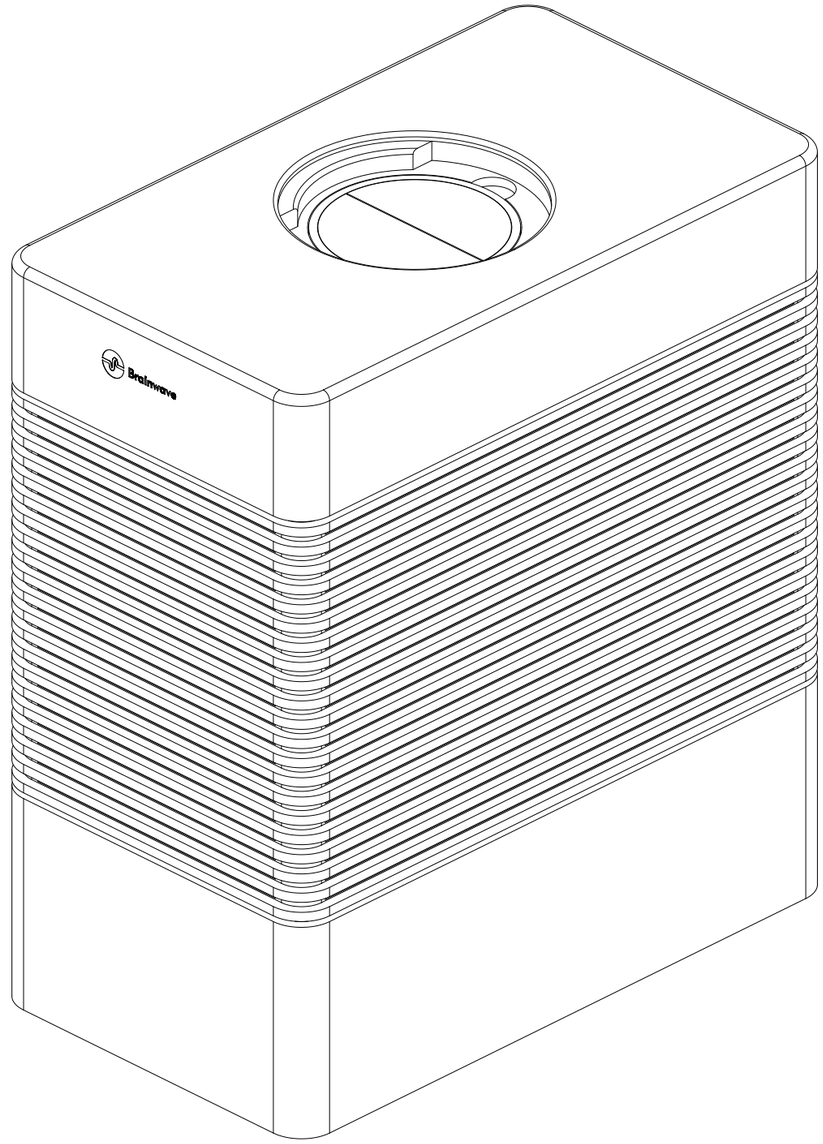
SHEET	CONTENT
1	index
2	GA: general assembly, 4 views, overall dimensions
3	Exploded view with balloons, BOM (made parts)
4	Hardware BOM, PEM table, torques
5	BW3-101 lower body
6	BW3-101 rear I/O detail 1:1
7	BW3-102 rib band, hidden groove slits
8	BW3-115 / 116 / 117 vent liners
9	BW3-103 top cap with carry grip
10	LATCH SECTION: twist latch A-A, B-B 2:1, part numbers
11	LATCH PARTS: BW3-301 .. 308 detail
12	SLEEVE / FRAME: lift-off architecture, interfaces
13	Airflow section x = 0, Gold, 1:2
14	Small parts: 104 window, 110 button, 107 foot ring, 108, 111, 112, 118, 119, 251
15	BW3-105 plinth, perforated, with flat
16	BW3-106 base plate and BW3-201 tray
17	BW3-202 / 203 sea walls with flats
18	BW3-206 saddle, BW3-204 frame rail, BW3-207 hot deck
19	BW3-210 / 211 board plates with ITX tables
20	BW3-240 GPU bracket, BW3-241 tail rests
21	BW3-250 PSU hanger, BW3-270 cable channel, BW3-280 I/O bracket
22	Interior assembly (Gold), fan mounts, standoffs
23	Tier configuration Silver / Copper / Gold
24	Tolerances, fits, datums, anodise spec, cosmetic classes
25	Open items, parts not fully specified

NOTES

1. All three tiers use the SAME exterior parts and base material: Al 6061-T6. Silver, Copper and Gold are anodised colours only (MIL-A-8625 Type II Class 2, dyed). No copper, gold or other precious metal is used.
2. Units mm. Third-angle projection. General tolerances ISO 2768-mK unless stated. Do not scale.
3. 3D STEP per part (step/BW3-xxx.step) and per tier (step/BW3-000_<tier>_assembly.step) are the master geometry for CNC. Drawings control tolerances, threads, finish and inspection.
4. Sheet-metal flats: dxf/BW3-xxx_flat.dxf (layers OUTLINE, HOLES, BEND, BEND_ZONE, PERF, TEXT). K-factor 0.45 (6061 formed in T4, then aged to T6 per AMS 2770), inside R = t unless stated. Flats to be confirmed by the fabricator's bend test before production.
5. Self-clinching hardware per PEM catalogue (hole sizes per PEM bulletin), install after finish for chem-film parts.
6. Items marked TBD / OPEN are not fully specified; see sheet 'Open items'.
7. Rev C (after the 2019 Mac Pro top): the shell 101+102+103 is one bonded sleeve BW3-100. Flip up the half-moon tab, turn 90 deg, lift: the sleeve comes off as one piece. Frame, electronics, I/O and base stay on the desk.

Brainwave v3 enclosure, BW3 (Silver / Copper / Gold)



GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	____ / ____
PROJECT	Brainwave v3 enclosure, BW3

TITLE

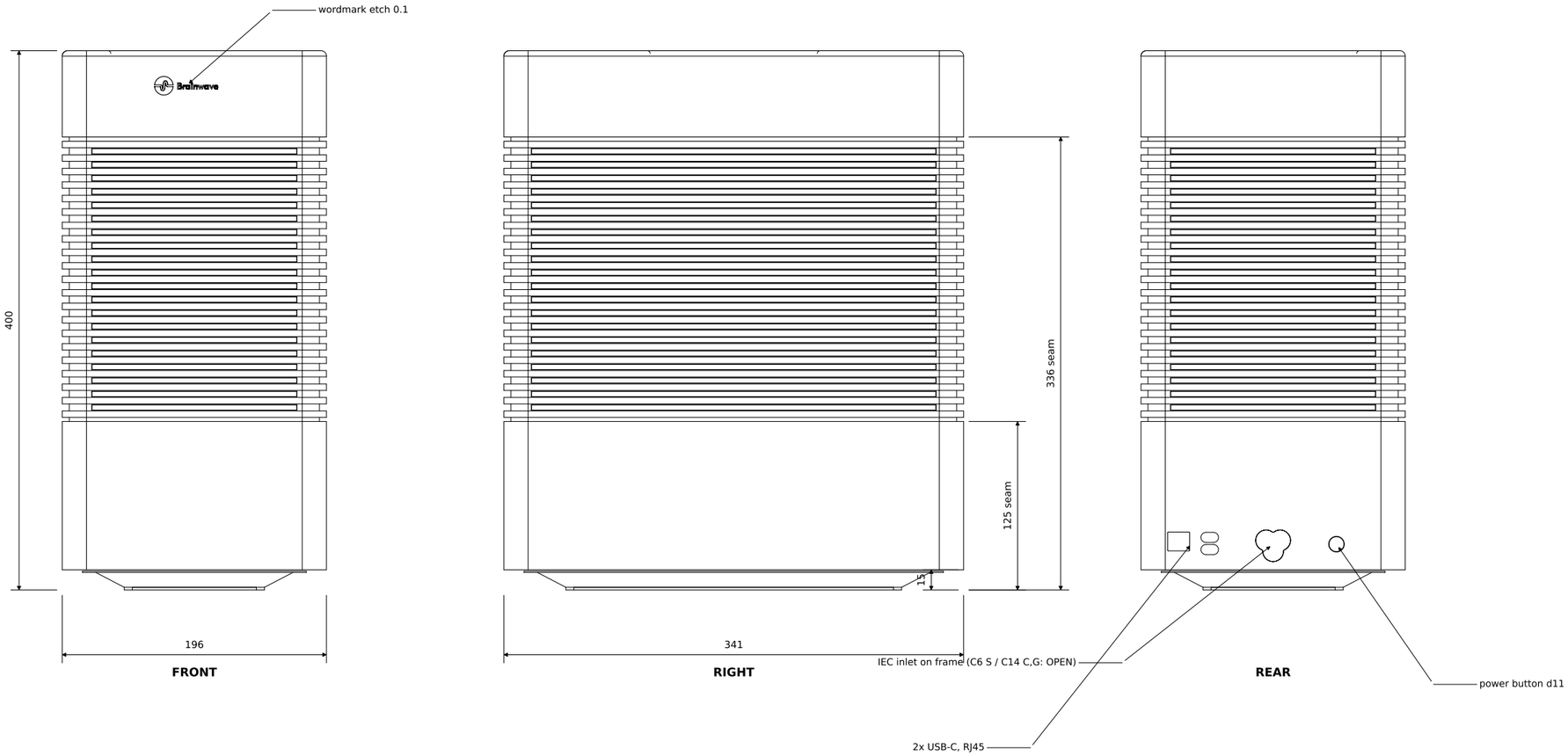
Drawing index, general notes

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000	C	1 / 25	NTS	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	1 set	2026-11-03

FINISH

Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal



ITEM	VALUE
Envelope W x D x H	196 x 341 x 400 (fin tips / smooth bands)
Core between fins	185.6 x 330.6, R12.8 corners
Fins	21 x 4.8 thk, pitch 10.0, depth 5.2, z 128..338
Mass (est.)	Silver 10.2 kg, Copper 12.2 kg, Gold 12.8 kg incl. components
Exhaust	80 hidden groove-bottom slits 4.0 wide; exhaust rows 228.5 cm2 cut, 163.8 cm2 free behind liner BW3-115/117
Service	sleeve BW3-100 lifts off after 90 deg turn of the tab (no tools); interlock cuts PS_ON
Intake	base plate d132 + filter, plinth perforation 40.3 %

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

PROJECT
Brainwave v3 enclosure, BW3

TITLE

General assembly, exterior (all tiers)

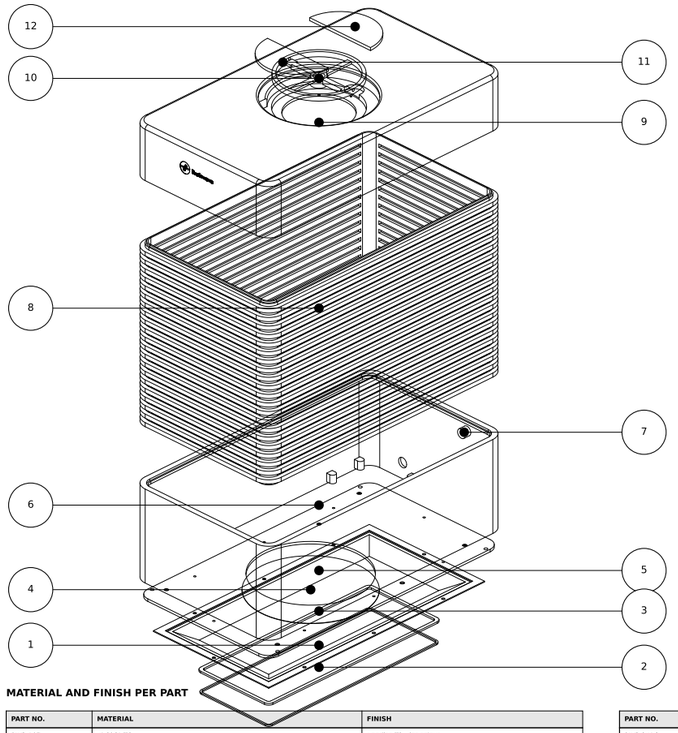
PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000	C	2 / 25	1:4	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	1 set	2026-11-03

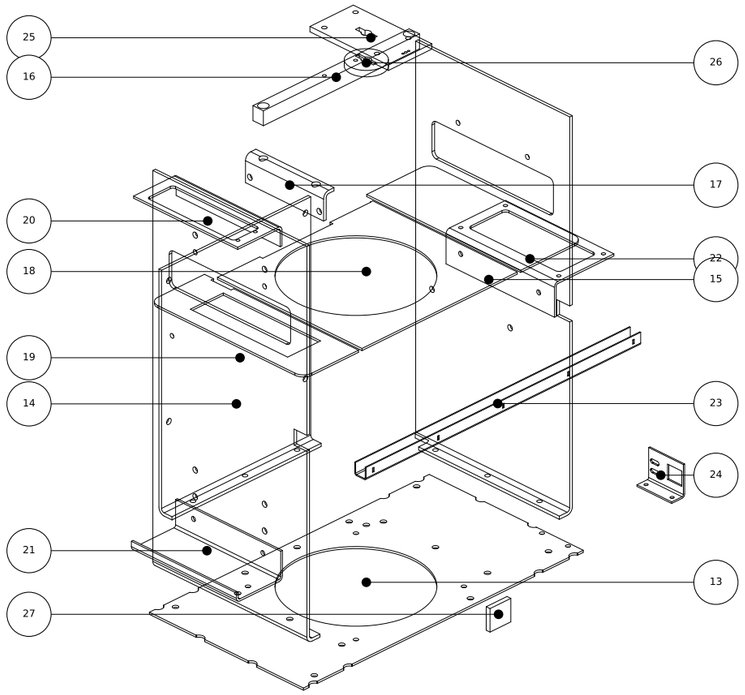
FINISH

Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal

EXTERIOR (all tiers)



INTERIOR FRAME (Gold shown)



#	PART NO.	DESCRIPTION	QTY	TIERS	g
1	BW3-107	Foot ring	1	S/C/G	11
2	BW3-108	Foot strip 2.0 x 1.5 silicone	1	S/C/G	2
3	BW3-105	Plinth, perforated slanted tray	1	S/C/G	173
4	BW3-111	Intake filter d140	1	S/C/G	6
5	BW3-106	Base plate 3.0	1	S/C/G	394
6	BW3-101	Lower body (smooth band, rear I/O,	1	S/C/G	994
7	BW3-110	Power button cap d11	1	S/C/G	2
8	BW3-102	Rib band (21 fins, 80 hidden groov	1	S/C/G	2594
9	BW3-103	Top cap with carry grip	1	S/C/G	1214
10	BW3-301	Latch knob spider (rim ring, 4 spo	1	S/C/G	31
11	BW3-104	Logo window, PC half-disc R43.85 x	1	S/C/G	13
12	BW3-302	Half-moon flip tab (lift handle)	1	S/C/G	14
13	BW3-201	Base tray 2.0	1	S/C/G	232
14	BW3-202	Sea wall front 3.0	1	S/C/G	505
15	BW3-203	Sea wall rear 3.0	1	S/C/G	506
16	BW3-204	Frame top rail 12 x 14 x 180	2	S/C/G	78
17	BW3-206	Rail saddle 3.0	2	S/C/G	23
18	BW3-207	Hot deck 1.5	1	S/C/G	191
19	BW3-211	Board plate Copper/Gold (deep mini	1	C/G	332
20	BW3-240	GPU top bracket 2.0	1	C/G	27
21	BW3-241G	GPU tail rest Gold 2.0	1	G	54
22	BW3-250	SFX-L PSU hanger 2.0	1	S/C/G	41
23	BW3-270	Cable channel 1.0	1	S/C/G	29
24	BW3-280	Rear I/O bracket 1.5	1	S/C/G	6
25	BW3-305	Latch receiver plate 90.5 x 50 x 5	1	S/C/G	59
26	BW3-306	Cam ring OD36 x 6, 2 ramps 1.5 / 9	1	S/C/G	42
27	BW3-118	Sleeve lead-in guide 4.4 x 24 x 22	4	S/C/G	3
28	BW3-100	Shell sleeve (101 + 102 + 103 bond	1	S/C/G	0
29	BW3-112	Sleeve base seal, EPDM sponge 1.2	1	S/C/G	0
30	BW3-115	Vent liner side 0.3 (perforated ro	2	S/C/G	18
31	BW3-116	Vent liner front 0.3 (solid, blind	1	S/C/G	9
32	BW3-117	Vent liner rear 0.3 (perforated ro	1	S/C/G	9
33	BW3-119	Sleeve dowel ISO 8734 4 x 12 (6 pr	4	S/C/G	1
34	BW3-210	Board plate Silver (mini-ITX)	1	S	332
35	BW3-241C	GPU tail rest Copper 2.0	1	C	43
36	BW3-251	PSU foam block	1	S/C/G	4
37	BW3-303	Latch shaft d8, head d12	1	S/C/G	11
38	BW3-304	Bayonet cross pin ISO 8734 4 x 20	1	S/C/G	2
39	BW3-307	Knob retainer, 2 arms	1	S/C/G	3
40	BW3-308	Antenna carrier	2	S/C/G	2

Mass est. (enclosure parts / with components): Silver 7.7 / 10.2 kg, Copper 7.8 / 12.2 kg, Gold 7.8 / 12.8 kg

Exterior parts: Al 6061-T6 all tiers, colour = anodise only, no precious metal.

