USER MANUAL

CYCLONE
SILENT

TABLE OF CONTENTS

USER MANUAL

1. General Instructions

CAUTION: High pressure pneumatic device

The **PARAMINA *Cyclone*** compressor is a high pressure air-compressor offering high quality breathing air. It is designed according to EU directive 2006/42/EC for the safety of machinery. Noise complies with 2005/88/EC directive.
The compressor must be used **ONLY** for producing compressed air as described in this manual.
Any other use is not allowed whatsoever!
Strictly observe all instructions pertaining to the operation and maintenance of this product. Fail to observe these instructions may lead to serious injury or even death.

The manufacturer accepts no liability for damage or injury due to non-compliance to all instructions of this manual.

FOR YOUR SAFETY

Thoroughly observe the following:

1. Timely replacement of filter elements and activated carbon - molecular sieve filter.

2. Make sure that the air compressor is installed in a place that guarantees plenty of fresh air, without any engine's exhaust gas.

3. Proper cylinder maintenance

4. Proper compressor maintenance

5. Only trained and experienced technicians are allowed to overhaul this compressor.

6. **NEVER INTERFERE WITH THE SAFETY DEVICES**

7. In case you become aware of any change in the compressor's operation, call us in order to help you responsibly troubleshoot the product and to provide you with repair instructions.

8. **NEVER USE THE COMPRESSOR FOR ANY OTHER GAS APART FROM ATMOSPHERIC AIR.**

The instructions concerning safety are marked with this symbol.

2. Technical Data

High pressure breathing air compressor, 4 cylinders, 4 stages, air-cooled.

Model:	**Cyclone Silent 24E**	**Cyclone Silent 30E**	**Cyclone Silent 36E**	**Cyclone Silent 24E - 420b**	**Cyclone Silent 30E - 420b**
Maximum pressure:	350 bar (5075 psi)			420 bar (6090 psi)	420 bar (6090 psi)
Minimum pressure:	40 bar (580 psi)			40 bar (580 psi)	40 bar (580 psi)
Capacity:	24,0 m3/h – 400 lit/min	30,0 m3/h – 500 lit/min	36,0 m3/h – 600 lit/min	24,0 m3/h – 400 lit/min	30,0 m3/h – 500 lit/min
Ambient temperature:	+5ºC to +45ºC			+5ºC to +45ºC	+5ºC to +45ºC
Oil capacity:	3,0 lit			3,0 lit	3,0 lit
Speed Rotation:	800 rpm	1000 rpm	1200rpm	800 rpm	1000 rpm
Piston stroke:	90 mm			90 mm	90 mm
Cylinder bore:	1st stage 105 mm			1st stage 105 mm	1st stage 105 mm
	2nd stage 55 mm			2nd stage 55 mm	2nd stage 55 mm
	3rd stage 36 mm			3rd stage 36 mm	3rd stage 36 mm
	4th stage 14 mm			4th stage 14 mm	4th stage 14 mm
Working Pressure:	1st stage 2,2 bar 2,2 bar 2nd stage10,4 bar 10,5 bar 3rd stage 52 bar 54 bar 4th stage 225 bar 350 bar			3,6 bar 11 bar 55 bar 410 bar	3,6 bar 11 bar 55 bar 410 bar
Electric Motor:	7,5 kW /10 Hp – 400-440V/50-60 Hz	11 kW / 15 Hp - 400-440V/50-60 Hz	15 kW / 20 Hp - 400-440V/50-60 Hz	7,5 kW / 10 Hp - 400-440V/50-60 Hz	11 kW/15 Hp - 400-440V/50-60 Hz
Control Voltage:	24 V, 50Hz			24 V, 50Hz	24 V, 50Hz
Dimensions LxDxH:	81x124x178 cm			81x124x178 cm	81x124x178 cm
Weight:	498 - 510 Kg	546 - 560 Kg	551 – 585 Kg	498 - 520 Kg	546 - 570 Kg

PARAMINA HIGH PRESSURE COMPRESSORS MOTORS*, FUSES & CABLES

STANDARD PLUGS, OTHER PLUGS ON REQUEST

MODEL	MOTOR			FUSE BOX (curve D or K)	PLUG (PGE)			CABLE	
	KW	AMPS	P. F.	AMPS	AMPS	PHOTOS		DIMENSIONS (mm^2)	LENGTH (m)
CYCLONE 24	7,5/400V/50-60Hz	14,9	0,88	35A	Wander plug 32A 3P+PE IP44		option	4 x 6	max. 15m
CYCLONE 30	11,0/400V/50-60Hz	21,3	0,89	50A	Wander plug 63A 3P+PE IP67		option	4 x 10	max. 15m
CYCLONE 36	15,0/400V/50-60Hz	28,8	0,89	63A	Wander plug 63A 3P+PE IP67		option	4 x 16	max. 15m

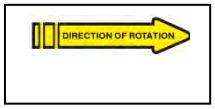
3. User Instructions

3.1. Safety Measures - Warning Signs

HOT SURFACES
Do not touch.
Risk of burns if you touch cylinders, aftercoolers, cylinder heads

DANGER
This sign is placed whenever there is danger of damage caused to the unit or its components

HIGH VOLTAGE
Risk of electric shock.
Maintenance work to be carried out **only** by a trained electrician



DIRECTION OF ROTATION
Make sure for the proper direction of rotation

USER INSTRUCTIONS
Users must read and fully comprehend operation instructions for using and maintaining the compressor

This sign refers to
timely user instructions for operating and maintaining the compressor

AUTOMATIC OPERATION
Caution, the unit may start its operation without any prior notice. Before any work, turn off mains supply

OBLIGATORY
During control and operation of this unit you must wear earplugs

RISK of rotating parts

TECHNICAL REQUIREMENTS
the operator must take into account

3.2. Basic safety recommendations

- The compressor is manufactured following current EU safety regulations.
- The compressor is intended **ONLY** for compressing atmospheric air with a content of oxygen (21±1)%. Use of any other gas type is not allowed. The manufacturer is not liable for damages caused by using the unit any other way than the intended.
- Use the compressor after making sure it is in perfect working condition. Any malfunction or failure must be repaired immediately. Strictly follow the operation and maintenance instructions described in this manual.
- Read carefully the instructions in this manual and follow them. Make sure users of the compressor are familiar with the user instructions of the unit and its proper operation. Make sure they are authorized, trained and trustworthy individuals. Make sure you are aware of and implement the current legal and all other regulations pertaining to avoiding accidents and protecting the environment.
- During first start or after maintenance, check motor's direction of rotation. There is an arrow indicating proper rotation. If the direction is reversed, interchange two of the three phase leads in the electrical box. **Never** change leads at the **motor** terminal board.
- Before starting any work pertaining to maintenance of the compressor, turn off the supply from the mains and press the Emergency Stop. Make also sure there is no compressed air inside and that all drain valves have been opened manually.
- Only an authorized trained electrician may do electrical works.
- If regulations dictate it, use means of individual protection.
- Pay attention to labels indicating safety and risk for the unit. Strictly follow them and do not destroy them.
- For any change in the operation of the unit, contact immediately the manufacturer.
- Any alteration – conversion of the unit without the manufacturer's prior written consent is not allowed.
- **NEVER ATTEMPT TO CHANGE THE PROGRAM OR THE PARAMETERS OF THE CONTROLLER.** For any alteration consult the manufacturer.
- **Spare parts MUST be genuine – approved by PARAMINA SA**.
- Get accustomed to the position and use of fire extinguishing equipment that must be near the compressors.

3.3. Instructions for safe operation - risks

- Check the unit on the inside and outside on a daily basis in order to make sure it is in good working condition.
- Do not start the operation of the unit if you do not ensure your own safety.
- Before you operate the compressor, make sure that requirements are met for the safe and smooth operation of the unit.
- Floor must be even. Adjust the anti vibration pads, so as the unit is in horizontal position and shocks are minimized.
- Place the compressor in a well-ventilated area. Make sure that the intake air for the compressor is clean and cool. **Prevent the hot cooling air from recirculation to the cooling air intake.** Make sure that foreign objects cannot get into the compressor with the intake air. Make sure that the intake air does not contain any smells, fuel or fumes, explosive or inflammable gases or harmful substances.
- Keep the compressor away from flammable material. Do not smoke when opening the fuel tank.
- If any malfunction of the unit occurs, stop immediately its operation and check – fix the problem.
- Before any maintenance or repair works, inform the users.
- When replacing heavy-weight components, strap them carefully on the proper lift truck. Never walk under such components when they are lifted.
- Before any maintenance works, clean the area from out-of-use material, oils, fuel or other liquids from the unit. Do not use corrosive materials. If you clean the unit by water or steam, make sure that neither (water nor steam) comes close to the electric motor or the electric system and ensure that they will not enter open hoses. For cleaning, use lint-free cloth.
- After cleaning or repairing the unit, check all hoses for leaks, loose connections, wear or damages. Tight again all connections and recheck every maintained safety device.
- Ensure safe and environmental friendly disposal of consumable materials and old spare parts.

3.4. Special attention

- **Do not use the compressor in explosive environment.**
- Connect the compressor only to electrical systems that are compatible with its electrical characteristics and that are with in its rated capacity.
- Comply with the local mains supply company regulations.
- Use only the recommended fuses.
- A trained electrician may only execute maintenance in the electrical system.
- During any maintenance work in the unit, turn off the power from the mains. Make sure there is no compressed air inside and that all drain valves have been opened manually. It is also recommended posting a notice warning about maintenance works on the compressor.
- In case of having to execute maintenance works on an operating unit, a second person beside the electrician must be present to handle the main safety switch or the Emergency Stop. Tools to be used must be isolated.
- Regularly check hoses, couplings and fittings for leaks and loose connections.
- Regularly check tightening of the electrical connections.
- If you replace mains cable, you must use the same type.
- Decompress all hoses, filters, pressure tanks and, basically, the entire unit, before you carry out any work.
- Never exceed the allowed operating pressure of the cylinders.
- Immediately replace cylinders with any kind of damage.
- Do not heat the cylinders or any of their parts, because pressure will rise.
- For loading – lifting of the unit or heavy parts of it, use the proper lift truck that is handled by trained stuff.
- Make sure you have properly secured the unit during its elevation or transport.
- The unit must be unplugged from mains supply even during small movements. After you move it, plug it again according to regulations and turn it on, following the directions described in this manual.
- The compressor is not made for use by the sea. In such a case, spray the unit with anticorrosive material.

3.5. Safety Regulations

The **PARAMINA *Cyclone*** compressor is a high pressure air-compressor and it is made according to EU directive 2006/42/EC for the safety of machinery. Noise complies with 2005/88/EC directive.

The manufacturer follows all regulations above and declares that the unit is manufactured accordingly.

Following the safety regulations, an authorized professional in site must supervise compressors that will be used as filling stations before starting their operation.

4. Installation - Operation

4.1. General Specifications 🕮

High pressure compressors are complete units for filling cylinders with compressed air at 225 bar (3200 psi) and 330 bar (4700 psi). They are mostly used for compressing breathing air for divers, fire brigades, military, paint ball applications, etc.

Cyclone is a 4 staged, air cooled, piston compressor with 4 cylinders, 3 intercoolers and 1 final aftercooler. The machine is also equipped with condensate separators after the 1st and 2nd stage, coalescing filters (for retaining particles and oil droplets down to 0.01 ppm) after the 3rd and 4th stage, all accompanied with automatic and manual drains. The compressor has pressure control in all stages of compression, with pressure switches and mechanical safety valves, as well as BA final filter at the final pressure (after fourth stage) which incorporate molecular sieve for dehumidification and activated carbon for air purification.
All functions of ***Cyclone*** are completely automated through **Paramina Controller** (digital control panel). You simply adjust the desirable maximum operating pressure and press the start button.
The compressor starts its operation and will stop when the pressure reaches the preset maximum value.

4.2. Installation - First start of the compressor 🕮

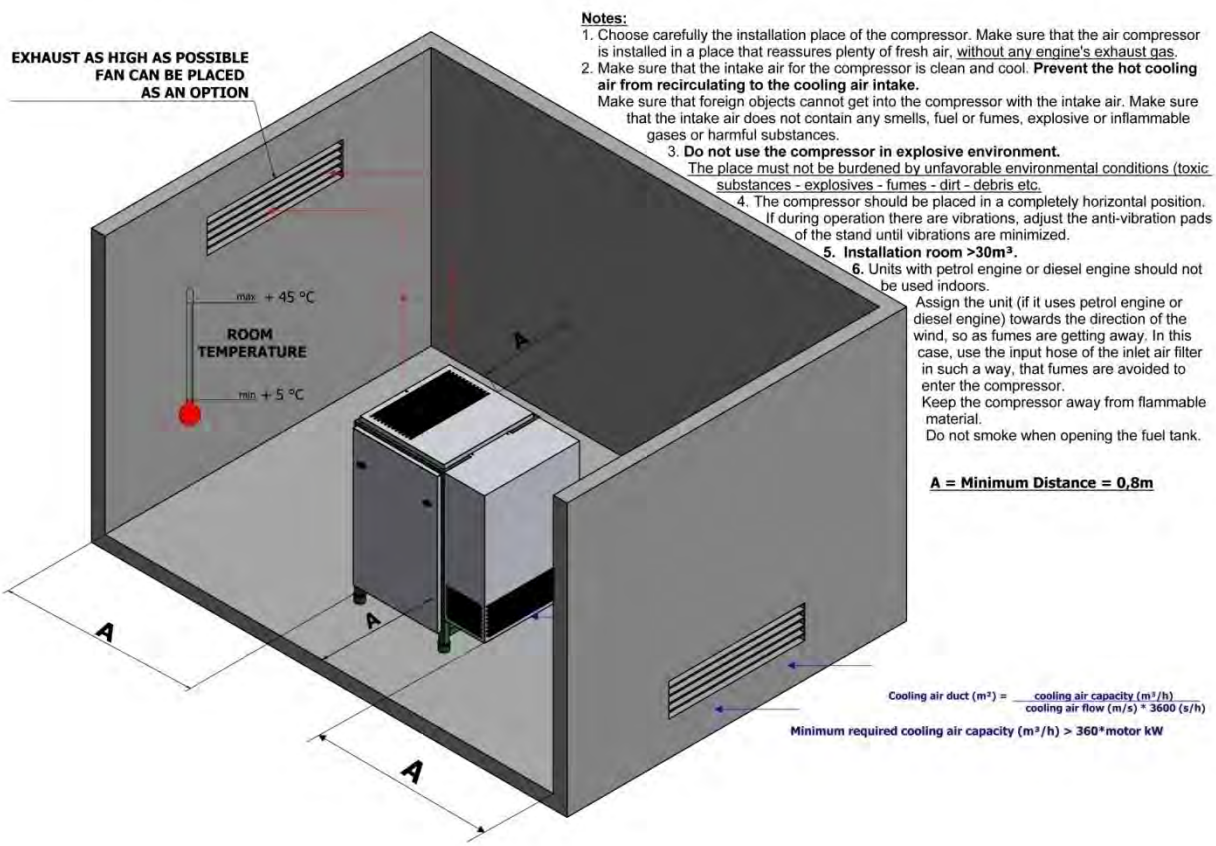
All compressors are tested and pre-adjusted by the manufacturer before they are shipped to the buyer.
They can start their operation immediately on the following conditions that are considered necessary, for safety and ease.
Anyone who will be handling the unit must read carefully all contents of this manual so as to have full knowledge of the product.

1. Choose carefully the installation place of the compressor. The place must not be burdened by unfavorable environmental conditions (toxic substances – explosives – fumes – dirt – debris etc).
2. Place the compressor in a well-ventilated area. Make sure that the intake air for the compressor is clean and cool. **Prevent the hot cooling air from recirculation to the cooling air intake.** Make sure that foreign objects cannot get into the compressor with the intake air. Make sure that the intake air does not contain any smells, fuel or fumes, explosive or inflammable gases or harmful substances.
3. Turn the compressor by using the flywheel and make sure it turns freely. Do the same after overhaul of the unit or a long-term out of service period.
4. Check the rotation direction (follow the arrow) by pressing instantly the start-stop button. The same check should be carried out after any service or reconnection of electrical supply.
5. Before any start of the compressor, check oil level. It should always be at the top of the oil sight glass.
6. The compressor should be placed in a completely horizontal position. If during operation there are vibrations, adjust the anti-vibration pads of the stand until vibrations are minimized. **Installation room >30m^3.**

ATTENTION:
Larger oil quantity may increase pressures inside the block and also cause leak of larger oil quantity in the pneumatic air resulting in the creation of chars in the valves, burden the filters and affect their life duration, as well as the quality of breathing air.
Smaller amount of oil means inadequate lubrication affecting the life duration of the compressor.

4.3. Ventilation 🕮

- ✓ Natural ventilation
- ✓ Forced ventilation (fan)



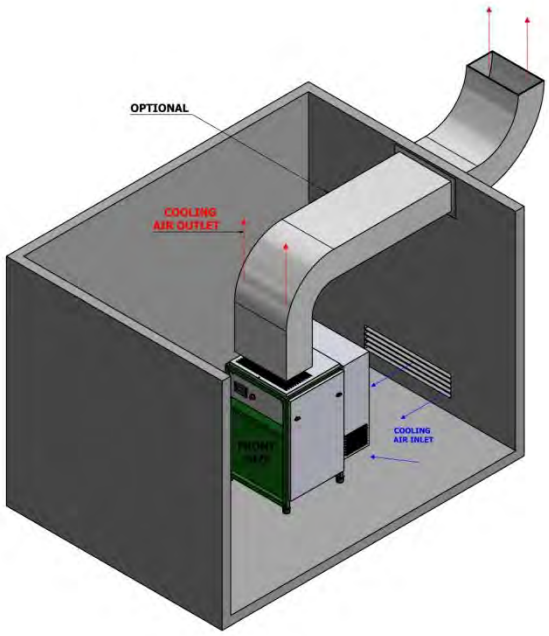
Notes:

1. Choose carefully the installation place of the compressor. Make sure that the air compressor is installed in a place that reassures plenty of fresh air, without any engine's exhaust gas.
2. Make sure that the intake air for the compressor is clean and cool. **Prevent the hot cooling air from recirculating to the cooling air intake.**
   Make sure that foreign objects cannot get into the compressor with the intake air. Make sure that the intake air does not contain any smells, fuel or fumes, explosive or inflammable gases or harmful substances.
3. **Do not use the compressor in explosive environment.**
   The place must not be burdened by unfavorable environmental conditions (toxic substances - explosives - fumes - dirt - debris etc.
4. The compressor should be placed in a completely horizontal position. If during operation there are vibrations, adjust the anti-vibration pads of the stand until vibrations are minimized.
5. **Installation room >30m³.**
6. Units with petrol engine or diesel engine should not be used indoors.
   Assign the unit (if it uses petrol engine or diesel engine) towards the direction of the wind, so as fumes are getting away. In this case, use the input hose of the inlet air filter in such a way, that fumes are avoided to enter the compressor.
   Keep the compressor away from flammable material.
   Do not smoke when opening the fuel tank.

A = Minimum Distance = 0,8m

$$\text{Cooling air duct (m}^2\text{)} = \frac{\text{cooling air capacity (m}^3\text{/h)}}{\text{cooling air flow (m/s) * 3600 (s/h)}}$$

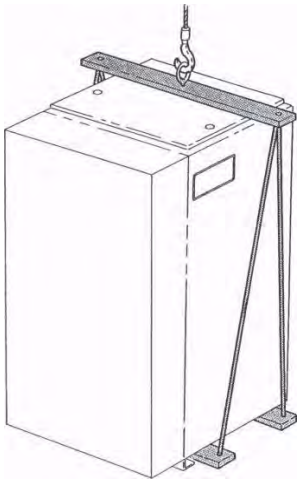
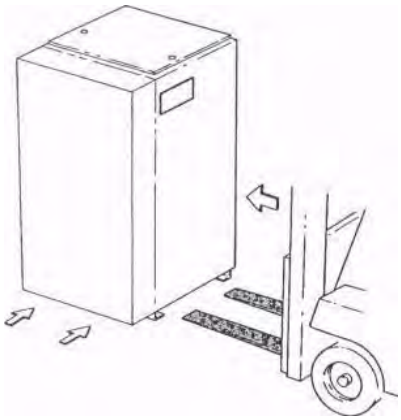
Minimum required cooling air capacity (m³/h) > 360*motor kW



4.4. Transport and Lifting

Check compressor's center of gravity.

Do not step under the load

Transport with Lifting 1. Spreader beam between lifting ropes 2. Two support beams underneath 3. **The lifting ropes must not squeeze the compressor casing!** 	**Transport with forklift truck** Exercise great caution when lifting and transporting the compressor. 

4.5. Cylinder filling procedure

Make sure that filling hoses as well as threads are in perfect condition without cracks or breaks.
Filling hose connectors should be connected on the cylinder without the use of tools. Sealing is achieved with o-ring and internal pressure.

A. Filling hose connectors used for filling cylinders up to 232 bar are divided in two categories:
   - Filling Connector according to DIN 200
   - INTERNATIONAL / ''A'' Clamp Adaptor

INTERNATIONAL / ''A'' Clamp Adaptor (Only up to 232 bar)

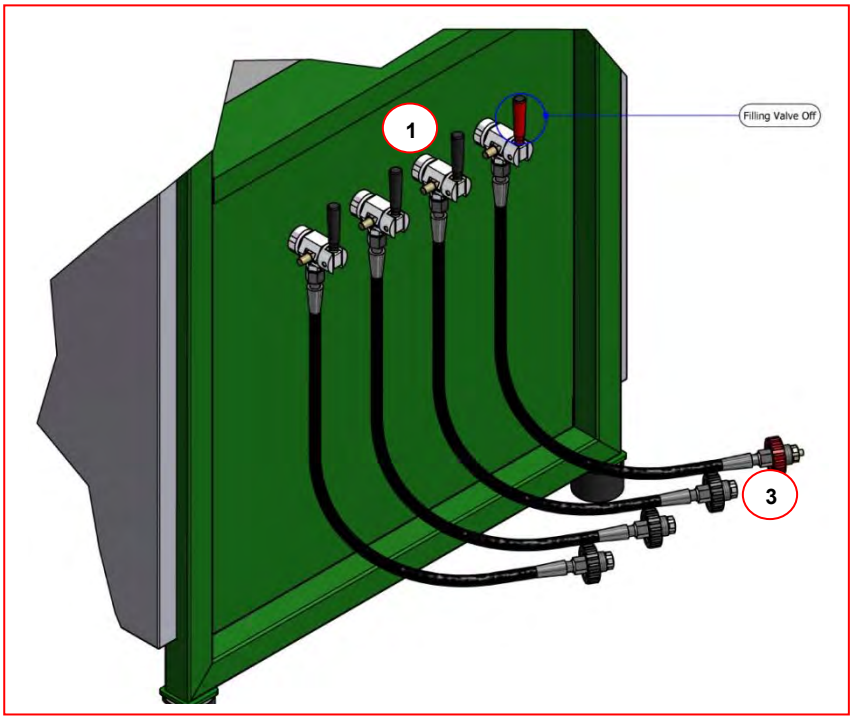
DIN 200 filling connector (Only up to 232 bar)

B. For cylinders filling at 330 bar, only the use of filling connectors according to DIN 300 (different adaptor than the one at DIN 200 bar) is allowed.

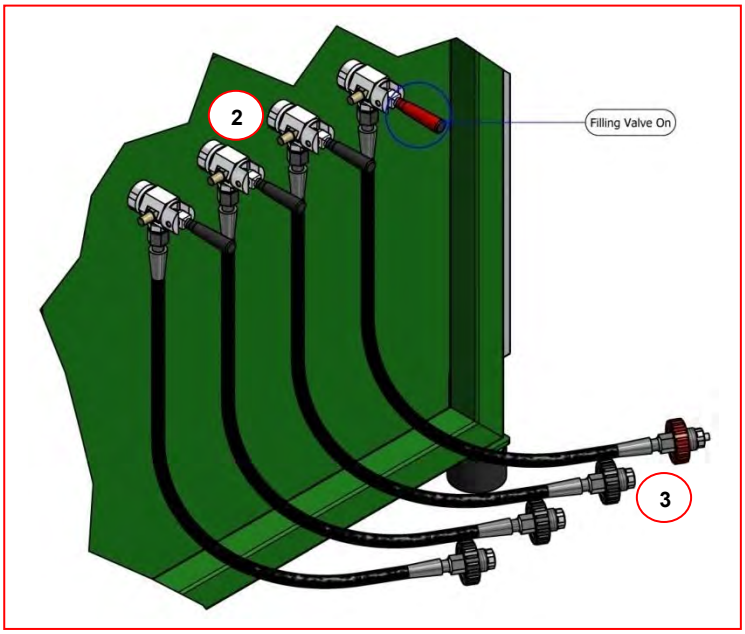
DIN 300 filling connector (ATTENTION: longer adaptor – red knob) (Up to 330 bar)

Use cylinders that correspond to the pressures produced by the compressor. All the using filling cylinders must be in accordance with international standards and directives. They must have the corresponding mark (symbol and technical data) at its neck and a valid hydraulic overpressure certificate test. Cylinder valve has to be DIN200 or DIN300 (according to EN 144-2).

1. **Check cylinder max working pressure (232 or 330 bar for example) so as to correspond to the correct lever filling valve (1) & Connector End (3). Black colour = 200bar filling / Red colour = 300bar filling**
2. **Connect the cylinder, having turned off both filling hose lever valve (1) and the cylinder's valve, and start the compressor by pressing the Start button.**



3. **Start filling by first turning on the filling hose lever valve (2) and then the one of the cylinder.**
4. **After filling is complete, first turn off the cylinder valve and then filling hose lever valve. Filling hose air venting is done automatically when turning off the lever valve (through lever valve's side sintered filter).**
5. Finally, safely disconnect the cylinder.



During the filling procedure, cylinder's temperature will rise. Let it cool down. Pressure will slightly drop. If you wish, re-connect the cylinder with the filling hose (following the same procedure) and fill until the maximum filling pressure.

Never turn on the lever filling valve, unless the cylinder is connected to the filling hose. In case of mistake, hose whipping due to pressurized air is secured as the connector ends DIN200 & DIN300 (3) are equipped with flow stop facility (air passes after the connector only if it is safely connected onto the cylinder valve)

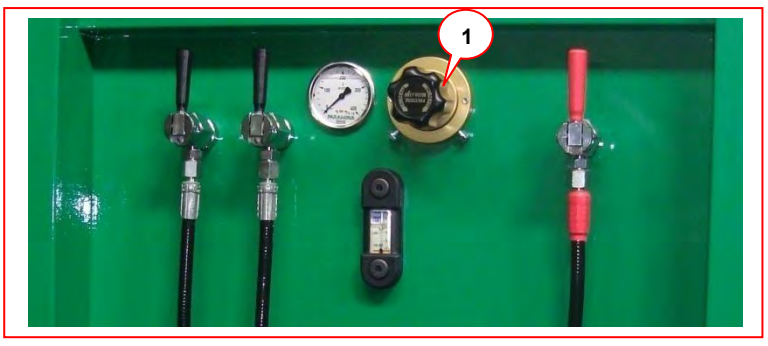
4.6. Automatic start / stop system

When the pressure reaches the pre-adjusted final level the compressor stops automatically {through the pressure switches}. By changing the parameter M (menu P01, parameter 1, compressor mode – see page 22) from S (semi) to F (full) automatic mode, both the stoppage and the restart of the compressor will be done automatically too. Max. operating pressure 350 bar.

4.7. Dual pressure filling module

✓ Optional equipment.

It controls the pressure through the pressure switches and gives the possibility to the user to fill 200 and 300 bar cylinders. By turning the key (1) on the left the user can fill at 225 bar max. pressure and by turning the same key on the right, the user fills at 350 bar max. pressure.



4.8. Condensate drainage

Automatic drain system

The system consists of four electronically controlled condensate drains, which are installed one after the 1st stage, one after the 2nd stage, one after the 3rd stage and one after the final 4th stage separator. The drains are controlled electronically and open automatically via the digital controller.

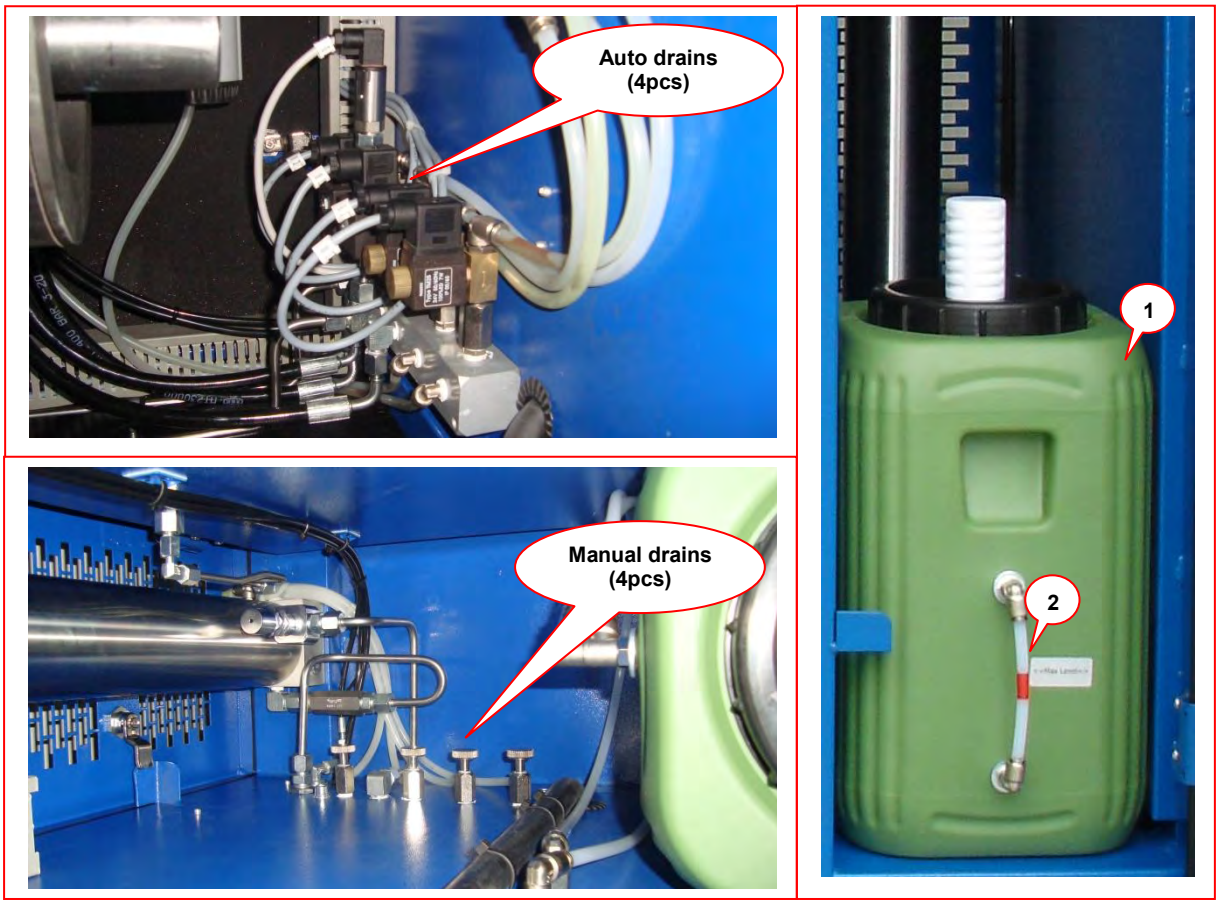
Note 1: In case of emergency (damaged auto drain system), the user may use the four (4) alternative manual drains.

