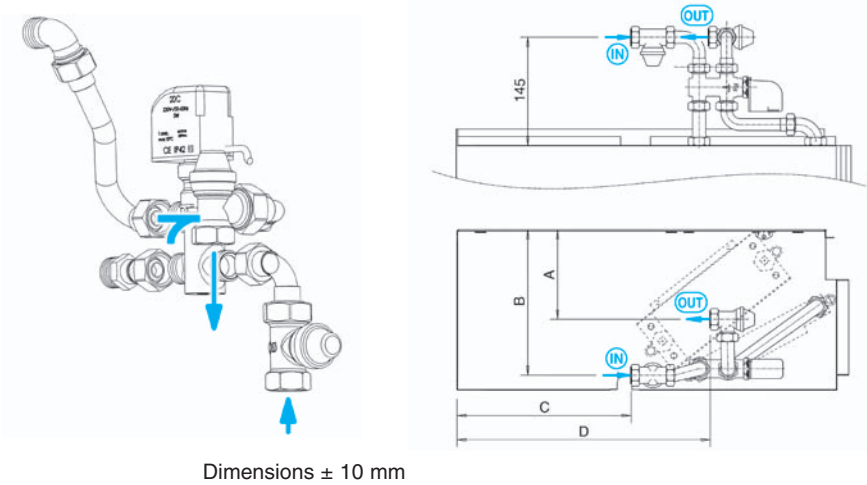
Control valve kit:
3 way valve, ON-OFF,
with electric motor and mounting kit
with micrometric lockshield valve.



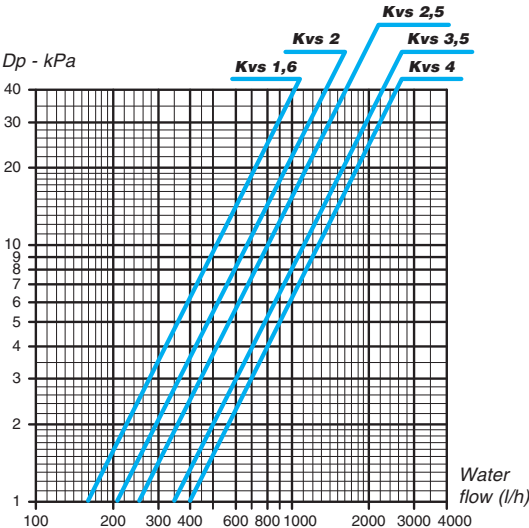
Mod.	Dimensions (mm)					Valve			Micrometric lockshield valve			Code	
	A	B	C	D	E	DN	(Ø)	Kvs	DN	(Ø)	Kvs	FITTED	NOT FITTED
1	25	85	190	290	105	15	1/2"	1,6	15	1/2" F	2	9066561H	9066560H
2	25	85	190	290	105	20	3/4"	2,5	15	1/2" F	2	9060471H	9060474H
3	50	120	185	290	105	20	3/4"	2,5	15	1/2" F	2	9060471H	9060474H
4	50	120	185	290	105	20	3/4"	4	20	3/4" F	3,5	9069202H	9069200H

VBA
additional coil 3 way valve

Control valve kit:
3 way valve, ON-OFF,
with electric motor and mounting kit
with micrometric lockshield valve.



Mod.	Dimensions (mm)				Valve			Micrometric lockshield valve			Code	
	A	B	C	D	DN	(Ø)	Kvs	DN	(Ø)	Kvs	FITTED	NOT FITTED
1 - 2	120	195	240	340	15	1/2"	1,6	15	1/2" F	2	9060472H	9060475H
3	135	200	235	330	15	1/2"	1,6	15	1/2" F	2	9060472H	9060475H
4	135	200	235	330	15	1/2"	1,6	15	1/2" F	2	9060472H	9060475H

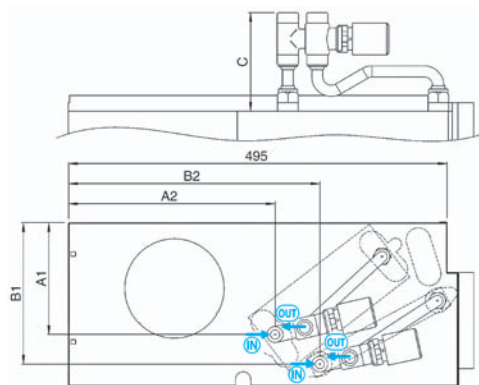
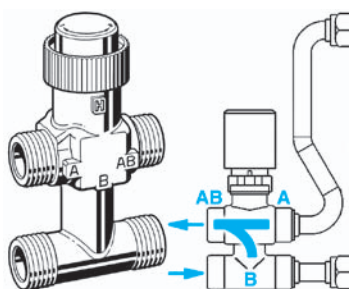


Accessories for **HPO** version

VS

simplified kit for 3 way valve

3 way valve, (ON-OFF)
with electric motor and mounting kit.
Valve with flat connection
without micrometric lockshield valve.



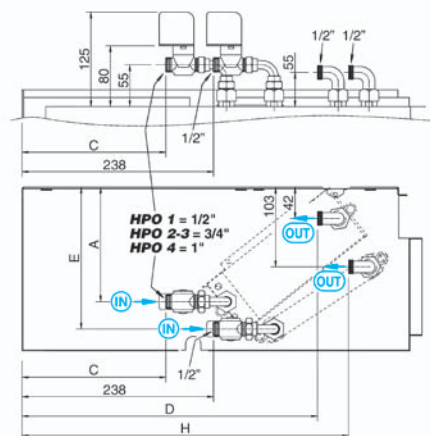
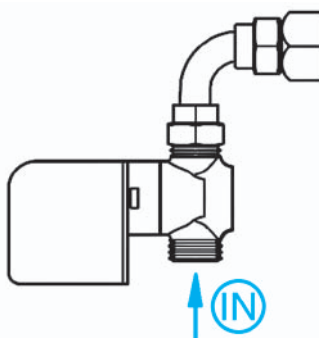
Dimensions ± 10 mm

Mod.	Dimensions (mm)					MAIN					ADDITIONAL				
	MAIN		ADDITIONAL		C	Valve			Code		Valve			Code	
	A1	A2	B1	B2		DN	(Ø)	Kvs	FITTED	NOT FITTED	DN	(Ø)	Kvs	FITTED	NOT FITTED
1	152	270	185	330	116	15	1/2"	1,6	9066571H	9066570H	15	1/2"	1,6	9060483H	9060480H
2	152	268	185	330	124	20	3/4"	2,5	9060484H	9060481H					
3	177	270	210	327	124	20	3/4"	2,5	9060484H	9060481H					
4	177	270	210	329	124	20	3/4"	4	9069205H	9069204H					

V2

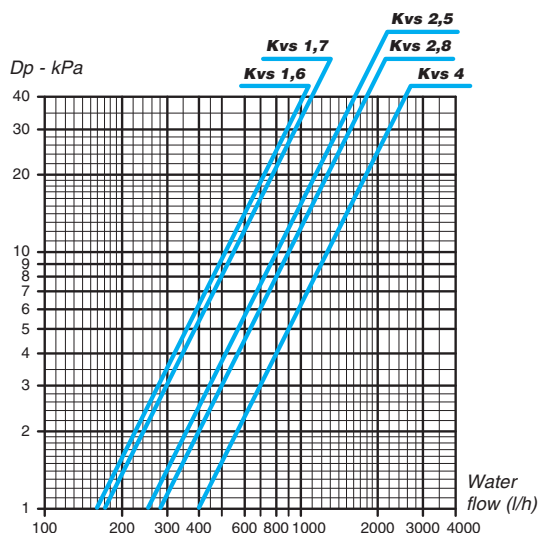
2 way valve for main and additional coil

Control valve kit:
2 way valve, ON-OFF,
with electric motor and mounting kit.



Dimensions ± 10 mm

Mod.	Dimensions (mm)					MAIN					ADDITIONAL				
	MAIN		ADDITIONAL		H	Valve			Code		Valve			Code	
	A	C	D	E		DN	(Ø)	Kvs	FITTED	NOT FITTED	DN	(Ø)	Kvs	FITTED	NOT FITTED
1	149	180	438	186	456	15	1/2"	1,7	9060476H	9060478H	15	1/2"	1,7	9060476H	9060478H
2	150	181	438	186	456	20	3/4"	2,8	9060477H	9060479H					
3	176	175	422	210	440	20	3/4"	2,8	9060477H	9060479H					
4	176	175	422	210	440	25	1"	4	9069203H	9069201H					



3 way double valve kit for 4 tube installation and single coil

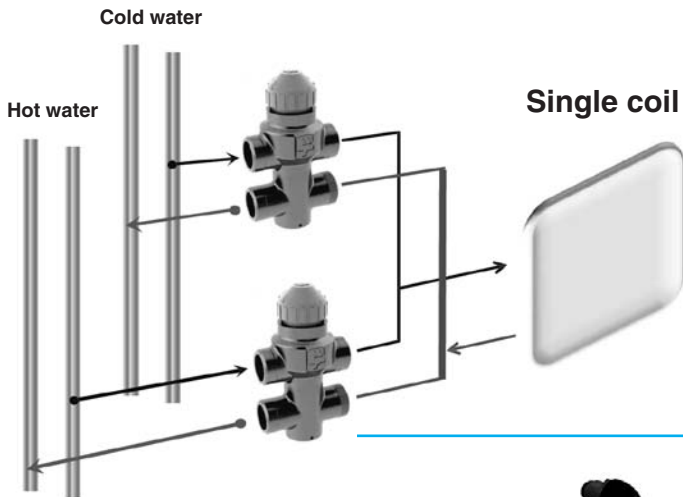
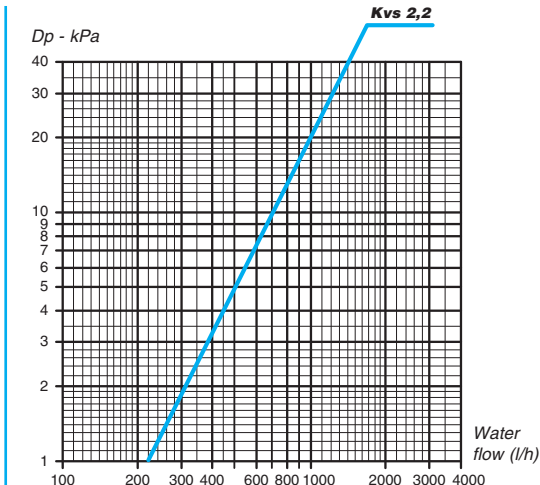
- The kit consists of:
- 2 special 3 way valves;
 - 2 230 Volt ON-OFF actuators with internal safety micro switch;
 - insulated pipe kit;
 - external valve insulation sleeve.

