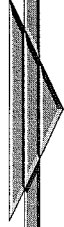

INSTRUCTION MANUAL



LW 720 E

BREATHING AIR COMPRESSOR



S A F E T Y P R E C A U T I O N S

General Notice

This instruction manual contains the operation and maintenance procedures necessary to safely run your L&W compressor. We strongly recommend to read this manual thoroughly prior to operation and follow all the safety precautions precisely.

Damage resulting from any deviation from these instructions is excluded from warranty and liability for this product.

Be sure to pay attention to the following points:

- Fill only tanks with a valid hydrostatic test date
- Never exceed the working-pressure rating indicated on the tank
- Carry out proper maintenance on the compressor and filtration system
- Care must be taken to avoid the intake of contaminated air in to the compressor
- Do not exceed maximum operating temperatures

Safety Precautions

- Read the operation manual of your compressor carefully
- Allow only qualified personnel to run the compressor
- Do not place any objects on compressor while in operation
- Make sure no person or object can accidentally touch any moving parts while running
- Take care that the intake-air is pure and free of toxic gases
- All work on compressor must be carried out while compressor is disconnected for the power supply and depressurized
- Check unit regularly for air- & oil leaks
- Never weld damaged high-pressure tubes
- Filling-hoses must be in perfect condition; special attention should be paid to the connecting fittings
- Do not touch any hot compressor / engine parts while doing maintenance work as these may cause injury by burning. Wait until unit has cooled down.

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Technical Data	LW 720 E
Delivery Capacity:	720 Litre/min. (43.2 m³/h) 25.5 cfm
Max. Pressure:	350 bar (420 bar on request)
RPM Compressor:	980 min ⁻¹
No of Pressure Stages:	4
Cylinder Bore 1st Stage::	Ø 115 mm
Cylinder Bore 2nd Stage:	Ø 55 mm
Cylinder Bore 3rd Stage:	Ø 25 mm
Cylinder Bore 4th Stage:	Ø 14 mm
Medium:	Air
Intake Pressure:	atmospheric
Oil Pressure:	+2.0 bar
Oil Capacity:	3.0 ltr
Intake Temperature:	0 < +45°C
Ambient Temperature:	+5 < +45°C
Cooling Air Requirement:	> 5,550 m³/h
Voltage: (Special Windings on Request)	400 V / 3-Phase / 50 Hz
Protection Class Drive Motor	IP 54
Motor Power:	18,5 kW
RPM Motor:	2,890 min ⁻¹
Start:	Star / Delta
Dimensions:	
Depth:	755 mm (29.7")
Length:	1,530 mm (60.2")
Height:	1,160 mm (45.7")
Weight:	approx. 600 kg
Capacity Filter Housing:	2.3 ltr.

INSTRUCTION MANUAL

Model:

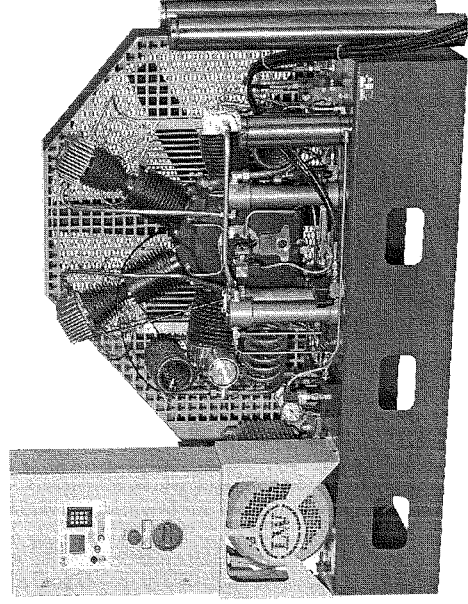
LW 720 E

Application:

4-stage compressor for breathing air applications.
Large capacity, slow running stationary unit.

Specifications:

- Pressure gauge for each stage
- Sturdy steel frame, torsion free, powder coated in RAL 6026
- Steel drive belt guard, powder coated in RAL 7004
- All pistons fitted with piston rings
- Low pressure oil pump
- Oil/water separators after each stage
- Pressure relief valves for each stage
- Oil pressure control
- Automatic drain on all stages, without loss of pressure



LW 720 E

LW 720 E (with optional filter housings & ECC)

General Notice

This instruction manual contains the operation and maintenance procedures necessary to safely run your L&W compressor. We strongly recommend to read this manual thoroughly prior to operation and follow all the safety precautions precisely. Damage resulting from any deviation from these instructions is excluded from warranty and liability for this product. Be sure to pay attention to the following points:

- Fill only tanks with a valid hydrostatic test date
- Never exceed the working-pressure rating indicated on the tank
- Do proper maintenance to the filtration system
- Avoid contaminated air to reach the air intake
- Do not exceed maximum operation temperatures

Installation

The compressor should only be connected by a qualified electrician. Use a 32 Ampere plug for installation.

NOTE:

Check direction of rotation immediately after the first start. If it is wrong the pistons may cease due to lack of lubrication! Furthermore the unit would not be cooled properly.

Always ensure good room ventilation and pure intake air!

Method of Operation

Air comes through a micro filter into the first stage, is compressed and leaves through the heat exchanger into a water / oil separator . A short pipe leads the air into the second cylinder and is further compressed, leaving again through a heat exchanger and the second water /oil separator and then compressed in the third stage to the final pressure. The air then goes through the after cooler and into the mole carbon filter. The purified air goes through a safety valve and into the pressure maintaining valve, there to the air manifold and filling hoses or, if required, into an external filling panel.

Electric Motor(s)

Standard: 18.5 kW / 400V / 3-phase / 2930 rpm.

Motors are mounted by four bolts to the main frame.

- *Special motors on request* -

Installation

The compressor should only be connected by a qualified licensed electrician.

NOTE: Check direction of rotation immediately after the first start !

If the direction of rotation is wrong, the oil pump will not lubricate the 3rd & 4th stage pistons which may cause them to cease. Furthermore the unit would not get the required cooling air flow. When facing the front of the compressor cover, the direction of rotation should be anticlockwise (check arrow on motor). Don't place compressor closer than 1 meter to any walls and ensure good ventilation. Check nitrogen inlet for gas leaks!

Filling Process

Fill only air tanks which are:

- Suitable for final pressure
- Hydro static tested (check last testing date)

The automatic switch off, or safety valve, has to be checked before tanks can be filled

- Close filling valves
 - Start compressor by key 1 (on ECC key-pad)
 - Connect tank to compressor - *Filling valve and tank are still closed* -
 - First slowly open filling valve
 - Carefully open tank valve
 - Fill tank to desired pressure - *watch pressure gauge* -
 - Close tank valve
 - Close filling valve - *selfventing type* - A hissing sound can be heard
 - Disconnect tank from filling connection
 - Turn off compressor by key 1 (ECC Version)
-

Automatic Condensation Dump System

Condensate will be separated after each stage of compression.

Standard Version: all three separators have solenoids which were controlled by an electronic timer. The timer is located in the switchboard compartment and activates the dump valves every 15 minutes - interval is adjustable - to release the condensate through hoses. We recommend the use of a 20 litre container to collect all condensate. It can then be disposed of like discarded oil. The drain noise is kept to a minimum with a silencer.

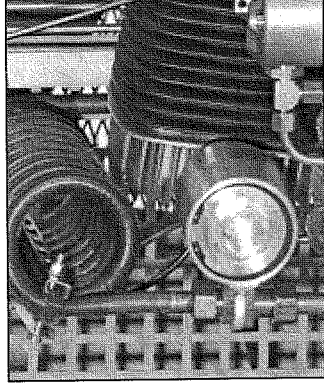
We recommend to operate the blue push button - mounted on the dash panel - every 10 hours, to ensure all auto dump valves are in working

ECC Version: all three separators have solenoids which were controlled by the ECC. It activates the dump valves every 15 minutes to release the condensate through. We recommend the use of a 20 litre container to collect all condensate. It can then be disposed of like discarded oil. The drain noise is kept to a minimum with a silencer.

Run solenoid test every 10 hours.

Intake Filter

A micro filter cartridge is used as an intake filter. We recommend to replace the filter cartridge every 2000 working hours, or at least once a year, depending on gas pollution. A dirty, contaminated filter restricts the gasflow, reduces the compressors capacity and causes overheating.



Air Intake Filter Housing

Cylinder Heads and Valves

Inlet and outlet valves are located inside the cylinder heads.

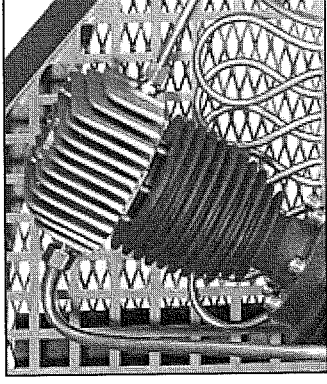
The inlet valve opens on the down stroke. The outlet valve opens on the upstroke.

All valves should be replaced after 2000 working hours due to normal wear and tear.

To replace valves the cylinder heads have to be removed. All four valves are combined valves

Inlet and outlet valves form one unit.

The first and second stage valves are of plate valve design. The third and fourth stage valves use spring operated pistons in brass cylinders. These valves are loose placed inside the cylinder head.



Valve Head & Compression Cylinder

There are no special tools required to change any of the valves.

Lubrication

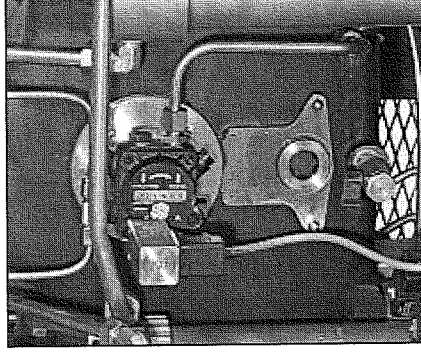
The crankshaft is lubricated by an oil slinger.

The 1st and 2nd stage is lubricated by spray oil.

The 3rd and 4th stage is lubricated by a mechanical oil pump.

3.0 litre of synthetic oil (order no. L&W 9001) is required for an oil change.

NOTE: The oil level should not be lower than the red marking on the oil level indicator glass (located on the front of the compressor crankcase).



Oil Pressure Switch & Oil Pump

Starting the Compressor for the first Time

- Place compressor unit in a distance of at least 1metre to any walls or objects
 - Ensure good room ventilation (required cooling air flow: 5,550 m³/h)
 - Check room temperature (min +5°C < max +40°C)
 - Check compressor oil level
 - Make sure all filling devices are closed
 - Start compressor by key 1 (on ECC keypad)
 - Check direction of rotation immediately after start
 - Check inlet pressure once the unit has reached working pressure, readjust if necessary
 - Run compressor to max. pressure
 - Check if end-pressure switch works at max. pressure
 - Check compressor unit for gas leaks
 - Check auto dump valves for function by pushing the blue push button on the dash panel ("Standard version" only)
 - Turn off compressor by blue push button (Standard version) or key 0 (on ECC keypad, ECC version)
 - Release pressure by filling valves
-

Safety Valves

Every pressure-stage is equipped with its own safety valve. They protect the unit from over -pressure / load.

Safety valves are adjusted to:

- 1st Stage: 12 bar**
- 2nd Stage: 39 bar**
- 3rd Stage: 110 bar**
- 4th Stage: final pressure**

If a safety valve blows it usually indicates problems with either inlet or outlet valve of the following stage.

NOTE: Faulty safety valves should always be replaced!

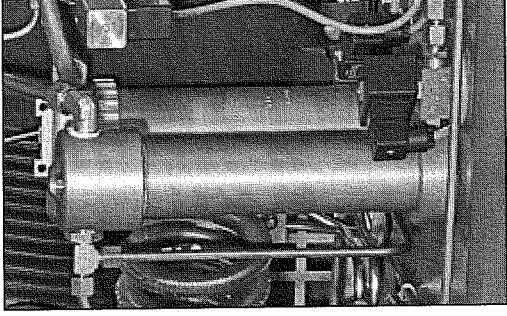
Oil / Water Separator

After each stage an oil / water separator (condense separator) is fitted.

They were automatically drained every 15 minutes by solenoids (auto dumps).

The condensate separators are free of maintenance. However, we do recommend that they should be cleaned every 1000 working hours.

Replace O-rings if necessary.



