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DISTRIBUTOR
COOL4U AUTOMOTIVE KFT.

Air Conditioner Component Flushing Unit

EkoFlush-K570

OPERATING MANUAL

(36 150 204)

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OPERATING MANUAL

1. Table of contents

The EkoFlush-K570 device is designed for qualified servicemen in the refrigeration branch!

2. Safety Precautions

WARNING: Failure to follow these precautions can result in serious injury.

- This Operating Manual is to be read and understood completely before operating this Unit.
- Suitable skin and eye protective equipment should be worn while operating or maintaining this Unit.
- The use of flushing solvent is permitted only in cylinders equipped with a safety valve. Cylinders can be filled up to a maximum of 70% of the available volume. Before beginning the flushing procedure, please check the availability of the solvent by putting the cylinder on a scale.
- The flushing agent must be drained every time before transporting this Unit (“0” bar or less should be shown on the low-pressure manometer).
- The EkoFlush-K570 unit can only be transported by transportation means if its refrigerant cylinder is disassembled and transported separately. The main unit can be transported in the standard position on wheels (properly protected against moving), or laid down on its rear side leaning on its handle and wheels. Other positions are prohibited.
- The Unit must be protected against open flames and flying sparks.
- All repairs must be done by an authorized service or by the Unit producer.
- This Unit can be used only in compliance with EU regulations on manipulation of volatile matters.
- **Material Safety Data Sheet** must be according to the regulations located in the workshop. The English version can be found on the website www.honeywell-solvent.com.

CAUTION

Failure to observe precautions as outlined in this Operating Manual can result in damage to the compressor, other components or even of the Unit as a whole, and cannot be supported or covered by the guarantee.

3. Unit Description

3.1 The EkoFlush-K570 is a mobile Flushing unit with wheels and rugged metal structure. A refrigerant cylinder is to be bought with a two-way valve and filled with the flushing agent SOLSTICE® PF-C from HONEYWELL and pressurized with nitrogen.
A universal connecting adapter can be delivered as an extra accessory.

3.2 This Unit was designed exclusively for use with the flushing agent SOLSTICE® PF-C from HONEYWELL. It is prohibited to use other flushing agents without previous written approval of the producer. Failure to observe this prohibition can result in significant damage to the Unit and in personnel-safety hazard.

3.3 Operation of this Unit is based on the principle of pulsating pressurised flushing of the components or systems to be cleaned. The construction has a patent certificate, so the SOLSTICE® PF-C flushing agent is distilled by each through-flow and returns to the refrigerant cylinder naturally pure in practical terms, prepared to be re-used for another flushing. This ensures that the cleaned components are flushed very effectively and fast.

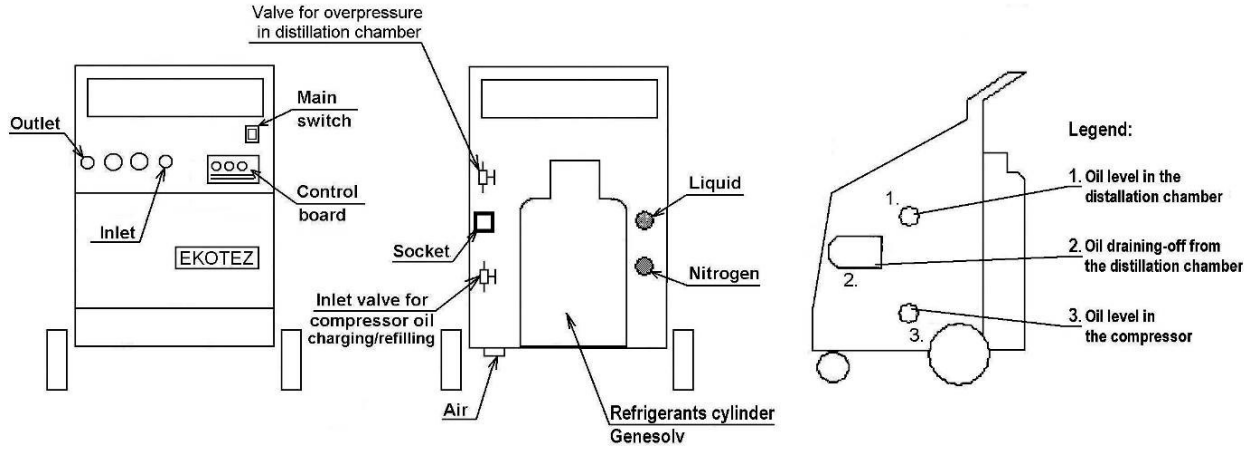
3.4 The cycle has four phases.

3.4.1 I – AIR SUCKING-OFF
After safely connecting the flushed component to the Unit and the refrigerant cylinders with the SOLSTICE® PF-C flushing agent as well, after starting and selecting cycles, the EkoFlush will suck off the flushing component to remove the air. After sucking off the air the Unit begins the flushing procedure automatically.

3.4.2 II – FLUSHING
The flushing agent is forced under high pressure of nitrogen (6 – 8 bar) into the flushed component. The high pressure, the speed of through-flow, and the pulsation ensure that the contaminants and fats are also removed from hard-to-reach corners. The full capacity of the flushed component is filled with SOLSTICE® PF-C. The most intensive flushing is ensured by a special pulsating mode of the through-flow. Then SOLSTICE® PF-C is forced up from the flushed component into the distillation chamber of the Unit. After completing all programmed cycles the next step will begin automatically.

3.4.3 III – REMOVING THE LIQUID PHASE OF SOLSTICE® PF-C
Nitrogen purges the flushed component at a pressure of 6 – 8 bar in order to quickly remove the liquid SOLSTICE® PF.
The purge is repeated a number of times till there is liquid in the component.

3.4.4 IV – SUCKING OFF OF THE VAPOR PHASE OF THE SOLSTICE® PF-C
In this last step the last residues of SOLSTICE® PF-C are removed and are returned clean to the storage tank, the refrigerant cylinder. There is an acoustic signal to announce the completion of the automatic procedure. After getting a signal, oil and contaminants from the distillation chamber 1 can be drained off.



Your new unit is able to:

- Flush easily, quickly and effectively components of refrigerant circuits, evaporators, condensers and line circuits as well.
- Save money as the SOLSTICE® PF-C flushing agent can be re-used several times (see recommendations of the producer). Particularly, not having to pay for disposal after each use.
- Clean and flush in a complete circuit without any unfavourable influence on the environment.

4. Accessories

4.1 Standard accessories – delivered together with the Unit

- Hoses

1/4“ SAE x 90cm with valve – blue	1 piece	interconnection of the refrigerant cylinder, vapour outlet, on inlet nitrogen on the Unit
3/8“ SAE x 90cm with valve – red	1 piece	interconnection of the refrigerant cylinder, liquid outlet, on inlet liquid on the Unit
3/8“ SAE x 180cm with valve – blue	1 piece	unit connection (out) on the flushed component
3/8“ SAE x 180cm with valve – red	1 piece	unit connection (in) on the flushed component.
Flare adapter 3/8” Male SAE x 1/4” Fem. SAE	1 piece	hose access on the liquid bottle output

4.2 Extra accessories to order

- Refrigerant cylinder together with the SOLSTICE® PF-C flushing agent under nitrogen pressure. Size 12,5 litre or 27,5 litre (volume of cylinder), according to the order.
- Special universal adapter for connecting the flushed component on the line outlets.
- Filter for particles P47 (K560) a P48 (K570).

