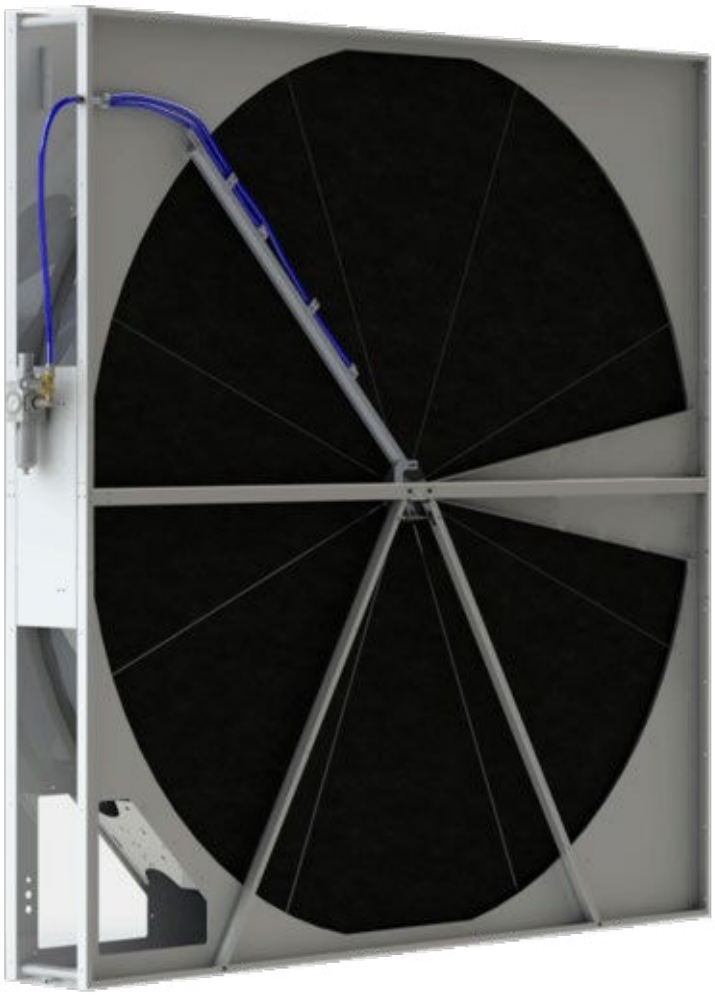
HEATEX

CLEAN BLADE



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CONTENT

1. PURPOSE AND FUNCTION

The purpose of the clean blade solution is to remove any contamination stuck in the rotary heat exchanger. The cleaning is done by an air knife acting as a static air nozzle that covers the entire radius of the rotor. One revolution of the rotor is enough to clean the entire surface. The clean blade solution uses pressurized air to push the contaminants out of the rotor and into the leaving air.

The air knife should be positioned on the exhaust/contaminated air inlet side of the rotor. It will then push the contamination through the rotor and out into the leaving air.

2. COMPONENTS

The clean blade solution consists of a pressure regulator with a filter (1), a solenoid valve (2) for on/off control, one or two air knives (3) to distribute the pressurized air onto the rotor, and hoses and connections (4). The clean blade solution covers the complete model E and EQ diameter ranges, 500-2575mm and 1600-3800mm. Predefined kits are available. All kits can be delivered and installed on the casings.

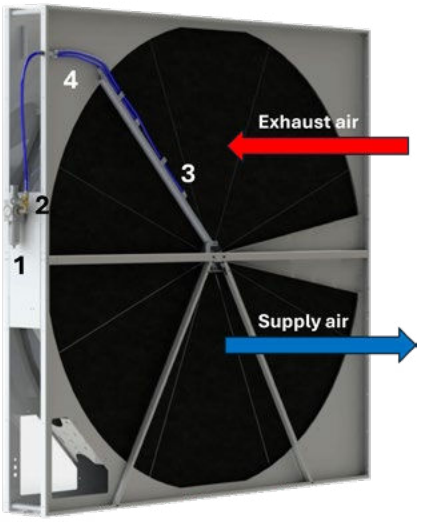

Figure 1. Clean blade position and components

2.1 Materials

- Air knife: Aluminium
- Hoses: Polyethylene
- Connectors: Brass nickel plated & plastics (acetylate resin)
- Solenoid valve: brass, stainless steel and BUNA
- Pressure regulator: Aluminium, polyamide, NBR, polycarbonate

