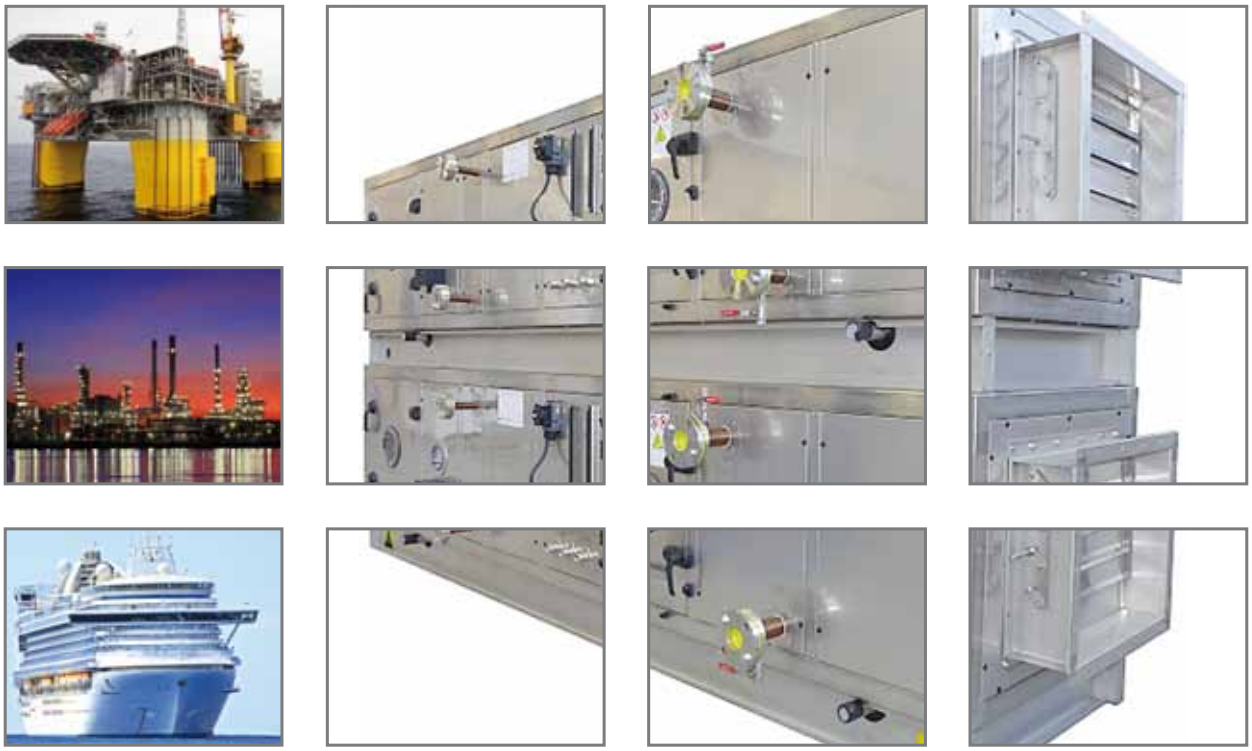


ROCCHEGGIANI®

care for air

CTA-IX

Special construction air handling units

Nuclear & Power

Marine & Offshore

Oil & Gas

A constantly evolving company that has made history

Commitment, intuition and a constant striving for quality. A history spanning over half a century. Roccheggiani's beginnings are rooted in the metal construction and plant component sector. A typical Italian entrepreneurial endeavour dotted with small and large successes. This dogged determination has enabled Roccheggiani to become a leader in the manufacture of ducts and components for air distribution plants, stainless steel flues and air handling plants, heat recovery systems and terminal units.

The broad, diversified production range adequately reflects the commitment and professional expertise of a company that has made history.

Marine

Roccheggiani's Marine Air Handling Units have been designed and built to meet all possible requirements for marine air conditioning systems, in full compliance with the most stringent health and safety regulations.

The family includes 15 units, with air capacities ranging from 1.000 m3/h (277 l/s) to 45.000 m3/h (12500 l/s) and pressures up to 3500 Pa delivered.

Each unit includes normalised standard modular sections, allowing maximum liberty in the selection of the air handling plant, and providing total comfort in the areas of utilization.

Built in compliance with EN 1886 mechanical features, and adopting state-of-the-art technology, all units are fully assembled in our facilities for stringent vibration and performance tests and certifications on the motor-fan assembly.

Main components

Mixing section including dampers providing opposed blade operation, manually or motor operated via electric actuators.

Air filtering section including flat pleated or pocket filters (G4 efficiency), or rigid bag filters (efficiency F5, F6, F7, F8).

Water or direct expansion Cu-Cu coil, up to 14 rows. Droplet separators. Rotary enthalpic heat recovery unit. Supply and return fan section. Supply and return plenum with connection for round or square ducting.

The following range of accessories is available: inspection window, energy-saving internal lighting, antifreeze thermostat, differential pressure switch, U-type pressure gauge for filters, smoke dampers, actuators for dampers.

Base

Hot dip Galvanised steel base, 140 mm high.

Frame fabrication

Supporting frame fabricated with special AISI 304 stainless steel sections.

Frame coupling with three-way corner 40 mm or 70 mm pre-loaded fiberglass nylon joints.

Panels

Sandwich-type cover panels, 25 or 54 mm thick, having interior and exterior AISI 316 or AISI 304 stainless steel plates. Interposed insulation in either high-density expanded polyurethane foam (approx. 45 Kg/m3) or approved mineral wool (approx. 100 Kg/m3). The panels are secured to the frame through AISI 304 screws and inserts fitted inside closed nylon bushings.