Note 2: Condensate color is milky-white. If condensate suddenly changes color or start smelling, this is indication of oil presence. Immediately check:

1. oil quality
2. oil level
3. filters' condition and especially the condition of BA filter cartidges
4. air inlet filter's condition
5. piston rings and cylinders condition

Note 3: Always empty the condensate collecting tank (1) when the level reaches the maximum allowed (2).

Note 4: BA Filter base is equipped with an extra manual drain, 5th drain. Use this drain only to check the status of BA filter housing/cartridges. Open this drain every 5 continuous working hours and after compressor shut down.

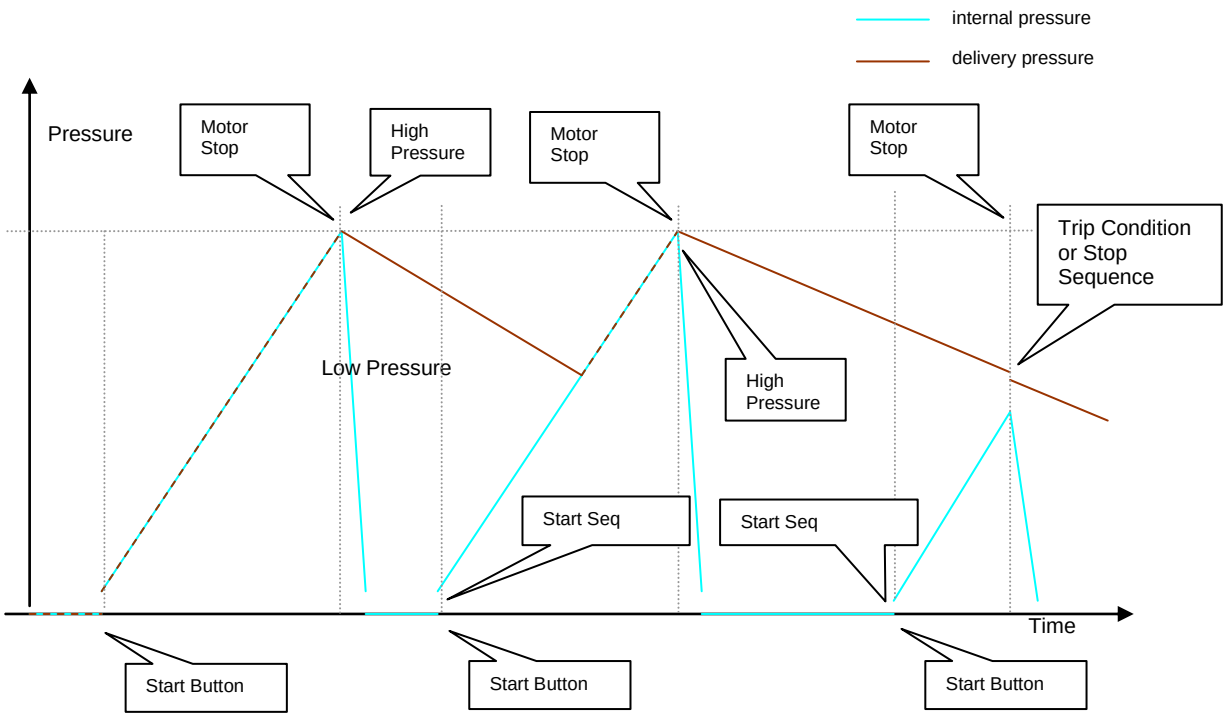


5. Electronic Controller

5.1. General Operation

5.1.1. Semi Automatic Mode (Standard Configuration)

Semi Automatic mode can be set in Operation Menu P01 after entering the user level access code. Semi Automatic is a mode of operation in which the operator has control of when the compressor runs. The operator starts the compressor by pressing the start button. When the pressure is below the unload pressure, the motor is started immediately and the pressure will rise. The compressor will achieve the set unload pressure and then stop. The compressor will only start again if the operator presses the start button again. In any case, the compressor stops immediately when pressing the stop button.

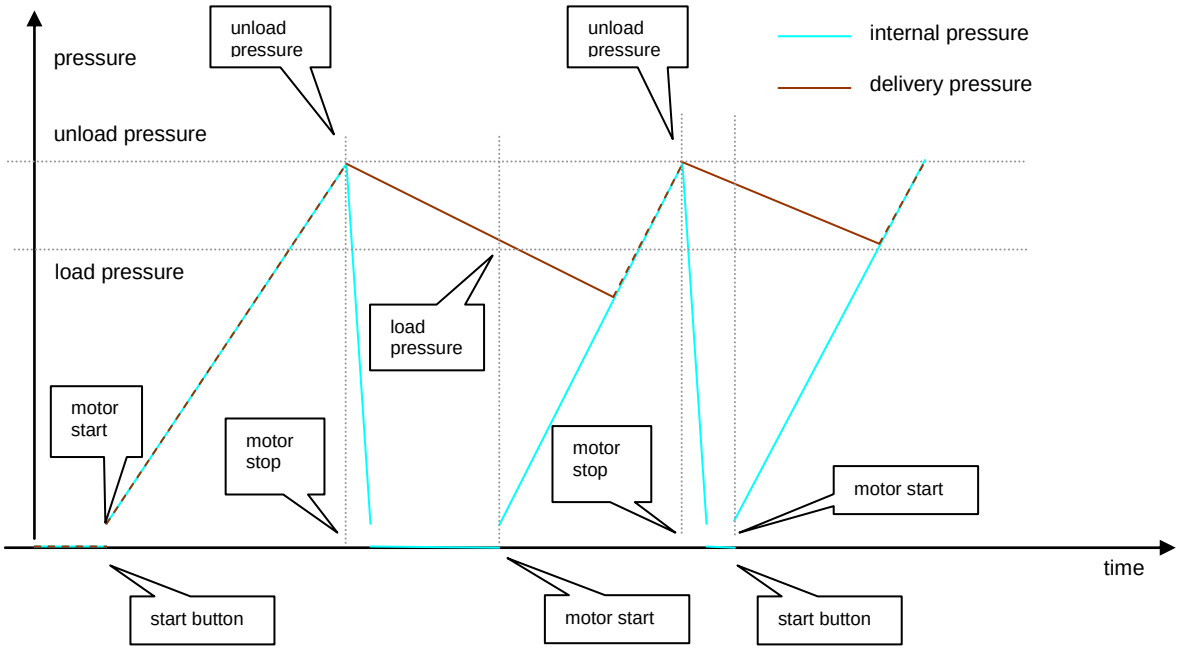


5.1.2. Fully Automatic mode

Fully Automatic mode can be set in Operation Menu P01 after entering the user level access code. Fully Automatic is a mode of operation in which the delivery pressure controls compressor start and stop operation once the operator has started the compressor. The motor is started and pressure will begin to rise. When the unload pressure level is achieved, the compressor motor will stop and the compressor will remain active in a standby state. The compressor motor will automatically start again when the delivery pressure falls below the load pressure level or when there is a new operator request to start. This cycle will continue until the operator stops the compressor by pressing the stop button, which means an exit of Fully Automatic mode.

REMARK:

When delivery pressure is below the unload level, but above the load level, the motor can be immediately started again by pressing the start button. This will cause the compressor to start and increase pressure to the unload level again without the need to wait for the pressure to decrease to the load level.



5.2. Display 🕮

Display : Custom backlit LCD
Indicators : 2 x LED
Controls : 7 x Tactile push buttons

5.2.1. Keypad 🕮

START: Enter STARTED condition
STOP: Exit STARTED condition
RESET: Reset and clear fault conditions
ENTER: Confirm selection or value adjustments
-/DOWN: Scroll down through menu, menu item options or decrement value
+/UP: Scroll up through menu, menu item options or increment value
ESCAPE (C): Step back one menu navigation level

Start and Stop have one defined function and are not used for any other purpose.

Reset will initiate a display jump to the fault code item if a fault condition remains active or initiate a display jump to the information item if no active faults exist in normal display mode. If pressed and held for longer than two seconds in menu mode will exit menu mode to the normal operational display mode, page 00.

Enter will lock a selected value display preventing return, after a short delay, to the default Td value display. When locked, the 'key' symbol will flash. To unlock, press Escape.

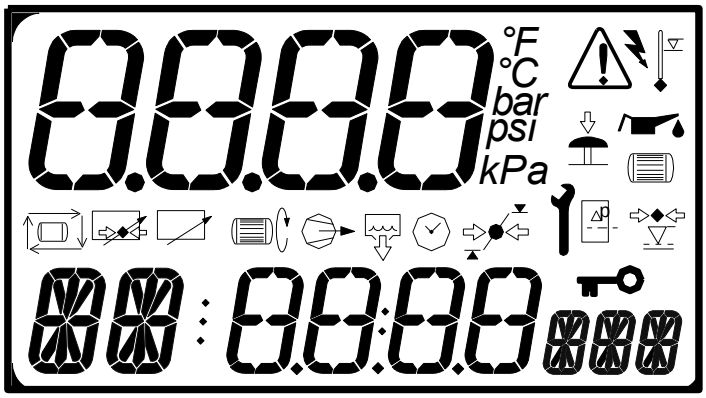
Escape will initiate a display jump to the information item in normal display mode, page 00.

Plus, Minus, Enter and Escape are used to navigate menu mode and adjust menu parameters.

5.2.2. LED Indicators

STATUS: Green, adjacent to Start and Stop buttons
FAULT: Red, adjacent to Stop and Reset buttons

5.2.3. Display Index 🕮



The display is divided in to 4 areas.

Top, Left: Display Field:-
4-character numeric display, with unit symbols, used to continuously show delivery pressure in normal operating mode or menu page number in menu mode

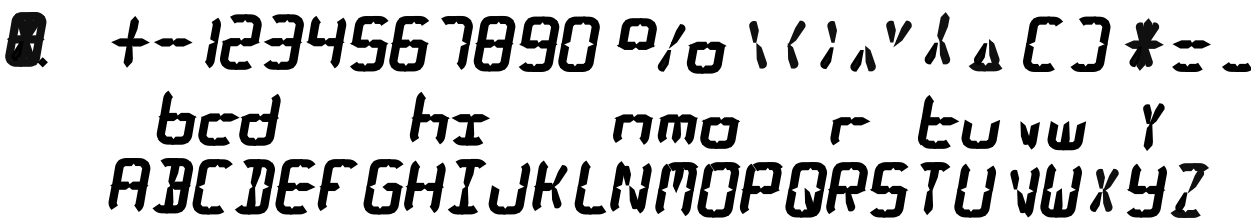
Top, Right: Fault Symbol Field:-
Symbolic displays used to indicate common general fault conditions

Middle: Symbolic displays used to reinforce meaning of selected item, fault condition.
Symbolic status information in normal operational mode 'Information Screen' item

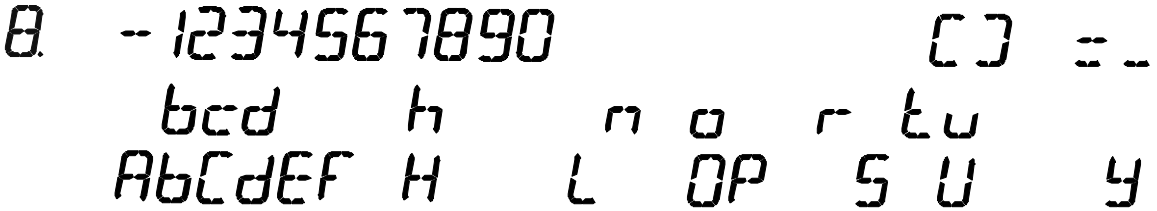
Bottom: Item and Value Field:-

Item identification:	2 character alphanumeric, 14 segment
Item Value:	4 character numeric, 7 segment
Item Unit:	3 character alphanumeric, 14 segment

14 Segment Display Character Set:



7 Segment Display Character Set:



5.2.4. Operational Display Symbols 🕮


Motor Running


Loaded


Service


Time period


Filter, differential pressure


Pressure set point indication (upper and lower set point indicators displayed independently)


Condensate drain active (optional function)


Power failure auto restart enabled (optional function) – **Fully Automatic Mode only!**


Remote load/unload


Remote start/stop active


Normal Operational: selected item locked as temporary default display
Menu Mode: page item locked (adjustment inhibited)

5.2.5. Fault Display Symbols 🕮


General fault


Emergency stop


Excess pressure


Motor


Power failure


Above set temperature limit


Service due, maintenance


Lubrication, oil, oil level


Filter, filter service

5.3. Display Structure and Menu Navigation

5.3.1. Display Item Structure 🕮

All value, parameter or option selection displays are grouped into menu lists. Items are assigned to a list according to type and classification. Items that can be used to select options or modify functions are assigned to 'menu mode' lists. Items that an operator may require to view during routine operation, detected pressure or temperature values for example, are assigned to the normal operational mode list. Lists are identified by page number, the normal operational display list is page 0. All parameters and options are assigned to menu mode pages 1 or higher. All Page 0 items are view only and cannot be adjusted.

5.3.2. Normal Operational Mode (Page 0) 🕮

At controller initialization, all display elements and LED indicators are switched on for three seconds, the display will then show the software version code for a further 3 seconds before initialisation is complete and the normal operating display (Page 0) is shown. In page 0 'normal operational display mode' the Display Field will show the final delivery pressure continuously and the Item and Value Fields will initially show the Information Item display for 35 seconds before reverting to the default temperature display item. All available Item and Value field option displays (temperatures, pressures, hours counters) can be selected using the Up or Down buttons at any time. The Item display will revert to the default item after 35 seconds if no further selection is made. Pressing the Enter button will lock any selected Item display and inhibit return to the default display. When an Item display is locked the lock key symbol will slow flash. To unlock an Item display press Up or Down to view an alternative Item display or press Reset or Escape. In page 0 Escape will select the Status Information Item display and Reset will select any active fault code display or the Status Information Item display if no faults are active. Unless a selected Item display is locked, the display will automatically jump to the Status Information Item display at key status change events. The timeout period before returning to the default Item display is modified in some instances to enable the full range of a set countdown timer to be shown. No Item values, options or parameters can be adjusted in page 0. If a fault condition occurs the fault code becomes the first list item and the display will automatically jump to display the fault code. More than one active fault code item can exist at any one time.

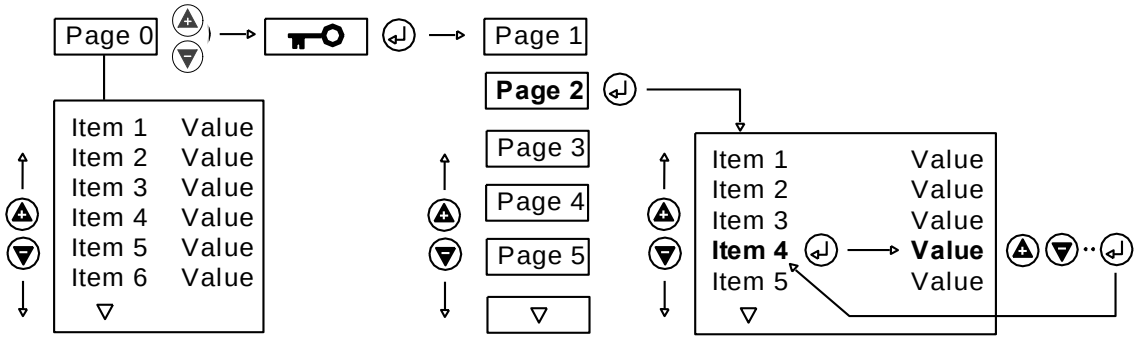
Access Code:

Access to page list displays higher than page 0 are restricted by access code. To access menu mode pages press UP and DOWN together, an access code entry display is shown and the first code character will flash. Use PLUS or MINUS to adjust the value of the first code character then press ENTER. The next code character will flash; use UP or DOWN to adjust then press ENTER. Repeat for all four code characters. If the code number is less than 1000 then the first code character will be 0(zero). To return to a previous code character press ESCAPE. When all four code characters have been set to an authorized code number press ENTER. Access to certain menu mode pages is dependent on authority level determined by the access code used. An invalid code will return the display to normal operational mode; page 0.

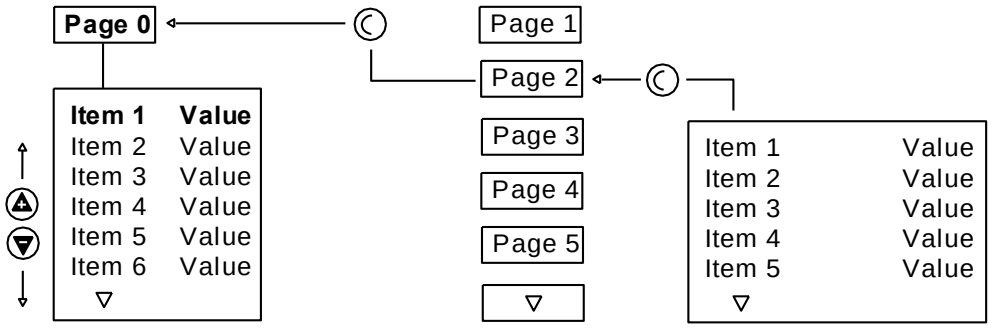
ACCESS LEVEL CODE = 0100

5.3.3. Menu Mode Navigation 🕮

In menu mode the Display Field will flash and show the Page number. To select a page, press UP or DOWN. For each page the Item and Value field will display the first Item of the page list. To view a page list, press ENTER, the Page number will stop flashing and the Item display will flash. Press UP or DOWN to view the selected page list items. To select an Item value for modification, press ENTER, the Item display will stop flashing and the Value display will flash. The value or option can now be modified by pressing UP (Plus) or DOWN (Minus). To enter a modified value or option in memory, press ENTER; alternatively the modification can be abandoned, and the original setting maintained, by pressing ESCAPE.



Press ESCAPE at any time in menu mode to step backwards one stage in the navigation process. Pressing ESCAPE when the page number is flashing will exit menu mode and return the display to normal operational mode; page 0.



Press and hold RESET for two seconds at any time to immediately exit menu mode and return to the normal operational mode display. Any value or option adjustment that has not been confirmed and entered into memory will be abandoned and the original setting maintained.

A flashing Key symbol displayed with any Item indicates the Item is locked and cannot be modified. This will occur if the Item is view only (non adjustable) or in instances where the item cannot be adjusted while the compressor is in the operational STARTED state.

5.3.4. P00 - User Menu 🕮

The User menu shows normal operational values and information displays. This is the default display menu; no access code is required.

item	description	units	step	min	max	display*
1	Compressor status	---	no_edit	---	---	**S>** Semi Automatic mode **F>** Fully Automatic mode **TS** Safety valve test **TL** Leakage test **TO** Output test
2	Cabinet temp	°C/°F	no_edit	---	---	**T2** 100 ^{0}C
3**	3rd stage press	bar/psi	no_edit	---	---	**P2** 50 bar
4	Delivery press	bar/psi	no_edit	---	---	**Pd** 270 bar
5	Hours Run	H	no_edit	---	---	**H1** 0 hrs
6	Oil service hrs	H	no_edit	---	---	**H2** 500 hrs
7	BA filter service hrs	H	no_edit	---	---	**H3** 500 hrs

* All values shown in display column are ONLY examples.
** Only shown if enabled

Status Information Item:

The page 0 'Status Information Item' provides a basic overview of status using symbols. Press the 'C' button at any time while in normal operation, menu P00, to view this menu item.

The mode of operation is displayed as the status information item identifier:

S> Semi Automatic Mode (normal operational mode)
F> Fully Automatic Mode (normal operational mode)
TS Safety valve test (test mode)
TL Leakage test (test mode)

5.3.5. P01 - Operation Menu 🕮

Contains general operation parameters that may be modified by the User from time to time.

item	description	units	step	min	max	display*
1	Compressor mode	0/1	1	0	1	0 => **M> S** (Semi) 1 => **M> F** (Full)
2	**unload pressure****	bar/psi	1 0.1	55.0 5.5	390.0 59.0	**Pu 225 bar**
3	**load pressure****	bar/psi	1 0.1	50 5.0	385.0 58.5	**PL 215 bar**
4	**cutout pressure**	bar/psi	1 0.1	55.0 5.0	390.0 59.0	**Pc 235 bar**
5	Drain open time before start	s	1	1	10	**db** 8 s
6	Drain open time after start	s	1	1	10	**dA** 6 s
7	Drain exhaust time	s	1	1	20	**dE** 10 s
8	Drain 1 open time	s	1	1	5	**d1** 3 s
9	Drain 1 interval time	m	1	1	20	**d1** 4 m
10	Drain 2 open time	s	1	1	5	**d2** 3 s
11	Drain 2 interval time	m	1	1	20	**d2** 4 m
12	Drain 3 open time	s	1	1	5	**d3** 3 s
13	Drain 3 interval time	m	1	1	20	**d3** 4 m
14	pressure units	0=bar 1=psi 2=kPA	1	0	2	**P>** 0
15	temperature units	0=^{0}C 1=^{0}F	1	0	1	**T>** 0

* All values shown in display column are ONLY examples.
** Minimum differential between load and unload set points is 5 bar for a 225/350 bar machine, and 0.5 bar for a 35 bar machine.

5.3.6. P02 - Error Log Menu

Contains the last 15 fault states in chronological order. The most recent fault (alarm, start inhibit or shutdown) is stored as item 1. Each item consists of two values: the fault code number and the running hours when the fault occurred. The display will automatically alternate between these two values. All items are view only.

item	description	units	step	min	max	display*
1	Logged error #1	---	no_edit	---	---	**01** . . . Er: 0010 E <> 12345 *
2 to 15	logged error #2 to error #15	---	no_edit	---	---	**02 to 15**

* All values shown in display column are ONLY examples.

Example: last detected error = Emergency Stop shutdown (fault code 0010E) at 12345 running hrs

5.3.7. P03 - Shutdown Menu

Settings that determine the level or condition at which a shutdown fault is generated.

item	description	units	step	min	max	display*
1	**Oil service error**	hours	1	-999	1000	H2 10
2	**BA filter service error**	hours	1	-999	1000	H3 2
3	Cabinet temperature high level	°C/°F	1	41	250	**T2** 100°C
4	3rd stage pressure high level	bar/psi	1	8	Sens. Range - 5bar	**P2** 45 bar
5	Delivery pressure high level	bar/psi	1 0.1	65.0 6.5	400.0 60.0	**Pd** 350 bar

* All values shown in display column are ONLY examples.

5.3.8. P04 - Alarm Menu

Settings that determine the level or condition at which an alarm fault is generated. With yellow mark are the service / maintenance hours.

item	description	units	step	min	max	display*
1	**Oil service alarm**	hours	1	-1000	999	**H2 190**
2	**BA filter service alarm**	hours	1	-1000	999	**H3 18**
3	Cabinet temperature high level	°C/°F	1	40	249	**T2** 90 °C
4	3rd stage pressure high level	bar/psi	1	3	Shtdwn max -5	**P2** 40 bar
5	Delivery pressure high level	bar/psi	1 0.1	60.0 6.0	395.0 59.5	**Pd** 330 bar

* All values shown in display column are ONLY examples.

5.3.9. Service hours reset procedure 🕮

Reset Procedure for BA filter (molecular sieve and active carbon filter) change

- After the filter change we press buttons + and – (at the same time). The screen will display the code (CD : 0000). By pressing the enter button to move from one digit to the other and by using the buttons + and – we enter the code nr. **0100**
- After pressing again the enter button the screen will display the index **P00** (flashing). Using the buttons + and – we go to menu **P04** and we press the button Enter. We observe that the bottom index flashes and by using the buttons + and – we select the index **H3.** We press again the enter button and we observe that the value of H3 flashes. By using the buttons + and - we adjust the hours at the value of **20.** Then we push the **C (Cancel)** button 2 or 3 times so as to leave this menu and return to the first screen (pressure – bar wll be displayed upon the screen).

Reset procedure for oil change

- We follow the same steps in the menu P04, we select the index **H2** and we adjust **the hours** at the **value of 200.**

After these procedures we press the reset button. The compressor is now ready to operate (the red led will switch off).

5.4. Fault Messages

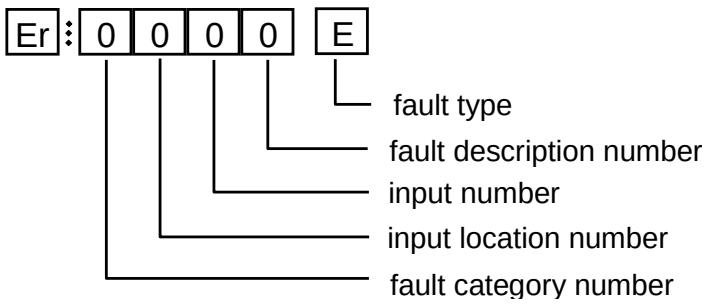
Faults are abnormal operating condition states. Alarms are fault states that indicate normal operating conditions have been exceeded but do not present an immediate hazard or potentially damaging condition. Alarms are intended as a warning only and will not stop the compressor or prevent the compressor from being started and run.

Start inhibits are fault states that prevent the compressor from initially being starting. Start inhibit faults are conditions that may present a hazard or damaging situation if the compressor was to be started. A start inhibit will self reset when the condition being monitored returns to normal operational levels. Start inhibit conditions are only checked during the initial start procedure and will not stop the compressor once started and in the 'started' state. Start inhibit conditions are not checked during an automated motor start from Standby.

Run inhibits are fault states that prevent the compressor from starting and running the main motor. Run inhibit faults are conditions that may present a hazard or damaging situation if the main motor is run. A run inhibit will self reset when the condition being monitored returns to normal operational levels and the compressor will then be allowed to exit the standby condition and run without further manual intervention. Run inhibit conditions are checked prior to a main motor start sequence and will not stop the compressor motor once started. Run inhibit conditions do not prevent the compressor from entering the 'started' state condition.

Shutdown trip errors are fault states that present a hazardous or damaging condition, the compressor is stopped immediately. The Shutdown trip error condition must be resolved, and the fault reset, before the compressor can be re-started.

The different fault state conditions are indicated on the screen with specific codes; the last character indicating the fault type: E = Shutdown Trip Error, A= Alarm, S = Start Inhibit, R = Run Inhibit. Shutdown trip errors are divided into two different categories: immediate shutdown errors and controlled stop errors. Immediate shutdown errors stop the compressor instantly (Emergency Stop button activated for example). Controlled stop errors stop the compressor in a controlled way using a normal Stop command; the motor will continue to run for the set stop run-on-time. Immediate shutdown errors have an error code where the first character is 0 (zero). Controlled stop faults have a "1" as the first character. Alarm faults are also divided into two different categories: alarms and service alarm messages. Alarms start with a "2", service alarm messages with a "4". Start Inhibit fault codes start with a "3".



Fault category number	fault category description
0	immediate shutdown trip error
1	controlled shutdown trip error
2	alarm
3	start or run inhibit
4	service

Input location number	input location description
0	digital input
1	analogue input
2 to 7	*not used*
8	special functions
9	special functions slave unit

Input number	input
#	Input number for controller input terminal/location

Fault description number	Fault description
9	high level shutdown trip
8	high level alarm
7	high level start inhibit
6	special function
5	sensor error
4	timeout
3	low level start inhibit
2	low level alarm
1	low level shutdown trip
0	digital input

Fault type	fault type description
E	shutdown trip error
A	alarm (or service message alarm)
S	start inhibit
R	run inhibit
L	load inhibit

SERIAL NUMBERS TILL 31/12/2010

5.5. Immediate Stop Shutdown Errors

5.5.1 Digital input errors

Er:0010 E Emergency stop
Er:0020 E 1st stage OR 2nd pressure switch. Pressure high or switch fault.
Er:0070 E main motor or fan motor overload. Thermal switch enabled.
Er:0080 E safety pressure switch – 3rd stage trip

5.5.2 Analog input errors

Er:0115 E delivery pressure (4th stage) sensor fault
Er:0119 E delivery pressure (4th stage) high
Er:0125 E temperature (4th stage) sensor fault
Er:0129 E temperature (4th stage) high

5.6 Controlled Stop Shutdown Errors

5.6.1 Special function service trips

Er:1814 E OIL service due trip
Er:1824 E final BA FILTER service due trip
Er:0821 E low resistance, short circuit or short circuit to earth condition exists on an analogue input or digital input (incorrect connection, cable fault or sensor fault)

5.7 Alarms

5.7.1 Analogue input alarms

Er:2118 A delivery pressure (4th stage) high
Er:2128 A temperature (4th stage) high

5.7.2 Special function alarms

Er:2816 A power failure while compressor was in started state

5.8 Start Inhibits

Er:3123 S Temperature (4th stage) below the set low temperature run inhibit level, controller will allow motor start when temperature increases above the preset level

5.9 Special function service alarms

Er:4814 A OIL service due alarm
Er:4824 A final BA FILTER due alarm

SERIAL NUMBERS FROM 1/1/2011

5.5. Immediate Stop Shutdown Errors

5.5.1 Digital input errors

Er:0010 E Emergency stop OR low oil level.
Er:0020 E 1st stage pressure switch. Pressure high or switch fault.
Er:0070 E main motor or fan motor overload. Thermal switch enabled
Er:0080 E 2nd stage pressure switch. Pressure high or switch fault.