2.2 Interface

The clean blade solution is connected and controlled via two interfaces:

- Pressurized air inlet to the pressure regulator. The inlet for the pressure regulator is R 1/2". A nipple for hoses with an inner diameter of 19mm comes with the installation. Heatex does not recommend going below this hose diameter due to pressure losses in the hose. See Figure 2 for a guide on how to set the correct pressure. Make sure that sufficient air is flowing through the pressure regulator before the correct pressure is set, if the air flow is too small the pressure won't be possible to set high enough. Start by pulling the top cap upwards according to figure 2. The correct pressure that the pressure regulator will let through is then adjusted by twisting the cap. The set pressure is indicated by the arrow on the manometer. Once the correct pressure is set, push the top cap downwards. Heatex recommends a minimum pressure of 5.5 bar, but this can vary depending on the level of debris.
- 24V DC is the standard connection to the solenoid valve for on/off control of the air flow. Cable (3Cx0.5mm2) is not included. See figure 3 for a guide how to install or change the power cables.

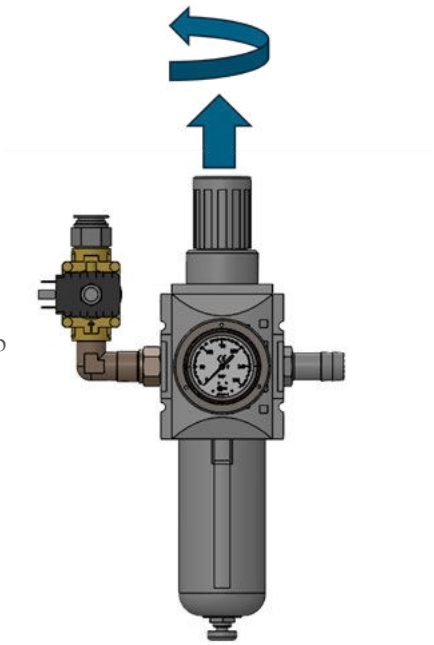

Figure 2. Setting the correct pressure

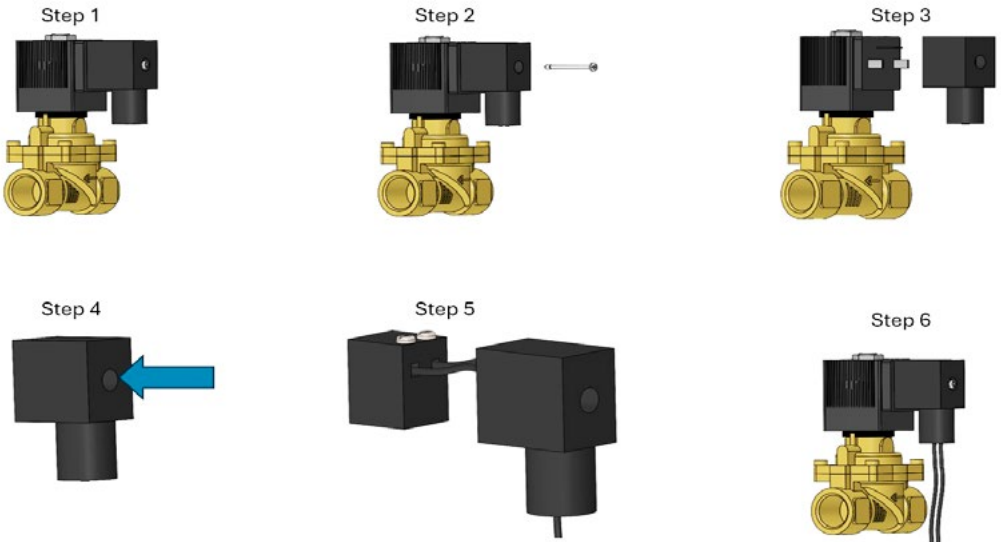

Figure 3. Steps for installing the power cables to the solenoid valve.

