

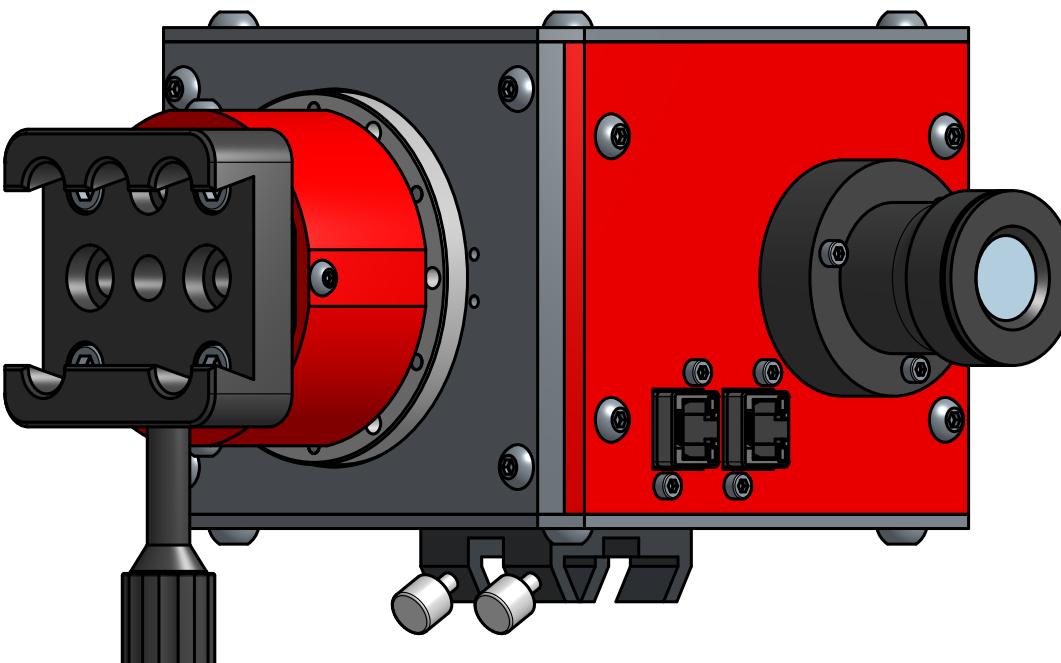
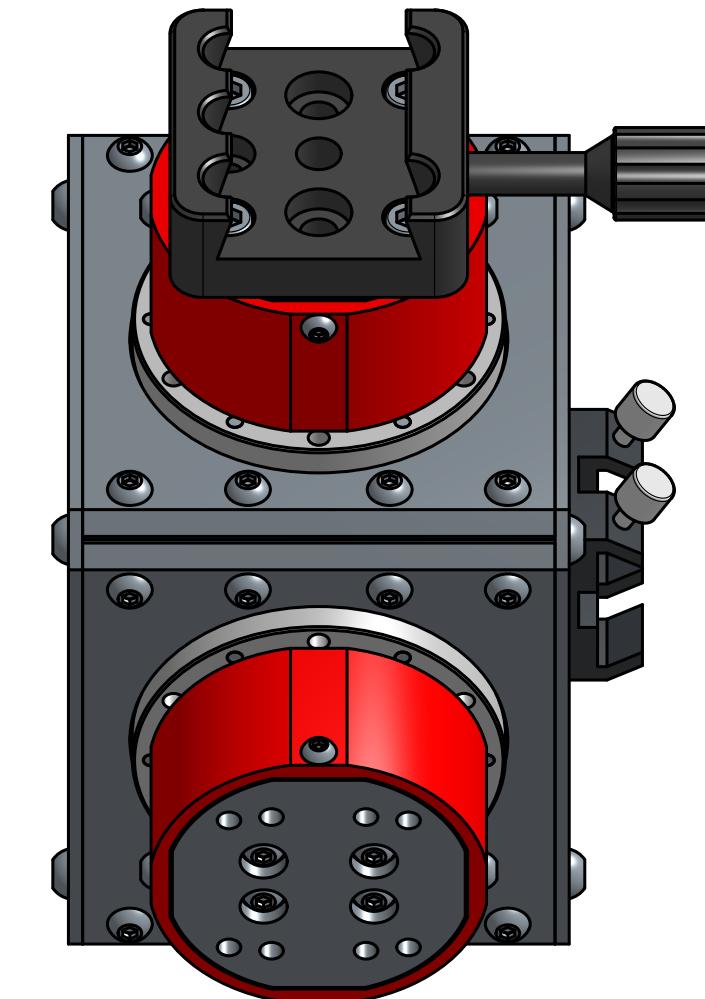
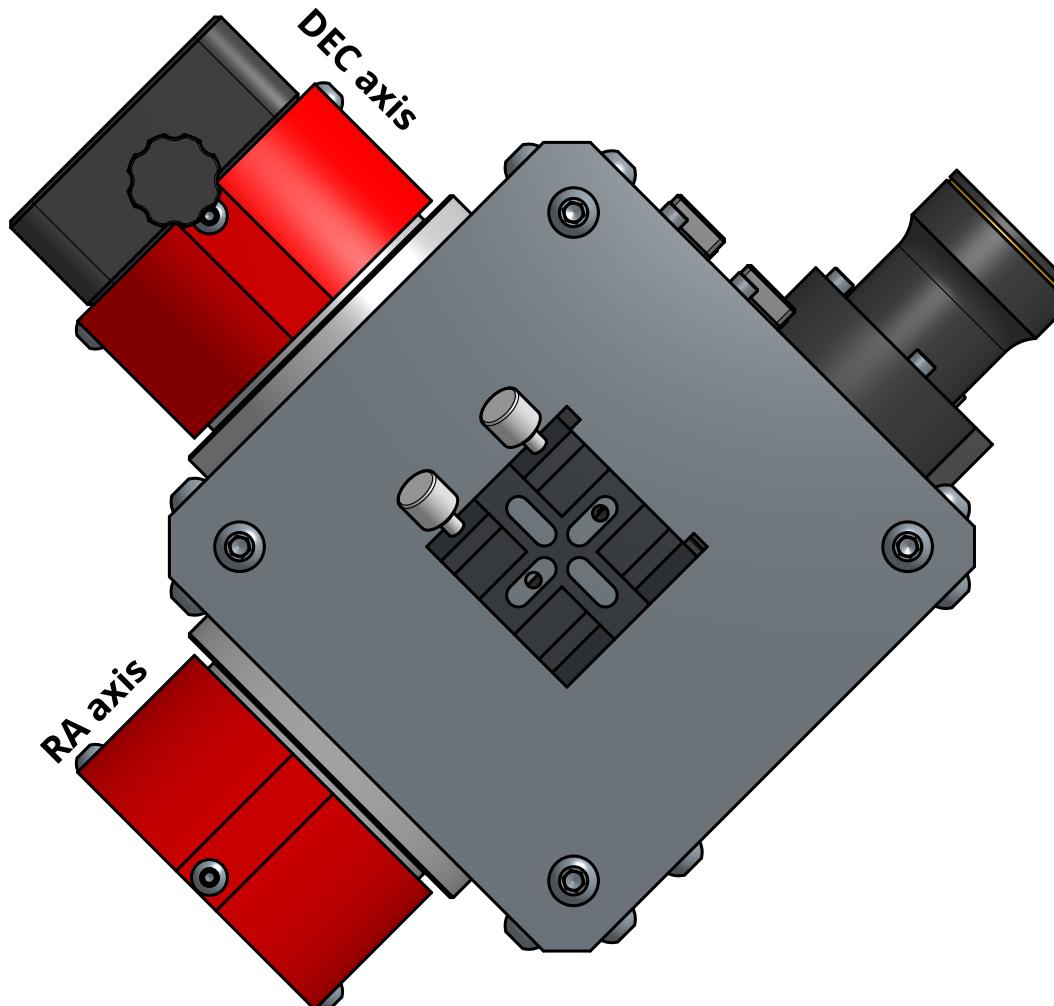
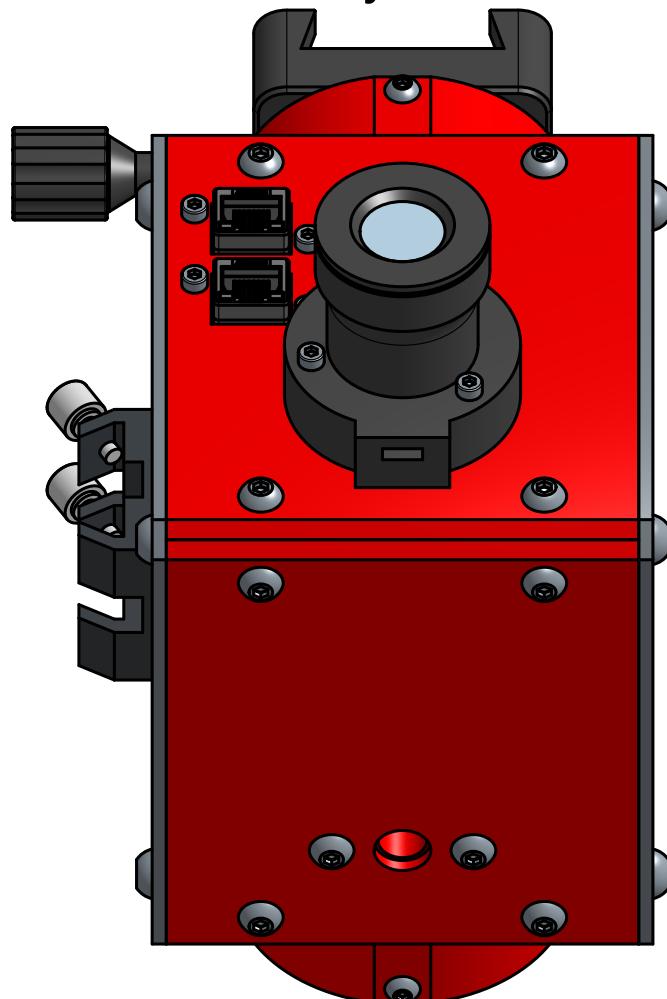
6 5 4 3 2 1

HEMY Harmonic Equatorial Mount Yourself

"Making your own Harmonic Equatorial Mount out of aluminium?

Only a moron would do that, even if it's opensource"

"Moron Yourself!"



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS				DRAWN CHECKED APPROVED	NAME POLVINC	SIGNATURE	DATE 2024-07-02	TITLE HEMY Harmonic Equatorial Mount Yourself https://github.com/polvinc/HEMY			
ANGULAR = \pm °	SURFACE FINISH \sqrt{Ra} 3.2	DO NOT SCALE DRAWING	BREAK ALL SHARP EDGES AND REMOVE BURRS					SIZE A3			
FIRST ANGLE PROJECTION	MATERIAL Al 6061	FINISH Bead blasting Anodizing	SCALE 1:2	WEIGHT 4.2 kg	SHEET 1 of 16	REV.					

