Honeywell

Wheeled Circuit Flushing Unit

EkoFlush-K572

USER OPERATING MANUAL

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1. Table of contents

The EkoFlush-K572 device is designed for qualified servicemen operating in the air conditioning and refrigeration industry.

2. Safety Precautions

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

- This Operating Manual must be completely read and understood before operating this unit.
- Suitable skin and eye protective equipment should be worn while operating or maintaining the EkoFlush 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 from the EkoFlush every time before transporting this Unit (“0” bar or less should be shown on the low-pressure manometer).
- The EkoFlush-K572 unit can only be transported by transportation means if its solvent cylinder is disconnected and transported separately. The main unit can be transported on wheels (properly protected against moving), or laid down on its rear side leaning on its handle and wheels. Other positions will result in damages to the EkoFlush machine.
- The EkoFlush unit must be protected against open flames and flying sparks.
- All repairs must be done by an authorized service or by the producer. Please consult your local dealer.
- 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-solvents.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 warranty.

3. Unit Description

3.1 The EkoFlush-K572 is a mobile flushing unit with wheels and rugged metal structure. The solvent cylinder required to operate the machine must have a two-way valve and must be filled only with the flushing agent SOLSTICE® PF-C by HONEYWELL, pressurized with nitrogen at 8 bar.

Please consult your local dealer on connectors to attach it to the circuit you need to clean.

3.2 IMPORTANT: This Unit was designed to operate exclusively with the flushing agent SOLSTICE® PF-C by HONEYWELL. If other fluids will be used, the result will be a significant damage to the Unit and injuries for the operator.

3.3 This Unit operates on the principle of pulsating pressurized flushing of the components or systems to be cleaned. The EkoFlush has a patent certificate. The flushing agent SOLSTICE® PF-C is distilled during every flow and returns to the cylinder virtually pure, ready to be re-used for another flushing. This ensures that the cleaned components are always flushed very effectively and fast.

3.4 The cycle has four phases.

3.4.1 I – AIR SUCKING-OFF

After having safely connected the EkoFlush unit to the circuit to flush and the solvent cylinder with SOLSTICE® PF-C, and having started the operations by switching the unit on and selected the number of flushing cycles, the EkoFlush will remove the air from the dirty circuit. Once this phase is completed, the EkoFlush begins the automatic flushing procedure.

3.4.2 II – FLUSHING

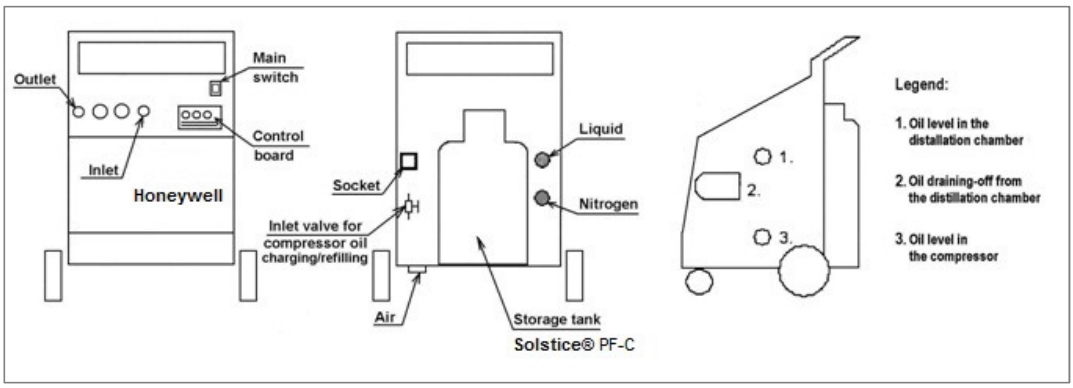
The flushing solvent is forced into the circuit to flush thanks to the high pressure of nitrogen (6 – 8 bar) present in the cylinder. The high pressure, the speed of the solvent flow and the pulsation ensure that the contaminants (oil, grease, particles, water, etc…) are also removed from every hard-to-reach corner. The full volume of the dirty circuit is filled with SOLSTICE® PF-C. An accurate flushing is ensured by a special pulsating mode of the solvent flow. At the end of this phase, the EkoFlush unit pushes SOLSTICE® PF-C from the circuit into its distillation chamber. Each step automatically follows the previous one without manual intervention of the operator.

3.4.3 III – REMOVING THE LIQUID PHASE OF SOLSTICE® PF-C

Nitrogen from the cylinder purges the flushed component at a pressure of 6 – 8 bar in order to quickly remove the liquid SOLSTICE® PF-C.
The purge is repeated a number of times until there is no more liquid in the flushed circuit.

3.4.4 IV – SUCKING OFF THE VAPOR PHASE OF THE SOLSTICE® PF-C

In this last step, the vapor residues of SOLSTICE® PF-C are extracted from the circuit and are returned clean to the storage cylinder. An acoustic signal announces the completion of the automatic procedure. After hearing this signal, oils, greases and contaminants can be drained from the distillation chamber.



Picture 1 - K572 Overview

Your new unit is able to:

- Flush easily, automatically, quickly and effectively components of air conditioning and refrigerant circuits, evaporators, condensers, as well as the pipework.
- Save money because SOLSTICE® PF-C flushing agent can be re-used up to 20 times (+1 open flush – solvent vented to air).
- Clean and flush a complete circuit without impacting the environment, thanks to closed circuit operations: you and your shop will remain clean!

