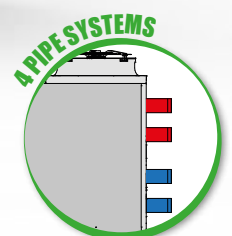
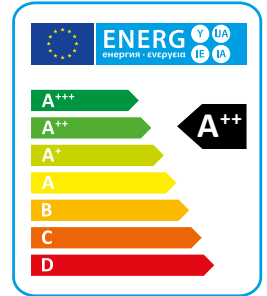


LHE/P4

**HIGH EFFICIENCY AIR TO WATER MULTIPURPOSE UNIT AND 4 PIPE HEAT PUMPS
EQUIPPED WITH SCROLL COMPRESSOR AND AXIAL FANS WITH LOW GWP REFRIGERANT**

Heating power from 45 kW to 454 kW

R454B



LHE high-efficiency air/water heat pumps are particularly suitable for applications where maximum efficiency in heating mode and a low noise level are required. The units are specifically designed to provide the best efficiency in heating mode; they can operate at outside temperatures down to -20°C and produce water up to a temperature of 60°C.

All sizes are supplied with reverse cycle valve used for winter defrost; the RV versions are also able to produce cold water in summer period (not available for HH versions).

VERSIONS

- RV** Reversible heating/cooling.
- HA** High efficiency, AC fans.
- HE** High efficiency, EC fans.
- LS** Low noise.
- XL** Super low noise.
- P4U** 4 pipe systems heating/cooling.
- P4S** 2+2 pipe systems with D.H.W. production.

TECHNICAL DATA

Reversible heating/cooling version (RV)

HA/LS/RV P4U		452	512	682	752	912	1102	1152	1352	1502	1612
Heating capacity (EN14511) ⁽¹⁾	kW	45,2	51,4	67,5	72,9	89,2	101,0	111,0	131,0	148,0	159,0
Total input power (EN14511) ⁽¹⁾	kW	14,1	15,9	19,7	22,1	26,1	29,7	32,6	38,5	44,2	46,9
COP (EN14511) ⁽¹⁾	W/W	3,21	3,23	3,43	3,30	3,42	3,40	3,40	3,40	3,35	3,39
Energy Class ⁽²⁾		A+	A+	A++	A++	A+	A++	A++	A+	A+	A++
SCOP ⁽²⁾	kWh/kWh	3,61	3,64	4,02	4,01	3,66	3,87	3,92	3,72	3,71	3,87
η _{s,h} ⁽²⁾	%	142	143	158	158	144	152	154	146	146	152
Cooling capacity (EN14511) ⁽³⁾	kW	38,4	44,2	57,8	62,1	76,8	86,5	96,1	112,0	125,0	135,0
Total input power (EN14511) ⁽³⁾	kW	14,0	16,5	21,5	24,6	26,5	30,7	35,0	38,4	44,6	48,8
EER (EN14511) ⁽³⁾	W/W	2,74	2,68	2,69	2,52	2,90	2,82	2,75	2,92	2,80	2,77
TER (EN14511) ⁽⁴⁾	W/W	7,05	7,22	7,48	7,20	7,46	7,30	7,48	7,30	7,04	7,22
Sound power ⁽⁵⁾	dB (A)	77	76	77	78	82	83	85	86	87	87
Sound pressure ⁽⁶⁾	dB (A)	46	44	45	46	50	51	53	54	55	55
HE/LS/RV P4U		452	512	682	752	912	1102	1152	1352	1502	1612
Heating capacity (EN14511) ⁽¹⁾	kW	45,3	51,4	67,5	72,9	89,2	101,0	111,0	131,0	148,0	159,0
Total input power (EN14511) ⁽¹⁾	kW	13,6	15,4	19,3	21,7	25,0	28,7	31,7	37,0	42,8	45,5
COP (EN14511) ⁽¹⁾	W/W	3,33	3,34	3,50	3,36	3,57	3,52	3,50	3,54	3,46	3,49
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,89	3,92	4,26	4,22	4,03	4,17	4,22	4,03	4,02	4,14
η _{s,h} ⁽²⁾	%	153	154	168	166	158	164	166	158	158	163
Cooling capacity (EN14511) ⁽³⁾	kW	38,4	44,1	57,8	62,2	76,8	86,5	96,1	112,0	125,0	135,0
Total input power (EN14511) ⁽³⁾	kW	13,8	16,4	21,3	24,4	25,9	30,3	34,6	37,6	44,1	48,2
EER (EN14511) ⁽³⁾	W/W	2,78	2,69	2,71	2,55	2,97	2,85	2,78	2,98	2,83	2,80
TER (EN14511) ⁽⁴⁾	W/W	7,05	7,22	7,48	7,20	7,46	7,30	7,48	7,30	7,04	7,22
Sound power ⁽⁵⁾	dB (A)	77	76	77	78	82	83	85	86	87	87
Sound pressure ⁽⁶⁾	dB (A)	46	44	45	46	50	51	53	54	55	55
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	1	1	1	1	2	2	2	3	3	3
Refrigerant		R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge	kg	11	11	17	17	25	25	25	36	36	36
Global warming potential (GWP)		466	466	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	5,1	5,1	7,9	7,9	11,7	11,7	11,7	16,8	16,8	16,8
Water tank volume	l	140	140	300	300	300	300	300	500	500	500
HA/LS/RV P4U		1792	2012	2304	2312	2654	2954	3214	3514	3954	4454
Heating capacity (EN14511) ⁽¹⁾	kW	179	199	222	227	260	292	312	349	393	427
Total input power (EN14511) ⁽¹⁾	kW	52,2	57,7	65,6	64,2	78,1	89,6	95,7	109,0	121,0	134,0
COP (EN14511) ⁽¹⁾	W/W	3,43	3,45	3,38	3,54	3,33	3,26	3,26	3,20	3,25	3,19
Energy Class ⁽²⁾		A++	A++	A++	A++	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	4,03	4,08	3,91	4,25	3,64	3,64	3,77	3,77	3,74	3,79
η _{s,h} ⁽²⁾	%	158	160	154	167	143	143	148	148	147	149
Cooling capacity (EN14511) ⁽³⁾	kW	160	175	197	195	230	255	273	306	353	388
Total input power (EN14511) ⁽³⁾	kW	57,1	62,9	70,3	69,6	78,0	91,6	99,9	116,0	125,0	141,0
EER (EN14511) ⁽³⁾	W/W	2,80	2,78	2,80	2,80	2,95	2,78	2,73	2,64	2,82	2,75
TER (EN14511) ⁽⁴⁾	W/W	7,75	7,57	7,54	7,54	7,33	7,11	7,15	7,10	7,30	7,32
Sound power ⁽⁵⁾	dB (A)	89	89	88	91	89	90	90	92	92	94
Sound pressure ⁽⁶⁾	dB (A)	57	57	56	58	56	58	58	60	59	62
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n° / n°	2 / 1	2 / 1	4 / 2	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	4	3	6	6	6	6	8	8
Refrigerant		R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge	kg	37	47	50	59	64	63	63	62	73	82
Global warming potential (GWP)		466	466	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	17,2	21,9	23,3	27,5	29,8	29,4	29,4	28,9	34,0	38,2
Water tank volume	l	500	500	500	500	500	500	500	500	500	500