MATERIAL AND FINISH PER PART

PART NO.	MATERIAL	FINISH
BW3-107	Al 6061-T6	Anodise T2, tier colour
BW3-108	Silicone 50 Shore A, black	-
BW3-105	Al 6061-T4>T6 1.0 perf d2 / 3.	Anodise T2 black
BW3-111	PET mesh 80 um, black	-
BW3-106	Al 6061-T6 plate 3.0	Anodise T2 black
BW3-101	Al 6061-T6	Anodise T2, tier colour
BW3-110	Al 6061-T6	Anodise MIL-A-8625 Type II
BW3-102	Al 6061-T6	Anodise T2, tier colour
BW3-103	Al 6061-T6	Anodise T2, tier colour
BW3-301	Al 6061-T6	Anodise T2, tier colour
BW3-104	PC Lexan 9034, RF transparent	Back-painted white, black
BW3-302	PA66-GF30 (DuPont Zytel 70G30H	Textured MT-11010, white t
BW3-201	Al 6061-T4>T6 2.0	Chem film T2 Cl.3
BW3-202	Al 6061-T4>T6 3.0	Chem film T2 Cl.3
BW3-203	Al 6061-T4>T6 3.0	Chem film T2 Cl.3
BW3-204	Al 6061-T6 bar	Chem film T2 Cl.3
BW3-206	Al 6061-T4>T6 3.0	Chem film T2 Cl.3
BW3-207	Al 6061-T4>T6 1.5	Chem film T2 Cl.3
BW3-211	Al 6061-T4>T6 3.0	Chem film T2 Cl.3
BW3-240	Al 6061-T4>T6 2.0	Chem film T2 Cl.3

PART NO.	MATERIAL	FINISH
BW3-241G	Al 6061-T4>T6 2.0	Chem film T2 Cl.3
BW3-250	Al 6061-T4>T6 2.0	Chem film T2 Cl.3
BW3-270	Al 6061-T4>T6 1.0	Chem film T2 Cl.3
BW3-280	Al 6061-T4>T6 1.5	Chem film T2 Cl.3
BW3-305	Al 6061-T6 plate	Chem film T2 Cl.3
BW3-306	17-4PH H900	Passivate
BW3-118	POM-C black	-
BW3-100	Al 6061-T6	Anodise T2, tier colour
BW3-112	EPDM sponge 1.2 (compressed to	-
BW3-115	SS304 0.3, photo-etched hex d2	Black e-coat / black oxide
BW3-116	SS304 0.3	Black e-coat, conductive e
BW3-117	SS304 0.3, photo-etched hex d2	Black e-coat, conductive e
BW3-119	Steel hardened, black oxide	-
BW3-210	Al 6061-T4>T6 3.0	Chem film T2 Cl.3
BW3-241C	Al 6061-T4>T6 2.0	Chem film T2 Cl.3
BW3-251	PU foam 30 kg/m3, black	-
BW3-303	17-4PH H1025	Passivate
BW3-304	Steel hardened	-
BW3-307	POM-C white	-
BW3-308	POM-C black	-

GENERAL TOLERANCES

ISO 2768-mK unless stated

EDGES

break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE

Ra 1.6 unless stated

DRAWN

Brainwave

CHECKED / APPROVED

___ / ___

PROJECT

Brainwave v3 enclosure, BW3

TITLE

Exploded view and bill of materials

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000	C	3 / 25	1:6 / 1:5	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	1 set	2026-11-03

FINISH

Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal

REF	STANDARD PART	QTY	TIERS	USE	TORQUE Nm
H01	ISO 8734 4x12 dowel (= BW3-119), press N7	4	S/C/G	Base plate BW3-106, locate sleeve (no screws to shell)	press
H02	ISO 10642 M4x8 A2-70	6	S/C/G	Base plate to tray PEM S-M4-2	1.6
H03	ISO 4762 M4x10 A2-70 + Loctite 222	4	S/C/G	Receiver BW3-305 to rails BW3-204 (lift path)	2.0
H04	ISO 4762 M5x16 A2-70 + Loctite 222	4	S/C/G	Rails to saddle PEM CLS-M5-1 (lift path)	3.0
H05	ISO 7380 M4x8 A2-70	4	S/C/G	Saddle BW3-206 legs to sea walls	1.6
H06	ISO 7380 M4x6 A2-70	6	S/C/G	Sea wall bottom flanges to tray	1.6
H07	ISO 7380 M4x6 A2-70	3	S/C/G	Board plate flange to tray	1.6
H08	#6-32 x 1/4 pan Phillips, zinc black	4	S	mini-ITX board to SO-632-8	0.6
H08	#6-32 x 1/4 pan Phillips, zinc black	6	C/G	deep mini-ITX board to SO-632-8	0.6
H09	#6-32 x 1/4 UNC pan	4	S/C/G	SFX-L PSU to hanger BW3-250	0.6
H10	ISO 7380 M4x6 A2-70	2	S/C/G	PSU hanger to rear sea wall	1.6
H11	ISO 7380 M4x6 A2-70	2	C/G	GPU top bracket BW3-240 to front sea wall	1.6
H12	ISO 7380 M3x5 A2-70 (TBD per card)	2	C/G	GPU bracket to card shroud	0.6
H13	ISO 7380 M4x6 A2-70	2	C/G	GPU tail rest BW3-241 to front sea wall	1.6
H14	Noctua NA-AV2 anti-vibration mount	8	C/G	2x NF-A14x25 G2 to tray / deck	hand
H15	ISO 7380 M3x5 A2-70	2	S/C/G	Rear I/O bracket BW3-280 to lower-body PEM	0.6
H16	ISO 7380 M3x5 A2-70	2	C/G	PCIe riser to board plate S-M3-1	0.6
H17	ISO 7380 M3x6 A2-70 black	8	S/C/G	Plinth flange BW3-105 to base plate	0.6
H18	ISO 8734 3x8 dowel pin, hardened	2	S/C/G	Tab BW3-302 pivot in spider BW3-301	press
H19	DIN 471 18x1.2 retaining ring	1	S/C/G	Retainer BW3-307 on spider hub	-
H20	ISO 7380 M3x8 A2-70	4	S/C/G	Guides BW3-118 to tray walls	0.6
H21	JIS B1111 M2.3x10 pan, A2	2	S/C/G	Interlock D2F-01F under receiver wing	0.25
H22	ISO 7380 M2.5x5 A2-70	4	S/C/G	Antenna carriers BW3-308 to cap underside	0.4
H23	ISO 8734 3x8 dowel pin	8	S/C/G	Seam dowels 101/102, 102/103 (4 per seam)	press

ASSEMBLY NOTES

1. All fasteners A2-70 stainless unless stated; install with anti-galling wax on 6061 tapped holes (no threadlocker on M3 into anodised parts, H01).
2. Torque with calibrated driver; tolerance +/-10 %.
3. PEM installation after chem film. Squeeze force per PEM bulletin; verify push-out on first article.
4. Lift path: tab -> pins H18 -> spider -> shaft -> cross pin -> cam -> receiver -> H03 -> rails -> H04 -> saddles -> frame.
5. Thread forms: M per ISO 261 6H, #6-32 UNC-2B.
6. Tapped holes in 6061 bosses: M3 x 8 full thread, d2.5 drill 9.5 deep, countersink 90 x d3.3.

SELF-CLINCHING HARDWARE (PEM)

PEM P/N	DESCRIPTION	QTY	HOLE	LOCATION	PARTS
S-M4-2	clinch nut M4, Al-compatible (SP-M4-2 if hardness > HRB 70)	27	d5.40 +0.08/0	tray 15, sea walls 8, saddles 4	BW3-201/202/203/206
S-M3-1	clinch nut M3	4	d4.22 +0.08/0	riser 2, IO bracket 2	BW3-210/211, 101 (insert)
CLS-M5-1	clinch nut M5 (verify hole vs bulletin)	4	d7.14 +0.08/0	rail saddles	BW3-206
SO-632-8	standoff #6-32, 6.35 long thru	4	d5.41 +0.08/0	Silver board plate	BW3-210
SO-632-8	standoff #6-32, 6.35 long thru	6	d5.41 +0.08/0	Copper/Gold board plate	BW3-211

COTS / PURCHASED (not drawn)

ITEM	QTY	TIERS	NOTE
Noctua NF-A14x25 G2 PWM 140 mm	2	S/C/G	intake bottom + exhaust top (Silver: 0 rpm below ~44 W)
Omron D2F-01F micro switch, pin plunger (interlock)	1	S/C/G	in PS_ON loop, NO, closes when sleeve seated
Smalley CM12-M5 wave spring (crest-to-crest, verify code)	1	S/C/G	latch preload 40 N @ 5.54
MISUMI ball plunger M3, C-BPK3 (order code to confirm)	1	S/C/G	knob detent at -45 / +45 deg
3M DP490 epoxy + 3M VHB 4910 (window BW3-104)	-	S/C/G	sleeve seams / window bond
Silicone foot strip (BW3-108, bulk)	1	S/C/G	cut to length 760 mm
IEC C6 inlet panel-mount (Silver) / C14 (Copper, Gold): P/N OPEN	1	S/C/G	rating check, see open items
Momentary switch d12 IP65 (P/N OPEN), button cap BW3-110	1	S/C/G	
USB-C panel-mount extension x2, RJ45 keystone (P/N OPEN)	3	S/C/G	on BW3-280
Loctite 222 low strength threadlocker	-	S/C/G	H03, H04

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

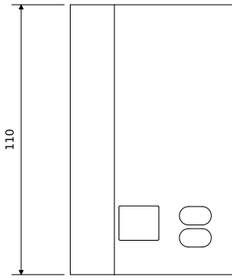
PROJECT
Brainwave v3 enclosure, BW3

TITLE
Hardware bill of materials and torques

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000-H	C	4 / 25	NTS	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
see table	1 set	2026-11-03

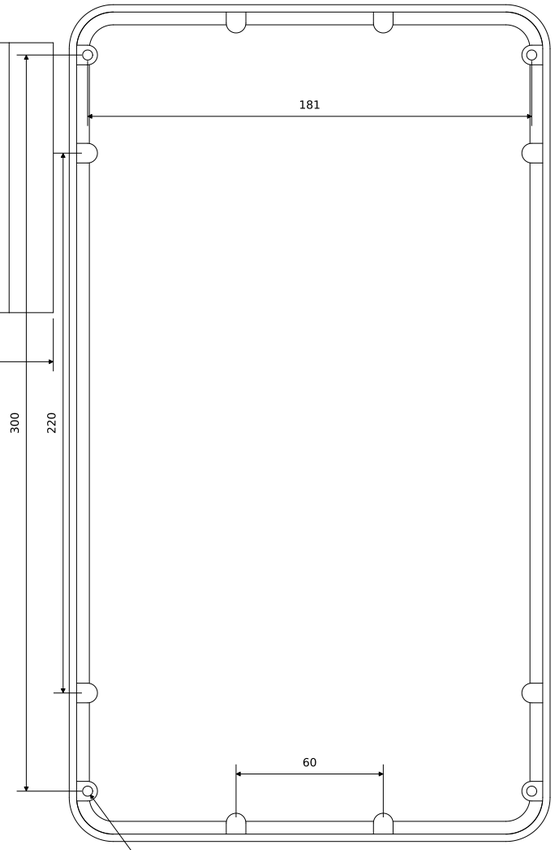
FINISH
see table



REAR

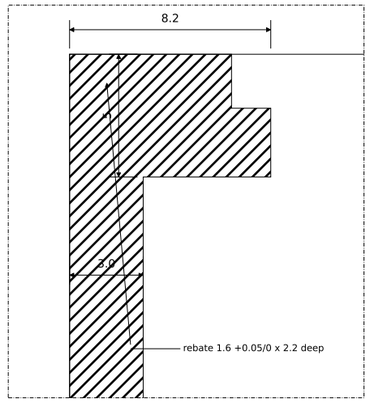


RIGHT



BOTTOM (bosses)

12x rest pad d8 (no screws); 4 corner pads d4.1 H8 x 7 dowel socket



DETAIL B (4:1) seam seat, from A-A



SECTION A-A (x = 0)

NOTES

1. Material 6061-T6 billet / plate, CNC 3-axis + 4th for side ops.
2. Wall 3.0 +/-0.1 in thin band, inner corner R15.
3. Rear I/O cut-outs: see next sheet.
4. Mask seam face z125, rebate and pad faces from anodise (EMI contact to BW3-106).
5. Cosmetic class A outside, C inside.

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

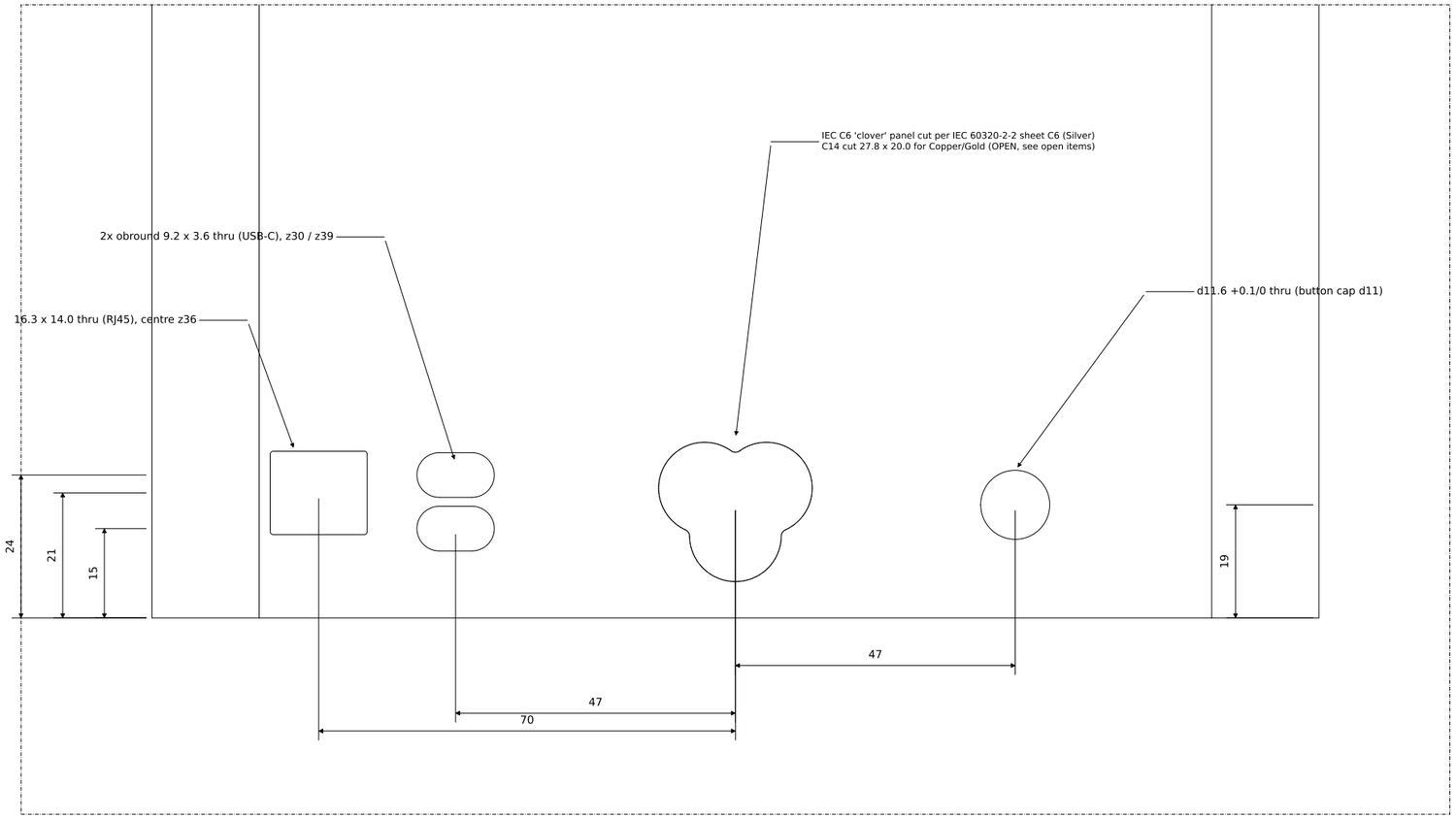
Lower body (smooth band, rear I/O, inlet, button)

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-101	C	5 / 25	1:2.5	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	1 / set (S/C/G)	2026-11-03

FINISH

Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal



REAR VIEW, I/O ZONE (1:1)

CUT-OUT TABLE (x from centre plane C viewed from rear: + = right of IEC when viewed from rear is -X model)

FEATURE	X	Z	SIZE	TOL
IEC inlet (Silver C6)	0	34	C6 clover	per IEC 60320 sheet
Power button	-47	34	d11.6	+0.1/0
USB-C 1	47	30	9.2 x 3.6 obround	+0.1/0
USB-C 2	47	39	9.2 x 3.6 obround	+0.1/0
RJ45	70	36	16.3 x 14.0	+0.1/0
M3 PEM (IO bracket)	see BW3-280		S-M3-1 in boss	+0.08/0

NOTES

1. Model coords: x positive = +X side; rear view shows +X on the LEFT.
2. z measured from datum A (base seat z15 of BW3-101 is z=15 in assembly; table uses assembly z).
3. Cut-outs machined from outside, edges break 0.3, no burr visible class A.
4. Connector P/Ns OPEN; cut-outs to be confirmed against chosen parts before release.

