



POWER GENERATION AND INDUSTRIAL COOLING

RADIATORS, DRY COOLERS,
OIL COOLERS

Power Generation and Process Cooling

POWER:

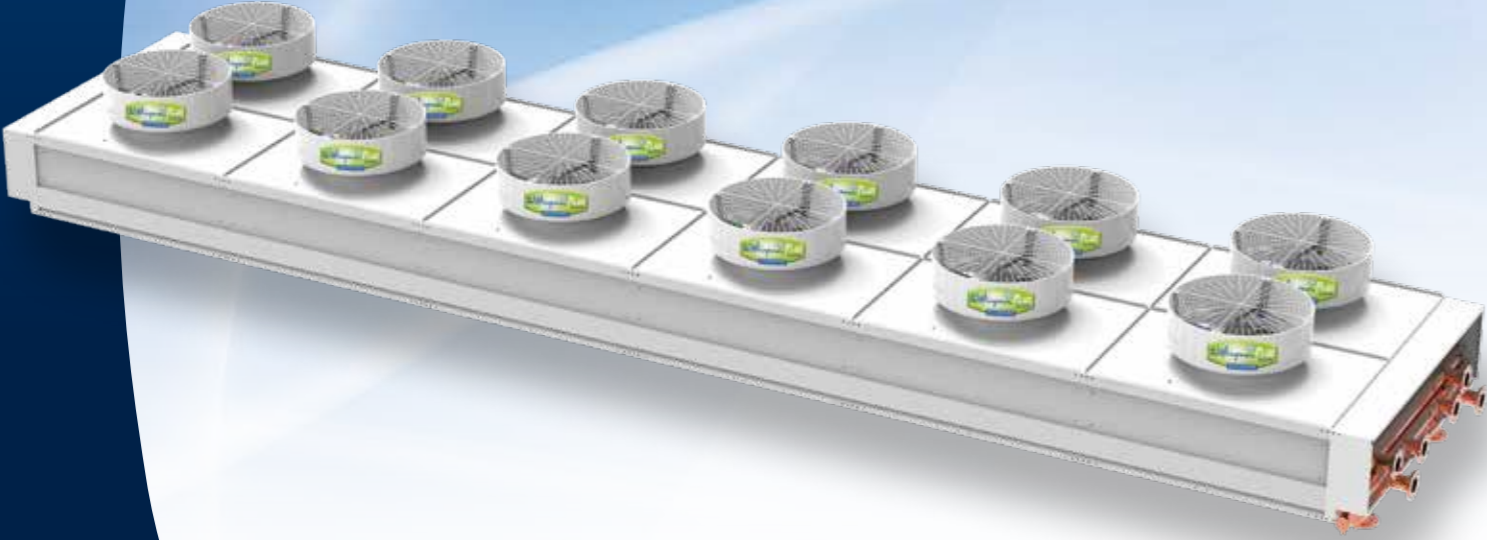
- Engine cooling (gas, biogas, diesel, HFO..)
- Cogeneration / ORC / Waste to Energy Power plants
- HVDC (High Voltage Direct Current)
- TAIC cooling (Turbine Air Inlet Cooling)
- Geothermal plants
- Solar thermodynamic plants

PROCESS:

- Chemical and pharmaceutical industries
- Air / Gas compressor cooling stations
- Industrial processes cooling (steel / plastic / glass / cement plants)
- Automotive industry
- Data centres

OIL&GAS:

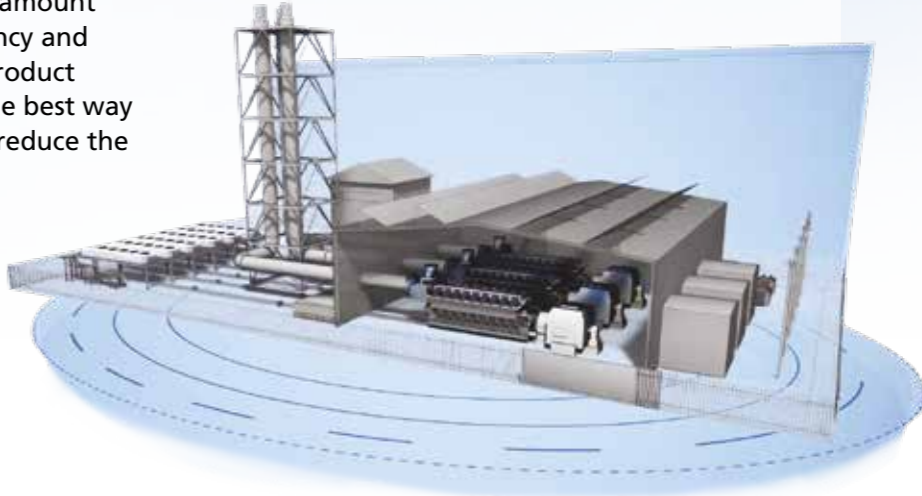
- Oil and gas industry



LU-VE Group has developed a high technology range of radiators and dry coolers with very high performance suitable for any application.

WIDE VARIETY AND COMPACT SOLUTIONS

In big installations, a great number of radiators are required to dissipate the large amount of heat produced. The high efficiency and the wide variety of LU-VE Group product solutions make it easy to choose the best way optimize the number of units and reduce the investment and operating costs.



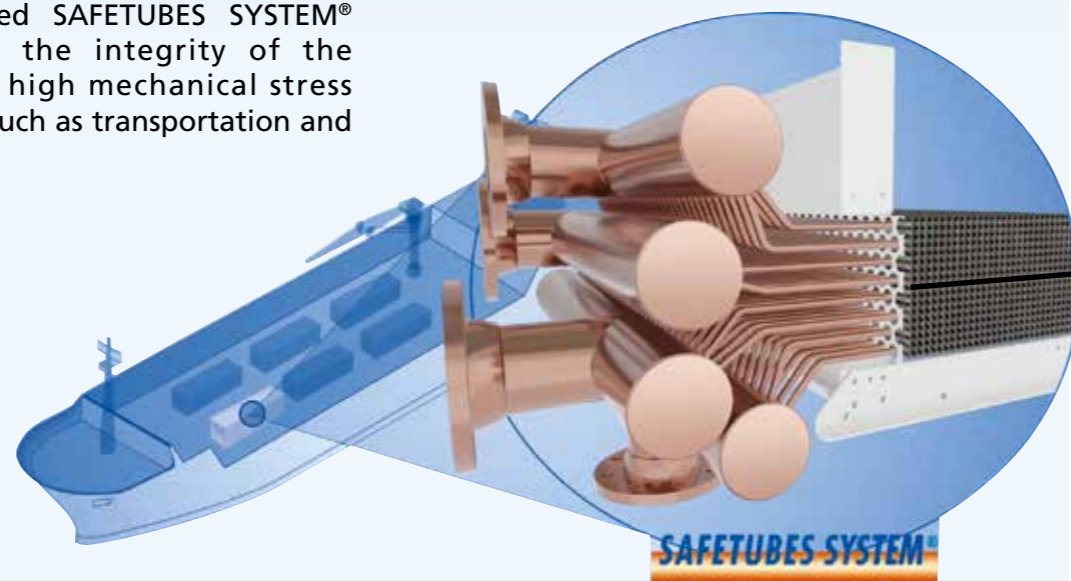
LOW DIRT ACCUMULATION & SELF-CLEANING SYSTEM

The direction of rotation of the EC motors can be reversed in order to clean the coil making maintenance fast, cheap and easy.



MACHINE RESISTANCE TO STRESS

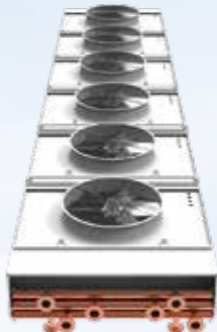

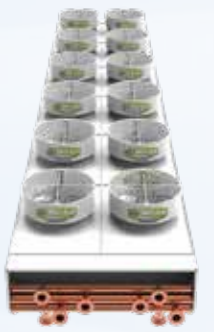
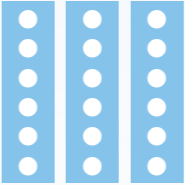
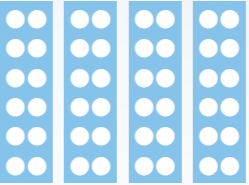
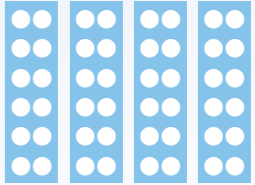
The patented SAFETUBES SYSTEM® guarantees the integrity of the coil during high mechanical stress operations such as transportation and installation.