Maintenance
and inspection panels are fitted with lockable nylon handles and hinges.

Pan
Slanted condensation collection pan, made in AISI 316, steel, fitted with two drains (1½" gas) located in opposite positions, insulated externally with approved anti condensation material.

Internal plates
Internal component covers in AISI 304 stainless steel or AISI 316 steel.

Dampers
Multileaf external air and recirculation air dampers with opposite blade operation, made in various materials, including galvanized steel, AISI 316 or AISI 304 stainless steel, or airfoil aluminium blades. All dampers are suitable for manual or motorized operation.

Filters
The following types of filters are available:
Cell type, with regenerable multipleated synthetic filter section, 90 mm th., efficiency class G4-EN 779
Bag type, with synthetic filter section, 360 mm th., efficiency class G4-EN 779 These types of filters are self-extinguishing class 1.
Other types of bag filters, with efficiency classes F5, F6, F7, F8, or F9 are available upon request.

Enthalpic heat recovery wheel
Air—to-air, rotary enthalpic heat recovery unit, with honeycomb wheel in hygroscopic aluminium, can be provided with removable sections, or single body wheel, and fixed or variable rotation speed.

Heat exchange coil
Bundle-type heat exchange coils, operating with cold or hot water, and with copper pipes and fins. Stainless steel AISI 304 or AISI 316 frame. Copper manifolds with gas-threaded taps, fitted with air vent and water drainage valves. All coils have been tested to a pressure of 20 bar.

Droplet separator
Multipleated droplet separator, with AISI 304 or AISI 316 stainless steel frame and flame-resistant polypropylene fins B2-DIN4102.

Industrial fans
Double intake fans are used, fitted with backward inclined, airfoil or flat plate blades. The volute and the impeller are of heavy carbon steel construction, protected by an epoxy coating. Bearings and chocks are fitted with greasing nipples.

Electric motors
Three-phase asynchronous motors, made by UNEL-MEC, suitable for operation in tropical environments, with cast iron or epoxy coated aluminium casing. Insulation class F and protection IP55.
Motors of varying polarities are available as required, with 380V, 440V, 690V - 3 Phase - 60 Hz power supply.

Motor/fan frame
The base support frame of the motor/fan assembly is a galvanized carbon steel fabrication, and is isolated from the structure of the unit by special rubber suspensions.

“When the things get tough...”

During the years Roccheggiani estended its production over the most critical fields of application: the natural development of the Marine units were the Oil & Gas world both Offshore and Onshore

Offshore - Oil & Gas

Main components

Base frame

Base frame made AISI 316L Stainless steel plate 3,0 mm thickness, H= 140 mm (optional: 190 mm).

Frame construction

Structural frame made of AISI 316L Stainless Steel Roccheggiani own design.

Three ways 70 mm corner joint made of AISI 316L Stainless Steel.

Panels

Sandwich panels th. 54 mm made of AISI 316L Stainless Steel 1,0mm external and 1,0 mm internal, insulation made of Rockwool.

470Li-Cr RAL 9010 also available.

Drain pan

AISI 316L water trap with twin (both sides) drain connection GAS 1”½ externally insulated by anti–condensate materials.

Internal plates

AISI 316L th.1,5mm internal plates (Filter frames, Fan-motor base frame, Coils rails).

Dampers

Dampers manufactured from AISI 316L Stainless Steel, duct mountings connection according to ISO 15138.

Upon request Pneumatic servomotors complete with solenoid valves and proximity sensor limit switches or Explosion proof electric actuators available;

Coils

- Water Heating coils made of:
- Titanium tubes 0,71xØ15,88mm;
  AISI 316 Fins 0,13mm (option Titanium 0,13 or CuSn 0,15);
- Titanium headers;
- AISI 316 frame;
- A316 ASME B16.5 threaded flanges ANSI 150.
- 3 parts penetrates + pressure testing,
  Design pressure: 18 bar;
  Test Pressure: 27 bar
- Heresite coating also available
- Steam coils also available

Water cooling coils made of:

- Titanium tubes 0,71xØ15,88 mm;
- AISI 316 Fins 0,13 mm (option Titanium 0,13 or CuSn also available);
- Titanium headers;
- AISI 316 frame;
- A316 ASME B16.5 threaded flanges ANSI 150.
- 3 parts penetrates + pressure testing,
  Design pressure: 18 bar;
  Test Pressure: 27 bar
- DX coils also available
- Heresite coating also available
- Two pleats drop eliminator with AlMg3 Aluminium Alloy frame and fins.

Electric heaters

- AISI 316 Stainless Steel Elements;
- AISI 316 Stainless Steel fins;
- AISI 316 frame;
- Automatic adjustable safety thermostat 0°-120°C
- Supply voltage upon request.
- No. of stages on request

- IP56 protection grade
- ATEX 94/9/CE Cat. 2 Zone 1 IIB T3

Filters

- G4 pleated type (EN 779 efficiency)
- F5 bag type (EN 779 efficiency)
- F7 class (EN 779 efficiency) rigid bag type Camfil CAM GT®;
- AISI 316L filters guide frame;

Fans

- Centrifugal Plug-fan with backward curved blades:
- Impellers made of AISI 316L Stainless Steel;
- Base plate Motor – Fan, made of AISI 316L Stainless Steel;
- ATEX Zone 1 – 2G IIB T3/T4