5. Technical Specifications

• Voltage	230V, 50Hz
• Maximum power input	2200 W
• Compressor oil	Ester ISO VG 46
• Compressor oil filling	0,5 l
• Connection to the flushed device	3/8“ SAE
• Connection to the refrigerant cylinder (liquid)	3/8“ SAE
• Connection for nitrogen	1/4“ SAE
• Maximum operating overpressure of the Unit	8 bar
• Ambient temperature	+5°C – +30°C
• Weight without the refrigerant cylinder	54 kg
• Main dimensions (WxDxH)	570x605x950 (mm)
• Weight including the filled refrigerant cylinder, volume 27,5 l (weight of the cylinder 13,5 kg)	93 kg
• Weight including the filled refrigerant cylinder, volume 12,5 l (weight of the cylinder 7,5 kg)	73 kg
• Flushing agent for systems cleaning	SOLSTICE® PF-C

WARNING

The Flushing Unit EkoFlush-K570 is designed exclusively for the SOLSTICE® PF-C flushing agent made by HONEYWELL. Please see our warning given on page 3, paragraph 3.2.

6. Main principles and interconnection

6.1 Circuit to be flushed had to be tight and through. Without refrigerant liquid residues (without pressure)

6.2 If possible, Interconnect the K570 in the circuit instead of compressor.
It is necessary to disconnect compressor before flushing procedure. The compressor oil charging would be washed off!!

6.3 Large circuit has to be flushed in sections, especially circuit with several branches.

6.4 All throttling elements (capillary tubes, expansion valves, pressure limiters) have to be replaced by standard pipe or create “by-pass”.

6.5 Filters have to be replaced by standard pipe. Otherwise the filter would be immediately filled up by impurities.

6.6 If it possible, turn upside-down the accumulators. Eventual rest of SOLSTICE® PF-C in accumulators prolong flushing procedure.

6.7 The Unit K570 including the refrigerant cylinder are to be connected with hoses:

1/4“ SAE x 90 cm – blue	- nitrogen outlet on the cylinder vapour outlet
3/8“ SAE x 90 cm – red	- liquid outlet on the cylinder liquid outlet
	On the cylinder liquid outlet screw on an adapter (part in accessories)

Hoses are to be installed with the valve end to the refrigerant cylinder.

6.8 Use the belt to fix up the pressure cylinder.

6.9 For flushing of complicated circuit use a scale to check the SOLSTICE® PF-C quantity.

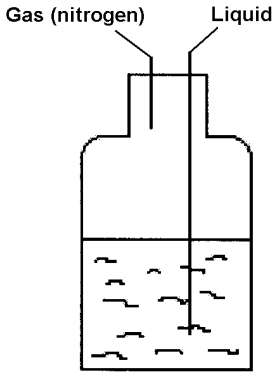
6.10 Before use, be sure that the cylinder pressure is between 6 to 8 bar (max 8 bar). Tests can be carried out on the high-pressure manometer (pos. 13) without the Unit being switched on. The valve of the cylinder liquid outlet and the relevant hose valve must be open when this test is under progress. Maximum permissible pressure of 8 bar is indicated by a red line on the high-pressure manometer!
Adding pressure is done by connecting nitrogen source (min 8 bar) to the vapour inlet of the pressure cylinder, liquid inlet remains connected to the K570 with opened valves. Check the pressure with a high pressure manometer of the K570. When you have a source of nitrogen with pressure higher than 10 bar use a pressure reducing valve!!!

6.11 Check the oil level at the compressor sight glass (picture, page 4), refill if necessary.
WARNING: Any claim caused by oil lack will be disallow!!

6.12 For better flushing connect the inlet to circuit to be flushed above the outlet. The end of hoses with valve are at the flushing unit.
- inlet into the flushed device “IN”
- outlet from the flushed device “OUT”

6.13 If connected directly to the pipe and using couplings with rubber cone, Escarpment edges tube so as to prevent damage to the cone.

7. Device flushing procedure

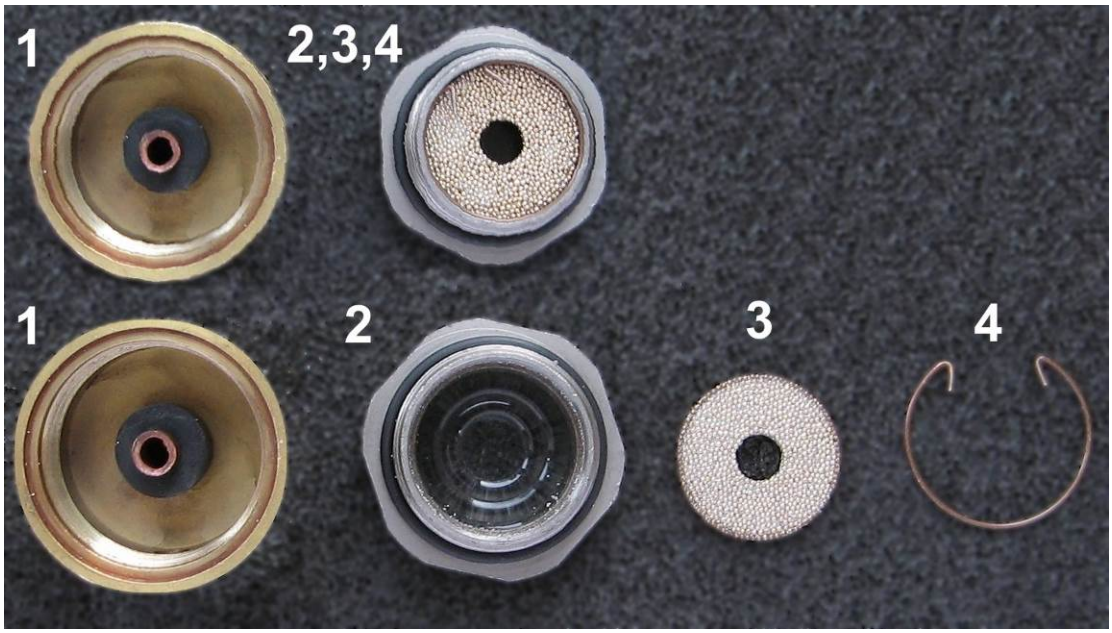


7.1 Check the hose interconnection (see capture 6).

7.2 Open all valves on the refrigerant cylinder and hoses as well.
After ending of the complete flushing procedure is the situation identic!
After switching on and starting up the unit automatically evacuates the flushed equipment, the next automatically step fills the flushed equipment with the solvent liquid.
For flushing equipment with more sections are recommended following steps:
As soon as the sight glass (Pos.6) is filled with the liquid, close the hose valve on "OUT" marked outlet.
The sight glass Pos.7 enables the control of filling of the complete system with the solvent SOLSTICE® PF. Until the liquid stops to flow in the sight glass (Pos.7), the complete flushed system is filled and it is possible to open the hose valve on "OUT" marked outlet. Further runs the procedure automatically.
At simple equipment it can be omitted.

7.3 Size of the refrigerant cylinder is to be adapted to the size of the flushed device (alternative refrigerant cylinders of volume 12,5 litres or 27,5 litres). Maximum recommended volume of the flushed component can be 14 litres by using a refrigerant cylinder with a total volume of 27,5 litres. If the recommended volume is 3 litres, a refrigerant cylinder with a total volume of 12.5 litres should be used.
Permissible filling of a 12,5 litre refrigerant cylinder using SOLSTICE® PF-C is 11,0 kg.
Permissible filling of a 27,5 litre refrigerant cylinder using SOLSTICE® PF-C -TZ is 24 kg.
Recommended range of the line inside diameter (Dn) of the flushed components is 8 to 20 mm.

7.4 When the filter of a sight glass (pos. 6) is fouled and the current process slows down or stops practically (the pressure on low pressure gauge pos. 16 is slowly increasing compared to normal operation or it doesn´t increase), act upon following instructions:
Close the valve on the hose connected on outlet, let the unit to run up until the pressure on the low pressure gauge (pos. 16) doesn´t drop under 0 bar (1 bar of absolute pressure).
Then turn off the unit (pos. 31), wait for several minutes, if the pressure does not increase on the low pressure gauge. Provided the pressure increases over 0 bar (1 bar of absolute pressure), repeat the process (turn on the unit and wait for the pressure drop). When the pressure does not increase after the turn-off of the unit, you can dismantle the sight glass and clean the filter.
The unit has to be turned off while dismantling of the sight glass, herewith the valve (pos. 21) is closed, **and at the same time the valve of the hose on the outlet (pos.35) has to be closed!!!**



After dismantling of the upper part (No. 2, 3, 4) withdraw the blocking spring (No.4) and dismantle all single parts (No. 2, 3, 4), which has to be cleaned including the sight glass interior (No. 1).