Digital input errors when Humidity Control Device option is installed

Er:0010 E Emergency stop OR low oil level (option).
Er:0020 E 1st stage pressure switch & 2nd stage pressure switch. Pressure high or switch fault.
Er:0070 E motor overload. Thermal switch enabled.
Er:0080 E Humidity Control Alarm (option)

Digital input errors when Voltage Failure/Phase Rotation Device option is installed

Er:0010 E Emergency stop OR low oil level (option).
Er:0020 E 1st stage pressure switch & 2nd stage pressure switch. Pressure high or switch fault.
Er:0070 E motor overload. Thermal switch enabled.
Er:0080 E Voltage Failure/Phase Rotation Alarm (option)

5.5.2 Analog input errors

Er:0115 E delivery pressure (4th stage) sensor fault
Er:0119 E delivery pressure (4th stage) high
Er:0125 E temperature (4th stage) sensor fault
Er:0129 E temperature (4th stage) high
Er:0135 E Inter-stage pressure (3rd stage) sensor fault
Er:0139 E Inter-stage pressure (3rd stage) high

5.6 Controlled Stop Shutdown Errors

5.6.1 Special function service trips

Er:1814 E OIL service due trip
Er:1824 E final BA FILTER service due trip
Er:0821 E low resistance, short circuit or short circuit to earth condition exists on an analogue input or digital input (incorrect connection, cable fault or sensor fault)

5.7 Alarms

5.7.1 Analogue input alarms

Er:2118 A delivery pressure (4th stage) high
Er:2128 A temperature (4th stage) high
Er:2138 A Inter-stage pressure (3rd stage) high

5.7.2 Special function alarms

Er:2816 A power failure while compressor was in started state

5.8 Start Inhibits

Er:3123 S Temperature (4th stage) below the set low temperature run inhibit level, controller will allow motor start when temperature increases above the preset level

5.9 Special function service alarms

Er:4814 A OIL service due alarm
Er:4824 A final BA FILTER due alarm

6. Maintenance

6.1. Compressor's long period storage

In case the compressor is intended to stay out of operation for more than three months, special procedure should be followed for the storage as well as for its re-operation:

- ✓ Make sure it is stored in a closed, dry, dust-free place.
- ✓ Run the compressor at normal pressure for 10-15 minutes.
- ✓ Check filters, hose connections and safety valves for leaks.
- ✓ Tighten all connections, if necessary.
- ✓ Open manual drain valves and run the compressor without pressure for 5 minutes.
- ✓ Stop the compressor, drain well and shut all valves.
- ✓ Open filters and put special grease used in the food industry or vaseline on all threads. Filter elements should normally be in their place.
- ✓ Let the compressor cool down.
- ✓ Start the compressor and spray some compressor oil (5-6 c.c.) in the suction while in operation.
- ✓ Do not let the compressor heat up, stop its operation.
- ✓ Close all valves.
- ✓ Wrap the inlet air filter with nylon.
- ✓ Cover the compressor with a plastic cover to keep the dust out.

- Units and motors should always be stored in a dry, vibration - free and dust - free environment.
- Unprotected machined surfaces (shaft – ends and flanges) should be treated with an anti – corrosive.
- It is recommended that units and motors shafts are periodically rotated by hand to prevent grease migration.
- Anti – condensation heaters are recommended to avoid water condensation in the motor and should preferably be energized.

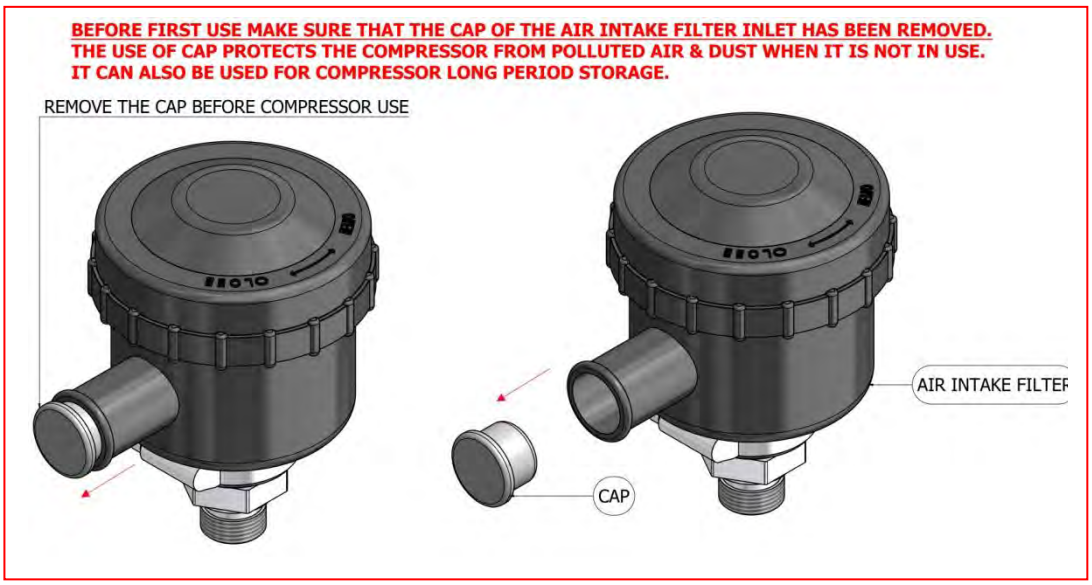
6.2. Re-Operation of the compressor after a long period of storage

- ✓ Remove the nylon and place a new inlet air filter.
- ✓ Follow the procedure related to the first start of the unit.
- ✓ Run the compressor functioning at normal pressure for 5-10 minutes.
- ✓ Change the oil.
- ✓ Place new coalescing filter element, Active Carbon-Molecular Sieve.

6.3. Intake air filter

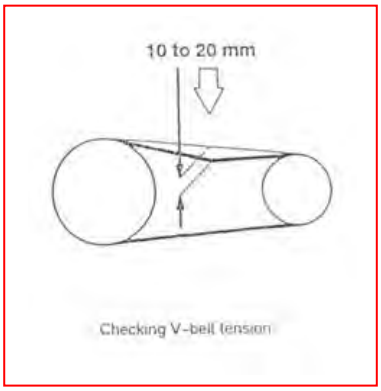
Replace the air intake cartridge every 200 hours or once per year.
According to the environment it is recommended to change the air intake cartridge at the end of season.

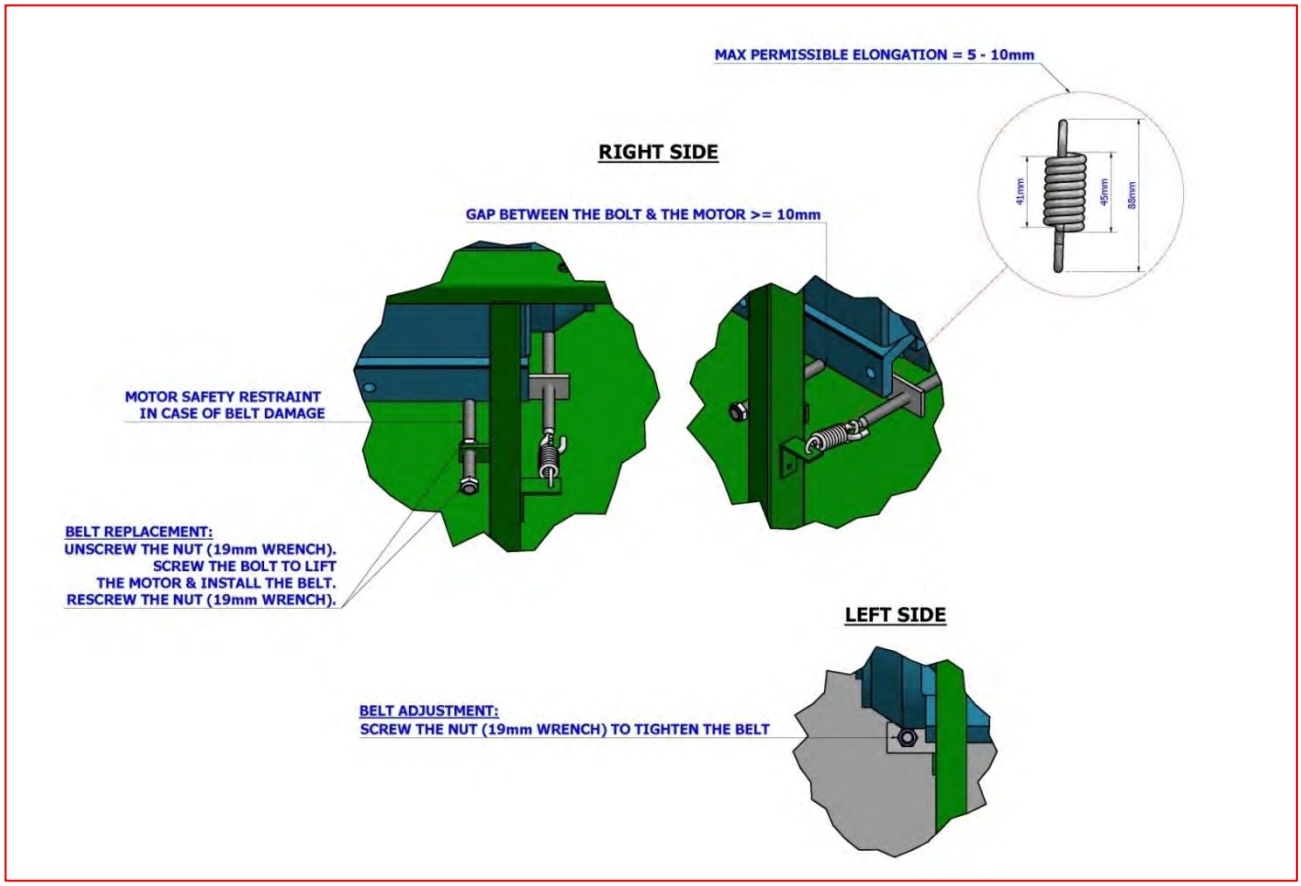
Air intake cartridge - code: 109460302



6.4. Belt adjustment

Automatic belt tensioning system.
Check tension of belts after the first 20 hours of operation and then every 100 hours. Pressing in the center of the belt's length applying 5 Kg of force, it should not give way more than 20 mm.





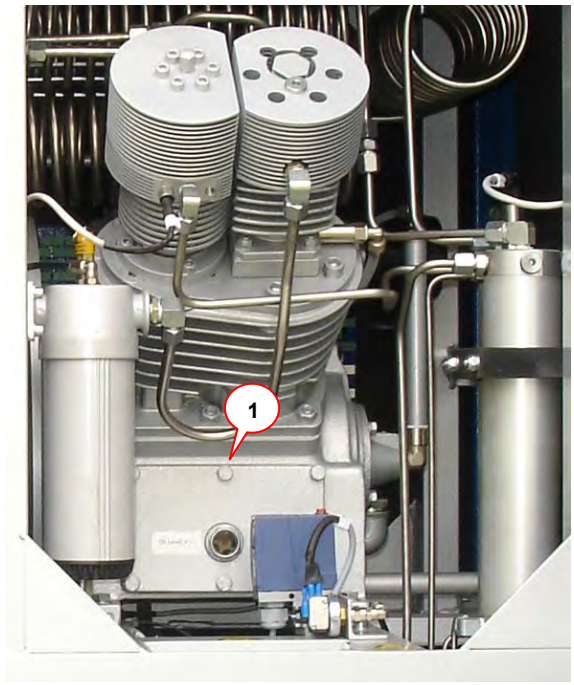
6.5. Oil change

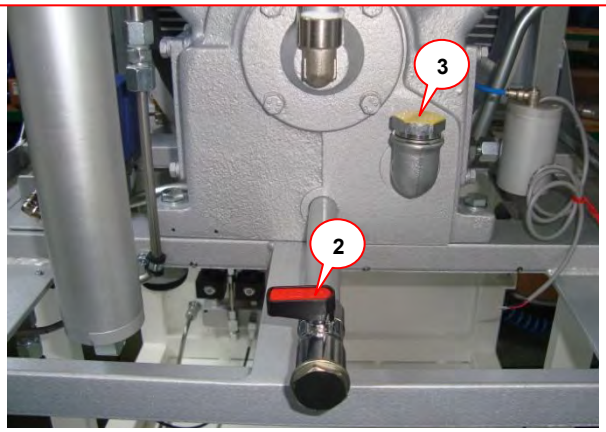
Change the oil after the first 20 operating hours and then every 500 hours.

Always check the oil level through the oil sight glass (1) before every start of the compressor. The level should always be at the top of the sight glass (leaving a small air bubble at the top of the glass). While the compressor is operating the level should be between the minimum and the maximum of the sight glass (red mark).

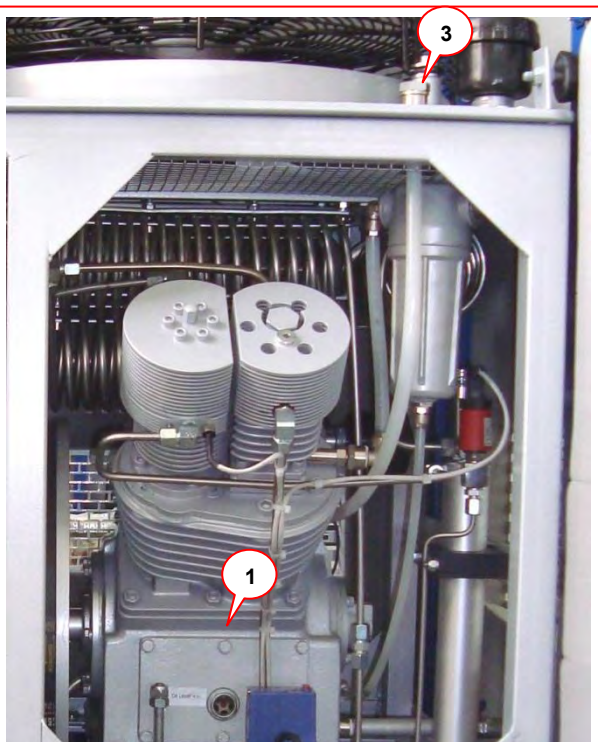
Oil change procedure:

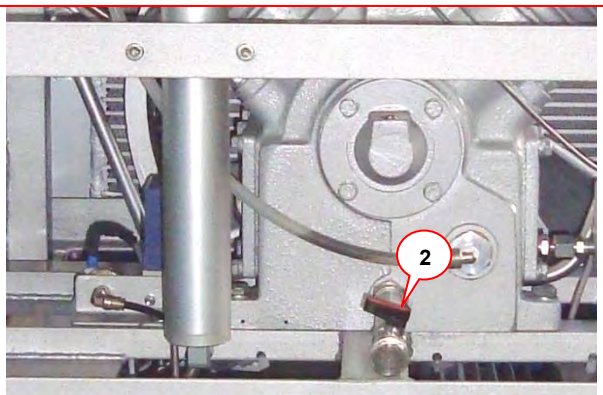
1. Open the drain valve (2) and empty the oil vessel into a canister. After emptying the oil vessel close the valve.
2. Unscrew the plug (3) and pour new oil inside the compressor block **(3,0* lit.),** till the upper part of the oil sight glass. Screw the plug (3) again at the same position.
3. Now you are ready to restart the compressor.
   ***The proper quantity of oil, when you replace it, is 3,0 lit for compressors with serial numbers after / including the 1424012 (CYCL.24E), 1330067 (CYCL.30E) & 1336001 (CYCL.36E). All compressors with earlier serial numbers must be filled with 2,7 lit oil.**





New Version from serial numbers:
1424012 (CYCL.24) – 1430084 (CYCL.30) – 1436009 (CYCL.36)





Old Version up to serial numbers:
1324011 (CYCL.24) – 1430083 (CYCL.30) – 1436008 (CYCL.36)

6.6 Filters Maintenance 🕮

Before installing a new filter cartridge, clean very carefully the filter housing, of all liquids.

PARAMINA compressors operate at environmental temperatures from +5 ^{0}C to +45 ^{0}C. Higher temperatures could cause changes in the quality of breathing air; lower temperatures may cause a malfunction.

CAUTION: Before any interference in the filters' housing, make sure there is no compressed air inside and that all drain valves have been opened manually.

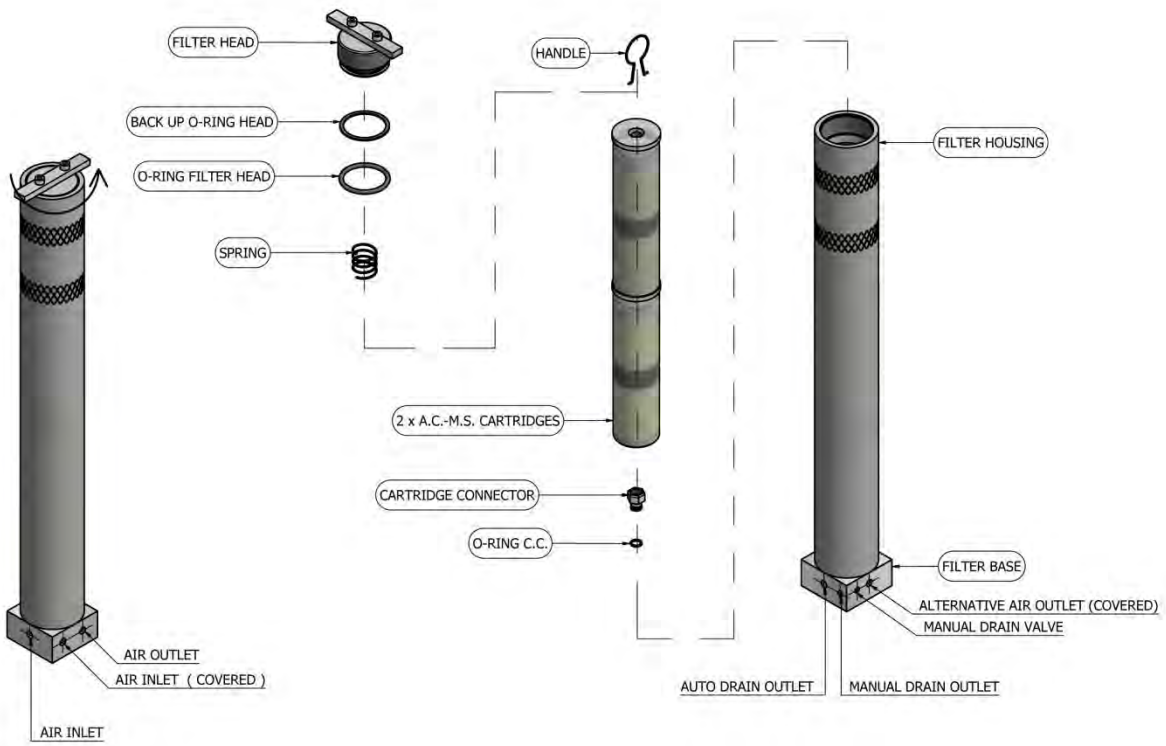
Maintenance work on the compressor must always be done with the compressor stopped and disconnected from the mains supply.

Filters' housing lifetime is 20 years. Hydraulic overpressure test, every 5 years.

Option 1 (standard version till end of 2017):

- **Ø90 x 770 (max. working pressure 350 bar)**

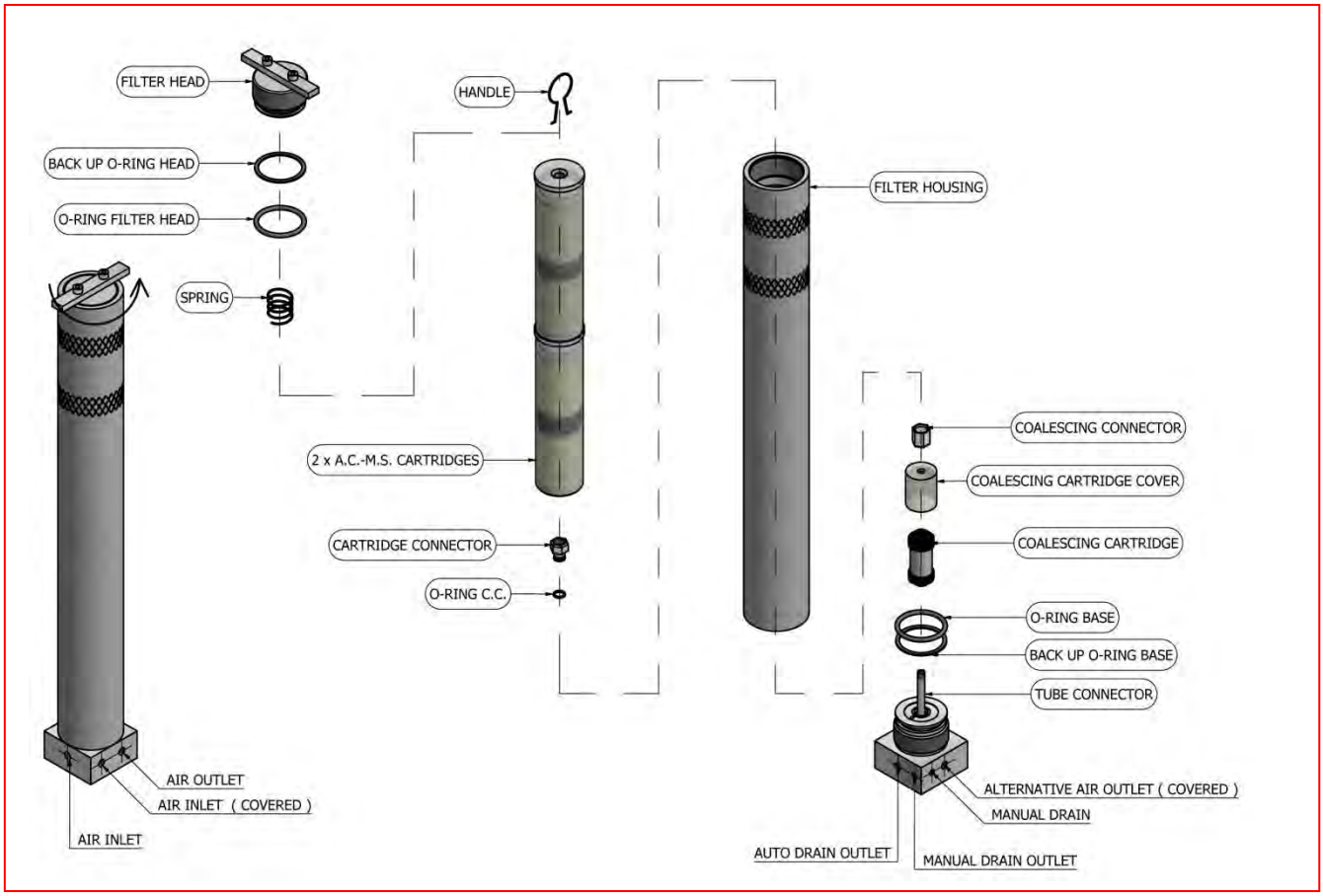
Replacement of active carbon - molecular sieve cartridges



1. Unscrew the filter head counter clockwise.
2. Remove the filter head and the spring.
3. Place the **special handle** on top of the A.C.-M.S cartridges.
4. Remove the A.C.-M.S. cartridges by pulling upwards with the **special handle.** Before throwing away the used cartridges, do not forget to remove the cartridge connector.
5. Clean the inside of the filter housing with a clean cloth.

6. Remove the new A.C.-M.S. cartridges from their protective case. Be sure that packaging is not punctured. If it is damaged do not use it.
7. Lay a small amount of silicone grease on the o-ring of the new A.C.-M.S. cartridges.
8. Screw the two A.C.-M.S. cartridges together so as to create a solid body.
9. Replace the o-ring of the cartridge connector, lay a small amount of silicone grease on the new o-ring and then screw the connector on the bottom A.C.-M.S. cartridge.
10. Place the new A.C.-M.S. cartridges in the filter housing and screw by hand on the coalescing connector (see also drawing nr. B).
11. Lay a small amount of silicone grease on the o-rings of the filter head. If there is a trace of damage on the o-rings, replace.
12. Install the spring in between the filter head and the cartridge.
13. Screw the filter head carefully by hand with light pressure until it fits evenly to the filter housing.

Replacement of coalescing cartridge and active carbon - molecular sieve cartridge



1. Unscrew the filter head counter clockwise.
2. Remove the filter head and the spring.
3. Place the **special handle** on top of the A.C.-M.S cartridges.
4. Remove the A.C.-M.S. cartridges by pulling upwards with the **special handle.** Before throwing away the used cartridges, do not forget to remove the cartridge connector.
5. Unscrew and remove the filter housing from filter's base.
6. Unscrew and remove the coalescing connector & cover.
7. Remove the coalescing cartridge by pulling upwards.
8. Lay a small amount of silicone grease on the o-rings of filter's base. If there is a trace of damage on the o-rings, replace.
9. Install the new coalescing cartridge on filter's base by fastening it down with your hand.
10. Wrap a small amount of Teflon around the thread of the tube connector.
11. Screw the cartridge connector & cover on the tube connector (on top of the coalescing cartridge).
12. Clean the inside of the filter housing with a clean cloth.

13. Screw the filter housing back on its base.
14. Remove the new A.C.-M.S. cartridges from their protective case. Be sure that packaging is not punctured. If it is damaged do not use it.
15. Lay a small amount of silicone grease on the o-ring of the new A.C.-M.S. cartridges.
16. Screw the two A.C.-M.S. cartridges together so as to create a solid body.
17. Replace the o-ring of the cartridge connector, lay a small amount of silicone grease on the new o-ring and then screw the connector on the new A.C.-M.S. cartridge.
18. Place the new A.C.-M.S. cartridge in the filter housing and screw by hand on the coalescing connector (see also drawing nr. B).
19. Lay a small amount of silicone grease on the o-rings of the filter head. If there is a trace of damage on the o-rings, replace.
20. Install the spring in between the filter head and the cartridge.
21. Screw the filter head carefully by hand with light pressure until it fits evenly to the filter housing.