Water Separator & Solenoid

Final Air Purifier (Mole Carbon Filter) – optional -

The mole carbon filter housing is mounted on the right hand side of the compressor housing *available capacities: 1.7 or 2.3 litre*. Inside the filter housing a jet blows air on to the housing wall. Oil and water mist condenses and flows to the bottom of the housing. Air then flows through the mole carbon filter cartridge, which purifies the air from moisture and odours. Cartridges should be changed once they are saturated (depends on moisture of nitrogen & ambient temperature). Use a humidity controller to check cartridge condition.

Cartridges are vacuum packed. We recommend that they should be opened just before they will be fitted to the compressor, as they could be saturated with moisture just being exposed to high humidity. To change the filter cartridge stop the compressor. It will then automatically release all remaining air pressure. This can take up to two minutes. Once the unit is free of pressure the filter housing cap can be unscrewed with the filter tool delivered with the compressor. If any pressure remains in the housing, it will be almost impossible to open the filter housing cap. The filter itself can also be unscrewed with the filter tool and replaced by a new one. Screw cap on hand tight.

ELECTRONIC COMPRESSOR CONTROL LW ECC

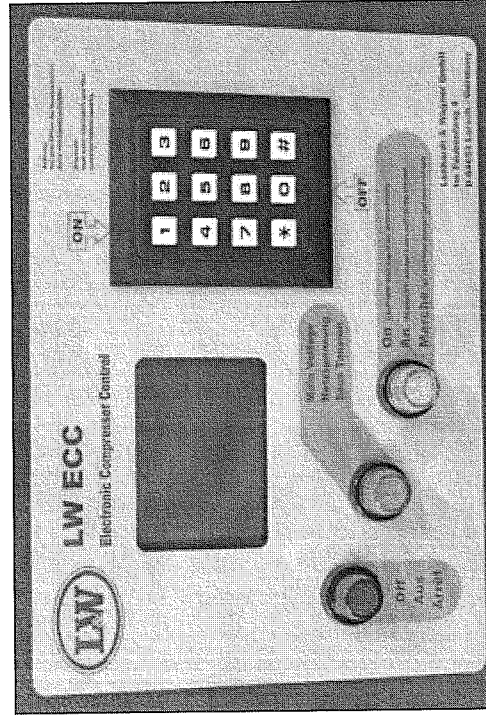
Various L&W compressors are equipped with the all-electrical computer supported control system LW ECC – as an option.
It is easy to operate and allows multiple and individual settings.

LW ECC Features:

- LCD-Display with key pad
- Coloured LEDs for ON / OFF / Main Voltage indication
- Automatic- & semi-automatic operation mode
- Automatic dump system
- Integrated counter for operation hours
- Integrated counter for load cycles
- Maintenance intervals automatically displayed
- Required service part numbers automatically displayed
- Fully adjustable pressure ranges for start and stop
- Various warning messages will be displayed
- Check of end-pressure safety valve possible
- Auto switch-off when system is not running
- Extentable by additional modules (external filling panel)
- Easy to operate menu
- Warning messages ("Housing Open" / "Emergency Switch")
- Load-free start cycles
- Star / Delta start

LW ECC OPTIONS:

- Oil Pressure Control
- Oil Temperature Control
- Cylinder Head Temperature Control
- Inter Stage Pressure Monitoring
- PIN Controlled Access
- Ambient Air Temperature Control
- Master / Slave Option
(if more than one ECC equipped compressors are combined)



ECC CONTROLLER

Immediately after the compressor has been connected to power, the ECC-display comes up with the following menu:

MAINMENU

Charging

Total

Start : 1

Help: *

Final Press

0 min

0,0 h

Stop : 0

OFF

0 bar

Present filling time in minutes

Total operation hours

Key 1 to start compressor / Key 0 to stop compressor

* Key leads to submenus Current operation state = Off

Present filling pressure

The following keys can now be used:

Key	Function
1	Start - Starts the compressor
0	Stop - Stops the compressor
*	Leads to the submenus

After typing the * key the following menu appears:

SELECTION MENU

M100

Selection:

2 Display

3 Settings

4 Test

5 Statistics

6 Maintenance

7 Operation Mode

(M100) Return: #

Key 2 leads to submenu "Display"

Key 3 leads to submenu "Settings"

Key 4 leads to submenu "Test"

Key 5 leads to submenu "Statistics"

Key 6 leads to submenu "Maintenance"

Key 7 leads to submenu "Operation mode"

Key # leads back to submenu "Mainmenu"

(M100) tells that you are currently on menu page 100.

Remark:

Beside the listed numbers, the compressor unit can always be started / stopped by using keys 1 and 0.

DISPLAY MENU

M200

Display I:

2	Press. Stage 1
3	Press. Stage 2
4	Press. Stage 3
5	Cyl. Head Temp.
6	Oil Temp.
7	Display II
(M200) Return#	

Key 2 shows current pressure of the 1st stage*
 Key 3 shows current pressure of the 2nd stage
 Key 4 shows current pressure of the 3rd stage
 Key 5 shows temperature of the final stage cylinder head
 Key 6 shows the oil temperature
 Key 7 shows Display II
 Key # leads back to "Mainmenu"

By pressing key 2 the following informations appear:

Charging	0 min
Total	0,0 h
Start:1	Stop: 0
Help:*	OFF
Press.	0 bar
1 st Stage	0,0 bar

Use keys 3 to 6 to change between values displayed in this line

* = Option

Option:

If the compressor unit features two different pressure ranges, both pressures can be displayed in the main menu by pressing key 8.
 (text of line 3 changes to „Press. 200/300“).

Display II:

Press.	Temp.	
4: 0	C:	0
5: 0	D:	0
6: 0	E:	0
7: 0	F:	0
bar		°C

Key # leads back to "Mainmenu".

SETTINGS

M300

Settings:

Automatic

2 Stop pressure

3 Restart Press.

Semi-Automatic

4 Stop Pressure

9 Close

(M300) Return: #

Key 2 leads to submenu "Set Stop Pressure"
(in automatic mode)

Key 3 leads to submenu „Set Restart Pressure“
(in automatic mode)

Key 4 leads to submenu "Set Stop Pressure"
(in the semi automatic mode)

Key 9 leads back to "Selection menu"

Key # leads back to "Mainmenu"

Remark:

Use menu M700 to change between "Automatic" and "Semi-Automatic" mode.
Restart pressure can only be set in "Automatic Mode".

SET STOP PRESSURE (Automatic Mode)

M320

(Only in automatic mode, see menu M700))

Set

Stop Pressure:

Actual: 330 bar

7 New Value:

>> XXX bar

(050., 333)

8 Confirm

(M320) Return: #

Current restart pressure

Key 7 if restart pressure should be changed

XXX indicates modified stop pressure

Chooseable pressure range for restart pressure

Key 8 confirms new restart pressure

Key # leads back to „Mainmenu“

SET RESTART PRESSURE (Automatic Mode) **M330**
(Only in automatic mode, see menu M700)

Set
Restart Pressure:
Actual: 180 bar
7 New value:
>> XXX bar
(030,, 310)
8 Confirm
(M330) Return : #

Current restart pressure
Key 7 if restart pressure should be changed
XXX indicates modified restart pressure
Chooseable pressure range for restart pressure
Key 8 confirms new restart pressure
Key # leads back to „Mainmenu“

Remark:
Restart pressure must be at least 20 bar lower than current stop pressure.

SET STOP PRESSURE (Semi-Automatic Mode) **M340**
(Only in semi-automatic mode, see menu M700)

Set
Stop Pressure:
Actual: 180 bar
7 New Value:
>> XXX bar
(030,, 310)
8 Confirm
(M340) Return : #

Current stop pressure
Key 7 if stop pressure should be changed
XXX indicates modified stop pressure
Chooseable pressure range for stop pressure
Key 8 confirms new stop pressure
Key # leads back to „Mainmenu“

TEST MENU **M400**

Test:
2 Solenoids
3 Safety Valve
4 Test-Stop
9 Close
(M400) Return : #

Key 2 leads to submenu „Test Solenoids“
Key 3 leads to submenu „Test Safety Valve“
Key 4 leads to submenu „Test Stop without Venting“
Key 9 leads back to submenu „Selection“
Key # leads back to „Mainmenu“

TEST SOLENOIDS**M420****Test Solenoids**

3 open
7 close

*Key 3 opens solenoids
Key 7 closes solenoids*

9 Close

*Key 9 leads back to submenu „Test“
Key # leads back to „Mainmenu“*

(M420) Return : #

Remark:

This menu can not be left unless solenoids have been closed by key 7

TEST SAFETY VALVE**M430****Test
Safety Valve**

Close Filling
Valves!
5 Start 0 Stop
9 Close

*Key 5 to start test Key 0 to stop test
Key 9 leads back to submenu „Test“
Key # leads back to „Mainmenu“*

(M430) Return : #

Remark:

Close all filling valves /-panels before you run the safety valve test.
Compressor will run up to its maximum pressure, which is limited by the setting of the end-pressure safety valve.
It will not stop at “Stop Pressure” (see menu M320).

TEST STOP **M440**

**Test Stop
without Venting**

5 Stop
6 Vent
Pressure | 0 bar
9 Close
(M440) Return : #

Key 5 stops compressor during test run
Key 6 vents compressor after leak search has been finished
Shows current filling pressure
Key 9 leads back to submenu „Test“
Key # leads back to „Mainmenu“

Remark:

Test Stop can only be carried out after compressor has been started (key 1). Main purpose of it is to check compressor unit for air leaks.

STATISTICS MENU **M500**

Statistics

Operation Hours: 15,2 h
Start cycles: 48
Max Press 338 bar
9 Close
(M500) Return : #

Total operation hours of compressor unit

Total number of compressor starts
Maximum working pressure of unit (set by safety valve test)
Key 9 leads back to submenu „Selection“
Key # leads back to „Mainmenu“

Remark:

Press key 5 to get information on which ECC software version is currently installed on your system (M505), i.e.: .
By pressing key 2 you get the total load cycles of the filter housing.

MAINTENANCE MENU **M600**

Hours remaining	14 h
Oil change	989 h
Sinter filt	4989 h
Silencer	5989 h
Valves	1000 h
Oil filter	
8 Change done	
(M600) Return : #	

*Shows remaining hours of listed components
(i.e. next oil change in 14 hours,...)*

*Key 8 leads to submenu "Receipt Maintenance"
Key # leads back to „Mainmenu“*

Remark:

System will display message when any of the listed parts should be replaced, plus in addition matching L&W spare part numbers.

CONFIRM MAINTENANCE **M680**

Confirm Maintenance
2 Oil change
3 Sinter filters
4 Silencer
5 Valves
6 Oil filter
(M680) Return : #

*Key 2 receipts oil change
Key 3 receipts change of sinter filters
Key 4 receipts change of silencer
Key 5 receipts change of valves
Key 6 receipts oil filter
Key # leads back to „Mainmenu“*

Display confirms any reset of „Hours remaining“ with the following message:

Confirm Maintenance
Operation Hours Meter Set
9 Close
(M680) Return : #

*Key 9 leads back to submenu "Hours remaining"
Key # leads back to „Mainmenu“*

OPERATION MODE MENU**M700****Operation Mode:**

- 2 Automatic
- 3 **Semi-Automatic**

Key 2 activates automatic mode
Key 3 activates semi-automatic mode

- 9 Close
(M700) Return : #

Key 9 leads back to submenu „Selection“
Key # leads back to „Mainmenu“

Remark:

See also menu 300.

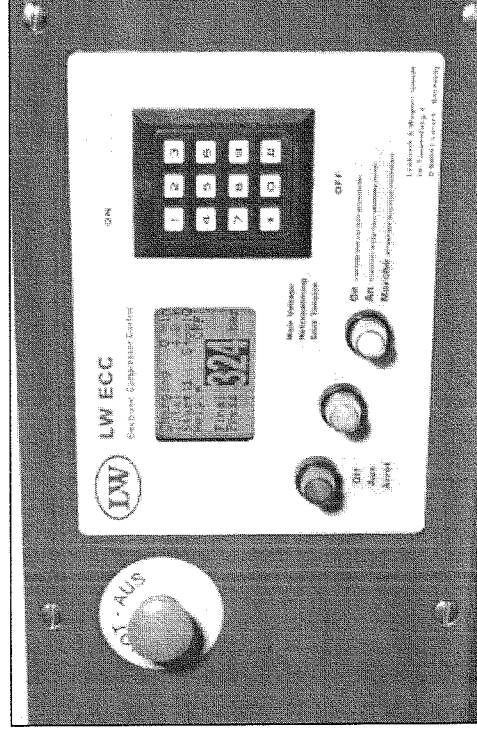
Activated modes are always displayed in bolt letters
(above example: Semi-Automatic)

Attention:

Compressor can start automatically if automatic mode is activated
(depending on restart pressure, see M330) !!

