

Air Systems - Interiors Solutions made by Liebherr-Aerospace



LIEBHERR

We make your flight more comfortable

Liebherr-Aerospace has built its solid reputation through successful partnerships with aircraft manufacturers and operators worldwide by offering an extensive range of high quality air management systems. Our newly developed products for the aircraft interiors world continue this tradition:

- Galley Air Chillers
- Cabin and Cockpit Air Humidification Systems
- Electrical Heating Systems
- Cooling Systems

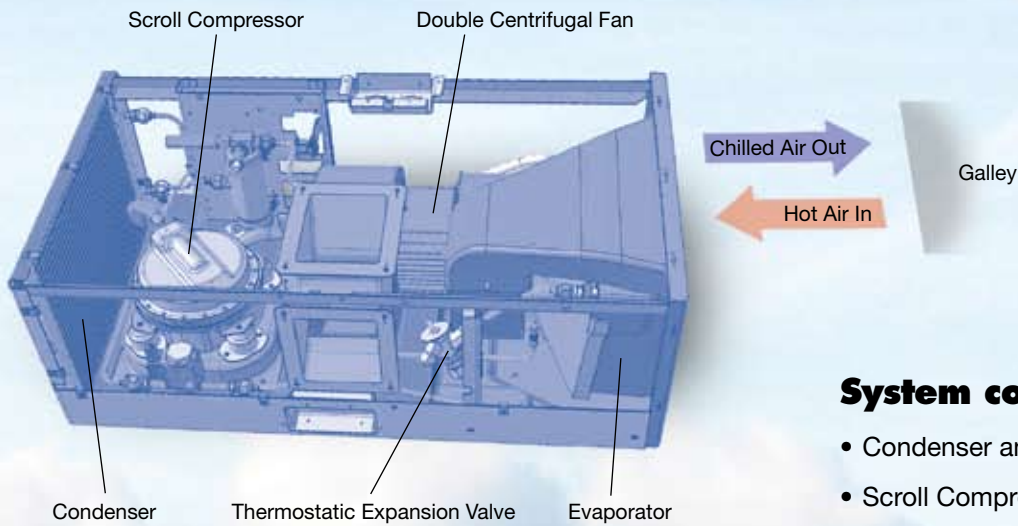
made by Liebherr stand for superior performance, reliability and cost efficiency.





Galley Air Chillers

Class 7000 and 4700 Btu/hr



System consists of:

- Condenser and Evaporator
- Scroll Compressor
- Double Centrifugal Fan
- Thermostatic Expansion Valve

Features

- Cooling capacity: Class 7000 Btu/hr and 4700 Btu/hr
- R134a refrigerant
- Compliant with new flammability requirement (FAR 25.856 a)
- New technology scroll compressor
- Interchangeable with currently existing units
- Windmilling certified

Advantages

Superior Performance

- 15 % more cooling power than comparable systems in the same envelope
- Faster pull-down
- Designed to keep food at 4 °C / 39.2 °F
- Extended operating temperature up to 55 °C / 131 °F

