



Dwg.	Item No.	Qty	Description	Material	Manufacturer	Part Number	Manufacturer Link	Weight	Total Weight
CNC.01.01		3	Structural Aluminum Profile 2040	6063-T5	McMaster-Carr	5537T111-5537T107	McMaster-Carr	346	1038
					Soberizavod	224SHX	Soberizavod		
CNC.01.11		2	Structural Aluminum Profile 2020	6063-T5	McMaster-Carr	5537T514-5537T751	McMaster-Carr	169	338
					Soberizavod	222SHX	Soberizavod		
CNC.01.21		1	Frame Base Y	6063-T5	McMaster-Carr	4630T124	McMaster-Carr	43.77	43.77
CNC.01.22-1		1	Frame Base Mount Bracket Y Without Hole	6061 Alloy	McMaster-Carr	9146T14-9146T141	McMaster-Carr	7.97	7.97
CNC.01.22-2		1	Frame Base Mount Bracket Y With Hole	6061 Alloy	McMaster-Carr	9146T14-9146T142	McMaster-Carr	7.9	7.9
CNC.02.25		4	Threaded Rod	Alloy Steel	McMaster-Carr	94595A235	McMaster-Carr	2.16	8.64
CNC.01.02-1		2	Foot	Polycarbonate Sheet	McMaster-Carr	8574K281	McMaster-Carr	32.67	65.34
CNC.01.02-2		1	Foot	Polycarbonate Sheet	McMaster-Carr	8574K281	McMaster-Carr	32.67	32.67
CNC.01.02-3		1	Foot	Polycarbonate Sheet	McMaster-Carr	8574K281	McMaster-Carr	30.39	30.39
CNC.02.42		1	Adjustment Equipment Part	Polycarbonate Sheet	McMaster-Carr	8574K281	McMaster-Carr	73.78	73.78
CNC.02.41		1	Stepper Side Part	Polycarbonate Sheet	McMaster-Carr	8574K281	McMaster-Carr	67.72	67.72
CNC.02.44		1	Equipment Adapter	Polycarbonate Sheet	McMaster-Carr	8574K281	McMaster-Carr	51.48	51.48
CNC.02.21		1	Right Side Base	Polycarbonate Sheet	McMaster-Carr	8574K281	McMaster-Carr	99.76	99.76
CNC.02.31		1	Left Side Base	Polycarbonate Sheet	McMaster-Carr	8574K281	McMaster-Carr	104.4	104.4
CNC.02.22		8	Wheel Spacer 1	6061-T6 (SS)	McMaster-Carr	4634T36	McMaster-Carr	1.12	8.96
CNC.01.31		4	Corner For Sensor	6060 Alloy	McMaster-Carr	5585N13-5585N117	McMaster-Carr	2.49	9.96
CNC.02.24		2	Corner Bracket For Cable Chain	6060 Aluminum	McMaster-Carr	5585N19-5585N137	McMaster-Carr	5	10
CNC.02.43		8	Wheel Spacer 2	6061-T6 (SS)	McMaster-Carr	4634T36	McMaster-Carr	1.37	10.96
CNC.02.51		1	Frame Base X	6063-T5	McMaster-Carr	4630T124	McMaster-Carr	17.7	17.7
CNC.02.52		1	Frame Base Mount Bracket X	6061 Alloy	McMaster-Carr	9146T15-9146T151	McMaster-Carr	6.75	6.75
CNC.02.60		1	Equipment Cable Carrier	Nylon	Aliexpress	none	Aliexpress	21.86	21.86
CNC.03.00		1	Cable Carrier	Nylon	Aliexpress	none	Aliexpress	21.86	21.86
CNC.04.05-1		1	Cable label X	Acrylic	Aliexpress	none	Aliexpress	1.58	1.58
CNC.04.05-2		1	Cable label Y	Acrylic	Aliexpress	none	Aliexpress	1.58	1.58
CNC.04.05-4		1	Cable label PWR	Acrylic	Aliexpress	none	Aliexpress	1.58	1.58
CNC.04.05-5		1	Cable label DATA	Acrylic	Aliexpress	none	Aliexpress	1.58	1.58
CNC.05.01-1		2	T-slot Table Plate	6105 Alloy	Soberizavod	TL1	Soberizavod	541.63	1083.3
CNC.05.01-2		2	T-slot Table Plate	6105 Alloy	Soberizavod	TL1	Soberizavod	541.8	1083.6
CNC.05.01-3		1	T-slot Table Plate	6105 Alloy	Soberizavod	TL1	Soberizavod	377.6	377.6
CNC.05.05		2	Corner Braket Long	6061 Alloy	McMaster-Carr	5585N18-5585N134	McMaster-Carr	117.04	234.08
CNC.02.11		1	Rotary Shaft	AISI 1020	McMaster-Carr	8920K18-8920K183	McMaster-Carr	61.66	61.66
None		4	Corner Bracket 40x20L	AISI 1035 Steel (SS)	Soberizavod	H49	Soberizavod	49	196
None		8	Corner Bracket 20x20L	Steel	Soberizavod	none	Soberizavod	10.14	81.12
				Anodized 6063 Aluminum	McMaster-Carr	5537T935	McMaster-Carr		
None		1	LASER 5500mW	Multimaterial	Aliexpress	none	Aliexpress	400	400
None		4	Limit Switch	Multimaterial	DIGIKEY	none	DIGIKEY	1.6	6.4
				Multimaterial	Aliexpress	none	Aliexpress		
None		2	Nema 17HS4401 Stepper Motor	Multimaterial	Aliexpress	none	Aliexpress	315	630
None		12	Cable Tie Plastic	Nylon 101	McMaster-Carr	7130K12	McMaster-Carr	0.18	2.16
None		3	Timing Belt 430mm	Rubber	Aliexpress	none	Aliexpress	3.98	11.94
			Timing Belt 430mm	Rubber	McMaster-Carr	3682N1-3682N13	McMaster-Carr		
None		3	GX16-4P cable female	Multimaterial	Aliexpress	none	Aliexpress	10	30
None		3	Pulley GT2-12	Multimaterial	Aliexpress	none	Aliexpress	1.23	3.69

Dwg.	Item No.	Qty	Description	Material	Manufacturer	Part Number	Manufacturer Link	Weight	Total Weight
None		1	Flexible shaft coupling 5x5	Multimaterial	Aliexpress	none	Aliexpress	16.06	16.06
None		1	Connector D-SUB 9 Male	Multimaterial	MOUSER	none	Mooser	5	5
None		1	Connector PG11	ABS	Amazon	none	Amazon	12.38	12.38
None		1	Cable Holder	ABS	Soberizavod	none	Soberizavod	3.07	3.07
None		1	Heat-Shrink Tubing 1 (Length 110mm)	Rubber	Digikey	ATU031K-ND	Digikey	0	0
None		1	Heat-Shrink Tubing 2 (Length 25mm)	Rubber	Digikey	SCT-NO.2-E5-0-12MMND	Digikey	0	0
								Total weight	6322.2

3D printed parts

CNC.02.23		1	Spacer for stepper File: ProductionFiles/SpacerForStepper.STL	PET-G	McMaster-Carr	3462N1	McMaster-Carr	20.9	20.9
CNC.02.45		2	Carriage Spacer File: ProductionFiles/CarriageSpacer.STL	PET-G	McMaster-Carr	3462N1	McMaster-Carr	5.49	10.98
								Total weight	31.88

Screws

None		4	Head screw ISO 7380 M5 x 50	AISI 304	Aliexpress	none	Aliexpress	8.84	35.36
None		56	M3 NYLOC DIN 985	AISI 304	Aliexpress	500214	Aliexpress	0.4	22.4
None		6	Square nut M5	Zinc-Plated Steel	Soberizavod	A209	Soberizavod	1.84	11.04
				Zinc-Plated Steel	McMaster-Carr	5537t161	McMaster-Carr		
None		20	M5 NYLOC DIN 985	AISI 304	McMaster-Carr	5100214	McMaster-Carr	1.1	22
None		4	Low Profile Hex Screw M5x30	Alloy Steel	Aliexpress	none	Aliexpress	5.27	21.08
				Alloy Steel	McMaster-Carr	none	McMaster-Carr		
None		8	Head screw ISO 7380 M5 x 35	AISI 304	Aliexpress	none	Aliexpress	5.08	40.64
None		6	Head screw ISO 7380 M5 x 6	18-8 Stainless Steel	Aliexpress	none	Aliexpress	2	12
None		20	ISO 10642 - M3 x 16 - 16N	18-8 Stainless Steel	McMaster-Carr	none	McMaster-Carr	0.47	9.4
None		24	Head screw ISO 7380 M5 x 8	18-8 Stainless Steel	McMaster-Carr	91292A121	McMaster-Carr	2	48
				18-8 Stainless Steel	Aliexpress	none	Aliexpress		
None		16	Washer DIN 125 - A 5.3	Zinc Plated Steel	McMaster-Carr	91166A240	McMaster-Carr	0.44	7.04
None		32	T nut 2020 M5	316 Stainless Steel	Aliexpress	none	Aliexpress	2.08	66.56
None		4	Washer DIN 125 - A 3.2	Zinc Plated Steel	McMaster-Carr	91166A210	McMaster-Carr	0.12	0.48
None		14	ISO 4762 M3 x 8 - 8N	Zinc Plated Steel	McMaster-Carr	91502A103	McMaster-Carr	0.8	11.2
None		14	ISO 4762 M3 x 12 - 12N	18-8 Stainless Steel	McMaster-Carr	none	McMaster-Carr	1.16	16.24
None		8	ISO 7380 - M5 x 10 - 10N	316 Stainless Steel	McMaster-Carr	90943A117	McMaster-Carr	2.09	16.72
None		4	ISO 7380 - M5 x 16 - 16N	18-8 Stainless Steel	McMaster-Carr	92095A212	McMaster-Carr	2.9	11.6
None		16	ISO 7380 - M3 x 8 - 8N	18-8 Stainless Steel	McMaster-Carr	92095A181	McMaster-Carr	0.6	9.6
None		12	ISO 4762 M6 x 20 - 20N	Zinc-Plated Steel	McMaster-Carr	90128A264	McMaster-Carr	6.53	78.36
None		4	ISO 4762 M4 x 6 - 6N	Zinc-Plated Steel	McMaster-Carr	90128A208	McMaster-Carr	3.7	14.8
None		4	Head screw ISO 7380 M3 x 16	AISI 304	Aliexpress	none	Aliexpress	1	4
None		1	Stainless Steel Ball Bearing 625-2Z (ISO 15 RBB - 025 - 8,DE,NC,8_68)	Multimaterial	McMaster-Carr	6153K15	McMaster-Carr	5.6	5.6
								Total weight	464.12

Cables

None		1	Stepper X Cable (Control Cable 1850mm)	Multimaterial	McMaster-Carr	6650T12	McMaster-Carr	50	50
None		1	Stepper Y Cable (Control Cable 2900mm)	Multimaterial	McMaster-Carr	6650T12	McMaster-Carr	50	50
None		1	Power Cable (Power Supply Cable 3200mm)	Multimaterial	McMaster-Carr	7394K31	McMaster-Carr	50	50
None		1	Data Cable (Multiple Conductor Cable 1040mm)	Multimaterial	Digikey	T1430-153-ND	Digikey	50	50
				Multimaterial	McMaster-Carr	6650T14	McMaster-Carr	0	
None		1	Hook-Up Wire (Wire 5300mm)	Multimaterial	Digikey	FLTWC0311-26-9-ND	Digikey	50	50
								Total weight	250
								All project weight	7068.2

4

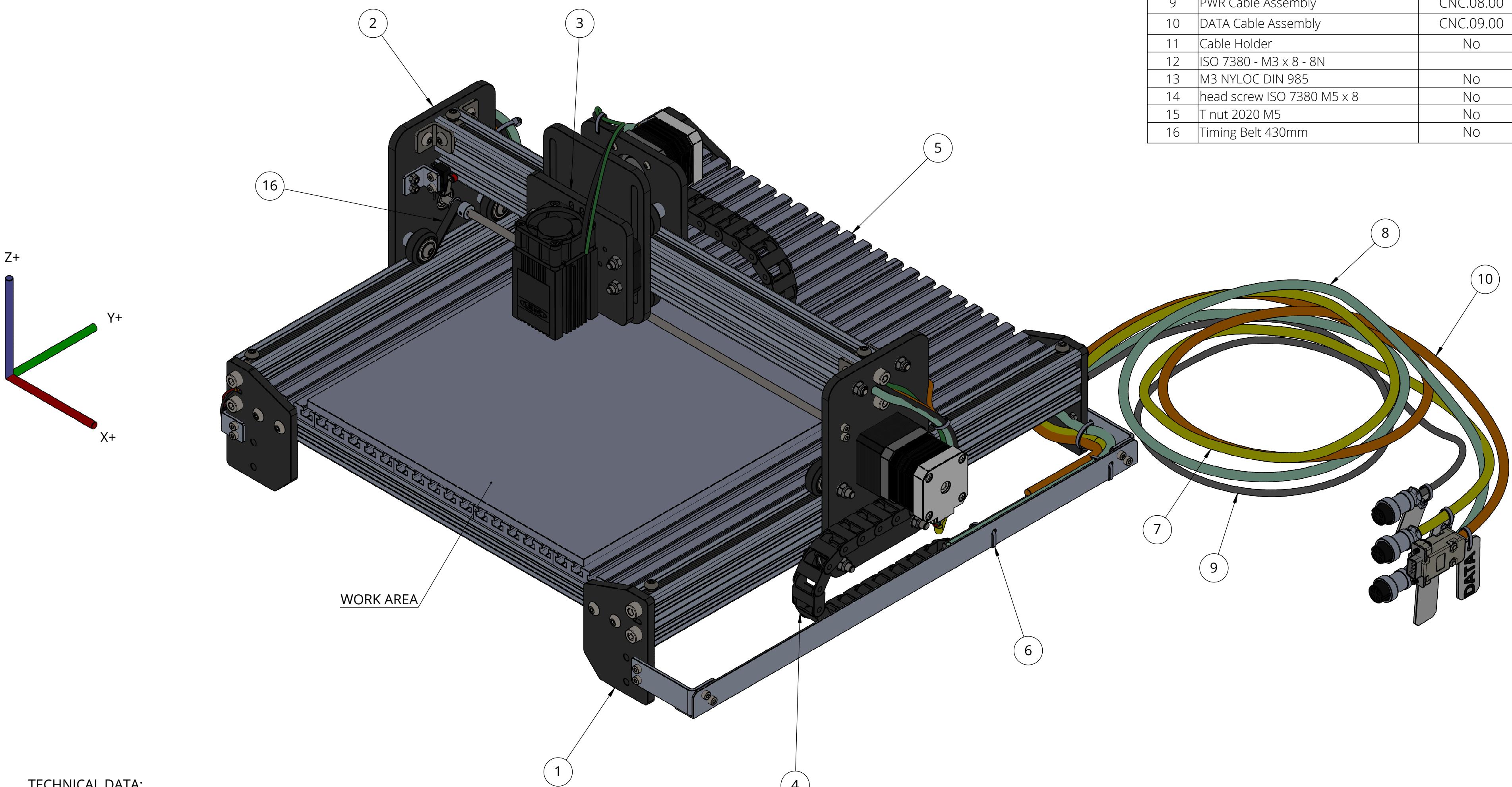
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D

D



TECHNICAL DATA:

1. TOTAL DIMENSIONS (EXCLUDE CABLES):

Width: 490 mm MAX
Length: 450 mm MAX
Height: 360 mm MAX

2. WORK AREA:

X: 260 mm MAX
Y: 265 mm MAX
Z: 26 mm MAX

ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Base Frame Assembly	CNC.01.00	1
2	MainCarriageAssembly	CNC.02.00	1
3	Laser Unit	CNC.04.00	1
4	Cable Carrier	CNC.03.00	1
5	Table T-Slot	CNC.05.00	1
6	Cable Tie Plastic	No	3
7	Stepper X Cable Assembly	CNC.06.00	1
8	Stepper Y Cable Assembly	CNC.07.00	1
9	PWR Cable Assembly	CNC.08.00	1
10	DATA Cable Assembly	CNC.09.00	1
11	Cable Holder	No	1
12	ISO 7380 - M3 x 8 - 8N		4
13	M3 NYLOC DIN 985	No	4
14	head screw ISO 7380 M5	No	4
15	T nut 2020 M5	No	4
16	Timing Belt 430mm	No	2

4

3

2

1

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		DIMENSIONS ARE IN MILLIMETRES	DRAWN		
		TOLERANCING PER:			
		FRACTIONAL +			
		ANGULAR: MACH ± BEND ±			
		TWO PLACE DECIMAL ±			
		THREE PLACE DECIMAL ±			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
		Multimaterial			
NEXT ASSY	USED ON	FINISH	No		
		APPLICATION	DO NOT SCALE DRAWING		
VR TITLE: CNC router					
DWG. NO. C DWG. NO. CNC.00.00 REV					
Vladimir Tyrkin veres.pcb@gmail.com					
SCALE: 1:2 WEIGHT: 7250.93 SHEET 1 OF 3					

4

3

2

1

D

D

C

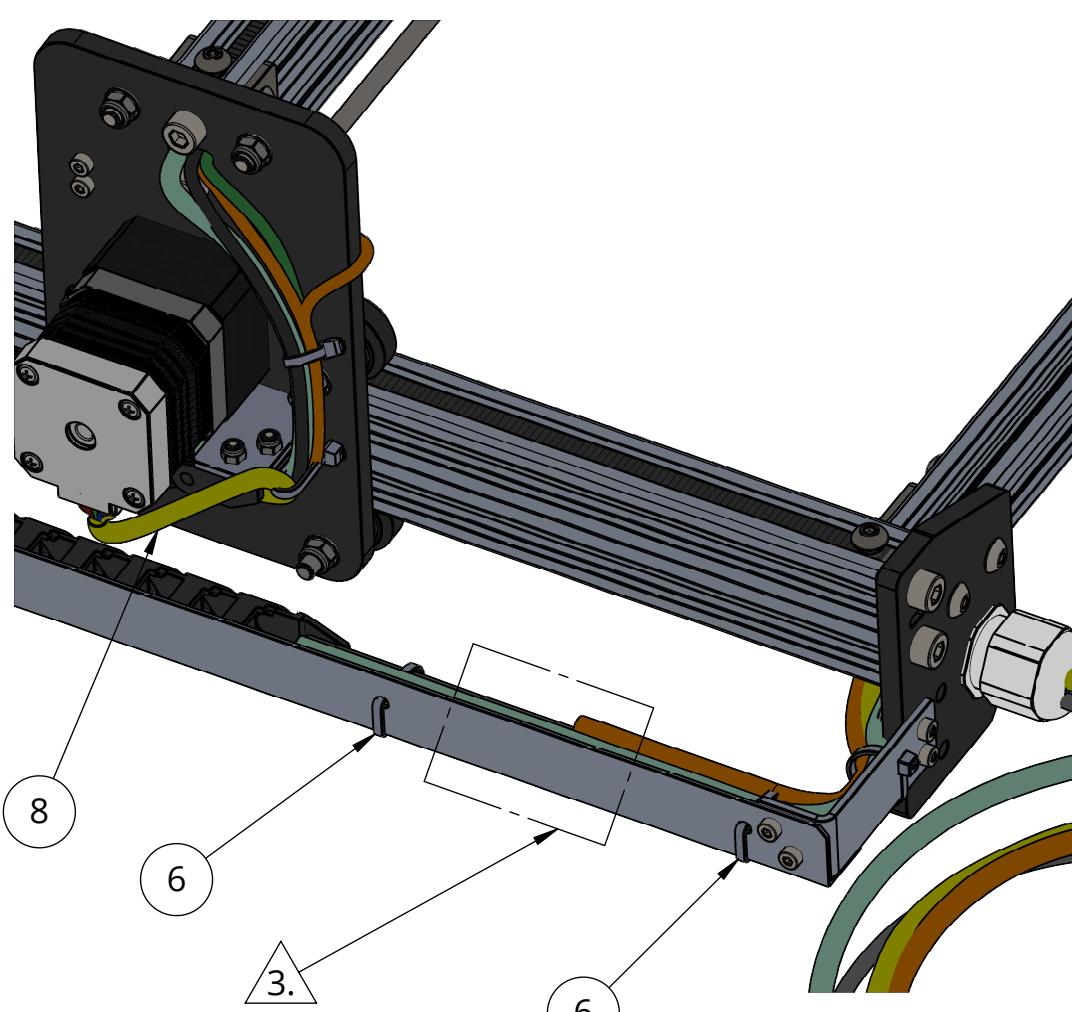
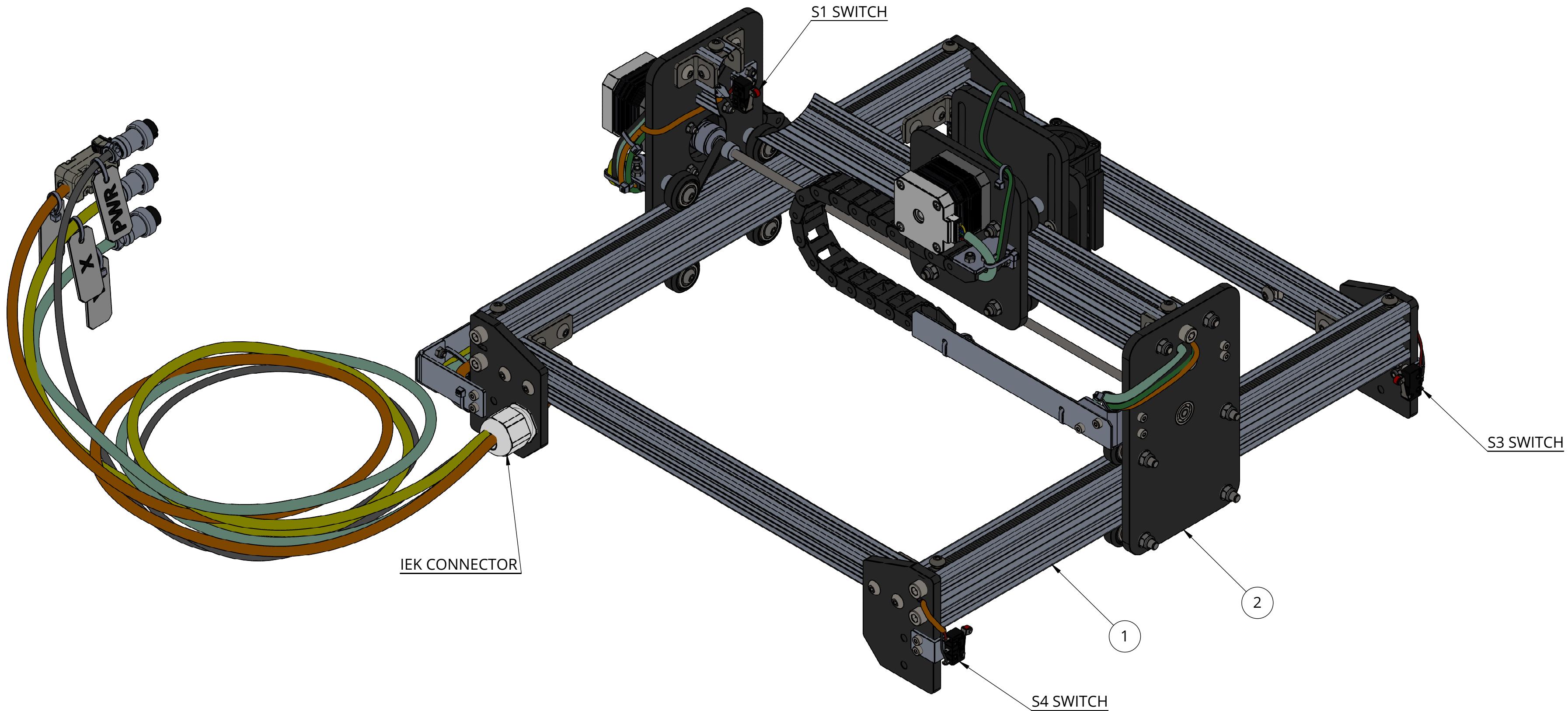
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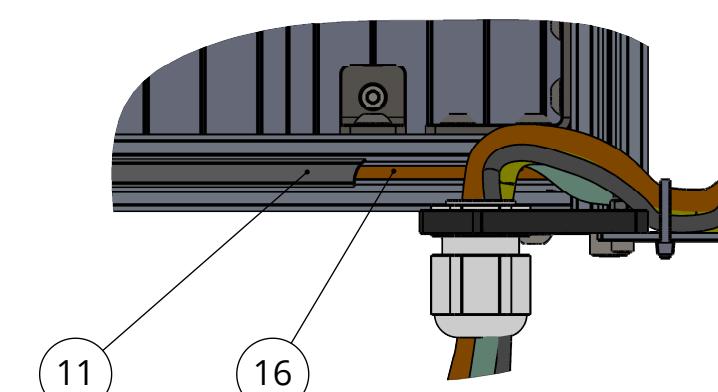


AXIS X STEPPER SIDE

PLACING CABLES:

1. ASSEMBLY ITEMS 1 AND 2 TOGETHER AND TIGHT WHEEL'S SCREWS.
2. INSERT CABLES INTO IEK CONNECTOR AND PLACE THEM AS SHOWN.
3. PLACE SOLDERED GROUND WIRES AT SHOWN AREA.

BACK SIDE. T-SLOT TABLE NOT SHOWN



BOTTOM SIDE

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		FRACTIONAL ±		ENG APPR.	
		ANGULAR: MACH ± BEND ±		MFG APPR.	
		TWO PLACE DECIMAL ±			
		THREE PLACE DECIMAL ±			
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		Multimaterial			
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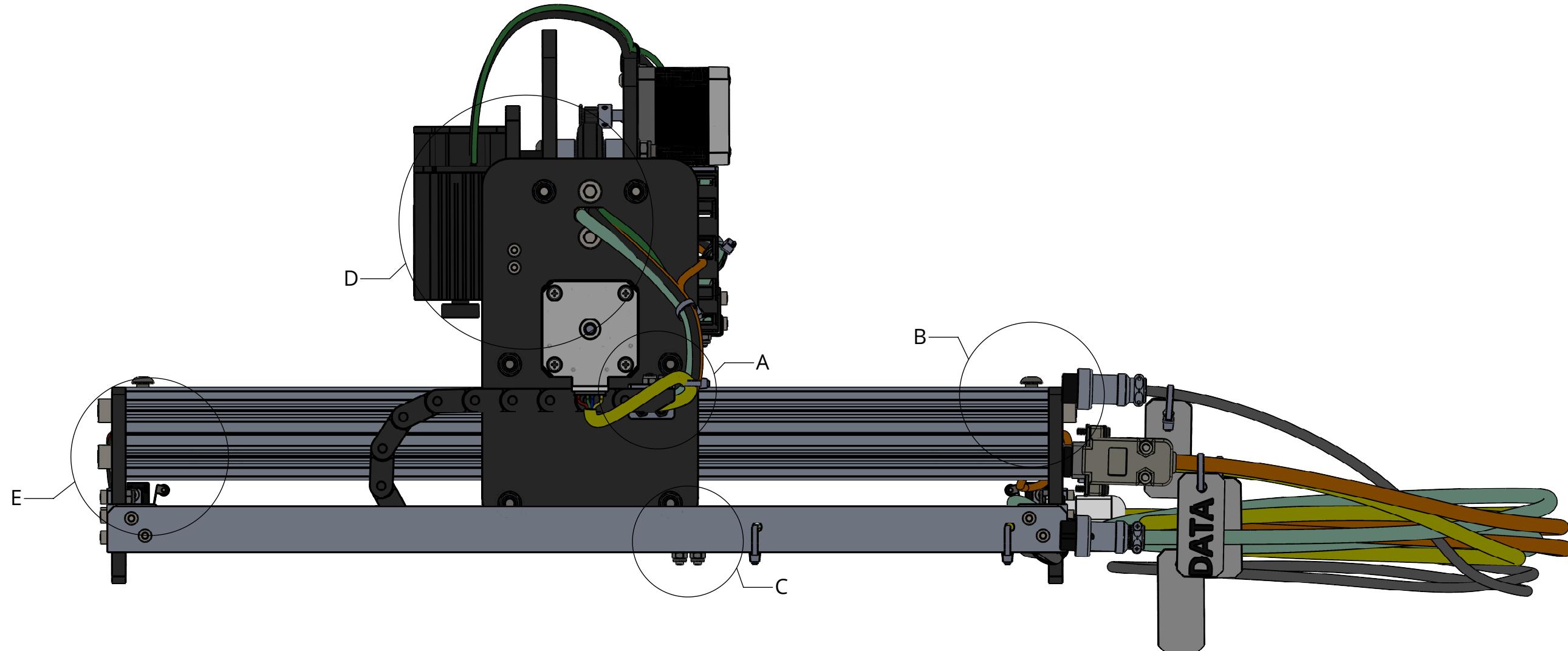
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TITLE:
CNC router
DWG. NO.
C CNC.00.00
REV
Vladimir Tyrkin
veres.pcb@gmail.com
SCALE: 1:2 WEIGHT: 7250.93 SHEET 2 OF 3

4

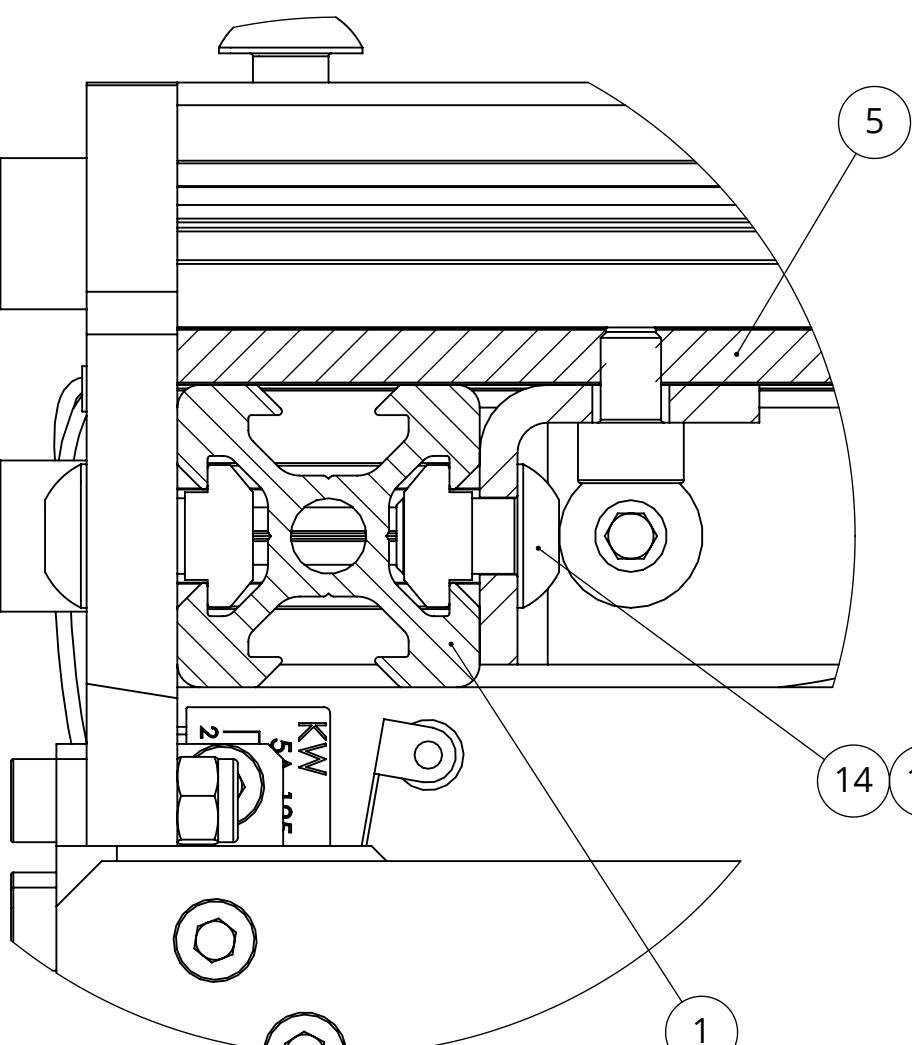
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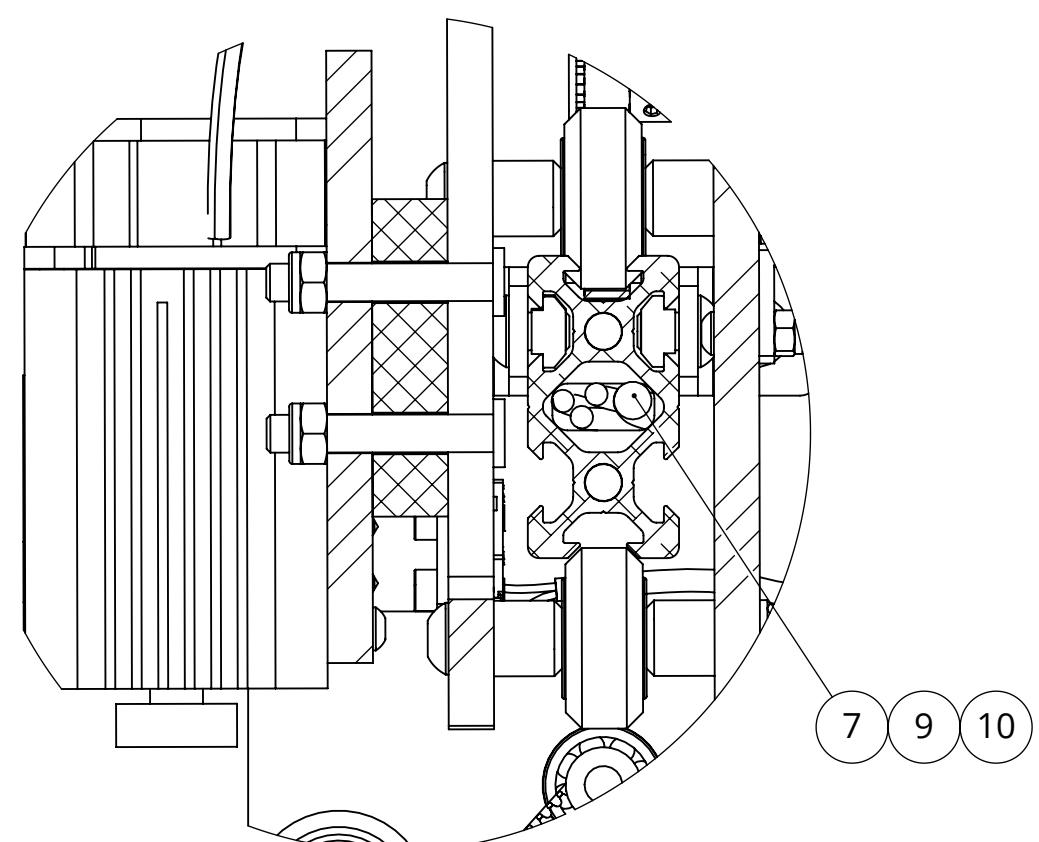
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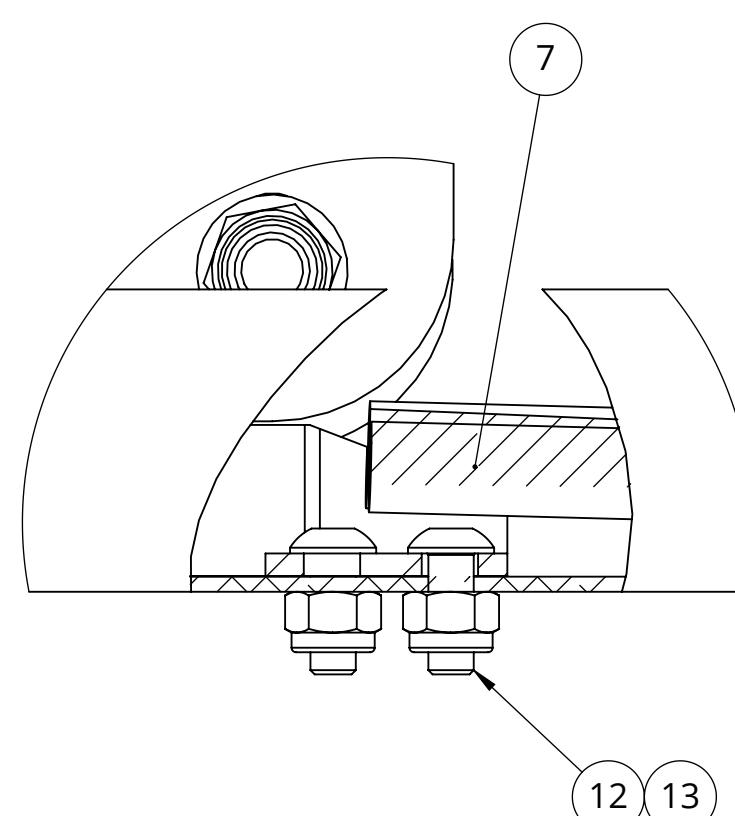
RIGHT SIDE VIEW



