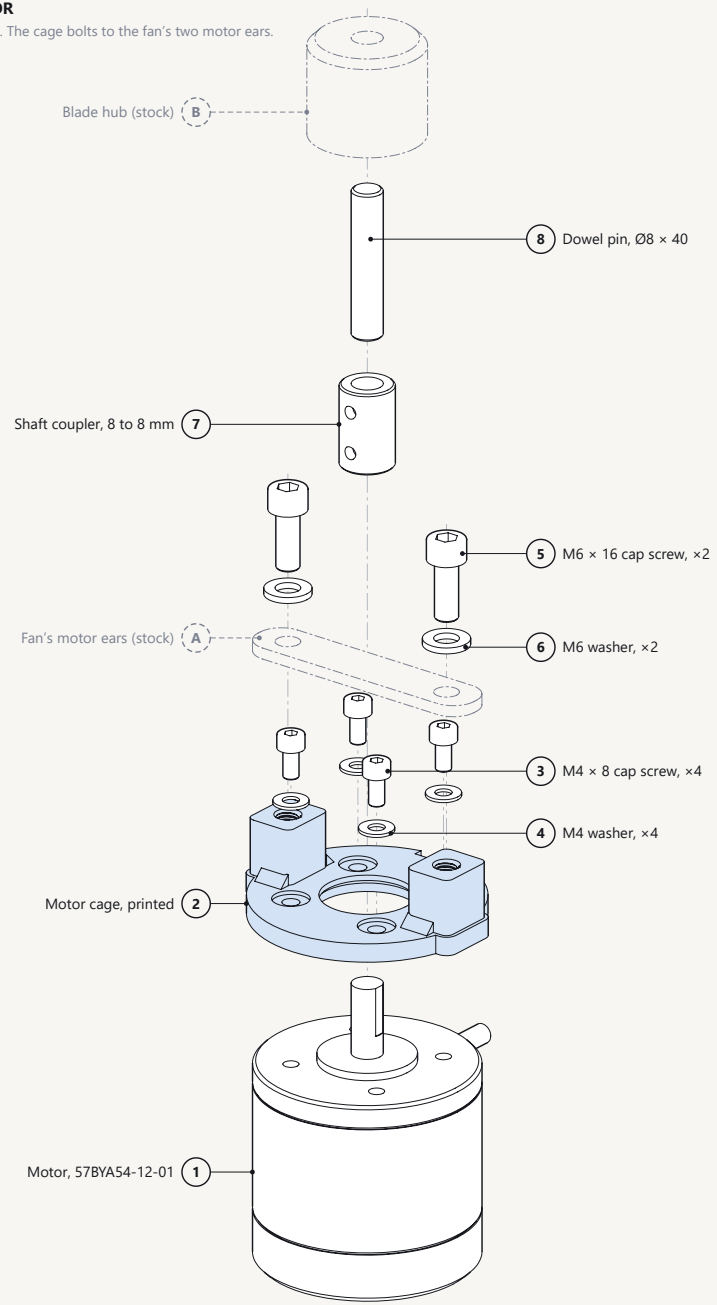
MaxxFan brushless retrofit

Exploded assembly · every part in the fan and the controller box

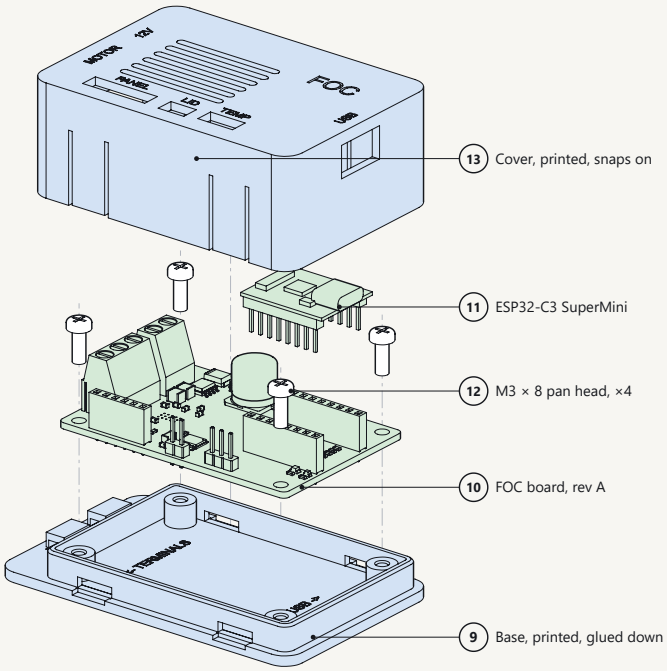
FAN MOTOR

Blade end up. The cage bolts to the fan's two motor ears.



CONTROLLER

The base is glued down; the board screws to it; the cover snaps on.