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 40/45°C.
- (2) Average conditions, low temperature, variable - Reg EU 811/2013
- (3) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 40/45°C.

(5) Sound power level in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

LHE/P4

HA/XL/RV P4U		452	512	682	752	912	1102	1152	1352	1502	1612
Heating capacity (EN14511) ⁽¹⁾	kW	44,5	50	65,4	70,7	88,2	99,1	109,0	130,0	146,0	155,0
Total input power (EN14511) ⁽¹⁾	kW	13,8	15,5	19,4	21,8	25,5	29,1	32,0	37,6	43,3	46,0
COP (EN14511) ⁽¹⁾	W/W	3,22	3,23	3,37	3,24	3,46	3,41	3,41	3,46	3,37	3,37
Energy Class ⁽²⁾		A+	A+	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,76	3,78	4,13	4,10	3,86	4,03	4,08	3,91	3,89	4,01
η _{s,h} ⁽²⁾	%	148	148	162	161	152	158	160	153	153	157
Cooling capacity (EN14511) ⁽³⁾	kW	37,0	42,6	55,4	59,1	75,0	84,6	92,8	110,0	121,0	131,0
Total input power (EN14511) ⁽³⁾	kW	14,5	17,1	22,5	25,9	26,8	31,6	36,0	38,8	45,7	50,0
EER (EN14511) ⁽³⁾	W/W	2,55	2,49	2,46	2,28	2,80	2,68	2,58	2,84	2,65	2,62
TER (EN14511) ⁽⁴⁾	W/W	7,05	7,22	7,48	7,20	7,46	7,30	7,48	7,30	7,04	7,22
Sound power ⁽⁵⁾	dB (A)	73	73	73	74	76	77	79	81	82	82
Sound pressure ⁽⁶⁾	dB (A)	41	41	41	42	44	45	47	49	50	50
HE/XL/RV P4U		452	512	682	752	912	1102	1152	1352	1502	1612
Heating capacity (EN14511) ⁽¹⁾	kW	45,1	50,9	66,5	72,0	89,2	101,0	111,0	131,0	148,0	159,0
Total input power (EN14511) ⁽¹⁾	kW	13,0	14,8	18,7	21,1	24,1	27,7	30,6	35,6	41,2	43,9
COP (EN14511) ⁽¹⁾	W/W	3,47	3,44	3,56	3,41	3,70	3,65	3,63	3,68	3,59	3,62
Energy Class ⁽²⁾		A++	A++	A+++	A+++	A+++	A+++	A+++	A+++	A++	A+++
SCOP ⁽²⁾	kWh/kWh	4,29	4,31	4,59	4,53	4,51	4,58	4,64	4,45	4,41	4,53
η _{s,h} ⁽²⁾	%	169	169	181	178	178	180	183	175	173	178
Cooling capacity (EN14511) ⁽³⁾	kW	37,4	42,9	55,9	59,4	75,6	84,4	93,5	111,0	123,0	132,0
Total input power (EN14511) ⁽³⁾	kW	13,8	16,5	21,8	25,3	25,5	30,2	34,7	36,9	43,7	48,1
EER (EN14511) ⁽³⁾	W/W	2,71	2,60	2,56	2,35	2,96	2,79	2,70	3,01	2,81	2,74
TER (EN14511) ⁽⁴⁾	W/W	7,05	7,22	7,48	7,20	7,46	7,30	7,48	7,30	7,04	7,22
Sound power ⁽⁵⁾	dB (A)	73	73	73	74	76	77	79	81	82	82
Sound pressure ⁽⁶⁾	dB (A)	41	41	41	42	44	45	47	49	50	50
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	1	1	1	1	2	2	2	3	3	3
Refrigerant		R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge	kg	11	11	17	17	25	25	25	36	36	36
Global warming potential (GWP)		466	466	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	5,1	5,1	7,9	7,9	11,7	11,7	11,7	16,8	16,8	16,8
Water tank volume	l	140	140	300	300	300	300	300	500	500	500
HA/XL/RV P4U		1792	2012	2304	2312	2654	2954	3214	3514	3954	4454
Heating capacity (EN14511) ⁽¹⁾	kW	174	194	218	221	256	286	306	339	383	416
Total input power (EN14511) ⁽¹⁾	kW	51,3	56,8	64,4	63,2	76,2	87,6	93,7	107,0	118,0	131,0
COP (EN14511) ⁽¹⁾	W/W	3,39	3,42	3,39	3,50	3,36	3,26	3,27	3,17	3,25	3,18
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	4,18	4,20	4,10	4,31	3,82	3,82	3,90	3,92	3,88	3,88
η _{s,h} ⁽²⁾	%	164	165	161	169	150	150	153	154	152	152
Cooling capacity (EN14511) ⁽³⁾	kW	154	168	190	185	222	247	263	293	342	375
Total input power (EN14511) ⁽³⁾	kW	59,2	65,5	72,2	73,6	80,0	94,0	103,0	121,0	128,0	145,0
EER (EN14511) ⁽³⁾	W/W	2,60	2,56	2,63	2,51	2,78	2,63	2,55	2,42	2,67	2,59
TER (EN14511) ⁽⁴⁾	W/W	7,75	7,57	7,54	7,54	7,33	7,11	7,15	7,10	7,30	7,32
Sound power ⁽⁵⁾	dB (A)	82	84	82	85	84	85	85	85	87	88
Sound pressure ⁽⁶⁾	dB (A)	50	52	49	52	52	53	53	52	54	55
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n° / n°	2 / 1	2 / 1	4 / 2	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	4	3	6	6	6	6	8	8
Refrigerant		R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge	kg	37	47	50	59	64	63	63	62	73	82
Global warming potential (GWP)		466	466	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	17,2	21,9	23,3	27,5	29,8	29,4	29,4	28,9	34,0	38,2
Water tank volume	l	500	500	500	500	500	500	500	500	500	500

