KELVIN
Air Conditioning System
2016

Qualified for **Energy Technology List**
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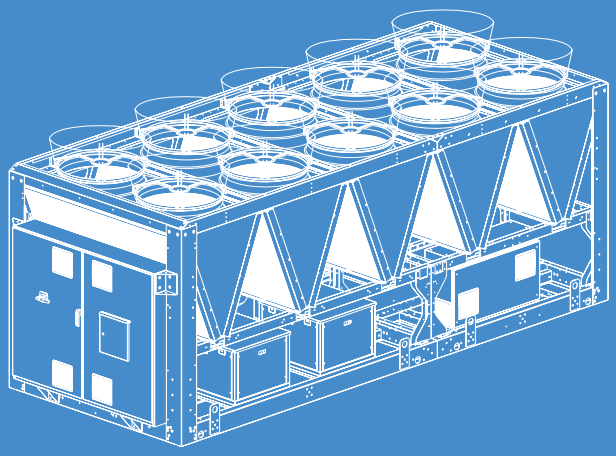
TM

bsi. ISO 9001 Quality Management | ISO 14001 Environmental Management

KELVIN Clim A260

Cooling Capacity: 260 ~ 1260 kW



A CLASS | INVERTER | OIL FREE | 1234ze | A C | FLOODED | MICRO CHANNEL | EU

Air cooled liquid chillers with oil-free centrifugal compressors with magnetic levitation bearings, flooded evaporator, AC axial fans with optimized diffusor and Microchannel condensing coils

KELVIN AIR CONDITIONING

KELVIN Clim A260

LOW GWP

KELVIN CLIM A260 : Air cooled liquid chillers in "A" class energy efficiency for outdoor installation, equipped with oil-free centrifugal compressors with magnetic levitation bearings, flooded evaporator and microchannel condensing coils
Cooling Capacity: 260 ~ 1260 kW

EUROVENT CERTIFIED PERFORMANCE Pending... www.eurovent-certification.com

KELVIN AIR CONDITIONING

A CLASS · INVERTER · OIL FREE · 1234ze · A/C · FLOODED · MICRO CHANNEL · EU

MAIN FEATURES

- Air cooled liquid chiller in A class energy efficiency.
- 11 models available, for a wide selection opportunity.
- Average step of 100kW.
- EER up to 3,36.
- ESEER up to 5,94.
- Oil-free centrifugal compressors with magnetic levitation bearings driven by built-in inverter.
- HFO1234ze refrigerant charge, LOW GWP, GWP < 6.
- Single refrigerant circuit.
- EC Axial fans with optimized diffusor.
- Flooded evaporator.
- Microchannel condensing coils in aluminium.
- Electronic expansion valve.
- Single air circuit.
- Modular construction.
- Suitable for outdoor installation.

MAIN BENEFITS

- Up to four centrifugal compressors with magnetic levitation bearings on the refrigerant circuit for an high efficiency.
- No need of power factor correction.
- Minimum starting current (LRA).
- Low refrigerant charge.
- Very high EER and ESEER.
- A Class energy efficiency.
- Quiet operation.
- Availability of double refrigerant circuit version.
- Availability of kit for further reduction of the noise.
- Availability of pumping groups.
- Eurovent Certifi cation.(pending)
- Microprocessor control system with 7" touch screen display.
- Extremely easily of maintenance.
- Complete set of components dedicated to the safety of the unity.

MAGNETIC LEVITATION CENTRIFUGAL COMPRESSOR

The KELVIN Clim A260 liquid chillers are equipped with two-stage centrifugal compressor with variable speed, which is able to follow punctually plant demands, obtaining values of energy efficiency ratio (EER) growing in a narrowing of the cooling load. The compressors are equipped with magnetic levitation oil-free bearings which compared to traditional ball bearings, completely eliminate all the maintenance procedures of lubrication.

A CLASS ENERGY EFFICIENCY

The best and most accurate components applied to the chillers.

WORKING LIMITS IN COOLING MODE

Chilled water outlet temperature: 4~15°C

Ambient temperature: -15~45°C

COMPONENTS

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

COMPRESSORS
- Twin-turbine centrifugal compressor, oil-free type, optimized for HFO1234ze refrigerant.

The term "oil-free" refers to the total absence of lubricating oil within the compressor.
- Magnetic levitation bearings.
- Manometric compression ratio: 1.5 ~ 5.0.
- Capacity control trough integrated inverter.
- High efficiency permanent-magnet synchronous motor with integrated Soft-Start system (starting current limited to 5A).
- Power factor motor cos φ > 0.9 for a large part of the operating range.
- Motor and electronic power section cooling by liquid refrigerant injection into the integrated cooling circuit.
- Electric motor thermal protection via internal winding temperature sensors.
- Electronic integrated control for operation and alarms status.
- Sensor on refrigerant discharge for temperature monitoring.
- Inner sensors for electronic components and inverter temperature control.
- Security system to protect the crankshaft and magnetic bearings in the event of failure of power supply.
- Installation with walls sound attenuators.
- Degree of protection: IP54.
- Electric resistance of the suction pipe, together with activated antifreeze evaporator, to prevent the migration of refrigerant inside the compressor.

EVAPORATOR
- Flooded shell and tube evaporator, optimized for HFO1234ze refrigerant.
- Version two passes, characterized by low pressure losses on the water side.
- Water tubes with a helical rifled internal surface.
- Integrated liquid drop separator.
- Shell, header, tube sheets made of carbon steel, tubes in Cu.
- Anticondensate insulation made of polyurethane.
- Large liquid level indicator.
- Temperature sensors on water inlet and outlet.
- Water flow switch for water flow control on water outlet towards the plant, not installed but supplied in kit.
- Large liquid level indicator
- Antifreeze heater.
- Hydraulic connections with grooved end supplied as standard with flexible joint and adapter pipe to be welded.

CONDENSING COIL
- Microchannel condensing coil in aluminium, perfectly suitable for the civil and industrial applications cooling, while the protection function of the oxide layer allows an optimum resistance to corrosion also in case of aggressive ambient conditions.
- Extremely light construction. The coil weight is only 50% compared to traditional copper pipes and aluminium fins of the same capacity.
- Low air side pressure drop and consequentially drastic reduction of the fans motors electric energy consumption.
- High heat exchange efficiency.
- Reduced internal volume capable of reducing the total refrigerant charge. At the same performances conditions, the micro-channels condensers require up-to less than 75% refrigerant when compared to the traditional heat exchangers.
- Single air circuit.
- Frame in painted galvanized steel.

FANS SECTION
- Axial fans with sickle-shaped blades and fan guard optimized for low noise levels designed with bionical know how.
- Optimized diffusor with static blades.
- External rotor EC type electric motor with stepless variable speed for condensing pressure control.
- IP54 enclosure class.

REFRIGERANT CIRCUIT
Components for each refrigerant circuit:
- Capacitive level sensor connected to the driver of the expansion valve.
- Electronic expansion valve that allows high performance and system efficiency and for the refrigerant level control in the evaporator.
- By-pass valve for start-up.
- Non return valve on by-pass line for compressor start.
- Economizer for model 310 T1E, 520 T2E, 620 T2E, 780 T3E, 900 T3E, 1040 T4E, 1300 T4E. The system includes:
  - Copper brazed plate type with cover plates, plates and connections in AISI 316 stainless steel,
  - Anticondensate insulation made of polyurethane,
  - Intermediate electronic expansion valve.
- Sight glass.
- Filter dryer on liquid line.
- Service valve on liquid line.
- Service valve on gas suction and discharge.
- Non return valve on gas discharge.
- Safety valve on low pressure side.
- Safety valve on high pressure side.
- Pressure transducers with indication, control and protection functions, on low and high refrigerant pressure.
- High pressure safety switch with manual reset.
- Refrigerant circuit with copper tubing with anticondensate insulation of the suction line.
- Plastic capillary hoses for pressure sensors connection and cooling line of the compressor.
- HFO 1234ze refrigerant charge.

ELECTRICAL PANEL
In accordance with EN60204-1 norms, suitable for outdoor installation, complete with:
- Main switch with door lock safety.
- Fuses for each compressor.
- Magnetothermic switches for fans or water pumps (if scheduled).
- Contactors for each load.
- Transformer for auxiliary circuit and microprocessor supply.
- Panel with machine controls.
- Power supply 400/3/50.

CONTROL SYSTEM
- Microprocessor system with "Touch Screen" graphic display for control and monitor of operating and alarms status. The system includes:
  - Voltage free contact for remote general alarm,
  - Voltage free contact for external alarm. The inlet is associable with refrigerant gas leak detector (optional accessory),
  - Main components hour-meter,
  - Recording of the last 24 occurred alarms,
  - Non-volatile "Flash" memory for data storage,
  - Menu with protection password.

OPTIONAL ACCESSORIES

KELVIN Clim A260 SIZE	260 T1 VT2	310 T1E VT3	400 T2 VT4	520 T2E VT5	620 T2E VT6	700 T3 VT7	780 T3E VT7	900 T3E VT8	1040 T4E VT10	1200 T4E VT11	1300 T4E VT12
739 - Pumping group (1 pump)	-	-	●	●	●	-	-	-	-	-	-
769 - Pumping group (1+1stby)	-	-	●	●	●	-	-	-	-	-	-
740 - Pumping group (2 pumps)	-	-	-	-	-	●	●	●	●	●	●
770 - Pumping group (1+2stby)	-	-	-	-	-	●	●	●	●	●	●
756 - Pumping group LN (1 pump)	-	-	●	●	●	●	●	●	-	-	-
771 - Pumping group LN (1+1stby)	-	-	●	●	●	●	●	●	-	-	-
757 - Pumping group LN (2 pumps)	-	-	-	-	-	-	-	-	●	●	●
772 - Pumping group LN (1+2stby)	-	-	-	-	-	-	-	-	●	●	●
150 - LNO kit (noise reduction)	●	●	●	●	●	●	●	●	●	●	●
Active filters for containment of the harmonic distortion	●	●	●	●	●	●	●	●	●	●	●
172 - Rubber support (kit)	●	●	●	●	●	●	●	●	●	●	●
Condenser partialization system	●	●	●	●	●	●	●	●	●	●	●
79 - Electrical panel heating system	●	●	●	●	●	●	●	●	●	●	●
179 - Double refrigerant circuit	-	-	●	●	●	●	●	-	-	-	-
350 -Kit TK PRO corrosion resistant painting treatment	●	●	●	●	●	●	●	●	●	●	●
1003 - Analogic flowmeter	●	●	●	●	●	●	●	●	●	●	●
1005 - Power supply analyzer	●	●	●	●	●	●	●	●	●	●	●
1009 - Multimeter kit	●	●	●	●	●	●	●	●	●	●	●
Refrigerant gas leak detector	●	●	●	●	●	●	●	●	●	●	●
943 - Data Logger	●	●	●	●	●	●	●	●	●	●	●
923 - KELVIN-Com MBUS/JBUS Serial board	●	●	●	●	●	●	●	●	●	●	●
926 - LON Serial board	●	●	●	●	●	●	●	●	●	●	●
931 - BACnet Ethernet - SNMP - TCP/IP Serial board	●	●	●	●	●	●	●	●	●	●	●
932 - BACnet MS/TP Serial board	●	●	●	●	●	●	●	●	●	●	●
942 - Serial card for GSM Modem	●	●	●	●	●	●	●	●	●	●	●
962 - Kit modem GSM	●	●	●	●	●	●	●	●	●	●	●
957 - Plantwatch without modem	●	●	●	●	●	●	●	●	●	●	●
930 - Remote graphic terminal kit	●	●	●	●	●	●	●	●	●	●	●
889 - Master plant SEQUENCER	●	●	●	●	●	●	●	●	●	●	●
KELVIN CLOUD PLATFORM	●	●	●	●	●	●	●	●	●	●	●

● available accessory; - not available accessory

TECHNICAL DATA KELVIN Clim A260

	KELVIN Clim A260 SIZE		260 T1 VT3	310 T1E VT3	400 T2 VT4	520 T2E VT5	620 T2E VT6	700 T3 VT7	780 T3E VT7	900 T3E VT8
STANDARD	**Cooling capacity (1)**	**kW**	**260**	**310**	**400**	**520**	**620**	**700**	**780**	**900**
	Unit power input	kW	80,3	96,9	124,9	153,3	194,1	218,5	235,4	280,8
	Evaporator water flow rate	m³/h	44,7	53,3	68,8	89,4	106,6	120,4	134,2	154,8
	Evaporator pressure drop	kPa	25,9	36,8	37,0	28,5	40,5	25,7	31,9	42,5
	Compressors		centrifugal	centrifugal	centrifugal	centrifugal	centrifugal	centrifugal	centrifugal	centrifugal
	Quantity	n.	1	1	2	2	2	3	3	3
	Cooling capacity control (5)	%	29%...100%	29%...100%	15%...100%	14%...100%	14%...100%	10%...100%	10%...100%	10%...100%
	Axial fans	n.	6	6	8	10	12	14	14	16
	Total air flow	m³/h	156600	156600	208800	261000	313200	365400	365400	417600
	Air circuits	n.	1	1	1	1	1	1	1	1
	Refrigerant		HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze
	Total refrigerant charge (optional excluded)	kg	191	191	190	216	224	360	360	368
	Gas circuits	n.	1	1	1	1	1	1	1	1
	Power supply	V/Ph/Hz	50/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/400
	Max unit operating current (FLA)	A	185,2	185,2	352,0	361,2	370,4	537,2	537,2	546,4
	Unit starting current (LRA)	A	31,4	31,4	40,2	49,0	57,8	66,6	66,6	75,4
	EER (1)	kW/kW	3,20	3,16	3,16	3,36	3,15	3,18	3,28	3,16
	ESEER		4,91	5,47	4,89	5,27	5,69	5,08	5,16	5,77
	Sound power level [Lw] (2)	dB(A)	93,4	93,4	94,8	95,6	96,4	97,1	97,1	97,8
	Average sound pressure level [LPm] (3)	dB(A)	73,9	73,9	74,8	75,1	75,4	75,7	75,7	76,1
	Net weight	kg	2347	2382	3182	3773	4206	5335	5430	5863
	Hydraulic connections									
	Evaporator IN/OUT - OD (4)	Ø mm	114,3	114,3	168,3	168,3	168,3	168,3	168,3	168,3
OPT	Pumping group									
	2 poles motor - Power input	kW	-	-	5,5	5,5	11,0	11,0	11,0	11,0
	4 poles motor - Power input	kW	-	-	5,5	5,5	11,0	11,0	11,0	11,0

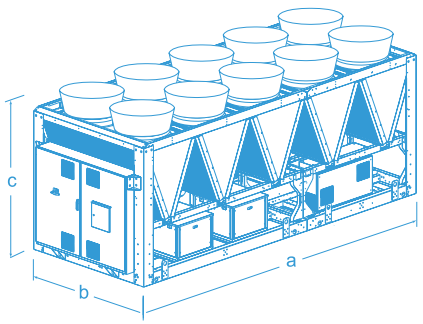
	KELVIN Clim A260 SIZE		1040 T4E VT9	1200 T4E VT11	1300 T4E VT12
STANDARD	**Cooling capacity (1)**	**kW**	**1040**	**1200**	**1260**
	Unit power input	kW	317,5	369,6	394,9
	Evaporator water flow rate	m³/h	178,9	206,4	216,7
	Evaporator pressure drop	kPa	39,0	51,9	57,2
	Compressors		centrifugal	centrifugal	centrifugal
	Quantity	n.	4	4	4
	Cooling capacity control (5)	%	7%...100%	7%...100%	7%...100%
	Axial fans	n.	18	22	24
	Total air flow	m³/h	469800	574200	626400
	Air circuits	n.	1	1	1
	Refrigerant		HFO1234ze	HFO1234ze	HFO1234ze
	Total refrigerant charge (optional excluded)	kg	469	485	493
	Gas circuits	n.	1	1	1
	Power supply	V/Ph/Hz	50/3/50	400/3/50	400/3/400
	Max unit operating current (FLA)	A	713,2	731,6	740,9
	Unit starting current (LRA)	A	84,2	101,8	110,6
	EER (1)	kW/kW	3,24	3,20	3,14
	ESEER		5,14	5,60	5,94
	Sound power level [Lw] (2)	dB(A)	98,2	99,1	99,5
	Average sound pressure level [LPm] (3)	dB(A)	76,1	76,4	76,5
	Net weight	kg	7304	8169	8601
	Hydraulic connections				
	Evaporator IN/OUT - OD (4)	Ø mm	219,1	219,1	219,1
OPT	Pumping group				
	2 poles motor - Power input	kW	22,0	22,0	22,0
	4 poles motor - Power input	kW	11,0	15,0	15,0

1. Referred to chilled water temperature 12/7°C – 0% glycol solution; air temperature to the condenser 35°C. Fouling factor of the exchangers 0,018 m²°K/kW.
2. Sound power level [Lw] according to ISO EN 9614 – 2.
3. Average sound pressure level [LPm] 1m far according to ISO EN 3744.
4. Hydraulic connection with grooved end, supplied as standard with fl exible joint and adapter pipe.
5. Referred to ambient air temperature at 18°C.

DIMENSIONS (mm)

KELVIN Clim A260

SIZE VT	a	b	c
VT3	3760	2260	2370
VT4	4880	2260	2370
VT5	5994	2260	2370
VT6	7114	2260	2370
VT7	8234	2260	2370
VT8	9354	2260	2370
VT10	10468	2260	2370
VT11	12708	2260	2370
VT12	13828	2260	2370



Note

Note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