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D
D

C
C

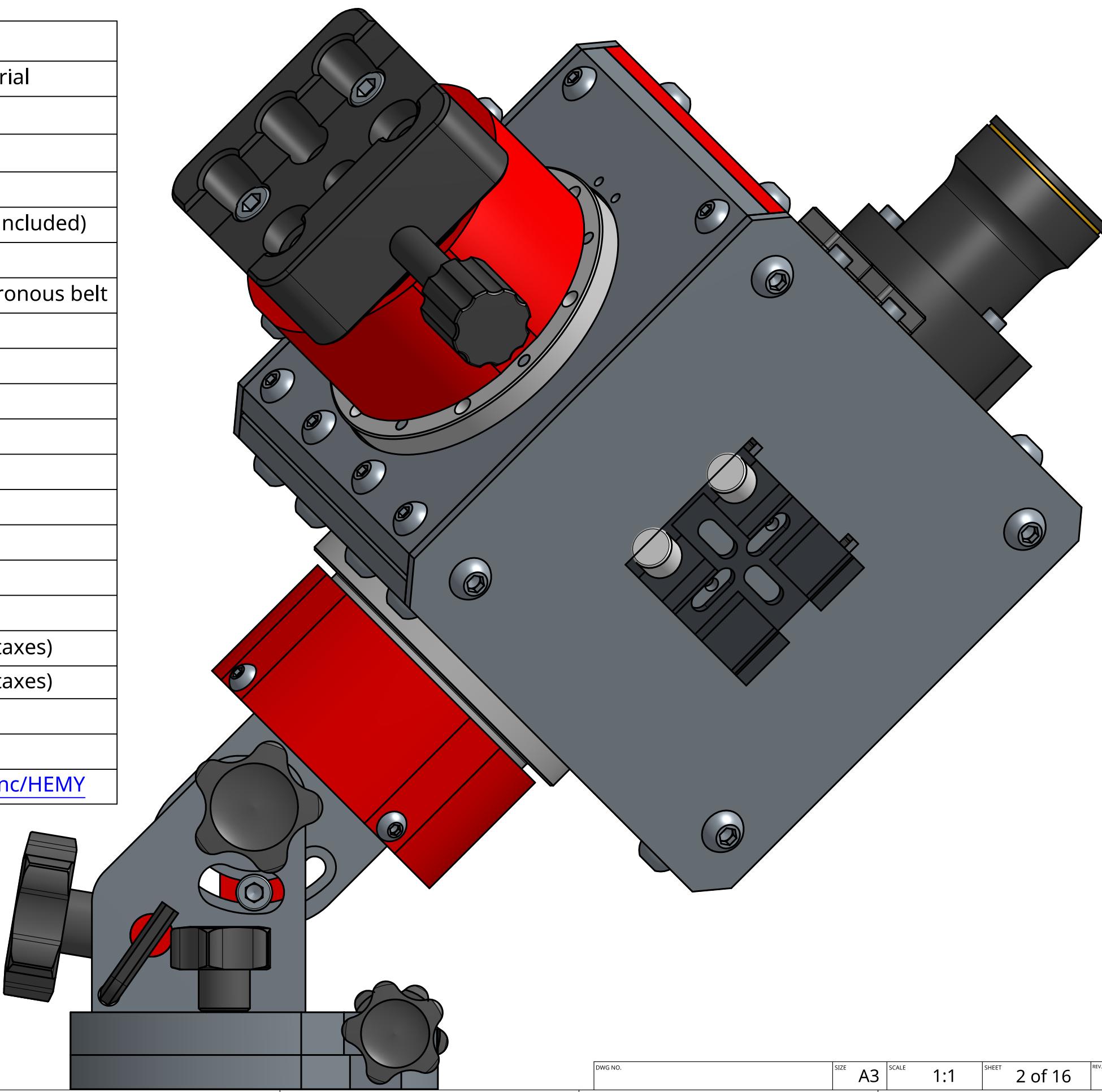
B
B

A
A

1

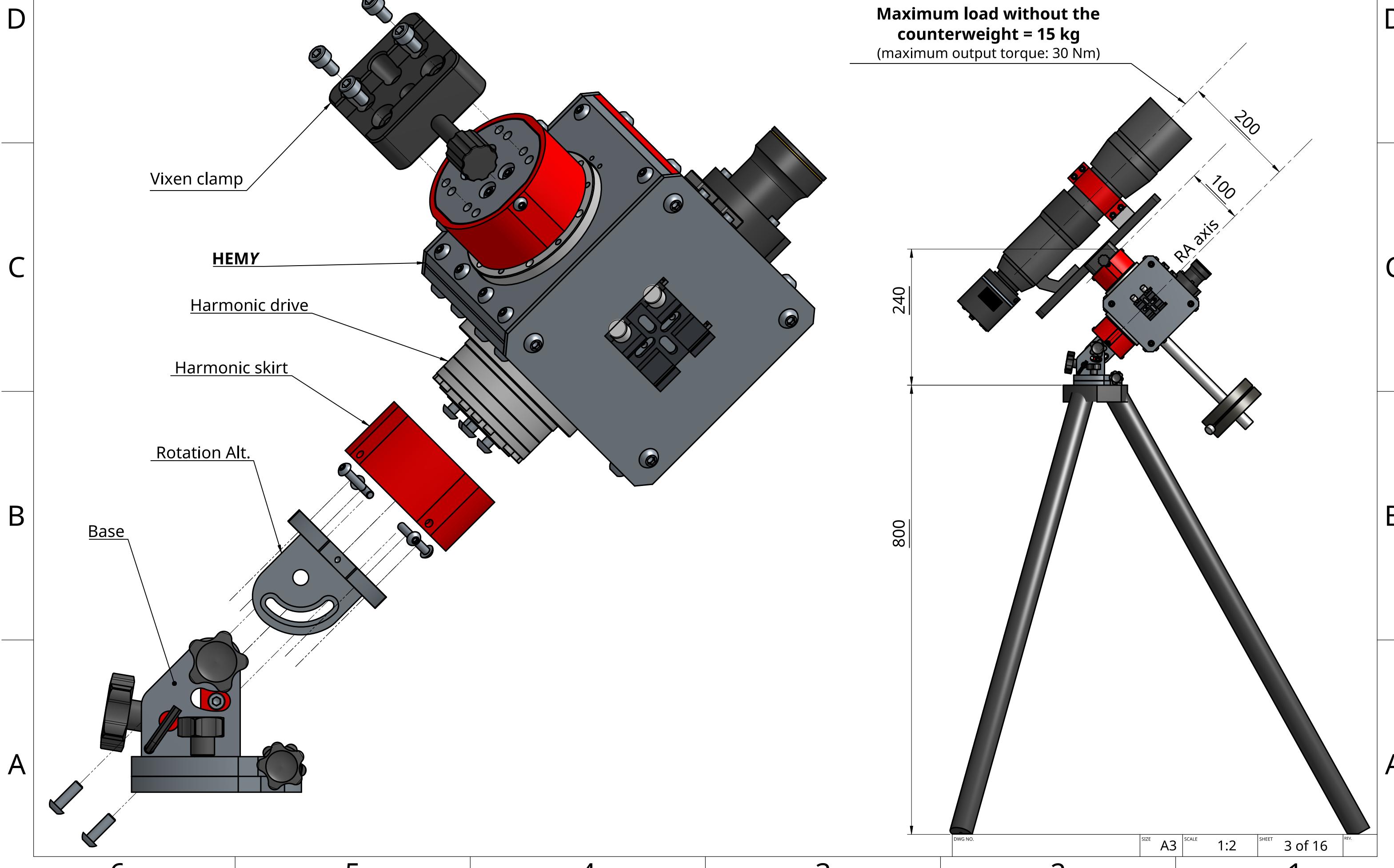
HEMY Harmonic Equatorial Mount *Youself*

Specifications	
Mount Type	Dual Alt-Az/Equatorial
Mount Series	HEMY
License	GPL-3.0 license
Weight Capacity	15 kg / 20 kg
Type of Mount Electronics	AstrAlim / OnStepX (not included)
Mount Slew Speeds	5°/s
Motor Type	Harmonic Drive and Synchronous belt
Reduction Ratio RA	500:1
Reduction Ratio DEC	300:1
Resolution RA	0.10"
Resolution DEC	0.17"
Mount Latitude Range (°)	0° - 90°
Azimuth Angle Range	±5°
Periodic Error Duration	440s
Polar Scope Included?	No
Mount Weight	5 kg
CNC for the mount	JLC3DP = 200\$ (excl. taxes)
CNC for the base	JLC3DP = 160\$ (excl. taxes)
Price for CNC building	< 400\$
Total price	< 800\$
Sources	https://github.com/polvinc/HEMY



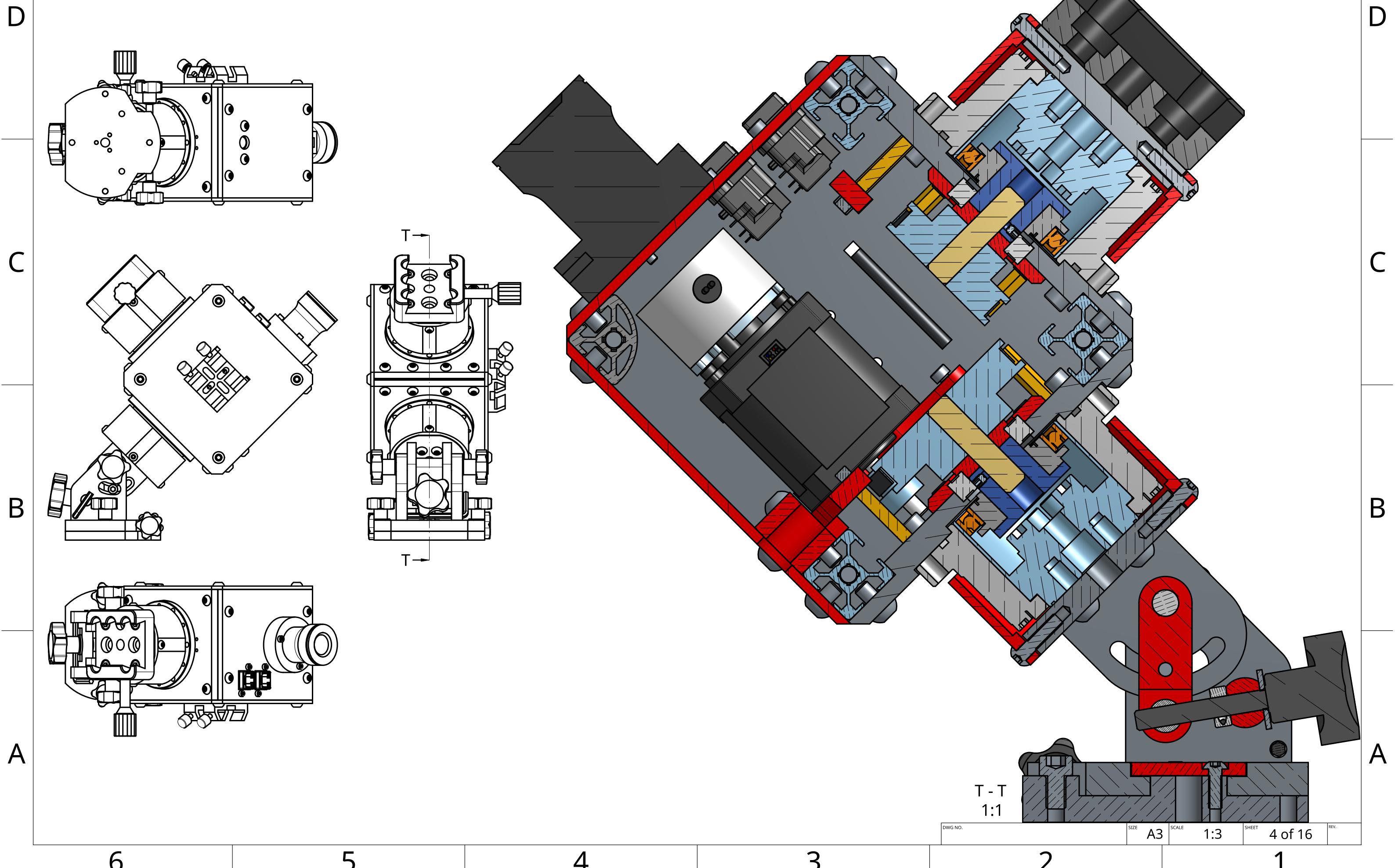
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HEMY Harmonic Equatorial Mount Yourself



