Lifespan Machine v2 Scanner Modifications

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Stroustrup Group  
Centre for Genomic Regulation**

***New Parts:***

Back Fans: DC fans, 120x120x25 mm, 85CFM, 2200 RPM, e.g. Orion Fans OD1225-12HSS

Side Fans: DC fans, 80x80x10.6mm, 33.61 CFM, 3300 RPM, e.g. CUI Inc CFM-8010-13-10

Front Fan: DC fans, 80x80x25mm, 37 CFM, 2900 RPM, e.g. Thermaltake TT-8025A

Screws: for side fans: 30 mm, for front fan: 40 mm

Plastic spacers: 1" segments cut from plastic u channels, Outside Leg Length 3/4",

Hole Saw: 70 mm diameter

Connectors: 1 x 4-pin Molex Male, e.g. IEI 32100-087100-RS

Wire: Audio cable, pair stranded, polypropylene insulation, Belden Wire & Cable 9740MN 008100

***New protocol for cutting holes for fans in the flatbed scanner chassis (bottom):***

1. Disconnect the chassis from the scanner lid
2. Remove the plastic caps from the screws on the top of chassis (in total 4). You can do so by softly hammer a screwdriver under the caps.
3. Remove the screws and open the chassis
4. Place tape on the scanner bar to seal the long slit opening
5. Unscrew the plastic cover on the front of the scanner and remove it
6. Mark the location of the fans according to the scanner modification diagram. Also mark the center of these squares (H1-H3)
7. Cut holes using a power drill:
   1. Wear necessary protection like safety googles
   2. Don’t forget to move the scanner bar away to prevent damage and also protect the cables inside the scanner
   3. For H1-H3: It is advisable to first drill a hole in the marked center of the squares with a regular drill bit and then use a hole saw which you can then easily place in the right position. This will also help to prevent the saw to get stuck in the plastic which would lead to abrupt movements and eventually damage of the scanners
   4. H4: Use a hand saw to cut along the marked lines on the side until the marked line on the bottom (5 cm from the top). Then you can use the power drill to make a lot of small holes along that line and ultimately bend the plastic piece to break it out.
   5. Clean the chassis to remove plastic pieces. You can use compressed air and a handheld vacuum cleaner.

***New protocol for cutting holes for fans in the flatbed transparency unit (lid):***

1. Unscrew the lower part of the lid and remove.
2. Mark the position of the screws (S1, S2) inside the top part of the TPUaccording scanner modification diagram.
3. Drill holes and mount screws (screw nut being on the outside)
4. Mark lines on the lower part of the TPU ccording scanner modification diagram (H5).
5. Use a hand saw to cut along the marked lines on the side up to the bottom line (2,5 cm from top)
6. You can use the power drill to make a lot of small holes along the bottom line and ultimately bend the plastic piece to break it out.
7. Clean both parts to remove plastic pieces. You can use compressed air and a handheld vacuum cleaner.
8. Screw both parts together again

***New fan mounting protocol:***

Use the thin fans (80x80x10.6mm) for the sides of the chassis (F1, F2) and the 80x80x25mm DC fan for the front of the scanner. Mount all of them with screws (two on the top give sufficient stability). The airflow should be directed towards the outside. Attach the wires of the side fans to the audio wire (should be at least 50 cm long) and connect the end of the audio wires with the front fan and a molex connector. The back fans will be attached with strings to the screws on the TPU (airflow directed to the inside). Connect their wires to one audio cable and attach the end to another molex connector. Solder the connected wires together and surround the soldered parts with tape. If you need a longer cable to connect our fans to the molex, you can prepare another, longer audio wire with 4 pin connectors on both sides.

**Final steps:**

After focusing the scanner, you can attach a QR code of the device name inside the lid of the chassis. It should be positioned on the right lower corner of the lid (approx. 2,5 cm from the bottom, 1 cm from the side). Screw the lid back to the scanner chassis and mount 2 plastic spacers on the chassis (at the back of the scanner) and two on the TPU (front of the scanner). With this you will have more space when you lift the TPU up to position the glass plates onto the scanner before starting an experiment. When putting the TPU back in place, make sure it is in a straight position before starting a scan.