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

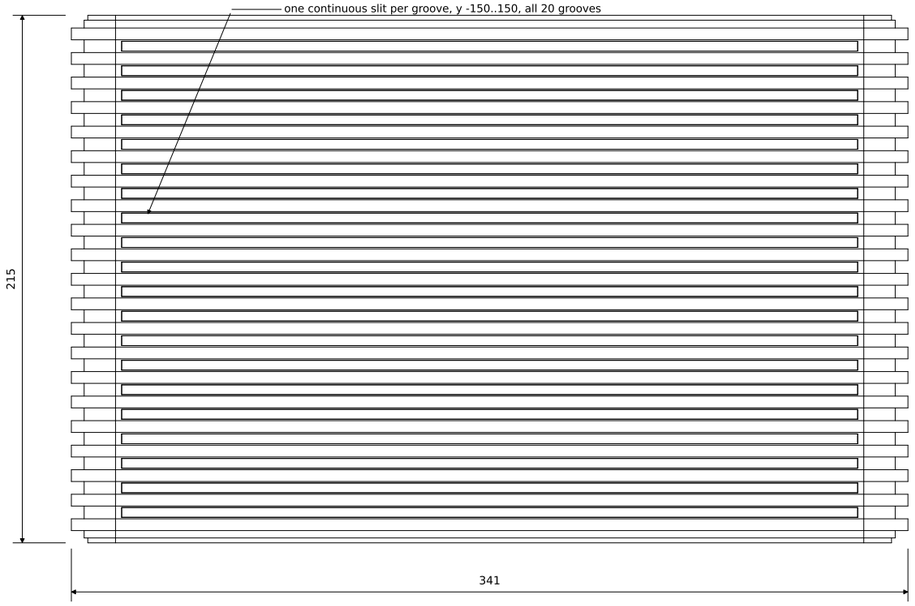
PROJECT
Brainwave v3 enclosure, BW3

TITLE
Lower body, rear I/O detail

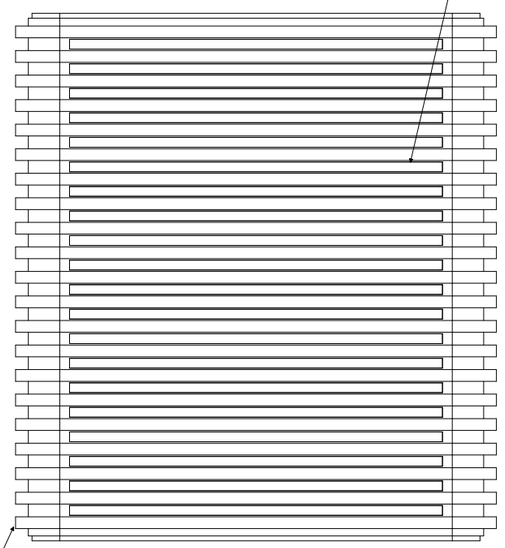
PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-101	C	6 / 25	1:1	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	1 / set (S/C/G)	2026-11-03

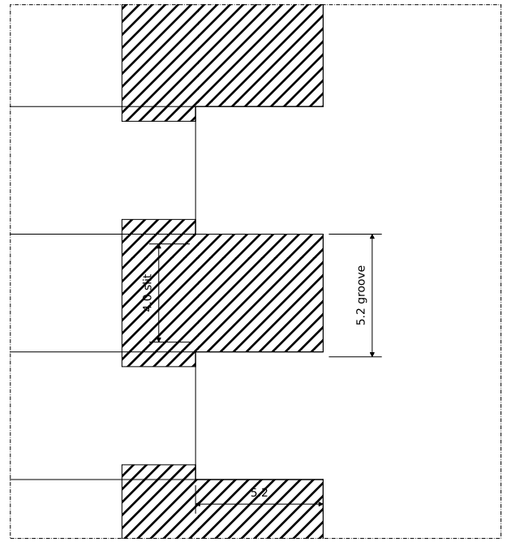
FINISH
Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal



RIGHT (+X side)



REAR



DETAIL C (4:1) groove + hidden slit, section x=0

SLIT TABLE (slit 4.0 wide at the groove bottom, through the 3.0 core wall, ends R2)

FACE	GROOVES	SLIT LENGTH	QTY	CUT cm2	EXHAUST (behind liner)
Side (+X / -X)	0..19	300 (y -150..150)	40	480.0	rows 12..19 open: 192.0
Rear (+Y)	0..19	152 (x -76..76)	20	121.6	rows 14..19 open: 36.5
Front (-Y)	0..19	152 (x -76..76)	20	121.6	blind (liner BW3-116 solid)
TOTAL			80	723.2	228.5 cut, 163.8 free (liner 71.7 %)

NOTES

1. Groove centre z = 135.4 + 10 i (i = row 0..19). Slits on all 4 faces so every groove reads the same dark.
2. Slits: d4 end mill from outside at the groove floor, edges break 0.2, deburr inside. Fin rings tie to the core at the 4 corner radii only.
3. Air passes only where the bonded black liner BW3-115 / 117 is perforated (see LINER sheet); elsewhere the liner is solid.
4. Tongue 1.5 -0.05/-0.10 at both ends mates rebates in 101 / 103; seams bonded 3M DP490 + 4x d3 dowel (sleeve BW3-100).
5. Slit floor hidden behind the 5.2 fin overhang at view angles > 15 deg from horizontal.

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

PROJECT
Brainwave v3 enclosure, BW3

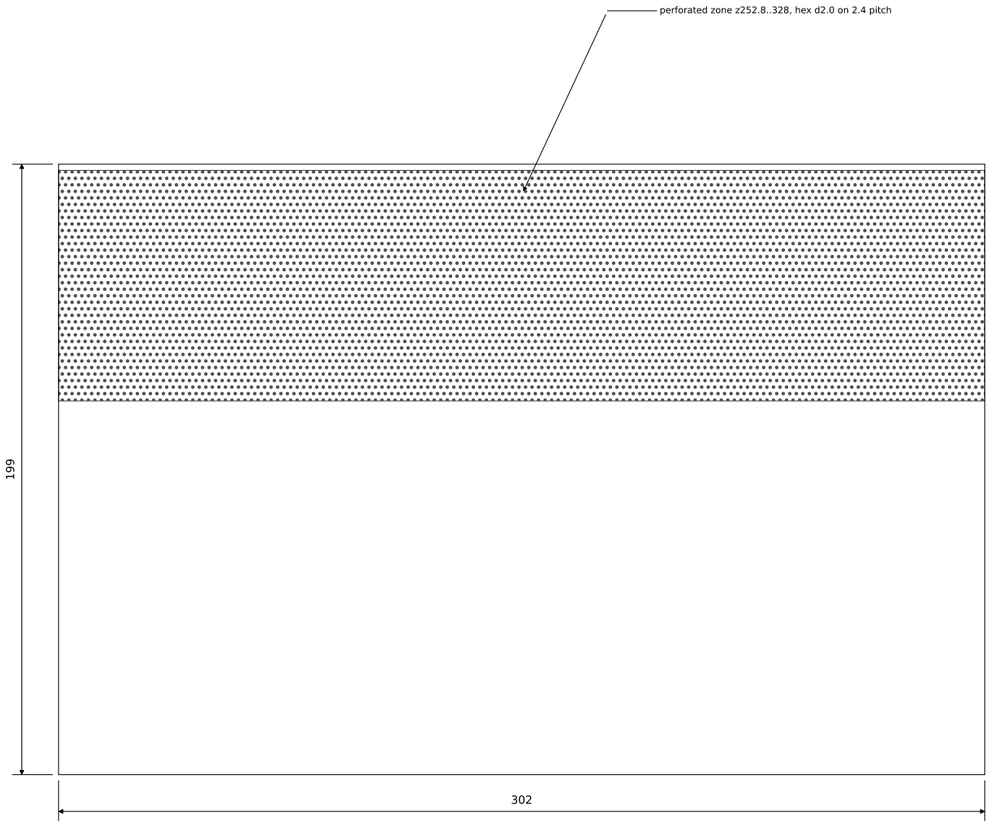
TITLE

Rib band (21 fins, 80 hidden groove slits 4.0 wide)

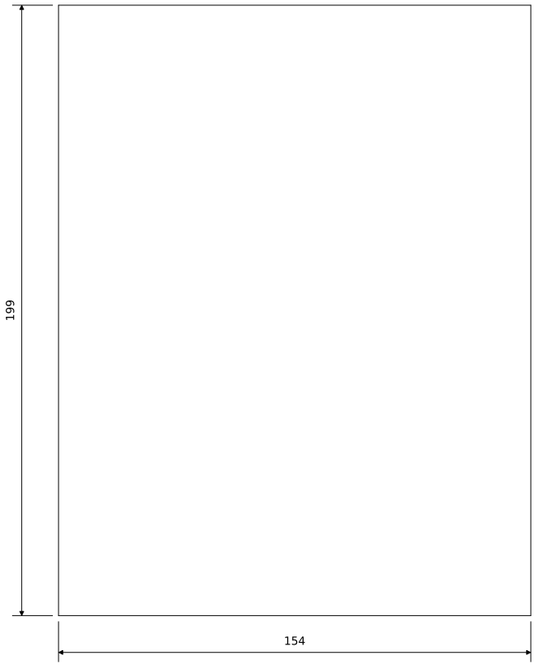
PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-102	C	7 / 25	1:2.5	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	1 / set (S/C/G)	2026-11-03

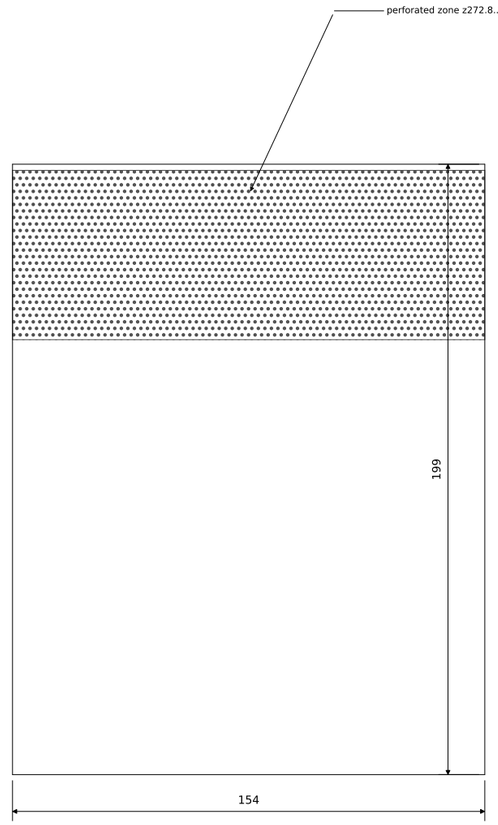
FINISH
Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal



BW3-115 SIDE (qty 2, mirror) 1:2



BW3-116 FRONT (solid) 1:2



BW3-117 REAR 1:2

PART	POSITION	SIZE	OPEN AREA	QTY
BW3-115	side, inner face x = +/-WI/2	302 x 199 x 0.3	perforated rows 12..19 (z252.8..328)	2
BW3-116	front, inner face y = -DI/2	154 x 199 x 0.3	solid (front grooves blind)	1
BW3-117	rear, inner face y = +DI/2	154 x 199 x 0.3	perforated rows 14..19 (z272.8..328)	1

NOTES

1. Liner z131..330 covers every slit; bonded to the core wall with 3M VHB 9469 strips on solid lands only.
2. Open ratio in the perforated zone 71.7 % (163.8 cm2 free of 228.5 cm2 slit area). Mesh is the dust and EMI screen.
3. Matte black so all 80 slits read as uniform dark ribs from outside (ref renders 2023).
4. Liners are part of the sleeve BW3-100 and lift off with it; 0.4 min clearance to the frame.

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

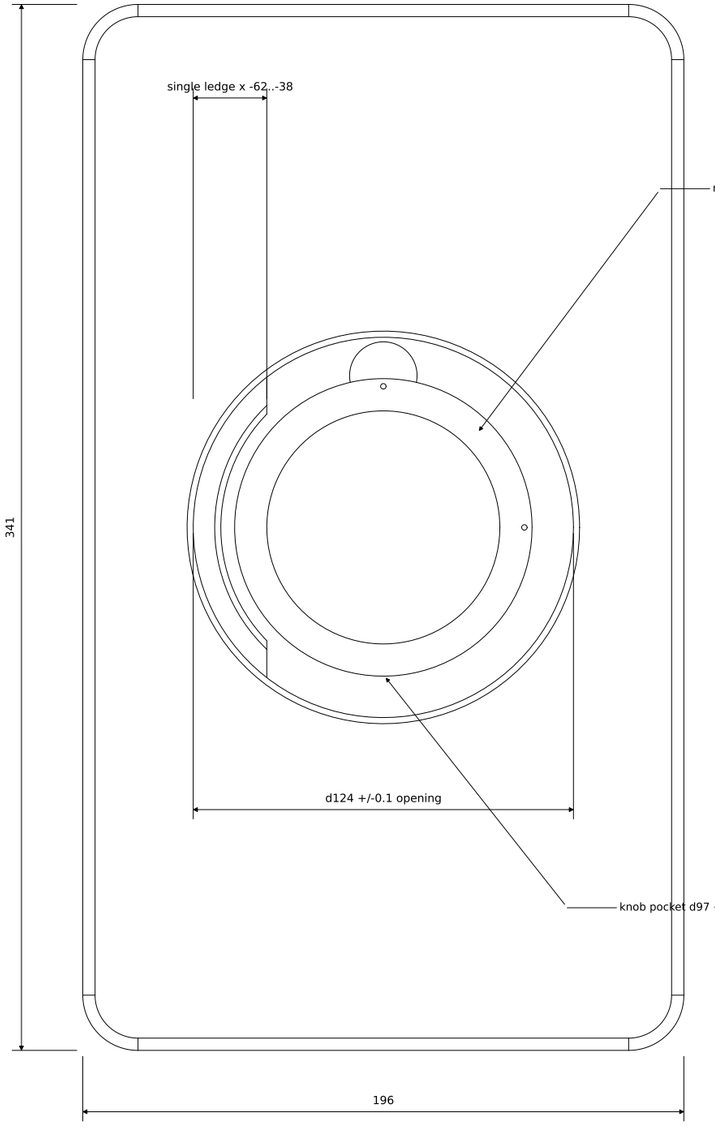
Vent liners, black, bonded inside the rib band

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-115 / 116 / 117	C	8 / 25	1:2	mm	3rd angle

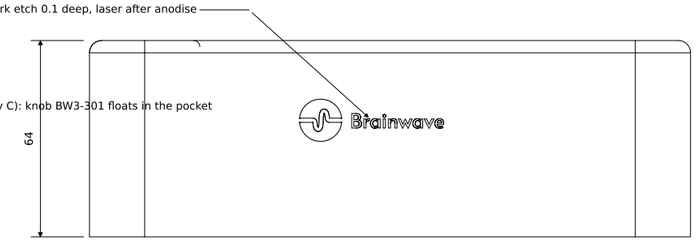
MATERIAL	QTY / UNIT	DATE
SS304 0.3, photo-etched hex d2	2 + 1 + 1 / set	2026-11-03

FINISH

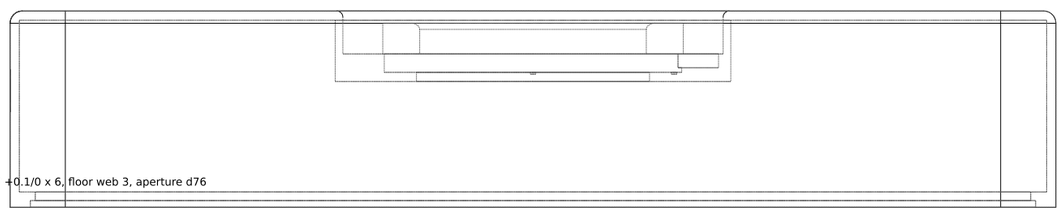
black oxide / matte black e-coat



TOP



FRONT



RIGHT (hidden lines)

NOTES

1. Grip bowl surfaces cosmetic class A, Ra 0.8, bead-blast + anodise.
2. All finger-contact edges R2 min; lip edge R2.5.
3. Only through opening: aperture d76 under the knob (RF window BW3-104 + tab BW3-302 close it).
4. Twist latch detail: see sheets LATCH SECTION and LATCH PARTS. Antenna carriers BW3-308 on the underside.

