



Technical Guide



Your Life Cycle Partner
in air compressors

Dear customer,

We hope that this Technical Guide will help you to find the information you need about Sperre products quickly and easily. The guide provides concise but comprehensive information about our compressors, air receivers and heat exchangers. It also includes general information about compressed-air technology. Please get to know the contents of this guide – we hope it will be a useful tool in your work with systems that include Sperre products.

No handbook can replace personal communication. For further information and advice, please contact our friendly staff (see pages 92-95). For the latest Sperre news and updates, see **www.sperre.com**.

Sperre is the world leader in starting-air compressors for ships and power stations. We thank you for your confidence in us. We will do everything in our power to maintain the service level that has made us famous.



Mr Ole Nustad
President



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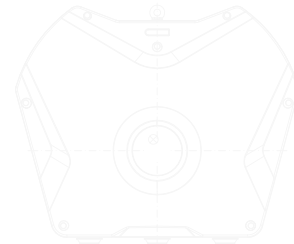




Photo: Jallalim



Photo: Harald M. Valderhaug



Photo: Wärtsilä Corporation

Commercial shipping and navy

Right from the start, Sperre has supplied starting-air compressors to all kinds of vessels. Today, Sperre compressors are installed on every fifth ship on the world's oceans. In collaboration with ship designers, shipyards, ship owners and partners, we plan, develop and deliver all the compressed air that any ship needs. A Sperre solution ensures unique operational reliability and service for the ship, from construction and delivery until the final voyage.

Offshore

Sperre is located in Ålesund, at the hub of a maritime cluster that develops and builds some of the most advanced offshore vessels in the world. We know all the requirements associated with equipment for oil and offshore vessels, and we have developed specialized skills in deliveries to this demanding industry. Today, some 3 of 4 offshore service vessels rely on starting air from Sperre.

Industry

Through decades of daily use in highly demanding maritime environments, our compressors and solutions have proved their superior performance. These lifetime advantages are just as valuable for land-based installations and power plants as they are for ships. For installations exposed to extreme cold, heat, and the ravages of the elements, a robust and reliable Sperre solution is a natural choice. We deliver complete packages, tested and ready for installation. Today, you will find Sperre solutions in some of the most remote regions on Earth.

Sperre's total service concept

We are there when you need us, where you need us. Our service engineers are available 24/7.

For more than 60 years, we have kept our service promise:

"Any part to any place within 48 hours".

It does not matter whether your compressor is 3 years old – or 30.



Every 5th ship on the world's oceans relies on starting air from Sperre



Olympic Challenger



Gijon Knutsen



Baltic Princess

Sperre Compressors have a unique reputation, and Sperre is by far the most frequently chosen starting air compressor on the world's oceans.

Feedback from demanding customers confirms the unique standing of Sperre as the most reliable and cost-effective compressor brand.

Innovations

Sperre is constantly developing compressor solutions as well as our support and service. Innovative thinking yields results. Working together with customers and suppliers, we are constantly making improvements and refinements to our solutions. The result is important benefits and large savings during the entire life cycle of the product, from engineering to decommissioning or recycling.

30 years of Spare parts availability

With the right maintenance routines, a Sperre compressor is designed to last for the lifetime of the vessel or the plant. This is the basis for our unique reputation. As part of our Life Cycle Concept, we guarantee that we will stock parts and accessories for at least 30 years from the installation of the system.

Sperre 24/7 service

Fast response is often vital for the operation of the installation. Professional service and support are more important than ever. That's why our experienced support teams are available around the clock, every day, and all enquiries are processed immediately.

Sperre's global network

Sperre has offices in Ålesund, Rotterdam, Singapore and Shanghai. We are also represented by an extensive and professional network of agents in more than 20 important locations around the world. Our representative is there, wherever and whenever you need us.

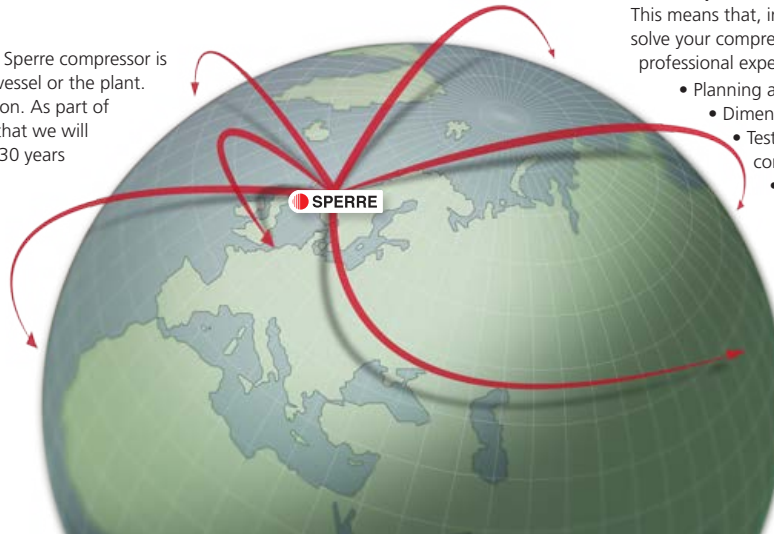
The complete life cycle concept

This means that, in partnership with you as our customer, we solve your compressed-air needs and support you with essential professional expertise.

- Planning and engineering, customized solutions
- Dimensions, coordination and production
- Testing and delivery of complete compressor systems
- Installation, training, operations and monitoring
- Periodic maintenance, service and repairs
- Replacement, disassembly and recycling

Any part to any place within 48 hrs

With 24/7 service, fast response time, unique logistics, a 30-year spare part guarantee and our global network, we have fulfilled our 48-hour spare-part guarantee for more than 60 years. This provides great peace of mind.



What is a starting air system?



Optional

Working air system

General consumption (machines, doors, tools etc.)

Optional

Control air system

Controlling ship's engine speed, direction of running, starting/stopping/reversing etc.

Optional

Emergency starting air compressor and receiver



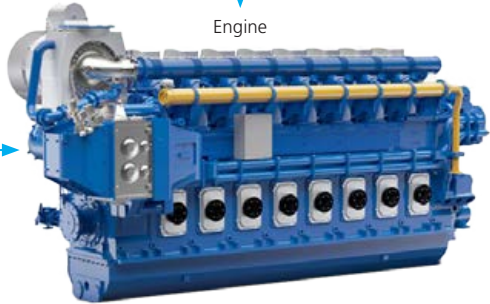
Starting air compressor

Reduction valve reduces air pressure to approx. 8-10 bar.



Starting air receiver

Engine



All Capacities for the Marine Market

Sperre Classic



With 21 compressors the Sperre range includes all the capacities needed by the marine market. The air-cooled capacity runs from 11 to 275m³/h. The water-cooled range runs from 60 to 470m³/h.

The Sperre Compressor Range



| | | 30 BAR | | | |
|--|--------------|----------|----------|-----|-----|
| | | 50 HZ | 60 HZ | | |
| Air-cooled | Water-cooled | 1500 RPM | 1800 RPM | | |
|  | | HLF2/77 | 11 | 13 | |
| | | HL2/77A | 26 | 32 | |
| | | HL2/90A | 35 | 40 | |
| | | HL2/105A | 45 | 55 | |
|  | | XA060 | XW060 | 60 | 70 |
| | | XA090 | XW090 | 85 | 100 |
| | | XA120 | XW120 | 115 | 135 |
| | | XA150 | XW150 | 140 | 165 |
| | | XA180 | XW180 | 152 | 180 |
| | | XA200 | XW200 | 185 | 220 |
| | | XA250 | XW250 | 230 | 275 |
| | | | XW300 | 270 | 330 |
| | | | XW350 | 360 | 420 |
| | | | XW400 | 400 | 470 |

Table subject to change. Check our website www.sperre.com/range for updates.

Sperre X-range



Air-Cooled Compressors

Classic Air-Cooled Range

The world's most renowned maritime compressor



Sperre Classic compressors have a unique reputation – they are by far the most frequently chosen compressors on the world's oceans. For smaller compressors, the HL range is our ultimate recommendation.

Unanimous feedback from demanding customers confirms the unique standing of the HL. It's the most reliable and cost-effective small compressor range and the first choice of 7 out of 10 offshore supply vessels.

- Reliable and cost effective
- No loose parts – lower installation costs
- Perfected in demanding working conditions over decades
- Built-in oil separator, substantial savings in installation
- Easy to operate, no need for special training
- Simple maintenance and repair
- Uniquely low life cycle cost
- Engine driven compressors for emergency use can be delivered for all of the models below.


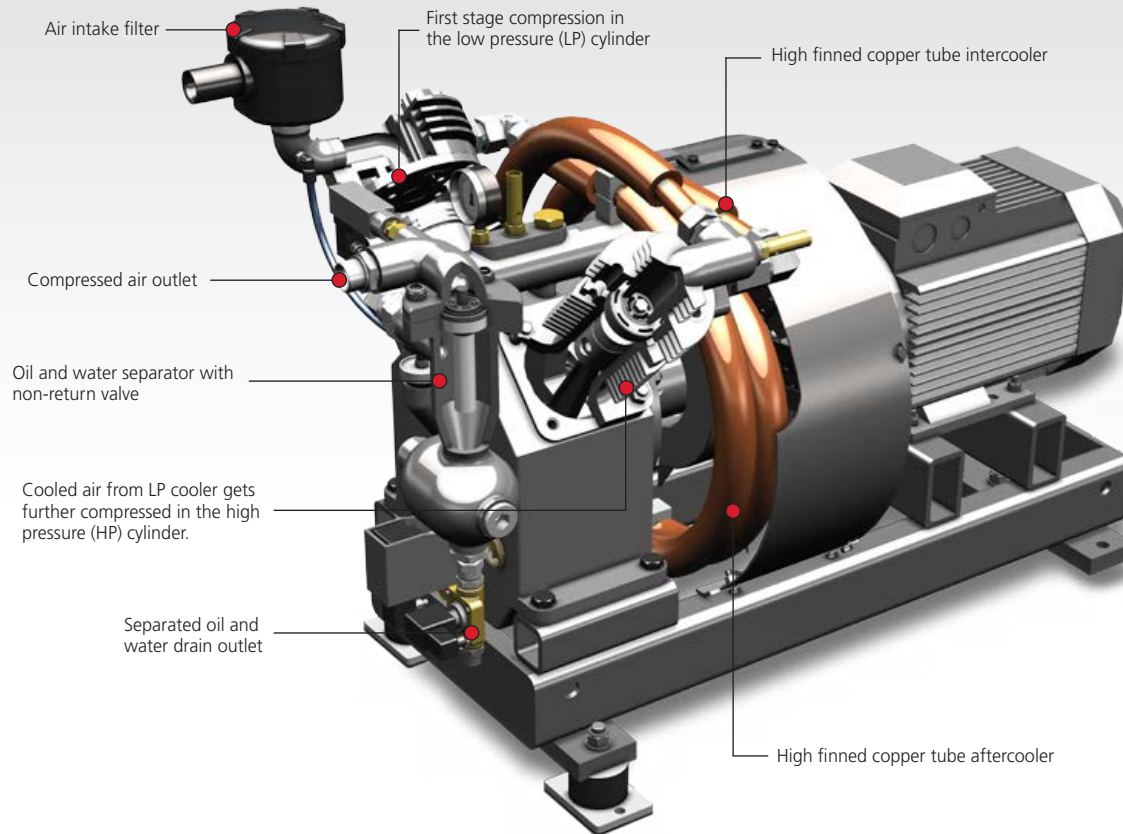
| 30 BAR | | | |
|---|-------------------|-------------------|----|
| | 50 HZ 1500 RPM | 60 HZ 1800 RPM | |
|  | HLF2/77 | 11 | 13 |
| | HL2/77A | 26 | 32 |
| | HL2/90A | 35 | 40 |
| | HL2/105A | 45 | 55 |

Table subject to change. Check our website www.sperre.com/range for updates.



The compressor is designed as a two-cylinder, two-stage, air-cooled compressor. High-finned copper tubes on the inter- and after cooler along with the axial fan provide ample cooling.

All rotating parts inside the compressor are equipped with roller or needle bearings – efficiently lubricated through the splash pin principle.

The compressor is usually supplied fully assembled, with electric motor, flexible coupling and baseplate with three point footprint for easy installation.

The effective cyclone separator removes at least 80% of the remaining water droplets at 30 barg - providing good quality starting air.



Classic Air-Cooled Compressor



HLF2/77

| Technical Data | | | 25 Bar | | | 30 Bar | | | 35 Bar | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|-------------------------------------|----------------------|-------------------------|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h |
| HLF2/77 | 1450 | 50 | 11,1 | 2,7 | 2090 | 11,0 | 2,8 | 2129 | 10,9 | 2,8 | 2167 |
| | 1750 | 60 | 13,2 | 3,1 | 2399 | 13,0 | 3,1 | 2399 | - | - | - |

Design particulars

Design

| | |
|---------------------------|------------------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Air |
| Valve LP | Reed valve |
| Valve HP | Concentric plate valve |

Dimensions & weight

| | |
|------------------------------|--------|
| Cylinder diameter LP | 77 mm |
| Cylinder diameter HP | 50 mm |
| Stroke | 40 mm |
| Weight (compressor/el.motor) | 120 kg |

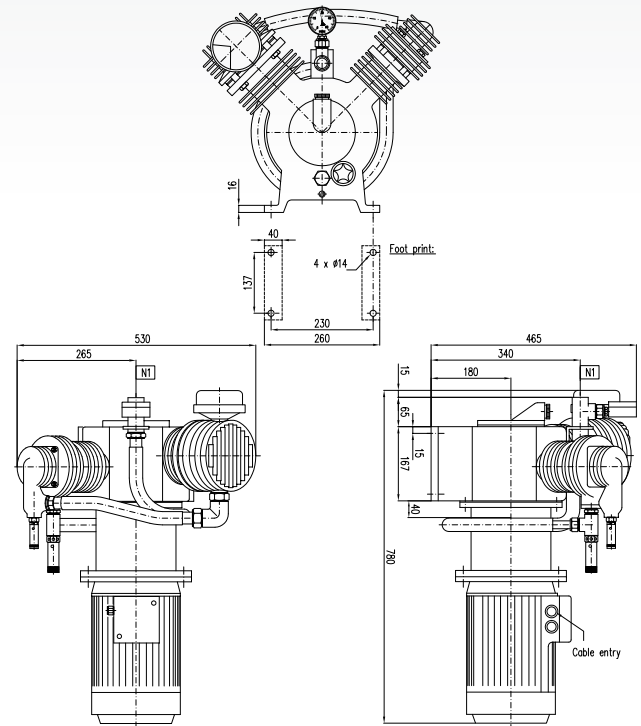
Lubrication

| | |
|--------------------|------------|
| Sump capacity | 1.8 litres |
| Lubrication system | Splash |

Operating parameters

| | |
|--|---|
| Maximum delivery pressure | 35 bar |
| Ambient temperature | 45°C |
| Normal working pressure LP | 2-4 bar |
| Normal temperature outlet air | Approx. 25°C above ambient |
| Maximum speed | 1800 RPM |
| Set point thermo switch air alarm/stop | 75°C/80°C |
| Rotation | Clockwise (looking at compressor front) |
| Safety valves set point | 10% above stage pressure |
| Max. noise level | 81 dBA |

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.