Motors

- Electric motors for marine application.
- Three-phase Asynchronous motors closed casing UNEL – MEC series;
- Polarity: as demand;
- Non essential service;
- Certification Board: DNV Type approval (Witnessed test not included)
- ATEX Zone 1 – 2G IIB T3/T4

Factory Acceptance test

The Air handling unit can be tested upon Costumer request on:

- Airflow volume
- Pressure
- Power consumption
- Vibration
- Due to the following standards:
- UNI EN 13053:2007
- UNI EN 12599:2001
- ISO 14694:2003

CERTIFICATION

The Air Handling Unit are designed, manufactured and verified due to the following standard:

- ISO 15138:2007 Petroleum and natural gas industries -- Offshore production installations -- Heating, ventilation and air-conditioning;
- TR 1562 Statoil HVAC Design and fabrication requirements;
- EN 14986:2007 Design of fans working in potentially explosive atmospheres;
- EN 13463-1:2009 Non-electrical equipment for use in potentially explosive atmospheres. Basic method and requirements;
- EN 60079-14 Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines);
- EN 60079-17 Explosive atmospheres. Electrical installations inspection and maintenance;
- EN 15198:2007 Methodology for the risk assessment of non-electrical equipment and components for intended use in potentially explosive atmospheres
- CLC/TR 50404:2003 Electrostatics - Code of practice for the avoidance of hazards due to static electricity
- CLC/TC31 Electrical apparatus for potentially explosive atmospheres

The Air handling units are CE marked in conformity to the following standard:

- Directive 2006/42/EC on machinery;
- Directive 2004/108/EC Electromagnetic Compatibility (EMC);
- Directive 2006/95/EC Low Voltage Directive (LVD);

The Air handling units are CE-ex marked in conformity to the 94/9/EC ATEX Directive Category 2 Zone 1 with the deposit of the Technical File (Annex VIII) at Bureau Veritas Italia notified body no. 1370.

CE Ex II 2 G IIB T4

“When the things get tough...”

During the years Roccheggiani extended its production over the most critical fields of application: the natural development of the Marine units was the Oil & Gas world both offshore and onshore

Onshore - Oil & Gas

Packaged units suitable for outdoor installation including air evaporating section with centrifugal plug-fans and air-cooled condensing section with Plug-fans. The unit is assembled with R134a refrigerant charge. The unit complies with the current regulatory framework: 97/23 EC (Directive for equipment under pressure); 98/37 EC (Machinery Directive); 89/336 CE (EMC Directive as amended 92/31 CE - 93/68 EC - 93/97 EC), 72/23 (low Voltage Directive as amended 93/68 EC). In addition, the certification of the quality system UNI EN 9001:2000 (ISO 9001:2000) issued by DNV ensures the design and construction of the device according to high quality standards.

Main components

Case

Made of extruded anodized aluminum profiles according to 9006/1 6060 T6 anticorodal with shaping accident prevention, corner joints nylon PA66 with glass fiber, rock wool sandwich panel 90 kg/m3 class of reaction to fire “0” (UNI 9177), thickness 54 mm, outer support plate AISI 304 stainless steel, galvanized steel internal support. AISI 304 Stainless steel Roof.

Condensing section

Filters

Aluminum Sand-trap and shut-off damper with spring return electric actuator on fan discharge.

Compressor

Reciprocating SEMIHERMETIC type, mounted on antivibration mountings and complete with oil pump, crankcase electrical heater, electronic protection.

Flexible joints on suction and discharge.

COMPRESSOR SUITABLE FOR ATEX 94/9/CE ZONE 2

Condensing Coil

Finned exchanger, made from copper pipes in staggered rows and electro-tinned copper fins with large exchange surface.

Condensing unit fan section

AISI 304 Stainless steel Centrifugal fans Plug-fans type directly coupled with degree of protection IP 55, condensation control by digital frequency converter for fan control.

FAN SUITABLE FOR ATEX 94/9/CE ZONE 2

FAN ELECTRIC MOTOR ATEX 94/9/CE Exde IIB T4

Refrigerant Circuit

Filter gas molecular sieve.

Liquid sight glass and moisture indicator.

Transducers of high and low pressure.

Evaporating section (air treatment)

Filters

Aluminum Sand-trap and synthetic filter class G3 on fresh air inlet, F7 class final filter

Mixing section (recirculation and external air intake)

Section complete of Aluminum opposed blades damper to adjust the amount of outside air and recirculation and provide the necessary relief to the
premises Damper actuators Schischek mod. ExMax-5.10-Y ATEX
94/9/CE II 2G Ex-d IIC T6 Suitable for Zone 1

Evaporator

Finned exchanger, made from copper pipes in staggered rows and Electro-tinned copper fins with large exchange surface.
Condensate drip tray in stainless steel AISI 304.

Humidification

Stand alone steam humidifier

Electric heater

2 Stage 400V/3/50Hz electric heater (2 + 4 kW)
ELECTRIC HEATER ATEX 94/9/CE Ex-d IIB T3 IP65

Fan section evaporating unit

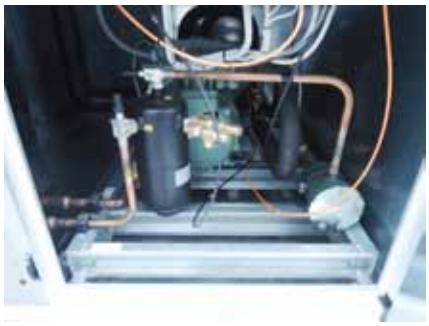
Epoxy painted Centrifugal fans Plug-fans type directly
coupled with degree of protection IP 55.
FAN SUITABLE FOR ATEX 94/9/CE ZONE 2
FAN ELECTRIC MOTOR ATEX 94/9/CE Ex-de IIB T4

Supply section

Back-draught damper for operation Run - Stand-by.