VERY LOW ENERGY CONSUMPTION AND SILENT OPERATION

At equal capacity LU-VE can propose different solutions with different benefits. Best results can be obtained by using electronic motors in conjunction with the Whisperer Plus® silencers.

Comparison amongst different LU-VE solutions to cool a 10 MWe engine sample:

	BASE	HIGH EFFICIENCY	VERY HIGH EFFICIENCY
RADIATOR TYPE	 Ø1250 MODEL AC FANS	 Ø910 MODEL EC FANS	 Ø910 MODEL EC FANS + WHISPERER PLUS®
Number of radiators			
Δ Investment cost	Ref. value	+4%	+18%
Δ Total Power consumption	Ref. value	-38%	-50%
Δ Total sound level	Ref. value	-9 dB(A)	-14 dB(A)
Δ Total footprint	-25%	Ref. value	Ref. value
Δ investment pay back time	Ref. value	approx 900 working hours	approx 3000 working hours

Note: 1) Electricity cost 0.1/kWh - 2) Constant thermal load for all the year - 3) Ambient temperature 45°C with same working conditions

TRANSPORTATION COST REDUCTION

The high thermal efficiency and therefore the reduced footprint make it possible to ship two units in the same container, virtually halving transport costs.



PROTECTION FOR ALL ENVIRONMENTAL CONDITIONS

There are several alternatives to protect heat exchangers from corrosion, each of them designed for a specific environmental condition. In addition to thicker fins, there are solutions in aluminium-manganese alloy or copper fins and many surface treatments for the most severe conditions.



DIFFERENT MATERIALS (AVAILABLE ON REQUEST)

	STANDARD CONFIGURATIONS	SPECIAL CONFIGURATIONS
Tubes	Cu DHP	CuNi 90-10, CuSn, SS AISI 304L, SS AISI 316L
Fins	Al – alloy 8006	Alupaint(*), Cu DHP, CuSn, heat exchanger painted after construction (Blygold, Heresite,...)
Headers	Cu DHP	Fe (ASTM A106 gr B), SS AISI 304L (cylindrical header or openable header box) SS AISI 316
Casing	Galvanized steel, powder-coated, RAL 9003 (C4 corrosion resistance)	SS AISI 304L, SS AISI 316L

(*)Alupaint: pre-polyester-painted aluminium strip capable of withstanding 1000 hours in salt spray test (ASTM B117).



Axial fans are fitted, lubricated for life and balanced both statically and dynamically.
Balance grade G6.3 (to ISO 1940 part 1).
The protective fan grilles conform to the EN 294 Standard.

FAN DIAMETERS 800 - 910 - 1000 [mm]

Fan-motors with external aluminum or composite material rotors. In this configuration the fan-motor is a single item and has several advantages:

- compactness
- excellent aerolic and electrical efficiency
- lightness
- easy replacement

AC fan motors can be regulated with cut-phase controller or inverter. To achieve the highest energy efficiency, EC fans are recommended.

Using more compact fans rather than few big-diameter fans enhances the reliability of the radiator, limiting loss of performance in the event of one motor failing.

Surface treatments are available on request for these fan motors for severe environmental conditions.

FAN DIAMETERS 1250 , 1500 [mm] AND MORE

Fan-motors with traditional internal rotors, directly coupled to the fan, generally constructed in PPG, PAG, Al.

These motors can be supplied with different grades of mechanical and electrical protection to match every condition.

For these motors, speed regulation can be obtained with inverter. In this configuration, the fan and motor can be adapted to the specific needs of the plant, maximizing heat capacity and reducing the footprint.