4. Accessories

4.1 Standard accessories – delivered together with the Unit

- Hoses

- 1/4“ SAE x 90cm with valve – blue	1 piece	to connect the solvent cylinder, vapor outlet (Blue) to the inlet on the rear side of the EkoFlush Unit (Nitrogen)
- 3/8“ SAE x 90cm with valve – red	1 piece	to connect the solvent cylinder, liquid outlet (Red), to the inlet on the rear side of the EkoFlush Unit (Liquid)
- 3/8“ SAE x 180cm with valve – blue	1 piece	to connect the EkoFlush front panel (OUT) to the circuit to flush
- 3/8“ SAE x 180cm with valve – red	1 piece	to connect the EkoFlush front panel (IN) to the circuit to flush.
- Flare adapter 3/8” Male SAE x 1/4” Fem. SAE	1 piece	Adapter for the vapor outlet valve on the solvent cylinder (Blue)
- Additional external filter P48	1 piece	To intercept solid particles when flushing particularly dirty circuits.

4.2 Additional accessories to order

- Please refer to your local supplier for the size of the cylinders of SOLSTICE® PF-C that best suits your flushing operation.

5. Technical Specifications

• Voltage	110/230V, 50/60Hz
• Maximum power input	1850 W
• Compressor oil	ester oil ISO VG 46
• Compressor oil filling	0,4 kg
• Connection to the flushed device	3/8“ SAE
• Connection to the refrigerant cylinder (liquid valve)	3/8“ SAE
• Connection to the refrigerant cylinder (vapor valve - nitrogen)	1/4“ SAE
• Maximum operating overpressure of the Unit	8 bar
• Ambient temperature	+5°C – +40°C
• Weight without the refrigerant cylinder	54 kg
• Main dimensions (WxDxH)	570x605x950 (mm)
• Flushing agent for systems cleaning	SOLSTICE® PF-C

!! WARNING !!

The Flushing Unit EkoFlush-K572 is designed to operate exclusively with the SOLSTICE® PF-C flushing solvent produced by HONEYWELL.

6. Main principles and interconnections

6.1 The circuit to flush must be tight, free from leaks and from internal blocks.

IMPORTANT!

Please check the absence of internal blocks by flowing some nitrogen or air through the circuit, before starting the flushing operations. The pressure of the solvent and the EkoFlush unit may not be sufficient to remove the blocks and the flushing operation will not be completed, resulting in loss of solvent.

6.2 Connect the K572 directly to the circuit, by-passing the compressor.

IMPORTANT!
It is necessary to disconnect the compressor before flushing, or the oil present in the compressor will be washed off!!

6.3 Large circuits need to be flushed in sections, especially circuits with several branches.

6.4 All throttling elements (capillary tubes, expansion valves, pressure limiters) need to be replaced by standard pipes or “by-passed”.

6.5 Filters must be replaced by standard pipes; otherwise they will be immediately filled up with impurities collected in the circuit.

6.6 Remove or turn upside-down the accumulators (receivers).

If portions of SOLSTICE® PF-C will end up in accumulators, the flushing procedure will become longer or solvent will remain trapped inside.

6.7 The back side of the EkoFlush K572 unit and the solvent cylinder must to be connected with the following hoses:

1/4“ SAE x 90 cm – blue	- vapor outlet on the solvent cylinder – BLUE
3/8“ SAE x 90 cm – red	- liquid outlet on the solvent cylinder - RED

NOTE: Depending on the cylinder you are using, you may need an adapter for these connections. Please refer to your local supplier of SOLSTICE® PF-C.

NOTE: Hoses must be installed with the valve-end close to the cylinder of the solvent.

6.8 Use the belt to secure the solvent cylinder to the EkoFlush K572 and prevent it from falling onto the operators.

6.9 For the flushing of complicated circuits, it’s kindly suggested to use a scale to check the quantity of SOLSTICE® PF-C at the beginning of the operations and the solvent recuperated at the end of the process. This check will confirm the total extraction of the solvent from the cleaned circuit.

6.10 Before starting the flushing, please verify that the pressure in the solvent cylinder is between 6 and 8 bar (max 8 bar). This check can be done after having connected the hoses, by looking at the high-pressure manometer (pos. 13 – see Picture 4) without switching on the K572 Unit. The valve on the liquid outlet of the cylinder and the relevant valve on the hose must be open when this test is in progress. Maximum permissible pressure of 8 bar is indicated by a red line on the high-pressure manometer (pos. 13)!

The refilling of nitrogen in the refrigerant cylinder is permitted using appropriate equipment. Please consult your local supplier of the SOLSTICE® PC-C solvent in case of need.

6.11 Check the oil level in the compressor sight-glass and refill if necessary. The level of the oil must be between those two lines, indicated in the picture below.

Picture 2 - Sight-glass for compressor oil

WARNING! Any claim for malfunctioning caused by lack of oil won't be accepted!!

6.12 Connect the front panel of the EkoFlush K572 to the circuit to flush, as follows:

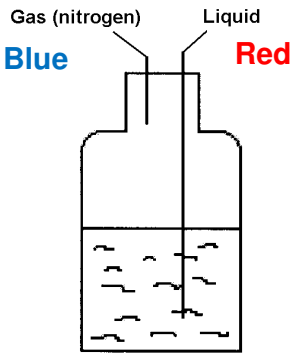
- inlet into the flushed circuit to "IN"
- outlet from the flushed device "OUT"

The ends of the hoses with the valves must be near the flushing unit.