CONTROLS

Control Electric box for the Packaged Air handling unit (Loose supplied to be mounted inside the control room) suitable for SAFE AREA. Regulation and Control: The microprocessor through the management of ignition timing adjusts the cooling capacity of the compressors and controls the operating alarms with the possibility of connection to supervision systems. The air flow to the heat exchanger is controlled by the pressure transducer.



CERTIFICATION

The Air Handling Unit are designed, manufactured and verified due to the following standard:

- EN 14986:2007 Design of fans working in potentially explosive atmospheres;
- EN 13463-1:2009 Non-electrical equipment for use in potentially explosive atmospheres. Basic method and requirements;
- EN 60034-1:2004 Rotating electrical machines - Part 1: Rating and performance;
- EN 60034-14:2004/A1:2007 Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity;
- EN 60079-14 Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines);
- EN 60079-17 Explosive atmospheres. Electrical installations inspection and maintenance;
- EN 15198:2007 Methodology for the risk assessment of non-electrical equipment and components for intended use in potentially explosive atmospheres
- CLC/TR 50404:2003 Electrostatics - Code of practice for the avoidance of hazards due to static electricity
- CLC/TC31 Electrical apparatus for potentially explosive atmospheres

The Air handling units are CE marked in conformity to the following standard:

- Directive 2006/42/EC on machinery;
- Directive 2004/108/EC Electromagnetic Compatibility (EMC);
- Directive 2006/95/EC Low Voltage Directive (LVD);

The Units are marked in conformity to the 94/9/EC ATEX Directive Category 3 Zone 2 (Manufacturer declaration of conformity – Internal control of production) CE Ex **II 3/3 G IIB T3 (-20°C <Tamb < +40°C)**

"When the things get tough..."
The roughest environment, the hardest conditions and even the most critical applications, this is the challenge.

Nuclear Power Plants

The Air handling units for the Nuclear Power Plants are designed and manufactured to guarantee 40 years of lifespan.
All the AHUs are designed and engineered with the newest FEM and CFD software.
The N.P.P. Air handling units have been tested over a Thermal and Vibration Ageing and, when aged, Seismic tests on tri-axial shaking tables have been performed to comply with the most critical safety standards.
The N.P.P. Air handling units are suitable for safety related application up to Class III Seismic Category 1a and can operate before, during and after the accident event.

Main components

Base frame

Fully welded base frame made AISI 304 Stainless steel plate 2,0 mm thickness, H= 300 mm.

Frame construction

Fully welded Structural frame made of AISI 304 Stainless Steel Roccheggiani own design.
Three ways 70 mm corner joint made of AISI 304 Stainless Steel.

Panels

Sandwich panels th. 54mm made of AISI 316L Stainless Steel 1,0mm external and 1,0mm internal, insulation made of Polyurethane foam

Drain pan

AISI 316L water trap with twin (both sides) drain connection GAS 1"½ externally insulated by anti–condensate materials.
Internal plates
AISI 304 th.1,5 mm internal plates (Filter frames, Fan-motor base frame, Coils rails).

Dampers

Dampers manufactured from AISI 304 Stainless Steel.
Upon request electric actuators available;

Coils

Heat exchangers, heating coils made of:

- Copper tubes 0,4xØ16,50 mm;
- Aluminium fins 0,23 mm;
- Copper headers;
- AISI 316 frame;
- A316 ASME B16.5 threaded flanges ANSI 150.
- Water cooling coils made of:
- Copper tubes 0,4xØ16,50mm;
- Aluminium fins 0,23 mm;
- Copper headers;
- AISI 316 frame;
- A316 ASME B16.5 threaded flanges ANSI 150.
- Two pleats drop eliminator with AISI 304 Stainless steel frame and fins.

Electric heaters

- AISI 304 Stainless Steel Elements;
- AISI 304 Stainless Steel fins;
- AISI 304 frame;
- Automatic adjustable safety thermostat 0°-120°C
- Supply voltage on demand.
- No. of stages on request
- IP56 protection grade

Filters

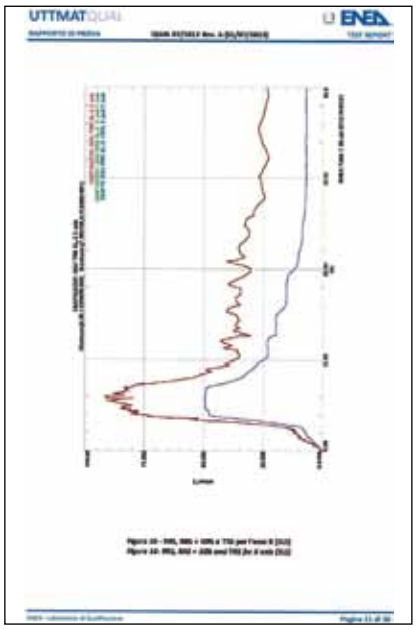
- G4 pleated type (EN 779 efficiency)
- F7 class (EN 779 efficiency) rigid bag minipleat type ;
- AISI 304 filters guide frame;

