

BOM Level	Part-ID	Part Name	Quantity	Technical Requirement Notes	OperationAIR Suppliers
0	0	AIRone, Packed	1	Mechanical ventilator	
1	1	Electronic control system	1		
2	1.1.	Assembled PCB	1	Link to Github: https://github.com/OperationAIR/electronics <i>See the Technical Manual (4.17) for detailed specifications</i>	Interay Solutions
3	1.1.1.	Pressure Sensors	1		Interay Solutions
4	1.1.1.1	Pressure Sensor 1	1	MPVZ5010GW6U <i>See the Technical Manual for detailed specifications</i>	Interay Solutions
4	1.1.1.2	Pressure Sensor 2	1	MPRLS0001PG0000SA <i>See the Technical Manual for detailed specifications</i>	Interay Solutions
4	1.1.1.3	Pressure Sensor 3	1	ABPDANT015PGAA5 <i>See the Technical Manual for detailed specifications</i>	Interay Solutions
3	1.1.2	PCB printing parts	1		Interay Solutions
3	1.1.3	PCB Base Plate	1		Würth Elektronik GmbH & Co. KG
3	1.1.4	Software	1		Jitter
2	1.2	Raspberry Pi	1	Raspberry Pi 4 4G Model B <i>See the Technical Manual (4.18) for detailed specifications</i>	RS online
2	1.3	Raspberry Pi Touchscreen Display	1	Raspberry Pi 7" 800x480 DSI Touchscreen Display <i>See the Technical Manual (4.18) for detailed specifications</i>	RS online
2	1.4	Micro-SD Card (16G)	1	Kingston 16 GB MicroSDHC Card Class 10, UHS-1 U1	RS online
2	1.5	High pressure hoses	1		
3	1.5.1	High pressure hose 1	2	4mm, PVC 4x6mm	Landfeld
3	1.5.2	High pressure hose 2	1	4mm, 6x1 mm	Festo
3	1.5.3	High pressure hose 3	3	2mm, 3x0.5mm	Festo
3	1.5.4	High pressure hose connector	3	Adapter, PP, Male luer to 1/16" barbed	Interscience
2	1.6	Cables	1		
3	1.6.1	Jumper Cable	1	6876 FFC, 0.5mm Pitch, 6 Way, 200mm Cable Length, 500 mA, 60 V ac	RS online
3	1.6.2	Flex cable Raspberry Pi to Camera Board	1	30 cm, MPN: 2283	Kiwi electronics
3	1.6.3	Cable PCB to Solenoid Control Valve	1	10cm, 0.3255mm ² (22 AWG), 2 cable cores	
3	1.6.4	Cable PCB to ARMAND klep	1	40cm, 0.3255mm ² (22 AWG), 2 cable cores	
3	1.6.5	Cable PCB to Raspberry Pi	1	USB IDC connection cable, 45cm, 24 AWG, 5 cable cores, F-F connections	
3	1.6.6	Cable PCB to Power cable	1	20cm, 1.3087 mm ² (16 AWG), 5 cable cores	
2	1.7	Aluminum tape	-		
2	1.8	Ferrite cores	1		
3	1.8.1	Ferrite core: cable PCB to MFC	1	TDK Openable Ferrite Clamp, 16.5 Dia. x 30mm	RS online
3	1.8.2	Ferrite core: cable PCB to flow sensor	1	28R0480-000 - Ferrite Ribbon Core, 190 ohm, 100 MHz, 8.0mm x 1.0mm	Farnell
3	1.8.3	Ferrite core: cable PCB to Raspberry Pi	1	Würth Elektronik 4 W 1500 Ferrite Sleeve, Inner dimensions:18.8 x 1.1mm	Farnell
2	1.9	Grounding cable	-	Grounding for cables 30cm, 2.5mm ² (AWG14)	
2	1.1	Heatshrink	-	1 mm diameter	
2	1.11	Speaker	1	Nedis - CSPR10020BK <i>See the Technical Manual (4.19) for detailed specifications</i>	TodoTipo
2	1.12	Grounding	1		Medical IT Shop
3	1.12.1	Grounding pin	1	Potential Equalization Pin Built in Plug Complete 6/15	Medical IT Shop
3	1.12.2	Grounding cable	1	DIN 42801, PE Connection Lead STD 6mm ² / 3m	Medical IT Shop
2	1.13	Power Supply	1	<i>See the Technical Manual (4.23) for detailed specifications</i>	
3	1.13.1	Power Cable	1	Power Cable C13	Medical IT Shop
3	1.13.2	Transformer	1	Meanwell 200W Reliable Green Medical Power Supply, RPS-200-24	TelereX

3	1.13.3	UPS	1	Meanwell Supply40ADC UPS Module, DR-UPS40	Telerex
3	1.13.4	Battery	1	DYN/DAS12-2.2	NS

