

Ref.: **Internet**
TWEevo 402 Special
 SN: **2200175397**

TWEEVO 402 Special (Krones 60Hz)

Serial No .: 2200175397
 Year of construction 2011,
 Condition: Optisch 1, Technisch1
 Storage chiller (original packaging)



DESCRIPTION OF THE UNIT

General Description: the TWEevo is chiller equipped with hermetic scroll or piston compressors and with an innovative evaporator-in-tank with finned coil. Thanks to the wide water inlet and outlet limits, to the possibility of working in hydraulic circuits at atmospheric pressure and under pressure circuits and thanks to the numerous configurations and available options, the TWEevo is on the top of his range, allowing large and versatile applications and high level of reliability. The TWEevo is therefore the perfect solution for all those industrial applications that require high performances, a continuous operation and a reduction of the managing costs.

Structure and casing: the structure is made of a base and of structural panels in galvanized carbon steel and painted with polyester power. All the models have a structure with the compressor compartment separated from the condenser section in order to assure the maximum accessibility for service and maintenance operations. All the models are fitted with a base supplied with fork channels for handling by the forklift; the basement of models 201-602 is also provided with holes for handling the units thanks to lifting bars and lifting straps. The base and the panels with coolant pressure gauges are in RAL 5013 blue

colour, whereas the rest of the structure and panels are in RAL 7035 light grey.

Compressors: Hermetic reciprocating piston compressors (from model 015 to 051) and scroll compressors (from model 081 to 602). All the compressors are complete with the motor protection against overheating and overcurrent and are mounted on rubber anti-vibration dampers. The crankcase heater with automatic insertion prevents the dilution of the oil by the refrigerant fluid when the compressor is switched-off.

Refrigerant fluid: R407C

Evaporator: the innovative direct expansion evaporator is made of finned coils with copper tubes and aluminium fins and it is protected by a galvanized steel cabinet.

Thanks to the generous thermal exchange surface and to the wide water passing sections, the evaporator allows to optimize the heat exchange and to minimize the pressure drops. The exchanger is installed inside the accumulation tank, reducing the ambient heat losses and it is protected from the risk of freezing, potentially caused by malfunctions, thanks to the anti-freezing function of the electronic control.

Condenser: Aisi 361 stainless steel brazed copper plate water-cooled exchangers (TWE EVO 015-020); coaxial exchangers with shell in carbon steel and copper refrigerant tubes (TWEevo 031-161); shell & tube exchangers with connections for the use with tower water, shell and heads in carbon steel and copper tube bundle (TWEevo 201-602). The hydraulic condensing circuit features a pressure control valve for condensing temperature control installed inside the unit as option.

Refrigeration circuit: the refrigeration circuit is composed of:

- Refrigerant filter-dryer with hygroscopic molecular sieves
- Refrigerant liquid flow sight glass and moisture control
- Thermostatic expansion valve with external equalization
- High pressure switches
- Low pressure switches



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- Pressure switch to control the solenoid valve in parallel to the pressure control
- High pressure transducer (models 402-602)
- Refrigerant pressure gauges (models 031-602)
- Hot gas by-pass solenoid valve (only for close control).

minimum flow rate necessary to the intervention of the antifreeze alarm and to protect the pump.
Attention: the bypass has the unique aim of preserving the integrity of the unit in case of an erroneous closing of the shut-off valves. The operation of the bypass with continuous cycles and extended periods of time is strongly discouraged.

Hydraulic circuit fitted with:

- Pumps:

Centrifugal pumps with seals made of silicon carbide with a controlled porosity, graphitized (SiC/SiC/EPDM), available in two different configurations:

Pump P3: nominal head pressure 3 bar, in stainless steel water side throughout model 015 up to model 251 and cast iron from model 301 to 602.

Pump P5: nominal head pressure 5 bar, in stainless steel water side throughout up model 161 and cast iron from 201 to 602. For models from 201 to 602 it is available the configuration with double pump P3 or P5 in standby; the switching between the two pumps can be done manually by a switch for models 201-351 and automatically for models 402-602.

- Storage tank:

All the TWE evo are provided as standard with cylindrical storage tank (with the evaporator inside) 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. The storage tank is made of carbon steel and it is sized to work in closed hydraulic circuits with a maximum pressure of 6 bar: it can be used also in atmospheric hydraulic circuits installing the manual filling kit. Every storage tank is equipped with a drain valve and with a bleed valve to vent air during the process of filling the hydraulic circuit.