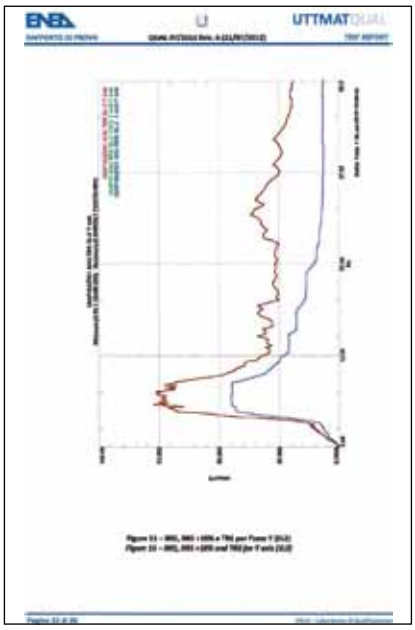
Fans

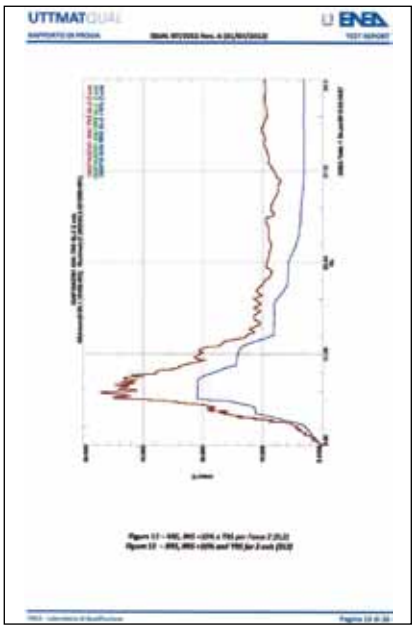
- Industrial fan DIDW with airfoil profile backward blades:
- Impellers made of Carbon steel 180 mm epoxy painted;
- Base plate Motor – Fan, made of AISI 304 Stainless steel;

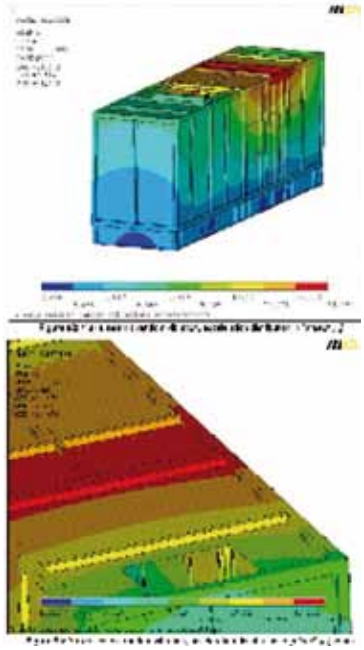
The Air Handling units for Nuclear Power Plants are designed and manufactured in accordante with:

- **ASME N509**
- **ASME N510**
- **ASME Section III**
- **ASME Section VIII**
- **AMCA210**
- **ASME AG-1 standard**
- **The units are qualified in accordance with:**
- **ASME QME-1-2007: Qualification of Active Mechanical Equipment Used in Nuclear Power Plants**
- **IEC 980: Recommended practices for seismic qualification of electrical equipment of the safety system for nuclear generating stations**
- **IEEE 323-2003: IEEE Standard for Qualifying Class 1E Equipment for Nu clear Power Generating Stations**
- **IEEE 344-2004: Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations**









Related products in our catalogue

Cabin units for passengers and crew cabins

Construction

The terminal unit enables the adjustment of the temperature within a cabin. It is manufactured with 0,8 mm thick galvanized steel, the dimensions are 500 x 595 x 240 mm, it is internally insulated with a layer of Rockwool (code 759) mineral wool that is protected with a layer of Interglass (type 018) fibre glass. The insulation of the terminal is fixed into position by the means of an interlocking puzzle, thus without the use of adhesives or glues.
Air flow range: 100-350 (m3/h).

Main components

Inside the terminal are:

- Mobile aphonic air flow regulation damper made of Steel AISI 304 stainless steel, insulated with a layer of Rockwool (code 759) mineral wool, protected with a layer of Interglass (type 018) fibre glass; the total density of the insulation is 100 kg/m3 and sums up to a 25 mm thickness;
- Airflow equalizer with calibrated holes;
- Automatic electronic controller including differential pressure sensor and onboard ethernet communication (where required);
- Linear actuator for mobile damper (where required);
- Temperature probe NTC (where required);
- Armoured electric re-heater with safety thermostat (230 V/1/50 Hz) (where required);
- Power cable 3 x 1 mm with pass-thru connector (where required);
- Outside the terminal are provided (where required);
- 8 poles data cable 7 meters length (where required);

Outside the terminal are:

- Diffuser
- Room unit with room temperature sensor and set-point re-adjuster (thermostat) (where required).

Automatic electronic control

Main module

The main module works as Stand alone or embedded into an ethernet network for communication between controllers of different units, communication with other systems or communication with BMS (Building Management System).

Acoustic characterization

The acoustic performance of the unit was assessed in cooperation with the Department of Mechanics of the Università Politecnica delle Marche, simulating real operating conditions. Detected noise at the outlet of the unit was definitely lower than the sound level produced by analogous commercially available products.

RINA certification

Roccheggiani Cabin Units were proved to comply with the Fire and Protection requirements of Marine Equipment Directive (MED) 96/98/EC as modified by Directive 2002/75/EC.

Related products in our catalogue

Cabin fan coil unit

Construction

The FR-MCU-VI is a very compact fan coil unit for marine applications. This fancoil features very small dimension, fulfills every demand of cooling and heating, joining performances and silence, perfectly integrable in any marine environment. The FR-MCU-VI series consists of two models with a nominal air flow of 450 m3/h and 700 m3/h.