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

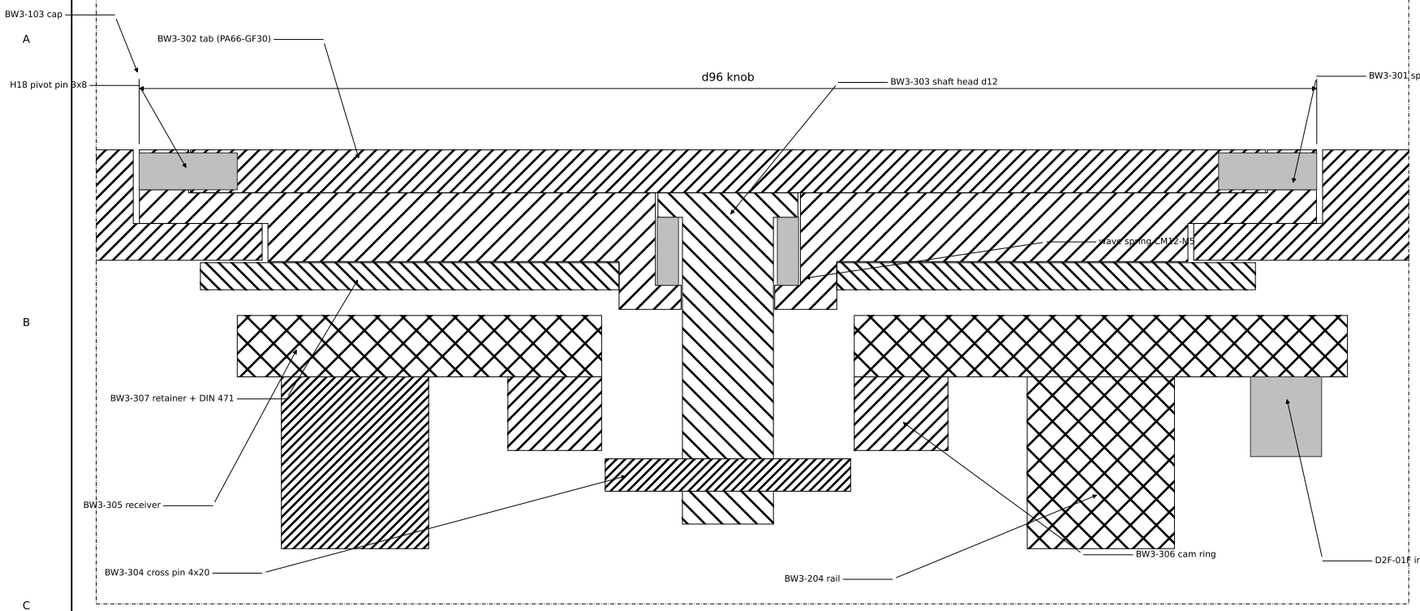
Top cap with carry grip

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-103	C	9 / 25	1:2	mm	3rd angle

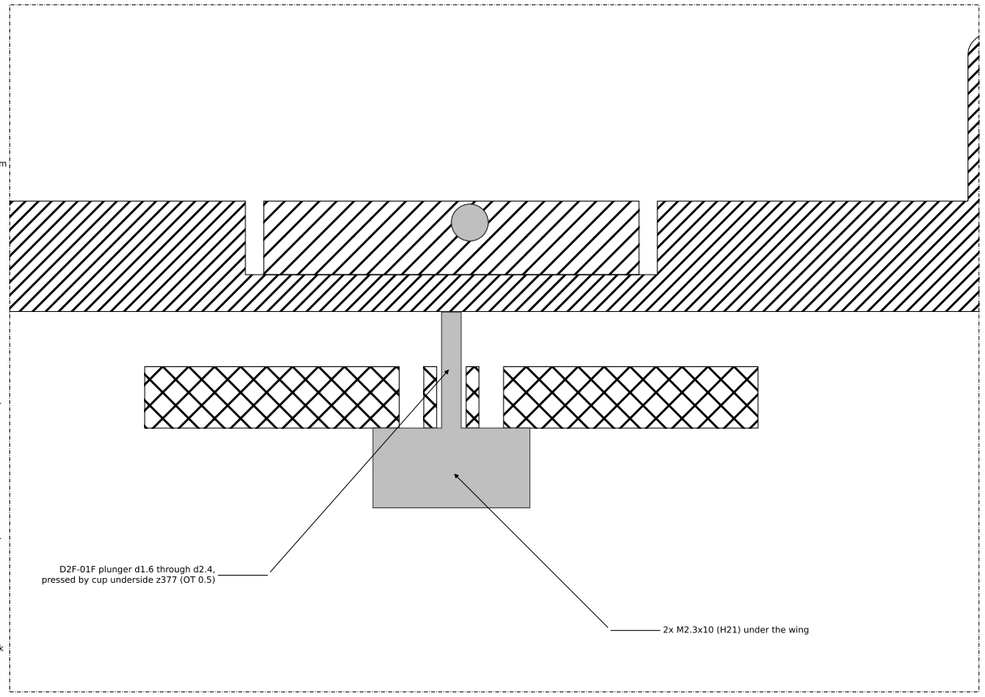
MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	1 / set (S/C/G)	2026-11-03

FINISH

Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal



SECTION A-A (y = 1.5, through pivot pins, shaft, cross pin), 2:1, LOCKED



SECTION B-B (x = 45.5, interlock plunger), 2:1

#	P/N	DESCRIPTION	MATERIAL / SOURCE	QTY
1	BW3-302	Half-moon flip tab, white, flips up 90 deg = handle	DuPont Zytel 70G30HSL NC010 (PA66-GF30)	1
2	BW3-104	Logo / RF window, front half, 3.5	PC Lexan 9034, back-painted	1
3	BW3-301	Knob spider: rim r44..48, 4 spokes, hub	Al 6061-T6, tier anodise	1
4	H18	Pivot pins ISO 8734 3x8 (tab to rim)	steel hardened	2
5	MISUMI C-BPK3	Ball plunger M3 in rim at -45 deg, dimples -45 / +45 (code to confirm)	SUS, ball	1
6	BW3-303	Latch shaft d8 x 25, head d12, d4 H7 cross hole	17-4PH H1025	1
7	Smalley CM12-M5	Wave spring 12 bore, 40 N at 5.54 (verify code)	17-7PH	1
8	BW3-307 + H19	Retainer 2 arms + DIN 471 18x1.2 ring	POM-C white / spring steel	1+1
9	BW3-304	Cross pin ISO 8734 4x20 = bayonet lugs	steel hardened	1
10	BW3-305 + H03	Receiver 90.5 x 50 x 5, keyhole 20.6 x 4.4 + 4x M4x10	Al 6061-T6, chem film	1+4
11	BW3-306	Cam ring OD36 x 6, 2 ramps 1.5 / 90 deg + notches	17-4PH H900	1
12	Omron D2F-01F + H21	Interlock micro switch, pin plunger, in PS_ON	-	1+2
13	BW3-204	Frame top rails 12 x 14 (receiver sits on them)	Al 6061-T6	2

OPERATION

LOCK: lower sleeve over guides BW3-118 onto 4 dowels BW3-119; the cross pin drops through the receiver keyhole. Tab flat, turn 90 deg CW: pin rides the 2 cam ramps (1.5 / 90 deg) into the notches, wave spring preload 40 N pulls the sleeve down on seal BW3-112, detent clicks, cup presses D2F-01F = power ON.
UNLOCK: shut down, unplug rear cables, flip tab up, turn 90 deg CCW, lift. Interlock opens on the first 0.5 mm of lift (PS_ON cut).
LIFT LOAD 258 N (2 x Gold mass): tab > H18 > spider > shaft > cross pin > cam > receiver > 4x M4 > rails > 4x M5 > saddles > sea walls > tray.
FEA: frame 13.3 MPa (SF 20.8), spider 114 MPa peak (SF 2.4), see sim_v3.

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

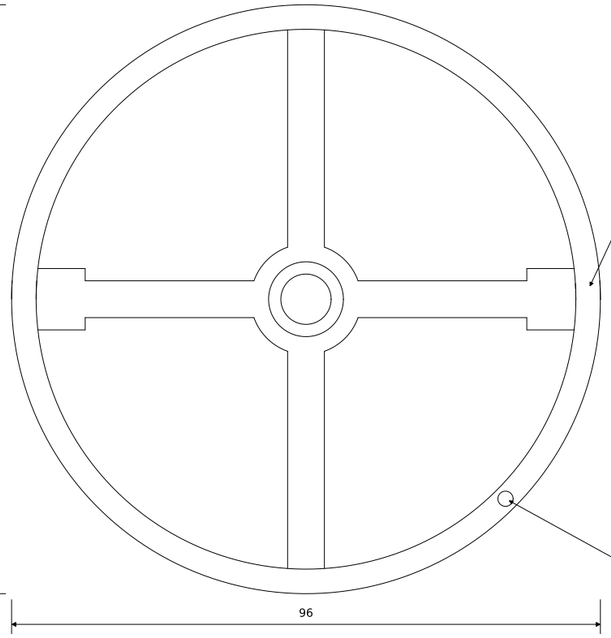
TITLE

Twist latch section (after Mac Pro 2019 top)

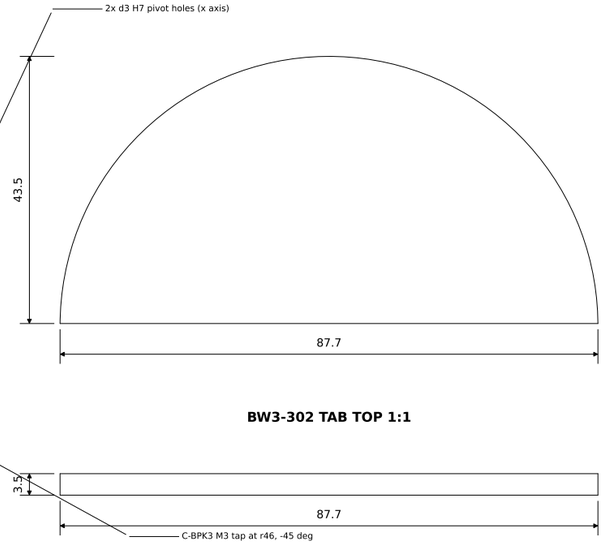
PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-300	C	10 / 25	2:1	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
see P/N table	1 set	2026-11-03

FINISH: see P/N table

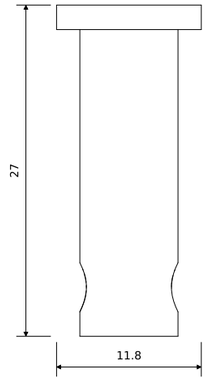


BW3-301 SPIDER TOP 1:1

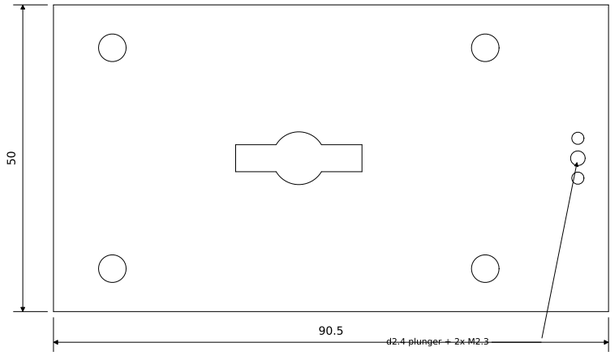


BW3-302 TAB TOP 1:1

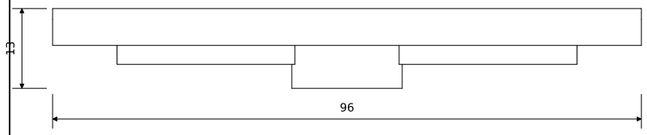
FRONT

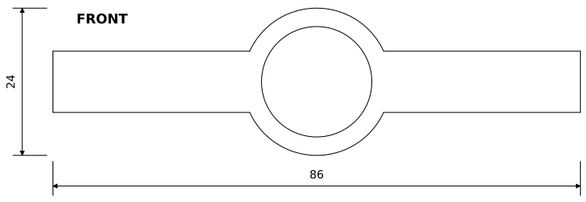


BW3-303 SHAFT 2:1

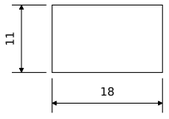


BW3-305 RECEIVER 1:1

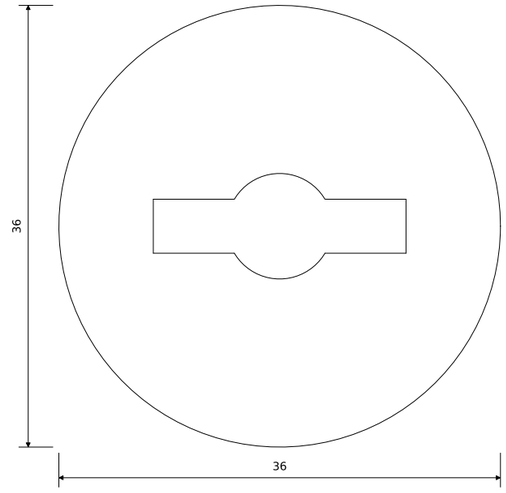


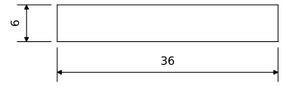


BW3-307 RETAINER 1:1



BW3-308 ANTENNA CARRIER 1:1





FRONT 1:1

BW3-306 CAM TOP 2:1

PART	MATERIAL	KEY DIMENSIONS
BW3-301	Al 6061-T6, tier anodise	rim r44..48 x 6; spokes 6 wide, 0/180 deep z376.9..382.5 (root 10 wide); hub r9; c'bore d12.2 x 7.5
BW3-302	Zytel 70G30HSL	R43.85 half disc x 3.5, pivot bores d3 at y1.5 z384.25, finger lip 1.5
BW3-303	17-4PH H1025	d8 g6 x 25, head d11.8 x 2, d4 H7 cross hole at z359.5
BW3-305	Al 6061-T6 plate 5	90.5 x 50 x 5, keyhole d8.6 + 20.6 x 4.4, 4x d4.5 at (+/-30.4, +/-18)
BW3-306	17-4PH H900	OD36 x 6, bore d8.6 + slot 20.6 x 4.4, 2 ramps 1.5 / 90 deg, notches 0.8 deep
BW3-307	POM-C white	2 arms +/-43 x 10 x 2.2, bore d18 for DIN 471 18x1.2
BW3-308	POM-C black	antenna carrier quadrants II / IV, 2x M2.5 to cap underside