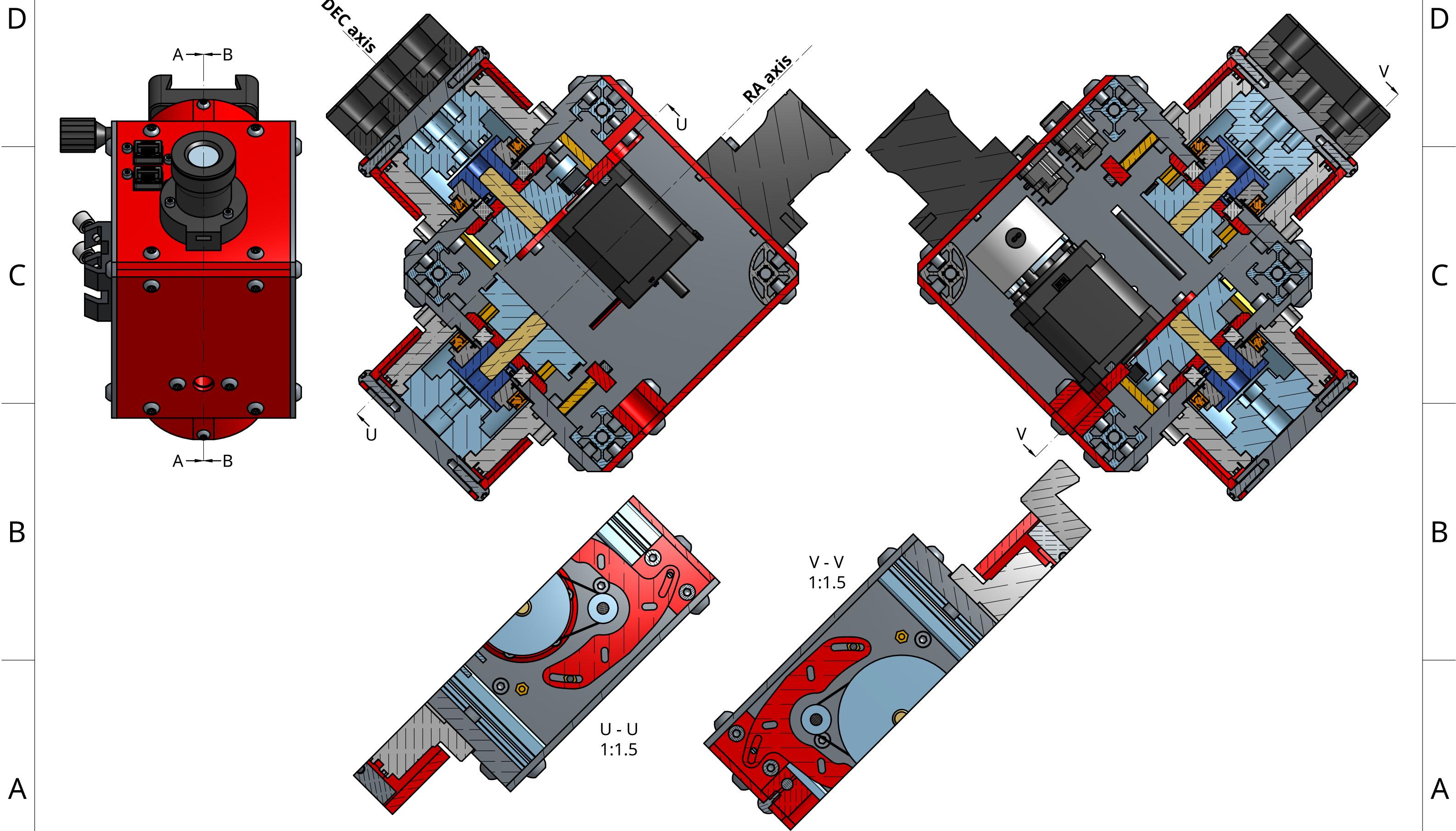
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HEMY Harmonic Equatorial Mount Yourself



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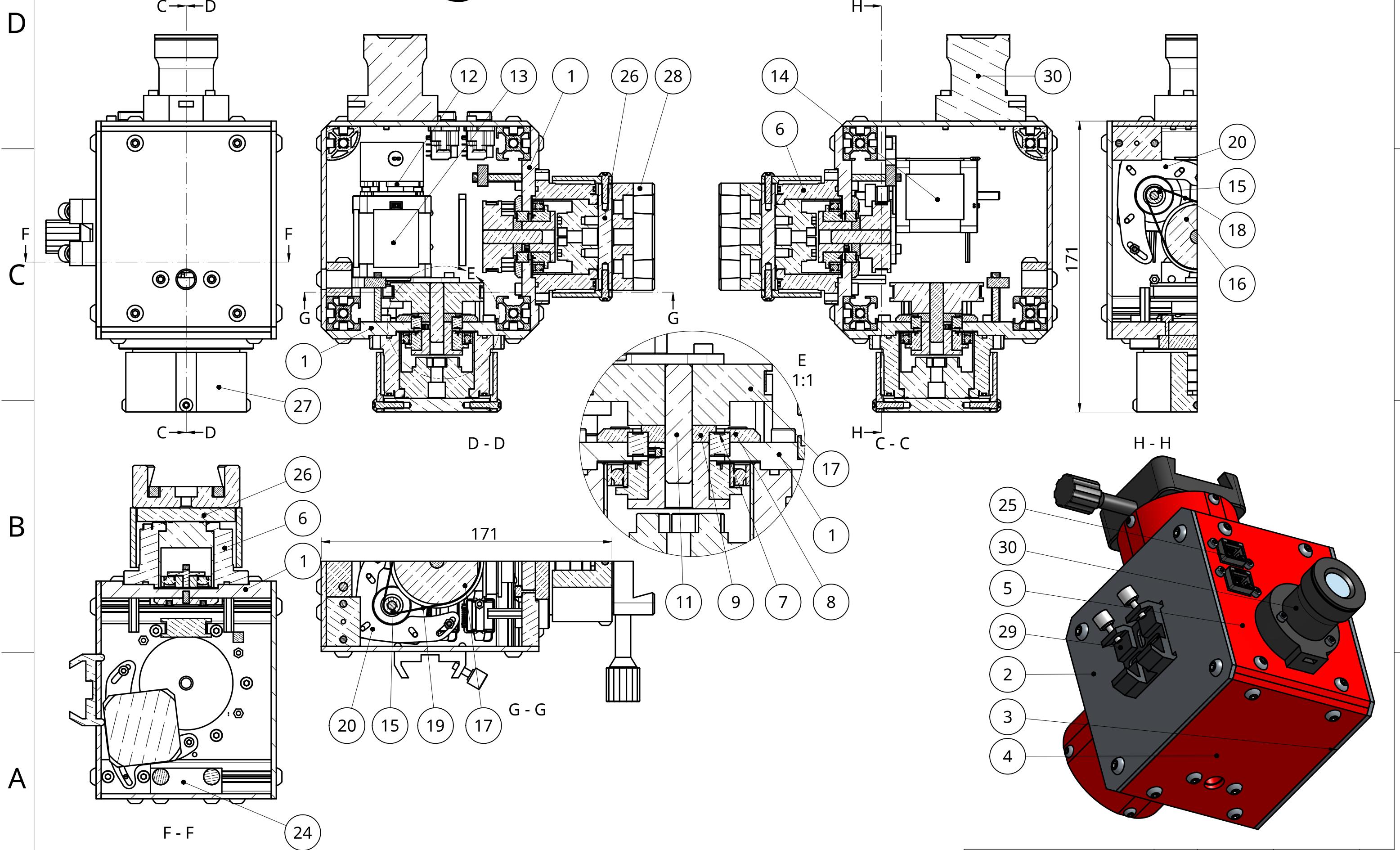
HEMY Harmonic Equatorial Mount Yourself



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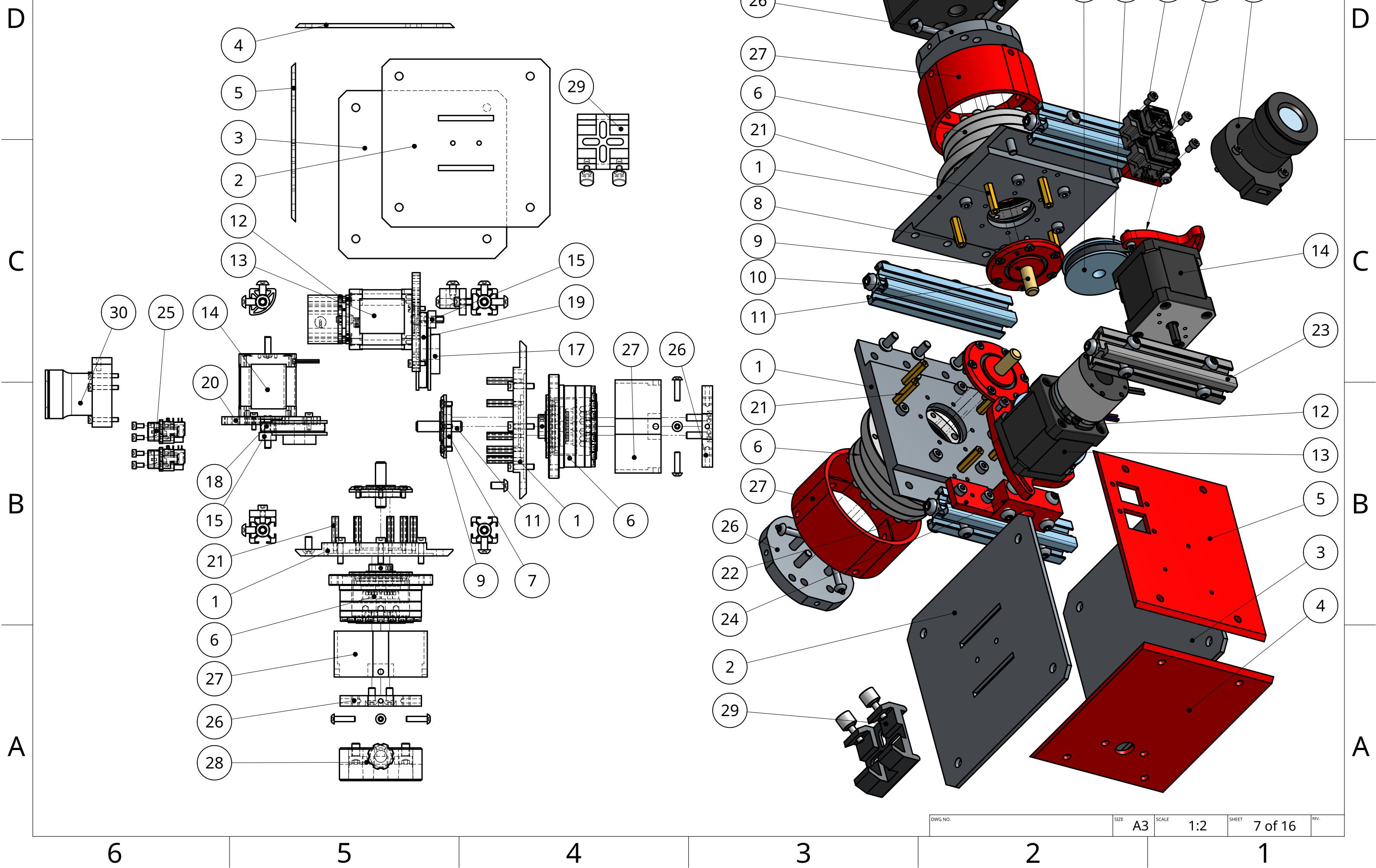
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Global drawing - HEMY



