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DESCRIPTION

WRA251SSB500

WRA ErP

WRA ErP is the next generation of high efficiency chillers specifically designed for industrial process cooling. WRA ERP is the result of a design that has focused on reliability, energy efficiency, extended operating limits and extreme configurability. Thanks to dedicated technological solutions such as oversized heat exchangers, standard electronic expansion valve and new high-efficiency fans, each WRA ERP is characterised by high thermodynamic performance that exceeds the most stringent minimum energy efficiency requirements imposed by the Ecodesign directive from 2021.
WRA ErP units are outdoor unit for the production of chilled water with Scroll compressors optimized for R410A and R134a in a single-circuit configuration, axial-flow fans, mini-tubes type finned coils, stainless steel plate type evaporator, programmable microprocessor and electronic expansion valve as standard equipment (from mod.20).
Thanks to the wide operating limits and to the numerous configurations and available options, the WRA ErP is on the top of his range, allowing large and versatile applications and high level of reliability. The WRA ErP is therefore the perfect solution for all those industrial applications that require high performances, a continuous operation and a reduction of the managing costs.

Outdoor installation

The WRA ErP range was designed for use in any outdoor environment. The standard operating range is from -10°C (mod.13-25) or -5°C (mod.30-50) up to +45°C. All electrical components subject to weathering have an IP54 protection rating.
Structural steelwork, piping, insulation and all components are selected to ensure the correct operation of the chiller throughout its working range.
Further additional options allow you to extend the operating limits of the chiller.

Structure and casing

The structure consists of a base, uprights and panels made of galvanised carbon steel, assembled with stainless steel/galvanised metal fittings and painted with polyester powder in light grey RAL 7035. All the panels are dismountable ensuring a better access to internal components and simplifying maintenance.

Refrigeration circuit

- Refrigerant R134a (mod.13 18) ODP=0 GWP=1550; R410A (mod. 20 50) ODP=0 GWP=2088.
- Thermostatic expansion valve with external equalization (mod.013-018)
- EEV electronic expansion valve (from mod.020): EEV ensures a stable superheat in the whole range of operation conditions and the possibility of working with reduced condensation temperatures by extending the working range of the chiller and increasing its efficiency.
- High and low pressure safety valves
- Refrigerant line sight glass with humidity indicator
- High pressure transducer (from mod.020)
- Refrigerant filter-dryer with hygroscopic molecular sieves
- HP High pressure switch
- LP Low pressure switch

Cold parts of the thermally insulated refrigerant circuit with a specific insulator suitable for outdoor installation, weatherproof and UV-resistant. The circuit comply with the requirements of the PED Directive 97/23/EC (Pressure Equipment Directive).

Compressor

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compressor electrical supply line is protected by:

- Thermal protection: magnetothermal manual reset device.
- Magnetic protection: electronic overload relay.

Start-up and shutdown of compressor is managed by the electronic control, optimising efficiency of the refrigerant circuits.

Evaporator

High efficiency brazed plate heat exchanger made of AISI 316 stainless steel and thermally insulated with UV and atmospheric agent resistant thermal insulator. The evaporator is protected from the risk of freezing as standard by a differential pressure switch and an anti-freeze probe on the water side.

Condenser

Heat exchanger with finned core condensing coils, featuring copper tubes and corrugated aluminium fins. Mini-tube geometry maximize the surface concerned by the air, thus allowing compact dimension and refrigerant charge reduction. Metal filters suitable to protect the heat exchanger are available as option and they're easily removable to facilitate cleaning operation procedures.

Fan

Axial electric fan protected to IP 54, with external rotor and corrosion-resistant grooved blades in PP. A diffuser directly integrated into the impeller performs the function of a diffuser increasing the fluid dynamic efficiency and reducing the noise level. The fans of mod. 013-25 are equipped with phase-cut electronic speed control as standard. The LT version for low ambient temperature and the LASERPACK version of mod.30-50 include EC fans with brushless synchronous motor driven by inverter with continuous speed variation from 10% to 100%. Thanks to a continuous and efficient regulation of the fan speed at partial loads, the EC fan allows a reduction in consumption together with a decrease in noise levels.