Never work on a unit which is connected to main power!
Always pull main plug before doing any maintenance work!

RISK OF ACCIDENT during maintenance work!!



ECC Display



Service, repair and maintenance

All repair, service and maintenance work is to be carried out when the compressor is stopped, isolated from the power supply and pressure free.

The unit is to be regularly checked for leaks of air/oil, air leaks can be localised using a leak detector or spray

It is recommended that only authorised L&W service technicians carry out repair and service on the bearing of the compressor (crankshaft and connecting rods)

Conservation / storage of the compressor:

If the compressor is not to be used for an extended period of time, we recommend the following conservation work is carried out before the storage:

- ✓ Run the compressor at 200 bar for approx 10 mins (control the flow with the filling valve to maintain the pressure).
 - ✓ Replace the oil with new oil.
 - ✓ Open the filling valve(s) and run the compressor for a few minutes .
 - ✓ Stop the compressor and open the drain valves.
 - ✓ Close the filling valves
 - ✓ Open the final filter housing and lubricate the O Ring with a food grade grease or silicone grease.
 - ✓ Store the compressor in a cool dry place free from dust and contamination. A cover is recommended as long as condensation can be avoided.
-

De-conservation, commissioning:

After the compressor has been stored, the following Steps are to be taken:

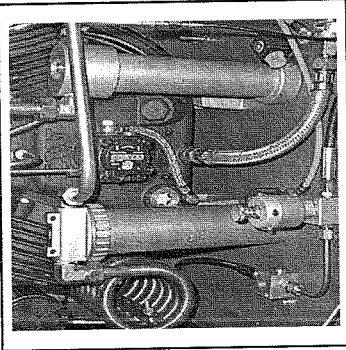
- ✓ If the compressor has been stored for more than 12 Months, we recommend replacing the oil before use.
- ✓ Replace the final purification filter.
- ✓ Check oil level.
- ✓ Inspect the condition of the vee belts, replace if necessary
- ✓ Inspect the filling hoses visually for signs of deterioration, replace as necessary.
- ✓ Open the filling valves and run the compressor for approx 10 minutes with the filling valves open.
- ✓ Close the filling valves and allow the compressor to build up to working pressure.
- ✓ Check the correct safety valve setting and/or pressure switch setting (option).
- ✓ Check all connections and pipe work for leaks.

Once the above Steps are completed to satisfaction, the unit is ready to use.



OIL CHANGE INSTRUCTIONS

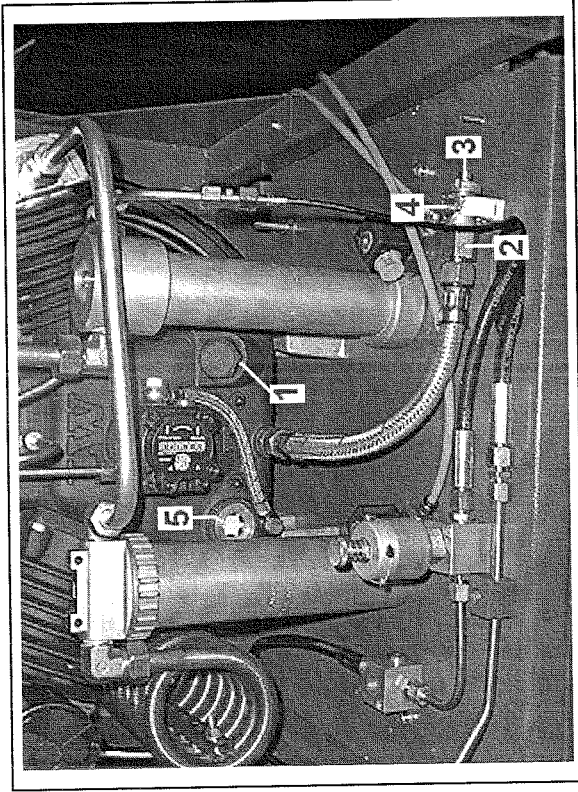
LW 300 / LW 450 / LW 570 / LW 720 / LW 1300



For the periodic oil change, please follow the time schedule of the instruction manual;
Only use the original L&W synthetic oil 9001/01 (1 ltr bottle) or 9001/12 (12 x 1 ltr bottle packing).

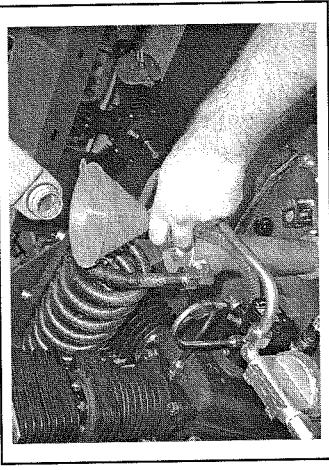
Before changing the oil, be sure the compressor is switched off and cannot be inadvertently started. Disconnect it from the power supply or by switch off the starter of the gasoline or Diesel engine.

To conduct an oil change, the temperature of the oil must be at least +20°C to allow it to flow easily. In cold climates, the compressor should run first for about 15 minutes, dependent on the ambient temperature;



Oil change

- Unscrew the filling cap anti-clockwise (1)
- Remove the oil drain hose from its holder (2)
- Unscrew the drain hose cap anti-clockwise (3)
- Hold the drain hose over a container for waste oil and open the drain valve (4)
- Let the oil drain completely, close valve (4), screw on plug (3) and relocate the hose
- Refill the block with original L&W compressor oil (approx. 1.8 ltr) by using a funnel
- The indicator glass (5) should be filled up to the top level - **DO NOT OVERFILL WITH OIL!!**
- Refit the oil filler cap

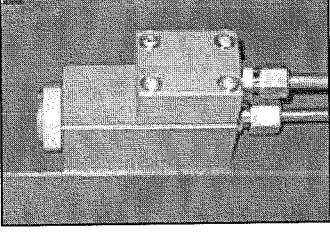


The picture above is showing the easy way of oil refilling by using a funnel placed on the oil drain hose.

The oil change is now completed, **ensure the filling cap (1) is securely refitted.**
The schedule in the maintenance manual will indicate the next oil change or the ECC display. Ensure the waste oil is disposed of correctly at an approved waste oil point.

Pressure maintaining and non-return valve

The combined pressure maintaining non-return valve is located in the system directly after the final filter housing



Pressure Maintaining Valve

Pressure maintaining valve

The pressure maintaining valve serves to keep the pressure in the final filter housing at a minimum of 150 - 180 bar. This high pressure creates more condensation in the separator/housing that can be mechanically removed (opening the drain valve) before the air is finally purified in the final filter, thus extending the life of the filter cartridge.

When the compressor is started, the pressure will build up in each stage as the compressor runs. The pressure in the final filter housing will increase until the pressure maintaining valve set pressure is reached. As a result of this function, the filling pressure gauge will not show any pressure for approx 1 min after the compressor is started and no air will flow out of the filling valve if opened.

Once the pressure maintaining valve opens, the pressure gauge will respond by climbing quite rapidly (within a few seconds) to the set pressure of the pressure maintaining valve (default 150 – 180 bar).

Adjusting the pressure maintaining valve:

- Open the filling valve to vent the system completely, close the filling valve
(*Pressure gauge reads 0 bar*)
- Start the compressor
- Monitor the pressure gauge
- The valve will open and the pressure the gauge climbs to quickly to the set pressure, this should be 150 – 180 bar
- If the pressure setting is outside this valve, adjust the pressure maintaining valve as follows:

Increase the pressure setting:

- Stop the compressor and open the drain valves
- Open the filling valve to vent the system after the pressure maintaining valve
(*Pressure gauge reads 0 bar*)
- Loosen the locking screw on the pressure maintain valve



- Using a suitable tool, screw the valve setting screw clockwise to increase the spring tension
 - Start the compressor and check the pressure setting, adjust as necessary
 - Re-tighten the locking screw
 - Check the pressure maintaining opening pressure once again
- Decrease the pressure setting:**
- Stop the compressor and open the drain valves
 - Open the filling valve to vent the system after the pressure maintaining valve (*Pressure gauge reads 0 bar*)
 - Loosen the locking screw on the pressure maintain valve
 - Using a suitable tool, screw the valve setting screw anti-clockwise to decrease the spring tension
 - Start the compressor and check the pressure setting, adjust as necessary
 - Re-tighten the locking screw
 - Check the pressure maintaining opening pressure once again

Warning:

If the pressure maintaining valve is set at a higher pressure than the maximum working pressure, the final safety valve will blow off before the pressure maintaining valve opens, the pressure gauge will read 0 bar!
After repair work where the pressure maintaining valve is not yet adjusted, the basic setting is the setting screw approx 3 turns in to the housing.

Non-return valve

The non-return valve is located in the system after the pressure maintaining valve and prevent air from flowing back from the filling lines into the final filter housing/compressor block. The non-return valve is operating correctly if the pressure gauge on the filling valve remains constant when the drain valves on the compressor are opened.

V-Belts

The compressor block is driven by the engine via 3 V-belts.
Check V-belt condition / tension at least once a month.

In case of high V-belt wear, check the following:

- V-belt tension
- Check if both V-belts are the same length / specification
- Check pulley grooves for marks / scratches / damage
- Check if pulley grooves are free from oil / grease

How to tension the V-belts

Attention: Do not work on hot compressors / engines

- Stop compressor
- Slightly loose nuts of motor flange
- Adjust motor tensioning bolt until correct V-belt tension is achieved
(located on the right hand side of the compressor frame)
- Tighten nuts of motor flange
- Check tension of V-belts (*readjust if necessary*)

ATTENTION:

Insufficient V-belt tension leads to higher vibrations and increases the noise level of the compressor unit.

Replace faulty V-belts immediately.

Always use V-belts of identical length / specification.



Symptom	Problem	Remedy
Final pressure is not reached	Connections leaking	Re-tighten, clean and/or replace
	Final pressure safety valve blows off	Replace
	Cooling pipe leaking	Replace
	Condensation drain valves	Check tightness, clean and/or replace
	Final pressure switch cuts off (option)	Re-set final pressure cut off
Compressor vibrates excessively	V-Belt tension insufficient	Tighten V-Belts
	Compressor block and/or prime mover mounting screws loose	Re-tighten
	Shock absorbing feet worn down	Replace
	Uneven surface	Move compressor accordingly
Compressor overheats	Inlet filter cartridge blocked	Replace
	Ambient temperature too high	Improve ambient conditions or run for shorter periods
	Cooling air feed/exhaust not sufficient	Adhere to the installation data
	Inlet hose too long	Reduce the length and/or increase the diameter
	Inlet hose diameter too small	Increase diameter
	Compressor turning in the wrong direction	Ensure correct rotation (phase)
	Suction/pressure valve blocked	Clean and/or replace
Safety valve blows off	Suction / pressure valve in the following stage defect	Clean and/or replace
	Sinter filter in the following stage blocked	Replace
	Safety valve leaks	Replace (do not tamper)
Air tastes of oil	Molecular filter needs replacing	Replace
	Incorrect compressor oil	Use only authorised oil type
	Non conform type of filter	Replace with correct filter
	Cylinders and / or piston rings worn	Replace
Delivery rate too low	Suction/pressure valve blocked	Clean and/or replace
	Cylinder / piston rings worn	Replace
	Also see section „final pressure is not reached“	
Automatic condensation drainin not functioning (Option))	Solenoids defect	Replace
	Cable/wiring defect	Repair
	Timer defect	Replace
	Sinter filter from pneumatic valve blocked	Replace
	Piston in the pneumatic valve blocking	Dismantle pneumatic valve
Automatic condensation drain operates between cycles	Pilot pressure for pneumatic valve too low	Replace suction/pressure valve / safety valve
	Piston seat in the pneumatic valve damaged/contaminated	Clean / Replace
	Timer settings incorrect	Set default settings