The fancoil unit is made of 0,8 mm thick galvanized steel, the overall dimensions including duct connections are 950 mm height and 240 mm depth, the width is 430 mm for the 450 m3/h model and 550 mm for the 700 m3/h model. The unit is internally insulated with a layer of Rockwool (code 759) mineral wool that is protected with a layer of Interglass (type 018) fibreglass. The insulation of the terminal is fixed into position by means of an interlocking puzzle thus without the use of adhesives or glues. Two frontal panels, fully dismountable, assembled with screws only, provide the access to the coil, the fan and the pipework connection.

Main components

Inside the fancoil unit are:

- G4 or F7 withdrawable waved filters;
- AISI 316L M1 insulated drain pan;
- 4 rows copper tubes and copper fins coil with AISI 316 frame;
- 2 step electric heater 230V/1Ph/60 Hz power supply with safety thermostat;
- A direct-driven AC or EC fan-motor group easily dismountable for maintenance; enquires for the low power consumptions (more than 60% savings) and the low noise are fulfilled.
- Flanged supply duct connection;
- Circular duct connection for fresh air inlet;
- Automatic electronic controller including onboard Ethernet port for network communication with BMS (Building Management System);
- 3-Port control valve with T bypass and thermic actuator 230V/1Ph/50Hz power supply;
- Temperature probe NTC;
- RJ12T data cable with pass-through connector;
- Power cable 3 x 1 mm with pass-through connector;
- Outside the fancoil unit are:
- RJ12T data cable of 7 meters length;
- Room unit with room temperature sensor and set-point re-adjuster (With key-card holder as an option).

Automatic electronic control

Main module

Main module works as Stand alone or on Ethernet network for communication between main modules, and other systems or communication with Building Management System.

Control operating sequences

The on-board control regulates the temperature inside the cabin by automatic sequences on the fan-speed, the water valve and the electric re-heater.

The regulation loop is based on manual control by the wall mounted user interface, local key-card holder to monitor occupancy, limit switch on balcony door or via BMS.

Room control panel

Control panel is a user interface. User can choose temperature, switch On/Off HVAC cabin system or choose maximal cooling.

Related products in our catalogue

Fan coil unit for public and technical spaces

Construction

Depending on the design airflow fan coil units for public and technical spaces are available in different sizes and equipped with one up to three axial direct driven plug-fans. Units are characterized by sandwich-type cover panels, 25 or 54 mm thick, having interior and exterior AISI 316 or AISI 304 stainless steel plates. Interposed insulation in either high-density expanded polyurethane foam or approved mineral wool. Airflow range: 1000—13000 m3/h .

Main components

- Axial Fans made of AISI 316L stainless steel.
- Coil (Cu/Cu, frame in stainless steel AISI 316L).
- Pleated filter F5.

Fan heater

Construction

Fan heaters are suitable for a number of applications within the Oil&Gas and Marine sectors. Past application: heating up outdoor workforce on platforms, especially those subjected to harsh climates.
Airflow range: 2000—8000 m3/h .

Main components

- Axial Fan made of AISI 316L stainless steel.
- Heating section: Electric heater or Water heating coil (stainless steel AISI 316L/CuSn).
- Diffuser made of stainless steel AISI 316L with a row of adjustable fins.
- Atex execution Zone 1—2G IIB T3.

Related products in our catalogue

Dampers

Shut-off dampers (Code SO)

Construction

The shut-off dampers SO series are used in high pressure ductworks. The frame, fully welded is realized in heavy thickness stainless steel. External casing protects the damper mechanism and is ready for all kinds of actuator. Blades pitch is 150 mm. Standard flanges and drilling according to ISO 15138. According to EN 1751, the SO dampers feature Class C frame and leakage class of closed damper Class 4.

Material

- Frame and blades: A4 stainless steel (A2 or galvanized on request).
- System: A4 stainless steel (A2 or galvanized on request).
- Shaft: stainless steel.
- Self oiling sintered bearing.

Options

- ATEX execution.
- Pneumatic/electric actuators.
- Lifting eyes.

SO with pneumatic actuator

SO with electric actuator

Opposite blades regulating dampers (Code SC)

Construction

The regulation damper allows to alter the neat flow cross section: this results in the reduction of the air flow and the increase of the upstream pressure within the duct. The movement system of the blades is inserted within the side profiles. Dampers are supplied with 100 mm or 150 mm blades pitch. According to EN 1751, the SC dampers feature :

- Class C frame and leakage class of closed damper Class 4 in case blades have 150 mm pitch.
- Class C frame and leakage class of closed damper Class 4 in case blades have 100 mm pitch.

Material

- Frame and blades: A4 stainless steel (A2 or galvanized on request).
- System: A4 stainless steel (A2 or galvanized on request).
- Shaft: stainless steel.
- Self oiling sintered bearing.

Options

- ATEX execution.
- Pneumatic/electric actuators.
- Lifting eyes.

