

Custom Machined Components

Description	File Name	Material	Qty Needed	Qty Spare	Qty	Notes
Flow Chamber Walls	FlowChamberWalls	Aluminum, anodized black	1	0	1	
Flow Chamber Clamp for Glass Base	FlowChamberBase For Glass Plate	Aluminum, anodized black	1	0	1	Several Base Options
Glass Base For Flow Chamber	Bottom Glass Plate	Glass	1	2	3	Clear Glass, Clear Polycarb/Acryl
Polycarbonate/Aluminum Base For Flow Chambe	FlowChamberBase	Polycarb or Aluminum(black)	1	0	1	Or Anodized Aluminum (black)
Insert to hold BD biodish XL	FlowChamberInsert_BiodishXL	Aluminum, anodized black	1	0	1	
Insert to hold clear agar plate	FlowChamberInsert_Plate	Aluminum, anodized black	1	0	1	
Glass Plate to Seal Flow Chamber	Top Glass Plate	Glass	1	4	5	
post mountable 10-32 t-manifold	t-manifold	stainless steel	5	1	6	
post mountable valve manifold	ValveManifold shared no and nc individu	stainless steel	5	1	6	for lee lhda hdi face mount valve
GL45 bottle to 1/4-28 flat bottom adapter	GL45 bottle cap insert with qtr28 flat bot	stainless steel	3	3	6	used to make bubbler for odor
Top Plate for Gradient measurement	top plate for gradient measurement	Aluminum (anodization option	1	0	1	
Clamp for Pidtech plus	simple clamp block for pidtech plus	Aluminum (anodization option	2	1	3	
flow block for draw sampling	flow block for measuring concentration i	Aluminum (anodization option	2	1	3	

Thorlabs

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
Aluminum Breadboard, 24" x 36" x 1/2", 1/4"-20	MB2436	690	1	0	1	690
Ø1/2" x 3/4" Stainless Steel Optical Post	TR075	4.74	5	0	5	23.7
Ø1/2" x 1" Stainless Steel Optical Post	TR1	4.74	2	1	3	14.22
Ø1/2" x 1.5" Stainless Steel Optical Post	TR1.5	4.97	3	0	3	14.91
1" Post holder	PH1	7.03	5	0	5	35.15
Pedestal Base Adapter	BE1	9.1	15	0	15	136.5
Small Clamping Fork	CF125	8.75	15	0	15	131.25
8-32 drop in t-nut box of 10	XE25T4	23	0	1	1	23
XE25 rail table clamp	XE25CL2	11.3	0	1	1	11.3
1/4-20 cap screw and hardware kit	HW-KIT2	106.1	0	1	1	106.1
66 mm construction rail, L = 75 cm	XT66-750	82	2	0	2	164
Vertical Mounting Plate for 66 mm rail	XT66P1	34	2	0	2	68

additional components required to mount camera; see bruno afonso setup
additional components required to filter out channelrhodopsin stimulating light

I dex/Upchurch

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
headless vacutight nut, 10-32 w/ ferrule 10 pk	P-844x	46.82	20	2	22	1030.04
vacutight ferrule 10 pk	P-840x	46.76	0	4	4	187.04
teflon fep tubing, yellow 175 um ID x 1/16" OD	1477-20	96.48	1	0	1	96.48
teflon fep tubing, natural 0.030" ID x 1/16" OD	1520L	85	1	0	1	85
peek tubing 1/16" ID x 1/8" OD		85.19	1	0	1	85.19
flangeless ferrule 1/8" yellow	P-300x	11.91	1	1	2	23.82
flangless nut 1/4-28 for 1/8" tubing	P-301x	11.91	1	0	1	11.91
6-port manifold for 1/8" OD tubing	P-153	85.36	2	0	2	170.72
frit-in-a-ferrule 2 um for 1/8" tubing	P-372	6.65	0	2	2	13.3
extender tool for headless nuts	P-297	10.55	1	1	2	21.1
					0	0
					0	0

Lee Valve

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
semi-inert hdi 3-way valves, face-mount	LHDA1221515H	request quote	40	10	50	#VALUE!
mounting screw support for 2 valves	LHDX0307130A	request quote	20	5	25	#VALUE!

Clippard

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
epdm gaskets - 25 pack	11761-7-PKG	1.96	12	6	18	35.28
12 port manifold 10-32 fittings x 1 1/8-27 NPT fit	MAN-12	6.27	8	2	10	62.7
10-32 screw plug, nickel plated, pack of 10	11755-ENP-PKG	3.05	6	2	8	24.4
10-32 to 1/16" single barb, pack of 10	11752-5-PKG	4.64	12	4	16	74.24
10-32 to 1/8" single barb, pack of 10	11752-4-PKG	4.64	0	2	2	9.28
10-32 to 1/8" OD compression, pack of 10	11923-PKG	12.29	10	4	14	172.06
8 port manifold 1/8 NPT fittings	MAN-ASF1-08	16.48	1	0	1	16.48
manifold mounting hardware	MAN-MH	2.06	1	0	1	2.06
replacement nut and ferrule, pack of 10	15155-PKG	6.7	0	2	2	13.4
10-32 to 1/16" OD compression, pack of 10	15160-ENP-PKG	18.16	4	4	8	145.28
minimatic fittings kit		17555	106.81	0	1	106.81

note: needed quantities are approximate & may be overestimates; I requested ENP (electroless nickel plating) when available in stock. All buna-n gaskets must be swapped out for epdm