Atmospheric no-ferrous hydronic module

The standard hydronic module is suitable for atmospheric circuits and includes the main water circuit components, thus optimizing water circuit and electrical installation costs. It features:

- **No ferrous materials** (polymers, brass, stainless steel)suitable to avoid any contamination of the process fluid.
- **Storage tank**: dust-tight tank in polyethylene HDPE with external thermal insulation. Thanks to its high thermal inertia, it allows to reduce the changes of the process fluid outlet temperature caused by the sudden variations of the thermal load and to minimize the mechanical stress of the compressors thanks to the reduction of the ON/OFF cycles of the compressors. Every storage tank is equipped with visual level indicator, front connections for filling/draining, overflow and level switch.
- **Automatic hydraulic adjustable by-pass**: hydraulic bypass between the supply and return of the process fluid featuring an adjustable overpressure valve. In case of a wrong interception of the inlet and outlet fittings the bypass allows to preserve the integrity of the unit and of the pump as it lets the passage of a minimum flow rate necessary to the intervention of the antifreeze alarm and to protect the pump.
- **Level sensor (standard with storage tank option)**: this level switch stops the operation of the unit when the level of the process fluid in the accumulation tank is insufficient.
- **Pressure gauge** 0-10 barg
- **Differential pressure switch** (on heat exchanger)
- **Electric pre-heater / antifreeze (option)**: the preheater increases the fluid temperature and it is installed directly in contact with the fluid.
- **Automatic hydraulic filling unit (option)**

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Hydronic module for pressurised hydraulic circuits (option)

The hydronic module It is optionally available in a version for pressurised hydraulic circuits (design pressure 4 barg). It features:

- **Storage tank**: cylindrical carbon steel tank (pmax = 6barg) with external thermal insulation. Every storage tank is equipped with vacuum breaker and bleeder valve, front connections for filling/draining and overflow.
- **Automatic hydraulic adjustable by-pass**: hydraulic bypass between the supply and return of the process fluid featuring an adjustable overpressure valve. In case of a wrong interception of the inlet and outlet fittings the bypass allows to preserve the integrity of the unit and of the pump as it lets the passage of a minimum flow rate necessary to the intervention of the antifreeze alarm and to protect the pump.
- **Membrane expansion tank** (precharge 1barg)
- **Pressure gauge** 0-10 barg
- **Differential pressure switch** (on heat exchanger)
- **Electric pre-heater / antifreeze + safety vacuum switch (option)**: the preheater increases the fluid temperature and it is installed directly in contact with the fluid.
- **Automatic hydraulic filling unit (option)**

Pumps

Horizontal multistage high-pressure centrifugal pumps designed specifically for process cooling.

- **Head pressure available: P3** 3barg; **P4** 4,5/5barg; **P6** 6/6,5barg
- **Asynchronous motor IE3**, Insulation Class F, suitable for continuous service
- **Pump body and casing cover in AISI 304**
- **Mechanical seals** Sic/SiC/FPM
- **Protection degree**: IP55

Inverter pump (option)

The Horizontal multistage high-pressure centrifugal pump is optionally available also with MGE motors featuring permanent magnets, incorporating a high-efficiency frequency converter. MGE motor have an efficiency that exceeds
the IE4 demands, including the energy consumption of the integrated frequency converter. The inverter pump automatically controls the discharge pressure to the set pressure eliminating the need for a hydraulic bypass valve, the resulting in energy savings of up to 50% compared to conventional pumps.