Step 1	Solenoid without power cables connected.
Step 2	Remove the screw.
Step 3	Disconnect the socket from the solenoid valve.
Step 4	Push the inner socket out of its cover by pushing the screwdriver in the screw hole.
Step 5	Change or install the cables.
Step 6	Follow step 1-5 backwards to complete the installation.

3. MODEL E

If the rotor heat exchanger is intended for slide-in AHU, clean blade solutions for casings with a width below 316mm need to be assembled when the casing is already installed inside the AHU. Casings with a rotor diameter of 1100mm and below have a casing width less than 316mm. However, that can be changed to 316mm if specified.

Rotor diameter range (mm)	Standard casing width (mm)
1600-1820	276
1821-2135	276
2136-2440	276
2400-2700	316
2701-3000	316
3001-3800	316
1926-2300	316
2301-2575	316

Figure 4. Clean blade ranges for Model E

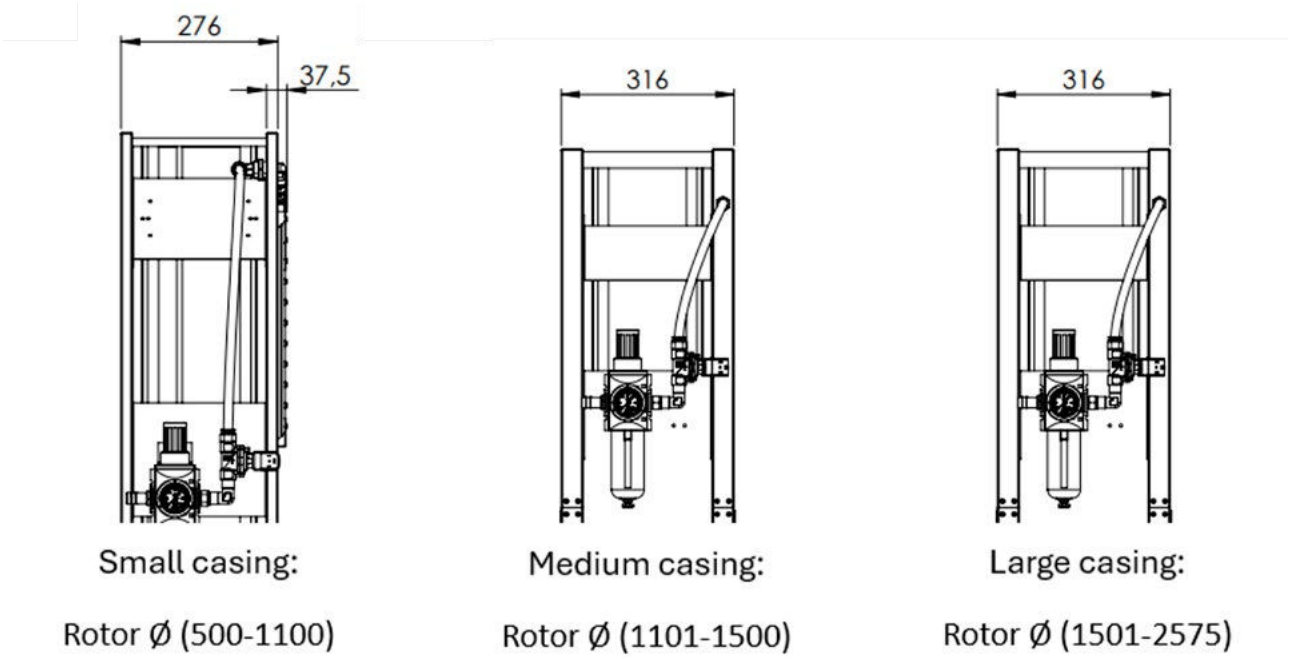

Figure 5. In small model E casings with a width of 276mm (diameter ≤1100mm), the clean blade protrudes the casing by 17.5 ±2mm. For mid and large model E casings, the clean blade solution does not protrude the casing.