MODEL	Ø	Kvs	FITTED		NOT FITTED	
			CODE	TYPE	CODE	TYPE
1 ÷ 4	3/4"	2,2	9066572W	V3M4X2	9066562W	V3S4X2

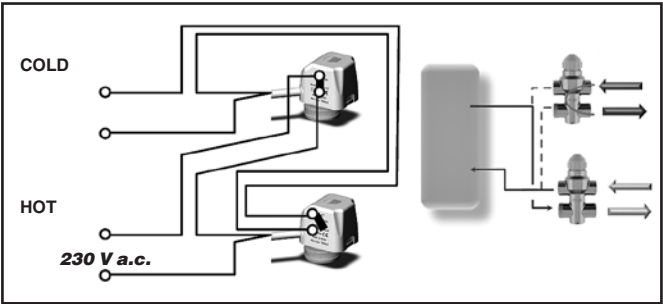
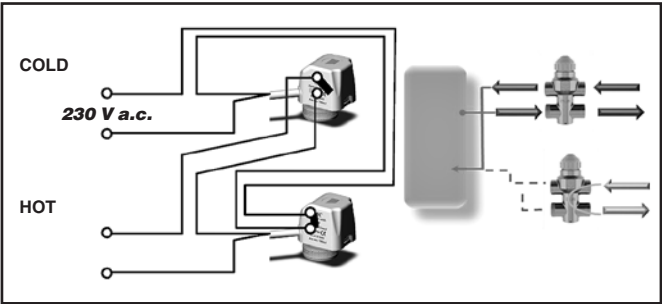
The kit uses a special 3 way valve which allows the transformation of the fan coil, equipped with one single coil, into a 4 tube installation.

The new **4X2** valve has been designed to keep the water flow between flow and return perfectly separated, allowing its use in parallel.

Therefore, it can be used on 4 pipe fan coil systems with one single heat-exchange coil on board the fan coil.



Double actuator electrical connections



Balancing valves independent from the system pressure

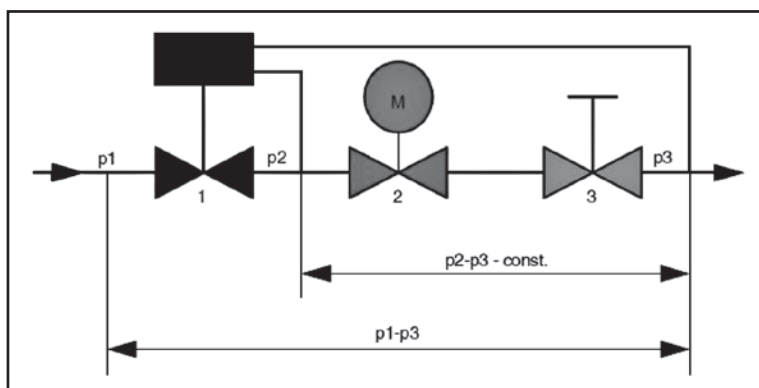
- The balancing valve and a combined 2 way valve allow the regulation of the water flow value autonomously, regardless of the system pressure, and the control of the flow by using an ON/OFF electro-thermal actuator.
- The balancing valve allows you to balance the hydraulic system by supplying the required water flow, for each fan- coil, and to maintain it even under partial load conditions.
- A graduated ring nut placed under the valve allows you to set the flow rate value and also allows direct reading of the set value.



Valve operation logic

- "p1" is the valve inlet pressure.
- "p3" is the outlet pressure.
- "p2" is the diaphragm activation pressure, which allows differential pressure "p2" – "p3" to be maintained at a constant value, in order to guarantee the water to flow at the set value.

The minimum differential pressure "p1" – "p3", required to guarantee the correct value of the set water flow rate, is indicated in the diagrams on page 22. This is an essential factor to size the system pressure drop and pump pressure head. The flow rate is kept at a constant value only if the valve pressure drop is higher than the indicated value.



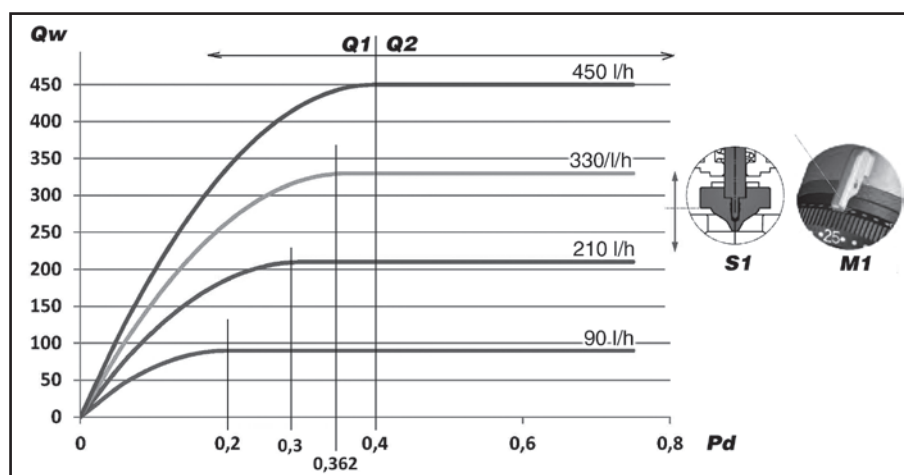
Minimum operating differential pressure

The minimum differential pressure and the balancing valve pressure drop must be considered to size the system pumps.

Flow rate is constant if the pressure drop is higher than that indicated in the diagrams on page 22.

The following diagram shows an example of the flow rate trend according to the pressure drop and calibration required.

Example DN 10 Model



LEGEND:

Qw = Water flow rate

Pd = Min. differential pressure
"p1" – "p3" (bar)

Q1 = Area
with inconstant water flow

Q2 = Area
with constant water flow

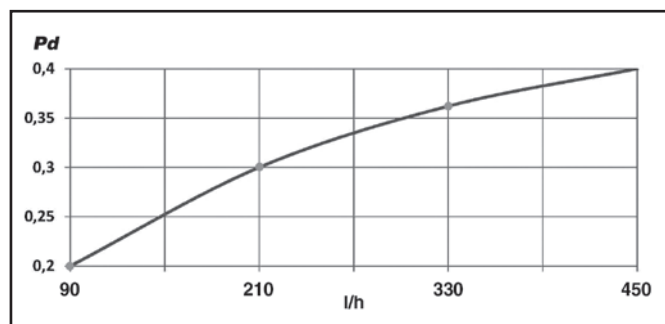
S1 = Position of the adjustment valve
plunger

M1 = Position of the knob

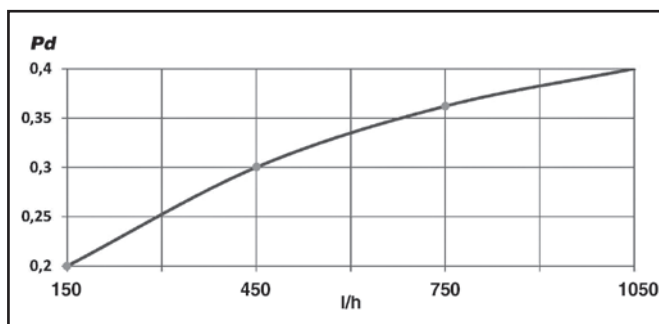
Accessories for **HPO** version

The valve upstream-downstream minimum differential pressure ("p1" – "p3"), which depends on the valve calibration value, must be exceeded to access the constant flow rate field.