Symptom	Problem	Remedy
<i>(Option)</i>		
	Timer defective	Replace
Compressor switches off before final pressure is reached <i>(Option)</i>	Final pressure switch not properly set	Reset
	Pressure maintaining valve set too high	Reset
	Fuse/breaker tripped	Refer to the correct fuse ratings for the supply
Filter cartridges times too short	Pressure maintain valve set too low	Reset to 170 bar
	Non conform type of filter	Use only correct filters
	Shelf life exceeded	Adhere to date of expiry
	Packing damaged and / or filter packing opened too long before use	Store properly and open immediately before use
	Ambient temperature too high	Ensure correct and sufficient cooling air feed and exhaust
	Cylinder / piston rings worn	Replace
Excessive oil consumption	Cylinder / piston rings worn	Replace
	Incorrect compressor oil	Use only authorised oil type
	Operating temperature too high	Adhere to operating parameters
	Oil leak in the compressor block	Check relevant components especially shaft seal and replace/re-tighten

ELECTRONIC COMPRESSOR CONTROL LW ECC

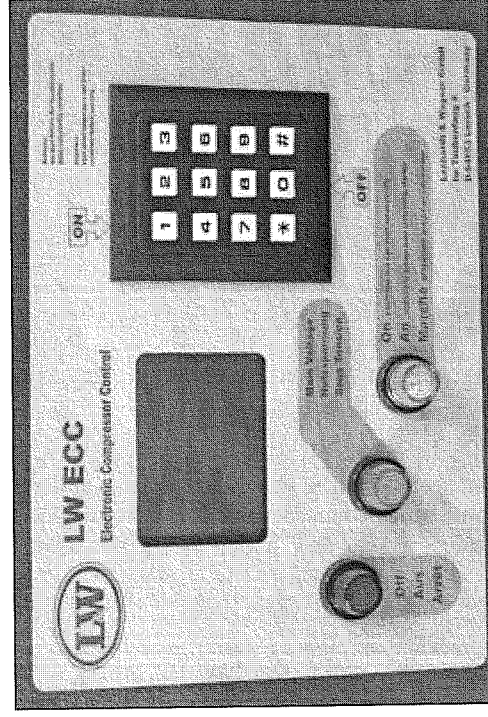
Various L&W compressors are equipped with the all-electrical computer supported control system LW ECC – as an option.
It is easy to operate and allows multiple and individual settings.

LW ECC Features:

- LCD-Display with key pad
- Coloured LEDs for ON / OFF / Main Voltage indication
- Automatic- & semi-automatic operation mode
- Automatic dump system
- Integrated counter for operation hours
- Integrated counter for load cycles
- Maintenance intervals automatically displayed
- Required service part numbers automatically displayed
- Fully adjustable pressure ranges for start and stop
- Various warning messages will be displayed
- Check of end-pressure safety valve possible
- Auto switch-off when system is not running
- Extentable by additional modules (external filling panel)
- Easy to operate menu
- Warning messages ("Housing Open" / "Emergency Switch")
- Load-free start cycles
- Star / Delta start

LW ECC OPTIONS:

- Oil Pressure Control
- Oil Temperature Control
- Cylinder Head Temperature Control
- Inter Stage Pressure Monitoring
- PIN Controlled Access
- Ambient Air Temperature Control
- Master / Slave Option
(if more than one ECC equipped compressors are combined)



ECC CONTROLLER

Immediately after the compressor has been connected to power, the ECC-display comes up with the following menu:

MAINMENU

Charging	0 min
Total	0,0 h
Start : 1	Stop : 0
Help: *	OFF
Final	
Press	0 bar

Present filling time in minutes

Total operation hours

Key 1 to start compressor / Key 0 to stop compressor

** Key leads to submenus Current operation state = Off*

Present filling pressure

The following keys can now be used:

Key	Function
-----	----------

1	Start - Starts the compressor
---	--------------------------------------

0	Stop - Stops the compressor
---	------------------------------------

*	Leads to the submenus
---	------------------------------

After typing the * key the following menu appears:

SELECTION MENU**M100****Selection:**

2	Display
3	Settings
4	Test
5	Statistics
6	Maintenance
7	Operation Mode
(M100)	Return: #

Key 2 leads to submenu "Display"

Key 3 leads to submenu "Settings"

Key 4 leads to submenu "Test"

Key 5 leads to submenu "Statistics"

Key 6 leads to submenu "Maintenance"

Key 7 leads to submenu "Operation mode"

Key # leads back to submenu "Mainmenu"

(M100) tells that you are currently on menu page 100.

Remark:

Beside the listed numbers, the compressor unit can always be started / stopped by using keys 1 and 0.

DISPLAY MENU

M200

Display I:

- 2 Press. Stage 1
- 3 Press. Stage 2
- 4 Press. Stage 3
- 5 Cyl. Head Temp.
- 6 Oil Temp.
- 7 Display II
- (M200) Return#

- Key 2 shows current pressure of the 1st stage*
- Key 3 shows current pressure of the 2nd stage
- Key 4 shows current pressure of the 3rd stage
- Key 5 shows temperature of the final stage cylinder head
- Key 6 shows the oil temperature
- Key 7 shows Display II
- Key # leads back to "Mainmenu"

By pressing key 2 the following informations appear:

Charging	0 min
Total	0,0 h
Start:1	Stop: 0
Help:*	OFF
Press.	0 bar
1 st Stage	0,0 bar

Use keys 3 to 6 to change between values displayed in this line

* = Option

Option:

If the compressor unit features two different pressure ranges, both pressures can be displayed in the main menu by pressing key 8.
(text of line 3 changes to „Press. 200/300“).

Display II:

Press.	Temp.
4: 0	C: 0
5: 0	D: 0
6: 0	E: 0
7: 0	F: 0
bar	°C

Key # leads back to "Mainmenu".

SETTINGS

M300

Settings:

Automatic

2 Stop pressure

3 Restart Press.

Semi-Automatic

4 Stop Pressure

9 Close

(M300) Return: #

Key 2 leads to submenu "Set Stop Pressure"
(in automatic mode)

Key 3 leads to submenu „Set Restart Pressure“
(in automatic mode)

Key 4 leads to submenu "Set Stop Pressure"
(in the semi automatic mode)

Key 9 leads back to "Selection menu"

Key # leads back to "Mainmenu"

Remark:

Use menu M700 to change between "Automatic" and "Semi-Automatic" mode.
Restart pressure can only be set in "Automatic Mode".

SET STOP PRESSURE (Automatic Mode)

M320

(Only in automatic mode, see menu M700))

Set

Stop Pressure:

Actual: 330 bar

7 New Value:

>> XXX bar

(050., 333)

8 Confirm

(M320) Return: #

Current restart pressure

Key 7 if restart pressure should be changed

XXX indicates modified stop pressure

Chooseable pressure range for restart pressure

Key 8 confirms new restart pressure

Key # leads back to „Mainmenu“

SET RESTART PRESSURE (Automatic Mode) M330*(Only in automatic mode, see menu M700)*

Set
Restart Pressure:
Actual: 180 bar
7 New value:
>> XXX bar
(030,, 310)
8 Confirm
(M330) Return : #

Current restart pressure
Key 7 if restart pressure should be changed
XXX indicates modified restart pressure
Chooseable pressure range for restart pressure
Key 8 confirms new restart pressure
Key # leads back to „Mainmenu“

Remark:

Restart pressure must be at least 20 bar lower than current stop pressure.

SET STOP PRESSURE (Semi-Automatic Mode) M340*(Only in semi-automatic mode, see menu M700)*

Set
Stop Pressure:
Actual: 180 bar
7 New Value:
>> XXX bar
(030,, 310)
8 Confirm
(M340) Return : #

Current stop pressure
Key 7 if stop pressure should be changed
XXX indicates modified stop pressure
Chooseable pressure range for stop pressure
Key 8 confirms new stop pressure
Key # leads back to „Mainmenu“

TEST MENU M400

Test:
2 Solenoids
3 Safety Valve
4 Test-Stop
9 Close
(M400) Return : #

Key 2 leads to submenu „Test Solenoids“
Key 3 leads to submenu „Test Safety Valve“
Key 4 leads to submenu „Test Stop without Venting“
Key 9 leads back to submenu „Selection“
Key # leads back to „Mainmenu“

TEST SOLENOIDS **M420**

Test Solenoids	
3	open
7	close
9	Close
(M420) Return : #	

Key 3 opens solenoids
Key 7 closes solenoids

Key 9 leads back to submenu „Test“
Key # leads back to „Mainmenu“

Remark:

This menu can not be left unless solenoids have been closed by key 7

TEST SAFETY VALVE **M430**

Test Safety Valve	
Close Filling Valves!	
5 Start	0 Stop
9 Close	
(M430) Return : #	

Key 5 to start test Key 0 to stop test
Key 9 leads back to submenu „Test“
Key # leads back to „Mainmenu“

Remark:

Close all filling valves /-panels before you run the safety valve test.
Compressor will run up to its maximum pressure, which is limited by the setting of the end-
pressure safety valve.
It will not stop at “Stop Pressure” (see menu M320).

TEST STOP **M440**

Test Stop without Venting	
5 Stop	
6 Vent	
Pressure	0 bar
9 Close	
(M440) Return : #	

Key 5 stops compressor during test run
 Key 6 vents compressor after leak search has been finished
 Shows current filling pressure
 Key 9 leads back to submenu „Test“
 Key # leads back to „Mainmenu“

Remark:

Test Stop can only be carried out after compressor has been started (key 1). Main purpose of it is to check compressor unit for air leaks.

STATISTICS MENU **M500**

Statistics	
Operation Hours:	15,2 h
Start cycles:	48
Max Press	338 bar
9 Close	
(M500) Return : #	

Total operation hours of compressor unit

Total number of compressor starts

Maximum working pressure of unit (set by safety valve test)

Key 9 leads back to submenu „Selection“

Key # leads back to „Mainmenu“

Remark:

Press key 5 to get information on which ECC software version is currently installed on your system (M505), i.e.: .

By pressing key 2 you get the total load cycles of the filter housing.

MAINTENANCE MENU**M600**

Hours remaining	
Oil change	14 h
Sinter filt	989 h
Silencer	4989 h
Valves	5989 h
Oil filter	1000 h
8 Change done	
(M600) Return : #	

*Shows remaining hours of listed components
(i.e. next oil change in 14 hours,...)*

*Key 8 leads to submenu "Receipt Maintenance"
Key # leads back to „Mainmenu“*

Remark:

System will display message when any of the listed parts should be replaced, plus in addition matching L&W spare part numbers.

CONFIRM MAINTENANCE**M680**

Confirm Maintenance	
2	Oil change
3	Sinter filters
4	Silencer
5	Valves
6	Oil filter
(M680) Return : #	

*Key 2 receipts oil change
Key 3 receipts change of sinter filters
Key 4 receipts change of silencer
Key 5 receipts change of valves
Key 6 receipts oil filter
Key # leads back to „Mainmenu“*

Display confirms any reset of „Hours remaining” with the following message:

Confirm Maintenance	
Operation Hours Meter Set	
9	Close
(M680) Return : #	

*Key 9 leads back to submenu "Hours remaining"
Key # leads back to „Mainmenu“*

Operation Mode:

- 2 Automatic
- 3 **Semi-Automatic**

Key 2 activates automatic mode
Key 3 activates semi-automatic mode

9 Close
(M700) Return : #

Key 9 leads back to submenu „Selection“
Key # leads back to „Mainmenu“

Remark:

See also menu 300.

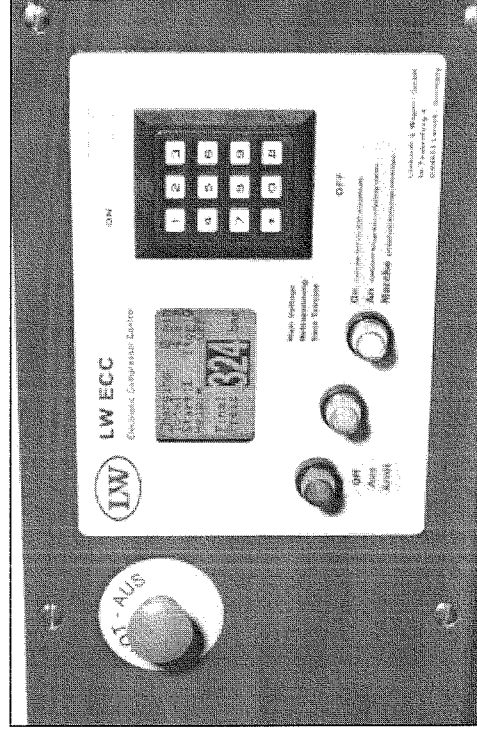
Activated modes are always displayed in bolt letters
(above example: *Semi-Automatic*)

Attention:

Compressor can start automatically if automatic mode is activated
(depending on restart pressure, see M330) !!