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

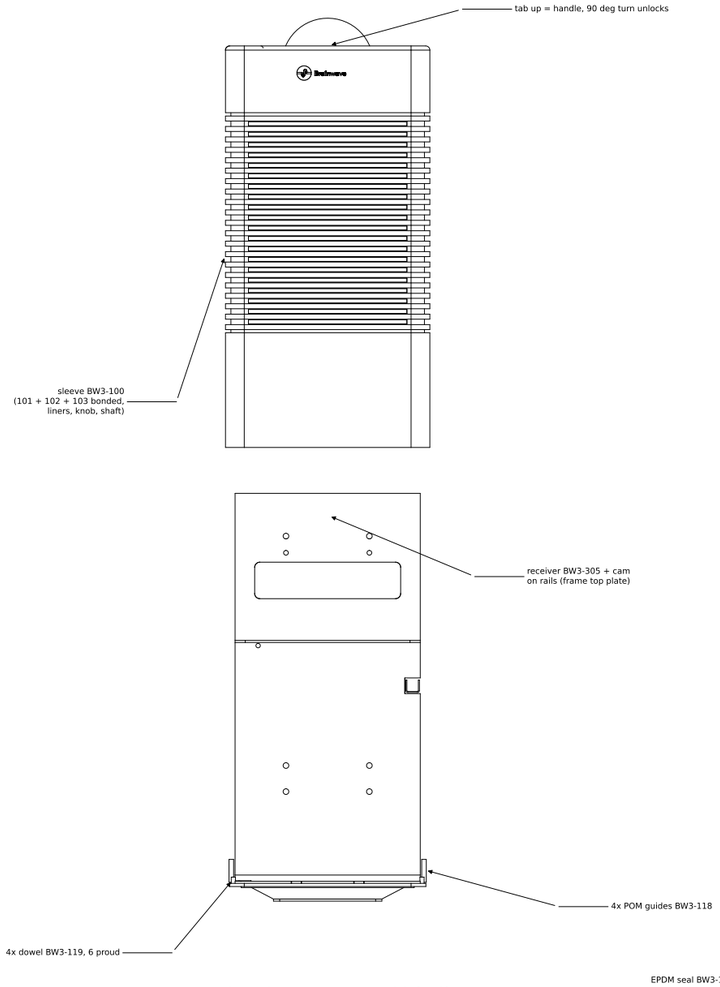
PROJECT
Brainwave v3 enclosure, BW3

TITLE
Twist latch parts

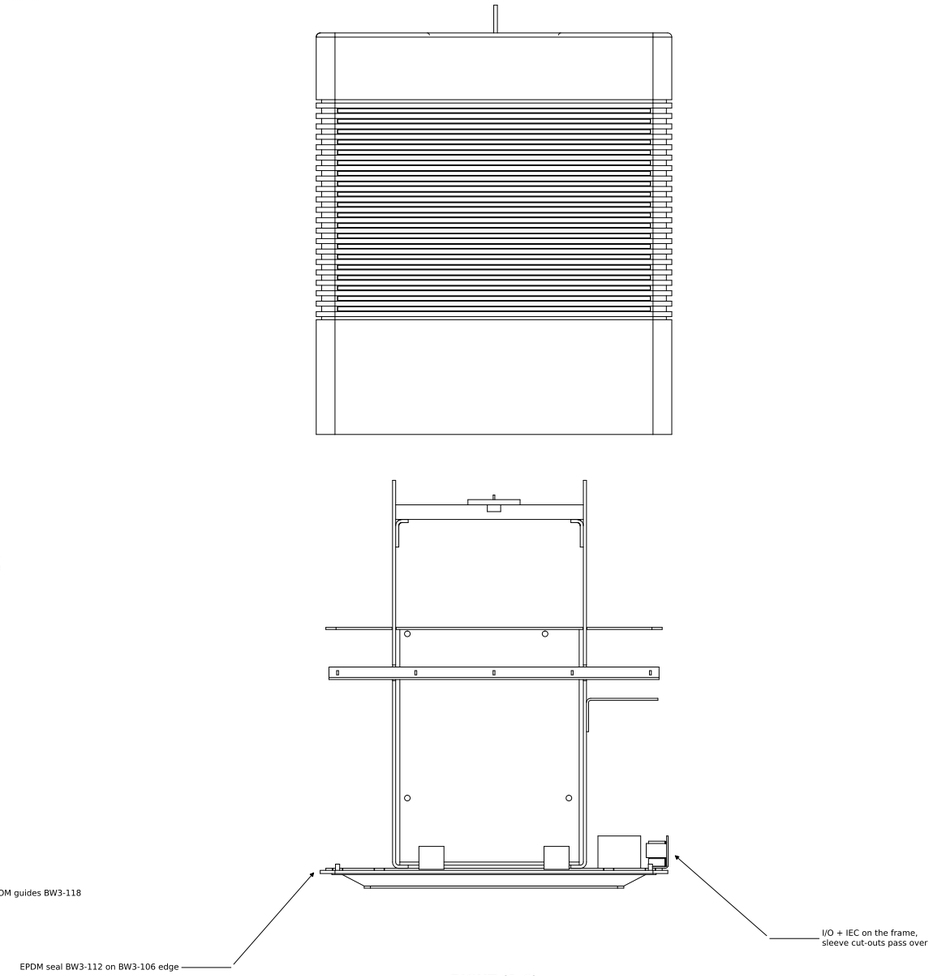
PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-301 .. 308	C	11 / 25	1:1 / 2:1	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
see table	1 set	2026-11-03

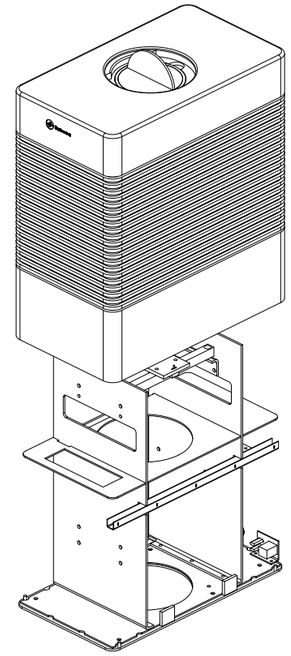
FINISH
see table



FRONT, SLEEVE LIFTED 420 (1:6)



RIGHT (1:6)



ISO

INTERFACE	DESCRIPTION	NOTE
Locate	4 dowels ISO 8734 4x12 in BW3-106 into d4.1 H8 sockets in the corner pads of BW3-101	+/-0.05
Guide	4 POM-C lead-in guides BW3-118 (3 x 45 deg), 0.4 radial to the sleeve inner wall	no contact when seated
Rest	12 rest pads d8 of BW3-101 on BW3-106 top face; EPDM 1.2 sponge seal compressed to 0.8	EMI contact via masked pads
Clamp	twist latch: cross pin under cam ring, wave spring 40 N preload	see LATCH SECTION
Interlock	Omron D2F-01F, NO, closes when the cup underside is at z377 +/-0.3; wired in series with PS_ON	fail safe: no sleeve = no power
I/O	IEC, button, 2x USB-C, RJ45 mounted on frame bracket BW3-280; sleeve cut-outs +0.5 all round	cables must be unplugged before lift
Lift	sleeve mass about 3.3 kg lifts by the tab; full unit 13.1 kg (Gold) lifts by the tab when locked	258 N design load

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

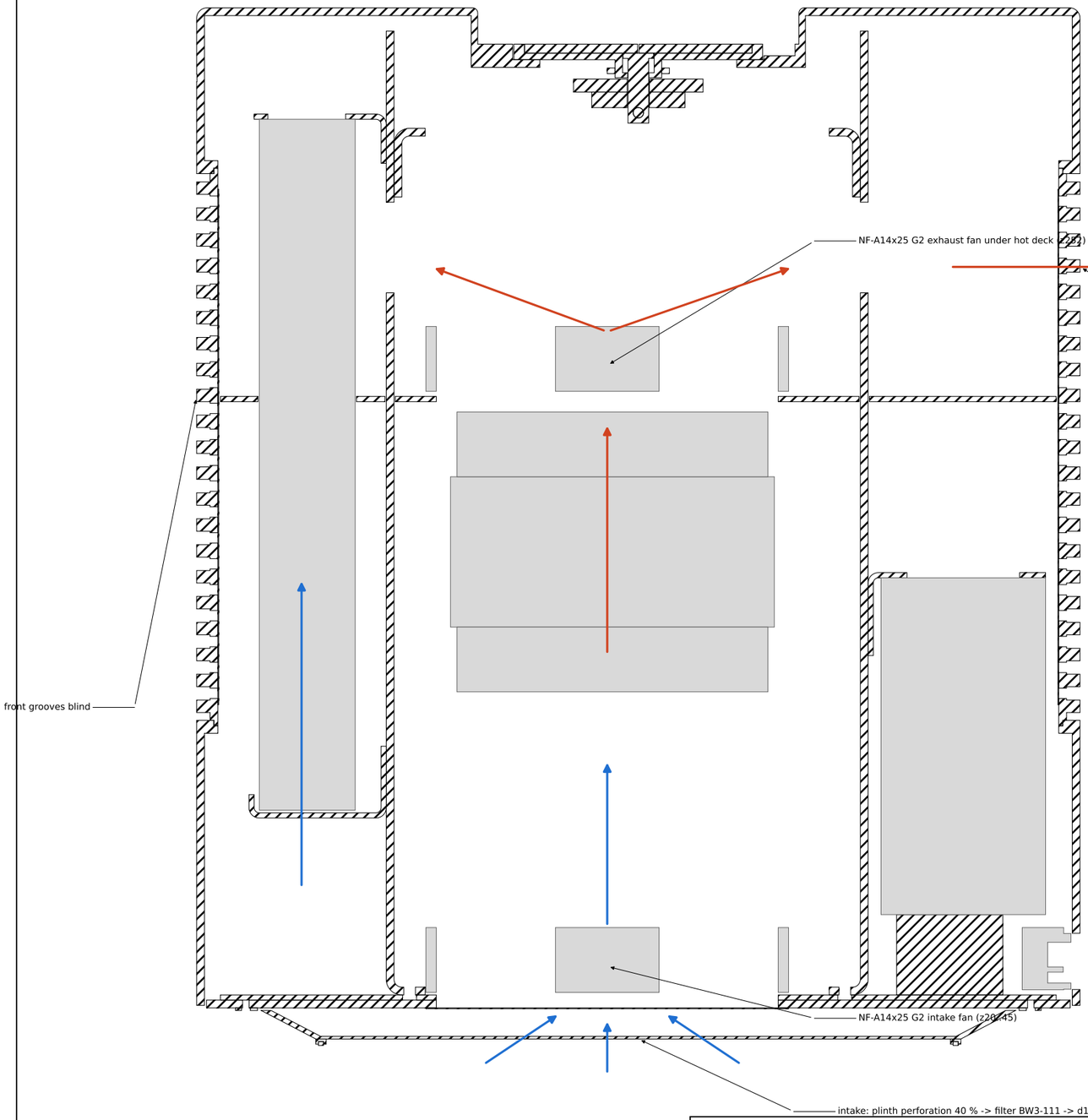
PROJECT
Brainwave v3 enclosure, BW3

TITLE
Sleeve lift-off architecture (rev C)

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-100 / 200	C	12 / 25	1:6	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
see BOM	1 set	2026-11-03

FINISH
see BOM



TIER	AIR PATH
Silver	2 fans at low rpm (25 CFM, 22 dBA at 192 W); fans stop below ~44 W (chimney + shell skin 48 C)
Copper	2 fans 770 rpm, GPU 2-slot in front bay, CPU tower cooler; same path
Gold	2 fans, GPU 2.5-slot in front bay + tail rest, same path
Pressure path	intake ~ 150 cm2 filtered -> chamber -> top fan -> 163.8 cm2 free slit area behind liner (see sim_v3)

Legend: hatched = enclosure parts cut at x=0; grey = bought-in parts (envelopes);
blue = cold intake, red = hot exhaust.

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

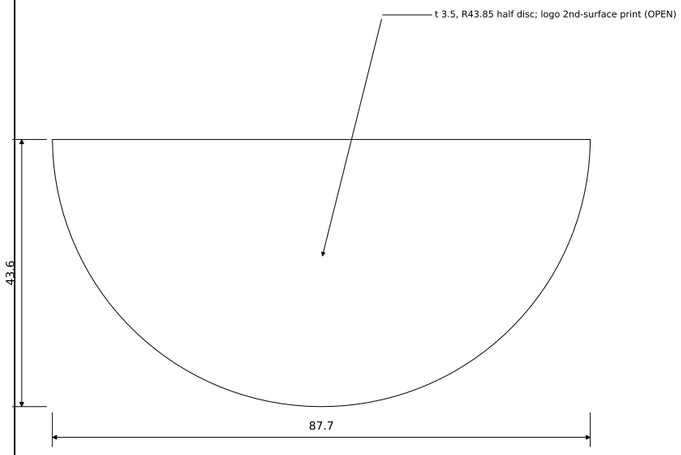
Airflow path section (Gold shown), tier notes

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000-AF	C	13 / 25	1:2	mm	3rd angle

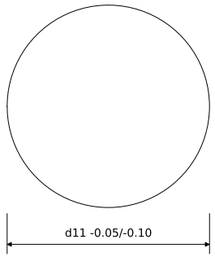
MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	ref	2026-11-03

FINISH

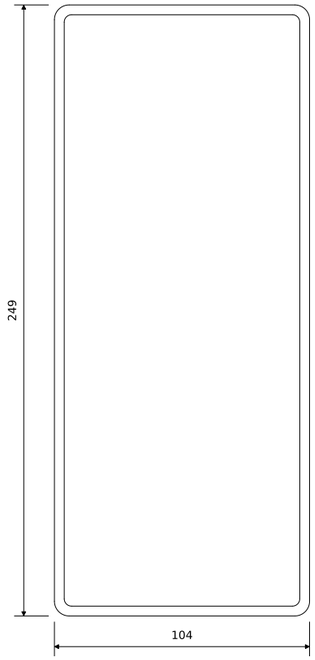
Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal



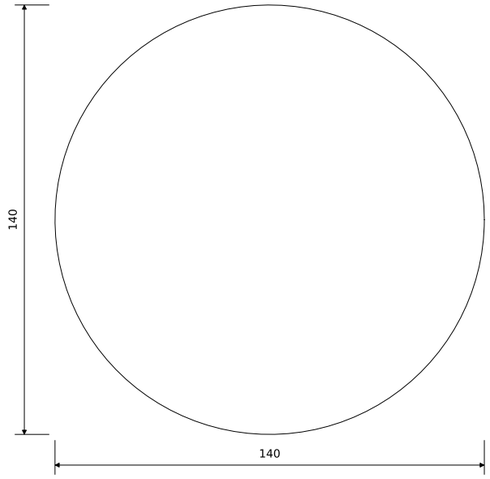
BW3-104 LOGO WINDOW (front half) 1:1



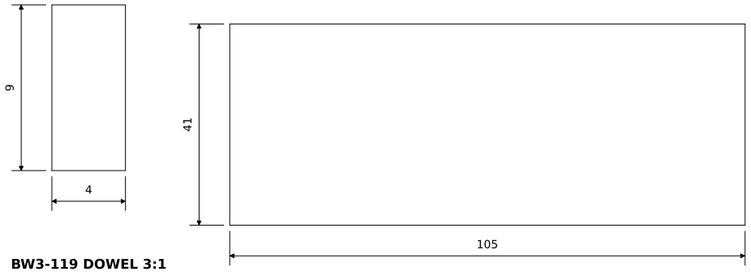
BW3-110 BUTTON CAP 3:1



BW3-107 FOOT RING 1:2.5



BW3-111 INTAKE FILTER 1:2



BW3-119 DOWEL 3:1

BW3-251 PSU FOAM 1:1.25

PART	NAME	MATERIAL	FINISH	QTY
BW3-104	Logo window, PC half-dis	PC Lexan 9034, RF transparent	Back-painted white,	1
BW3-110	Power button cap d11	Al 6061-T6	Anodise MIL-A-8625 T	1
BW3-107	Foot ring	Al 6061-T6	Anodise T2, tier col	1
BW3-108	Foot strip 2.0 x 1.5 sil	Silicone 50 Shore A, black	-	1
BW3-111	Intake filter d140	PET mesh 80 um, black	-	1
BW3-112	Sleeve base seal, EPDM s	EPDM sponge 1.2 (compressed to 0.	-	1
BW3-118	Sleeve lead-in guide 4.4	POM-C black	-	4
BW3-119	Sleeve dowel ISO 8734 4	Steel hardened, black oxide	-	4
BW3-251	PSU foam block	PU foam 30 kg/m3, black	-	1

NOTES

1. BW3-104: PC Lexan 9034 (RF transparent) 3.5, front half of the knob; bonded to the spider spokes with VHB 4910. Antennas sit below in carriers BW3-308. BW3-112: EPDM seal, see SLEEVE sheet.
2. BW3-110 Al 6061-T6 anodised in tier colour, same batch as shell.
3. BW3-108 silicone strip 2.0 x 1.5 bonded into foot ring groove, length 760 mm.
4. BW3-111 PET mesh 80 um, die-cut, retained between plinth and base plate.

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

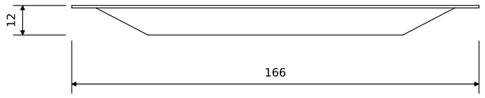
Small parts

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-1xx	C	14 / 25	3:1 / 1:1 / 1:2.5	mm	3rd angle

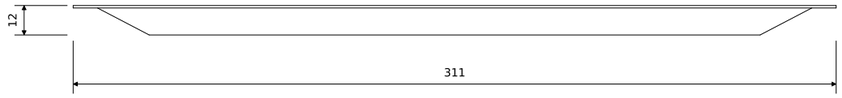
MATERIAL	QTY / UNIT	DATE
see table	see table	2026-11-03

FINISH

see table



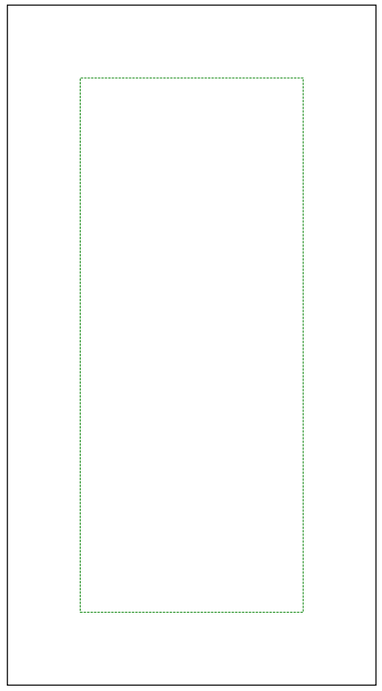
FRONT



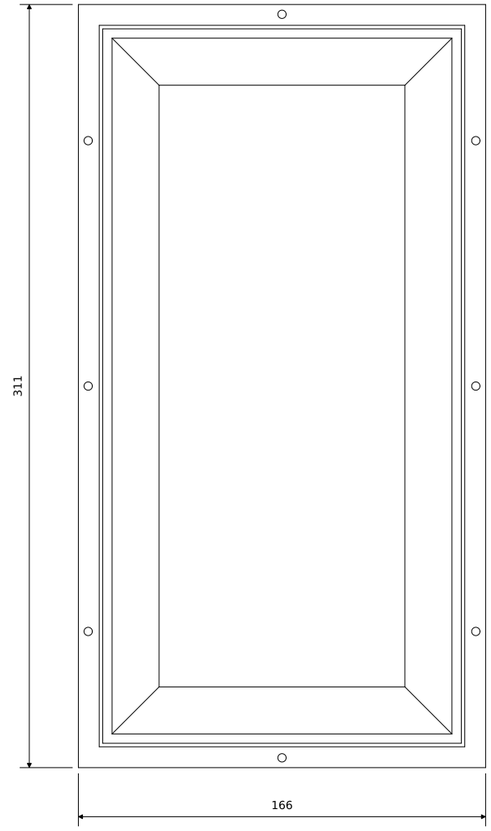
RIGHT

FLAT PATTERN (see dxf/BW3-105_flat.dxf, layer PERF 1756 x d2.0 on 3.0 hex)

Flat envelope 171.71 x 316.71 mm, 4 walls developed at 27.55 deg (slant length 25.94),
corners: laser-welded (fibre laser, filler-less) after bending, ground flush, then black anodise.
Top flange 8 mm (to 166 x 311) with 8x d3.4 for H17 M3 into base plate (PL_SCREWS).
Open area 40.3 % (d2 at 3.0 hex). Perforation keeps 5 mm solid border at bends and corners.
t 1.0 Al 6061, form in T4 then age to T6, R 1.0, K 0.45.