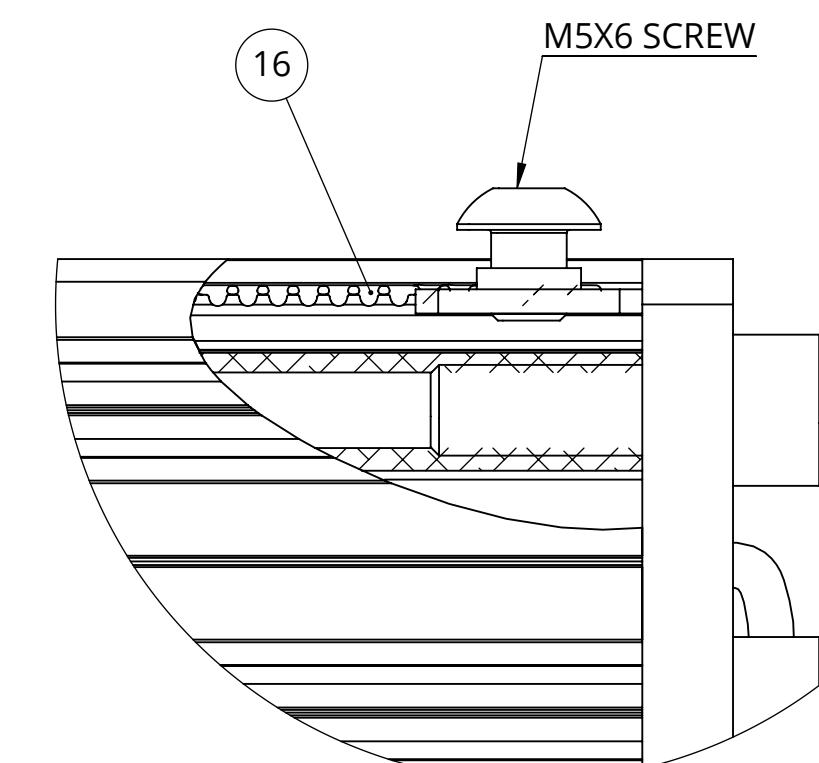
DETAIL E
SCALE 2 : 1



DETAIL D
SCALE 1 : 1



DETAIL C
SCALE 2 : 1



DETAIL B
SCALE 2 : 1

NOTES:

- NOTES:**

 1. ASSEMBLY PROCEDURE:
 1. SCREW CABLE CHANNELS AFTER INSTALLING CABLES.
 2. TIGHT BELT AND FIX IT WITH M5X6 SCREW AS SHOWN.
 3. MOUNT LASER UNIT, REGULATE IT DISTANCE AND TIGHT IT AS SHOWN AT DETAIL D
 4. ASSEMBLY THE REST COMPONENTS.
 2. FOR MANUFACTURING LINKS REFER TO CNC BOM.PDF.

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		DIMENSIONS ARE IN MILLIMETRES TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	DRAWN			TITLE: CNC router	
			CHECKED				
			ENG APPR.				
			MFG APPR.				
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.				
		MATERIAL Multimaterial	COMMENTS:				
NEXT ASSY	USED ON	FINISH No	Vladimir Tyrkin veres.pcb@gmail.com				
APPLICATION		DO NOT SCALE DRAWING	SIZE	DWG. NO. CNC.00.00		REV	
			SCALE: 1:2	WEIGHT: 7250.93	SHEET 3 OF 3		

4

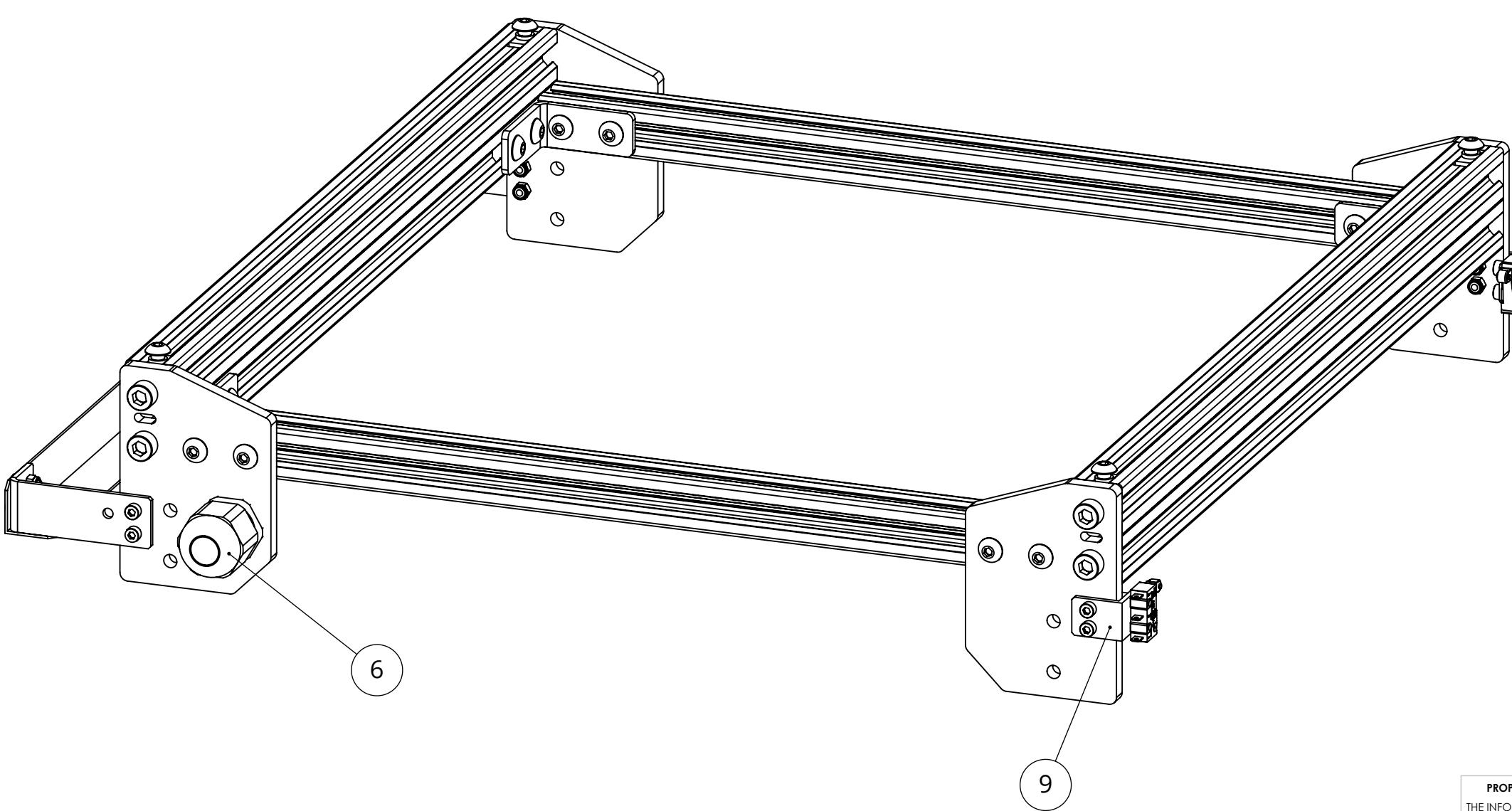
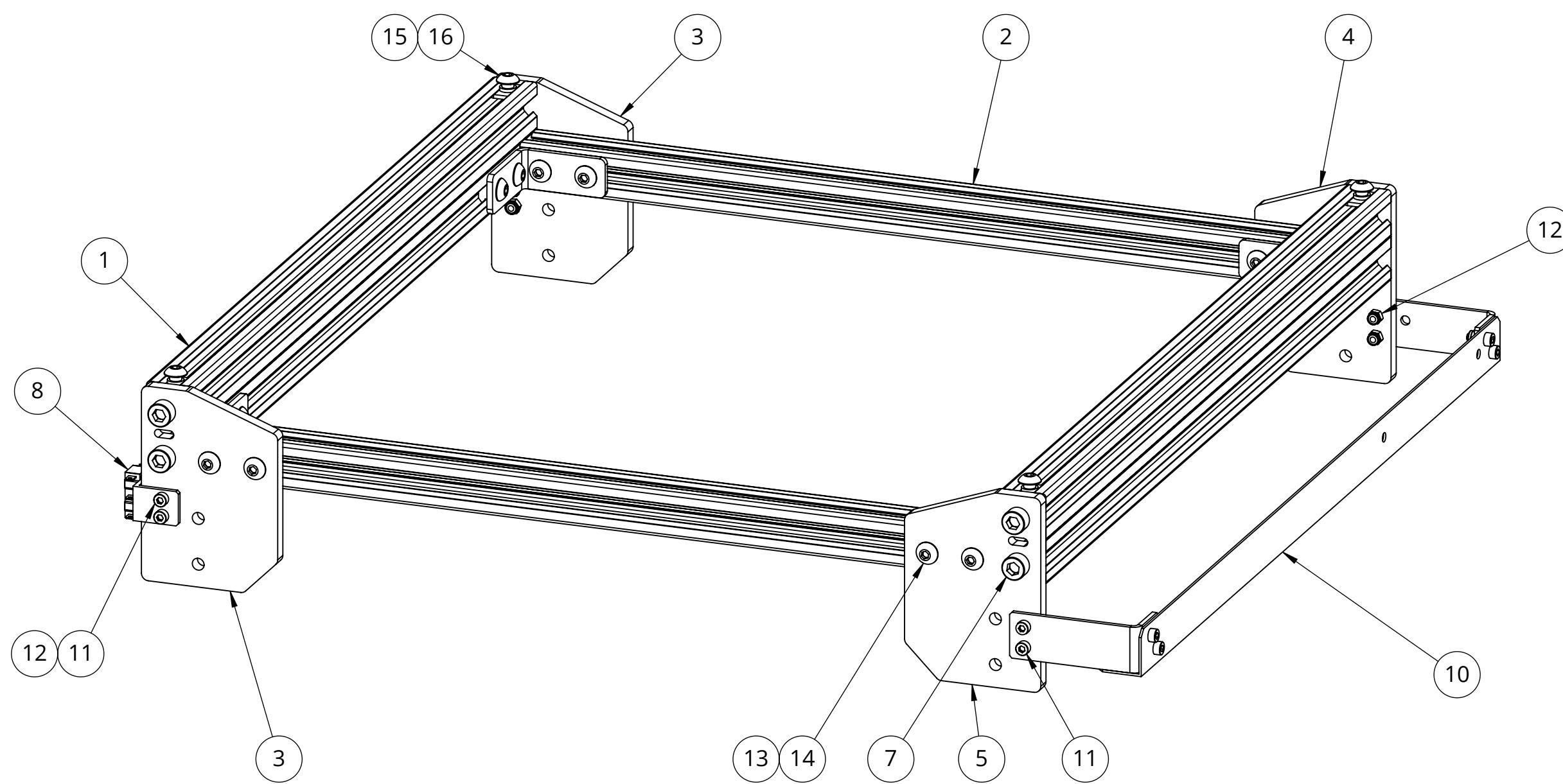
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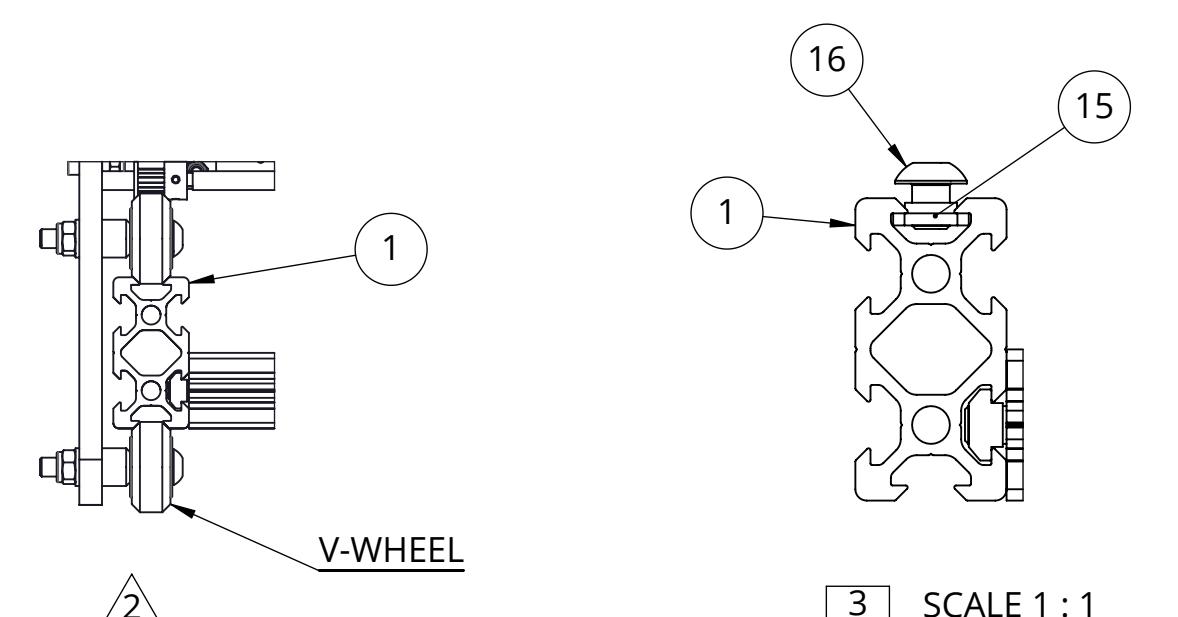
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ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Structural Aluminum Profile 2040	CNC.01.01	2
2	Crossbar	CNC.01.10	2
3	Foot	CNC.01.02-1	2
4	Foot	CNC.01.02-3	1
5	Foot	CNC.01.02-2	1
6	Connector PG11	No	1
7	ISO 4762 M6 x 20 - 20N		8
8	Limit Switch Variant 2	CNC.01.30-2	1
9	Limit Switch Variant 1	CNC.01.30-1	1
10	Cable Chain Mount Frame Y	CNC.01.20	1
11	ISO 4762 M3 x 12 - 12N		8
12	M3 NYLOC DIN 985	No	8
13	T nut 2020 M5	No	8
14	ISO 7380 - M5 x 10 - 10N		8
15	Square nut M5	No	4
16	head screw ISO 7380 M5 x 6	No	4



NOTES:

- ASSEMBLY PROCEDURE:
 - PRE-ASSEMBLE ITEMS 1 AND 2.
 - INSTALL CARRIAGE DWG.NO. CNC.02.00 INTO ALUMINUM PROFILE BEFORE ASSEMBLING THE REST PARTS AS SHOWN.
 - INSERT SQUARE NUTS 15 AND SCREWS 16 AS SHOWN.
 - MOUNT LIMIT SWITCHES TO FEET ITEM 3.
 - SCREW ALL FEET TO FRAME. MOUNT THE REST COMPONENTS.
- FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN MILLIMETRES	DRAWN		
		TOLERANCES		CHECKED	
		FRACTIONAL +		ENG APPR.	
		ANGULAR: MACH ± BEND ±		MFG APPR.	
		TWO PLACE DECIMAL ±			
		THREE PLACE DECIMAL ±			
		INTERPRET GEOMETRIC TOLERANCING PER:		Q.A.	
		MATERIAL	Multimaterial	COMMENTS:	
		FINISH	No		
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				

VR
TITLE:
Base Frame Assembly
SIZE DWG. NO. REV
C DWG. NO. REV
CNC.01.00

Vladimir Tyrkin
veres.pcb@gmail.com

SCALE: 1:2 WEIGHT: 1455.39 SHEET 1 OF 1

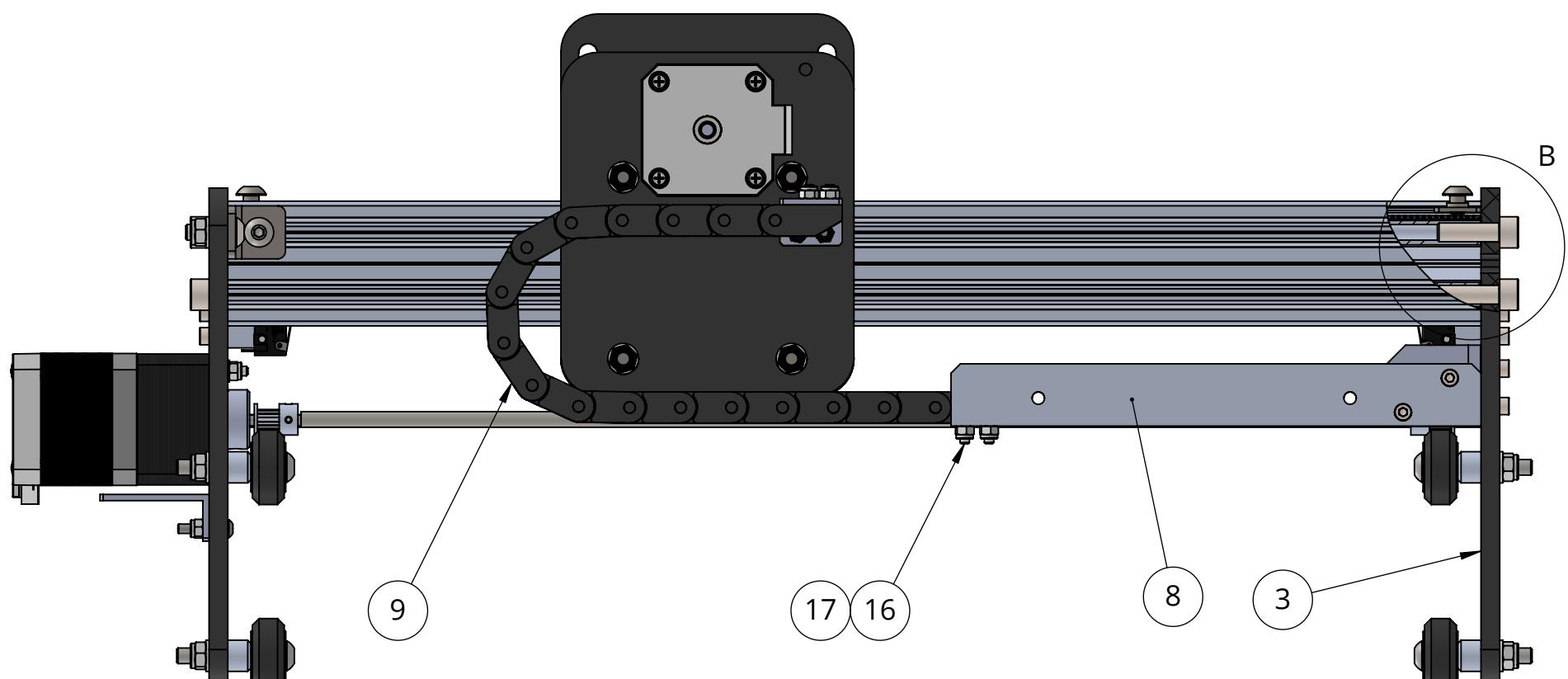
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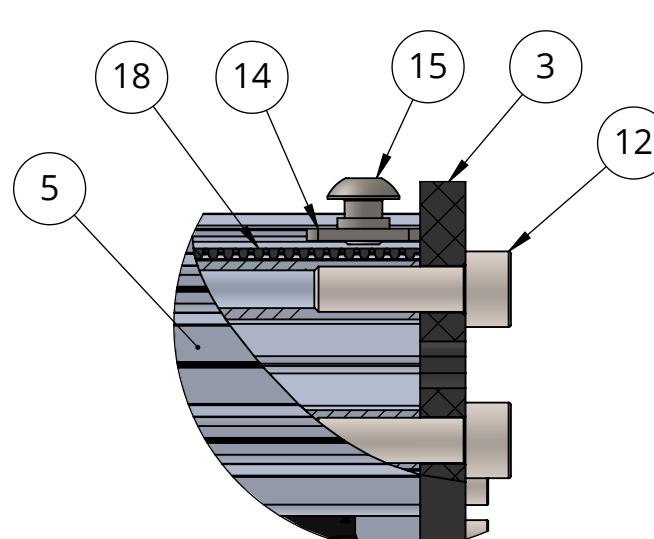
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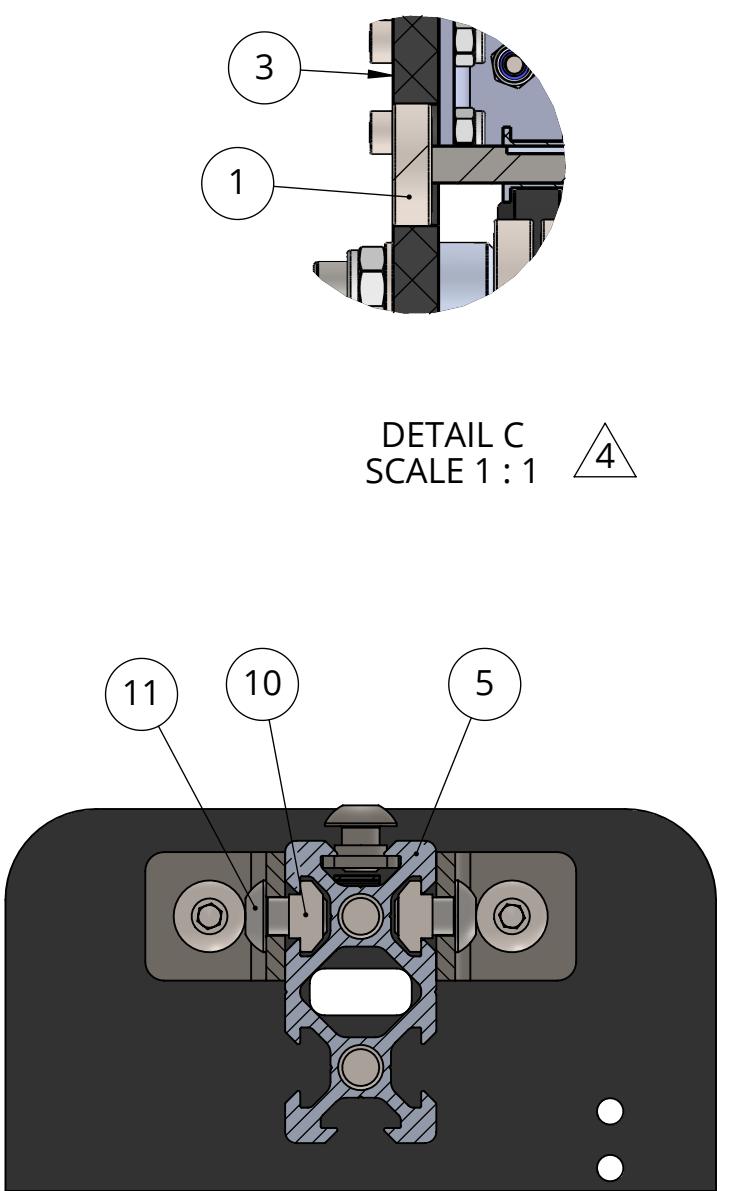
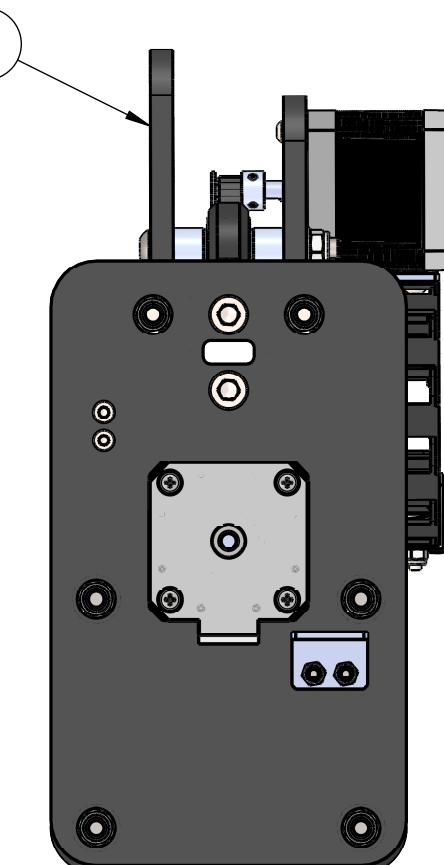
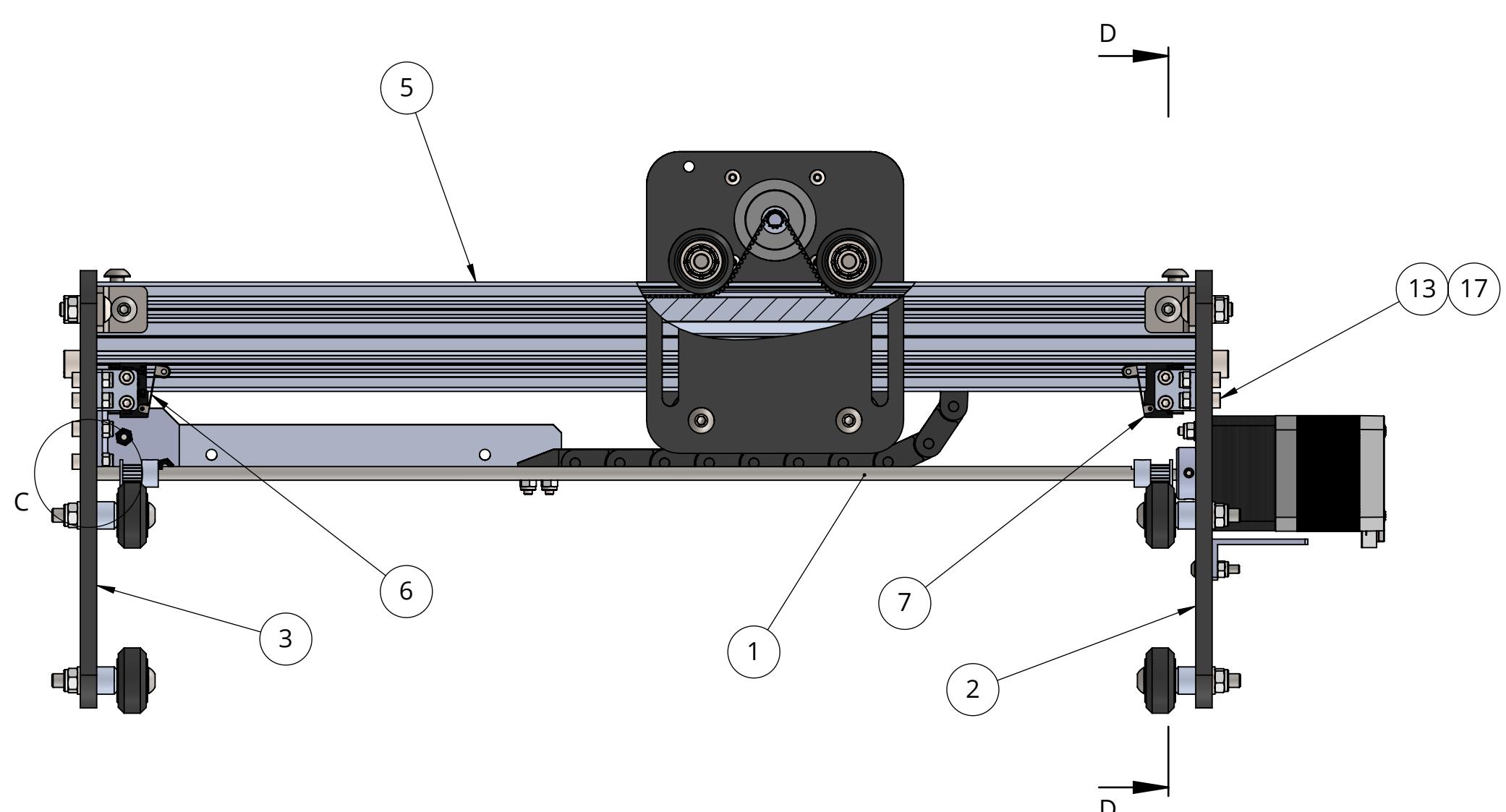
ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Rotary Shaft Assembly	CNC.02.10	1
2	Right Side Carriage	CNC.02.20	1
3	Left Side Carriage	CNC.02.30	1
4	Equipment Carriage	CNC.02.40	1
5	Structural Aluminum Profile 2040	CNC.01.01	1
6	Limit Switch Variant 2	CNC.01.30-2	1
7	Limit Switch Variant 1	CNC.01.30-1	1
8	Cable Chain Mount Frame X	CNC.02.50	1
9	Equipment Cable Carrier	CNC.02.60	1
10	T nut 2020 M5	No	4
11	head screw ISO 7380 M5 x 8	No	4
12	ISO 4762 M6 x 20 - 20N		4
13	ISO 4762 M3 x 12 - 12N		6
14	Square nut M5	No	2
15	head screw ISO 7380 M5 x 6	No	2
16	ISO 7380 - M3 x 8 - 8N		4
17	M3 NYLOC DIN 985	No	10
18	Timing Belt 430mm	No	1



VIEW A



DETAIL B
SCALE 1 : 1



DETAIL C
SCALE 1:1 

NOTES:

1. ASSEMBLY PROCEDURE:

 1. INSERT ITEM 5 INTO ITEM 4 AND TIGHT WHEL'S SCREWS.
 2. PRE-ASSEMBLE ITEMS 3 & 8.

3 INSERT FOUR T-NUTS 10 AND TWO SQUARE NUTS 14 INTO ITEM 5 AND PRE-ASSEMBLE ITEMS 2 & 3 AS SHOWN.

4 INSERT ITEM 1 AND LOCATE IT AS SHOWN. LOCK BEARING AND BASE PART TOGETHER USING EPOXY GLUE. TIGHTEN TWO SET SCREWS AT FLEXIBLE JAW PART ITEM 2 AND APPLY LOCTITE OR THREAD LOCKER.