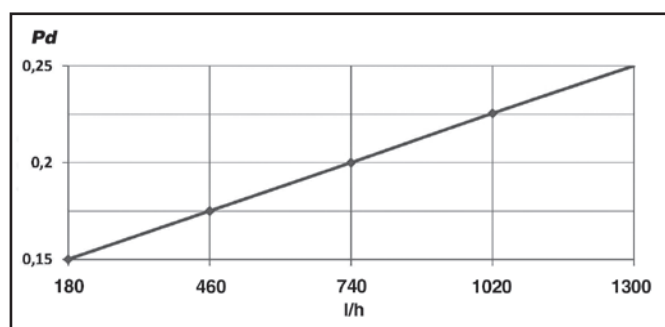
DN 10 Model



DN 15 Model



DN 20 Model



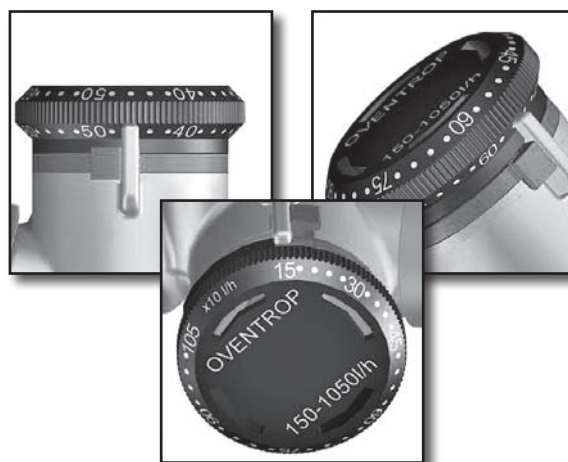
LEGEND:

Pd = Min. differential pressure "p1" – "p3" (bar)

E.g., when sizing the system pump, in which the **DN 10** valves will be installed and in which 210 l/h are constantly required for each device, consider a useful pressure of 0.3 bar (to compensate the pressure drop of the valve) for each balancing valve. Therefore, the pressure drop values produced by the system balancing valves must be summed and the pump must be sized to produce a pressure equal to or greater than the value obtained previously.

Benefits

- Reduced dimensions.
- Easy installation on 2 or 4 pipe devices.
- Pre-regulation of the nominal value set even with installed actuator.
- Easy display of the nominal value set. Nominal values are indicated in 10 l/h without any conversion.
- Guarantee of constant flow rate set even with partial loads.
- Pre-regulation can be blocked and leaded with the locking ring.



Technical features

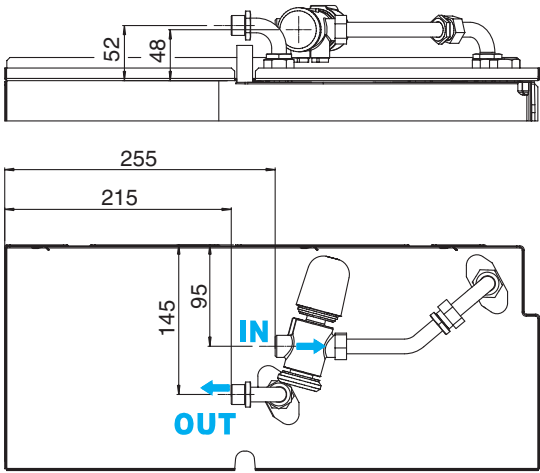
DN MODEL	FLOW RATE RANGE (l/h)	Kvs
DN 10	90 – 450	1,1
DN 15	150 – 1050	1,8
DN 20	180 – 1300	2,5

Operation limits of the balancing valves

- Maximum operating temperature 120°C
- Maximum operating pressure 16 bar
- Maximum % of water/glycol mixture 50%
- Minimum operating temperature -10°C
- Maximum differential pressure 4 bar

Balancing valves for main coil

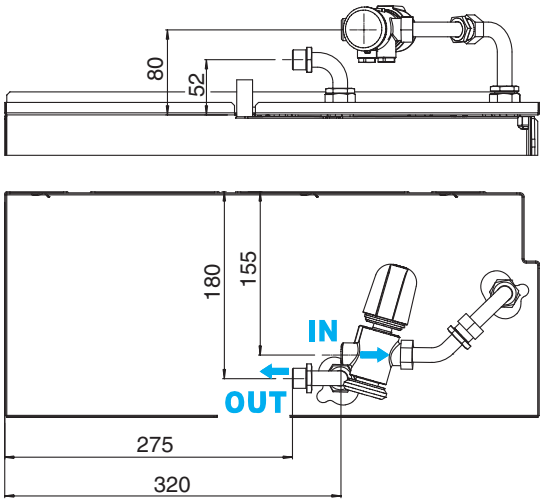
2 way valve for main coil and assembly kit.
The valve is supplied equipped with
230 Volt electro-thermal actuator for the ON/OFF control.



MODEL	VALVE			FITTED		NOT FITTED	
	DN	Ø	Range	CODE	TYPE	CODE	TYPE
1	10	1/2"	90 – 450	9066660	V2OVBPM 90-450	9066650	V2OVBPS 90-450
2 – 3	15	3/4"	150 – 1050	9066661	V2OVBPM 150-1050	9066651	V2OVBPS 150-1050
4	20	1"	180 – 1300	9066662	V2OVBPM 180-1300	9066652	V2OVBPS 180-1300

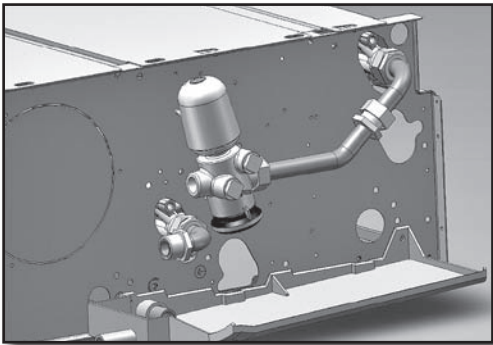
Balancing valves for additional coil

2 way valve for additional coil and assembly kit.
The valve is supplied equipped with
230 Volt electro-thermal actuator for the ON/OFF control.

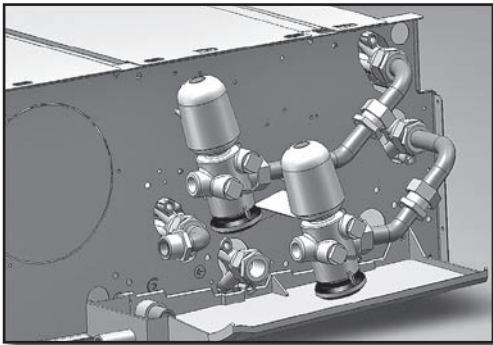


MODEL	VALVE			FITTED		NOT FITTED	
	DN	Ø	Range	CODE	TYPE	CODE	TYPE
1 ÷ 3	10	1/2"	90 – 450	9066663	V2OVBAM 90-450	9066653	V2OVBAS 90-450
4	15	3/4"	150 – 1050	9066664	V2OVBAM 150-1050	9066654	V2OVBAS 150-1050

2 pipe system



4 pipe system

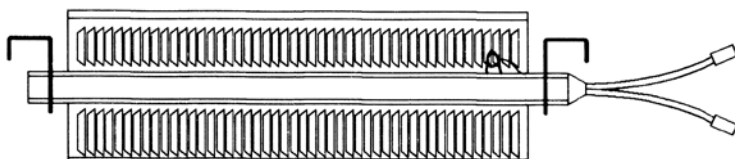
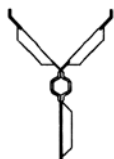


Accessories for **HPO** version

BEL electric heater

1 PHASE 230V

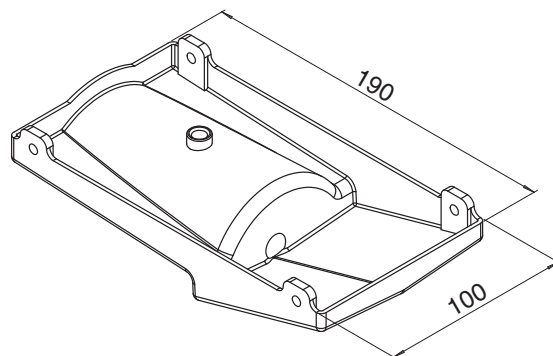
Electric heater with integral:
safety thermostat and relay control.



SIZE	HPO 1			HPO 2			HPO 3			HPO 4
WATT	1500	900	600	2000	1250	750	2500	1500	1000	3500
CODE	9066613	9066603	9066593	9066615	9066605	9066595	9066617	9066607	9066597	9038026

BSV extension condensate collection tray to cover valve assembly

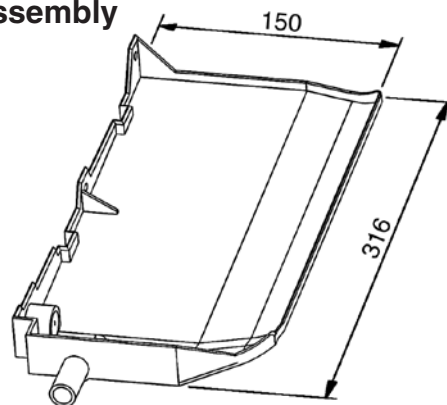
(for vertical units)



CODE	6060400
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BSO extension condensate collection tray to cover valve assembly

(for horizontal units)

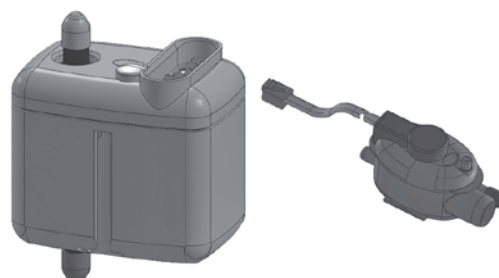


CONNECTION SIDE	LEFT	RIGHT
TYPE	BSO-SX	BSO-DX
CODE	6060402	6060403

DRPV-C fitted condensate pump (for vertical units)