3.1 Pressurized Air for Model E

Rotor diameter (mm)	Air knife length (mm)	Air consumption Nlpm (Normal liters per min at 5.5 Bar)	Condensation and hybrid material (Normal liters needed at 5.5bar for 1 rotation (5sec))	Adsorption material (Normal liters needed at 5.5bar for 1 rotation (2.4sec))
500-725	305	763	64	31
726-950	457	1143	95	46
951-1100	610	1525	127	61
1101-1300	610	1525	127	61
1301-1500	762	1905	159	76
1501-1600	762	1905	159	76
1601-1925	914	2285	190	91
1926-2300	1100	2750	229	110
2301-2575	1220	3050	254	122

Figure 6. Air flow required at 5.5bar for model E. If the required air flow is higher than available at the site, an alternative is to use two air knives instead of one, which lower the need for pressurized air volume. However, this requires additional components.

4. MODEL EQ

The clean blade solution can always be preassembled in the EQ casing and then slid into the AHU. If the casing is assembled inside the AHU, it must be installed once the rotor is finalized.

The airflow configuration impacts the clean blade solutions design for model EQ. If the exhaust is on the upper/top level, the clean blade solution is installed on the horizontal beam. Then, it is possible to use only one air knife and one solenoid valve for the smaller rotors. If the exhaust air is on the bottom/lower level, then two air knives and solenoid valves are required in all sizes.

Rotor diameter range (mm)	Number of solenoid valves
1600-1820	1
1821-2135	1
2136-2440	1
2400-2700	1
2701-3000	2
3001-3800	2

Figure 7. Clean blade ranges for Model EQ if the exhaust inlet is positioned on the upper/top level.

Rotor diameter range (mm)	Number of solenoid valves
1600-3800	2

Figure 8. Clean blade ranges for model EQ if the exhaust inlet is positioned on the bottom/lower level.

4.1 Pressurized Air for Model EQ

Rotor diameter (mm)	Air knife length (mm)	Air consumption Nlpm (Normal liters per min at 5.5 Bar)	Condensation and hybrid material (Normal liters needed at 5.5bar for 1 rotation (5sec))	Adsorption material (Normal liters needed at 5.5bar for 1 rotation (2.4sec))
1600-1820	762	1905	159	76
1821-2135	914	2285	190	91
2136-2400	1100	2750	229	110
2401-2700	1220	3050	254	122
2701-3000	762	1905	159	76
3001-3800	914	2285	190	91

Figure 9. Air flow required at 5.5bar for model EQ when the exhaust inlet is on the upper/top level.

Rotor diameter (mm)	Air knife length (mm)	Air consumption Nlpm (Normal liters per min at 5.5 Bar)	Condensation and hybrid material (Normal liters needed at 5.5bar for 1 rotation (5sec))	Adsorption material (Normal liters needed at 5.5bar for 1 rotation (2.4sec))
1600-2090	457	1143	95	46
2091-2700	610	1525	127	61
2721-3000	762	1905	159	76
3001-3800	914	2285	190	91

Figure 10. Air flow required at 5.5bar for model EQ when the exhaust inlet is on the bottom/lower level.

5. SYSTEM IMPACT

The clean blade solution will create a shadow effect on the rotor. The impact is larger on small-diameter rotors. In the worst case, assuming the clean blade solution fully blocks the shadowed surface, the impact would be an extra 10Pa and 1%-unit lower performance. The clean blade solution will, however, not fully block the rotor surface since it is installed 25 mm from the rotor surface, so the real impact is significantly less. For mid- and large rotor diameters, the impact will be neglectable.

6. MAINTENANCE

The clean blade solution requires minimal maintenance. The white filter in the pressure regulator is visible from the outside and should be changed when discolored by contaminations. Any humidity is collected in the filter regulator. The water will automatically trickle out if the air pressure to the pressure regulator is shut off.

Heatex recommends including a reoccurring control of hoses and connections in the standard control of the system.

7. DISPOSAL

The disposal of each component should be according to the regulations in the country where the product is dismantled. For a material list, see the chapter Components.