

The background of the slide is a collage of industrial images. On the top left, there's a photograph of an industrial facility with tall distillation columns and piping. On the top right, there's a photograph of an offshore oil rig at sea. In the bottom left, there's a large, detailed 3D CAD model of a complex industrial component, likely a compressor or valve, showing various ports, bolts, and internal structures. The text 'company profile' is centered in the upper half of the slide, enclosed within a blue circular graphic element.

# company profile

[www.lmf.at](http://www.lmf.at)



your high pressure solution



# company profile

## MAIN PRODUCT LINES

- Air- and water-cooled high pressure piston compressors
- Water-cooled compressors according to API 618, with vertical and balanced-opposed cylinder arrangements, lubricated or non-lubricated
- High speed balanced-opposed compressors
- High pressure compound units
- Compound units with integrated nitrogen separation system
- Special compressor units, produced according to customer specifications

## GEOGRAPHICAL POSITION

Leobersdorf is located approx. 30 km south from the capital of Austria, Vienna and has direct access to the freeways, both to the city of Vienna and to the Vienna International Airport.



LMF Headquarters in Leobersdorf, Austria

# content



## API/TAILORED-MADE 07

API 11P  
API 618



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Pipeline pressure testing  
Pipeline evacuation  
On-site nitrogen generation



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CBG – biomethane  
NG – individual compressor systems  
Air- and watercooled  
PET applications  
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### AUSTRIAN DURABILITY

LMF, the leading Austrian manufacturer with over 60 years experience in the compressor business, produces HP piston compressor systems for air, natural gas, technical and industrial gases (process gases) with power rates of up to 6,200 kW (8,300 hp) and pressure rates of up to 700 bar (10,150 psi).

LMF's high pressure compressor systems are designed according to international standards, using standard

design principles. As a single source LMF offers design, engineering, production, testing under full load, erection, start-up and related services. LMF's special modular system makes it possible to find the optimum solution in each specific case – both from a technical and an economical point of view. The careful selection of materials and components ensures troublefree operation, even under the most demanding operating conditions.

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03

# pressure solution





# austrian durability

## PROJECT PROCESS

### STEP 1: Analysis

**LMF** management – and its highly motivated team of qualified engineers, workers, sales, service and administration staff is strongly committed to its clients and partners. **LMF** is constantly looking for ways and means to improve its customer oriented approach.

### STEP 2: Development

Just as much attention is paid to individual customer requirements. Compressor concepts precisely tailored to the demands of our customers are developed using the engineering and high quality know-how of **LMF**.

### STEP 3: Manufacturing

**LMF** invests in modern, computer-controlled machinery in order to meet our customer's high quality requirements. Also every compressor unit is tested in our own testing area, which guarantees fast and smooth start-up at customer's site.

### STEP 4: Delivery on time

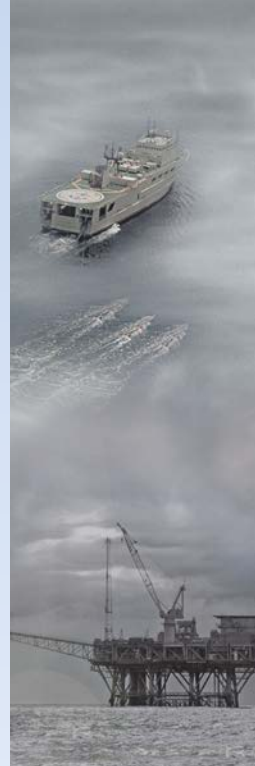
**LMF** works with a detailed time schedule for projects, in which all milestones are specified and followed up. This guarantees that all deadlines defined by our customers are met.

### STEP 5: Service

Service is of paramount importance. Therefore our service department, trained to the highest standard, pays utmost attention to all requests for service and spare parts.

### STEP 6: Perfect solution

Perfect customer cooperation and partnership, targeted project management and customer-oriented after sales and service guarantee the optimum solution for any specific customer's requirements.








# ensures customer expectations



## YOUR SOPHISTICATED ENGINEERING

### SOPHISTICATED ENGINEERING



At **LMF** the most up-to-date engineering aids are used to ensure complete customer satisfaction with regard to optimized selection of materials, calculation, design, engineering and manufacturing. These aids comprise a modern data-bank-based CAE system as well as recognized quality assurance program workflow. Specific consideration is given to the technical documentation for our products, thus maintaining a high standard of quality from quotation up to after sales and service.

### SUPPORTED BY UP-TO-DATE- COMPUTER PROGRAMS



**LMF** engineering is supported by various software, based on proven and/or codified calculation methods. Proprietary programs for the selection and recalculation of reciprocating compressors are based on experience over decades and are continuously updated. Several programs for calculating non-

ideal gas properties, among others ChemShare and GPA, are examples of computer programs used by the Engineering Department.

### QUALITY STANDARDS

**LMF** compressors are designed and built in accordance with international standards, such as DIN/ISO/VDE, API, ANSI, ASME, BS, NACE, ISC, TEMA, standards for hazardous area applications where there is a potential risk of explosion, the relevant EMC/EMI requirements, as well as all other applicable standards and requirements of various classification societies, such as GOST Standard, BV, DNV, GL, LRS, RINA, ABS etc.

Rules for the classification of ships and for mobile offshore units as well as for process decks, especially NORSOK, are also part of **LMF's** quality standard principles.

