

LDA

Air to water chillers and heat pumps



R410A



LDA water chillers and heat pumps are efficient, low-noise products designed for medium to large applications. They are suitable for generating chilled water at temperatures in the region of 7°C, commonly used in applications with fan coils and/or air handling units. The use of tandem scroll compressors results in high efficiencies (especially at part loads) and low noise levels, making them suitable for use in many applications. Differing versions and a wide range of accessories, enable the optimal solution to be selected.

VERSIONS

- LDA cooling only version.
- LDA/XLextra low noise version.
- LDA/CN condensing unit version.
- LDA/HP reversible heat pump version.
- LDA/FC free-cooling version.
- LDA/FC100 free-cooling 100% version.

ACCESSORIES

- A0NP: Hydraulic kit without tank and pump
- A1NT: Hydraulic kit with: pump, expansion valve, safety valve, flow switch
- A1ZZ: Hydraulic kit with: pump, expansion valve, safety valve, flow switch, insulated tank
- DCCF: Low ambient condensing pressure control
- DSSE: Electronic soft starter
- FAMM: Coil protection mesh with metallic filter
- LS00: Low noise version
- PCRL: Remote control panel
- RAES: Antifreeze kit (for unit with hydraulic kit)
- RAEV: Evaporator antifreeze heater (Basic version only)
- RP00: Partial heat recovery
- VSOG: Liquid line solenoid valve

Version LDA ÷ LDA/HP		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity EN14511 ⁽¹⁾	kW	40,2	45,3	54,6	60,9	67,6	79,3	90,1	99,4	113,0	124,6	150
Compressor input EN14511 ⁽¹⁾	kW	14,0	15,9	18,7	21,3	23,1	27,3	31,3	34,5	38,5	44,2	49,8
E.E.R. EN14511 ⁽¹⁾	W/W	2,9	2,9	2,9	2,8	2,9	2,9	2,9	2,9	2,9	2,8	3,0
Heating capacity EN14511 ⁽²⁾	kW	44,0	48,9	58,9	67,8	77,2	87,8	104,5	113,5	128,1	139,3	162,8
Compressor input EN14511 ⁽²⁾	kW	10,8	12,0	14,1	15,8	17,5	20,7	24,1	27,0	30,0	33,0	38,8
C.O.P. EN14511 ⁽²⁾	W/W	4,1	4,0	4,2	4,3	4,4	4,2	4,3	4,2	4,3	4,2	4,2
Heating capacity EN14511 ⁽³⁾	kW	43,2	48,0	57,4	66,0	75,2	85,6	101,7	110,7	125,2	136,6	159,0
Compressor input EN14511 ⁽³⁾	kW	13,1	14,7	17,4	19,4	21,5	24,9	29,0	32,5	36,0	40,0	46,8
C.O.P. EN14511 ⁽³⁾	W/W	3,3	3,3	3,3	3,4	3,5	3,4	3,5	3,4	3,5	3,4	3,4
Power supply	V/Ph/Hz	400/3+N/50			400/3/50							
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	2x0,5	2x0,5	2x0,69	2x0,69	2x0,69	2x0,69	3x0,69	3x0,69	3x0,69	3x0,69	4x0,69
Sound power level ⁽³⁾	dB(A)	77	77	79	79	80	80	82	82,5	82,9	83,1	83,5
Sound pressure level ⁽⁴⁾	dB(A)	49	49	51	51	52	52	54	54,5	54,9	55,1	55,5
Water Pump input power	kW	1,3	1,3	1,5	1,5	1,5	1,5	1,5	1,9	1,9	1,9	2,2
Pump available static press.	kPa	174	158	196	189	171	162	141	146	136	128	110
Water tank volume	l	180	180	300	300	300	300	500	500	500	500	500