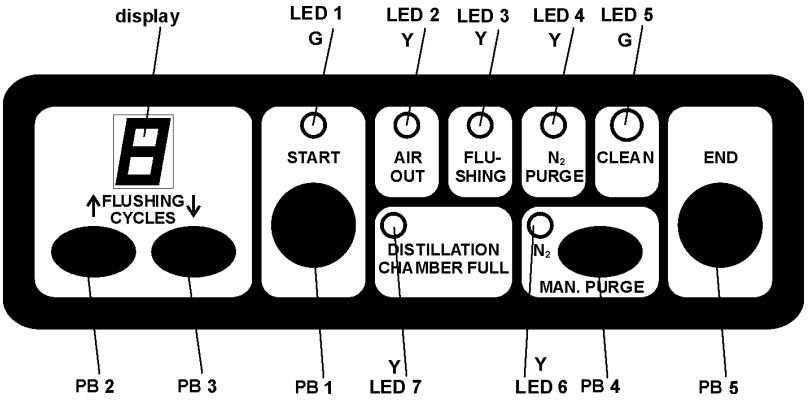
7.5 After ending of the flushing it may come (for many reasons) to the pressure loss in the cylinder and to the reduction of the SOLSTICE® PF-C quantity.

It is recommendable to check the SOLSTICE® PF-C quantity with weighing of the cylinder and to refill SOLSTICE® PF-C in case that the net weight sinks under 80% of sufferable filling. In any case the SOLSTICE® PF-C quantity must be sufficient for the volume of flushed equipment - with a reserve for the connections etc.

Warning:
Groundless loss of SOLSTICE® PF-C can indicate a problem in the flushed equipment.

8. Unit controlling – work flow

G = green
Y = yellow
PB = button
LED = diode-signal light



8.1.	Turn on the main switch.	**It lights :** on display 3times number of remaining flushing procedures. –see 10
8.1.1.	Initial status.	**It lights :** on display "1" and LED 1, LED 6
8.1.2.	Selecting the number of flushing cycles (1 to 9), PB 2 increases, PB 3 decreases. It is possible to change the number of cycles at any time, min. cycle count „1", just processing cycle will be completed.	**It lights :** on display "X" and LED 1, LED 6 "X" = number of selected flushing procedures
8.1.3.	Option to discharge the oil and sludge from distillation chamber. – see 8.4.	**It lights :** on display "X" and LED 1, LED 6 blinks.
8.2.	Pressing PB 1 – start	
8.2.1.	Sucking-off (90 sec.)	**It lights :** on display "X" and LED 2
8.2.2.	Flushing (after filling the distillation chamber 7min. sucking-off) Next cycle of flushing.	**It lights :** on display "X" and LED 3 LED7 lights when the dist. chamber is full. **It lights :** on display X-1 and LED 3
Note : At any time during flushing the number of flushing cycles PB 2 or PB 3 can be changed – to increase or decrease up to "1", i.e. the minimum, just the processing cycle will be completed.		
8.2.3.	Sucking-off of the liquid phase SOLSTICE® PF-C - nitrogen purge, 20sec./ 60 sec. interval minimum 5 times, i.e. 5 times after the last turning on of the float switch.	**It lights :** on display "0" and LED 4, by intervals LED 4 blinks
8.2.4.	Sucking-off of the vapour phase of SOLSTICE® PF-C - when the last blow-out was completed. There is possible to blow-out by nitrogen (20 sec) during this period – pressing PB 4 After 180 sec. peeps 3 times (acoustic signal). After this signal and at pressure on LP manometer higher than 0 bar, pressing PB 4 you repeat 5times the blowing by nitrogen.	**It lights :** on display "-" and LED 5, LED 6 By pressing PB 4, LED 6 blinks **It lights :** on display "-" and LED 5 blinks, LED 6
8.2.5	Within 15 min. of the acoustic signal, the compressor turns off, the display goes blank. Until PB 5 -"END" is pushed, nitrogen blow-out may be repeated 5 times by pushing PB 4.	**It lights :** LED 6, LED 5 blinks, on display "-"
Note : During the flushing (8.2.2) the dist. chamber is filled and or emptied with dist. chamber and LED 7 is blinking.- lighting. When the procedure of par. 8.2.4. is under progress, nitrogen blow-out process may be carried out for 20s by pushing PB 4 – LED 6 blinks. If the pressure on the low-pressure manometer is higher than 0 bar after the acoustic signal, repeat nitrogen blow-out 5 times by pushing PB 4.		
Warning : If the feeding is broken when the procedure of point 8.2. is under process (after pressing PB 1 up to the first acoustic signal), LED 1 blinks after feeding has been renewed. After pressing PB 1 the program continues from the point it stopped at. (The last broken period runs from the very beginning). The same happens after pressing PB 5 – END (compressor is stopped, LED 1 blinks, after pressing PB 1 the program continues).		

8.3.	Completing flushing.	
8.3.1.	By pressing PB 5 – END, if LED 5 blinks and the pressure on the low-pressure manometer (pos. 16) is lower than –0,5 bar. (see the note on page 8)	**It shows:** on display "1" and LED 1, LED 6
8.4	Oil and sludge discharge from the distillation chamber	
8.4.1	Open the nitrogen supply to the distillation chamber for 20s by pushing PB 4.	**It shows:** on display "1", LED 6 blinks
8.4.2	Turn on the compressor by pushing PB 4 and reduce the pressure to 0,5 – 0,7 bar .	
8.4.3	Turn off the compressor by pushing PB 5.	**It shows:** on display "1", LED 1, LED 6
8.4.4	Open the discharge valve of the distillation chamber and discharge the oil and sludge into the vessel prepared. Once the oil stops running out and nitrogen leaks, close the valve.	**It shows:** on display "1", LED 6
Note: In the unit –flushed device the overpressure of about 0,3 bar is remaining. The cycle can be finished by the work flow stated in point 8.4.8. To reduce the nitrogen loss is advisable to act upon the work flow stated in point 8.4.5 and 8.4.6. The procedure will by finished by the work flow stated in point 8.4.8.		
8.4.5	Open the nitrogen supply to the distillation chamber for 20s by pushing PB 4.	**It shows:** on display "1", LED 6 blinks
8.4.6	Turn on the compressor by pushing PB 4 and reduce the pressure to atmospheric pressure level (0.0 bar – LP manometer).	
8.4.7	Turn off the compressor by pushing PB 5.	**It shows:** on display "1", LED 1, LED 6
Note: To reduce any losses of SOLSTICE® PF-C it is better, especially at flushing of larger circuits, at point 8.4.6. to wait for underpressure – (0,5-0,8), after that by pushing PB5 switch off the compressor. We recommend to equalize on the atmospheric pressure or on slight overpressure by nitrogen from cylinder with pure nitrogen, e.g. see bellow P220. The pressure cylinder with nitrogen must be equipped with proper regulator for pressure reduction !!!		
8.4.8	Main switch turn off	

Note:

1) Low-pressure manometer – pos. 16 – shows an overpressure in the section being flushed. It does not show any overpressure in the distillation chamber.
2) Oil and sludge can also be discharged from the distillation chamber later, when the equipment being flushed is disconnected. However, we must connect the device's inlet and outlet with a hose and turn off the compressor during sucking off by PB 5, if the pressure is 0 bar.
3) Described procedure and pressure stated in this manual assume workplace ambient temperature of about 16°C – 24°C.
4) **Pressure of vapour above. SOLSTICE® PF-C level at various temperature**

T (°C)	- 8	- 4	0	+ 4	+ 8	+ 12	+ 16	+ 20	+ 24	+ 28	+ 32
p (bar)	-0.67	-0.60	-0.53	-0.44	-0.33	-0.22	-0.90	0.06	0.23	0.42	0.63
T (°C)	+ 36	+ 40	+ 44	+48	+ 52						
p (bar)	0.86	1.12	1.41	1.73	2.08						

If the pressure after flushing procedure is higher than the pressure of vapour matching the stated temperature, there is a rest of liquid SOLSTICE® PF-C in the circuit to be flushed. **Temperature can drop bellow the ambient temperature under the thumb of evaporation of SOLSTICE® PF-C, especially during the flushing of complicated circuits with siphons.**

5) For recovery of flushing solvent at lower ambient temperature because of undercooling of flushing solvent there will be necessary to repeat several times the procedure – point 8.2.4 or to warm up the circuit to be flushed on temperature at least 15°C.
6) Ambient temperature in excess of 30°C decreases an operation lifetime of EkoFlush unit.