	FITTED	NOT FITTED
TYPE	DRPV-C-M	DRPV-C-S
CODE	9066297	9066296

HEIGHT FOR VERTICAL FLOW (m)	WATER FLOW (l/h) DEPENDENT ON THE LENGTH OF HORIZONTAL FLOW	
	5 m	10 m
1	7,6	7,2
2	5,6	5,2
3	4,0	3,7
4	3,2	2,9

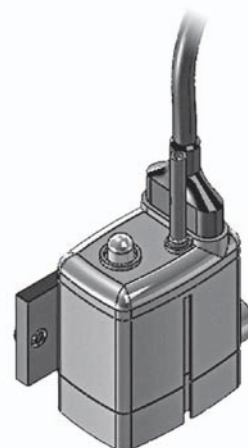


Accessories for **HPO** version

DRPO-C fitted condensate pump (for horizontal units)

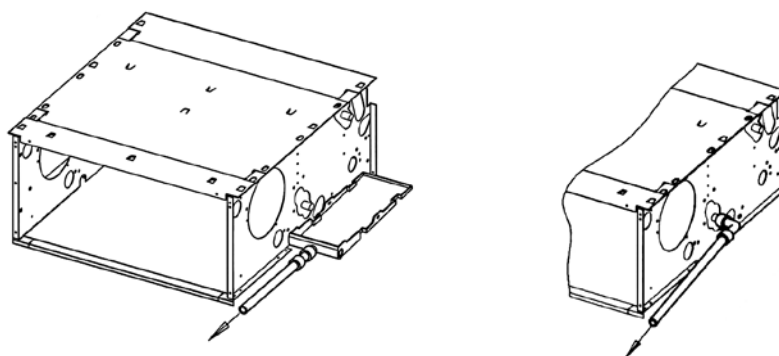
TYPE	DRPO-C
CODE	9066295

HEIGHT FOR VERTICAL FLOW (m)	WATER FLOW (l/h) DEPENDENT ON THE LENGTH OF HORIZONTAL FLOW	
	5 m	10 m
1	7,6	7,2
2	5,6	5,2
3	4,0	3,7
4	3,2	2,9



SCR plastic condensate drain pipe with fast connection (allows correct condensate drain)

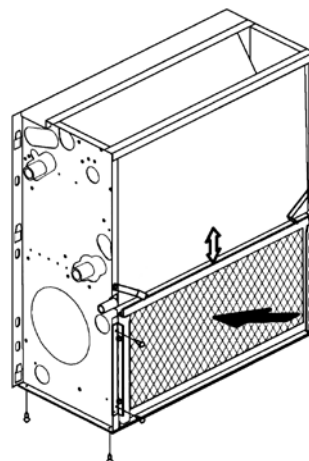
CODE	6060420
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KAF frontal intake kit

Bottom closing panel and filter sliding guides.

SIZE	CODE
HPO 1	9069071
HPO 2	9069072
HPO 3	9069073
HPO 4	9069074



FRD straight inlet flange

Can be used together with GRAG air inlet grid.
Made of galvanized steel.

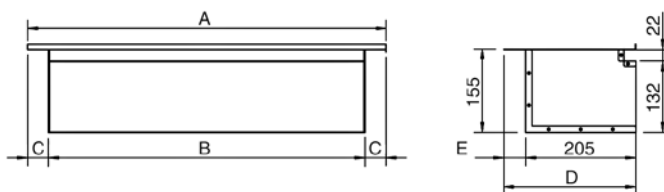


SIZE	TYPE	A	B	C	D	G	CODE
HPO 1	FRD - 3/4	669	590	39,5	216	16	9060721
HPO 2	FRD - 4S	884	790	47	246	46	9038002
HPO 3	FRD - 8/9	1099	990	54,5	246	46	9060724
HPO 4	FRD - 8S	1549	1440	54,5	246	46	9038007

Accessories for **HPO** version

FR 90 90° inlet flange

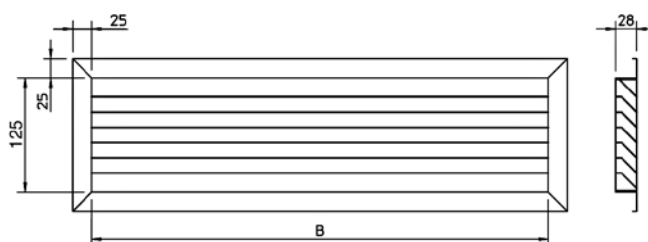
Can be used together with GRAP air inlet grid.
Made of galvanized steel.



SIZE	TYPE	A	B	C	D	G	CODE
HPO 1	FR90 - 3/4	669	590	39,5	216	11	9060711
HPO 2	FR90 - 4S	884	790	47	246	41	9038001
HPO 3	FR90 - 8/9	1099	990	54,5	246	41	9060714
HPO 4	FR90 - 8S	1549	1440	54,5	246	41	9038006

GRAP air inlet grid

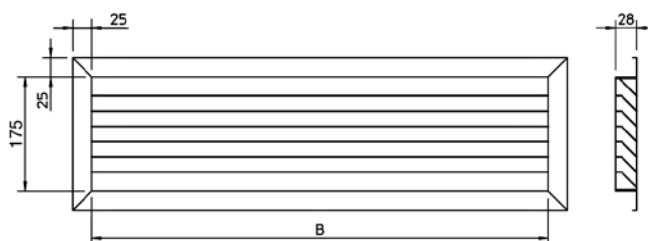
To be used with FR 90 90° inlet flange.
Made of anodized aluminium.



SIZE	TYPE	DESCRIPTION	B	CODE
HPO 1	GRAP - 3/4	Grid 600x150	575	9060761
HPO 2	GRAP - 5/6	Grid 800x150	775	9060762
HPO 3	GRAP - 7/9	Grid 1000x150	975	9060763
HPO 4	GRAP - S4	Grid 1450x150	1425	9038041

GRAG air inlet grid

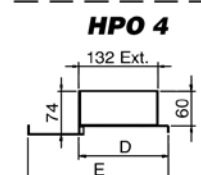
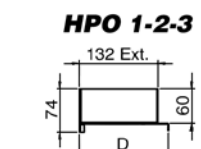
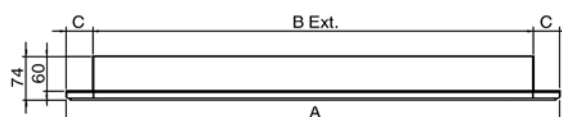
To be used with FRD straight inlet flange.
Made of anodized aluminium.



SIZE	TYPE	DESCRIPTION	B	CODE
HPO 1	GRAG - 3/4	Grid 600x200	575	9060765
HPO 2	GRAG - 5/6	Grid 800x200	775	9060766
HPO 3	GRAG - 7/9	Grid 1000x200	975	9060767
HPO 4	GRAG - S4	Grid 1450x200	1425	9038042

FMD straight outlet flange

Made of galvanized steel.

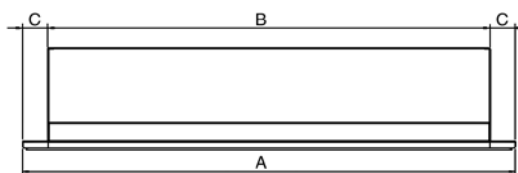


SIZE	TYPE	A	B	C	D	E	CODE
HPO 1	FMD - 3/4	667	590	38,5	152	-	9066373
HPO 2	FMD - 4S	882	790	46	179	-	9069232
HPO 3	FMD - 8/9	1097	990	53,5	179	-	9066378
HPO 4	FMD - 8S	1547	1440	53,5	152	248	9069234

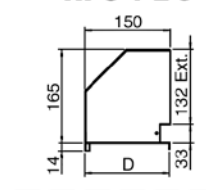
Accessories for **HPO** version

FM 90 90° outlet flange

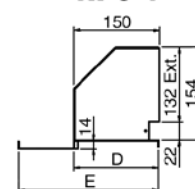
Made of galvanized steel
insulated with polyethylene lining.



HPO 1-2-3



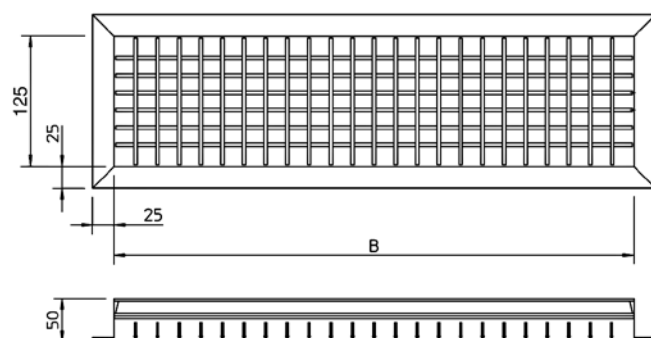
HPO 4



SIZE	TYPE	A	B	C	D	E	CODE
HPO 1	FM90 - 3/4	667	590	38,5	152	-	9066383
HPO 2	FM90 - 4S	882	790	46	179	-	9069242
HPO 3	FM90 - 8/9	1097	990	53,5	179	-	9066388
HPO 4	FM90 - 8S	1547	1440	53,5	152	248	9069244

BMA air outlet grid

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.