Classic Air-Cooled Compressor



HL2/77A

| Technical Data | | | 30 Bar | | | 40 Bar | | |
|----------------|-----------|----------|-------------------------------------|---------------|-------------------------|-------------------------------------|---------------|-------------------------|
| Comp. Model | Speed RPM | Freq. Hz | Charging capacity m ³ /h | Power req. kW | Heat dissipation kCal/h | Charging capacity m ³ /h | Power req. kW | Heat dissipation kCal/h |
| HL2/77A | 1450 | 50 | 26 | 6,8 | 5263 | 23 | 7 | 5418 |
| | 1750 | 60 | 32 | 8,6 | 6656 | 30 | 9,2 | 6863 |

Charging capacity is from ambient pressure to final pressure. Tolerance +1-5%.

Design particulars

Design

| | |
|---------------------------|-------------------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Air |
| Cooling system | Direct driven axial fan |
| Valve LP | Reed valve |
| Valve HP | Concentric plate valve |

Dimensions & weight

HL2/77A

| | |
|-------------------------------------|--------|
| Cylinder diameter LP | 77 mm |
| Cylinder diameter HP | 50 mm |
| Stroke | 80 mm |
| Weight (compressor/motor/baseplate) | 260 kg |

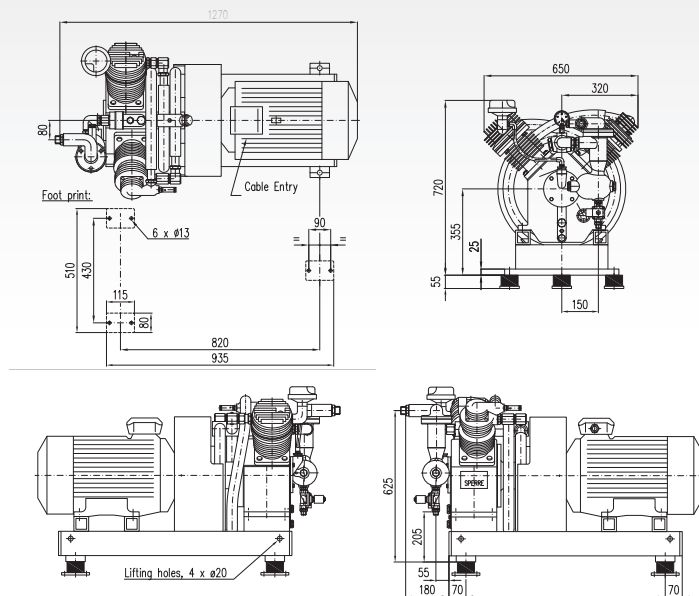
Lubrication

| | |
|--------------------|-----------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Sump capacity | 4 litres |
| Lubrication system | Splash |

Operating parameters

HL2/77A

| | |
|--|---|
| Maximum delivery pressure | 40 bar |
| Ambient temperature | 45°C |
| Normal working pressure LP | 2-4 bar |
| Normal temperature outlet air | 15°C-30°C above ambient temperature |
| Maximum speed | 1800 RPM |
| Set point thermo switch air alarm/stop | 75°C/80°C |
| Rotation | Clockwise (looking at compressor front) |
| Safety valves set point | 5-10% above stage pressure |
| Max. noise level | 84 dBA |
| Max. vibration level | 40 mm/s-RMS |





Classic Air-Cooled Compressor



HL2/90A, HL2/105A

| Technical Data | | | 30 Bar | | | 40 Bar | | |
|----------------|-----------|----------|-------------------------------------|---------------|-------------------------|-------------------------------------|---------------|-------------------------|
| Comp. Model | Speed RPM | Freq. Hz | Charging capacity m ³ /h | Power req. kW | Heat dissipation kCal/h | Charging capacity m ³ /h | Power req. kW | Heat dissipation kCal/h |
| HL2/90A | 1450 | 50 | 35 | 8,2 | 6346 | 33 | 8,8 | 6811 |
| | 1750 | 60 | 40 | 10,3 | 7972 | 38 | 11 | 8514 |
| HL2/105A | 1450 | 50 | 45 | 10,7 | 8282 | 44 | 11,2 | 8669 |
| | 1750 | 60 | 55 | 14 | 10836 | 54 | 15,1 | 11688 |

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.

Design particulars

Design

| | |
|---------------------------|-------------------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Air |
| Cooling system | Direct driven axial fan |
| Valve LP | Reed valve |
| Valve HP | Concentric plate valve |

Dimensions & weight

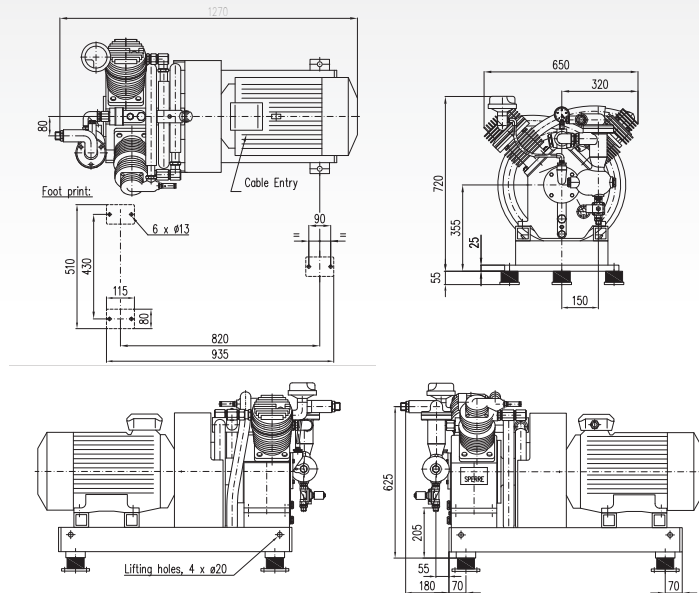
| | HL2/90A | HL2/105A |
|-------------------------------------|---------|----------|
| Cylinder diameter LP | 90 mm | 105 mm |
| Cylinder diameter HP | 50 mm | 50 mm |
| Stroke | 80 mm | 80 mm |
| Weight (compressor/motor/baseplate) | 326 kg | 328 kg |

Lubrication

| | | |
|--------------------|--------------------------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) | Synthetic oil (see approved list) |
| Sump capacity | 4 litres | 4 litres |
| Lubrication system | Splash | Splash |

Operating parameters

| | HL2/90A | HL2/105A |
|--|---|-----------|
| Maximum delivery pressure | 40 bar | 40 bar |
| Ambient temperature | 45°C | 45°C |
| Normal working pressure LP | 3–4 bar | 4–5 bar |
| Normal temperature outlet air | 15°C–30°C above ambient temperature | |
| Maximum speed | 1800 RPM | 1800 RPM |
| Set point thermo switch air alarm/stop | 75°C/80°C | 75°C/80°C |
| Rotation | Clockwise (looking at compressor front) | |
| Safety valves set point | 5–10% above stage pressure | |
| Max. noise level | 84 dBA | |
| Max. vibration level | 40 mm/s-RMS | |





Classic Air-Cooled Compressor



LL2/77A, LL2/90A, LL2/105A

| Technical Data | | | | | | Technical Data | | | | | | Technical Data | | | | | |
|----------------|-----------|----------|-------------------------------------|---------------|-------------------------|----------------|-----------|----------|-------------------------------------|---------------|-------------------------|----------------|-----------|----------|-------------------------------------|---------------|-------------------------|
| 8 Bar | | | | | | 8 Bar | | | | | | 8 Bar | | | | | |
| Comp. Model | Speed RPM | Freq. Hz | Charging capacity m ³ /h | Power req. kW | Heat dissipation kCal/h | Comp. Model | Speed RPM | Freq. Hz | Charging capacity m ³ /h | Power req. kW | Heat dissipation kCal/h | Comp. Model | Speed RPM | Freq. Hz | Charging capacity m ³ /h | Power req. kW | Heat dissipation kCal/h |
| LL2/77A | 1475 | 50 | 49 | 6,9 | 5341 | LL2/90A | 1475 | 50 | 68 | 9,3 | 7198 | LL2/105A | 1475 | 50 | 93 | 13,2 | 10217 |
| | 1750 | 60 | 60 | 8,4 | 6502 | | 1750 | 60 | 86 | 12,4 | 9597 | | 1750 | 60 | 120 | 17 | 13158 |

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.

Design particulars

Design

| | |
|---------------------------|-------------------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 1 |
| Cooling | Air |
| Cooling system | Direct driven axial fan |
| Valve LP | Reed valve |

Dimensions & weight

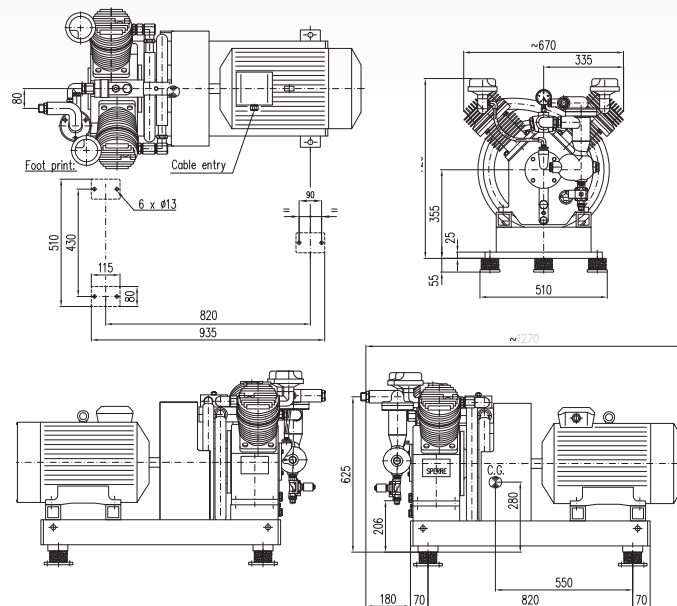
| | LL2/77A | LL2/90A | LL2/105A |
|-------------------------------------|---------|---------|----------|
| Cylinder diameter LP | 77 mm | 90 mm | 105 mm |
| Stroke | 80 mm | 80 mm | 80 mm |
| Weight (compressor/motor/baseplate) | 265 kg | 290 kg | 320 kg |

Lubrication

| | | | |
|--------------------|---------------|--------------------------------------|---------------|
| Oil type | Synthetic oil | Synthetic oil (see approved list) | Synthetic oil |
| Sump capacity | 4 litres | 4 litres | 4 litres |
| Lubrication system | Splash | Splash | Splash |

Operating parameters

| | LL2/77A | LL2/90A | LL2/105A |
|--|---|-----------|-----------|
| Maximum delivery pressure | 10 bar | 10 bar | 10 bar |
| Ambient temperature | 45°C | 45°C | 45°C |
| Normal temperature outlet air | 10°C–20°C above ambient temperature | | |
| Maximum speed | 1800 RPM | 1800 RPM | 1800 RPM |
| Set point thermo switch air alarm/stop | 75°C/80°C | 75°C/80°C | 75°C/80°C |
| Rotation | Clockwise (looking at compressor front) | | |
| Safety valves set point | 5–10% above stage pressure | | |
| Max. noise level | 84 dBA | | |
| Max. vibration level | 40 mm/s-RMS | | |



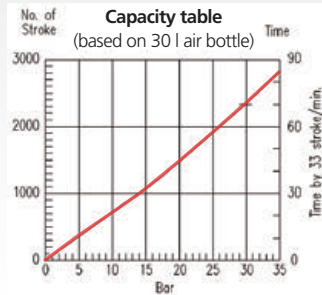
| • Standard supply • Option | 30 BAR COMPRESSORS | | | | 8 BAR COMPRESSORS | | |
|--|--------------------|---------|---------|----------|-------------------|---------|----------|
| | HLF2/77 | HL2/77A | HL2/90A | HL2/105A | LL2/77A | LL2/90A | LL2/105A |
| Mechanical components | | | | | | | |
| Non-return valve | • | • | • | • | • | • | • |
| Oil & water separator | • | • | • | • | • | • | • |
| HP safety valve | • | • | • | • | N / A | N / A | N / A |
| LP safety valve | • | • | • | • | • | • | • |
| HP air pressure gauge | • | • | • | • | N / A | N / A | N / A |
| LP air pressure gauge | • | • | • | • | • | • | • |
| Oil level sight glass | • | • | • | • | • | • | • |
| Air suction filter | • | • | • | • | • | • | • |
| Intercooler | • | • | • | • | N / A | N / A | N / A |
| Aftercooler | • | • | • | • | • | • | • |
| Thermometer air outlet | • | • | • | • | • | • | • |
| Vibration dampers | • | • | • | • | • | • | • |
| Flexible hoses | • | • | • | • | • | • | • |
| Manual unloader (unloaded running) | N / A | N / A | N / A | N / A | N / A | N / A | N / A |
| Electrical components | | | | | | | |
| Starter panel | • | • | • | • | • | • | • |
| Junction box with internal wiring | • | • | • | • | • | • | • |
| Start/stop pressure transmitter | • | • | • | • | • | • | • |
| Solenoid HP drain/unloaded start device | • | • | • | • | • | • | • |
| Solenoid drain valve LP | N / A | N / A | N / A | N / A | N / A | N / A | N / A |
| Solenoid valve unloaded running (and start) | N / A | N / A | N / A | N / A | N / A | N / A | N / A |
| Other | | | | | | | |
| Manufacturer's test protocol | • | • | • | • | • | • | • |
| Class certificate | • | • | • | • | • | • | • |
| Spares acc. to class/manufacturer's std. | • | • | • | • | • | • | • |



Type HLH/119 is a 2-stage air-cooled manually operated emergency air compressor designed for a maximum operating pressure of 35 bar. The compressor can be supplied separately or fitted to an air bottle, including the necessary pressure gauge and safety valve. The compressor is supplied with classification certificates from most classification societies, if required.