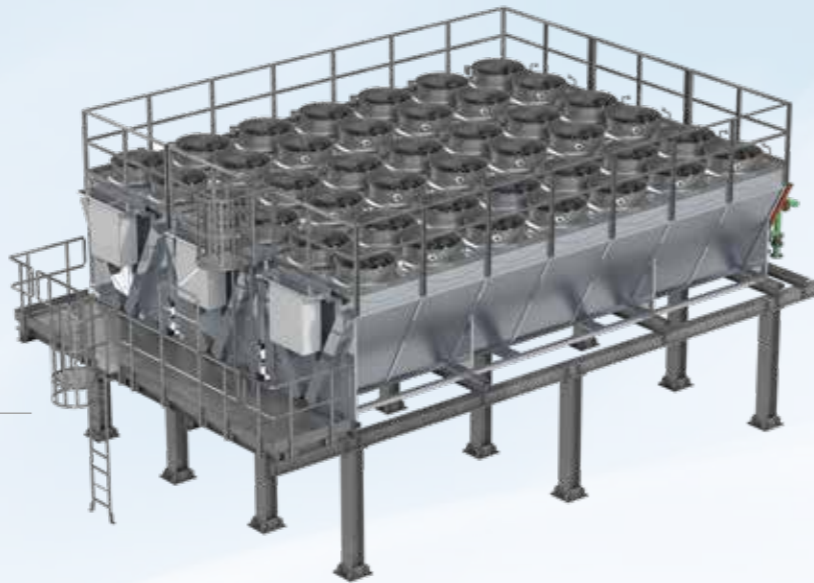
Own industrial IEC electric motors solution available starting from 1200 to 1800 [mm] diameter fan.



There are different accessories available for all the types of radiators and dry coolers to facilitate installation and maintenance:

1

Platforms and frames ladders and handrails



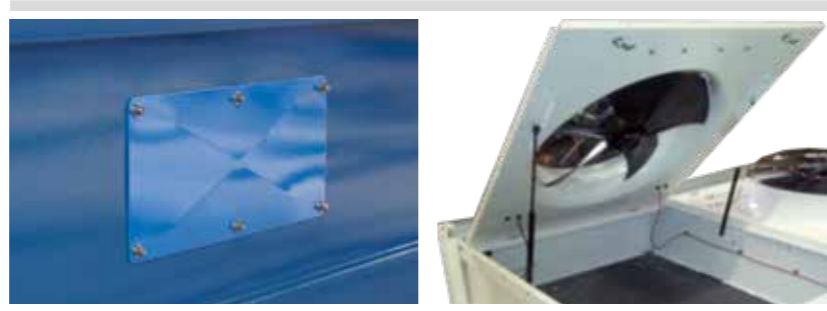
2

Special connections and headers box to guarantee complete drainage of the heat exchanger



3

Inspection panels and hinged fan shrouds to facilitate maintenance and cleaning of the heat exchanger



These products can be supplied with customized electrical panel both for electrical connections and fan speed control to match every need.

A complete range of regulation systems can be installed in order to better control operating conditions and maximize energy efficiency:

- Inverters
- Cut-phase controllers
- EC fan controllers
- STEP controller



An example of electrical panels

BENEFIT OF EC FANS

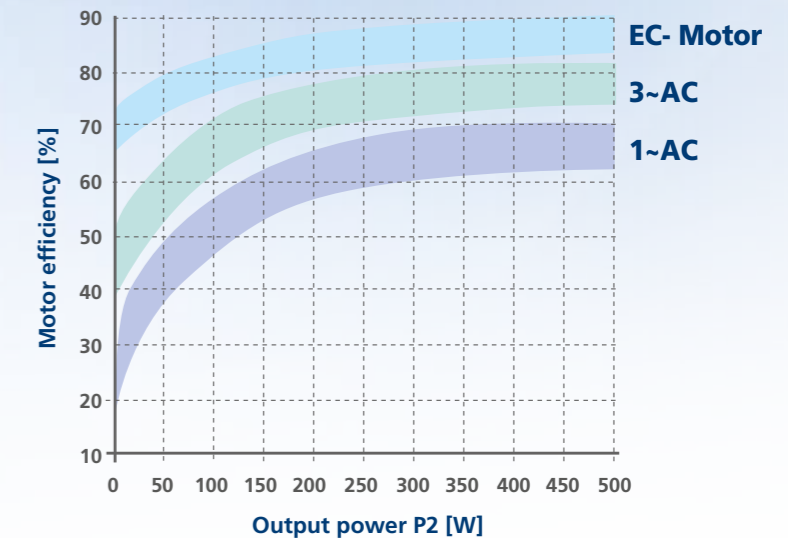
LU-VE Group proposes EC brushless fan technology. This guarantees even greater energy savings, thanks to the superior efficiency of the motor.