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 40/45°C.
- (2) Average conditions, low temperature, variable - Reg EU 811/2013
- (3) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 40/45°C.

(5) Sound power level in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

HA/LS/RV P4S		452	512	682	752	912	1102	1152	1352	1502	1612
Heating capacity (EN14511) ⁽¹⁾	kW	44,9	51,0	67,2	72,7	89,0	100,0	111,0	130,0	147,0	158,0
Total input power (EN14511) ⁽¹⁾	kW	14,7	16,8	20,6	23,1	27,3	31,0	34,1	40,4	46,0	48,7
COP (EN14511) ⁽¹⁾	W/W	3,05	3,04	3,30	3,15	3,24	3,23	3,26	3,22	3,20	3,24
Energy Class ⁽²⁾		A+	A+	A++	A++	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,47	3,48	3,90	3,90	3,49	3,75	3,79	3,56	3,57	3,75
η _{s,h} ⁽²⁾	%	136	136	153	153	137	147	148	140	140	147
Cooling capacity (EN14511) ⁽³⁾	kW	38,4	44,2	57,8	62,1	76,8	86,2	96,1	112,0	125,0	135,0
Total input power (EN14511) ⁽³⁾	kW	14,0	16,5	21,5	24,6	26,5	31,0	35,0	38,4	44,6	48,8
EER (EN14511) ⁽³⁾	W/W	2,74	2,68	2,69	2,52	2,90	2,78	2,75	2,92	2,80	2,77
TER (EN14511) ⁽⁴⁾	W/W	7,04	7,20	7,47	7,19	7,46	7,30	7,44	7,27	7,04	7,20
Sound power ⁽⁵⁾	dB (A)	77	76	77	78	82	83	85	86	87	87
Sound pressure ⁽⁶⁾	dB (A)	46	44	45	46	50	51	53	54	55	55
HE/LS/RV P4S		452	512	682	752	912	1102	1152	1352	1502	1612
Heating capacity (EN14511) ⁽¹⁾	kW	44,7	50,9	67,2	72,8	88,6	100,0	111,0	130,0	147,0	158,0
Total input power (EN14511) ⁽¹⁾	kW	14,2	16,3	20,1	22,6	26,3	30,0	33,2	38,8	44,5	47,3
COP (EN14511) ⁽¹⁾	W/W	3,15	3,12	3,34	3,22	3,37	3,33	3,34	3,35	3,30	3,34
Energy Class ⁽²⁾		A+	A+	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,71	3,74	4,12	4,08	3,84	4,02	4,07	3,87	3,85	4,02
η _{s,h} ⁽²⁾	%	146	147	162	160	151	158	160	152	151	158
Cooling capacity (EN14511) ⁽³⁾	kW	38,3	44,1	57,8	62,2	76,8	86,0	96,1	112,0	125,0	135,0
Total input power (EN14511) ⁽³⁾	kW	13,9	16,4	21,3	24,4	25,9	30,6	34,6	37,6	44,1	48,2
EER (EN14511) ⁽³⁾	W/W	2,76	2,69	2,71	2,55	2,97	2,81	2,78	2,98	2,83	2,80
TER (EN14511) ⁽⁴⁾	W/W	7,04	7,20	7,47	7,19	7,46	7,30	7,44	7,27	7,04	7,20
Sound power ⁽⁵⁾	dB (A)	77	76	77	78	82	83	85	86	87	87
Sound pressure ⁽⁶⁾	dB (A)	46	44	45	46	50	51	53	54	55	55
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	1	1	1	1	2	2	2	3	3	3
Refrigerant		R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge	kg	11	11	17	17	25	25	25	36	36	36
Global warming potential (GWP)		466	466	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	5,1	5,1	7,9	7,9	11,7	11,7	11,7	16,8	16,8	16,8
Water tank volume	l	140	140	300	300	300	300	300	500	500	500
HA/LS/RV P4S		1792	2012	2304	2312	2654	2954	3214	3514	3954	4454
Heating capacity (EN14511) ⁽¹⁾	kW	178	198	221	225	257	290	312	348	392	424
Total input power (EN14511) ⁽¹⁾	kW	54,4	59,9	68,4	66,5	81,2	93,0	98,4	112,0	125,0	137,0
COP (EN14511) ⁽¹⁾	W/W	3,27	3,31	3,23	3,38	3,17	3,12	3,17	3,11	3,14	3,09
Energy Class ⁽²⁾		A++	A++	A+	A++	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,88	3,97	3,79	4,11	3,52	3,57	3,72	3,73	3,67	3,73
η _{s,h} ⁽²⁾	%	152	156	149	162	138	140	146	146	144	146
Cooling capacity (EN14511) ⁽³⁾	kW	160	175	197	195	230	255	273	306	353	388
Total input power (EN14511) ⁽³⁾	kW	57,0	62,9	70,3	69,6	78,0	91,6	99,9	116,0	125,0	141,0
EER (EN14511) ⁽³⁾	W/W	2,80	2,78	2,80	2,80	2,95	2,78	2,73	2,64	2,82	2,75
TER (EN14511) ⁽⁴⁾	W/W	7,75	7,57	7,54	7,54	7,32	7,11	7,15	7,09	8,47	8,50
Sound power ⁽⁵⁾	dB (A)	89	89	88	91	89	90	90	92	92	94
Sound pressure ⁽⁶⁾	dB (A)	57	57	56	58	56	58	58	60	59	62
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n° / n°	2 / 1	2 / 1	4 / 2	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	4	3	6	6	6	6	8	8
Refrigerant		R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge	kg	37	47	50	59	64	63	63	62	73	82
Global warming potential (GWP)		466	466	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	17,2	21,9	23,3	27,5	29,8	29,4	29,4	28,9	34,0	38,2
Water tank volume	l	500	500	500	500	500	500	500	500	500	500