1	2	Housing	1	See the Technical Manual (4.22) for detailed specifications	
2	2.1	Metal bottom plate	1	Custom design	Kasteelmetaal
2	2.2	Top cap	1	Custom design	Formit
2	2.3	Sealing cap	1	Intersurgical reference number: 1978000	Merkala
2	2.4	Chassis	1	Custom design	Item
2	2.5	Stickers	1	Custom design	Sticker Koning
3	2.5.1	Technical Sticker	1	Custom design	Sticker Koning
3	2.5.2	Safety Sticker	1	Custom design	Sticker Koning
3	2.5.3	Inlet / outlet stickerset	1	Custom design	Sticker Koning
3	2.5.4	Logo sticker	1	Custom design	Sticker Koning

1	3	Mechanic	1		
2	3.1	Mass flow controller	1		Bronkhorst
3	3.1.1	MFC AIR including cables	1	OAD-001F See the Technical Manual (4.3) for detailed specifications	Bronkhorst
3	3.1.2	MFC O2 including cables	1	OAD-002F See the Technical Manual (4.3) for detailed specifications	Bronkhorst
2	3.2	Gas pipe fittings	1	See the Technical Manual (4.23) for detailed specifications	Swagelok
3	3.2.1	G1/4" to 3/8" tube fitting	6	SS-600-1-4RS	Swagelok
3	3.2.2	G1/4" to 1/4" tube fitting	4	SS-400-1-4RS	Swagelok
3	3.2.3	G3/8" to 3/8" tube fitting	1	SS-600-1-6RS	Swagelok
3	3.2.4	Elbow 1/4"	1	SS-400-2R-4	Swagelok
3	3.2.5	Elbow 3/8"	1	SS-600-2R-6	Swagelok
3	3.2.6	G1/8" Gasket	1	SS-2-RS-2V	Swagelok
3	3.2.7	G1/4" Gasket	16	SS-4-RS-2V	Swagelok
3	3.2.8	G3/8" Gasket	1	SS-6-RS-2V	Swagelok
3	3.2.9	G1/2" Gasket	1	SS-8-RS-2V	Swagelok
3	3.2.10	G1/4" to 3/8 tube fitting	2	SS-6-TA-1-4RS	Swagelok
3	3.2.11	G1/8" to 6mm	1	SS-6M0-1-2RS	Swagelok
2	3.3	PFA Tubing	1		Swagelock
3	3.3.1	PFA Tubing 3/8"	-	PFA_T6_062_100	Swagelock
3	3.3.2	PFA tubing 1/4"	-	PFA-T4-047-100	Swagelock
2	3.4	Solenoid Control Valve (Expiratory)	1	Type 2875 - Direct-acting 2 way standard solenoid control valve See the Technical Manual (4.16) for detailed specifications	Burkert
2	3.5	Spring loaded overpressure relief valve	1	70-250 mbar, Part number 5046, DN40KF See the Technical Manual (4.15) for detailed specifications	Demaco
2	3.6	Safety Valve	1	Mini safety valve G 1/4", 1 - 4 bar, Brass, Item number: SVM 14-4 See the Technical Manual (4.6) for detailed specifications	Landefeld
2	3.7	Umbrella Valve	2	UM 215.002 SD See the Technical Manual (4.8+4.14) for detailed specifications	Minivalve
2	3.8	SLS 3D prints		Printed with Nylon 12	
3	3.8.1	Patient IN	1	Custom design: housing umbrella valve	Shell
3	3.8.2	Patient OUT	1	Custom design: housing umbrella valve, pressure sensor, pressure relief	Shell
3	3.8.3	Check valve mount	2	Custom design: mount for umbrella valve, placed on Patient IN/OUT	Shell
3	3.8.4	Pressure tubes	1	Custom design: mount for pressure tubes, placed in tube doublemount	Shell