Swagelok

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
brass tee; 1/4 x 1/4 x 1/8 NPT	B-400-3TTM	9	4	1	5	45
1/8" tube fitting to 1/8" NPT F, stainless	SS-200-7-2	9.4	3	0	3	28.2
1/4" tube fitting to 1/8" NPT M, stainless	SS-400-1-2	6.9	6	0	6	41.4
1/8" tube fitting to 1/8" NPT M, stainless	SS-200-1-2	7.5	6	0	6	45
1/4" to 1/8" swagelok adapter, brass	B-400-6-2	3.6	3	3	6	21.6
brass tee; 1/4 x 1/4 x 1/4	B-400-3	9	2	2	4	36
brass 1/4" tube to 1/4" NPT	B-400-1-4BT	2.9	1	2	3	8.7
brass cap for 1/4" tubing	B-400-C	1.7	1	3	4	6.8
brass plug for 1/4" tube fitting	B-400-P	1.7	0	2	2	3.4
brass pipe plug 1/4" male NPT	B-4-P	2.8	1	2	3	8.4
brass pipe plug 1/8" male NPT	B-2-P	2.2	4	4	8	17.6

pfa tubing, 1/8" OD x 0.03 wall; 100 feet	PFA-T2-030-100	96.4	1	0	1	96.4
1/4" od tube bender; 3/4" bend radius	MS-HTB-4	129.9	1	0	1	129.9
tubing cutter	MS-TC-308	46.4	1	0	1	46.4
tube deburring tool	MS-TDT-24	34.9	1	0	1	34.9
brass 3-way switching ball valve	B-42XS4	44.1	1	0	1	44.1
brass hose connector 1/4" male NPT to 3/8" host	B-6-HC-1-4	3.4	1	1	2	6.8
brass swagelok 1/4" to F NPT 1/4"	B-400-7-4	3.4	1	1	2	6.8
brass hose connector 1/4" male NPT to 1/2" host	B-8-HC-1-4	5.2	0	1	1	5.2
brass replacement ferrules 1/4"	B-400-SET	0.74	0	10	10	7.4
brass replacement ferrules 1/8"	B-200-SET	0.76	0	10	10	7.6

McMaster-Carr

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
corrosion-resistant muffler 1/8" NPT M	4402K51	8.32	3	1	4	33.28
cleaned and capped copper tubing 1/4" OD	5174K3	43.38	1	0	1	43.38
fep lined tygon tubing 1/16" ID x 1/8" OD	5046K16	1.21	50	0	50	60.5
black PVC tubing 3/8" ID x 1/2" OD	5231K6	0.43	25	0	25	10.75
tube clamps	9579K66	9.08	1	0	1	9.08
6" cable ties	7130K41	4.01	1	0	1	4.01
cable tie assortment	7338K53	12.32	0	1	1	12.32
EPDM O-Ring AS568A Dash Number 282, 2 pack	9557K282	6.65	1	1	2	13.3
EPDM O-Ring AS568A Dash Number 213, packs o	9557K482	5.6	1	0	1	5.6
EPDM O-Ring AS568A Dash Number 212, packs o	9557K481	5.45	0	1	1	5.45
EPDM O-Ring AS568A Dash Number 210	9557K478	5.89	1	0	1	5.89
EPDM O-Ring AS568A Dash Number 211	9557K479	5.28	1	0	1	5.28
green nylon tubing 1/4" OD	5635K53	0.39	50	0	50	19.5
nylon screws 2-56 x 3/8	94607A079	4.99	1	0	1	4.99
nylon screws 2-56 x 7/16	94607A080	5.01	1	0	1	5.01
adhesive back uhmw plastic bumper 1/16" heigh	8962T31	5.65	1	0	1	5.65
nylon spacer, #4 3/16" OD, 100 pk	94639A704	7.08	1	0	1	7.08
SHCS 4-40 x 3/8, 100 pk	92196A108	2.87	1	0	1	2.87
SHCS 4-40 x 1/2, 100 pk	92196A110	3.13	1	0	1	3.13
adhesive backed fep film 12" square	5805T11	13.94	2	0	2	27.88
Push-in Tapered Colored Rubber Plug Red, Fits 1:	9277K38	10.48	2	0	2	20.96
Push-in Tapered Round Plug with Flange Std, Fits	40025K26	11.91	0	2	2	23.82

80/20

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
hinged clamp for pneumatic compression	see separate bill of materials	381.45	1	0	1	381.45
enclosure	see separate bill of materials	1710.44	1	0	1	1710.44

National Instruments

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
NI USB 6008; USB based analog input/output dev	779051-01	169	2	0	2	338

Baseline-Mocon

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
Pidtech Plus Black (0.05 to 2000 ppm)	ZPP6018001 042-208	540	2	0	2	1080
Pidtech Plus Silver (<5ppb to 20 ppm)	ZPP6018002 042-209	675	1	0	1	675

Custom electronics

valve controller board	separate pcb and parts list
led light bars	separate pcb and parts list

Aalborg

Description	Part #	Cost	Qty Needed	Qty Spare	Qty	Total
gas flow controller; aluminum housing; viton sea	GFC17A-VADL2-C0A	852	3	0	3	2556
calibrated for air 5L/min	3AB-09-SS		1	0	1	0
calibrated for air 100mL/min	3AB-04-SS		2	0	2	0
flow meter - housing	P11A3-TA0A	277	1	0	1	277
flow meter - flow tube 0-10 L/min direct reading	102-16-CA-TN		1		1	0

12V computer power supply
basic electronic supplies (wires, connectors, solder, etc.)
tools (wrenches, allen wrenches, t-handle ball driver, etc.)
hardware (screws, nuts, etc. I've tried to put hardware into list, but I'm sure there's stuff missing)

Additional components will be required.
Need to provide clean filtered air (charcoal filtered & filtered at 35 microns or better) at 20 psi to mass flow controllers and air to pneumatic clamp at adjustable pressure ~10 psi
Need camera, acquisition board, computer, etc. for acquisition