6 5 4 3 2 1

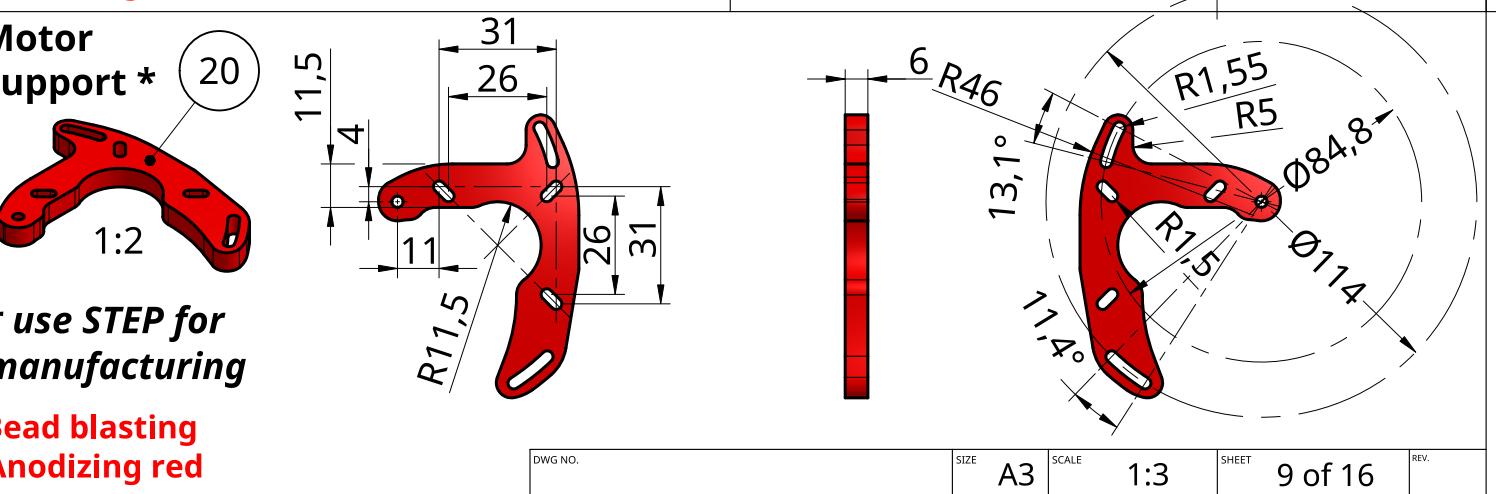
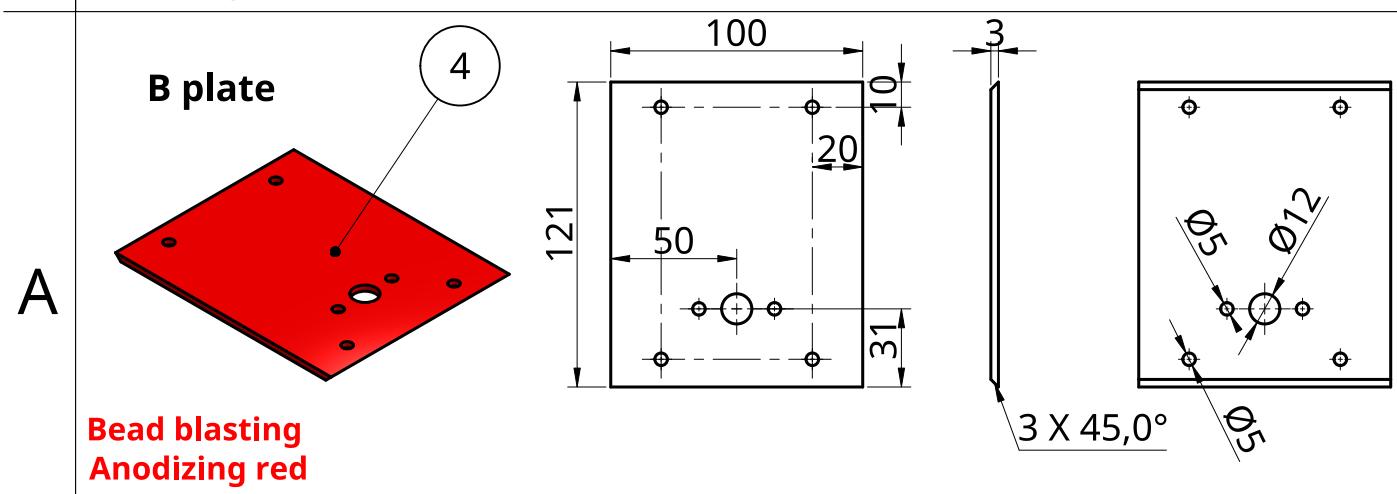
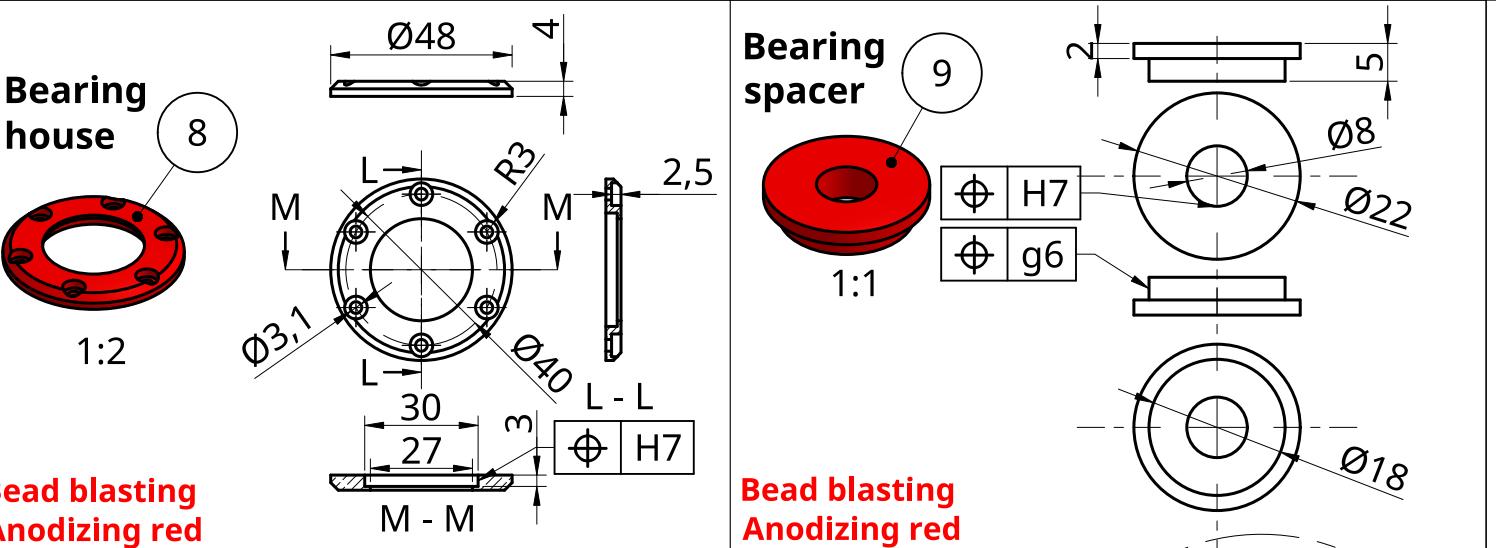
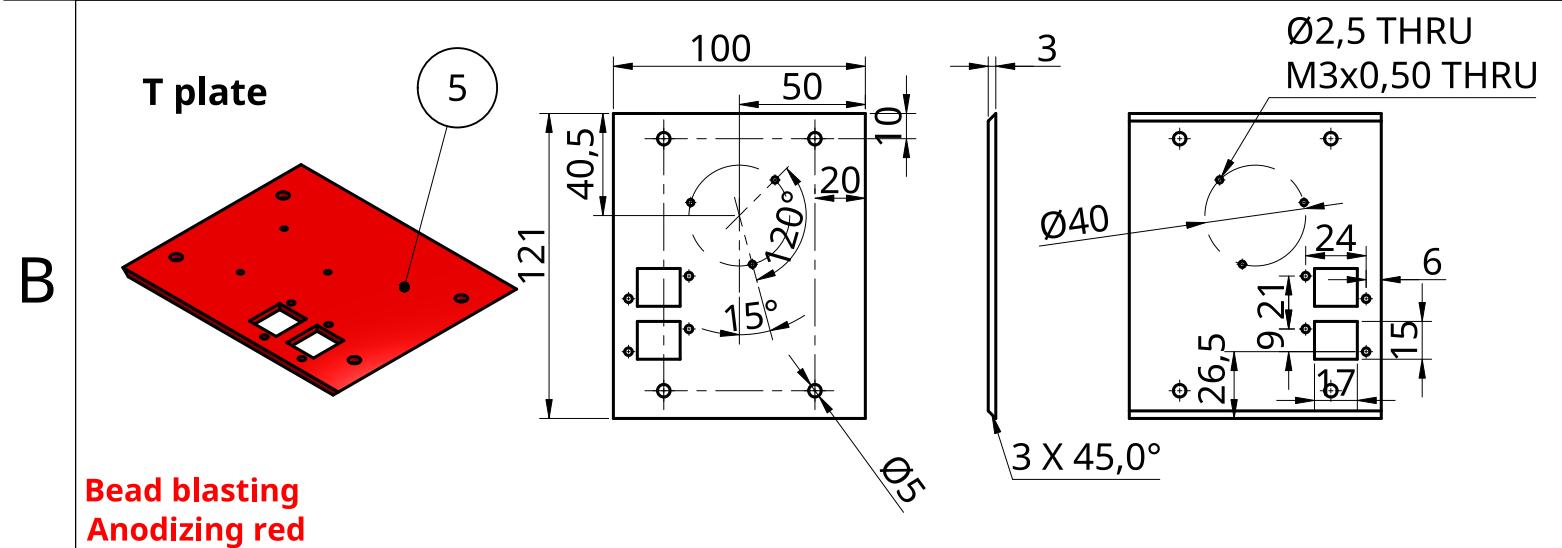
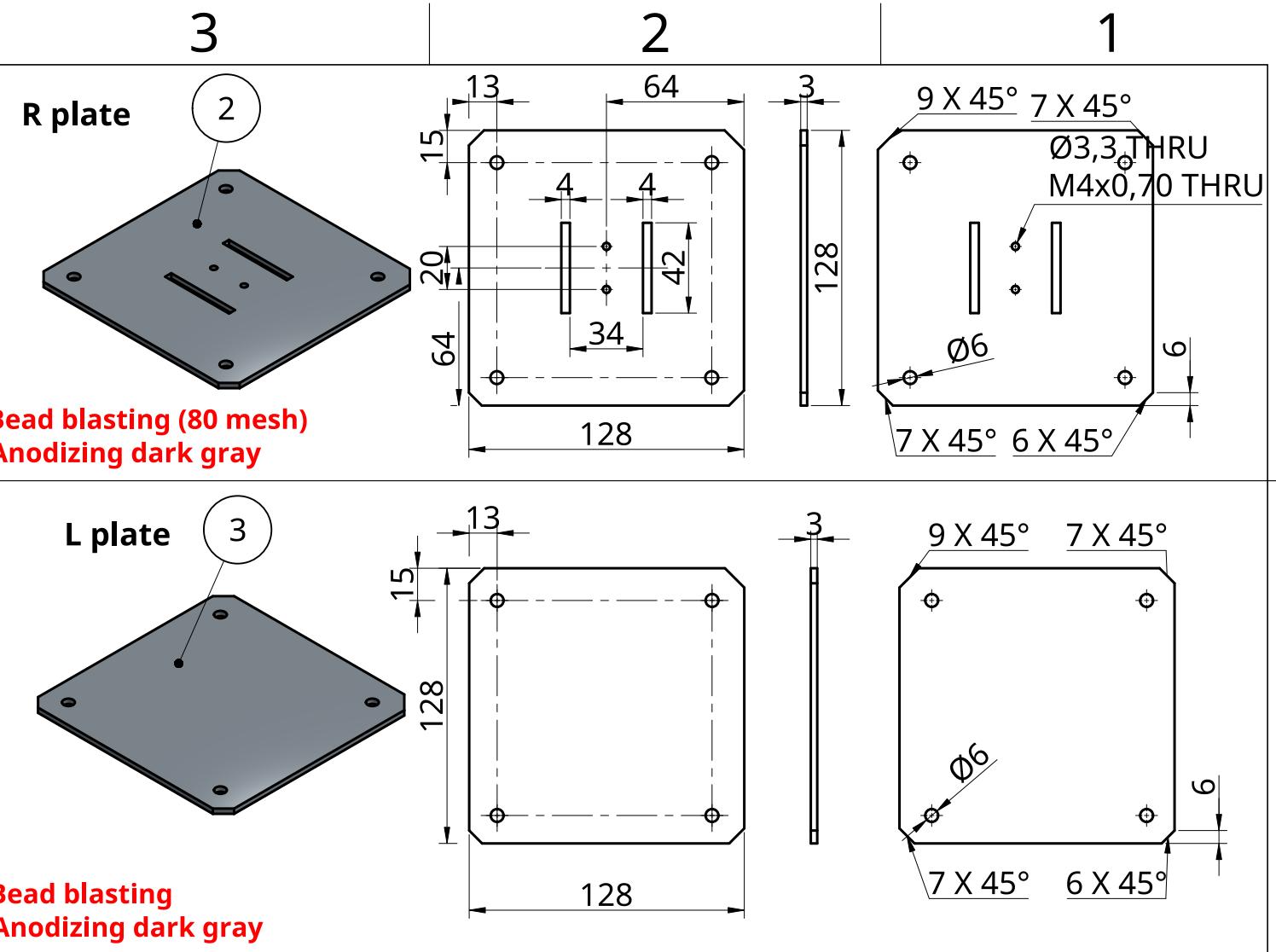
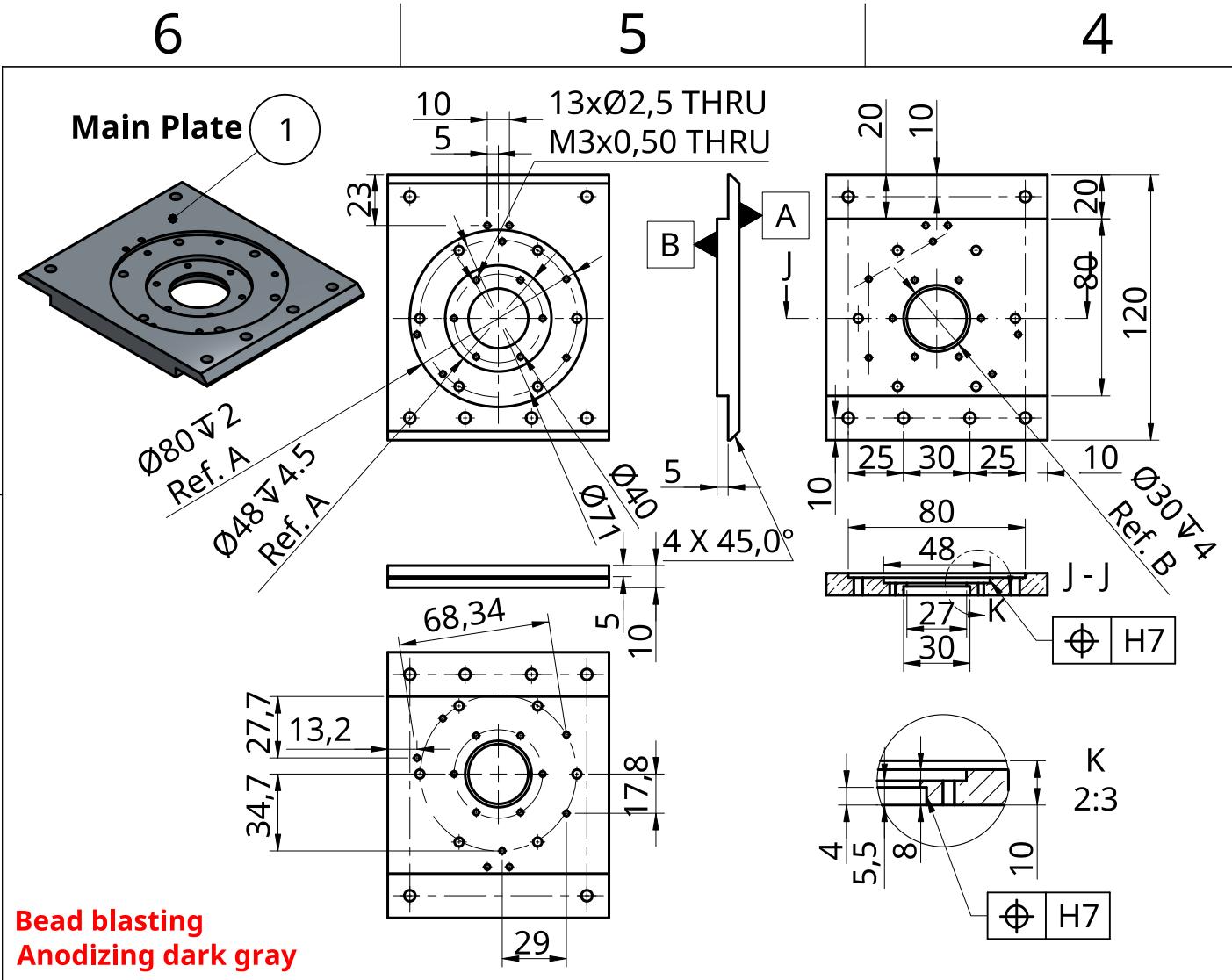
Explode view - HEMY