FLAT ENVELOPE BW3-105 171.71 x 316.71 t=1 (1:2.9) perforation omitted, see DXF



TOP

NOTES

1. Plinth visible only at low angles; black anodise Type II, class B.
2. Weld corners on inside; no burn-through visible outside.
3. Flatness of top flange 0.3 after welding.

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

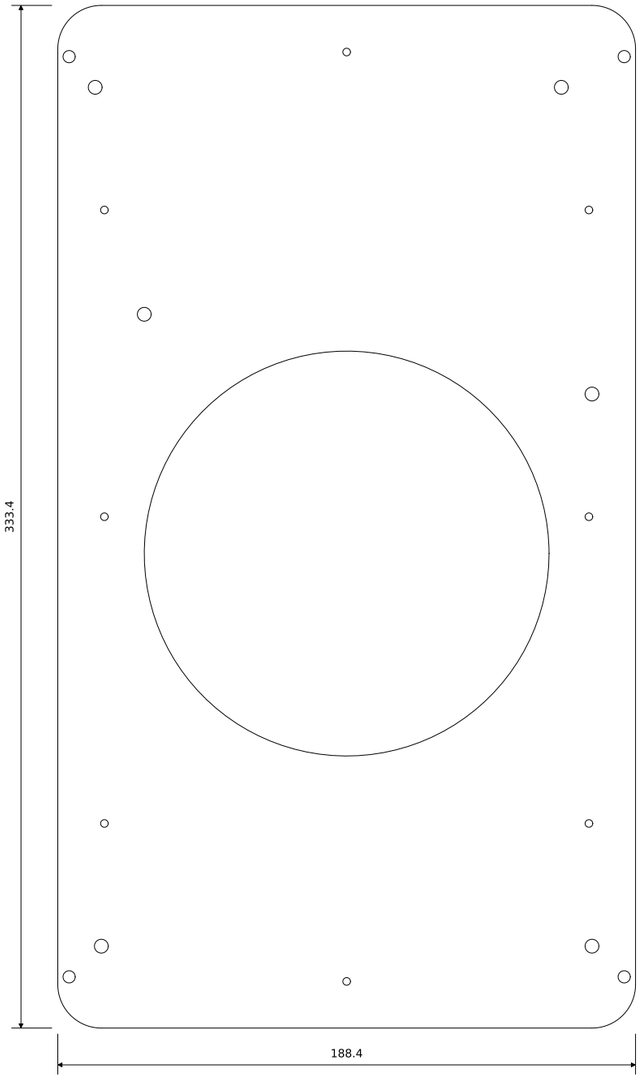
Plinth, perforated slanted tray

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-105	C	15 / 25	1:2.5 / 1:3	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T4>T6 1.0 perf d2 / 3.0 hex	1 / set (S/C/G)	2026-11-03

FINISH

Anodise MIL-A-8625 Type II Class 2, black, bead-blast #120



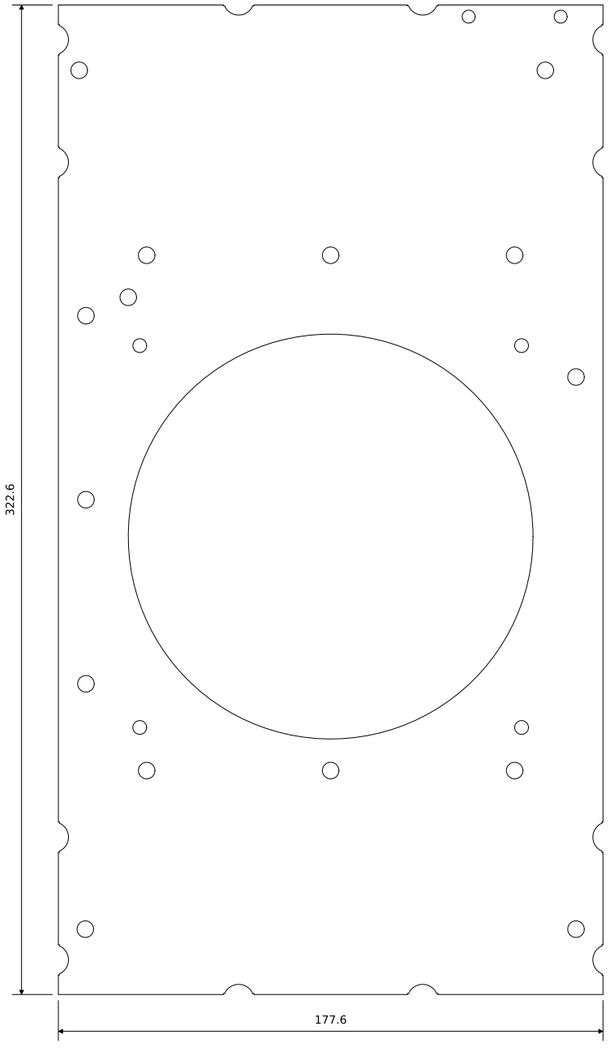
BW3-106 TOP (1:2)

BW3-106 HOLES (datum centre)

#	FEATURE	X	Y
1	dowel (BW3-119)	-90.5	-150.0
2	dowel (BW3-119)	90.5	-150.0
3	dowel (BW3-119)	-90.5	150.0
4	dowel (BW3-119)	90.5	150.0
5	M4 csk (H02)	-80.0	-140.0
6	M4 csk (H02)	80.0	-140.0
7	M4 csk (H02)	-66.0	66.0
8	M4 csk (H02)	80.0	40.0
9	M4 csk (H02)	-82.0	140.0
10	M4 csk (H02)	70.0	140.0
11	M3 tap (H17)	-79.0	-100.0
12	M3 tap (H17)	-79.0	100.0
13	M3 tap (H17)	79.0	-100.0
14	M3 tap (H17)	79.0	100.0
15	M3 tap (H17)	-79.0	0.0
16	M3 tap (H17)	79.0	0.0
17	M3 tap (H17)	0.0	-151.5
18	M3 tap (H17)	0.0	151.5
19	intake d132 thru	0.0	-12.0

BW3-201 HOLES (datum centre)

#	FEATURE	X	Y
1	PEM S-M4-2 (H02)	-80.0	-140.0
2	PEM S-M4-2 (H02)	80.0	-140.0
3	PEM S-M4-2 (H02)	-66.0	66.0
4	PEM S-M4-2 (H02)	80.0	40.0
5	PEM S-M4-2 (H02)	-82.0	140.0
6	PEM S-M4-2 (H02)	70.0	140.0
7	PEM S-M4-2 (H06)	-60.0	-88.3
8	PEM S-M4-2 (H06)	-60.0	79.7
9	PEM S-M4-2 (H06)	0.0	-88.3
10	PEM S-M4-2 (H06)	0.0	79.7
11	PEM S-M4-2 (H06)	60.0	-88.3
12	PEM S-M4-2 (H06)	60.0	79.7
13	PEM S-M4-2 (H07)	-79.8	-60.0
14	PEM S-M4-2 (H07)	-79.8	0.0
15	PEM S-M4-2 (H07)	-79.8	60.0
16	PEM S-M3-1 (H15)	45.0	157.5
17	PEM S-M3-1 (H15)	75.0	157.5
18	intake d132 thru	0.0	-12.0



BW3-201 TOP (1:2)

NOTES

1. BW3-106: 4x d3.98 N7 for dowels BW3-119 (sleeve locate), 6x csk d8.96 for H02 M4 (to tray PEM), 8x M3 tap (d2.5) for plinth H17, intake opening d132, seal BW3-112 on edge.
2. BW3-201: PEM S-M4-2 x15 (H02 6, sea-wall flanges 6, board flange 3), S-M3-1 x2 (IO).
3. Hole coordinates: dxf/BW3-106_flat.dxf, dxf/BW3-201_flat.dxf (datum = part centre, Y+ = rear).
4. Flatness 0.3 over whole plate after PEM install.

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

PROJECT
Brainwave v3 enclosure, BW3

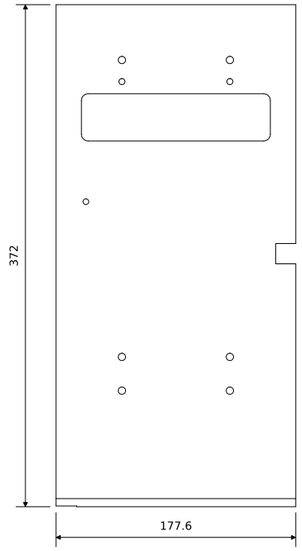
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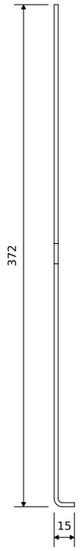
Base plate 3.0 and base tray 2.0

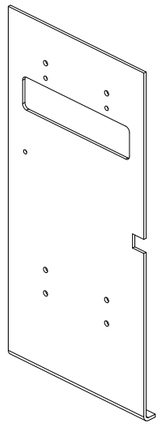
PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-106 / 201	C	16 / 25	1:2.5	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
6061-T6 plate 3.0 / 6061-T6 sheet 2.0	1 + 1 / set (S/C/G)	2026-11-03

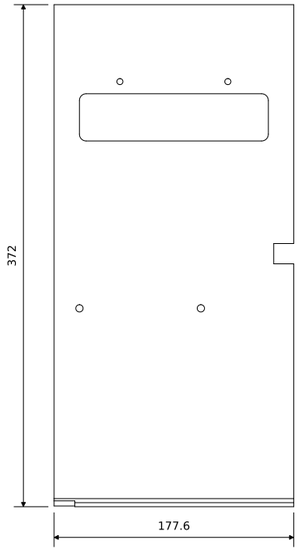
FINISH
106: Anodise T2 black; 201: chem film

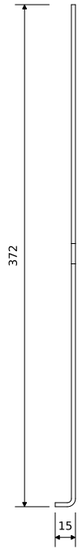


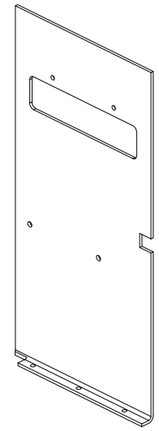




ISO



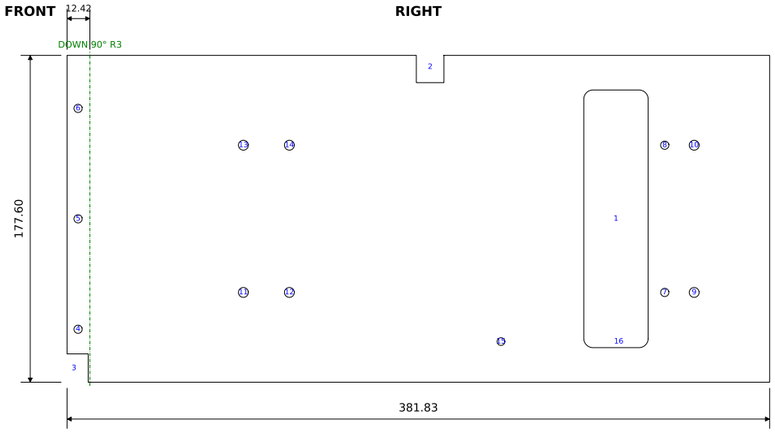




ISO

FRONT

RIGHT

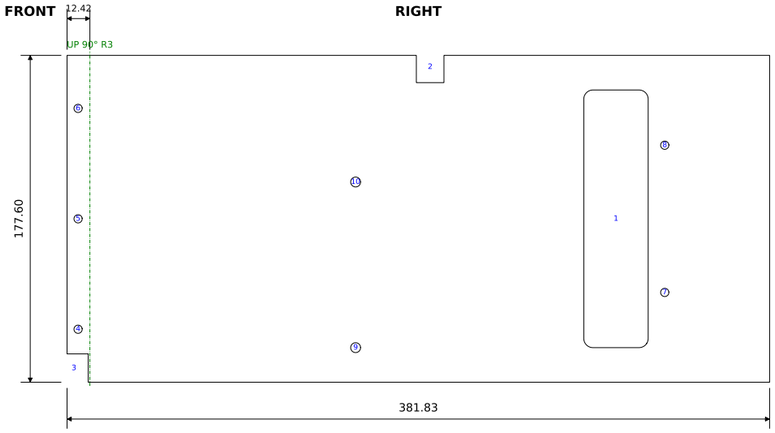


FLAT PATTERN BW3-202 t=3 R=3 K=0.45 (scale 1:3.33)

BW3-202 Sea wall front 3.0
Al 6061-T4>T6 3.0, Chem film T2 Cl.3, qty 1 (S/C/G)
t 3 R 3 K 0.45 flat 381.83 x 177.60 BA 6.83
2x d4.22 PEM S-M3-1
5x d4.5 M4 clearance
6x d5.4 PEM S-M4-2

FRONT

RIGHT



FLAT PATTERN BW3-203 t=3 R=3 K=0.45 (scale 1:3.33)

BW3-203 Sea wall rear 3.0
Al 6061-T4>T6 3.0, Chem film T2 Cl.3, qty 1 (S/C/G)
t 3 R 3 K 0.45 flat 381.83 x 177.60 BA 6.83
5x d4.5 M4 clearance
2x d5.4 PEM S-M4-2

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

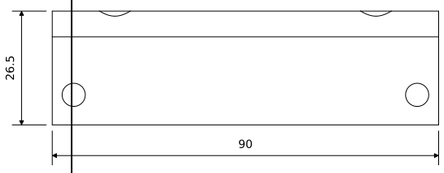
Sea walls front and rear 3.0

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-202 / 203	C	17 / 25	1:4.5 / 1:3.3	mm	3rd angle

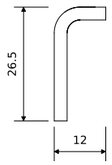
MATERIAL	QTY / UNIT	DATE
Al 6061-T6 3.0 (form T4, age T6)	1 + 1 / set (S/C/G)	2026-11-03

FINISH

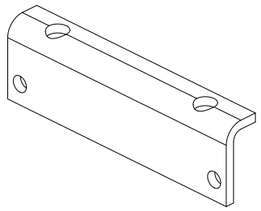
Chem film MIL-DTL-5541 Type II Class 3 (clear, conductive for EMI bonding)



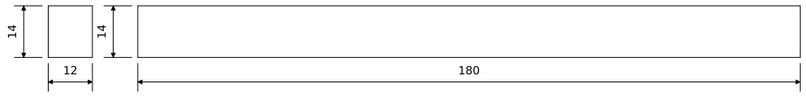
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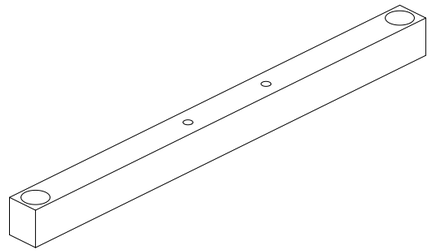


RIGHT

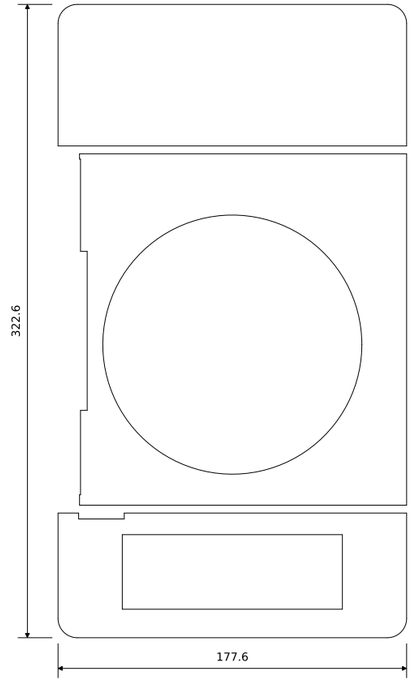


ISO



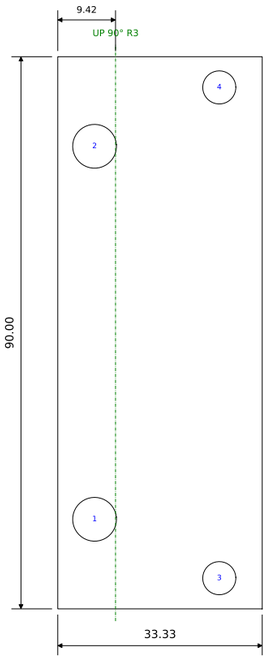


BW3-204 frame top rail 12 x 14 x 180, 6061-T6 bar, chem film
2x M4-6H x 10 (H03 from receiver BW3-305), 2x d5.5 c'bore d9.5 x 5.5 for H04 M5
qty 2, mirror pair identical



BW3-207 HOT DECK TOP (1:3.1)

Hot deck 1.5 6061-T6 laser cut flat (no bends), 3 pieces:
207-1 front bay, 207-2 main (top fan d138 + Silver heat-pipe relief),
207-3 rear bay; split by the two sea walls passing through z248.
One set of profiles for all tiers. Fixing tabs / screws to sea
walls not yet modelled (OPEN, see open items).