 5. ASSEMBLY ITEM 9 WITH ITEMS 4 AND 8.
 6. PLACE THE BELT AS SHOWN, TIGHTEN AND LOCK IT BY ITEM 15.

2. FOR MANUFACTURING LINKS REFER TO CNC_BOM.PDF.

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 VR TITLE: Main Carriage Assembly
		DIMENSIONS ARE IN MILLIMETRES	DRAWN			
		TOLERANCES:	CHECKED			
		FRACTIONAL \pm	ENG APPR.			
		ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	MFG APPR.			
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.			
		MATERIAL Multimaterial	COMMENTS:			
NEXT ASSY	USED ON	FINISH No	<i>Vladimir Tyrkin</i> veres.pcb@gmail.com			
APPLICATION		DO NOT SCALE DRAWING	SIZE DWG. NO. REV			
			C	CNC.02.00		
			SCALE: 1:2 WEIGHT: 1731.73 SHEET 1 OF 1			

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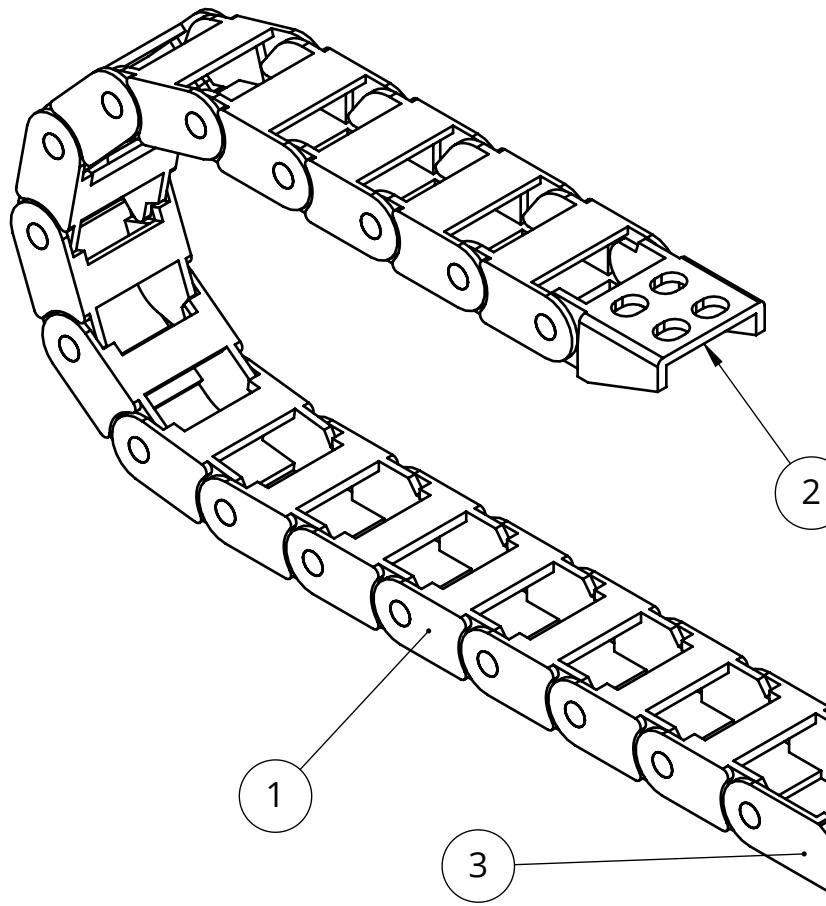
2

1

ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Cable Chain Section	No	15
2	Carrier Part Male	No	1
3	Carrier Part Female	No	1

B

B



NOTE:

1. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF.

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ± INTERPRET GEOMETRIC TOLERANCING PER:	DRAWN	NAME	DATE
		MATERIAL	CHECKED		
		Nylon	ENG APPR.		
		FINISH	MFG APPR.		
		None	Q.A.		
NEXT ASSY		COMMENTS:			
USED ON					
APPLICATION		Vladimir Tyrkin veres.pcb@gmail.com			
DO NOT SCALE DRAWING					

2

1

VR

VR

Cable Carrier

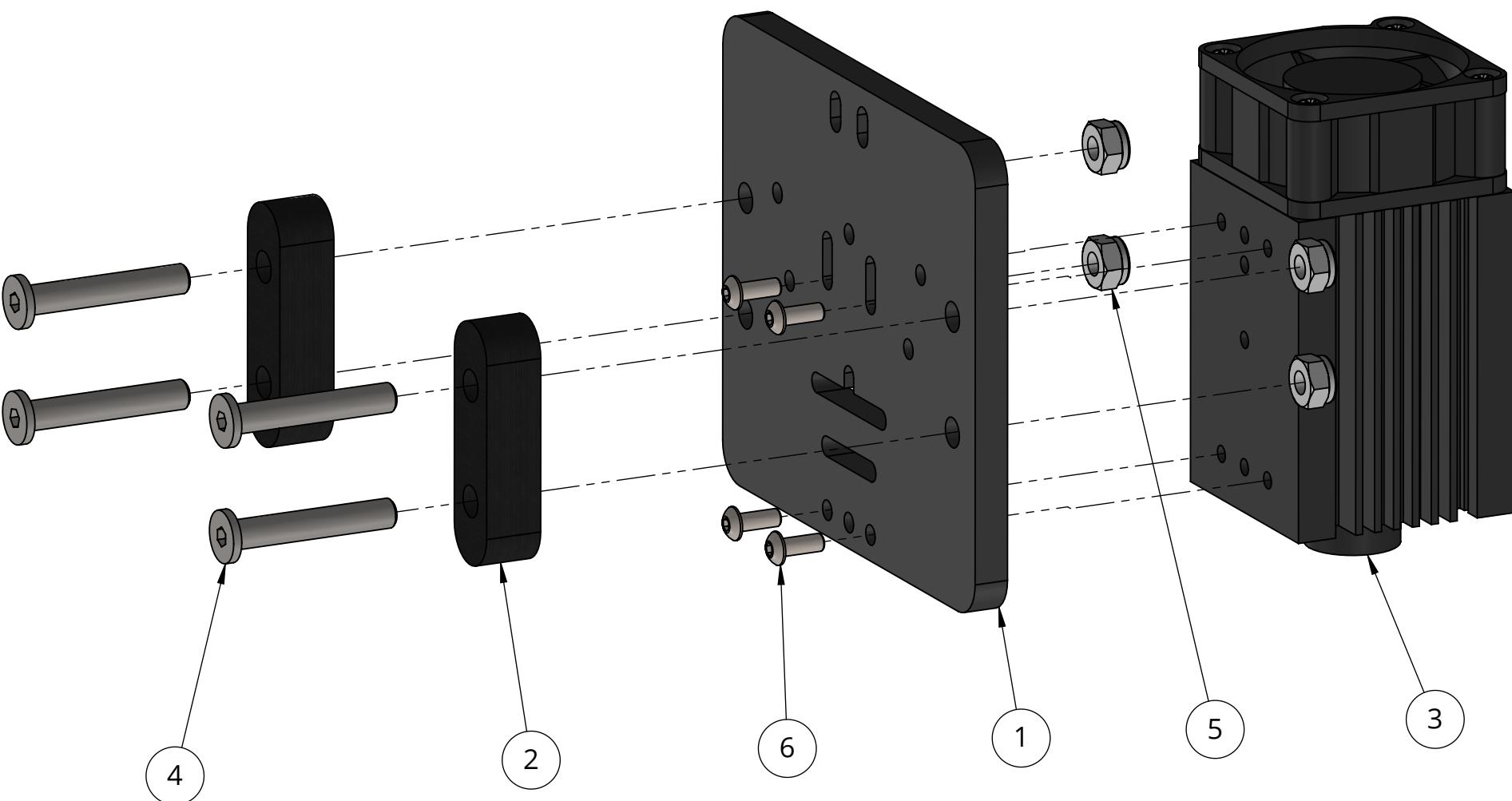
SIZE	DWG. NO.	REV
A	CNC.03.00	
SCALE: 1:1	WEIGHT: 21.86	SHEET 1 OF 1

4

3

2

1



ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Equipment Adapter	CNC.02.44	1
2	Carriage Spacer	CNC.02.45	2
3	LASER 5500mW	No	1
4	Low Profile Hex Screw M5x30	No	4
5	M5 NYLOC DIN 985	No	4
6	ISO 7380 - M3 x 8 - 8N		4

NOTES:

- SCREW ITEMS 4, 2 AND 5 WITH PART DWG.NO. CNC.02.41 AS SHOWN IN ASSEMBLY CNC.00.00.
- FOR MANUFACTURING LINKS REFER TO CNC_BOM.PDF.

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin veres.pcb@gmail.com		
SIZE B	DWG. NO. CNC.04.00	REV		
SCALE: 1:1 WEIGHT: 492.72 SHEET 1 OF 1				

4

3

2

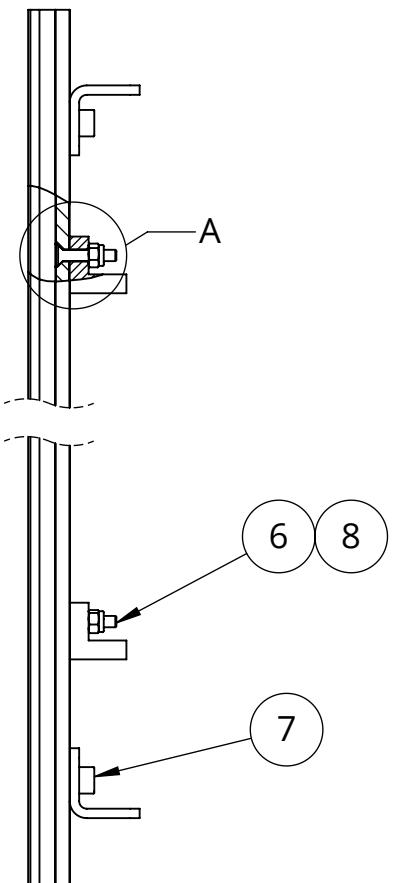
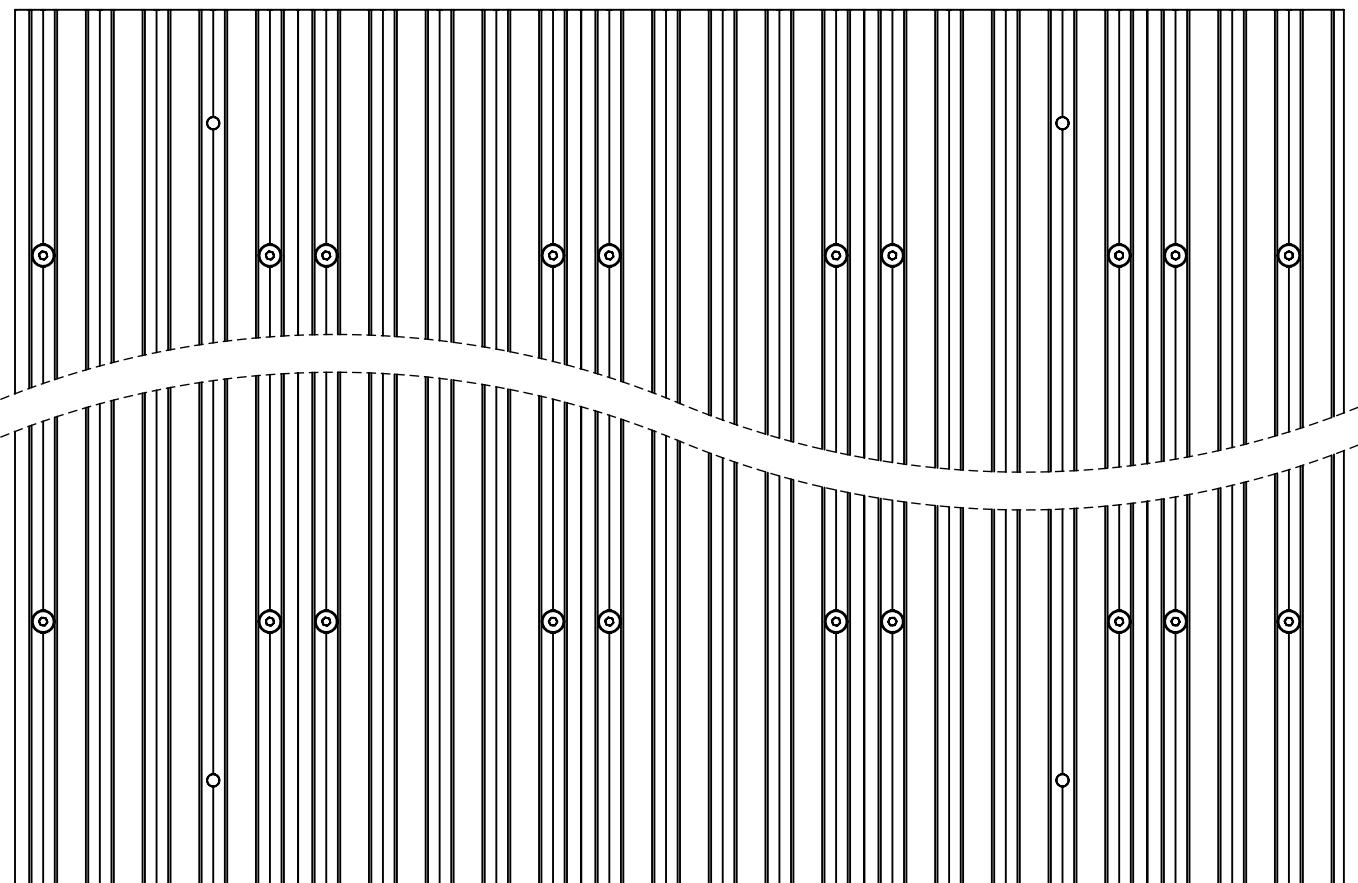
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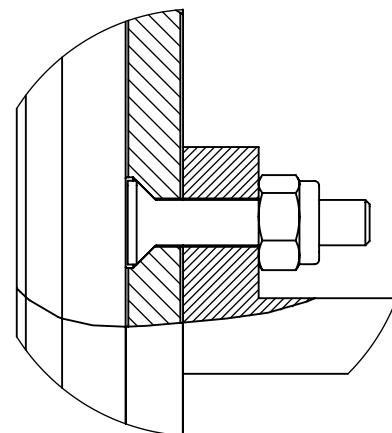
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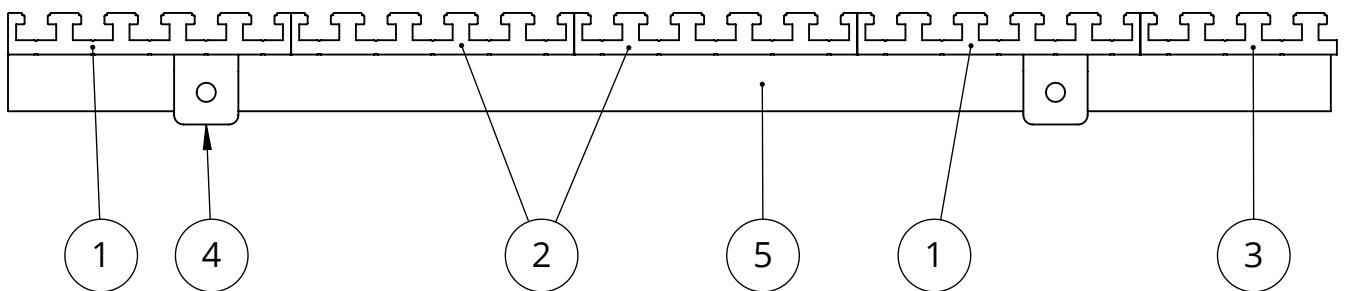
1



ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	T-slot Table Plate	CNC.05.01-1	2
2	T-slot Table Plate	CNC.05.01-2	2
3	T-slot Table Plate	CNC.05.01-3	1
4	Corner Bracket 20x20L	No	4
5	Corner Braket Long	CNC.05.05	2
6	ISO 10642 - M3 x 16 - 16N		20
7	ISO 4762 M4 x 6 - 6N		4
8	M3 NYLOC DIN 985	No	20



DETAIL A
SCALE 2 : 1



NOTES:

1. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF
2. FOR MORE INFORMATION SEE CAD FILE: TableTSlot.SLDASM

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.	REV		
B	CNC.05.00			
SCALE: 1:2 WEIGHT: 2835.46 SHEET 1 OF 1				

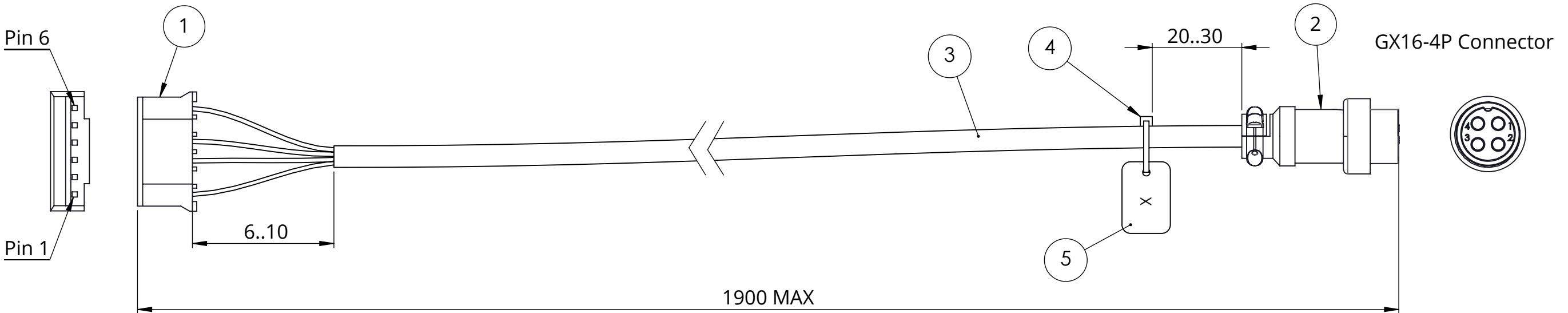
4

3

2

1

PHR-6 Connector



WIRING CHART			
PHR-6	WIRE COLOR	WIRE NAME	GX16-4P
1	BLUE (BLACK)	A	1
3	YELLOW (WHITE)	B	2
4	GREEN	C	3
6	RED	D	4

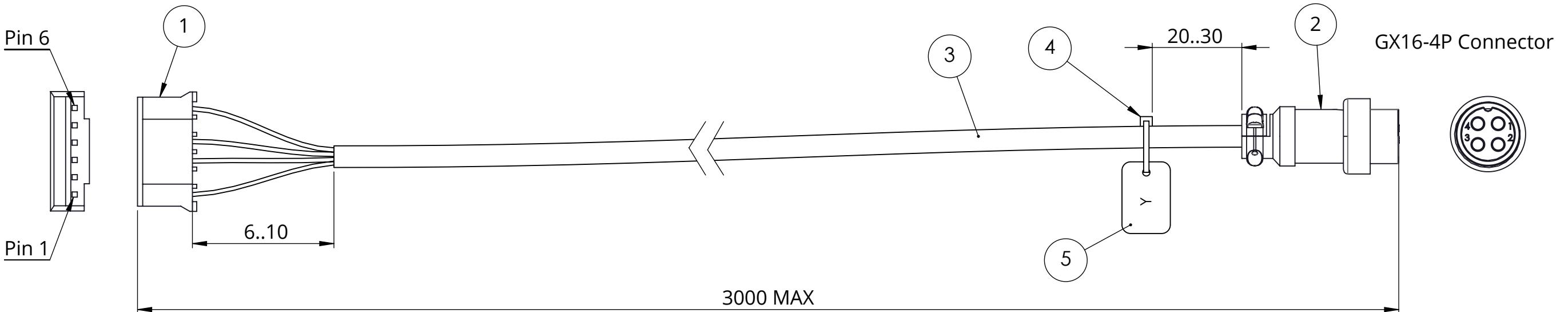
NOTES:

1. STRIP 3.4 mm AND TIN EACH SIDE OF WIRE.
2. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.	REV		
B	CNC.06.00			
SCALE: 1:1		WEIGHT:	SHEET 1 OF 1	

PHR-6 Connector



WIRING CHART			
PHR-6	WIRE COLOR	WIRE NAME	GX16-4P
1	BLUE (BLACK)	A	1
3	YELLOW (WHITE)	B	2
4	GREEN	C	3
6	RED	D	4

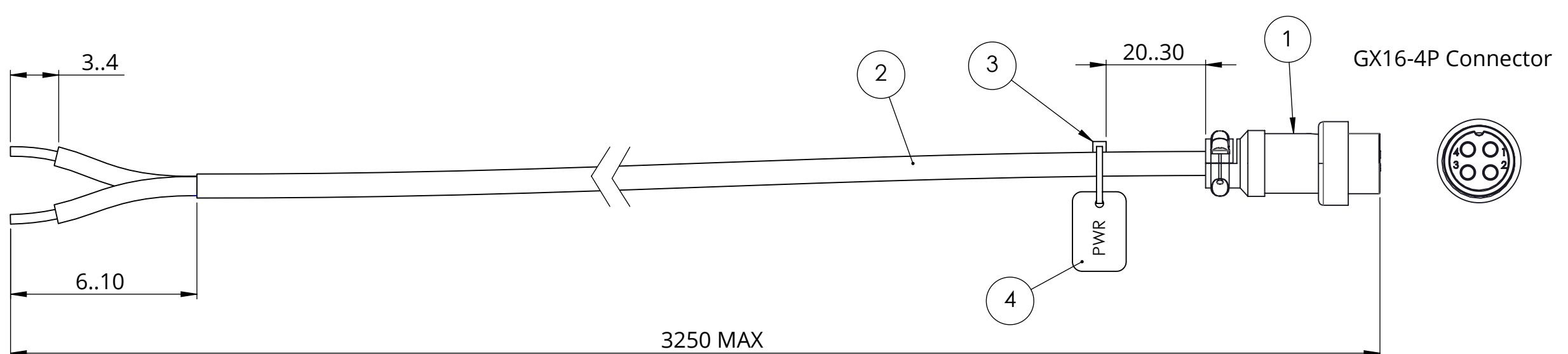
NOTES:

1. STRIP 3.4 mm AND TIN EACH SIDE OF WIRE.
2. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.	REV		
B	CNC.07.00			
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1		

ITEM	PART	UNIT	QTY.
1	GX16-4P Connector Female	pcs	1
2	Power Supply Cable (MCMASTER-CARR P/N: 7394K31)	mm	3200
3	Cable Tie (Digikey P/N: 298-1021-ND)	pcs	1
4	Cable label DWG. NO.: CNC.04.05-4	pcs	1



WIRING CHART		
WIRE COLOR	WIRE NAME	GX16-4P
WHITE (RED)	+12V	1, 2
BLACK	GND	3, 4

NOTES:

1. STRIP 3.4 mm AND TIN EACH SIDE OF WIRE.
2. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.	REV		
B	CNC.08.00			
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1		

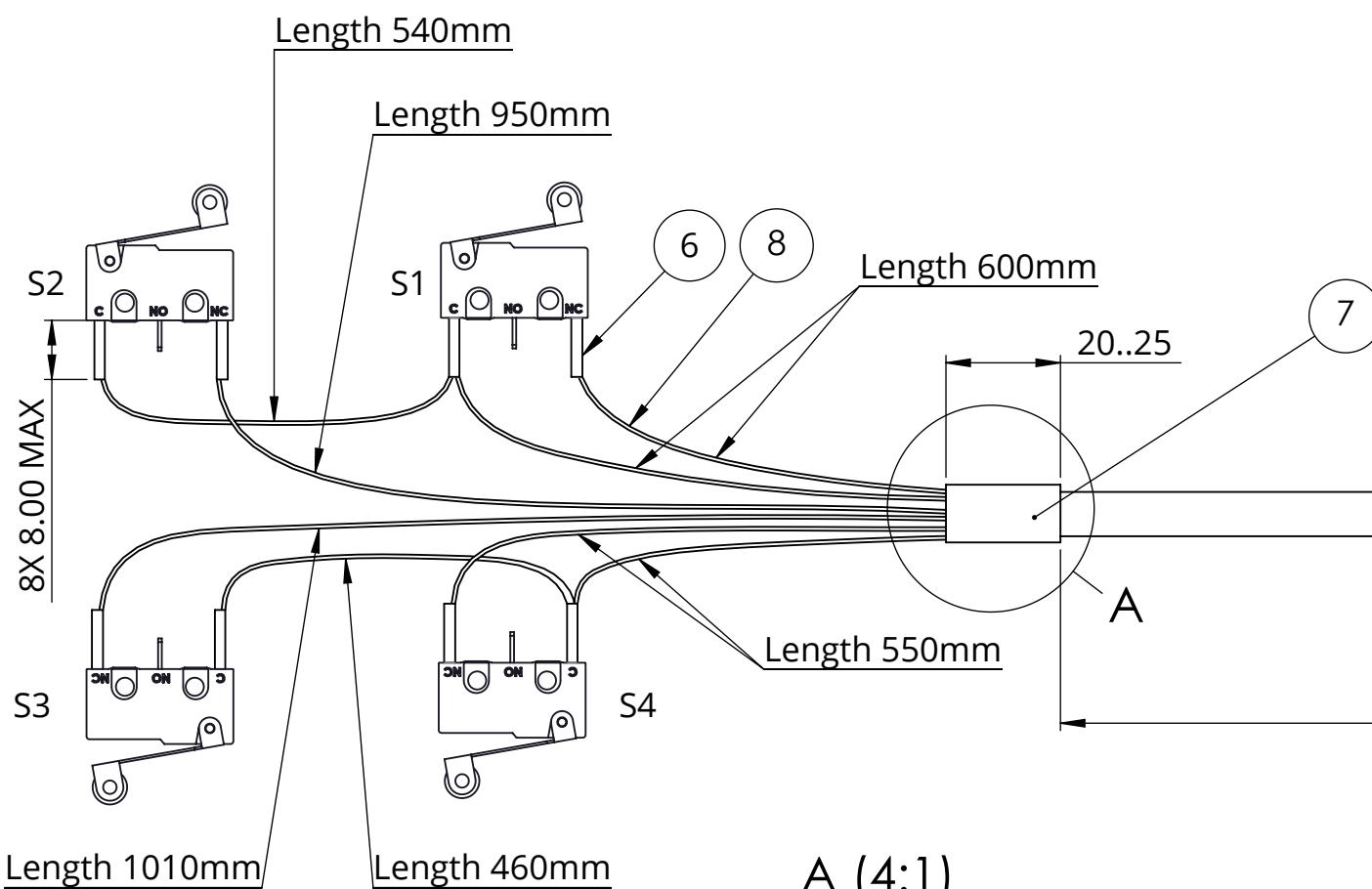
VR VR
TITLE: PWR Cable Assembly

NOTES:

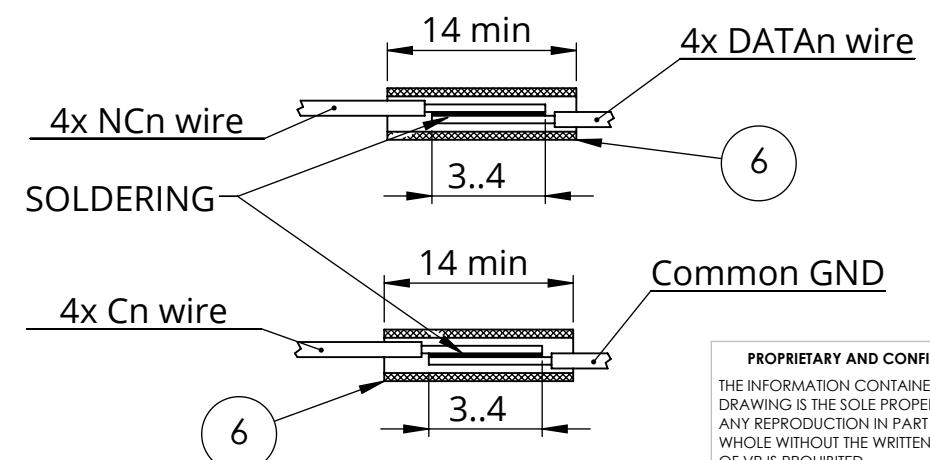
1. STRIP 3..4 mm AND TIN EACH SIDE OF WIRE.
2. EVERY END SWITCH PINS MAY BE SOLDERING WITH HOOK-UP WIRES AND COVERING BY ITEM 6.
3. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

PIN OUT			
Object from	Pin from	Object to	Pin to
S1 (X+)	NC	X1	1
S1 (X+)	C	X1	9
S2 (X-)	NC	X1	2
S2 (X-)	C	X1	9
S3 (Y-)	NC	X1	3
S3 (Y-)	C	X1	9
S4 (Y+)	NC	X1	4
S4 (Y+)	C	X1	9

ITEM	DESCRIPTION	UNIT	QTY
1	D-SUB 9pin male (Digikey P/N: AE10972-ND)	pcs	1
2	D-SUB 9pin Backshell 9pos 180deg (Digikey P/N: 116-40-9709H-ND)	pcs	1
3	Multiple Conductor Cable (Digikey P/N: T1430-153-ND)	mm	1040
4	Cable Tie (Digikey P/N: 298-1021-ND)	pcs	1
5	Cable label DWG. NO.: CNC.04.05-5	pcs	1
6	Heat-Shrink Tubing (Digikey P/N: ATU031K-ND)	mm	110
7	Heat-Shrink Tubing (Digikey P/N: SCT-NO.2-E5-0-12MM-ND)	mm	25
8	Hook-Up Wire (Digikey P/N: FLTWC0311-26-9-ND)	mm	5300



A (4:1)



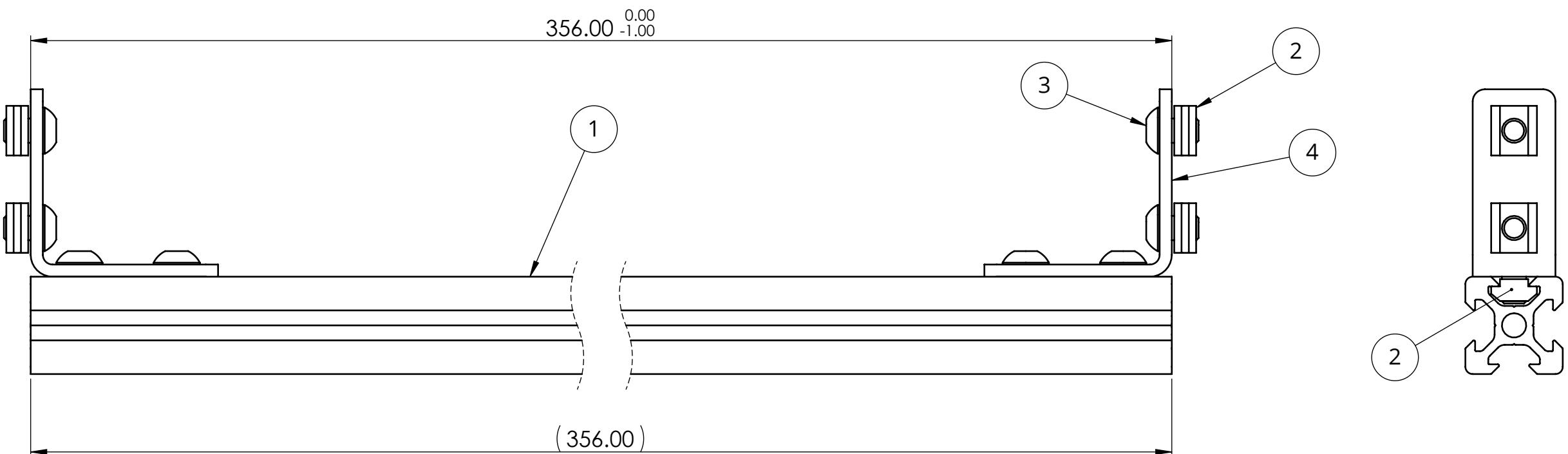
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DRAWN		
CHECKED		
ENG APPR.		
MFG APPR.		
INTERPRET GEOMETRIC TOLERANCING PER:		
Q.A.		
COMMENTS:	Vladimir Tyrkin veres.pcb@gmail.com	
MATERIAL		
NEXT ASSY	USED ON	FINISH
APPLICATION	DO NOT SCALE DRAWING	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

VR VR
TITLE:
DATA Cable Assembly
SIZE **B** DWG. NO. **CNC.09.00** REV
SCALE: 1:1 WEIGHT: SHEET 1 OF 1

ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Structural Aluminum Profile 2020	CNC.01.11	1
2	T nut 2020 M5	No	8
3	head screw ISO 7380 M5 x 8	No	8
4	Corner Bracket 40x20L	No	2

B



B

NOTES:

- FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		DRAWN		VR TITLE: Crossbar
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.	
		MATERIAL Multimaterial	COMMENTS: Vladimir Tyrkin veres.pcb@gmail.com	
NEXT ASSY	USED ON	FINISH No		
APPLICATION		DO NOT SCALE DRAWING	SIZE B DWG. NO. CNC.01.10 REV	
			SCALE: 1:1 WEIGHT: 248.62 SHEET 1 OF 1	