Version LDA ÷ LDA/HP		162	190	210	240	260	300	320	380	430	500
Cooling capacity EN14511 ⁽¹⁾	kW	166,8	184,9	202,2	232,4	260,6	314,7	343,0	383,7	454,0	497,0
Compressor input EN14511 ⁽¹⁾	kW	52,8	67,3	78,3	84,9	92,1	103,1	116,9	140,9	161,2	176,0
E.E.R. EN14511 ⁽¹⁾	W/W	3,1	2,7	2,6	2,7	2,8	3,0	2,9	2,7	2,8	2,8
Heating capacity EN14511 ⁽²⁾	kW	176,6	194,9	210	252,6	217,7	331,2	362,9	422,6	488,8	529,3
Compressor input EN14511 ⁽²⁾	kW	42,8	50,0	55,0	64,0	71,0	87,0	95,0	114,0	126,0	139,0
C.O.P. EN14511 ⁽²⁾	W/W	4,1	3,9	3,8	3,9	3,8	3,8	3,8	3,7	3,9	3,8
Heating capacity EN14511 ⁽³⁾	kW	173,3	190,6	206,3	246,5	266,5	323,2	355,2	412,3	476,7	519,0
Compressor input EN14511 ⁽³⁾	kW	51,8	62,0	66,0	77,0	85,0	105,0	114,0	135,0	151,0	168,0
C.O.P. EN14511 ⁽³⁾	W/W	3,3	3,1	3,1	3,2	3,1	3,1	3,1	3,1	3,2	3,1
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Fans	n° x kW	4x0,69	3x2	3x2	4x2	4x2	6x2	6x2	8x2	8x2	8x2
Sound power level ⁽⁴⁾	dB(A)	84	86	86	89	89	90	90	91	91	91
Sound pressure level ⁽⁵⁾	dB(A)	56	58	58	61	61	62	62	63	63	63
Water Pump input power	kW	2,2	3,0	3,0	4,0	4,0	5,5	5,5	7,5	7,5	7,5
Pump available static press.	kPa	98	172	155	172	143	177	167	174	154	139
Water tank volume	l	500	600	600	600	600	1000	1000	1000	1000	1000

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

⁽²⁾ Heating: condenser water temperature in/out 30/35 °C, ambient air temperature 7°C DB, 6°C WB.

⁽³⁾ Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

⁽⁴⁾ Sound power level in accordance with ISO 9614.

⁽⁵⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 in accordance with ISO 9614.

LDA

Versions LDA/XL ÷ LDA/HP/XL		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity EN14511 ⁽¹⁾	kW	--	--	--	61,3	68,4	81,0	90,7	100,5	114,8	127,0	146,5
Compressor input EN14511 ⁽¹⁾	kW	--	--	--	21,7	23,3	27,0	31,8	34,7	38,4	43,8	51,7
E.E.R. EN14511 ⁽¹⁾	W/W	--	--	--	2,8	2,9	3,0	2,8	2,9	3,0	2,9	2,8
Heating capacity EN14511 ⁽²⁾	kW	--	--	--	68,4	78,4	89,5	105,5	115,1	130,7	142,2	158,1
Compressor input EN14511 ⁽²⁾	kW	--	--	--	16,4	18,2	21,4	25,0	27,9	31,0	33,9	38,9
C.O.P. EN14511 ⁽²⁾	W/W	--	--	--	4,1	4,3	4,2	4,2	4,1	4,2	4,2	4,1
Heating capacity EN14511 ⁽³⁾	kW	--	--	--	66,5	76,2	87,2	102,5	112,0	127,5	139,1	155,1
Compressor input EN14511 ⁽³⁾	kW	--	--	--	19,9	22,1	25,6	29,8	34,0	37,9	41,0	46,9
C.O.P. EN14511 ⁽³⁾	W/W	--	--	--	3,3	3,4	3,4	3,4	3,3	3,4	3,4	3,3
Power supply	V/Ph/Hz	--	--	--	400/3/50							
Compressors / Circuits	n°	--	--	--	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	--	--	--	2x0,98	2x0,98	2x0,98	3x0,98	3x0,98	3x0,98	3x0,98	3x0,98
Sound power level ⁽⁴⁾	dB(A)	--	--	--	76	78	78	79,5	79,9	80,1	80,5	81
Sound pressure level ⁽⁵⁾	dB(A)	--	--	--	48	50	50	51,5	51,9	52,1	52,5	53

Versions LDA/XL ÷ LDA/HP/XL		162	190	210	240	260	300	320	380	430	500
Cooling capacity EN14511 ⁽¹⁾	kW	162,5	179,8	196,4	--	--	--	--	--	--	--
Compressor input EN14511 ⁽¹⁾	kW	57,2	67,7	79,4	--	--	--	--	--	--	--
E.E.R. EN14511 ⁽¹⁾	W/W	2,8	2,6	2,5	--	--	--	--	--	--	--
Heating capacity EN14511 ⁽²⁾	kW	171,3	189,4	203,6	--	--	--	--	--	--	--
Compressor input EN14511 ⁽²⁾	kW	42,9	47,9	52,9	--	--	--	--	--	--	--
C.O.P. EN14511 ⁽²⁾	W/W	4,0	4,0	3,9	--	--	--	--	--	--	--
Heating capacity EN14511 ⁽³⁾	kW	168,8	186,0	201,1	--	--	--	--	--	--	--
Compressor input EN14511 ⁽³⁾	kW	51,9	56,9	63,9	--	--	--	--	--	--	--
C.O.P. EN14511 ⁽³⁾	W/W	3,2	3,3	3,1	--	--	--	--	--	--	--
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n°	2/1	4/2	4/2	--	--	--	--	--	--	--
Fans	n° x kW	3x0,89	4x0,89	4x0,89	--	--	--	--	--	--	--
Sound power level ⁽⁴⁾	dB(A)	81,3	84	84	--	--	--	--	--	--	--
Sound pressure level ⁽⁵⁾	dB(A)	53,3	56	56	--	--	--	--	--	--	--

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

⁽²⁾ Heating : condenser water temperature in/out 30/35 °C, ambient air temperature 7°C DB, 6°C WB.

