

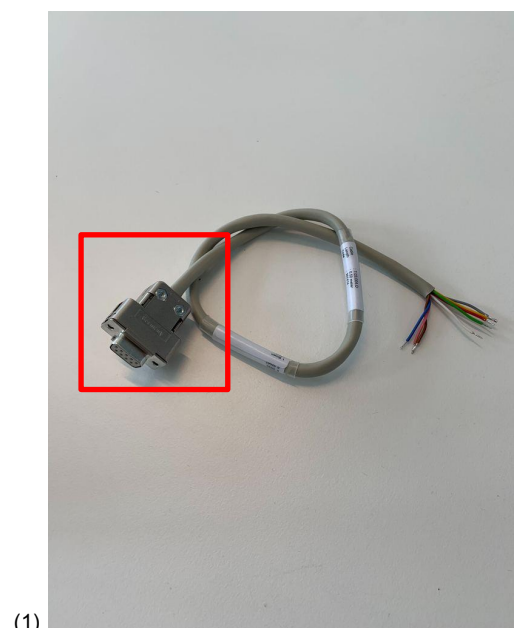
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Revision	Date	Modifications	Author
V1.0	21-04-2020	Description and labeling of all cables and PCB attachment	Jeroen Roest / Bart Spel
V1.1	27-04-2020	Translation from Dutch to English	Karin Olthof

The assembly of the electronic connections between the components is described here. In most parts, the cables need to be guided along the bottom plate as closely as possible. For this purpose, aluminium tape is used. As little as possible of the cables (and therefore also aluminium tape) should be placed over the ventilation grids.

Onderdeel	Leverancier	Aantal
Result subassembly 6 – PCB+ wiring	-	1
Solenoid control valve	Bürkert	1
Ferrite core: cable PCB to MFC	RS online	2
Heat shrink	-	2
Ferrite core: cable PCB to flow sensor	Farnell	1
Grounding cable, 2.5mm2 (AWG14)	-	1
Ring Tongue terminal M4	-	1
Aluminium tape	-	-

- The side to the MFC is provided with a 9 pin D-Sub connector. This needs to be connected to the O2-labeled MFC (see figure 1). Before the cable is connected, the cable needs to be provided with a ferrite core (with circular tunnel).
 - This cable needs to come from location 1, as shown in appendix I. Or you can look at the labeling on the side of the housing.
 - Try to place the cable as close to the bottom plate as possible and secure on a few locations using aluminium tape.
 - On both sides, the M2.5 bolts need to be turned in the connector. these are already located in the connector.
- 1. • The side to the MFC is provided with a 9 pin D-Sub connector. This needs to be connected to the O2-labeled MFC (see figure 2). Before the cable is connected, the



(1)

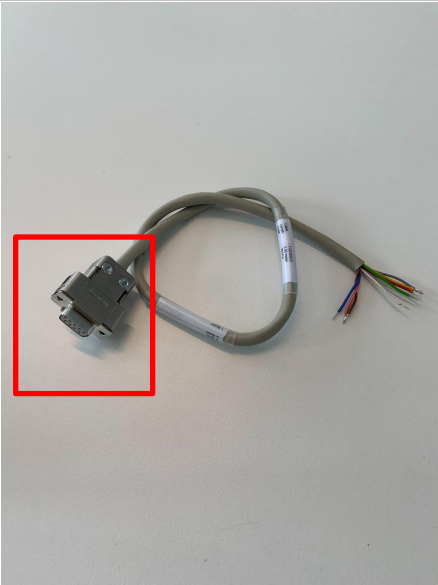
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cable needs to be provided with a ferrite core (with circular tunnel).

2.

- This cable needs to come from location 2, as shown in appendix I. Or you can look at the labeling on the side of the housing.
- Try to place the cable as close to the bottom plate as possible and secure on a few locations using aluminium tape.
- On both sides, the M2.5 bolts need to be turned in the connector. these are already located in the connector.

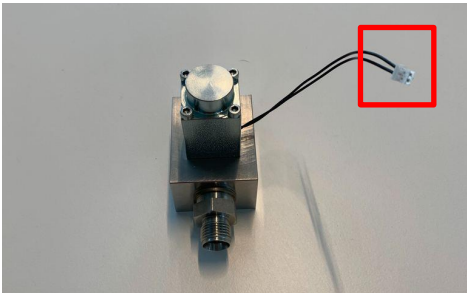


(2)

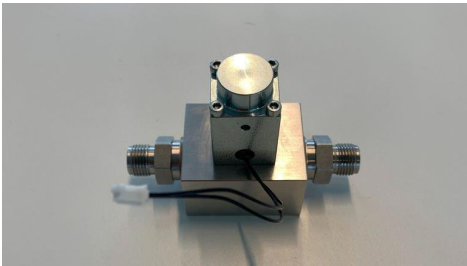
Proportional Inhalation Valve

3.