7) The maximum capacity of the distillation chamber for oil and residues is about 1 liter.
If during the flushing this capacity is filled with contaminants, LED7 (Distillation Chamber Full) will not switch off and the process can "freeze".
It is necessary to discharge the distillation chamber, but first it´s necessary to add pressure to chamber, so that oil and particles can flow out through the drain valve.
Press END.
On the back side of the unit, just above the power cable, you can find the drain valve.
When this valve is opened, vapour of SOLSTICE® PF-C will flow into the distillation chamber.
Open the discharge valve of the distillation chamber (see **Chyba! Nenalezen zdroj odkazů.**) and discharge the oil and the sludge into a container.
Once the oil stops flowing, close the valve.
To continue flushing, press „START

Please note that in this case, some SOLSTICE® PF-C could be lost together with the oil.
In order to prevent this inconvenience, it is necessary to discharge the distillation chamber after every flushing operation!!!

We recommend!
Upon completion of cleaning operation, the device flushed can remain under-pressured (See par. 8.3). Therefore we recommend balancing the pressure using nitrogen, so that no moister gets into the circuit after disconnecting the device that is being flushed.
Note:
It is appropriate to blind outlets of the device flushed after its disconnection (By plastic or rubber cover or using a self-adhesive tape).

9. Completing Flushing

- Drain off the oil and residues from the distillation chamber.
- Close all valves.
- Dispose of oil and residues from the distillation chamber according to ecological regulations!
- Total capacity of a distillation chamber for dirt (incl. oil) is about 1 litre.
  Provided during flushing this capacity is filled, the LED7 (Distillation Chamber Full) will not switch off untill the end of flushing. Not even after a repeated pushing of PB4. After the completion of flushing (acoustic signal) it the system is necessary to end up the process by pushing END. After that by pushing PB4 nitrogen let into the system and by repeated pushing start the compressor and try to recover SOLSTICE® PF-C mixed with oil. Provided it will not succeed untill about 10 min. (the pressure will not sink on LP gauge) it is necessary to discharge the distillation chamber in spite of loss of some SOLSTICE® PF-C.
  Therfore it is necessary after every flushing to discharge the distillation chamber!!!
- Check the oil in the compressor after each flushing process. Replace oil after 200 hours of operation. After this time, the device will automatically alert you of the necessity to change the oil – when turned on, the display shows the message "OIL" (gradually O, I, L). This message is cancelled by pushing PB 2 and PB 3 simultaneously, then you can continue with PB 1. The message is displayed 3 times, always when the unit is turned on, therefore, it is necessary to delete all three alerts once the oil has been changed. If there is no message after turning the unit on, it has been deleted and the program counts the service time of 200 hours from the beginning.

10. Exchange of SOLSTICE® PF-C solvent

The programme of the EkoFlush unit is according to the recommendation of company Honeywell set so, that after 20 flushing procedures (not only cycles) the unit informs SOLSTICE® PF-C solvent should be changed showing symbols – 3 horizontal blinking lines on a display.

The company Honeywell recommends to change the flushing solvent SOLSTICE® PF-C after flushing 20 A/C or refrigerating circuits. The real efficiency abatement of the flushing solvent depends on the type and level of fouling of the cleaned equipment.
The number of remaining flushing procedures appears on the display three times after turn on the main switch.

After SOLSTICE® PF-C solvent is changed the report – 3 horizontal blinking lines – has to be cancelled with following step:

- turn on the main switch
- pressing simultaneously PB4 and PB5

Provided the flushing unit is used only for distillation of used SOLSTICE® PF-C (see chapter 11), this indication is unimportant, but it is necessary to cancel it by a described method. Provided the report is not cancelled trough described procedure, it appears always after machine switch on before the new flushing procedure starts and for continuing of programme setting is necessary to press simultaneously PB2 and PB3.

11. Oil Change, Adding Oil

The oil change procedure: open the sight glass and drain off the oil from the Unit into a suitable vessel.
During filling, it is necessary to place a sufficient volume of oil in a suitable vessel under the oil inlet (pos. 33), so that the hose fitted to the valve aperture reaches the bottom of the vessel. Then follow the procedure stated below.
Procedure:

11.1 Open the valve pos. 33
11.2 Connect the inlet (IN) and the outlet (OUT) with a hose with a ball valve and close the valve.
11.3 Turn the main switch on.
11.4 Press PB 4 button and wait for 20s until LED 6 stops blinking.
11.5 Press PB 4 again – the compressor will turn on and the oil from the vessel will be sucked into the device.
11.6 Once the vessel is empty, press PB 5 – “END”.
11.7 Close the valve pos. 33, disconnect the hose between the device’s inlet and outlet, and turn the main switch off.

12. Waste Disposal (SOLSTICE® PF-C flushing liquid and waste product)

12.1 Depending on the size and pollution of the flushed circuits, it is possible to flush from 10 to 30 devices/components. It is then necessary to replace the flushing liquid with a new one. Please return empty refrigerant cylinders to the distribution place. The liquid must be returned in the original refrigerant cylinder.

12.2 You can also use a fuel can to collect waste residuals (even a plastic one), it must however be indicated as “Dangerous waste collection container – SLUDGE WITH HALOGEN DISSOLVENT CONTENT no. 140604”.
Please dispose of waste residuals according to your system of dangerous waste disposal, their disposal can also be arranged at distribution places for SOLSTICE® PF-C.

13. Risks Analysis

The producer has paid great attention to users’ health and environmental protection, and safety as well. In spite of that there are some general risks as follows:

a) Risk of nitrogen high pressure by refilling the refrigerant cylinder with SOLSTICE® PF-C. The refrigerant cylinders with nitrogen are filled to an overpressure of 150 to 200 bar, so they must be equipped with a cylinder pressure regulator on the outlet, adjusted to the maximum outlet pressure of 8 bar. It is prohibited to fill nitrogen into the refrigerant cylinder with SOLSTICE® PF-C without an integrated cylinder pressure regulator adjusted to the given pressure.
b) The EkoFlush unit works with pressurised liquid and gas. Handling of connecting hoses without observing instructions and general principles can result in pressure inrush. Therefore, be extremely careful and use protective goggles and gloves. Always check that valves on hoses and the refrigerant cylinder are closed.