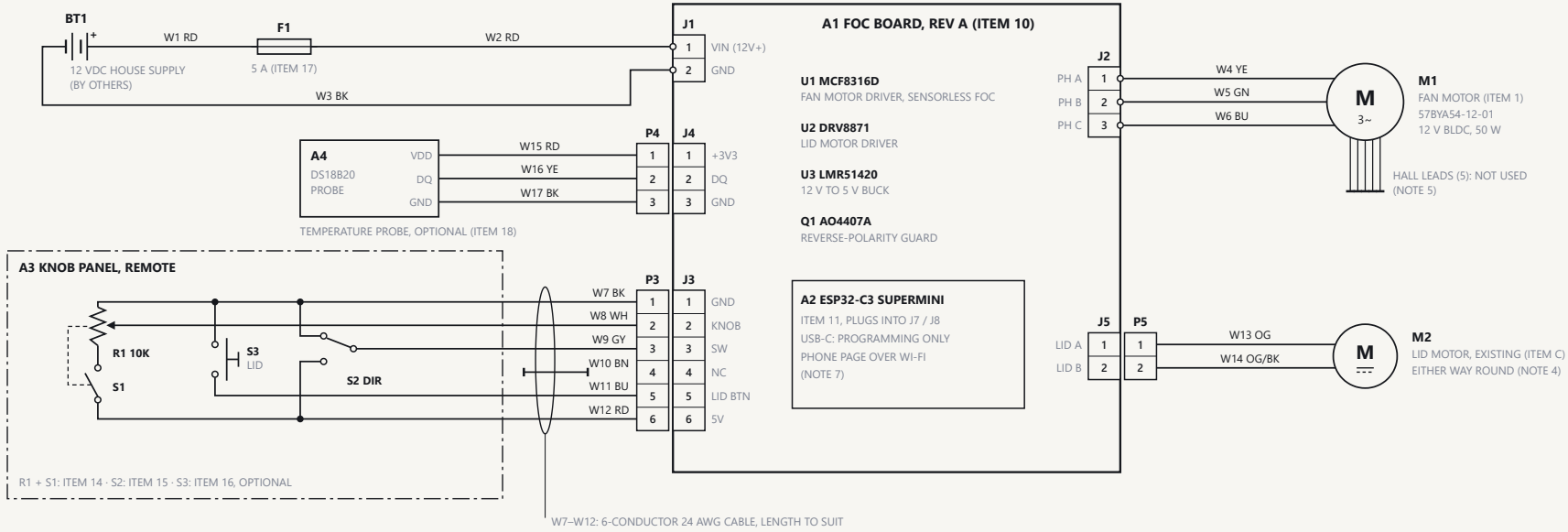
PARTS LIST

No.	Qty	Part	Notes
1	1	Motor	StepperOnline 57BYA54-12-01, 12 V 50 W
2	1	Motor cage	printed, PETG
3	4	M4 × 8 socket head cap screw	check the motor's thread pitch first
4	4	M4 flat washer	9 mm OD
5	2	M6 × 16 socket head cap screw	threads into the cage's posts
6	2	M6 flat washer	12 mm OD
7	1	Rigid shaft coupler	8 mm to 8 mm, Ø14 × 22, grub screws
8	1	Dowel pin	Ø8 × 40, file a flat for the grubs
9	1	Controller base	printed, ABS or ASA
10	1	FOC board, rev A	JLCPCB; you solder the connectors
11	1	ESP32-C3 SuperMini	plugs into the board's sockets
12	4	M3 × 8 pan head screw	self-threads into the base
13	1	Controller cover	printed, ABS or ASA
A		Fan's motor ears	stock, reused
B		Blade	stock, reused

Printed · Bought · Circuit board · Stock, reused

Not shown: the knob and switch, the 5 A fuse, the lid motor and the temperature probe (see the wiring diagram). Drawn from the CAD, not to scale. Rev A board, November 2026.

REVISIONS		
REV	DESCRIPTION	DATE
A	FIRST RELEASE	2026-11-13



WIRE LIST

WIRE	FROM	TO	AWG	COLOR	REMARKS
W1	BT1 (+)	F1	14	RD	F1 AT THE SUPPLY END (NOTE 2)
W2	F1	A1-J1-1 VIN	14	RD	SCREW TERMINAL
W3	BT1 (–)	A1-J1-2 GND	14	BK	SCREW TERMINAL
W4	M1 PHASE LEAD	A1-J2-1 PH A	LEAD	YE	ANY ORDER (NOTE 3)
W5	M1 PHASE LEAD	A1-J2-2 PH B	LEAD	GN	
W6	M1 PHASE LEAD	A1-J2-3 PH C	LEAD	BU	
W7	A3: R1 CCW, S2, S3	P3-1 GND	24	BK	SPLICED AT THE PANEL (NOTE 6)
W8	A3: R1 WIPER	P3-2 KNOB	24	WH	