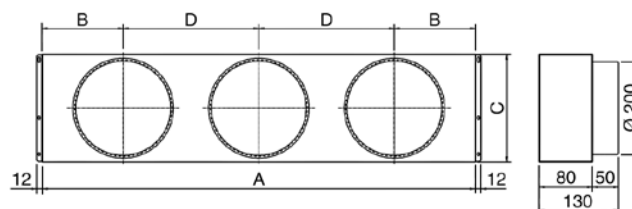


SIZE	TYPE	B	CODE
HPO 1	BMA - 3/4	575	9060751
HPO 2	BMA - 5/6	775	9060752
HPO 3	BMA - 7/9	975	9060753
HPO 4	BMA - 8S	1425	9038040

PRC air inlet spigot plenum

Made of galvanized steel
insulated with polyethylene lining.

All the plenums are supplied
with spigots for the connection of flexible ducts.

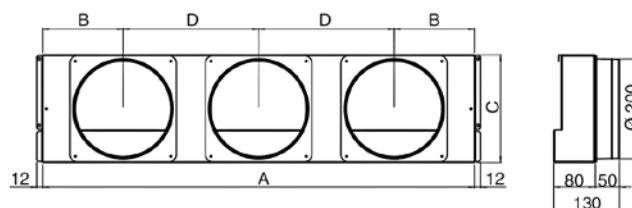


SIZE	TYPE	A	B	C	D	SPIGOTS	CODE
HPO 1	PRC - 3/4	645	166	218	313	N° 2	9066463
HPO 2	PRC - 4S	860	160	248	270	N° 3	9038050
HPO 3	PRC - 8/9	1075	190	248	347,5	N° 3	9066468
HPO 4	PRC - 8S	1525	223	248	360	N° 4	9038051

PMC spigot diffuser

Made of galvanized steel
insulated with polyethylene lining.

All the plenums are supplied
with spigots for the connection of flexible ducts.



SIZE	TYPE	A	B	C	D	SPIGOTS	CODE
HPO 1	PMC - 3/4	645	166	218	313	N° 2	9066363
HPO 2	PMC - 4S	860	160	248	270	N° 3	9069222
HPO 3	PMC - 8/9	1075	190	248	347,5	N° 3	9066368
HPO 4	PMC - 8S	1525	223	248	360	N° 4	9069224

Control functions

Electrical diagrams are shown on the installation, use and maintenance manual

T2T																	9060174
TMO-503-SV2																	9060172
T-MB (+ UP-AU)																	9066331E
WM-AU (+ UP-AU)																	9066632E
WM-TQR																	9066631E
WM-T																	9066630E
WM-3V																	9066642
CONTROL OPERATIONS IDENTIFICATION																	
ON-OFF switch																	
ON-OFF switch for 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 heater is working)																	
Room thermostat for fan and electric heater control (4 pipe installation + electric heater)																	
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)																	
CONTROL CODES																	

Electronic controls

The **HPO** units can be controlled using the remote controls above;
in the standard version, the motor speeds connected to the main terminal block, are:

- **for sizes 1, 2 and 3** motor speeds 2, 3 and 4 are connected while the wires for speeds 1 and 5 are connected to a two-pole support terminal block.
- **for size 4** motor speeds 1, 2 and 3 are connected while the wires for speeds 4 and 5 are connected to a two-pole support terminal block.

Wall electronic controls

IDENTIFICATION	CODE
WM-3V	9066642



Dimensions: 75x75x30 mm

- Manual 3 speed switch.
- Without thermostatic control.
- It can not control the valves.

IDENTIFICATION	CODE
WM-T	9066630E



Dimensions: 135x86x31 mm

- ON-OFF switch.
- Manual 3 speed switch.
- Manual Summer/Winter switch.
- Electronic room thermostat for fan control (ON-OFF).
- Electronic room thermostat for valve control (ON-OFF) (the fan keeps working).
- It allows to control the low temperature cut-out thermostat (TMM).
- It allows to control the chilled water valve (ON-OFF) and the electric heater (BEL) only in case that hot water is not used in winter (otherwise please use WM-TQR control with on/off switch for the electric heater).

IDENTIFICATION	CODE
WM-TQR	9066631E



Dimensions: 135x86x31 mm

- ON-OFF switch.
- Manual 3 speed switch.
- Manual, automatic or centralized Summer/Winter switch.
- Electric heater activation button.
- Electronic room thermostat for fan control (ON-OFF).
- Electronic room thermostat for valve control (ON-OFF).
- Simultaneous thermostatic control of the valves and fan.
- It allows to control the low temperature cut-out thermostat (NTC).
- It allows to control the water valves (ON-OFF) and the electric heater managed as main heating element or as an integration element.
- Energy saving function.

IDENTIFICATION	CODE
WM-AU	9066632E



Dimensions: 135x86x24 mm

The control must always be connected with UPM-AU power unit (fitted on the unit) or with UP-AU power unit (not fitted on the unit).

- ON-OFF push button.
- Manual, automatic or centralized Summer/Winter switch.
- Manual or automatic 3 speed progressive push button.
- Summer/Winter/Fan/Auto mode push button.
- Electric heater activation button.
- Electronic room thermostat for fan control (ON-OFF).
- Electronic room thermostat for valve control (ON-OFF).
- Simultaneous thermostatic control of the valves and fan.
- It allows to control the low temperature cut-out thermostat (NTC).
- It allows to control the water valves (ON-OFF) and the electric heater managed as main heating element or as an integration element.
- Energy saving push button.

N.B.: with 4 pipe installations and continuous chilled and hot water supply, it allows the automatic summer winter change-over in accordance to the room temperature (-1°C = Winter, +1°C = Summer, Neutral Zone 2°C).

Wall electronic controls

IDENTIFICATION	CODE
T-MB	9066331E



Dimensions: 110x72x25 mm

The control must always be connected with UPM-AU power unit (fitted on the unit) or with UP-AU power unit (not fitted on the unit).

Wall control with display that allows controlling one or more units in Master/Slave mode. The control is equipped with internal sensor to detect the room temperature, which can be defined as a priority compared to the return air sensor on the fan coil.

The T-MB control features the following functions:

- Switch the unit ON and OFF.
- Temperature set.
- Manual, centralized or automatic Summer/Winter switch.
- Set the fan speed (low, medium, high or autofan).
- Set the operation mode (fan only, cooling, heating; auto for 4 pipe systems with mode selection depending on the air temperature).
- It allows to control the water valves (ON-OFF) and the electric heater managed as main heating element or as an integration element.
- Time setting.
- Weekly ON/OFF program.

IDENTIFICATION	CODE
TMO-503-SV2	9060172



Dimensions: 118x87x8 mm

The TMO-503-SV2 control for fan coils with valves, is designed to be installed in a 503 wall box. It is easy to use, it has a big and clear display, and a great precision.

The control is supplied integral with the external frame, but it is possible to use frames of the most known brand on the market (BTicino, Vimar, AVE, Gewiss).

- Manual or automatic speed switch.
- Manual Summer/Winter switch.
- Electronic thermostat for valves control (ON-OFF).
- Simultaneous thermostatic control of the valves and fan.
- It allows to control the low temperature cut-out thermostat, included with the control.

N.B.: with 4 pipe installations and continuous chilled and hot water supply, it allows the automatic summer/winter change-over in accordance to the room temperature (-1°C = Winter, +1°C = Summer, Neutral Zone 2°C).

IDENTIFICATION	CODE
T2T	9060174



Dimensions: 128x75x25 mm

2 pipes units only.

- ON-OFF switch.
- 3 speed switch.
- Manual Summer/Winter switch.
- Thermostatic control on the fan.
- Thermostatic control on the valve and continuous fan operation.
- Simultaneous thermostatic control of the valve and fan.

Speed switches

IDENTIFICATION	CODE
SEL-CR	9066311



- Speed switch (Slave).
- It allows to control up to 8 units with only one centralized wall control (1 speed switch for each unit).
- For controls WM-T, WM-TQR and TMO-503-SV2.

DESCRIPTION	IDENTIFICATION	CODE
Power unit for WM-AU and T-MB remote control (fitted on the unit)	UPM-AU	9066641
Power unit for WM-AU and T-MB remote control (not fitted on the unit)	UP-AU	9066640



Power unit to be installed on the fan coil (fan coil interface).

- It controls the fan and the valves of the fan coil.
- It is connected to the electric supply.
- It receives the information required from the control.

Control power absorption: 2,3 VA

TMM low temperature cut-out thermostat

To be installed in contact with the hot water circuit.

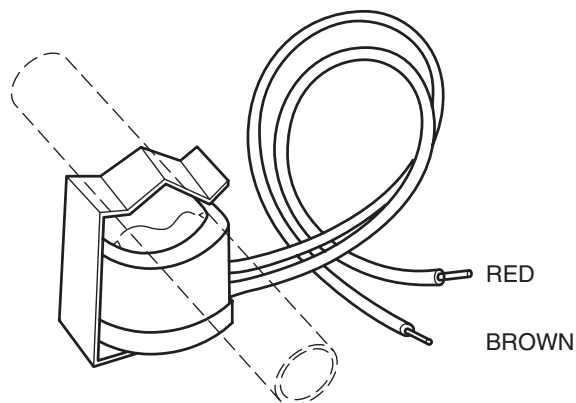
To eliminate cold air blow.

Installed by the installing engineer.

To be used with the WM-T control.

For units working on heating only.

It stops the fan when the water temperature is lower than 30°C and it starts the fan when is higher than 38°C.