⁽³⁾ Heating : condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

⁽⁴⁾ Sound power level in accordance with ISO 9614.

⁽⁵⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 in accordance with ISO 9614.

Versions LDA/FC		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity EN14511 ⁽¹⁾	kW	--	--	--	60,3	66,8	78,5	88,8	97,9	111,1	123,0	148,1
Compressor input EN14511 ⁽¹⁾	kW	--	--	--	21,2	23,0	27,2	31,2	34,3	38,5	44,0	49,6
E.E.R. EN14511 ⁽¹⁾	W/W	--	--	--	2,8	2,9	2,9	2,8	2,9	2,9	2,8	3,0
Free cooling capacity ⁽⁵⁾	kW	--	--	--	51,3	51,3	51,7	76,0	74,5	75,1	76,6	104,5
Compressors input EN14511 ⁽⁵⁾	kW	--	--	--	1,4	1,4	1,4	2,1	2,1	2,1	2,1	2,8
Water flow ⁽⁵⁾	m ³ /h	--	--	--	10,9	12,1	14,2	16,1	17,8	20,2	22,3	26,9
Power supply	V/Ph/Hz	400/3/50										
Compressors / Circuits	n°	--	--	--	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	--	--	--	2x0,69	2x0,69	2x0,69	3x0,69	3x0,69	3x0,69	3x0,69	4x0,69
Sound power level ⁽³⁾	dB(A)	--	--	--	79	80	80	82	82,5	82,9	83,1	83,5
Sound power level ⁽⁴⁾	dB(A)	--	--	--	51	52	52	54	54,5	54,9	55,1	55,5
Water pump input power	kW	--	--	--	1,5	2,3	2,3	2,2	2,2	3,0	3,0	3,0
Pump available static press.	kPa	--	--	--	129	159	139	141	130	160	148	103
Water tank volume	l	--	--	--	300	300	300	500	500	500	500	500

Versions LDA/FC		162	190	210	240	260	300	320	380	430	500
Cooling capacity EN14511 ⁽¹⁾	kW	164,6	183,2	200,7	230,1	258,1	311,6	339,2	380,2	449,6	492,3
Compressor input EN14511 ⁽¹⁾	kW	54,6	67,1	77,7	84,5	91,8	102,8	116,5	140,4	160,7	175,4
E.E.R. EN14511 ⁽¹⁾	W/W	3,0	2,7	2,6	2,7	2,8	3,0	2,9	2,7	2,8	2,8
Free cooling capacity ⁽⁵⁾	kW	106,6	134,1	136,6	164,1	168,0	241,4	246,6	313,9	326,6	332,8
Compressors input EN14511 ⁽⁵⁾	kW	2,8	6,0	6,0	8,0	8,0	12,0	12,0	16,0	16,0	16,0
Water flow ⁽⁵⁾	m ³ /h	29,9	33,3	36,4	41,8	46,9	56,6	61,6	69,0	81,6	89,3
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Fans	n° x kW	4x0,69	3x2	3x2	4x2	4x2	6x2	6x2	8x2	8x2	8x2
Sound power level ⁽³⁾	dB(A)	84	86	86	89	89	90	90	91	91	91
Sound power level ⁽⁴⁾	dB(A)	56	58	58	61	61	62	62	63	63	63
Water pump input power	kW	3,0	4,0	4,0	5,5	5,5	5,5	5,5	11,0	11,0	11,0
Pump available static press.	kPa	80	182	158	126	92	126	115	111	70	42
Water tank volume	l	500	600	600	600	600	1000	1000	1000	1000	1000

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C glycol 20%.

⁽³⁾ Sound power level in accordance with ISO 9614.

⁽⁴⁾ Sound pressure level at 10 mt Q = 2 from the unit in free field conditions direction factor Q=2 in accordance with ISO 9614.

⁽⁵⁾ Free Cooling : ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal water flow, compressors switched off.