Never work on a unit which is connected to main power!
Always pull main plug before doing any maintenance work!

RISK OF ACCIDENT during maintenance work!!



ECC Display

Instructions for use



L&W PURACON Humidity Controller

Contents

For your safety-----	2
Intended Use-----	2
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Sensor -----	4
Operation -----	5
Sensor calibration-----	6
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Technical data -----	7

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For your safety

For correct, effective and safe use of the equipment and to avoid hazards it is essential to read and adhere to the following recommendations.

Strictly follow the instructions for use

Any use of the equipment requires full understanding and strict adherence of these instructions. The apparatus is only to be used for purposes specified here. Attention is drawn to the specific instructions for use of compressor and/or compressed air accordingly.

Maintenance

The apparatus must be inspected, calibrated and serviced by specialists at regular intervals (and a record kept). We recommend obtaining a service contract with our authorized Service. Repair or calibration should only be carried out by authorized Service technicians

Liability for correct function or damage

The liability for the correct function of apparatus is irrevocably transferred to the owner or operator to the extent that if the equipment has been serviced or repaired by personnel not employed or authorised by Lenhardt & Wagner or when the equipment was used in a manner incompatible with the intended use. Lenhardt & Wagner cannot be held responsible for damage caused by non-compliance with the recommendations given above. The warranty and liability provisions of the terms of sale and delivery of Lenhardt & Wagner are affected by the recommendations given above.

Lenhardt & Wagner GmbH

Intended Use

The instrument is for monitoring the humidity of air/gas in a filling system such as a breathing air filling station using high pressure compressors.

Correctly installed and connected, the instrument monitors and displays the moisture content in a high pressure pipeline. The instrument can be used as a visual reference for the state of purification filters, as an audio alarm for exceeding pre-set moisture levels, or as a safety device for cutting out off a compressor when a pre-set moisture level is exceeded.

Regulations

Regulations for the quality of breathing are relevant, as are regulations for the installation and operation of high pressure gas installations and cylinders. In particular, the EN 12021 stipulates a limit of 25 mg/m³ moisture in breathing air as measured from a compressor.

Description

The instrument consists of the following components which make up the standard scope of delivery:

Display unit

The display unit consists of a housing with an LCD display, 3 quick reference LEDs, a mains power cable, an orange sensor cable and two buttons on the front for Mode and Rest.

The orange sensor cable should only be connected / disconnected when the power supply is off (unplugged). Cables up to 30m length are available as accessories.

The power supply cable is for use with a standard 230V CE socket with Earth. Other voltages available on request.

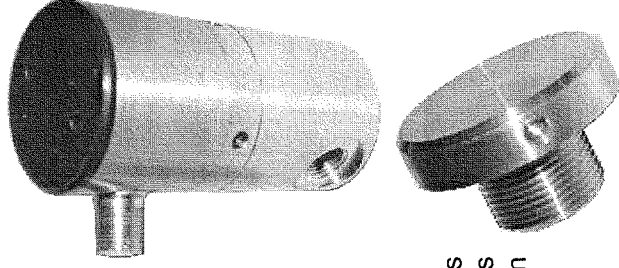
The LCD display shows the present moisture level in mg/m^3 and/or self test and alarm messages.

The 3 quick reference LEDs give a visual indication of the moisture level (factory settings):

- Green $<20 \text{ mg}/\text{m}^3$
- Yellow 21-25 mg/m^3
- Red $>25 \text{ mg}/\text{m}^3$ (cut-off or alarm relay is activated)

Sensor housing

The cylindrical sensor housing consists of two halves screwed into each other and sealed with an O ring. The sensor housing contains the highly sensitive sensor that monitors the moisture content. If a filter is not changed when the display indicates, then water droplets may enter the sensor housing causing faults in the system.



Blind plug

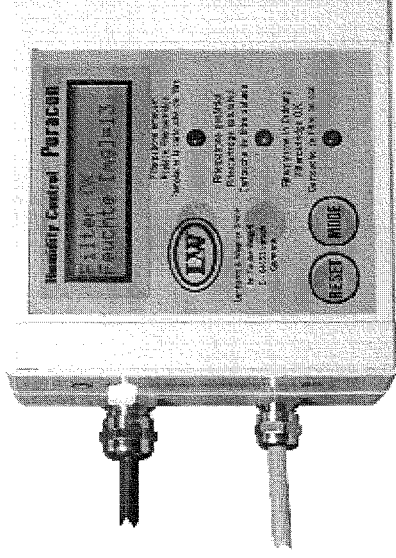
The stainless steel blind plug that is sealed with an o ring, is used to block the lower housing body when the upper body is removed for repair/service. This ensures that the filling station can still function without the humidity controller.

Instructions for use

These instructions form part of the scope of delivery

Installation

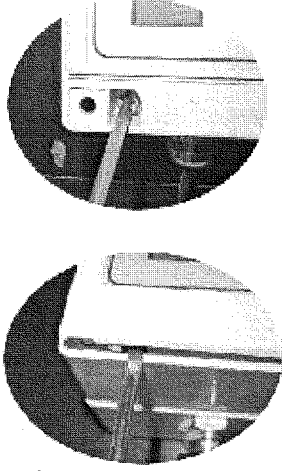
Warning: Before any work is carried out, isolate the power supply to prevent injury. The puracon may be already installed in a compressor or a filling station, or may need to be installed in an existing system as follows:



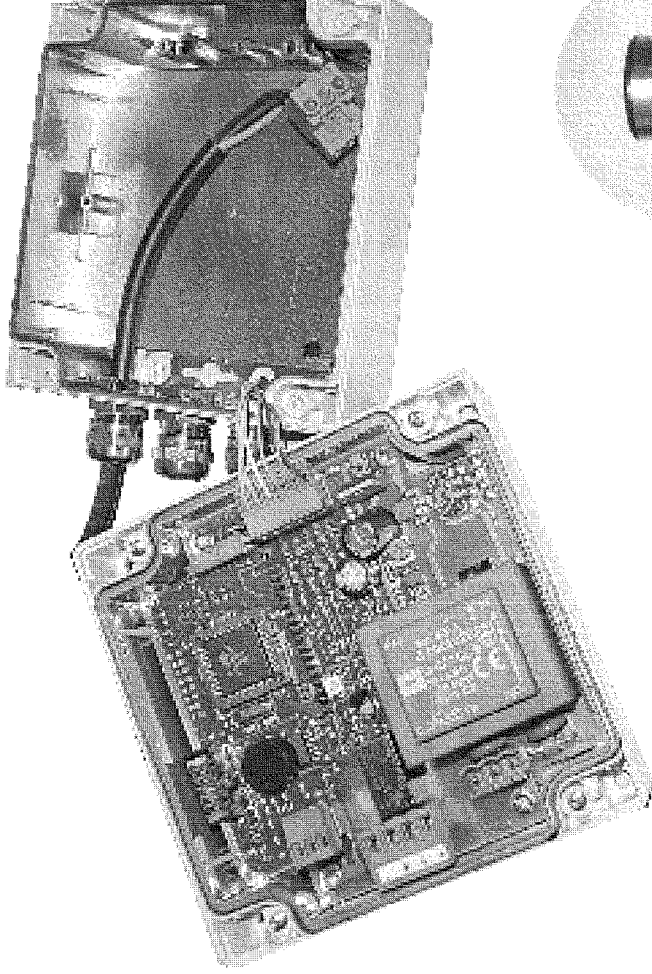
Display

Remove the two plastic covers from the front of the display, unscrew the four screws which join the front cover and the rear cover.

When the display is opened, the two cables can be unplugged from the printed circuit board (PCB) and the front cover including PCB placed in a safe place.



The rear cover can now be mounted onto a wall or panel with 4 screws (not included). The two cables are located on the left hand side.

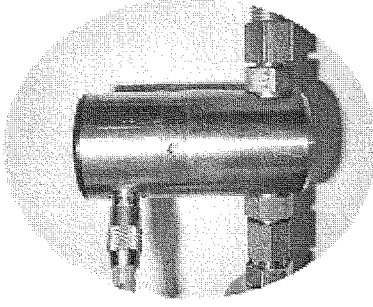


Plug in the cables onto the PCB without using excessive force and refit the front cover and the two plastic strips.

Sensor

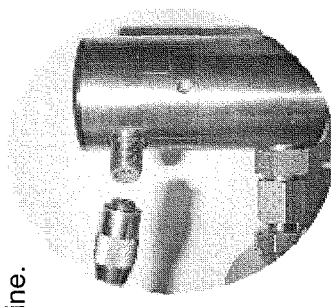
The sensor housing should be vertically mounted in the high pressure pipeline after a non return/pressure maintaining valve. A non return valve is recommended in the outlet of the housing towards the filling panel. The connections should be made with suitable ermeto connections by a qualified technician. There is no particular direction of flow.

Care is to be taken that no burrs or debris remains in the pipeline.



Sensor cable

The sensor cable plug has a guide inside for the sensor housing socket to prevent incorrect connections. Do not use excessive force when plugging the cable in, and screw down the plug finger tight.



Warning: Do not connect/disconnect the sensor cable when the power supply is on.

Power supply

If the Puracon is to be connected to a standard electric socket, simply plug in the CE plug into an earthed socket. The standard units require 210 – 250V AC, 40-60 Hz. Other voltages available on request.

If the Puracon is to be connected into a compressor's power supply, the cable in the electrical distribution box of the compressor is to be shielded, the shielding can be connected to a suitable metal connection. A qualified electrician is recommended for carrying out this work.

Electrical connections

- | | |
|---|---|
| 1 | PE Earth green/yellow cable) |
| 2 | L1 240V AC or +12V / +24V (special version) |
| 3 | Neutral or Return in -12V / -24V (special version) |
| 4 | Free |
| 5 | Off (Relay switched. Motor off) |
| 6 | On (Relay switched, motor can be started) Relay voltage <40V AC or <2V DC |
| 7 | Common connection |

Operation

When the power supply is turned on, or when the compressor is turned on, the Puracon will start a self test sequence.

Language selection

Press **Reset**

Press and hold **Model**, press **Reset**

When a Peep is heard and the display goes blank, release **Model**

“**Language**” will appear in the display

After hearing a peep, press **Model** and keep it pressed

When the desired language appears in the display, release **Model**

A long peep signal the end of the selection.

Display

The display will show the actual humidity in the system and display the value in mg/m³ on the LCD accompanied by an LED as follows.

After the compressor has been standing for some time or after a filter change, there will be remaining moisture in the system that will be displayed as a value higher than 20 mg/m³ with a yellow or red LED. When the compressor air starts to flow through the system, the remaining moisture will be flushed out of the system and the moisture level will reduce.

Errors

If and error is shown in the display, the unit can be re-set by pressing and then releasing the **Reset** button. The system will restart and carry out a self test. Pressing **Reset** at any time will return the unit to the normal monitoring mode.

The following errors may appear in the display:

- Error 1 Moisture, defective or contaminated sensor
 - Error 2 Moisture, value outside normal parameters or out of calibration
 - Error 3 -
 - Error 4 Default is missing, data loss in memory, cross connection
 - Error 5 Sensor cable is defective or broken, no monitoring
- If this error remains, replace the sensor cable.
- Error 10 Voltage for sensor supply <7 volt> 10 volt
 - Error 11 Voltage for processor supply <4.7 volt>5.3 volt
 - Error 12 12V DC Supply <10 volt> 14 volt
 - Error 13 15V AC/DC transformer <13 volt> 17 volt

If the error remains on the display after reset, then the unit must be returned to an authorised repair facility.

Sensor calibration

The sensor is subject to a natural aging process with an expected life of approx. 6 years. The sensor should be calibrated every 2 years. This calibration requirement is not necessary if independent air/gas quality assurance measures are taken (at least once a year).

Removal of sensor and display for return

For the regular calibration or if the unit has a defect and must be sent back for repair, the unit can be dismantled as follows:

Sensor cable

Ensure the power supply is isolated and unplug the sensor cable from the sensor housing.

Sensor housing

Ensure that the sensor housing is vented and pressure free. The upper part of the sensor housing can be unscrewed from the lower housing using a suitable "C" spanner. Fit the blanking plug into the lower housing to seal the system and allow continued use (without humidity monitoring).