Design particulars

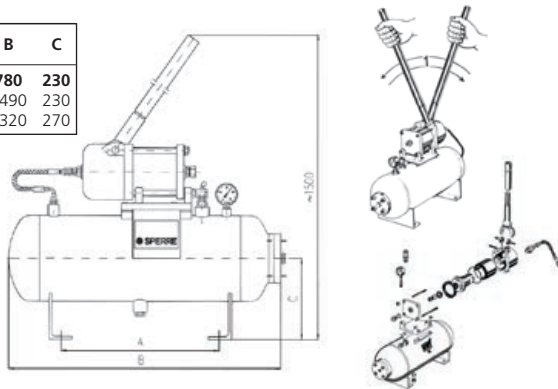
| | |
|----------------------|----------------|
| Stroke volume | 0.9 l |
| LP cylinder diameter | 120 mm |
| HP cylinder diameter | 50 mm |
| Stroke | 80 mm |
| Maximum pressure | 35 bar |
| Air bottle volume | 30, 60 or 90 l |



Operation

The compressor is manually operated by means of a hand lever acting through the journal to impart a dual function to the reciprocating piston. The piston acts as both LP piston and HP cylinder. Through a combined suction filter and LP suction valve, the air is then pumped into the HP cylinder through the HP suction valve on the LP piston. The HP compressed air passes through the HP pressure valve and through the HP pipe to the air bottle.

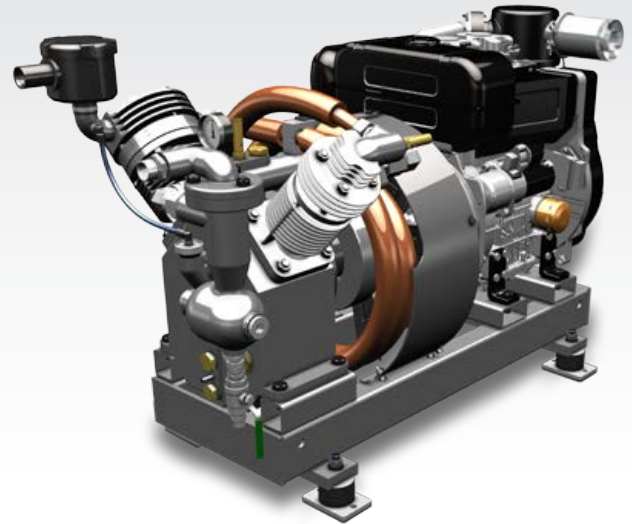
| DIM VOL | A | B | C |
|---------|-----|------|-----|
| 30 | 450 | 780 | 230 |
| 60 | 900 | 1490 | 230 |
| 90 | 870 | 1320 | 270 |




Emergency compressors



Hand operated and diesel driven models



The **HL2/77A-105A** and **HLF2/77** can be delivered as diesel driven versions for emergency use. Crankstart available for HL2/77A-105A and HLF2/77. Battery start available for all models.

| | 30 BAR | | | | |
|--|----------|----------|----------|----------|----|
| | 50 HZ | | 60 HZ | | |
| | 1000 RPM | 1500 RPM | 1200 RPM | 1800 RPM | |
|  | HLF2/77 | 7 | 11 | 9 | 13 |
| | HL2/77A | 18 | 26 | 21 | 32 |
| | HL2/90A | 24 | 35 | 28 | 40 |
| | HL2/105A | 30 | 45 | 37 | 55 |

All capacities are charging capacity in m³/h. Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%. Table subject to change. Check www.sperre.com/range for updates.

Sperre Compressors

Performance Through Superior Technology



Air-cooled

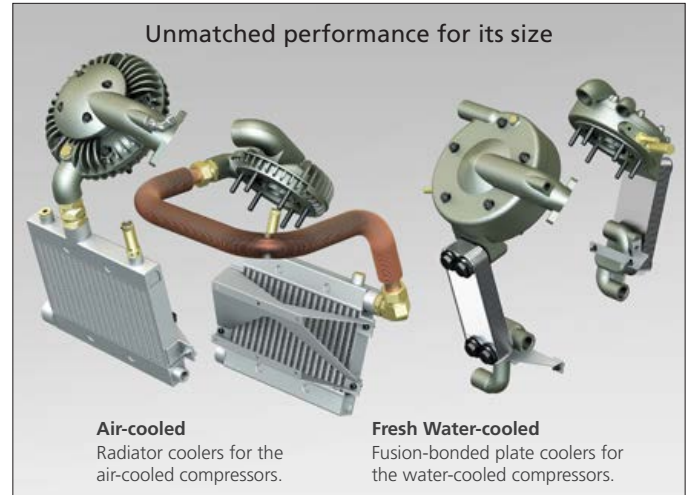
The Sperre X-range compressor offers a number of innovative and improved features. In short, the X-range brings the field of specialized compressors a great step forward to a new level of efficiency. That means considerable savings throughout the lifetime of your compressor system.

- One platform for water-cooled and air-cooled compressors sharpen our competitive edge
- Only 10% different parts from air- to water-cooled compressors
- Modularization and multifunctional components
- 50% less installation time (approx.)
- Safe and green
- Less weight, 25% for air cooled, 40% for water cooled
- Fewer wear parts, more reliable, less maintenance and service
- Lower average operational costs

One common platform



Fresh water-cooled



Unmatched performance for its size

Air-cooled
Radiator coolers for the air-cooled compressors.

Fresh Water-cooled
Fusion-bonded plate coolers for the water-cooled compressors.

The X-Range Compressor Air-Cooled Range

With seven models the air-cooled X-range series covers the capacities from 60 to 275m³/h.

- Modularization and fewer parts
- Only 10% different parts from air- to water-cooled
- 25% less weight – a major step for air-cooled
- Fully enclosed structure, safe and green
- X-control – a new level of compressor control



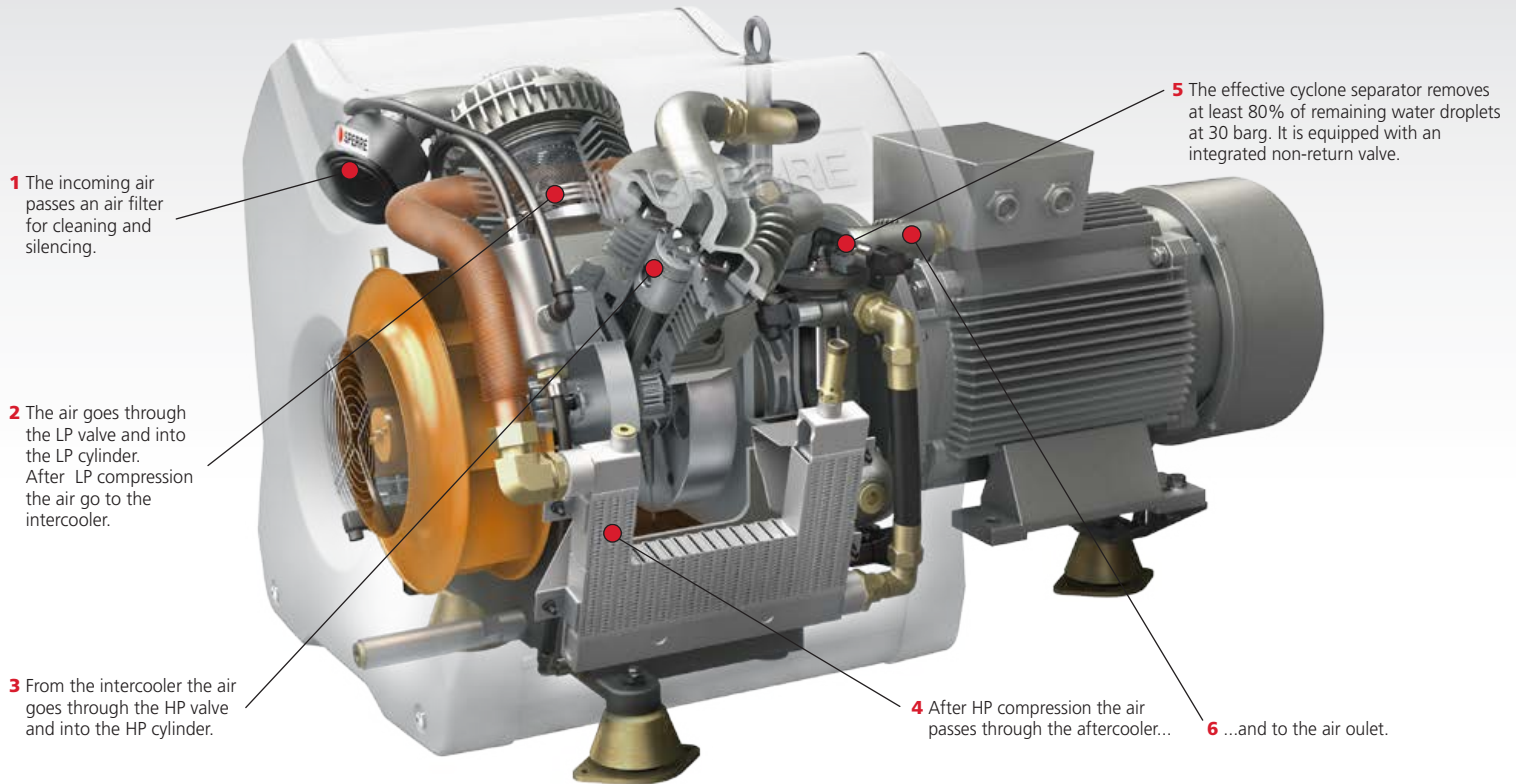
| 30 BAR | | | |
|--------|-------------------|-------------------|-----|
| | 50 Hz 1500 RPM | 60 Hz 1800 RPM | |
| | XA060 | 60 | 70 |
| | XA090 | 85 | 100 |
| | XA120 | 115 | 135 |
| | XA150 | 140 | 165 |
| | XA180 | 152 | 180 |
| | XA200 | 185 | 220 |
| | XA250 | 230 | 275 |

Table subject to change. Check our website www.sperre.com/range for updates.



Air-cooled
Radiator coolers for the
air-cooled compressors.

The X-Range Compressor The Principles Of Air-Cooled



1 The incoming air passes an air filter for cleaning and silencing.

2 The air goes through the LP valve and into the LP cylinder. After LP compression the air goes to the intercooler.

3 From the intercooler the air goes through the HP valve and into the HP cylinder.

4 After HP compression the air passes through the aftercooler...

5 The effective cyclone separator removes at least 80% of remaining water droplets at 30 barg. It is equipped with an integrated non-return valve.

6 ...and to the air outlet.

Pistons and piston rings: Both pistons are made from an aluminium alloy. The compression and oil scraper rings are both made of high-grade cast iron.

Both valves are high-efficiency, easy to dismantle and check.

The cooling fan and the high efficiency coolers provide ample cooling to the compressor.

HP and LP cylinders are made of cast iron. The cylinder heads are also made of cast iron

The **crankshaft** and connecting rods are made of nodular iron. Counterweights are integrated in the crankshaft. The crank and gudgeon bearings are needle bearings.



The X-Range Compressor

XA060, XA090



| Technical Data | | air-cooled | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h |
| 7-10 BAR | | | | | | |
| XA060 | 1475 | 50 | 65 | 10,0 | 7 738 | 3.100 |
| XA060 | 1775 | 60 | 80 | 12,0 | 9 458 | 3.700 |
| XA090 | 1475 | 50 | 90 | 13,0 | 9 458 | 3.100 |
| XA090 | 1775 | 60 | 105 | 15,0 | 11 177 | 3:700 |
| 30 BAR | | | | | | |
| XA060 | 1475 | 50 | 60 | 13,0 | 10 315 | 3.100 |
| XA060 | 1775 | 60 | 70 | 15,0 | 12 034 | 3.700 |
| XA090 | 1475 | 50 | 85 | 17,0 | 13 753 | 3.100 |
| XA090 | 1775 | 60 | 100 | 20,0 | 16 332 | 3:700 |

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Air cooled |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

Lubrication

| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 8 liters |
| Lubrication system | Splash |

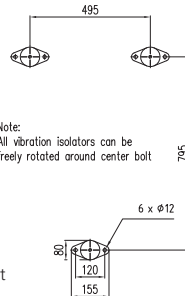
Operation Parameters

| | |
|-----------------------------------|---|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 25°C above ambient |
| Max. noise level | 95 dBA |
| Max. vibration level | 15 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Rotation | Counterclockwise (looking at compressor front) |

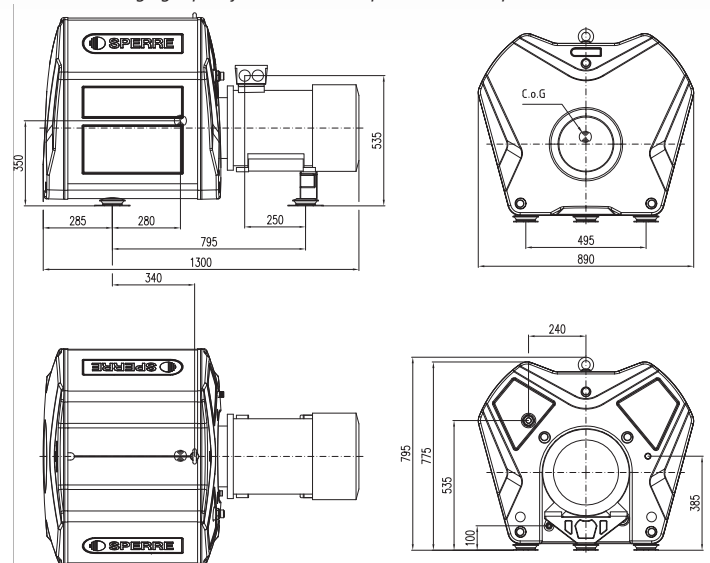
Weight (compressor/motor)

XA060 412 kg, XA090 470 kg

Footprint



Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.