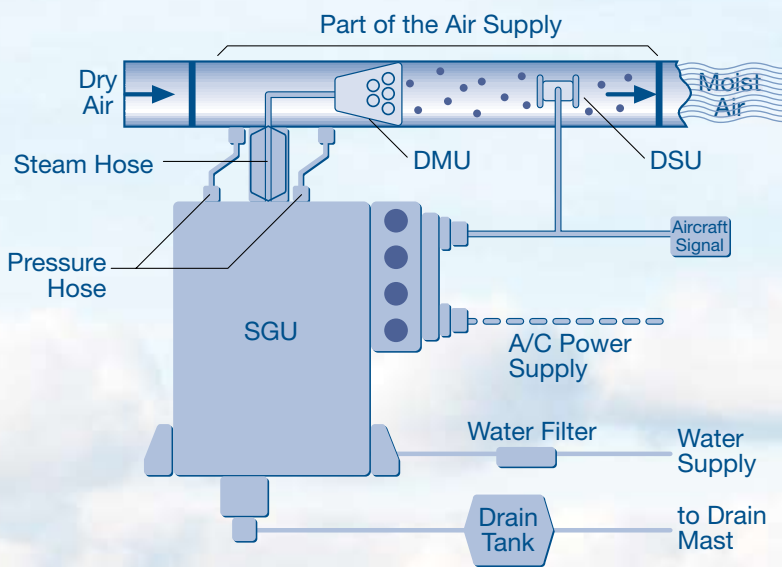
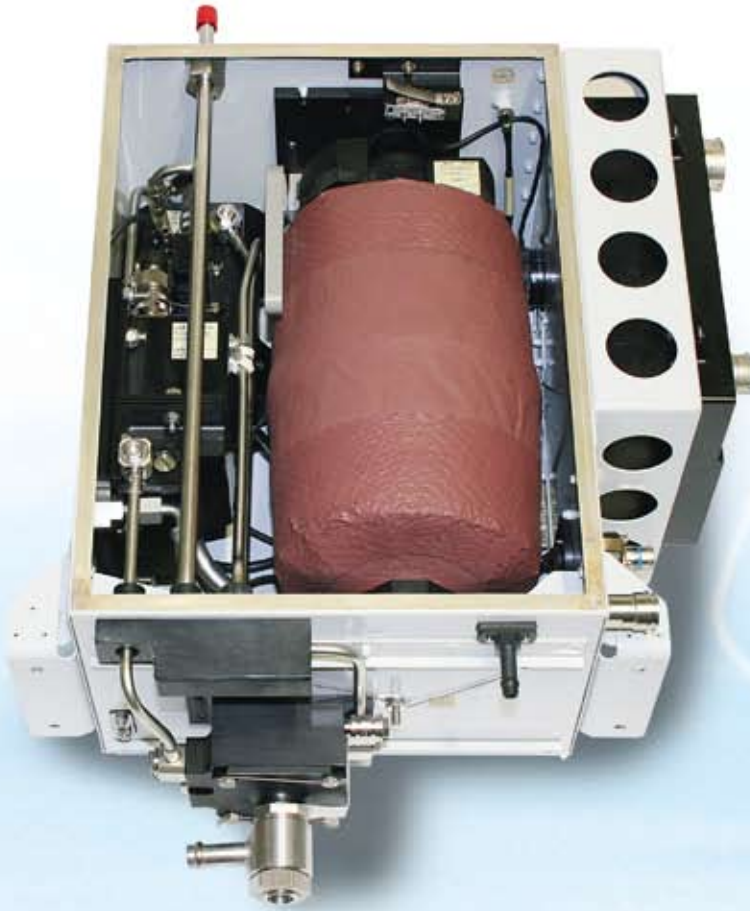
Low Cost

- No preventive/scheduled maintenance required
- Low cost consumable filter, replaceable on-wing
- Guaranteed MTBF exceeding market benchmark
- Robust design focused on reliability

Technical Data

	4700 Btu/hr (1400 W)	7000 Btu/hr (2050 W)
Rated Performance	Cooling Capacity >4700 Btu/hr (1400 W) Chilled Air Flow 118 l/s (250 cfm)	Cooling Capacity 7000 Btu/hr (2050 W) Chilled Air Flow 189 l/s (400 cfm)
At Sea Level		
External Static Pressure Rise	5 mbar (2.2 in H ₂ O) at 118 l/s (250 cfm)	7.5 mbar (3.2 in H ₂ O) at 193 l/s (410 cfm)
At 29 °C Ambient Temperature		
Chilled Air Outlet Temperature	- 2 °C (28.4 °F)	- 2 °C (28.4 °F)
Electrical Characteristics		
Power Source	115 VAC, 400 Hz, 3 phases Breaker Size, 10 A	115 VAC, 400 Hz, 3 phases Breaker Size, 15 A
Control Power Source	28 VDC	28 VDC
EMI	Filtered acc. to RCTA DO160D	Filtered acc. to RCTA DO160D
Interface		
Length/Width/Height	653 x 385 x 272 mm 25.7 x 15.15 x 10.7 inches	762 x 438.1 x 307.3 mm 30.0 x 17.25 x 12.1 inches
Weight	29 kg / 62 lb	31.5 kg / 68 lb
Electrical Connector	MS24264R16B10 PN/P6	MS24264R16B10 PN/P6