- The cables are casted in the model of the proportional inhalation valve, the exit cables, as shown in figure 3.1 and 3.2, are supplied and should not be manipulated.
- The white connector (see figure 3.1) should be removed.
- Turn the cables coming from the proportional inhalation valve together to reduce electromagnetic radiation.
- Add a heat shrink (diameter 1 mm) to the individual veins (slide over the veins in the direction of the proportional inhalation valve).
- Connect the stripped ends of the proportional inspiratory valve with the stripped ends of the prepared cable, which is coming from the PCB, by soldering the wires on each other.
- After this, slide back the heat shrink over the non-isolated part and heat the heat shrinks until they isolated the wires correctly.
- Lead the total wire along the bottom plate as good as possible using aluminium tape.



(3.1)

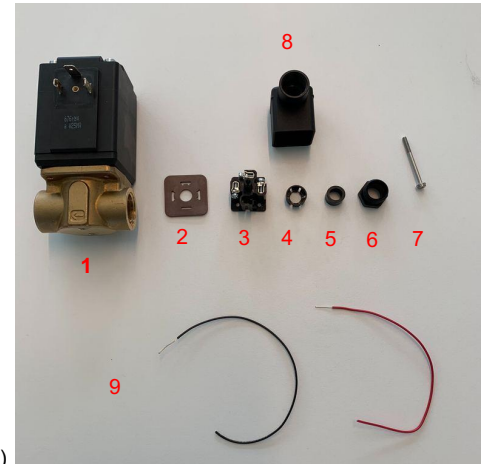


(3.2)

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Solenoid Control Valve (Expiration)

- The previous shown overview of the components is shown in figure 4.1
- The part as shown in figure 4.2 needs to be connected to the solenoid control valve. The cable should be lead along the bottom plate as well as possible. For this, it is useful if the head (see figure 4.2) is guided underneath the structures where the air passes through (in order to do so, it is possible to remove the connector from the PCB and reconnect it afterwards).
 - To do so, first add part 2 in between the pins on the solenoid control valve and then add the complex shown in figure 4.2 on the pins.
 - The connection needs to be secured using a bolt (part 7), which is supplied with the valve. This needs to be inserted through the center of the three pins on the solenoid control valve.
 - The connection is shown in figure 4.3
- The remained cable needs to be connected to the bottom plate on several locations using aluminium tape.



(4.1)



(4.2)



(4.3)

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5.

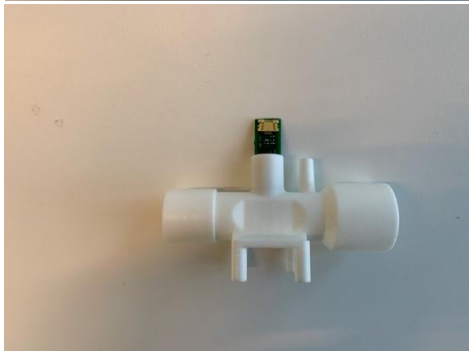
Flow sensor

- The flow sensor will be glued to the 3D printed model (see figure 5.1 and 5.2).
- Remove the protection cover of the flow sensor (see figure 5.3).
- Connect the flex cable with 6 veins (thin flex cable) to the connection available on the flow sensor.
 - Add a ferrite core: PCB flowsensor, around the flex cable .
 - To do so, the ferrite core should be put through the opening of the flow sensor protection, after which it can be reconnected.

(5.1)



(5.2)



(5.3)

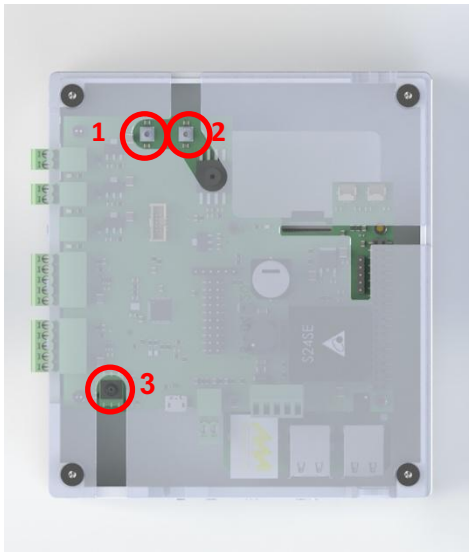


6.

Pressure sensors

- From the housing of the PCB, three connections arise. The three tubes that are assembled in subassembly 10 need to be connected to these connections.
 - The transparent tube from the inspiratory tract needs to be connected to the to the connection for the inspiratory pressure sensor, which is indicated on the PCB housing, see figure 6, location 1.
 - The transparent tube from the expiratory tract needs to be connected to the to the connection for the expiratory pressure sensor, which is indicated on the PCB housing, see figure 6, location 2.
 - Pay attention that location 1 and 2 are not accidentally switched (by checking whether the tubes do not

(6)



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- cross under the roof of the housing).
 - The less transparent tube from the expiratory tract needs to be connected to the connection for the pressure sensor to the mixing chamber, which is indicated on the PCB housing, see figure 6, location 3.