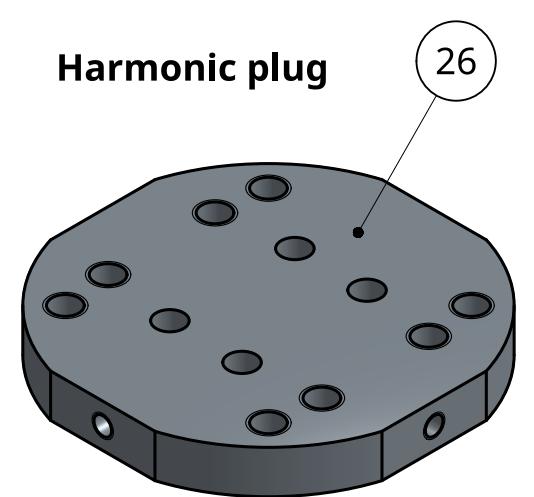


Bill of Materials - HEMY

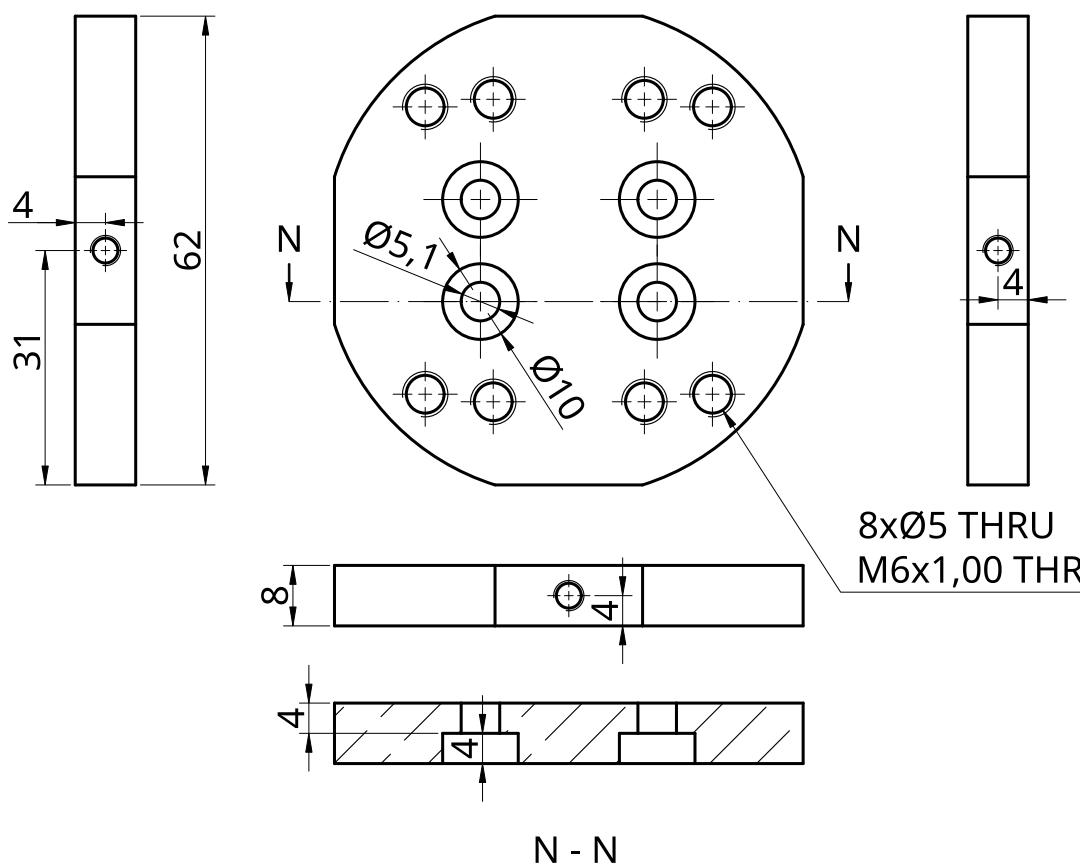
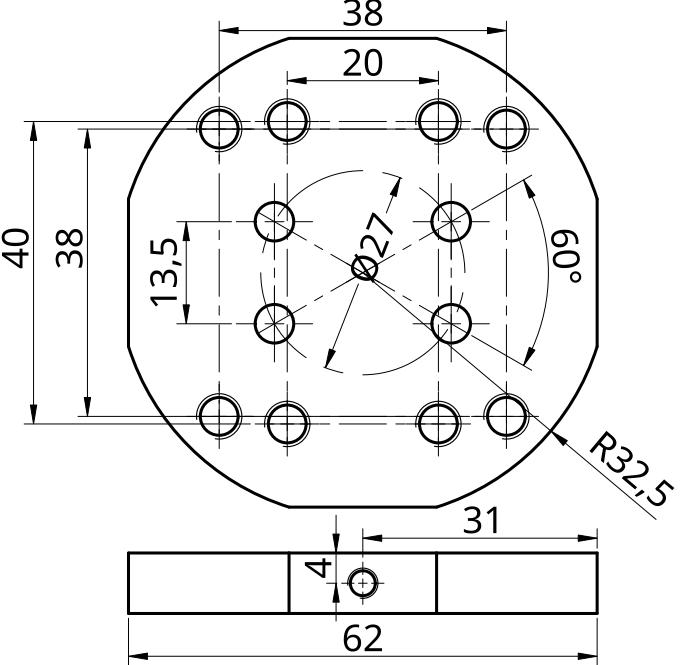
Item	Quantity	Description	Mass
1	2	01 - Main plate	0.213 kg
2	1	02 - R plate	0.129 kg
3	1	03 - L plate	0.132 kg
4	1	04 - B plate	0.094 kg
5	1	05 - T plate	0.091 kg
6	2	06 - Harmonic drive (CSF-17-100-2UH or HBS/HBG-17-100)	0.539 kg
7	2	07 - Bearing 18307-RS	0.008 kg
8	2	08 - Bearing housing	0.01 kg
9	2	09 - Pulley spacer	0.003 kg
10	3	10 - Rexroth 20x20x100mm	0.041 kg
11	2	11 - Diameter 8 shaft	0.014 kg
12	1	12 - Nema 17 brake (SWB-01)	0.018 kg
13	1	13 - Nema 17 double shaft 0.9° (17HM19-1684D)	0.412 kg
14	1	14 - Nema 17 simple or double shaft 0.9° (17HM19-1684D)	0.32 kg
15	2	15 - Pulley 16T	0.003 kg
16	1	16 - Pulley 60T	0.043 kg
17	1	17 - Pulley 80T	0.075 kg
18	1	18 - Belt 150mm	0.001 kg
19	1	19 - Belt 200mm	0.001 kg
20	2	20 - Motor support	0.02 kg
21	10	21 - Spacer M3x20mm	0.003 kg
22	2	22 - Spacer pivot motor	0.007 kg
23	1	23 - Round Rexroth 20x20x100mm	0.044 kg
24	1	24 - Counterweight Support	0.028 kg
25	2	25 - Ethernet connectors (MRJ538401)	0.008 kg
26	2	26 - Harmonic/Vixen plug	0.061 kg
27	2	27 - Harmonic skirt (3D printed)	0.024 kg