- **Head pressure available:** P5 5barg maximum head pressure
- **Pump body and casing cover in AISI 304**
- **Mechanical seal** SiC/SiC/EPDM
- **Insulation:** Class F
- **Protection degree:** IP55

Electrical and control panel

The electrical cabinet is designed and wired in compliance with EN 60204-1, with Low Voltage Directive 2006/95/CE and with Electromagnetic Compatibility Directive EN61000-6-2. The electrical board is made of top quality components and it is suitable for the outdoor installation (the protection rating of the electrical board is IP54).

The power section includes:

- The main disconnect switch (red/yellow) with safety door lock
- The isolation transformer feeding the control circuits and microprocessor circuit boards
- Automatic circuit breakers on electric loads (compressors, fans and pumps

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- Contactors for the control of the compressors, fans and the pumps
- Potential free contact of ON/OFF remote
- Potential free contact of general alarm
- Labelled wires
- Phase sequence relay standard
- Electronic control

Electronic Control

All units are controlled and managed by an electronic controller with presentation of parameters on a LED display and icon-based identification of functions. The microprocessor offers advanced functions and allows to display the main operating parameters of the system and to optimize the performances. The electronic controller manages the following functions:

- Proportional regulation of the water outlet temperature
- Fan speed control
- Measurement and display of process fluid inlet/outlet temperatures and ambient temperature
- Antifreeze heater control (water side)
- Management of alarm messages and alarms history display
- Differential temperature control
- TTL serial interface standard (RS485 option)
- 1 LAN Expansion bus (for additional expansion module SME4500)
- **A dedicated panel-mounted keypad** can be used for remote control of all the functions.
- **LASER function for single hydraulic circuit** (hysteresis ±0.5K / ±0.1K)
- **LASER function for double hydraulic circuits** (hysteresis ±0.5K / ±0.1K)

Quality

All chillers of the WRA ErP range were designed and manufactured in compliance with:

- UNI EN ISO 9001: Quality Management System.
- UNI EN ISO 14001: Environmental Management.
- 2006/42/EC: Machinery Directive.
- 2006/95/EC: Low Voltage Directive.
- 2004/108/EC: EMC Directive.
- 97/23/EC: Pressure Equipment Directive.
- EN 378-1, 2, 3, 4: Refrigerating systems and heat pumps.
- EN ISO 12100 -1, 2: Safety of machinery.
- EN ISO 13857: Safety of machinery - Safety distances.
- EN 60204 -1: Safety of machinery - Electrical equipment.
- EN 61000-6-2: Immunity for industrial environments.
- EN 61000-6-4: Emission standard for industrial environments.
- European Regulation 5539/16: ErP 2018.

Compliance with these guidelines and laws was verified by an independent quality system at all stages of design and manufacturing.

Components and Tests

The components installed on WRA ErP chillers are supplied by the best manufacturers and checked by the Quality Office as soon as they are received.

Finished chillers are subject to functional tests and leak checks, including:

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- Visual inspection of proper assembly.
- Check for leaks in the refrigerant circuit with a dedicated detector.
- Check for leaks in the hydraulic circuit.
- Electronic control programming and setting.
- Sensor and probe calibration check.
- Functional and alarm test.
- Labelling, documentation completion and complementary material.

The test certificate is included in the documentation package.
For further performance/sound tests, please refer to the "Factory Tests" documentation, or ask your COSMOTEC reference contact.

Documentation

The documentation provided with the chiller is:

- Manual 1st part, with the instructions for “Use and Maintenance”.
- Manual 2nd part, consisting of:
  - Technical sheet (1).
  - Layout of the chiller (1).
  - Refrigerant diagram (1), in compliance with EN1861.
  - Hydraulic diagram (1).
  - Wiring diagram in compliance with UNI EN 60204.
  - EC declaration of conformity.
  - Test certificate.
  - Spare parts list (if required).
- Controller User Manual.