LDA

Version LDA/FC100		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity EN14511 ⁽¹⁾	kW	--	--	--	63,8	71,5	85,2	93,3	103,6	118,5	132,3	154,1
Compressor input EN14511 ⁽¹⁾	kW	--	--	--	22,1	23,3	26,9	32,8	35,1	38,5	43,1	49,6
E.E.R. EN14511 ⁽¹⁾	W/W	--	--	--	2,9	3,1	3,2	2,8	2,9	3,1	3,1	3,1
Free cooling capacity ⁽⁵⁾	kW	--	--	--	81,9	86,1	92,0	113,4	119,9	127,8	133,8	166,0
Compressors input EN14511 ⁽⁵⁾	kW	--	--	--	4,0	4,0	4,0	6,0	6,0	6,0	6,0	6,0
Water flow ⁽⁵⁾	m ³ /h	--	--	--	11,6	13,0	15,5	16,9	18,8	21,5	24,0	28,0
Power supply	V/Ph/Hz	400/3/50										
Compressors / Circuits	n°	--	--	--	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	--	--	--	2x2	2x2	2x2	3x2	3x2	3x2	3x2	3x2
Sound power level ⁽³⁾	dB(A)	--	--	--	79	80	80	82	82,5	82,9	83,1	83,5
Sound power level ⁽⁴⁾	dB(A)	--	--	--	51	52	52	54	54,5	54,9	55,1	55,5
Water tank volume	l	--	--	--	300	300	300	500	500	500	500	500

Versions LDA/FC100		162	190	210	240	260	300	320	380	430	500
Cooling capacity EN14511 ⁽¹⁾	kW	172,4	191,5	210,4	233,3	260,5	--	--	--	--	--
Compressor input EN14511 ⁽¹⁾	kW	53,9	65,1	74,6	82,7	90,7	--	--	--	--	--
E.E.R. EN14511 ⁽¹⁾	W/W	3,2	2,9	2,8	2,8	2,9	--	--	--	--	--
Free cooling capacity ⁽⁵⁾	kW	170,2	195,8	201,9	208,1	214,2	--	--	--	--	--
Compressors input EN14511 ⁽⁵⁾	kW	6,0	8,0	8,0	8,0	8,0	--	--	--	--	--
Water flow ⁽⁵⁾	m ³ /h	31,3	34,8	38,2	42,4	47,3	--	--	--	--	--
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	--	--	--	--	--
Fans	n° x kW	3x2	4x2	4x2	4x2	4x2	--	--	--	--	--
Sound power level ⁽³⁾	dB(A)	84	86	86	89	89	--	--	--	--	--
Sound power level ⁽⁴⁾	dB(A)	56	58	58	61	61	--	--	--	--	--
Water tank volume	l	500	600	600	600	600	--	--	--	--	--

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C glycol 20%.

⁽³⁾ Sound power level in accordance with ISO 9614.

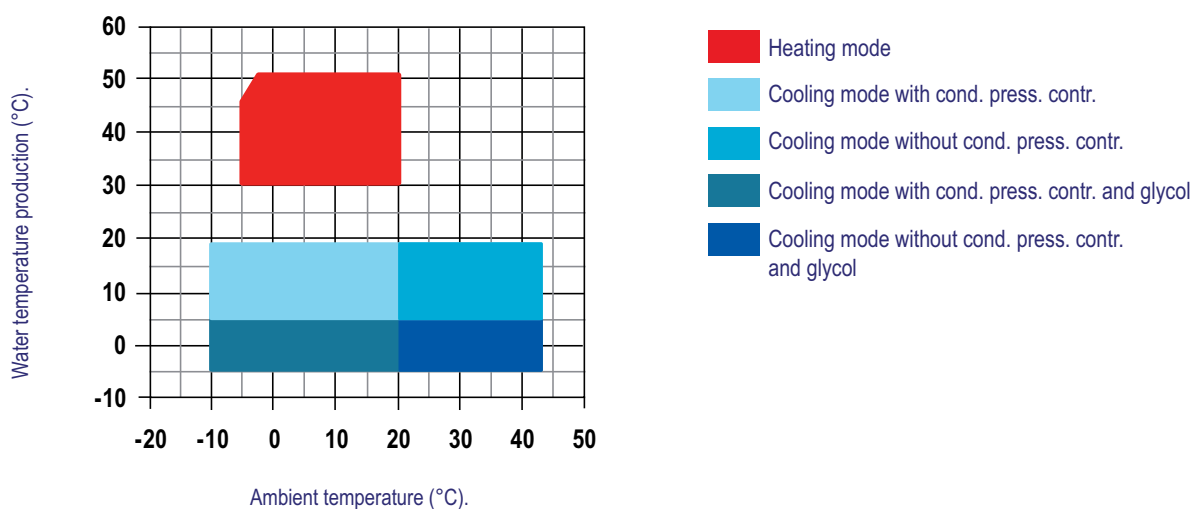
⁽⁴⁾ Sound pressure level at 10 mt Q = 2 from the unit in free field conditions direction factor Q=2 in accordance with ISO 9614.