Item	Quantity	Description	Mass
28	1	27 - Vixen clamp (Neewer QR011)	0.177 kg
29	1	28 - (Optional) Polar viewfinder support (Neewer LS-15)	0.031 kg
30	1	30 - (Optional) QHY Polemaster	0.065 kg
31	4	Hex socket head cap screw M3x0.50 x 10 Stainless Steel	0.001 kg
32	3	Hex socket head cap screw M3x0.50 x 20 Stainless Steel	0.002 kg
33	16	Hex socket head cap screw M3x0.50 x 6 Stainless Steel	0.001 kg
34	4	Hex socket head cap screw M4x0.70 x 10 Stainless Steel	0.002 kg
35	12	Hex socket head cap screw M4x0.70 x 16 Stainless Steel	0.003 kg
36	4	Hex socket head cap screw M6x1.00 x 10 Stainless Steel	0.005 kg
37	8	Socket button head screw M4x0.7 x 16 Stainless Steel	0.002 kg
38	16	Socket button head screw M5x0.8 x 10 Stainless Steel	0.002 kg
39	4	Socket button head screw M5x0.8 x 16 Stainless Steel	0.003 kg
40	2	Socket button head screw M5x0.8 x 25 Stainless Steel	0.005 kg
41	10	Socket button head screw M5x0.8 x 8 Stainless Steel	0.002 kg
42	8	Socket button head screw M6x1 x 16 Stainless Steel	0.005 kg

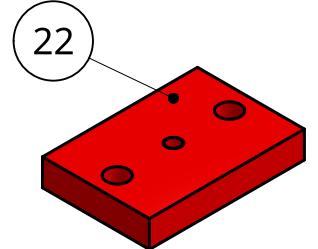




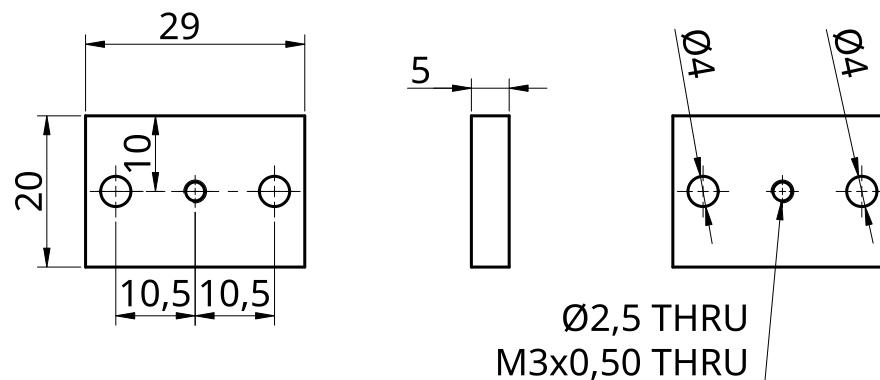
**Bead blasting
Anodizing dark gray**



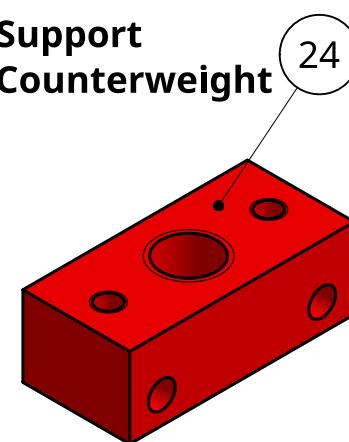
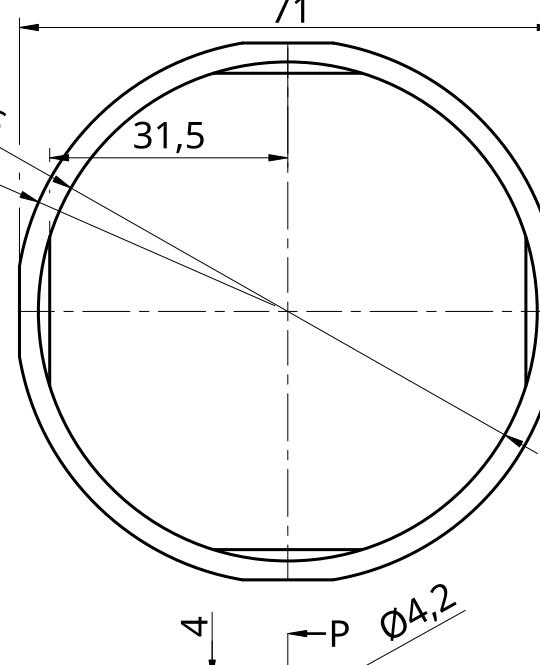
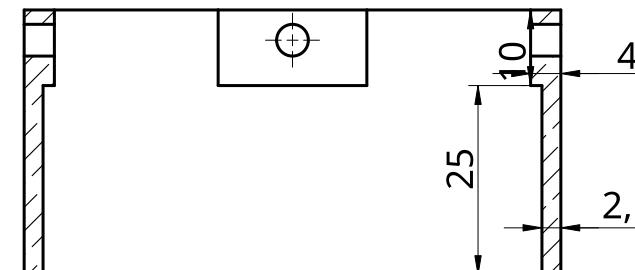
Spacer support



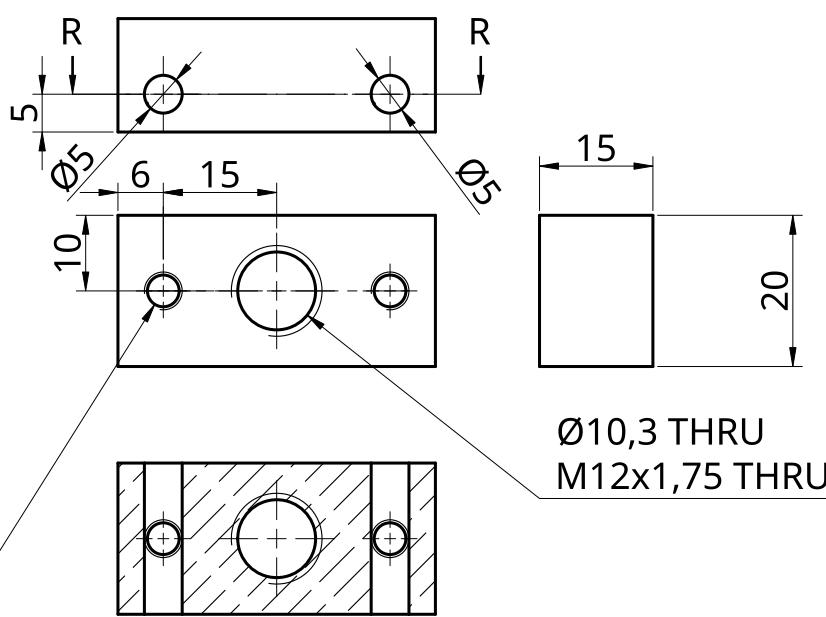
Bead blasting Anodizing red



A diagram of a harmonic skirt, which is a 3D-printed cylindrical component. It features a red outer ring and a white inner cavity. Four small circular holes are evenly spaced around the inner circumference. A single circular hole is located near the top edge of the inner surface. A horizontal line extends from a callout circle containing the number '27' to point towards the top edge of the inner surface.



