

WDAT-IK4 400.2 Air cooled water chiller for outdoor installation**COMPRESSOR**

Compact, semi hermetic, helicoidal twin-screw compressors with high efficiency integrated oil separator. The cooling capacity continuous modulation is made by a variable speed motor activated by the inverter integrated in the compressor. The start-up with limited current absorption is achieved by progressively accelerating the compressor with the inverter. The inverter is cooled with the liquid cooler taken from the liquid line. The liquid flow is activated by a solenoid valve and is sent to the inverter cooling plate by a thermostatic valve. Subsequently, the steam generated by the heat exchange is sucked by the screws inside a closed chamber at medium pressure without thereby reducing the compressor suction capacity. The electronic boards are housed inside the inverter. They, in addition to managing the inverter and the electric motor rotation speed, perform all the functions of protection, monitoring and control of the compressor: oil level, oil temperature, motor temperature, Vi control, oil heater activation, if necessary, liquid injection for the inverter and compressor cooling, check of the operating range by specific HP and LP transducers, communication via MODBUS, operating timing, alarm management. The inverter and electric motor supply is three-phase, the auxiliaries are supplied with single phase line. At the compressor discharge is provided a non-return valve to avoid the counter-rotating during the stop. The emergency internal overpressure valve connects the compressor discharge with suction in case of an extreme pressure drop.

STRUCTURE

Structure and base made entirely of sturdy sheet steel, thickness of 30/10 or 40/10, with the surface treatment in Zinc-Magnesium painted, for the parts in view, with polyester powder RAL 9001 that guarantees excellent mechanical characteristics and high corrosion strength over time.

INTERNAL EXCHANGER

Direct expansion exchanger with refrigerant side independent circuit for each compressor. The exchanger is composed of a cover made of carbon steel. The tubes, anchored to the tube plate by mechanical expansion, are made of copper, high efficiency, internally rifled to improve thermal exchange and specially designed for use with modern ecological refrigerants. It also includes a water side protection differential switch, an anti-freeze heating element to protect against icing, and covering in closed-cell thermo-insulating material that prevents the formation of condensation and heat exchange with the exterior. The water connections of the exchanger are quick-release with splined joint (Victaulic).

EXTERNAL EXCHANGER

Full aluminium microchannel coil with V structure open angle geometry. The entire exchanger (tubes, fins and manifolds) is made of aluminum and welded into a single body through a special brazing technology in a controlled-temperature chamber. The fins have a special corrugated surface to ensure maximum heat exchange efficiency. The special flat configuration of the pipes reduces the section that opposes to the air flow, limiting the pressure drops and maximizing the surface. The total refrigerant charge into the microchannel coil is reduced by 30% compared to an equivalent copper coil.

FAN

Axial fans with high performance and low-noise, balanced statically and dynamically, with blades in aluminum sheet coated in PP and sickle profile terminating with "Winglets", Wall ring in sheet steel pre-galvanised, directly coupled to the three-phase electric motor with external rotor and IP54 protection and class F insulation. Fans are located in aerodynamically shaped structures, equipped with accident prevention steel guards.

REFRIGERANT CIRCUIT

One or two independent refrigeration circuits made of copper, brazed and factory-assembled, complete with: anti-acid dehydrator filter with solid cartridge complete with quick-fit connector for refrigerant; high-pressure safety pressure switch; low pressure transducer; refrigerant temperature probe; electronic expansion valve; high pressure safety valve (safety valve with sealed tap open for inspection); double low pressure safety valves (safety valve with sealed tap open for inspection); liquid flow and humidity indicator; cut-off valve on compressor supply circuit; cut-off valve on liquid line. Suction pipes thermally insulated with highly flexible EPDM rubber closed-cell elastomer insulation. Each cooling circuit is

tested under pressure for leaks and is supplied complete with load of refrigerant gas.

ELECTRICAL PANEL

Entirely manufactured and wired in conformity to the EN 60204 standard.

The power section includes: door locking main circuit breaker; insulation transformer for powering the auxiliary circuit; fuses and thermal relays for protecting the compressors; magneto-thermal cut-out switches to protect fans; electrical panel ventilation.