⚠ **Do not screw really tight, while screwing cartridges or connectors inside filter's housing.**

⚠ **FILTER HEAD & FILTER HOUSING SHOULD BE ADJOINED ON TOP WHEN REINSTALLING.**

BA Filter's parts & numbers

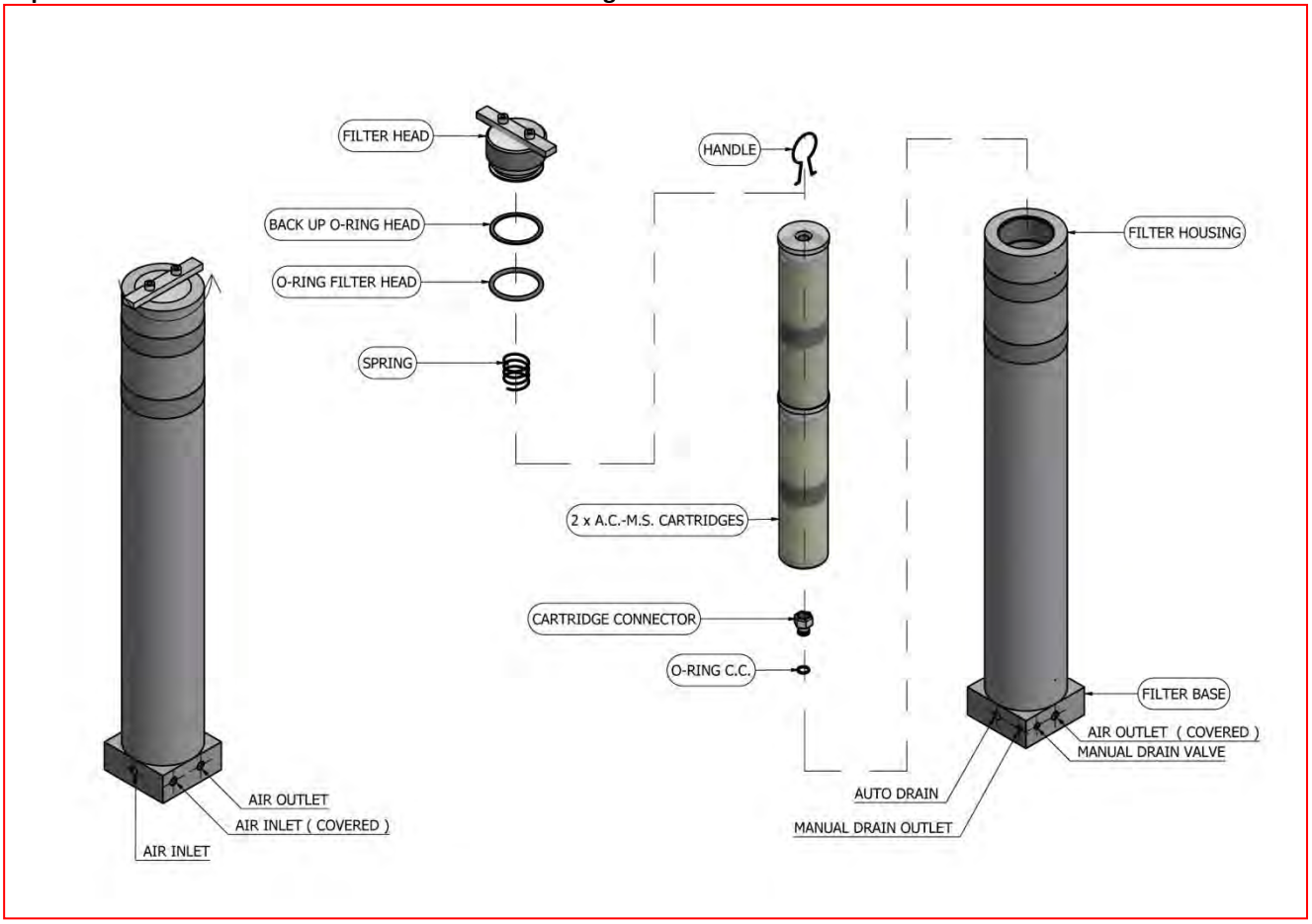
Part Nr.	Description	Qty
208907700	Filter complete Φ90x770 (350bar max)	1
208000042	Filter housing Φ90x770 (350bar max)	1
208000062	Filter base Φ90x770 (350bar max)	1
208000052	Filter head Φ90x770 (350bar max)	1
137000080	AC/MS cartridge (active carbon/molecular sieve cartridge)	2
208000072	Tube connector	1
208000031	Connector cartridge	1
208000030	Connector coalescing	1
137800000	Coalescing pre-filter Cover	1
306049631	Coalescing cartridge	1
133000182	Spring	1
133000092	Handle	1
127052332	O-ring c.c. (connector cartridge)	1
127566942	O-ring f.h. (filter head and base)	2
208970942*	Back-up o-ring f.h. (filter head and base)	2
190000080	Manual drain complete with seat	1
190008112	Manual drain's seat	1

⚠ ***Back-up o-ring head & base - BA filter Φ90x770 (only for s.n. till 1424012 – CYCL.24, 1430084 – CYCL.30 & 1436009 – CYCL.36)**

Option 2 (standard version from begin of 2018):

- **Ø110 x 740 (max. working pressure 480 bar)**

Replacement of active carbon – molecular sieve cartridge

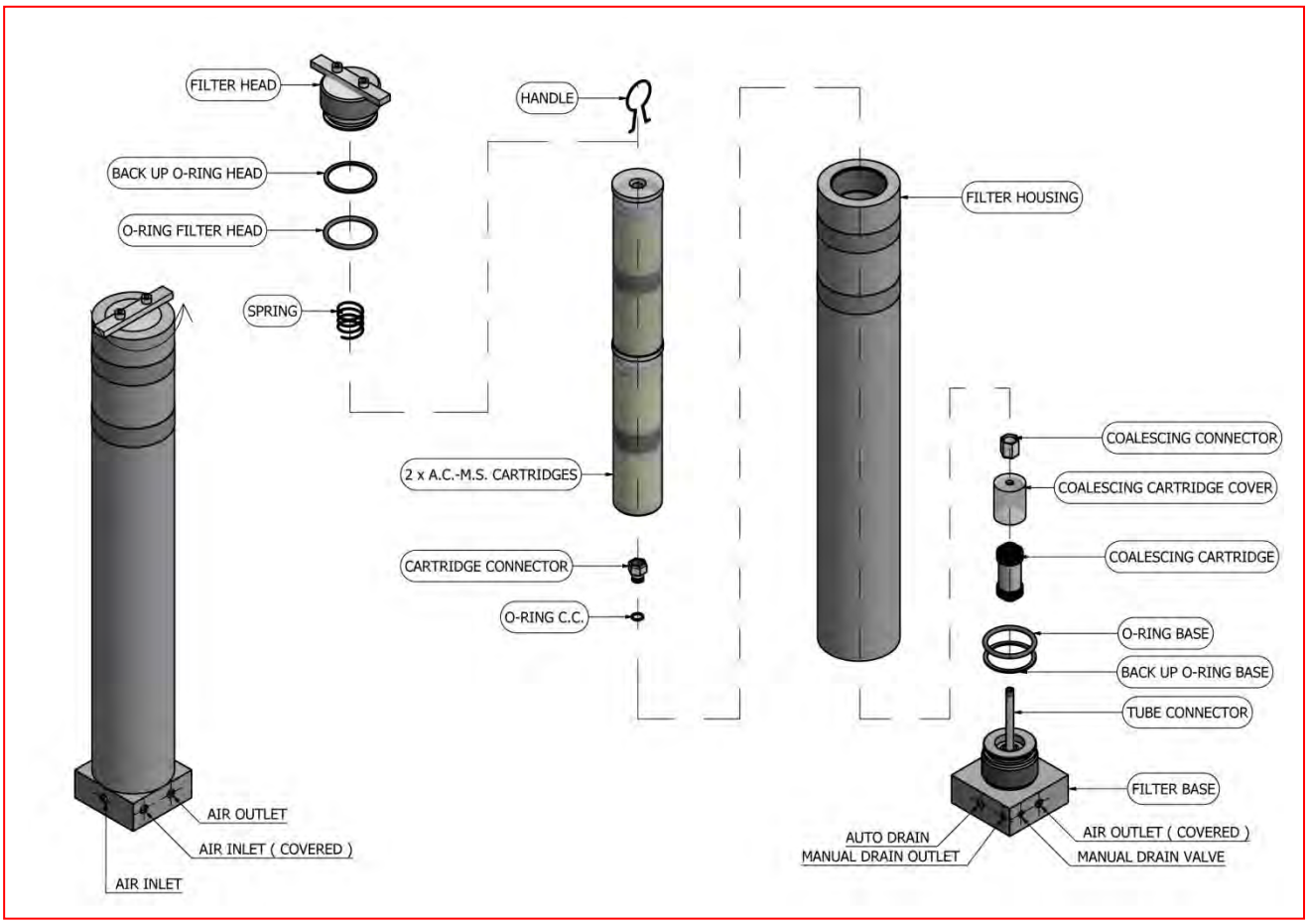


1. Unscrew the filter head counter clockwise.
2. Remove the filter head and the spring.
3. Place the **special handle** on top of the A.C.-M.S cartridges.
4. Remove the A.C.-M.S. cartridges by pulling upwards with the **special handle.** Before throwing away the used cartridge, do not forget to remove the cartridge connector.
5. Clean the inside of the filter housing with a clean cloth.
6. Remove the new A.C.-M.S. cartridges from their protective case. Be sure that packaging is not punctured. If it is damaged do not use it.
7. Lay a small amount of silicone grease on the o-ring of the new A.C.-M.S. cartridges.
8. Screw the two A.C.-M.S. cartridges together so as to create a solid body.
9. Replace the o-ring of the cartridge connector, lay a small amount of silicone grease on the new o-ring and then screw the connector on the bottom A.C.-M.S. cartridge.
10. Place the new A.C.-M.S. cartridge in the filter housing and screw it down by hand on the coalescing connector (see also drawing nr. B).
11. Lay a small amount of silicone grease on the o-rings of the filter head. If there is a trace of damage on the o-rings, replace.
12. Install the spring in between the filter head and the cartridge.
13. Screw the filter head carefully by hand with light pressure until it fits evenly to the filter housing.

⚠ **Do not screw really tight, while screwing cartridges or connectors inside filter's housing.**

FILTER HEAD & FILTER HOUSING SHOULD BE ADJOINED ON TOP WHEN REINSTALLING.

Replacement of coalescing cartridge & active carbon – molecular sieve cartridge



1. Unscrew the filter head counter clockwise.
2. Remove the filter head and the spring.
3. Place the **special handle** on top of the A.C.-M.S cartridges.
4. Remove the A.C.-M.S. cartridges by pulling upwards with the **special handle.** Before throwing away the used cartridges, do not forget to remove the cartridge connector.
5. Unscrew and remove the filter housing from filter's base.
6. Unscrew and remove the coalescing connector & cover.
7. Remove the coalescing cartridge by pulling upwards.
8. Lay a small amount of silicone grease on the o-rings of filter's base. If there is a trace of damage on the o-rings, replace.
9. Install the new coalescing cartridge on filter's base by fastening it down with your hand.
10. Wrap a small amount of Teflon around the thread of the tube connector.
11. Screw the cartridge connector & cover on the tube connector (on top of the coalescing cartridge).
12. Clean the inside of the filter housing with a clean cloth.
13. Screw the filter housing back on its base.
14. Remove the new A.C.-M.S. cartridges from their protective case. Be sure that packaging is not punctured. If it is damaged do not use it.
15. Lay a small amount of silicone grease on the o-ring of the new A.C.-M.S. cartridge.
16. Screw the two A.C.-M.S. cartridges together so as to create a solid body.
17. Replace the o-ring of the cartridge connector, lay a small amount of silicone grease on the new o-ring and then screw the connector on the bottom A.C.-M.S. cartridge.
18. Place the new A.C.-M.S. cartridge in the filter housing and fasten it down by hand on the coalescing connector (see also drawing nr. B).
19. Lay a small amount of silicone grease on the o-rings of the filter head. If there is a trace of damage on the o-rings, replace.
20. Install the spring in between the filter head and the cartridge.

21. Screw the filter head carefully by hand with light pressure until it fits evenly to the filter housing.

Do not screw really tight, while screwing cartridges or connectors inside filter's housing.

FILTER HEAD & FILTER HOUSING SHOULD BE ADJOINED ON TOP WHEN REINSTALLING.

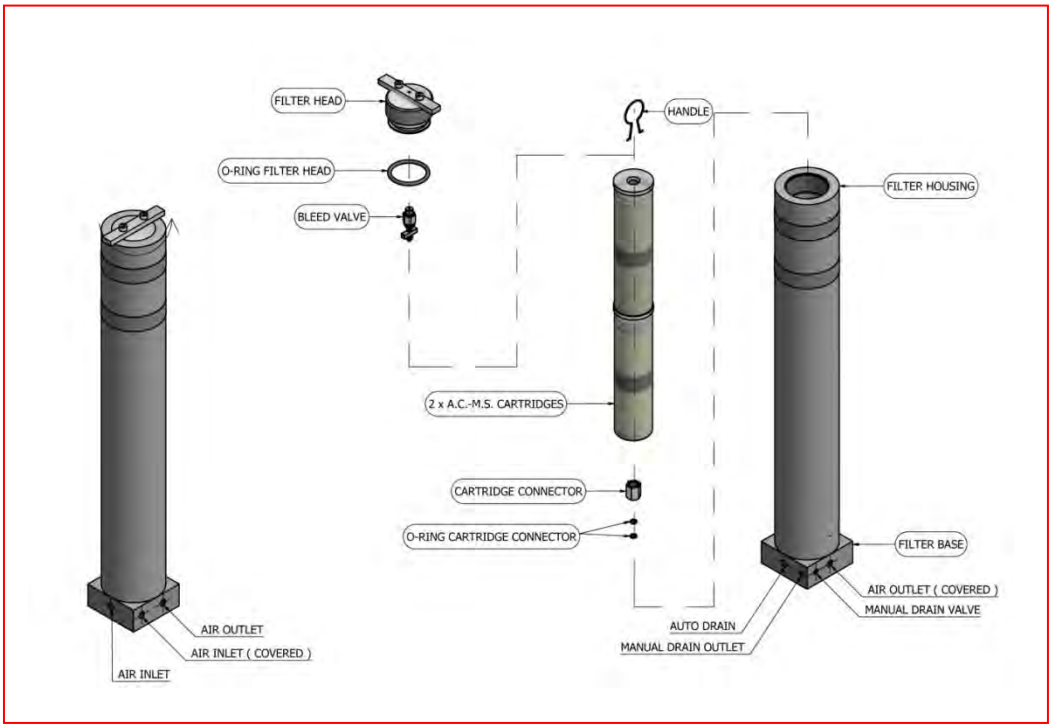
Parts & Codes

Part Nr.	Description	Qty
208611482	Filter complete	1
208620032	Filter housing Φ110x740 (480bar max – C.SIL. 420b version)	1
208620030	Filter base Φ110x740 (480bar max – C.SIL. 420b version)	1
208620012	Filter head Φ110x740 (480bar max – C.SIL. 420b version)	1
137000080	AC/MS cartridge (active carbon/molecular sieve cartridge)	2
208000072	Tube connector	1
208000031	Connector cartridge	1
208000030	Connector coalescing	1
137800000	Coalescing pre-filter Cover	1
306049631	Coalescing cartridge	1
133000182	Spring	1
133000092	Handle	1
127052332	O-ring c.c. (connector cartridge)	1
127566942	O-ring f.h. (filter head) and base	2
208970942*	Back-up o-ring f.h. (filter head) and base	2
190000080	Manual drain complete with seat	1
190008112	Manual drain's seat	1

*** For compressors manufactured till 31/12/2013 an additional Back up O-Ring (part number: 208970962) has to be installed on BA Filter Φ110x495 head & base.**

Option 3 (optional version from begin of 2018):

Replacement of active carbon – molecular sieve cartridge

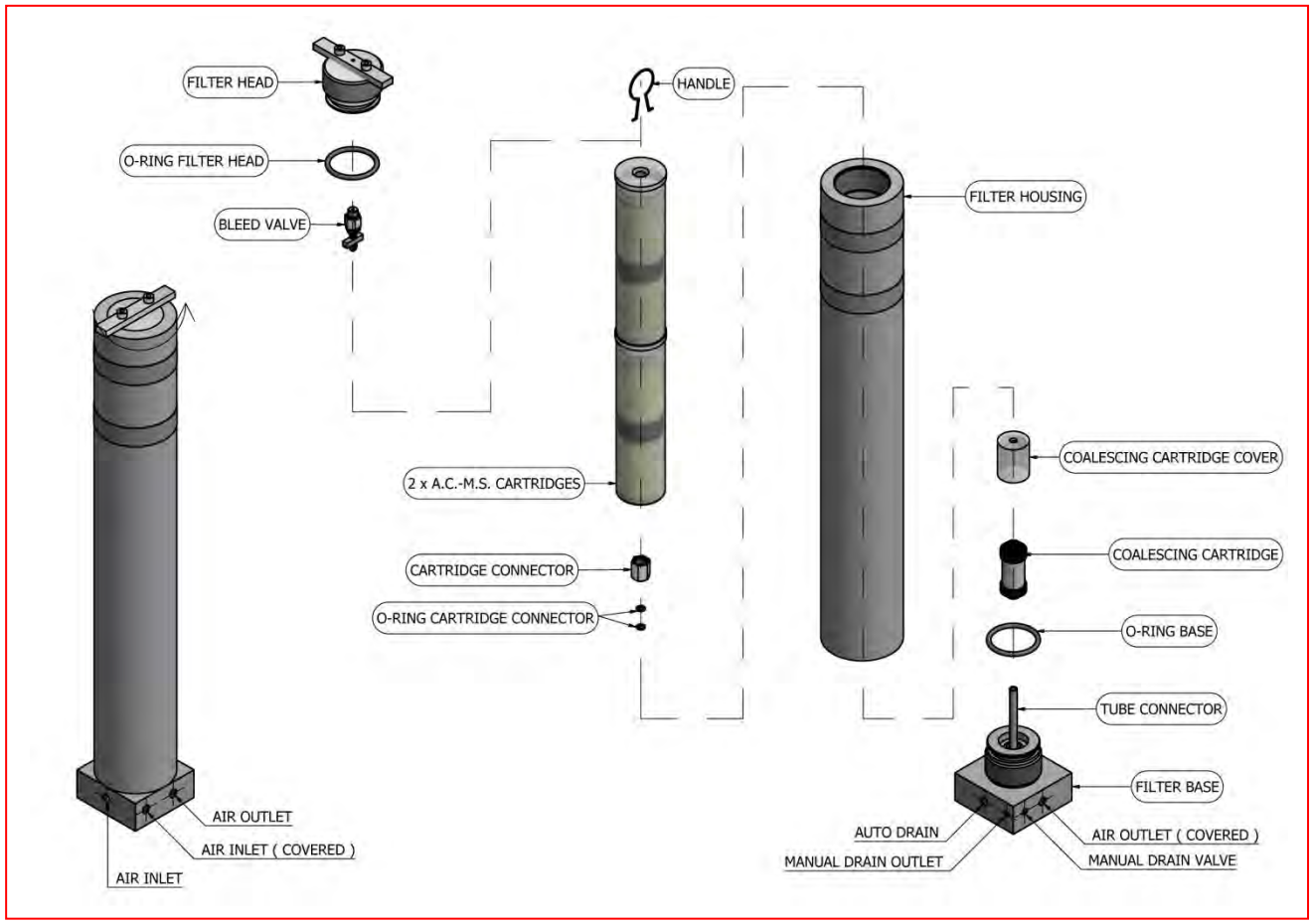


1. Unscrew the filter head counter clockwise.
2. Remove the filter head.
3. Place the **special handle** on top of the A.C.-M.S cartridges.
4. Remove the A.C.-M.S. cartridges by pulling upwards with the **special handle.** Before throwing away the used cartridges, do not forget to remove the cartridge connector.
5. Clean the inside of the filter housing with a clean cloth.
6. Remove the new A.C.-M.S. cartridges from their protective case. Be sure that packaging is not punctured. If it is damaged do not use it.
7. Lay a small amount of silicone grease on the o-ring of the new A.C.-M.S. cartridge.
8. Screw the two A.C.-M.S. cartridges together so as to create a solid body.
9. Replace the two o-rings of the cartridge connector, lay a small amount of silicone grease on the new o-rings and then screw the connector on the bottom A.C.-M.S. cartridge.
10. Place the new A.C.-M.S. cartridges in the filter housing and fasten it down by hand on the coalescing connector (see also drawing nr. B).
11. Lay a small amount of silicone grease on the o-rings of the filter head. If there is a trace of damage on the o-rings, replace.
12. Screw the filter head carefully by hand with light pressure until it fits evenly to the filter housing.

⚠ **Do not screw really tight, while screwing cartridges or connectors inside filter's housing.**

⚠ **FILTER HEAD & FILTER HOUSING SHOULD BE ADJOINED ON TOP WHEN REINSTALLING.**

Replacement of coalescing cartridge & active carbon – molecular sieve cartridge



1. Unscrew the filter head counter clockwise.
2. Remove the filter head.

3. Place the **special handle** on top of the A.C.-M.S cartridges.
4. Remove the A.C.-M.S. cartridges by pulling upwards with the **special handle.** Before throwing away the used cartridge, do not forget to remove the cartridge connector.
5. Unscrew and remove the filter housing from filter's base.
6. Remove the coalescing cartridge & cover by pulling upwards.
7. Lay a small amount of silicone grease on the o-rings of filter's base. If there is a trace of damage on the o-rings, replace.
8. Install the new coalescing cartridge & cover on filter's base by fastening it down with your hand.
9. Wrap a small amount of Teflon around the thread of the tube connector.
10. Clean the inside of the filter housing with a clean cloth.
11. Screw the filter housing back on its base.
12. Remove the new A.C.-M.S. cartridges from their protective case. Be sure that packaging is not punctured. If it is damaged do not use it.
13. Lay a small amount of silicone grease on the o-ring of the new A.C.-M.S. cartridges.
14. Screw the two A.C.-M.S. cartridges together so as to create a solid body.
15. Replace the two o-rings of the cartridge connector, lay a small amount of silicone grease on the new o-rings and then screw the connector on the bottom A.C.-M.S. cartridge.
16. Place the new A.C.-M.S. cartridges in the filter housing and fasten it down by hand on the tube connector (see also drawing nr. B).
17. Lay a small amount of silicone grease on the o-rings of the filter head. If there is a trace of damage on the o-rings, replace.
18. Screw the filter head carefully by hand with light pressure until it fits evenly to the filter housing.

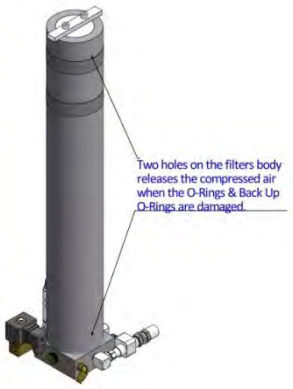
⚠ **Do not screw really tight, while screwing cartridges or connectors inside filter's housing.**

⚠ **FILTER HEAD & FILTER HOUSING SHOULD BE ADJOINED ON TOP WHEN REINSTALLING.**

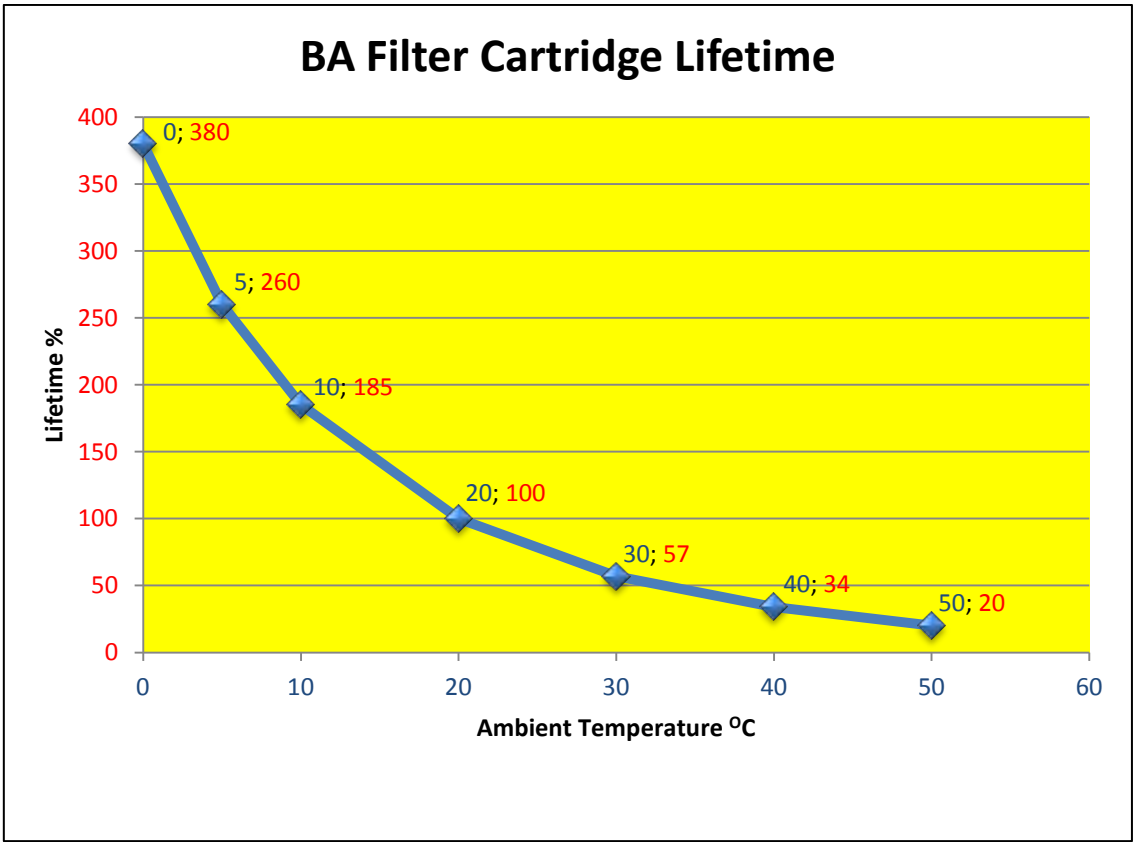
Parts & Codes

Part Nr.	Description	Qty
208611482	Filter complete	1
208620032	Filter housing Φ110x740 (480bar max – C.SIL. 420b version)	1
208620030	Filter base Φ110x740 (480bar max – C.SIL. 420b version)	1
208620012	Filter head Φ110x740 φορ Bleed Valve (480bar max – C.SIL. 420b version)	1
208000082	Bleed Valve	1
137000080	AC/MS cartridge (active carbon/molecular sieve cartridge)	2
208000033	Connector cartridge	1
127505802	O-ring c.c. (connector cartridge)	2
137800000	Coalescing pre-filter Cover	1
306049631	Coalescing cartridge	1
133000092	Handle	1
208000071	Tube connector	1
127566942	O-ring f.h. (filter head and base)	2
190000080	Manual drain complete with seat	1
190008112	Manual drain's seat	1

5.5.6 Pressure auto Release

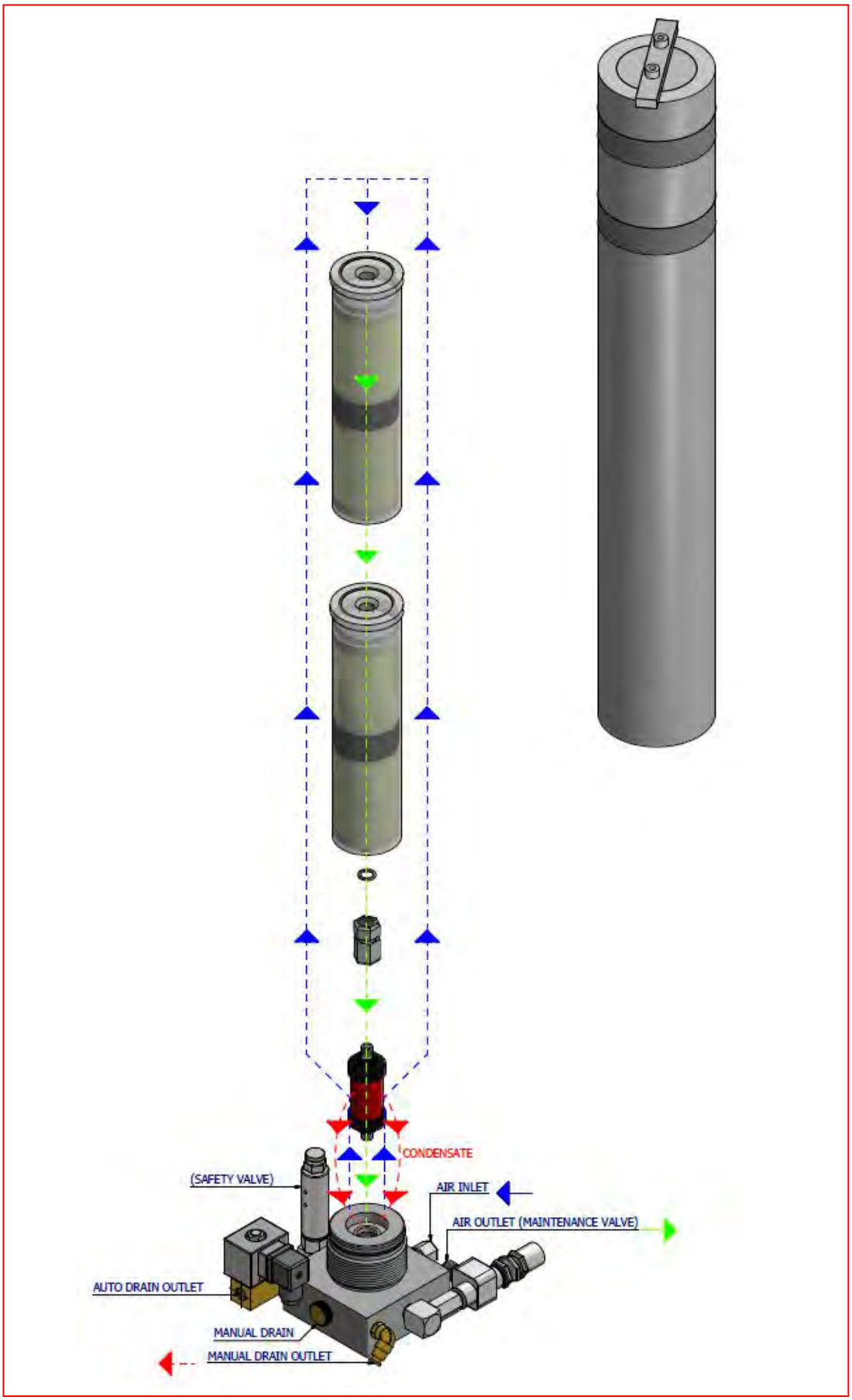


BA Cartridge lifetime



BA cartridge lifetime may change as humidity & temperature levels change. In summer a reduction in service hours is recommended, see above chart for examples relative to temperature.

Air Flow Diagram



6.7 General Service Instructions

- **CAUTION: Before any maintenance on the compressor, make sure there is not air inside, under pressure. Every time you stop the compressor, ALWAYS open the manual drains so as to remove condensate.**
- **Maintenance must always be done with the compressor stopped and disconnected from the mains supply.**

		Operating hours									
		Every 20 hrs	**Every 30 hrs**	**Every 40 hrs**	**Every 100 hrs**	**Every 200 hrs**	**Every 500 hrs**	**Every 1000 hrs**	**Every 2000 hrs**	**Every 6 mths**	**Every 12 mths**
Check V - Belt tension		1st			X						
Check oil level [1] & Condensate drain system		Daily									
Change of oil [2]		1st					X			X	
Replace air intake cartridge [3]						X					X
Replace the BA filter cartridges [2]	**Cyclone 24**			X [4]						X	
	Cyclone 30		X [4]							X	
	Cyclone 36	X [4]								X	
Replace coalescing cartridge [3]						X					X
Replace the Sintered Filter Sponge -Oil Vapour Exhaust →item 10b of page 63 – concern only some serial numbers of 2016								X			
Check Valves							X				
Replace Valves								X			
Replace pistons and piston rings								X			
Sintered Filter (Interstage & Final stage Separator) [6]							X clean	X replace			
Service Kit 1000hrs [5] **(p.n.190962400)**								X			
Service Kit 2000hrs [5] **(p.n.190962500)**									X		
Replace filling hoses									X		Once per 5 years

ATTENTION

1. Check every day the oil level and the general condition of the compressor. Check all connections for leakage.

2. After 6 months, you have to replace the oil and the BA filter's cartridge(s), whether they have completed the required operating hours or not. If the compressor is out of operation for a long period of time, you must also replace them before restart.