SC with manual control

Related products in our catalogue

Overpressure dampers (Code SS)

Construction

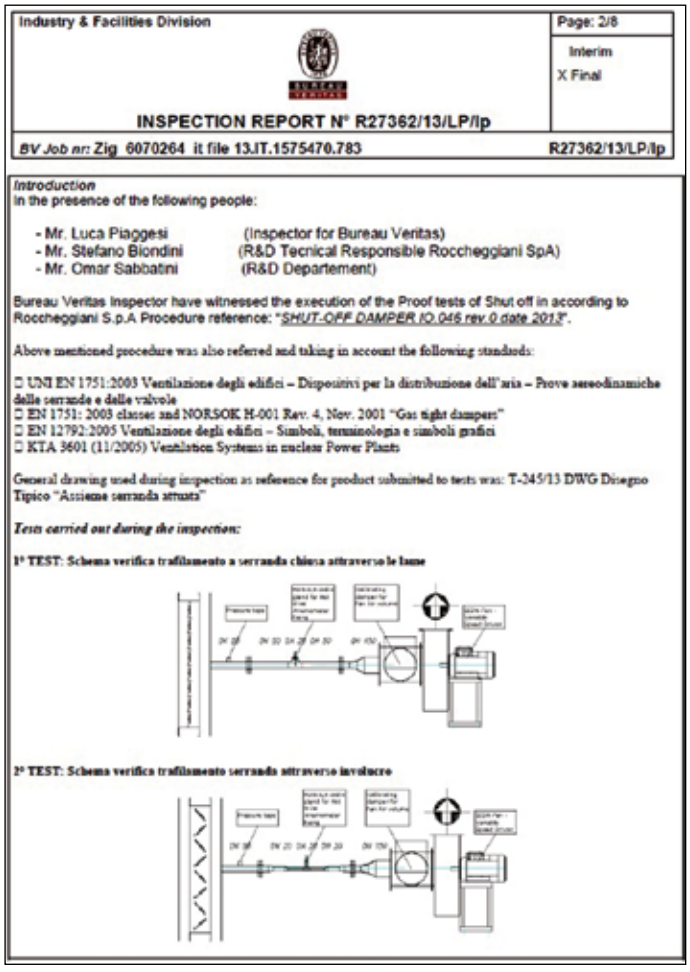
The overpressure dampers SS allow only one-way air flow in the duct. The pressure generated by the air flow opens the blades. As the pressure drops below a minimum value, the blades close and seal the duct, preventing reverse air flow to occur. The movement system of parallel blades (galvanized or stainless steel) is inserted within the side profiles. The minimum opening pressure is adjustable by using optional counteweights. Leakage class of closed damper, according EN 1751 Class 2.

Material

- Frame and blades: galvanized steel (standard), or, on request, stainless steel AISI 304 or 316.
- Blades and gear system: galvanized steel (standard), or, on request, stainless steel AISI 304 or 316.
- Shaft: stainless steel.
- Gasket: stainless steel on side and EPDM on each blade.

Options

- ATEX execution.



Industry & Facilities Division — Page: 2/8

Interim
X Final

INSPECTION REPORT N° R27362/13/LP/lp

BV Job nr: Zig 6070264 it file 13.IT.1575470.783 — R27362/13/LP/lp

Introduction
In the presence of the following people:

- Mr. Luca Piaggesi (Inspector for Bureau Veritas)
- Mr. Stefano Biondini (R&D Tecnical Responsible Roccheggiani SpA)
- Mr. Omar Sabbatini (R&D Departement)

Bureau Veritas Inspector have witnessed the execution of the Proof tests of Shut off in according to Roccheggiani S.p.A Procedure reference: "*SHUT-OFF DAMPER IO 046 rev.0 date 2013*".

Above mentioned procedure was also referred and taking in account the following standards:

- UNI EN 1751:2003 Ventilazione degli edifici – Dispositivi per la distribuzione dell'aria – Prove aerodinamiche delle serrande e delle valvole
- EN 1751: 2003 classes and NORSOK H-001 Rev. 4, Nov. 2001 "Gas tight dampers"
- EN 12792:2005 Ventilazione degli edifici – Simboli, terminologia e simboli grafici
- KTA 3601 (11/2005) Ventilation Systems in nuclear Power Plants

General drawing used during inspection as reference for product submitted to tests was: T-245/13 DWG Disegno Tipico "Assieme serranda attuata"

Tests carried out during the inspection:

1° TEST: Schema verifica trafilamento a serranda chiusa attraverso le lame

2° TEST: Schema verifica trafilamento serranda attraverso involucro

8.1 Report risultati trafilamento a serranda chiusa – Certificato di prova

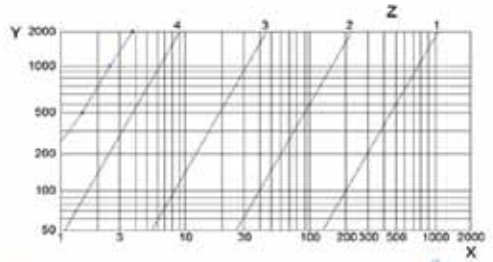
Di seguito si riporta la tabella dei dati essenziali da rilevare prima e durante la prova di trafilamento a serranda chiusa.

Data della prova	20/09/2013_12:06
Temperatura ambiente [°C]	23.3
Umidità relativa [%]	54.6
r [kg/m³]	1,176
A [m²]	1,464
Area della sezione di misura [m²]	1,464
Ps [Pa] Indice di frequenza: 15 Numero di punti: 20	2007
V [m/s] Indice di frequenza: 5 Numero di punti: 60	1,655
Qmax [m³/h]	12.05

Sulla base dei valori rilevati si ottiene che la serranda soddisfa:

I requisiti di classe **4** Secondo la EN 1751:2003

I requisiti della NORSOK H-001 Rev. 4, Nov. 2001 "Gas tight dampers"