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 40/45°C.
- (2) Average conditions, low temperature, variable - Reg EU 811/2013
- (3) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 40/45°C.

(5) Sound power level in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

LHE/P4

HA/XL/RV P4S		452	512	682	752	912	1102	1152	1352	1502	1612
Heating capacity (EN14511) ⁽¹⁾	kW	44,2	49,8	65,2	70,6	87,4	98,8	109,0	128,0	145,0	155,0
Total input power (EN14511) ⁽¹⁾	kW	14,4	16,3	20,2	22,8	26,6	30,4	33,4	39,2	45,1	47,9
COP (EN14511) ⁽¹⁾	W/W	3,07	3,06	3,23	3,10	3,30	3,25	3,26	3,27	3,22	3,24
Energy Class ⁽²⁾		A+	A+	A++	A++	A+	A++	A++	A+	A+	A++
SCOP ⁽²⁾	kWh/kWh	3,60	3,64	3,97	3,94	3,71	3,90	3,94	3,77	3,77	3,89
η _{s,h} ⁽²⁾	%	141	143	156	155	146	153	155	148	148	152
Cooling capacity (EN14511) ⁽³⁾	kW	37,0	42,6	55,2	59,2	75,0	83,6	92,8	110,0	121,0	131,0
Total input power (EN14511) ⁽³⁾	kW	14,5	17,1	22,6	25,8	26,8	31,6	36,0	38,8	45,7	50,0
EER (EN14511) ⁽³⁾	W/W	2,55	2,49	2,44	2,29	2,80	2,65	2,58	2,84	2,65	2,62
TER (EN14511) ⁽⁴⁾	W/W	7,04	7,20	7,47	7,19	7,46	7,30	7,44	7,27	7,04	7,20
Sound power ⁽⁵⁾	dB (A)	73	73	73	74	76	77	79	81	82	82
Sound pressure ⁽⁶⁾	dB (A)	41	41	41	42	44	45	47	49	50	50
HE/XL/RV P4S		452	512	682	752	912	1102	1152	1352	1502	1612
Heating capacity (EN14511) ⁽¹⁾	kW	44,6	50,8	66,4	72,0	88,7	100,0	110,0	130,0	147,0	158,0
Total input power (EN14511) ⁽¹⁾	kW	13,7	15,5	19,4	22,0	25,1	28,9	32,0	37,0	43,0	45,8
COP (EN14511) ⁽¹⁾	W/W	3,26	3,28	3,42	3,27	3,53	3,46	3,44	3,51	3,42	3,45
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A+++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	4,13	4,06	4,40	4,39	4,32	4,37	4,45	4,27	4,25	4,37
η _{s,h} ⁽²⁾	%	162	160	173	173	170	172	175	168	167	172
Cooling capacity (EN14511) ⁽³⁾	kW	37,3	42,9	55,7	59,5	75,6	84,4	93,5	111,0	123,0	132,0
Total input power (EN14511) ⁽³⁾	kW	13,9	16,5	21,9	25,3	25,5	30,2	34,7	36,9	43,7	48,1
EER (EN14511) ⁽³⁾	W/W	2,68	2,60	2,54	2,35	2,96	2,79	2,70	3,01	2,81	2,74
TER (EN14511) ⁽⁴⁾	W/W	7,04	7,20	7,47	7,19	7,46	7,30	7,44	7,27	7,04	7,2
Sound power ⁽⁵⁾	dB (A)	73	73	73	74	76	77	79	81	82	82
Sound pressure ⁽⁶⁾	dB (A)	41	41	41	42	44	45	47	49	50	50
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	1	1	1	1	2	2	2	3	3	3
Refrigerant		R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge	kg	11	11	17	17	25	25	25	36	36	36
Global warming potential (GWP)		466	466	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	5,1	5,1	7,9	7,9	11,7	11,7	11,7	16,8	16,8	16,8
Water tank volume	l	140	140	300	300	300	300	300	500	500	500
HA/XL/RV P4S		1792	2012	2304	2312	2654	2954	3214	3514	3954	4454
Heating capacity (EN14511) ⁽¹⁾	kW	173	196	216	222	254	285	305	338	382	415
Total input power (EN14511) ⁽¹⁾	kW	53,5	61,2	67,2	65,7	79,3	91,0	96,9	110,0	122,0	135,0
COP (EN14511) ⁽¹⁾	W/W	3,23	3,2	3,21	3,38	3,20	3,13	3,15	3,07	3,13	3,07
Energy Class ⁽²⁾		A++	A++	A++	A++	A+	A+	A++	A++	A+	A++
SCOP ⁽²⁾	kWh/kWh	4,02	4,05	3,98	4,17	3,73	3,72	3,84	3,84	3,80	3,81
η _{s,h} ⁽²⁾	%	158	159	156	164	146	146	151	151	149	150
Cooling capacity (EN14511) ⁽³⁾	kW	154	168	190	185	222	247	263	293	341	375
Total input power (EN14511) ⁽³⁾	kW	59,2	65,5	72,2	73,4	80,0	94,0	103,0	121,0	128,0	145,0
EER (EN14511) ⁽³⁾	W/W	2,60	2,56	2,63	2,52	2,78	2,63	2,55	2,42	2,66	2,59
TER (EN14511) ⁽⁴⁾	W/W	7,75	7,57	7,54	7,54	7,32	7,11	7,15	7,09	8,47	8,50
Sound power ⁽⁵⁾	dB (A)	82	84	82	85	84	85	85	85	87	88
Sound pressure ⁽⁶⁾	dB (A)	50	52	49	52	52	53	53	52	54	55
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n° / n°	2 / 1	2 / 1	4 / 2	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	4	3	6	6	6	6	8	8
Refrigerant		R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge	kg	37	47	50	59	64	63	63	62	73	82
Global warming potential (GWP)		466	466	466	466	466	466	466	466	466	466
Equivalent CO ₂ charge	t	17,2	21,9	23,3	27,5	29,8	29,4	29,4	28,9	34,0	38,2
Water tank volume	l	500	500	500	500	500	500	500	500	500	500