Display

Remove the two plastic strips from the front of the display, remove the 4 screws and pull the front display half away from the rear half carefully.

Unplug the two (or three) cables from the PCB.

Return the front half of the display and the upper sensor unit to an authorised repair facility or to a Lenhardt & Wagner facility. It is not necessary to include the cables with the returned unit.

Technical data

Display

Dimensions (L x W x H):	120 x 120 x 60 mm
Installation dimensions:	150 x 120 x 60 mm
Weight	approx. 800 g
Voltage (standard unit)	210 - 250 V AC 6VA
Frequency	40 - 60Hz
Protection class	IP65
Relay	<40V DC/<2A DC

Sensor

Dimensions (L x Ø):	95 x 45 mm
Installation dimensions:	95 x 100 mm
Weight:	approx. 800 g
Maximum pressure:	330bar
Protection class:	IP65
Working temperature	+5 - +50°C

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Maintenance List

LW 720 E

Routine Service	Intervals	Qty.
Check oil level	before each day of use	
Oil changes	1 st after 25 working hours 2 nd after 200 working hours 3 rd after 1000 working hours thereafter every 2000 working hours – but at least once a year	3000 ml
Replace air inlet filter	every 2000 working hours	1
Check V-belt tension	every 200 working hours	3
Replace in- & outlet valves	every 2000 working hours	
Check safety devices	at least once a year	
Check pressure pipes for air leaks	every 200 working hours	
Clean pressure pipes	Depends on degree of pollution - but at least once a year	
Check filling hoses for damage	before each use - once a year by an expert	
Clean sieve of oil pump	every 5000 working hours	
Replace sintered filter of condensate valve	after 1000 working hours - thereafter every 5000 working hours	1
Replace sintered filter of waterseparators	every 1000 working hours	1 1
Clean oil / waterseparator and check for corrosion	every 1000 working hours - but at least once a year	
Check connections and fixings for correct torque	after 15 working hours - thereafter every 500 working hours	

ERSATZTEILLISTE LW 720 E
**BESTELL NR.
ORDER NO.**

ST. BENENNUNG	DESCRIPTION	
1	Dichtung Ölstandsauge	Gasket oil level indicator 0078
8	Schneidring 12mm	Olive seal 12mm 0094
8	Überwurfmutter 12L	Nut 12L 0095
10	Schneidring 6mm	Olive seal 6mm 0099
10	Überwurfmutter 6L	Nut 6L 0100
1	Verschraubung T-Stück	T-piece connection 0101
1	Verschlußstopfen	Plug 0124
1	T-Stück	T-Piece connection 0158
6	Flügelblatt	Fan blade 0202
1	Flügelhalteflansch	Flange fan blades 0203
1	Schwungrad	Flywheel 0204
3	Keilriemen	V-belt 0205
1	Riemenscheibe Antriebsmotor	Pulley Drive Motor 0206
1	Antriebsmotor LW 720 E 18,5 kW / 400 V / 50 Hz	Drive motor LW 720 E 18,5 kW / 400 V / 50 Hz 0207
1	Antriebsmotor LW 720 EG 18,5 kW / 400 V / 50 Hz, ex- geschützt	Drive motor LW 720 E 18,5 kW / 400 V / 50 Hz, 0208
1	Schraube	Bolt 0209
1	Scheibe	Washer 0210
2	Ventilkopf	Valve head 0211
1	Kompressionszylinder 4. Stufe	Compression cylinder 4th stage 0212
1	Führungszylinder 4.Stufe	Guide cylinder 4th stage 0213
1	Kompressionszylinder 3. Stufe	Compression cylinder 3rd stage 0214
1	Führungszylinder 3. Stufe	Guide cylinder 3rd stage 0215
1	Kolbenringe 3. Stufe (kompl. Satz)	Piston rings 3rd stage 0216
1	Kompressionskolben 3. Stufe	Compression piston 3rd stage 0217
2	Führungskolben	Guide piston 0218

ERSATZTEILLISTE LW 720 EBESTELL NR.
ORDER NO.

ST. BENENNUNG	DESCRIPTION	
1 Kolbenringe 4. Stufe (kompl. Satz)	Piston rings 4th stage	0219
1 Kompressionskolben 4. Stufe	Compression piston 4th stage	0220
1 Kurbelwelle	Crankshaft	0222
1 Lagerflansch	Bearing flange0	0223
1 Dichtung	Gasket	0224
1 Hauptlager	Main beaing	0225
1 Sicherungsring	Circlip	0226
1 Innenring Kurbelwellenlager	Inner ring crankshaft bearing	0227
1 Öl-Schleuderring	Oil spray ring	0228
1 Radialwellendichtring	Shaft seal	0229
1 Sicherungsring	Circlip	0230
1 Ventilkopf 1. Stufe	Valve head 1st stage	0231
1 Ventildichtung 1. Stufe oben	Valve gasket 1st stage	0232
1 Saug- & Druckventil 1. Stufe	In- & outlet valve 1st stage	0233
1 Ventildichtring 1. Stufe unten	Lower valve gasket 1st stage	0234
1 Ansaugfiltergehäuse	Air intake housing	0235
1 Sicherungsring Ansaugfiltergehäuse	Circlip	0237
1 Verschraubung	Connection	0238
1 Zylinder 1. Stufe	Cylinder 1st stage	0239
4 Flanschdichtung	Flange gasket	0240
1 Kolbenringe 1. Stufe (kompl. Satz)	Piston rings 1st stage	0241
1 Kolben 1. Stufe	Piston 1st stage complete	0242
2 Pleuel 3. / 4. Stufe	Connection rod 3rd/4th stage	0243
1 Pleuel 1. Stufe	Connecting rod 1st stage	0244
1 Pleuel 2. Stufe	Connecting rod 2nd stage	0245
1 Ölpumpenflansch	Oil pump flange	0247
2 Madenschraube	Worm screw	0248
1 Ventildichtung 2. Stufe	Lower valve gasket 2nd stage	0251

ERSATZTEILLISTE LW 720 E
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ORDER NO.
ST. BENENNUNG**DESCRIPTION**

unten

1	Zylinder 2. Stufe	Cylinder 2nd stage	0252
1	Kolben 2. Stufe	Piston 2nd stage	0253
1	Kolbenringe 2. Stufe (kompl. Satz)	Set piston rings 2nd stage	0254
1	Dichtung Ölpumpenflansch	Gasket oil pump flange	0255
1	Rollenlager	Roller bearing	0256
2	O-Ring	O-ring	0257
2	Kolbenbolzen 2. & 3. Stufe	Piston pin 2nd & 3rd stage	0258
1	Kolbenbolzen 1. Stufe	Piston pin 1st stage	0259
1	Kolbenbolzen 2. Stufe	Piston pin 2nd stage	0260
1	Oberes Pleuellager 2. Stufe	Upper conrod bearing 2nd stage	0261
2	Nadellager	Needle bearing	0262
2	Sicherungsring Kolben	Circlip piston	0263
16	Zylinderschraube	Bolt	0265
12	Zylinderschraube	Bolt	0266
12	Zylinderschraube	Bolt	0267
1	Ansauggehäuseeinsatz Erdgas	Intake filter cartridge CNG	0268
1	Ansauggehäuseeinsatz Atemluft	Intake filter cartridge breathing air	0269
1	Dichtscheibe	Gasket	0341
1	Madenschraube	Worm screw	0342
1	Schraube Gegengewicht	Bolt	0343
1	Paßfeder Kurbelwelle	Woodruf key	0344
1	Entlüftungsrohr	Vent pipe	0346
1	Halteblech Ölabscheider	Bracket oil separator	0347
1	Eingangsröhrleitung 2. Stufe	Pressure pipe	0348
1	Röhrleitung Kondensatventil	Pipe condensate 2nd stage	0349
3	Magnetventil ex-geschützt, 24V, < 40 bar	Solenoid, CNG specification 24V, 40 bar	0350

ERSATZTEILLISTE LW 720 E
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ST. BENENNUNG	DESCRIPTION	
1 Hochdruck Wasserabscheider 0,5 ltr	High pressure water separator, volume: 0.5 ltr	0351
1 Hochdruckrohr	Pressure pipe	0352
1 Rohrleitung	Pipe	0353
1 Entwässerungsleitung	Drain pipe	0354
1 Rohrleitung kondensatablaß	Condensate pipe	0355
1 Wärmetauscher 2. Stufe	Heat exchanger 2nd stage	0356
1 Ölrückführungsleitung	Oil return pipe	0357
1 Unterer Wärmetauscher	Lower heat exchanger	0358
1 Rohrleitung	Pipe	0359
1 Überdruckleitung 3. Stufe	Pipe	0360
1 Rohrbogen	Pipe	0361
1 Rückleitungsrohr	Pipe	0362
1 Überdruckleitung 1. Stufe	Pipe	0363
1 Oldruckleitung	Oil pressure pipe	0364
1 Öldruckleitung	Oil pressure pipe	0365
1 Halteblech Wärmetauscher	Bracket heat exchanger	0366
1 Überdruckleitung 2. Stufe	Overpressure pipe 2nd stage	0367
1 Adapter Ölablass	Adapter oil drain	0368
1 Ölablasshahn	Oil release valve	0369
1 Verschlussstopfen	Plug	0370
1 Ölsaugleitung	Oil suction pipe	0371
1 Öldruckschalter	Oil pressure switch	0372
1 Magnetventil, ex-geschützt, 24V, < 100 bar	Solenoid, CNG specification 24V, 100 bar	0373
1 Anschlußstück	Connector	0374
1 Schottverschraubung 18L	Bulkhead fitting	0375
1 Oberer Wärmetauscher	Upper heat exchanger	0376
2 Kühlwendel Halteschiene 1. Stufe	Cooling pipe bracket 1st stage	0377
4 Klemmschlauch	Hose	0378

ERSATZTEILLISTE LW 720 EBESTELL NR.
ORDER NO.

ST. BENENNUNG	DESCRIPTION	
3 Kappe für Sicherheitsventil klein	Cap safety valve, small	0379
1 Kappe für Sicherheitsventil groß	Cap safety valve, large	0380
1 Sicherheitsventilblock	Safety valve block	0381
1 Enddruck Sicherheitsventil (Erdgas)	Endpressure safety valve	0382
1 O-Ring Ansaugfiltergehäuse	O-ring air intake housing	0383
1 Sicherheitsventil 3. Stufe	Safety valve 3rd stage	0384
1 Sicherheitsventil 2. Stufe	Safety valve 2nd stage	0385
1 Sicherheitsventil 1. Stufe	Safety valve 1st stage	0386
1 Enddruckschalter (ex-geschützte Ausführung)	Endpressure switch, CNG specification	0387
1 Verschraubung	Connection	0388
2 Winkelverschraubung	Elbow connection	0389
1 Verschraubung gerade	Straight connection	0390
8 Überwurfmutter 10L	Nut 10L	0391
8 Schneidring 10mm	Olive seal 10mm	0392
1 Verschraubung gerade	Straight connection	0393
1 Halterahmen 4. Stufe	Bracket 4th stage	0394
3 Dreilochflansch klein	3-hole flange, small	0395
1 Dreilochflansch groß	3-hole flange, large	0396
1 Manometer 0-10 bar	Pressure gauge 0-10 bar	0397
1 Manometer 0-40 bar	Pressure gauge 0-40 bar	0398
1 Manometer 0-100 bar	Pressure gauge 0-100 bar	0399
1 Haltestütze 3. Stufe	Bracket 3rd stage	0400
1 Haltestütze 4. Stufe	Bracket 4th stage	0401
1 Halteblech	Sheet bracket	0402
1 Verschraubung	Connection	0405
2 Verschraubung, gerade	Straight connection	0406
1 Verschlussstopfen	Plug	0443
1 Verschraubung	Connection	0465