- Hydraulic bypass:

The TWE evo are equipped as standard with an internal hydraulic bypass between the supply and return of the process fluid. 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

- Level sensor:

The level sensor is of a conductive type. The operation of the unit is stopped when the level of the process fluid in the accumulation tank is insufficient.

Electrical Board: 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 2004/108/CE. 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 with safety door lock;
- The isolation transformer feeding the control circuits and microprocessor circuit boards;
- Phase monitor for the protection of the unit from the lack of phase and from wrong sequence of phases (available from November 2012);
- Automatic circuit breakers to protect the compressors, fans and pumps;
- 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;

Electronic Control: the TWE evo units are controlled and managed by the IC121 electronic controller (models 015-351) and by the IC281 (models 402-602) with presentation of parameters on a dual display and icon-based identification of functions; these microprocessor controllers allow to display the main operating parameters of the system and to optimize the performances. The IC121 and IC281 electronic controllers manage the following functions:

- Proportional regulation of the water outlet temperature (from model 015 to 351);



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- Proportional regulation or neutral zone of the water outlet temperature (from model 402 to 602). Standard factory pre-set: proportional;
- Antifreeze heater control (water side);
- Management and control of the automatic rotation of the compressors start sequence (from model 201 to 602);
- Count of operating hours of the chiller and compressors;
- Measurement and display of the condensing pressure (models 402-602);
- Measurement and display of the environment temperature for control of the anti-freezing heating elements (if present);
- Unloading function (from model 402 to 602);
- Management of alarm messages;
- Alarms history display;
- TTL type serial interface (RS485 conversion kit required).

Testing: Before shipment, all the chillers are tested in MTA in proper testing rooms. In particular, the main checks performed are the following: correct installation of all components, absence of refrigerant leaks and electrical safety tests. With the unit running in nominal conditions it is also checked the correct functioning of the refrigerant circuit.



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Configuration: to be filled by Sales Department.

Options: to be filled by Sales Department.

- **Pumpe P5**
- **Special- Voltage: 380V/3Ph/60Hz**
- **AD vessel for open circuits**
- **Special color RAL9018 in neutral design**
- **Automatic spring-loaded bypass valve**
- **Tank in stainless steel**
- **Delivery without refrigerant charge**



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PERFORMANCES

Range	TWEvo
Model	TWEvo 402
Version	Special (Krones)
Refrigerant	R407C
Frequency	60 Hz
Heat exchanger	Immersed finned coil
Compressors	Scroll
Hydraulic Kit	P5
Inlet Water Temperature	14 C
Outlet Water Temperature	10 C
Glycol Type	EthyleneGlycol
Glycol Percentage Weight	0 %
Fouling Factor	0 m ² K/W
Condensers	Shell Tube
Inlet Water Temperature	30 C
Outlet Water Temperature	35 C
Glycol Type	EthyleneGlycol
Glycol Percentage Weight	0 %
Fouling Factor	0 m ² K/W
Cooling Capacity	112 kW
Total Absorbed Power	26,9 kW
Evaporator water flow Rate	25,29 m ³ /h
Condenser water flow Rate	23,98 m ³ /h
Available Head Pressure	489 kPa
Condenser Pressure Drops	165 kPa

Data declared according to UNI EN 14511:2011.



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GENERAL DATA

Cooling Circuits	nr. 2
Compressors	nr. 2+2
Capacity Control	0-25-50-75-100
Power	380/3-PE/60 V/ph/Hz
Auxiliary	24 - 230/1/50 V/ph/Hz
Condensers	nr. 2
Min evaporator flow rate	7,7 m ³ /h
Max evaporator flow rate	48 m ³ /h
Evaporator Water Volume	500 l
Tank Volume	500 l
Min condenser flow rate	6,6 m ³ /h
Max condenser flow rate	28 m ³ /h
Condenser Water Volume	0 l
Lenght	3289 mm
Width	1255 mm
Height	2050 mm
Weight	1657 kg



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ELECTRICAL DATA

Model	FLI	FLA	ICF
TWEevo 402	52,2 kW	87 A	190 A

FLI = max power absorbed in the operating limit conditions
 FLA = max current absorbed in the operating limit conditions
 ICF = start-up current at the start of the last compressor in the operating limits condition

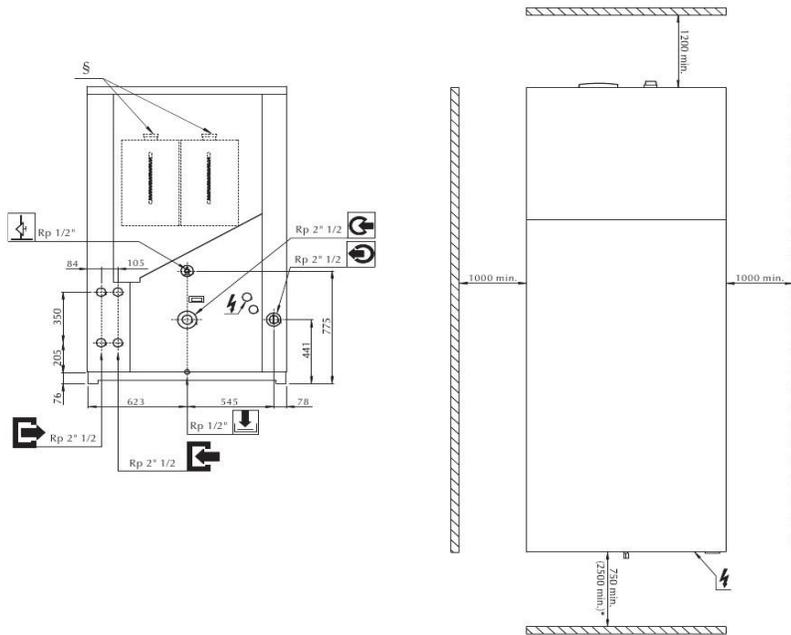
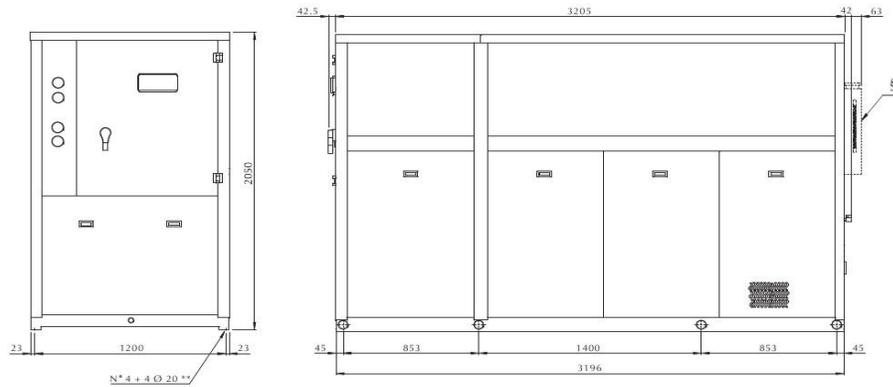
SOUND LEVEL

Model	Octave Bands (Hz)	63	125	250	500	1000	2000	4000	8000
TWEevo 402	Sound Power Level	40,4	38,6	54,4	74,3	76,6	77,5	70,3	69,4

Model	Sound Power Level	Sound Pressure Level	Sound Pressure Level	Sound Pressure Level	Sound Pressure Level
TWEevo 402	81,7 dB(A)	53,7 dB(A) 10 m	59,7 dB(A) 5 m	63,7 dB(A) 3 m	68,7 dB(A) 1 m

Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. Sound pressure at 10 m: Average value obtained in free field on a reflective surface at a distance of 10 m from the external side of the electrical panel of machine and at a height of 1.6 m from the unit support base. Values with tolerance +/- 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions.

TWEvo 402 - 502 - 602



* Valore minimo per garantire la estraibilità del serbatoio in caso di manutenzione on site.
 * Minimum distance to allow the tank replacement in case of maintenance on site.



-  : Ingresso acqua - Water inlet
-  : Uscita acqua - Water outlet
-  : Ingresso acqua condensatore - Condenser water inlet
-  : Uscita acqua condensatore - Condenser water outlet

- ** : Fori - Holes
-  : Alimentazione elettrica - Electrical power supply
-  : Scarico acqua - Water discharge
-  : Sfiato aria - Air vent
-  : Kit tanica - Tank kit

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QUALITY AND CERTIFICATION



MTA is ISO9001 certified, a sign of its commitment to complete customer satisfaction.



MTA products comply with European safety directives, as recognised by the CE symbol.



MTA participates in the E.C.C. programme for LCP-HP.

Eurovent certification applied to the units:
- air/water with cooling capacity up to 600 kW;
- water/water with cooling capacity up to 1500 kW.

Check outgoing validity of certificate:

- www.eurovent-certification.com.

- www.certiflash.com

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