3	3.8.5	Flow sensor holder	1	Custom design: housing flowsensor	Shell
3	3.8.6	EndTube	1	Custom design: leads expiratory air outside the device	Oceanz
3	3.8.7	Tankout	1	device	Oceanz
2	3.9	Diamond Dichtol	-	Dichtol WFT standard #1532	Leering
2	3.1	Glue Loctite	-	Loctite super glue 4061	Eriks
2	3.11	Connector G3/8" - 22M	1	Custom design	Heemskerk
2	3.12	Connector G1/2" - 22M	2	Custom design	Heemskerk
2	3.13	Flow sensor	1	0-100 L/min, 24V, max 6W <i>See the Technical Manual (4.12) for detailed specifications</i>	VPinstruments
2	3.14	Mixing chamber	1	Custom design <i>See the Technical Manual (4.4) for detailed specifications</i>	RPP
2	3.15	Proportional Inhalation Valve	1	Model: PCS-FV-010-EV-IV. Inlet pressure: 0.1-1 bar gauge. Outlet pressure: 0-0.15 bar gauge. Max operating pressure: 1 bar gauge. Orifice Size: 4,5 mm <i>See the Technical Manual (4.7) for detailed specifications</i>	Pressure control solutions
2	3.16	Pressure regulator	2	DRV1340 Pressure regulator 4bar <i>See the Technical Manual (4.2) for detailed specifications</i>	Kramp
2	3.17	FDM 3D prints	1	Printed with PLA (polylactic acid)	
3	3.17.1	Tube doublemount	1	Custom design: mount on bottom plate to fixate inspiratory and expiratory tubes and pressure tubes	MTB3D
3	3.17.2	Flow sensor protection	1	Custom design: cap to protect flow sensor	MTB3D
3	3.17.3	Pressure relief print	1	Custom design: plate to fixate pressure relief to bottom plate	MTB3D
3	3.17.4	Elektronics cover	1	Custom design: housing for electronics	MTB3D
3	3.17.5	Elektronics roof	1	Custom design: roof for electronics cover	MTB3D
3	3.17.6	Speaker print	1	Custom design: housing for speaker	MTB3D
3	3.17.7	Cover	1	Custom design: cover for front of the tube doublemount	MTB3D
3	3.17.8	FlowsensorBasket	1	Custom design: fixation of flow sensor to bottom plate	MTB3D
2	3.18	Ventilator	1	Noctua NF-A8 5V PWM USB 80mm Fan <i>See the Technical Manual (4.20) for detailed specifications</i>	Azerty
2	3.19	NIST fitting O2	1	Custom design <i>See the Technical Manual (4.1) for detailed specifications</i>	Heemskerk
2	3.2	NIST fitting AIR	2	Custom design <i>See the Technical Manual (4.1) for detailed specifications</i>	Heemskerk
2	3.21	22mm-22mm connector	2	Intersurgical reference number: 1960000 <i>See the Technical Manual (4.10) for detailed specifications</i>	Merkala/Intersurgical

1	4	Fasteners Mechanic - Housing	1		
2	4.1	NIST air / NIST O2	1		
3	4.1.1	Bolt M3x12	6	Steel	
3	4.1.2	Nut M3	6	Steel	
3	4.1.3	Ring M3	6	Steel	
2	4.2	MFC air / MFC O2	1		
3	4.2.1	Bolt M4x6	4	Steel	
3	4.2.2	Ring M4	4	Steel	
2	4.3	Mixing chamber	1		
3	4.3.1	Bolt M5x10	3	Steel	
3	4.3.2	Nut M5	3	Steel	
3	4.3.3	Ring M5	3	Steel	
2	4.4	Digital pressure regulator	1		
3	4.4.1	Bolt M5x12	2	Steel	

3	4.4.2	Ring M5	2	Steel	
3	4.4.3	Laser cut plate for proportional inhalation valve	1	Custom design	
2	4.5	3D printed components	1		
3	4.5.1	Bolt M4x12	8	Plastic	
3	4.5.2	Bolt M4x16	2	Plastic	
3	4.5.3	Nut M4	14	Plastic	
3	4.5.4	Ring M4	10	Plastic	
3	4.5.5	M4x20 Countersunk screws	4	Plastic	
2	4.6	Solenoid Control Valve	1		
3	4.6.1	Bolt M4x16	1	Steel	
3	4.6.2	Ring M4	1	Steel	
2	4.7	Speaker and electronics	1		
3	4.7.1	M4x14mm Countersunk screws	8	Self tapping, steel	
3	4.7.2	Machine Screw M2.5x10	14	DIN 7985, M2.5, 10 mm, Steel, Zinc, Recessed Pan Head Pozidriv	
3	4.7.3	Standoff M2.5x11	4	Nickel Plated, Brass, M2.5, Hex Female, 11 mm, 11 mm	
3	4.7.4	Standoff M2.5x18	4	Steel, M2.5, Hex Male-Female, 18 mm, 24 mm	
3	4.7.5	Standoff M2.5x30	3	Steel, M2.5, Hex Female-Female, 30 mm	
3	4.7.6	Push-In Rivet	6	Black Nylon Fir Tree Push-In Rivet. Item code: 27MXT003006	
3	4.7.7	Screw M2.5x8	2	DIN7500, M2.5, 8 mm, Zinc, Steel, Recessed Pan Head Pozidriv	
3	4.7.8	Tooth lock washer M4	7	Steel	
3	4.7.9	Tooth lock washer M5	5	Steel	
3	4.7.10	Ring Tongue terminal M4	3	Ring Tongue terminal M4 2.5mm2	
3	4.7.11	Ring M2.5	7	Steel	
3	4.7.12	Tooth lock washer M2.5	7	Steel	
2	4.8	Top Cap	1		
3	4.8.1	Push-In Rivet 1	6	Black UL94 V-0 Nylon Round Snap Push-In Rivet, Item code: SRVO-4100B	
1	5	Manuals	1		
2	5.1	Technical Manual	1	See <i>'Technical_Manual.pdf'</i>	
2	5.2	Hand-out Instruction for User	1		
2	5.3	Instructions for Use	1	See <i>'Instructions for Use.pdf'</i>	
1	6	Packaging	1		
2	6.1	Pallet and box	1		JOPAK
2	6.2	Sticker	1		Stickerkoning