⁽⁵⁾ Free Cooling : ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal water flow, compressors switched off.

Versions LDA/CN		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity ⁽¹⁾	kW	41,7	46,8	57,0	63,4	71,5	83,3	98,3	110,1	124,2	134,9	164,1
Compressor input power ⁽¹⁾	kW	14,2	16,0	18,9	21,5	23,4	27,8	32,2	35,8	40,1	45,6	51,3
E.E.R. EN14511 ⁽¹⁾	W/W	2,9	2,9	3,0	2,9	3,1	3,0	3,1	3,1	3,1	3,0	3,2
Power supply	V/Ph/Hz	400/3+N/50		400/3/50								
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	2x0,5	2x0,5	2x0,69	2x0,69	2x0,69	2x0,69	3x0,69	3x0,69	3x0,69	3x0,69	4x0,69
Sound power level ⁽³⁾	dB(A)	77	77	79	79	80	80	82	82,5	82,9	83,1	83,5
Sound pressure level ⁽⁴⁾	dB(A)	49	49	51	51	52	52	54	54,5	54,9	55,1	55,5

Versions LDA/CN		162	190	210	240	260	300	320	380	430	500
Cooling capacity ⁽¹⁾	kW	180,5	193,8	211,6	244,6	273,6	325,5	359,3	396,4	467,0	513,7
Compressor input power ⁽¹⁾	kW	56,3	66,6	77,2	84,6	91,6	104,0	118,6	142,3	162,7	178,1
E.E.R. EN14511 ⁽¹⁾	W/W	3,2	2,9	2,7	2,9	3,0	3,1	3,0	2,8	2,9	2,9
Power supply	V/Ph/Hz	400/3/50									
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Fans	n° x kW	4x0,69	3x2	3x2	4x2	4x2	6x2	6x2	8x2	8x2	8x2
Sound power level ⁽³⁾	dB(A)	84	86	86	89	89	90	90	91	91	91
Sound pressure level ⁽⁴⁾	dB(A)	56	58	58	61	61	62	62	63	63	63

OPERATION LIMITS



⁽¹⁾ Cooling: ambient air temperature 35°C, evaporation temperature 5 °C.

⁽³⁾ Sound power level in accordance with ISO 9614.

⁽⁴⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 in accordance with ISO 9614.

LDA

Version LDA/CN/XL		039	045	050	060	070	080	090	110	120
Cooling capacity ⁽¹⁾	kW	--	--	--	64,4	72,6	85,4	99,1	111,6	127,0
Compressor input power ⁽¹⁾	kW	--	--	--	21,7	23,7	27,6	32,7	36,0	39,8
E.E.R. EN14511 ⁽¹⁾	W/W	--	--	--	2,9	3,1	3,1	3,0	3,1	3,2
Power supply	V/Ph/Hz	400/3/50								
Compressors / Circuits	n°	--	--	--	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	--	--	--	2x0,98	2x0,98	2x0,98	3x0,98	3x0,98	3x0,98
Sound power level ⁽³⁾	dB(A)	--	--	--	76	78	78	79,5	79,9	80,1
Sound pressure level ⁽⁴⁾	dB(A)	--	--	--	48	50	50	51,5	51,9	52,1

Version LDA/CN/XL		130	152	162	190	210	240	260
Cooling capacity ⁽¹⁾	kW	138,2	159,5	174,8	183,9	200,9	--	--
Compressor input power ⁽¹⁾	kW	45,1	53,4	58,8	68,6	80,2	--	--
E.E.R. EN14511 ⁽¹⁾	W/W	3,1	3,0	3,0	2,7	2,5	--	--
Power supply	V/Ph/Hz	400/3/50						
Compressors / Circuits	n°	2/1	2/1	2/1	4/2	4/2	--	--
Fans	n° x kW	3x0,98	3x0,98	3x0,98	4x0,98	4x0,98	--	--
Sound power level ⁽³⁾	dB(A)	80,5	81	81,3	84	84	--	--
Sound pressure level ⁽⁴⁾	dB(A)	52,5	53	53,3	56	56	--	--

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporation temperature 5 °C.

⁽³⁾ Sound power level in accordance with ISO 9614.

⁽⁴⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 in accordance with ISO 9614.