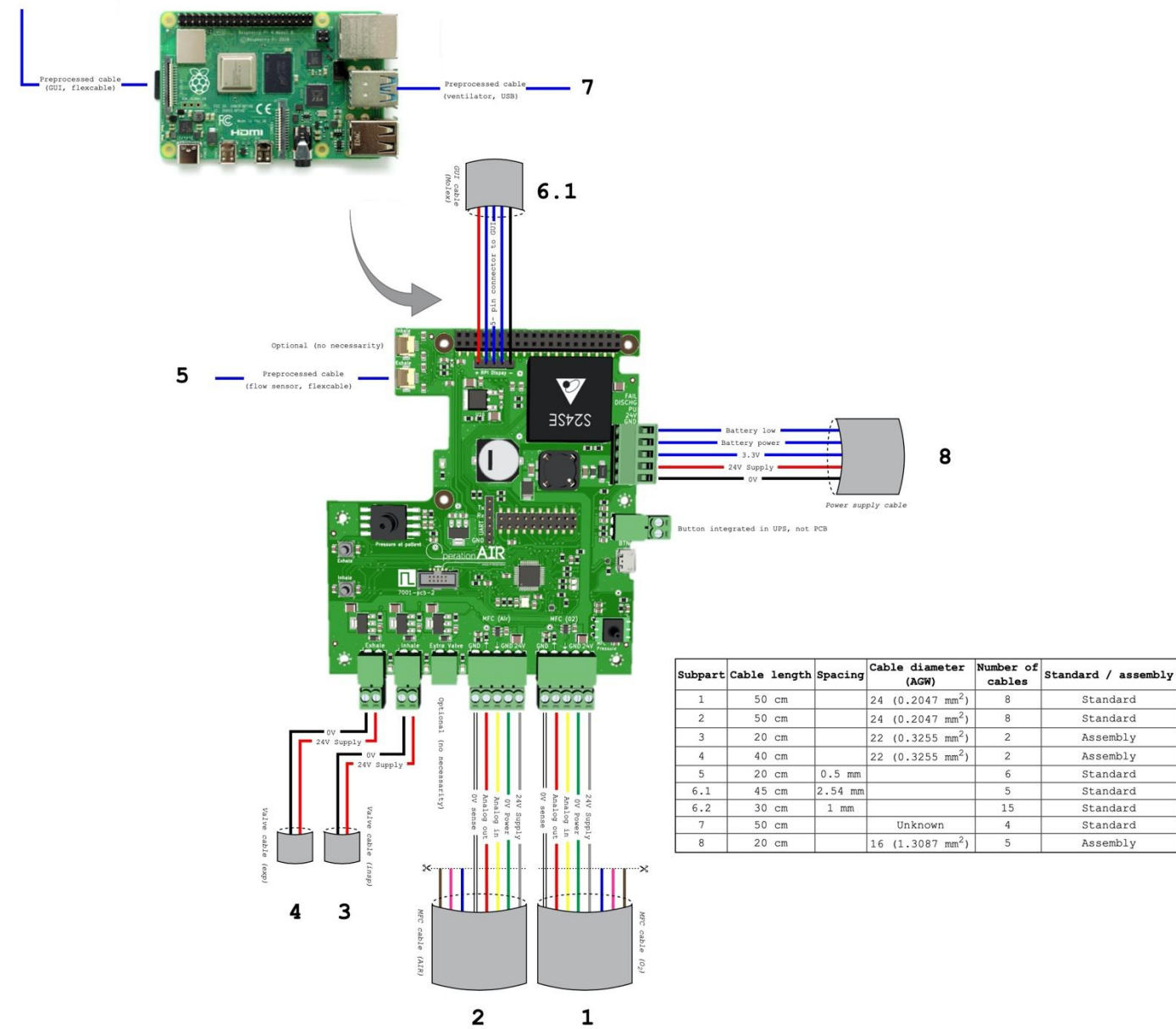
-
- Power supply

 - The power supply needs to be connected to the chassis that comes through to bottom plate.
 - The cable with 5 veins for the power supply needs to be connected to the opening in the chassis. The combination of which pin from the PCV belongs to which pin in the chassis, can be found in appendix II. **The connection of the right pin to the right location is crucial!**
 - The cable should be lead along the bottom plate as well as possible. Therefore, connect it to the bottom plate on several location using aluminium tape. Pay attention that the tape is not placed over the grounding pin of the bottom plate.
 - In appendix II is shown that a grounding wire should be connected to pin 6 Therefore, a grounding wire (AWG 14, 10 cm) is stripped on both sides. One side is connected to pin 6 of the chassis. The other side is provided with a Ring Tongue terminal M4.
7.

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Appendix I

6.2



Subpart	Cable length	Spacing	Cable diameter (AGW)	Number of cables	Standard / assembly
1	50 cm		24 (0.2047 mm ²)	8	Standard
2	50 cm		24 (0.2047 mm ²)	8	Standard
3	20 cm		22 (0.3255 mm ²)	2	Assembly
4	40 cm		22 (0.3255 mm ²)	2	Assembly
5	20 cm	0.5 mm		6	Standard
6.1	45 cm	2.54 mm		5	Standard
6.2	30 cm	1 mm		15	Standard
7	50 cm		Unknown	4	Standard
8	20 cm		16 (1.3087 mm ²)	5	Assembly

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Appendix II