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# ssure solution



## API/TAILORED-MADE

your quality product  
your challenging application

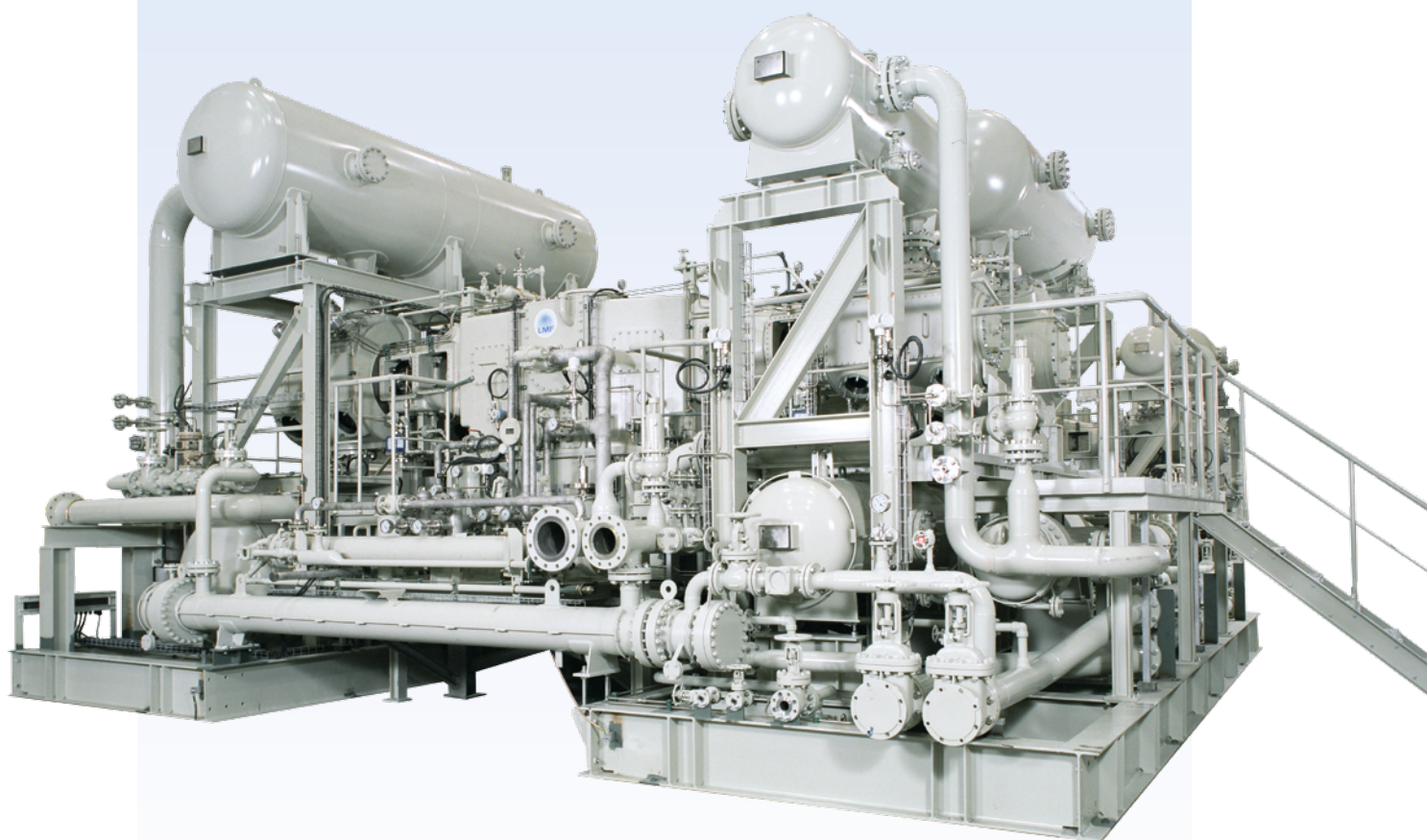
06

your high pres



# API/tailor-made

- API 618 process gas compressors
- API 11P compressor packages



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API/TAILORED-MADE

07

ssure solution





your quality product

# API 618 process gas compressors

## PROCESS GAS COMPRESSORS (according to API 618)

This series is of modular design with six possible piston strokes of 90, 120, 150, 180, 250 and 360 mm, respectively. One to six cylinders are arranged either vertically (in line), horizontally (balanced-opposed design), or in "V" configuration. Final pressure rates of up to 250 bar (3,625 psi) in case of non-lubricated

cylinders or 700 bar (10,150 psi) in case of lubricated cylinders are possible.

Power ranges between 65 kW (85 hp) – model 90 – and 1,035 kW (1,407 hp) – model 360 – per cylinder can be achieved up to a total of 6,200 kW (6 x 1,035 kW or 8,300 hp).



flare gas

### TWO-STAGE COMPRESSOR UNIT B 154-255 S2.1

For compressing HC-gas mixture, balanced-opposed cylinder arrangement, min-lubricated.





refinery services

### **THREE-STAGE COMPRESSOR UNIT B 254-360 N3.3**

For compressing HC-gas mixture,  
balanced-opposed cylinder  
arrangement, non-lubricated.

high pressure hydrogen

### **THREE-STAGE COMPRESSOR UNIT T 122-310 N22.5**

For compressing Hydrogen, vertical  
cylinder arrangement, non-lubricated.



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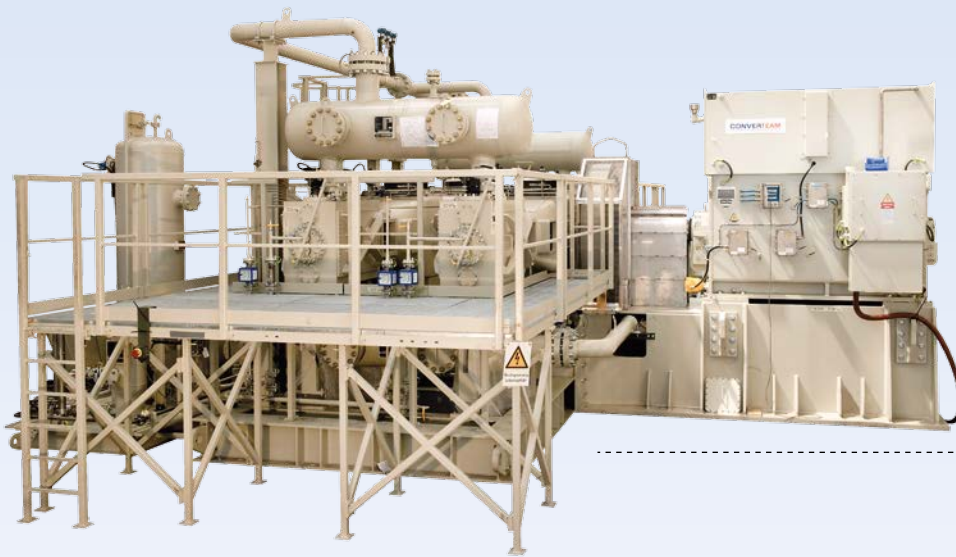


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# pressure solution

your challenging application

# API 618 process gas compressors



natural gas  
underground storage

## **ONE-STAGE COMPRESSOR UNIT B214-120 S12.4**

For underground storage and  
withdrawal of natural gas, package  
designed for one stage operation,  
balanced-opposed cylinder  
arrangement, min-lubricated.

offshore platforms/FPSO

## **FOUR-STAGE COMPRESSOR UNIT B254-462 S12**

For disposing  $\text{CO}_2/\text{H}_2\text{S}$  into dedicated  
gas injection valves on the sea bed,  
with stepless flow regulation, balanced-  
opposed cylinder arrangement, min-  
lubricated.







boil-off/ethylene

**TWO-STAGE COMPRESSOR  
UNIT B222-274 N1.6**

For a boil-off ethylene recovery system,  
balanced-opposed cylinder arrangement,  
non-lubricated, suction temperature  $-65^{\circ}\text{C}$ .



gas turbine feeding

**ONE-STAGE COMPRESSOR  
UNIT B 222 - 128 N 6.1**

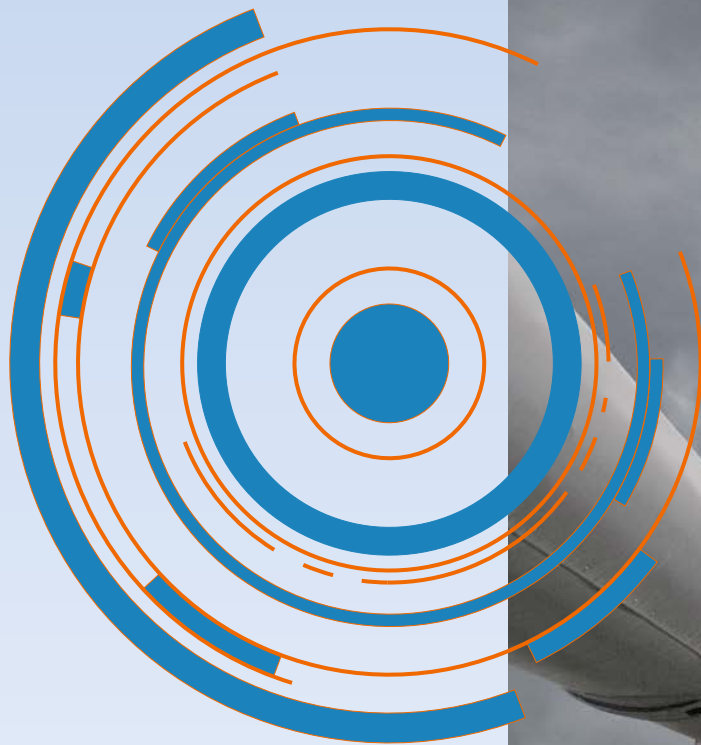
For compression of Natural gas, feeding a  
Rolls-Royce Trend turbine, with stepless  
flow regulation, balanced-opposed cylinder  
arrangement, non-lubricated.