The X-Range Compressor



XA120, XA150, XA180

| Technical Data | | air-cooled | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h |
| 7-10 BAR | | | | | | |
| XA120 | 1475 | 50 | 120 | 16,0 | 12 897 | 4.600 |
| XA120 | 1775 | 60 | 145 | 19,0 | 15 477 | 5.500 |
| XA150 | 1475 | 50 | 140 | 21,0 | 17 196 | 4.600 |
| XA150 | 1775 | 60 | 170 | 26,0 | 21 496 | 5.500 |
| XA180 | 1475 | 50 | 160 | 26,00 | 21 496 | 4.600 |
| XA180 | 1775 | 60 | 185 | 30,00 | 24 935 | 5.500 |
| 30 BAR | | | | | | |
| XA120 | 1475 | 50 | 115 | 23,0 | 19 911 | 4.600 |
| XA120 | 1775 | 60 | 135 | 27,0 | 22 349 | 5.500 |
| XA150 | 1475 | 50 | 140 | 27,0 | 22 300 | 4.600 |
| XA150 | 1775 | 60 | 165 | 33,0 | 26 650 | 5.500 |
| XA180 | 1475 | 50 | 152 | 32,00 | 25 795 | 4.600 |
| XA180 | 1775 | 60 | 180 | 38,00 | 30 094 | 5.500 |

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Air cooled |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

Lubrication

| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 11 liters |
| Lubrication system | Pressure |

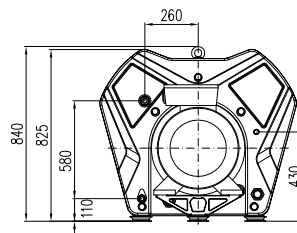
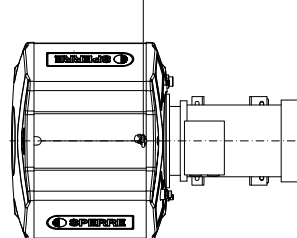
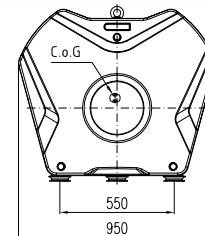
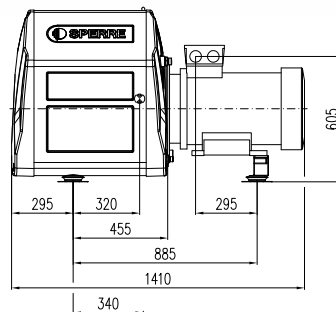
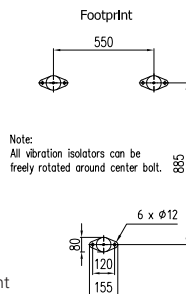
Operation Parameters

| | |
|-----------------------------------|---|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 25°C above ambient |
| Max. noise level | 95 dBA |
| Max. vibration level | 20 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor)

XA120-150 570 kg, XA180 613 kg

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.





The X-Range Compressor



XA200

| Technical Data | | air-cooled | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h |
| 7-10 BAR | | | | | | |
| XA200 | 1475 | 50 | 190 | 30,0 | 23 215 | 11.000 |
| XA200 | 1775 | 60 | 225 | 35,0 | 27 085 | 13.000 |
| 30 BAR | | | | | | |
| XA200 | 1475 | 50 | 185 | 38,0 | 29 406 | 11.000 |
| XA200 | 1775 | 60 | 220 | 44,0 | 33 705 | 13.000 |

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Air cooled |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

Lubrication

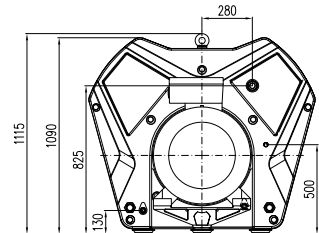
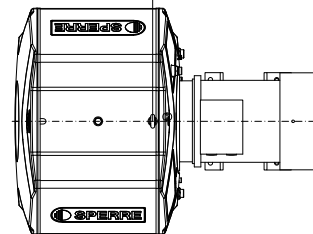
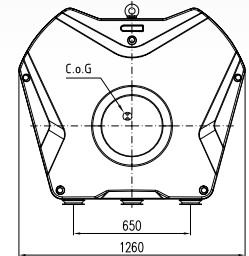
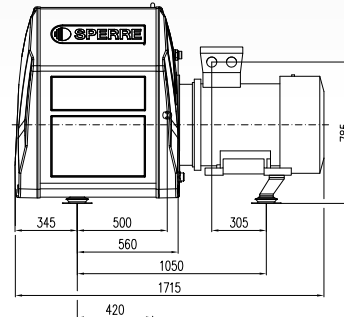
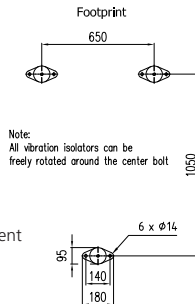
| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 23 liters |
| Lubrication system | Pressure |

Operation Parameters

| | |
|-----------------------------------|---|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 25°C above ambient |
| Max. noise level | 98 dBA |
| Max. vibration level | 30 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor) 925 kg

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.





The X-Range Compressor



XA250

| Technical Data | | air-cooled | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h |
| 7-10 BAR | | | | | | |
| XA250 | 1475 | 50 | 235 | 36,0 | 27 514 | 11.000 |
| XA250 | 1775 | 60 | 280 | 42,0 | 33 533 | 13.000 |
| 30 BAR | | | | | | |
| XA250 | 1475 | 50 | 230 | 46,0 | 37 822 | 11.000 |
| XA250 | 1775 | 60 | 275 | 54,0 | 43 839 | 13.000 |

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Air cooled |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

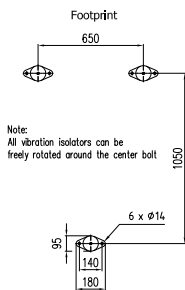
Lubrication

| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 23 liters |
| Lubrication system | Pressure |

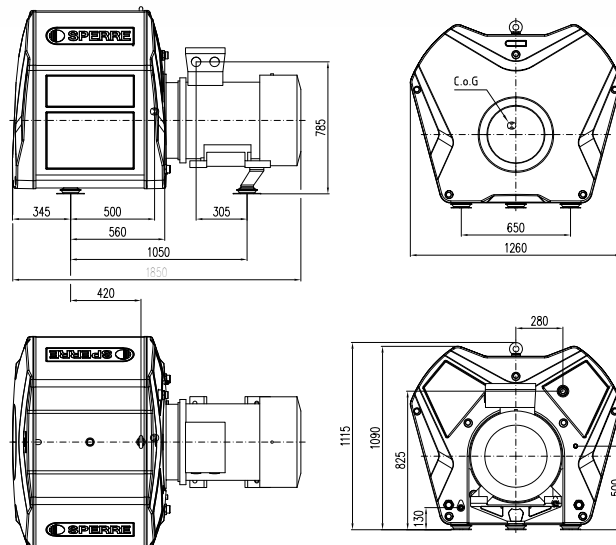
Operation Parameters

| | |
|-----------------------------------|---|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 25°C above ambient |
| Max. noise level | 98 dBA |
| Max. vibration level | 30 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor) 1156 kg



Note:
All vibration isolators can be
freely rotated around the center bolt



Fresh Water-Cooled Compressors



X-range Fresh Water-Cooled range

With ten models the water-cooled X-range series covers the capacities from 60 to 470m³/h.

- Modularization and fewer parts
- Only 10% different parts from water-cooled to air-cooled
- 40% less weight – a quantum leap for air-cooled
- Fully enclosed structure, safe and green
- X-control – a new level of compressor control




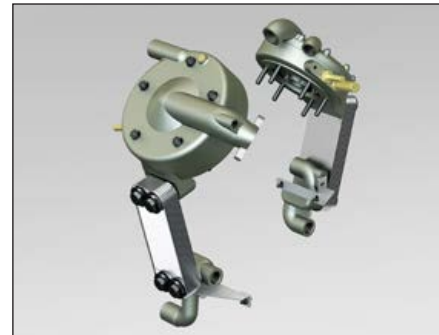
| 30 BAR | | | |
|--|-------------------|-------------------|-----|
| | 50 Hz 1500 RPM | 60 Hz 1800 RPM | |
|  | XW060 | 60 | 70 |
| | XW090 | 85 | 100 |
| | XW120 | 115 | 135 |
| | XW150 | 140 | 165 |
| | XW180 | 152 | 180 |
| | XW200 | 185 | 220 |
| | XW250 | 230 | 275 |
| | XW300 | 270 | 330 |
| | XW350 | 360 | 420 |
| | XW400 | 400 | 470 |

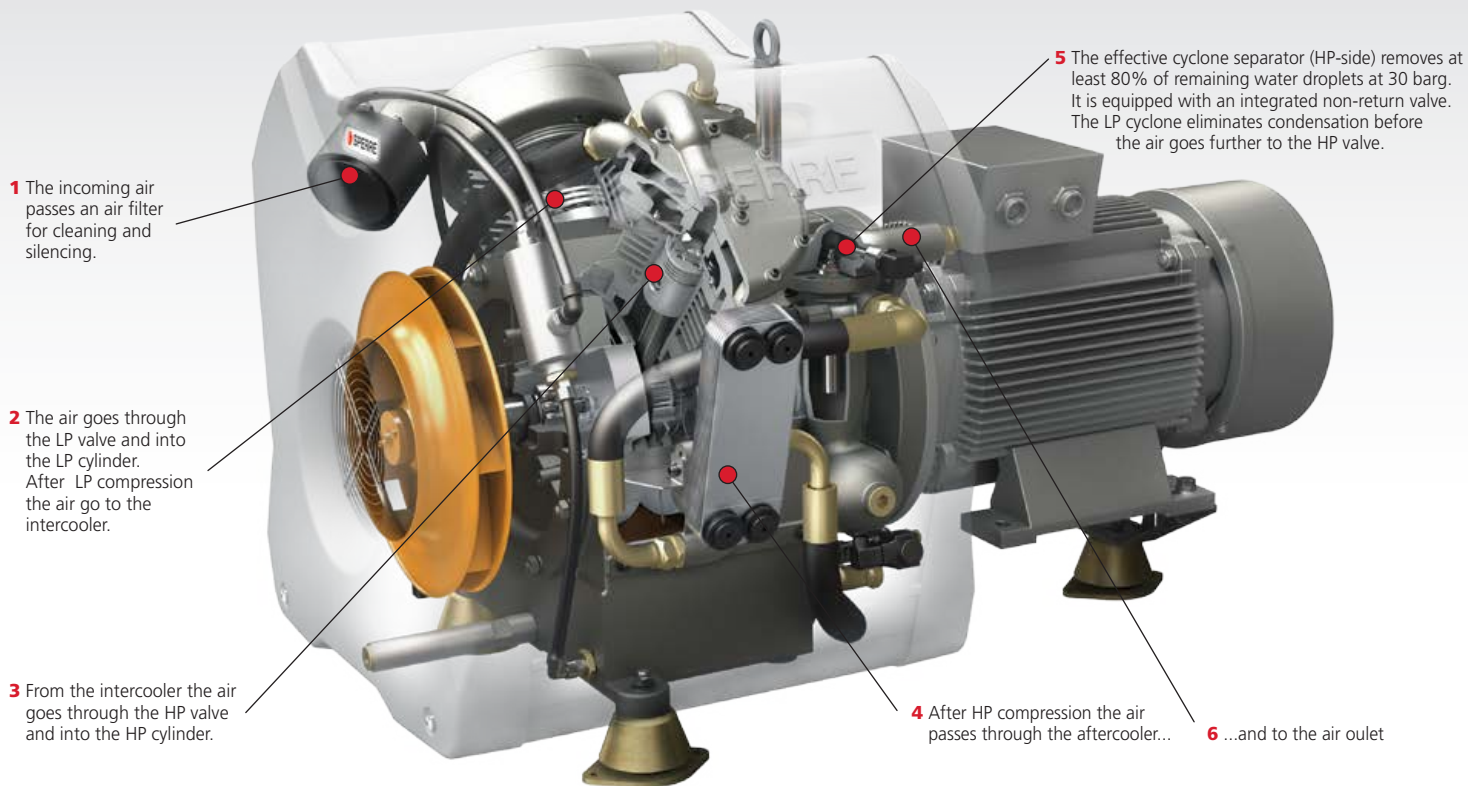
Table subject to change. Check our website www.sperre.com/range for updates.



Fresh Water-Cooled
Fusion-bonded plate coolers for the water-cooled compressors.

The X-Range Compressor

The Principles of Fresh Water-Cooled



Pistons and piston rings: Both pistons are made from an aluminium alloy. The compression and oil scraper rings are both made of high-grade cast iron.

Both valves are high-efficiency, easy to dismantle and check.

The cooling fan and the high efficiency coolers provide ample cooling to the compressor.

HP and LP cylinders are made of cast iron. The cylinder heads are also made of cast iron

The **crankshaft** and connecting rods are made of nodular iron. Counterweights are integrated in the crankshaft. The crank and gudgeon bearings are needle bearings.