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 40/45°C.
- (2) Average conditions, low temperature, variable - Reg EU 811/2013
- (3) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 40/45°C.

(5) Sound power level in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

COMPONENTS

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL9018.

REFRIGERANT CIRCUIT

The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. The refrigerant utilised is R454B. The refrigerant circuit includes: sight glass, filter drier, electronic expansion valves, 4 way reversing valve, check valves, liquid receiver, liquid separator, schrader valves for maintenance and control, pressure safety device (for compliance with PED regulations).

COMPRESSORS

The compressors are scroll type, with crankcase resistance and thermal protection, installed in a separate compartment from the airflow in order to reduce noise. When the unit is on stand-by mode, the crankcase heater is always powered. Through the unit's front panel, it is possible to inspect and repair the compressors even when the unit is running.

The compressors used are tandem type. This solution allows a significantly higher efficiency with partial loads compared to the option with independent refrigerant circuits. The control system constantly monitors the discharge temperature of the single compressors.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm at least thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans. All heat exchangers are supplied standard with fins hydrophilic coating "Blue Fins".

USER CIRCUIT HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit. The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for antifreeze protection.

FANS

The fans are direct drive axial type with aerofoil blades, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335. They are fixed to the unit frame via rubber anti-vibration mountings. The electric motors, in HA versions are 6 poles type and a phase-cut regulator controls their speed of rotation to increase energy efficiency and allow them to be used over a wider operating range. In the HE versions, the fans are electronic type, with permanent magnet motors with an integrated driver that modulates the speed of rotation. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple

compressors), alarm reset.

The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over. The control also manages the integration with other heating sources (electric heaters, boilers, solar panels etc) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards 2014/35/UE and 2014/30/UE. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are standardly equipped with several control and safety devices: water return temperature sensor, installed on the water return pipe of the system, and anti-freeze probe, installed on the water supply pipe to the system high-pressure switch with automatic reset. There are also included a low-pressure automatic reset, pressure transducer (used to optimize the defrosting cycle and modulate the rotation speed of the fans according to external conditions), Freon side safety device, compressor thermal protection, fan thermal protection, flow switch, and external air compensation probe.

LEAK DETECTOR

When the unit is powered ON, the sensor is warmed up/initialised (duration approx. 1min.).

During this period, the LEDs inside the sensor blink, the refrigerant leakage alarm is notified and the 24Vac auxiliary circuit is switched off. After this period, if in the absence of any further feedback from the sensor, the PLC control is powered up and the unit is ready to operate. If refrigerant leaks occur, the sensor is activated and the power supply to the control PLC is immediately switched off until the sensor indicates the refrigerant is still present.

VERSIONI

Versione supersilenziata HA/XL HE/XL

All XL super silenced units are supplied equipped with a special vibration-damping system consisting of a floating basement placed upon the unit's frame, through the interposition of high-damping steel springs.

The compressors are housed on this floating base and are in turn fixed by means of rubber anti-vibration supports.

The enclosure is manufactured from galvanized steel sandwich panels that have a micro-perforated inner skin and a core of 30 mm thick, high density (25 kg/m³) soundproofing mat. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 6-8 dB(A) compared to units in standard configuration.

RV Version

Reversible heating/cooling unit, with cycle reversal on the cooling circuit.

HA Version

High efficiency version, according to current standard. Unit equipped with AC fans.

HE Version

High efficiency version, according to current standard. Unit equipped with EC fans.

LS Version

This version includes the complete acoustic insulation of the unit with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

P4U Version

The P4U units use 4 hydraulic connections and are used in modern 4-pipe systems. In these systems, cold and hot water is always available (in every period of the year) and present in the specific hydraulic circuit. These systems allow the simultaneous production of cold water and hot water using 4 hydraulic connections, 2 connections are related to the hot water circuit, 2 connections are related to the cold water circuit. The plant thus conceived is able to heat and, at the same time, if required, to cool with very high energy efficiencies. In this configuration, however, the units are also able to produce hot or cold water separately at any time of the year.