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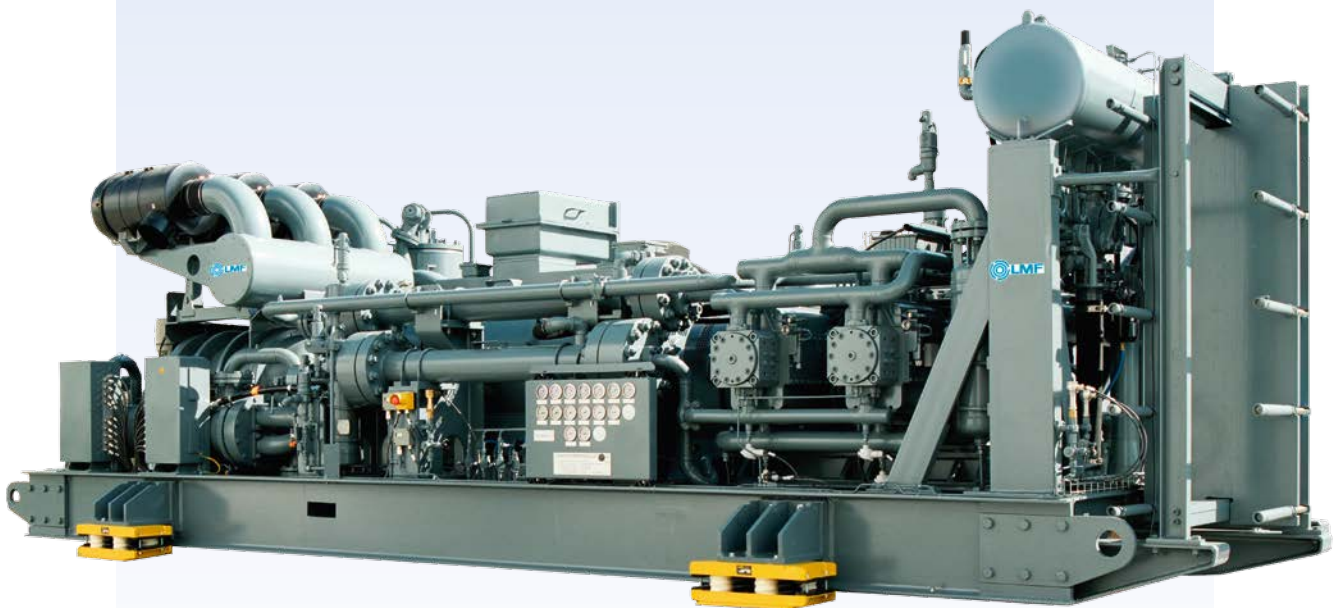


## MOBILE SYSTEMS

your flexible application  
your optimized unit

# mobile systems

- seismic research
- pipeline evacuation
- pipeline pressure testing
- on-site nitrogen generation
- mobile gas booster



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# pressure solution

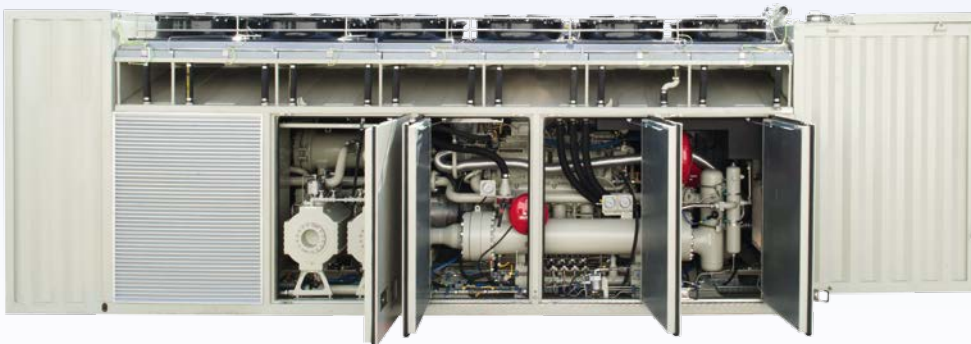
your flexible application

# pipeline evacuation

## LMF P-PACK 750

Evacuation pressure from 75 to 6 bar, discharge pressure 75 bar, delivers up to 64,500 Nm<sup>3</sup>/h at 75 bar suction pressure, driven by a 12-cylinder, 750 kW, 1,400 rpm gas engine,

equipped with water/air heat exchanger, control system for automatic operation, containerized with truck and trailer for ambient temperatures from -40°C to +35°C.



## LMF P-Pack 475

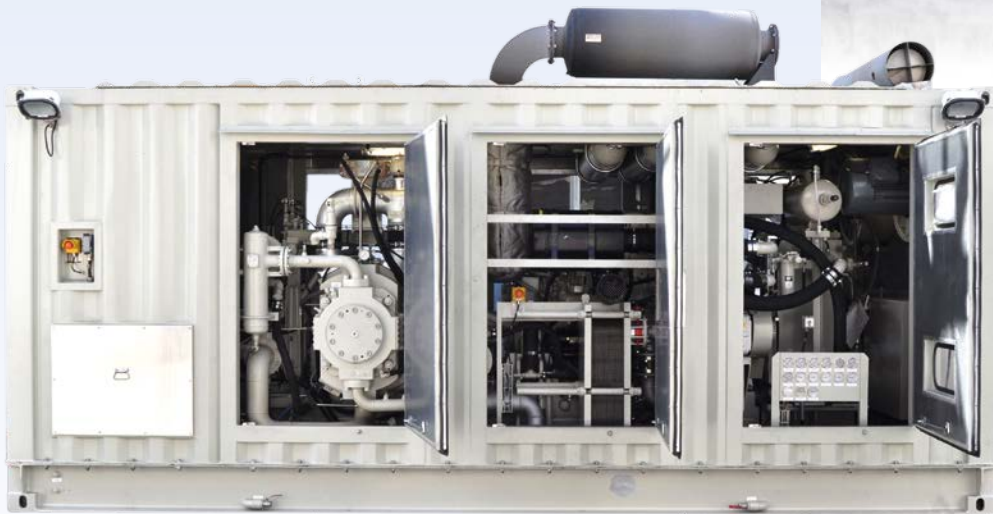
Delivery 1,183 Nm<sup>3</sup>/min (41,778 cfm) at 29 bar (421 psi), driven by a 12-cylinder, 475 kW, 1,800 rpm gas engine, containerized, equipped with water/air heat exchanger and control system for automatic operation, for ambient temperatures from -40°C to +40°C.