CODE	9053048
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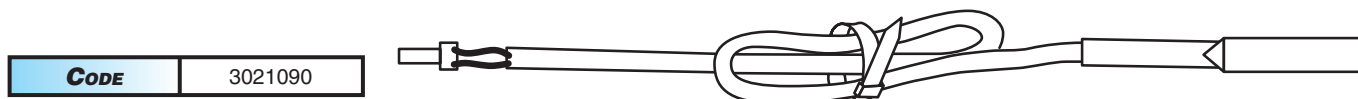
NTC low temperature cut-out thermostat

To be fitted between the coil fins.

When connecting the control, the NTC probe cable must be separated from the power supply wires.

To be used with the WM-TQR control and the UP-AU power unit.

It stops the fan when the water temperature is lower than 28°C and it starts the fan when is higher than 33°C.



CODE	3021090
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Change-Over CH 15-25

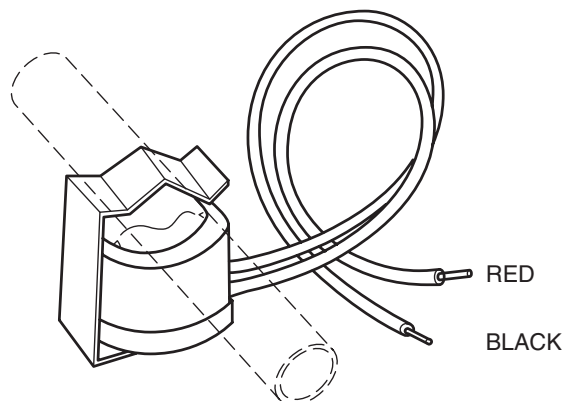
Automatic summer/winter switch

to be installed in contact with the water circuit.

For 2-tube installations only

(not to be used with 2 way valve).

To be used with the WM-TQR control.



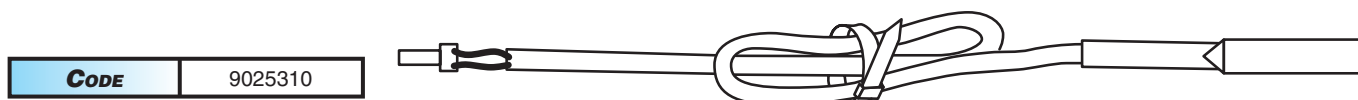
CODE	9053049
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T2 sensor to be placed on the water supply pipe upstream 3 way valves (not to be used with 2 way valve).

The T2 sensor must be used as described below:

- Change-Over for the automatic switch of the operating mode.
If water temperature is lower than 20°C, cooling mode is set; on the other hand, if water temperature exceeds 30°C, heating mode is set.
- It can be used on units with electric heater and hot water supply. The T2 priority probe activates the electric heater or water valve, depending on the water temperature detected. If water temperature exceeds 34°C, the water valve ON-OFF control is activated; on the other hand, if water temperature is lower than 30°C, the electric heater is activated.

To be used with the UP-AU power unit.



CODE	9025310
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Free wireless control system



Free is an innovative, **fully wireless**, electronic system for use with fan coil units, based on radio communication.

This technology **provides 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.

If 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 improved 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 more energy savings compared with a traditional measurement system.

Transmission is based on communication protocol IEE802.15.4, 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.



Free wireless control system

Main components

Free includes 3 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.

DESCRIPTION	IDENTIFICATION	CODE
Remote control	Free-Com	9060572



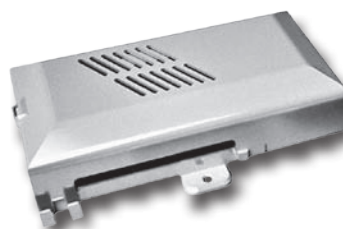
Control unit with support

- 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.

DESCRIPTION	IDENTIFICATION	CODE
Power unit fitted on the unit	Free-Upm	9060571
Power unit not fitted on the unit	Free-Ups	9060570



Power unit

- 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.

DESCRIPTION	IDENTIFICATION	CODE
Temperature probe	Free-Sen	9060573



Probe with support

Main features of the remote control

The control enables:

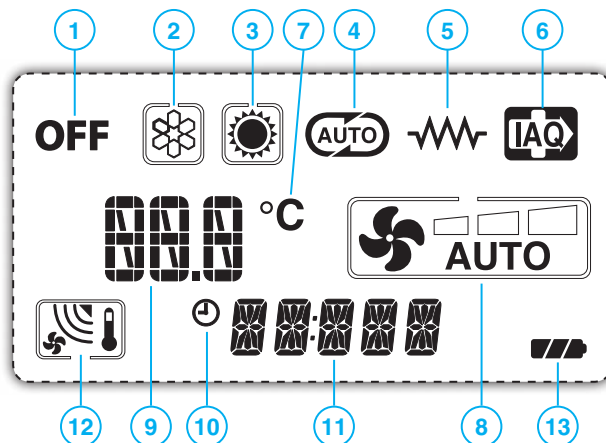
- Fan coil on/off switching
- Fan speed selection (high - medium - low - automatic)
- Summer/winter operation selection
- Valve on/off
- Real time clock setting
- Temperature setting
- Daily switch on/off setting (timer function)
- Enable/disable the timer function
- Activation of the (optional) electrostatic filter
- Activation of the (optional) electric heater



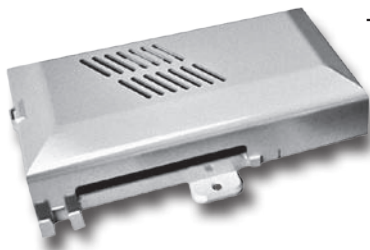
Free wireless control system

Main information displayed:

- ① On-off status
- ② Summer operation
- ③ Winter operation
- ④ Automatic season change
- ⑤ Electric heater
- ⑥ Electrostatic filter
- ⑦ Room temperature (with decimal accuracy)
- ⑧ Fan operating speed
- ⑨ Required/measured temperature
- ⑩ Timer
- ⑪ Clock
- ⑫ Transmission signal
- ⑬ Battery level



Main features of the power unit to be installed on the fan coil



The power unit controls the fan and the valves of the fan coil. The power unit receives the information required to control such units both from the remote control and locally.

It enables the following main actions:

- Fan on/off at a set speed
- Fan speed change (fan on/off)
- Water valve/s on/off (1 valve for 2 tube system - 2 valves for 4 tube system)
- Fan speed change operating the water valve/s
- Control of the electric heater as main heating unit or as integration to the battery supplied with hot water
- Control of the operation of the electrostatic filter (in parallel to the fan)
- Management of the dead zone function for 4-tube systems
- Available functional inputs:
 - Consent for remote on/off
 - Consent for remote Summer/Winter switch (centralized)
 - Consent for the activation of the Energy Saving function with setting change
 - Minimum probe
 - Probe for season change

Main features of the temperature probe



This device is able to measure the temperature of the air in the spot where it is positioned and to transmit it by means of radio communication to the other devices in the system. It is battery powered and can be freely positioned in the area to be air-conditioned.

Display:

- Measured environment temperature
- Transmission signal
- Clock
- Battery status

Controls and units **MB** version

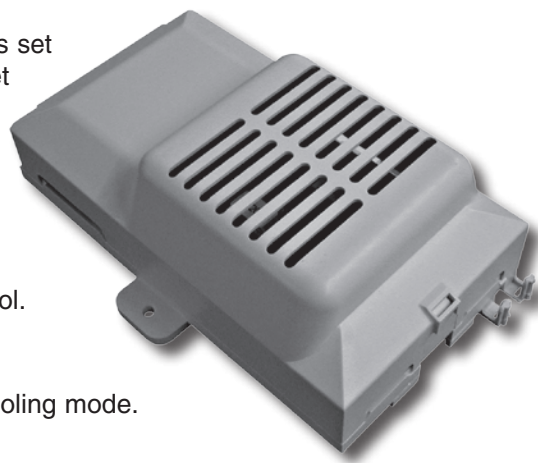
All the **HPO** units can be supplied with a wide range of controls, which allows managing one single unit or several units by using the Modbus RTU - RS 485 communication protocol. Units can be managed according to the Master/Slave logic (up to 20 units) or by supervisory components. The system consists in a **MB** board and a series of controls, such as the **T-MB** wall control, the **RT03** infra-red remote control, the **PSM-DI** multifunction control and the **NET** supervisory program.

MB electronic board

DESCRIPTION	IDENTIFICATION	CODE
<i>MB electronic board fitted on the unit</i>	MB-M	9066332
<i>MB electronic board supplied with separate packaging</i>	MB-S	9066333

The **MB** electronic board, to be mounted on the fan coil internal unit, is set to carry out different functions and adjustment modes, in order to meet the installation requirements. These modes are selected by setting the configuration dip switches on the board.

- 2/4 pipe system.
- Fan ON/OFF thermostatic control.
- Valve ON/OFF thermostatic control and continuous ventilation.
- Valve and simultaneous ventilation ON/OFF thermostatic control.
- Fan operation control
depending on the coil temperature (cut-out T3 probe fitted),
which can be activated only in heating mode or heating and cooling mode.
- Automatic switch of the operating mode
by means of T2 water probe (optional) applied on the 2 pipe system.
- Seasonal switch by means of remote contact.
- ON/OFF of the fan coil by means of the remote contact
(window or clock contact).
- Electric heater control.



By activating the cut-out T3 probe function, the fan is stopped in winter when the coil temperature is lower than 32°C and started when the temperature reaches 36°C. In summer mode, the fan stops when the temperature inside the coil exceeds 22°C and starts when it drops below 18°C.

The following connections are located on the power board:

- Receiver for infra-red remote control.
- T-MB wall mounted control.
- RS 485 serial connection to manage several fan coils in Master/Slave configuration or to create a supervisory network.