The units are supplied with 2 heat exchangers, one dedicated to the production of cold water and one dedicated to the production of hot water. The operating modes are:

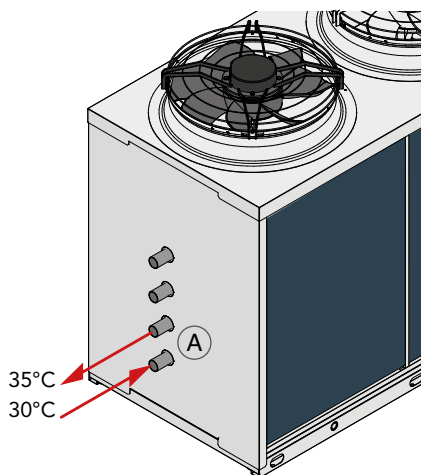
1. User water heating: The unit behaves like a normal air/water heat pump in heating mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.

2. User water cooling: The unit behaves like a normal air / water chiller in cooling mode, using the finned exchanger as the source and the B plate heat exchanger as user.

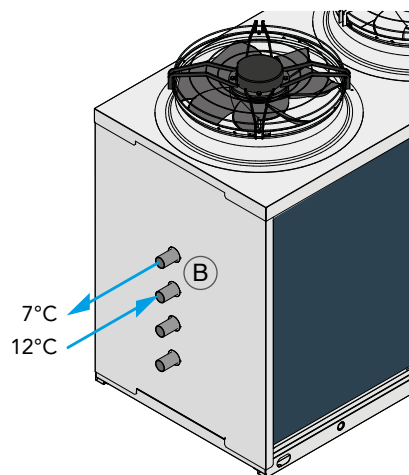
3. Simultaneous user Cooling + heating: The unit behaves like a water / water heat pump, using the plate heat exchanger B as the cold user and the plate heat exchanger A as hot user. This version is not able to produce domestic hot water.

P4U VERSION

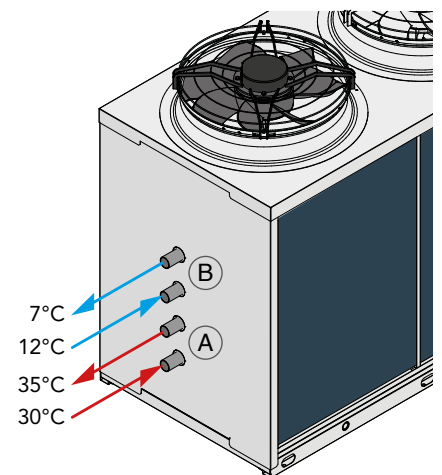
User water heating



User water cooling



Simultaneous user Cooling + heating



The above scheme is for illustrative purposes only. For the correct pipes placement, please refer to the units technical manual.

OPERATION LIMITS

P4S Version

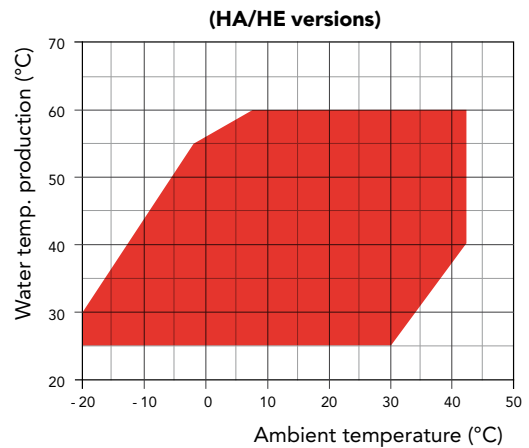
The P4S units have been designed to meet the needs of 2 + 2 pipe systems (2 user side pipes, 2 domestic hot water pipes) throughout the year. The units are supplied with 2 exchangers, one dedicated to the production of the user cold and hot water and one dedicated to the production of domestic hot water only (D.H.W.). The production of domestic hot water always has priority. In winter mode the activation of D.H.W. production temporarily stops the production of the user hot water, which is restored when the D.H.W. accumulation reaches the temperature set. In summer mode the unit will switch to cooling (by activating the reverse cycle valve installed in the refrigerant circuit) and any request for domestic hot water will allow, at the same time, the production of cold water. In this operating mode, the system can simultaneously produce cold water and domestic hot water. Domestic hot water, in summer mode, is produced by heat recovery and therefore free of charge. When the temperature measured by the D.H.W. sensor reaches the set, the D.H.W. water pump is stopped and normal operation is restored in cooling mode. The operating modes are:

1. User water heating: The unit behaves like a normal air/water heat pump in heating mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.

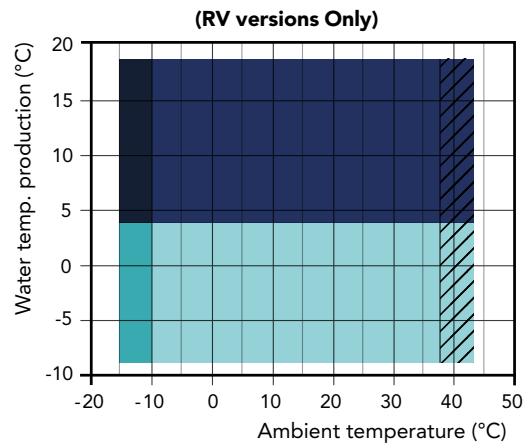
2. User water cooling: The unit behaves like a normal air/water chiller in cooling mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.

3. Domestic hot water production (D.H.W.): The unit behaves like a normal air / water heat pump in heating mode, using the finned heat exchanger as the source and as a user the plate heat exchanger B (a special D.H.W. heat exchanger that works with a higher set point).

4. User water cooling + D.H.W. production: The unit behaves like a water / water heat pump, using the plate heat exchanger A as the cold user and the plate heat exchanger B as D.H.W. production).