# seismic research

## LMF 51s/138-207-E

HP compound  
compressor unit for  
seismic research,  
compressor type  
BS604-317 S21,  
equipped with  
sea/fresh-water heat  
exchanger, driven  
by 950 kW electric  
motor (1,500 rpm).



## LMF 20sL / 138-175 D

HP compound compressor unit for seismic research,  
balanced opposed booster compressor type  
BS302 - 436 S21, with sea- / fresh-water  
heat exchanger, driven by 312 kW (420 hp),  
1,600 rpm diesel engine.

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your optimized unit

# on-site nitrogen generation

## HP COMPRESSOR UNITS FOR MOBILE APPLICATIONS

LMF designs, manufactures and assembles compressor units according to customer requirements for special applications, e.g.:

- Mobile compressor units for pipeline testing
- Mobile compressor units for pipeline evacuation
- High pressure nitrogen units in containerized portable version with pressures up to 700 bar (10,150 psi) producing nitrogen with a purity of up to 98 percent
- Mobile well service/stimulation-units
- Mobile compressor units for underbalanced drilling



### ECOPACK 20/ LMF 47-20/350-D

HP compound compressor unit for nitrogen generation, compressor type

BS 302-317 S35, containerized version with sound-proofing, truck-mounted.

# pipeline pressure testing

## LMF 67/150-D

HP compound compressor unit for pipeline pressure testing, compressor type VCS 3421 W20, containerized for ambient temperatures from  $-50^{\circ}\text{C}$  to  $+35^{\circ}\text{C}$ , truck-mounted.



# mobile gas booster



## LMF BS 604-319 S35.1

delivers up to  $5,160 \text{ Nm}^3/\text{h}$  ( $3,210 \text{ cfm}$ ) at 351 bar (5,090 psi) working pressure, driven by a 12-cylinder, 955 kW, 1,800 rpm diesel engine, equipped with water/air heat

exchanger, control system for automatic operation, containerised with truck and trailer for ambient temperatures from  $-9^{\circ}\text{C}$  to  $+30^{\circ}\text{C}$ .

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# INDUSTRIAL COMPRESSOR SYSTEMS

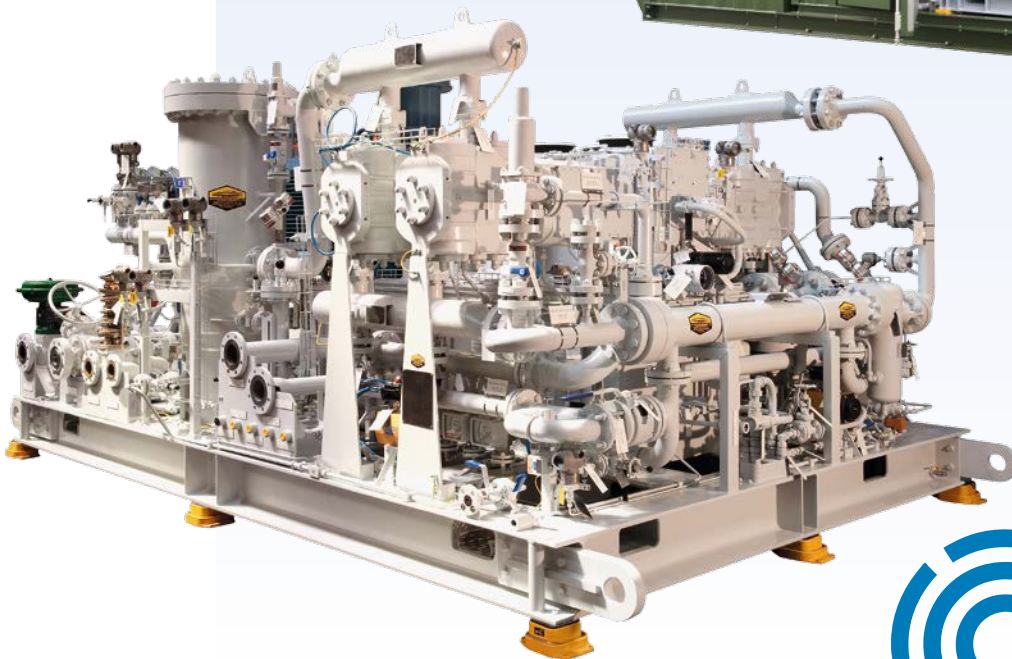
reliable long life cycle  
pressure tight crankcase  
oilfree compression  
service intervals

more than 30 years  
zero emissions  
meets environmental standards  
up to 8,000 hours



# industrial compressor systems

- CBG – biomethane grid feeding
- CNG – compressed natural gas
- TM – tailormade compressor system



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your reliable solution

# oilfree and pressure tight solutions

for all compressed natural gas /  
biomethane requirements



## PRESSURE TIGHT SYSTEMS IN CONCRETE ENCLOSURES

- Low space requirement, due to compact design economic installation with
- Installation height < 2,5 m to avoid investment costs for the compressor enclosure
- No dynamic loads due to the balanced opposed compressor system
- Water-cooled cylinders for optimum temperature Management
- Direct coupling for speeds up to 1,800/1,250 rpm in lubricated / non lubricated design possible
- 8,000 hour Service intervals
- Operation mode with frequency converter, Bypass and suction valve unloaders
- Capacity regulation from 0 up to 100 %
- No leakage during operation and stand-still period
- Oil free operation guaranteed due to non lubricated cylinders to save maintenance costs, Pressure tight crankcase system up to 20 barg helps to save operational costs and meets Zero emission requirements



non-lubricated compressor

**BOXER TYPES  
SERIES BS 302-245 N 1.3**

Compression of 1,160 Nm<sup>3</sup>/h biomethane  
from 1,02 upto 13 bara, Pulsations  
limited to values of 0,5 peak to peak  
measured on the suction and  
discharge side.



Leakage free grid feeding

**BOXER TYPES BS 302D-224 N 4.1**

Compression of 1,200 Nm<sup>3</sup>/h biomethane  
from 4,5 upto 41 bara.

Underground gas storage  
in containerized execution

**BOXER TYPES  
SERIES BS 302 -111 N 10.1**

Oilfree gas compression from variable  
suction pressures between 46–70 bara  
upto 100 bara, capacity range from  
9,800 upto 17,500 Nm<sup>3</sup>/h.



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your customized solution

# CBG – biomethane NG – individual compressor systems

## CBG / BIOMETHANE

**LMF** provides specialized solutions for modern CBG / biomethane processes, using expertise gained through our long-term experience of working with natural gas and in designing compression systems for biomethane (grid feeding) and raw biogas (wet gas / sour gas).

**LMF** also has expert knowledge of customer process system integration.

**LMF** offers a selection of oil-free compression systems for this application with a capacity of up to 6,000 Nm<sup>3</sup>/h, a suction pressure range from 1 to 50 bar and a power range from 55 to 1,200 kW.

## LMF BIOMETHANE GRID FEEDING SYSTEM

Small containerized package  
BS 102-325 N 2.6 with 75 kW  
main drive for compression of  
350 Nm<sup>3</sup>/h from 1,2 upto 26 bara  
L x B x H ~ 6,4 x 3,2 x 3,6 m,  
weight 15 tons.