T-MB wall control

DESCRIPTION	IDENTIFICATION	CODE
Wall control (to be used with MB board only)	T-MB	9066331E

Wall control with display that allows controlling one or more units in Master/ Slave mode. The control is equipped with internal sensor to detect the room temperature, which can be defined as a priority compared to the return air sensor on the fan coil. The **T-MB** control features the following functions:

- Switch the appliance ON and OFF.
- Temperature set.
- Modify the set point (when used as a +/- 3° variation of the set point configured from NET supervisory program or PSM-DI).
- Set the fan speed (low, medium, high or autofan).
- Set the operation mode (fan only, cooling, heating; auto for 4 pipe systems with mode selection depending on the air temperature).
- Time setting.
- Weekly ON/OFF program.
- Display and change of the fan coil operation parameters.



Dimensions: 110x72x25 mm

RT03 infra-red remote control

DESCRIPTION	IDENTIFICATION	CODE
RT03 infra-red remote control with receiver supplied with separate packaging (to be used with MB board only)	RS-RT03	9066337
RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)	RT03	3021203
Receiver for RT03 infra-red remote control supplied with separate packaging (to be used with MB board only)	RS	9066338

The infra-red remote control allows setting by a remote position the fan coil operation parameters. The **RT03** infra-red remote control features the following functions:

- Switch the appliance ON and OFF.
- Temperature set.
- Set the fan speed (low, medium, high or autofan).
- Set the operation mode (fan only, cooling, heating; auto for 4 pipe systems with mode selection depending on the air temperature).
- Time setting.
- 24 hours ON/OFF program.



INSTALLATION EXAMPLE
WITH INFRA-RED REMOTE CONTROL

Controls and units **MB** version

A group of **HPO** units with **MB** electronic board can be connected via a serial link and can consequently be managed at the same time by just one **T-MB** wall control or **RT03** infra-red remote control. Using the special jumper present on the **MB** board, one unit must be configured as the master, and all the others as slaves. It is clear that the remote control must be pointed at the receiver on the master unit. To avoid problems, it is recommended to install and connect the receiver only on the master unit.

With **T-MB** wall control

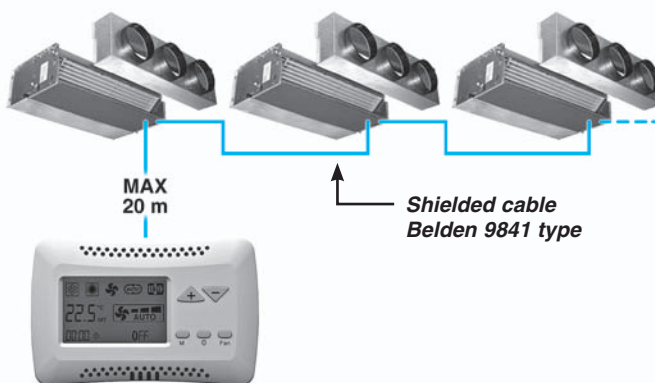
One control for each unit

(MAXIMUM LENGTH OF THE CONNECTION CABLE = 20 m)



One control for more units (20 units max.)

(MAXIMUM TOTAL LENGTH OF THE CONNECTION CABLE = 800 m)



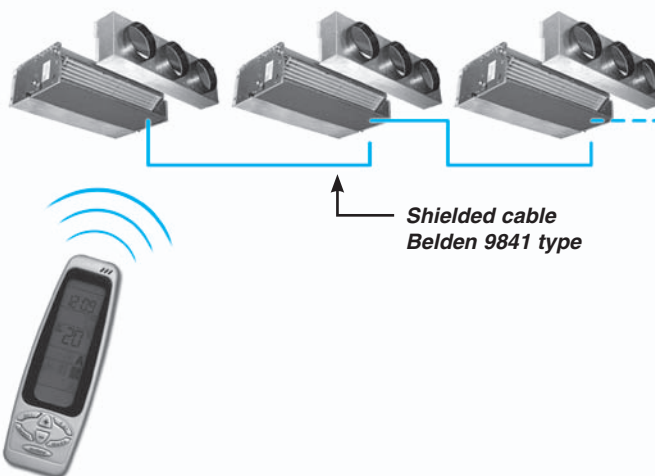
With **RT03** infra-red remote control

One control for each unit



One control for more units (20 units max.)

(MAXIMUM TOTAL LENGTH OF THE CONNECTION CABLE = 800 m)



T2 accessory for units with MB electronic board

IDENTIFICATION	CODE
T2	9025310



The T2 sensor can be combined with MB boards to be placed on the water supply pipe upstream 3 way valves (not to be used with 2 way valve).

The T2 sensor must be used as described below:

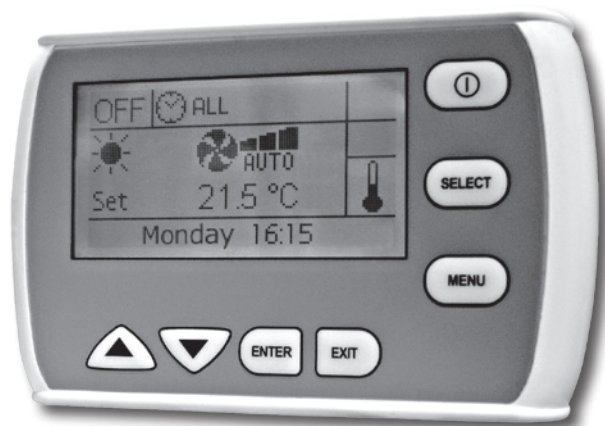
- Change-Over for 2-pipe system for the automatic switch of the operating mode.
If water temperature is lower than 20°C, cooling mode is set; on the other hand, if water temperature exceeds 30°C, heating mode is set.
- It can be used on units with electric heater and hot water supply. The T2 priority probe activates the electric heater or water valve, depending on the water temperature detected. If water temperature exceeds 34°C, the water valve ON-OFF control is activated; on the other hand, if water temperature is lower than 30°C, the electric heater is activated.

PSM-DI multifunction control panel

DESCRIPTION	IDENTIFICATION	CODE
Multifunction control (to be used with MB board only)	PSM-DI	3021293

Another option available for the serial communication between the units is the possibility to connect up to 60 **HPO** units in series and manage them with just one wall mounted **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 (the program can be set for all the units and for a maximum of two groups of units).

If more than 60 units need to be connected, two or more controllers must be used. Each unit must have a MB board. The **PSM-DI** control is used to manage a series of fan coils, up to a maximum of 60 units (the maximum length of the RS 485 connection cable must not exceed 800 m), from one single control point.



The **PSM-DI** control communicates via a serial line with all the units connected, with the possibility of controlling them all together or individually. In fact, the unique address of each individual fan coil means that all the units can be called at the same time, or the individual unit called, to perform the following functions:

- display the current operating mode, the fan speed, the set point;
- display the room temperature measured on the individual unit;
- turn all the units ON and OFF at the same time or alternatively each unit individually;
- change the operating mode (fan only, heating, cooling, automatic changeover);
- change the set point;
- modify the values and operation parameters of the fan speed.

Each function can then be sent to all the units connected, or alternatively to each individual unit.

Different set points or operating modes can be set for each individual unit.

The **PSM-DI** panel can also be used for the time management of the units over the week. Four ON times and four OFF times can be set on the units for each day of the week. A different Temperature set that will be considered as Operation set for all connected appliances, can be set for each event. If the Temperature set is not entered for the individual event, it must be set during programming for each individual unit or for the entire network.

Units without receiver or with receiver can be connected within the network: the former can receive instructions only from the **PSM-DI** wall mounted panel; while the latter can receive information from both the wall mounted panel (**PSM-DI**) and infra-red remote control. Use the infra-red remote control to force ON mode of the individual unit, if ON/OFF daily time programming has been set. The unit will regain the settings from the **PSM-DI** panel during execution of successive start-up program.

The PSM-DI panel cannot be used together with the NET management program (see next page).

Note: set the configuration Dip Switches of each fan coil as illustrated in the remote control use manual, based on the required solutions.

Note: the RS 485 network's overall length must not exceed 700/800 metres.

NET program for managing a network of MB fan coils

DESCRIPTION	IDENTIFICATION	CODE
Hardware/software supervisory system (to be used with MB board only)	NET	9079118

NET 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 NET software offers a practical and economical solution for managing the units, 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.

The program exploits all the potential of our units with remote controls, representing an addition to the latter.

The NET program is a control tool that can be used as a replacement for the remote control, or in parallel, however the settings made using NET can have priority over those made using the remote control.



The program can be used to:

- Create uniform groups (groups of units on individual floors, in offices or rooms).
- Save weekly programs configured for different types of operation (summer, winter, mid seasons, closing periods etc.); these can then be recalled and activated with a simple click of the mouse. Weekly on/off cycles can be set for individual units or groups of units.
- Set the operating conditions for each individual unit or groups of units (operating mode, fan speed, temperature setting).
- Set the set point limits for each individual unit or groups of units.
- Switch each individual unit or groups of units ON or OFF.

