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Turbomachinery



Turbo- machinery

MAN Energy Solutions
 Future in the making

Product range and
product centres

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MAN Energy Solutions
 Product range und product centres

Engineering the future – since 1758

We are MAN Energy Solutions SE, the force of innovation behind the world's leading large-bore engines and turbomachinery for marine and stationary applications. Our home is in Augsburg, Germany. But we are also close to you, in over 100 countries, with more than 15,000 employees who dedicate each workday to our customer's satisfaction.

Our products are an integral part of most energy and transportation solutions that surround you every day. We produce world-class marine propulsion systems, turbomachinery for the oil & gas and process industries, and complete power plant solutions. All fully backed by the comprehensive after sales service of the MAN PrimeServ team.

The roots of our company stretch back a long way, to the industrial revolution in Germany in 1758. That is when the furnaces of the legendary St. Antony Ironworks were fired up for the first time, which went on to become a driving force behind Germany's powerful coal and steel industry. That day in 1758 was the start of a journey of innovation that went on to include major milestones of industrial history.

Between 1893 and 1897, Rudolf Diesel and a group of M.A.N. engineers developed the first diesel engine in Augsburg, and in 1904 we produced our first steam turbine in Oberhausen. And we never stopped.

For more than 250 years we have made it our mission to continuously evolve. In a world where the only constant is change, it's how we help our customers succeed and prosper.


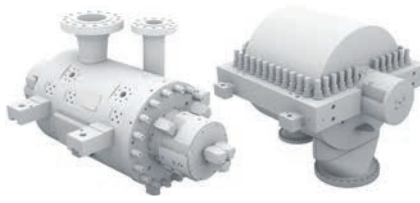




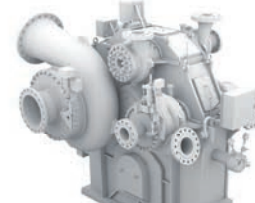



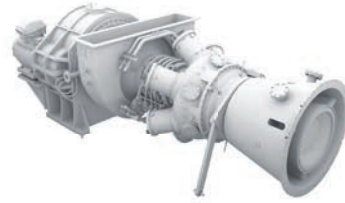

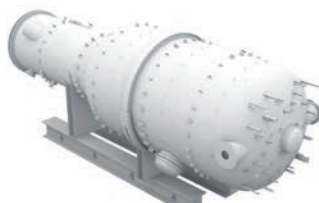
Turbomachinery products

None of our customers are the same, and many of them have very specific needs. Our solutions reflect that. Our comprehensive product range includes compressors, expanders, gas and steam turbines which will integrate seamlessly into most industrial applications. For large scale, demanding applications, the Turbomachinery Strategic Business Unit provides

custom, fully integrated train solutions that are unsurpassed in performance, efficiency and reliability.

We are here for the duration. Always breaking new ground. Creating sustainable solutions for our customers by producing great products and delivering world class service, worldwide. For the next 250 years and beyond.

Products and applications

Products	Axial	Radial (vertical/horizontal split)	Pipeline	MOPICO® technology	HOFIM™ technology	Isotherm	Gear type	TURBAIR® vacuum blowers	Process-gas screw	Expanders	Gas turbines	Steam turbines	DWE® reactors & apparatus
													