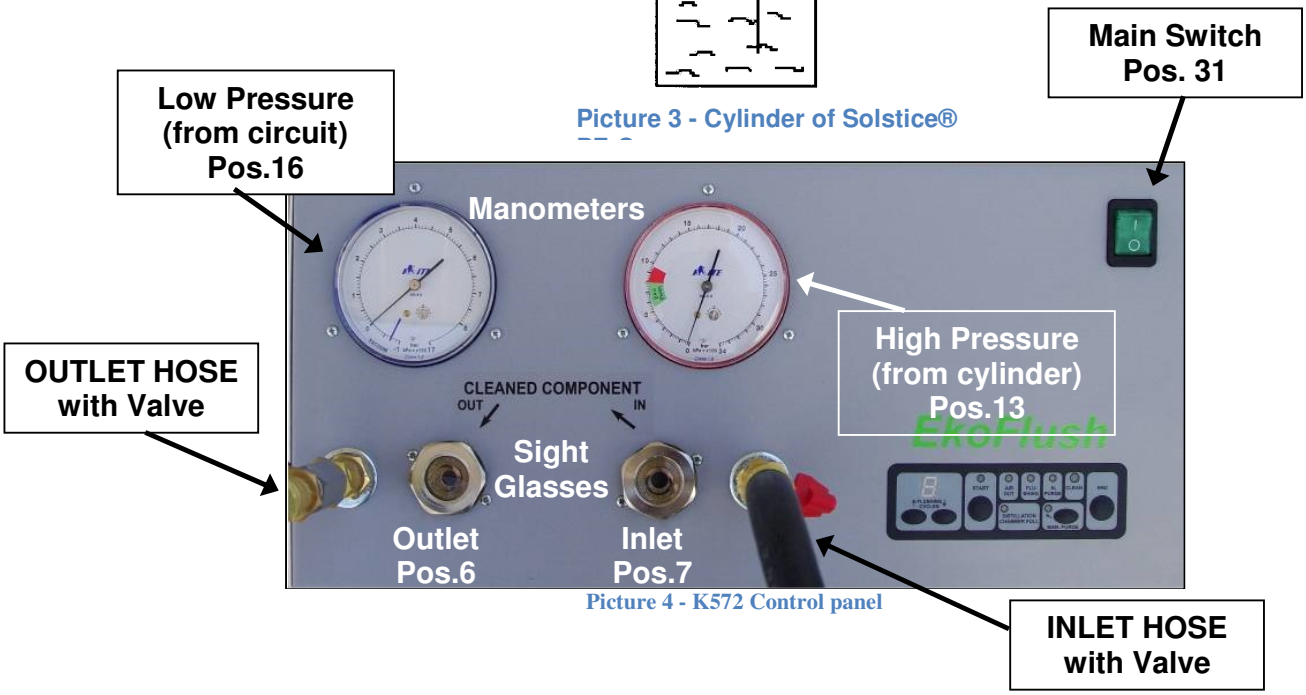
IMPORTANT

Whenever possible, in order to ensure easier flushing, please connect the inlet to the circuit to be flushed in higher position than the outlet: gravity helps the cleaning process.

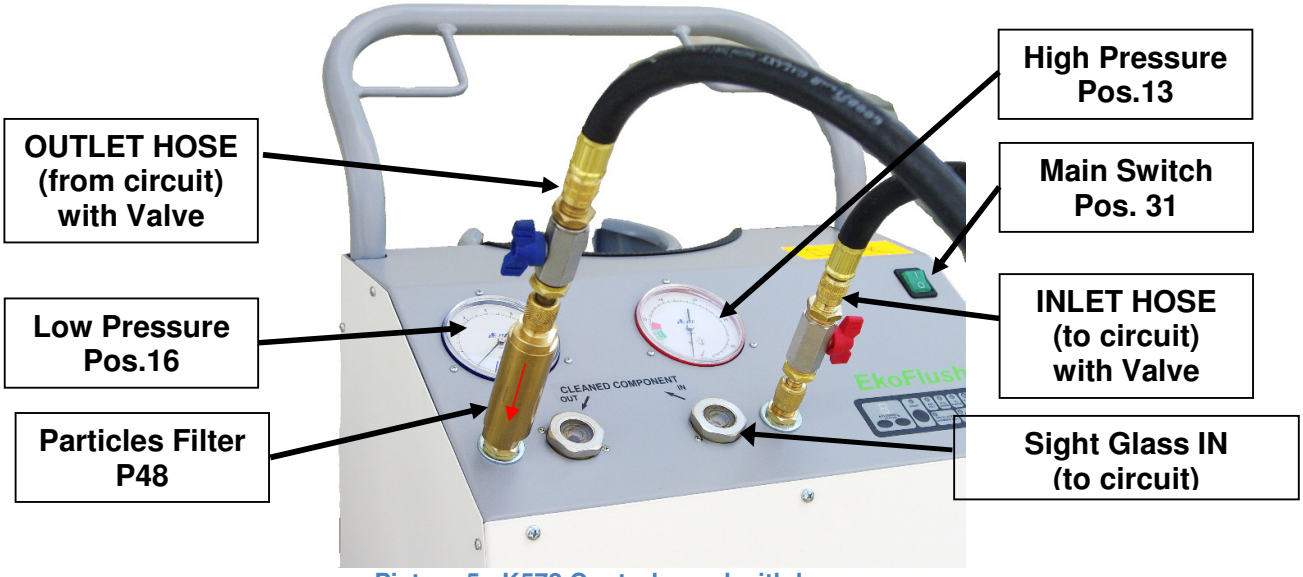
7. Device flushing procedure



Picture 3 - Cylinder of Solstice®



Picture 4 - K572 Control panel



Picture 5 - K572 Control panel with hoses

7.1 Ensure that the connections of all the hoses are tight (see chapter 6).

7.2 Open all valves both on the solvent cylinder and on the hoses.
Picture 5 here above describes the cylinder before and after the completion of the flushing procedure.

At the beginning of the flushing process, the unit automatically evacuates the circuit to clean from the air, then automatically fills it with the solvent SOLSTICE® PF-C.