The X-Range Compressor



XW060, XW090

| Technical Data | | water-cooled | | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|---------------------------------|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h | Cooling water requirement l/min |
| 7-10 BAR | | | | | | | |
| XW060 | 1475 | 50 | 65 | 10,0 | 7 738 | 1.200 | 25 |
| XW060 | 1775 | 60 | 80 | 12,0 | 9 458 | 1.400 | 30 |
| XW090 | 1475 | 50 | 90 | 13,0 | 9 458 | 1.200 | 25 |
| XW090 | 1775 | 60 | 105 | 15,0 | 11 332 | 1.400 | 30 |
| 30 BAR | | | | | | | |
| XW060 | 1475 | 50 | 60 | 13,0 | 10 315 | 1.200 | 25 |
| XW060 | 1775 | 60 | 70 | 15,0 | 12 034 | 1.400 | 30 |
| XW090 | 1475 | 50 | 85 | 17,0 | 13 753 | 1.200 | 25 |
| XW090 | 1775 | 60 | 100 | 20,0 | 16 332 | 1.400 | 30 |

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Fresh water |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

Lubrication

| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 8 liters |
| Lubrication system | Splash |

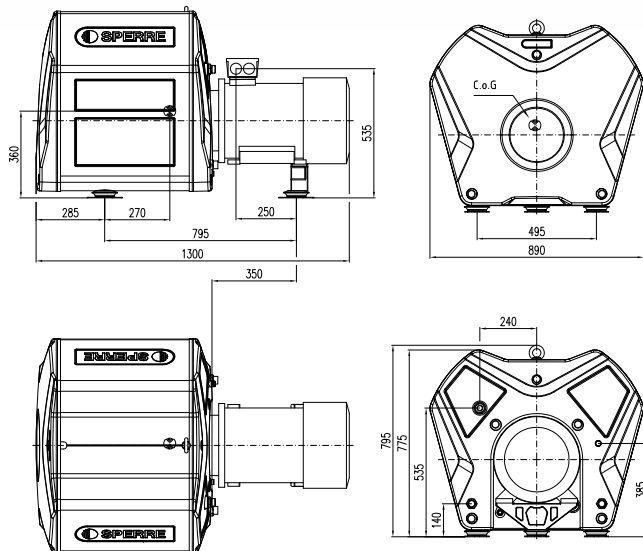
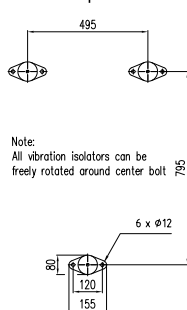
Operation Parameters

| | |
|-----------------------------------|--|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 10-15°C above CW inlet temp. |
| Max. noise level | 95 dBA |
| Max. vibration level | 15 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Safety valve cooling water | 6 barg |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor) XW060 437 kg, XW090 504 kg

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.

Footprint





The X-Range Compressor



XW120, XW150, XW180

| Technical Data | | water-cooled | | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|---------------------------------|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h | Cooling water requirement l/min |
| 7-10 BAR | | | | | | | |
| XW120 | 1475 | 50 | 120 | 16,0 | 12 897 | 2.000 | 40 |
| XW120 | 1775 | 60 | 145 | 19,0 | 15 477 | 2.400 | 50 |
| XW150 | 1475 | 50 | 140 | 21,0 | 17 196 | 2.000 | 40 |
| XW150 | 1775 | 60 | 170 | 26,0 | 21 496 | 2.400 | 50 |
| XW180 | 1475 | 50 | 160 | 26,0 | 21 496 | 2.000 | 40 |
| XW180 | 1775 | 60 | 185 | 30,0 | 24 935 | 2.400 | 50 |
| 30 BAR | | | | | | | |
| XW120 | 1475 | 50 | 115 | 23,0 | 18 911 | 2.000 | 40 |
| XW120 | 1775 | 60 | 135 | 27,0 | 22 349 | 2.400 | 50 |
| XW150 | 1475 | 50 | 140 | 27,0 | 22 300 | 2.000 | 40 |
| XW150 | 1775 | 60 | 165 | 33,0 | 26 650 | 2.400 | 50 |
| XW180 | 1475 | 50 | 152 | 32,0 | 25 795 | 2.000 | 40 |
| XW180 | 1775 | 60 | 180 | 38,0 | 30 094 | 2.400 | 50 |

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Fresh water |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

Lubrication

| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 11 liters |
| Lubrication system | Pressure |

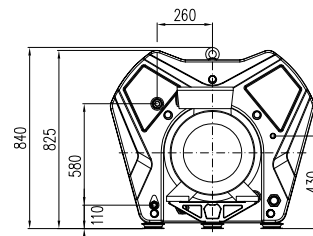
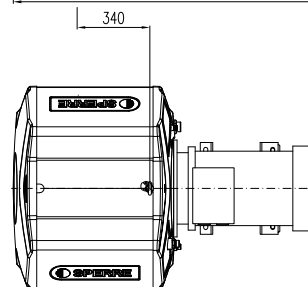
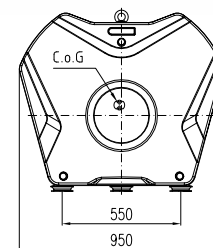
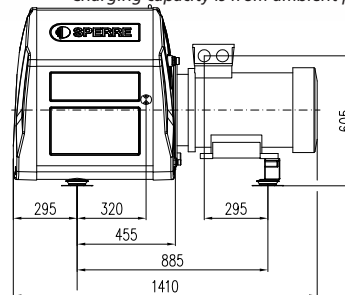
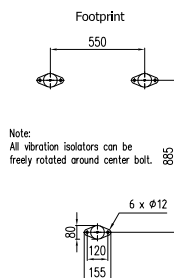
Operation Parameters

| | |
|-----------------------------------|--|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 10-15°C above CW inlet temp. |
| Max. noise level | 95 dBA |
| Max. vibration level | 20 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Safety valve cooling water | 6 barg |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor)

638 kg

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.





The X-Range Compressor

XW200



| Technical Data | | water-cooled | | | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|---------------------------------|--|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h | Cooling water requirement l/min | |
| 7-10 BAR | | | | | | | | |
| XW200 | 1475 | 50 | 190 | 30,0 | 23 215 | 3.600 | 65 | |
| XW200 | 1775 | 60 | 225 | 35,0 | 27 085 | 4.300 | 80 | |
| 30 BAR | | | | | | | | |
| XW200 | 1475 | 50 | 185 | 38,0 | 29 406 | 3.600 | 65 | |
| XW200 | 1775 | 60 | 220 | 44,0 | 33 705 | 4.300 | 80 | |

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Fresh water |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

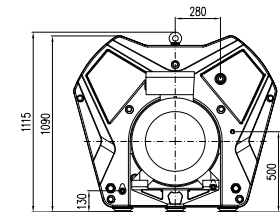
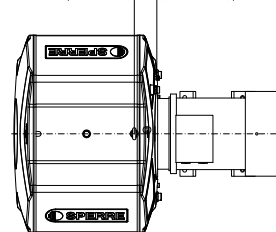
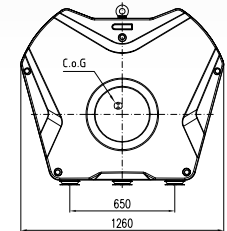
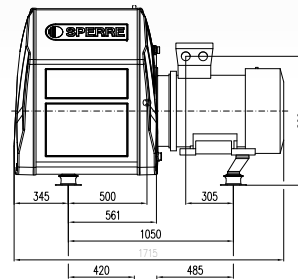
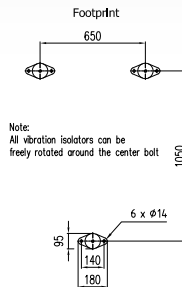
Lubrication

| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 23 liters |
| Lubrication system | Pressure |

Operation Parameters

| | |
|-----------------------------------|--|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 10-15°C above CW inlet temp. |
| Max. noise level | 98 dBA |
| Max. vibration level | 30 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Safety valve cooling water | 6 barg |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor) 975 kg





The X-Range Compressor

XW250, XW300



| Technical Data | | water-cooled | | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|---------------------------------|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h | Cooling water requirement l/min |
| 7-10 BAR | | | | | | | |
| XW250 | 1475 | 50 | 235 | 36,0 | 27 514 | 3.600 | 65 |
| XW250 | 1775 | 60 | 280 | 42,0 | 33 533 | 4.300 | 80 |
| XW300 | 1475 | 50 | 270 | 42,0 | 31 814 | 3.600 | 65 |
| XW300 | 1775 | 60 | 325 | 49,0 | 38 692 | 4.300 | 80 |
| 30 BAR | | | | | | | |
| XW250 | 1475 | 50 | 230 | 46,0 | 37 822 | 3.600 | 65 |
| XW250 | 1775 | 60 | 275 | 54,0 | 43 839 | 4.300 | 80 |
| XW300 | 1475 | 50 | 270 | 53,0 | 42 980 | 3.600 | 65 |
| XW300 | 1775 | 60 | 330 | 62,0 | 50 716 | 4.300 | 80 |

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Fresh water |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

Lubrication

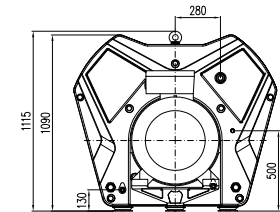
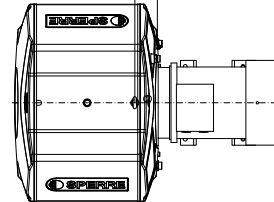
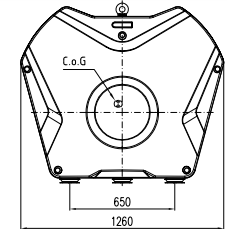
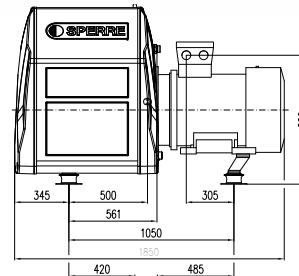
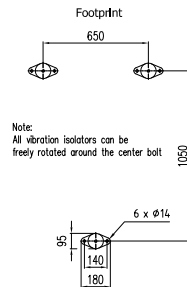
| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 23 liters |
| Lubrication system | Pressure |

Operation Parameters

| | |
|-----------------------------------|--|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 10-15°C above CW inlet temp. |
| Max. noise level | 98 dBA |
| Max. vibration level | 30 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Safety valve cooling water | 6 barg |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor)

XW250 1260 kg, XW300 1266 kg



Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.



The X-Range Compressor



XW350

| Technical Data | | water-cooled | | | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|---------------------------------|--|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h | Cooling water requirement l/min | |
| 7-10 BAR | | | | | | | | |
| XW350 | 1475 | 50 | 365 | 55,0 | 40 412 | 2.200 | 80 | |
| XW350 | 1775 | 60 | 425 | 64,0 | 49 010 | 2.600 | 100 | |
| 30 BAR | | | | | | | | |
| XW350 | 1475 | 50 | 360 | 70,0 | 53 310 | 2.200 | 80 | |
| XW350 | 1775 | 60 | 420 | 82,0 | 62 770 | 2.600 | 100 | |

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Fresh water |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

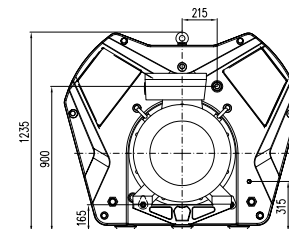
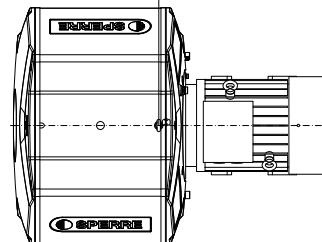
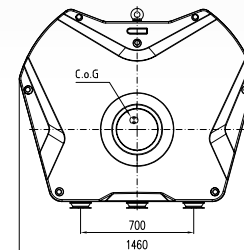
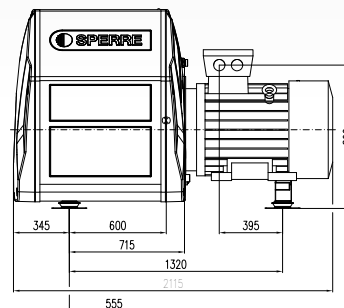
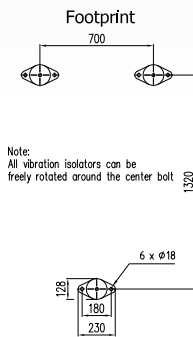
Lubrication

| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 36 liters |
| Lubrication system | Pressure |

Operation Parameters

| | |
|-----------------------------------|---|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 10-15°C above CW inlet temp. |
| Max. noise level | 100 dBA |
| Max. vibration level | 30 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Safety valve cooling water | 6 barg |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor) 1771 kg



Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.



The X-Range Compressor



XW400

| Technical Data | | water-cooled | | | | | |
|------------------|-----------|--------------|-------------------------------------|----------------------|-------------------------|---|---------------------------------|
| Compressor Model | Speed RPM | Frequency Hz | Charging capacity m ³ /h | Power requirement kW | Heat dissipation kCal/h | Cooling air requirement m ³ /h | Cooling water requirement l/min |
| 7-10 BAR | | | | | | | |
| XW400 | 1475 | 50 | 405 | 58,0 | 42 132 | 2.200 | 80 |
| XW400 | 1775 | 60 | 475 | 67,0 | 50 730 | 2.600 | 100 |
| 30 BAR | | | | | | | |
| XW400 | 1475 | 50 | 400 | 75,0 | 58 452 | 2.000 | 80 |
| XW400 | 1775 | 60 | 470 | 87,0 | 68 768 | 2.600 | 100 |

Charging capacity is from ambient pressure to final pressure. Tolerance +/-5%.