(1) if different from what is reported in Manual 1st Part

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TECHNICAL DATA

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Model		WRA Erp - WRA25
General		
Cooling capacity (1)	kW	8.1
EER (1)		3.12
Total absorbed Electrical power (1)	kW	2.6
S.E.P.R. (2)		5.18
Ambient temperature working limits	°C	min -10 max 45
Application		indoor/outdoor
Altitude above sea level	m	0
Outlet water temperature working limits	°C	min 0 max 25
Refrigerant		R410A
Refrigerant charge	kg	n/a
Main power supply	V/Ph/Hz	460V/3/60Hz
Secondaries voltage	Vac	24
Max absorbed electrical power (FLI) (4)	kW	4.7
Max absorbed current (FLA) (4)	A	8.4
Maximum inrush current (MIC) (4)	A	40.4
COMPRESSORS		
Compressor type	Scroll	1
Number of refrigerant circuits		1
Absorbed Electrical power	kW	2.40
FANS		
Fan		1 x ø400
Fans type		AC
Air temperature	°C	35.0
Fans part load	%	100
Fan air flow	m³/h	4200
Absorbed power at working point	kW	0.21

The above mentioned data are subject to the measuring tolerances of Eurovent. Unless otherwise stated, all data refer to a product in basic version

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TECHNICAL DATA

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HYDRAULIC		
Chilled fluid		Water
Fluid freezing temperature	°C	0
Max working pressure		n/a
Chilled fluid inlet temp.	°C	12.0
Chilled fluid outlet temp.	°C	7.0
Fluid flow rate	m³/h	1.40
Pressure drop	kPa	5.2
Head pressure available	kPa	365.6
Min chilled fluid flow rate (5)	m³/h	0.50
Max chilled fluid flow rate	m³/h	2.40
Width x Height x Depth	mm	550 x 1310 x 730
Weight empty (4)	kg	145
Hydraulic connections	Rp	3/4"
Sound pressure level (6)	dB(A)	41.6
Sound power level (7)	dB(A)	71.8

(1) Nominal performance GROSS: the data do not consider the pump share, required to overcome the pressure drop for the solution circulation inside the exchangers.

(2) Value refers to the standard unit without options. In accordance with the Regulation (EU) 2016/2281.

(3) Data declared according to UNI EN 14511:2018

(4) Data referred to standard units without pumps and tank; according to the installed accessories, the data can suffer some variations. For the definitive data please refer to the wiring diagram of the unit (supplied with the instruction manual of the unit).

(5) Flow rate value required to calibrate the flow switch. If the optional electronic flow switch is not provided, the customer must provide a flow switch on the system and he has to calibrate it to the value indicated

(6) Sound pressure level of a basic unit without options at full load and referred to the following conditions: evaporator fluid: 100% water, IN/OUT temp. = 20/15 °C, ambient temp. = 32°C. Average value in free field condition @ 10m distance on flat reflecting surface. Non-binding value obtained from sound power level according to EN ISO 3744.

(7) Sound power level measured according to EN ISO 9614. Data of basic unit without options, full load and referred to the following conditions: evaporator fluid: 100% water, IN/OUT temp. = +12/+7 °C, ambient temp. = +35°C.

Technical data may vary without notice.

The above mentioned data are subject to the measuring tolerances of Eurovent. Unless otherwise stated, all data refer to a product in basic version