PLEASE NOTE

For circuits with more sections, the following steps are recommended:

- As soon as the sight glass (Picture 4 - Pos.6) is filled with the liquid, close the valve on the hose connected to the outlet marked "OUT" (on the left in picture 3).
- The inlet sight glass (Picture 4 - Pos.7) enables the control of the filling of the complete system to flush with the solvent SOLSTICE® PF-C.
- When the liquid stops to flow in the inlet sight glass (Picture 4 - Pos.7), the circuit is completely filled and it is possible to open the valve on the outlet hose marked "OUT" (blue, on the left side of the picture).
- The flushing procedure goes on automatically.

With simple circuits, the instructions above can be omitted.

7.3 The size of the solvent cylinder needs to be adapted to the size of the circuit to be flushed.

Please consult your local supplier for recommendations on the most suitable cylinders for your flushing operations.

For best performance, the optimal internal diameter (Dn) of the circuits to flush should range from 8 to 20 mm.

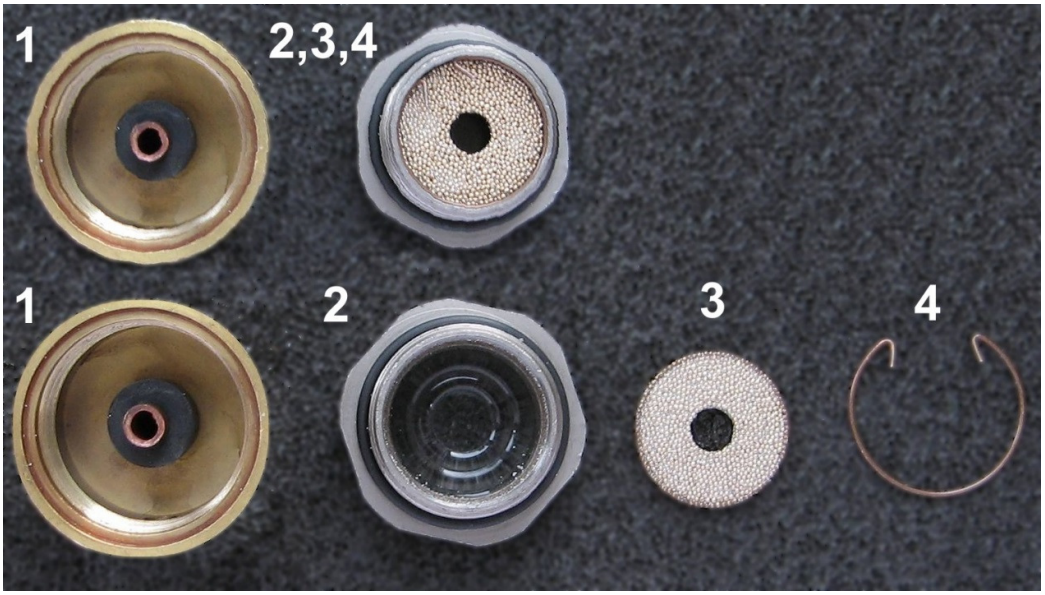
7.4 When the filter of the Outlet sight glass (Picture 4 - Pos. 6) is full of dirt and the current process slows down or practically stops (the pressure on the low pressure gauge - Picture 4 - Pos. 16 is increasing slower than normal or it doesn´t increase at all), please follow these instructions:

- Close the valve on the hose connected with the “OUT” outlet (Picture 4, on the left, in blue),
- Let the unit run until the pressure on the low pressure gauge (Picture 4 - Pos. 16) reaches 0 bar (equal to 1 bar of absolute pressure).
- Turn off the unit using the Main Switch (Picture 4 - pos. 31)
- Wait for several minutes. The pressure on the low pressure gauge (Picture 4 – Pos. 16) should increase.
- If the pressure increases over 0 bar (1 bar of absolute pressure), repeat the process (turn on the unit and wait for the pressure to drop).
- When the pressure does not increase after having turned off the unit, you can dismantle the sight glass (Picture 4 – Pos.6) and clean the filter.

Using the external P48 Filter prevents the Sight Glass filter to accumulate dirt.
It’s important to follow the instructions here above to prevent injuries when disconnecting it from the EkoFlush unit.

IMPORTANT!

The unit must be turned off while dismantling the sight glass or the P48 filter. At the same time, the valve of the hose on the outlet marked “OUT” (Picture 5 – left side – in blue) must be closed!!!



Picture 6 - Solvent front sight-glass distmantled

After dismantling the upper part (No. 2, 3, 4), withdraw the blocking spring (No.4) and dismantle all single parts (No.2, No.3 and No.4) and clean them, together with the interior of the sight glass (No. 1).

CLEANING THE P48 FILTER

The cleaning of the P48 Filter is extremely simple:
- Open the external cartridge by unscrewing it
- extract the inner metal filter,
- blow it with compressed air or brush it
- put the filter back in its original position and close the cartridge.

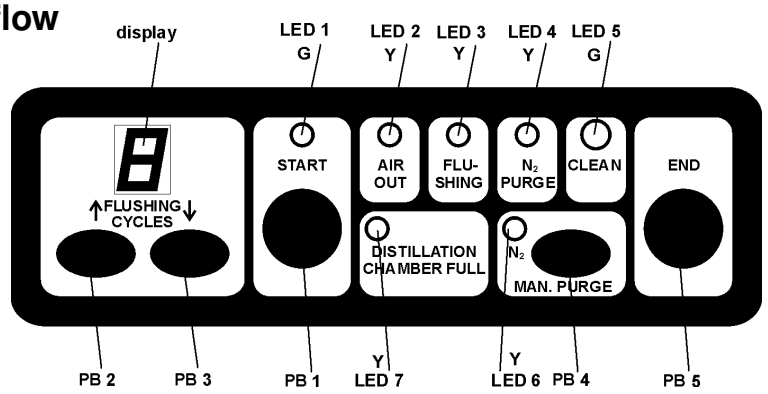
NOTE: The metal filter inside the cartridge has an infinite life. In case it's heavily clogged, you can wash it with solvent.