Markets													
Upstream		Gas Lift, -Injection, -Export, -Gathering, -Treatment, -Processing, CO ₂ -Injection, LPG, NGL, Flash Gas			Gas Export, Flash Gas, Subsea, Gas Gathering, Gas Processing, Wet Gas, Wellhead Gas		CO ₂ -Injection, CCS		Gas Export, -Gathering, -Treatment, -Processing, Flash Gas		Gas Lift, -Injection, -Export, -Gathering, -Treatment, -Processing, Liquefied Natural Gas		
Midstream	Liquefied Natural Gas, CO ₂	Gas Transport, Gas Storage, Fuel Gas, Liquefied Natural Gas Boil Off, Tank Vapour	Gas Transport	Gas Storage, Gas Transport	Gas Storage, Gas Transport, Liquefied Natural Gas		Gas Transport, Liquefied Natural Gas		Fuel Gas	Liquefied Natural Gas	Gas Transport, Gas Storage	Gas Transport	
Downstream	Desulfurization, Olefin Recovery, Fluid Catalytic Cracking, Propane Dehydrogenation, Nitric Acid, Maleic Acid, Others	Hydrogen Production, Hydrogen Recovery, Hydrogen Cracking, Desulfurization, Olefin Recovery, Fluid Catalytic Cracking, Propane Dehydrogenation, Methanol, Ethylene, Chlorine, Gas-to-Liquids, Coal-to-Liquids, Ammonia, Urea, Nitric Acid		C _n H _m Processes, Helium, Nitrogen	C _n H _m Processes, Helium, Nitrogen	Nitric Acid, Ammonia	Methanol, Chlorine, Hydrogen Processing, Propane Dehydrogenation, Ammonia, Urea, Nitric Acid, Gas-to-Liquids, Coal-to-Liquids, CO ₂ , Terephthalic Acid, Refrigeration, Vapor, Others		Hydrogen Production, Hydrogen Cracking, Hydrogen Mixtures, Styrene Monomer, Butadiene, Linear Alkyl Benzene (LAB), High Density Poly Ethylene (HDPE), Propylene, Vapor Recompression, Flare Gas	Fluid Catalytic Cracking, Terephthalic Acid, Nitric Acid		Gas-to-Liquids, Coal-to-Liquids, Hydrogen Processing, Hydrogen Production, Hydrogen Recovery, Hydrogen Cracking, Desulfurization, Fluid Catalytic Cracking, Propane Dehydrogenation, Methanol, Olefins, Terephthalic Acid, Chlorine, Ammonia, Urea, Nitric Acid, Ethylene, Others	Salt and water operated tubular reactors for synthesis of e.g. Maleic and Phthalic Anhydride, Acrylic Acid, Methanol, Ethylene Oxide; XTL-Reactors; Pilot reactors, Pilot plants, Revamps; RFCC/FCC units, -Turn-around services (EPC), Reformer furnaces; Hydrocracker/-treater; High Pressure Apparatus; Physical Plant Engineering; Nuclear Technology (Storage casks)
Industrial gases	Air Separation (incl. Gas-to-Liquids, Coal-to-Liquids), Blast Furnace, Others	Air Separation (incl. Gas-to-Liquids, Coal-to-Liquids), Paper				Air Separation, Blast Furnace, Oxygen	Air Separation (incl. Gas-to-Liquids, Coal-to-Liquids), Blast Furnace, Paper	Pulp & Paper, Tissue	Coke Oven Gas, Blast Furnace, Direct Reduction, Soda Ash	Blast Furnace Top Gas Recovery Turbine		Air Separation, Blast Furnace Blowers, Others	
Power generation	Fuel Gas, Carbon Capture & Storage (CCS), Compressed Air Energy Storage (CAES), Boil Off, Tank Vapour, Fuelgas, Others	Integrated Gasification Combined Cycle (IGCC), CCS, CAES				CCS, CAES	IGCC, Fuel Gas, CCS, CAES		Fuel Gas	CCS, Power Recovery	Simple Cycle Power Generation, CHP, Auxiliary, Black Start, Combined Cycle, Offshore, Peaking, Air Storage (CAES), Others	Industrial Power Generation incl. Waste-to-Energy, Biomass, Concentrated Solar Power, Pulp & Paper, Combined Cycle, Waste Heat Recovery Systems (WHRS), Air Storage (CAES), Others	
Performance data and features	<ul style="list-style-type: none"> - Suction flow rates up to 1.5 million m³/h - Max. discharge pressure: 25 bar 	<p>Horizontal split design</p> <ul style="list-style-type: none"> - Suction flow rates up to 710,000 m³/h - Max. discharge pressure: 80 bar <p>Barrel-type design</p> <ul style="list-style-type: none"> - Suction flow rates up to 330,000 m³/h - Min. suction flow rates: 100 m³/h - Max. discharge pressure: 1,000 bar 	<ul style="list-style-type: none"> - Gas transmission up to 50 MW - Outlet pressure up to 130 bar - Gas turbine drive or electrical motor drive 	<ul style="list-style-type: none"> - Gas transmission up to 18 MW - Outlet pressure up to 130 bar - Suction flow rates up to 40,000 m³/h - MOPICO® – hermetically sealed compact compressor with integrated high-speed electrical motor and active magnetic bearings 	<ul style="list-style-type: none"> - Gas compression up to 18 MW - Outlet pressure up to 300 bar - Suction flow rates up to 30,000 m³/h - HOFIM™ – hermetically sealed compact compressors with integrated high-speed electrical motor and active magnetic bearings 	<ul style="list-style-type: none"> - Flow rates up to 760,000 m³/h - Max. discharge pressure: 21 bar 	<ul style="list-style-type: none"> - Suction flow rates up to 690,000 m³/h - Max. discharge pressure: 250 bar 	<ul style="list-style-type: none"> - Suction flow rates up to 200,000 m³/h - Vacuum 	<ul style="list-style-type: none"> - Suction flow rates up to 100,000 m³/h - Max. discharge pressure: 50 bar 	<ul style="list-style-type: none"> - Single- and multi-stage design - Power output up to 30 MW - Inlet temperature up to 760 °C - Inlet pressure up to 25 bar - Axial- and radial flow design 	<ul style="list-style-type: none"> - Mechanical and generator drive - Power output 6-13 MW - Variety of gaseous and liquid fuels - Low emissions - High CHP-efficiency 	<ul style="list-style-type: none"> - Generator and mechanical drive - Live steam up to 140 bar and 540 °C - Power output up to 180 MW 	<ul style="list-style-type: none"> - Customized reactors & apparatuses of up to 1,500 tons, 80 m length and a diameter of 10 m