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LAYOUT

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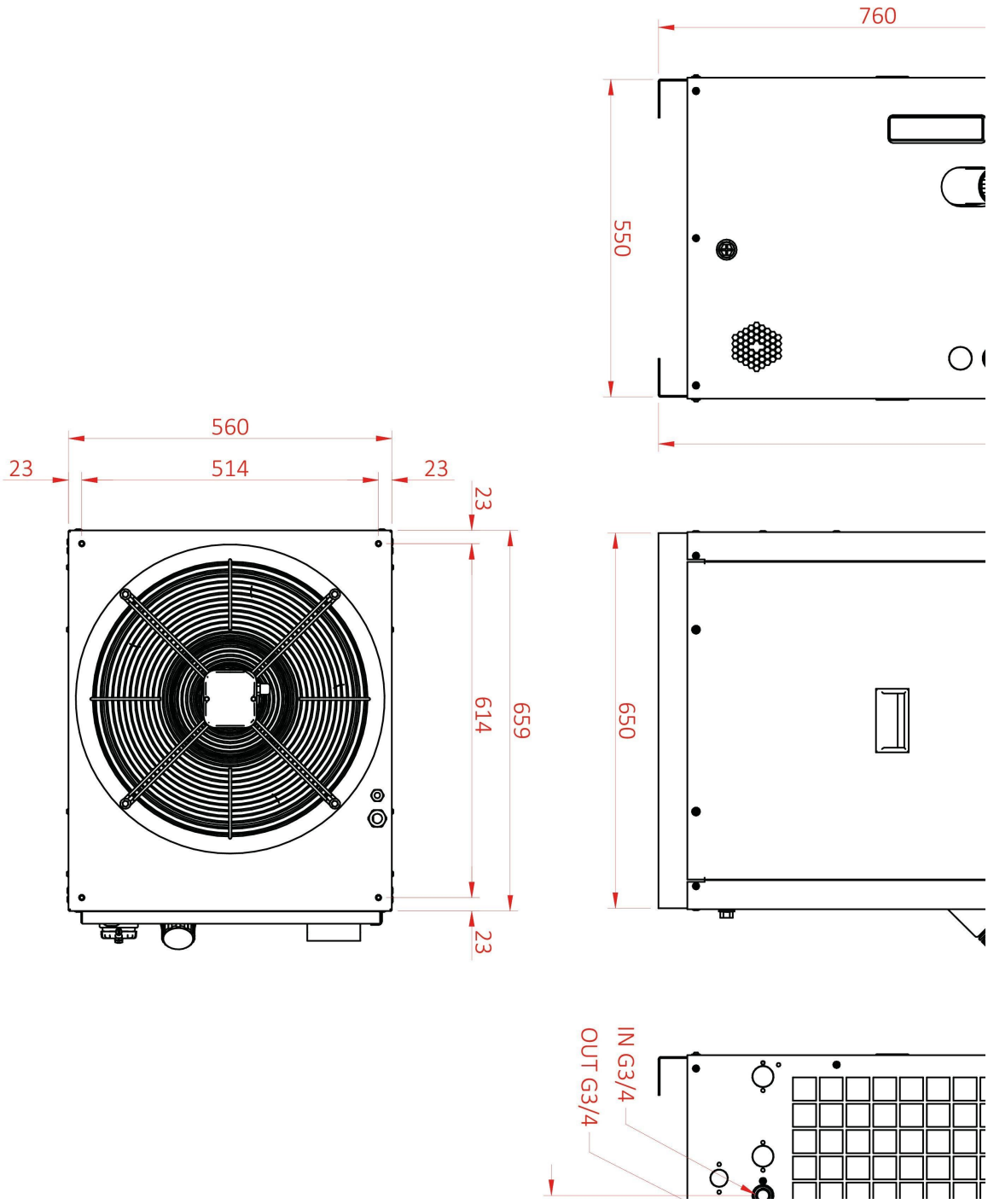
H [mm]	L [mm]	P [mm]
1310	550	730