14. Failures, Possible Causes, Troubleshooting Guide

Problems / Defects	Possible Cause	Suggested Solution
After switching on, the signal light does not light up.	Energy supply defect.	Check inlet flex, plug and distribution circuit breaker.
Unit runs but under-pressure cannot be reached in the distillation chamber.	a) Leakage in connection or leakage in flushing components. b) Outlet valve (pos. 5) on the distillation chamber is open. c) Defect in electromagnetic valve on outlet oil separator.	a) Check all connections – hoses, nuts and fittings. Close hoses valves. If defect remains there is leakage in flushed components – repair leakage. b) Close. c) Contact service centre.
After sucking off air, the flushing agent does not flow.	a) Closed valves on hoses or on the refrigerant cylinder with SOLSTICE® PF-C. b) Defect in hoses interconnection between the refrigerant cylinder and flushing unit.	a) Check openings of valves. b) Examine hoses connections / inlet-outlet and liquid and vapour outlet on the cylinder with SOLSTICE® PF.
During operation: a) "H" blinks on display b) "H" lights up on display c) "E" lights up on display d) "h" blinks on display e) "h" lights up on display	a) Closed valves on hoses or on the refrigerant cylinder on the liquid inlet. b) Pressure has fallen below maximum level. c) Defect in the heat detector. d) Maximum pressure of filling of cylinder with SOLSTICE® PF-C exceeded. e) Pressure in cylinder has fallen below maximum level.	a) Check valves openings on hoses and the refrigerant cylinder liquid inlet with SOLSTICE® PF-C. b) Press "START" and purge will continue. c) Contact service centre – see the notification on page 19. d) 1) Reduce the pressure in the refrigerant cylinder below 8 bar by releasing the hose screw joint at the gas valve of the refrigerant cylinder. 2) Reduce the pressure in the distillation chamber using the oil discharge valve (pos. 5). Discharge into a suitable vessel! e) Press "START" and flushing will continue.
Unit is connected to the socket, but compressor after start does not run. The signal light is lit up!	Defect in the electrical accessory of the compressor or defect in the compressor.	Contact service centre.
Reduction of the flushing output.	a) Polluted filter in the sight glass "OUT" pos. 6 b) Low nitrogen pressure in the cylinder.	a) Cleaning of the sight glass filter (see point 7.4) b) Fill up nitrogen in the refrigerant cylinder at the given pressure.

Problems / Defects	Possible Cause	Suggested Solution
Pressure on LP manometer is lower than minus 0.5bar, but in the circuit to be flushed is rest of liquid of SOLSTICE® PF-C.	The circuit is clogged.	Close the hose valves at flushing unit. (Hoses interconnecting flushing unit and flushing circuit) Disconnect them and then connect conversely (IN / OUT). Open hose valves. To recover SOLSTICE® PF-C from the circuit press MAN. PURGE (PB4). By first pressing of PB4 the nitrogen is filling (20s), by second pressing the recovery is starting (compressor). Maximum 10 minutes. Switch off the compressor by pressing PB5. Provided the underpressure will not be reached, repeat the procedure.
EkoFlush unit runs, but required underpressure cann´t be reached. Compressor doesn't work.	Compressor failure.	After completing of procedure wait for an acoustic signal, push the END bottom and switch off the unit. Close all hose valves and disconnect hoses from cylinder and EkoFlush unit. BEWARE: The EkoFlush unit can contain small quantity of liquid SOLSTICE® PF-C. Use the recovery machine to recover SOLSTICE® PF-C from the circuit to the pressure cylinder. Inlet of recovery machine connect to outlet of circuit to be flushed. Outlet of recovery machine connect to the cylinder valve - liquid. Follow the instructions of the recovery machine manual. Use the scale to avoid overfilling of cylinder.
High pressure gauge (red): pressure greater than 8 bar. Above the red-green field. .	Blocked hose to the liquid inlet (red) cylinder with SOLSTICE® PF-C	Check that the valves on the SOLSTICE® PF-C cylinder and the appropriate hose valves are not closed. Check the hose gasket for deformation

Notification:

If any heating sensor failure the occurs during flushing process ("E" lights up on the display)., the flushing cycle will be finished till the discharging of distillation chamber and next flushing will be not possible.
The time needed for the finishing of cycle will be longer, because the distillation will be running at the lower temperature.
If the pressure on the low-pressure manometer is -0,5 to -0,7 bar, turn the device off and contact the service centre.

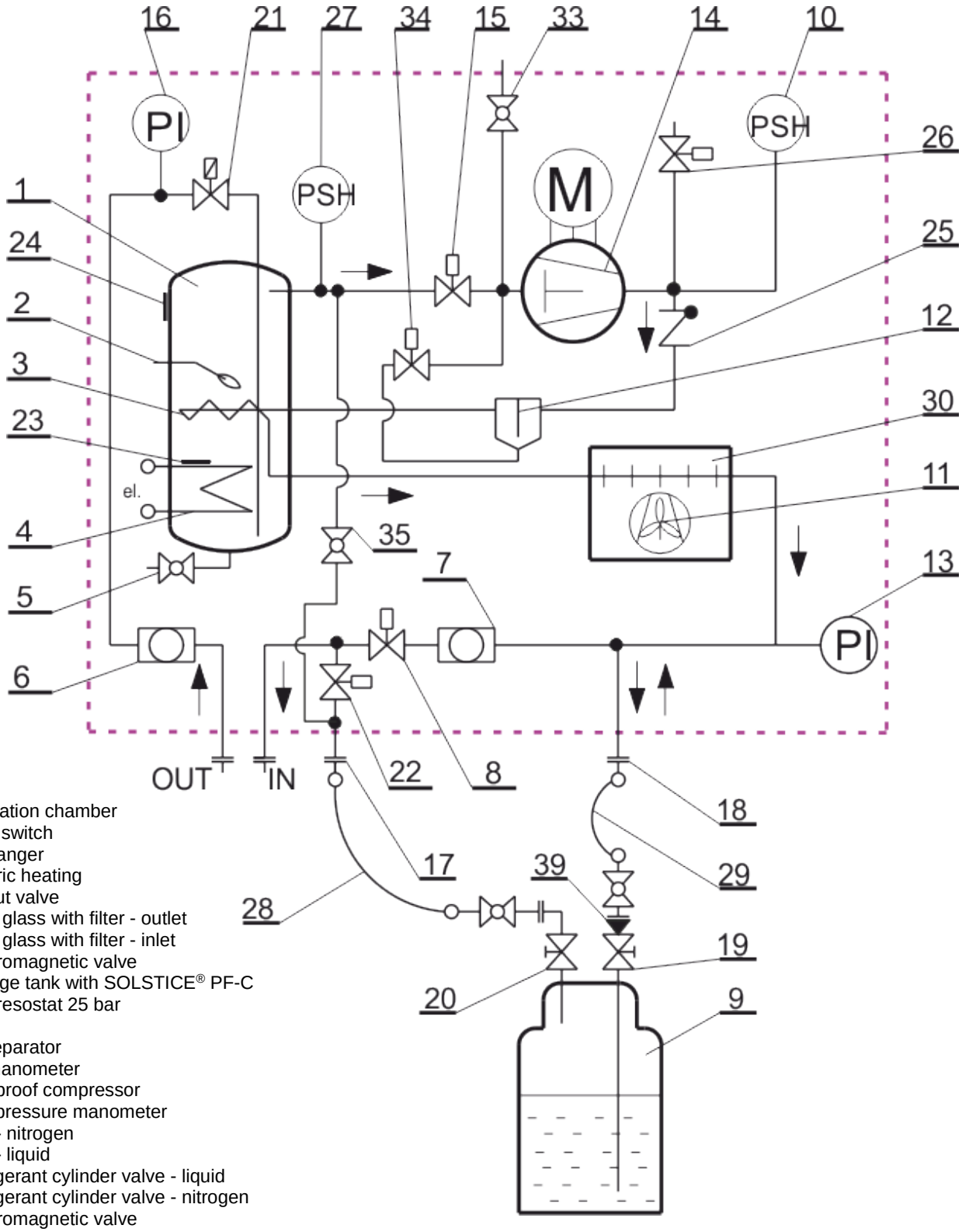
CHECKING THE FUNCTIONALITY of the EkoFlush

- Connect inlet and outlet of EkoFlush with one hose, if a hose with a valve, please open it.
- Turn on the unit and select 1 flushing cycle.
  Open the valves of a cylinder with SOLSTICE® PF-C
- Press START

The whole cycle will pass, until sucking off in under-pressure, charging with SOLSTICE® PF-C (see sight glasses), blowing-out by nitrogen, final recovery (it takes about 20 minutes)

- If the EkoFlush ends in under-pressure, the unit is OK, the problem is out of the unit
- If the cycle will not run as described above, the unit has a problem.
  Please contact your supplier.
  Please prepare information in which phase the unit stopped, state of gauges and which LED blinks or lights