## NG – INDIVIDUAL COMPRESSOR SYSTEMS

These Systems are designed entirely according to customer requirements on the basis of **LMF's** history and extensive experience in tailor-made systems. Individual compressor systems are engineered whenever particular requirement specifications such as high capacity, a wide range of suction and discharge pressure, variable capacity control, lightweight build packages or economic solutions for low service and lifecycle costs are defined.

The product portfolio is comprised of balanced-opposed compressors with up to 4 cylinders and a power range

up to 1,2 MW, able to handle any required suction pressure up to a maximum of 350 bar. The units are driven by electric motor or gas engine and feature speed control and a bypass function for maximum flexibility and economical operation through precision variable capacity control.

**LMF** also supplies auxiliary systems such as housings including containers or sound/weather-protecting enclosures, fully fitted with gas and fire detection equipment, HVAC\*, lighting etc.

\* HVAC: heating, ventilating and air conditioning.



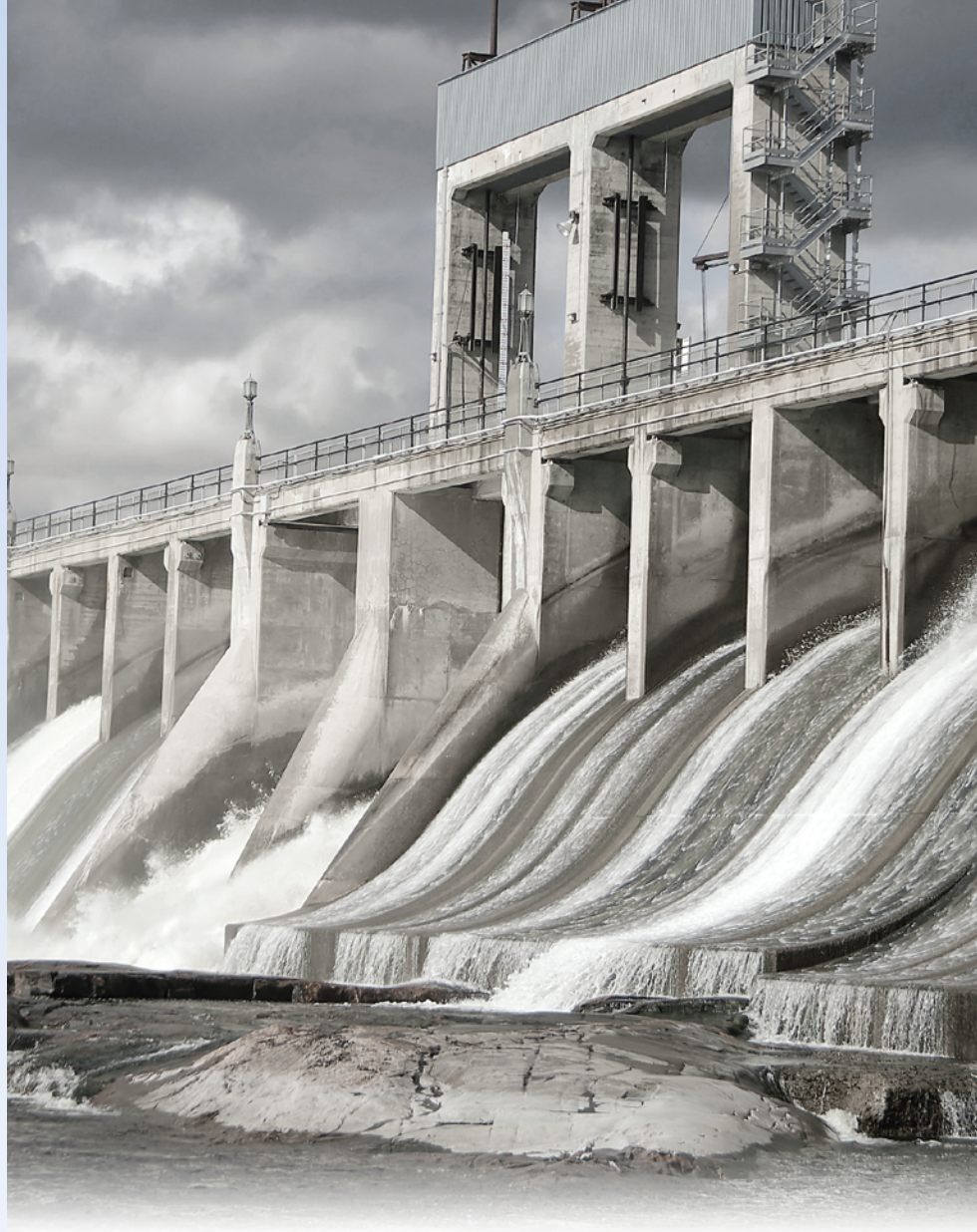
### LMF NG – INDIVIDUAL COMPRESSOR SYSTEM BS 604 - 213 S 20.1

Offshore CH<sub>4</sub> Gas Lift Compressor Package, 600 kW, 2 stages, water-cooled, high-speed balanced-opposed compressor type, 4 cylinders with double acting pistons and intermediate distance piece. Specifications: Norsok compliant, offshore application, 60 Hz.

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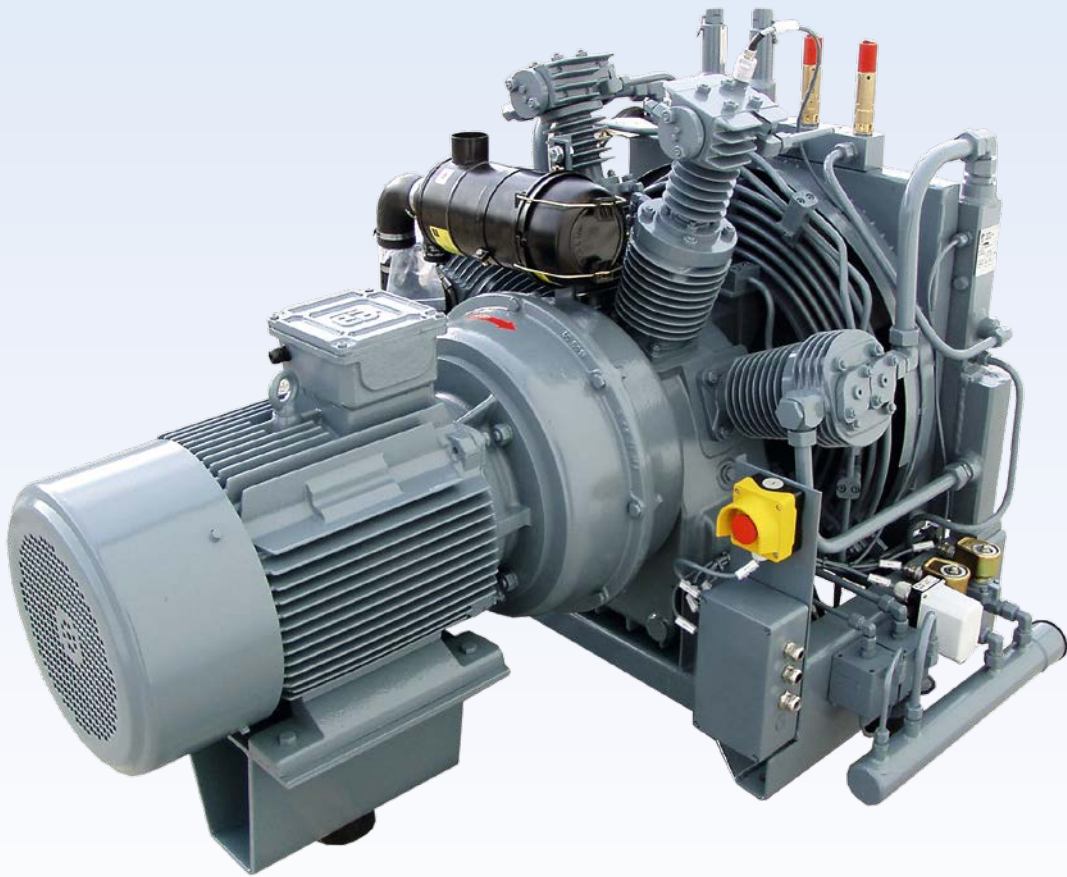