W9	A3: S2 COMMON	P3-3 SW	24	GY	
W10	SPARE	—	24	BN	P3-4 EMPTY; INSULATE BOTH ENDS
W11	A3: S3	P3-5 LID BTN	24	BU	OPTIONAL
W12	A3: S1, S2	P3-6 5V	24	RD	SPLICED AT THE PANEL (NOTE 6)
W13	M2 LEAD	P5-1 LID A	22	OG	EITHER WAY ROUND (NOTE 4)
W14	M2 LEAD	P5-2 LID B	22	OG/BK	
W15	A4 VDD	P4-1 +3V3	LEAD	RD	OPTIONAL PROBE
W16	A4 DQ	P4-2 DQ	LEAD	YE	
W17	A4 GND	P4-3 GND	LEAD	BK	
—	M1 HALL LEADS (5)	—	—	—	NOT USED (NOTE 5)

NOTES

1. WIRE COLOR CODES PER IEC 60757: BK BLACK, BN BROWN, RD RED, OG ORANGE, YE YELLOW, GN GREEN, BU BLUE, GY GREY, WH WHITE. GAUGES PER THE WIRE LIST.
2. F1 IS A 5 A INLINE FUSE AT THE SUPPLY END OF W1. J1-1 IS MARKED 12V+ ON THE BOARD; A1 Q1 PROTECTS THE BOARD IF THE PAIR IS REVERSED.
3. M1 PHASE LEADS MAY LAND ON J2 IN ANY ORDER. SWAP ANY TWO TO REVERSE THE FAN.
4. M2 MAY BE CONNECTED EITHER WAY ROUND. IF THE LID RUNS BACKWARDS, TURN P5 OVER OR SET “INVERT” ON THE PHONE PAGE.
5. M1 HALL LEADS ARE NOT USED: INSULATE EACH END SEPARATELY AND STOW.
6. A3: LEADS MEETING AT A DOT ARE SOLDER-SPLICED TO THEIR ONE CABLE CONDUCTOR AND INSULATED WITH HEAT SHRINK. S1 IS R1’S CLICK SWITCH AND OPENS AT FULL CCW. IF THE KNOB WORKS BACKWARDS, SWAP R1’S END LEADS.
7. A2’S USB-C IS FOR PROGRAMMING ONLY. THE PHONE PAGE RUNS OVER THE VAN’S WI-FI.
8. WITH A2 REMOVED, R1 AND S2 STILL RUN M1, TO ABOUT 76 % SPEED.
9. HOUSINGS AND CRIMPS: DUPONT 2.54 MM, ITEM 19. STRAIN-RELIEVE ALL WIRES AT THE BASE WITH ITEM 21.