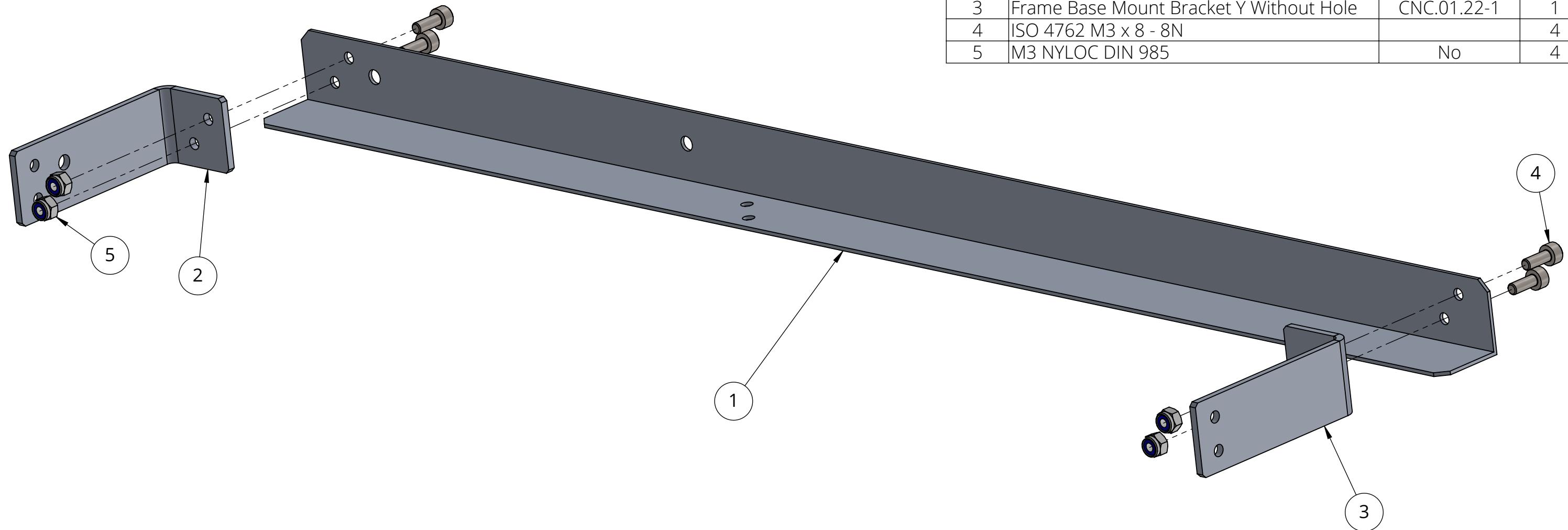
4

3

2

1

ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Frame Base Y	CNC.01.21	1
2	Frame Base Mount Bracket Y With Hole	CNC.01.22-2	1
3	Frame Base Mount Bracket Y Without Hole	CNC.01.22-1	1
4	ISO 4762 M3 x 8 - 8N		4
5	M3 NYLOC DIN 985	No	4



NOTE:

1. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF
2. FOR MORE INFORMATION SEE CAD FILE: CableChainMountFrameY.SLDASM

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.	REV		
B	CNC.01.20			
SCALE: 1:1 WEIGHT: 62.71 SHEET 1 OF 1				

4

3

2

1

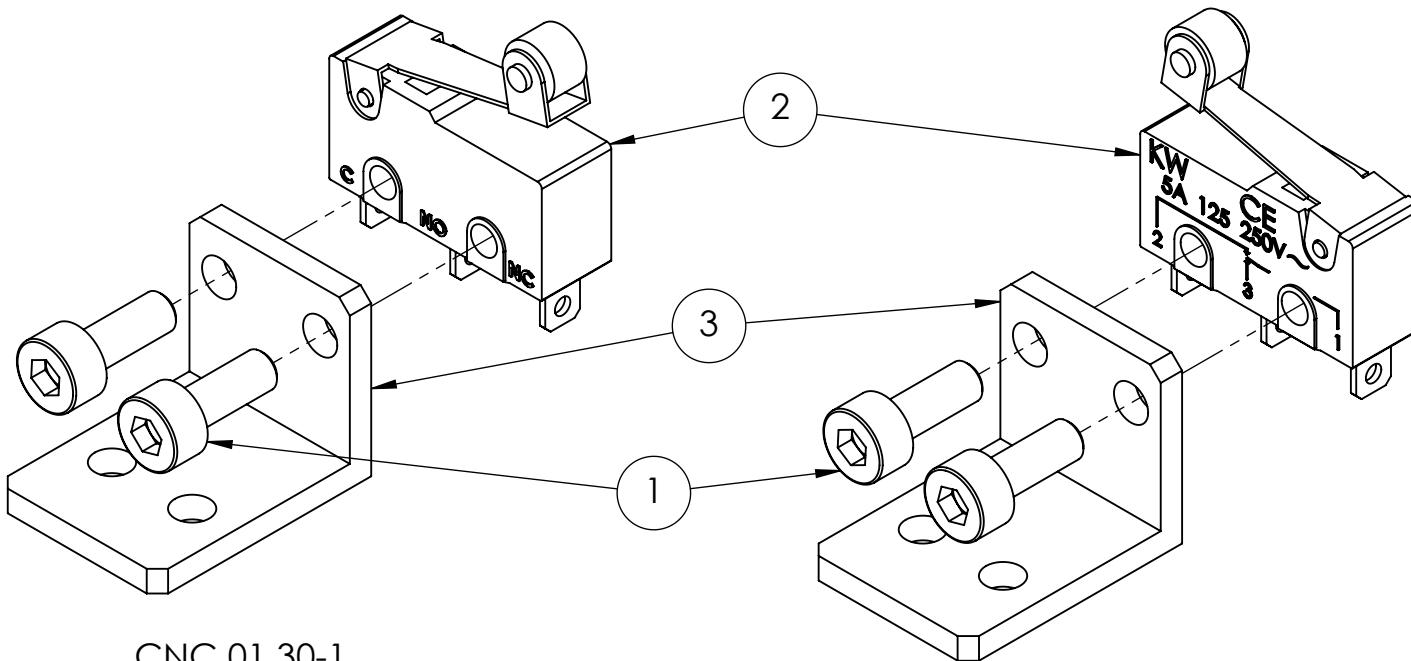
2

1

ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	ISO 4762 M3 x 8 - 8N		2
2	Limit Switch	No	1
3	Corner For Sensor	CNC.01.31	1

B

B



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	CHECKED		
	ENG APPR.		
	MFG APPR.		
	Q.A.		
COMMENTS:			
NEXT ASSY	USED ON	FINISH	No
APPLICATION		DO NOT SCALE DRAWING	

VR

VR

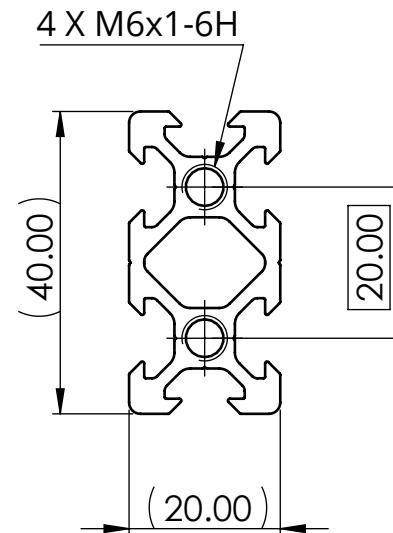
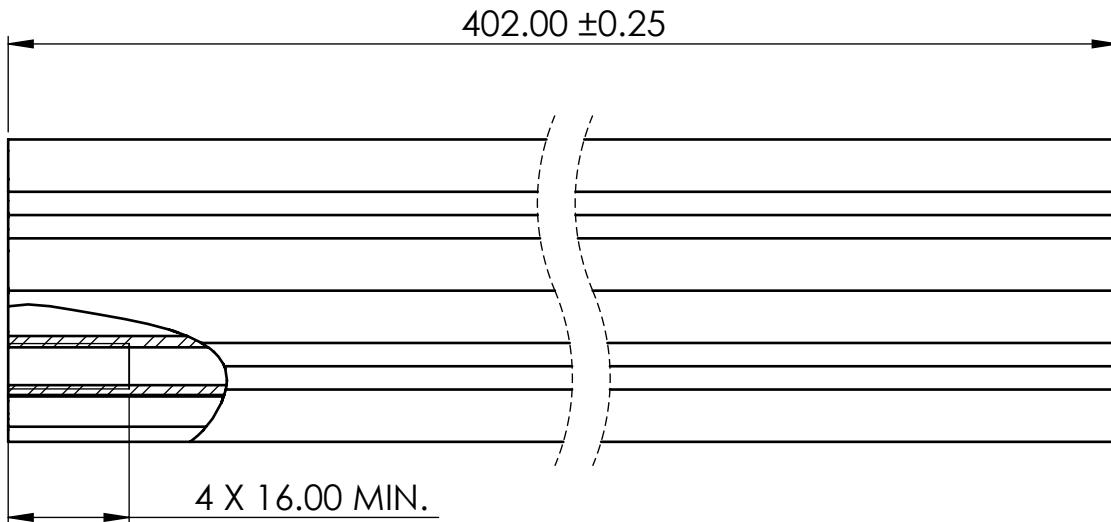
Limit Switch

Vladimir Tyrkin
veres.pcb@gmail.com

SIZE	DWG. NO.	REV
A	CNC.01.30	
SCALE: 2:1	WEIGHT: 4.30	SHEET 1 OF 1

2

1



NOTE:

1. MATERIAL: T-SLOTTED FRAME RAIL, MCMASTER-CARR P/N: 5537T111-5537T107.
2. BOTH CUTTED SIDES SHALL BE FREE OF SHARP EDGES AND BURRS.
3. FOR MORE DIMENSIONS SEE CAD FILE: Structural Aluminum Profile 2040.SLDPRT.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED:				
		BREAK ALL SHARP EDGES		DRAWN		
		DIMENSIONS ARE IN MILLIMETERS		CHECKED		
		TOLERANCES:		ENG APPR.		
		FRACTIONAL ±		MFG APPR.		
		ANGULAR: MACH ± BEND ±		Q.A.		
		TWO PLACE DECIMAL ±		COMMENTS:		
		THREE PLACE DECIMAL ±		Vladimir Tyrkin veres.pcb@gmail.com		
		INTERPRET GEOMETRIC TOLERANCING PER:				
		MATERIAL				
		6063-T5				
NEXT ASSY	USED ON	FINISH	As machined			
APPLICATION		DO NOT SCALE DRAWING				

VR

VR

TITLE:

Structural Aluminum Profile 2040

SIZE	DWG. NO.	REV
A	CNC.01.01	
SCALE: 1:1	WEIGHT: 346.04	SHEET 1 OF 1

4

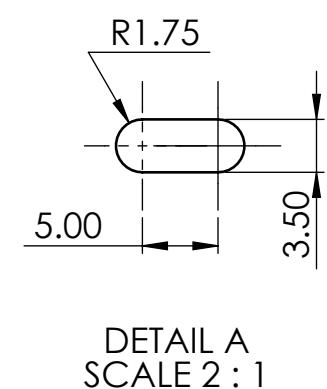
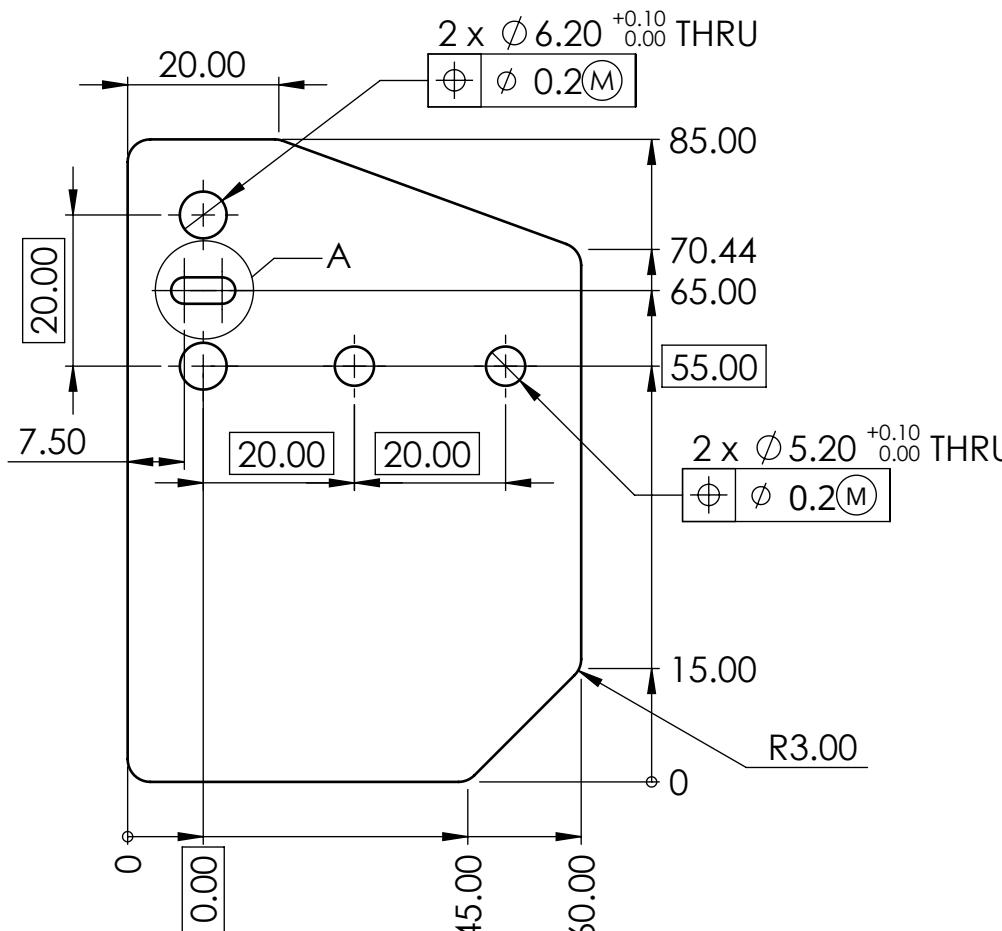
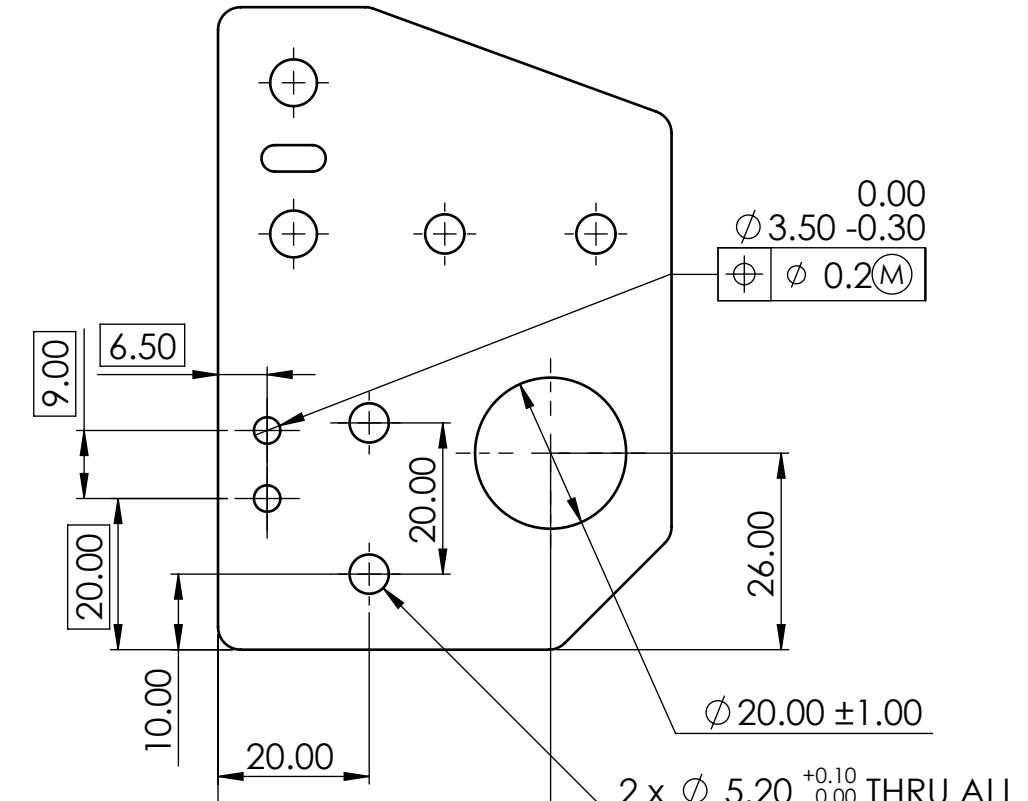
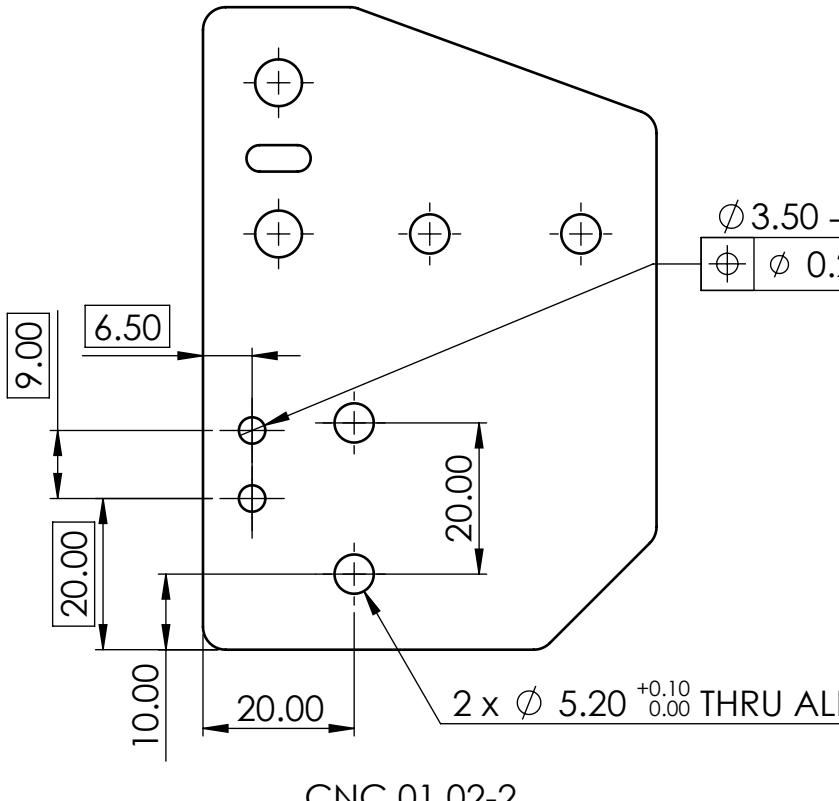
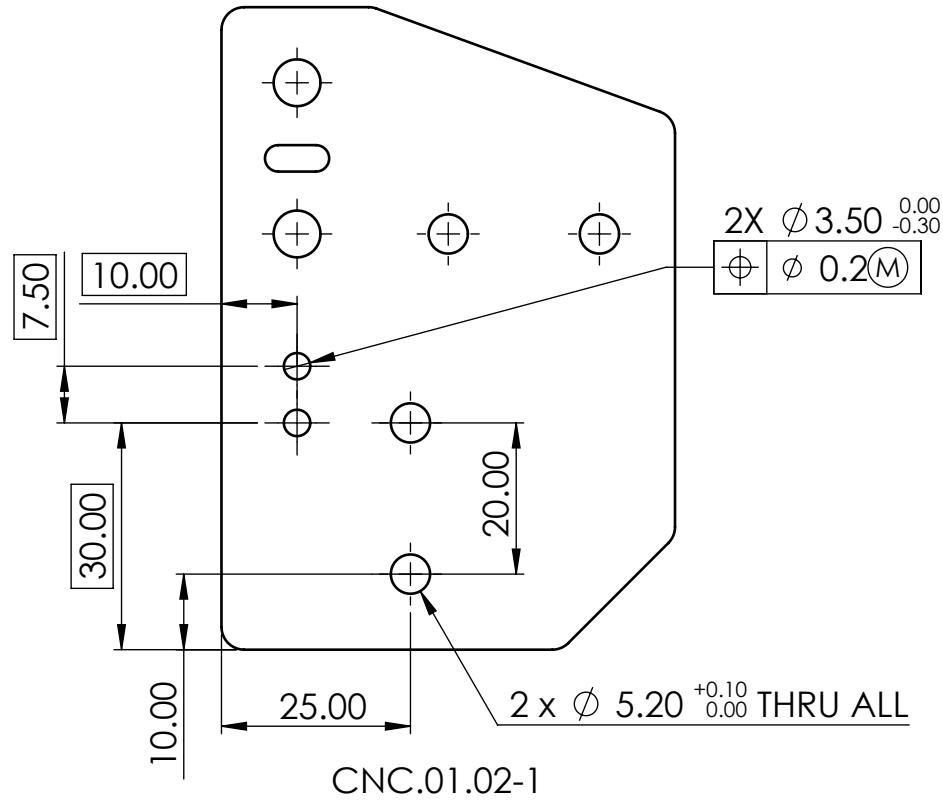
3

2

1

B

B



NOTE:

1. MATERIAL: CLEAR IMPACT-RESISTANT POLYCARBONATE, MCMASTER-CARR P/N: 8574K281.
2. GENERAL TOLERANCE DIN ISO 2768-mK.
3. FOR MORE DIMENSIONS SEE CAD FILE: Foot.SLDPRT.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CARRIAGE_BOM.PDF

UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
DRAWN	VR	
CHECKED		
ENG APPR.		
MFG APPR.		
INTERPRET GEOMETRIC TOLERANCING PER:		
MATERIAL Polycarbonate (PC)		
NEXT ASSY	USED ON	FINISH
		As machined
APPLICATION	DO NOT SCALE DRAWING	

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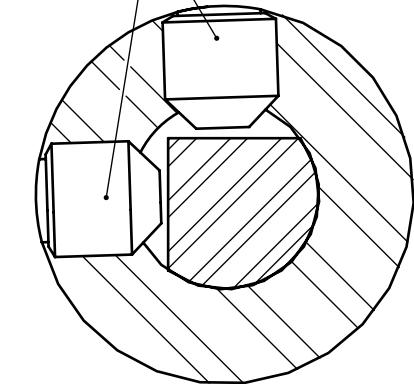
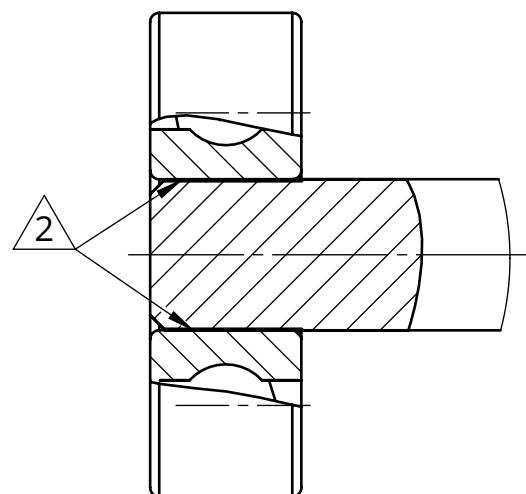
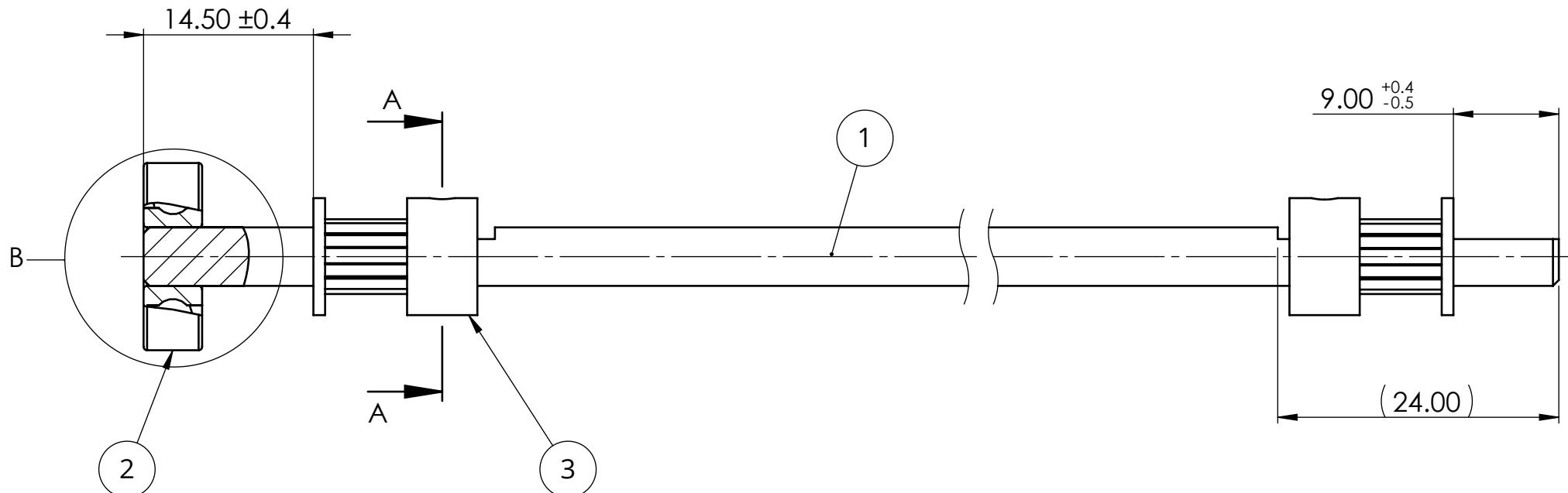
Foot

SIZE DWG. NO. REV
B CNC.01.02

SCALE: 1:1 WEIGHT: 32.67 SHEET 1 OF 1

Vladimir Tyrkin
verespcb@gmail.com

ISO 4029 - M3 x 3-N

SECTION A-A
SCALE 5 : 1DETAIL B
SCALE 4 : 1

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ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Rotary Shaft	CNC.02.11	1
2	ISO 15 RBB - 025 - 8,DE,NC,8_68		1
3	Pulley GT2-12	No	2

NOTE:

1. TIGHTEN FOUR ISO 4029 - M3 x 3-N SCREWS TO A TORQUE OF 0.25 TO 0.3 Nm.
APPLY LOCTITE OR THREAD LOCKER TO ALL FASTENERS PRIOR TO ASSEMBLY.
2. LOCK PARTS 2 AND 1 TOGETHER USING EPOXY GLUE.
3. FOR MANUFACTURING LINKS REFER TO CNC_BOM.PDF.

		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.	REV		
B	CNC.02.10			
SCALE: 2:1		WEIGHT: 0.06	SHEET 1 OF 1	

VR

TITLE:

Rotary Shaft Assembly

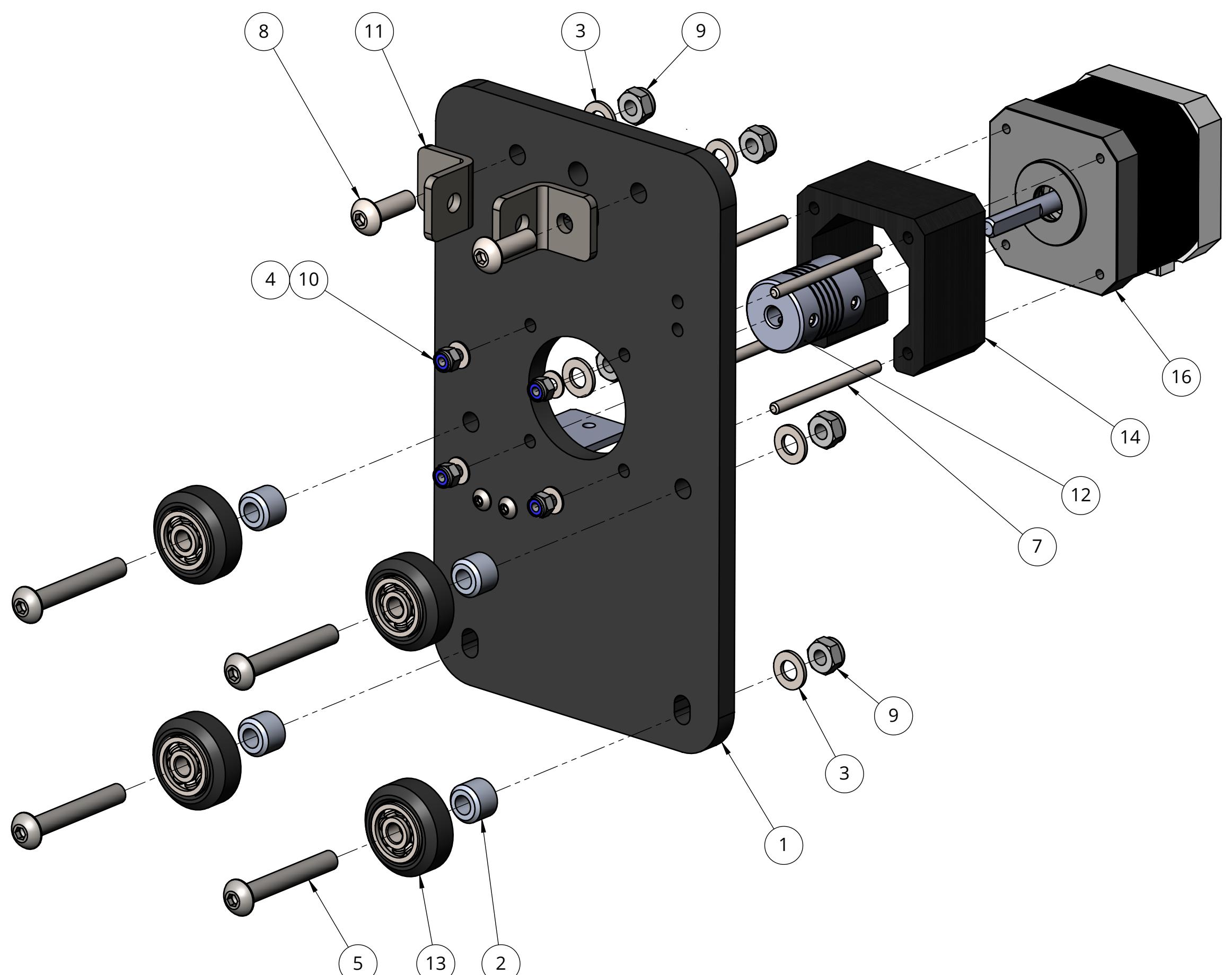
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3