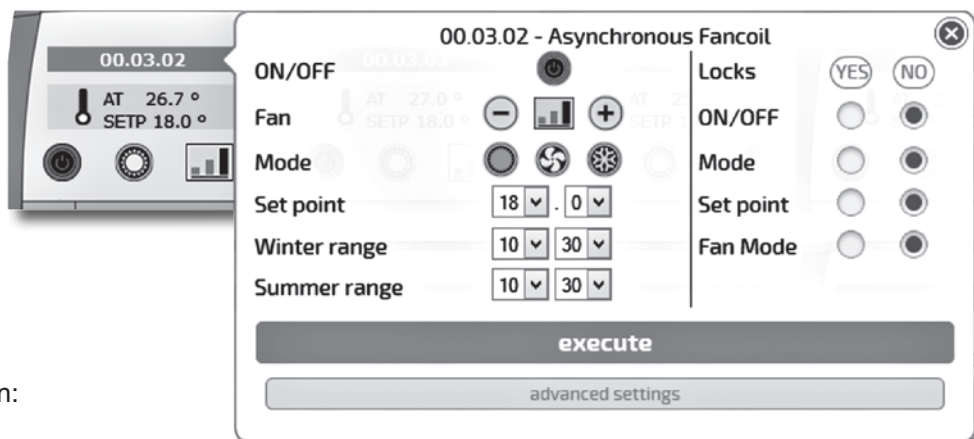
The main program screen can display and interact with the entire network of units. An individual unit, a group of units or the entire network can be called so as to make modifications to the operating mode and the set point. The user can then check the operating status of each individual unit, read the room temperature, the coil temperature and the operating status of the condensate drain pump or any alarms.



Management system for a network of fan coils

Displaying a unit

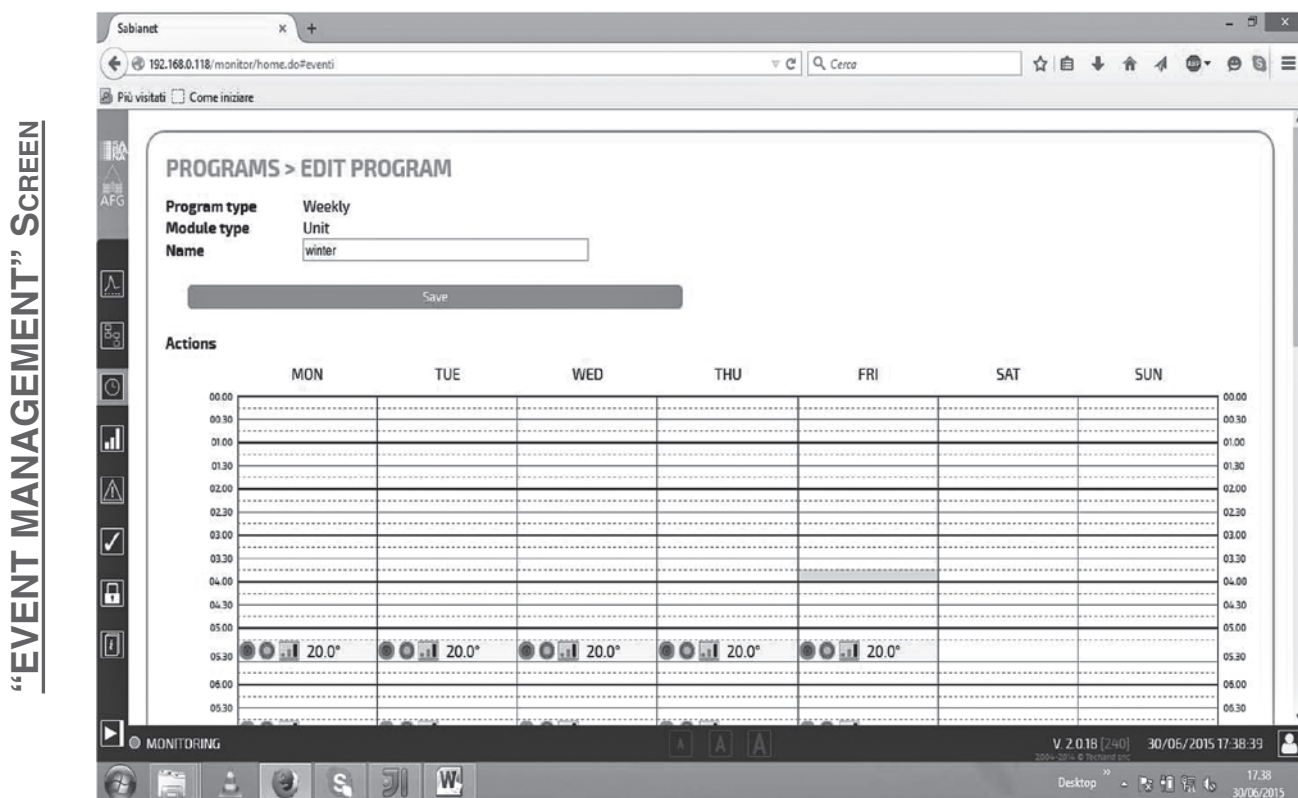
The “**MONITORING**” SCREEN shows the units that are connected to the network and scanned by the program.



The icon of the terminal unit provides the following information:

- Unit name (**00.03.02**)
- Set temperature (SETP)
- Room temperature (AT)
- Unit status: ON (Green)  or OFF (Red) 
- Mode:
 -  Summer
 -  Winter
 -  Fan only
 -  Auto
- Fan speed:
 -  Low
 -  Medium
 -  High
 -  AutoFan

The “Weekly Program” can be used to set the unit operating parameters for each day of the week. Up to 20 different weekly programs can be set.

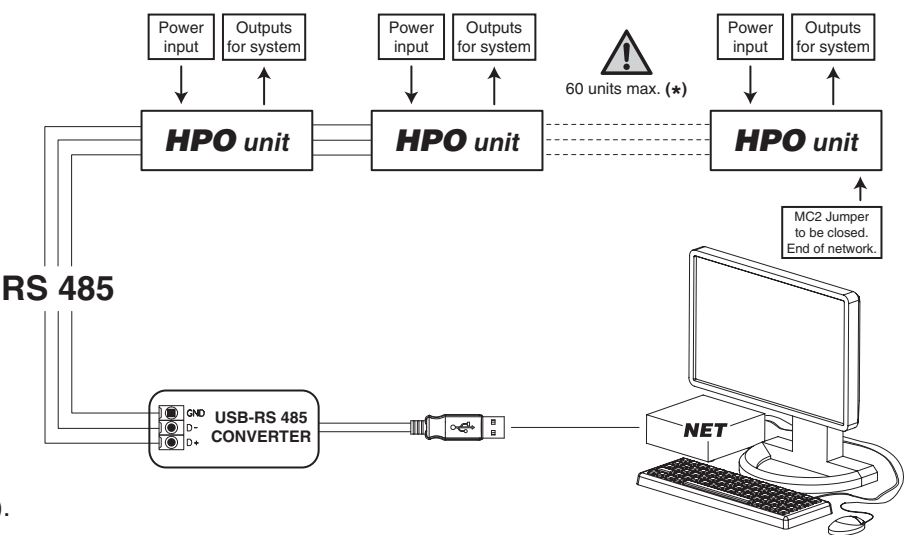


Time bands are available for each day of the week. The time and the type of operation to be performed by the unit can be set for each band. The time and the operating parameters can then be displayed before being sent to the unit and implemented.

Management system for a network of fan coils

PC NET Software

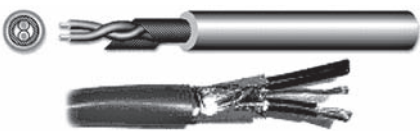
Connection of a **HPO** network with MB electronic board



(*) In the event of more than 60 units, add one or more Router-S (see below).

RS 485 serial connection cable

Shielded cable to be used:
Belden 9841, RS-485, 1x2x24 AWG SFTP, 120 Ohm

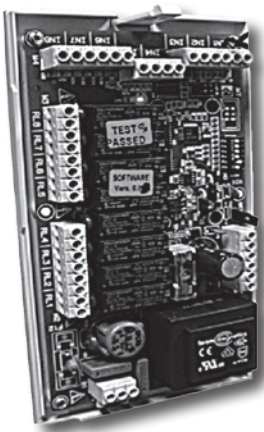


PSM-DI and NET electronic boards for HPO units

IDENTIFICATION	CODE
SIOS	3021292

SIOS is a board equipped with 8 relays with potential free contact to control the activation or deactivation of remote electric utilities. Moreover, the board has 8 digital inlets to display the actuators or external consents, such as motor or other. The SIOS boards can be connected:

- inside a network managed by NET;
- to a PSM-DI panel (one SIOS for each PSM-DI panel).



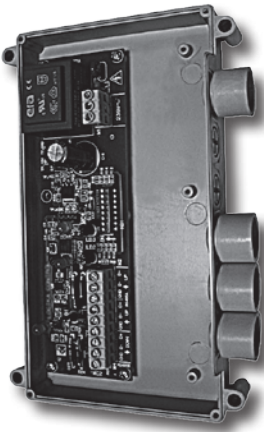
IDENTIFICATION	CODE
Router-S	3021290

The Router-S is an electronic board that:

- allows creating networks with more than 60 units (minimum 2 Router-S are required) or to divide the network (per floor, building, etc.);
- it allows creating a Master/Slave sub-network to be controlled as an independent group.

The Router-S can be used only inside a network managed by NET.

- The number of Router-S to be used is:
- up to 60 units: no Router-S
 - from 61 to 120 units: 2 Router-S
 - every 60 subsequent units: 1 additional Router-S



**The descriptions and illustrations provided in this publication are not binding:
we reserve 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.**



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