7.5 After completing the flushing, it may happen (for many reasons) that the final pressure in the cylinder is lower and that the quantity of recuperated SOLSTICE® PF-C is also less than at start. If a cylinder of an appropriate size has been chosen for the flushing operation, in absence of unexpected leaks, the quantity of the solvent should be sufficient to perform 20 cleanings. Please consult your solvent supplier in case of problems.

WARNING!
A high loss of SOLSTICE® PF-C can indicate a problem of leakage in the flushed circuit.

8. Unit controlling – work flow

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

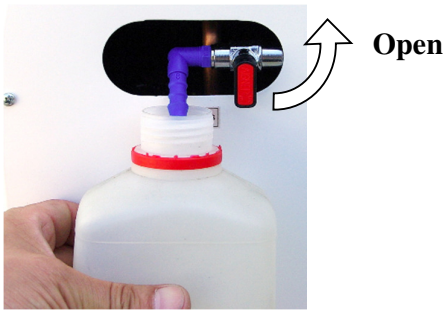


Picture 7 - K572 Switchboard

		DISPLAY or LEDS
8.1.	**Turn on the main switch.**	The display shows the number of remaining flushing procedures three times. –see 10
8.1.1.	Initial status.	On display "1" and LED 1, LED 6
8.1.2.	**Select 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. With min. cycle count at „1", just one processing cycle will be completed.	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.	On display "X" and LED 1, LED 6 blinks.
8.2.	**Press PB 1 – start**	
8.2.1.	Sucking-off (90 sec.)	On display "X" and LED 2
8.2.2.	Flushing (after filling the distillation chamber, 7min. sucking-off) Next cycle of flushing.	On display "X" and LED 3 LED7 lights up when the distillation chamber is full. 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. If "1" is selected, only the ongoing processing cycle will be completed.		
8.2.3.	Sucking-off the liquid phase of SOLSTICE® PF-C through nitrogen purge. 5 cycles made of 20 sec nitrogen purging + 60s pause	On display "0" and LED 4 during the pause intervals: LED 4 blinks
8.2.4.	Sucking-off the vapor phase of SOLSTICE® PF-C - after the discharge of liquid is completed. It is possible to blow-out the solvent with nitrogen (20 sec) during this period – pressing PB 4 After 180 sec. 3 beeps will follow. After this acoustic signal and at a pressure higher than 0 bar on LP manometer, pressing PB 4 the blow-out with nitrogen can be repeated up to 5 times.	On display "-" and LED 5, LED 6 By pressing PB 4, LED 6 blinks On display "-" and LED 5 blinks, LED 6
8.2.5	Within 15 min. from the acoustic signal, the compressor turns off, the display goes blank. Before PB 5 -"END" is pushed, nitrogen blow-out may be repeated up to 5 times by pushing PB 4.	LED 6, LED 5 blinks, on display "-"
NOTE: **During the flushing (8.2.2) the dist. chamber is filled and/or emptied with solvent and LED 7 blinking or simply on.** When the procedure of par. 8.2.4 is in progress, the nitrogen purging process can be activated 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 purging 5 times by pushing 1x PB 4.		

Remark :
If the electric power is interrupted when the procedure at point 8.2 is in process (from the pressing of "START" until the first acoustic signal), LED 1 blinks after electric power has been renewed.
You need to press PB 1 – START again to continue the program from the point it had stopped (the last active process step is repeated from its beginning).
The same happens if PB 5 – END is pressed (compressor is stopped, LED 1 blinks). To continue the program, press PB 1 – START.

8.3.	**Completing the flushing.**	
8.3.1.	Press 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 7.4)	On display "1" and LED 1, LED 6
8.4	**Discharge of oil and sludge from the distillation chamber**	
8.4.1	Press PB 4 – MAN.PURGE once. Nitrogen is sent to the distillation chamber for 20s.	On display "1", LED 6 blinks
8.4.2	Press PB 4 - MAN.PURGE a second time and reduce the pressure to 0,5 – 0,7 bar. The compressor is on.	
8.4.3	Press PB 5 – END to turn off the compressor.	On display "1", LED 1, LED 6
8.4.4	Open the discharge valve of the distillation chamber (see Picture 8) and discharge the oil and the sludge into a container. Once the oil stops flowing out and nitrogen begins to get released, close the valve.	On display "1", LED 6
NOTE In the flushed circuits an overpressure of about 0,3 bar will remain. The cycle can be finished with the work flow described at point 8.4.8. To reduce the nitrogen loss it is recommended to follow the work flow described in points 8.4.5 and 8.4.6. The procedure will be completed with point 8.4.8.		
8.4.5	Open the nitrogen supply of the distillation chamber for 20s by pushing PB 4 – MAN.PURGE once.	On display "1", LED 6 blinks
8.4.6	Turn on the compressor by pushing PB 4 – MAN.PURGE a second time and reduce the pressure to atmospheric pressure level (0.0 bar on the LP manometer – Picture 4, Pos.16).	
8.4.7	Turn off the compressor by pushing PB 5 – END.	On display "1", LED 1, LED 6
NOTE In order to reduce any losses of SOLSTICE® PF-C, especially when flushing larger circuits, at point 8.4.6 it is recommended to wait for an under-pressure between -0,5 and -0,8. Once that level is reached, press PB5 – END to switch off the compressor. We recommend to bring the flushed circuit to atmospheric pressure or slight overpressure using pure nitrogen (it'll prevent moisture to enter the circuit).		
8.4.8	Turn off the main switch (Picture 4, Pos.31)	



Picture 8 - Discharge of oil and dirt

IMPORTANT NOTE

1) The low-pressure manometer (Picture 4, Pos. 16) – shows the pressure in the circuit being flushed. It does not show any overpressure in the distillation chamber.