15. Flow Diagram

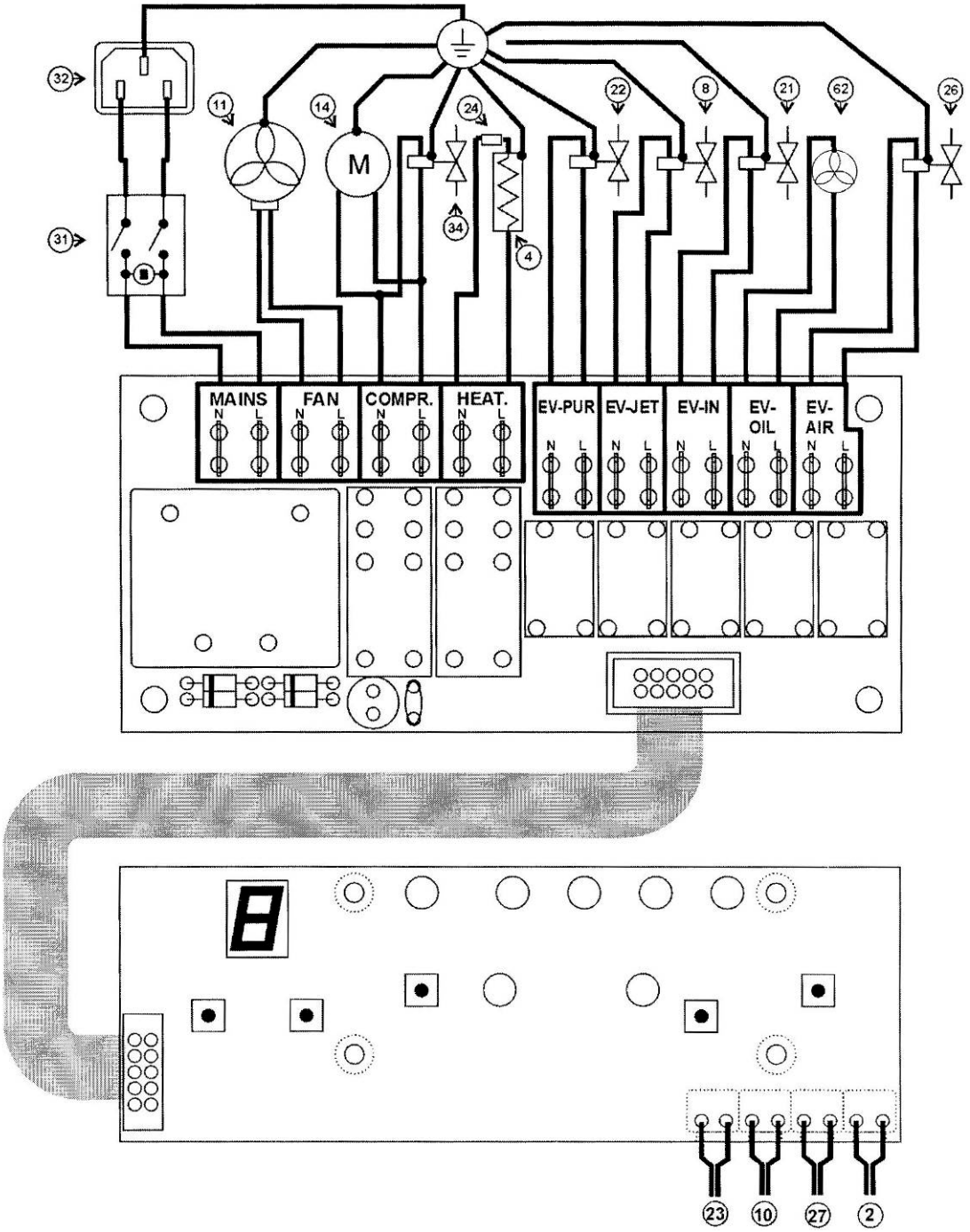


1 Distillation chamber
2 Float switch
3 Exchanger
4 Electric heating
5 Output valve
6 Sight glass with filter - outlet
7 Sight glass with filter - inlet
8 Electromagnetic valve
9 Storage tank with SOLSTICE® PF-C
10 HP presostat 25 bar
11 Fan
12 Oil separator
13 HP manometer
14 Leakproof compressor
16 Low-pressure manometer
17 Inlet - nitrogen
18 Inlet - liquid
19 Refrigerant cylinder valve - liquid
20 Refrigerant cylinder valve - nitrogen
21 Electromagnetic valve
22 Electromagnetic valve
23 Temperature sensor
24 Safety thermoregulator of the distillation vessel
25 Check valve
26 Electromagnetic valve
27 HP – presostat 8 bar
28 Hose 1/4” SAE x 90cm, blue
29 Hose 3/8” SAE x 90cm, red
30 Condenser
33 Inlet valve for compressor oil charging/refilling
34 Electromagnetic valve
39 Flare adapter 3/8” M SAE x 1/4” Fem. SAE

EKOTEZ®

FLUSHING UNIT WITH CONTINUOUS DISTILLATION
EkoFlush K570

16. Block Flowchart - K570

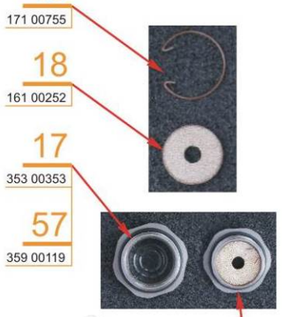


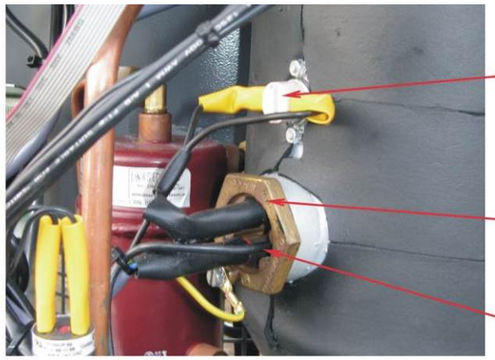
2 - Float switch
4 - Electric heating
8 - Electromagnetic valve
10 - HP 1 presostat
11 - Fan
14 - Hermetic compressor
62 - Axial fan
21 - Electromagnetic valve
22 - Electromagnetic valve
23 - Temperature sensor
24 - Distillation chamber thermo-regulator
26 - Electromagnetic valve
27 - HP 2 presostat
31 - Main switch
32 - Net socket
34 - Electromagnetic valve