LDA

FRAME

All LDA 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 RAL 9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. Each refrigerant circuit is totally independent from the other. Failure of one circuit does not influence the other circuit. The refrigerant circuit includes: sight glass, filter drier, reversing valve (for heat pump version only), one way valve (for heat pump version only), liquid receiver (for heat pump version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

Also available is an electronic expansion valve with electronic control which optimises the efficiency in part load conditions (option).

COMPRESSORS

The compressors utilised are scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. They are mounted in a separate compartment within the casing in order to isolate them from the condenser air stream. The crankcase heater is always energised when the compressor is in standby. Access to the compressor compartment is by removal of a front panel and, because they are isolated from the main airstream, maintenance of the compressors is possible whilst the unit is operating.

The compressors used are all in tandem configuration. This results in much higher efficiencies at part loads compared to units with independent refrigerant circuits.

CONDENSERS

The condenser is made from 3/8" copper pipes and 0,1mm thick aluminium fins with

the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the condenser design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise emission) fans. The condensers can be protected by a metallic filter that is available as an accessory.

FANS

The fans are direct drive axial type with aluminium 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 used are 6 pole (about 900 rpm) in the low noise versions and 8 pole (about 750 rpm) in the extra low noise versions. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

EVAPORATORS

The evaporator is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. Models 039 to 162 have a single water side circuit and from size 190 a double circuit "cross flow" type is used. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube evaporator. A further advantage is a reduction in the overall dimensions of the unit. The evaporators are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each evaporator is fitted with a temperature sensor on the discharge water side for antifreeze protection.

MICROPROCESSOR

All LDA 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, alarm reset, volt free contact for remote general alarm, alarms and operation LED's. 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. The Hidros technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. All LDA units have fitted as standard, 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). The following components are supplied as standard on all units: main switch, 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 supplied with the following control and protection devices: Return water temperature sensor installed on the return water line from the building, antifreeze protection sensor installed on the outlet water temperature, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection and flow switch.

HEAT PUMPS VERSIONS (HP)

The heat pump versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 50°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor controls defrost automatically (when operating in low ambient conditions) and also the summer / winter change over.

LDA

FREE COOLING VERSION FC-FC100%

If there is a requirement for the chiller to operate all year round it is possible to generate the chilled water by free cooling. The free cooling version has an extra coil through which the system water is passed if the ambient temperature is low enough to remove energy from it. This is especially useful with modern, low energy cooling systems such as high temperature fan coils, chilled beams or ceilings. If the return water temperature is, for example, 16°C, and the flow required is 12°C then it can be seen that if the ambient is below 16°C some of the cooling can be performed by free cooling. If the ambient is below 12°C most, if not all, of the cooling can be provided by free cooling. This process makes substantial energy savings and results in correctly designed water systems being among the

most energy efficient available.

Free Cooling is available in 2 different versions: FC; Standard Free Cooling capacity; FC100; Enhanced Free Cooling capacity that is capable of providing 100% of the chiller capacity at low ambient conditions; Free Cooling versions comprise the following components: Thermal exchange coil, an air to water heat exchanger manufactured from copper tubes with aluminium fins. It is supplied with shut-off valves.

Microprocessor control, the "heart" of the system; By measurement of all the critical parameters, the controller ensures that the unit operates at maximum efficiency under all conditions.

3 way valve, this is an ON/OFF 3 way valve which either passes the water into the free cooling coil or sends it directly to the plate exchanger.

Low ambient pressure control, control of the condensing pressure of the refrigerant circuit in low external conditions is provided by this device. If free cooling is in operation, the fans must run at full speed for maximum effect. If there is insufficient duty from free cooling then the chiller circuit must also run but with the fans at full speed. This is likely to result in a low condensing pressure as the exchanger capacity is too large.

The control therefore consists of several solenoid valves than can partialise the condenser coil into 1/3rd, 2/3rd's or full coil. This enables the heat transfer surface area to be reduced thereby maintaining the correct condensing pressure.

CONDENSING UNITS REFRIGERANT CONNECTIONS

Condensing unit (CN) versions must be connected to the indoor unit by refrigerant lines. The condensing units are supplied without refrigerant charge but with a holding charge of nitrogen.

Piping layout and max distance between the sections.