- ✓ The proper quantity of oil, when you replace it, is **3,0 lit for compressors with serial numbers after / including the 1424012 (CYCL.24E), 1330067 (CYCL.30E) & 1336001 (CYCL.36E). All compressors with earlier serial numbers must be filled with 2,7 lit oil.**
- ✓ Never mix different types of oil.
- ✓ The compressor unit is delivered filled with **PARAMINA HPS OIL** (Synthetic oil) with p.n.112001000.

3. After 12 months, you have to replace the coalescing cartridge and the air intake cartridge whether they have completed the required operating hours or not.

4. Measured @ 20°C ambient temperature.

5. Service Kits, o-rings & Teflon may need to be replaced at undefined periods according to several factors.

6. **Concerns only compressors equipped with separators part numbers 208501600, 208501610, 208501620 & 208704200.**

6.8 Tightening Torque Values

The tables' shows torques values for screw, bolts and fitting in general, please observe the PARAMINA 'Assembly Methodology' for the parts with the specific tightening torque, the parts with special tightening torque is marked with the proper value in PARAMINA 'Assembly Methodology'.
Damaged or dirty male or female treads can be destroy or cracking the parts.
Screw and bolts tightening torque values.

Tread	Maximum torque Nm
M6	10
M8	25
M10	46
M12	77
M14	113

BSPP fittings torque values.

Tread	Maximum torque Nm
1/8	9
1/4	35
3/8	45
1/2	65

Tapered Thread Port Assembly
The proper method of assembling tapered threaded connectors is to assemble them fingered tight and then wrench tighten further to the specified number of turns from fingered tight (T.F.F.T.) given in Table.
Apply sealant/lubricant to male pipe threads, If PTFE tape is used it should be wrapped 1-1/2 to 2 turns in clockwise direction when viewed from the pipe thread end.
Caution: big amount of tape may cause distortion or cracking of the port.
The total number of tapered threads engaged should be between 3-1/2 and 6.

BSPT	NPTF	**T.F.F.T.**
1/8-28	1/8-27	2 - 3
1/4-19	1/4-18	2 - 3
3/8-19	3/8-18	2 - 3
1/2-14	1/2-14	2 - 3

Pipe connections (swivel nuts) should be fingered tight (T.F.F.T.) plus an additional ½-1 turn.
Note: A second wrench may be required to prevent the fitting from moving during assembly.

General:

- *Always use new sealing ring – washer in reassembling works.*
- *Dirty male or female treads can destroy or crack the parts.*
- *Sealant/Lubricants assist in sealing and provide lubrication during assembly, reducing the potential for galling. Pipe thread sealants are available in various forms such as dry pre-applied, tape, paste and anaerobic liquid.*
- *We recommend observing the instructions for each block 'Assembly Methodology'.*

6.9 Maintenance Calendar 🕮

Operating Hours									
	Check V - Belt tension								
		Change oil							
			Change Air Filter						
				Change Coalescing pre-filter					
					Change BA filter				
						Check Valves			
							Pistons and piston rings		
								Date	
									Sign

Every Day Check: the general condition of the compressor**,** Oil Level, all connections for leakage, for unconventional operation, the auto drains and the color of condensates

1. **We recommend you to calibrate compressors manometers each year or according to:**
   a. **Compressor's yearly operation hours.**
   b. **The application in which compressor operates.**

2. **Interstage & Final stage condensate separator lifetime is 20 years. Hydraulic Overpressure test, every 5 years.**

3. **BA Filter's housing lifetime is 20 years. Hydraulic Overpressure test, every 5 years.**

6.10 Trouble Shooting 🕮

CAUTION

Before any maintenance work on the compressor, make sure there is not air inside, under pressure.

Every time you stop the compressor, ALWAYS open the manual drains so as to remove condensate.

Maintenance work on the compressor must always be done with the compressor stopped and disconnected from the mains supply. Never forget to open the manual drains, after stopping the compressor.

Especially when you are planning to clean the solenoid valves (auto drains version), always turn off the main electrical supply.

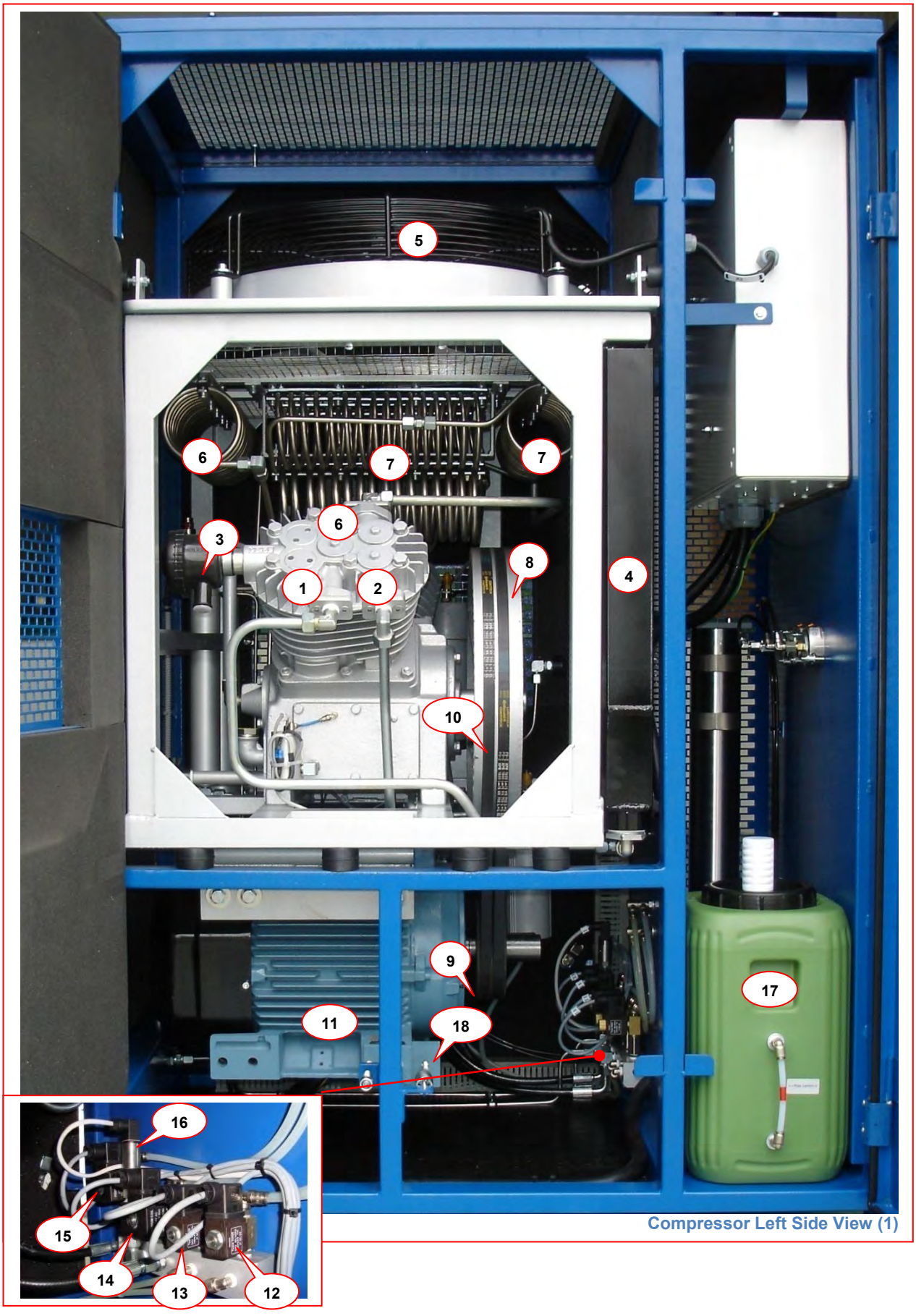
You must always have in mind, if you disconnect the coil of the solenoid valves, without turning off the electrical supply, it will be destroyed immediately!!!

Trouble	Cause	Remedy
unit does not start / no indication on the control panel	Electric circuitry faulty	Check main fuses, auxiliary fuses, terminal connections, wire leads.
	Thermal switch enabled	
Motor does not start	1.Motor protections has activated 2.Active errors forbid the motor start	1. Reset the motor trip and check the motor. 2. Reset the errors , eliminate the cause of the errors
The motor start with difficulty	1. Unstable power supply 2. Pressure remain in the stages 3.inlet pressure high 4.Star-delta switching incorrect	1. Check and stabilize the power supply. 2. a. too short time between stop – start. b. check drains function. 3. Check inlet valve and inlet pressure regulator setting. 4. check star/delta function
Wrong rotation direction	Phases reversed	Change phases
Main Motor protection has activated	1. unstable power supply 2. High power consumption	1. Check and stabilize the power supply. 2.a.motor faulty wiring b. motor overload via bearings c. compressor block overload d. high inlet pressure
Decreased performance of the compressor	**1**.Blocked air intake filter	**1**.Clean - Replace
	2.1st stage, 2nd stage or 3rd stage valves, are not properly closed	**2**.Check the intermediate pressures
	3.1st stage, 2nd stage or 3rd stage Piston rings worn	**3**.Replace
	4.Worn cylinders	**4**.Replace
	5.Pipes leaking	**5**.Tighten and reseal
	6.Solenoid valves stuck open	**6.**Clean - Replace
	7.Unstable power supply - voltage	**7.** Check power supply fuse box

	8.Wrong cable diameter or long cable	**8.**Check - Replace
	9.Interstage safety valves leaking	**9.**Check - Replace
Compressor does not attain final pressure	**1**.Condensate drain Valve and / or fittings leaking	**1**.Tighten and reseal
	2.Premature opening of final safety valve	**2**.Clean final safety valve and readjust
	3. Excessive piston clearance	**3**. Replace and regulate again
	4. Final Safety valve's safety lock opens prematurely	**4**. Check the intermediate pressures, regulate or replace valves
	5.Interstage safety valves leaking	**5.**Check - Replace
	6.Final stage piston rings worn	**9.**Check - Replace
Safety valves between individual stages releasing pressure	**1**.If the 1st stage safety valve is released, the 2nd stage valves do not close properly.	**1**.Check – replace valves
	2.If the 2nd stage safety is released, the 3rd stage valves do not close properly.	**2**.Check – replace valves
	3.Stacked 4th stage piston	**3**.Replace
	4. Blocked Sintered Filter of 3rd stage separator (when 2nd stage safety valve opens)*	**4.**Clean or Replace
	5. Blocked Sintered Filter of 4th – final stage separator (when 3rd stage safety valve opens)*	**5.**Clean or Replace
Compressor runs too hot	**1**.Insufficient supply of fresh cooling air	**1**.Check location. Check inlet air suction. Max. ambient temperature under 45 ºC
	2.Intake or outlet valves are not closing properly	**2**.Check and clean valves, Replace if necessary
	3.Wrong direction of rotation	**3**.See arrow on the compressor and remedy accordingly
	4.Low oil level	**4**.Check oil level
Oil residue/Oil smell in delivered air	**1**.Improper maintenance of final filter	**1**.Service filter - Renew BA cartridge
	2.Wrong type of oil	**2**.Use right type of oil
	3.Activated carbon saturated	**3**.Renew BA cartridge
	4.1st, 2nd, or 3rd stage piston rings worn	**4**. Check - Replace
	5. Worn Cylinders	**5**. Check - Replace

*** Concerns only compressors equipped with separators part numbers 208501600, 208501610, 208501620 & 208704200.**

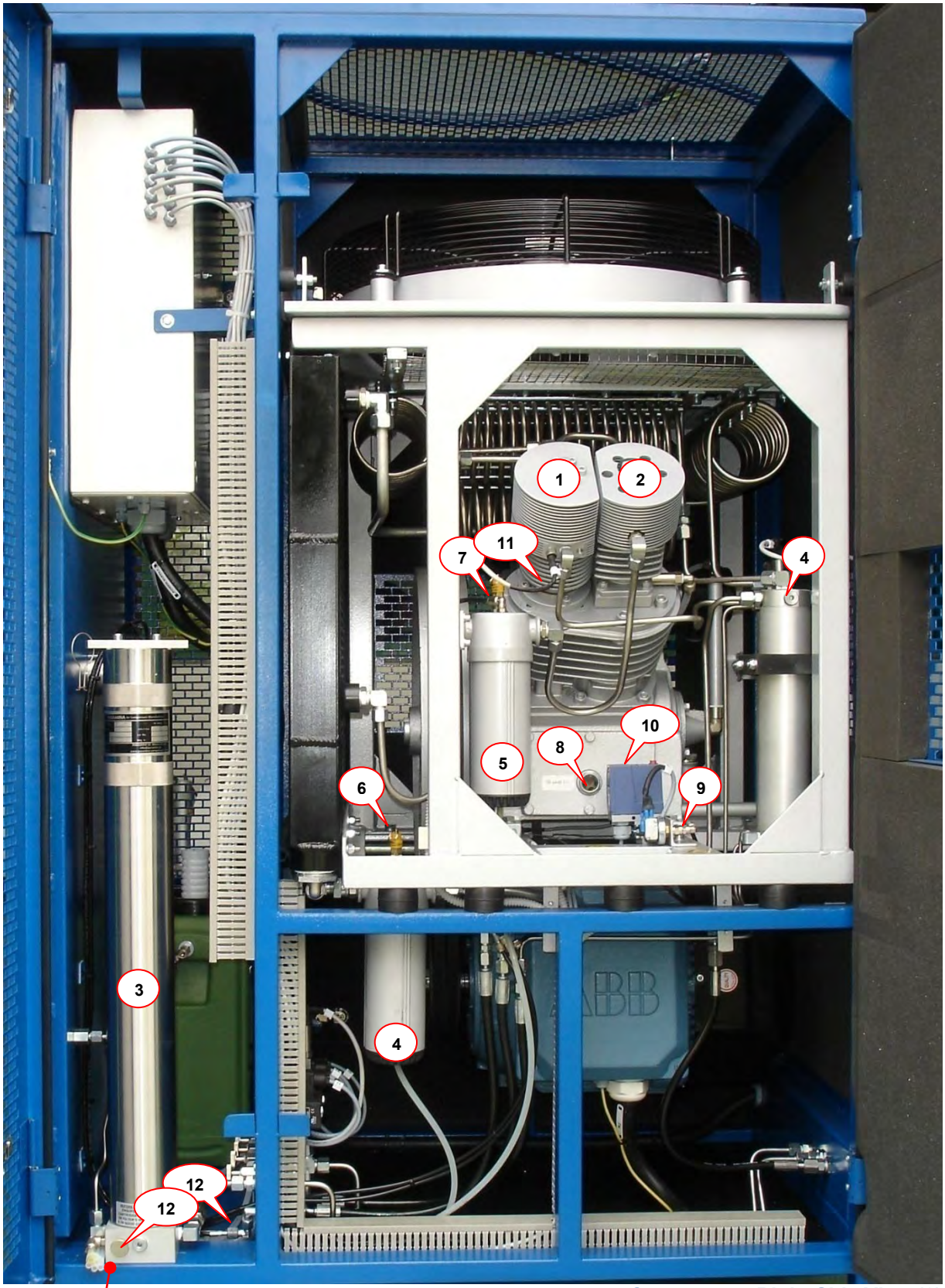
7. Spare Parts Catalog



Compressor Left Side View (1)

Item	Qty	Part Nr.	Description
1.1	1	–	1st stage
1.2	1	–	2nd stage
1.3	1	109460302	Air intake filter cartridge
	1	109000000	Air intake filter housing
1.4	1	101904021	1st - 2nd stage intercooler
1.5*	1	185790022*	Cooling fan (old)
	1	103353002*	Cooling fan motor 380V/50Hz 900rpm (old)
	1	149600182*	Cooling fan guard (old)
1.6	2	190000322	3rd stage intercooler
	2	190000322	3rd stage intercooler (C.SIL.30 420b version)
	1	190000323	
1.7	3	190000333	4th stage aftercooler
	3	190000333	4th stage aftercooler (C.SIL.30 420b version)
	1	190000334	
1.8	1	521212006	Flywheel
1.9	1	136016022	Motor pulley
1.10	2	148068222	Belt
1.11	1	103030102	Electric motor 10 Hp
	1	103030152	Electric motor 15 Hp
	1	103030202	Electric motor 20 Hp
1.12	2	154011251	Auto drain 1st stage 24VAC 16 bar w/o timer
1.13			Auto drain 2nd stage 24VAC 16 bar w/o timer
1.14	1	154122181	Auto drain 3rd stage 24VAC 80 bar w/o timer
1.15	1	154122221	Auto drain 4th stage 24VAC 250 bar w/o timer
	1	154122280	Auto drain 4th stage 24VAC 350 bar w/o timer
	1	154122420	Auto drain 4th stage 24V 400 bar w/o timer (C.SIL.30 420b version)
1.16	1	181091391	Analogue pressure sensor 4th stage
	1	181091481	Analogue pressure sensor 4th stage (0-600bar/ C.SIL.30 420b version)
1.17**	1	401001072	Condensate collecting tank 19lt
	1	142113401	Silencer ¾''
1.18	1	133000472	Support Spring + bolt set

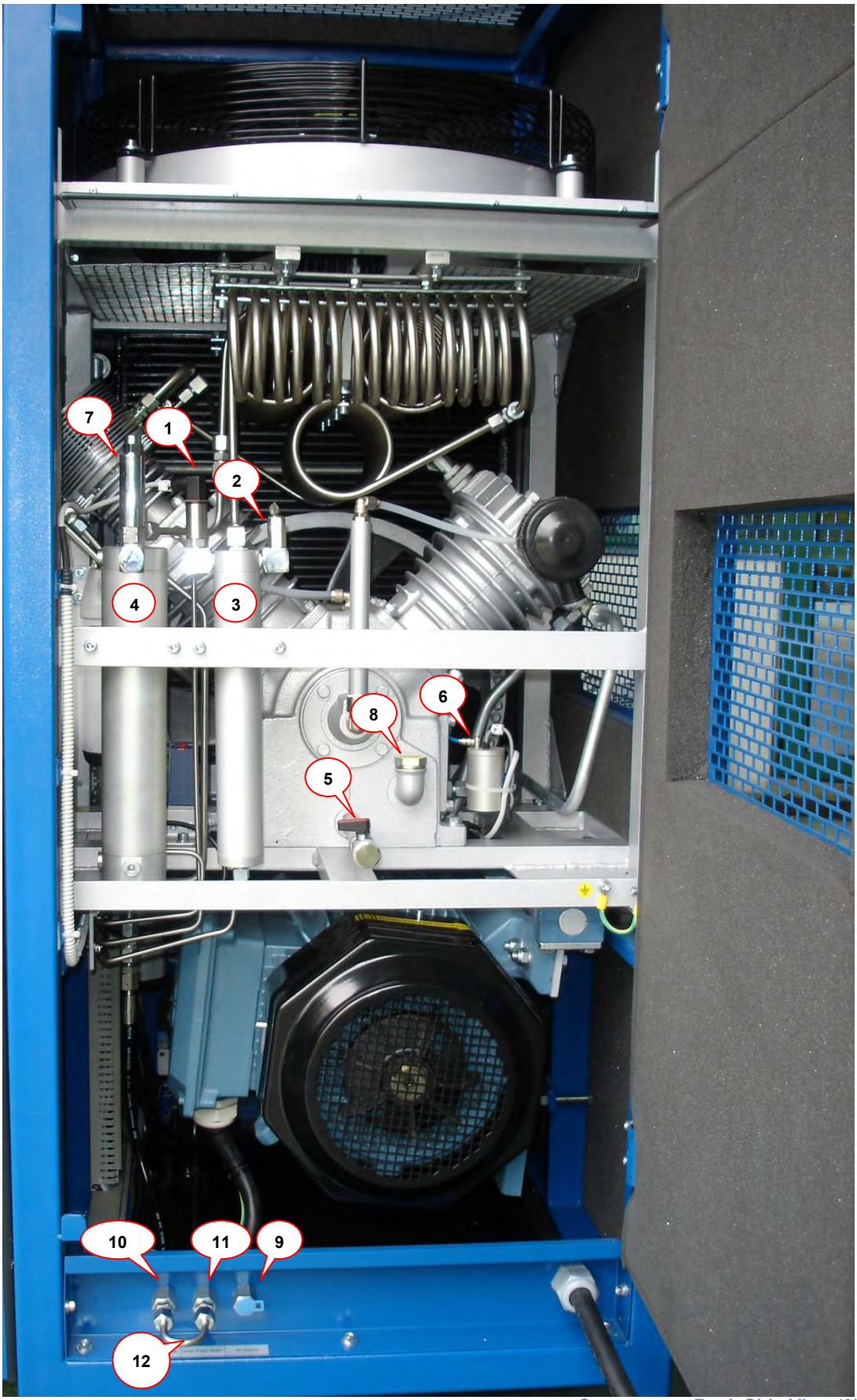
*** Cooling fan motor new complete sets (motor + fan + guard): p.n. 103369001**
**** Installed externally in case of 2 BA filter towers order.**



Compressor Right Side View (2)

Item	Qty	Part Nr.	Description
2.1	1	-	4th stage
2.2	1	-	3rd stage
2.3*	1	208907700	BA filter Φ90x770 complete
	1	208611482	BA filter Φ110x740 complete (C.SIL.30 420bar version)
	2	137000080	Active carbon – Molecular sieve cartridge
	1	306049631	Coalescing cartridge
	2	127566942	O-ring base and head
	2	208970942	Back up O-ring base and head
2.4	1	207101001	Condensate separator 1st stage
	1	127126922	O-Ring condensate separator
2.5	1	207101001	Condensate separator 2nd stage
	1	127126922	O-Ring condensate separator
2.6	1	190500600	Safety valve 1st stage 5bar
2.7	1	190500620	Safety valve 2nd stage 15bar
2.8	1	521165001	Oil sight glass
2.9	1	164100012	1st stage pressure switch
2.10	1	164305062	2nd stage pressure switch
2.11	1	181099411	Temperature sensor
2.12	5	190000080	Manual drain with seat
	5	190008112	Manual drain valve's seat
2.13	1	219004572	Pressure maintaining valve**
2.14	1	154001501	Non return valve

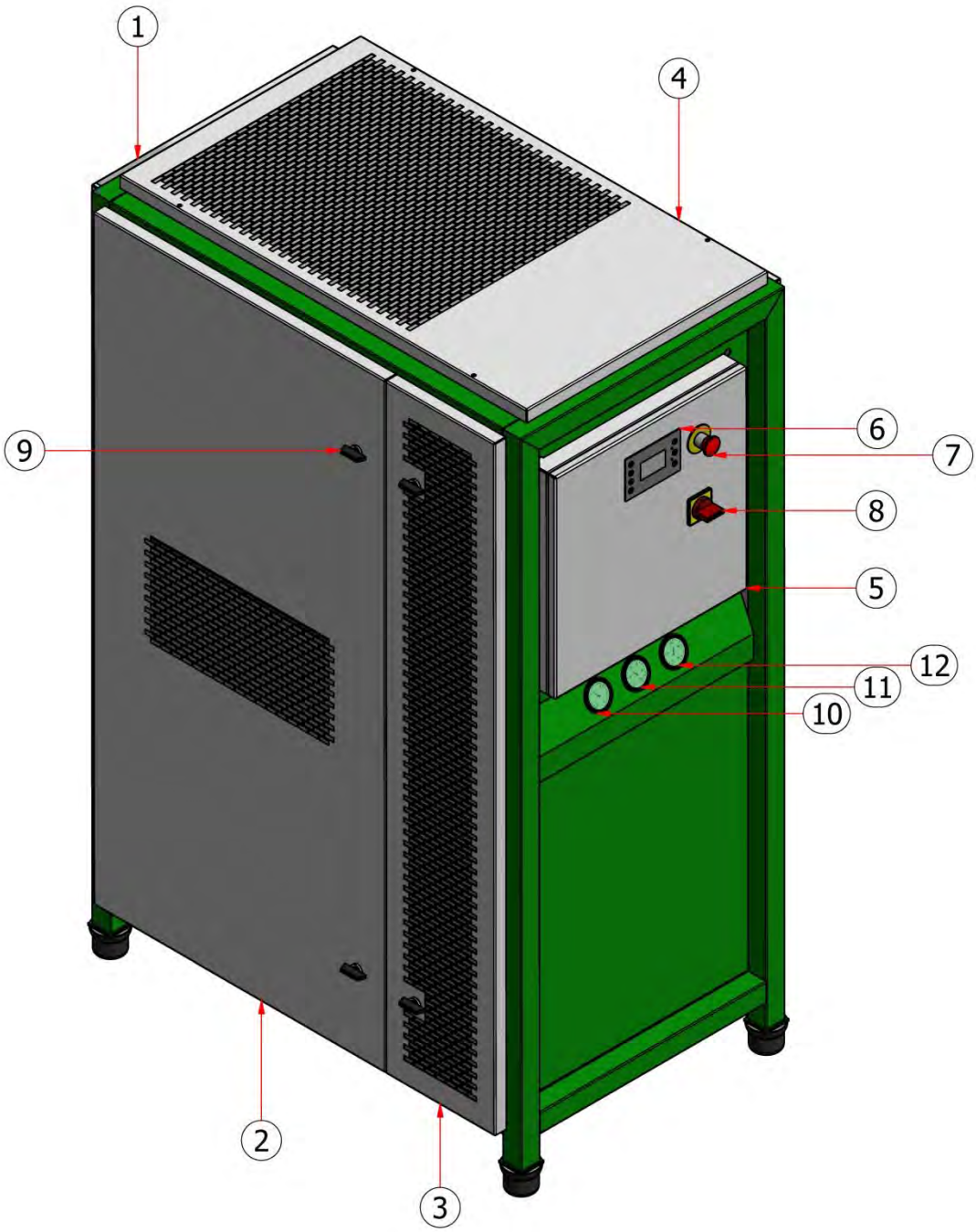
*** See all BA filter's parts and codes in pages 34, 37 & 39. 2pcs as an option.**
**** Go to page 65 for service kit installation instructions.**



Compressor Back Side View (3)

Item	Qty	Part Nr.	Description
3.1	1	181091391	Analogue pressure sensor 3rd stage
3.2	1	219000022	Safety valve 3rd - 100bar series @70bar
3.3	1	208501620	Condensate separator 3rd stage (drawing at page 67)
3.4	1	208704200	4th stage water separator, max. 420 bar
	1	127121422	O-ring 4th stage water separator
	1	142101199	Sintered Filter
3.5	1	145063102	Oil drain valve
3.6	1	190000060	Oil level sensor
	1	190000092	Oil level sensor service kit
3.7	1	219004552	Safety valve 4th stage (270b series) *
	1	219004522	Safety valve 4th stage (420b series) *
3.8	1	116000212	Oil Filling Plug
3.9	1	151000090	Compressed Air Outlet ¼'' BSP
	1	115000832	1/4'' BSPP male / straight M16x1,5 8S male for Stainless Steel pipe connection (Option)
	1	153000122	Fitting connector male 16 x 1,5 - male 1/4'' for Kevlar filling hose connection (Option)
3.10	1	151000090	Compressed Air Outlet ¼'' BSP
	1	115000832	Inlet to Dryer (Option)
3.11	1	151000090	Compressed Air Outlet ¼'' BSP
	1	115000832	Outlet to Dryer (Option)
3.12	1	205300160	By pass pipe set when dryer are not connected

*** Go to page 65 for service kit installation instructions.**

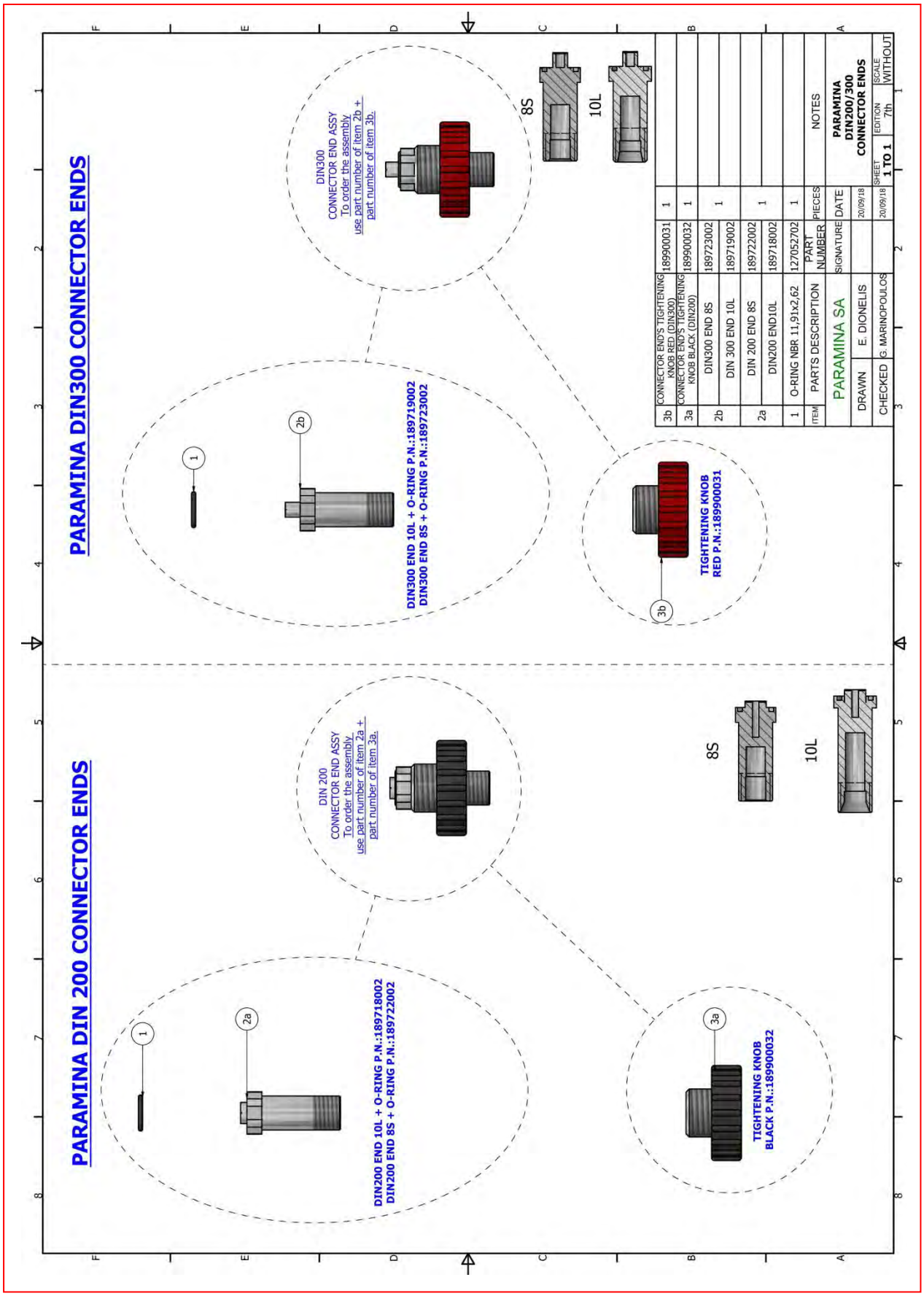


Compressor Outside View (4)