MAXXFAN BRUSHLESS RETROFIT

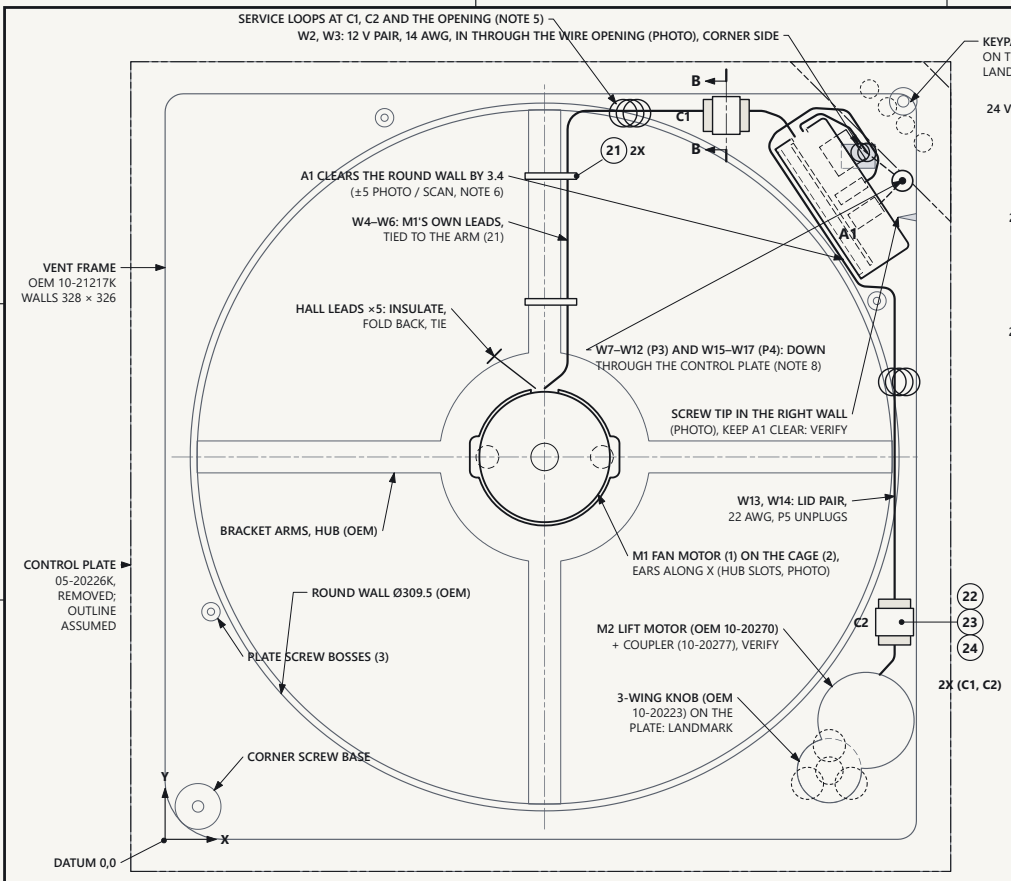
MOTOR CONTROL AFTER MINUET (BROWN STUDIOS)