On split-system applications, the piping layout is determined by the location of the indoor and outdoor units and by the building structure. Pipe runs should be minimised in order to reduce the pressure drops in the refrigerant circuit and the refrigerant charge required. The maximum allowable pipe length is 30 meters. Should your requirements exceed the limits described above,

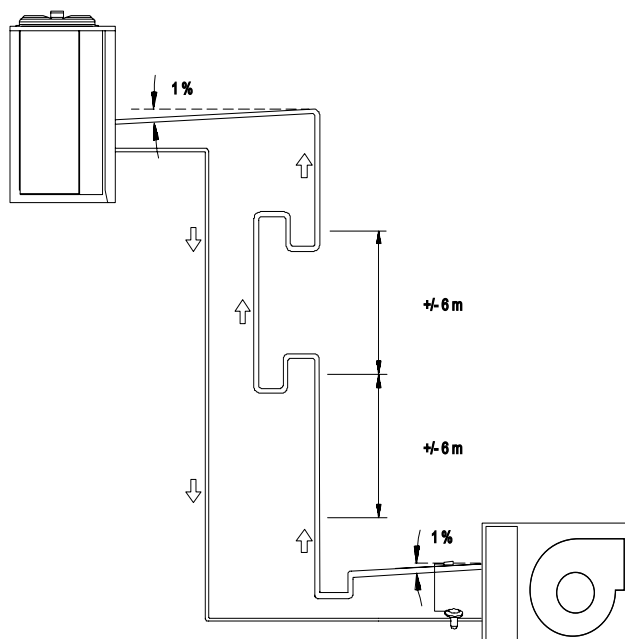
please contact our application engineers who will be delighted to assist.

Condensing unit installed at a higher level than the evaporation section

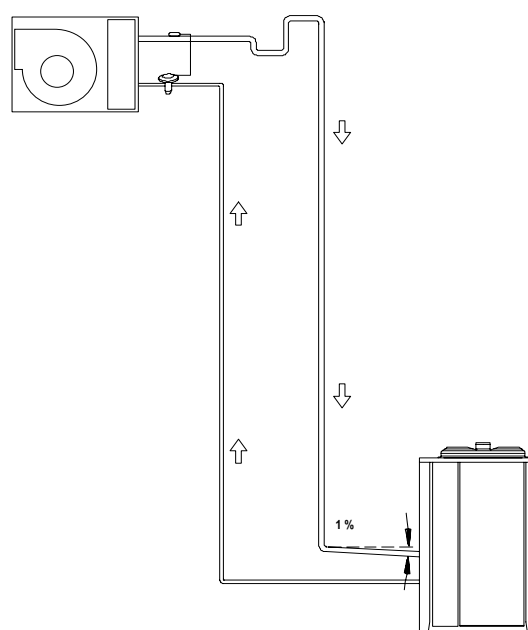
On the rising vertical pipes, oil traps should be fitted every 6 metres to ensure that the oil does not run back to the compressor by gravity and that it continues to circulate in the correct direction. On horizontal suction pipelines a minimum of 1% slope in the direction of flow should be provided in order to ensure the oil flow back to the compressor. Required pipeline diameters for various unit sizes and pipe run lengths can be found in Table II.

Condensing unit installed at a lower level than the evaporation section

Install a liquid trap on the suction line at the evaporator outlet and at the same height in order that liquid refrigerant, when the system is off, will not fall back to the compressor. Locate this trap down-stream from the bulb of the thermostatic valve to ensure that when the compressor is restarted, the rapid evaporation of the refrigerant liquid fluid in the trap will not affect the bulb of the thermostatic valve. On horizontal suction pipelines a minimum of 1% slope in the direction of flow should be provided in order to ensure the oil flow back to the compressor.



Condensing unit higher than the remote evaporator



Condensing unit lower than the remote evaporator

LDA

LDA

Refrigerant line diameters for CN versions						
Max distance (m)	10		20		30	
Mod.	Gas (mm)	Liquid (mm)	Gas (mm)	Liquid (mm)	Gas (mm)	Liquid (mm)
039	35	18	35	18	35	18
045	35	18	35	18	35	22
050	35	18	35	22	35	22
060	42	22	42	22	42	22
070	42	22	42	22	42	22
080	42	22	42	22	42	28
090	42	28	42	28	42	28
110	42	28	42	28	54	28
120	54	28	54	28	54	28
130	54	28	54	28	54	28
152	54	28	54	28	54	35
162	54	35	54	35	54	35
190	2x42	2x28	2x42	2x28	2x42	2x28
210	2x42	2x28	2x42	2x28	2x54	2x28
240	2x54	2x28	2x54	2x28	2x54	2x28
260	2x54	2x28	2x54	2x28	2x54	2x28
300	Contact the company					
320						
380						
430						
500						

Refrigerant charge for liquid line			
Liquid line diameter	Refrigerant charge g/m	Liquid line diameter	Refrigerant charge g/m
18	190	22	270
28	470	35	760

Cooling capacity correction factors				
Mod.	Refr. Line 0 mt.	Refr. Line = 10 mt.	Refr. Line 20 mt.	Refr. Line 30 mt.
LDA/CN	1	0,98	0,96	0,95