MAIN ADVANTAGES

- Reduced power consumption
- Noise reduction in comparison to traditional fan speed controls
- Self-protected motor
- Integrated speed control

Contact us: powergen@luvegroup.com

ENERGY EFFICIENCY



THE WHISPERER PLUS® SILENCER

This advanced and compact silencer, designed and tested in the LU-VE Group R&D laboratories, dramatically reduces sound pressure level up to -6 dB(A). This result has been guaranteed by independent tests carried out by TÜV SÜD of Munich (Germany). Condensers and dry coolers equipped with "THE WHISPERER® PLUS" have the following benefits:

- Energy savings
- Reduction of sound pressure level at equal capacity
- Increase of capacity at equal sound pressure level
- Smaller unit footprint at equal capacity and sound pressure level
- Elimination of warm air recirculation.





The oil and gas industry requires highly reliable products, involving thermodynamic and mechanical design aspects and also great attention to safety. LU-VE Group can completely comply with all the criteria, thanks also to the ASME Certification Mark with "U" designator of official approval on its machines. One more aspect of great relevance is the use of tubes with reduced diameter (normally 3/8" or 1/2") which drastically reduces the internal volume and the quantity of refrigerant.



For applications in explosion risk environments, LU-VE Group has a specific range equipped with fans which comply with the ATEX Directive 2014/34/UE for zones 1 and 2. To guarantee its complete adherence to the official regulations, the machine displays the EX mark. Therefore all the sheet metal parts are treated with a special paint which conducts current, guaranteeing the absolute equipotential of all the surfaces: as an alternative, the machines can also be supplied with stainless steel casings.



STANDARDS & REGULATIONS

The heat exchangers are designed and assembled in compliance with the following European Union standards and regulations:

- Machinery Directive 2006/42/CE
- Pressure Equipment Directive (PED) 2014/68/UE
- Electromagnetic Compatibility Directive (EMC) 2014/30/UE
- Low Voltage Directive (LVD) 2014/35/UE

It is also possible on request to have machines sized according to the standard ASME VIII div. I, approved by ASME U stamp.

PERFORMANCE

The full range of condensers and dry coolers are Eurovent certified. This means capacity, noise and energy efficiency specified in the commercial catalogues and selection software are guaranteed.

The tests standards applied to the machines are:

ENV 327 for heat exchange capacity of air-cooled condensers

ENV 1048 for heat exchange capacity of dry coolers

EN 13487 for the measurement of sound power level of condensers and dry coolers.

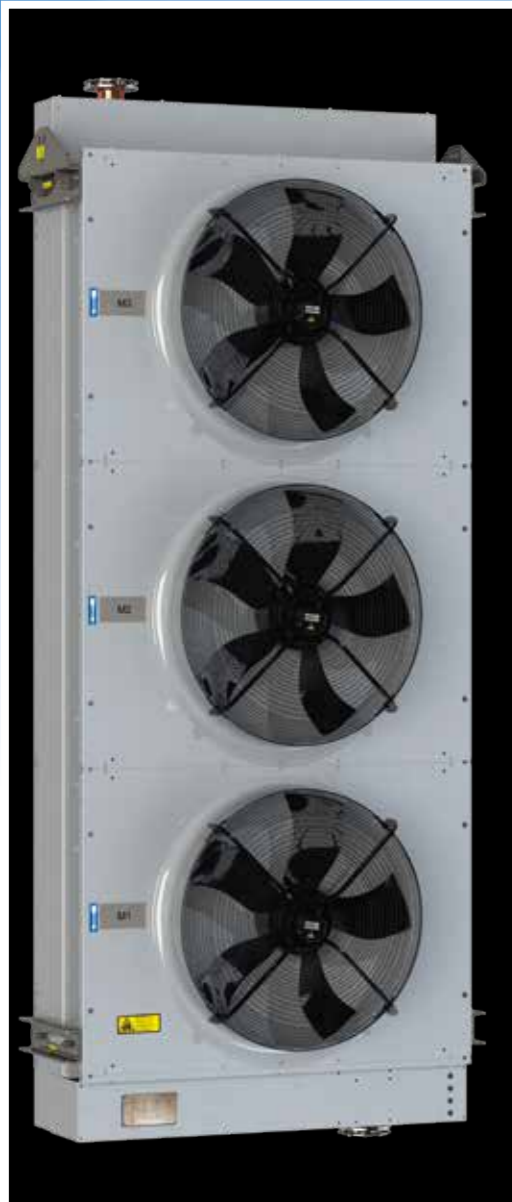
To ensure that the indicated performance levels are achieved, the products must be correctly installed in line with the general standards of best technical practice and following the instructions in the company manuals for use and maintenance.