TITLE

WIRING DIAGRAM
FAN MOTOR CONTROLLER

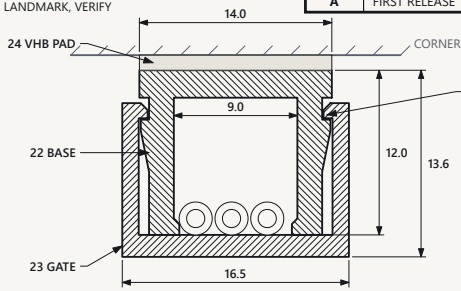
SIZE	DWG NO.	REV
B	MFB-002	A
SCALE NONE	DATE 2026-11-13	SHEET 1 OF 1

REVISIONS		
REV	DESCRIPTION	DATE
A	FIRST RELEASE	2026-11-13



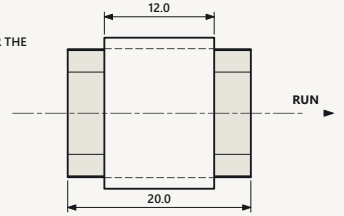
VIEW A: LOOKING UP FROM THE CABIN, CONTROL PLATE REMOVED (SHOWN PHANTOM) SCALE 1:2

OEM THIN · NEW PARTS HEAVY · HIDDEN DASHED · CONTROL PLATE, KEYPAD AND KNOB PHANTOM · A1 SHOWN WHERE IT SITS ON THE PLATE



SECTION B–B (AT C1) SCALE 3:1

INSTALLED: FLOOR ABOVE, CABIN BELOW. FILL AT C1 TO SCALE: 3 × M1 LEAD (~15 %)



DETAIL C: CLIP FROM THE CABIN SCALE 2:1

GATE (23) OVER THE BASE (22), PAD UNDER IT

LOCATIONS FROM DATUM 0,0 (VIEW A), MM

TAG	X	Y		WHAT
C1	245.0	316.5	ALONG X	W4–W6 (+ EXCESS COIL)
C2	318.5	95.0	ALONG Y	W13 W14
OPENING	295–310	293–304	–	12 V IN, STOCK HARNESS CROSSING (PHOTO)
M2 CAN	306	52	Ø42	LIFT MOTOR; COUPLER Ø28 AT 290, 30, VERIFY
A1	295.9	280.5	124°	ON EDGE: FOOTPRINT CENTRE, LONG AXIS; PLUGS TOWARD THE CORNER
KEYPAD	TR	CORNER	–	CABIN FACE, PARTS-LIST FIGURE: VERIFY

WIRE RUNS (LENGTHS ALONG VIEW A + SERVICE LOOP, MM)

WIRES	FROM	TO	HELD BY	RUN + LOOP
W2, W3	WIRE OPENING (TR)	A1 J1-1, J1-2	LOOP AT THE OPENING	40 + 150
W4–W6	M1 (OWN LEADS)	A1 J2-1, -2, -3	2 TIES, C1, LOOP	226 + 150
W13, W14	M2	P5 → A1 J5	C2, BEHIND A1, LOOP	336 + 150
W7–W12	P3 → A1 J3	A3 KNOB PANEL	THROUGH THE PLATE	BY INSTALLER
W15–W17	P4 → A1 J4	A4 PROBE	THROUGH THE PLATE	PROBE LEAD

PARTS ADDED BY THIS SHEET (OTHERS: SEE THE BUILD PARTS LIST)

ITEM	QTY	DESCRIPTION	SOURCE
22	2 (+6)	WIRE CLIP BASE, PRINTED ABS OR ASA	wire_clips/wire_clip_base.step
23	2 (+6)	WIRE CLIP GATE, PRINTED ABS OR ASA	wire_clips/wire_clip_gate.step
24	2 + A1	VHB PAD 14 × 20, 3M VHB LSE-110WF (ALSO UNDER A1'S BASE)	CUT FROM TAPE
21	+4	SMALL ZIP TIE: M1 AND HALL LEADS TO THE TOP ARM, EXCESS COIL	–

A1 FIT: PLAN CLEARANCE TO THE ROUND WALL (+ CLEAR, – INTO IT), BEST POSITION, MM (NOTE 6)