LDA

Versions LDA ÷ HP ÷ FC	Code	039	045	050	060	070	080	090	110	120	130	152
Flow switch	–	●	●	●	●	●	●	●	●	●	●	●
LS low noise version	LS00	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A1ZZ with tank and one pump.	A1ZZ	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A1NT with one pump without tank.	A1NT	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A2ZZ with tank and two pump.	A2ZZ	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A2NT with two pump without tank.	A2NT	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A0NP without tank and pump.	A0NP	○	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP00	○	○	○	○	○	○	○	○	○	○	○
Refrigerant pressure gauges	MAML	○	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○	○	○	○	○	○	○
Antifreeze kit*	RAES	○	○	○	○	○	○	○	○	○	○	○
Liquid line solenoid valve**	VSOG	○	○	○	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○	○	○	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○	○	○	○	○

Versions LDA ÷ HP ÷ FC	Code	162	190	210	240	260	300	320	380	430	500
Flow switch	–	●	●	●	●	●	●	●	●	●	●
LS low noise version	LS00	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A1ZZ with tank and one pump.	A1ZZ	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A1NT with one pump without tank.	A1NT	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A2ZZ with tank and two pump.	A2ZZ	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A2NT with two pump without tank.	A2NT	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A0NP without tank and pump.	A0NP	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP00	○	○	○	○	○	○	○	○	○	○
Refrigerant pressure gauges	MAML	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○	○	○	○	○	○
Antifreeze kit*	RAES	○	○	○	○	○	○	○	○	○	○
Liquid line solenoid valve**	VSOG	○	○	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○	○	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○	○	○	○

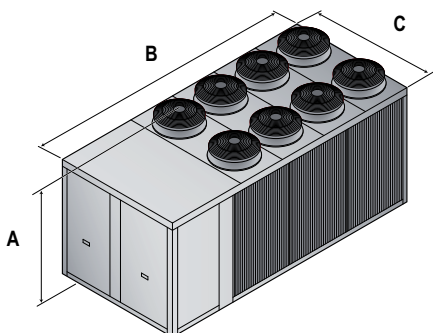
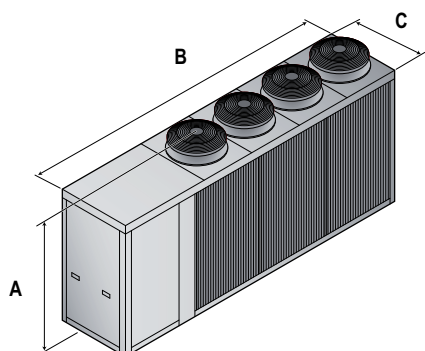
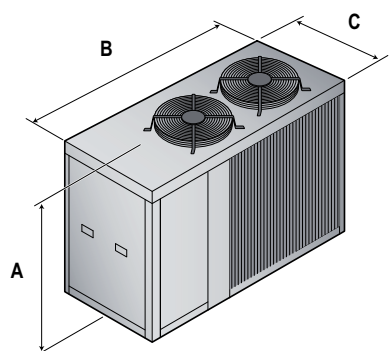
● Standard, ○ Optional, – Not available.

* Only for hydraulic kit version.

** Standard for HP version.

Versions LDA/CN	Code	039	045	050	060	070	080	090	110	120	130	152	162	190	210	240	260
Main switch	—	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Microprocessor control	—	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Free contacts for remote on/off	—	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Free contacts for general alarm	—	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Liquid line solenoid valve	—	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Expansion valve	VTER	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● Standard, ○ Optional, — Not available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
039/039A	1406	1870	850	570/890
045/045A	1406	1870	850	590/910
050/050A	1406	1870	850	600/920
060/060A	1759	2608	1105	725/1045
070/070A	1759	2608	1105	760/1070
080/080A	1759	2608	1105	810/1130
090/090A	1759	3608	1105	1070/1590
110/110A	1759	3608	1105	1150/1670
120/120A	1759	3608	1105	1200/1720
130/120A	1759	3608	1105	1230/1750

Mod.	A (mm)	B (mm)	C (mm)	Kg
152/152A	2179	3608	1105	1390/1910
162/162A	2179	3608	1105	1580/2100
190/190A	2350	4708	1105	1960/2580
210/210A	2350	4708	1105	2050/2670
240/240A	2350	4708	1105	2160/2780
260/260A	2350	4708	1105	2480/3000

Mod.	A (mm)	B (mm)	C (mm)	Kg
300/300A	2350	4108	2210	3150/4300
320/320A	2350	4108	2210	3220/4370
380/380A	2350	4708	2210	3560/4710
430/430A	2350	4708	2210	3650/4800
500/500A	2350	4708	2210	3750/4900