Air Humidification Systems for Cabin and Cockpit



System consists of:

- Steam Generator Unit (SGU)
- Steam Hose
- Duct Mixing Unit (DMU) receiving steam from SGU and injecting it into the air supply
- Duct Sensor Unit (DSU) measuring relative humidity level for control logic

Features

- Innovative steam production concept based on boiler system
- Designed to maintain the cabin and cockpit air at the selected relative humidity
- Maintain a constant humidity level (20 %)
- Automatic operation throughout the entire flight
- Lightweight and compact design
- Minimum water consumption

Advantages

Superior Performance

- Proven silent operation
- Boiler system producing pure water vapour
- Automatic purge: no water left in the boiler when on ground
- No risk of water contamination (bacteria, micro-organism, algae)

Low Cost

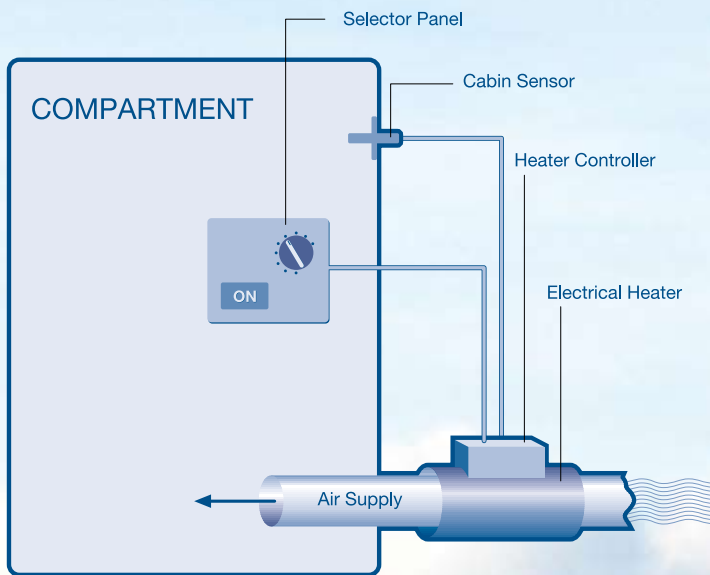
- Retrofit capacity on many aircraft types e.g. B737, B747, B757, B767, B777, A319, A320, A321, A330, A340, Challenger 604, Gulfstream
- Built-in test capabilities to ease fault isolation and reduce No Fault Found
- Control logic sequence programmed to avoid condensation and to dry-up circuit before landing

Technical Data

Rated Performance	Vapor rate 4.2 kg/9 lb /hour at 3.6 kW, dew point from -1 °C to +6 °C (30.2 °F to 42.8 °F)
Electrical Characteristics	
Power Source	115 VAC, 400 Hz, 3 phases, breaker size, 11 A
Control Power Source	28 VDC, ARINC 429 or CAN BUS communication
Interface	
Length/Width/Height	264.6 x 407.7 x 518.4 mm / 10.39 x 16.02 x 20.41 inches
Weight	13.8 kg / 30.5 lb (SGU + DMU + DSU)

Electrical Heating Systems

The Plug-In Solution



System consists of:

- Electrical Heating Controller
- Electrical Heating Unit
- Selector Panel (SP, optional) or direct link to aircraft CAN BUS system
- Cabin Sensor