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REFRIGERANT CIRCUIT

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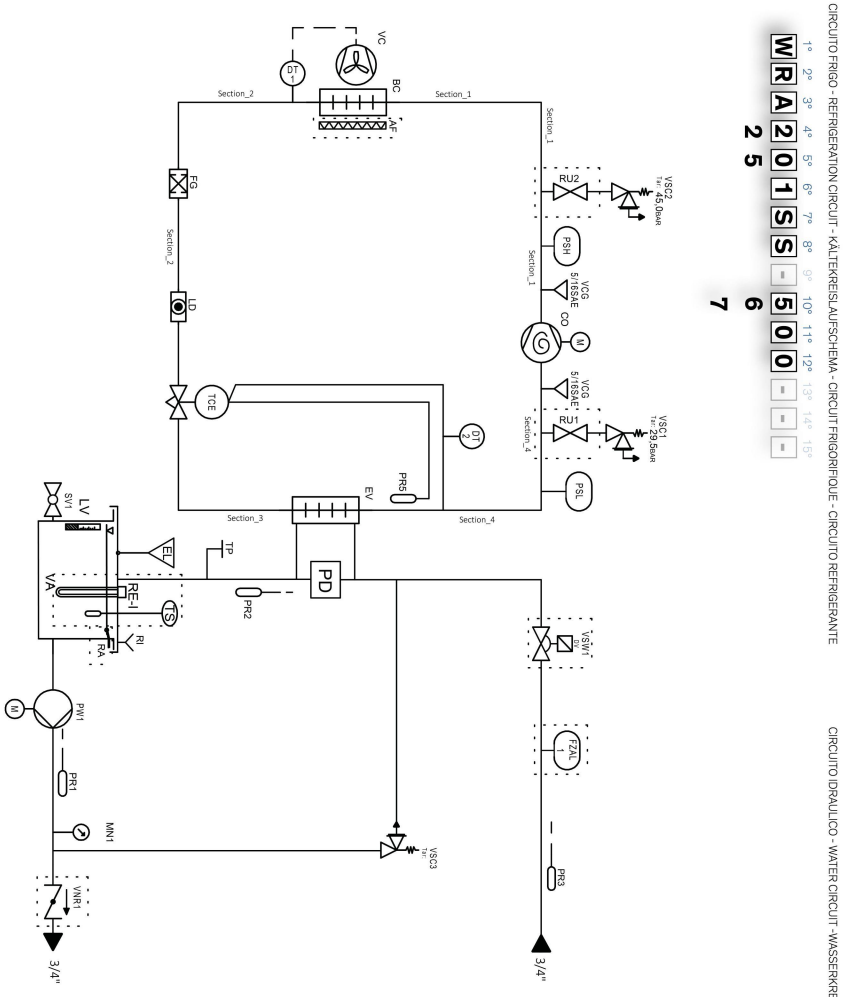

Numeric	Sinottico	Significato	Numeric	Sinottico	Significato
ABV		Valvola di blocco automatica	PSV		Pressostato per vuoto
AF		Filtro aria condensatore	PW		Pompa acqua
BPA		Bypass automatico	RA		Rabbocco automatico
BC		Condensatore	RE-I		Resistenza
CO		Compressore	RI		Tappo di rabbocco
DT		Trasduttore di pressione	RU		Valvola gas
EL		Livello elettrico	SV		Scarico valvola
EV		Evaporatore	TCE		Valvola termostatica
FG		Filtro del refrigerante	TCM		Valvola termostatica meccanica
PW		Pressostato	TP		Tappo
FZAL		Fluxostato	TS		Termostato di troppi
LD		Indicatore di gas	VA		Vasca
LV		Livello visivo	VAP		Vasca di accumulo pressurizzata
M		Motore	VC		Ventilatore condensatore
MBV		Valvola a sfera per lo stato dell'aria	VCG		Valvola del gas di carico
MN		Manometro	VSC		Valvola di sicurezza con ritorno a molla
PD		Pressostato differenziale	VNR		Valvola di non ritorno
PR		Sonda	VSW_DV		Valvola solenoide a membrana
PSH		Pressostato ad alta pressione	VX		Valvola di espansione
PSL		Pressostato a bassa pressione			Linea refrigerante

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ACCESSORIES AND PRICES

WRA251SSB500

Chiller WRA251SSB500	
HYDRONIC KIT : P3 pump with tank	included
POWER SUPPLY : 400/3/50 - 460/3/60	included
AMBIENT WORKING RANGE : Std	included
LIQUID WORKING RANGE : Std	included
VERSION : Basic version atmospheric hydr. Circ.	included