ERSATZTEILLISTE LW 720 E
**BESTELL NR.
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ST. BENENNUNG	DESCRIPTION	
4 Distanzhülse	Spacer	0466
5 Überwurfmutter A-Lok	Nut A-Lok	0468
5 Klemmring unten	Lower locking	0470
5 Verschraubung A-Lok	Connection A-Lok	0472
3 Winkelverschraubung	Elbow connection	0473
1 Verschraubung	Connection	0475
1 Adapterscheibe	Adapter	0476
1 Sicherungsscheibe	Safety washer	0478
1 Verschraubung	Connection	0479
3 Magnetventil (ex-geschützt) LW 720	Solenoid CNG specification	0480
1 Ventilatorschutz LW 720	Fan Cover	0481
1 Grundkonsole LW 720	Console	0482
2 Schraube	Bolt	0484
4 Zylinderschraube Ventilkopf 1. Stufe	Valve head bolt 1st stage	0485
1 Gegengewicht Kurbelwelle	Counterweight crankshaft	0486
2 Haltschraube	Bolt	0490
1 Saug- & Druckventile, kompl. Satz	In- & Outlet valves, complete set	0501
4 Standfuss	Rubber stand	0506
2 Schraube	Bolt	0507
4 Schraube	Bolt	0508
2 Zylinderschraube	Allen bolt	0509
1 T-Stück A-Lok	T-piece A-Lok	0510
1 Klemmring oben	Upper	0511
1 Winkelverschraubung	Elbow connection	0511
16 Zylinderschraube	Allen bolt	0512
3 Manometerschraubung	Pressure gauge connection	0512
3 Dichtring	Seal ring	0513
1 Verbindungsrohr	Pipe	0514
1 Einschraubadapter	Adapter connection	0515

ERSATZTEILLISTE LW 720 E
**BESTELL NR.
ORDER NO.**

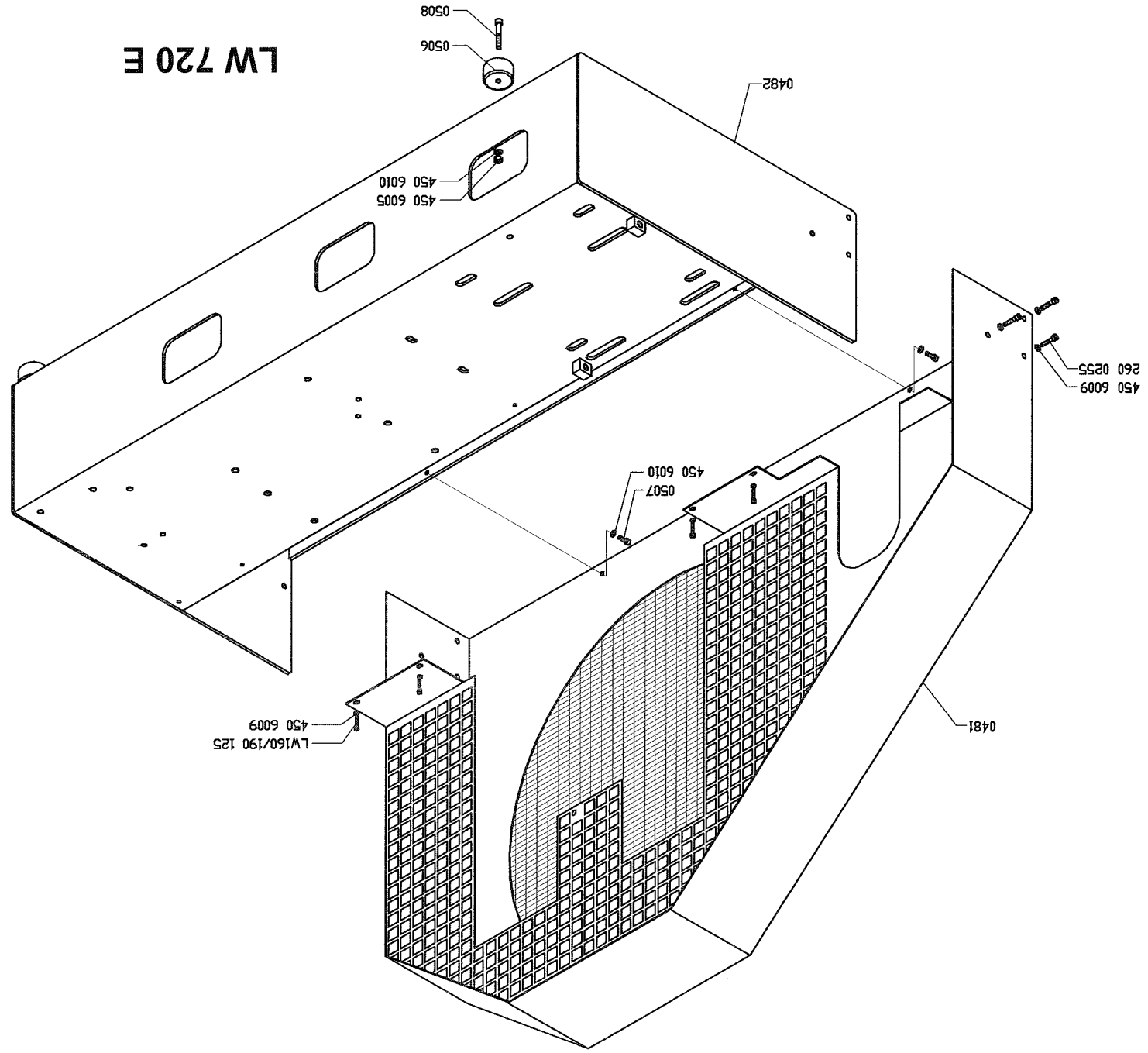
ST. BENENNUNG	DESCRIPTION	
1 O-Ring Sicherheitsventil	O-ring safety valve	0516
12 6-kant Schraube	Hexagon bolt	0517
1 Kurbelgehäuse LW 720	Crankcase LW 720	0518
1 Öleinfüllrohr	Oil filling pipe	0519
1 Passfeder	Woodruff key	0520
3 Winkelverschraubung A-Lok	Elbow connection A-Lok	0521
1 Kühlrohrwendel 4. Stufe	Heat exchanger 4th stage	0522
1 Druckminderer Kondensatventil	Pressure reducer condensate valve	0523
1 Druckleitung 3. Stufe	Pressure pipe 3rd stage	0524
1 Eingangsrohr 4. Stufe	Pressure pipe 4th stage	0525
1 Eingangsrohr 3. Stufe	Inlet pipe 3rd stage	0526
1 O-Ring Ölpumpe	O-ring oil pump	0527
2 Kühlwendel Halteschiene 2. Stufe	Bracket heat exchanger 2 nd stage	0528
1 Kompl. Satz Sinterfilter LW 720	Complete set sinterfilters LW 720	0551
1 Saug- & Druckventil	In- & Outlet valve	260 0084
2 Zylinderschraube	Allen bolt	260 0174
8 Schraube	Bolt	260 0255
3 Doppelnippel	Connection	3013
2 Oberteil Öl-/ Wasserabscheider	Upper part oil- / water separator	450 10001
2 Drallscheibe	Twist disc	450 10002
2 Wasserabweiser	Water shield	450 10003
2 Sinterfilter	Sinter filter	450 10004
2 Halteteller	Plate	450 10005
2 Deckel	Lid	450 10006
4 Mutter Wasserabscheider	Nut	450 10007
2 O-Ring Wasserabscheider	O-ring water separator	450 10008
1 Rohr Wasserabscheider	Tube water separator	450 10009
2 Befestigungsring	Fixing ring	450 10010

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ST. BENENNUNG	DESCRIPTION	
2 Oberteil Öl-/ Wasserabscheider	Top oil- / water separator	450 10016
2 Drallscheibe	Twist disc	450 10017
2 Wasserabweiser	Filter protector	450 10018
2 Sinterfilter	Sinter filter	450 10019
2 Halteteller	Plate	450 10020
6 O-Ring	O-ring	450 10021
2 Ring Wasserabscheider	Ring water separator	450 10022
2 Rohr Wasserabscheider	Tube water separator	450 10023
1 Spannschraube	Tension bolt	450 1003
1 Enddruckschalter (std. Ausführung Pressluft)	Endpressure switch standard specification	450 2013a
1 Ölabscheider	Oil separator	450 2015
2 Winkelverschraubung	Elbow connection	450 3001
3 Verschraubung gerade	Straight connction	450 3004
6 Verschraubung gerade	Straight connection	450 3007
1 Verschraubung, gerade	Straight connection	450 3008
3 Winkelverschraubung	Elbow connection	450 3011
2 Verschraubung	Connection	450 3016
1 Reduzierung	Reducer	450 3021
1 Gerade Verbingung 8L	Straight connection 8L	450 3022
2 Mutter M6	Nut M6	450 6004
4 Mutter	Nut	450 6005
2 Klemmmutter	Locknut	450 6006
18 Unterlegscheibe	Washer	450 6009
64 Unterlegscheibe	Washer	450 6010
10 Unterlegscheibe	Washer	450 6011
4 Stoppmutter M8	Nyloc nut M8	450 6027
1 Schraube	Bolt	450 6028
4 Zylinderschraube	Bolt	450 6029
2 Schraube	Bolt	450 6040
1 Saug- & Druckventil	In- & Outlet valve	450 7005

ERSATZTEILLISTE LW 720 E
**BESTELL NR.
ORDER NO.**

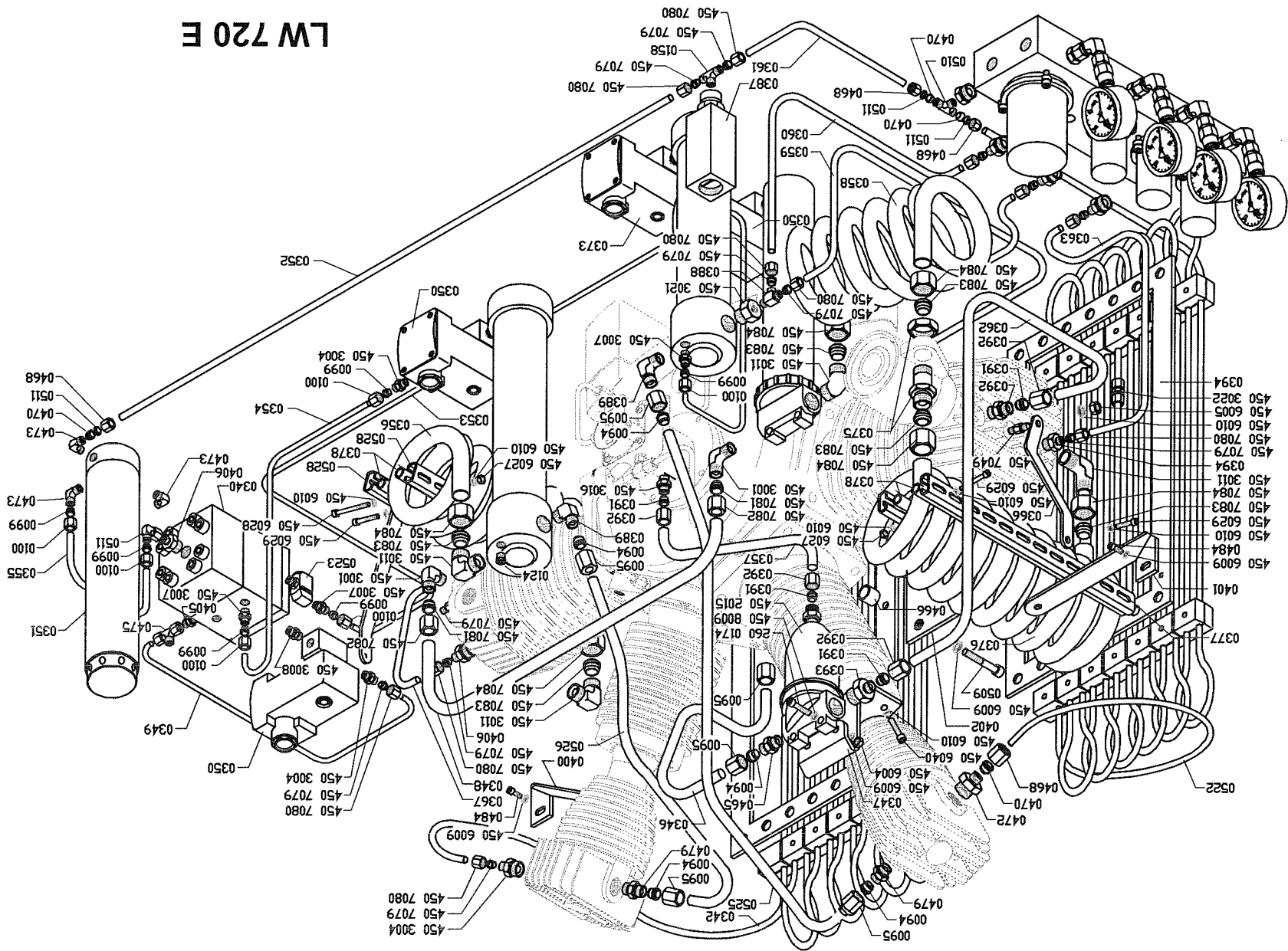
ST. BENENNUNG	DESCRIPTION	
1 Ölpumpenadapter	Adapter oil pump	450 7012
1 Ansaugfilterpatrone	Air intake cartridge	450 7017
1 Ölpumpe	Oil Pumop	450 7018
1 Ölstandsauge	Oil level indicator	450 7021
8 Sicherungsring Kolbenbolzen	Circlip piston	450 7026a
1 Ventilkopf 2. Stufe	Valve head 2nd stage	450 7032
4 Zylinderschraube Ventilkopf 2. Stufe	Valve head bolt 2nd stage	450 7046
1 Distanzbolzen Ventilkopf 1. Stufe	Spacer bolt 1st stage	450 7049
2 Haltewinkel	Bracket	450 7063
1 Ventildichtung 2. Stufe oben	Upper valve gasket 2nd stage	450 7066b
8 Schneidring 8mm	Olive seal 8mm	450 7079
8 Überwurfmutter 8L	Nut 8L	450 7080
2 Schneidring 15mm	Olive seal 15mm	450 7081
2 Überwurfmutter 15L	Nut 15L	450 7082
6 Schneidring 18mm	Olive seal 18mm	450 7083
6 Überwurfmutter 18L	Nut 18L	450 7084
4 Schraube	Bolt	LW 160/190 125
1 Manometer 0-400 bar	Pressure gauge 0-400 bar	LW 160/190 253