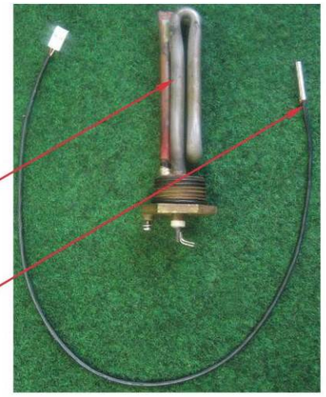
17. List of Replacement Parts

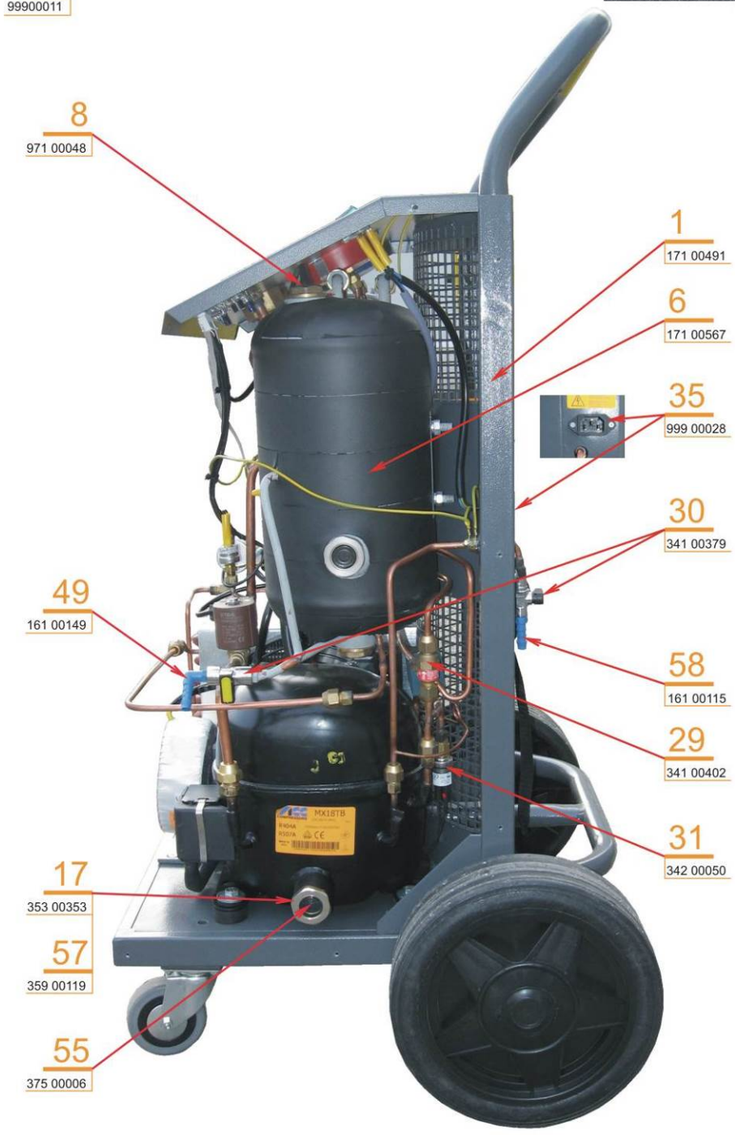
Components	Flow. diagram	Description	Code
1		Frame, complete	17100491
2		Control board	17100493
3		Front cover	17100494
4		Left side cover	17100497
5		Right side cover	17100495
6	1	Distillation chamber	17100567
7	4	Electric heating	16100206
8	2	Float switch, complete –spare part	97100048
9	24	Distillation chamber thermo-regulator	99900026
10	23	Temperature sensor complete	34300137
11	30	Condenser, complete	34500216
12	11	Fan motor M4Q-045/230 V, 50 Hz	34500026
13	14	Compressor MX, 230 V, 50 Hz, complete	21400046
14		Condenser 16 µF/400 V	16100190
15		Condenser 47 µF/400 V	16100188
16	6(7)	Sight glass cap of the board	35300439
17		Sight glass cap	35300353
18		Sight glass sintered filter	16100252
19		Sight glass filter fuse	17100755
20	16	Low-pressure manometer	33100365
21	13	High-pressure manometer	33100361
22	12	Oil separator	35400550
23	8,21	Electromagnetic valve 6810/230 V	34100190
24	26,22,34	Electromagnetic valve 6806/230 V	34100222
25		Electromagnetic valve coil 6810/230 V	34100551
26		Electromagnetic valve coil 6806/230 V	34100417
29	25	Check valve	34100402
30	5,33	Drain ball valve	34100272
31	10	Compressor high pressure presostat	34200050
32	27	Distillation chamber high pressure presostat (8-bar)	34200070
33		Electric base board	78100020
34		Electric control board	78100021
35	32	Power plug	99900028
36	31	Main switch, green	96100125
37		Wheel plastic, diameter 250 mm	16100162
38		Rotary roller 80 mm	16100195
39	9	Refrigerant cylinder 27,5 litre, complete	82200006
40	(9)	Refrigerant cylinder 12,5 litre, complete	82200013
41		Plastic cover cap 3/8” SAE	35200575
42		Plastic cover cap 1/4” SAE	35200349
43	29	Hose 3/8”, 90cm, red – with valve	33100344
44	28	Hose 1/4”, 90 cm, blue – with valve	33100098
45	38b	Hose 3/8”, 180 cm, blue – with valve	33100711
46	38r	Hose 3/8”, 180 cm, red – with valve	33100712
47		Tightening strip, complete	19500003
48		Wheel fixing base	16100177
49		Plastic angled outlet	16100149
50		Board of electronics – label	16100268
51	39	Adapter 3/8”SAE Male Fl. x 1/4” SAE Fem. Fl.	35200154
52		Sealing ring 28x3 NB70	35900312
53		Distance tube of sight glass	16100245
54		Drip pan, complete	17100756
55		Fuchs Reniso Triton SE 55 1L	37500013
56		Operating Manual in English	16100296
57		Sealing ring – sight glass	35900119
58		Plastic outlet	16100115
62		Axial fan	34500035
63		Grill	99900011