The control section includes: proportional-integral-derivative adjustment of water temperature; anti-freeze protection; management of unit start-up from local or remote device (serial); compressor overload protection and timer; potential-free contacts for compressor status and enabling; self-diagnosis system with instant error code visualisation; pre-alarm function for water anti-frost and refrigerant gas high pressure functions; visualisation of no. of hours of compressor operation; interface terminal with graphic display; multifunction phase monitor; remote ON/OFF control; second set-point enabling by potential-free contact; control of compressor start-up automatic rotation; relay for remote cumulative fault signal; set values, error codes and parameters can be displayed; high refrigerant gas pressure pre-alarm function that in many cases prevents the unit from being shut-down; input for demand limit (absorbed power limit according to an external signal 0÷10V or 4÷20mA); electrical socket (max 400W)

TEST

Unit subjected to factory-tested in specific steps and test pressure of the piping of the refrigerant circuit (with nitrogen and hydrogen), before shipping them.

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Unit loaded with R-513A refrigerant gas. Thanks to the low working pressures, 2-3 times lower than traditional refrigerants, it is used for large air conditioning units. It has a zero ODP, is not toxic or flammable and can be easily handled.

STANDARD ACOUSTIC CONFIGURATION

Unit not equipped with soundproof compressor compartment.

DEVICE FOR FAN CONSUMPTION REDUCTION OF THE EXTERNAL SECTION, ECOBREEZE TYPE

The device allows the reduction of consumption for the external section fans using variable speed control. Constituted of electric motor, Brushless type, with external rotor and permanent magnet with electronically commutated stator, induced by integrated electronics control, with incorporated thermal protection IP54 and class F insulation. The device allows to optimize the condensation phase at low outdoor temperatures cutting down the fans or activating the booster function at high temperature, always ensuring reduced noise levels.

STEEL MESH STRAINER ON THE WATER SIDE

Mechanical steel mesh strainer to place on the water input line to avoid fouling of the exchanger from being clogged by any impurities which are in the hydraulic circuit, easily dismantled for periodical maintenance and cleaning. It also includes: cast-iron shut-off butterfly valve with quick connections and activation lever with a mechanical calibration lock, Victaulic type quick connections with insulated casing.

SPRING ANTIVIBRATION MOUNTS

Spring antivibration mounts to be fixed in special housing on the support frame and serve to smooth the vibrations produced by the unit thus reducing the noise transmitted to the support structure.

MULTI-FUNCTION PHASE MONITOR

The phase monitor controls the electrical parameters of the power line to the unit. It works on the command circuit and orders the unit to be switched off when one of the following cases is present: when the phase connections do not respect the correct sequence, or when there is over voltage or under voltage for a certain amount of time: limit values of over and under voltage and the time interval can be manually and separately set. When the line conditions are re-established, the unit is re-armed automatically. Device installed and wired built-in the unit.

SERIAL COMMUNICATION MODULE FOR MODBUS SUPERVISOR

Module allows the serial connection of the supervision system, using Modbus as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems. Device installed and wired built-in the unit. The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out).

ELECTRICAL PANEL VENTILATION

It includes a thermostatically controlled fan to protect the components of the electrical panel from overheating, from high outside temperatures and solar radiation.

CUTOFF VALVE ON COMPRESSOR SUPPLY

It includes a shut-off valve on the discharge of the compressor for emergency maintenance.

ELECTRONIC EXPANSION VALVES

Electronic expansion valve for quick and accurate regulation according to the actual load required for use, allowing a high efficiency unit and a longer compressor life. The device includes: control of overheating to prevent phenomena harmful for the compressor, like overtemperature and return of liquid, pressure transmitter and temperature sensor.

UNIT CONFIGURATION		Q.TY
	Unit: WDAT-iK4 400.2 (R-513A)	1
R513A	Refrigerant R-513A	1
LIQW	Handled fluid made of only water	1
		1
SI-H2O	Water	1
HYGU	user side hydronic assembly	1
400T	Supply voltage 400/3/50 without neutral	1
ST	Standard acoustic configuration	1
TRG	unit delivery with full charge of refrigerant	1
FC3	EMC filtering for industrial environment (EN 61800-3 cat C3)	1
PED	Heat exchangers certified CE = PED - according to European PED Directive	1
MEN10G	Minimum outdoor air temperature down to -10°C	1
MEN10A	Minimum outdoor air temperature with unit powered on but not operational down to -10°C	1
MEN15S	Minimum storage outdoor air temperature down to -15°C	1
CREFB	Device for fan consumption reduction of the external section, ECOBREEZE type	1
IFWX	Steel mesh strainer on the water side (Accessory separately supplied)	1
IOM2	English manual	1
CCM	Microchannel condensing coil in aluminium	1
AMMX	spring antivibration mounts (Accessory separately supplied)	1
IMBNY	Packing with nylon	1
MF2	Multi-function phase monitor	1
CMSC9	Serial communication module for Modbus supervisor	1
CFSCF	potential-free contacts for compressor status and enabling	1
FANQE	Electrical panel ventilation	1
MSW	main isolator switch	1
DV	cutoff valve on compressor supply	1

SELECTED OPERATION CONDITIONS

COOLING		SELECTED
Outdoor air temperature	°C	35.0
Return water temperature load side	°C	12.0
Leaving water temperature load side	°C	7.00
Delta T load side loop	°C	5.00
GENERAL		SELECTED
Glycol on load loop	%	0.000

SOUND PRESSURE LEVEL AT DISTANCE		SELECTED
Distance from unit	m	1.00
PART LOAD		SELECTED
Required part load capacity	kW	0.000
Outdoor air temperature	°C	35.0

PERFORMANCE DATA

COOLING		SELECTED
Cooling capacity	kW	911
Compressor power input	kW	311
Total power input	kW	325
EER	Nr	2.81
EER compressor	Nr	2.93
Cooling capacity (EN14511:2018)	kW	910
Total power input (EN14511:2018)	kW	328
EER (EN 14511:2018)	Nr	2.78
Water flow-rate (User Side)	l/s	43.3

Water flow-rate (User Side)	m³/h	156
Pressure drop load side exchanger	kPa	48.4
NOISE LEVELS		SELECTED
Sound Pressure Level at Distance	dB(A)	81.0
STANDARD UNIT WEIGHTS		SELECTED
Shipping weight	kg	6498
Operating weight	kg	6744
POWER SUPPLY		SELECTED
F.L.I. - Total	kW	418
F.L.A. - Total	A	674

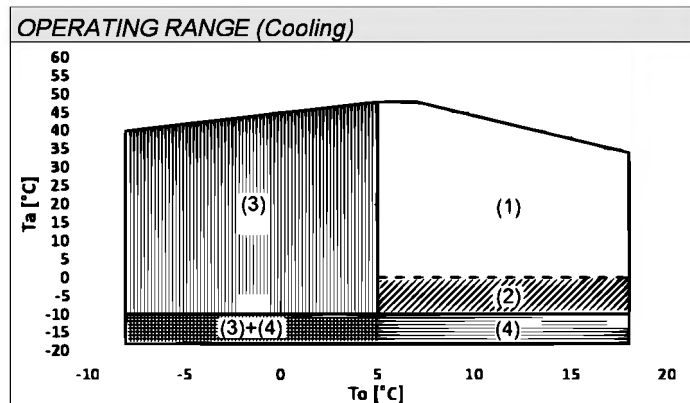
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TECHNICAL DATA REFER TO THE TECHNICAL BULLETIN

GENERAL			
COOLING			
IPLV			5.40
REFRIGERANT CIRCUIT			
Refrigeration circuits		Nr	2.00
Refrigerant charge (C1)		kg	53.0
Refrigerant charge (C2)		kg	86.0
Type of refrigerant			R-513A
Global Warming Potential			631
DIRECTIVE ERP (ENERGY RELATED PRODUCTS)			
COOLING			
SEER		Nr	4.91
Seasonal space cooling energy efficiency (η_{sc})		%	194
Rated cooling capacity		kW	911
HEATING			
Sound power level, outdoor		dB(A)	102
COMPRESSOR			
No. of compressors		Nr	2.00
Type of compressors	(3.3)		ISW
Std Capacity control steps		Nr	STEPLE SS

>>> EXTERNAL EXCHANGER			
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Type of external exchanger			MCHX
EXTERNAL SECTION FANS			
Type of fans	(5.5)		AX
Number of fans		Nr	12.0
Standard airflow		l/s	65000
Installed unit power		kW	1.10
INTERNAL EXCHANGER			
Water content		l	518
CONNECTIONS			
Water fittings			8"
ELECTRICAL DATA			
POWER SUPPLY			
Standard power supply		V	400/3~/5 0
M.I.C. MAXIMUM INRUSH CURRENT			
M.I.C. - Value		A	659
WEIGHT AND DIMENSIONS			
Shipping length		mm	7924
Shipping depth		mm	2367
Shipping height		mm	2535

(3.3) Translation not found for code 102077 on language en
 (5.5) AX = axial fan



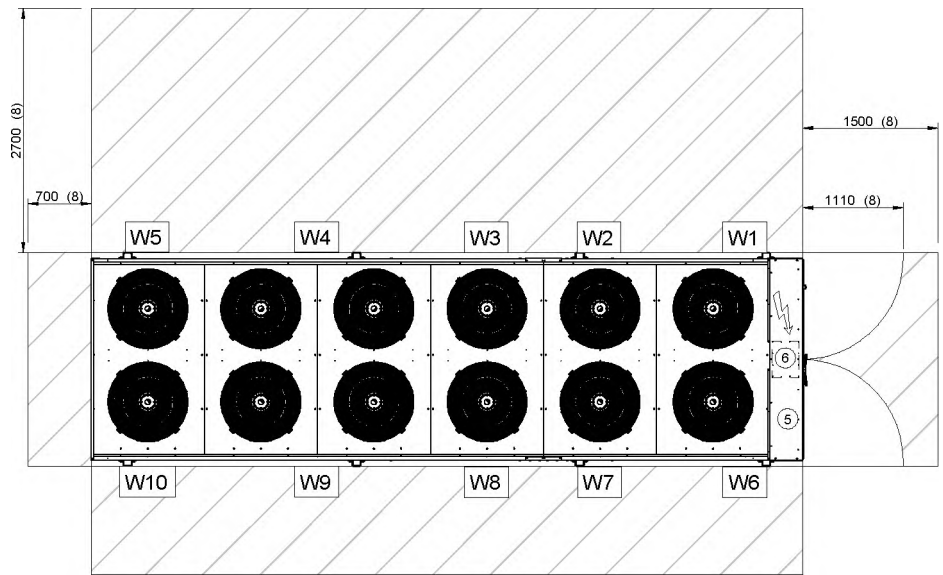
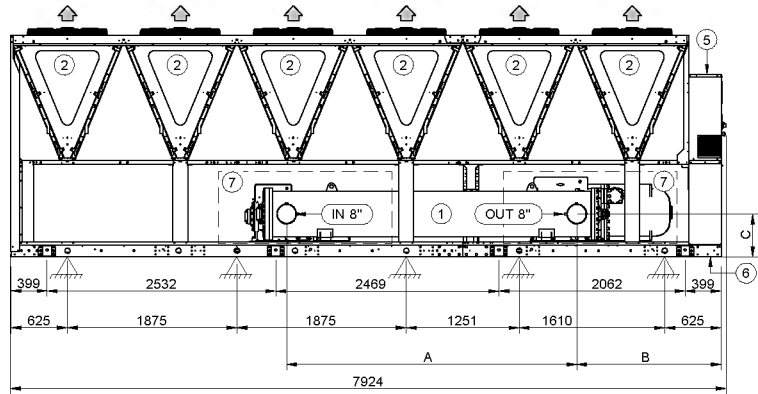
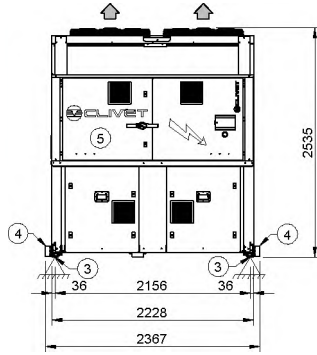
t_a = internal exchanger inlet air temperature
 t_o (°C) = leaving internal exchanger water temperature (evaporator)
 (1) standard unit operating range at full load
 (2) standard unit operating range with air flow automatic modulation
 (3) unit operating range in 'b - liquid low temperature' configuration
 (4) unit operating range with 'regbt - device for the condensing coil partialization'

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SOUND LEVELS									
Sound power level: Hz								Sound pressure level	Sound power level
Octave band (Hz)									
63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
83.0	79.0	83.0	94.0	101	92.0	82.0	67.0	81.0	102

the sound levels refer to the unit at full load, in the rated test conditions.
 The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.
 Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A) on the sound power level, which is the only acoustic data to be considered binding.
 Data refer to standard units.
 internal exchanger water = 12/7°C
 outdoor air temperature 35°C

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- (1) External exchanger (condenser)
- (2) Internal exchanger (evaporator)
- (3) hole to hang unit
- (4) lifting brackets (removable, if required, after positioning the unit)
- (5) GENERAL ELECTRICAL PANEL
- (6) Power input

- (7) sound proof enclosure (only in the expected versions)
- (8) Clearance access recommended

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

DIMENSIONS (mm)			
OD	A - Length	B - Width	C - Height
8"	7924	2228	2535

WEIGHT DISTRIBUTION (Kg)													
W1 Supportin g Point	W2 Supportin g Point	W3 Supportin g Point	W4 Supportin g Point	W5 Supportin g Point	W6 Supportin g Point	W7 Supportin g Point	W8 Supportin g Point	W9 Supportin g point	W10 Supportin g point	W11 Supportin g point	W12 Supportin g point	Shipping weight	Operating weight
1018	988	837	363	240	830	969	919	283	249	-	-	6150	6696