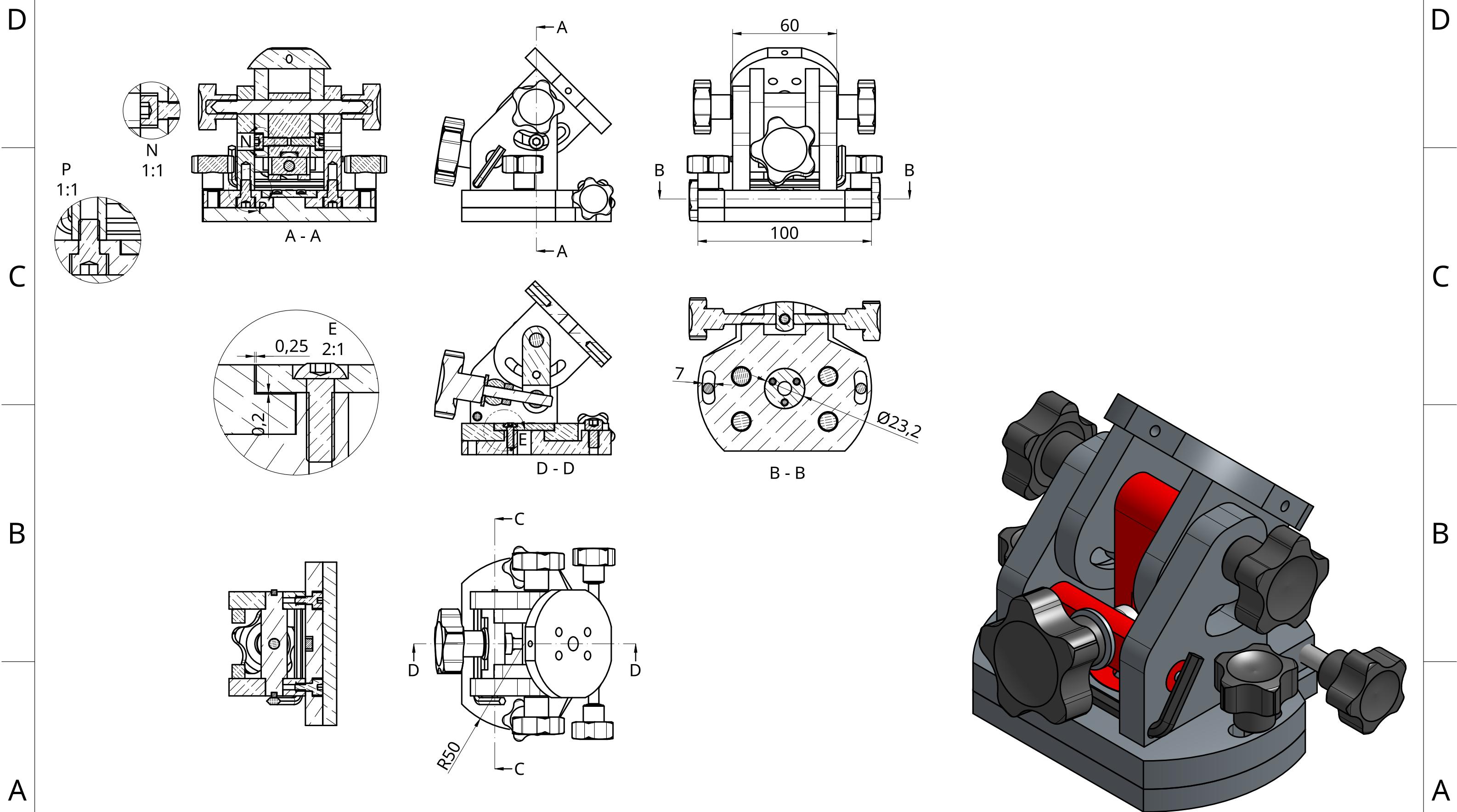
Ø4,2 THRU
M5x0,80 THRU



Bead blasting Anodizing red

6 5 4 3 2 1

HEMY Alt/Az Base

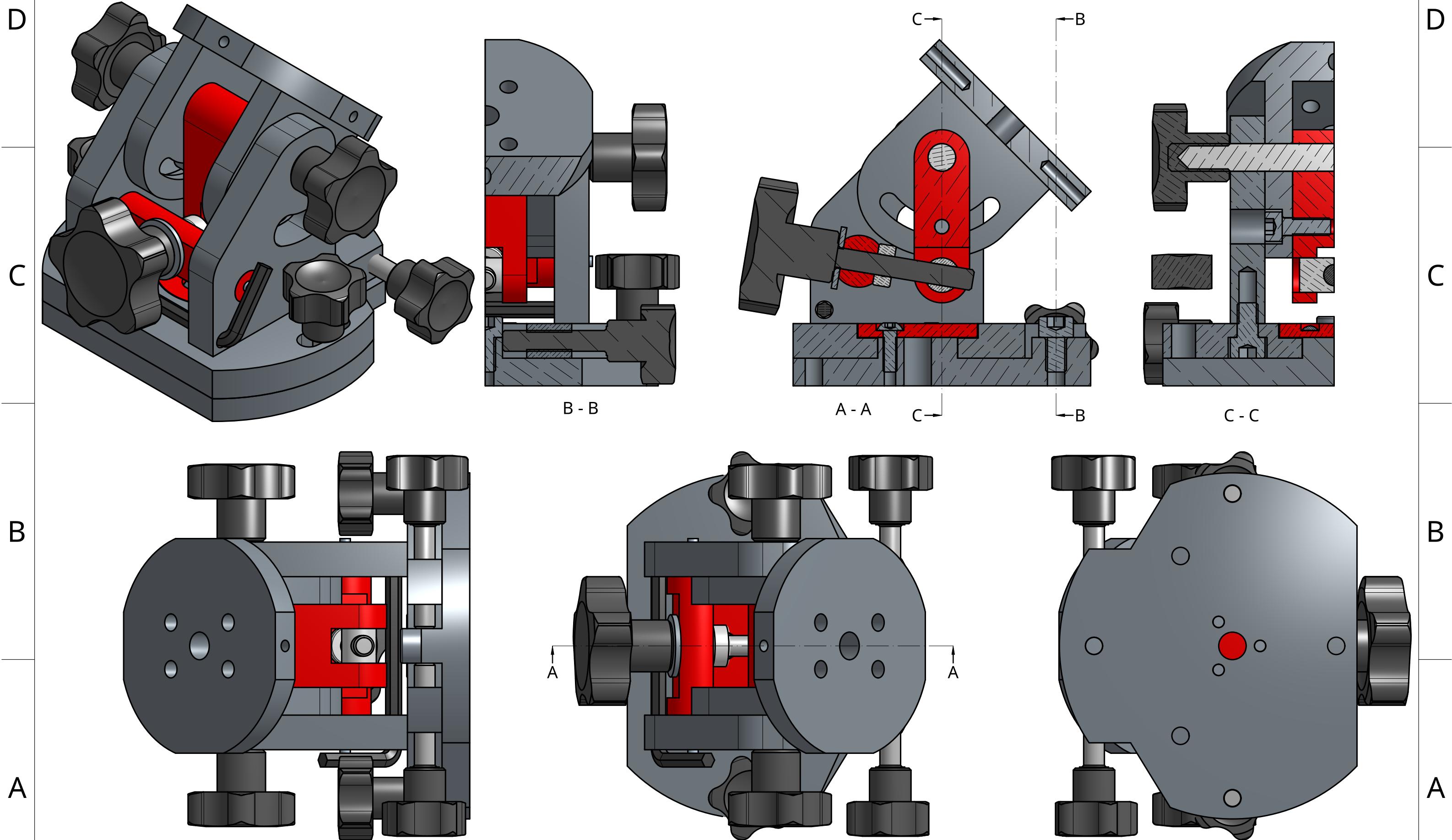


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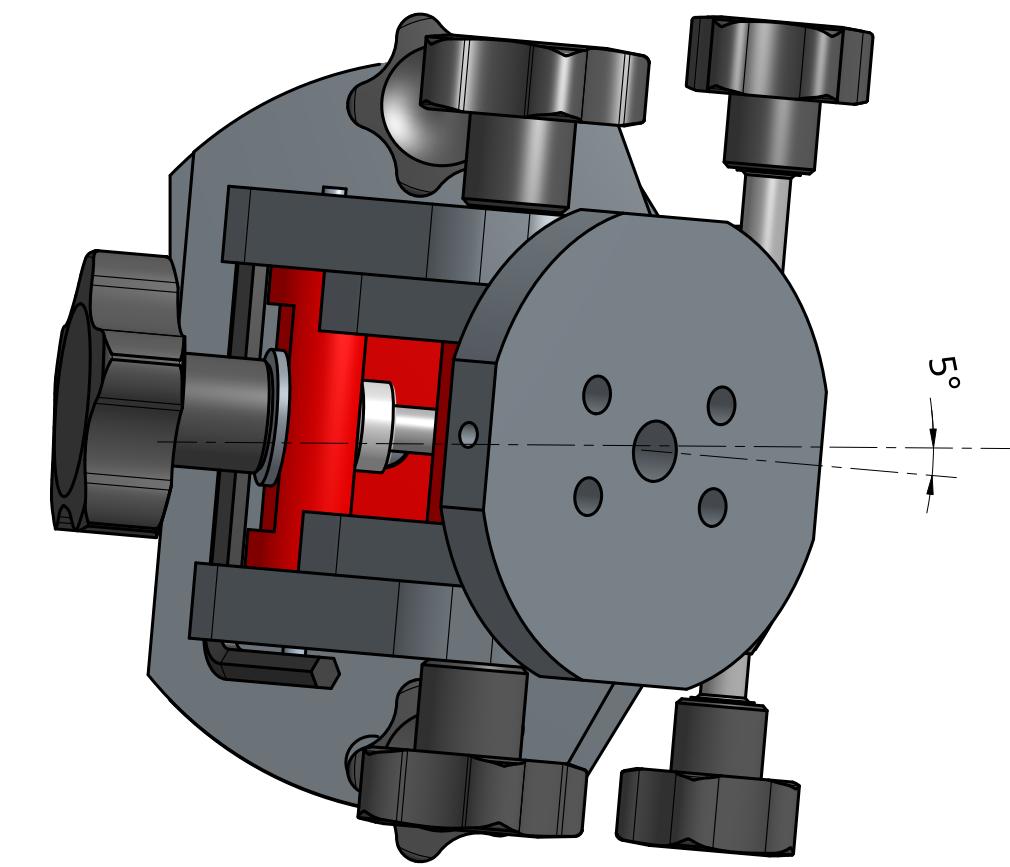
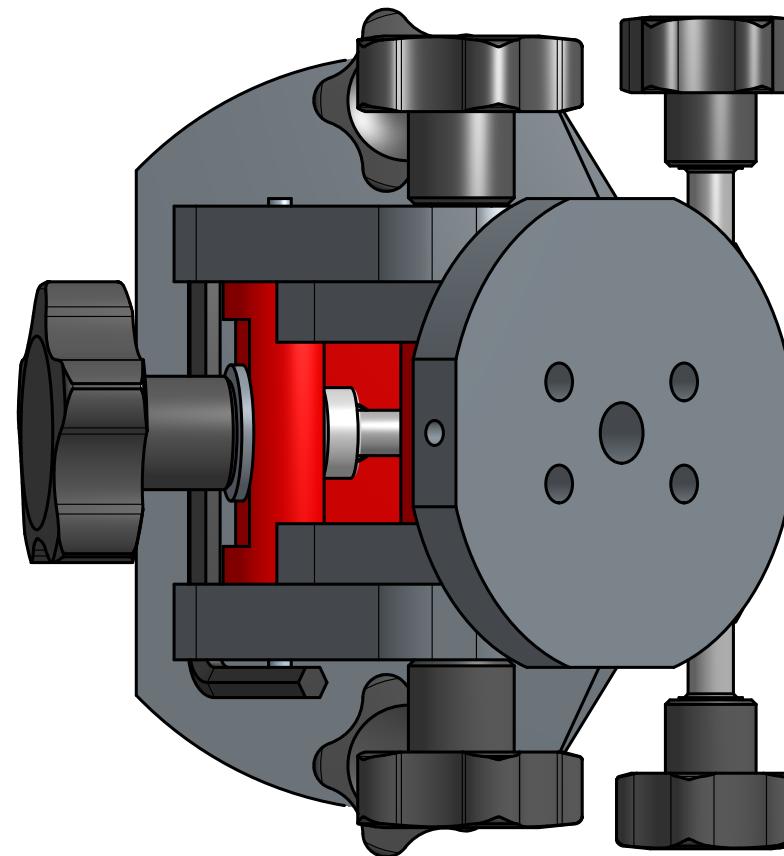
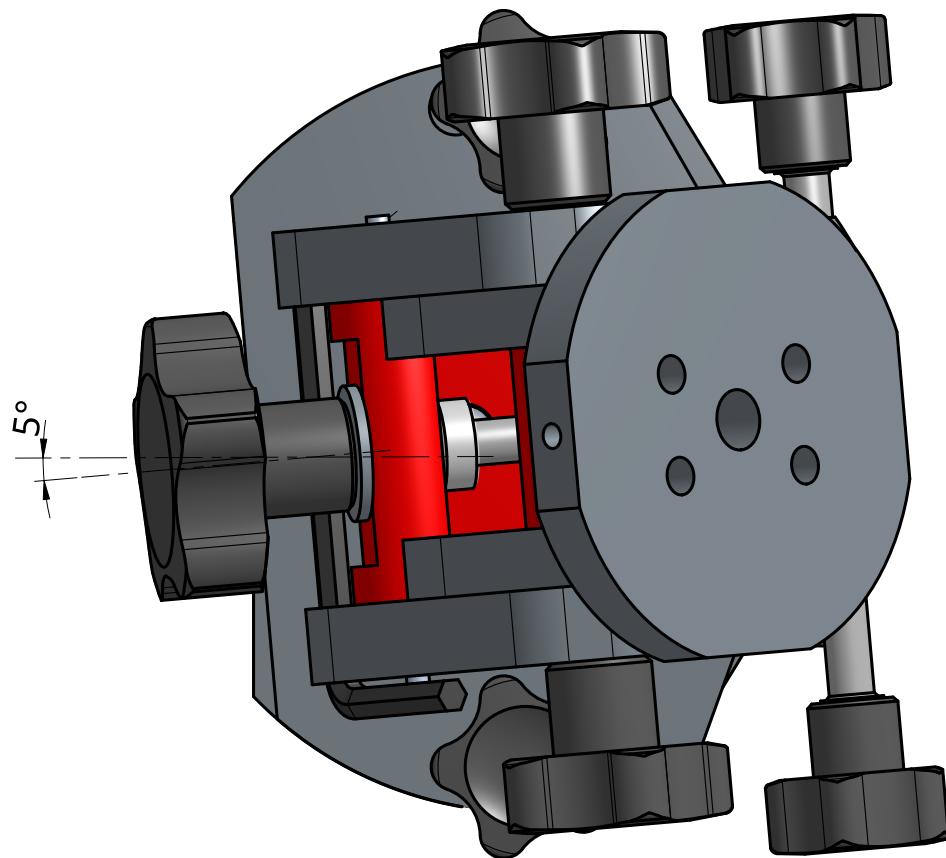
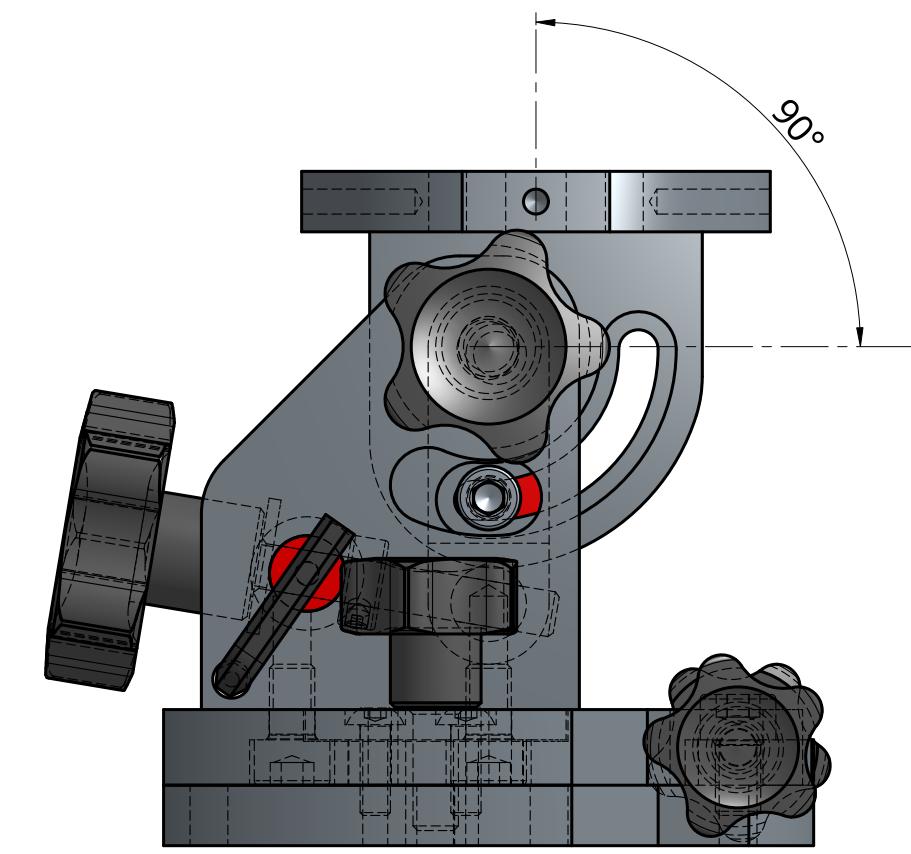
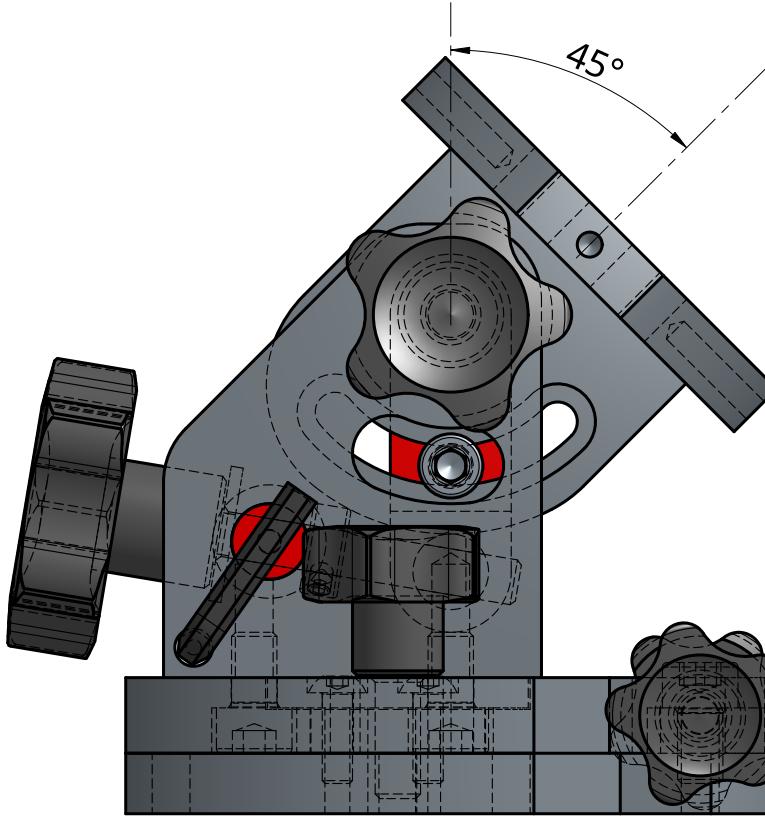
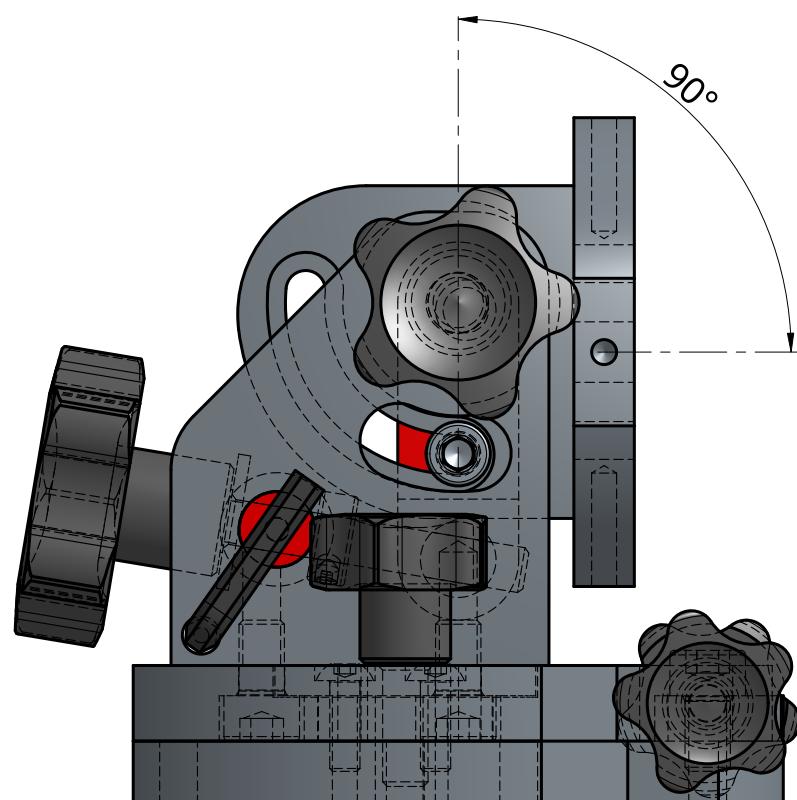
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HEMY Alt/Az Base