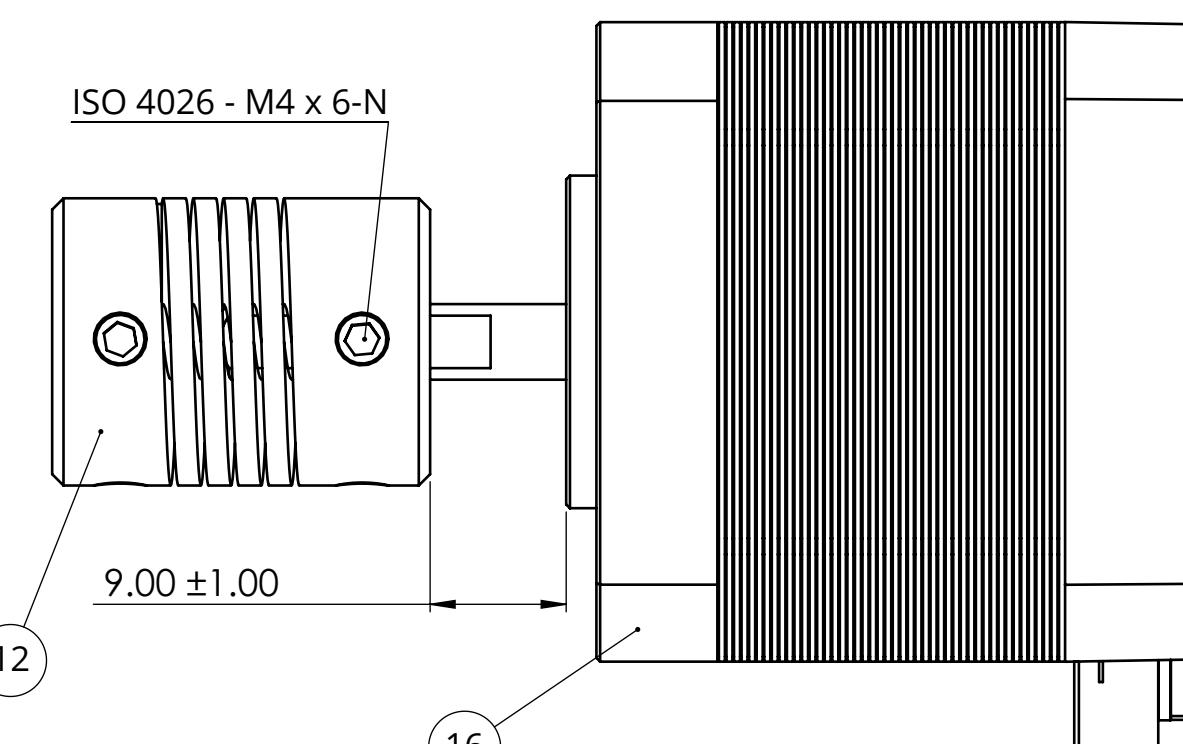
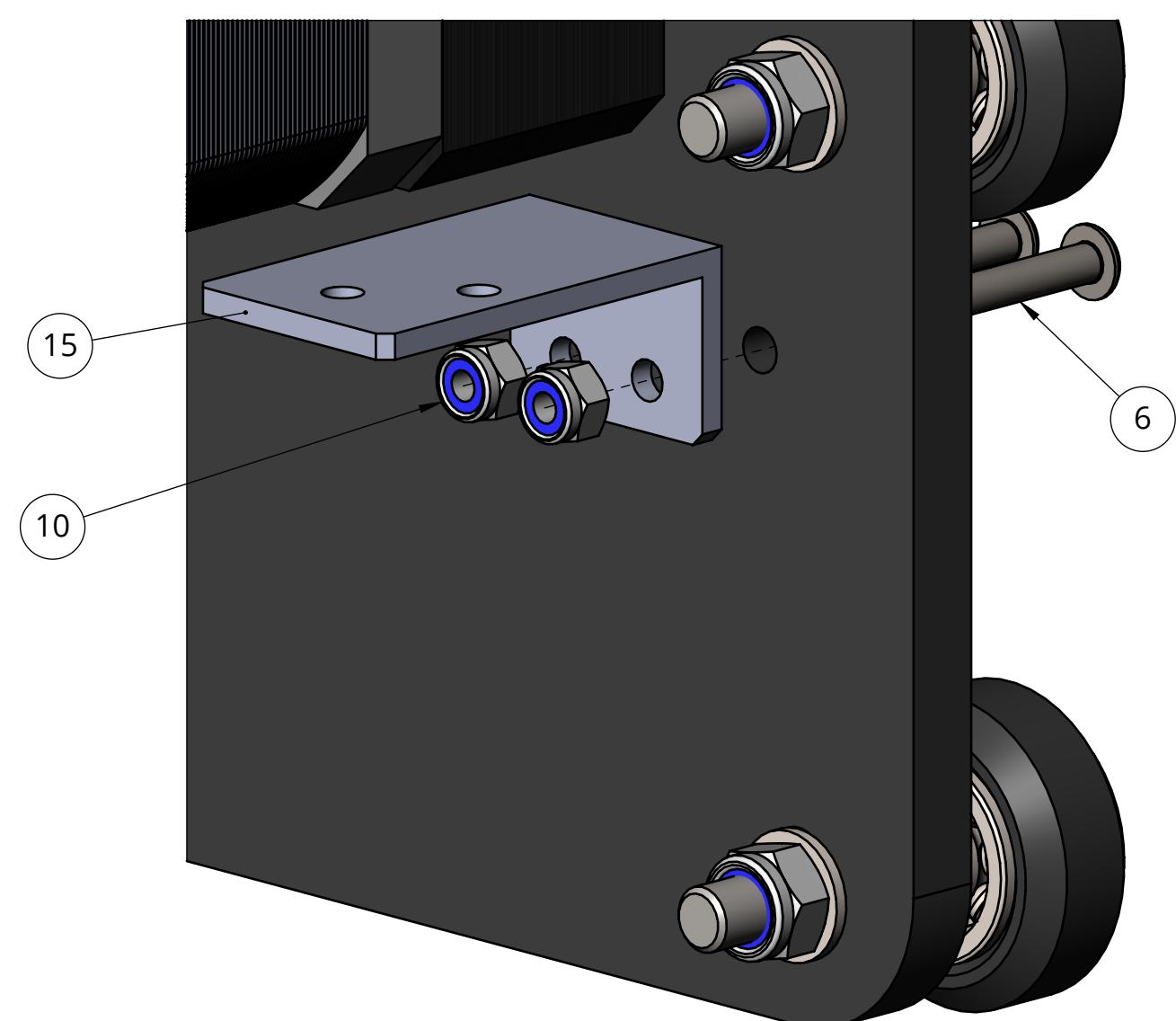
2

1

D



ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Right Side Base	CNC.02.21	1
2	Wheel Spacer 1	CNC.02.22	4
3	Washer DIN 125 - A 5.3		6
4	Washer DIN 125 - A 3.2		4
5	head screw ISO 7380 M5 x 35	No	4
6	head screw ISO 7380 M3 x 16	No	2
7	Threaded Rod	CNC.02.25	4
8	ISO 7380 - M5 x 16 - 16N		2
9	M5 NYLOC DIN 985	No	6
10	M3 NYLOC DIN 985	No	6
11	Corner Bracket 20x20L	No	2
12	Flexible shaft coupling 5x5	No	1
13	Solid V-Wheel D=24 d=5	No	4
14	Spacer for stepper	CNC.02.23	1
15	Corner Bracket For Cable Chain	CNC.02.24	1
16	Nema 17HS4401 Stepper Motor	No	1



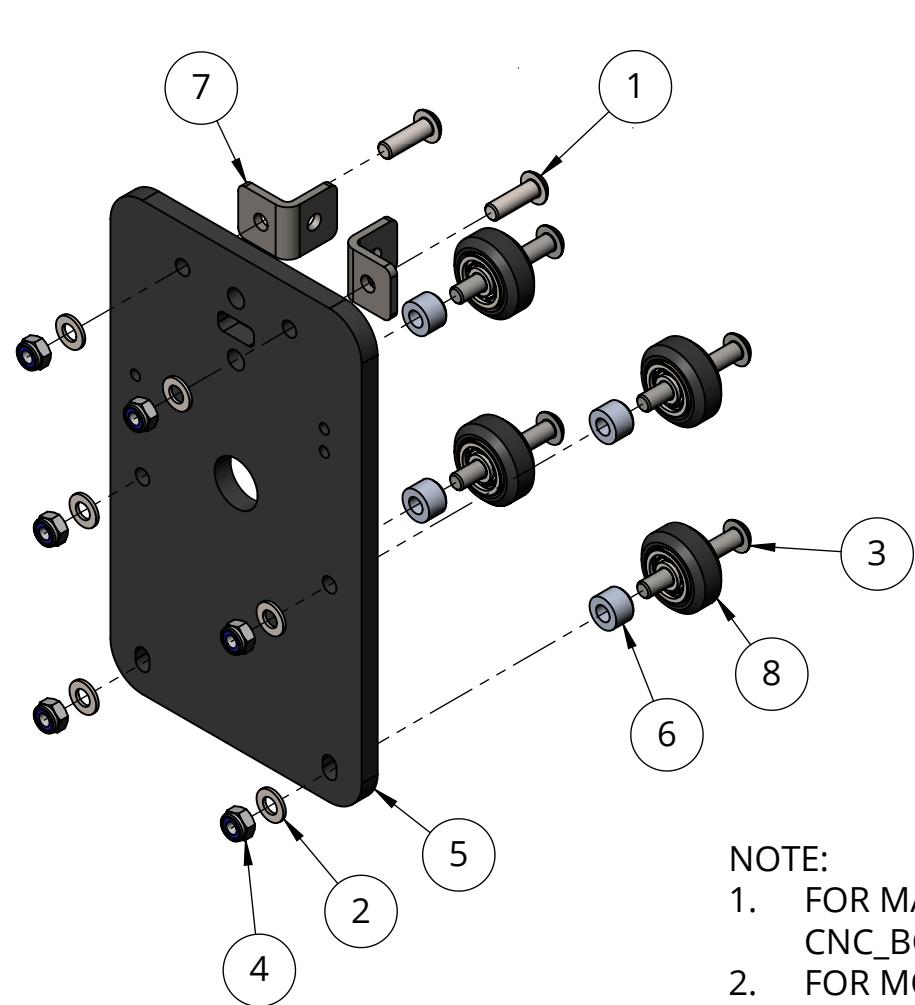
SHAFT COUPLING INSTALL
SCALE 2 : 1

NOTES:

1. PRE-ASSEMBLE ITEM 12 AND 16 AS SHOWN. APPLY LOCTITE OR THREAD LOCKER FOR TWO SET SCREWS PRIOR TO ASSEMBLY.
2. FOR MANUFACTURING LINKS REFER TO CNC_BOM.PDF.

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PERMISSION OF VR IS PROHIBITED.

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		DIMENSIONS ARE IN MILLIMETRES	DRAWN		
		TOLERANCES			
		FRACTIONAL +			
		ANGULAR: MACH + BEND +			
		TWO PLACE DECIMAL +			
		THREE PLACE DECIMAL +			
		INTERFERENT GEOMETRIC TOLERANCING PER:			
		MATERIAL	Multimaterial		
		FINISH	None		
		APPLICATION	DO NOT SCALE DRAWING		
VR	VR	TITLE:			
Right Side Carriage				SIZE	DWG. NO.
				C	CNC.02.20
				REV	
				Vladimir Tyrkin	
				veres.pcb@gmail.com	
				SCALE: 1:1	WEIGHT: 527.21
				SHEET 1 OF 1	



ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	ISO 7380 - M5 x 16 - 16N		2
2	Washer DIN 125 - A 5.3		6
3	head screw ISO 7380 M5 x 35	No	4
4	M5 NYLOC DIN 985	No	6
5	Left Side Base	CNC.02.31	1
6	Wheel Spacer 1	CNC.02.22	4
7	Corner Bracket 20x20L	No	2
8	Solid V-Wheel D=24 d=5	No	4

NOTE:

1. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF
2. FOR MORE INFORMATION SEE CAD FILE: LeftSideCarriage.SLDASM

		UNLESS OTHERWISE SPECIFIED:			
		BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS			
TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±			DRAWN		
			CHECKED		
			ENG APPR.		
			MFG APPR.		
			Q.A.		
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:		
		MATERIAL Multimaterial			
NEXT ASSY	USED ON	FINISH No			
APPLICATION		DO NOT SCALE DRAWING			

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VR

VR

TITLE:

Left Side Carriage

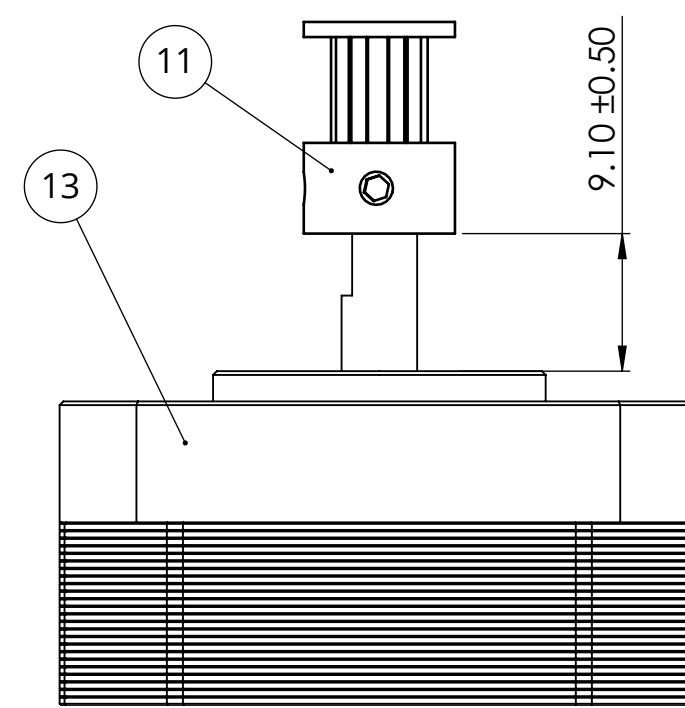
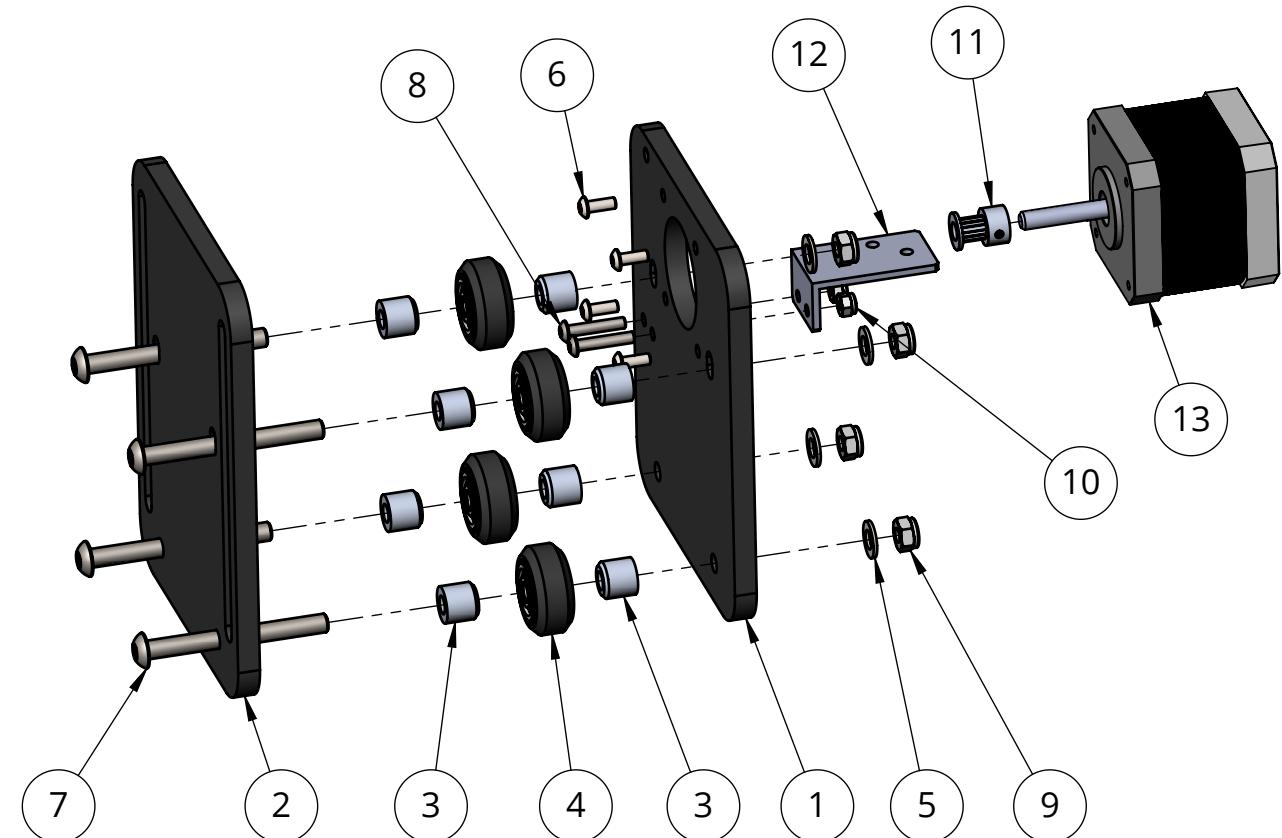
SIZE	DWG. NO.	REV
A	CNC.02.30	
SCALE: 1:2	WEIGHT: 0.19	SHEET 1 OF 1

4

3

2

1



NOTES:

1. PRE-ASSEMBLE ITEM 11 AND 13 AS SHOWN.
2. FOR MANUFACTURING LINKS REFER TO CNC_BOM.PDF.

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ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Stepper Side Part	CNC.02.41	1
2	Adjustment Equipment Part	CNC.02.42	1
3	Wheel Spacer 2	CNC.02.43	8
4	Solid V-Wheel D=24 d=5	No	4
5	Washer DIN 125 - A 5.3		4
6	ISO 7380 - M3 x 8 - 8N		4
7	Head screw ISO 7380 M5 x 50	No	4
8	head screw ISO 7380 M3 x 16	No	2
9	M5 NYLOC DIN 985	No	4
10	M3 NYLOC DIN 985	No	2
11	Pulley GT2-12	No	1
12	Corner Bracket For Cable Chain	CNC.02.24	1
13	Nema 17HS4401 Stepper Motor	No	1

		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.	REV		
B	CNC.02.40			
SCALE: 1:2		WEIGHT: 0.50	SHEET 1 OF 1	

**Equipment
Carriage**

4

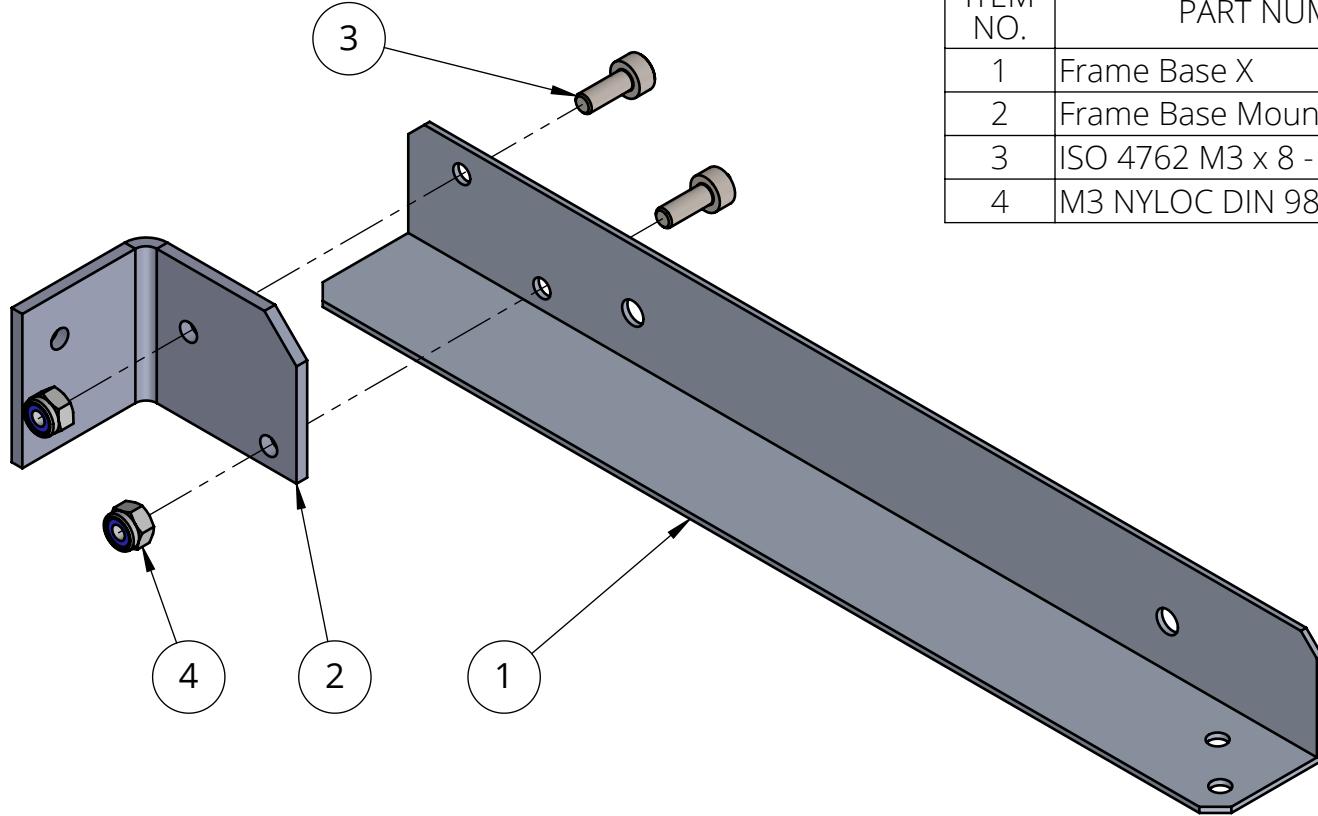
3

2

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2

1



ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Frame Base X	CNC.02.51	1
2	Frame Base Mount Bracket X	CNC.02.52	1
3	ISO 4762 M3 x 8 - 8N		2
4	M3 NYLOC DIN 985	No	2

NOTES:

1. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF
2. FOR MORE INFORMATION SEE CAD FILE: CableChainMountFrameX.SLDASM

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		BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS			
TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±			DRAWN		
			CHECKED		
			ENG APPR.		
			MFG APPR.		
			Q.A.		
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:		
		MATERIAL Multimaterial			
NEXT ASSY	USED ON	FINISH None			
APPLICATION		DO NOT SCALE DRAWING			

VR

TITLE:

VR

Cable Chain Mount Frame X

Vladimir Tyrkin
veres.pcb@gmail.com

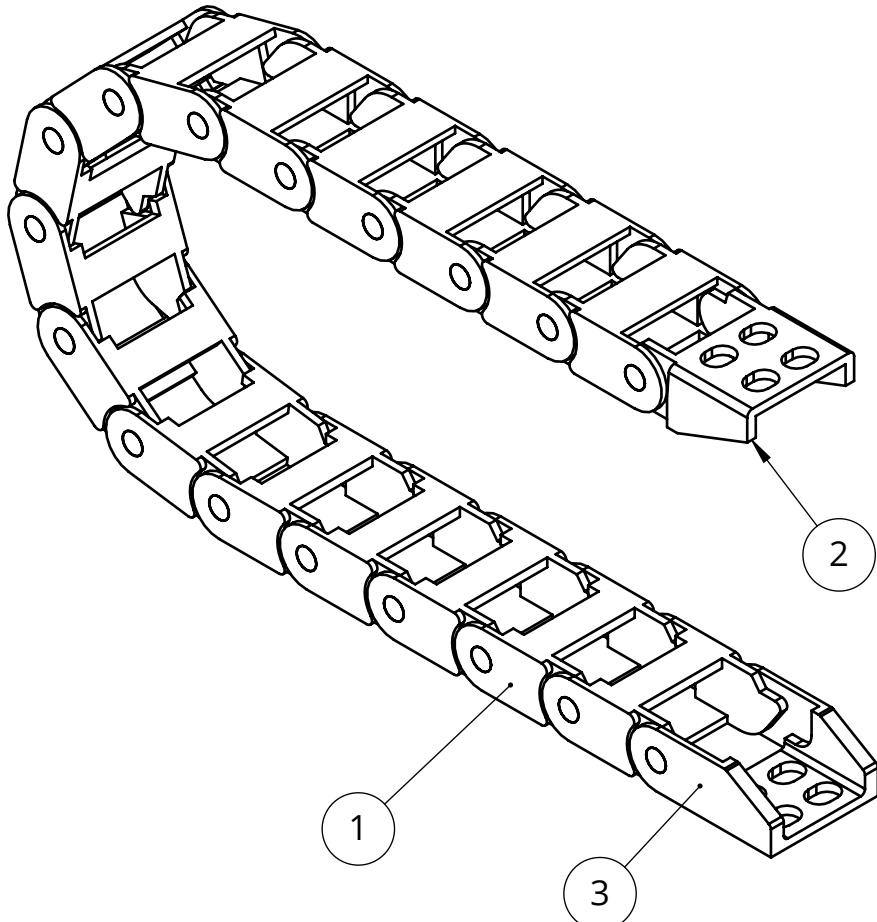
SIZE	DWG. NO.	REV
A	CNC.02.50	
SCALE: 1:1	WEIGHT: 0.04	SHEET 1 OF 1

2

1

2

1



ITEM NO.	PART NUMBER	DWG. NO.	QTY.
1	Cable Chain Section	No	16
2	Carrier Part Male	No	1
3	Carrier Part Female	No	1

NOTE:

1. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF.

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PERMISSION OF VR IS PROHIBITED.

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		BREAK ALL SHARP EDGES	DRAWN		
		DIMENSIONS ARE IN MILLIMETERS	CHECKED		
		TOLERANCES:	ENG APPR.		
		FRACTIONAL \pm	MFG APPR.		
		ANGULAR: MACH \pm BEND \pm	Q.A.		
		TWO PLACE DECIMAL \pm	COMMENTS:		
		THREE PLACE DECIMAL \pm			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
		Nylon			
NEXT ASSY	USED ON	FINISH			
		None			
APPLICATION		DO NOT SCALE DRAWING			

SIZE	DWG. NO.	REV
A	CNC.02.60	
SCALE: 1:1	WEIGHT: 21.86	SHEET 1 OF 1

VR

VR

TITLE:

Equipment Cable Carrier

Vladimir Tyrkin
veres.pcb@gmail.com

2

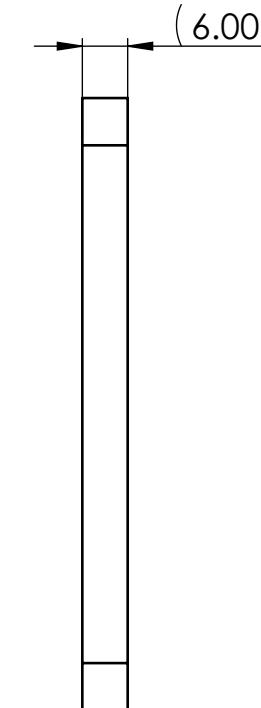
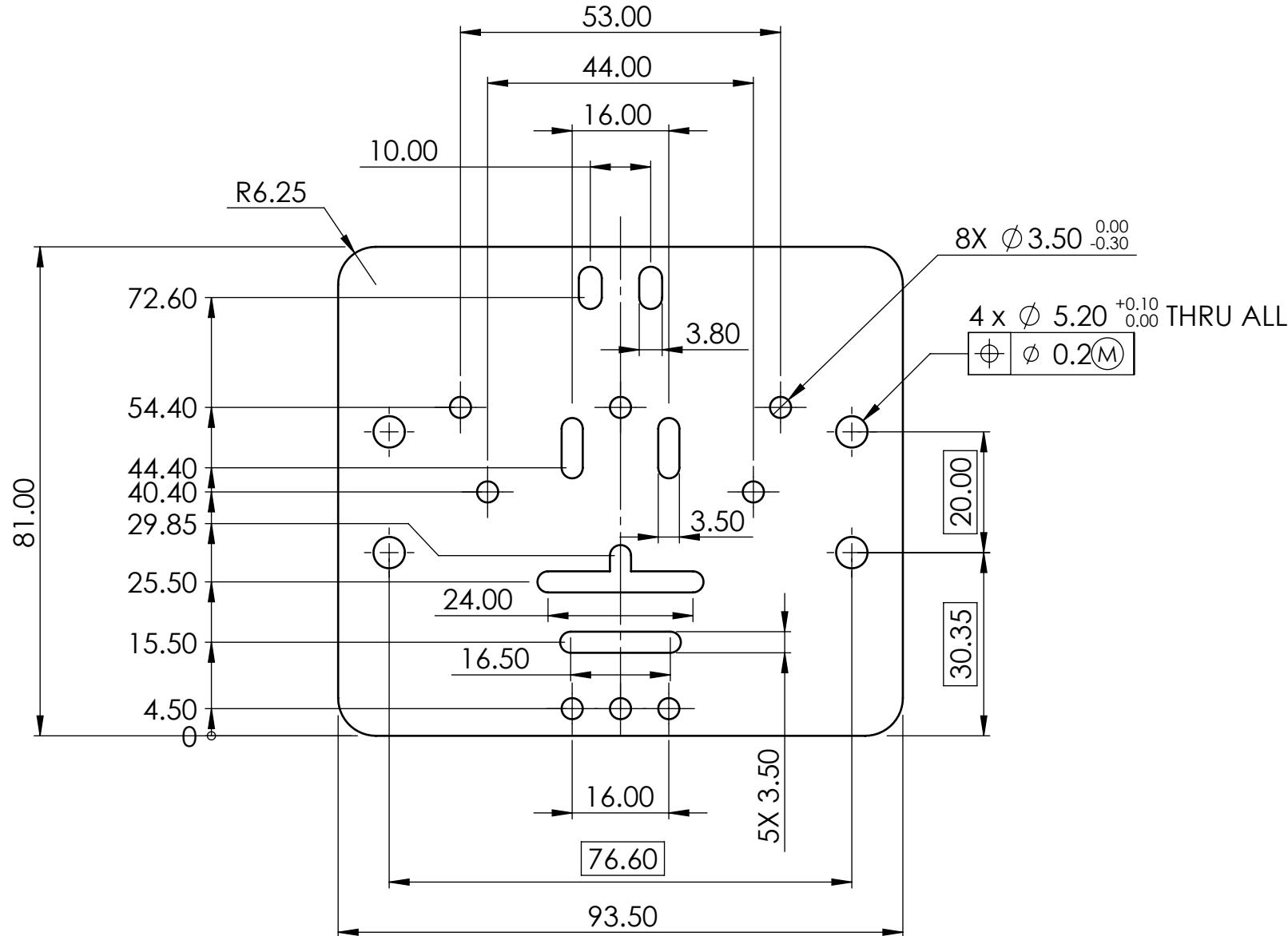
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4

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1

**NOTE:**

1. MATERIAL: CLEAR IMPACT-RESISTANT POLYCARBONATE, MCMASTER-CARR P/N: 8574K281.
2. GENERAL TOLERANCE DIN ISO 2768-mK.
3. FOR MORE DIMENSIONS SEE CAD FILE: Equipment Adapter.SLDPRT.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		verespcb@gmail.com		
SIZE	DWG. NO.		REV	
B	CNC.02.44			
SCALE: 1:1	WEIGHT: 51.48	SHEET 1 OF 1		

**Equipment
Adapter**

VR

VR

TITLE:

4

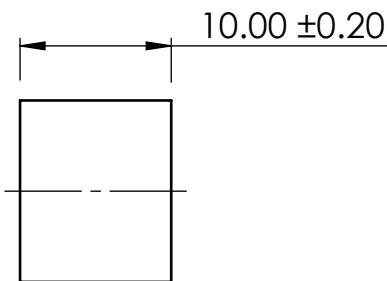
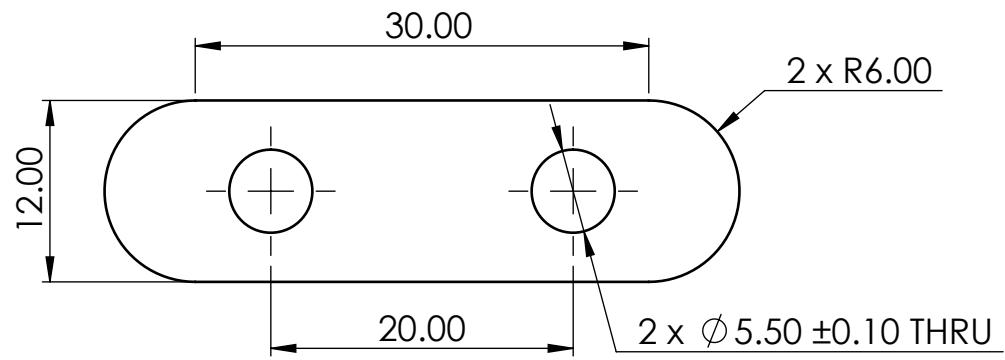
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2

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2

1



B

B

NOTES:

1. MATERIAL: PETG 3D PRINTER FILAMENT MCMASTER-CARR P/N: 3462N1. ALTERNATE: ABS PLASTIC P/N: 1317N538-1317N327.
2. INFILL: 100%. NOZZLE: 0.4mm.
3. GENERAL TOLERANCE DIN ISO 2768-c.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED:		DRAWN CHECKED ENG APPR. MFG APPR. Q.A.	NAME DATE COMMENTS: Vladimir Tyrkin veres.pcb@gmail.com		
		BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ± INTERPRET GEOMETRIC TOLERANCING PER:					
		MATERIAL PET-G					
NEXT ASSY		FINISH As machined					
APPLICATION		DO NOT SCALE DRAWING					