2) Oil and sludge can also be discharged from the distillation chamber after the flushed circuit is disconnected. However, you must connect the inlet and outlet with a single hose (see Picture 10) and follow procedure 8.4,.

3) The procedures and pressures in this manual assume a workplace ambient temperature of about 16°C – 24°C.

4) **Vapor Pressure of SOLSTICE® PF-C at various temperatures**

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 read on the LP manometer after the flushing procedure is higher than the vapor pressure reported here above (at the specific work temperature), there is some liquid SOLSTICE® PF-C in the circuit.

NOTE
The temperature of the flushed circuit can drop below ambient temperature due to the cooling effect caused by the evaporation of SOLSTICE® PF-C, especially during the flushing of complicated circuits with siphons.

5) For the recovery of the flushing solvent at low ambient temperature (or due to the under-cooling of flushing solvent described above) it is necessary to repeat several times the procedure at point 8.2.4 or to warm up the flushed circuit at a temperature of at least 20°C.

6) Ambient temperatures in excess of 40°C decrease the operative 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 Picture 8) 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!!!

9. Completing the Flushing

9.1 Drain off the oil and the residues from the distillation chamber.

9.2 Close all valves.

9.3 The disposal of the oil and residues from the distillation chamber must be done according to local waste regulations.

9.4 Check the oil in the compressor after each flushing process.

9.5 Replace the oil after 200 hours of operation.
After this time, the device will automatically display an alert on need to change the oil. When turning on the EkoFlush K572, the display will show the message "OIL" (in sequence "O", "I", "L").

This message can be dismissed by pushing PB 2 and PB 3 simultaneously- Operations can be continued by pressing then PB 1.

The message is displayed at 3 consecutive start-ups, always when the unit is turned on; therefore it is necessary to delete the alert three times once the oil has been changed. If there is no message after turning the unit on, it means that the alert has been deleted and that the counter has been reset to zero. From this moment, the internal counter will activate a new alert when the service time of 200 hours will be reached.

WE RECOMMEND
Upon completion of the cleaning operation, the flushed circuit may remain under-pressured (see par. 8.3), therefore we recommend to bring the pressure in the circuit to 1 bar using dry nitrogen, so that no moisture enters the circuit after disconnecting the EkoFlush K572. Further vacuuming of the circuit with a vacuum pump will be more efficient.
It is appropriate to close the outlets of the flushed circuits after the disconnection using plastic or rubber covers or adhesive scotch tape to prevent the entrance of moisture

10. Exchange of SOLSTICE® PF-C solvent

Honeywell recommends to replace the flushing solvent SOLSTICE® PF-C after 20 flushing operations. The real efficiency in the purification of the flushing solvent depends on the type and level of the fouling of the cleaned equipment.
The number of remaining flushing procedures appears on the display three times after turn on the main switch.
After 20 flushing procedures (not only cycles), the EkoFlush unit will inform that SOLSTICE® PF-C solvent needs to be changed. Three (3) horizontal blinking lines will appear on the display.

After SOLSTICE® PF-C solvent has been changed, the 3 horizontal blinking lines can be cancelled following these steps:

- turn on the main switch
- press simultaneously PB4 and PB5
- turn of the main switch

If the flushing unit is used only for distillation of dirty SOLSTICE® PF-C (see chapter 11), this indication of the three blinking lines is not important, but it is necessary to cancel it following the procedure described above.

PLEASE NOTE
In case the above procedure is not followed, the blinking lines will continue to appear every time the EkoFlush unit is switched on and before every other flushing operation. In this event, in order to start the flushing, it is necessary to press PB2 and PB3 simultaneously.

11. Subprogram „distillation“

If SOLSTICE® PF-C is used for flushing operations without the EkoFlush machine, the EkoFlush unit can be used for the cleaning of contaminated SOLSTICE® PF-C.

Please enter into the „distillation“ sub-program as follows:
- Turn on the main switch – on display lights „1“.
- Press „FLUSHING CYCLES DOWN“ and then „END“: on the display a “d” will appear .

Please note that it´s necessary to press „FLUSHING CYCLES DOWN“ and to keep it, then to press „END“ and finally to release them both together at the same time.

On the back side of the unit, please connect an empty solvent cylinder as you would connect the full solvent cylinder in normal flushing operations:

- vapour outlet (blue) from cylinder to „NITROGEN“
- liquid outlet (red) from cylinder to „LIQUID“.

Now connect the cylinder with dirty SOLSTICE® PF-C to the front of the unit:

- vapour outlet (blue) on cylinder to inlet „IN“
- liquid outlet (red) on cylinder to inlet „OUT“.

Open all valves on both the solvent cylinders.

Press „START“. The LED light „FLUSHING“ will turn on and SOLSTICE® PF-C begins to flow through the sight glass „OUT“ into the distillation chamber.

When the chamber is filled (it´s shown as „DISTILLATION CHAMBER FULL“) the distillation will proceed for 4 min., then the distillation chamber will be emptied and the LED “DISTILLATION CHAMBER FULL” will turn off.

If the level of contaminant (oil, particles, water, etc…) in the distillation chamber reaches the maximum upper limit, then the supply of dirty SOLSTICE® PF-C to the chamber is stopped, the display will show „o“ and the distillation will take another 7 minutes, until all SOLSTICE® PF-C is distilled.