FOOTPRINT ON THE PLATE, L × D × H	TR (KEYPAD)	BL	HEIGHT SPARE
A1 ON EDGE 67.8 × 25.7 × 43.2 (AS DRAWN)	+3.4	+14.1	1.95, VERIFY TR
FLAT 67.8 × 46.2 × 24.5 (BASE = BOARD + WALLS)	–7.5	+0.9	10.4 (PLUG WIRES)
OLD MOUNT 81.1 × 51.1 × 30.1 (WITH APRON)	–17.2	–8.9	15.0

NOTES

1. VIEW A: FROM THE CABIN, CONTROL PLATE (OEM 05-20226K) DROPPED. VENT FRAME, ROUND WALL, ARMS, LIFT MOTOR, OPENING, BOSSES: 2026-09-27 PHOTO + 2026-10-12 SCAN, ±5.
2. KEYPAD / KNOB / STOCK BOARD CORNERS FROM AIRXCEL R-619C: KNOB AT THE LIFT MOTOR (BR); KEYPAD AND BOARD 10-21275K ONE CORNER ANTICLOCKWISE (TR). VERIFY ON THE FAN.
3. CLEAN WITH IPA. LSE VHB SPECIFIED BECAUSE THE OEM RESIN IS UNPUBLISHED; IF THE MOLDED RESIN CODE ON THE PART READS >ABS<, 3M 5952 MAY BE USED. CLIPS AND A1'S BASE.
4. CLIPS: ITEM 22 ON ITEM 24, CHANNEL ALONG THE RUN, LOAD AFTER 24 H; PRESS ITEM 23 ON TILL BOTH HOOKS CLICK. NEVER DRILL THE CORNER PLATE: THE ROOF IS BEHIND IT.
5. SERVICE LOOPS: A1 DROPS WITH THE PLATE LIKE THE STOCK BOARD. 150 FREE FROM C1, C2 AND THE OPENING TO A1; UNPLUG P5, HANG THE PLATE ON THE LOOPS, UNSCREW J1 / J2 TO REMOVE.
6. A1 STANDS ON EDGE LIKE THE STOCK BOARD: 43.2 TALL + 1.1 VHB IN ≥46.25 (BL GAUGE), 1.95 SPARE: MEASURE AT TR. CLEARS THE ROUND WALL BY 3.4 WITH THE OPENING'S CORNER SIDE AND THE WALL SCREW FREE; AT BL 14.1, INSIDE THE BL GAUGE.
7. W4–W6 ARE M1'S OWN LEADS, NO SPLICE: COIL THE EXCESS FLAT AT C1 (TOP WALL, VENT FRAME SIDE, CLEAR OF A1) AND TIE IT; 10 CLEAR OF THE BLADE ON THE ARM. HALL LEADS: INSULATE, TIE.
8. W7–W12 / W15–W17: FROM P3 / P4 ON A1'S FRONT (TOWARD THE CORNER) DOWN THROUGH A GROMMETED HOLE IN THE PLATE IN FRONT OF IT, CLEAR OF THE KEYPAD. WIRES AS MFB-002.