VR

VR

Carriage Spacer

SIZE	DWG. NO.	REV
A	CNC.02.45	
SCALE: 2:1	WEIGHT: 5.49	SHEET 1 OF 1

2

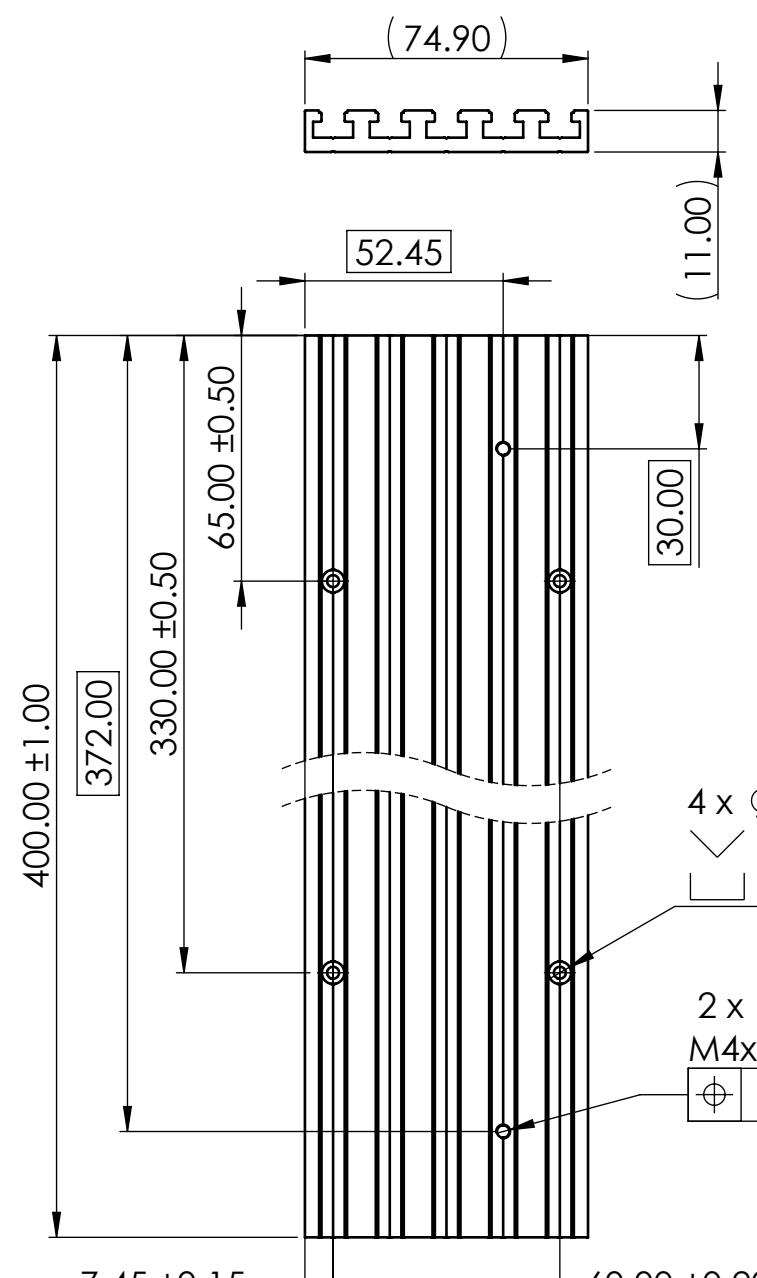
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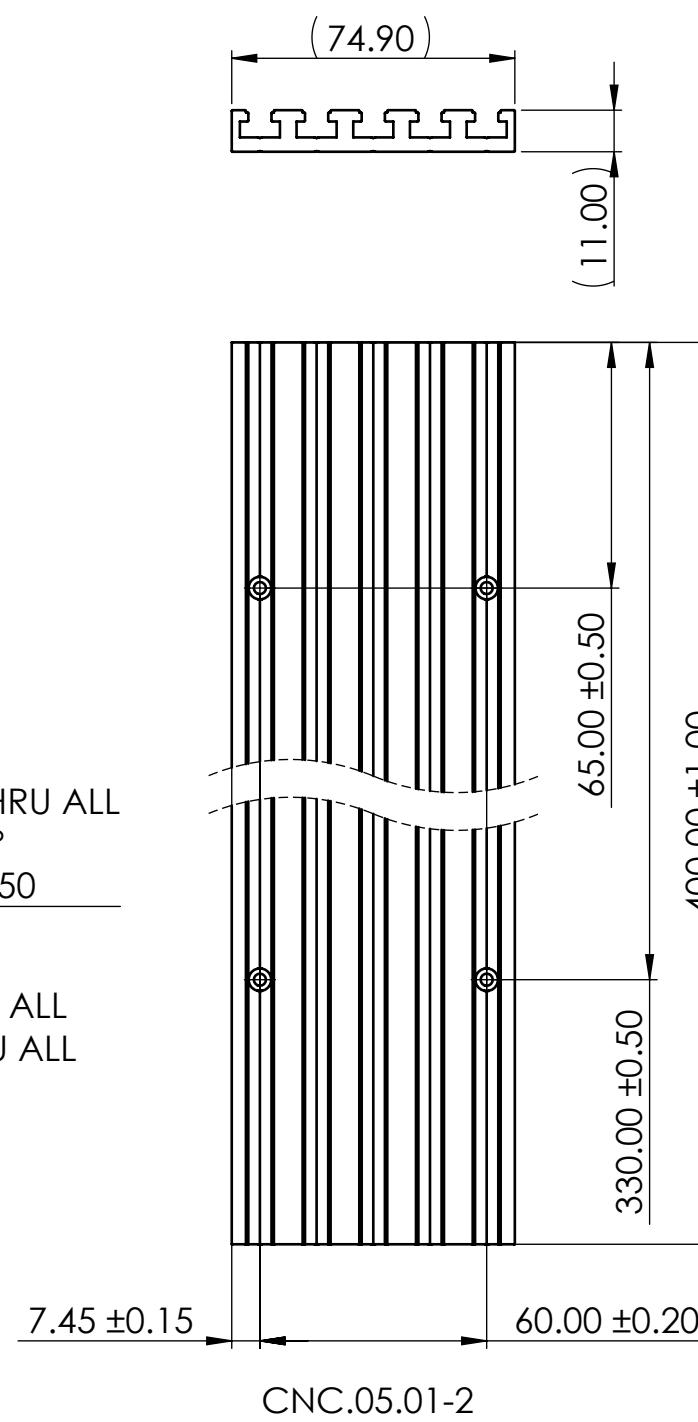
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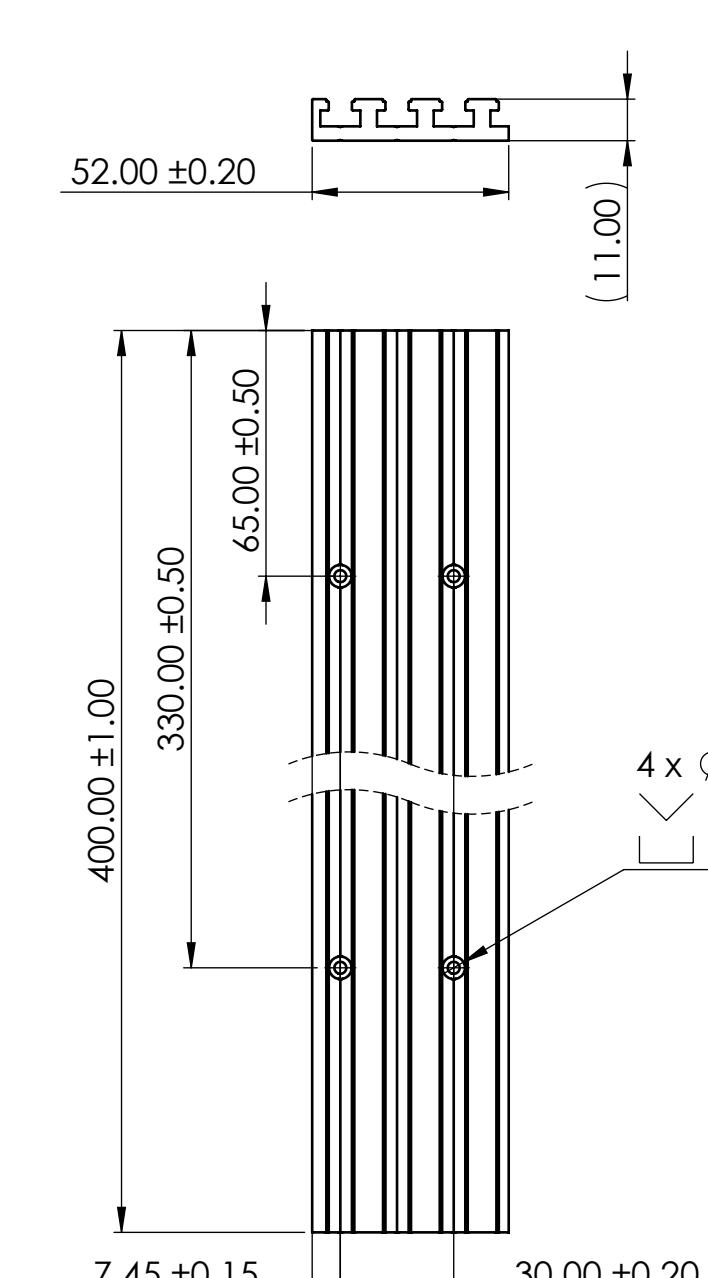
1



CNC.05.01-1



CNC.05.01-2



CNC.05.01-3

NOTES:

1. MATERIAL: ALUMINUM EXTRUSION FIXTURE PLATE.
2. BOTH CUTTED SIDES SHALL BE FREE OF SHARP EDGES AND BURRS.
3. FOR MORE DIMENSIONS SEE CAD FILE: T-SLOT TABLE PLATE.SLDPRP.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		DRAWN	VR	VR
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		verespcb@gmail.com		
SIZE	DWG. NO.			REV
B	CNC.05.01			
SCALE: 1:2	WEIGHT: 541.80	SHEET 1 OF 1		

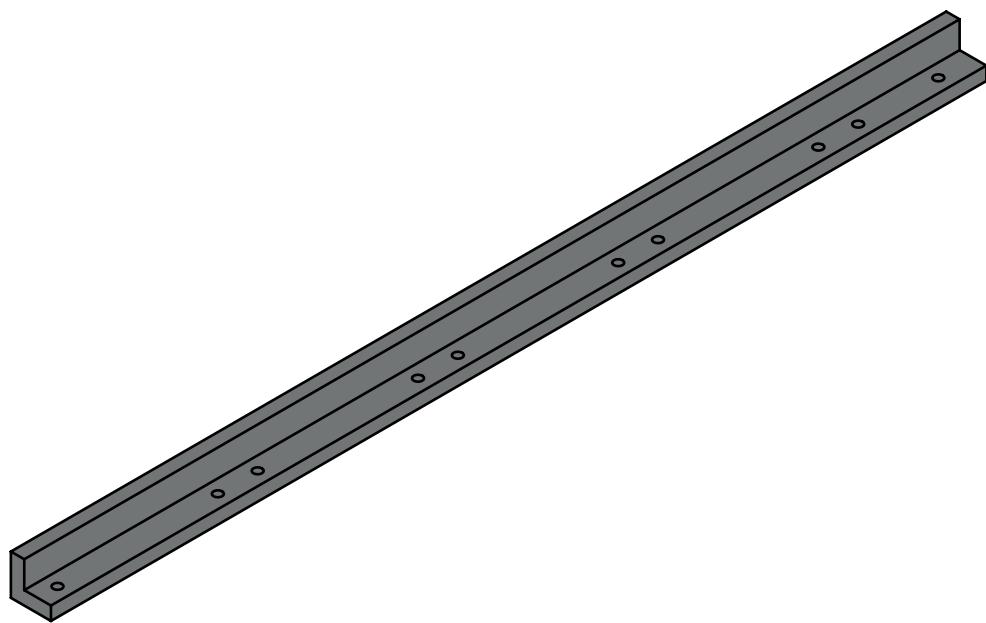
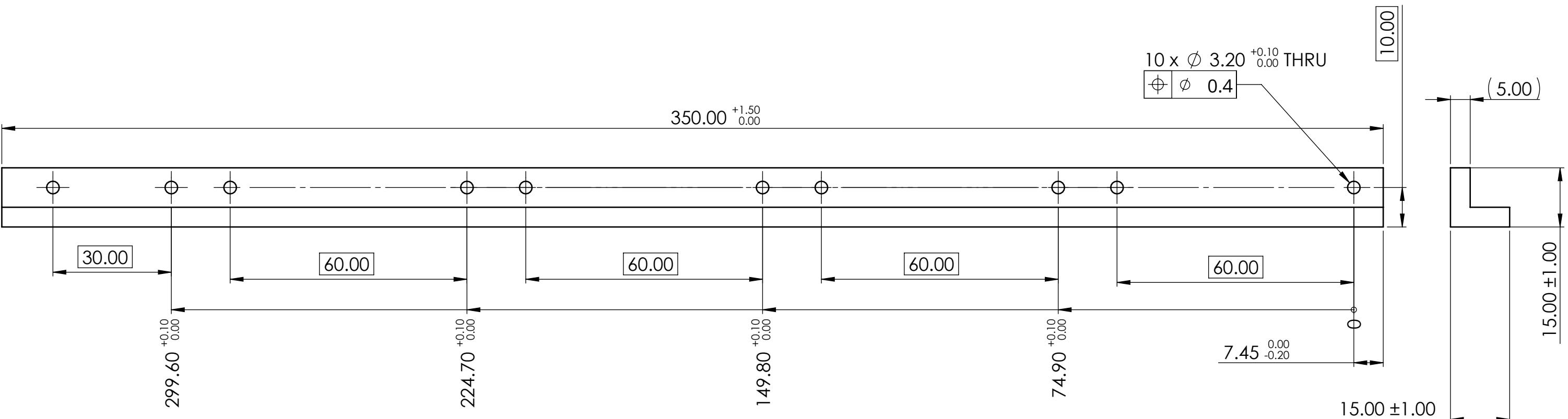
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3

2

1

B



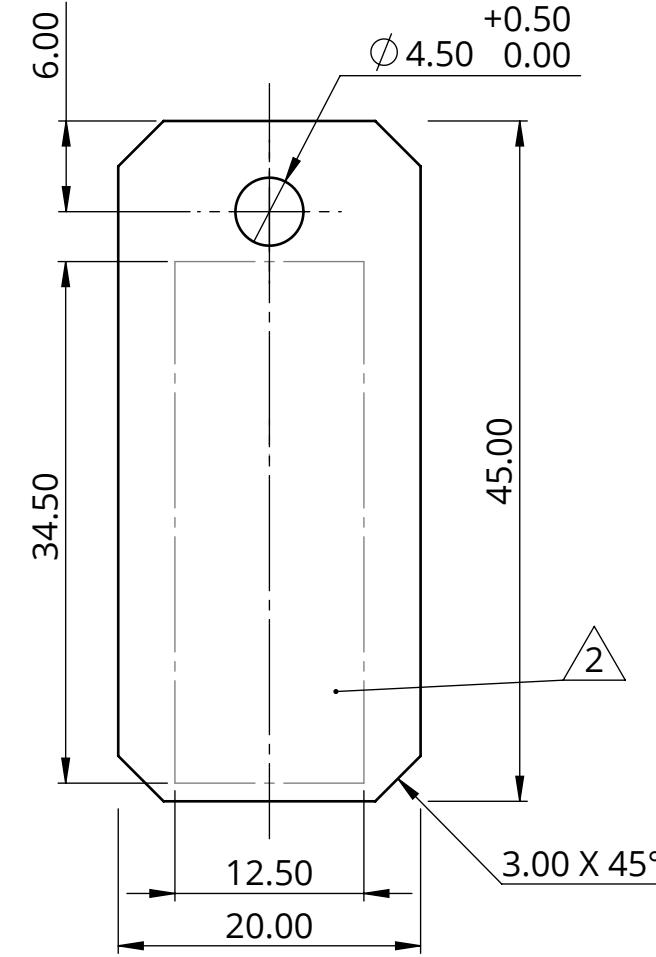
NOTES:

1. MATERIAL EXTRUDED 6060 ALUMINUM, MCMASTER-CARR P/N: 5585N18.
2. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.		REV	
B	CNC.05.05			
SCALE: 1:1	WEIGHT: 117.039	SHEET 1 OF 1		

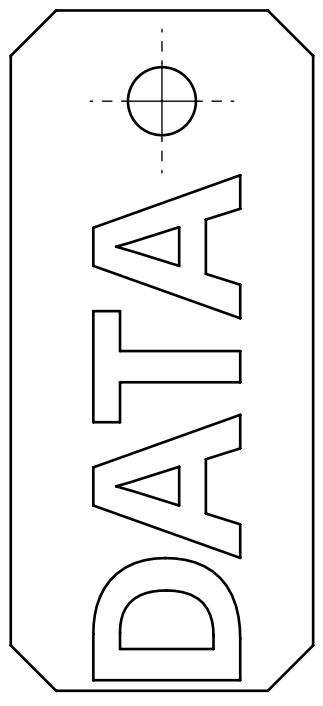
VR VR
TITLE: Corner Braket Long
SIZE DWG. NO. REV
B **CNC.05.05**



COMMON DIMENSIONS. CNC.04.05

NOTES:

1. MATERIAL: ABS/ACRYLIC/POLYCARBONATE PLASTIC SHEET THICKNESS 1.5 OR 2 MM. COLOR: WHITE.
- 2** FONT SHALL BE CLEARLY VISIBLE AND BLACK IN COLOR. TEXT SHALL BE PLACED INTO RECTANGULAR AREA AS SHOWN.
3. GENERAL TOLERANCE DIN ISO 2768-c.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

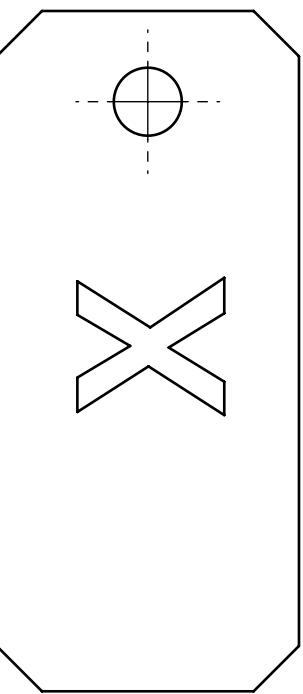


CNC.04.05-5

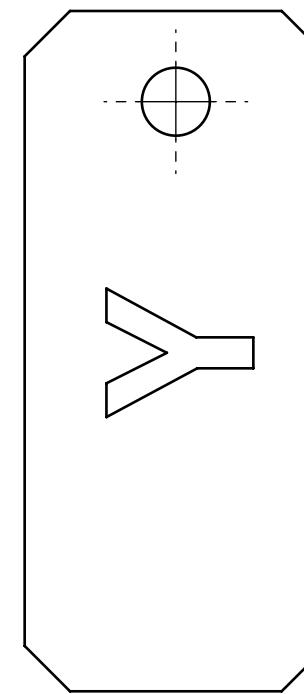
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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.		REV	
B	CNC.04.05			
SCALE: 2:1	WEIGHT: 1.57	SHEET 1 OF 1		

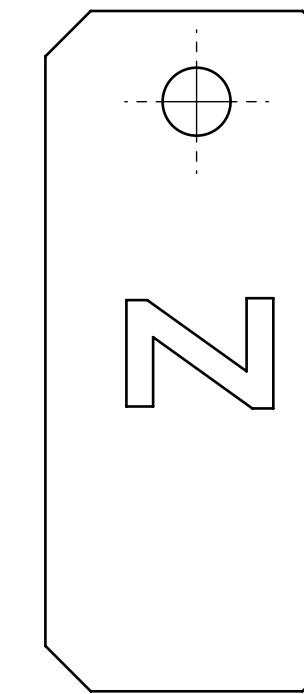
VR
Cable label



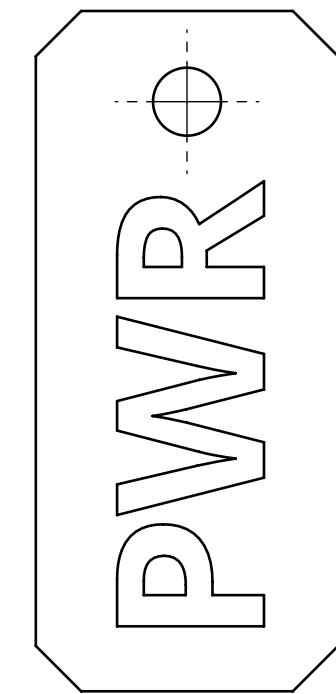
CNC.04.05-1



CNC.04.05-2



CNC.04.05-3



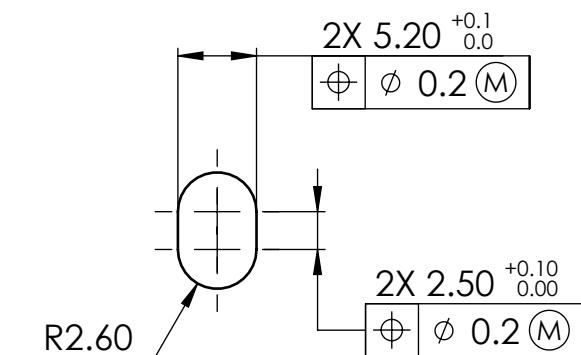
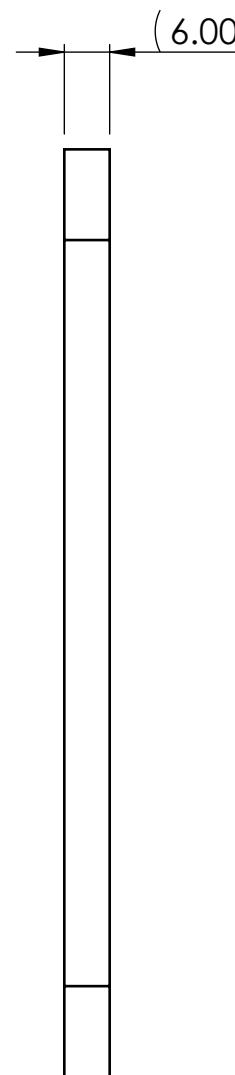
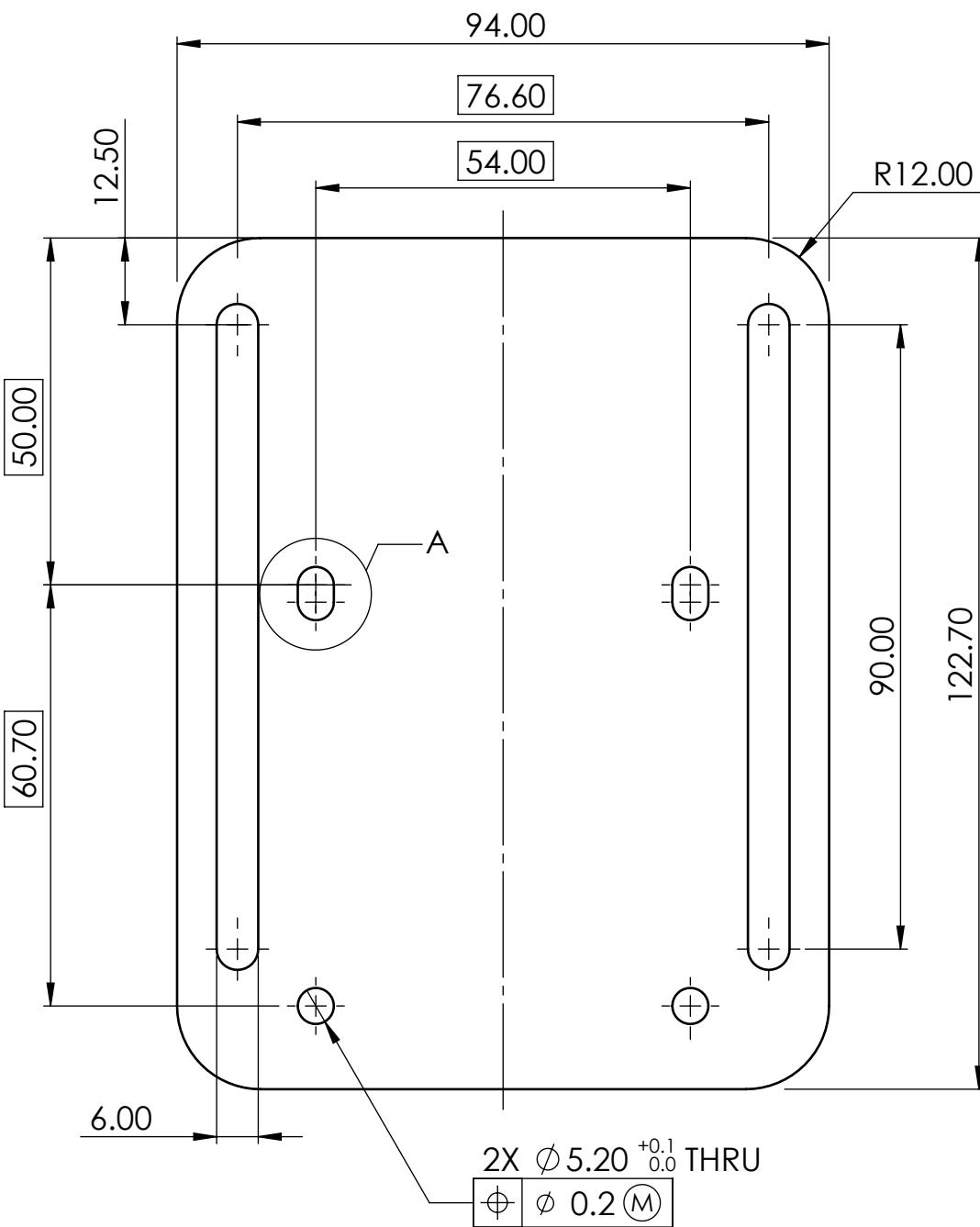
CNC.04.05-4

4

3

2

1



DETAIL A
SCALE 2 : 1

NOTE:

1. MATERIAL: CLEAR IMPACT-RESISTANT POLYCARBONATE, MCMASTER-CARR P/N: 8574K281.
2. GENERAL TOLERANCE DIN ISO 2768-mK.
3. FOR MORE DIMENSIONS SEE CAD FILE: Adjustment Equipment Part.SLDPRT.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		DRAWN	VR	VR
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.		REV	
B	CNC.02.42			
SCALE: 1:1	WEIGHT: 73.78	SHEET 1 OF 1		

Adjustment Equipment Part

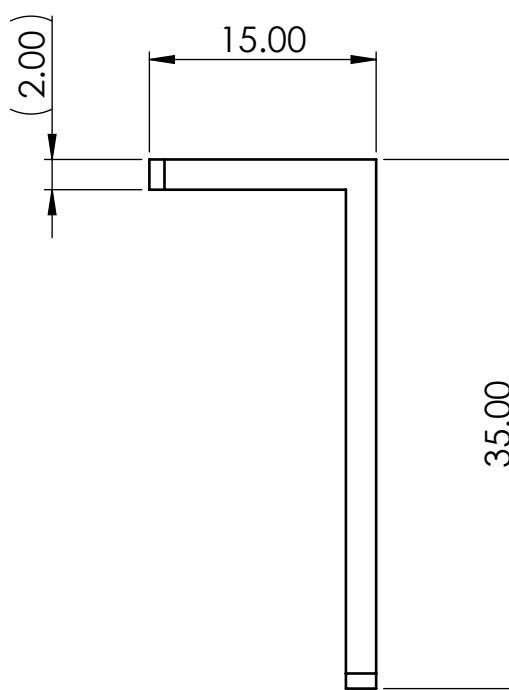
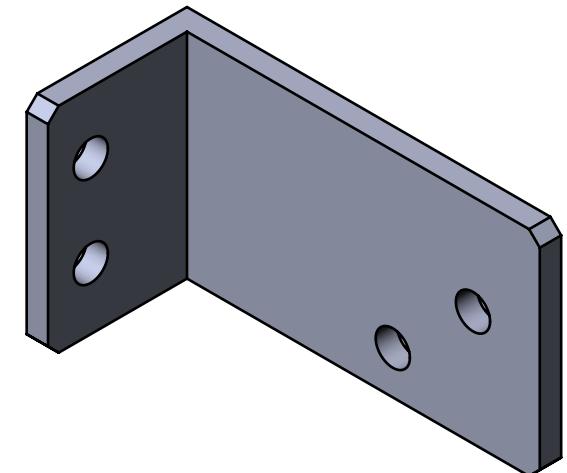
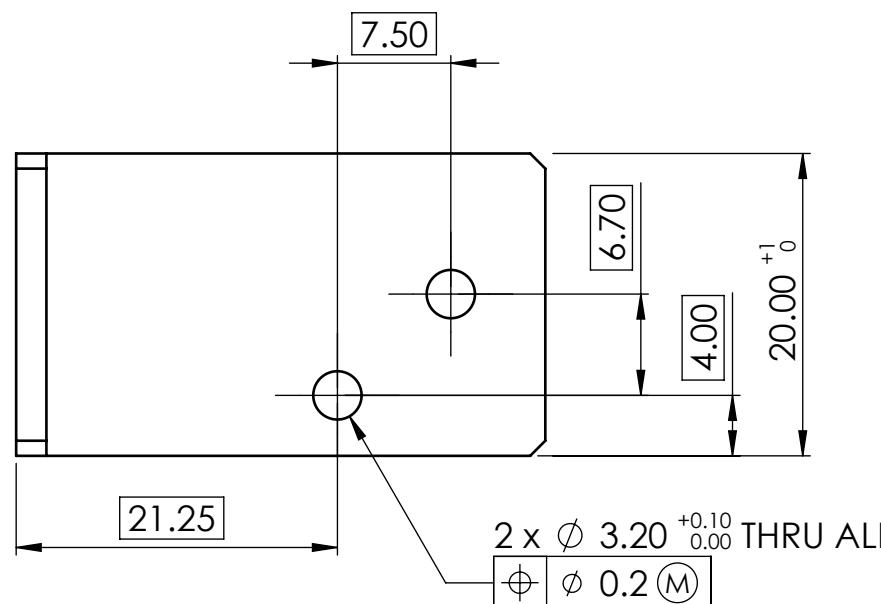
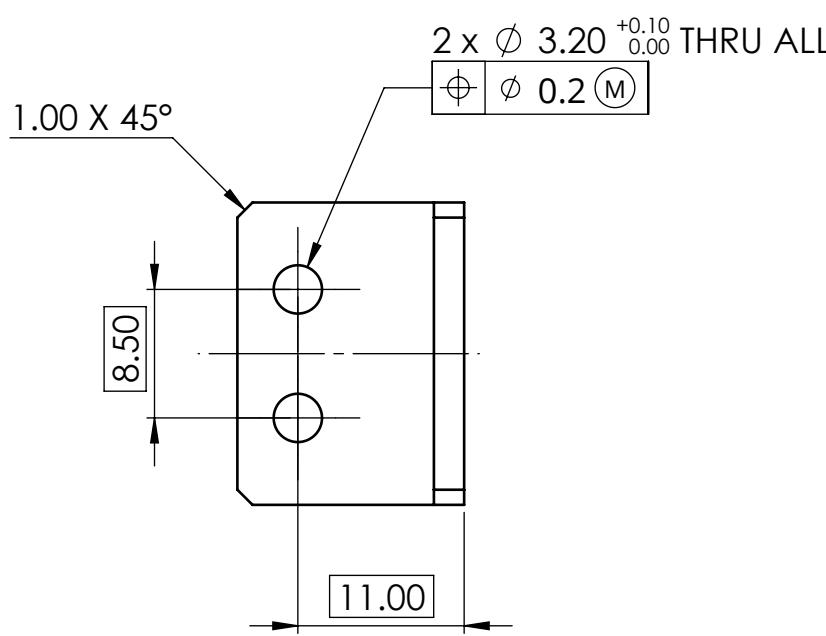
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3

2

1

B



NOTE:

1. MATERIAL: 6060 ALUMINUM 90° ANGLE . MCMASTER-CARR P/N: 5585N19-5585N137.
2. GENERAL TOLERANCE DIN ISO 2768-m.
3. FOR MORE DIMENSIONS SEE CAD FILE: CornerBracketForCableChain.SLDprt.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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WHOLE WITHOUT THE WRITTEN PERMISSION
OF VR IS PROHIBITED.