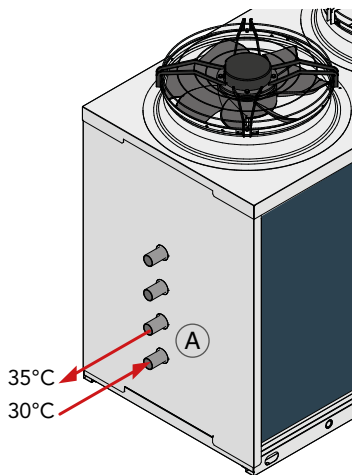
■ Heating mode



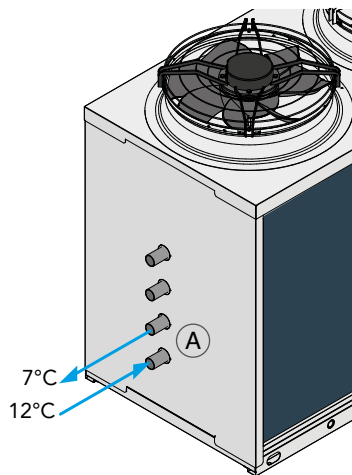
■ Cooling mode (only HE version)
 ■ Cooling mode
 ■ Cooling mode with glycol (only HE/BT version)
 ■ Cooling mode with glycol (only BT version)
 ▨ Possible noise increase for XL versions

P4S VERSION

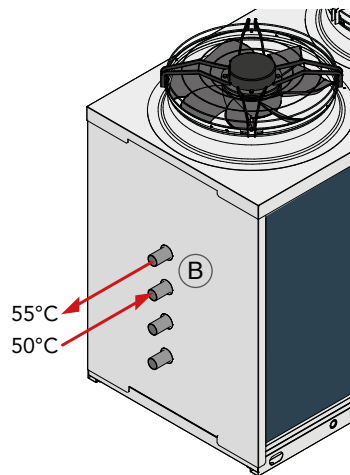
User water heating



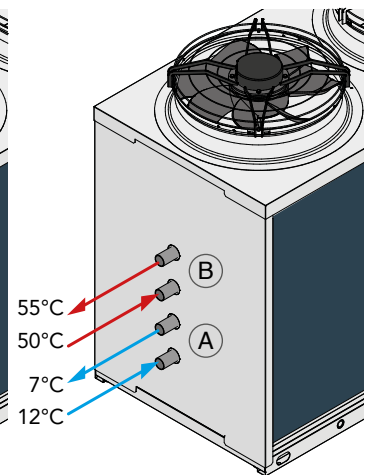
User water cooling



Domestic hot water production (D.H.W.)



User water cooling + D.H.W. production



The above scheme is for illustrative purposes only. For the correct pipes placement, please refer to the units technical manual.