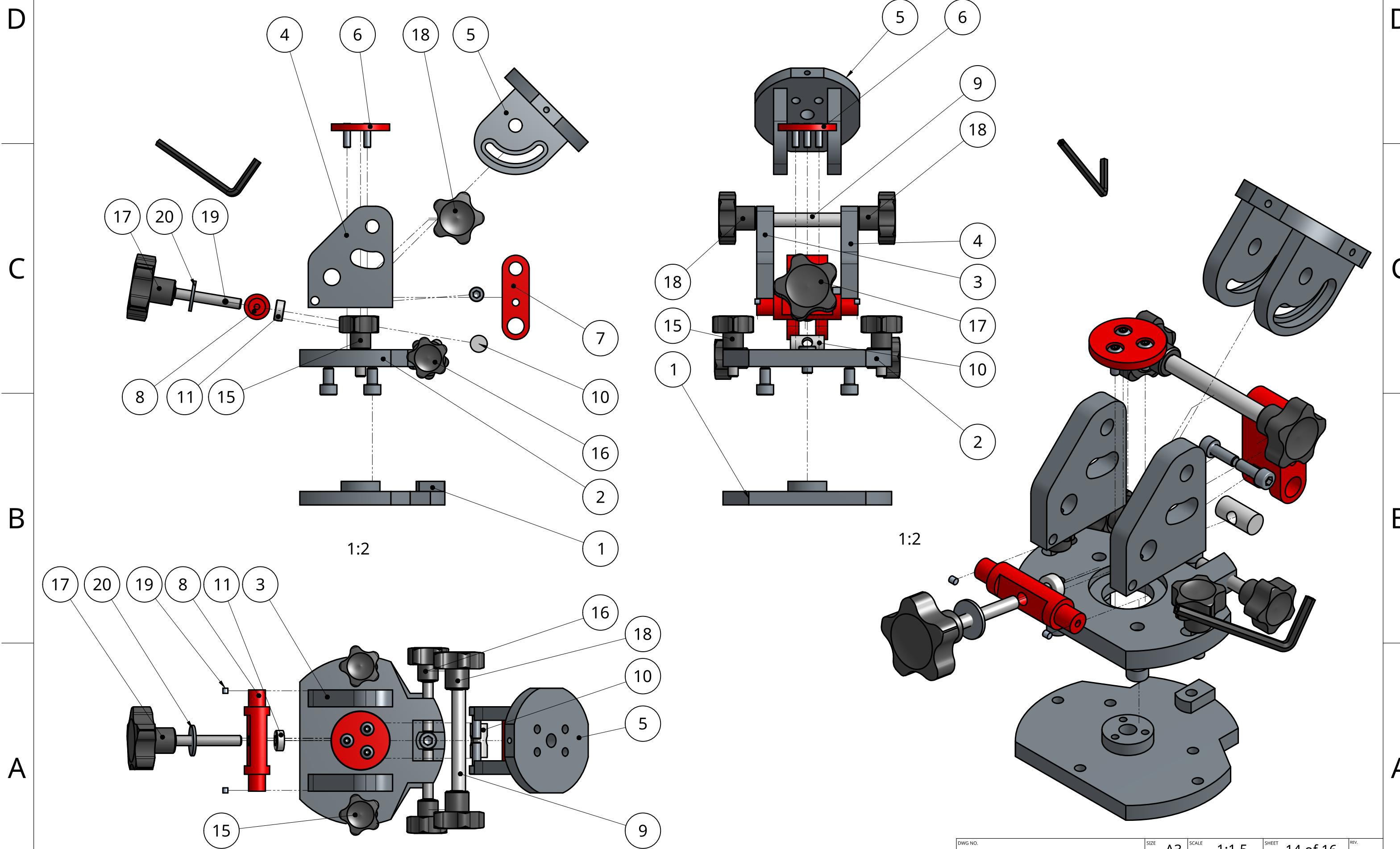
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HEMY Alt/Az Base - 0° to 90° Alt / $\pm 5^\circ$ Az



6 5 4 3 2 1

Explode view - HEMY Alt/Az Base



Bill of Materials - HEMY Alt/Az Base

Item	Quantity	Description	Mass	Material	Title 1
1	1	01 - Base tripod	0.153 kg	Aluminum - 6061	Bead blasting (80 mesh) -- Anodizing dark gray
2	1	02 - Base Az	0.137 kg	Aluminum - 6061	Bead blasting (80 mesh) -- Anodizing dark gray
3	1	03 - Lateral R (same L)	0.058 kg	Aluminum - 6061	Bead blasting (80 mesh) -- Anodizing dark gray
4	1	04 - Lateral L (same R)	0.058 kg	Aluminum - 6061	Bead blasting (80 mesh) -- Anodizing dark gray
5	1	05 - Rotation Alt	0.125 kg	Aluminum - 6061	Bead blasting (80 mesh) -- Anodizing dark gray
6	1	06 - Base Az Hold	0.009 kg	Aluminum - 6061	Bead blasting (80 mesh) -- Anodizing red
7	1	07 - Setting Alt	0.035 kg	Aluminum - 6061	Bead blasting (80 mesh) -- Anodizing red
8	1	08 - Barrel 60mm	0.019 kg	Aluminum - 6061	Bead blasting (80 mesh) -- Anodizing red
9	1	Axis M8	0.037 kg	Stainless Steel	To buy
10	1	Barrel nut M6x10x20mm	0.01 kg	Stainless Steel	To buy
11	1	Block M6	0.003 kg	Stainless Steel	To buy
12	1	BTR 4 (M5)	0.009 kg	Stainless Steel	To buy
13	2	Hex socket head cap screw M5x0.80 x 14 Stainless Steel	0.004 kg	Stainless Steel	To buy
14	5	Hex socket head cap screw M6x1.00 x 10 Stainless Steel	0.005 kg	Stainless Steel	To buy
15	2	Lobe knob M6x16	0.038 kg	Stainless Steel	To buy (ex: Elesa VC.692/25-SST-p-M6x16)
16	2	Lobe knob M6x30	0.04 kg	Stainless Steel	To buy (ex: Elesa VC.692/25-SST-p-M6x30)
17	1	Lobe knob M6x40	0.101 kg	Stainless Steel	To buy (ex: Elesa VC.692/40-SST-p-M6x40)
18	2	Lobe knob M8	0.052 kg	Stainless Steel	To buy (ex: Elesa VC.692/32 B-M8)
19	2	Magnet 3x3mm	0 kg	Neodymium	To buy
20	1	Plain washer large grade A M6 Brass	0.003 kg	Brass	To buy
21	3	Socket button head screw M4x0.7 x 12 Stainless Steel	0.002 kg	Stainless Steel	To buy