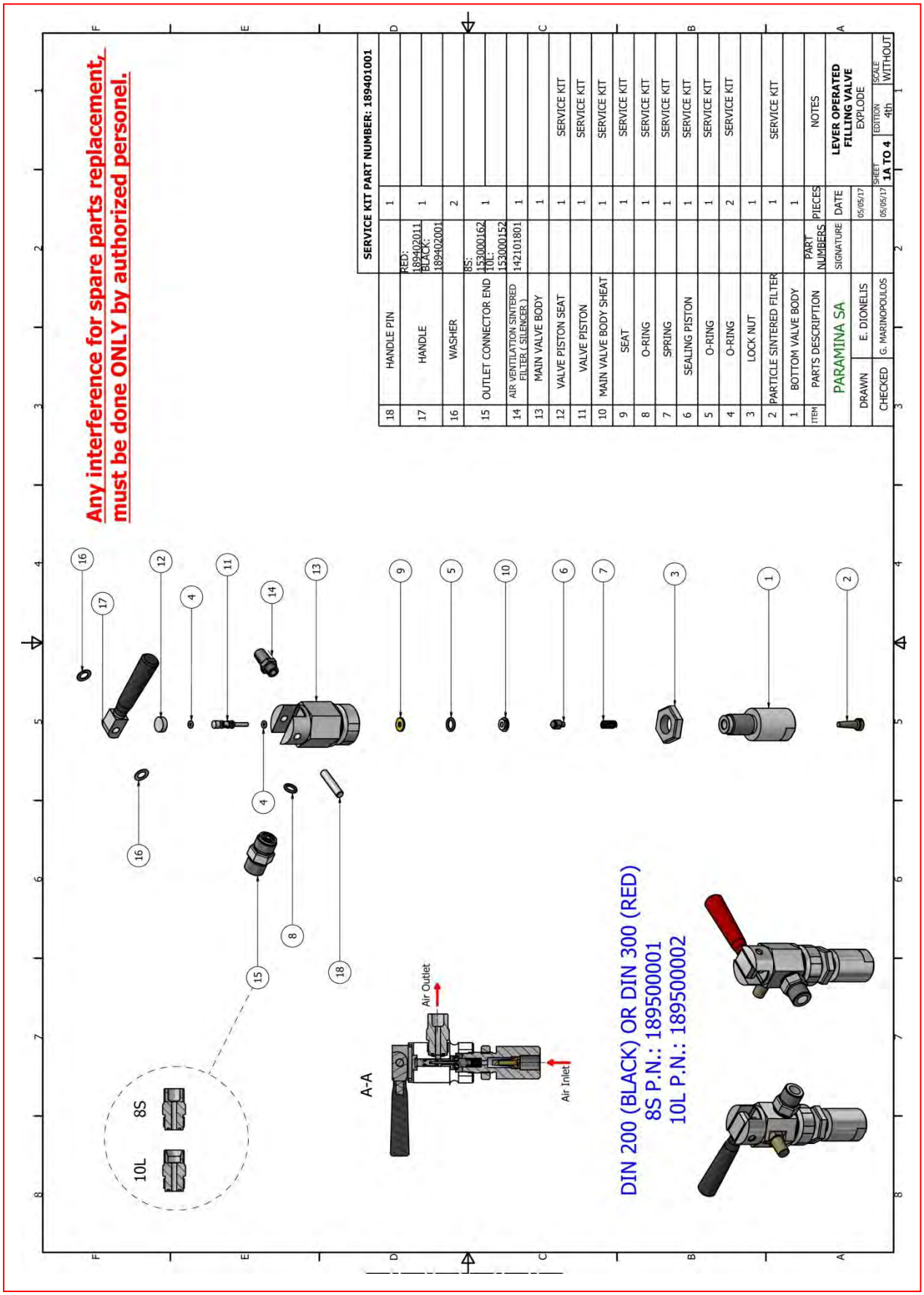
Item	Qty	Part Nr.	Description
4.1	1	105042002	Back door
		105042102*	Back door removable
4.2	2	105041002	Side door
		105041102*	Side door removable
4.3	2	105037002	Side door (small)
		105037102*	
4.4	1	105048002	Top cover
4.5	1	-	Electric Box
4.6	1	181096051	Digital controller
4.7	1	181000000	Emergency stop button
4.8	1	162034002	Main switch
4.9	10	184000022	Door Lock Handle
4.10	1	122063162	1st stage manometer
	1	140004602	1st stage manometer flexible hose
4.11	1	122063162	2nd stage manometer
	1	140004602	2nd stage manometer flexible hose
4.12	1	122063102	3rd stage manometer
	1	140000560	3rd stage manometer Flexible Hose

***Valid for all Cyclone Silent compressors, manufactured from 01/01/2016, including the following serial numbers of 2015:**
Cyclone Silent 24: 1524020,
Cyclone Silent 30: 1530093, 1530094, 1530095, 1530096, 1530097, 1530098G, 1530099
Cyclone Silent 36: 1536021, 1536022, 1536023

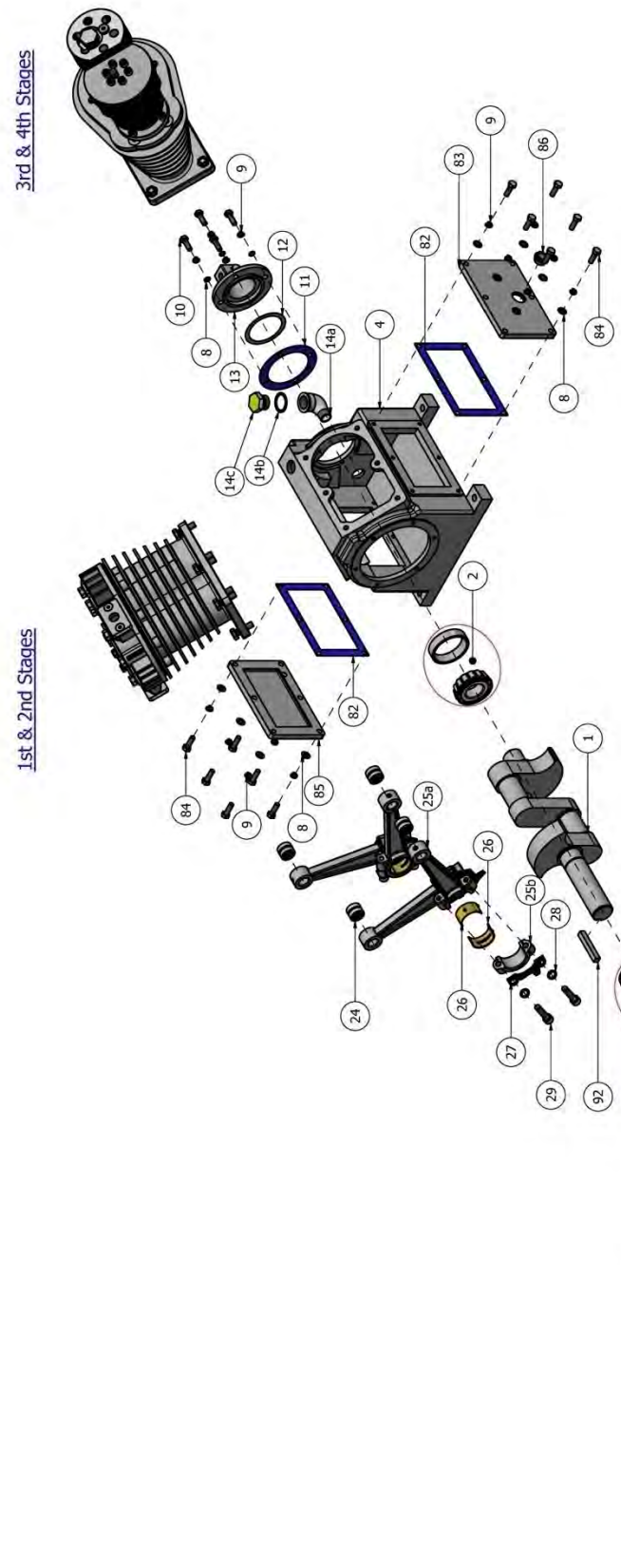
➢ Paramina DIN200/300 Connector Ends



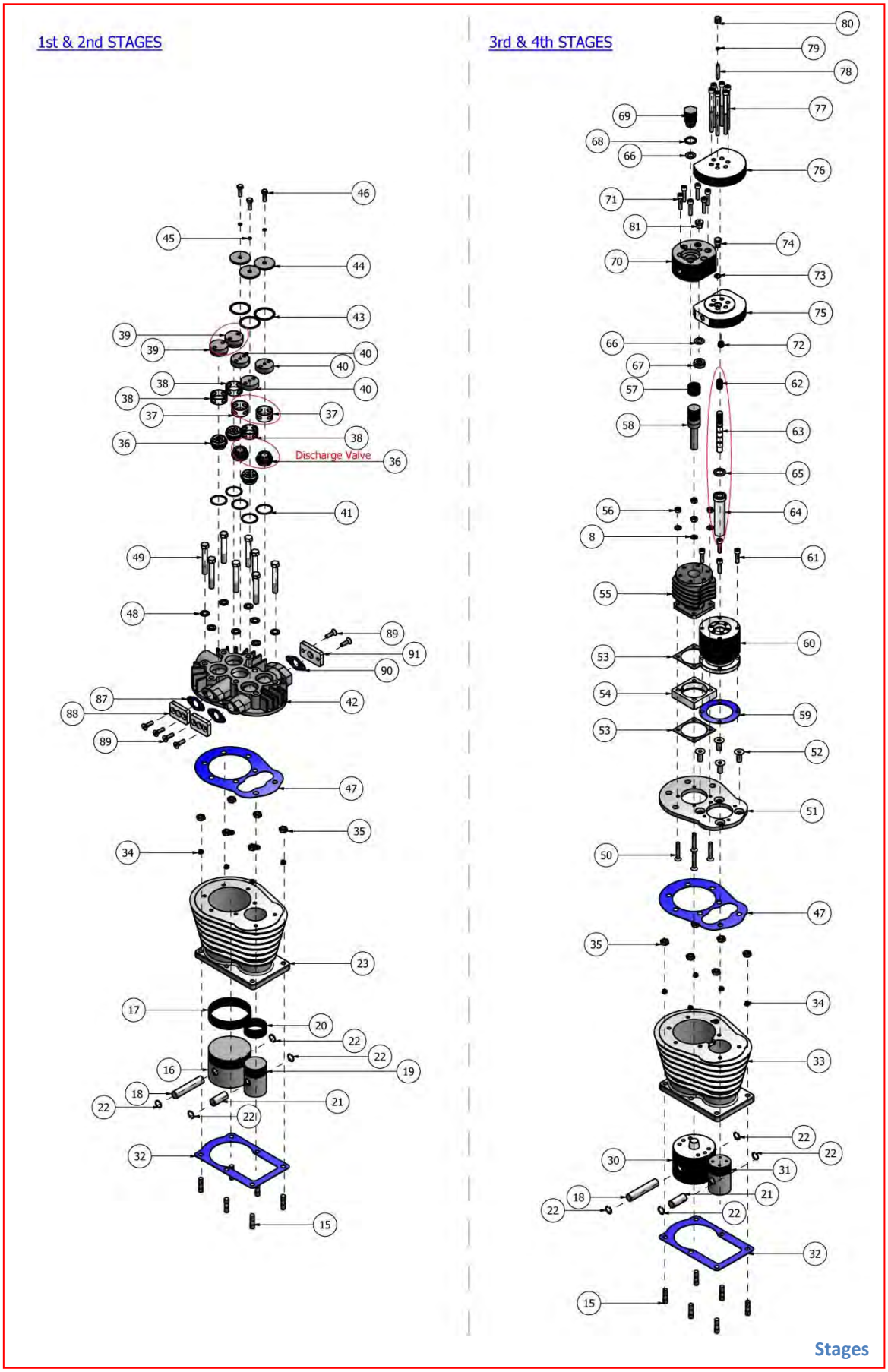
➢ Paramina Lever Operated Filling Valve



➢ Compressor Block



General

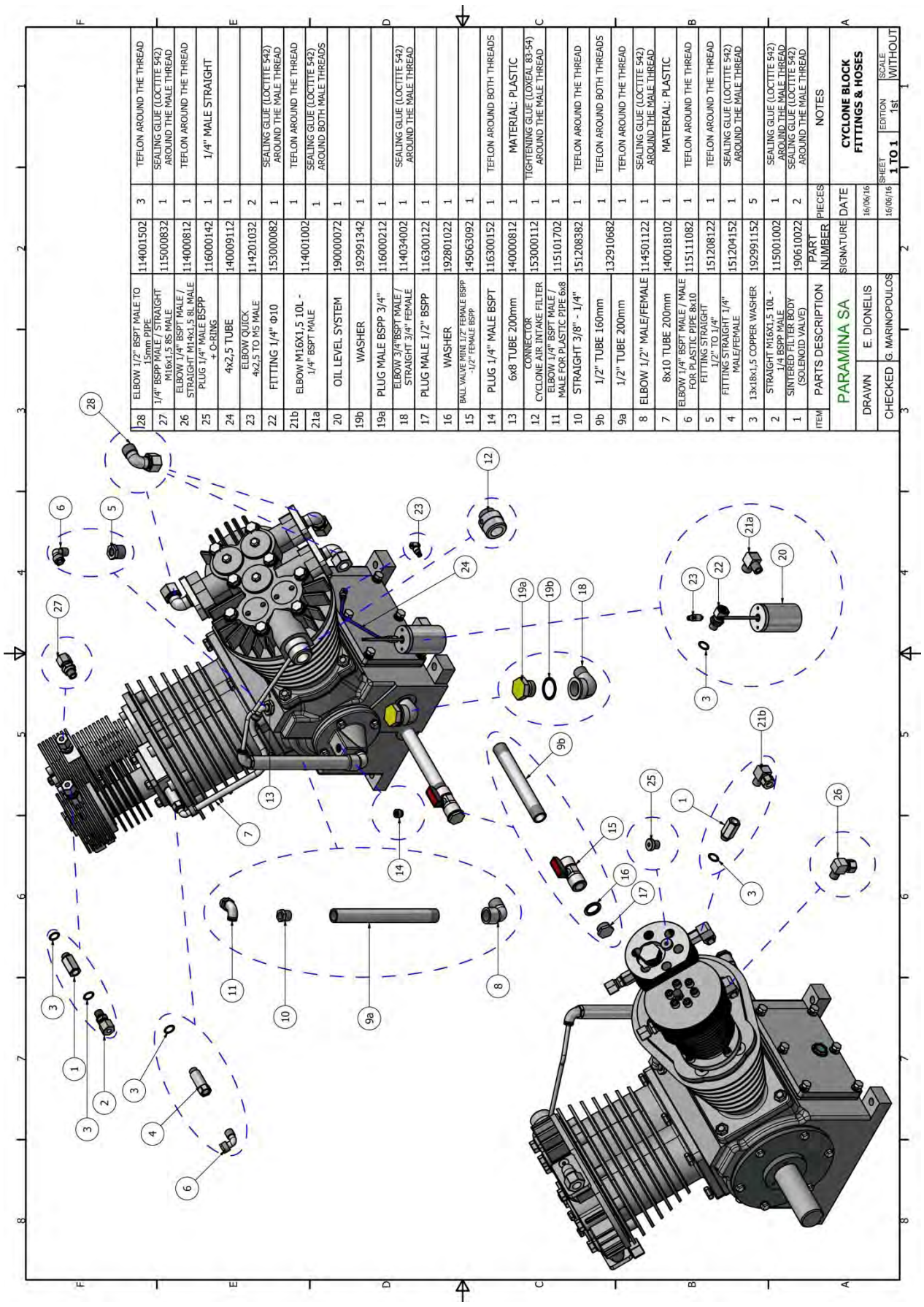

1st & 2nd STAGES
3rd & 4th STAGES
Discharge Valve
Stages

Item	Qty	Part Nr.	Description
1	1	521131009	Crankshaft
2	1	521134009	Bearing Tapered Roller Back
3	1	521134008	Bearing Tapered Roller Front
4	1	521111019	Crankcase
5	1	521152006	Bearing Seat Gasket
6	1	126656302	Oil Seal
7	1	521113006	Bearing Seat (Crankcase Back)
8	26	192200802	Washer Ø8
9	18	198000802	Lock Washer Ø8
10	10	197008252	Hex Head Screw M8x25
11	1	521157003	Connection Pan Gasket
12	1-5	511125001	Adjustment Ring
13	1	521114005	Front Cover Crankcase
14a	1	114034002	Elbow 3/4''BSPT male / straight 3/4'' female
14b	1	192991342	Washer
14c	1	116000212	Plug Male / Straight ¾''
15	12	211410031	Screw Crankcase M10
16	1	521141005	Piston 1st Stage
17	1	521145005	Piston Rings Set 1st Stage
18	2	521143006	Piston Pin 1st & 3rd Stage
19	1	521142001	Piston 2nd Stage
20	1	521145002	Piston Rings Set 2nd Stage
21	2	521143005	Piston Pin 2nd & 4th Stage
22	8	521144004	Piston Pin Circlip
23	1	521121006	Cylinder 1st & 2nd Stage
24	4	110019202	Bearing Con Rod
25a	4	521133001	Con Rod
25b	4		
26	8	521135001	Tile of Rod
27	4	521163002	Oil Splashier Con Rod
28	8	198001002	Con Rod Splashier Lock Washer Ø10
29	8	193110502	Allen Screw M10x50 Con Rod Splashier
30	1	521141006	Crosshead Piston 3rd Stage
31	1	521142002	Crosshead Piston 4th Stage
32	2	521153004	Crankcase Cylinder Gasket
33	1	521121007	Cylinder 3rd & 4th Stage
34	12	511123004	Lock Washer Ø10
35	12	194201002	Hex Nut M10
36	5	521124006	Inlet – Outlet Valve 1st & 2nd Stage
37	2	521125003	Discharge Cap Ring
38	3	521125004	Inlet Cap Ring
39	2	521125001	Pressure Valve Cap High
40	3	521125002	Pressure Valve Cap Low
41	5	511122004	Copper Washer
42	1	521122005	Cylinder Head 1st & 2nd Stage
43	3	521157006	Valve Cover Gasket
44	3	521125005	Valve Cover

45	3	192081212	Copper Washer Ø8
46	3	511131004	Hex Head Screw M8x25
47	2	521151006	Top Cylinder Gasket
48	8	511123005	Washer Ø12
49	8	511131009	Hex Head Screw M12x80
50	4	193208252	Allen Screw M8x25
51	1	190027702	Flange Connection
52	4	193112252	Allen Screw M12x25
53	2	190001312	Flange Gasket
54	1	183700010	Flange
55	1	190000472	Cylinder 3rd Stage
56	4	194200802	Hex Nut M8
57	1	133030022	Piston Ring Set 3rd Stage
58	1	141003002	3rd Stage Piston
59	1	183000142	Gasket Cylinder Guide 4th stage
60	1	190000482	Cylinder Guide 4th Stage
61	4	193108302	Allen Screw M8x30
62*	1	*	Piston Rings Set 4th Stage
63*	1	*	Piston 4th Stage
64*	1	*	Piston Sleeve 4th Stage
65*	1	127057122*	O-Ring Piston Sleeve 4th Stage
66	2	192000122	Copper Washer
67	1	154000430	Inlet Valve 3rd Stage
68	1	127056412	O-Ring Discharge Valve 3rd Stage
69	1	154000450	Discharge Valve 3rd Stage
70	1	190000522	Valve Head 3rd Stage
71	6	193108352	Allen Screw M8x35
72	1	154000200	Inlet Valve 4th Stage
73	1	127054362	O-Ring Discharge Valve 4th Stage
74	1	154000280	Discharge Valve 4th Stage
75	1	190000292	Valve Head 4th Stage
76	1	190000602	Top Cover 4th Stage
77	6	193108982	Allen Screw M8x120
78	1	193087002	Set Screw
79	1	192081212	Copper Washer Ø8
80	1	194000802	Plug Allen Screw
81	1	116000142	Plug ¼'' + O-Ring
82	2	521157001	Side Cover Gasket – crankcase
83	1	521114001	Crankcase Side Cover Right
84	12	511131004	Hex Head Screw M8x25
85	1	521114002	Crankcase Side Cover Left
86	1	521165001	Oil Sight Glass
87	2	521157007	Gasket – side cylinder 1st & 2nd stage
88	2	183700000	Flange
89	6	193112252	Allen Screw M12x25
90	1	521157009	Gasket – side cylinder head 1st & 2nd
91	1	183700020	Flange
92	1	521136002	Flat Key – Wedge Crankshaft

93	1	521212006	Flywheel
94	1	511131010	Hex Head Screw M16x120
95	2	511121004	Washer pulley bolt Ø16
96	1	511123006	Lock Washer Ø16
97	1	511111004	Hex Nut M16

*** Supply / Order only as assembly - 4th stage piston complete = 141000031 (replaced 141000030)**



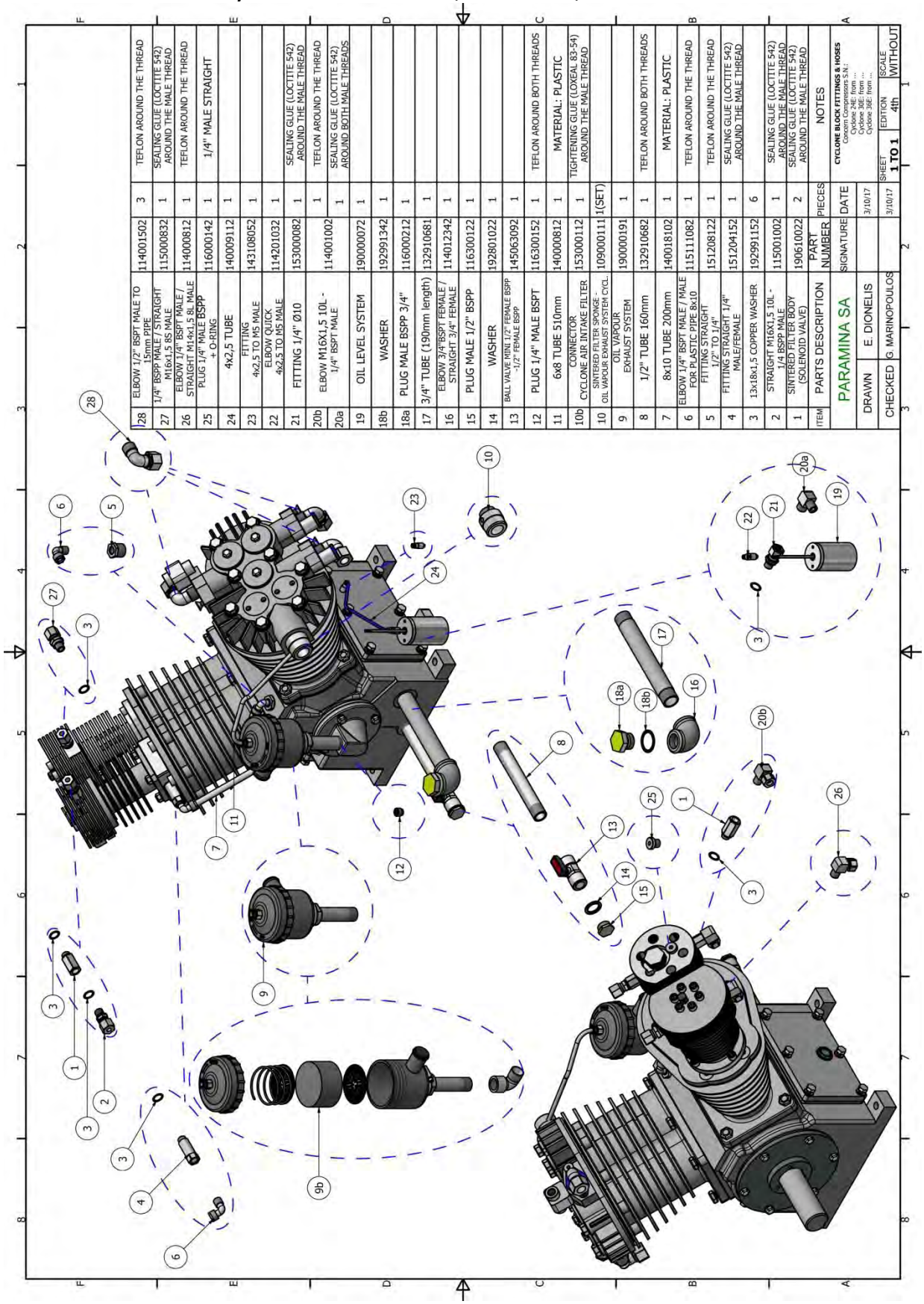
ITEM	PARTS DESCRIPTION	PART NUMBER	PIECES	NOTES
28	ELBOW 1/2" BSPT MALE TO 15mm PIPE	114001502	3	TEFLON AROUND THE THREAD
27	1/4" BSPP MALE / STRAIGHT M16x1,5 8S MALE	115000832	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
26	ELBOW 1/4" BSPT MALE / STRAIGHT M14x1,5 8L MALE	114000812	1	TEFLON AROUND THE THREAD
25	PLUG 1/4" MALE BSPP + O-RING	116000142	1	1/4" MALE STRAIGHT
24	4x2,5 TUBE	140009112	1	
23	ELBOW QUICK 4x2,5 TO M5 MALE	114201032	2	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
22	FITTING 1/4" Φ10	153000082	1	TEFLON AROUND THE THREAD
21b	ELBOW M16X1,5 10L - 1/4" BSPT MALE	114001002	1	SEALING GLUE (LOCTITE 542) AROUND BOTH MALE THREADS
21a			1	
20	OIL LEVEL SYSTEM	190000072	1	
19b	WASHER	192991342	1	
19a	PLUG MALE BSPP 3/4"	116000212	1	
18	ELBOW 3/4"BSPT MALE / STRAIGHT 3/4" FEMALE	114034002	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
17	PLUG MALE 1/2" BSPP	116300122	1	
16	WASHER	192801022	1	
15	BALL VALVE MINI 1/2" FEMALE BSPP -1/2" FEMALE BSPP	145063092	1	
14	PLUG 1/4" MALE BSPT	116300152	1	TEFLON AROUND BOTH THREADS
13	6x8 TUBE 200mm	140000812	1	MATERIAL: PLASTIC
12	CONNECTOR CYCLONE AIR INTAKE FILTER	153000112	1	TIGHTENING GLUE (LOXEAL 83-54) AROUND THE MALE THREAD
11	ELBOW 1/4" BSPT MALE / MALE FOR PLASTIC PIPE 6x8	115101702	1	
10	STRAIGHT 3/8" - 1/4"	151208382	1	TEFLON AROUND THE THREAD
9b	1/2" TUBE 160mm	132910682	1	TEFLON AROUND BOTH THREADS
9a	1/2" TUBE 200mm		1	TEFLON AROUND THE THREAD
8	ELBOW 1/2" MALE/FEMALE	114501122	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
7	8x10 TUBE 200mm	140018102	1	MATERIAL: PLASTIC
6	ELBOW 1/4" BSPT MALE / MALE FOR PLASTIC PIPE 8x10	115111082	1	TEFLON AROUND THE THREAD
5	FITTING STRAIGHT 1/2" TO 1/4"	151208122	1	TEFLON AROUND THE THREAD
4	FITTING STRAIGHT 1/4" MALE/FEMALE	151204152	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
3	13x18x1,5 COPPER WASHER	192991152	5	
2	STRAIGHT M16X1,5 10L - 1/4 BSPP MALE	115001002	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
1	SINTERED FILTER BODY (SOLENOID VALVE)	190610022	2	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD

PARAMINA SA		SIGNATURE	DATE
DRAWN	E. DIONELIS		16/06/16
CHECKED	G. MARINOPOULOS		16/06/16

CYCLONE BLOCK FITTINGS & HOSES

SHEET 1 TO 1 | EDITION 1st | SCALE WITHOUT

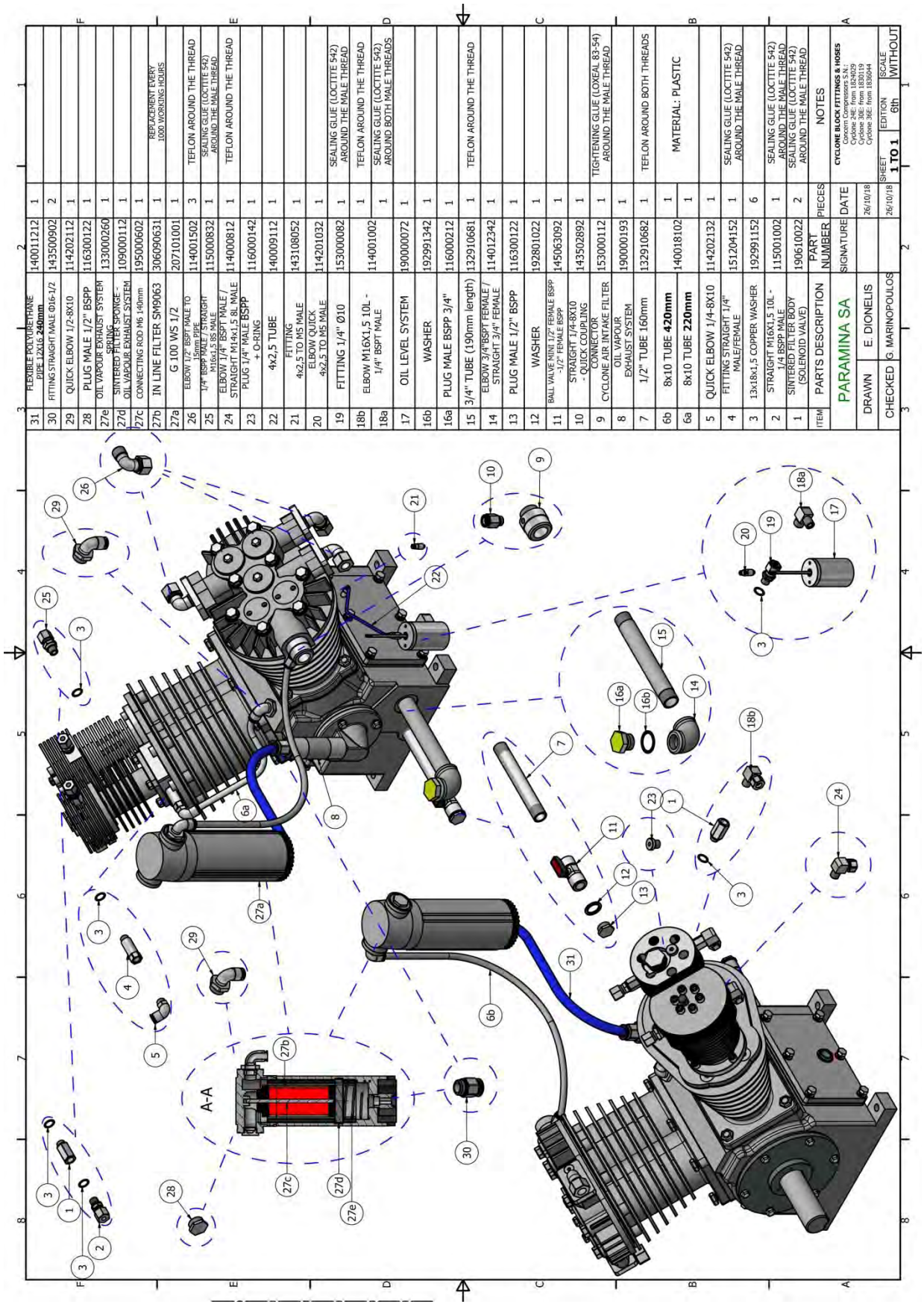
Valid from serial numbers: Cyclone Silent 24E: 1624023, 30E: 1630101, 36E: 1636028 1682335



ITEM	PARTS DESCRIPTION	PART NUMBER	PIECES	NOTES
28	ELBOW 1/2" BSPT MALE TO 15mm PIPE	114001502	3	TEFLON AROUND THE THREAD
27	1/4" BSPP MALE / STRAIGHT M16x1,5 8S MALE	115000832	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
26	ELBOW 1/4" BSPT MALE / STRAIGHT M14x1,5 8L MALE	114000812	1	TEFLON AROUND THE THREAD
25	PLUG 1/4" MALE BSPP + O-RING	116000142	1	1/4" MALE STRAIGHT
24	4x2,5 TUBE	140009112	1	
23	FITTING 4x2,5 TO M5 MALE	143108052	1	
22	ELBOW QUICK 4x2,5 TO M5 MALE	114201032	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
21	FITTING 1/4" Ø10	153000082	1	
20b	ELBOW M16X1,5 10L - 1/4" BSPT MALE	114001002	1	TEFLON AROUND THE THREAD
20a			1	SEALING GLUE (LOCTITE 542) AROUND BOTH MALE THREADS
19	OIL LEVEL SYSTEM	190000072	1	
18b	WASHER	192991342	1	
18a	PLUG MALE BSPP 3/4"	116000212	1	
17	3/4" TUBE (190mm length)	132910681	1	
16	ELBOW 3/4"BSPT FEMALE / STRAIGHT 3/4" FEMALE	114012342	1	
15	PLUG MALE 1/2" BSPP	116300122	1	
14	WASHER	192801022	1	
13	BALL VALVE MINI 1/2" FEMALE BSPP -1/2" FEMALE BSPP	145063092	1	
12	PLUG 1/4" MALE BSPT	116300152	1	TEFLON AROUND BOTH THREADS
11	6x8 TUBE 510mm	140000812	1	MATERIAL: PLASTIC
10b	CONNECTOR CYCLONE AIR INTAKE FILTER	153000112	1	TIGHTENING GLUE (LOXEAL 83-54) AROUND THE MALE THREAD
10	SINTERED FILTER SPONGE - OIL VAPOUR EXHAUST SYSTEM CYCL.	1090001111	1(SET)	
9	OIL VAPOUR EXHAUST SYSTEM	190000191	1	
8	1/2" TUBE 160mm	132910682	1	TEFLON AROUND BOTH THREADS
7	8x10 TUBE 200mm	140018102	1	MATERIAL: PLASTIC
6	ELBOW 1/4" BSPT MALE / MALE FOR PLASTIC PIPE 8x10	115111082	1	TEFLON AROUND THE THREAD
5	FITTING STRAIGHT 1/2" TO 1/4"	1512081122	1	TEFLON AROUND THE THREAD
4	FITTING STRAIGHT 1/4" MALE/FEMALE	1512041152	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
3	13x18x1,5 COPPER WASHER	192991152	6	
2	STRAIGHT M16X1,5 10L - 1/4 BSPP MALE	115001002	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
1	SINTERED FILTER BODY (SOLENOID VALVE)	1906100022	2	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD

PARAMINA SA	SIGNATURE	DATE	CYCLONE BLOCK FITTINGS & HOSES Concern: Paramina Compressors S.A.: Cyclone 24E: from ... Cyclone 30E: from ... Cyclone 36E: from ...
DRAWN E. DIONELIS		3/10/17	SHEET 1 TO 1 / EDITION 4th / SCALE WITHOUT
CHECKED G. MARINOPOULOS		3/10/17	

Valid from serial numbers: Cyclone Silent 24E: 1824029, 30E: 1830119, 36E: 1836044



ITEM	PARTS DESCRIPTION	PART NUMBER	PIECES	NOTES
31	FLEXIBLE POLYURETHANE PIPE 12X16 **240mm**	140011212	1	
30	FITTING STRAIGHT MALE Φ16-1/2	143500902	2	
29	QUICK ELBOW 1/2-8X10	114202112	1	
28	PLUG MALE 1/2" BSPP	116300122	1	
27e	OIL VAPOUR EXHAUST SYSTEM SPRING	133000260	1	
27d	SINTERED FILTER SPONGE - OIL VAPOUR EXHAUST SYSTEM	109000112	1	
27c	CONNECTING ROD M6 140mm	195000602	1	REPLACEMENT EVERY 1000 WORKING HOURS
27b	IN LINE FILTER SM9063	306090631	1	
27a	G 100 WS 1/2	207101001	1	
26	ELBOW 1/2" BSPT MALE TO 16mm PIPE	114001502	3	TEFLON AROUND THE THREAD
25	1/4" BSPP MALE / STRAIGHT M16x1,5 BS MALE	115000832	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
24	ELBOW 1/4" BSPT MALE / STRAIGHT M14x1,5 BL MALE	114000812	1	TEFLON AROUND THE THREAD
23	PLUG 1/4" MALE BSPP + O-RING	116000142	1	
22	4x2,5 TUBE	140009112	1	
21	FITTING 4x2,5 TO M5 MALE	143108052	1	
20	ELBOW QUICK 4x2,5 TO M5 MALE	114201032	1	
19	FITTING 1/4" Ø10	153000082	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
18b	ELBOW M16X1,5 10L - 1/4" BSPT MALE	114001002	1	TEFLON AROUND THE THREAD
18a			1	SEALING GLUE (LOCTITE 542) AROUND BOTH MALE THREADS
17	OIL LEVEL SYSTEM	190000072	1	
16b	WASHER	192991342	1	
16a	PLUG MALE BSPP 3/4"	116000212	1	
15	3/4" TUBE (190mm length)	132910681	1	TEFLON AROUND THE THREAD
14	ELBOW 3/4"BSPT FEMALE / STRAIGHT 3/4" FEMALE	114012342	1	
13	PLUG MALE 1/2" BSPP	116300122	1	
12	WASHER	192801022	1	
11	BALL VALVE MINI 1/2" FEMALE BSPP - 1/2" FEMALE BSPP	145063092	1	
10	STRAIGHT 1/4-8X10 - QUICK COUPLING	143502892	1	
9	CONNECTOR CYCLONE AIR INTAKE FILTER	153000112	1	TIGHTENING GLUE (LOXEAL 83-54) AROUND THE MALE THREAD
8	OIL VAPOUR EXHAUST SYSTEM	190000193	1	
7	1/2" TUBE 160mm	132910682	1	TEFLON AROUND BOTH THREADS
6b	8x10 TUBE **420mm**	140018102	1	MATERIAL: PLASTIC
6a	8x10 TUBE **220mm**		1	
5	QUICK ELBOW 1/4-8X10	114202132	1	
4	FITTING STRAIGHT 1/4" MALE/FEMALE	151204152	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
3	13x18x1,5 COPPER WASHER	192991152	6	
2	STRAIGHT M16X1,5 10L - 1/4 BSPP MALE	115001002	1	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD
1	SINTERED FILTER BODY (SOLENOID VALVE)	190610022	2	SEALING GLUE (LOCTITE 542) AROUND THE MALE THREAD

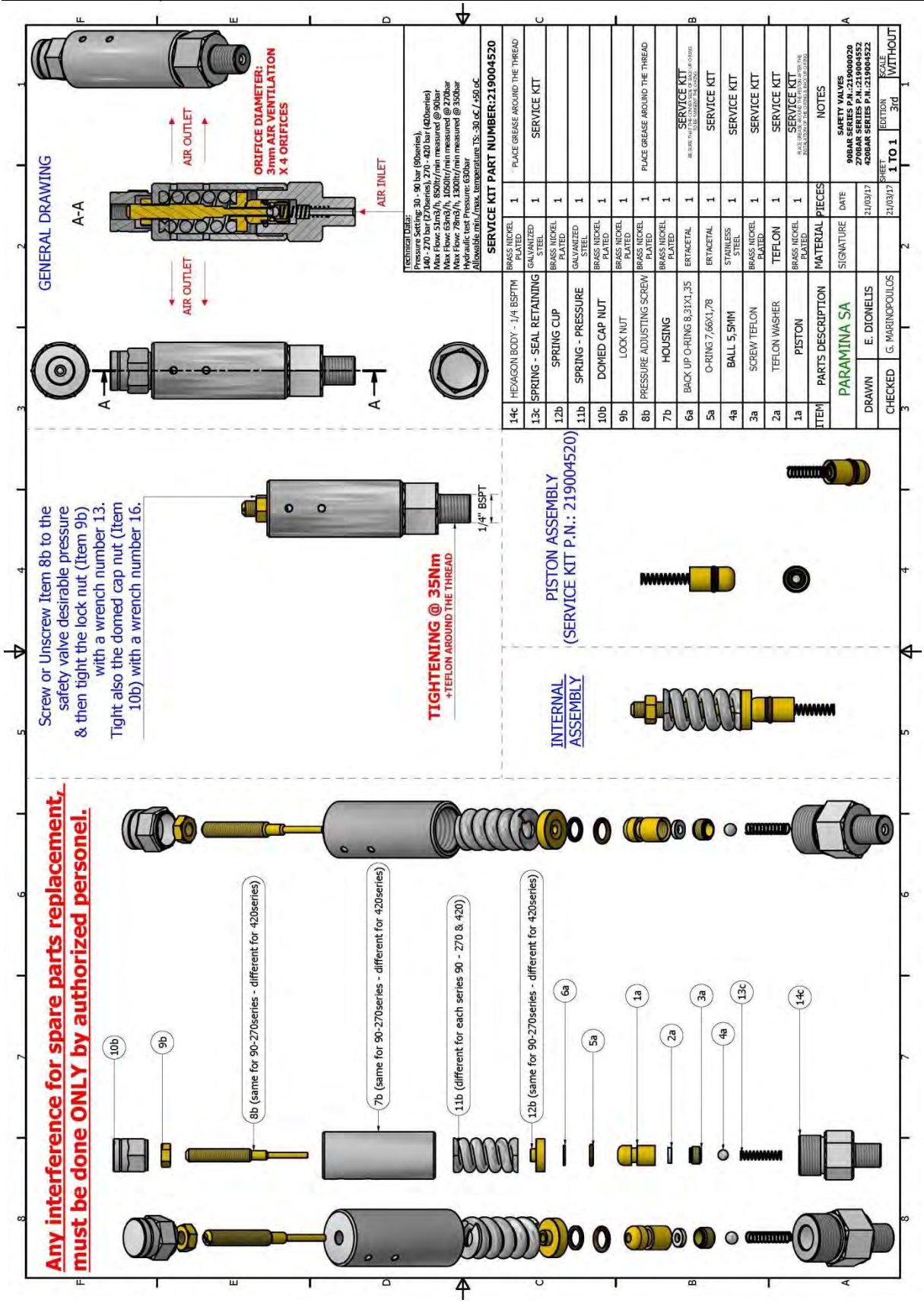
PARAMINA SA — SIGNATURE — DATE

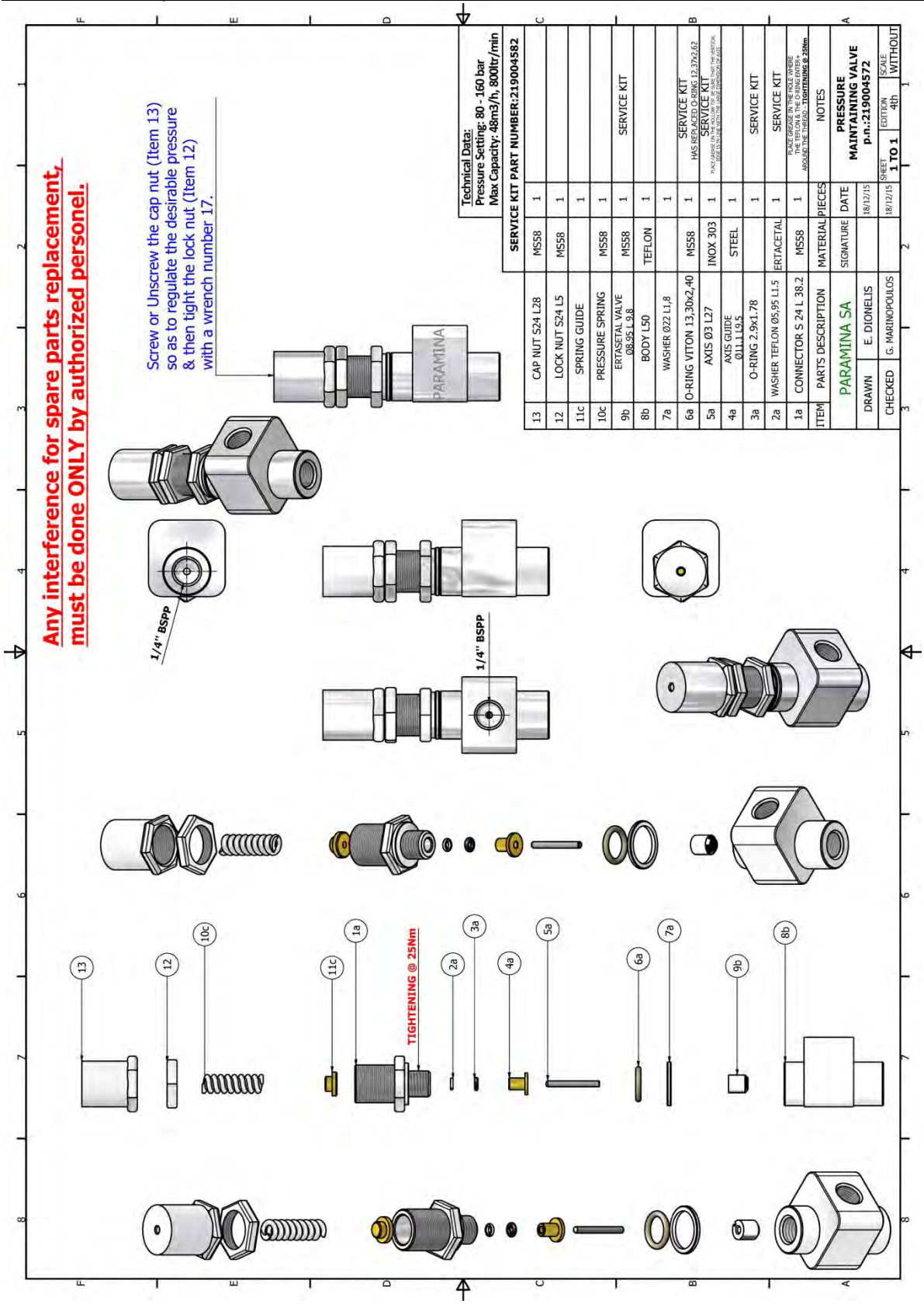
DRAWN: E. DIONELIS — 26/10/18

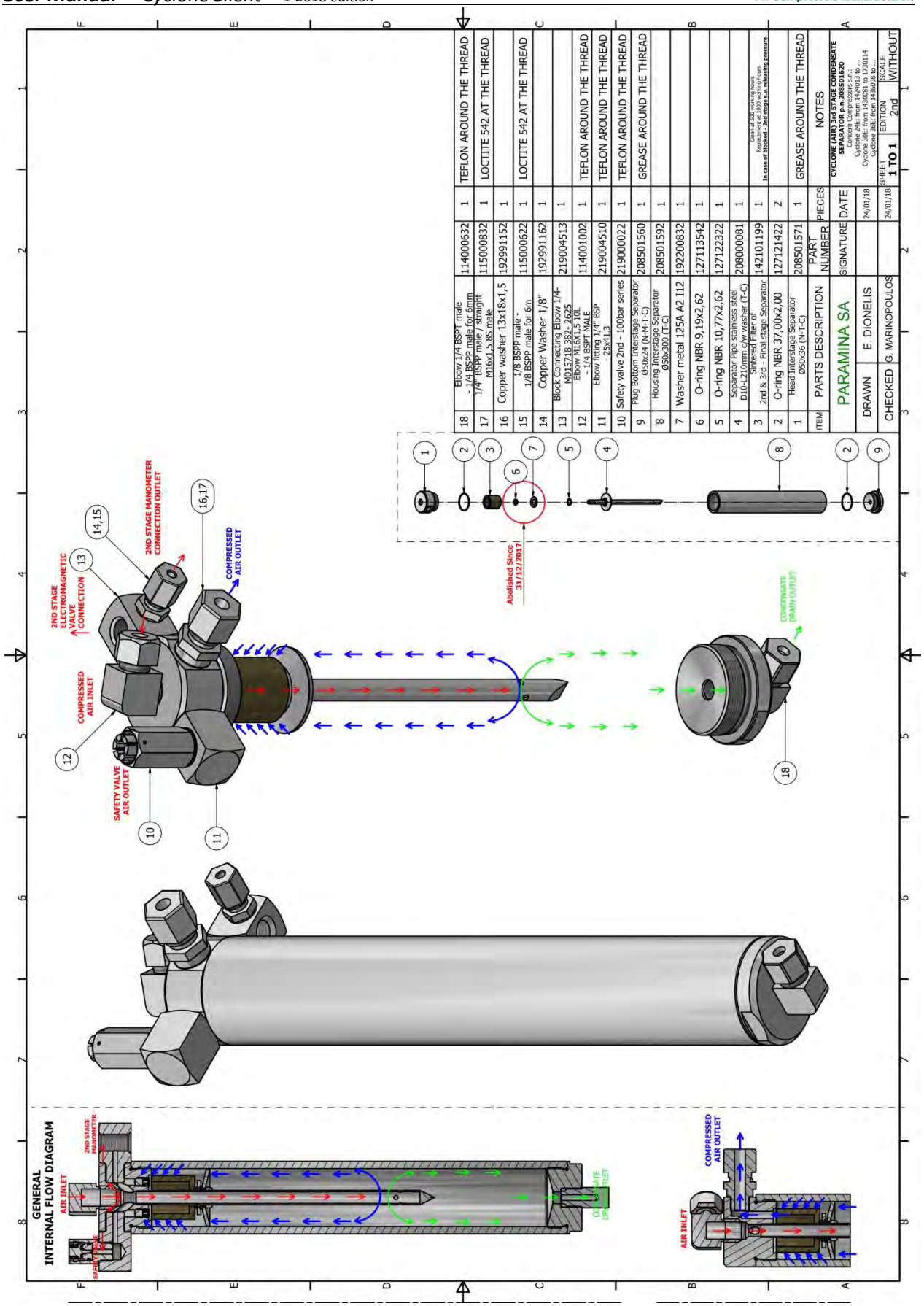
CHECKED: G. MARINOPOULOS — 26/10/18

CYCLONE BLOCK FITTINGS & HOSES
Piston Compressor Kit
Cyclone 24E: from 1824029
Cyclone 30E: from 1830119
Cyclone 36E: from 1836044

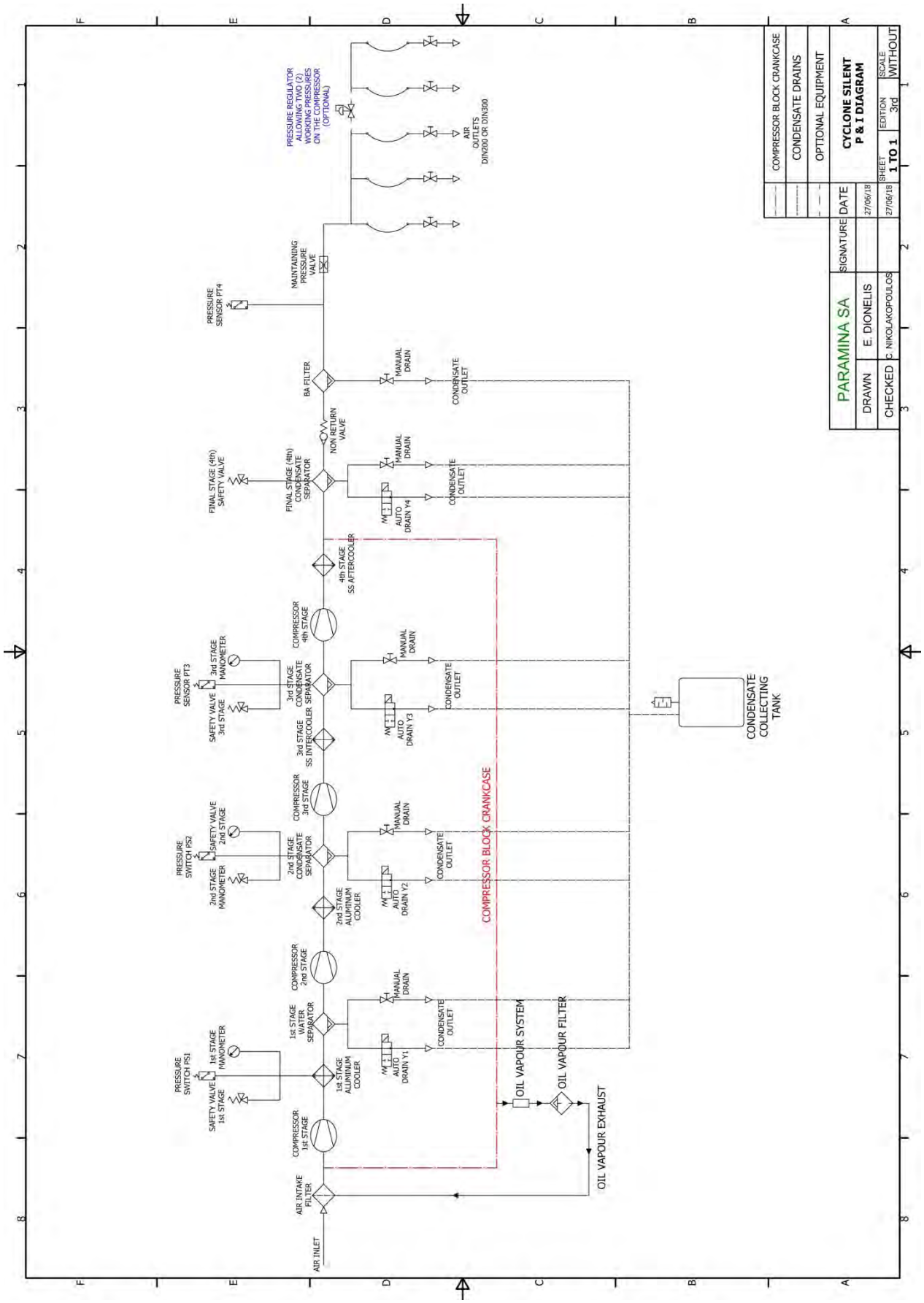
SHEET **1 TO 1** | EDITION 6th | SCALE WITHOUT


GENERAL DRAWING
A-A
AIR OUTLET
AIR OUTLET
ORIFICE DIAMETER:
3mm AIR VENTILATION
X 4 ORIFICES
AIR INLET
A
A
Technical Data:
Pressure Setting: 30 - 90 bar (90series),
140 - 270 bar (270series), 270 - 420 bar (420series)
Max Flow: 51m3/h, 850lt/min measured @ 90bar
Max Flow: 63m3/h, 1050lt/min measured @ 270bar
Max Flow: 27m3/h, 450lt/min measured @ 350bar
Hydraulic test Pressure: 630bar
Allowable min./max. temperature TS: -30 oC / +50 oC
SERVICE KIT PART NUMBER:219004520
14c HEXAGON BODY - 1/4 BSPTM BRASS NICKEL PLATED 1 PLACE GREASE AROUND THE THREAD
13c SPRING - SEAL RETAINING GALVANIZED STEEL 1 SERVICE KIT
12b SPRING CUP BRASS NICKEL PLATED 1
11b SPRING - PRESSURE GALVANIZED STEEL 1
10b DOMED CAP NUT BRASS NICKEL PLATED 1
9b LOCK NUT BRASS NICKEL PLATED 1
8b PRESSURE ADJUSTING SCREW BRASS NICKEL PLATED 1 PLACE GREASE AROUND THE THREAD
7b HOUSING BRASS NICKEL PLATED 1
6a BACK UP O-RING 8,31X1,35 ERTACETAL 1 SERVICE KIT
5a O-RING 7,66X1,78 ERTACETAL 1 SERVICE KIT
4a BALL 5,5MM STAINLESS STEEL 1 SERVICE KIT
3a SCREW TEFLON BRASS NICKEL PLATED 1 SERVICE KIT
2a TEFLON WASHER TEFLON 1 SERVICE KIT
1a PISTON BRASS NICKEL PLATED 1 SERVICE KIT
ITEM PARTS DESCRIPTION MATERIAL PIECES NOTES
PARAMINA SA SIGNATURE DATE
SAFETY VALVES
90BAR SERIES P.N.:219000020
270BAR SERIES P.N.:219004552
420BAR SERIES P.N.:219004522
DRAWN E. DIONELIS 21/03/17
CHECKED G. MARINOPOULOS 21/03/17
SHEET 1 TO 1
EDITION 3rd
SCALE WITHOUT
Screw or Unscrew Item 8b to the safety valve desirable pressure & then tight the lock nut (Item 9b) with a wrench number 13. Tight also the domed cap nut (Item 10b) with a wrench number 16.
TIGHTENING @ 35Nm
+TEFLON AROUND THE THREAD
1/4" BSPT
PISTON ASSEMBLY
(SERVICE KIT P.N.: 219004520)
INTERNAL ASSEMBLY
Any interference for spare parts replacement, must be done ONLY by authorized personel.
10b
9b
8b (same for 90-270series - different for 420series)
7b (same for 90-270series - different for 420series)
11b (different for each series 90 - 270 & 420)
12b (same for 90-270series - different for 420series)
6a
5a
1a
2a
3a
4a
13c
14c