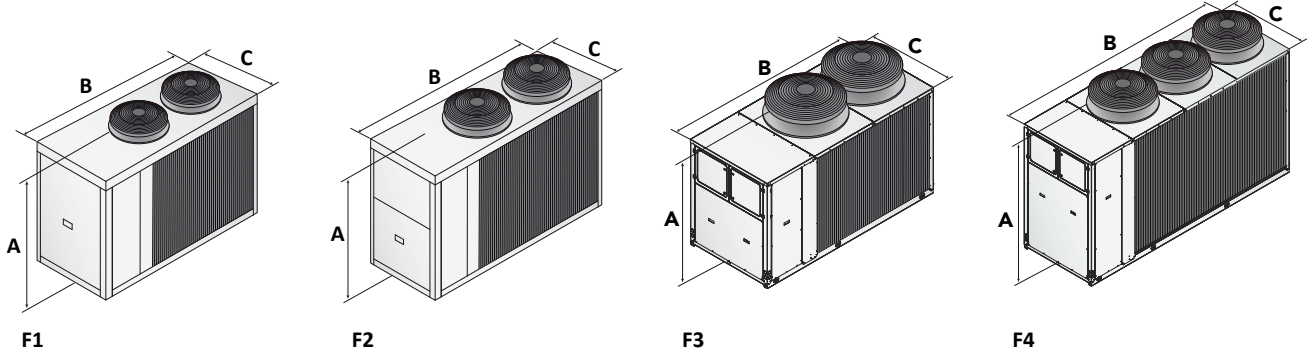
ACCESSOIRES

LHE/P4

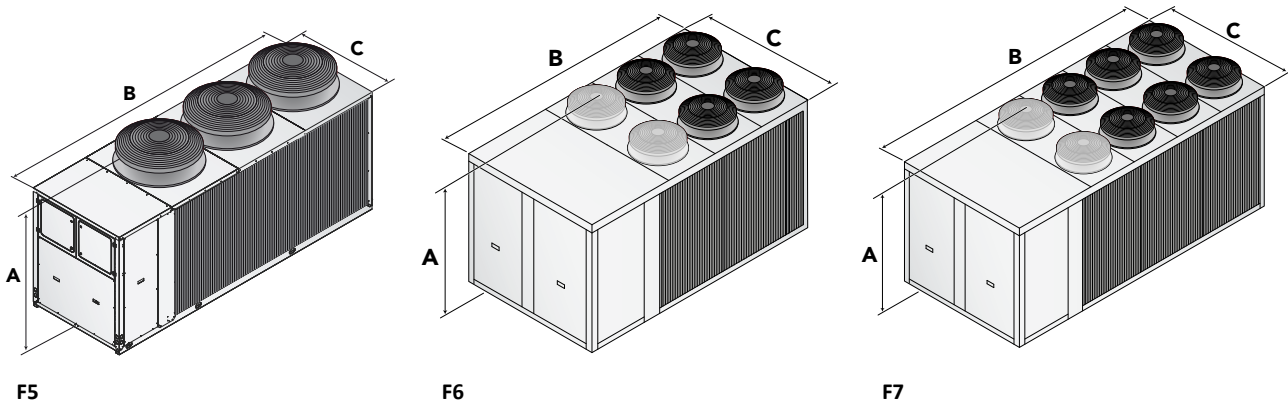
LHE HA-HE /HH-RV		F1	F2	F3	F4	F5	F6	F7
Contrôleur de débit		●	●	●	●	●	●	●
Technologie "floating frame" - Versions LS		-	-	-	-	-	-	-
Technologie "floating frame" - Versions XL		●	●	●	●	●	●	●
Kit hydraulique avec réservoir et une pompe à basse pression	A1LLU	◇	◇	◇	◇	◇	◇	◇
Kit hydraulique avec pompe à basse pression pour récupération de chaleur	A1LPR	◇	◇	◇	◇	◇	◇	◇
Kit hydraulique avec pompe à basse pression	A1LPU	◇	◇	◇	◇	◇	◇	◇
Kit hydraulique 1 pompe circuit ECS	A1NTR	□	□	□	□	□	□	□
Module hydraulique 1 pompe	A1NTU	□	□	□	□	□	□	□
Kit hydraulique avec une pompe inverter en circuit de récupération	A1VSR	-	-	-	-	-	○	○
Kit hydraulique circuit utilisateur, pompe simple avec inverseur, pas de reservoir	A1VSU	○	○	○	○	○	○	○
Kit hydraulique circuit utilisateur + inverseur	A1VVU	○	○	○	○	○	○	○
Kit hydraulique 1 pompe + réservoir	A1ZZU	□	□	□	□	□	□	□
Kit hydraulique 2 pompes circuit ECS	A2NTR	□	□	□	□	□	□	□
Kit hydraulique 2 pompes	A2NTU	□	□	□	□	□	□	□
Kit hydraulique 2 pompes + réservoir	A2ZZU	□	□	□	□	□	□	□
Batterie avec peinture epoxy	BEF0	○	○	○	○	○	○	○
Fonctionnement à basses températures air extérieur dans le refroidissement	BF00	●	●	●	●	●	●	●
Bac à condensât avec résistance antigel	BRCA	○	○	○	○	○	○	○
Réservoir à 4 connexions et pompe à basse pression disponible	BUF4A	◇	◇	◇	◇	◇	◇	◇
Fonctionnement à basse température	BT00	○	○	○	○	○	○	○
Régulation des ventilateurs par coupe de phase	DCCF	●	●	●	●	●	●	●
Détendeur de fuites de réfrigérant	DFR0	○	○	○	○	○	○	○
Soft starter électronique	DSSE	○	○	○	○	○	○	○
Double pressostat de sécurité	DSV0	○	○	○	○	○	○	○
Grille de protection de la batterie	GBPE	○	○	○	○	○	○	○
Application WIFI	HIPRO.web	○	○	○	○	○	○	○
Display	HMI.PRO	●	●	●	●	●	●	●
Interface série pour protocole BACNET RS485	IBAC	○	○	○	○	○	○	○
Interface Série RS485	INSE	●	●	●	●	●	●	●
Emballage marin	IM00	○	○	○	○	○	○	○
Pieds caoutchouc anti vibratiles	KAVG	○	○	○	○	○	○	○
Amortisseurs de vibrations à ressort	KAVM	○	○	○	○	○	○	○
Kit COP interne optimizer	KCOP	○	○	○	○	○	○	○
Kits d'anneaux de levage	KG50	●	●	●	●	●	●	●
Kit antigel de récupération	KPRO	○	○	○	○	○	○	○
Kit antigel pour ballon	KPSU	○	○	○	○	○	○	○
Kit antigel utilisateur	KPU0	○	○	○	○	○	○	○
Kit victaulic	KVICT	-	-	-	-*	●	●	●
Manomètres frigorifiques	MAML	○	○	○	○	○	○	○
Moniteur di phase	MF00	●	●	●	●	●	●	●
Clavier déporté	PCRL	○	○	○	○	○	○	○
Robinet de refoulement des compresseurs	RDCO	○	○	○	○	○	○	○
Relais thermiques des compresseurs	RL00	●	●	●	●	●	●	●
Batterie avec ailettes pré vernies	RM00	○	○	○	○	○	○	○
Recuperation partielle	RP00	-	-	-	-	-	-	-
Batterie cuivre/cuivre	RR00	○	○	○	○	○	○	○
Système de gestion en cascade RS485	SGRS	○	○	○	○	○	○	○
Kit sonde sanitaire	SOND1	●	●	●	●	●	●	●
Ventilateurs E.C. - versions HA	VECE	-	-	-	-	-	-	-
Ventilateurs E.C. - versions HE	VECE	●	●	●	●	●	●	●
Détendeur électronique	VTEE	●	●	●	●	●	●	●

● Standard ○ Option □ En option sur la version LS uniquement ◇ En option sur la version XL uniquement - Non disponible

* Standard pour la taille 1792



	452	512	682	752	912	1102	1152	1352	1502	1612
A (mm)	1838	1838	1955	1955	1955	1955	1955	1955	1955	1955
B (mm)	2400	2400	3000	3000	3000	3000	3000	4295	4295	4295
C (mm)	1265	1265	1265	1265	1265	1265	1265	1265	1265	1265
Kg	680	689	938	944	1162	1170	1176	1785	1811	1825
FRAME	F1	F1	F2	F2	F3	F3	F3	F4	F4	F4



	1792	2012	2304	2312	2654	2954	3214	3514	3954	4454
A (mm)	1955	2355	2415	2355	2415	2415	2415	2415	2415	2415
B (mm)	4295	4296	4515	4296	4515	4515	4515	4515	5557	5557
C (mm)	1265	1265	2310	1265	2310	2310	2310	2310	2310	2310
Kg	1879	1924	1940	3433	3519	3609	3724	3752	4044	4072
FRAME	F4	F5	F6	F5	F6	F6	F6	F6	F7	F7