		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.		REV	
B	CNC.02.24			
SCALE: 2:1	WEIGHT: 5.00	SHEET 1 OF 1		

VR

TITLE:

Corner Bracket For Cable Chain

4

3

2

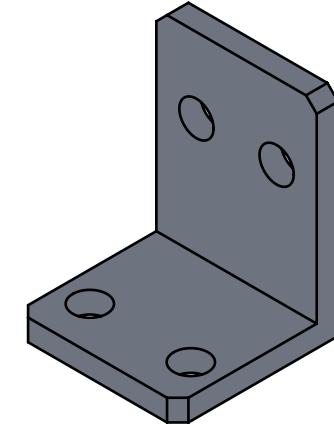
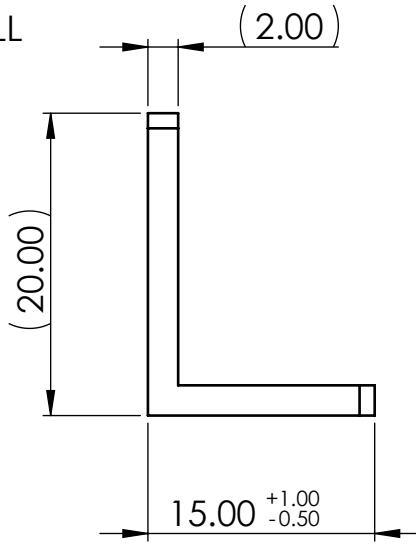
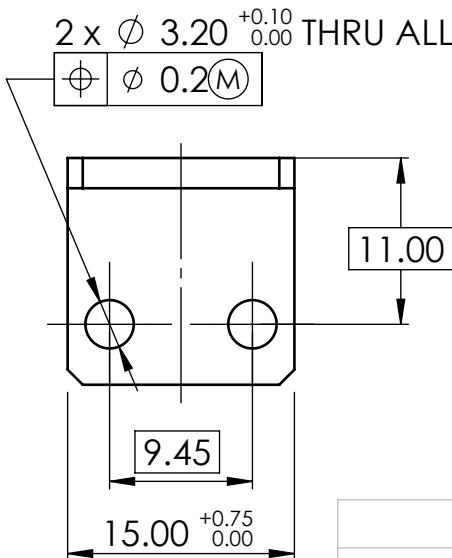
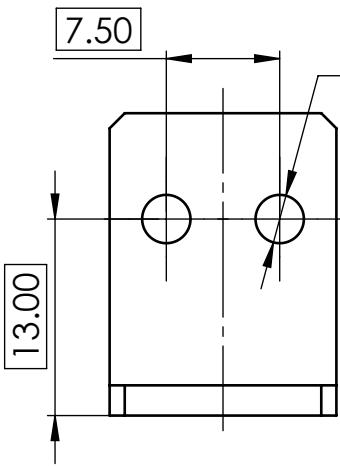
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2

1

B

B



NOTE:

1. MATERIAL: 6060 ALUMINUM 90° ANGLE . MCMASTER-CARR P/N: 5585N13.
2. GENERAL TOLERANCE DIN ISO 2768-m.
3. FOR MORE DIMENSIONS SEE CAD FILE: CornerForSensor.SLDPR
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED:				
		BREAK ALL SHARP EDGES		DRAWN		
		DIMENSIONS ARE IN MILLIMETERS		CHECKED		
		TOLERANCES:		ENG APPR.		
		FRACTIONAL ±		MFG APPR.		
		ANGULAR: MACH ± BEND ±		Q.A.		
		TWO PLACE DECIMAL ±		COMMENTS:		
		THREE PLACE DECIMAL ±				
		INTERPENETRATING GEOMETRIC				
		TOLERANCING PER:				
		MATERIAL				
		6060 Alloy				
NEXT ASSY	USED ON	FINISH	As machined			
APPLICATION		DO NOT SCALE DRAWING				

VR

VR

TITLE:

Corner For Sensor

SIZE	DWG. NO.	REV
A	CNC.01.31	
SCALE: 2:1	WEIGHT: 2.49	SHEET 1 OF 1

2

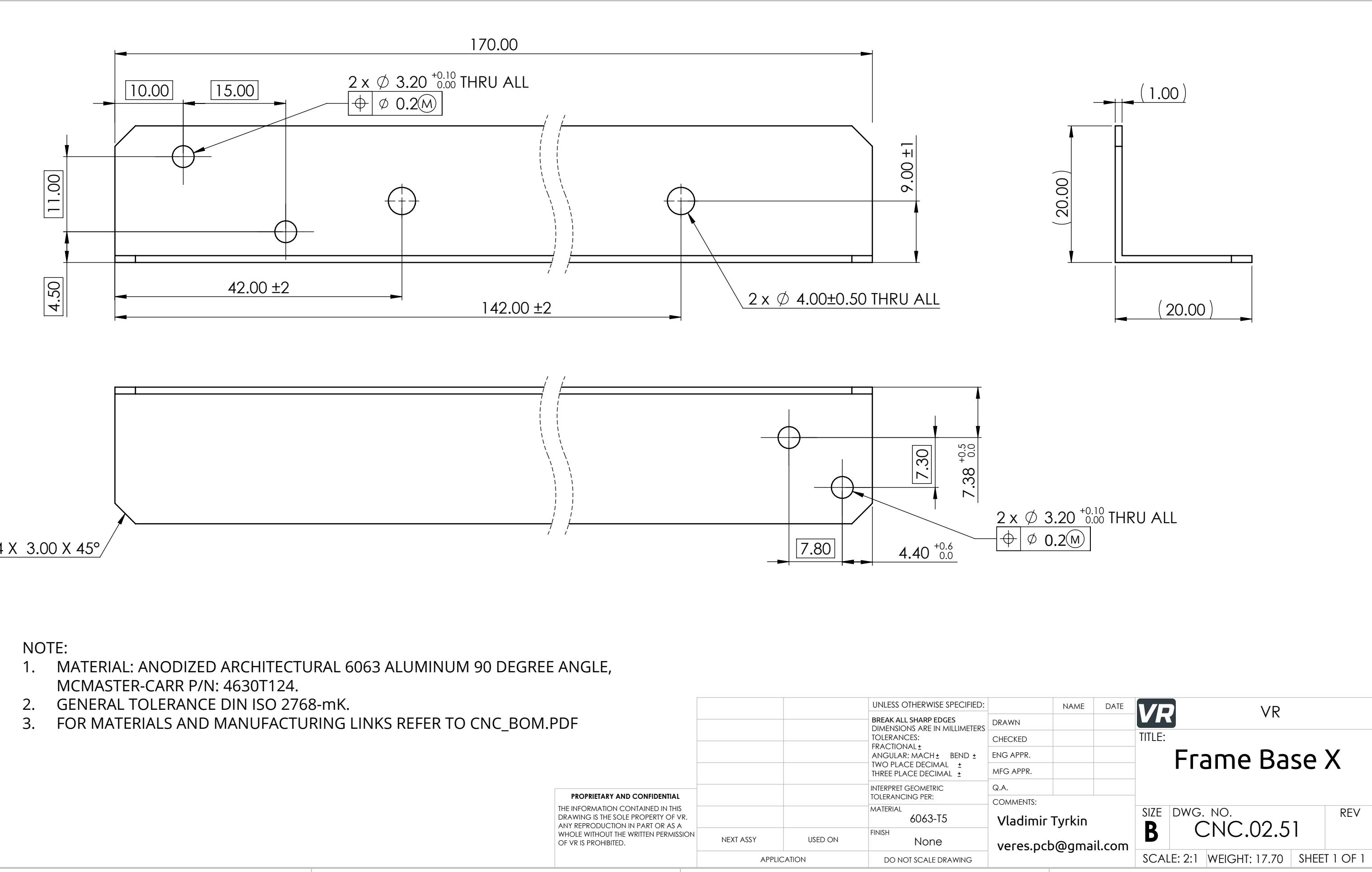
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2

1



4

3

2

1

4

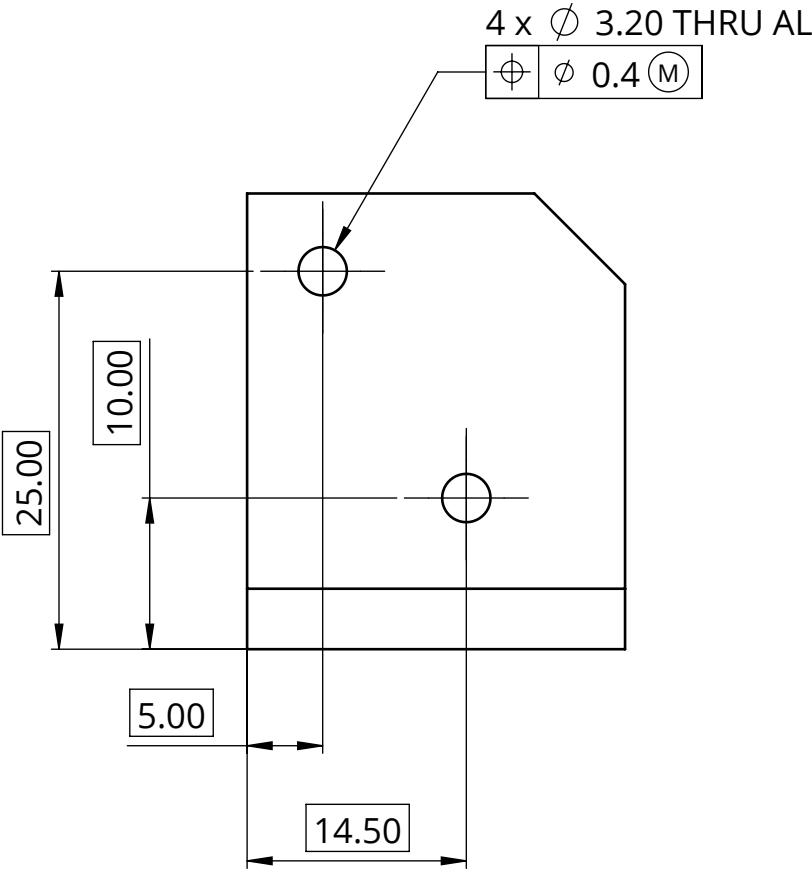
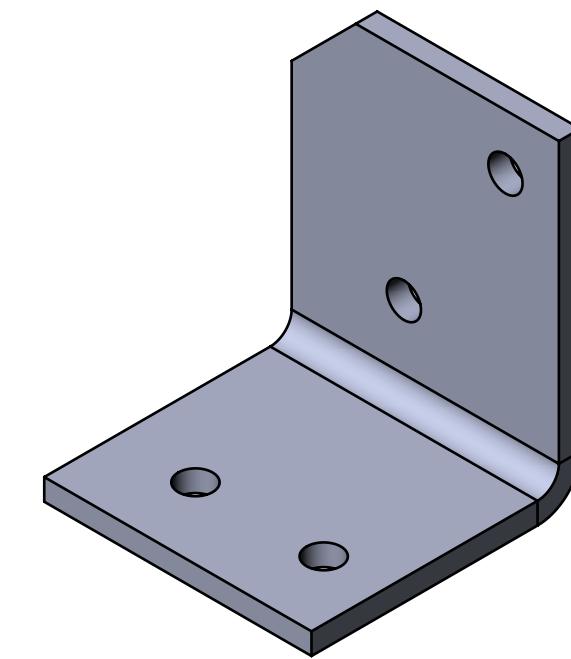
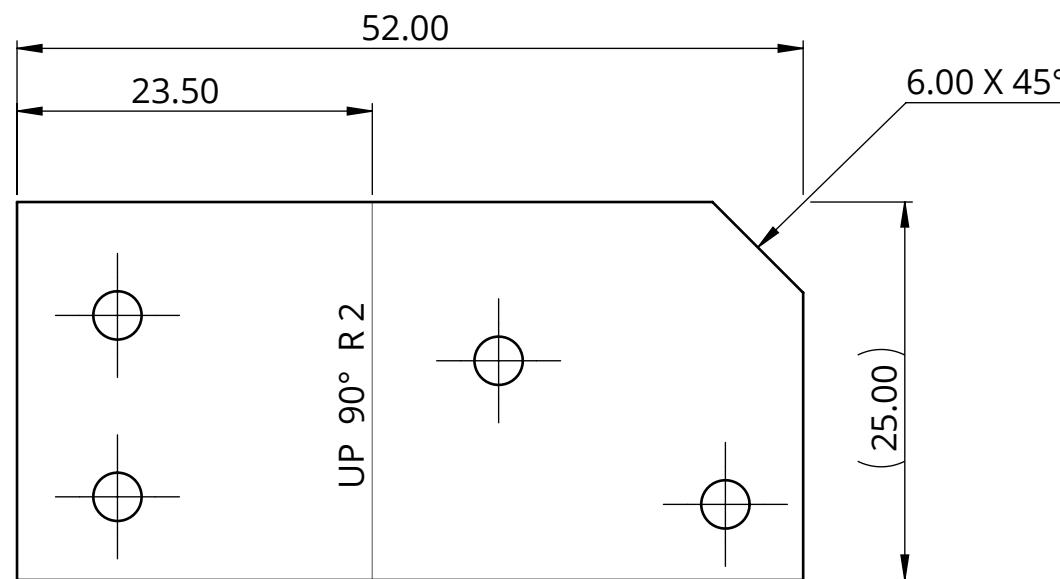
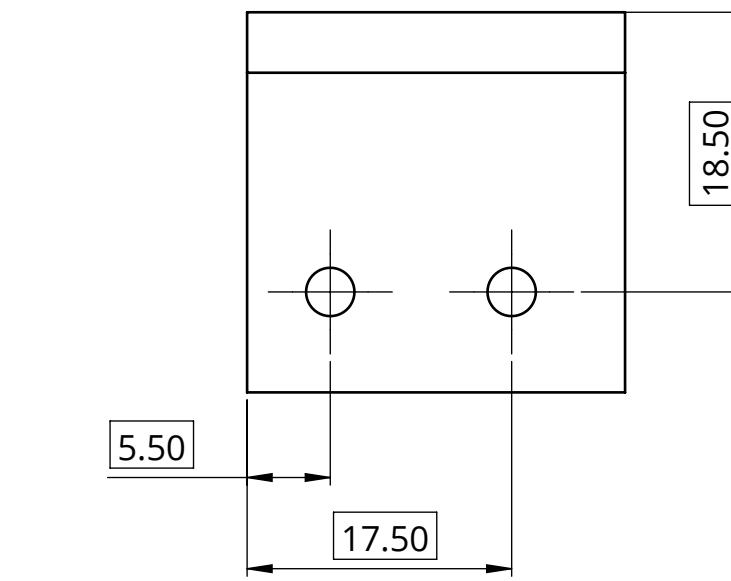
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2

1

B

B



NOTE:

1. MATERIAL: MULTIPURPOSE 6061 ALUMINUM BAR THICKNESS 2mm, MCMASTER-CARR P/N: 9146T15.
2. GENERAL TOLERANCE DIN ISO 2768-MK.
3. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
		DRAWN	VR	VR
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.		REV	
B	CNC.02.52			
SCALE: 2:1	WEIGHT: 6.75	SHEET 1 OF 1		

4

3

2

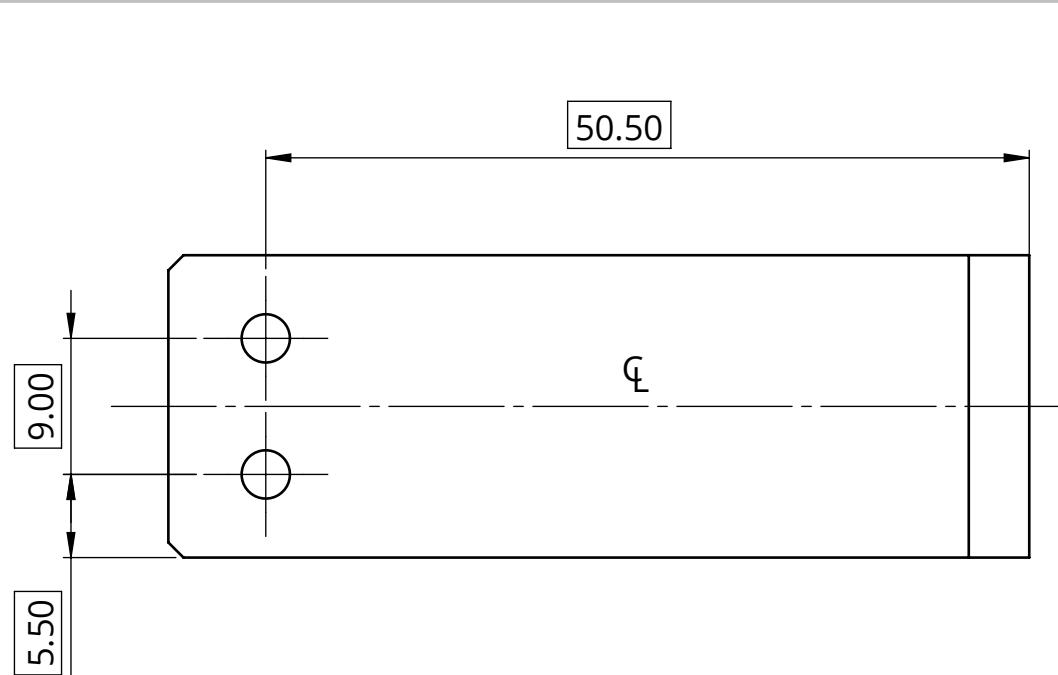
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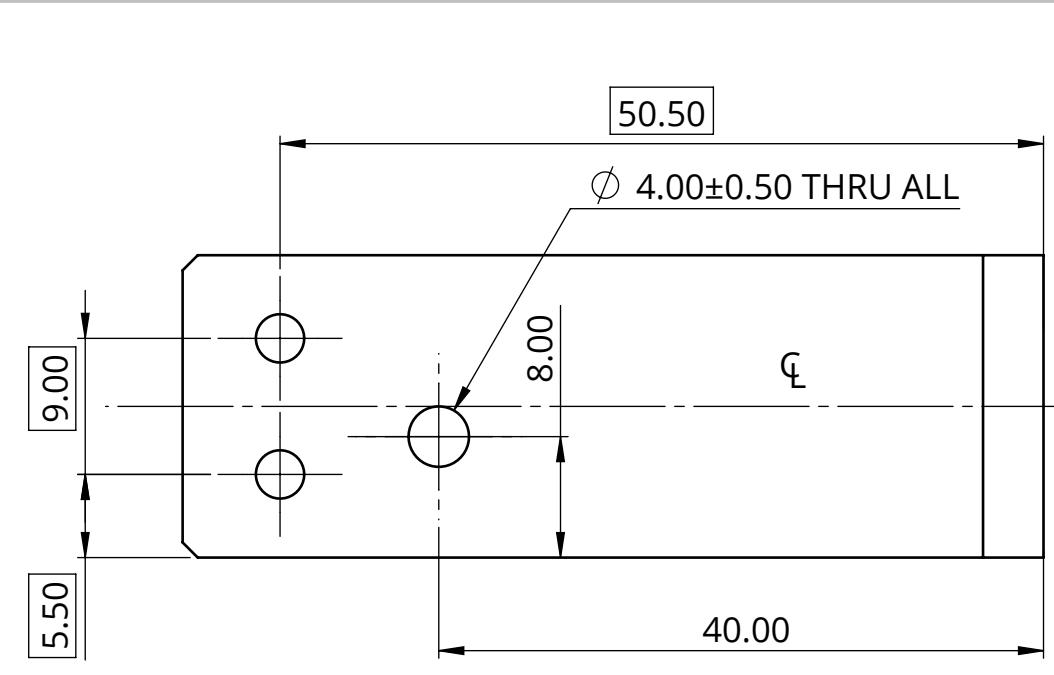
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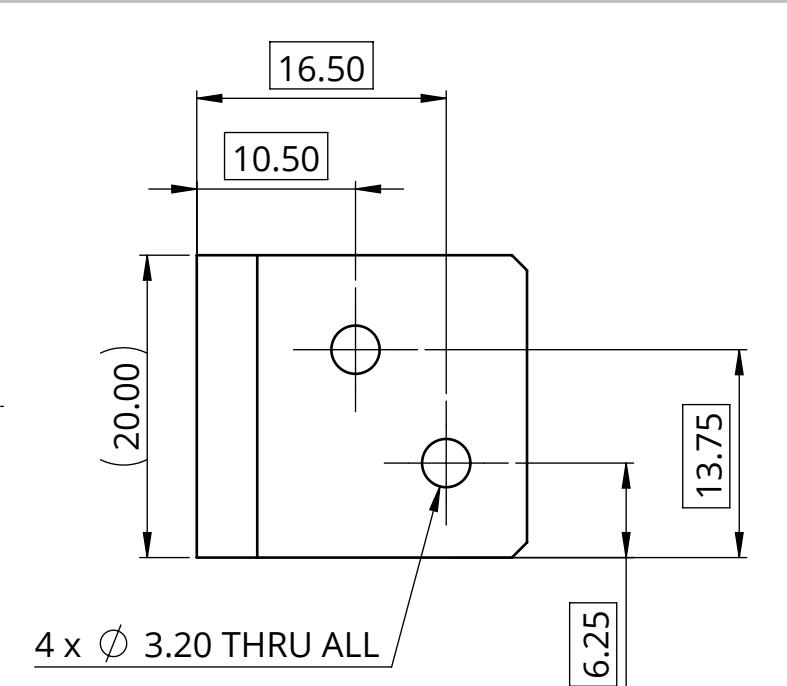
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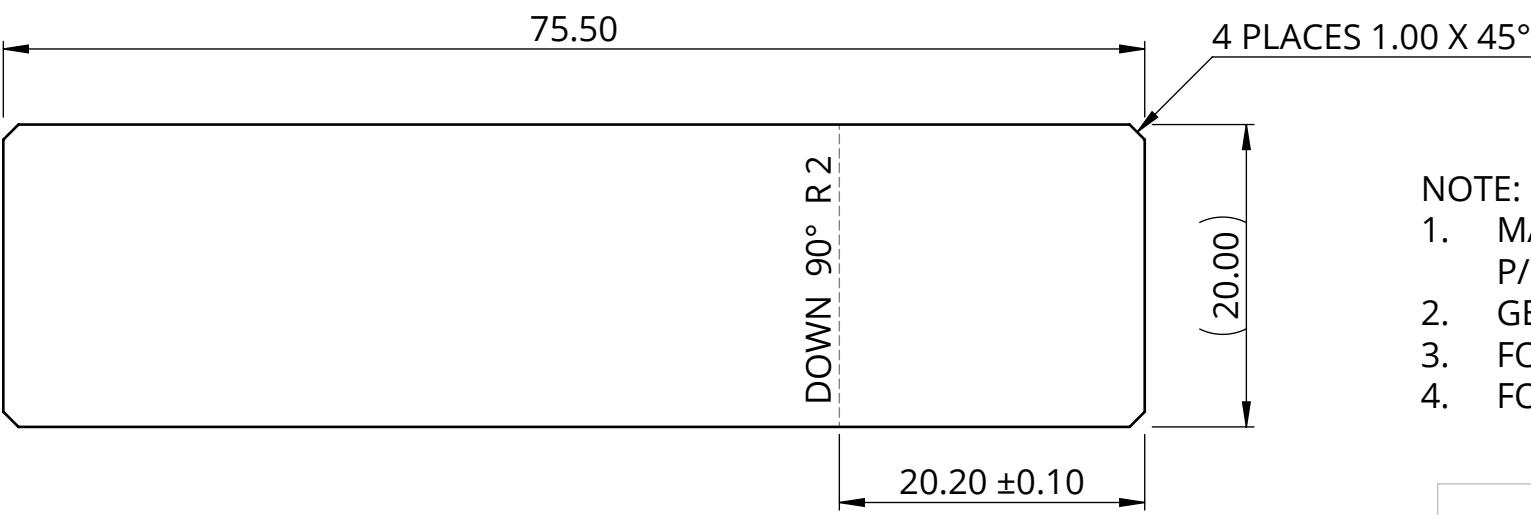
CONFIGURATION: CNC.01.22-1



CONFIGURATION: CNC.01.22-2



COMMON DIMENSIONS CNC.01.22



FLAT VIEW

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.		REV	
B	CNC.01.22			
SCALE: 2:1	WEIGHT: 7.97	SHEET 1 OF 1		

VR

VR

TITLE:

Frame Base Mount Bracket Y

4

3

2

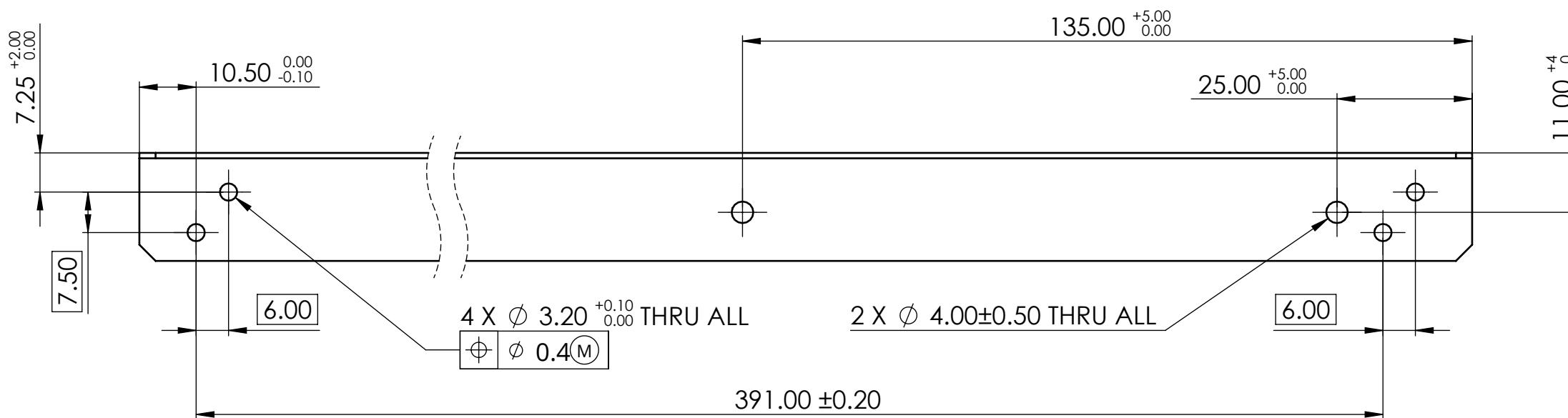
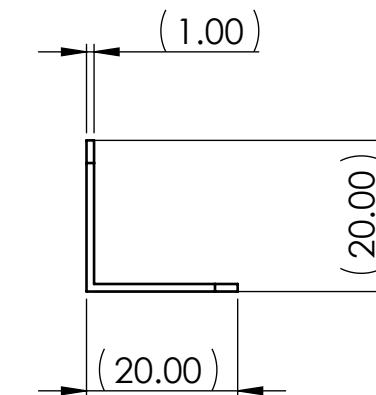
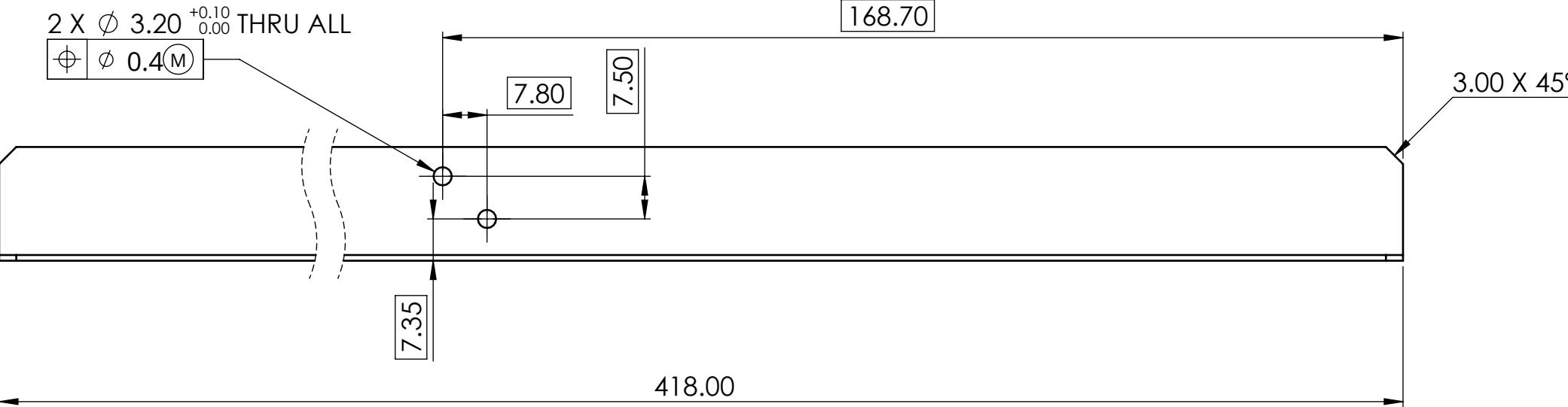
1

4

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2

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NOTE:

1. MATERIAL: ANODIZED ARCHITECTURAL 6063 ALUMINUM 90 DEGREE ANGLE, McMaster-Carr P/N: 4630T124.
2. GENERAL TOLERANCE DIN ISO 2768-mK.
3. FOR MORE DIMENSIONS SEE CAD FILE: FrameBaseY.SLDPRT.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
		DRAWN	VR	
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		Vladimir Tyrkin		
		veres.pcb@gmail.com		
SIZE	DWG. NO.		REV	
B	CNC.01.21			
SCALE: 1:1	WEIGHT: 43.77	SHEET 1 OF 1		

4

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1

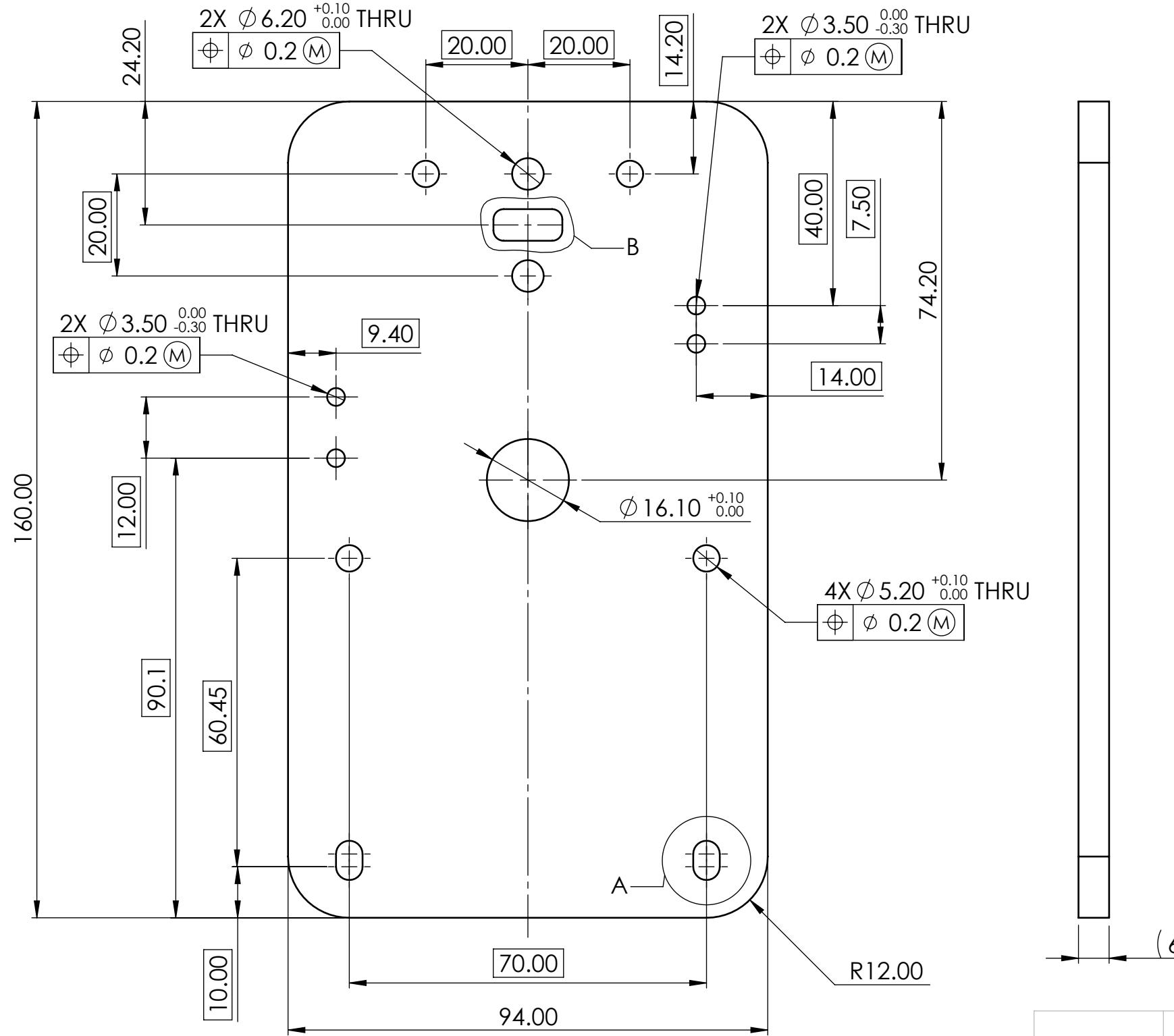
4

3

2

1

B



NOTE:

- MATERIAL: CLEAR IMPACT-RESISTANT POLYCARBONATE, MCMASTER-CARR P/N: 8574K281.
- GENERAL TOLERANCE DIN ISO 2768-mK.
- FOR MORE DIMENSIONS SEE CAD FILE: LeftSideBase.SLDPRT.
- FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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BREAK ALL SHARP EDGES
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:
FRACTIONAL \pm
ANGULAR: MACH \pm BEND \pm
TWO PLACE DECIMAL \pm
THREE PLACE DECIMAL \pm
INTERPRET GEOMETRIC
TOLERANCING PER:
MATERIAL
Polycarbonate (PC)

NAME	DATE
DRAWN	
CHECKED	
ENG APPR.	
MFG APPR.	
Q.A.	
COMMENTS:	
Vladimir Tyrkin	
veres.pcb@gmail.com	

VR

VR

TITLE:

Left Side Base

SIZE	DWG. NO.	REV
B	CNC.02.31	
SCALE: 1:1 WEIGHT: 104.40 SHEET 1 OF 1		

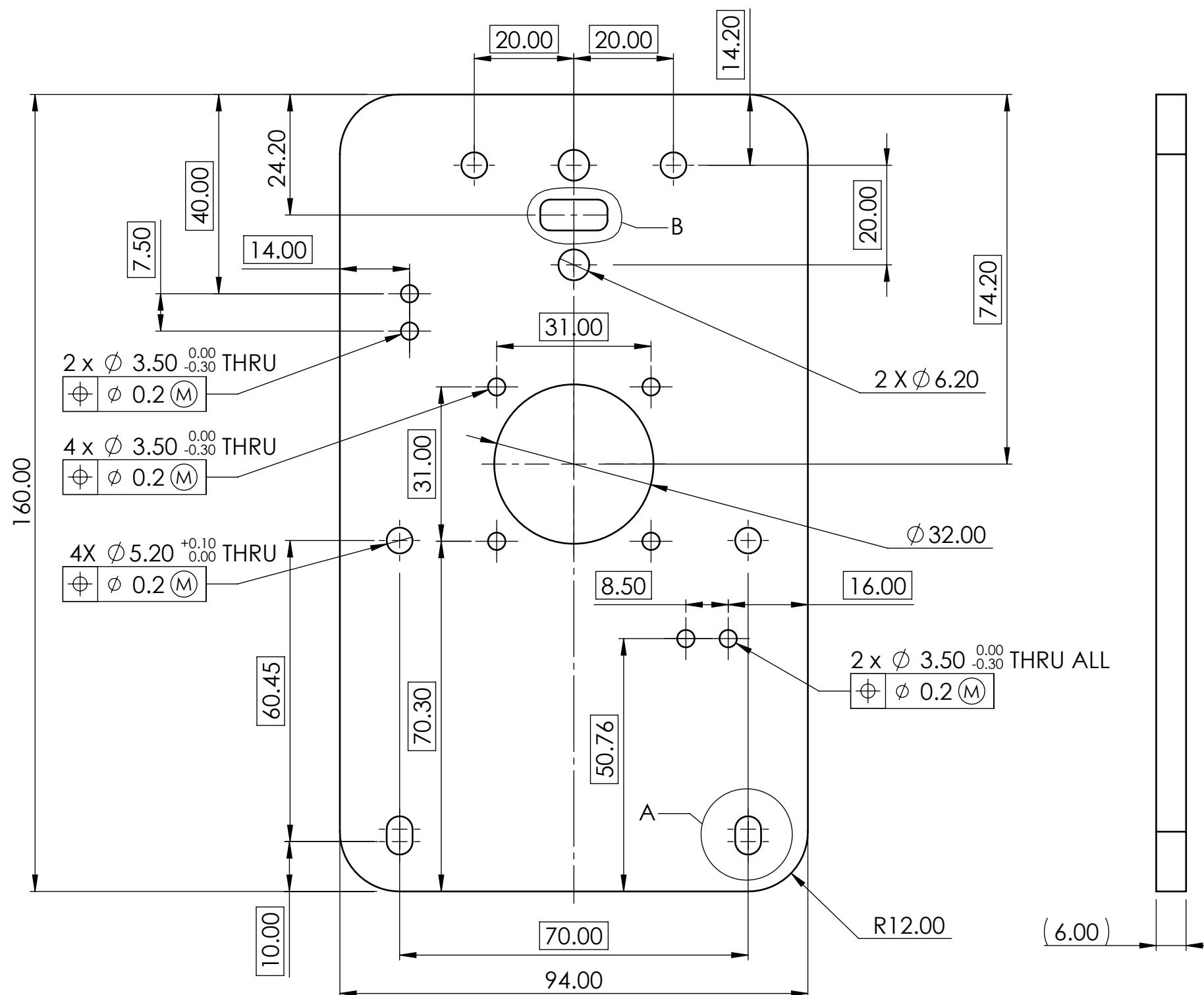
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3

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**NOTE:**

1. MATERIAL: CLEAR IMPACT-RESISTANT POLYCARBONATE, MCMASTER-CARR P/N: 8574K281.
2. GENERAL TOLERANCE DIN ISO 2768-mK.
3. FOR MORE DIMENSIONS SEE CAD FILE: RightSideBase.SLDPRT.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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DIMENSIONS ARE IN MILLIMETERS
TOLERANCES:
FRACTIONAL \pm
ANGULAR: MACH \pm BEND \pm
TWO PLACE DECIMAL \pm
THREE PLACE DECIMAL \pm

INTERPRET GEOMETRIC
TOLERANCING PER:
MATERIAL
Polycarbonate (PC)

NEXT ASSY
USED ON
APPLICATION
FINISH
As machined
DO NOT SCALE DRAWING

VR

VR

TITLE:

Right Side Base

SIZE DWG. NO. REV

B CNC.02.21

SCALE: 1:1 WEIGHT: 99.76 SHEET 1 OF 1

4

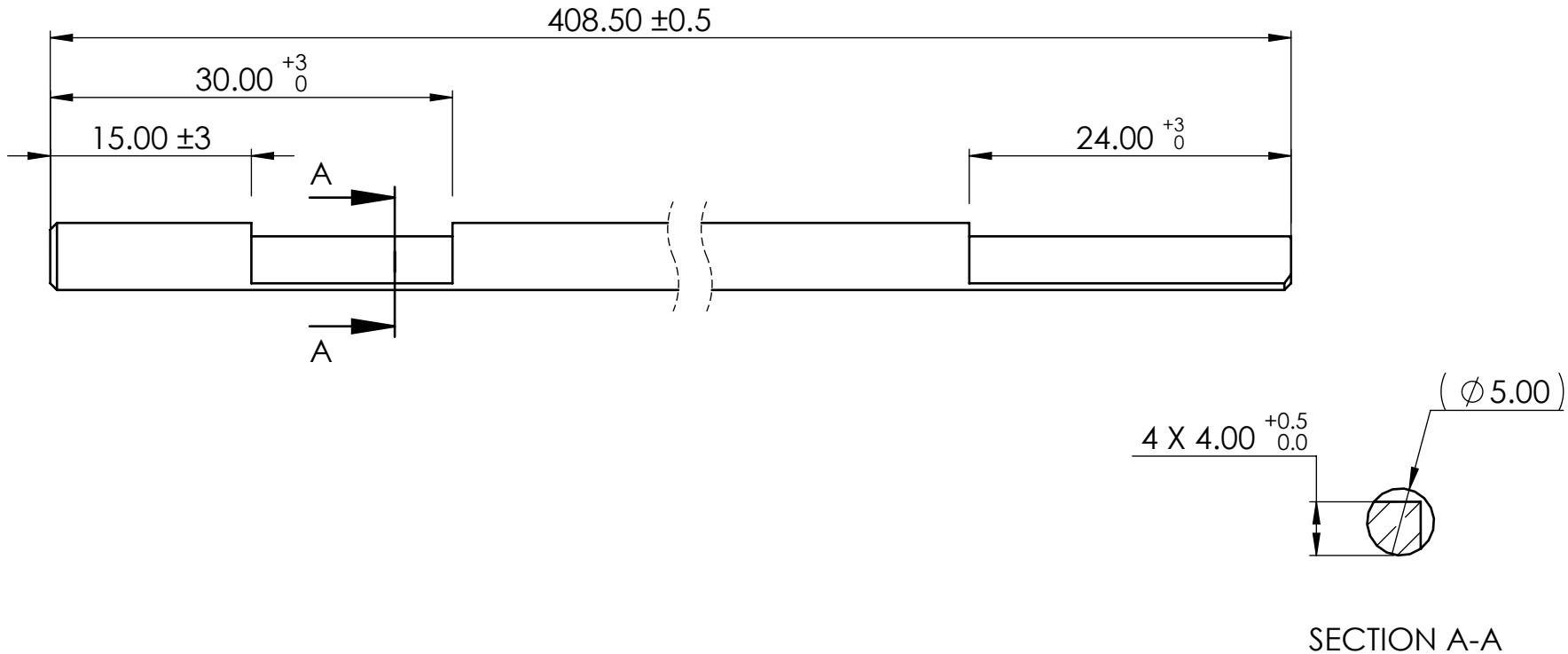
3

2

1

B

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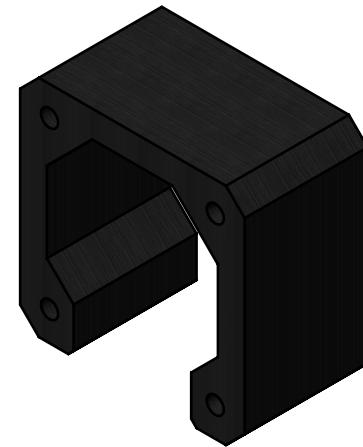
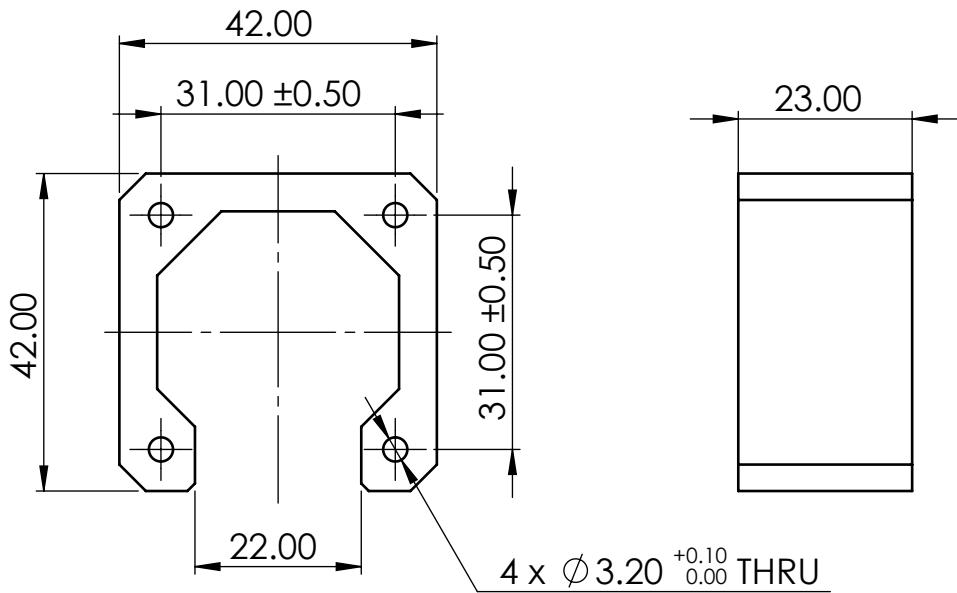


NOTE:

1. MATERIAL: LOW-CARBON STEEL ROD, MCMASTER-CARR P/N: 9820K183.
2. ALL EDGES 0.1..0.3MM MAX RADIUS OR CHAMFER.
3. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

		UNLESS OTHERWISE SPECIFIED:		DRAWN	NAME	DATE	VR TITLE: Rotary Shaft	
		BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ± INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	ENG APPR.	MFG APPR.		
MATERIAL AISI 1020								
NEXT ASSY	USED ON	FINISH	As machined	Q.A.	COMMENTS:			
APPLICATION		DO NOT SCALE DRAWING		Vladimir Tyrkin veres.pcb@gmail.com				
SIZE	DWG. NO.		REV	A	CNC.02.11			
SCALE: 2:1			WEIGHT: 61.66	SHEET 1 OF 1				

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NOTES:

1. MINIMALLY DIMENSIONED DRAWING. FOR MORE DIMENSIONS SEE CAD FILE: SpacerForStepper.sldprt.
2. MATERIAL: PETG 3D PRINTER FILAMENT MCMASTER-CARR P/N: 3462N1. ALTERNATE: ABS PLASTIC P/N: 1317N538-1317N327.
3. INFILL: 100%. NOZZLE: 0.4mm.
4. GENERAL TOLERANCE DIN ISO 2768-c.
5. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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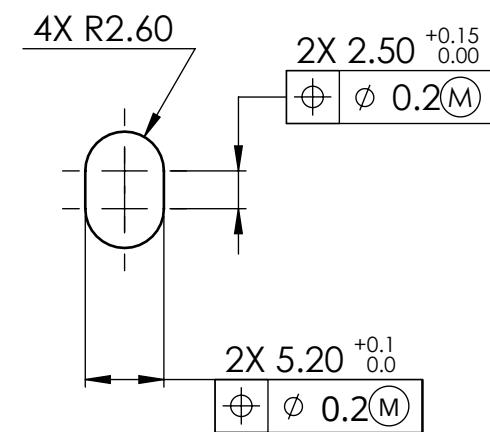
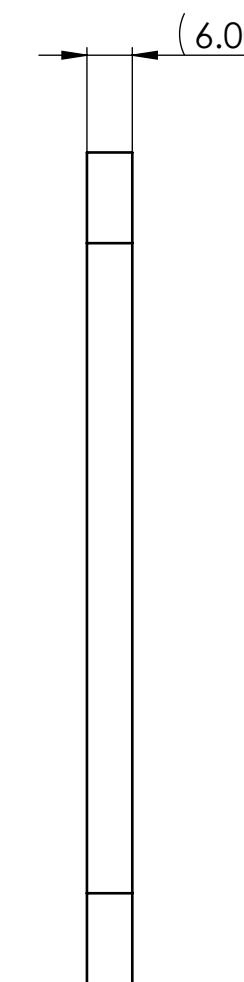
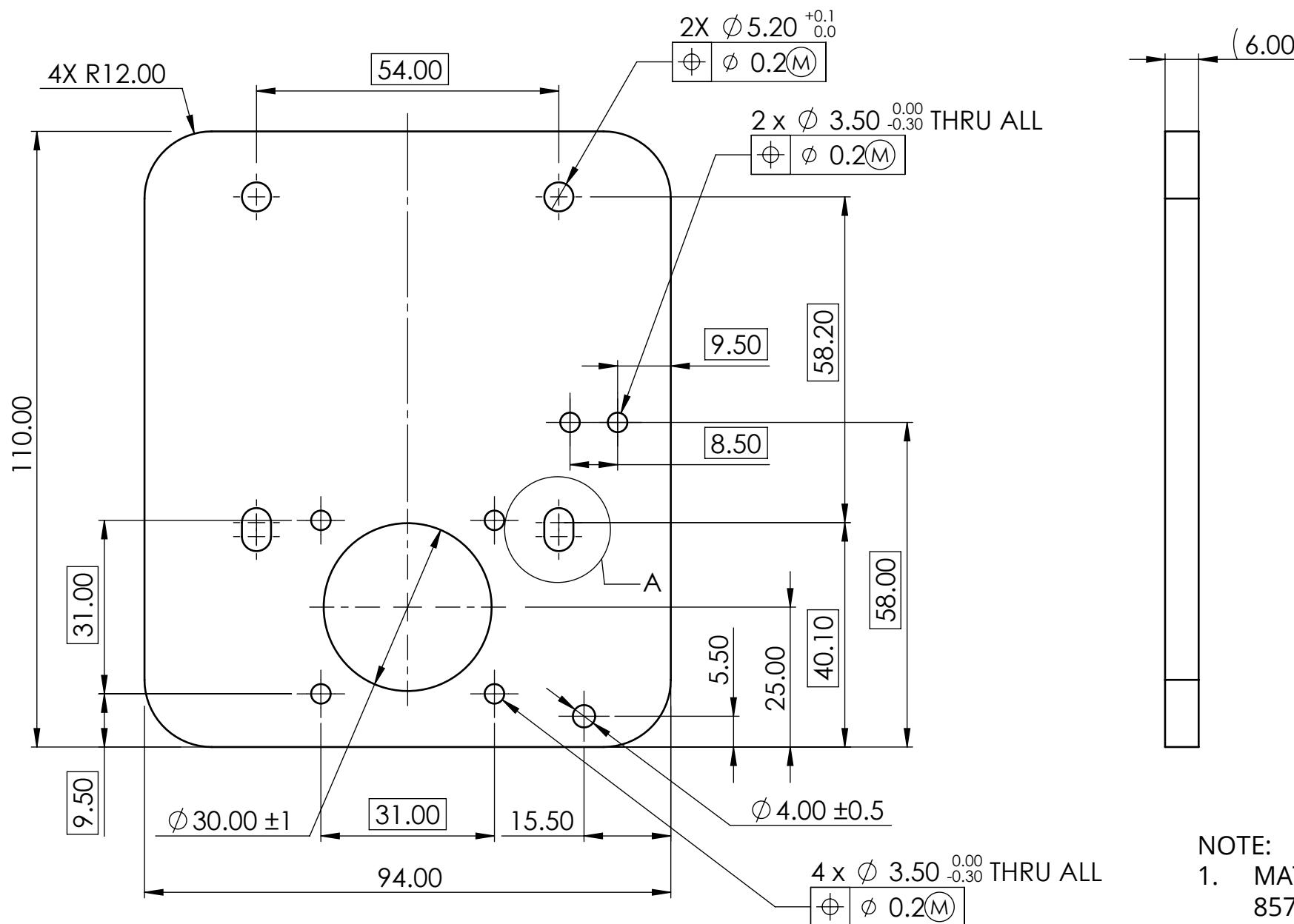
		UNLESS OTHERWISE SPECIFIED:				
		BREAK ALL SHARP EDGES		DRAWN		
		DIMENSIONS ARE IN MILLIMETERS		CHECKED		
		TOLERANCES:		ENG APPR.		
		FRACTIONAL ±		MFG APPR.		
		ANGULAR: MACH ± BEND ±		Q.A.		
		TWO PLACE DECIMAL ±		COMMENTS:		
		THREE PLACE DECIMAL ±				
		INTERPRET GEOMETRIC				
		TOLERANCING PER:				
		MATERIAL				
		PET-G				
NEXT ASSY	USED ON	FINISH	As machined			
APPLICATION		DO NOT SCALE DRAWING				

Vladimir Tyrkin
veres.pcb@gmail.com

VR

Spacer For Stepper

SIZE	DWG. NO.	REV
A	CNC.02.23	
SCALE: 1:1	WEIGHT: 20.90	SHEET 1 OF 1



DETAIL A
SCALE 2 : 1

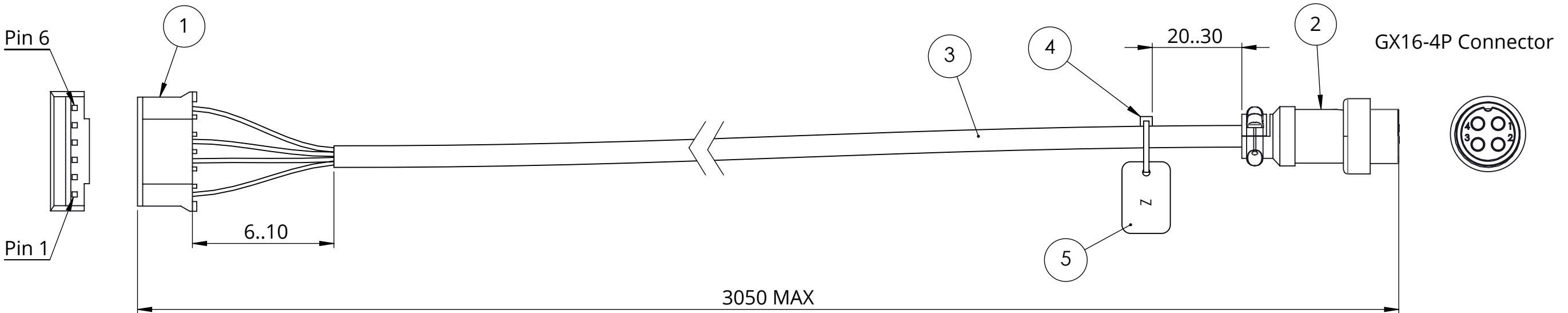
NOTE:

1. MATERIAL: CLEAR IMPACT-RESISTANT POLYCARBONATE, MCMASTER-CARR P/N: 8574K281.
2. GENERAL TOLERANCE DIN ISO 2768-mK.
3. FOR MORE DIMENSIONS SEE CAD FILE: Stepper Side Part.SLDprt.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm	NAME	DATE
		DRAWN	VR	VR
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.	
		MATERIAL Polycarbonate (PC)	COMMENTS:	
	NEXT ASSY	USED ON	Vladimir Tyrkin	
		FINISH	veres.pcb@gmail.com	
		As machined		
	APPLICATION	DO NOT SCALE DRAWING		
			SIZE B DWG. NO. CNC.02.41 REV	
			SCALE: 1:1 WEIGHT: 67.72 SHEET 1 OF 1	

PHR-6 Connector



WIRING CHART

PHR-6	WIRE COLOR	WIRE NAME	GX16-4P
1	BLUE (BLACK)	A	1
3	YELLOW (WHITE)	B	2
4	GREEN	C	3
6	RED	D	4

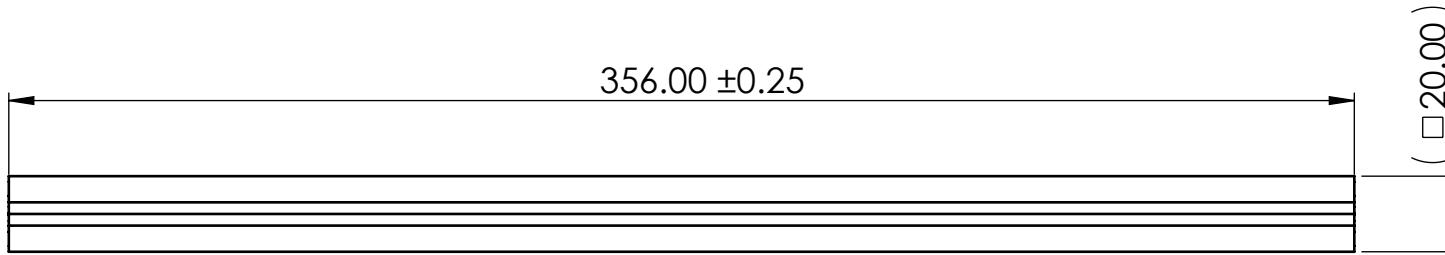
NOTES:

1. STRIP 3.4 mm AND TIN EACH SIDE OF WIRE.
2. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED: BREAK ALL SHARP EDGES DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL \pm ANGULAR: MACH \pm BEND \pm TWO PLACE DECIMAL \pm THREE PLACE DECIMAL \pm INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL Multimaterial NEXT ASSY USED ON FINISH None APPLICATION DO NOT SCALE DRAWING	NAME	DATE
			DRAWN	
			CHECKED	
			ENG APPR.	
			MFG APPR.	
			Q.A.	
			COMMENTS:	
			Vladimir Tyrkin	
			veres.pcb@gmail.com	
			SIZE B	DWG. NO. CNC.10.00
		SCALE: 1:1 WEIGHT: SHEET 1 OF 1		

VR VR
TITLE: Stepper Z Cable Assembly
SIZE **B** DWG. NO. **CNC.10.00** REV
SCALE: 1:1 WEIGHT: SHEET 1 OF 1



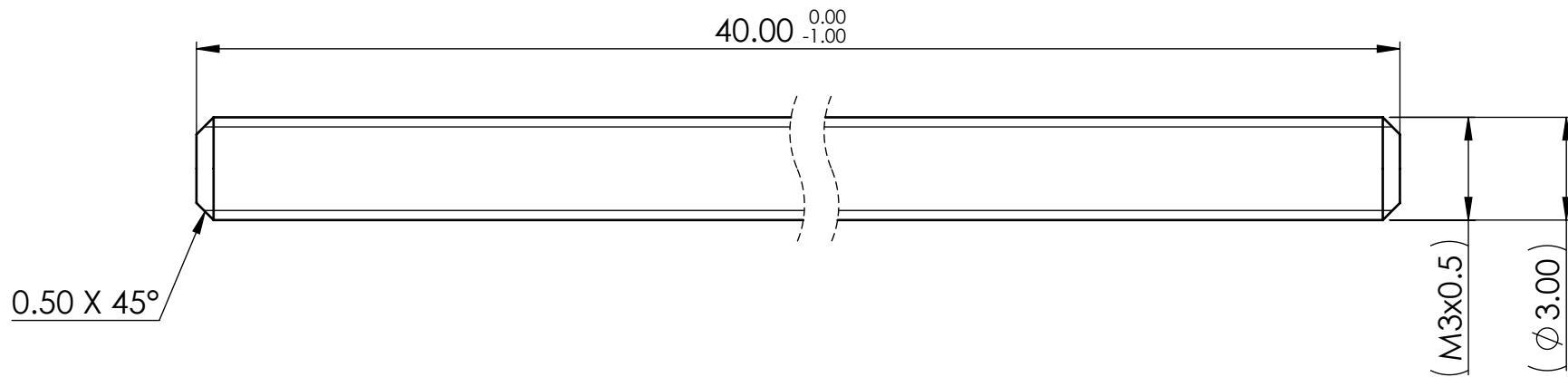
NOTE:

1. MATERIAL: T-SLOTTED FRAME RAIL, MCMASTER-CARR P/N: 5537T514-5537T751.
2. BOTH CUTTED SIDES SHALL BE FREE OF SHARP EDGES AND BURRS.
3. FOR MORE DIMENSIONS SEE CAD FILE: Structural Aluminum Profile 2020.SLDPRPT.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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		UNLESS OTHERWISE SPECIFIED:				
		BREAK ALL SHARP EDGES		DRAWN		
		DIMENSIONS ARE IN MILLIMETERS		CHECKED		
		TOLERANCES:		ENG APPR.		
		FRACTIONAL \pm		MFG APPR.		
		ANGULAR: MACH \pm BEND \pm		Q.A.		
		TWO PLACE DECIMAL \pm		COMMENTS:		
		THREE PLACE DECIMAL \pm		Vladimir Tyrkin veres.pcb@gmail.com		
		INTERPRET GEOMETRIC TOLERANCING PER:				
		MATERIAL				
		6063-T5				
NEXT ASSY	USED ON	FINISH	As machined			
APPLICATION		DO NOT SCALE DRAWING				

SIZE	DWG. NO.	REV
A	CNC.01.11	
SCALE: 1:2	WEIGHT: 168.96	SHEET 1 OF 1



NOTE:

1. MATERIAL: LOW-STRENGTH ZINC-PLATED STEEL THREADED ROD, MCMASTER-CARR P/N: 94595A235.
2. GENERAL TOLERANCE DIN ISO 2768-m.
3. AREAS WHERE MATERIAL HAS BEEN REMOVED SHALL HAVE SMOOTH TRANSITIONS AND BE FREE OF BURRS. SCRATCHES AND DENTS ARE NOT ACCEPTABLE AT THE THREAD.
4. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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OR AS A WHOLE WITHOUT THE WRITTEN
PERMISSION OF VR IS PROHIBITED.

		UNLESS OTHERWISE SPECIFIED:				
		BREAK ALL SHARP EDGES		DRAWN		
		DIMENSIONS ARE IN MILLIMETERS		CHECKED		
		TOLERANCES:		ENG APPR.		
		FRACTIONAL ±		MFG APPR.		
		ANGULAR: MACH ± BEND ±		Q.A.		
		TWO PLACE DECIMAL ±		COMMENTS:		
		THREE PLACE DECIMAL ±		Vladimir Tyrkin veres.pcb@gmail.com		
		INTERPRET GEOMETRIC TOLERANCING PER:				
		MATERIAL				
		Alloy Steel				
NEXT ASSY	USED ON	FINISH	As machined			
		APPLICATION	DO NOT SCALE DRAWING			

VR

VR

TITLE:

Threaded Rod M3

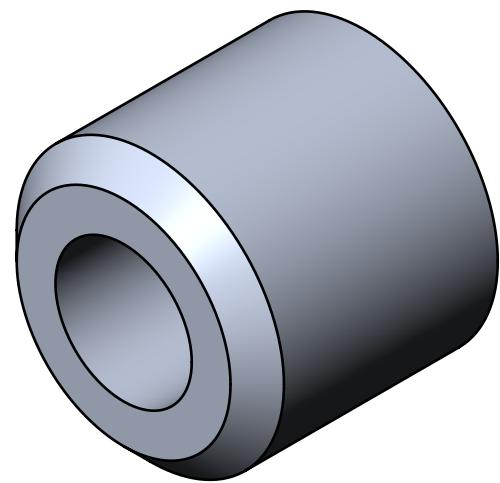
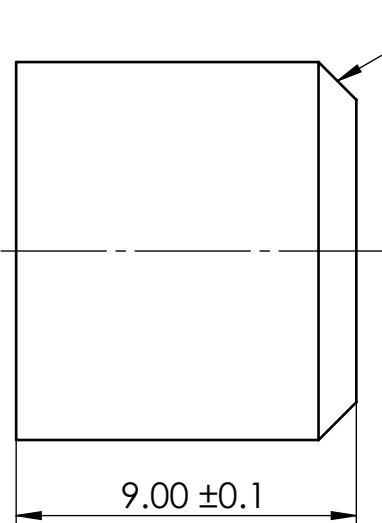
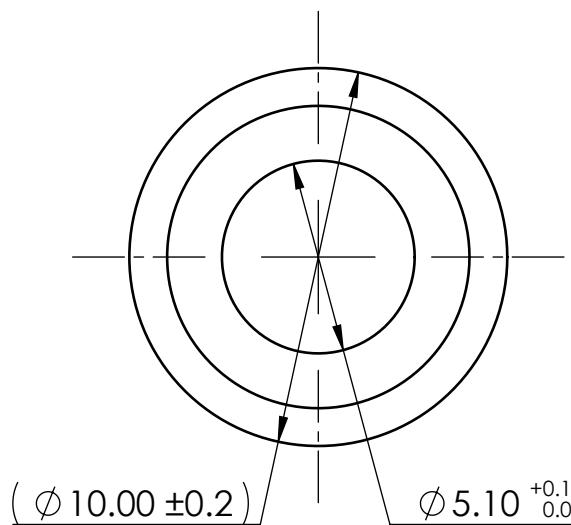
SIZE	DWG. NO.	REV
A	CNC.02.25	
SCALE: 2:1	WEIGHT: 2.16	SHEET 1 OF 1

2

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B

B



NOTE:

1. MATERIAL: MULTIPURPOSE 6061 ALUMINUM ROD. MCMASTER-CARR P/N: 4634T36.
2. GENERAL TOLERANCE DIN ISO 2768-m.
3. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

A

A

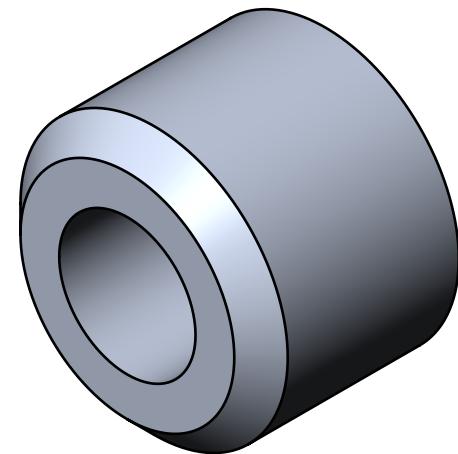
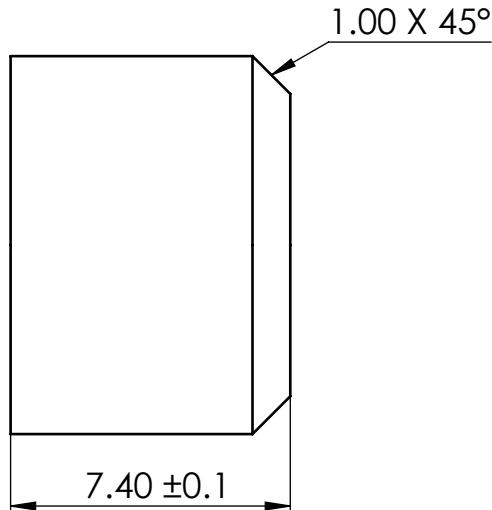
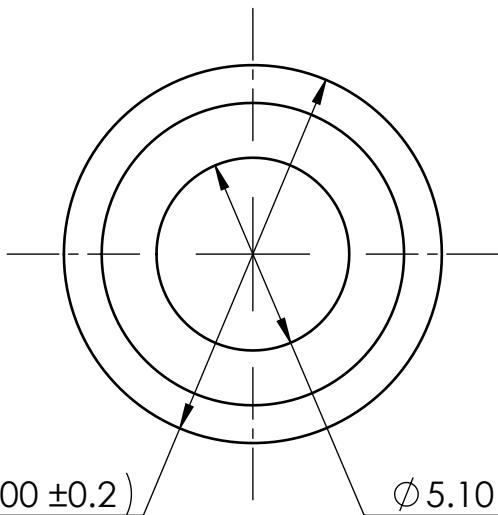
		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	VR TITLE: Wheel Spacer 2 SIZE DWG. NO. REV A CNC.02.43 SCALE: 5:1 WEIGHT: 1.37 SHEET 1 OF 1	
		BREAK ALL SHARP EDGES	DRAWN				
		DIMENSIONS ARE IN MILLIMETERS	CHECKED				
		TOLERANCES:	ENG APPR.				
		FRACTIONAL ±	MFG APPR.				
		ANGULAR: MACH ± BEND ±	Q.A.				
		TWO PLACE DECIMAL ±	COMMENTS:				
		THREE PLACE DECIMAL ±					
		INTERPRET GEOMETRIC					
		TOLERANCING PER:					
		MATERIAL					
		6061-T6 (SS)					
NEXT ASSY	USED ON	FINISH					
		As machined					
APPLICATION		DO NOT SCALE DRAWING					
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF VR. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF VR IS PROHIBITED.		Vladimir Tyrkin veres.pcb@gmail.com					

2

1

2

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NOTE:

1. MATERIAL: MULTIPURPOSE 6061 ALUMINUM ROD. MCMASTER-CARR P/N: 4634T36.
2. GENERAL TOLERANCE DIN ISO 2768-m.
3. FOR MATERIALS AND MANUFACTURING LINKS REFER TO CNC_BOM.PDF

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OR AS A WHOLE WITHOUT THE WRITTEN
PERMISSION OF VR IS PROHIBITED.

		UNLESS OTHERWISE SPECIFIED:				
		BREAK ALL SHARP EDGES		DRAWN		
		DIMENSIONS ARE IN MILLIMETERS		CHECKED		
		TOLERANCES:		ENG APPR.		
		FRACTIONAL ±		MFG APPR.		
		ANGULAR: MACH ± BEND ±		Q.A.		
		TWO PLACE DECIMAL ±		COMMENTS:		
		THREE PLACE DECIMAL ±		Vladimir Tyrkin veres.pcb@gmail.com		
		INTERPRET GEOMETRIC TOLERANCING PER:				
		MATERIAL				
		6061-T6 (SS)				
NEXT ASSY	USED ON	FINISH				
		As machined				
APPLICATION		DO NOT SCALE DRAWING				

VR

VR

TITLE:

Wheel Spacer 1

SIZE	DWG. NO.	REV
A	CNC.02.22	
SCALE: 5:1	WEIGHT: 1.12	SHEET 1 OF 1

2

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