FLAT PATTERN BW3-206 t=3 R=3 K=0.45 (scale 1:1)

BW3-206 Rail saddle 3.0
Al 6061-T4>T6 3.0, Chem film T2 Cl.3, qty 2 (S/C/G)
t 3 R 3 K 0.45 flat 33.33 x 90.00 BA 6.83
2x d5.4 PEM S-M4-2
2x d7.14 PEM CLS-M5-1

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

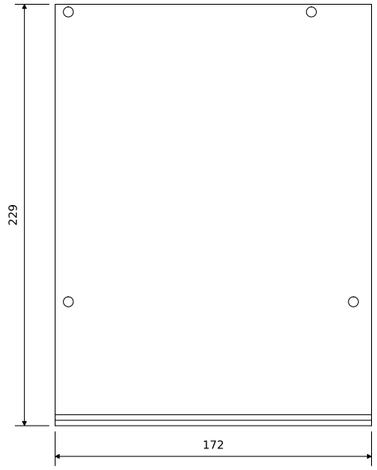
Rail saddle, frame top rail, hot deck

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-206 / 204 / 207	C	18 / 25	1:1.4 / 1:1.7 / 1:3.1	mm	3rd angle

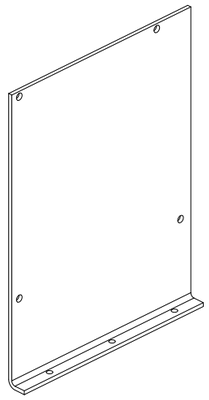
MATERIAL	QTY / UNIT	DATE
see parts	2 + 2 + 3 / set	2026-11-03

FINISH

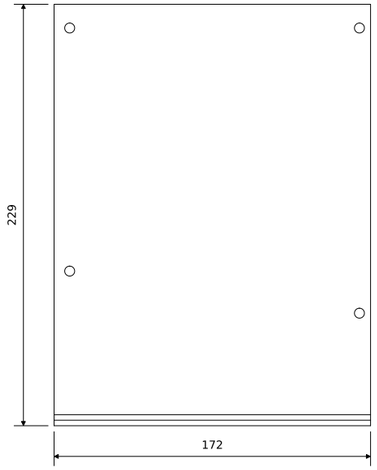
Chem film MIL-DTL-5541 Type II Class 3 (clear, conductive for EMI bonding)



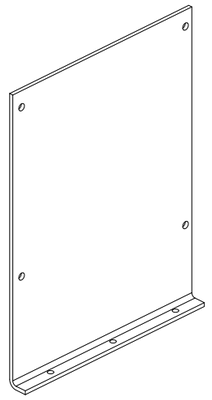
RIGHT



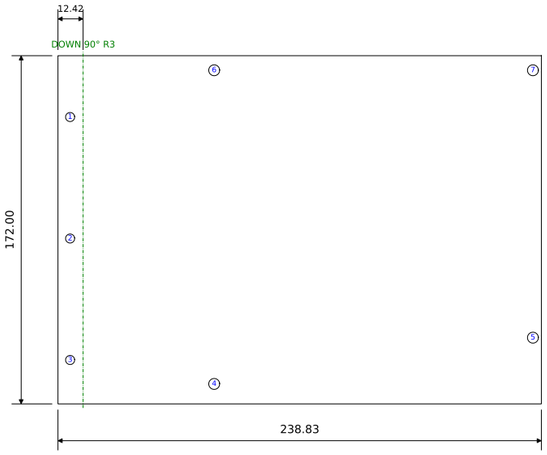
ISO



RIGHT

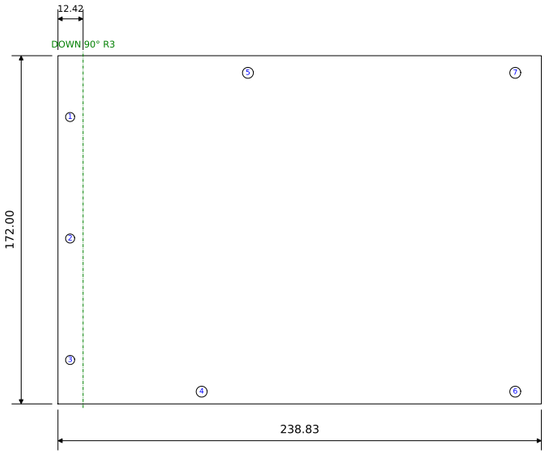


ISO



FLAT PATTERN BW3-210 t=3 R=3 K=0.45 (scale 1:3.03)

PART	Y	Z	PEM	POS TOL
BW3-210	71.84	86.35	SO-632-8	TP d0.2 |A|B|
BW3-210	48.98	243.83	SO-632-8	TP d0.2 |A|B|
BW3-210	-83.10	86.35	SO-632-8	TP d0.2 |A|B|
BW3-210	-83.10	243.83	SO-632-8	TP d0.2 |A|B|
BW3-211	75.65	80.16	SO-632-8	TP d0.2 |A|B|
BW3-211	-81.83	103.02	SO-632-8	TP d0.2 |A|B|
BW3-211	75.65	235.10	SO-632-8	TP d0.2 |A|B|
BW3-211	-81.83	235.10	SO-632-8	TP d0.2 |A|B|
BW3-211	75.65	270.00	SO-632-8	TP d0.2 |A|B|
BW3-211	-81.83	270.00	SO-632-8	TP d0.2 |A|B|



FLAT PATTERN BW3-211 t=3 R=3 K=0.45 (scale 1:3.03)

BW3-210 Board plate Silver (mini-ITX)
Al 6061-T4>T6 3.0, Chem film T2 Cl.3, qty 1 (S)
t 3 R 3 K 0.45 flat 238.83 x 172.00 BA 6.83
3x d4.5 M4 clearance
4x d5.41 PEM SO-632-8 (#6-32 x 6.35)

BW3-211 Board plate Copper/Gold (deep mini-ITX)
Al 6061-T4>T6 3.0, Chem film T2 Cl.3, qty 1 (C/G)
t 3 R 3 K 0.45 flat 238.83 x 172.00 BA 6.83
3x d4.5 M4 clearance
6x d5.41 PEM SO-632-8 (#6-32 x 6.35)

ITX hole positions: mini-ITX per Intel ATX/mini-ITX spec (holes C, F, H, J). Deep mini-ITX pattern for C/G: PLACEHOLDER (OPEN) until board P/N is fixed.

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

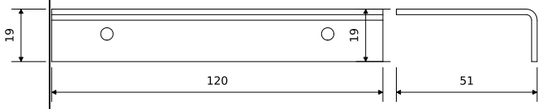
PROJECT
Brainwave v3 enclosure, BW3

TITLE
Board plates mini-ITX / deep mini-ITX

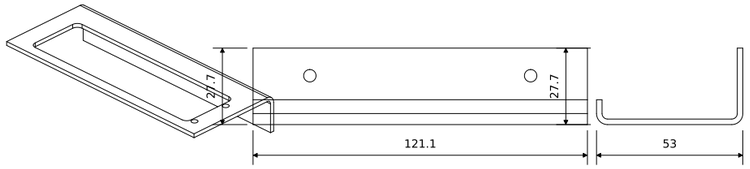
PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-210 / 211	C	19 / 25	1:3	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 3.0 (form T4, age T6)	1 / set (S or C/G)	2026-11-03

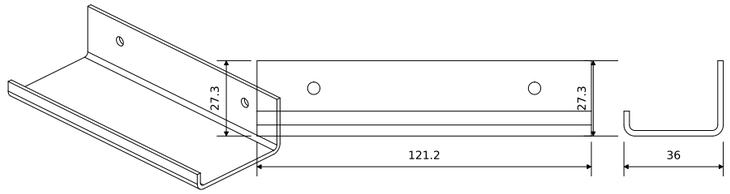
FINISH
Chem film MIL-DTL-5541 Type II Class 3 (clear, conductive for EMI bonding)



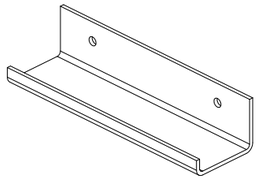
FRONT **RIGHT**



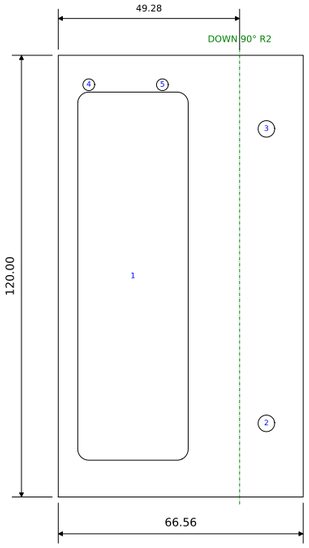
ISO **FRONT** **RIGHT**



ISO **FRONT** **RIGHT**

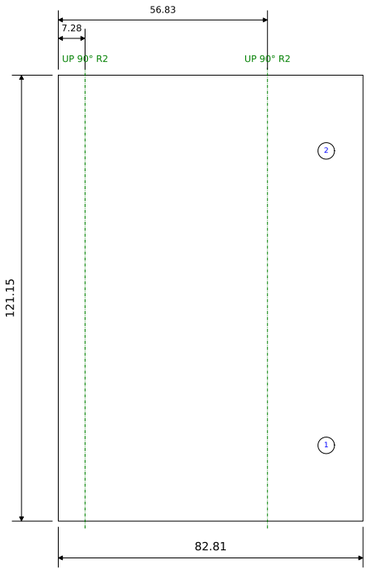


ISO



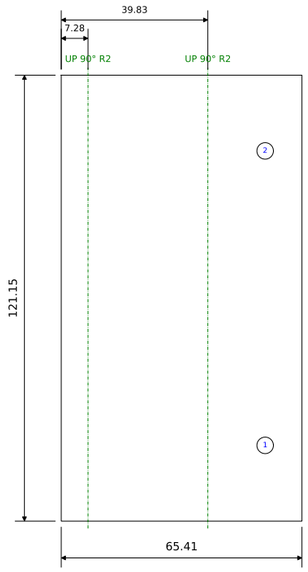
FLAT PATTERN BW3-240 t=2 R=2 K=0.45 (scale 1:1.67)

BW3-240 GPU top bracket 2.0
Al 6061-T4>T6 2.0, Chem film T2 Cl.3, qty 1 (C/G)
t 2 R 2 K 0.45 flat 66.56 x 120.00 BA 4.56
2x d3.2 M3 clearance (TBD per card)
2x d4.5 M4 clearance



FLAT PATTERN BW3-241G t=2 R=2 K=0.45 (scale 1:1.67)

BW3-241G GPU tail rest Gold 2.0
Al 6061-T4>T6 2.0, Chem film T2 Cl.3, qty 1 (G)
t 2 R 2 K 0.45 flat 82.81 x 121.15 BA 4.56, 4.56
2x d4.5 M4 clearance



FLAT PATTERN BW3-241C t=2 R=2 K=0.45 (scale 1:1.67)

BW3-241C GPU tail rest Copper 2.0
Al 6061-T4>T6 2.0, Chem film T2 Cl.3, qty 1 (C)
t 2 R 2 K 0.45 flat 65.41 x 121.15 BA 4.56, 4.56
2x d4.5 M4 clearance

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

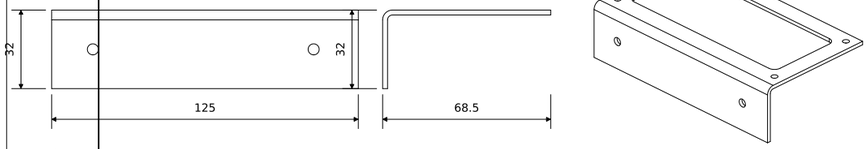
GPU top bracket and tail rests

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-240 / 241G / 241C	C	20 / 25	1:2	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 2.0 (form T4, age T6)	1 each (C/G)	2026-11-03

FINISH

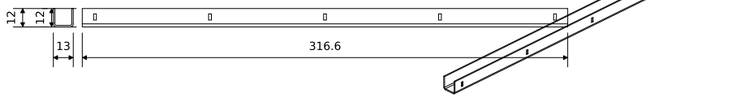
Chem film MIL-DTL-5541 Type II Class 3 (clear, conductive for EMI bonding)



FRONT

RIGHT

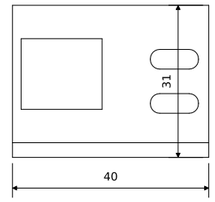
ISO



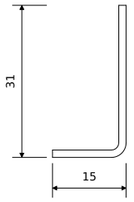
FRONT

RIGHT

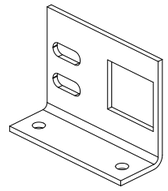
ISO



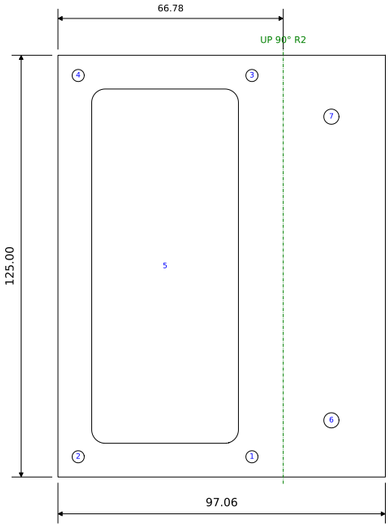
REAR



RIGHT

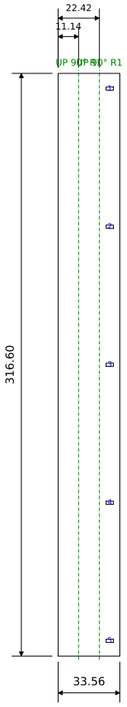


ISO



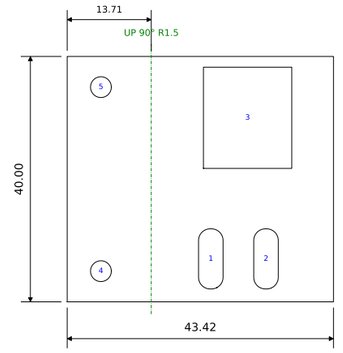
FLAT PATTERN BW3-250 t=2 R=2 K=0.45 (scale 1:1.82)

BW3-250 SFX-L PSU hanger 2.0
Al 6061-T4>T6 2.0, Chem film T2 Cl.3, qty 1 (S/C/G)
t 2 R 2 K 0.45 flat 97.06 x 125.00 BA 4.56
4x d3.6 #6-32 clearance
2x d4.5 M4 clearance



FLAT PATTERN BW3-270 t=1 R=1 K=0.45 (scale 1:3.33)

BW3-270 Cable channel 1.0
Al 6061-T4>T6 1.0, Chem film T2 Cl.3, qty 1 (S/C/G)
t 1 R 1 K 0.45 flat 33.56 x 316.60 BA 2.28, 2.28



FLAT PATTERN BW3-280 t=1.5 R=1.5 K=0.45 (scale 1:1)

BW3-280 Rear I/O bracket 1.5
Al 6061-T4>T6 1.5, Chem film T2 Cl.3, qty 1 (S/C/G)
t 1.5 R 1.5 K 0.45 flat 43.42 x 40.00 BA 3.42
2x d3.4 M3 clearance

GENERAL TOLERANCES	ISO 2768-mK unless stated
EDGES	break 0.2-0.4 unless stated; cosmetic edges see CMF
SURFACE	Ra 1.6 unless stated
DRAWN	Brainwave
CHECKED / APPROVED	___ / ___
PROJECT	Brainwave v3 enclosure, BW3

TITLE

SFX-L hanger, cable channel, rear I/O bracket

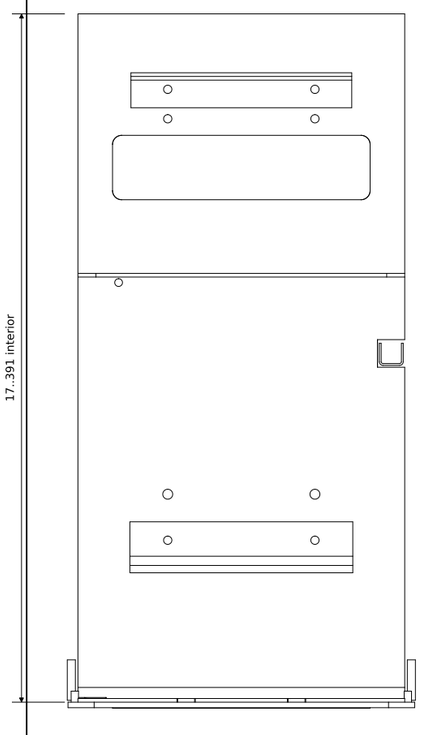
PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-250 / 270 / 280	C	21 / 25	1:2 / 1:3	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (form T4, age T6)	1 each / set	2026-11-03