Features

- Ideal support for VIP aircraft cabin comfort
- Proven design flying on existing certified aircraft
- Foreseen to be installed as enhanced temperature control (refurbishment) on customer aircraft
- System alternatives 1.2 kW, 2.4 kW, 3.0 kW and 4.0 kW are fully qualified
- Optional equipment based on operator's request

Advantages

Superior Performance

- Overheat protection guaranteed with a value better than 1×10^{-9} per flight hour

Low Cost

- High reliable product with a competitive price
- Plug-in solution
- Uploadable software feature

Technical Data

	Type 12	Type 30
Power	1.2 kW	3.0 kW
Flow nom.	50 l/s	100 l/s
Pressure Loss	250 Pa@50 l/s	200 Pa@100 l/s
Length/Width/Height (Heater incl. Controller)	340 x 165 x 165 mm 13.4 x 6.5 x 6.5 inches	250 x 220 x 165 mm 9.8 x 8.7 x 6.5 inches
Tube Diameter	102 mm / 4.01 inches	152 mm / 5.9 inches
Weight	2.7 kg / 5.83 lb	4.0 kg / 8.63 lb
Control Range (Compartment)	15 ... 30 °C / 59 ... 86 °F	
Power Supply	115 VAC, 360 - 800 Hz	

	Type 24	Type 40
Power	2.4 kW	4.0 kW
Flow nom.	50 l/s	200 l/s
Pressure loss	200 Pa@50 l/s	400 Pa@200 l/s
Length/Width/Height (Heater incl. Controller)	340 x 165 x 200 mm 13.4 x 6.5 x 7.9 inches	350 x 200 x 250 mm 13.8 x 7.9 x 9.8 inches
Tube Diameter	127 mm / 5 inches	178 mm / 7 inches
Weight	3.8 kg / 8.2 lb	5.0 kg / 10.8 lb
Control Range (Compartment)	15 ... 30 °C / 59 ... 86 °F	
Power Supply	115 VAC, 360 - 800 Hz	

Customer Services

Liebherr-Aerospace offers a comprehensive and competitive range of advanced services that combines innovative practices and high modularity to fully fit with the customers' requirements. Liebherr-Aerospace creates value for services. Our extensive OEM experience and our long-term strategy are our strengths: Liebherr, a reliable system integrator in the aerospace industry.

For Liebherr-Aerospace, supporting Customers means:

- Proximity with a worldwide network
- Efficiency with a sound design and trouble shooting experience
- Availability with a 365/24/7 access to your information: www.liebherr.aero*
- Reliability with strict OEM standard maintenance practices
- Quality with dedicated and highly qualified personnel

*www.liebherr.aero

The Liebherr-Aerospace solution that allows interactive access to your purchase and repair order status, your technical documentation, to the training catalogues and to the AOG contacts.

Visit our website to get an access !

	From Product Support ...
Technical Publication	<ul style="list-style-type: none">• CMM, SB, SIL on CD-ROM• Systems description
Technical Support	<ul style="list-style-type: none">• Test equipment and tooling• 24/7 Hotline & AOG
Training	<ul style="list-style-type: none">• Component familiarisation• Training manuals
Field Service	<ul style="list-style-type: none">• Proximity• On request visits
Spare Support	<ul style="list-style-type: none">• Worldwide stocks