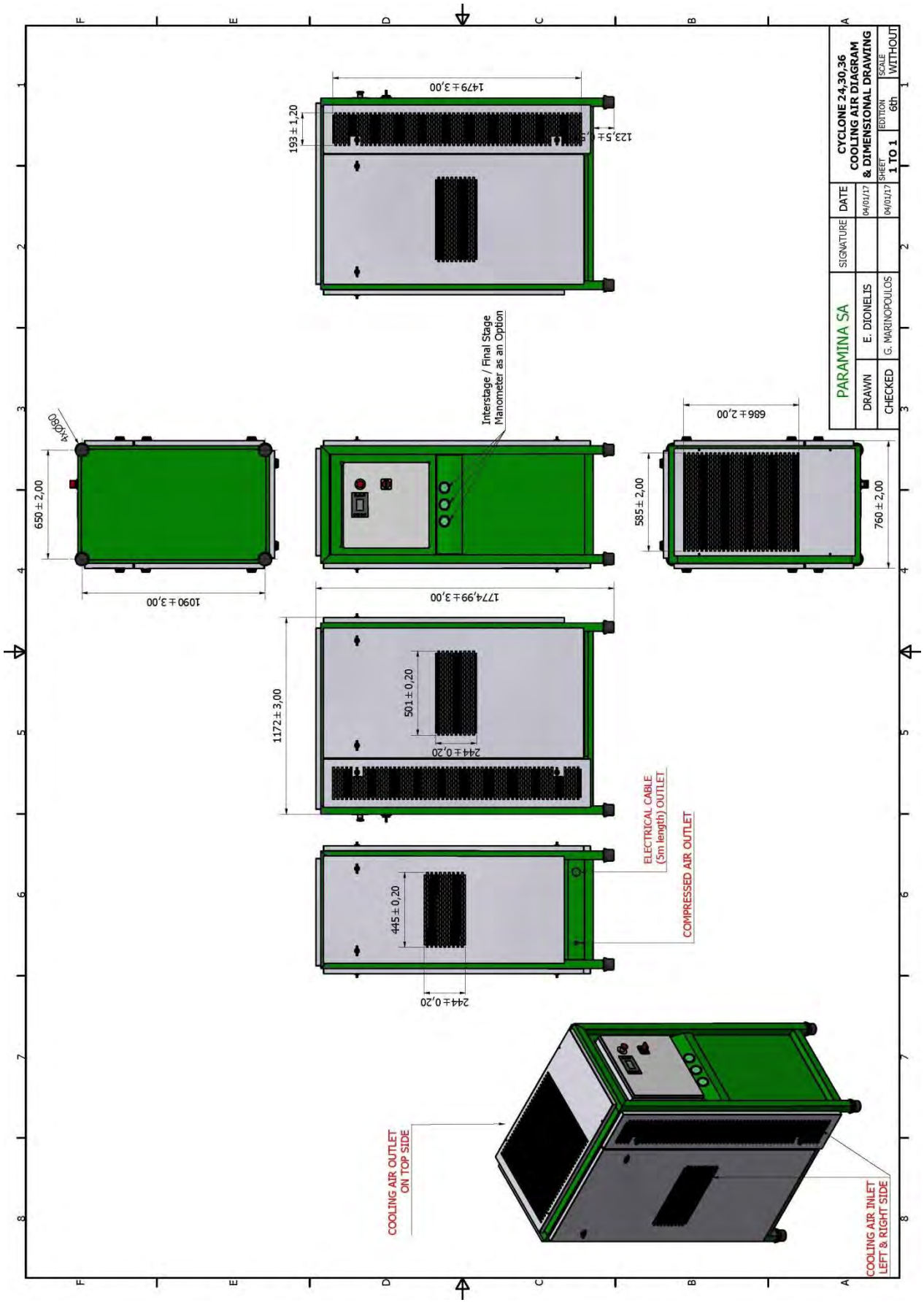

Any interference for spare parts replacement, must be done ONLY by authorized personel.
Screw or Unscrew the cap nut (Item 13) so as to regulate the desirable pressure & then tight the lock nut (Item 12) with a wrench number 17.
Technical Data:
Pressure Setting: 80 - 160 bar
Max Capacity: 48m3/h, 800ltr/min
SERVICE KIT PART NUMBER:219004582
13 CAP NUT S24 L28 MS58 1
12 LOCK NUT S24 L5 MS58 1
11c SPRING GUIDE 1
10c PRESSURE SPRING MS58 1
9b ERTASETAL VALVE Ø8,95 L 9,8 MS58 1 SERVICE KIT
8b BODY L50 TEFLON 1
7a WASHER Ø22 L1,8 1
6a O-RING VITON 13,30x2,40 MS58 1 SERVICE KIT HAS REPLACED WITH O-RING 12,37x2,62
5a AXIS Ø3 L27 INOX 303 1 SERVICE KIT PLACE GREASE ON THE AXIS BEFORE THAT THE AXISTAL BODY IS IN THE WITH THE LARGE DIAMETER OF AXIS
4a AXIS GUIDE Ø11,1 L9,5 STEEL 1
3a O-RING 2.9x1.78 1 SERVICE KIT
2a WASHER TEFLON Ø5,95 L1.5 ERTACETAL 1 SERVICE KIT
1a CONNECTOR S 24 L 38.2 MS58 1 PLACE GREASE IN THE HOLE WHERE THE TEFLON & THE O-RING ENTER+ AROUND THE THREAD. TIGHTENING @ 25Nm
ITEM PARTS DESCRIPTION MATERIAL PIECES NOTES
PARAMINA SA SIGNATURE DATE
DRAWN E. DIONELIS 18/12/15
CHECKED G. MARINOPOULOS 18/12/15
PRESSURE MAINTAINING VALVE p.n.:219004572
SHEET 1 TO 1 EDITION 4th SCALE WITHOUT
1/4" BSPP
1/4" BSPP
TIGHTENING @ 25Nm
PARAMINA


GENERAL
INTERNAL FLOW DIAGRAM
2ND STAGE MANOMETER
AIR INLET
SAFETY VALVE
CONDENSATE DRAIN OUTLET
COMPRESSED AIR OUTLET
AIR INLET
2ND STAGE MANOMETER CONNECTION OUTLET
2ND STAGE ELECTROMAGNETIC VALVE CONNECTION
COMPRESSED AIR OUTLET
COMPRESSED AIR INLET
SAFETY VALVE AIR OUTLET
CONDENSATE DRAIN OUTLET
Abolished Since 31/12/2017
PARAMINA SA
DRAWN E. DIONELIS
CHECKED G. MARINOPOULOS
CYCLONE (AIR) 3rd STAGE CONDENSATE SEPARATOR p.n.208501620
SHEET 1 TO 1
EDITION 2nd
SCALE WITHOUT
NOTES
1 TEFLON AROUND THE THREAD
1 LOCTITE 542 AT THE THREAD
1 LOCTITE 542 AT THE THREAD
1 TEFLON AROUND THE THREAD
1 TEFLON AROUND THE THREAD
1 GREASE AROUND THE THREAD
1 GREASE AROUND THE THREAD
PIECES
DATE
SIGNATURE
PART NUMBER
PARTS DESCRIPTION
ITEM

8. P & I Diagram


PRESSURE REGULATOR ALLOWING TWO (2) WORKING PRESSURES ON THE COMPRESSOR (OPTIONAL)
AIR OUTLETS DIN200 OR DIN300
MAINTAINING PRESSURE VALVE
PRESSURE SENSOR PT4
BA FILTER
MANUAL DRAIN
CONDENSATE OUTLET
NON RETURN VALVE
FINAL STAGE (4th) SAFETY VALVE
FINAL STAGE (4th) CONDENSATE SEPARATOR
AUTO DRAIN Y4
4th STAGE SS AFTERCOOLER
COMPRESSOR 4th STAGE
PRESSURE SENSOR PT3
3rd STAGE MANOMETER
SAFETY VALVE 3rd STAGE
3rd STAGE CONDENSATE SEPARATOR
AUTO DRAIN Y3
3rd STAGE SS INTERCOOLER
COMPRESSOR 3rd STAGE
PRESSURE SWITCH PS2
SAFETY VALVE 2nd STAGE
2nd STAGE MANOMETER
2nd STAGE CONDENSATE SEPARATOR
AUTO DRAIN Y2
2nd STAGE ALUMINUM COOLER
COMPRESSOR 2nd STAGE
1st STAGE WATER SEPARATOR
AUTO DRAIN Y1
PRESSURE SWITCH PS1
1st STAGE MANOMETER
SAFETY VALVE 1st STAGE
1st STAGE ALUMINUM COOLER
COMPRESSOR 1st STAGE
AIR INTAKE FILTER
AIR INLET
COMPRESSOR BLOCK CRANKCASE
OIL VAPOUR SYSTEM
OIL VAPOUR FILTER
OIL VAPOUR EXHAUST
CONDENSATE COLLECTING TANK
COMPRESSOR BLOCK CRANKCASE
CONDENSATE DRAINS
OPTIONAL EQUIPMENT
CYCLONE SILENT
P & I DIAGRAM
PARAMINA SA
DRAWN E. DIONELIS
CHECKED C. NIKOLAKOPOULOS
SIGNATURE
DATE 27/06/18
SHEET 1 TO 1
EDITION 3rd
SCALE WITHOUT

9. Cooling air – Dimensional Diagram



10. Certificates

MIRTEC ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΒΙΟΜΗΧΑΝΙΚΗΣ ΕΡΕΥΝΑΣ, ΤΕΧΝΟΛΟΓΙΚΗΣ ΑΝΑΠΤΥΞΗΣ & ΕΡΓΑΣΤΗΡΙΑΚΩΝ ΔΟΚΙΜΩΝ, ΠΙΣΤΟΠΟΙΗΣΗΣ ΚΑΙ ΠΟΙΟΤΗΤΑΣ
MATERIALS INDUSTRIAL RESEARCH & TECHNOLOGY CENTER S.A.

MBETAM

CERTIFICATE OF CONFORMITY

(MANUFACTURER INTERNAL CONTROL APPLICATION, According Art.12.2, 2006/42/EC)
Certificate No: **MCH/A-C- 0193/18**

Applicant/Certificate holder: Manufacturer Address:	PARAMINA S.A. By way Evaggelistrias str. 19300 ASPROPYRGOS, GREECE
Submission date of the application:	**Initial**: 25/07/2008 / **Reissue**: 4/12/2018
Description / Machine type:	**Cyclone Compressor series 24, 30, 36** (max working pressure 350bar)
Medium use:	Air / Nitrogen (N_2) / Argon (A_r) / Helium (H_e) (acc. model)
EC-Directive:	2006/42/EK, Annex I., Annex VII.A & Annex VIII
Applicable Standards:	EN ISO 1012-1:2010
Test Laboratory:	Factory PARAMINA S.A. and component Suppliers test Laboratories
Date of Report:	24.04.2018, Manufacturer's Internal Control
Documents Annexed to this Certification:	Technical documentation, operation installation and maintenance manual, Declaration of Conformity, Internal Inspection Report

The assessment machinery department of M.I.R.T.E.C. S.A. certifies that the above manufacturer has completed a technical file according to requirements of Annex VII.A, 2006/42/EC, which file has been initially deposited on October 2008 and additional documentation on November 2010 and on December 2012 for examination of implementation of the manufacturers' internal control, according Annex VIII, 2006/42/EC.

The Manufacturer performs for every product incoming, assembly and functional inspection and tests according §3.3 IEC 60364-6, issues a declaration of conformity according to the relative directives and applied standards and places the CE marking with his own responsibility. The product must be accompanied by operation and maintenance instructions and Declaration of Conformity.

Any changes in design and manufacture shall be notified to M.I.R.T.E.C. S.A.

Validity until December 2021

Place / Date of issue: **ATHENS / 4.12.2018**

Department of Certification

I.DIMITRIADIS
Director of Athens Office

www.ebetam.gr
EBETAM A.E.
CERT - mach / EN08E (5.1/1.2.2016)
AET: 31629

Page 1 of 1

Έδρα: Α' Βιομηχανική Περιοχή, Τ.Θ. 13, 385 00 Βόλος - **Head Office:** A' Industrial Area, P.O. Box 13, GR 385 00 Volos, **Tel.:** +30 24210 95340-2, **Fax:** +30 24210 95364, **E-mail:** volos.office@ebetam.gr
Γραφείο Αθηνών: Μελίνας Μερκούρη 76, 173 42 Άγιος Δημήτριος Αττικής - **Athens Office:** Melinas Merkouri 76, GR 173 42 Agios Dimitrios Attikis, **Tel.:** +30 210 9961408, **Fax:** +30 210 9969850, **E-mail:** athens.office@ebetam.gr
Γραφείο Θεσ/νίκης: Βιομηχανική περιοχή, 570 22 Θεσσαλονίκη - **Thessaloniki Office:** Industrial Area, GR 570 22 Thessaloniki, **Tel.:** +30 2310 797887, Fax: +30 2310 723117, **E-mail:** thess.office@ebetam.gr
Παράρτημα Αθηνών: Ελ. Βενιζέλου 4, 176 76 Καλλιθέα - **Athens Branch:** El. Venizelou 4, GR 176 76 Kallithea, **Tel.:** +30 210 9234932, Fax: +30 210 9235603, **E-mail:** athens.branch@ebetam.gr
Παράρτημα Θηβών: 72ο χλμ. ΕΟ Αθηνών - Λαμίας, Τ.Θ. 18646, 341 00 Χαλκίδα - **Thiva Branch:** 72 km of Athens - Lamia N.R., P.O. Box 18646 GR 341 00 Chalkida, **Tel.:** +30 22620 71811-15, **Fax:** +30 22620 71461, **E-mail:** thiva.office@ebetam.gr
Εργαστήρια Αθηνών: Λεωφ. Κηφισσού 50, 121 33 Περιστέρι - **Athens Laboratories:** Kifissou 50, 121 33 Peristeri, **Tel.:** +30 210 2283757, **Fax:** +30 210 5770556, **E-mail:** athens.lab@ebetam.gr

MIRTEC ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΒΙΟΜΗΧΑΝΙΚΗΣ ΕΡΕΥΝΑΣ, ΤΕΧΝΟΛΟΓΙΚΗΣ ΑΝΑΠΤΥΞΗΣ & ΕΡΓΑΣΤΗΡΙΑΚΩΝ ΔΟΚΙΜΩΝ, ΠΙΣΤΟΠΟΙΗΣΗΣ ΚΑΙ ΠΟΙΟΤΗΤΑΣ
MATERIALS INDUSTRIAL RESEARCH & TECHNOLOGY CENTER S.A.

ΕΒΕΤΑΜ

CERTIFICATE OF CONFORMITY

(MANUFACTURER INTERNAL CONTROL APPLICATION, According Art.12.2, 2006/42/EC)
Certificate No: **MC/A-C-10766D/16**

Applicant/Certificate holder: And Manufacturer Address:	PARAMINA S.A Byway Evangelistrias str. 19300 Aspropyrgos, Greece.
Submission date of the application:	07/08/2013
Description / Machine type:	**Cyclone Compressor series 24, 30, 36, 420b** (max. Working Pressure: 420 Bar)
Medium use:	Air / Nitrogen (N_2) (acc.model)
EC-Directive: Applicable Standards	**2006/42/EC, 2009/127/EC, Annex I** **EN ISO 12100:2010, EN ISO 13857, EN 349, EN ISO 1012-1, EN 1037+A1 :2008, ISO 13850, EN60204, IEC 60364-1& 6**
Test Laboratory:	Factory PARAMINA S.A, MIRTEC S.A. and Component Suppliers test Laboratories
Date & Number of Report:	MIRTEC S.A, MC/A-R-10766/13, 07.08.2013 MIRTEC S.A, PE-C-874/12, 20.07.2012
Documents Annexed to this Certification:	Technical File: Drawings, spare part list, operation and maintenance manual

The assessment machinery department of M.I.R.T.E.C. S.A. certifies that the above manufacturer has completed a technical file according to requirements of annex VII.A, 2006/42/EC, which file has been deposited, on July 2012, and additional on August 2013 for examination of implementation of the manufacturer internal control, according to annex VIII, 2006/42/EC.

The Manufacturer performs for every product the tests according § 3.3 IEC 60364-6, issues a declaration of conformity according to the basic requirements of the relative directive and places the CE marking with his own responsibility. The machine must be accompanied by operation and maintenance instructions.
Any changes in design and manufacture shall be notified to M.I.R.T.E.C. S.A.

Validity until July 2019

Place / Date of issue : ATHENS 21.07.2016

For the certification

I. DIMITRIADIS
Director of Athens Office

10766D_16_CYCLONE_24_30_36_420BAR Κωδ. Έργου: ΑΕΤ: 26057

www.ebetam.gr

Έδρα: 3ª Βιομηχανική Περιοχή, Τ.Θ. 13, 385 00 Βόλος - **Head Office:** 3rd Industrial Area, P.O. Box 13, GR 385 00 Volos, **Tel.:** +30 24210 95340-3, **Fax:** +30 24210 95344, **E-mail:** volos.office@ebetam.gr
Γραφείο Αθηνών: Μελίνας, Μερκούρη 76, 173 42 Αθήνα - **Athens Office:** Melinas Merkouri 76, GR 173 42 Athens, **Tel.:** +30 210 9904108, **Fax:** +30 210 9969850, **E-mail:** athens.office@ebetam.gr
Γραφείο Θεσ/νίκης: Βιομηχανική περιοχή, 570 22 Θερμαϊκός - **Thessaloniki Office:** Industrial Area, GR 570 22 Thermaikos, **Tel.:** +30 2310 [illegible], **Fax:** +30 2310 [illegible], **E-mail:** thess.office@ebetam.gr
Παράρτημα Αθηνών: Κ. Βενιζέλου 4, 176 76 Καλλιθέα - **Athens Branch:** K. Venizelou 4, GR 176 76 Kallithea, **Tel.:** +30 210 9235603, **E-mail:** athens.branch@ebetam.gr
Παράρτημα Θήβας: 72ο χλμ. ΕΟ Αθηνών - Λαμίας, Τ.Θ. 18646, 341 00 Χαλκίδα - **Thiva Branch:** 72 km of Athens-Lamia N.R., P.O. Box 18646 GR 341 00 Chalkis, **Tel.:** +30 22630 [illegible], **Fax:** +30 22620 [illegible], **E-mail:** thiva.office@ebetam.gr
Εργαστήρια Αθηνών, Λάρυμνα: Κηφισσού 50, [illegible] Περιστέρι - **Athens Laboratories,** Kifissou 50, [illegible] Peristeri, **Tel.:** +30 210 [illegible], **Fax:** +30 210 5770556, **E-mail:** athens.lab@mirtec.gr

MIRTEC ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΒΙΟΜΗΧΑΝΙΚΗΣ ΕΡΕΥΝΑΣ, ΤΕΧΝΟΛΟΓΙΚΗΣ ΑΝΑΠΤΥΞΗΣ & ΕΡΓΑΣΤΗΡΙΑΚΩΝ ΔΟΚΙΜΩΝ, ΠΙΣΤΟΠΟΙΗΣΗΣ ΚΑΙ ΠΟΙΟΤΗΤΑΣ
MATERIALS INDUSTRIAL RESEARCH & TECHNOLOGY CENTER S.A.

EBETAM

ΠΙΣΤΟΠΟΙΗΤΙΚΟ

CERTIFICATE

ΣΥΜΜΟΡΦΩΣΗΣ ΠΡΟΣ ΤΗΝ ΕΝΟΤΗΤΑ Α2 (Εποπτεία κατά τυχαία διαστήματα)
ΣΥΜΦΩΝΑ ΜΕ ΤΗΝ ΟΔΗΓΙΑ 2014/68/ΕΕ

CONFORMITY TO MODULE A2 (Supervised checks at random intervals)
ACCORDING TO DIRECTIVE 2014/68/EU

Αριθμός Πιστοποιητικού : **PE-C-2172/17**
Certificate No :

Αριθμός Κοινοποίησης του Φορέα Πιστοποίησης : **0437**
Notification No of the Certification Body:

Ημερομηνία Έκδοσης/ *Date of Issue:*18.7.2017 **Αριθμός Έκθεσης :** PE-R-2172/17,
Ημερομηνία Επανέκδοσης/ *Date of Revision:*27.7.2018 *Test Report No:* PE-R-2172/18

Όνομα και Διεύθυνση Κατασκευαστή : PARAMINA S.A.
Name and Address of the Manufacturer: Byway Evagelistrias Str., 19300 Aspropyrgos, Greece

Τύπος Προϊόντος : Aluminium BA Filters
Product Type: Ø110x495 P.N. 208611492 without bleed valve
Ø110x495 P.N. 208611490 with bleed valve
Ø110x740 P.N. 208611482 without bleed valve
Ø110x725 P.N. 208611480 with bleed valve
Inox BA filters
Ø90x770 P.N. 208907700

Χωρητικότητα του Εξοπλισμού : Al filters: 1,5 L, 1,5 L, 2,45 L, 2,39 L
Capacity of Equipment: Inox filters: 2,47 L

Μέγιστη Επιτρεπόμενη Πίεση Λειτουργίας : Al filters: 480 bar
Maximum Allowable Working Pressure: Inox filters: 350 bar

Ημερομηνία Λήξης Πιστοποιητικού : 17.7.2020
Expiry Date of the Certificate:

ΔΗΛΩΣΗ- *Declaration*

Ο Κατασκευαστής ή ο διαθέτης εξουσιοδοτείται –μετά την εξέταση των προαπαιτήσεων- να τοποθετεί στον εξοπλισμό υπό πίεση που κατασκευάζεται σύμφωνα με το αντικείμενο του παρόντος ελέγχου τον αριθμό αναγνώρισής μας δίπλα από την σήμανση CE , ως κατωτέρω :
The manufacturer or the agent is –after examination of the prerequisites- authorized to provide the pressure equipment manufactured within the scope of the examination, with our identification number next to the CE -mark as illustrated:

CE 0437

Το πιστοποιητικό ισχύει υπό τον όρο ότι ο Εσωτερικός Έλεγχος Παραγωγής του Κατασκευαστή υπόκειται σε επιτήρηση από τον Κοινοποιημένο Οργανισμό.
This certificate remains valid provided that the Manufacturer's Internal Production Control is subjected to surveillance by the Notified Body.

Για την EBETAM A.E.
For MIRTEC S.A.

ΕΣΥΔ Certification of Products Cert. No 27

A. Stamou
Certification Manager

EBETAM·MIRTEC·EBETAM 0437 Notified Body

Για το Τμήμα Αξιολόγησης
For the Evaluation Dpt.

K. Diamanti
Dr. Dipl. Mech Engineer

www.ebetam.gr EBETAM A.E.
CERT-ped / EN 08 (5.0 / 4.8.16) 1/1

Έδρα: Α' Βιομηχανική Περιοχή, Τ.Θ. 13, 385 00 Βόλος - **Head Office:** A' Industrial Area, P.O. Box 13, GR 385 00 Volos, **Tel.:** +30 24210 95340-2, **Fax:** +30 24210 95364, **E-mail:** volos.office@ebetam.gr
Γραφείο Αθηνών: Μελίνας Μερκούρη 76, 173 42 Άγιος Δημήτριος Αττικής - **Athens Office:** Melinas Merkouri 76, GR 173 42 Agios Dimitrios Attikis, **Tel.:** +30 210 9961408, **Fax:** +30 210 9969850, **E-mail:** athens.office@ebetam.gr
Γραφείο Θεσ/νίκης: Βιομηχανική περιοχή, 570 22 Θεσσαλονίκη - **Thessaloniki Office:** Industrial Area, GR 570 22 Thessaloniki, **Tel.:** +30 2310 797887, Fax: +30 2310 723117, **E-mail:** thess.office@ebetam.gr
Παράρτημα Αθηνών: Ελ. Βενιζέλου 4, 176 76 Καλλιθέα - **Athens Branch:** El. Venizelou 4, GR 176 76 Kallithea, **Tel.:** +30 210 9234932, Fax: +30 210 9235603, **E-mail:** athens.branch@ebetam.gr
Παράρτημα Θηβών: 72ο χλμ ΕΟ Αθηνών – Λαμίας, Τ.Θ. 18646, 341 00 Χαλκίδα - **Thiva Branch:** 72 km of Athens – Lamia N.R., P.O. Box 18646, GR 341 00 Chalkida, **Tel.:** +30 22620 71811-15, **Fax:** +30 22620 71461, **E-mail:** thiva.office@ebetam.gr
Εργαστήρια Αθηνών: Λεωφ. Κηφισσού 50, 121 33 Περιστέρι - **Athens Laboratories:** Kifissou 50, 121 33 Peristeri, **Tel.:** +30 210 2283757, **Fax:** +30 210 5770556, **E-mail:** athens.lab@ebetam.gr

MIRTEC
ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΒΙΟΜΗΧΑΝΙΚΗΣ ΕΡΕΥΝΑΣ, ΤΕΧΝΟΛΟΓΙΚΗΣ ΑΝΑΠΤΥΞΗΣ & ΕΡΓΑΣΤΗΡΙΑΚΩΝ ΔΟΚΙΜΩΝ, ΠΙΣΤΟΠΟΙΗΣΗΣ ΚΑΙ ΠΟΙΟΤΗΤΑΣ
MATERIALS INDUSTRIAL RESEARCH & TECHNOLOGY CENTER S.A.

EBETAM

ΠΙΣΤΟΠΟΙΗΤΙΚΟ
CERTIFICATE

ΣΥΜΜΟΡΦΩΣΗΣ ΠΡΟΣ ΤΗΝ ΕΝΟΤΗΤΑ Α2 (Εποπτεία κατά τυχαία διαστήματα) ΣΥΜΦΩΝΑ ΜΕ ΤΗΝ ΟΔΗΓΙΑ 2014/68/ΕΕ
CONFORMITY TO MODULE A2 (Supervised checks at random intervals) ACCORDING TO DIRECTIVE 2014/68/EU

Αριθμός Πιστοποιητικού : **PE-C-2171/17**
Certificate No :

Αριθμός Κοινοποίησης του Φορέα Πιστοποίησης : **0437**
Notification No of the Certification Body:

Ημερομηνία Έκδοσης: 18.7.2017
Date of Issue:

Αριθμός Έκθεσης : PE-R-2171/17
Test Report No:

Όνομα και Διεύθυνση Κατασκευαστή : PARAMINA S.A.
Name and Address of the Manufacturer: Byway Evagelistrias Str., 19300 Aspropyrgos, Greece

Τύπος Προϊόντος: Safety valves for air compressors
Product Type:
Series 90 (1/4") – P. No. 219000020
Series 270 (1/4") – P.No. 219004552
Series 420 (1/4") – P.No. 219004522
Series 100 (1/4") – P.No. 219000022

Μέγιστη Επιτρεπόμενη Πίεση Λειτουργίας :
Maximum Allowable Working Pressure:
Series 90 – 90 bar,
Series 270 – 270 bar
Series 420 – 420 bar
Series 100 – 100 bar

Ημερομηνία Λήξης Πιστοποιητικού : 17.7.2020
Expiry Date of the Certificate:

ΔΗΛΩΣΗ- *Declaration*
Ο Κατασκευαστής ή ο διαθέτης εξουσιοδοτείται –μετά την εξέταση των προαπαιτήσεων- να τοποθετεί στον εξοπλισμό υπό πίεση που κατασκευάζεται σύμφωνα με το αντικείμενο του παρόντος ελέγχου τον αριθμό αναγνώρισής μας δίπλα από την σήμανση CE , ως κατωτέρω :
The manufacturer or the agent is –after examination of the prerequisites- authorized to provide the pressure equipment manufactured within the scope of the examination, with our identification number next to the CE -mark as illustrated:

CE 0437

Το πιστοποιητικό ισχύει υπό τον όρο ότι ο Εσωτερικός Έλεγχος Παραγωγής του Κατασκευαστή υπόκειται σε επιτήρηση από τον Κοινοποιημένο Οργανισμό.
This certificate remains valid provided that the Manufacturer's Internal Production Control is subjected to surveillance by the Notified Body.

Για την EBETAM A.E.
For MIRTEC S.A.

A. Stamou
Certification Manager

Για το Τμήμα Αξιολόγησης
For the Evaluation Dpt.

K. Diamanti
Dr. Dipl. Mech Engineer

ΕΣΥΔ Certification of Products Cert. No 27

www.ebetam.gr EBETAM A.E.
CERT-ped / EN 08 (5.0 / 4.8.16) 1/1

Έδρα: Α' Βιομηχανική Περιοχή, Τ.Θ. 13, 385 00 Βόλος - **Head Office:** A' Industrial Area, P.O. Box 13, GR 385 00 Volos, **Tel.:** +30 24210 95340-2, **Fax:** +30 24210 95364, **E-mail:** volos.office@ebetam.gr
Γραφείο Αθηνών: Μελίνας Μερκούρη 76, 173 42 Αθήνα - **Athens Office:** Melinas Merkouri 76, GR 173 42 Athens, **Tel.:** +30 210 9961408, **Fax:** +30 210 9969850, **E-mail:** athens.office@ebetam.gr
Γραφείο Θεσ/νίκης: Βιομηχανική περιοχή, 570 22 Θεσσαλονίκη - **Thessaloniki Office:** Industrial Area, GR 570 22 Thessaloniki, **Tel.:** +30 2310 797887, Fax: +30 2310 723117, **E-mail:** thess.office@ebetam.gr
Παράρτημα Αθηνών: Ελ. Βενιζέλου 4, 176 76 Καλλιθέα - **Athens Branch:** El. Venizelou 4, GR 176 76 Kallithea, **Tel.:** +30 210 9234932, Fax: +30 210 9235603, **E-mail:** athens.branch@ebetam.gr
Παράρτημα Θήβων: 72ο χλμ. ΕΟ Αθηνών - Λαμίας, Τ.Θ. 18646, 341 00 Χαλκίδα - **Thiva Branch:** 72 km of Athens - Lamia N.R., P.O. Box 18646 GR 341 00 Chalkida, **Tel.:** +30 22620 71811-15, **Fax:** +30 22620 71461, **E-mail:** thiv

CERTIFICATE | ZERTIFICAT | ΠΙΣΤΟΠΟΙΗΤΙΚΟ | SERTIFICA | شهادة | 证书 | CERTIFICAT

TÜV AUSTRIA

CERTIFICATE

Management System as per
EN ISO 9001 : 2015

In accordance with TÜV AUSTRIA procedures, it is hereby certified that

PARAMINA
Air Compressors Manufacturers

PARAMINA S.A.
By Way Evagelistrias Str.
GR-193 00 ASPROPYRGOS, GREECE

Applies a Quality Management System in line with the above Standard for the following Scope

DEVELOPMENT, MANUFACTURING, SALES AND AFTER SALES SERVICE OF AIR COMPRESSORS AND AIR PROCESSING EQUIPMENT.

Certificate Registration No.: **01013354**

Valid until: 2021-07-15
Initial certification: 2010-07-02

Haralabos Ageloudis
Head of Management Systems & Products Certification Division
Certification Body
at TÜV AUSTRIA

Athens, 2018-07-16

This certification was conducted in accordance with TÜV AUSTRIA auditing and certification procedures and is subject to regular surveillance audits.

TÜV AUSTRIA HELLAS
429, Mesogeion Ave.
GR-153 43 Athens, Greece
www.tuvaustriahellas.gr

IAF ESYD
MS Certification
No. of Certificate 236

CePRK478_A1e

Headquarters in Athens bear the responsibility of the Certification decision

TÜV AUSTRIA GROUP