Design particulars

Design

| | |
|---------------------------|---------------|
| No. of cylinders | 2 |
| Cylinder arrangement | 90° V |
| No. of compression stages | 2 |
| Cooling | Fresh water |
| Valves LP | 1 Plate valve |
| Valves HP | 1 Reed valve |

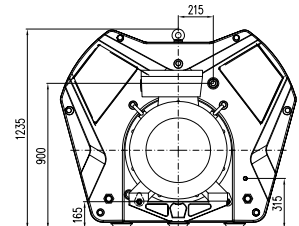
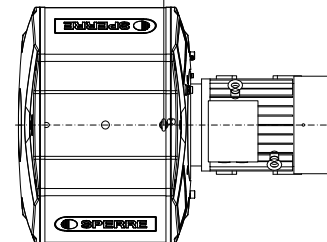
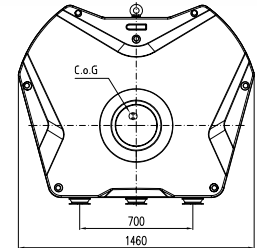
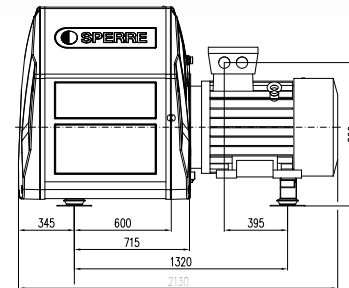
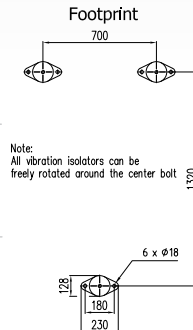
Lubrication

| | |
|--------------------|--------------------------------------|
| Oil type | Synthetic oil (see approved list) |
| Oil volume | 36 liters |
| Lubrication system | Pressure |

Operation Parameters

| | |
|-----------------------------------|---|
| Max. delivery pressure | 30 barg |
| Max. ambient temp. compressor | 55°C |
| Max. ambient temp. controller | 55°C |
| Max. ambient temp. electric motor | 45°C (55°C on request) |
| Outlet air temperature | Approx. 10-15°C above CW inlet temp. |
| Max. noise level | 100 dBA |
| Max. vibration level | 30 mm/s-RMS |
| Min. isolation grade | 90 % |
| Safety valve set point HP | 3 barg above HP |
| Safety valve cooling water | 6 barg |
| Rotation | Counterclockwise (looking at compressor front) |

Weight (compressor/motor) XW400 1781 kg



X-Range Delivery Scope

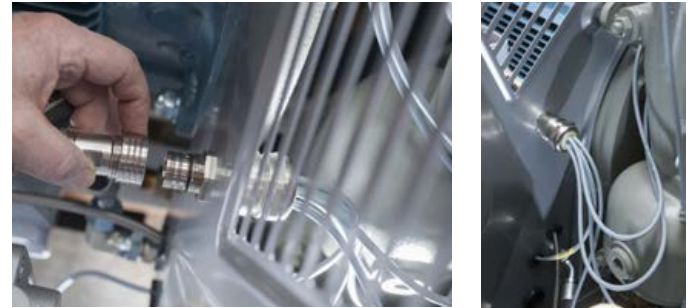


Tailored concepts, all included – great benefits for all

Our highly skilled and experienced engineers develop solutions tailored to the customer's specifications. Our technical experts are the best discussion partners, and put together optimal compressor solutions for your special project.

Leave it all to us. With our modular solutions, we customize and optimize the size and capacity. We build and deliver the equipment as specified, complete with piping, tanks and electrical systems – tested, classified and ready for plug-in installation. The only additional option is the water pump.

- Customized solutions with the right dimensions
- Efficient manufacturing, reduced production costs and installation costs
- Lower initial costs
- A complete, tested delivery with classification and documentation
- Easy installation, no adjustment/adaptation, reduction of about 50% in installation time
- No loose parts; no risk of incorrect installation
- Plug & play: one cable between the compressor and the control panel



The Sperre Plug & Play solution: Information and warnings from up to seven checkpoints inside the X-cover collected in one plug-in cable.



The Z-control provides a complete package of easy to use control and monitoring functions in one standard, configurable unit. Operating, monitoring and logging of high-precision data from one place. The starters are easy to handle for safe operation. Standard paintings are: RAL 7035 and Munsell 7,5 BG 72. Other paints on demand.

| Control Functions | Sperre Compressor Range | | | | |
|---|-------------------------|------------|-----------|--------------|--------------|
| | XAW060-090 | XAW120-300 | XW350-400 | HL2/77A-105A | LL2/77A-105A |
| 7" Touch screen controller | S | S | S | S | S |
| Compressor Auto Start Stop / Standby Control | S | S | S | S | S |
| Lead / follow function for two compressors * | S | S | S | S | S |
| Automatic load sharing / rotation * | S | S | S | S | S |
| Sea / Harbor mode (Eco mode) * | S | S | S | S | S |
| Input for remote start / stop * | S | S | S | S | S |
| Input for remote load source * | S | S | S | S | S |
| Voltage Free Remote Common Alarm Dig. Output | S | S | S | S | S |
| Voltage Free Remote Common Shutdown Dig. Output | S | S | S | S | S |
| Auto Restart After Power Blackout | S | S | S | S | S |
| Anti Condensation Heating Element Motor | O | O | O | O | O |
| PTC - Thermistor Control (3 in series type) | S | S | S | S | S |
| Modbus TCP communication for remote monitoring ** | S | S | S | S | S |
| Main Isolation Switch with door handle interlock | S | S | S | S | S |
| Main Isolation Switch for two power supply sources | O | O | O | O | O |
| DOL Start Contactor & Thermal overload relay | S | S | X | S | S |
| Soft starter with electronic overcurrent protection | O | O | S | O | O |
| Hour Counter & Service notification | S | S | S | S | S |
| 1 ph. Motor Current A-meter | S | S | S | S | S |
| Oil Pressure Lubrication Pump Control | X | X | S | X | X |
| Local Emergency stop switch | S | S | S | S | S |
| Prepared for remote Emergency stop signal | S | S | S | S | S |
| Emergency Stop Button Protection | S | S | S | S | S |
| Cooling Water Pump Control | O | O | O | X | X |
| Cooling Water Valve Control | S | S | S | X | X |
| Unload / Drain Valve Control | S | S | S | S | S |
| Ventilation Fan with Thermostat Control *** | O | O | O | O | O |
| Receiver Pressure Monitoring and Alarm | S | S | S | S | S |
| Compressor Low Pressure Alarm and Shutdown | S | S | S | X | X |
| Compressor High Pressure Alarm and Shutdown | S | S | S | X | X |
| Compressor High Pressure Air Temperature Alarm and Shutdown | S | S | S | S | S |
| Compressor Oil Level Alarm and Shutdown | S | X | X | S | S |
| Compressor Oil Pressure Alarm and Shutdown | X | S | S | X | X |
| Door Stop | S | S | S | S | S |
| Junction Box on compressor | X | X | X | O | O |
| Heating Element inside panel | O | O | O | O | O |

Masters Of Packages

Have you ever stopped to add up the real costs of installing a compressor? After the engineering, you have to tackle the fitting: the nuts and bolts, the piping, the assembly, the electrical wiring, and the steelwork. Your purchasing staff have the task of making sure every item is in stock exactly when you need it. You need space to do the job as well as space to store the parts. Then every aspect of the system must be tested and retested... all under relentless deadline pressure.

Why not leave it all to Sperre? We have the facilities and expertise dedicated to putting compressors together.

We can deliver a complete compressor package – tested, classified and ready to commission.

You eliminate the risk of incorrect assembly and benefit from substantial savings in installation hours.





Sperre supplies air receivers according to standard drawings, in sizes from 30 to 3000 litres. The working pressure ranges from 7 to 30 bar.

We also supply receivers manufactured to customer specifications. The company has supplied special high-pressure receivers to seismic ships and offshore installations, where the working pressure has been up to 300 bar.

Certification

All our welders are certified in compliance with NS-EN 287. The company produces pressure vessels approved by the national and international classification societies, and holds the necessary approvals.

Air receivers in accordance with DNV, LRS, BV, and RINA are type approved.

Other design codes on request.

Surface Preparation

Standard paint system:

Inside: Sandblasting acc. to SA 2.5 SIS 05 5900
INTERPRIME CPA 099 (Red)

Outside: Sandblasting acc. to SA 2.5 SIS 05 5900
Coating with primer and Alcyd top coat

Other paint systems on request.

Air Receivers Verticle and Horizontal

| Technical Data - Vertical | | | | |
|---------------------------|-----------|-------------|------------------|------------------|
| Volume m ³ | Length mm | Diameter mm | Weight kg 10 BAR | Weight kg 30 BAR |
| 0.100 | 1110 | 406 | 110 | 110 |
| 0.150 | 1530 | 406 | 150 | 150 |
| 0.200 | 1620 | 450 | 160 | 160 |
| 0.250 | 1590 | 508 | 180 | 180 |
| 0.300 | 1860 | 508 | 200 | 200 |
| 0.400 | 2060 | 550 | 190 | 230 |
| 0.500 | 2510 | 550 | 220 | 290 |
| 0.600 | 2210 | 650 | 235 | 310 |
| 0.800 | 2520 | 700 | 280 | 460 |
| 1.000 | 2430 | 800 | 310 | 550 |
| 1.500 | 2590 | 950 | 520 | 770 |
| 2.000 | 2270 | 1200 | 590 | 1100 |
| 3.000 | 3200 | 1200 | 700 | 1600 |

| Technical Data - Horizontal | | | | |
|-----------------------------|-----------|-------------|------------------|------------------|
| Volume m ³ | Length mm | Diameter mm | Weight kg 10 BAR | Weight kg 30 BAR |
| 0.100 | 930 | 406 | 110 | 110 |
| 0.150 | 1350 | 406 | 150 | 150 |
| 0.200 | 1440 | 450 | 120 | 160 |
| 0.250 | 1410 | 508 | 180 | 180 |
| 0.300 | 1680 | 508 | 200 | 200 |
| 0.400 | 1890 | 550 | 190 | 230 |
| 0.500 | 2340 | 550 | 220 | 290 |
| 0.600 | 2030 | 650 | 235 | 310 |
| 0.800 | 2340 | 700 | 280 | 460 |
| 1.000 | 2250 | 800 | 310 | 550 |
| 1.500 | 2410 | 950 | 520 | 770 |
| 2.000 | 2090 | 1200 | 590 | 1100 |
| 3.000 | 3020 | 1200 | 700 | 1600 |

The standard supply includes

- Inlet valve
- Outlet valve
- Drain valve
- Safety valve
- Pressure gauge with root cock
- Lifting lugs
- Name plate
- Inspection opening(s)
- Supporting legs

Our standard is BSP threaded valves, but flanged valves can be supplied on request.





Fully equipped turn-key containers

Sperre containerized solutions are developed as result of a need in the market for turn-key solutions. We deliver containers tailor-made to your capacity needs - a complete package tested and ready to use. The Sperre turn-key containers are well suited for operation at land based installations.

Standard container configuration:

- 20 or 40 feet container
- Compressors
- Receivers
- Dryers
- Filtering system
- Reduction stations
- Complete piping and wiring
- Local starters
- Service door
- Lighting fixtures
- Ventilation system
- Fire extinguisher
- Single point inlet power supply
- Compliance with national standards
- Painting and marking acc. to customer requirement
- As built factory tested acc. to Sperre standard



For high pressure systems

Sperre booster compressors are based on our renowned Classic compressors and developed for high pressure system as a plug and play solution.

- Delivery pressure 10-40 bar
- Inlet pressure 4-8 bar
- Tailor-made skid solution
- Can be delivered with filter package and cooler
- Plug and play solution

Typical applications

- N²
- Inert gas
- Air

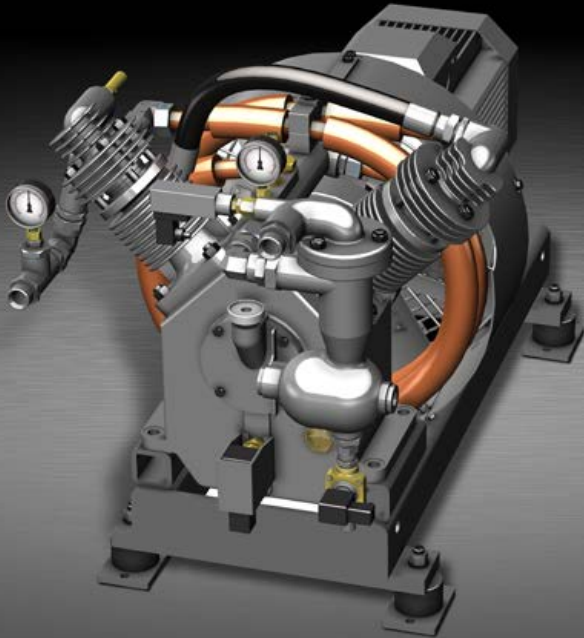
| 40 BAR | | | |
|------------|---------|----------|--|
| 60 Hz | | | |
| Air-cooled | 900 RPM | 1200 RPM | |
| HH2/50 | 120* | 165* | |
| HH2/77 | 312* | 390* | |

**FAD capacity at 6 barg inlet pressure. For different speed, inlet- or outlet pressure please contact Sperre.*

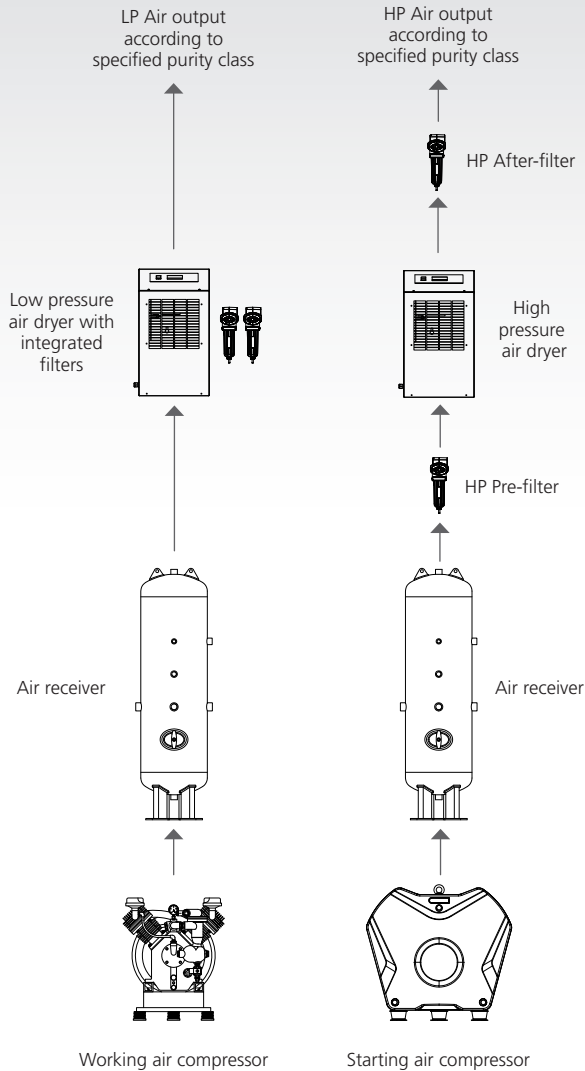
All capacities in m³/h FAD. Tolerance +/-5%. Table subject to change. Check www.sperre.com/range for updates.