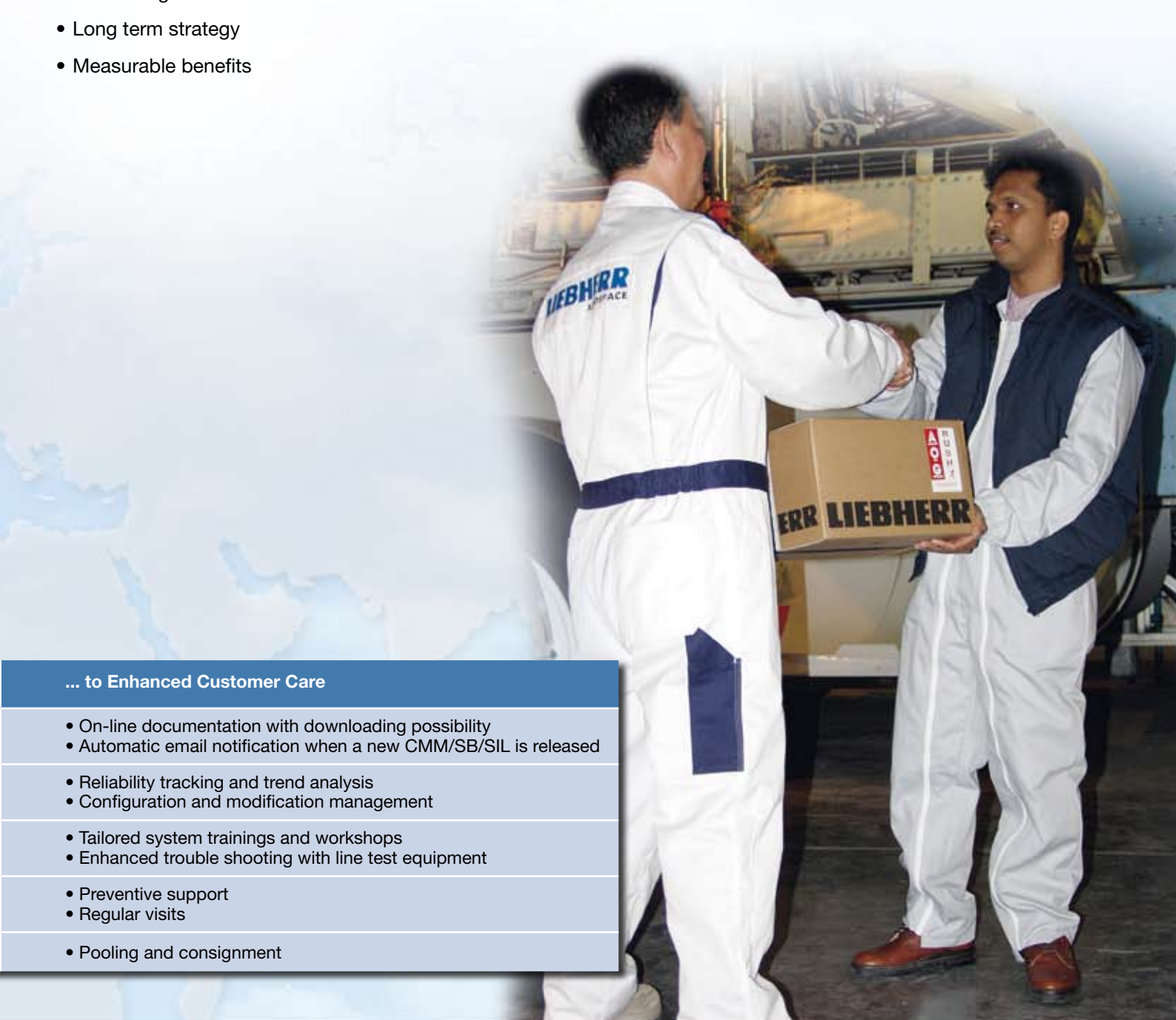
With Liebherr-Aerospace services you can concentrate on your core business.

Liebherr-Aerospace services allow:

- Predictable costs for budgeting
- Less capital spent in parts
- High operational readiness
- Risks mitigation
- Long term strategy
- Measurable benefits

Take advantage of:

- An uncompromised quality
- A maximised fleet reliability
- An increased component time



... to Enhanced Customer Care

- On-line documentation with downloading possibility
- Automatic email notification when a new CMM/SB/SIL is released
- Reliability tracking and trend analysis
- Configuration and modification management
- Tailored system trainings and workshops
- Enhanced trouble shooting with line test equipment
- Preventive support
- Regular visits
- Pooling and consignment

Liebherr-Aerospace in General

System Supplier

Liebherr-Aerospace is a world-wide approved system and equipment supplier for the aerospace industry in the field of flight controls and actuation systems, air systems and landing gear systems. It participates in various civil and military aircraft programmes as well as research & technology developments.