## INDUSTRIAL APPLICATIONS

your optimal compressor  
your durable compressor

# industrial compressor systems

- air- and water-cooled
- PET applications
- tailor-made solutions



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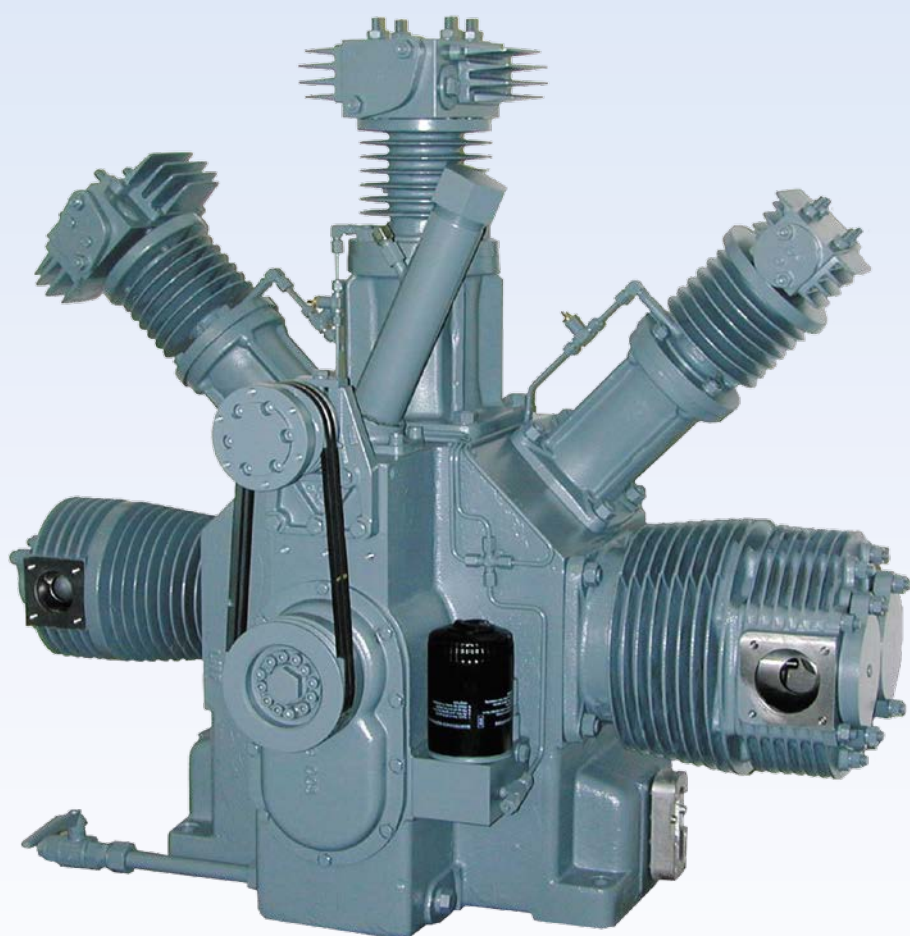
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ssure solution



your optimal compressor

# air- and water-cooled



## INDUSTRIAL COMPRESSORS

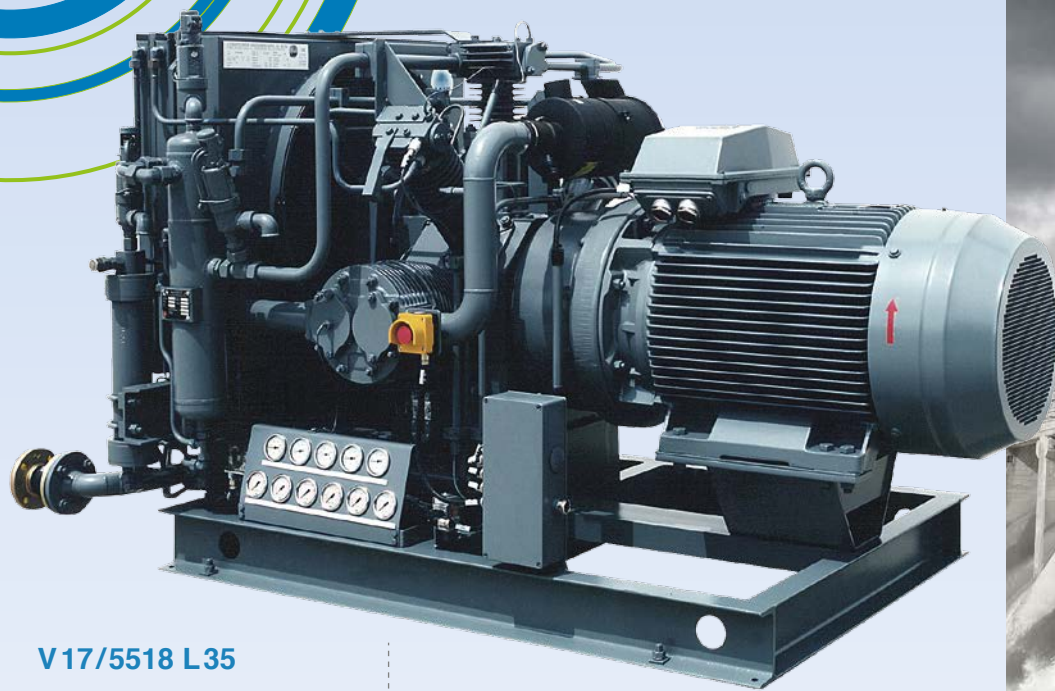
The compressors are available from 2 to 6 stages, with 2 to 6 single-acting cylinders. For your industrial compressor application **LMF** supplies a standard compressor from our product portfolio or designs a specially modified version to suit your specific requirements.