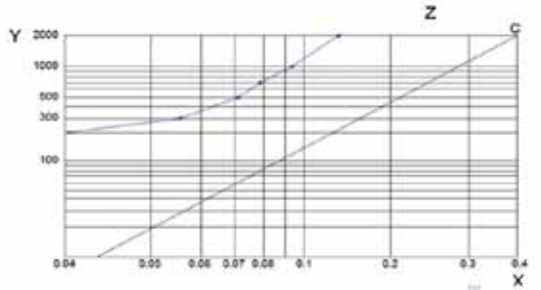
8.2 Report risultati trafilamento serranda da involucro – Certificato di prova

Di seguito si riporta la tabella dei dati essenziali da rilevare prima e durante la prova di trafilamento da involucro

Data della prova	20/09/2013_10:18
Temperatura ambiente [°C]	23.0
Umidità relativa [%]	50.4
r [kg/m³]	1,176
A [m²]	1,464
Area della sezione di misura [m²]	3,944
Ps [Pa] Indice di frequenza: 15 Numero di punti: 20	2019
V [m/s] Indice di frequenza: 5 Numero di punti: 60	1,507
Qmax [m³/h]	0,375

Sulla base dei valori rilevati si ottiene che la serranda soddisfa:

I requisiti di classe **C** Secondo la EN 1751:2003



Industry & Facilities Division

INSPECTION CERTIFICATE Nr. R27363/13/MM/lp

BVJob Nr: Zig 6070264 it file 13.IT.1575470.783 R27363/13/LP/lp

PROJECT: SHUT-OFF DAMPER	*Ref:*
BV Client: **Rocchegiani S.p.A.** Address: Via 1°Maggio, 10, Zip Code: 60021, City: Camerano	*P/o nr:* R27298 CP 13.IT.1575470.783 -R0 *(client to BV)*
Manufacturer: **Rocchegiani S.p.A.**	*P/o nr:* **SHUT-OFF DAMPER**

Inspection requested by: **Rocchegiani S.p.A.**

SUPPLY / SUBJECT OF INSPECTION	ITEM / TAG Nr	QTY
SHUT-OFF DAMPER	Serial: M481-13	1

➢ **Scope of inspection:**

Bureau Veritas attended Technical Inspection regarding SHUT-OFF DAMPER
Serial: M481-13
Ref.
Bureau Veritas Inspector have witnessed the execution of the Proof tests of Shut off in according to Rocchegiani S.p.A Procedure reference: "SHUT-OFF DAMPER IO.046 rev.0 date 2013".
Following result of test as showed on the test certificate annexes to the Ispection Report R27362/13/MM/lp
"Trafilamento attraverso la/e lama/e chiusa/e : per serrande di superficie ≤ 1,44 mq (UNI EN 1751 clausola C.1)".
"Trafilamento attraverso l'involucro: per serrande con aria di riferimento ≤ 4,0 mq (UNI EN 1751 clausola C.2)".
During the inspection BV inspector attended also to documentation review and Certificates Review.

➢ **Particulars:**

ID. Numbers: M481-13,
Short Description: SHUT-OFF DAMPER

➢ **Reference Documents used for inspection:**

Rocchegiani S.p.A Procedure reference: "SHUT-OFF DAMPER IO.046 rev.0 date 2013".
Other references for test carried out with the scope of the work, were: UNI EN 1751:2003, EN 1751: 2003, NORSOK H-001 Rev. 4, EN 12792:2005, KTA 3601 (11/2005)

➢ **Place of inspection & date or period:**

Date: September 20th 2013
Location: Camerano (AN) Italy

➢ **Marking and stamping:** *Any*

➢ **Annexes to this certificate:**

Inspection report take in the account for this Certificate of inspection is: **R27362/13/MM/lp**

Industry & Facilities Division

INSPECTION CERTIFICATE Nr. R27363/13/MM/lp

BVJob Nr: Zig 6070264 it file 13.IT.1575470.783 R27363/13/LP/lp

The undersigned, inspector to Bureau Veritas, certifies that the hereabove mentioned supply was inspected in conformity with the applicable requirements of the purchase order and the contractual requirements governing the mission entrusted to Bureau Veritas without any remarks.

Inspected by:

Name: Piaggesi Luca

Checked by:
Name: Maurizio Montagnari

Date of issue: Sept 23th , 2013.

Inspection centre: BV Rome (Italy)

Distribution: ☒ CLIENT ☐ MANUFACTURER ☐ ☐

Related products in our catalogue

Air ducts

Black sandblasted primer coated steel ducts

Ducts are manufactured in thick black steel, welded by TIG continuous process according to Fincantieri technical specifications. Inner and outer walls are finished by sandblast process SA 2 1/2 and a 15-20 µm thick shop primer layer.

Double wall insulated spiral ducts SZC

Double wall circular insulated spiral ducts are used to reduce possible thermal leak in civil and industrial air-conditioning systems.
Their characteristics of thermal insulation, anti-condensation and tightness make these ducts particularly suitable for outside applications.
The duct is made up of two concentric spiral pipes made of galvanized steel, with a gap insulated with high density mineral wool, 25 and 50 mm thick, perfectly separated from the air flow.

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Rectangular section straight duct production is carried out in a highly automated line, allowing the realization of ducts of all sizes and guaranteeing a final product of high quality. Cross flanges are obtained directly from the plate of the duct itself, avoiding the construction of the section frame to be fastened on duct. This technique represents an innovative goal in the cross joint system for rectangular section air duct: it allows a better air tightness, in compliance with the current provisions, and increases the mechanical resistance, which is fundamental during the installation and operation. The longitudinal junction of ducts is realized by Pittsburgh-type seam. Duct manufacturing is in compliance with UNI 10381 standards.

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2000 - 03/2014

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