The range includes: commercial transport aircraft, military transport aircraft, business jets, regional aircraft, fighter aircraft, military trainer aircraft, civil helicopters and combat helicopters.

Air Management Systems:

- Air Conditioning Systems
- Engine Bleed Air Systems
- Cabin Pressure Control Systems
- Wing Anti-Ice Systems
- Galley Air Chillers
- Heating Systems
- Air Humidification Systems
- Cooled Air Supply for OBIGGS / FTIS
- System Electronics

Landing Gear Systems:

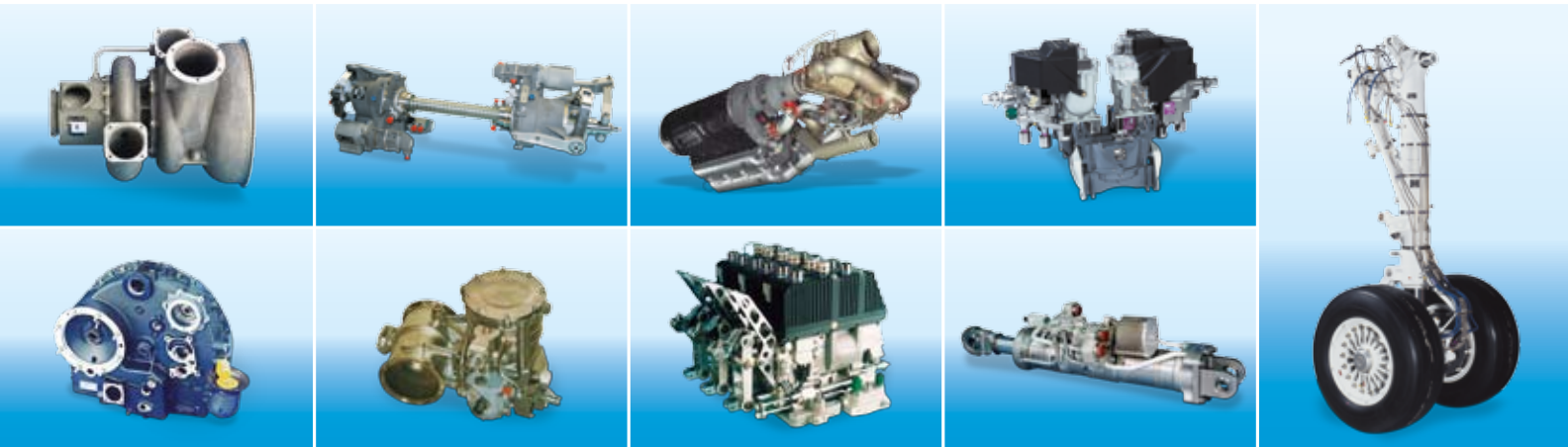
- Main Landing Gears
- Nose Landing Gears
- Nose Wheel Steering Systems
- Tail Landing Gears
- Actuation Systems
- System Electronics

System Solutions

Liebherr-Aerospace offers complete system solutions and components according to the individual needs of aircraft manufacturers and operators. With the certified disciplines of development, production, qualification, integration and customer services, Liebherr-Aerospace combines innovative practices and high modularity to fully fit the customers' requirements.

Flight Control and Actuation Systems:

- High Lift Systems
- Primary Flight Control Systems
- Flight Control Computers
- Horizontal Stabilizer Actuators
- Cockpit Controls
- Power Electronics
- Actuation Systems
- Gearboxes
- Hydraulics
- System Electronics



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