- Compressors with power rates from 3 to 600 kW (4 to 800 hp)
- Final pressure rates from 30 to 500 bar (435 to 7,250 psi)
- Capacities from 7 m<sup>3</sup>/h up to 1,000 m<sup>3</sup>/h (4 to 590 cfm) under atmospheric inlet conditions
- Medium: air and industrial gases
- Lubricated and oil-free

### V17/5518 L7-42

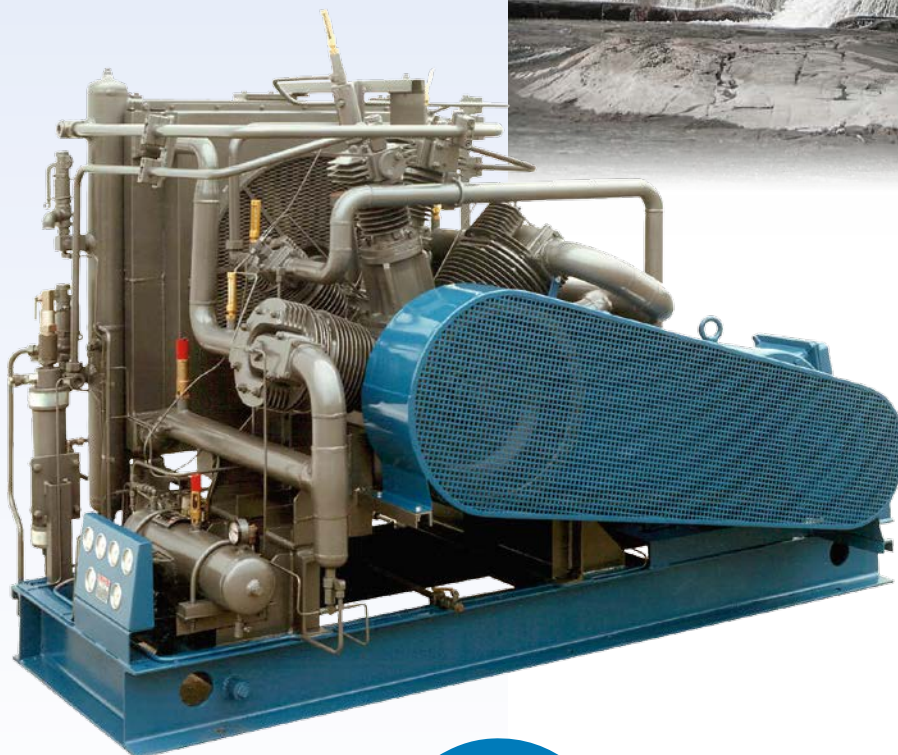
Air-cooled block, five stages, five cylinders.





### V 17/5518 L 35

Electric driven, direct coupled,  
150 m³/h (88 cfm) at  
350 bar (5,076 psi).



### V 19/5621 L 35

Delivery 4,570 ltr/min (161 cfm),  
working pressure 350 bar (5,075 psi),  
driven by 110 kW (150 hp) electric  
motor.

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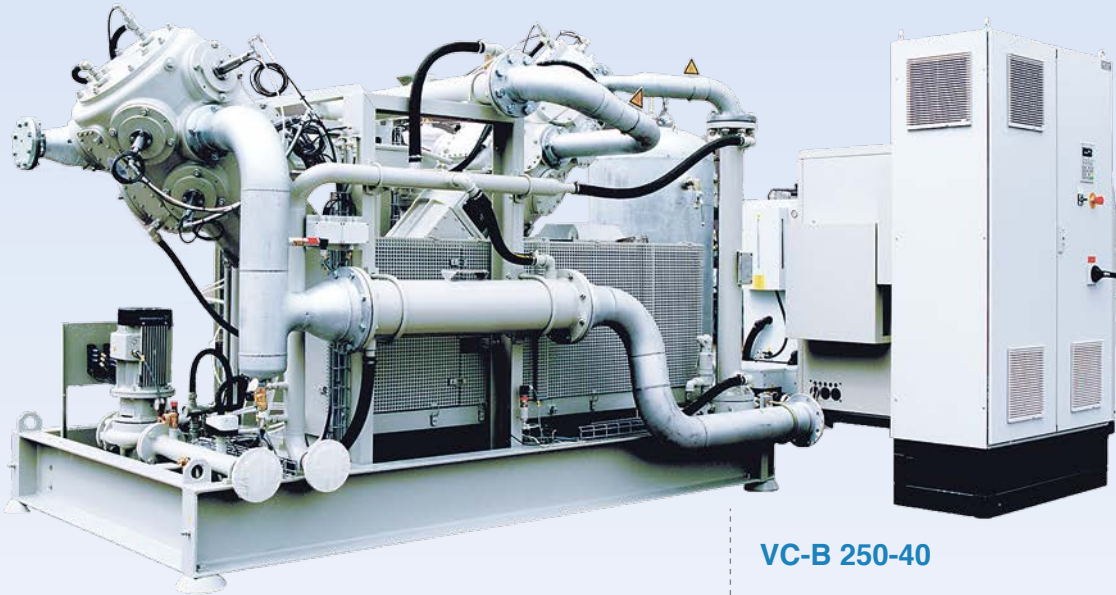


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your durable compressor

# tailor-made solutions PET applications



## **VC-B 250-40**

Oil-free LMF ECOPET compressor package  
with a capacity of 1,619 m<sup>3</sup>/h (952 cfm).

## **CONTAINERIZED VC-B 200 - 40**

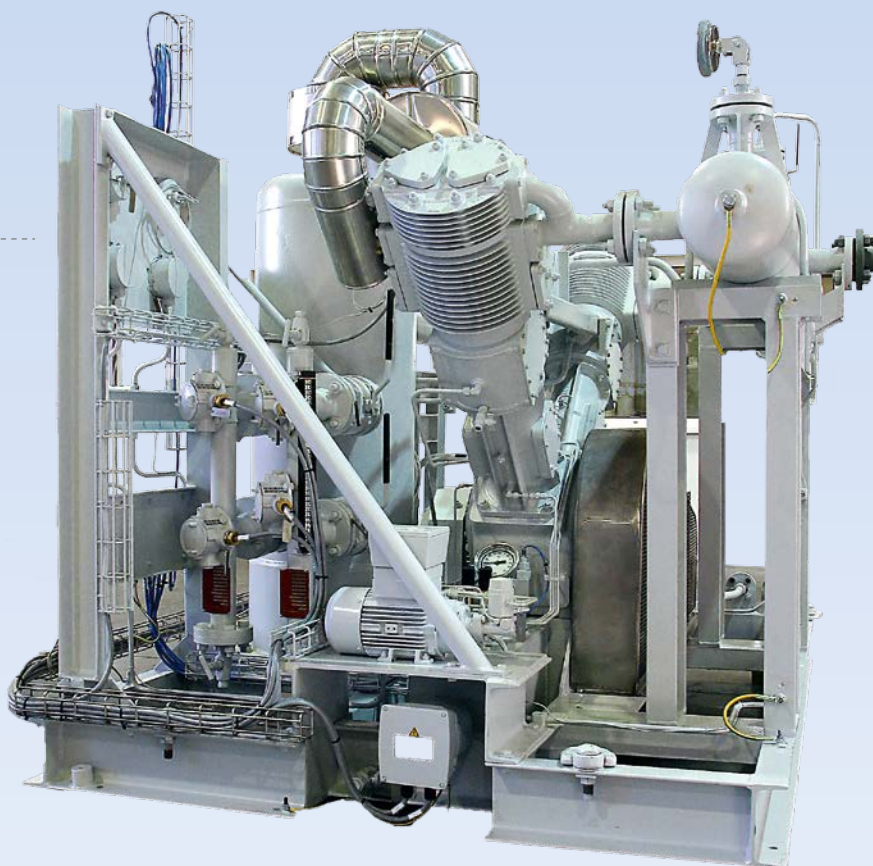
Equipped with C.A.R. system  
(Compressed Air Recovery).