DIMENSIONS IN MILLIMETERS

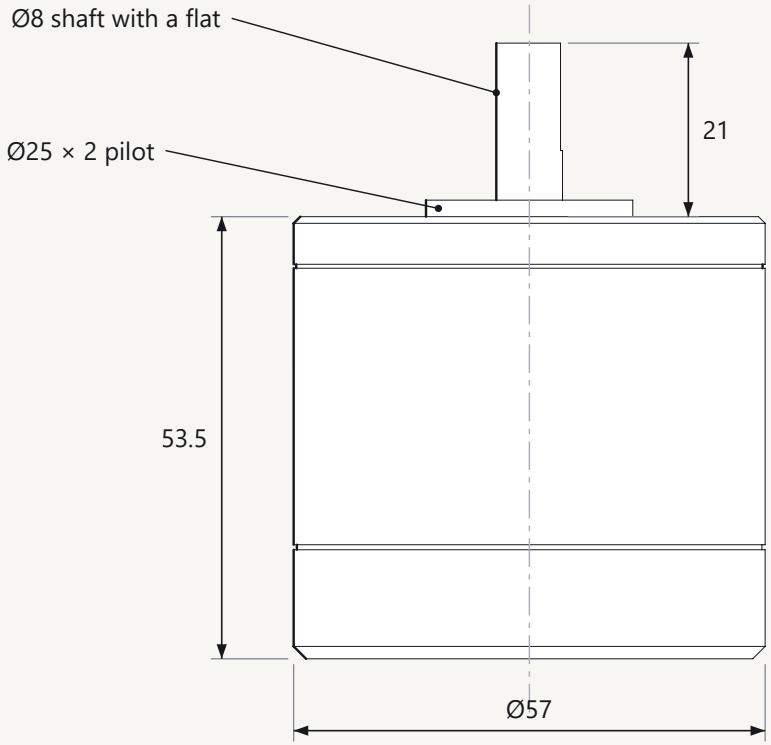
MAXXFAN BRUSHLESS RETROFIT

MOTOR CONTROL AFTER MINUET (BROWN STUDIOS)

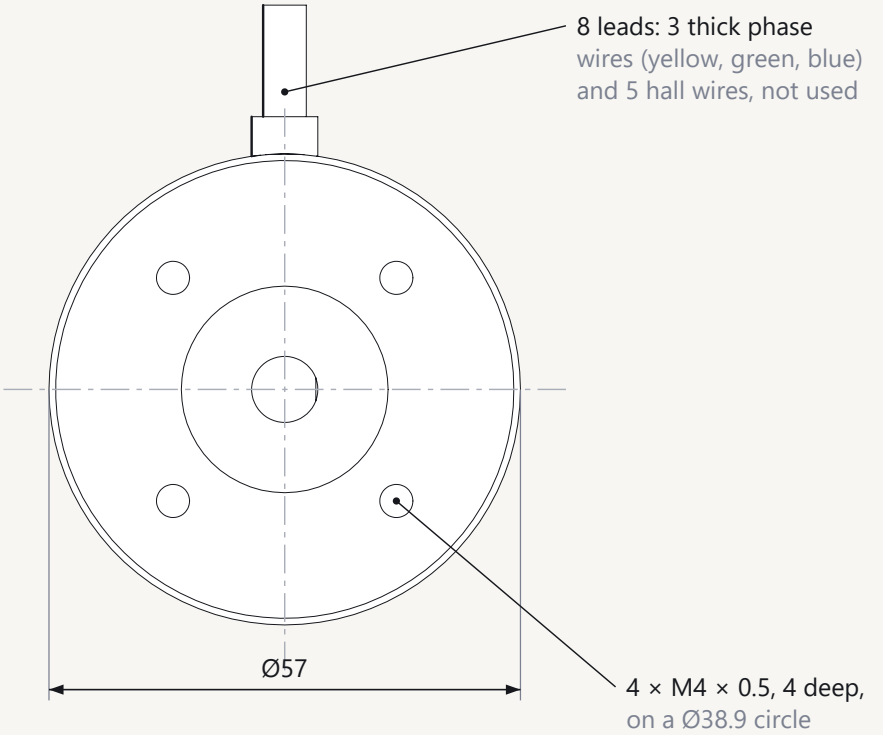
TITLE

INSTALLED LAYOUT
VIEW LOOKING UP FROM CABIN

SIZE	DWG NO.	REV
B	MFB-004	A
SCALE 1:2	DATE 2026-11-13	SHEET 1 OF 1



SIDE



FACE, BLADE END

StepperOnline 57BYA54-12-01: 12 V, 50 W, 5.9 A, 3000 rpm and 0.16 N·m rated, 4 poles. Dimensions in mm, from the maker's drawing.