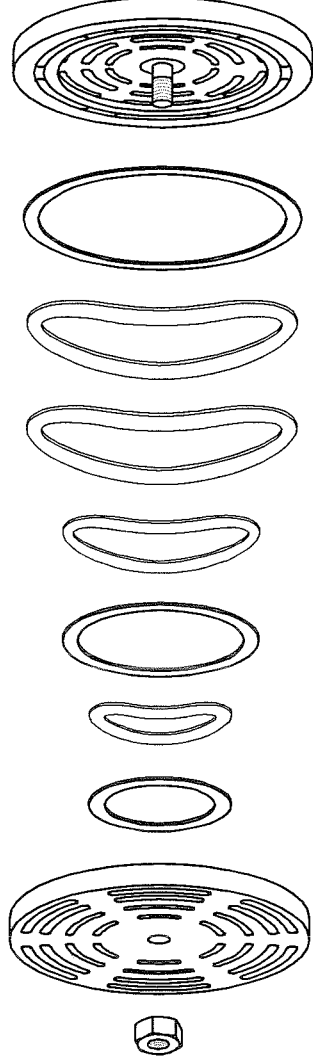
LW 720 E

This is a detailed exploded view diagram of a LW 720 E engine assembly. The diagram shows the engine block, cylinder head, piston and connecting rod assembly, crankshaft, and various ancillary components like the timing belt, valves, and sensors. Each part is labeled with a unique alphanumeric code, such as 0207 for the cylinder head, 0227 for the piston, and 0213 for the crankshaft. The diagram is oriented with the engine block at the top and the crankshaft at the bottom, showing the internal components in their relative positions for assembly.

LW 720 E

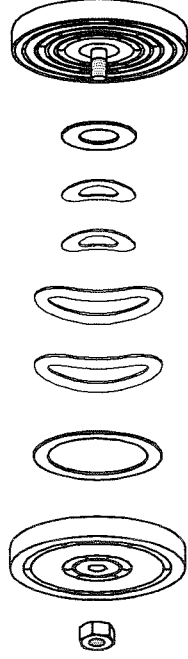


1st Stage 0233



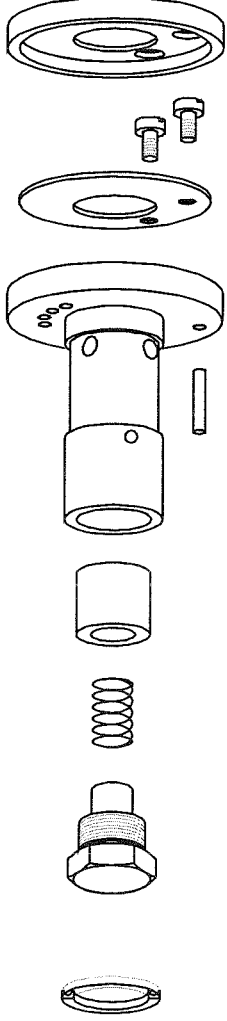
Complete Set of Valves
Order No.: 0501

2nd Stage 450 7065

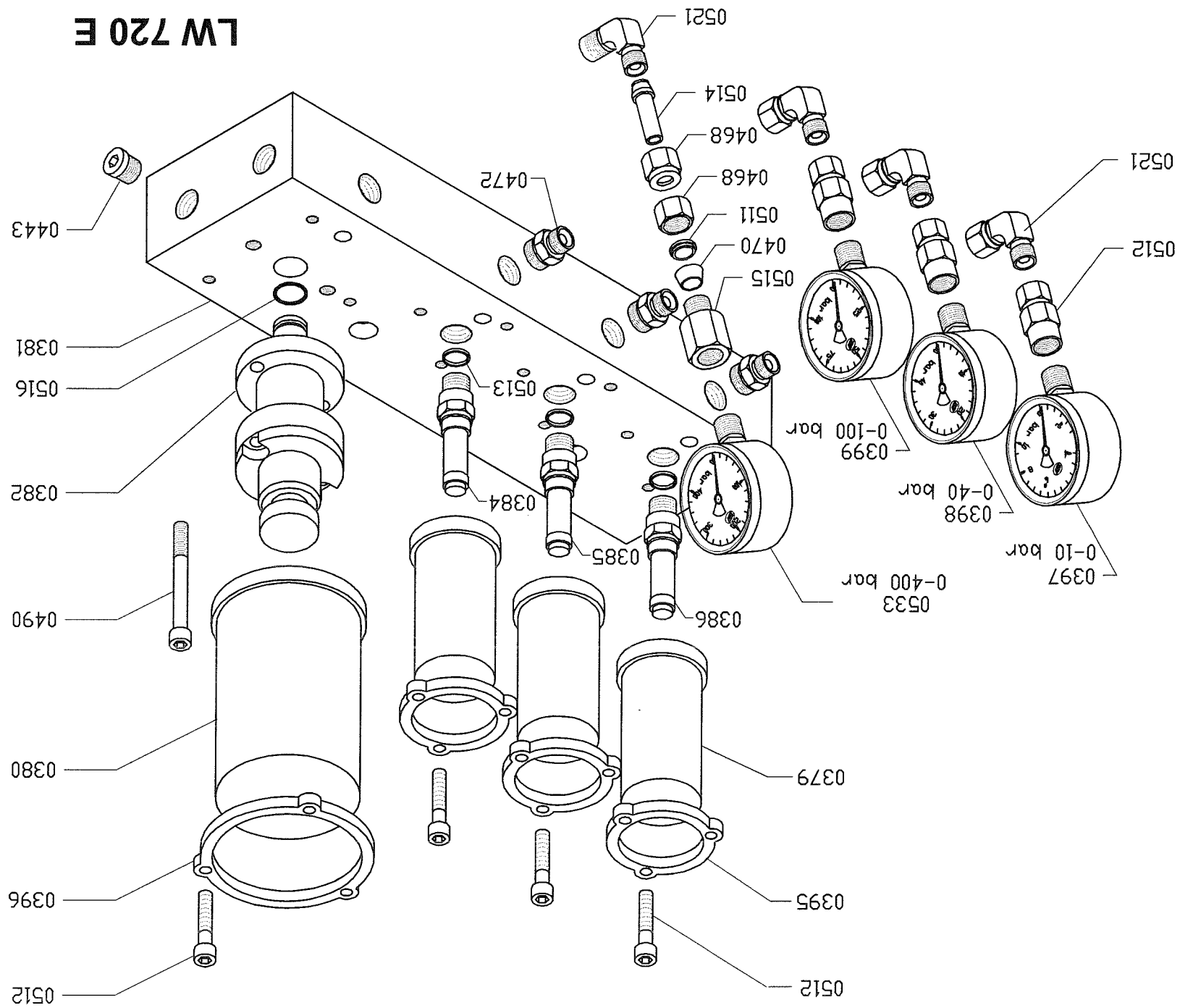


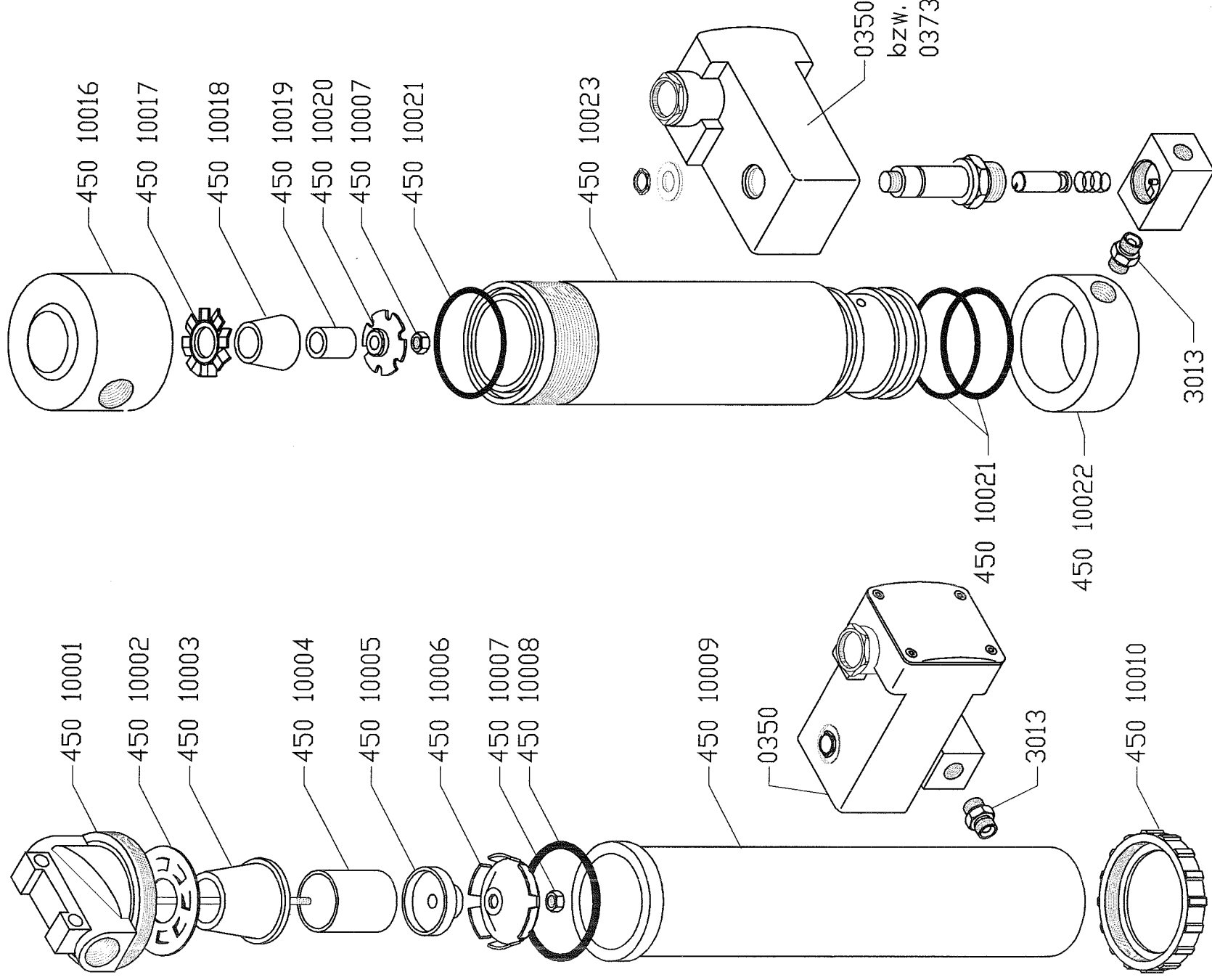
LW 720 E

3rd Stage 260 0084
4th Stage 450 7005



LW 720 E





LW 720 E