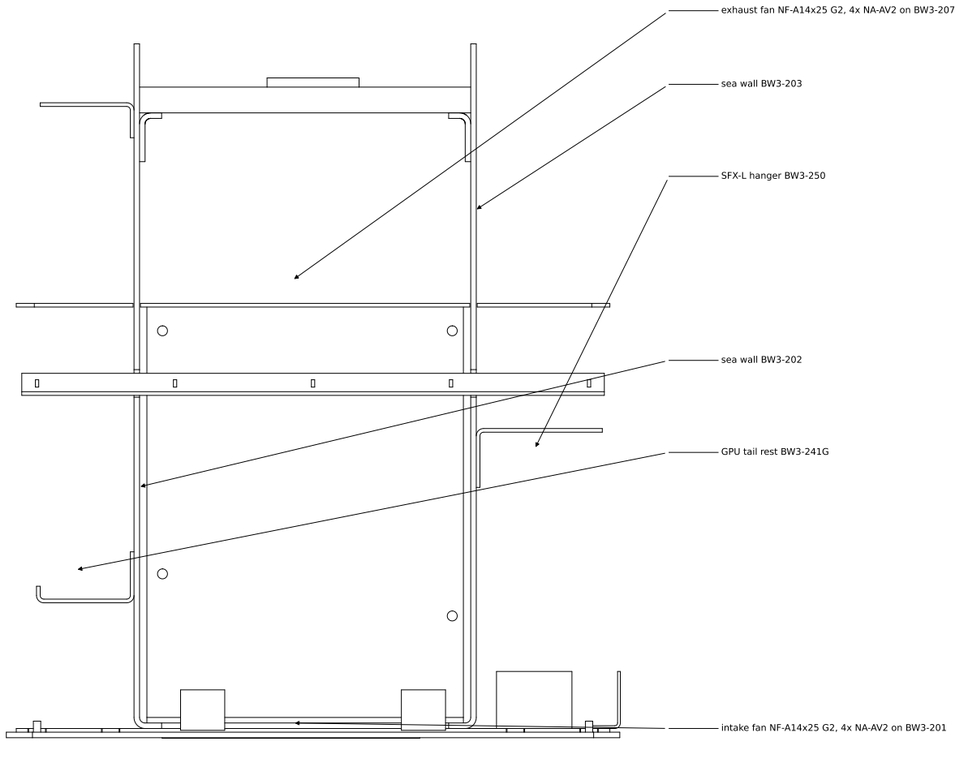
FINISH

Chem film MIL-DTL-5541 Type II Class 3 (clear, conductive for EMI bonding)

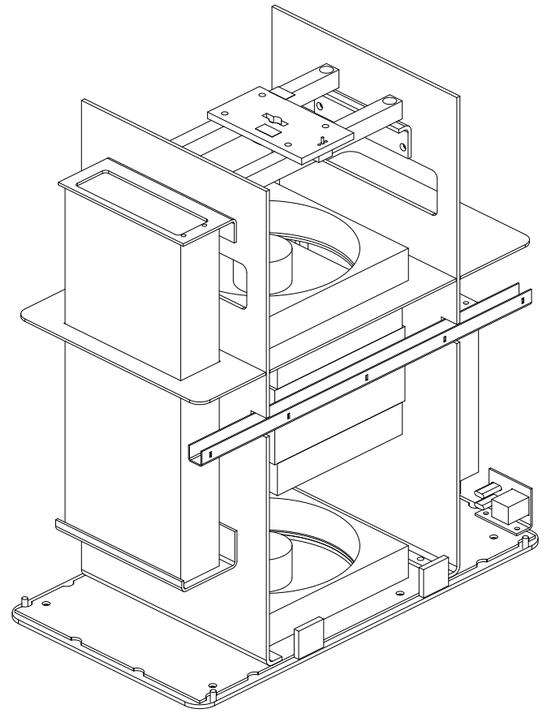
Sleeve parts (101..117, knob) hidden for clarity.
All interior sheet: Al 6061-T6, chem film MIL-DTL-5541 Type II Class 3 (bonded to shell for EMI). Bought-in parts shown as CAD envelopes in iso, for fit only.



FRONT (made parts)



RIGHT (made parts)



ISO (made parts + bought-in envelopes)

ITEM	SPEC	NOTE
Fan mount	4x NA-AV2 silicone per fan, d4.5 holes 124.5 x 124.5 (tray -12 offset, hot deck)	bottom intake pushes up, top exhaust pulls through deck
Board standoffs	PEM SO-632-8 (#6-32 x 6.35) in BW3-210/211 at ITX holes C,F,H,J	torque 0.6 Nm, H08
GPU	PCIe x16 riser (OPEN P/N) to BW3-240 top bracket, tail on BW3-241G/C	GPU screws OPEN
PSU	SFX-L, 4x #6-32 (H09) into BW3-250, AC through rear window, foam BW3-251	PSU fan faces rear grooves
Cables	BW3-270 channel 316.6 long on +X wall, zip-tie slots every 50	24-pin / EPS / 12V-2x6 routed rear bay
Ducts	sea walls 202/203 + hot deck 207 form the CPU duct; GPU bay self-ducted (blower)	no separate duct parts
Rear I/O	BW3-280 bracket on the frame (tray PEM S-M3-1), USB-C x2 + RJ45 keystone	passes through sleeve cut-outs
Latch	receiver BW3-305 + cam BW3-306 + interlock D2F-01F on rails BW3-204	frame top plate

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

PROJECT
Brainwave v3 enclosure, BW3

TITLE
Interior assembly, Gold shown

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000-I	C	22 / 25	1:3.3	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
see BOM	1 set	2026-11-03

FINISH
Chem film MIL-DTL-5541 Type II Class 3 (clear, conductive for EMI bonding)

PART	NAME	S	C	G	QTY
BW3-100	Shell sleeve (101 + 102 + 103 bonded,	x	x	x	1
BW3-101	Lower body (smooth band, rear I/O, inl	x	x	x	1
BW3-102	Rib band (21 fins, 80 hidden groove sl	x	x	x	1
BW3-103	Top cap with carry grip	x	x	x	1
BW3-104	Logo window, PC half-disc R43.85 x 3.5	x	x	x	1
BW3-105	Plinth, perforated slanted tray	x	x	x	1
BW3-106	Base plate 3.0	x	x	x	1
BW3-107	Foot ring	x	x	x	1
BW3-108	Foot strip 2.0 x 1.5 silicone	x	x	x	1
BW3-110	Power button cap d11	x	x	x	1
BW3-111	Intake filter d140	x	x	x	1
BW3-112	Sleeve base seal, EPDM sponge 1.2 x 3,	x	x	x	1
BW3-115	Vent liner side 0.3 (perforated rows 1	x	x	x	2
BW3-116	Vent liner front 0.3 (solid, blind)	x	x	x	1
BW3-117	Vent liner rear 0.3 (perforated rows 1	x	x	x	1
BW3-118	Sleeve lead-in guide 4.4 x 24 x 22	x	x	x	4
BW3-119	Sleeve dowel ISO 8734 4 x 12 (6 proud)	x	x	x	4
BW3-201	Base tray 2.0	x	x	x	1
BW3-202	Sea wall front 3.0	x	x	x	1
BW3-203	Sea wall rear 3.0	x	x	x	1
BW3-204	Frame top rail 12 x 14 x 180	x	x	x	2
BW3-206	Rail saddle 3.0	x	x	x	2
BW3-207	Hot deck 1.5	x	x	x	1
BW3-210	Board plate Silver (mini-ITX)	x	-	-	1
BW3-211	Board plate Copper/Gold (deep mini-ITX	-	x	x	1
BW3-240	GPU top bracket 2.0	-	x	x	1
BW3-241C	GPU tail rest Copper 2.0	-	x	-	1
BW3-241G	GPU tail rest Gold 2.0	-	-	x	1
BW3-250	SFX-L PSU hanger 2.0	x	x	x	1
BW3-251	PSU foam block	x	x	x	1
BW3-270	Cable channel 1.0	x	x	x	1
BW3-280	Rear I/O bracket 1.5	x	x	x	1
BW3-301	Latch knob spider (rim ring, 4 spokes,	x	x	x	1
BW3-302	Half-moon flip tab (lift handle)	x	x	x	1
BW3-303	Latch shaft d8, head d12	x	x	x	1
BW3-304	Bayonet cross pin ISO 8734 4 x 20	x	x	x	1
BW3-305	Latch receiver plate 90.5 x 50 x 5 (fr	x	x	x	1
BW3-306	Cam ring OD36 x 6, 2 ramps 1.5 / 90 de	x	x	x	1
BW3-307	Knob retainer, 2 arms	x	x	x	1
BW3-308	Antenna carrier	x	x	x	2

TIER MATRIX

ITEM	SILVER	COPPER	GOLD
Exterior colour	Silver (clear anodise)	Copper anodise	Gold (champagne) anodise
Base material	Al 6061-T6	Al 6061-T6	Al 6061-T6
Compute	RTX Spark N1X, 128 GB	Ryzen 7 9700X + RTX PRO 4000 Blackwell	Ryzen 9 9950X (120 W cap) + RTX PRO 6000 Max-Q
Board plate	BW3-210 mini-ITX	BW3-211 deep mini-ITX	BW3-211 deep mini-ITX
CPU cooling	VC + heat pipes + board plate + shell	NH-U12A	NH-U12A
GPU parts	-	BW3-240 + BW3-241C	BW3-240 + BW3-241G
Case fans	2x NF-A14x25 G2, 0 rpm < 44 W	2x NF-A14x25 G2	2x NF-A14x25 G2
Fan point 25 C	1150 rpm, 22 dBA, Tj 68 C	770 rpm, ~13 dBA, Tj 52 C	1370 rpm, 26 dBA, Tj 58 C
PSU / inlet	SF750, IEC C6 (2.5 A, OPEN)	SF750, IEC C14	SF1000, IEC C14
Heat load (est.)	192 W	307 W	576 W
Mass (est.)	10.2 kg	12.2 kg	12.8 kg

Silver, Copper and Gold are anodise colours only. All tiers use the same
Al 6061-T6 shell and 6061-T6 interior (sheet formed in T4, aged to T6). No precious metal anywhere.
Colour: Finish: anodised, colour Silver (clear), base material Al 6061-T6, no precious metal.
Tier marking: laser mark tier letter + serial on BW3-106 inner face, 2 mm text.

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

PROJECT
Brainwave v3 enclosure, BW3

TITLE
Tier configuration (one shell, 3 colours)

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000-T	C	23 / 25	NTS	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	per tier	2026-11-03

FINISH
Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal

TOLERANCES, FITS AND DATUMS

FEATURE	REQUIREMENT	PARTS
General	ISO 2768-mK (machined), ISO 2768-m sheet, ISO 13920-B weld	all
Datum A	base face of BW3-101 (z15), flatness 0.05	101
Datum B	rear face +Y of BW3-101, perpendicular to A 0.05	101
Datum C	centre plane x=0 (boss pattern)	101/102/103
Seam 101/102	spigot 5 mm shoulder, H8/f7 on 185.6 x 330.6 (clearance 0.03..0.11)	101,102
Seam 102/103	same as above, z336..341	102,103
Seam step	exterior step at seams max 0.05, gap 0.10 +0.05/0	cosmetic A
Fin pitch	10.0 +/-0.05 non-accumulating, fin thk 4.8 +/-0.05	102
Vent slits	4.0 +0.1/0, length +/-0.2, TP 0.1 |A|B|C|	102
Dowel sockets	d4.1 H8 x 7 in corner pads, TP 0.05 |A|C|; dowels d4 m6 in d3.98 N7	101,106,119
Knob fit	spider d96 h9 in d97 H9 pocket (0.5 radial), aperture d76 +/-0.05	103,301
Latch	shaft d8 g6 / d8.6; cross pin d4 m6 in d4 H7; pivot pins d3 m6 / tab d3 H8; cam to receiver M4 TP 0.1	303..306
Interlock	cup underside z377 +/-0.3 to plunger operating position	103,305
Rear I/O cut-outs	+0.1/0, TP 0.1 |A|B|C|	101
PEM holes	per PEM bulletin, +0.08/0, min edge distance per bulletin	sheet
Sheet bends	angle +/-0.5 deg, flange +/-0.15, flats per DXF	sheet
Board standoffs	TP 0.2 |A|B| vs ITX spec	210/211
Fan holes	124.5 +/-0.2 square, d4.5	201/207

ANODISE SPECIFICATION

ITEM	REQUIREMENT
Process	Anodise MIL-A-8625 Type II Class 2 (dyed), sulphuric acid
Pre-treat	bead-blast #120 glass bead, uniform matte, then etch-free deox (no caustic etch)
Thickness	10..18 um, hot-sealed (nickel acetate), seal test ASTM B136
Colour	Silver = clear, Copper, Gold = champagne; match master samples, dE <= 1.5 CIELAB, D65 10 deg
Batch	101, 102, 103 of one unit anodised in the same tank batch, racked same orientation
Mask	seam spigots (conductive EMI path), M4 threads, ground lug pad, PEM bores
Rack marks	only on class C faces (inside, base z15 face)
Black parts	105, 107: Type II black, same pre-treat, dE <= 2.0
Interior sheet	chem film MIL-DTL-5541 Type II Class 3, clear
Base material	Al 6061-T6 all tiers; colour is the only difference

COSMETIC CLASSES (inspect 1000 lux, 450 mm, 30..90 deg)

CL	SURFACES	ACCEPTANCE
A	exterior visible: fins, top cap, grip, front	no scratch/dent visible at 450 mm / 3 s, uniform blast, no tool marks
B	rear face, plinth, foot ring	minor marks < 0.5 mm, max 2 per face
C	interior, base face, hidden	functional only, rack marks allowed

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

PROJECT
Brainwave v3 enclosure, BW3

TITLE
Tolerances, fits, finish and cosmetic spec

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000-Q	C	24 / 25	NTS	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
Al 6061-T6 (all tiers; colour by anodise only, no precious metal)	-	2026-11-03

FINISH
Anodise MIL-A-8625 Type II Class 2, bead-blast #120 glass, colour per tier: Silver (clear) / Copper / Gold (champagne). Base material Al 6061-T6 all tiers, no precious metal

#	ITEM	DESCRIPTION	OWNER
1	IEC inlet	C6 is 2.5 A; Copper/Gold need C14 (10 A). Final P/N and cut-out TBD	electrical
2	Exhaust area	163.8 cm2 free behind the liner; reduced-order CFD OK (Gold Tj 58 C); confirm with prototype smoke test	thermal
3	Detent code	MISUMI C-BPK3 order code and Smalley CM12-M5 wave spring code to confirm with suppliers	purchasing
4	Hard stop	latch end stop (collar / notch depth) and ramp profile not modelled in 3D; define on cam BW3-306	mechanical
5	Tab	tab held flat by gravity + detent only; consider a small magnet or spring in the pivot	design
6	BW3-211	deep mini-ITX hole pattern is placeholder until board P/N is fixed	mechanical
7	Connectors	switch, USB-C, RJ45 keystone, IEC P/N TBD; cables must be unplugged before lift	purchasing
8	GPU	GPU bracket screw positions TBD with sample card	mechanical
9	CLS-M5	hole size for PEM CLS-M5 to be verified vs bulletin	mechanical
10	Silver	no fin duct: in 3D the air may bypass the fin stack; add a duct if prototype shows it	thermal
11	BW3-207	hot deck is 3 pieces (split by sea walls); fixing tabs/screws not yet modelled	mechanical
12	Sleeve bond	DP490 + dowels at seams vs one-piece machining; band stiffness of the thin 101 wall to check	mechanical
13	Riser	PCIe x16 riser cable P/N and routing open	purchasing
14	Silver board	N1X board mechanical data pending; BW3-210 uses mini-ITX	mechanical
15	Antennas	deep spokes 0/180 pass close to the antennas (quadrants I / III sweep only); RF test needed	electrical
16	6061 sheet	interior sheet changed to 6061 (form in T4, age to T6); confirm bend R = t and perforated 6061 stock for BW3-105 with the fabricator	purchasing

GENERAL TOLERANCES
ISO 2768-mK unless stated

EDGES
break 0.2-0.4 unless stated; cosmetic edges see CMF

SURFACE
Ra 1.6 unless stated

DRAWN
Brainwave

CHECKED / APPROVED
___ / ___

PROJECT
Brainwave v3 enclosure, BW3

TITLE
Open items (rev C)

PART NO.	REV	SHEET	SCALE	UNITS	PROJ.
BW3-000-O	C	25 / 25	NTS	mm	3rd angle

MATERIAL	QTY / UNIT	DATE
-	-	2026-11-03

FINISH
-