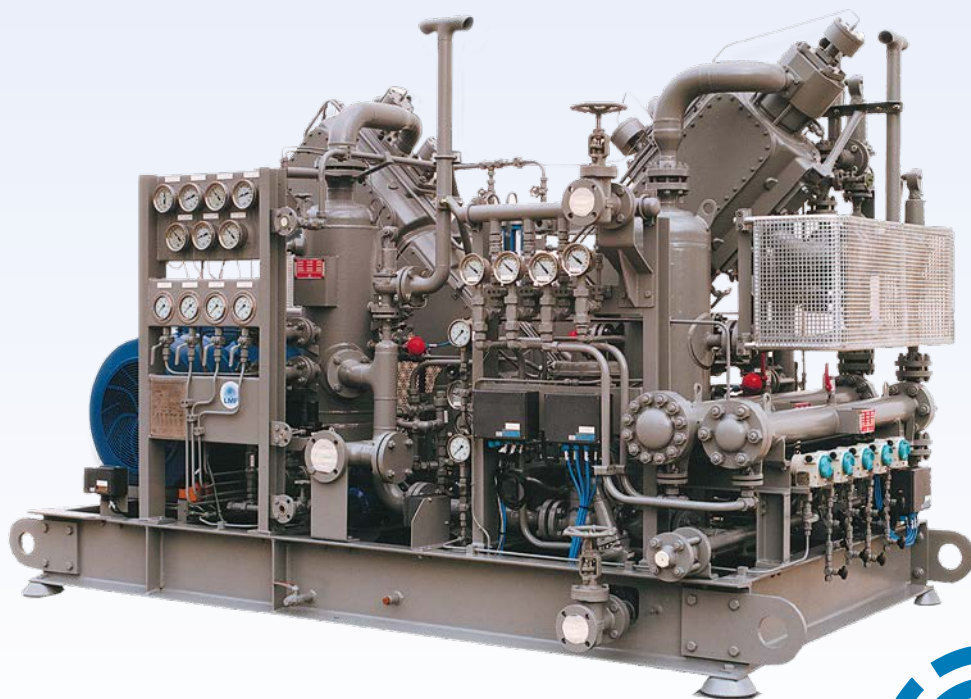
### V7D/2107 L4.0

Delivery 10m<sup>3</sup>/min (350 cfm),  
suction pressure 10 bar (145 psi),  
working pressure 40 bar (480 psi),  
electric motor 55 kW (75 hp).



### NITROGEN COMPRESSOR PACKAGE WITH HP-COMPRESSOR VC3216 N6.6

Delivery 1,655 m<sup>3</sup>/h (980 scfm),  
working pressure 66 bar (957 psi),  
driven by 180 kW (245 hp) electric  
motor.



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# manufacturing assembly testing

quality competence

## HIGH STANDARDS IN MANUFACTURING & QUALITY ASSURANCE

In order to meet our own high quality requirements as well as those of our customers, we continuously invest in modern, computer-controlled machinery, appliances and tools, electric testing systems and CAD equipment amongst other apparatus. Equally as much attention is paid to training, with ongoing education and motivation programs available for both blue-collar and white-collar employees. A high percentage of the latter have completed a college education or have graduated as engineers.

## COMPRESSOR ASSEMBLY

The compressor itself, cabling, terminal boxes and operator panels are all mounted on a single skid. The control systems can either be mounted on the compressor frame or installed in separate, stand-alone cabinets, depending on the requirements of the customer.

## COMPRESSOR CONTROL SYSTEMS

Our sophisticated electronic control systems are designed and maintained by a team of highly-qualified electrical engineers using CAD systems and other computer-based programs. More than 60 % of all LMF compressors are equipped with these systems, which

include programmable logic controls, display panels, annunciators and overall pressure control logics. Also telephone modems and IP interfaces are supplied on request in order to facilitate service activities all over the world.

## ASSEMBLY

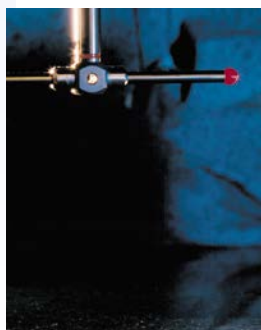
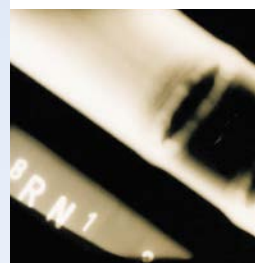
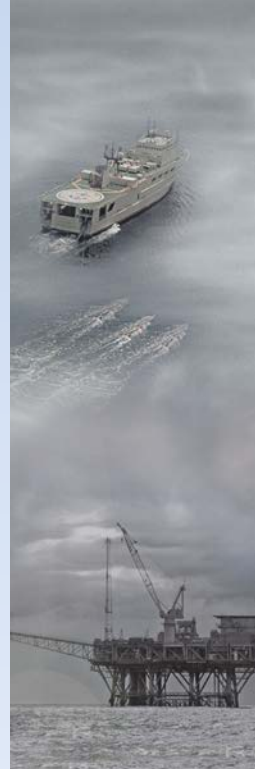
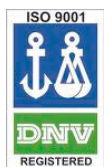
Compressor units are assembled in the highly-equipped LMF assembly shop in accordance with our high quality assurance standards.

## TESTING

Every compressor unit is tested in our own testing area during a four-hour mechanical testrun or under full load conditions according to contractual specifications and the relevant international standards, such as ISO, ASME, DNV, BV, LRS, GL, ect.

## ISO 9001:2008

LMF's Quality Management System is certified in accordance with the requirements of ISO 9001:2008 with Bureau Veritas Certification. Within our production facility in Austria an Integrated Management System (IMS) for HSE has been established in compliance with the standards EN ISO 14001:2009 and OHSAS 18001:2007.






# after sales service


assure productivity

## AFTER SALES SERVICE



Great emphasis is placed on after sales service at **LMF**, where the utmost attention is paid to all requests for service and spare parts. Spare parts are delivered as quickly as possible to any required destination, and service engineers are sent upon request to operating sites right around the globe.

## MANUALS & TEST CERTIFICATES




**LMF** machines are supplied with test-certificates and operating manuals containing comprehensive parts lists, enabling the user to identify and order any required spare parts with accuracy and speed.




**24 h Service Hotline:**  
**+43 / 22 56 / 640 64**

## TRAINING



**LMF** also conducts training courses for customer operating and maintenance staff, either on site during start-up or at the **LMF** factory. Training handbooks in printed form or on CD-ROM as well as maintenance videos also contribute to our high level of customer satisfaction.



Inclined-bed models of  
CNC high power lathes.



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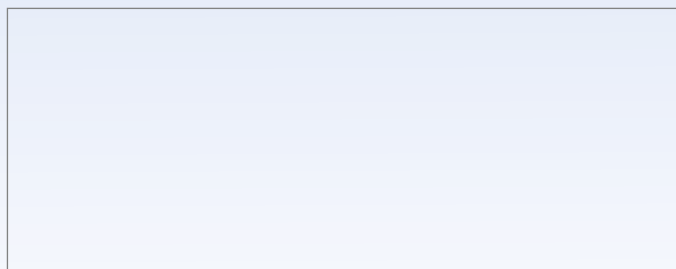
**China**

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