After this phase, a triple beep will be heard, the compressor switches off, the display will show a blinking „o“ and the LED „START“ will lighten up.
It’s time now to discharge the contaminants (oil and particles) from 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.

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.
Please place the short rubber hose provided and a suitable fluid container (bottle, pail,…) to collect the contaminant, open the drain valve of the distillation chamber and then open the valve on the back side of the unit.
The pressure of the vapour of SOLSTICE® PF-C will push oil, particles and dirt out from the distillation chamber. When the flow will stop, close both valves.
To continue with the distillation, press „START.

If the solvent cylinder with dirty SOLSTICE® PF-C (to be distilled) is empty, the LED „CLEAN“ will turn on and the display will show „o“ at the same time.
From this moment, the distillation will take approximately another 7 min, after which you will hear three beeps, the display will show „o“ and the LED „START “will blink.

Finally, discharge the contaminants (oil and particles) from the distillation chamber as described above, then press „START“, the LED „CLEAN“ will blink and the units will evacuate the vapour of SOLSTICE® PF-C from the cylinder.
When the pressure on the low-pressure manometer will go under 0 bar, it´s necessary to stop this programme by pressing „END“.
The final evacuation of the vapours takes max. 15 minutes, then the compressor will switch off automatically. No need to press „END“ again.

Warning!
During the distillation process, it´s necessary to check the filter in the sight glass „OUT“, because if that filter will accumulate a lot of dirt, the flow may be limited, and the unit will respond as if the cylinder with dirty SOLSTICE® PF-C is empty.
If this happens, press „END“ (the LED „START“ will blink), close the hose valve (red) at the sight glass and clean the filter in the sight glass (see paragraph 7.4) and the filter P48 if you are using it.
Once the filters have been cleaned and placed in the original position, open the liquid valve (red) and continue the distillation by pressing „START“.

PLEASE NOTE
In case you are using the filter P48 too, you can realize that the flow has been stopped only by weighing the cylinder with the dirty solvent.
Should you have remaining solvent to distillate, stop the flow as described above (press “END” and close hose valve at the filter) and clean the P48 filter, then continue the process by pressing “START”.

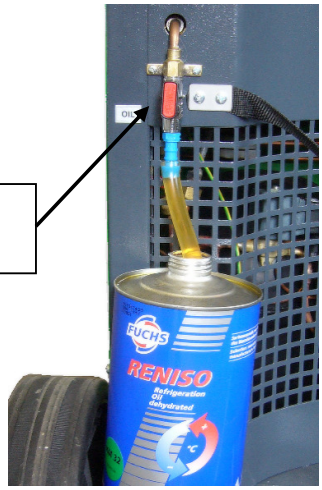
12. Oil

12.1 Oil change

New complete filling is 0,4 liters of recomended oil. During filling, it is necessary to place a sufficient volume of oil in a suitable container under the oil inlet (pos. 33), so that the hose fitted to the valve reaches the bottom of the vessel. Then follow the procedure here below.

a. Open the sight glass cap and drain off the oil from the Unit into a suitable container.
b. Check the cap sealing and close sight glass.
c. Open the valve (pos. 33 - Picture 9 - Adding oil to the compressor)
d. Connect the inlet (IN) and the outlet (OUT) with a hose with a ball valve and close the valve
(Picture 10 - Connecting INlet and OUTlet)

b) **Picture 10 - Connecting INlet and OUTlet**



Picture 9 - Adding oil to the compressor

a. Turn on the main switch (Picture 4, pos.31).
b. Press PB 4 - MAIN.PURGE and wait for 20s until LED 6 stops blinking.
c. Press PB 4 – MAIN.PURGE again. The compressor will turn on and the oil from the vessel will be sucked into the device.
d. Once the oil container is empty, press PB 5 – END.
e. Close the valve (pos. 33)
f. Disconnect the hose between the device's inlet and outlet
g. Turn off the main switch (Picture 4, pos.31).

12.2 **Adding oil**

PLEASE NOTE: If the oil is cloudy or dirty, replace it !!! (12.1)

a. Connect the inlet (IN) and the outlet (OUT) with a hose with a ball valve and close the valve (Picture 10 - Connecting INlet and OUTlet)
b. Suitable container with the recommended oil placed according to the picture 9.
c. Open the valve (pos. 33 - Picture 9 - Adding oil to the compressor)
d. Turn on the main switch (Picture 4, pos.31).
e. Press PB 4 - MAIN.PURGE and wait for 20s until LED 6 stops blinking.
f. Press PB 4 – MAIN.PURGE again. The compressor will turn on and the oil from the vessel will be sucked into the device. Be carefull to avoid overfilling.
g. Check the oil level (Picture 2) and press END (PB5) when the correct level is reached.
h. Close the valve (pos. 33)
i. Disconnect the hose between the device's inlet and outlet
j. Turn off the main switch (Picture 4, pos.31).

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

A cylinder of SOLSTICE PF-C can be used to flush efficiently a maximum of 20 circuits, after which you can still use the solvent for a final Open-flush operation (vented to air).

Please return the empty cylinder of SOLSTICE PF-C to your local supplier.

Please dispose waste residuals (contaminants) according to the local laws on the disposal of dangerous waste.

14. Risks Analysis

The manufacturer has dedicated great attention to the protection and safety of the users and of the environment. However, there are some general risks to be aware of:

- Risk working with a high pressure gas when refilling the cylinder with SOLSTICE® PF-C with nitrogen (to raise the internal pressure of the cylinder to 8 bar).
  Typically, the cylinders containing 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 cylinder with SOLSTICE®PF-C without an integrated cylinder pressure regulator adjusted to the given pressure. RISK OF SERIOUS INJURIES!