Skid mounted booster compressor with filter package and coolers.



Configuration example



Air dryers and filters



Sperre Air Dryers and Filter systems

In partnership with other suppliers Sperre can deliver complete packages for all compressed air solutions needed on board. With long expertise, strong engineering skills and unrivalled understanding of the marine market, Sperre is capable of designing solutions that are customized to each customer's specific needs.

We can deliver filters and dryers to obtain all purity classes acc. to ISO 8573-1:2010 for both low- and high pressure systems.

In our air dryer product range we have refrigerated-, adsorption- and membrane dryers.



Approved

Sperre products are approved by the classification societies.

Sperre management system is certified in compliance to latest ISO 9001, ISO 14001 and OHSAS 18001.

The system is further approved by the majority of classification members in IACS as a basis for manufacturing survey arrangements.



Contents

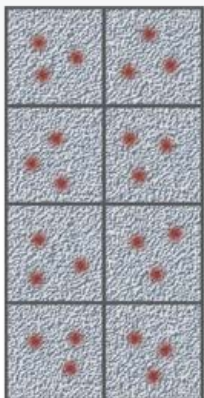
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General Information

Oil-Free Air / Installation

Proper filtration is the only way to obtain oil-free air

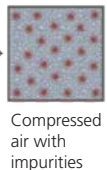
A compressor installed on-board a ship will compress the ambient air, which normally contains impurities up to 1 mg/m³ of oil. Due to the large oil content in suction air, proper filtration should always be installed downstream to ensure the quality of the air.



Suction air with impurities



Compressor



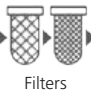
Compressed air with impurities



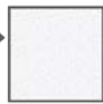
Filter



Dryer



Filters



Technical oil-free compressed air

An oil-lubricated compressor with proper filtration can easily achieve **oil-free air** of the highest purity class under ISO 8573.1.

An **oil-free** compressor without filtration of the compressed air **cannot** achieve this.

To determine the total economy of an oil-free compressor versus an oil-lubricated compressor, consider the following:

Investment costs

Considerably lower for an oil-lubricated compressor.

Overhaul intervals

Considerably longer for an oil-lubricated compressor.

Service

Considerably simpler and easier for an oil-lubricated compressor.

Reliability

The reliability of oil-lubricated Sperre compressors is well-established. Reliability is particularly high for those high ambient temperatures in which an oil-free compressor suffers.

Recommended installation instrument air compressors



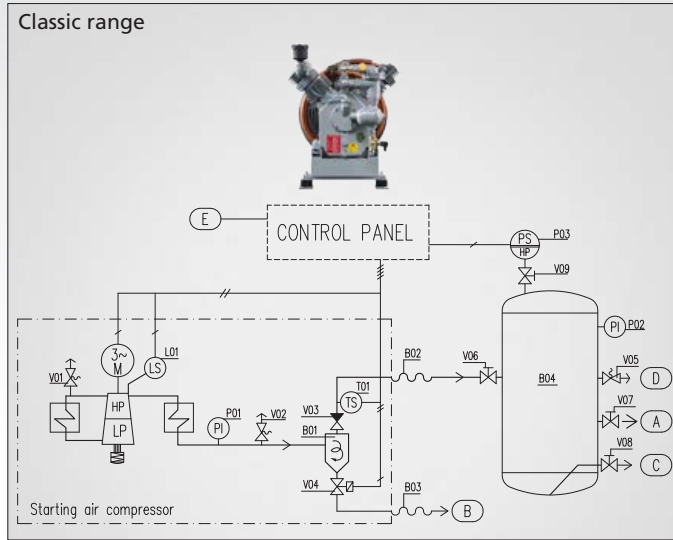
Every compressor unit is supplied complete with drawings and specifications showing its dimensions and attachment points. The customer also receives installation instructions giving recommendations for the installation of equipment and piping.

To ensure trouble-free operation, it is important that the foundation is well stiffened and free from vibrations from other installed machinery.

The compressor should be installed in a location where the air is not too hot. Normally, the ambient temperature for electrical equipment should not exceed 45°C. For air-cooled compressors, a well-dimensioned fresh air duct must be provided to the location where the compressor is to be installed.

Other equipment should not be installed around the compressor unit in a way that might hamper inspection and maintenance.

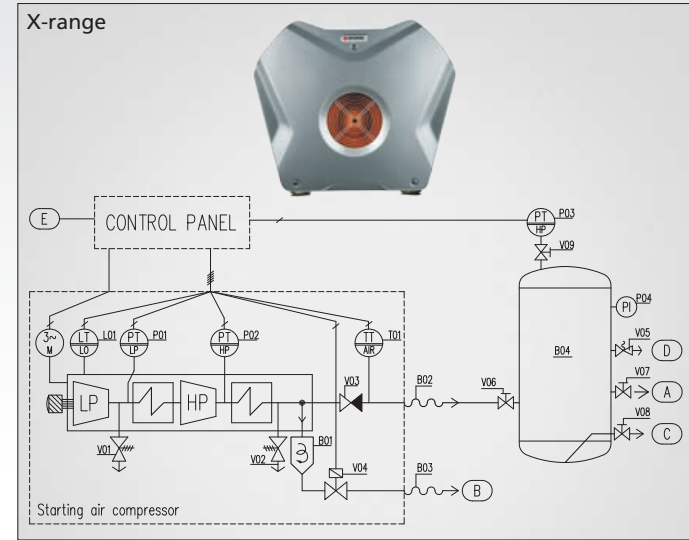
Installation



- B01 = Oil and water separator
 B02 = Flexible hose
 B03 = Flexible hose
 B04 = Air receiver
 LO1 = Oil level switch
 P01 = Pressure gauge, 0 - 60 bar
 P02 = Pressure gauge, air receiver
 P03 = Pressure switch, air receiver
 T01 = Temperature switch
 V01 = Safety valve, L.P.
 V02 = Safety valve, H.P.
 V03 = Non-return valve, air
 V04 = Sol. drain / unloading valve
 V05 = Safety valve, air receiver
 V06 = Stop valve, air to receiver
 V07 = Stop valve, air from receiver
 V08 = Stop valve, drain - receiver
 V09 = Stop valve, press. switch

○ LOCAL DEVICE OR GAUGE

| Connection | |
|------------|---------------------------|
| A | Starting air from bottle |
| B | Drain outlet - compressor |
| C | Drain outlet - receiver |
| D | Safety valve outlet |
| E | Main power supply |



- B01 = Oil and water separator
 B02 = Flexible hose
 B03 = Flexible hose
 B04 = Air receiver
 LO1 = Level / press transmitter, lub. oil
 P01 = Pressure transmitter, L.P.
 P02 = Pressure transmitter, H.P.
 P03 = Pressure transmitter, air receiver
 P04 = Pressure gauge, air receiver
 T01 = Temperature transmitter, air
 V01 = Safety valve, L.P.
 V02 = Safety valve, H.P.
 V03 = Non-return valve, air
 V04 = Sol. drain valve, compressor
 V05 = Safety valve, receiver
 V06 = Stop valve, air to receiver
 V07 = Stop valve, air from receiver
 V08 = Stop valve, drain - receiver
 V09 = Stop valve, transmitter

○ LOCAL DEVICE OR GAUGE

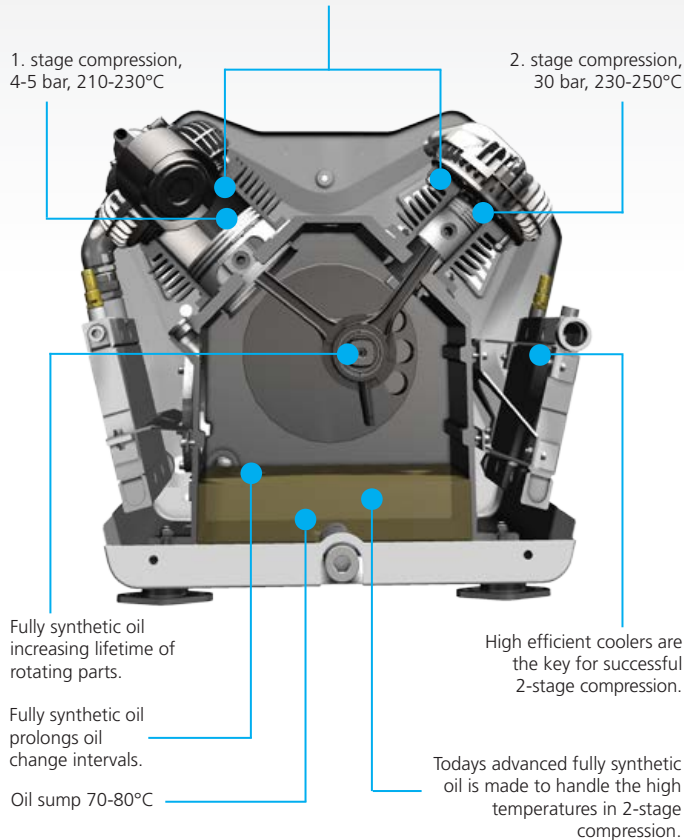
| Connection | |
|------------|---------------------------|
| A | Starting air from bottle |
| B | Drain outlet - compressor |
| C | Drain outlet - receiver |
| D | Safety valve outlet |
| E | Main power supply |

Why are Sperre using 2-stage compression?

For more than 75 years, we have developed our compressors in close collaboration with the most demanding customers around the world. Through evaluation and research, both on 2-stage and 3-stage technology, our conclusion is that 2-stage compressors gives a more reliable operation with less maintenance cost. Today there are approx. 36.000 Sperre compressors in operation world-wide.

Sperre 2-stage technology

With the best cooling efficiency in the market and fully synthetic oil there are no risk of oil cracking. Fully synthetic oil is formulated with an advanced base oil which ensures exceptional resistance to oxidation and thermal degradation.
Flash Point at 270°C (ASTM D 92).



General Information



Piston Speed



| Piston speed | | | |
|--------------------------|-------------|---------------------------|---------------------------|
| Frequency | | 50 Hz | 60 Hz |
| Nominal speed (rpm) | | 1450 | 1750 |
| Compressor Classic range | Stroke (mm) | Piston Speed (mean) [m/s] | Piston Speed (mean) [m/s] |
| HLF2/77 | 40 | 1,9 | 2,3 |
| HL2/77A-90A-105A | 80 | 3,9 | 4,7 |

| Piston speed | | | |
|--------------------|-------------|-------------|--------------------|
| Compressor X-range | Stroke (mm) | Speed (rpm) | Piston speed (m/s) |
| XAW060 - 090 | 100 | 1750 | 5,8 |
| XAW120 - 180 | 100 | 1750 | 5,8 |
| XA200 - 250 | 110 | 1750 | 6,4 |
| XW200 - 300 | 110 | 1750 | 6,4 |
| XW350 - 400 | 120 | 1750 | 7,0 |
| XAW060 - 090 | 100 | 1450 | 4,8 |
| XAW120 - 150 | 100 | 1450 | 4,8 |
| XA200 - 250 | 110 | 1450 | 5,3 |
| XW200 - 300 | 110 | 1450 | 5,3 |
| XW350 - 400 | 120 | 1450 | 5,8 |



Oil consumption

The compressors oil consumption is determined by size and RPM, but will vary with different running cycles and ambient temperatures.

Normal oil consumption pr running hour

- Compressor capacity: 10-50 m³/h 0,01-0,02 liters
- Compressor capacity: 50-150 m³/h 0,02-0,04 liters
- Compressor capacity: 150-450 m³/h 0,04-0,08 liters

A new compressor can consume more oil than a compressor broken in. The compressors breaking in time can vary from compressor to compressor and is dependent on several factors.

With abnormal high oil consumption we recommend checking the following:

- Cylinder and piston ring wear, form and dimensions.
- Check that the piston rings run free in their grooves.
- Check the cylinder walls for scoring marks or scratches, as this can result in higher oil consumption due to higher back flow into the crank case.
- Check the oil level.

General Information Lubricants

Tips for safe and reliable operation

Just a little attention to maintaining your compressor will keep it running smoothly and efficiently. To avoid problems and save money, schedule preventive maintenance with the right lubrication and cleaning, and replace wear parts at the right time.

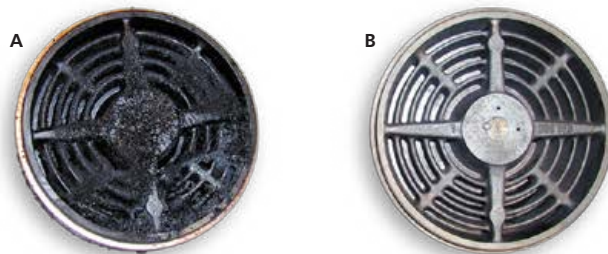
Choose the right lube oil

We advice to use oil's specially made for reciprocating piston type air compressors. Most oil companies have developed oils particularly for air compressors. Tests shows that use of correct oil reduce wear and formation of carbon deposits in valves, which often is the main reason for reduced performance and following compressor problems

Some compressor models are designed to operate with fully synthetic oil's only. Please refer to your compressor manual.