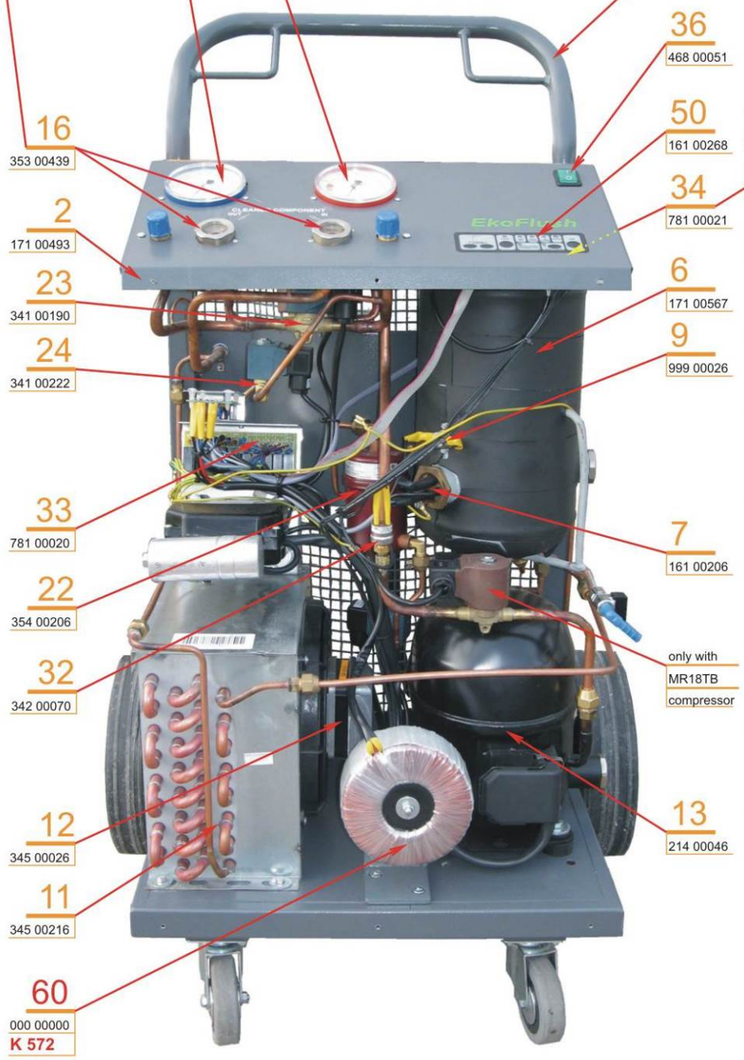
18. Components

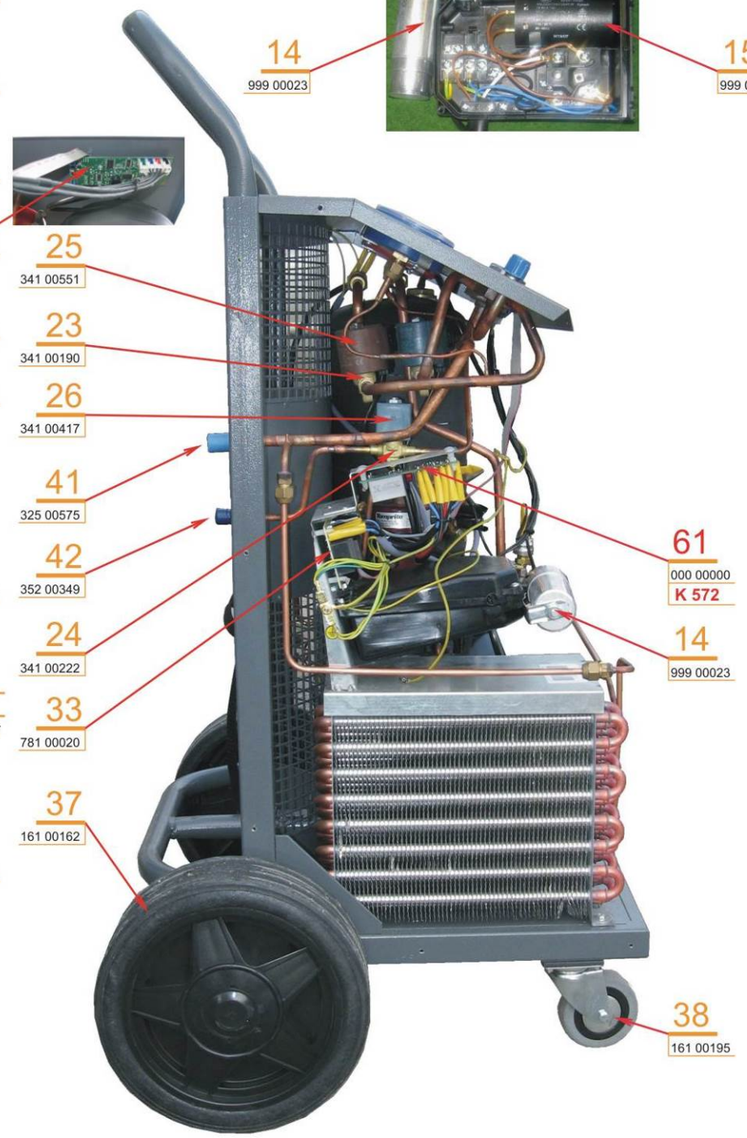












19. CE Conformity Declaration

Konformiátätserklärung
EC Declaration of conformity

Hersteller / *Manufacturer:* **Anschrift** / *Address:* **Bevollmächtiger Vertreter** /*Authorised representative:* **Anschrift** / *Address:* **ID-Nr.** / *ID:*	**EKOTEZ spol s.r.o.** **Prag 3, Koněvova 47, Tschechische Republik** / *Czech Republic*
Name und Anschrift des Beauftragten für die technische Dokumentation (laut 2006/42/EC): *Name and address of the person authorised to compile the technical file according to 2006/42/EC):*	**EKOTEZ spol s.r.o.** **Prag 3, Koněvova 47, Tschechische Republik** / *Czech Republic*
Erzeugnis (Gerät) – Typ / *Product (Machine) – Type:* **Serial-Nr.** / *Serial number:*	**Reinigungseinrichtung K56x, K57x** *Flushing Unit K56x, K57x*
Beschreibung / *Description:*	
Wir erklären, dass diese Einrichtung erfüllt alle einschägigen Bestimmungen der eingeführten Richtliniern (Regierungsverordnung) / *We declare that the machinery fulfils all the relevant provisions mentioned Directives (Government Provisions):*	**2006/42 EC, 2014/30/EU, 2011/65/EU**
Harmonisierte technische Normen und zur Konformitätsbewertung angewandte technische Normen / *The harmonized technical standards and the technical standards applied to the conformity assessment:*	**EN 60335-1** **EN 55014-1** **EN 61000-3-3** **EN ISO 12100**
Letzte Dopplezahl bezeichnet das Jahr, in dem das Erzeignis mit dem CE-Symbol bezeichnet wurde / *The last two digits of the year in which the CE marking was affixed:*	
Personen an der Konformitätsbewertung beteiligt / *Bodies engaged in the conformity assessment:*	**EZÚ, Pod Lisem 129, 171 02 Prag 8, Tschechische Republik** / *Czech Republic*
Methode der Konformitätsbewertung / *To the conformity assessment applied procedure:*	**Protokoll: 901972-01/01** *Test report: 901972-01/01* **Zertifikat Nr.: 1090637, 1090636** *Certificate No: 1090637, 1090636*
Die Konformitätsbewertung wurde vom akkreditiertem Prüflabor durchgeführt / *The conformity assessment carried out by the accredited testing laboratory:*	**EZÚ, Pod Lisem 129, 171 02 Prag 8, Tschechische Republik** / *Czech Republic*

Notiz: Alle Vorschriften wurden in Sinne ihrer Änderungen und Vervolständigungen verwendet, die im Augenblick des Erjklärungserlasses gültig waren und zwar ohne sie zu zitieren.
Note: All regulations were applied in wording of later amendments and modifications valid at the time of this declaration issue without any citation of them.

Ort und Datum / Prag 11.01.2018
Place and date of issue: Prague 11.01.2018
Person bevollmächtigt zum Unterschrift im Namen des Herstellers /
Signed by the person entitled to deal in the name of producer:

Name / *Name:*	Position / *Grade:*	Unterschrift / *Signature:*
František Janda	**Generaldirektor**/*director general*	

20. Safety guidelines

SOLSTICE® PF-C

Please refer to the MSDS of Solstice® PF-C.

trans-1-Chloro-3,3,3-trifluoropropene CAS: 700-486-0 100 weight %.

Vapor pressure: 1.065 bar at a temperature of 20°C; 3.26 bar at a temperature of 54°C
Liquid Density: 1,27 kg/dm³
Boiling Point: 19.5°C at 1 atm. Pressure (101,325 kPa)

Colorless, vaporous fluid with slightly sweetish odor, non-flammable

Producer: Honeywell Fluorine Products Europe BV
Laarderhoogtweg 18, 1101 EA Amsterdam, The Netherlands

MANIPULATION:
The flushing solvent has been designed for the cleaning of cooling and refrigerating circuits during maintenance and repair operations.
Before attaching the EkoFlush unit and the solvent cylinder to the respective cooling/refrigerating circuit (component), the circuit must be completely free from refrigerant (recovered into a suitable cylinder). During the cleaning process, follow the instructions in the user's manual of the EkoFlush Unit.

WARNING:
The SOLSTICE® PF-C solvent cylinder is pressurized.
Keep away from direct sunlight. Keep only in the original container in a cool, well ventilated place away from acids. When operating with SOLSTICE® PF-C the premises must be well ventilated. Keep away from fire and flammable materials. Do not inhale the vapors. Keep out of reach of children. The product has been designed for professional use. Do not use it for other purposes. The cylinder is pressurized with N_2 (nitrogen) at a pressure of 8 bar and it will remain pressurized also after the content of the bottle has been completely used up.

ADR/IMDG: 2,2
H-statements: 280, 412
P-statements: 281, 260, 273, 308, 313, 410, 403

Emergency response: (32-16)391391
This product has been notified in the EEC according to article 8 of the EC Directive 67/548 VII notification dossier 96-02-0171.

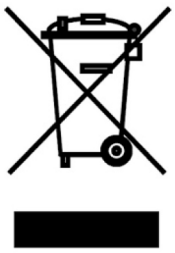
EKOTEZ Ltd.
Koněvova 47
130 00 Prague 3
Tel: +420 221 599 111
E-mail: ekotez@ekotez.cz
www.ekotez.cz

The solvent cylinder can only be filled with SOLSTICE® PF-C fluid up to 11,0kg of weight for the 12,5 liters bottle.
The solvent cylinder can only be filled with SOLSTICE® PF-C fluid up to 24kg of weight for the 27,5 liters bottle.

21. Warranty and disposal

Any use, installation, maintenance that is not effected according to the rules as asserted in the technical manual, or unauthorized modifications on the original version as delivered from manufacturer leads to expiration of any right to warranty.

Disposal



Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available.
When replacing old appliances with new once, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.