LU-VE Group is one of the major manufacturers in the world in the air heat exchanger field. It operates in various segments of the market: refrigeration (commercial and industrial); process cooling for industrial applications and power generation; air conditioning (civil, industrial and close control); glass doors and closing systems for refrigerated counters and cabinets. The LU-VE Group is an international company (with HQ in Uboldo, Varese, Italy) consisting of 16 manufacturing facilities in 9 different countries: Italy, China, Czech Rep., Finland, India, Poland, Russia, Sweden & USA, with a network of sales companies and representative offices in Europe, Asia, the Middle East and Oceania. The Group also includes a software house dedicated to ICT (Information and Communications Technology), the development of product calculation software and digitalization. The strength of the Group lies in its employees: over 3,000 qualified people (over 1,000 in Italy); total surface 600,000 sq. m (over 214,000 covered); 3,235 sq. m Research and Development laboratories; 83% of products exported to 100 countries. Turnover €420.7 million (pro-forma 2018).

- AIA/LU-VE Sweden (Asarum, Sweden):**
ventilated heat exchangers for refrigeration, air conditioning and industrial applications;
- Air Hex Alonte (Alonte, VI, Italy):**
ventilated heat exchangers for refrigeration, air conditioning and industrial applications;
- Fincoil LU-VE Oy (Vantaa, Finland):**
ventilated heat exchangers for industrial cooling
- HTS Heat Transfer Systems (Novosedly, Czech Republic):**
coils for air conditioning, refrigeration and for special applications (trains and means of transport in particular);
- LU-VE Digital (Uboldo, VA, Italy):**
information technology, development and implementation of calculation software;
- LU-VE Exchangers (Uboldo, VA, Italy):**
ventilated heat exchangers for refrigeration, air conditioning and industrial applications;
- LU-VE Heat Exchangers (Tianmen, China):**
ventilated heat exchangers for refrigeration and air conditioning, destined for the Chinese and Asian markets;
- SEST (Limana, BL, Italy), SEST LU-VE Polska (Gliwice, Poland), "OOO" SEST LU-VE (Lipetsk, Russia):**
heat exchangers and condensers for refrigerated cabinets and finned heat exchanger coils for commercial refrigeration and air conditioning;
- SPIROTECH Heat Exchangers (Bhiwadi, Rajasthan, India):**
heat exchangers for domestic appliances, air conditioning and refrigeration;
- TECNAIR LV (Uboldo, VA, Italy):**
close control air conditioning for applications in surgical rooms, white rooms, data centres and telephone exchanges;
- TGD - Thermo Glass Door (Travacò Siccomario, PV, Italy):**
glass doors and closing systems for professional, domestic and industrial refrigeration equipment.



**Didn't you find what you were looking for in this brochure?
A wide variety of solutions is available to satisfy every requirement in all types of plants.**



LU-VE S.p.A.
Via Caduti della Liberazione, 53
21040 Uboldo (Va) - Italy
Tel: +39 02 96716.1
sales@luvegroup.com

Air Hex Alonte s.r.l.
Via delle Albere, 5,
36045 Alonte (VI) - Italy
Tel: 0444 725411
alair@luvegroup.com

Fincoil LU-VE Oy
Ansatie 3
01740 Vantaa
Puhelin: +358 9 894 41
csc@luvegroup.com

LU-VE Sweden AB
Södra Industrivägen 2-4. SE-374 50
Asarum - Sweden
Tel: +46 454 334 00
info.se@luvegroup.com

www.luve.it