Oils intended for gear boxes, petrol engines, turbines, and refrigeration compressors are not recommended for use in Sperre air compressors.

Photos **A** and **B**, shows a delivery valve after 300 running hours in a Sperre compressor.



A Oil quality not suitable. Valve is covered with carbon deposits.

B Synthetic air compressor oil has been used with excellent results.

Choose genuine Sperre parts

Sometimes non-genuine parts cause no problems. Sometime they just take more time to fit. But sometimes they start vicious circles of trouble for the compressor: oil coke deposits, overheating, excessive oil consumption, unnecessary strain on your system, leaks, scuffing and cracks. With essential equipment like a starting-air compressor on a ship at sea, it is not worth gambling with imitation parts. Because of the enormous pressure at work in the compressor, safety and reliable operation must come first.

General Information

Useful Formulas & Classification Requirements

Required capacity of starting air compressors

According to classification society requirements, two (2) or more compressors of approximately equal capacity must be installed. At least one of the compressors must be independently driven (for emergency use). The total capacity of the compressors should be sufficient for charging the starting air receivers from atmospheric to full pressure in one (1) hour. Required compressor capacity, based on two (2) equal starting air receivers and two (2) equal starting air compressors:

$$Q = V \cdot P_{\max} \quad [\text{m}^3/\text{h}]$$

Where: P_{\max} = Max. receiver pressure (normally 30 bar) [bar]
 V = Starting air receiver volume [m³]

Charging time of air receivers

Capacity for starting air compressors is normally quoted as "Pumping Up Capacity", i.e. the capacity is measured by filling an air receiver with an exact known volume. The charging time is normally calculated as follows:

$$T = \frac{60 \cdot V (P_1 - P_0)}{Q} \quad [\text{min.}]$$

V = Receiver volume [m³] P_0 = Absolute press. in receiver at start [bar a]
 Q = Compressor capacity [m³/h] P_1 = Absolute press. in receiver at end [bar a]

If the temperature increase in the air receiver during the test should be taken into account, the capacity has to be calculated by formula as follows (according to ISO1217, Annex F):

$$q_z = \frac{V_r \cdot T_1}{z \cdot P_1} \left(\frac{P_{4z} - P_{40}}{T_{4z} - T_{40}} \right) 3600 \quad [\text{m}^3/\text{h}]$$

Where:
 V_r = Receiver volume [m³]
 P_1 = Absolute pressure at standard inlet point [bar a]
 T_1 = Absolute temperature at standard inlet point [°K]
 P_{40} = Absolute pressure in receiver at beginning of charging period [bar a]
 T_{40} = Absolute temperature in receiver at beginning of charging period [°K]
 P_{4z} = Absolute pressure in receiver at end of charging period [bar a]
 T_{4z} = Absolute temperature in receiver at end of charging period [°K]
 z = Charging time (z) [sec.]

Required volume of starting air receivers

According to classification society requirements, main engines started by compressed air must have at least two (2) starting air receivers of about equal capacity, and which may be used independently. The air receivers must have capacity for the number of starts specified below without reloading the receivers. Required receiver capacity, V , based on two receivers of equal capacity:

$$V = \frac{n \cdot q}{2 (P_{\max} - P_{\min})} \quad [\text{m}^3]$$

Where:
 P_{\max} = Max. receiver pressure* [bar]
 P_{\min} = Min. required start pressure ** [bar]
 q = Air consumption per start ** [Nm³]
 n = Number of starts required as follows:

Duty of engine(s) Number of starts required

| | |
|--|---------------|
| • Propulsion engine, reversible | 12 starts |
| • Propulsion engine, non-reversible | 6 starts |
| • Engines for driving electric generators and emergency generators, and engines for other purposes | 3 starts each |

Notes: *) Normally 30 bar. **) Normally informed by diesel eng. manufact.

Classification requirements electrical components

| Class. Society | Temp. switch air SP 80° C | Oil press. or level switch SP 0.8 bar | Separate alarms | Remote control | Main switch | Type approved el. motor | Heating element |
|----------------|---------------------------|---------------------------------------|-----------------|----------------|-------------|-------------------------|-----------------|
| LR | ■ | ■ | ■ | | ■ | | |
| BV | ■ | | | | ■ | ■ | |
| RINA | ■ | ■ | | | | | |
| NK | | ■ | | | ■ | | |
| KR | | ■ | | | | ■ | |
| DNV GL | | | | | | | |
| CCS | | | | | | ■ | |
| CR | | | | | | | ■* |
| RMRS | ■ | ■ | | | ■ | ■ | |

Notes: *) El. motors 40 kW and up.

After Sales Any part to any place within 48 hours



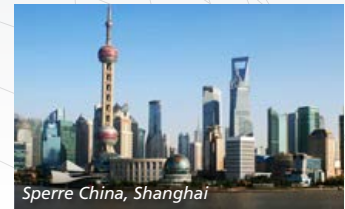
Sperre Industri AS, Norway



Sperre Rotterdam BV, The Netherlands



Sperre Asia PTE Ltd, Singapore



Sperre China, Shanghai



In 1958, Sperre established its global service slogan: "Any part to any place within 48 hours". This is a promise we have kept ever since. Sperre Global service means that our customers can contact our service people 24/7 and meet "our man" in important locations around the world. We have parts and spare compressors in stock in Norway, the Netherlands, Singapore and China.

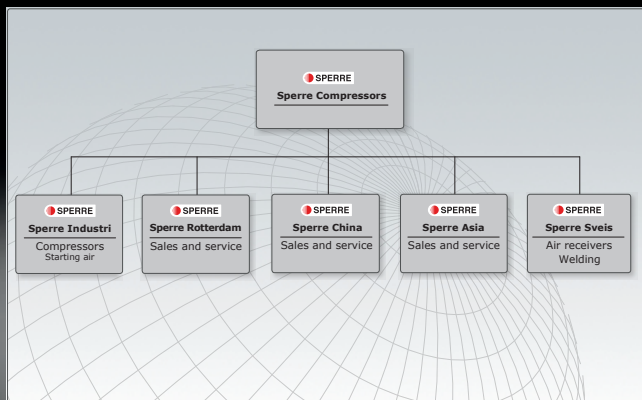
Sperre spare part logistics

Our service-minded after sales teams are ready to provide necessary help. Sperre always has the cor-rect spare part in stock – directly from our factory in Norway, or from our offices abroad.

- Retrofit Compressors – complete from the shelf.
- We can supply complete compressor units
- off the shelf
- even from our subsidiaries in Rotterdam and Singapore.



COMPANY STRUCTURE



Sperre Group more than 75 years of compressor business

The Sperre compressor tradition has lasted for more than 75 years. Starting-air compressors have been the heart and soul of our business. It is what we do best. We're in the business for the long term. That's the commitment it takes to maintain our position as the world leader in starting air for the next generations.



Compressors

With our range of 24 compressors we cover all the capacities needed both for marine- and industrial purposes. In alliance with TMC we can design a package tailored to the special compressed air needs of your application.



Air receivers

Sperre Sveis AS supplies air receivers according to standard drawings, in sizes from 30 to 3000 litres. The working pressure ranges from 7 to 30 bar. All documentation is reviewed and handed over for classification. Sperre Sveis AS files all documentation on product subject to pressure for a minimum of 10 years.



TMC, no. 1 marine screw compressor

In alliance with TMC, Sperre forms a unique partnership in starting air and service air. Together we can design a package tailored to the special compressed air needs of your application.



Sperre has offices in Ålesund, Rotterdam, Singapore and Shanghai. We are also represented by an extensive and professional network of agents in more than 20 important locations around the world. Our representative is there, wherever and whenever you need us.

Check our website www.sperre.com/agents for updates.

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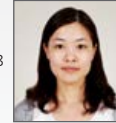
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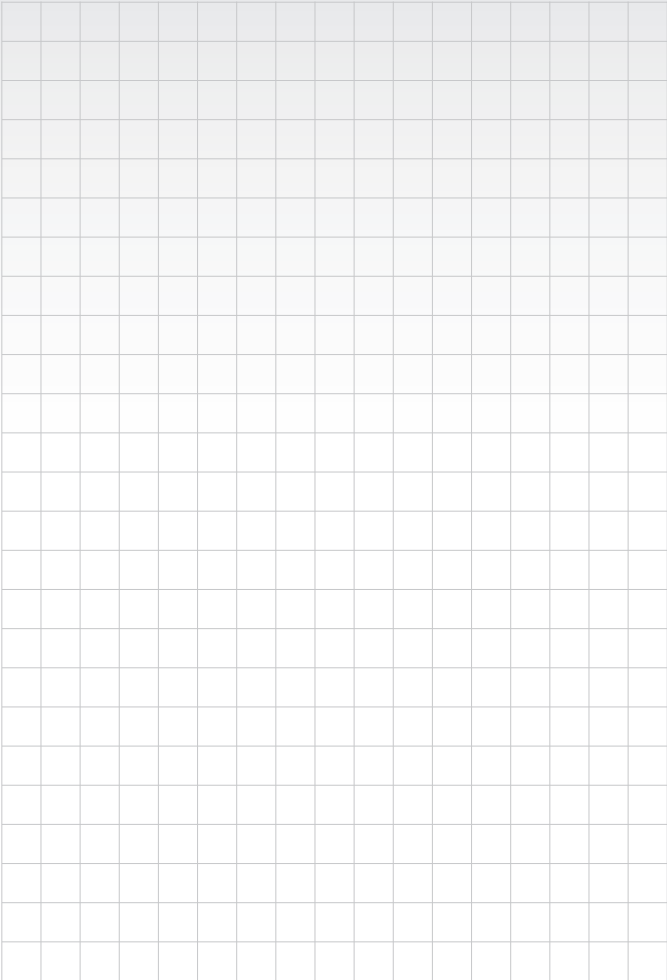
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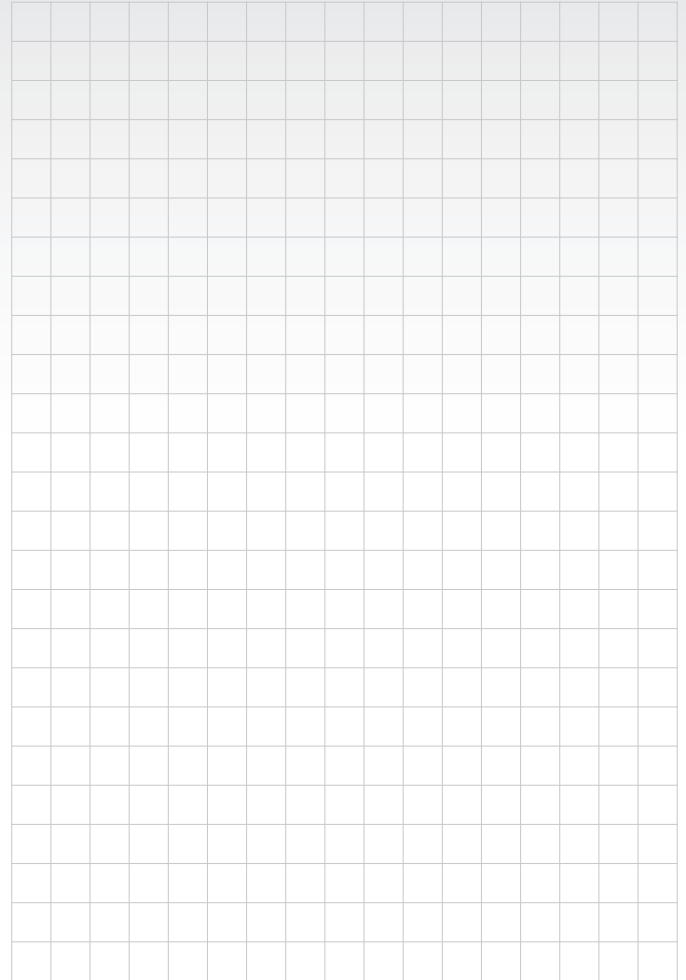
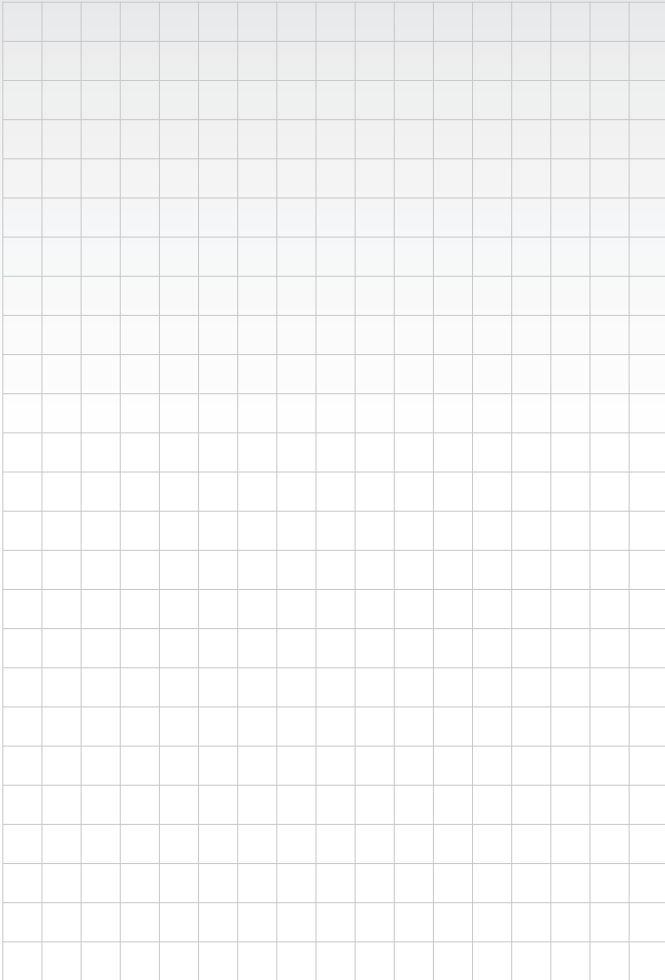


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