Please refer to your local supplier in case you need to rebuild the nitrogen pressure in your cylinder of solvent.

- The EkoFlush unit works with pressurized liquid and gas. Handling of connecting hoses without observing instructions and general safety principles can result in quick pressure increase and sudden solvent release, therefore, be extremely careful and use protective goggles and gloves.

  At the beginning and at the end of the flushing operations, always ensure that the valves on the hoses and on the solvent cylinder are closed and that hoses are correctly and tightly connected before opening them.

  Always check that the valves on the cylinder are closed before removing the connecting hoses
  Please slowly unscrew the hoses when removing them, in order to release any internal pressure.

15. Failures, Possible Causes, Troubleshooting Guide

Problems / Defects	Possible Cause	Suggested Solution
After switching on, the signal light does not turn on.	Energy supply defect.	Check power cable, plug and distribution circuit breaker.
The unit works but under-pressure in the distillation chamber cannot be reached.	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 valves on hoses. If defect remains there is leakage in circuit to flush – repair leakage. b) Close valve. c) Contact service center.
After sucking off the air, the flushing agent does not flow.	a) Valves on hoses or on the cylinder with SOLSTICE® PF-C are closed. b) Defect in hoses interconnection between the solvent cylinder and the K572 unit.	a) Open valves on hoses and on the cylinder. b) Verify the connection of the hoses: inlet-outlet and liquid and vapor outlets on the cylinder with SOLSTICE® PF-C.
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) The valves on hoses or on the refrigerant cylinder on the liquid inlet are closed. b) Pressure has gone beyond 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 gone beyond maximum level.	a) Open valves on hoses and the refrigerant cylinder liquid inlet with SOLSTICE® PF-C. b) Press PB1 -START and purge will continue. c) Contact service center – see the notification on page 21. d) 1) Reduce the pressure in the solvent cylinder below 8 bar by releasing the hose screw joint at the gas valve (blue) of the solvent cylinder. 2) Reduce the pressure in the distillation chamber using the oil discharge valve (pos. 5). Discharge into a suitable vessel! e) Press PB1- START and flushing will continue.
The unit is connected to the socket, but after having pressed PB1- START compressor does not work. The signal light is lit up!	Defect in the electrical accessory of the compressor or defect in the compressor.	Contact service center.
Low flushing output.	a) Polluted filter in the sight glass “OUT” pos. 6 b) Low nitrogen pressure in the cylinder.	a) Clean the sight glass filter (see point 7.4) b) Fill some nitrogen in the solvent cylinder to raise the pressure to 8 bar.Please consult your solvent supplier.

Problems / Defects	Possible Cause	Suggested Solution
The pressure on LP manometer is lower than minus 0.5 bar, but in the flushed circuit there is still liquid SOLSTICE® PF-C.	The circuit is clogged.	Close the valves on the hoses at flushing unit. (on the hoses interconnecting flushing unit and circuit to flush – see Picture 5) Disconnect them and then connect them reversed (IN / OUT). Open valves on hoses. 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). Wait for about 10 minutes. Switch off the compressor by pressing PB5. If an under-pressure is not reached, repeat the procedure.
EkoFlush unit runs, but required under-pressure cannot be reached. Compressor doesn't work.	Compressor failure.	After completing the flushing procedure, wait for an acoustic signal, then push the PB5-END button and switch off the unit. Close all valves on hoses and disconnect hoses from cylinder and EkoFlush unit. BEWARE: The EkoFlush unit can contain small quantity of liquid SOLSTICE® PF-C. Use a recovery machine to recover SOLSTICE® PF-C from the circuit to the solvent cylinder. The Inlet of recovery machine must be connected to outlet of the circuit to be flushed. The Outlet of the recovery machine must be connected to the cylinder valve – liquid phase - RED. Follow the instructions in the manual of the recovery machine. Use a scale to avoid the overfilling of the solvent cylinder.

Notification:

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

Checking EkoFlush function

- Connect inlet and outlet of EkoFlush with one hose, if a hose with a valve, please open it (Picture 10 - with open valve)
- 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

16. 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) a jName und Anschrift des Beauftragten für Aufbewahrung der technischen Dokumentation (laut 2000/14/EC) / *Name and address of the person authorised to compile the technical file according to 2006/42/EC) and name and address of the person, who keeps the technical documentation (according 2000/14/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, 2006/95/EC, 2004/108/EC**
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 ed.2:03+A11:04+A1:05+A12:06+A2:07, EN 55014-1 ed.3:07, EN 61000-3-2 ed.3:06, EN 61000-3-3:97+Z1:02, EN 55014-2:98+A1:02 EN ISO 12100-1:04, EN ISO 12100-2:04**
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 26.03.2010
Place and date of issue: Prague 26.03.2010
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*	

17. Safety guidelines

SOLSTICE® PF-C

These data are just indicative, please refer to a valid MSDS of Solstice® PF-C for latest information.

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
R-phrases: 52/53
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.

18. K572 Optional Accessories to order

ITEM	DESCRIPTION	PHOTO
Pipe with flange connection Order number: 352 00560	connecting pipes diameter 8 - 18mm (if used with EkoFlush-K572 it is necessary to use reduction for hose connection)	
Pipe connection 8-18 mm Order number: 352 00561	connecting pipes diameter 8 - 18mm (if used with EkoFlush-K572 it is necessary to use reduction for hose connection)	

Please contact your local supplier for advices on different kind of connectors.

Manufacturer:

For Honeywell:

Ekotez Ltd.
Koněvova 47
CZ-13000 Prague 3
Czech Republic

Franchise Dealer – Reseller:

Remark: