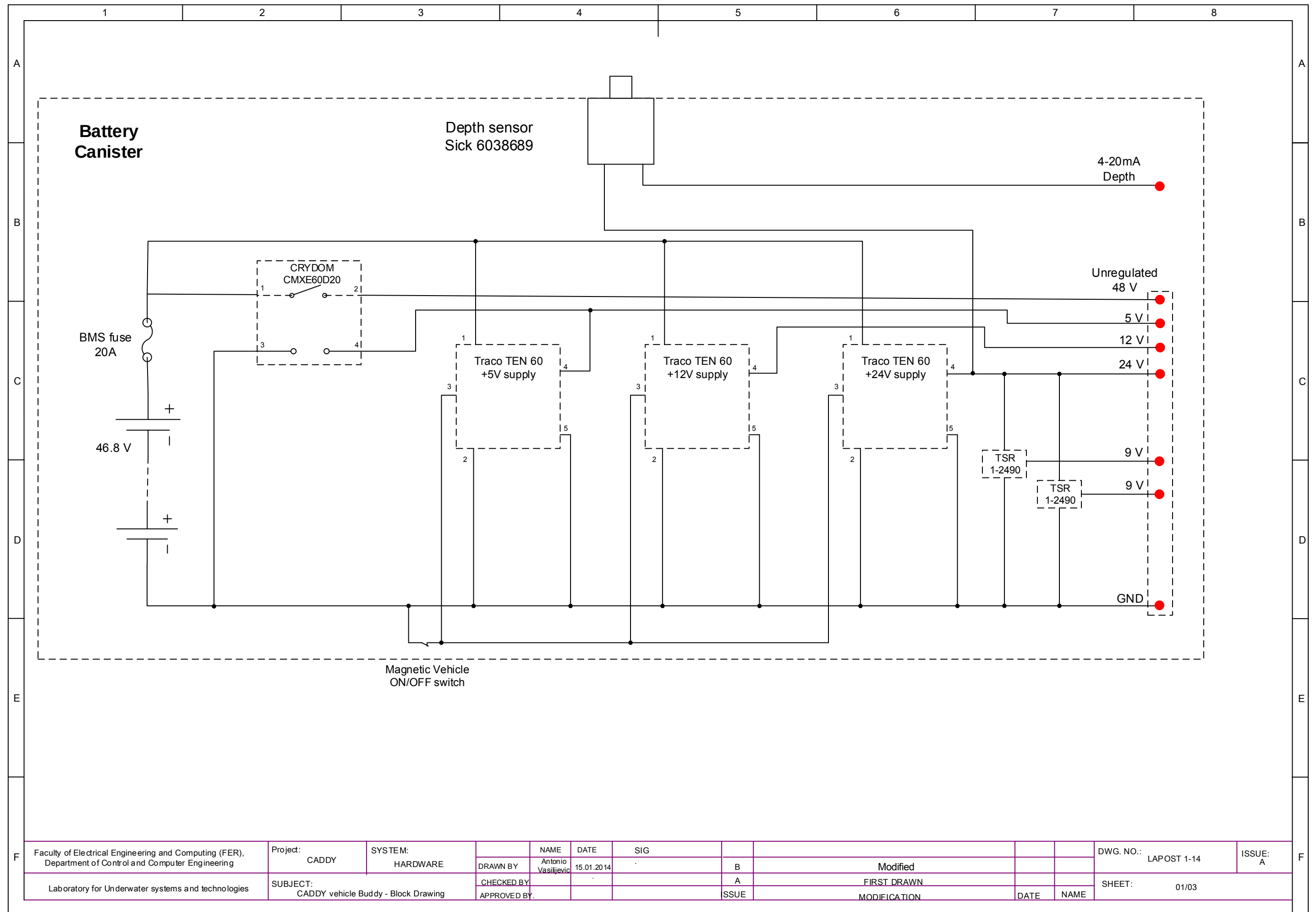
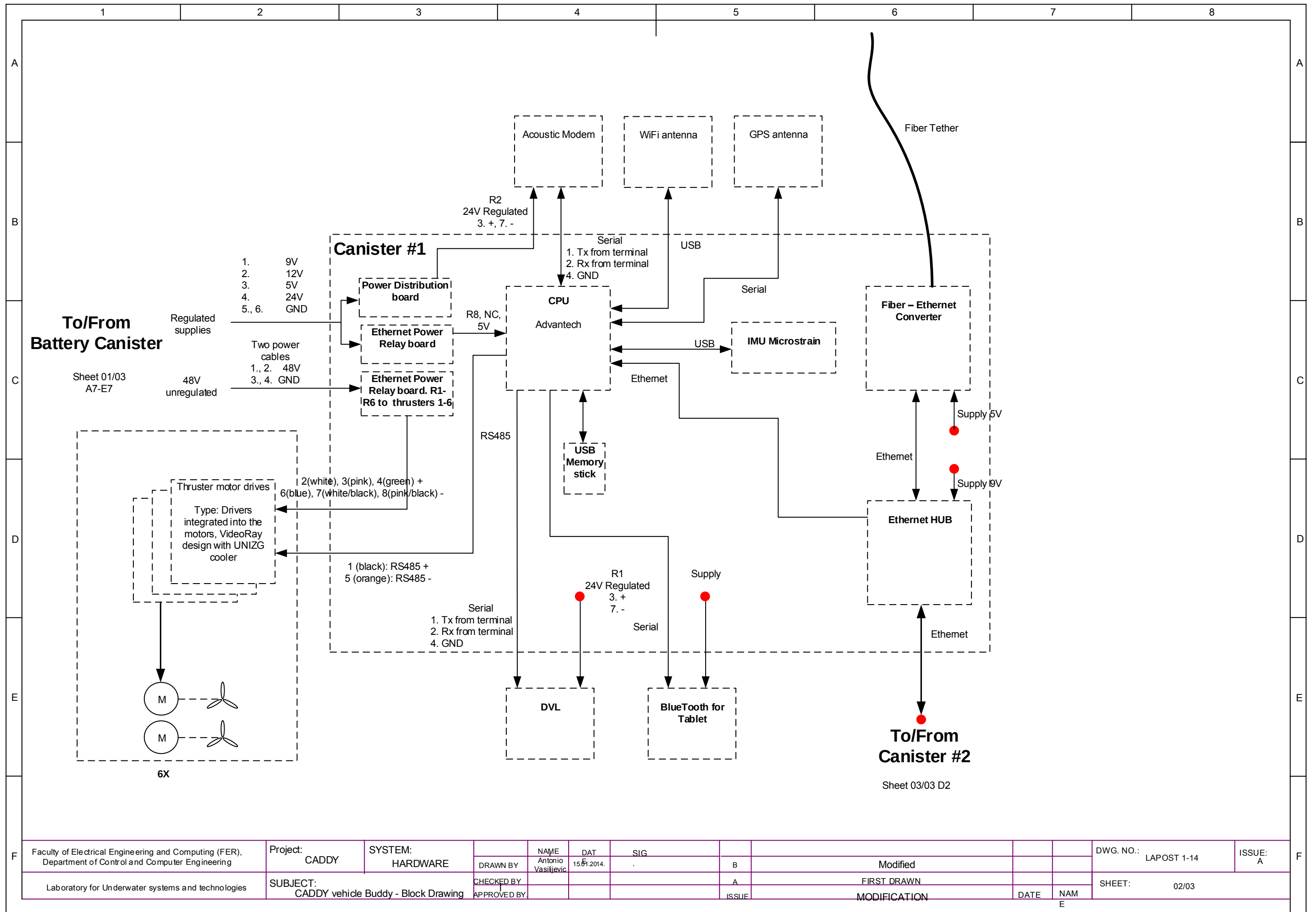


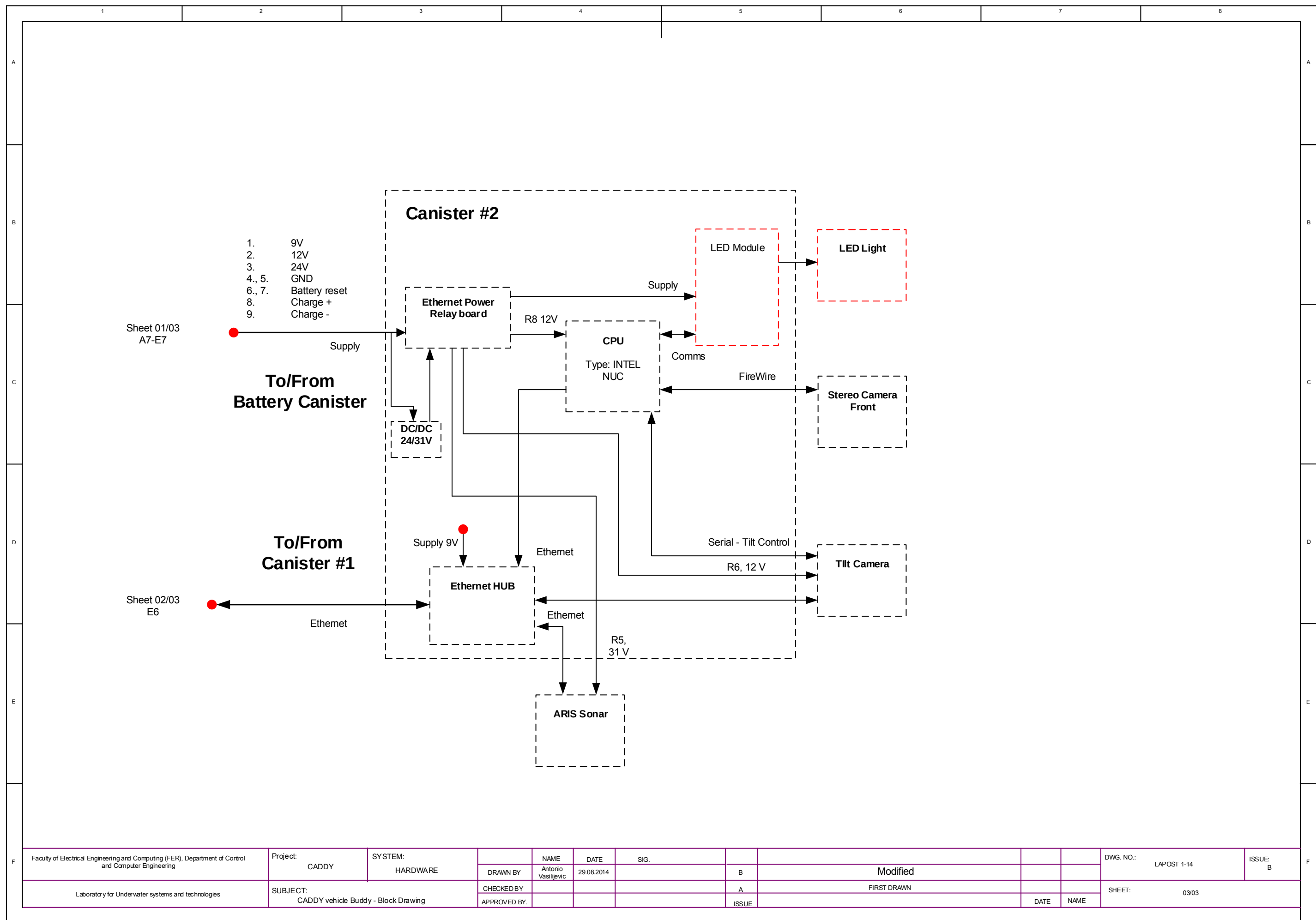
Battery canister - electric diagram

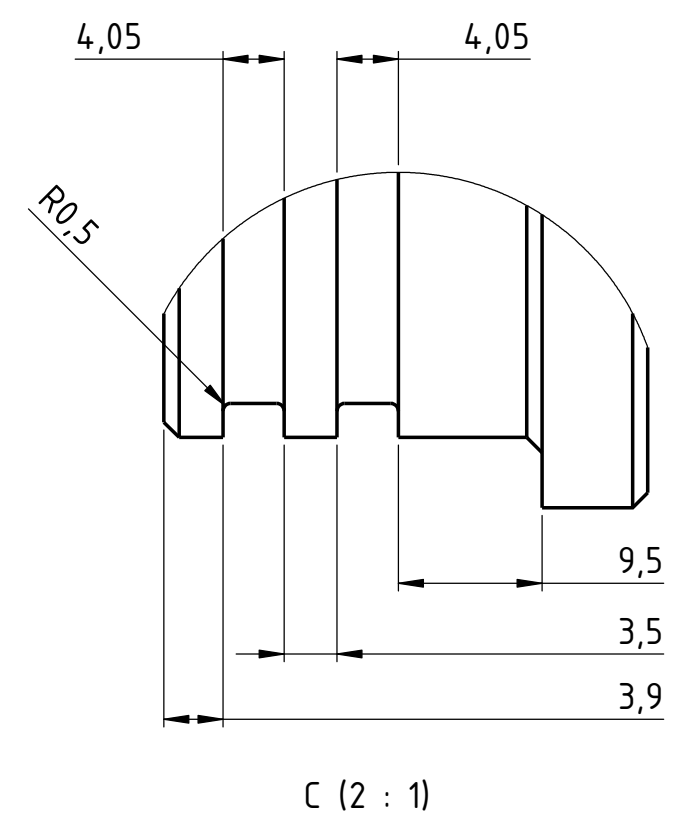
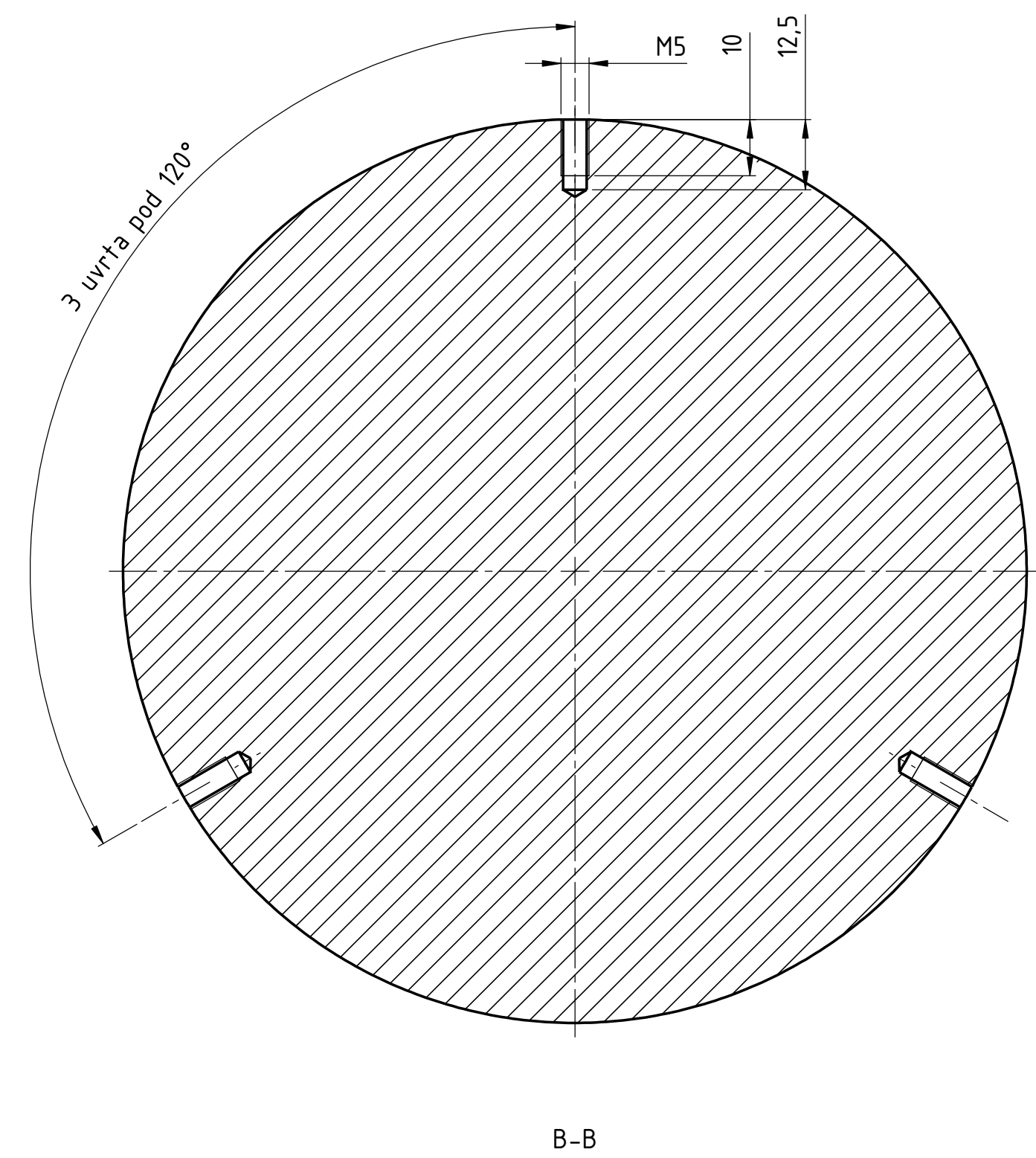
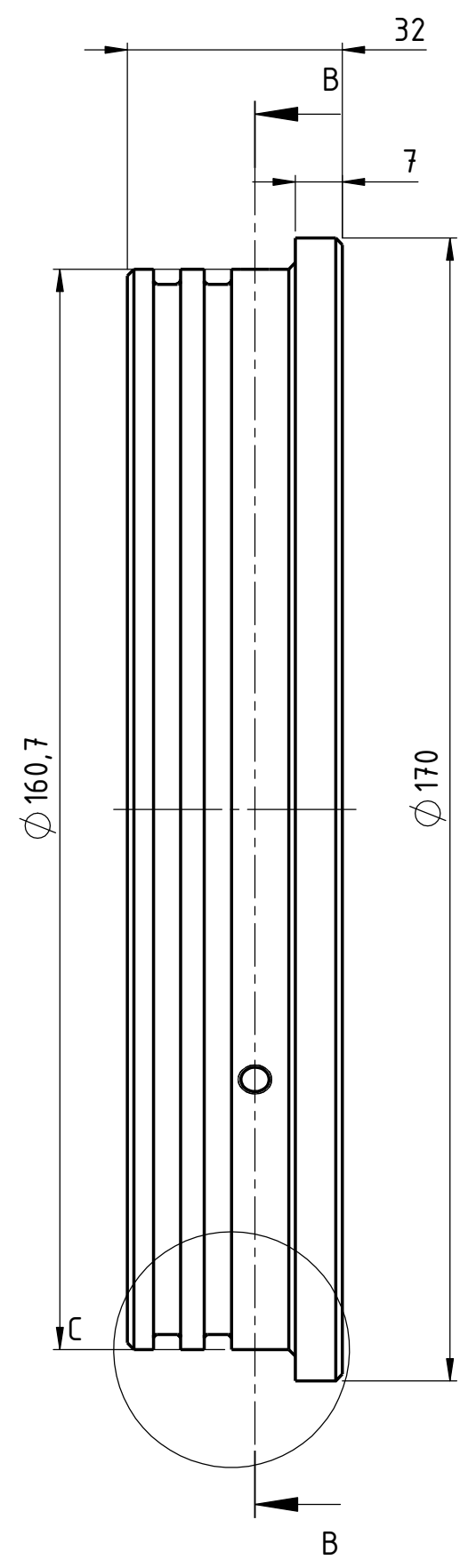


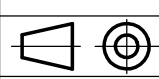
Master canister - electric diagram

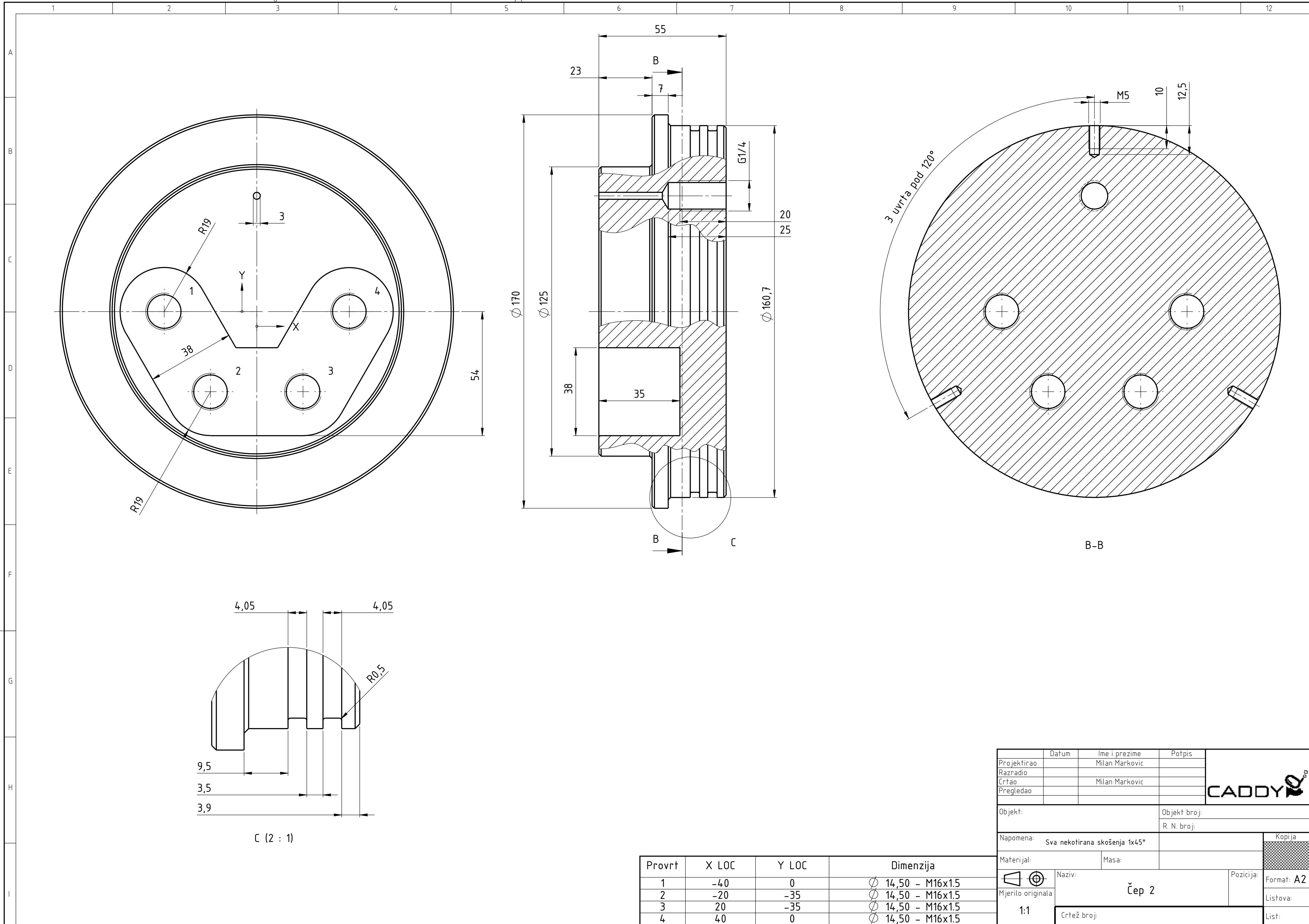


Vision canister - electric diagram



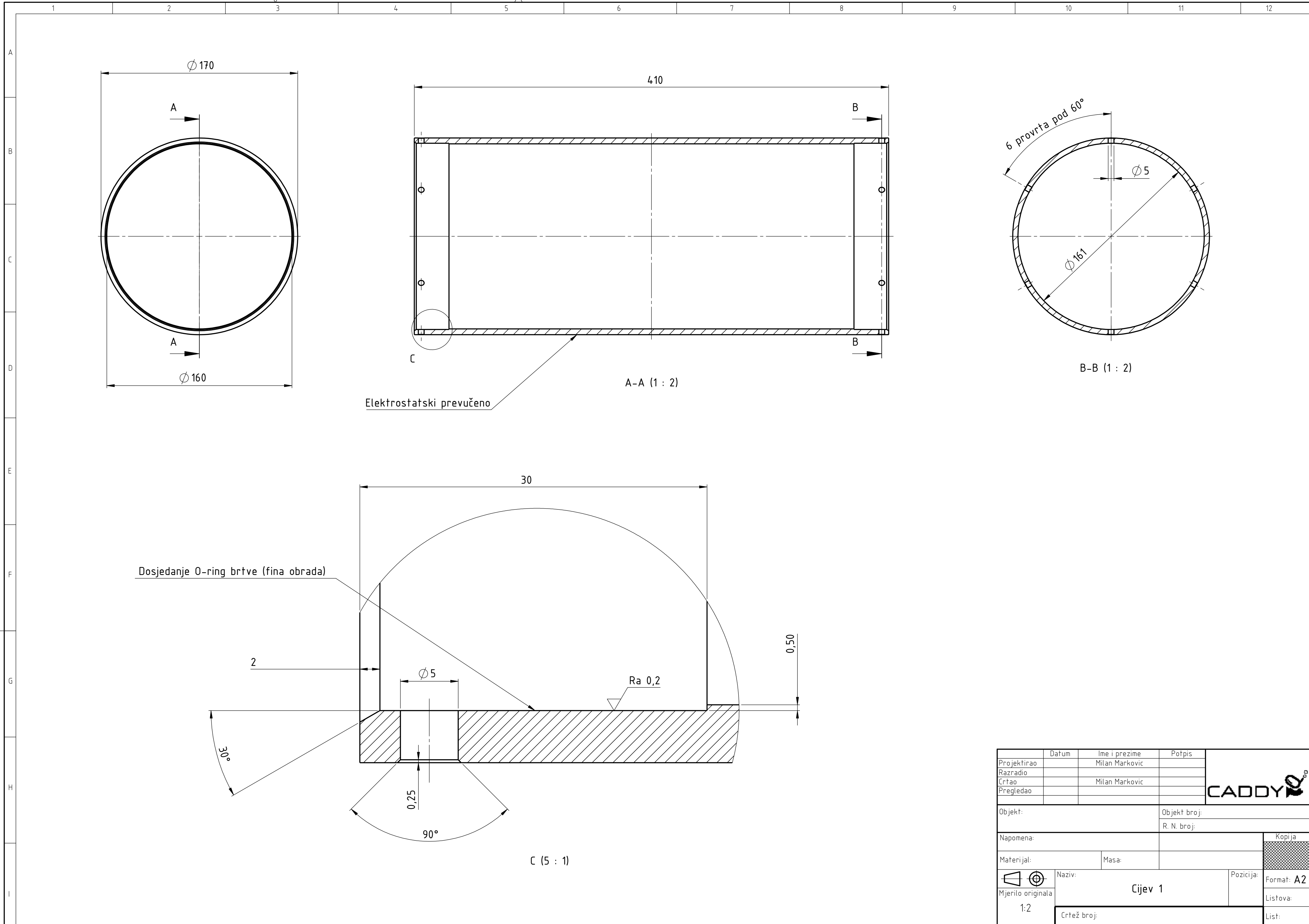


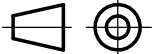
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Projektirao		Milan Markovic		
Razradio				
Crtao		Milan Markovic		
Pregledao				
Objekt:		Objekt broj:		
		R. N. broj:		
Napomena:		Sva nekotirana skošenja 1x45°		Kopija
Materijal:		Masa:		
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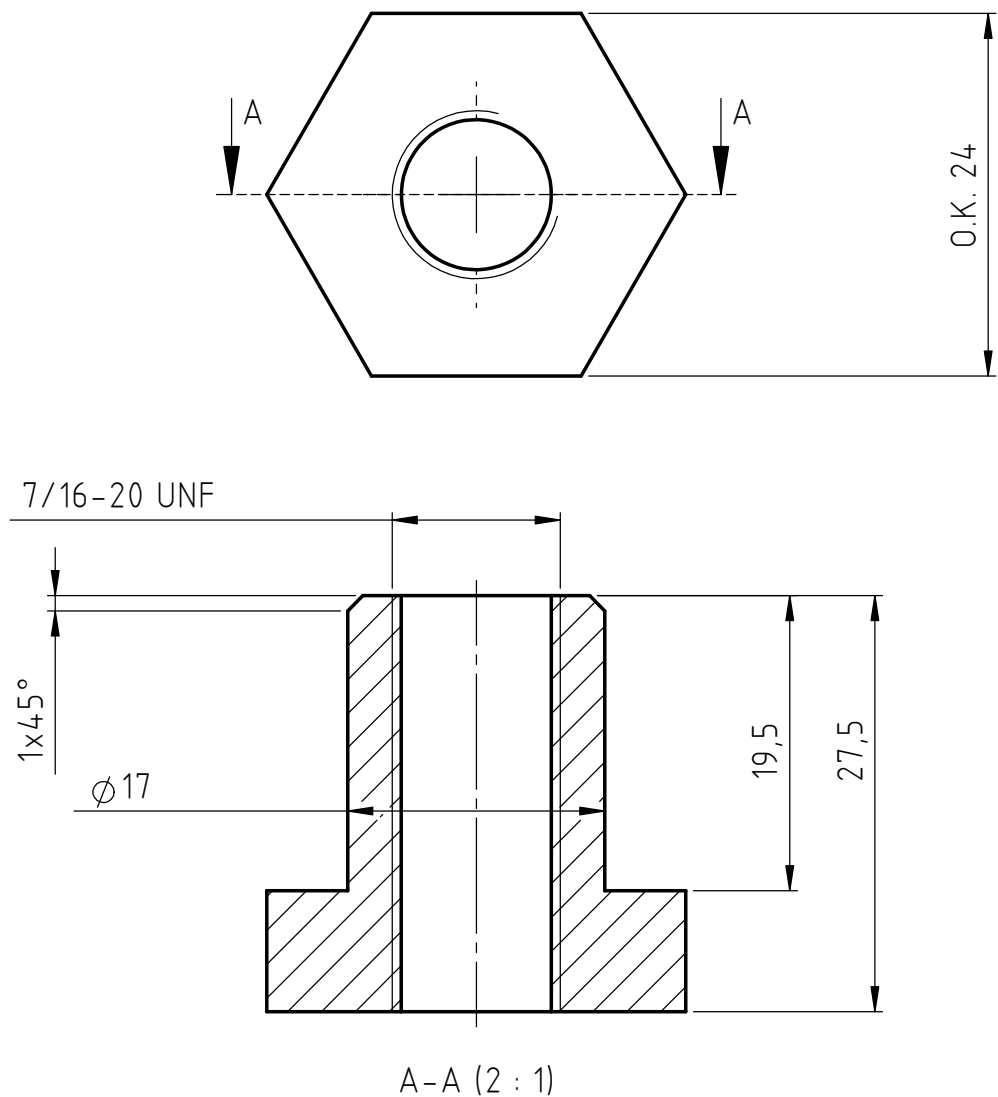
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Projekтирао		Milan Markovic		
Razradio				
Crtao		Milan Markovic		
Pregledao				
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			R. N. broj:	
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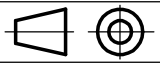
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2	-20	-35	Ø 14,50 - M16x1.5
3	20	-35	Ø 14,50 - M16x1.5
4	40	0	Ø 14,50 - M16x1.5

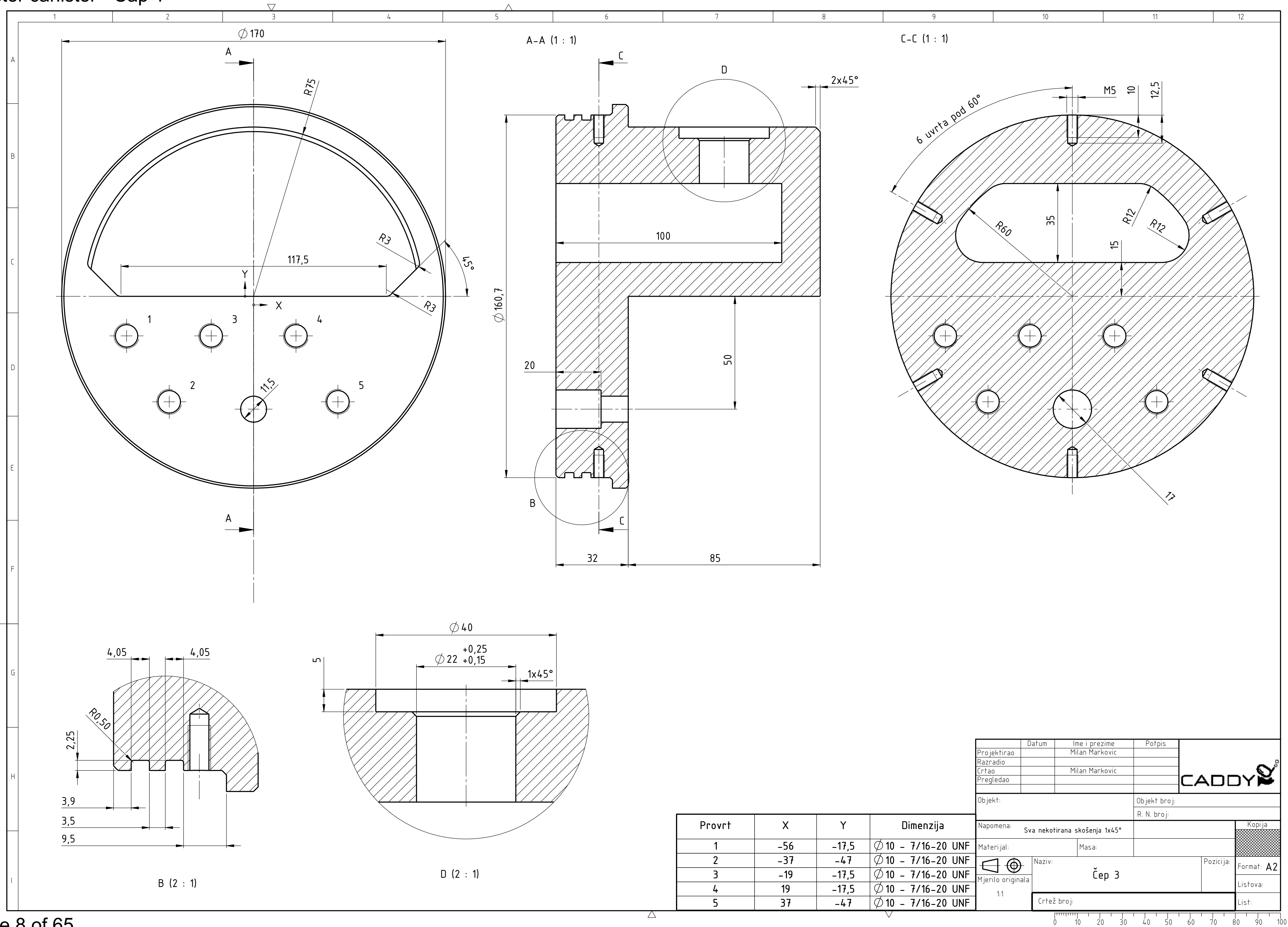


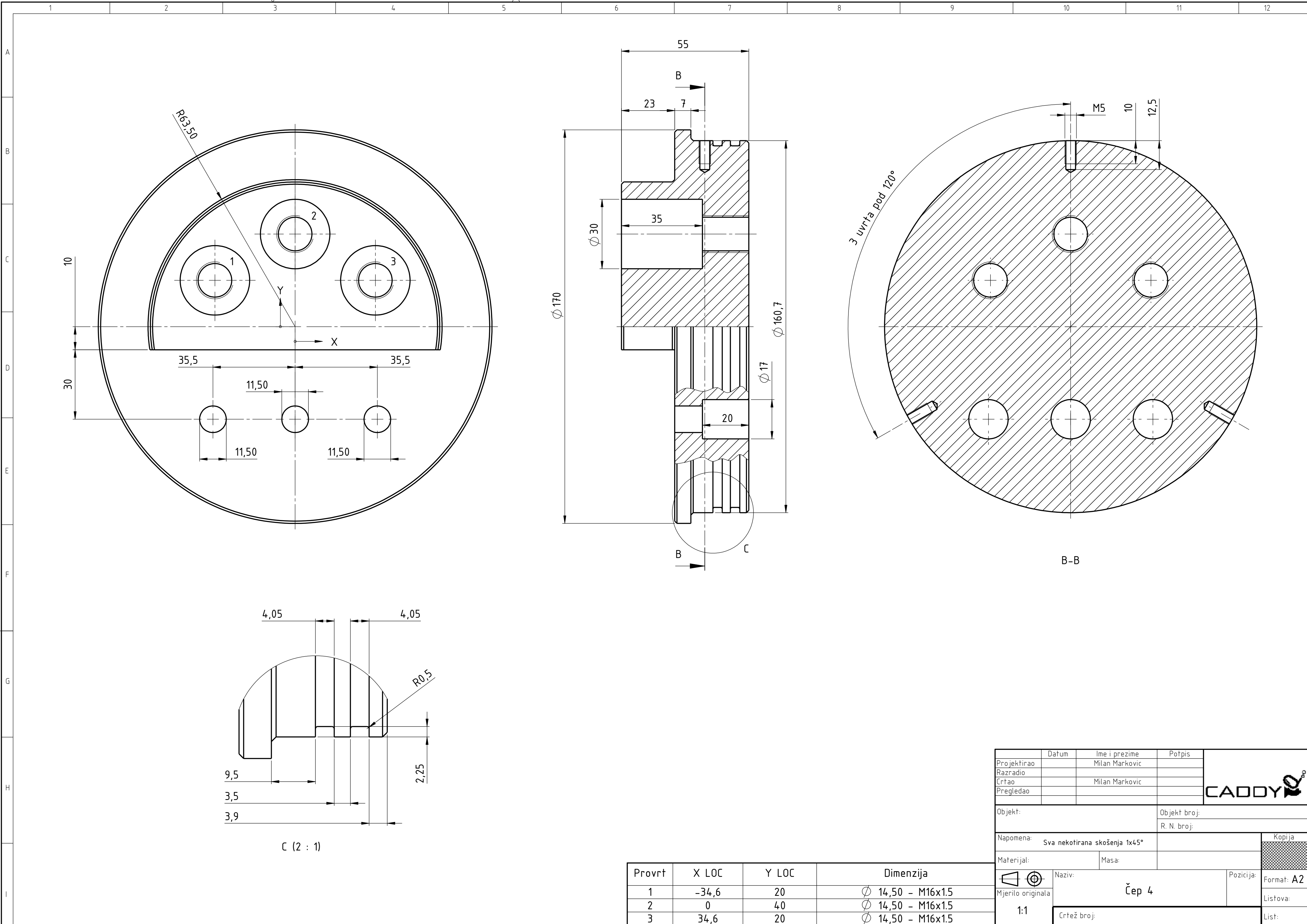
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Projekтираo		Milan Markovic		
Razradio				
Crtao		Milan Markovic		
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Nut for 9 pin Low Profile Bulkheads

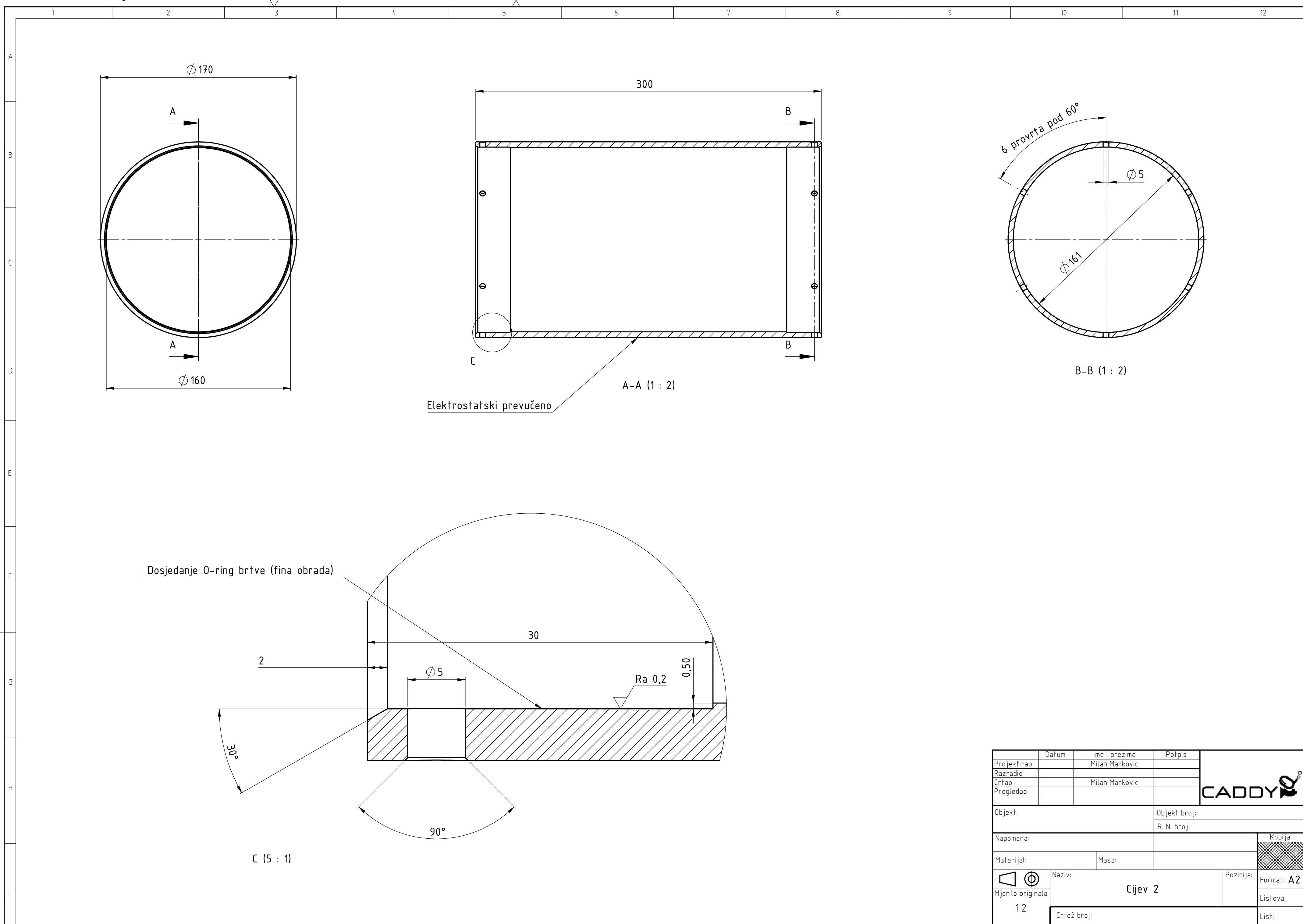


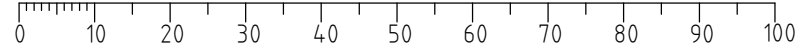
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Crtao		Milan Markovic		
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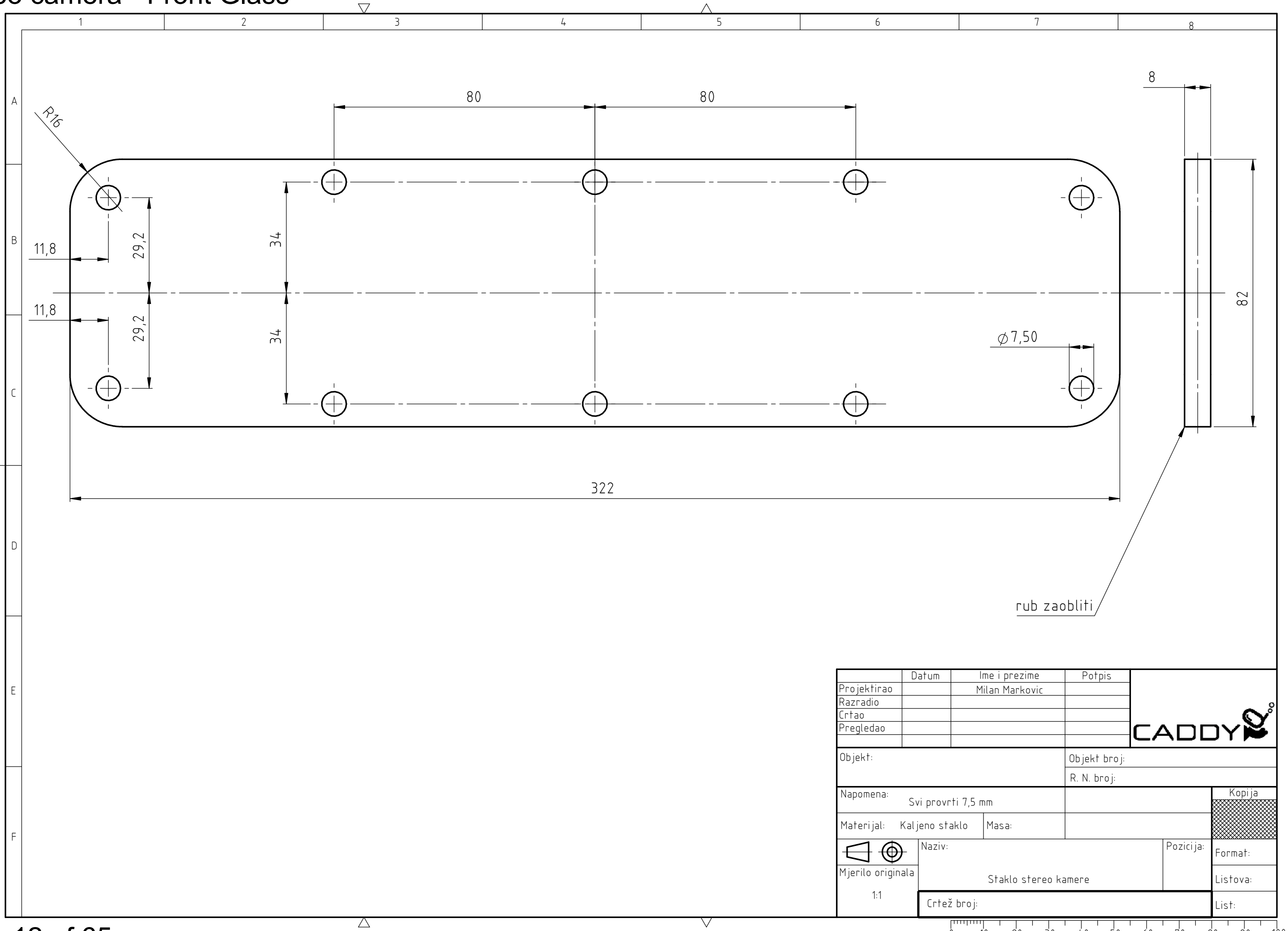




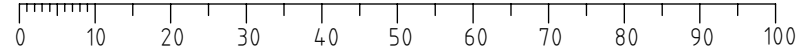
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Crtao		Milan Markovic		
Pregledao				
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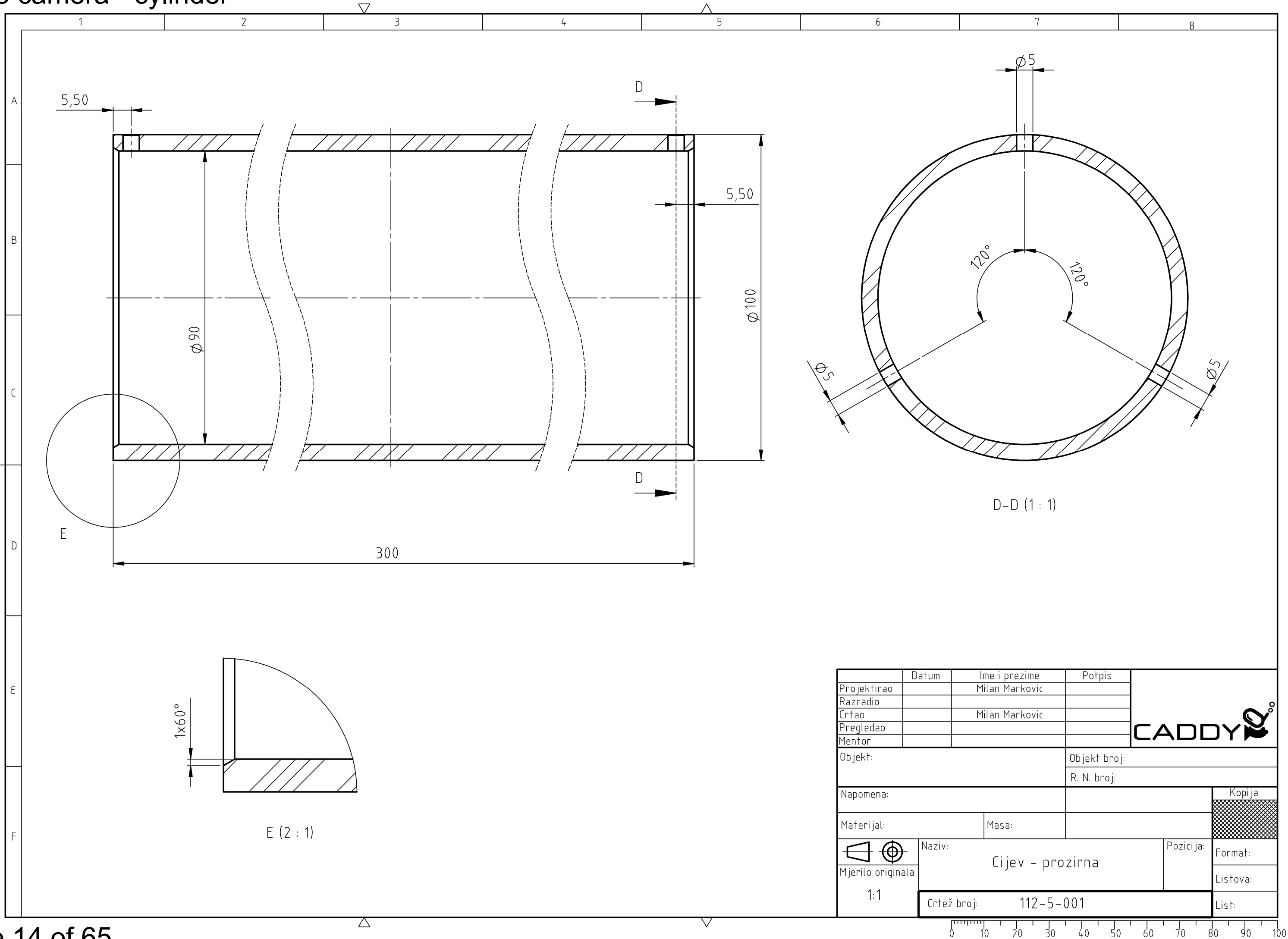


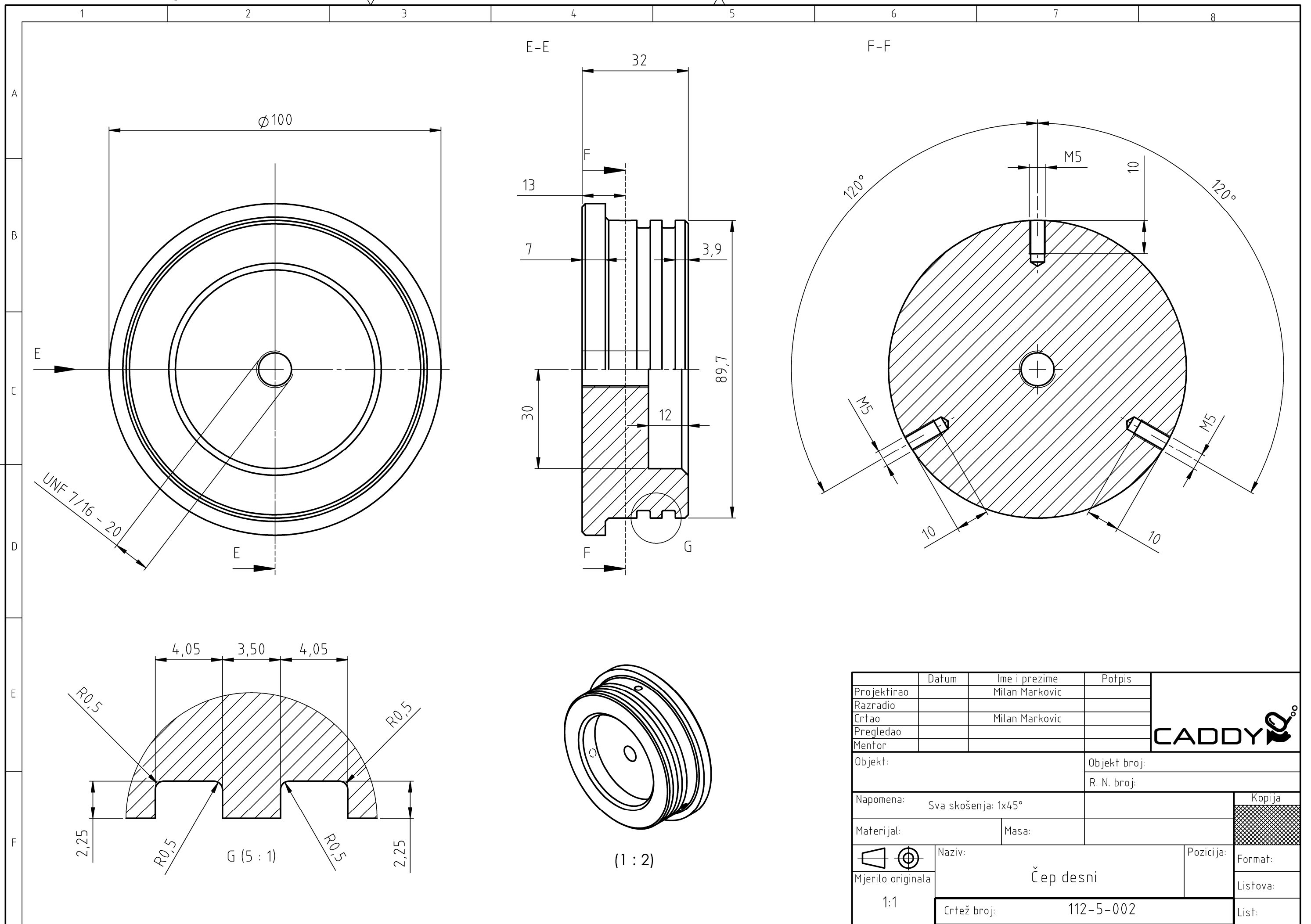


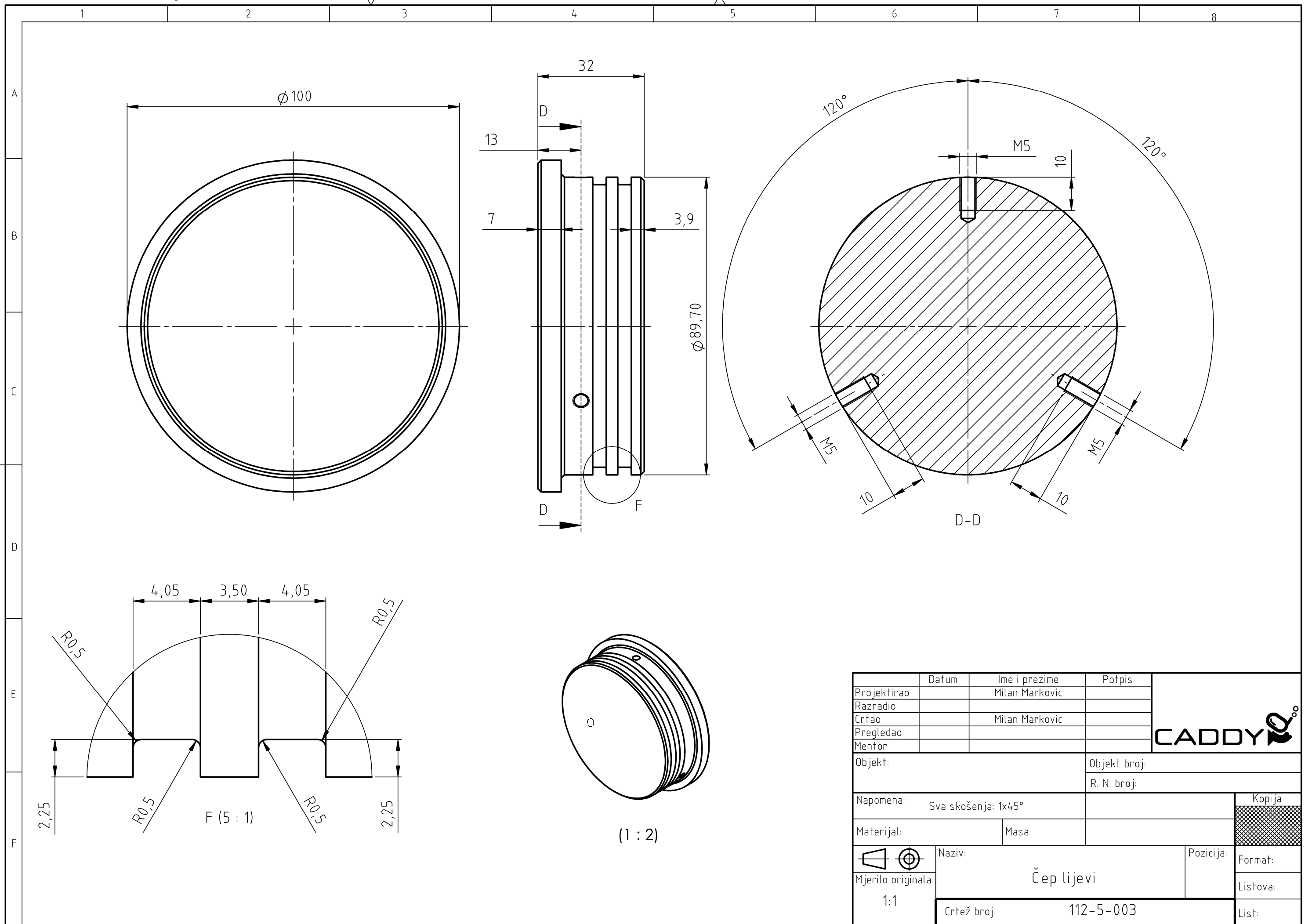


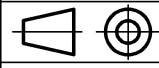
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Razradio					
Crtao					
Pregledao					
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Svi provrti 7,5 mm					
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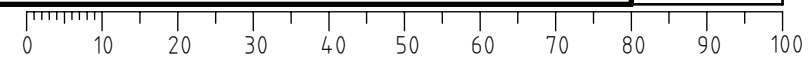
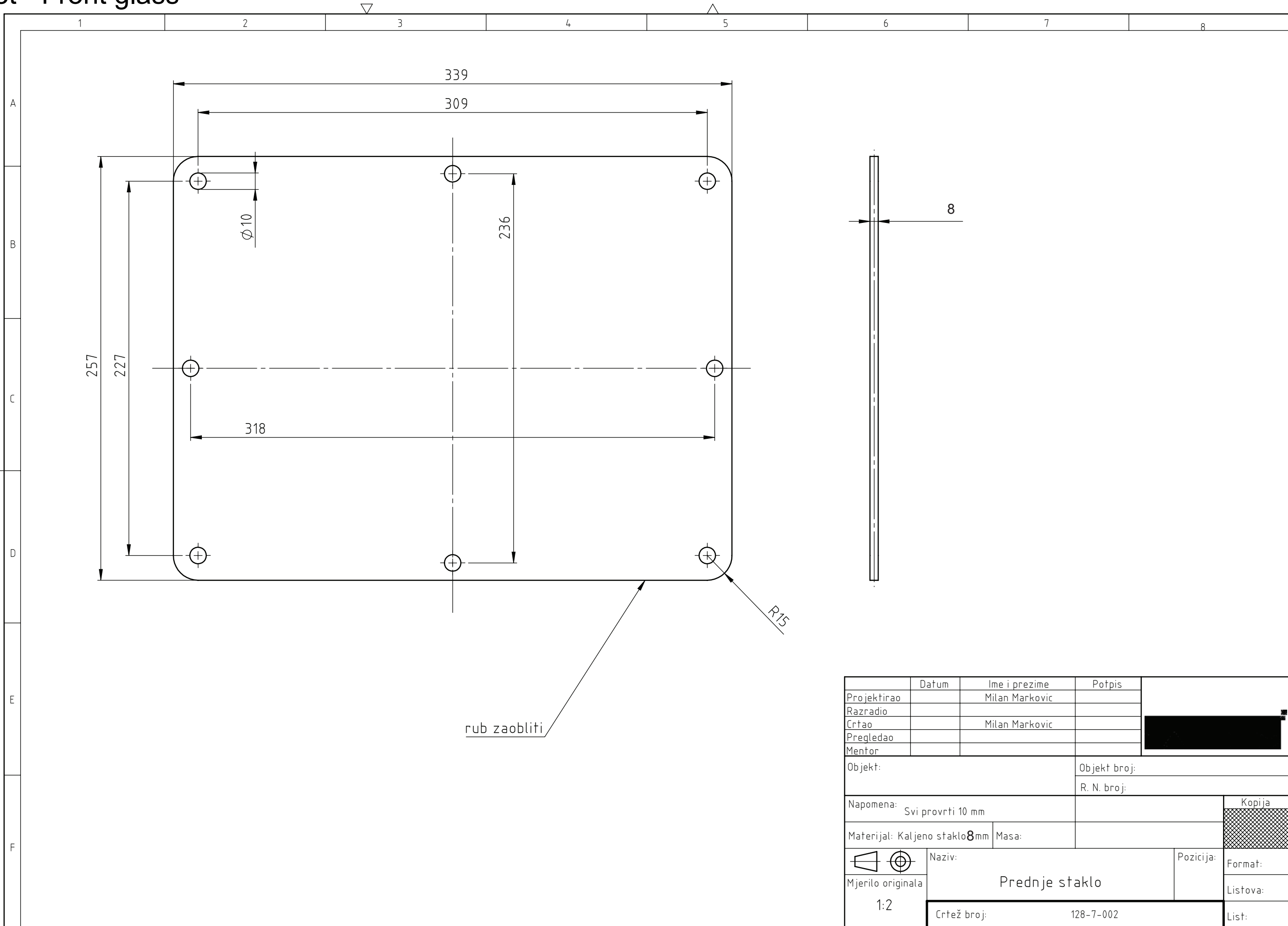


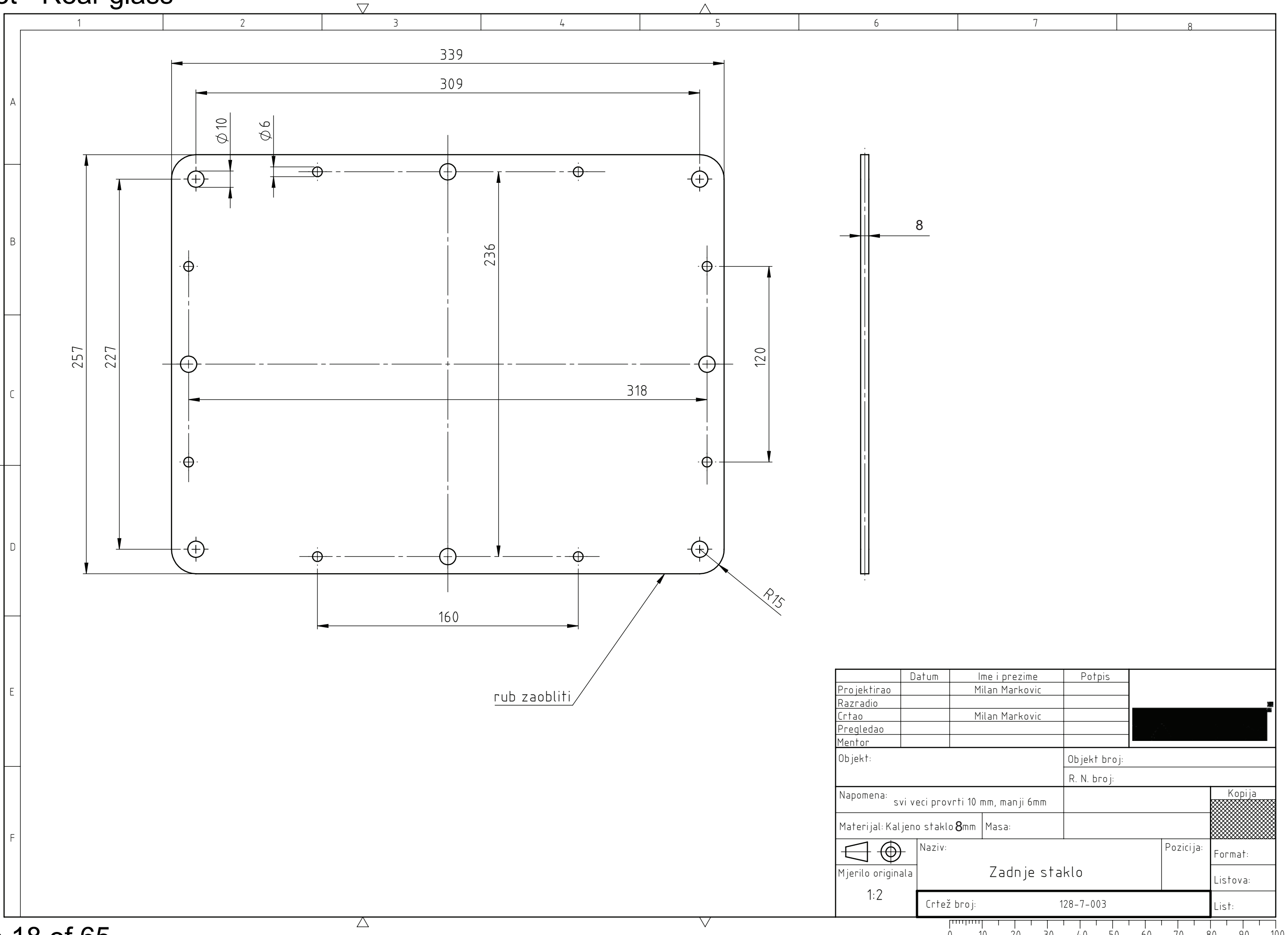


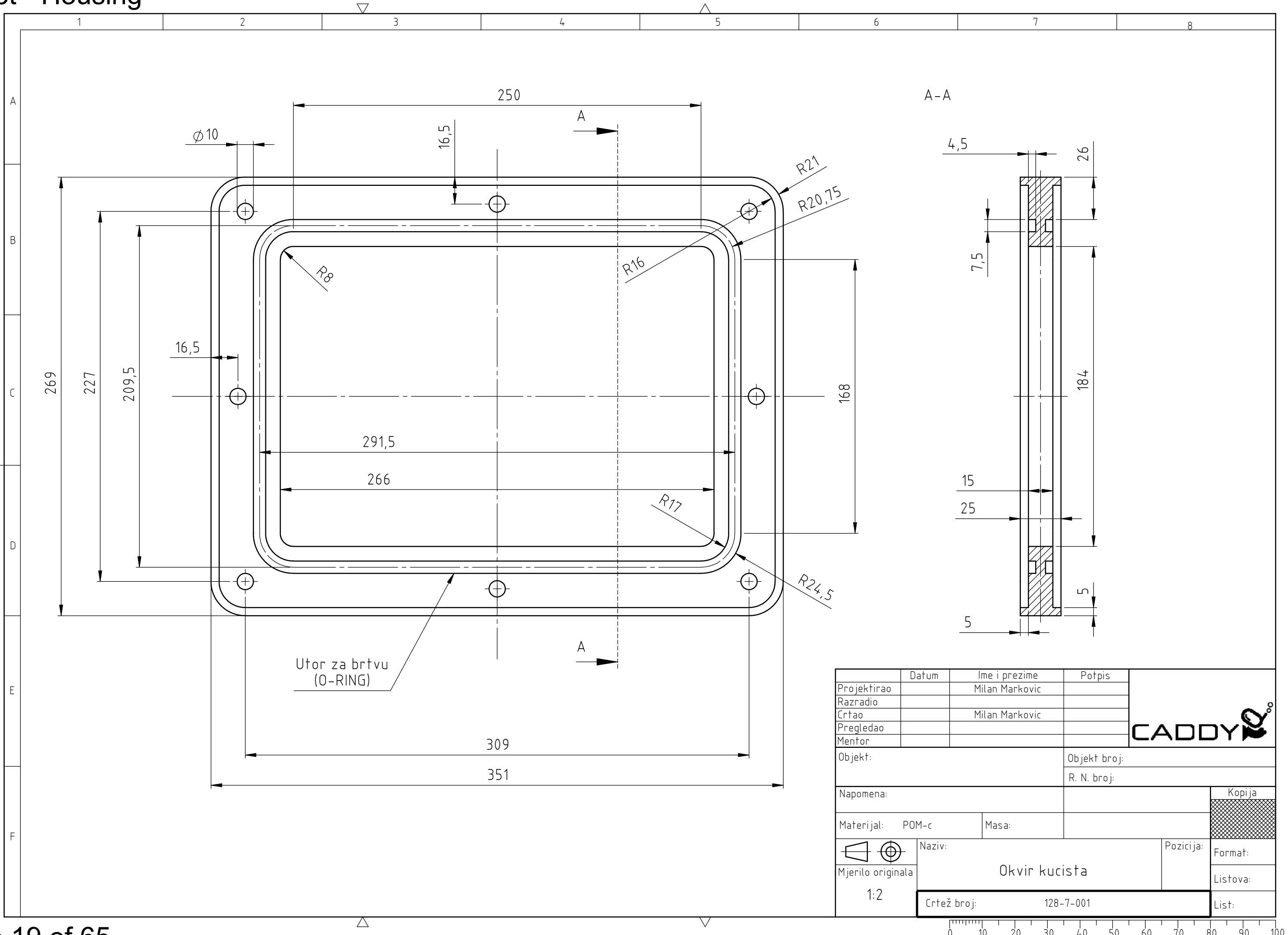


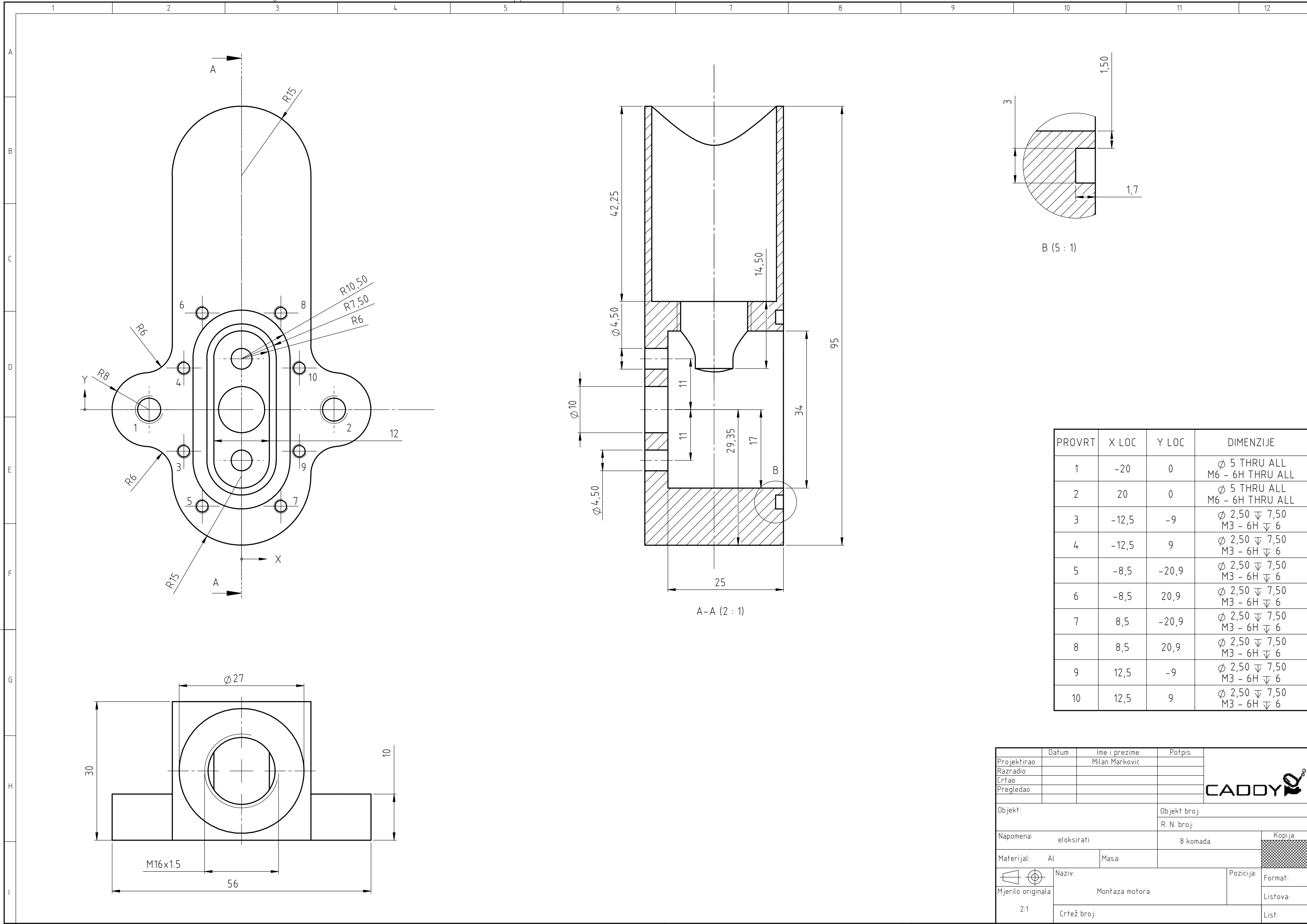


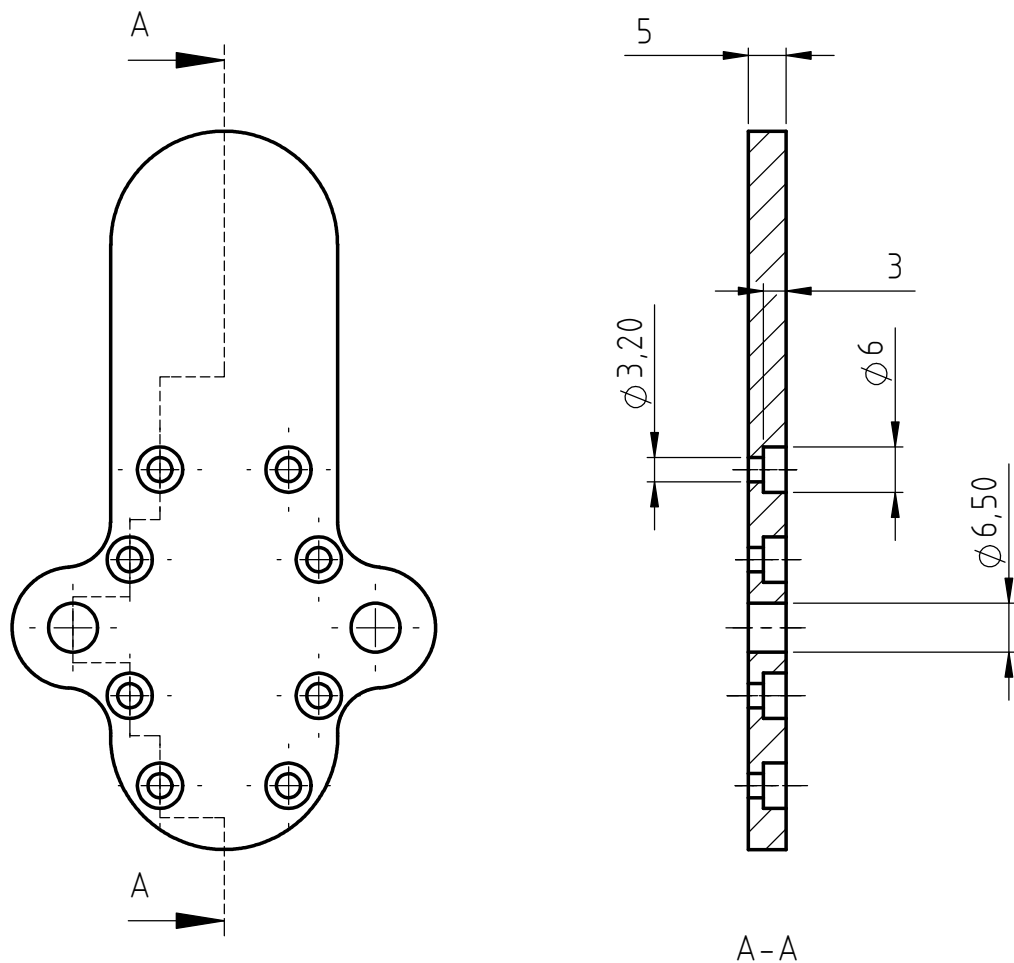
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Razradio				
Crtao		Milan Markovic		
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Mentor				
Objekt:			Objekt broj:	
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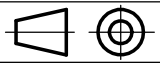


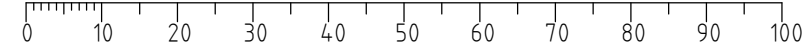
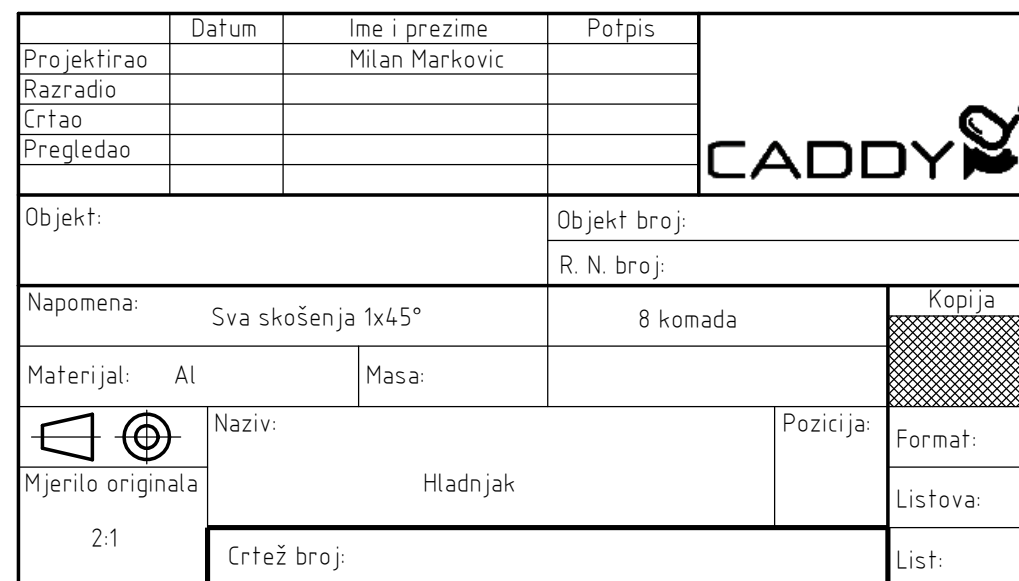
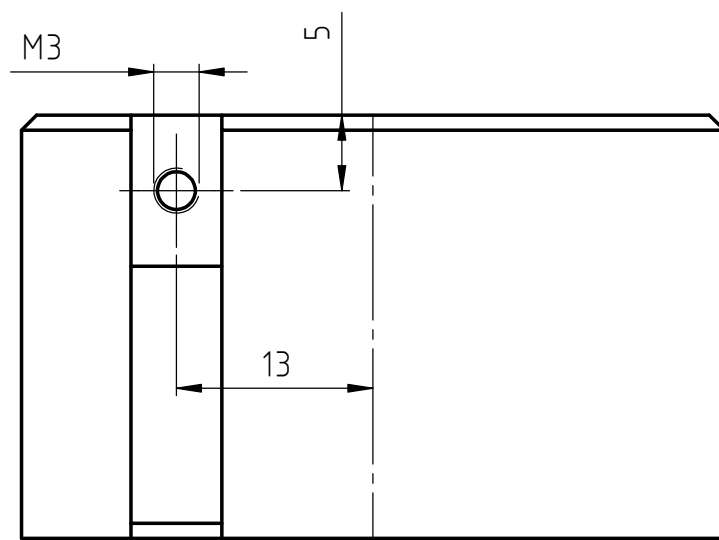


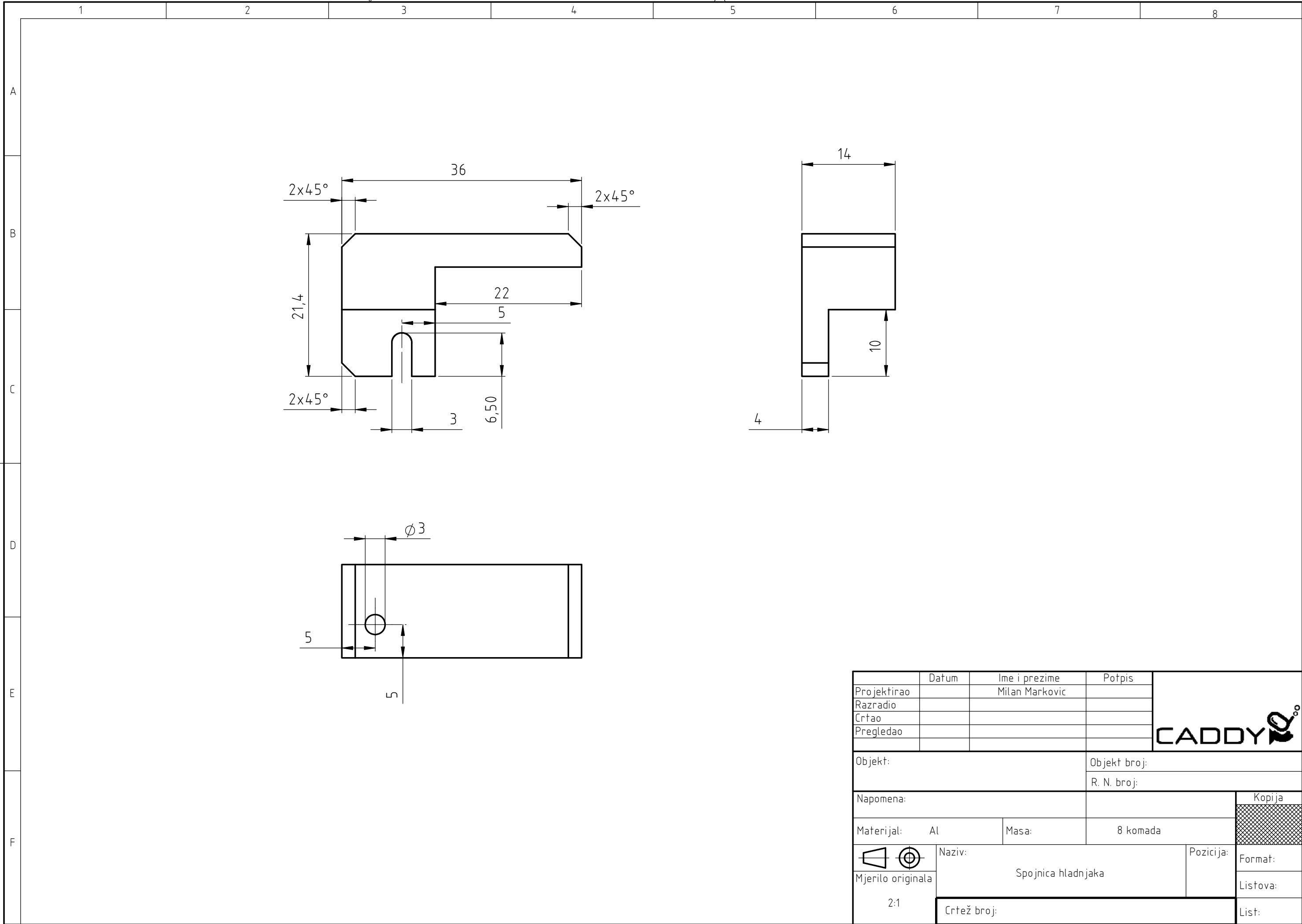




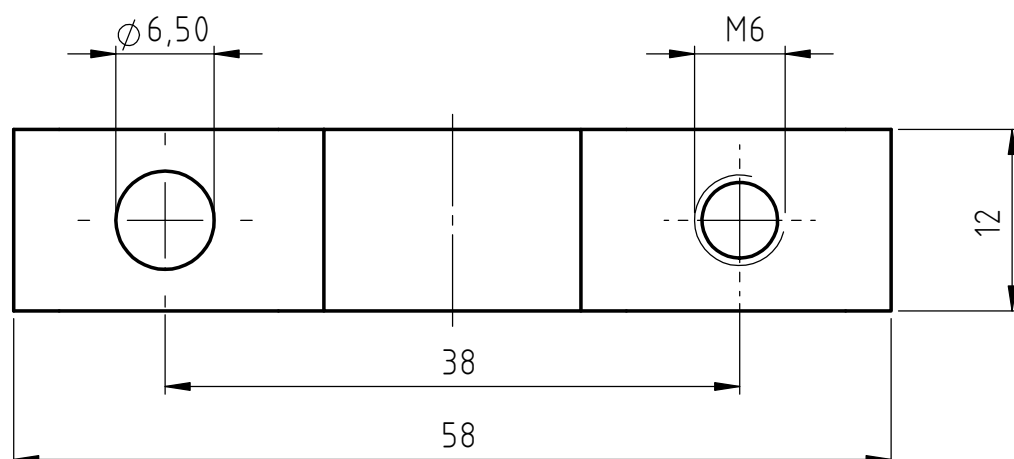
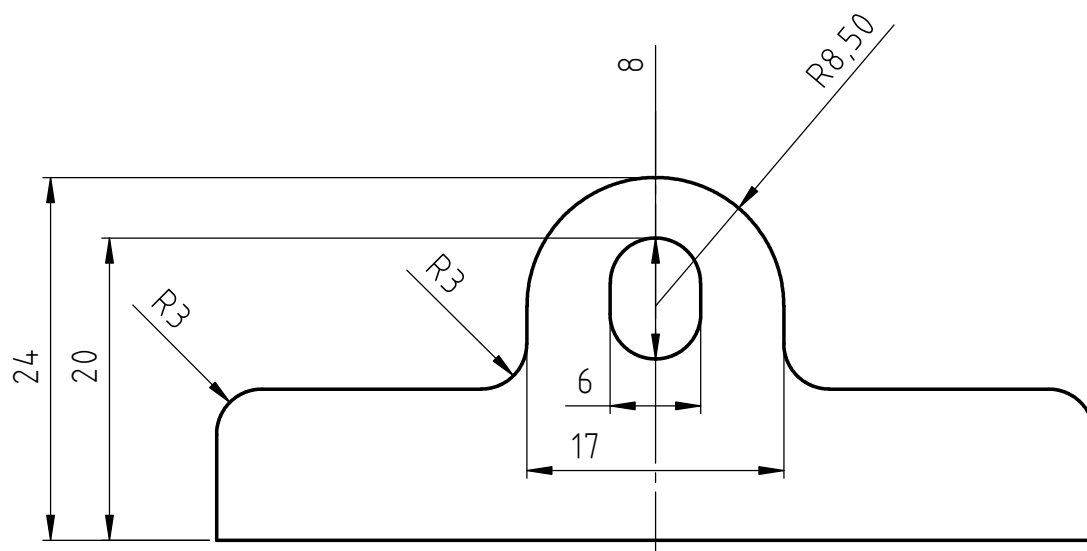


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Projektirao		Milan Markovic		
Razradio				
Crtao				
Pregledao				
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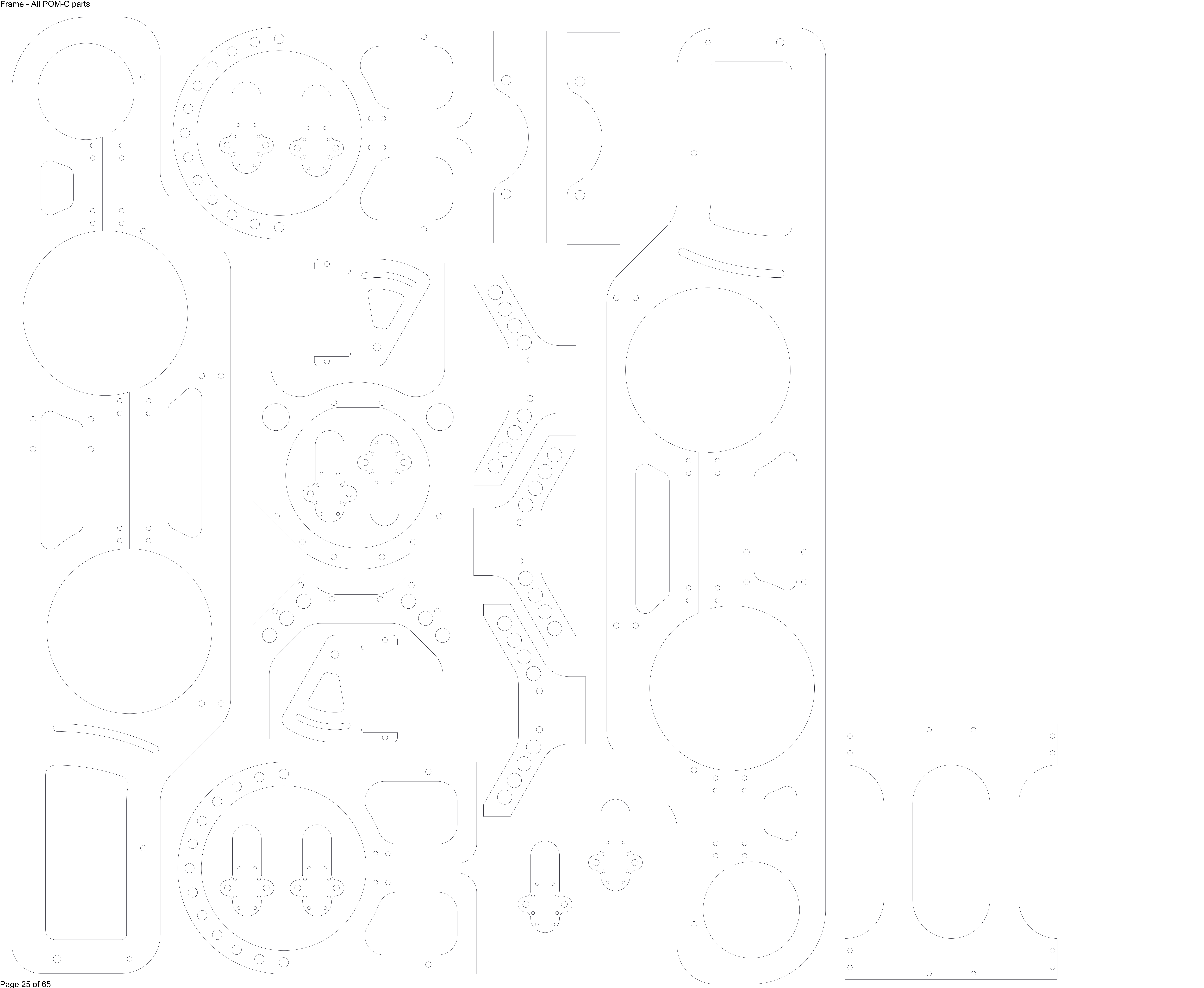


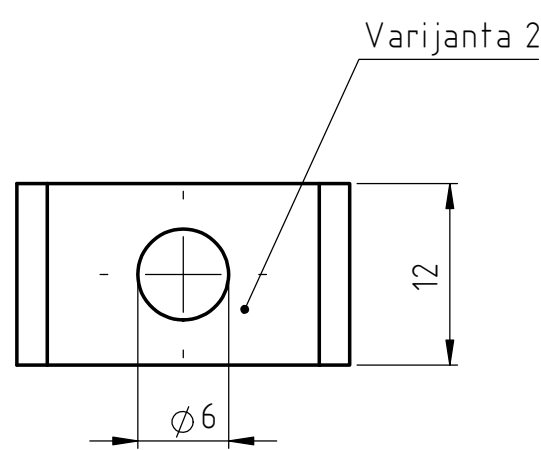
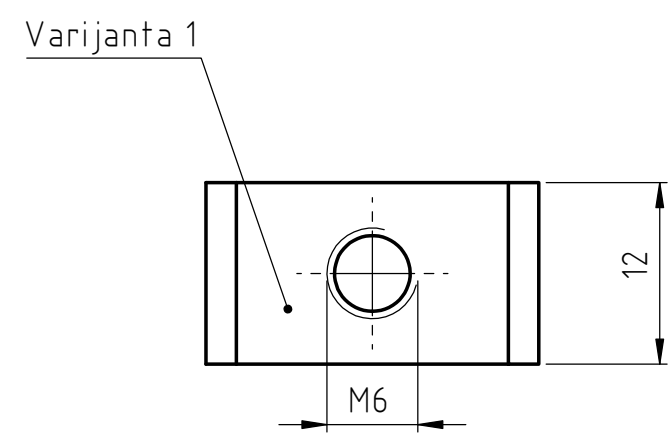
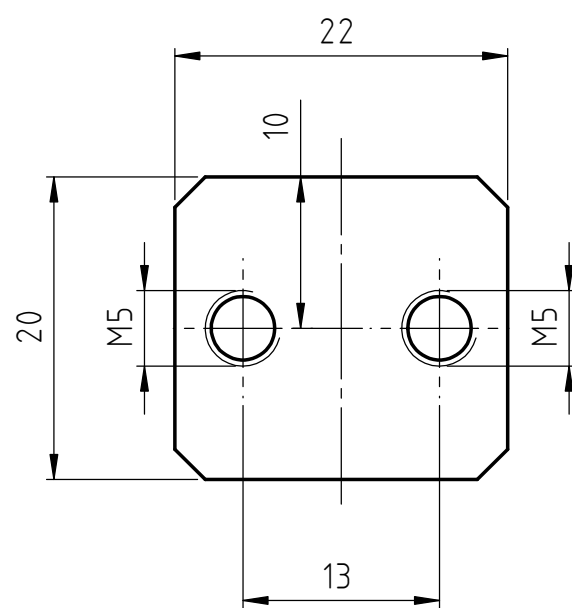
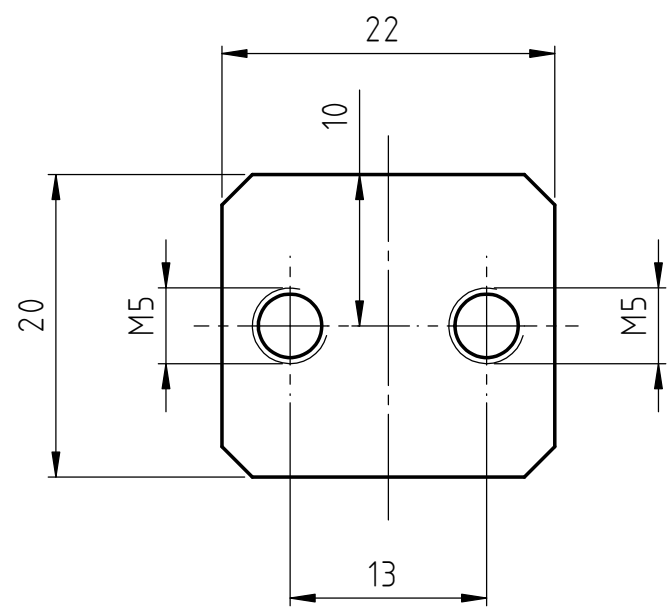


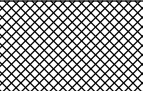
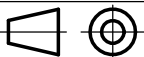
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Crtao					
Pregledao					
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			R. N. broj:		
Napomena:				Kopija	
Materijal:	Al	Masa:	8 komada		
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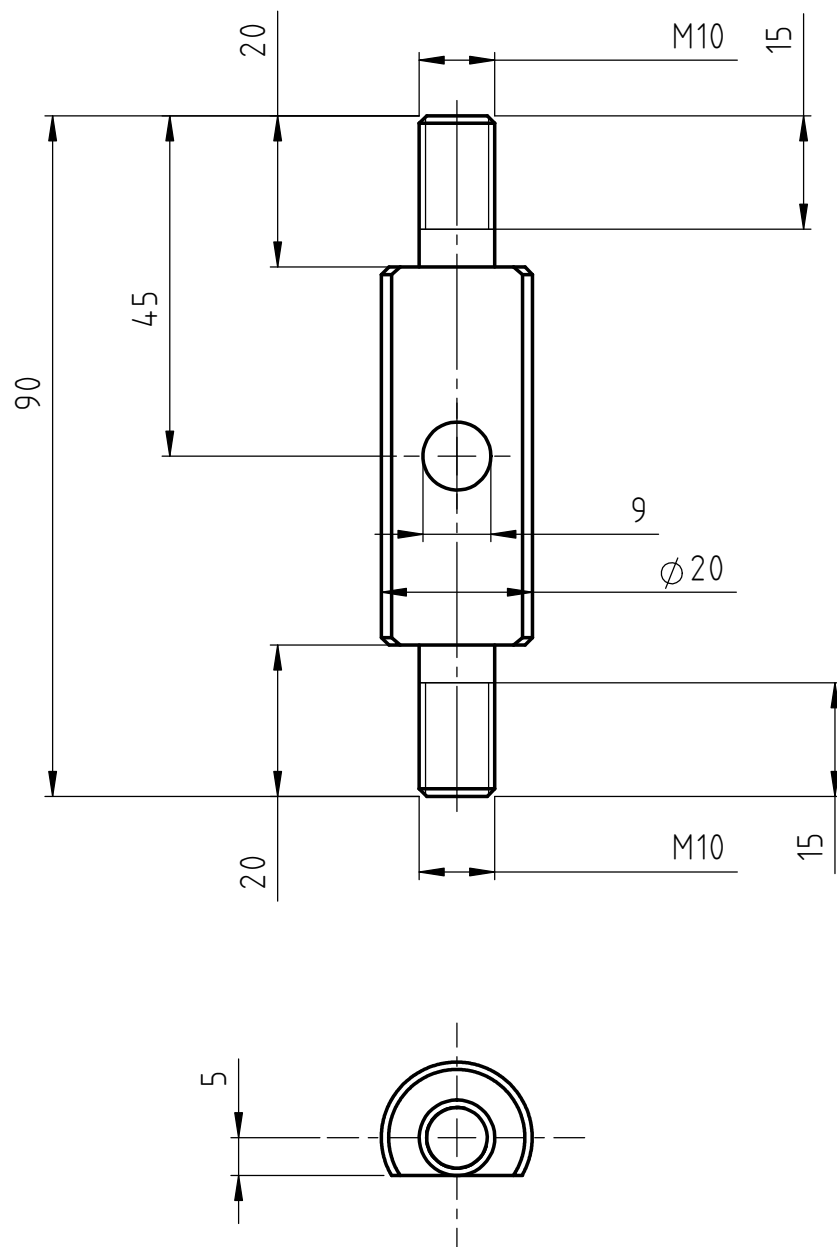


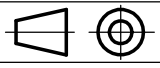
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Projektirao		Milan Markovic		
Razradio				
Crtao				
Pregledao				
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Napomena:			8 komada	Kopija
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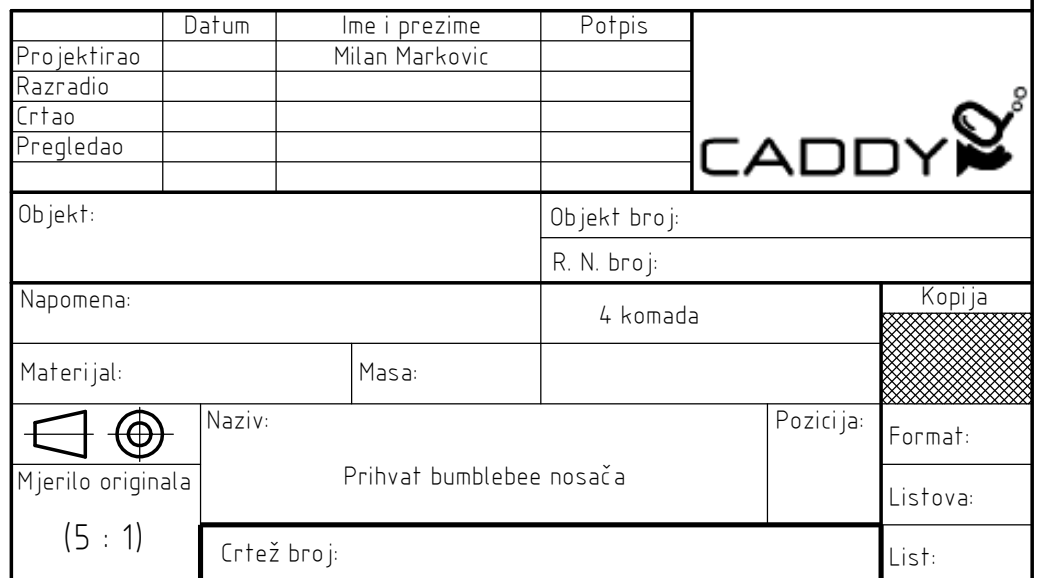


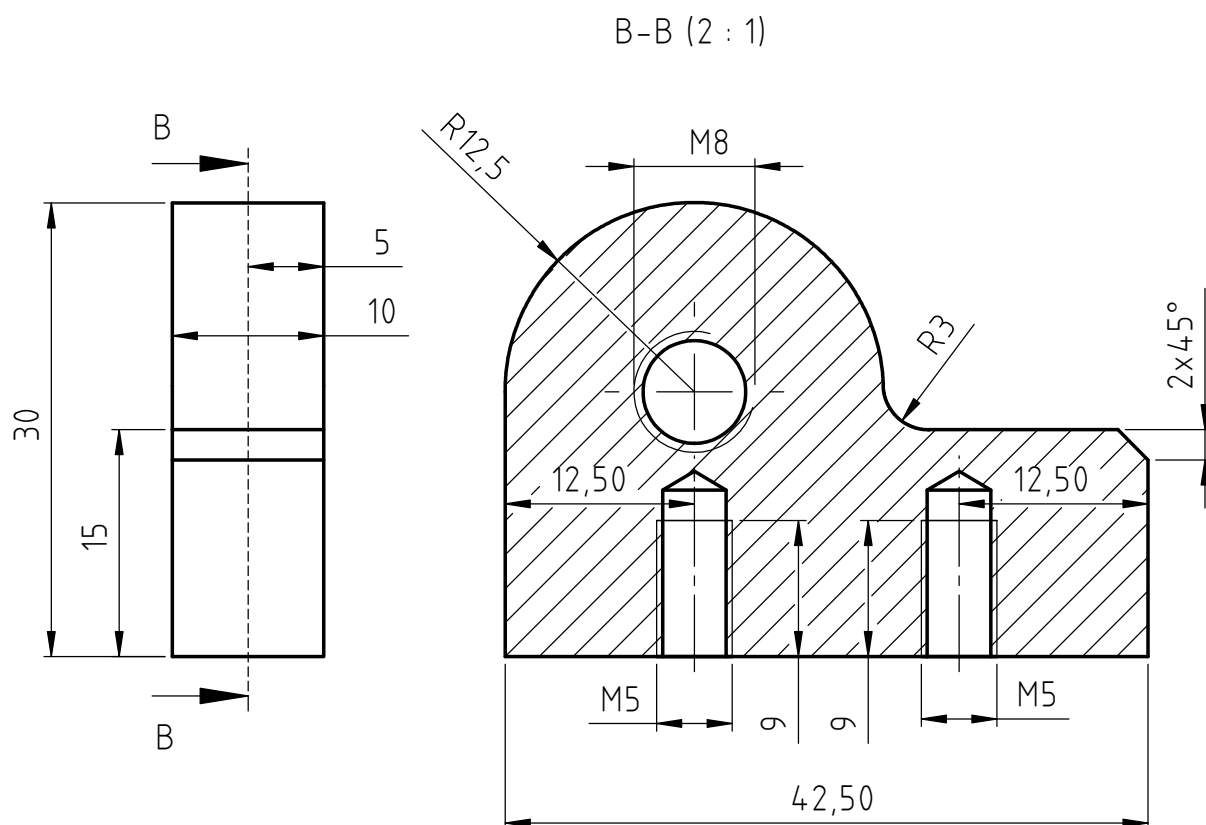


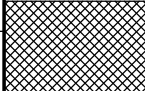
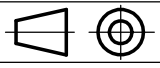
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Projektirao		Milan Markovic			
Razradio					
Crtao					
Pregledao					
Objekt:		Objekt broj:			
		R. N. broj:			
Napomena:		Sva skosenja 2x45°		Po 12 komada obje varijante	
Materijal:		Masa:			
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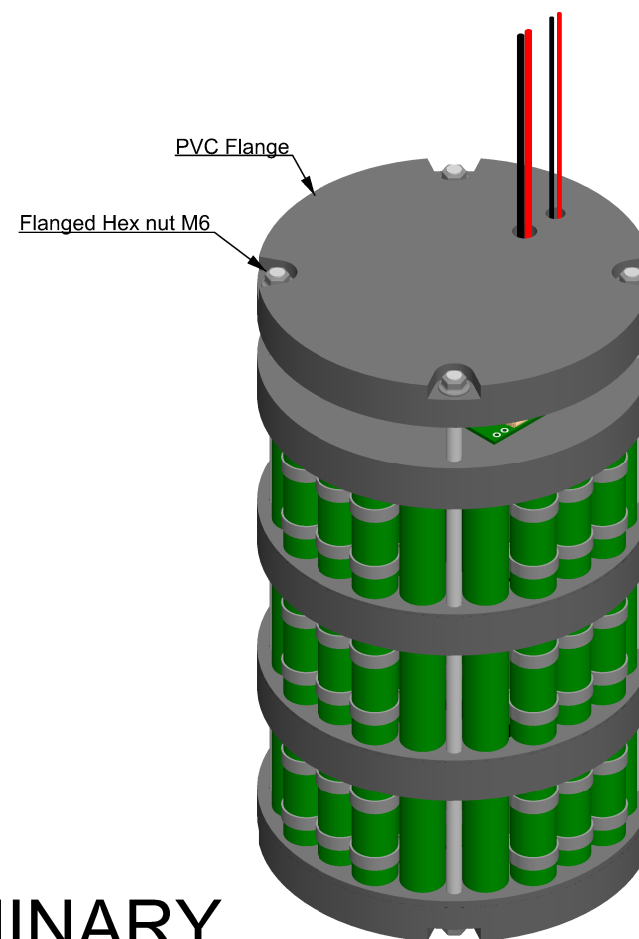
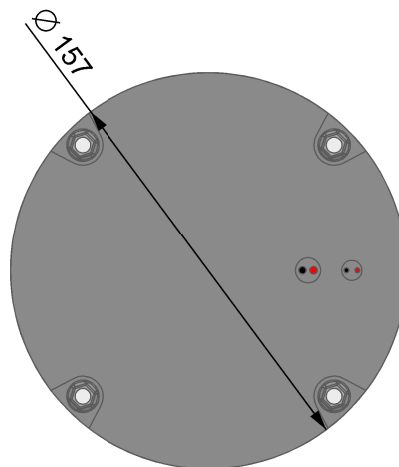
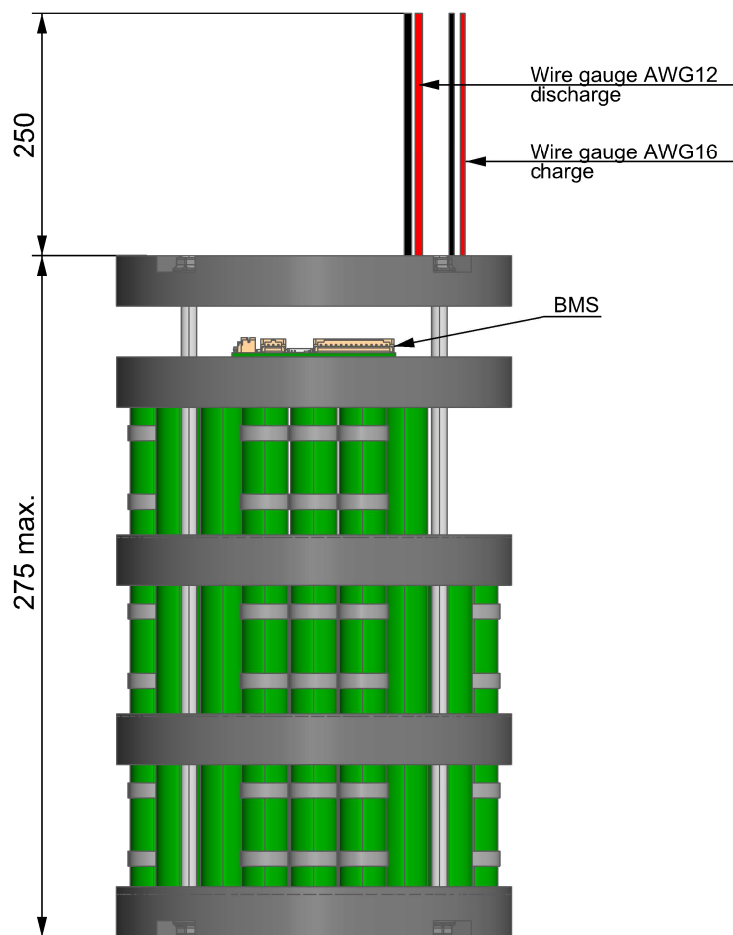


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Projektirao		Milan Markovic		
Razradio				
Crtao				
Pregledao				
Objekt:		Objekt broj:		
		R. N. broj:		
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Materijal:		Masa:	Kopija	
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	Datum	Ime i prezime	Potpis	
Projektirao		Milan Markovic		
Razradio				
Crtao				
Pregledao				
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Mjerilo originala	Prihvat multibeam nosača			Listova:
2:1	Crtež broj:			List:



PRELIMINARY

Dimensions in mm

ELTEC
Carasco - Italy

REF.13s8pNCR18650ASC
"PANASONIC" Li-Ion Battery

Battery outline:

Nominal voltage: 46,8 V
Nominal capacity: 24,8 Ah
Standard charge: CC/CV 4,96A / 54,6V +/-1%
Discharge current: 20A cont.
Approx. battery weight: 6,2 Kg

Project Mng.: Volante G.

Drawing: Di Marcello S.

Date: 18/02/2014

Rev.:0

Customer sign

Rights reserved to make technical changes, as a result of further development, without notice. This drawing is the property of ELTEC s.a.s. and must not be copied or disclosed to a third party without the written consent of ELTEC s.a.s.

Scale: -

Features

- ◆ 2" x 1" metal package
- ◆ Wide 2:1 input voltage range
9–18, 18–36, 36–75 VDC
- ◆ High efficiency up to 92%
- ◆ Adjustable output voltage
- ◆ No minimum load required
- ◆ Operating temperature range
–40°C to +85°C
- ◆ Input filter to meet EN55022, class A
- ◆ Remote On/Off
- ◆ Under voltage lockout
- ◆ Lead free design, RoHS compliant
- ◆ 3-year product warranty



The TEN 60N series is a family of high performance 60 Watt dc/dc converter modules featuring wide 2:1 input voltage ranges in a six side shielded 2" x 1" metal package with industry standard footprint. Standard features include remote On/Off, over voltage protection, under voltage lockout and short circuit protection. High efficiency across load range and low input current characteristics at no load make these converters the ideal solution for battery-operated systems. Typical applications are in wireless networks, telecom/datacom, industry control systems and measurement equipment.

Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
TEN 60-1211N TEN 60-1212N TEN 60-1213N TEN 60-1215N TEN 60-1222N TEN 60-1223N	9 – 18 VDC (12 VDC nominal)	5.0 VDC 12 VDC 15 VDC 24 VDC ±12 VDC ±15 VDC	12'000 mA 5000 mA 4000 mA 2500 mA ±2500 mA ±2000 mA	90.5 % 90.5 % 91.5 % 91.5 % 90 % 90 %
TEN 60-2411N TEN 60-2412N TEN 60-2413N TEN 60-2415N TEN 60-2422N TEN 60-2423N	18 – 36 VDC (24 VDC nominal)	5.0 VDC 12 VDC 15 VDC 24 VDC ±12 VDC ±15 VDC	12'000 mA 5000 mA 4000 mA 2500 mA ±2500 mA ±2000 mA	92 % 92 % 92 % 92 % 90 % 90 %
TEN 60-4811N TEN 60-4812N TEN 60-4813N TEN 60-4815N TEN 60-4822N TEN 60-4823N	36 – 75 VDC (48 VDC nominal)	5.0 VDC 12 VDC 15 VDC 24 VDC ±12 VDC ±15 VDC	12'000 mA 5000 mA 4000 mA 2500 mA ±2500 mA ±2000 mA	92 % 92 % 92 % 92 % 91 % 91 %

Input Specifications

Input current at no load		10 mA typ.
Start-up voltage	12 Vin models: 24 Vin models: 48 Vin models:	< 9.0 VDC < 18 VDC < 36 VDC
Under voltage shut down (lock-out circuit)	12 Vin models: 24 Vin models: 48 Vin models:	8.0 VDC typ. 16 VDC typ. 32 VDC typ.
Surge voltage (1 sec.)	12 Vin models: 24 Vin models: 48 Vin models:	25 V max. 50 V max. 100 V max.
Conducted noise		EN 55022 class A with external components filter proposal to be advised
ESD (electrostatic discharge)		EN 61000-4-2, air ± 8 kV, contact ± 6 kV, perf. criteria A
Radiated immunity		EN 61000-4-3, 20 V/m, perf. criteria A
Fast transient / surge (with external input capacitor)		EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 2 kV perf. criteria A
– external input capacitor	12 & 24 Vin models: 48 Vin models:	Nippon chemi-con KY 220 μ F, 100 V, ESR 48 mOhm and TVS 58V, 3000W peak (SMDJ58A) in parallel Nippon chemi-con KY 220 μ F, 100 V, ESR 48 mOhm and TVS 120V, 3000W peak (SMDJ120A) in parallel
Conducted immunity		EN 61000-4-6, 10 Vrms, perf. criteria A

Output Specifications

Voltage set accuracy		± 1 %
Voltage adjustment range (single output models only)	15 & 24 VDC models: other models:	+20%, -10% ± 10 %
Regulation	– Input variation Vin min. to Vin max. – Load variation 0 – 100 % – Load cross variation 25 % / 100 %	0.2 % max. single output models: 0.5 % max. dual output models: 1 % max. 5 % max.
Minimum load		not required
Temperature coefficient		± 0.02 %/K
Ripple and noise (20 MHz bandwidth)	5.0 VDC: 12 & 15 VDC: 24 VDC:	100 mVp-p max. with 10 μ F/25V X7R MLCC 125 mVp-p max. with 10 μ F/25V X7R MLCC 200 mVp-p max. with 4.7 μ F/50V X7R MLCC
Start up time (constant resistive load)	– Power On – Remote On	60 ms typ. 60 ms typ.
Transient response (25% load step change)		250 μ s typ.
Short circuit protection		continuous, automatic recovery
Over load protection		150 % of Iout max. typ. hiccup
Over-voltage protection (Zener diode, single output models only)	5 VDC models: 12 VDC models: 15 VDC models: 24 VDC models:	6.2 V 15 V 20 V 30 V
Capacitive load (max. values)	5.0 VDC models: 12 VDC models: 15 VDC models: 24 VDC models: ± 12 VDC models: ± 15 VDC models:	30'000 μ F 5850 μ F 3900 μ F 2000 μ F 3900 μ F (each output) 2400 μ F (each output)

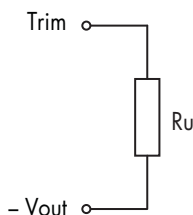
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

General Specifications

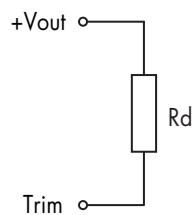
Temperature ranges	– Operating – Casing temperature – Storage	–40°C to +85°C (with derating) +105°C max. –55°C to +125°C
Power derating	– Natural convection – Natural convection with heat sink (optional)	2.5 %/K above 50°C 2.25 %/K above 55°C
Thermal impedance	– Natural convection – Natural convection with heat sink (optional)	10.8 K/W 10.3 K/W
Over-temperature protection		at 115°C
Humidity (non condensing)		5 – 95 % rel. H
Isolation voltage (60 sec.)	– Input / Output	1500 VDC
Isolation resistance	– Input / Output	>1 GOhm
Isolation capacitance	– Input / Output	2'200 pF max.
Switching frequency		250 kHz typ. (pulse width modulation PWM)
Thermal shock, mechanical shock & vibration	– Test conditions	MIL-STD-810F www.tracopower.com/products/mil810.pdf
Safety standards		UL/cUL 60950-1, IEC/EN 60950-1
Safety approvals	– UL/cUL (entry pending)	www.ul.com -> certifications -> File e188913
Remote On/Off	– On: – Off: – Off idle current:	3.0 ... 12 VDC or open circuit 0 ... 1.2 VDC or short circuit pin 2 and pin 6 3.0 mA
Reliability, calculated MTBF (Telcordia SR-332, 50% stress, Ta=40°C)		2.6 Mio. h
Environmental compliance	– Reach – RoHS	www.tracopower.com/products/reach-declaration.pdf RoHS directive 2002/95/EC

Output Voltage Adjustment (for single output models only)

Trim up



Trim down



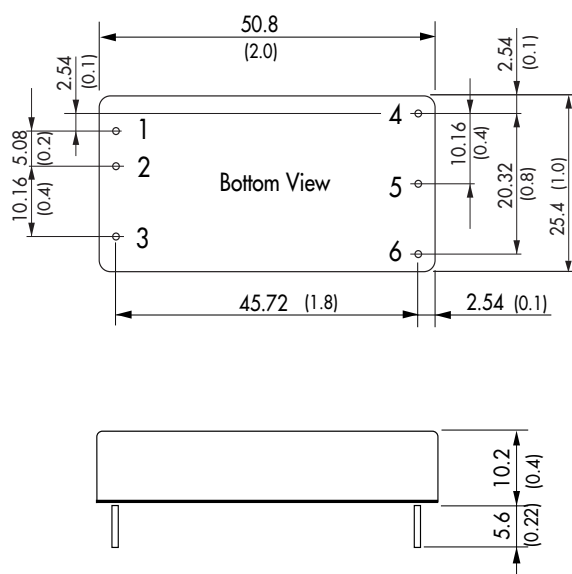
Nominal output voltage at open Trim input
 Ru, Rd for adjustment to be advised

Application note: www.tracopower.com/products/ten60n-application.pdf

Physical Specifications

Casing material	copper
Baseplate material	non conductive FR4
Potting material	silicon (UL94V-0 rated)
Weight	33 g (1.16 oz)
Soldering temperature	max. +265°C / 10 sec.

Outline Dimensions



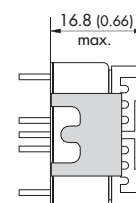
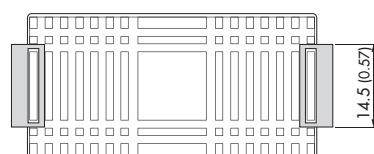
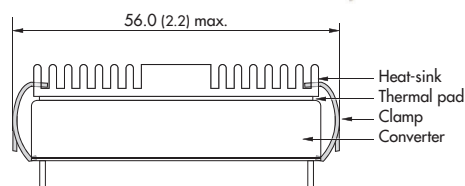
Pin-Out

Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	-Vin (GND)	-Vin (GND)
3	Remote On/Off	
4	+Vout	+Vout
5	-Vout	Common
6	TRIM	-Vout

Dimensions in [mm], () = Inch
Pin diameter: 1.0 ±0.1 (0.04 ±0.004)
Pin pitch tolerances: ±0.25 (±0.01)
Case tolerances: ±0.5 (±0.02)

Heat-Sink (Option)

Order code: TEN-HS1
(cont.: heat-sink, thermal pad, 2 clamps)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 17g (0.60oz) without converter
Thermal impedance after assembling: 10.3 K/W



Note:

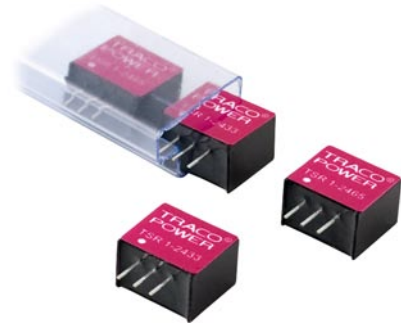
Before attaching the heatsink, the product label on converter has to be removed for optimal performance.
For volume orders we can supply the converters with heatsink already mounted.
Please contact us for a relative quotation.

Dimensions in mm, () = Inch

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com

Features

- ◆ Up to 96 % efficiency
→ No heat-sink required
- ◆ Pin compatible with LMxx linear regulators
- ◆ SIP-package fitsexisting TO-220 footprint
- ◆ Built in filter capacitors
- ◆ Operation temp. range -40 to +85 °C
- ◆ Short circuit protection
- ◆ Wide input operating range
- ◆ Excellent line / load regulation
- ◆ Low standby current
- ◆ 3-year product warranty



The new TSR-1 series step-down switching regulators are drop-in replacement for inefficient 78xx linear regulators. A high efficiency up to 96 % allows full load operation up to +60 °C ambient temperature without the need of any heat-sink or forced cooling.

The TSR-1 switching regulators provide other significant features over linear regulators, i.e. better output accuracy ($\pm 2\%$), lower standby current of 2 mA and no requirement of external capacitors. The high efficiency and low standby power consumption makes these regulators an ideal solution for many battery powered applications.

Models

Order code	Input voltage		Output voltage	Output current max.	Efficiency typ.	
	range	nominal			@ Vin min.	@ Vin max.
TSR 1-2415	4.75 – 32 VDC	9 VDC	1.5 VDC	1.0 A	78 %	65 %
TSR 1-2418	4.75 – 32 VDC		1.8 VDC		81 %	68 %
TSR 1-2425	4.75 – 32 VDC		2.5 VDC		87 %	75 %
TSR 1-2433	5.5 – 32 VDC		3.3 VDC		90 %	79 %
TSR 1-2450	6.5 – 32 VDC	12 VDC	5.0 VDC		93 %	84 %
TSR 1-2465	9.0 – 32 VDC		6.5 VDC		94 %	87 %
TSR 1-2490	12 – 32 VDC	24 VDC	9.0 VDC		95 %	89 %
TSR 1-24120	15 – 32 VDC		12 VDC		95 %	91 %
TSR 1-24150	18 – 32 VDC		15 VDC		96 %	94 %

Input Specifications

Maximum input current (@ Vin min. and 1 A output current)	1 A
No load input current	24 V models: 1 mA max. other models: 2 mA max.
Reflected ripple current	150 mA
Input filter	internal capacitors

Output Specifications

Voltage set accuracy	±2 % (at full load)
Regulation	– Input variation 0.2 % – Load variation (10 – 100 %) 0.4 %
Overshoot startup voltage	1.0 % max.
Minimum load	not required
Ripple and noise (20 MHz Bandwidth)	1.5 – 6.5 VDC models: 50 mVpk-pk max. 9 – 15 VDC models: 75 mVpk-pk max.
Temperature coefficient	± 0.015 % / °C max.
Dynamic load response 50% load change (upper half)	150 mV max. peak variation 250 µS max. response time
Startup rise time 10 % to 90 % Vout	2 mS
Short circuit protection	continuous, automatic recovery
Current limitation	@ 2.5 A typ.
Capacitive load	470 µF max.

General Specifications

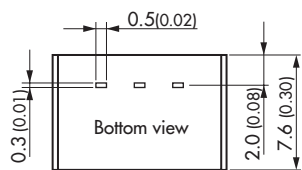
Temperature ranges	– Operating –40 °C to +85 °C – Storage –55 °C to +125 °C
Derating	2.4 %/K above 60 °C
Thermal shock	acc. MIL-STD-810F
Humidity (non condensing)	95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, ground benign)	>5'350'000 h @ 25 °C
Isolation voltage	none
Isolation capacity	– Input/Output 40 pF typ.
Isolation resistance	– Input/Output >1'000 Mohm
Switching frequency	500 kHz typ.

Physical Specifications

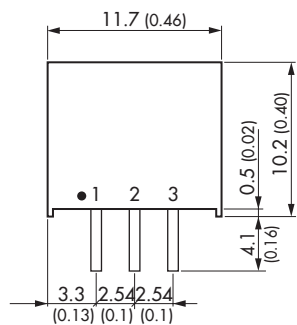
Case material	non-conductive plastic
Potting material	epoxy (flammability to UL 94V-0 rated)
Package weight	1.9 g (0.07 oz)
Soldering profile	max. 265 °C / 10 sec. (wave soldering)

All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Outline Dimensions



Pin-Out	
1	+Vin
3	GND
7	+Vout



Dimensions in [mm], () = Inch
Pin pitch tolerances: ± 0.25 (± 0.01)
Pin profile tolerance: ± 0.1 (± 0.004)
Other tolerances: ± 0.5 (± 0.02)

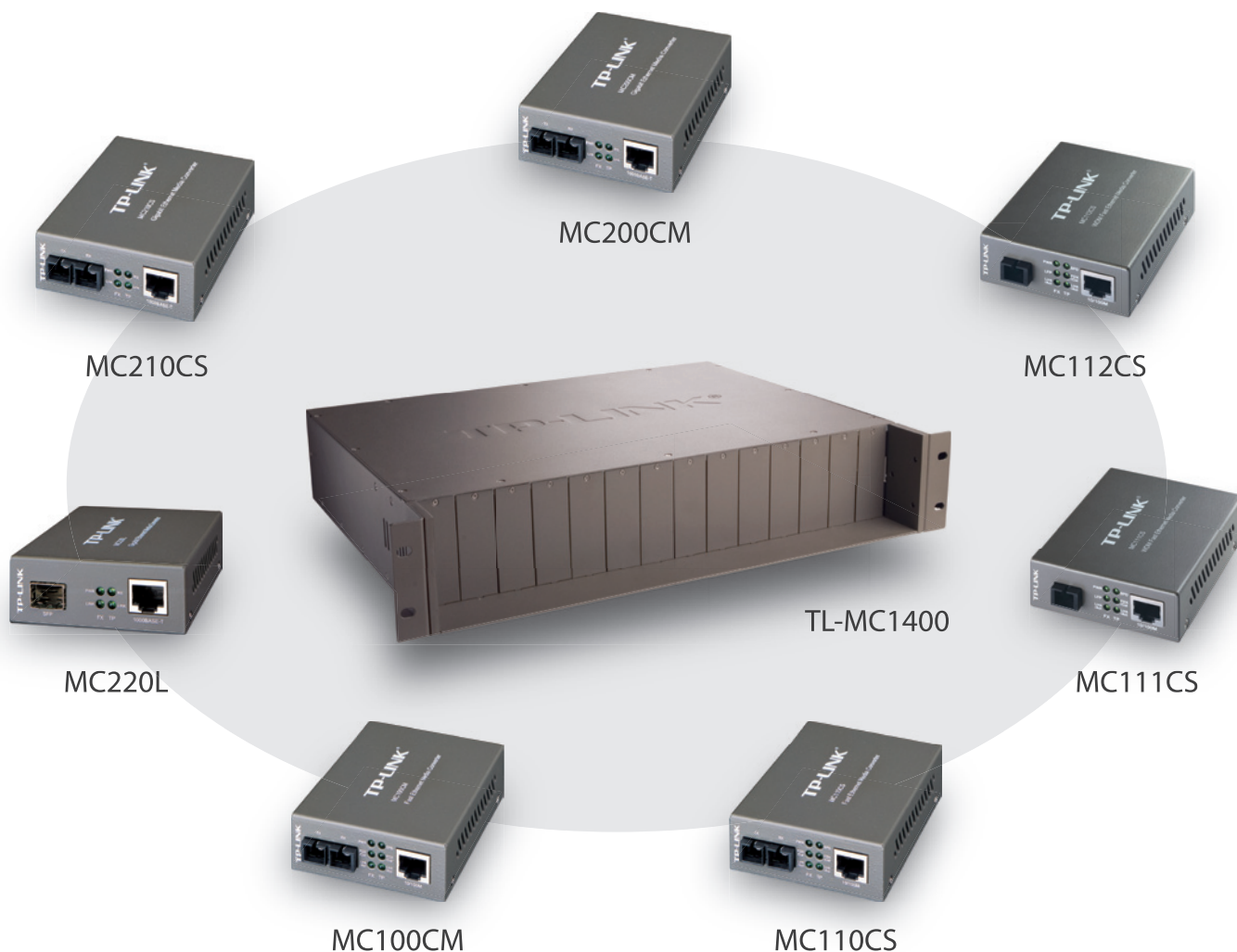
Specifications can be changed any time without notice.

TRACO
ELECTRONIC AG

Jenatschstrasse 1 · CH-8002 Zurich · Switzerland
Tel. +41 43 311 45 11 · Fax +41 43 311 45 45 · info@traco.ch · www.tracopower.com

Rev. 07/08

Media Converters & Chassis



Overview

The Chassis-based Media Converters include a number of independent media converters and a chassis capable of housing up to 14 media converters. You can start with single media converters, each equipped with its own housing and AC power adapter. When you require more room, you can mount a chassis in your equipment rack and install your media converters in the chassis - the media converters can be slid into the chassis.

MC220L

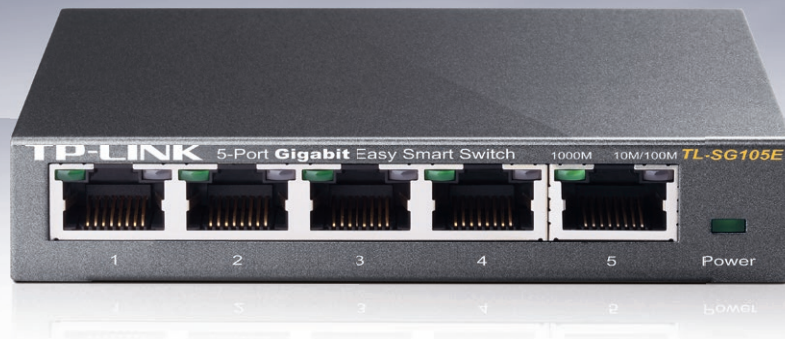
The MC220L converts 1000BASE-SX/LX/LH fiber to 1000Base-T copper media or vice versa. It is designed for use with 850nm multi-mode/1310nm single-mode/WDM fiber cable utilizing the LC-Type connector, transmitting data up to 0.55 kilometers or 10 kilometers. What's more, MC220L can work as a stand alone device (no chassis required) or with TP-LINK's 19" system chassis.

Features:

- Works at 1000Mbps in Full-Duplex mode for both TX port and FX port
- Supports Auto MDI/MDIX for TX port
- Provides switch configuration of Force /Auto transfer mode for FX port
- FX port support hot-swappable
- Extends fiber distance up to 0.55 km for multi-mode fiber and 10 km for single-mode fiber
- Easy-to-view LED indicators provide status to monitor network activity easily

Specifications:

Standards	IEEE 802.3ab, IEEE 802.3z, IEEE 802.3x
Basic Function	Full Duplex Flow Control (IEEE 802.3x) Extends fiber distance up to 10km
Wave Length	Depend on the used SFP module
Interface	1 SFP port 1 1000Mbps RJ45 port (Auto MDI/MDIX)
Network Media	1000BASE-T: UTP category 5, 5e cable (maximum 100m) EIA/TIA-568 100Ω STP (maximum 100m) 1000BASE-FX: Multi-mode Fiber
LED Indicators	PWR, LINK, RX
Certifications	FCC, CE
Dimensions (W x D x H)	3.7 x 2.9 x 1.1 in. (94.5 x 73.0 x 27.0 mm)
Environment	Operating Temperature: 0°C~40°C (32°F~104°F) Storage Temperature: -40°C~70°C (-40°F~158°F) Operating Humidity: 10%~90% non-condensing Storage Humidity: 5%~90% non-condensing
Power Supply	External Power Adapter, 9V/0.6A or 5V/1A



TP-LINK

5-Port Gigabit Easy Smart Switch

TL-SG105E

Overview

The TL-SG105E 5-Port Gigabit Easy Smart switch is an ideal upgrade from an unmanaged switch, designed for small and medium business networks that require simple network management. Network administrators can effectively monitor traffic via Port Mirroring, Loop Prevention and Cable Diagnostics features. To optimize traffic on your business network, TL-SG105E offers both port and tag based QoS to keep latency-sensitive traffic moving smoothly and jitter-free. Additionally, port-based, tag-based and MTU VLAN can improve security and meet more network segmentation requirements. Moreover, with its innovative energy-efficient technology, the TL-SG105E can save up to 75% of power consumption, making it an eco-friendly solution for your business network.

Layer 2 Features

- IGMP Snooping
- Link Aggregation
- Port Mirroring
- Cable Test
- Loop Prevention

VLAN

- 32 VLANs
- MTU/Port/Tag VLAN

Quality of Service

- Port Based/802.1p Based priority
- 4 priority queues
- Rate Limit
- Storm Control

Green Technology

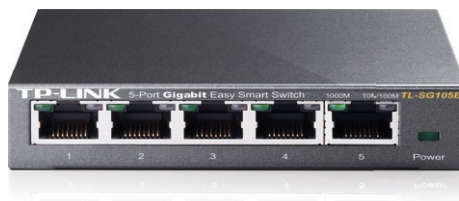
- Saving power 75%
- Recyclable packaging material

Easy Smart Configuration Utility

- Central Management
- Friendly User Interface



- Details: <http://www.tp-link.com/support/Localesupport.asp>
- German/Austrian/Swiss users are not included



TP-LINK 5-Port Gigabit Easy Smart Switch TL-SG105E

Simple & Effective Management

TP-LINK's Gigabit Easy Smart switch, TL-SG105E offers network monitoring for users to observe traffic behavior. With Port Mirroring, Loop Prevention and Cable Diagnostics features, TL-SG105E can identify and even locate connection problems on your business network. Moreover, administrators can designate the priority of the traffic based on Port Priority and 802.1P Priority, to ensure that voice and video are always clear, smooth and lag-free. Additionally, to improve security and network performance, TL-SG105E supports MTU VLAN, port-based VLAN and 802.1Q-based VLAN functions. TL-SG105E is an upgrade from the plug-and-play Unmanaged Switch, delivering great value while empowering your network and similarly delivering great value to the end user.

Go Green With Your Ethernet

You now have the choice to go green when upgrading to a gigabit network! This new generation TL-SG105E 5-Port Gigabit Easy Smart Switch features the latest innovative energy-efficient technologies that can greatly expand your network capacity with much less power. It automatically adjusts power consumption according to the link status and cable length to limit the carbon footprint of your network.

Power down Idle Ports

When a computer or network equipment is off, the corresponding port of a traditional switch will continue to consume considerable amounts of power. The TL-SG105E can automatically detect the link status of each port and reduce the power consumption of ports that are idle.

Power Budget According to Cable Length

Ideally, shorter cables would use less power because of less power degradation over their length; this is not the case with most devices as they will use the same amount of power across the cable regardless of whether it is 10 or 50 meters in length. The TL-SG105E analyzes the length of the Ethernet cable connected and adjusts the power usage accordingly, rather than keeping the power consumption in a conventional solution.

Ease of Use

TL-SG105E is easy to use and manage. Auto MDI/MDI-X crossover on all ports eliminate the need for crossover cables or uplink ports. Auto-negotiation on each port senses the link speed of a network device (either 10, 100, or 1000 Mbps) and intelligently adjusts for compatibility and optimal performance. Its compact size makes it ideal for desktops with limited space while also being Rack-mountable, convenient and safe. Dynamic LED lights provide real-time work status display and basic fault diagnosis.

Specifications

Hardware Features & Performance

Product Picture	
Model	TL-SG105E
Physical Features	
10/100/1000Mbps RJ45 Ports	5
Power Supply	100-240VAC, 50/60Hz
Fan Quantity	Fanless
Certification	CE, FCC
Dimensions (W x D x H)	3.9 x 3.9 x 1.0 in. (100 x 98 x 25 mm)
Environment	Operating Temperature: 0°C~40°C (32°F~104°F); Storage Temperature: -40°C~70°C (-40°F~158°F); Operating Humidity: 10%~90% non-condensing; Storage Humidity: 5%~90% non-condensing
Performance	
Switch Capacity	10Gbps
Forwarding Rate	7.4Mpps
Mac Address Table	8k
Packet Buffer Memory	2Mb
Jumbo Frame	16KB

Software Features

L2 Switching Features

- **IGMP Snooping**
 - IGMP Snooping v1/v2/v3
 - Supports 128 Groups
- **Link Aggregation**
 - Support static link aggregation
 - 1 aggregation group, containing 4 ports per group
- **Port Mirroring**
 - One-to-One
 - Many-to-One
- **Cable Test**
- **Loop Prevention**

VLAN

- Supports up to 32 VLANs simultaneously (out of 4K VLAN IDs)
- MTU/Port/Tag VLAN

Quality of Service(QoS)

- Support Port Based/802.1p Based priority
- Support 4 priority queues
- Rate Limit
- Storm Control

Ethernet Protocols

- IEEE 802.3 10BASE-T
- IEEE 802.3u 100BASE-TX/FX
- IEEE 802.3ab 1000BASE-T
- IEEE 802.3x Flow Control
- IEEE 802.1q VLANs/VLAN tagging
- IEEE 802.1p QoS

Easy Smart Configuration Utility

- Central Management
- Friendly User Interface

Ordering Information

Switch	
Product Model	Description
TL-SG105E	5-Port Gigabit Easy Smart Switch
Router	
Product Model	Description
TL-ER604W	SafeStream Wireless N Gigabit Broadband VPN Router

ETH008 - 8 relay outputs at 16A

Technical Documentation

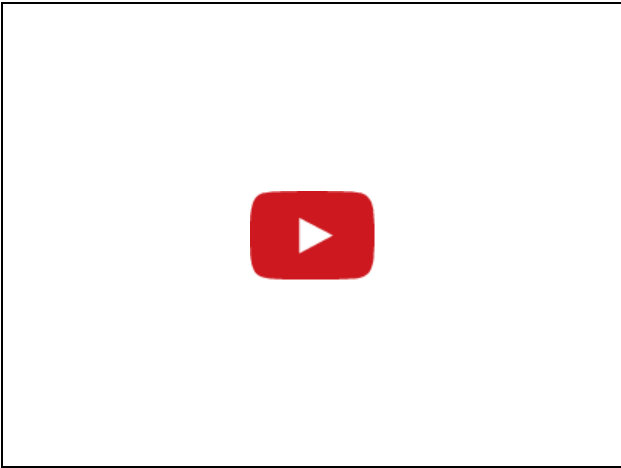


Overview

The ETH008 provides eight volt free contact relay outputs with a current rating of up to 16Amp each. The module is powered from a 12vdc supply which can be regulated or unregulated. The DC input jack is 2.1mm with positive core polarity, DC supplies are required to supply at least 500mA at 12vdc. The relays are SPCO (Single Pole Change Over) types. The normally open, normally closed and common pins are all available on the screw terminals. The ETH008 is fully compatible with the ETH-RLY16 and includes the legacy ETH-RLY16 command set.

The ETH008 has additional features over the ETH-RLY16:

1. Full Factory Reset, all ETH008 firmware and settings can be reset to the original state.
2. Firmware updates, firmware in the ETH008 is fully updateable by re-flashing the board with our custom windows program. This will be made available in the event of feature updates.
3. New Command Format, the new command format allows for consistent compatibility with future boards. New commands now allow for pulsed control of relays from 100mS to 25.5 seconds.
4. TCP/IP Password Protection, it is now possible to set a password for TCP/IP protection. This is independent of the configuration password.



Operating Temperature

-40C to +70C

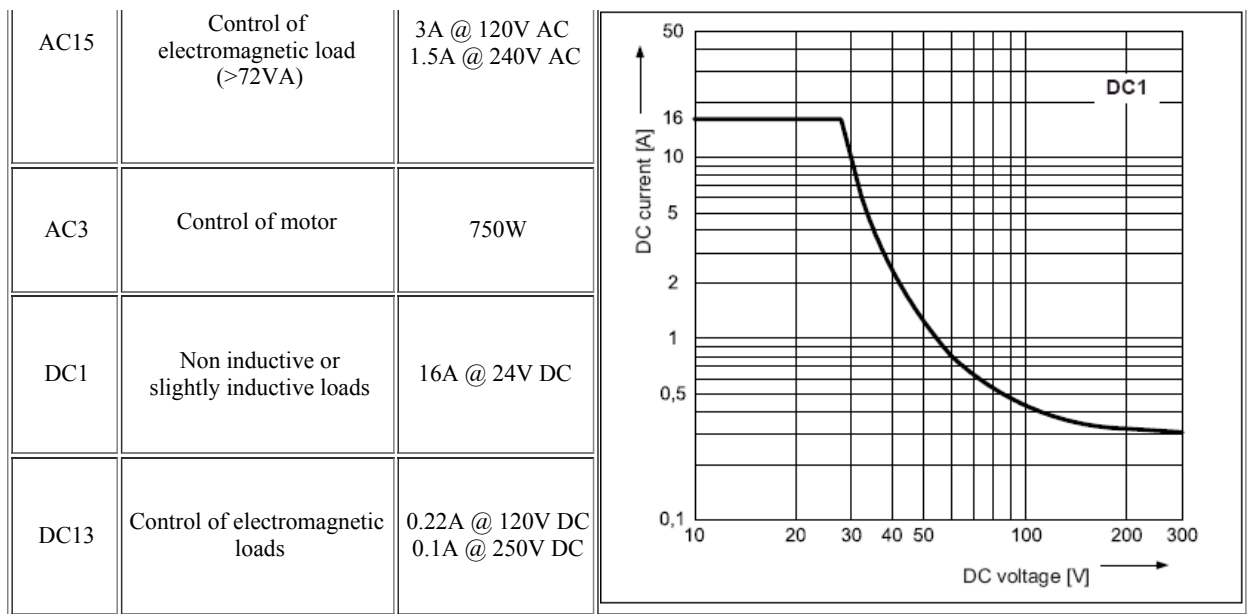
LED Indication

The ETH008 provides a red LED mounted immediately next to each relay to indicate whether it is in a powered state (LED on), there is also two LED's mounted in the Ethernet connector which will flash with Ethernet traffic. Finally there is green power LED just above the processor.

Relay Power Rating

If the contact load voltage and current of the relay are in the region enclosed by the solid and dotted lines in the figure below, the relay can perform stable switching operation. If the relay is used at a voltage or current exceeding this region, the life of the contacts may be significantly shortened.

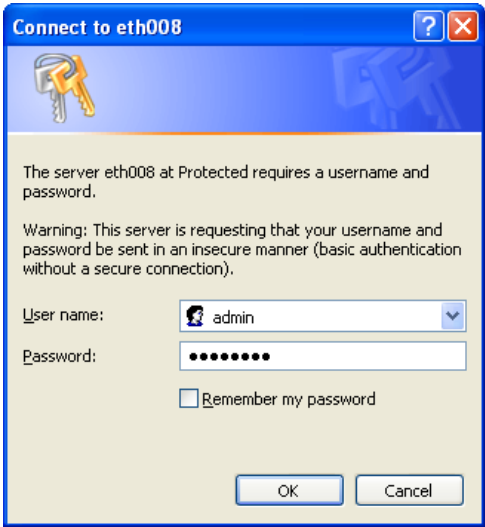
load type	Typical applications	Rating	Max DC load capacity
AC1	Non inductive or slightly inductive loads	16A @ 250V AC	



A full datasheet for the relays used on the ETH008 is here: [HF115FD datasheet](#)

First Test

Having plugged in your 12vdc power supply and Ethernet connection, start up your web browser and type **http://eth008** into the address bar, please note this only works in windows. You will be prompted for a password as shown below:



The default login is:
Username: admin
Password: password

The ability to change these settings is shown in the configuration section

You should now see the following web page:

ETH008 Test Application

Below you will see the current status of the ETH008 board, Relay1 is on the right hand side. Click the bullets to toggle the relays or turn change the output states on the board.

The status is updated in real time. You will see this page automatically update when changing states with commands over TCP/IP.

Firmware V1

Module Id 19

Hardware V1

input voltage 12v

[Technical Documentation](#)
[Configuration](#)

Relay's: (click to toggle)

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This web page will allow you to switch the relays on and off by clicking the relay buttons (the red/gray circles). It also contains a link to this technical documentation page.

Configuration

By clicking the configuration link it's possible to configure the ETH008 IP address and subnet mask together with the ability to set a password for entry to control screens. The ETH008 now also offers the option to set a password that will be required to change any of the relay states using TCP/IP commands, this is explained in the TCP/IP password section.

All settings are saved to memory so be careful to remember the username and password! Default password settings are shown in the picture below. Version 2 now offers a latched outputs option, this will automatically save any permanent output changes (not pulsed) and restore them following power loss.

Board Configuration

This section allows the configuration of the board's network settings.

CAUTION: Incorrect settings may cause the board to lose network connectivity.

MAC Address	00:04:A3:A7:A9:A0
Host Name	ETH008
☒ HTTP authentication	
HTTP Username:	admin
HTTP Password:	password
Port	17499
☐ Enable DHCP	
IP Address	192.168.0.99
Subnet Mask	255.255.255.0
☐ TCP/IP Password	password
☐ Latched outputs	
Save Config	

Factory Reset

Should it be necessary to reset the ETH008 to its shipped condition then the end two contacts of PL2 (the row of 5 holes near the large chip) on the side nearest the Ethernet connection must be shorted together at board power up. The green LED should then flash as the settings are reset, please wait until the LED finishes flashing and do not remove power during this period.

Firmware Updates

The firmware is fully updateable by re-flashing the board using our custom windows program. The updates currently available are:

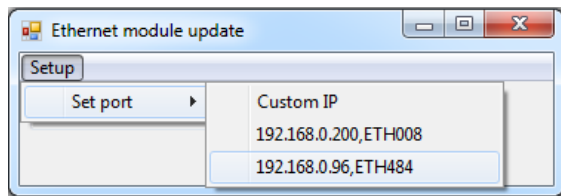
[V3 - 08/04/2014](#) - DNS and Gateway string lengths corrected in http config page, new latching function added to config and board name now appears correctly on NBNS (WINS) meaning routers display board name.

[V4 - 11/07/2014](#) - ASCII messages added in tcp, security now on all http pages, http set output commands added

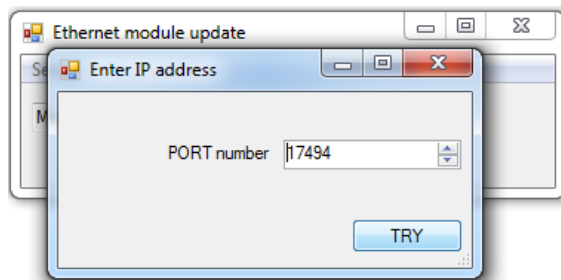
[V5 - 13/08/2014](#) - Fixed ASCII command buffer overruns

Using the [Ethernet module update](#):

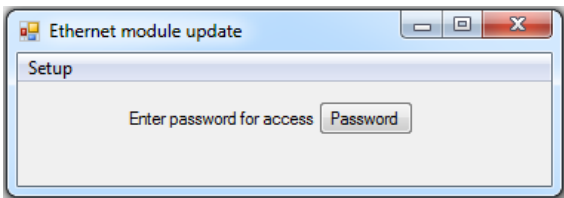
First you need to connect to the board, the program will scan the local network and provide any boards in a list that it can see.



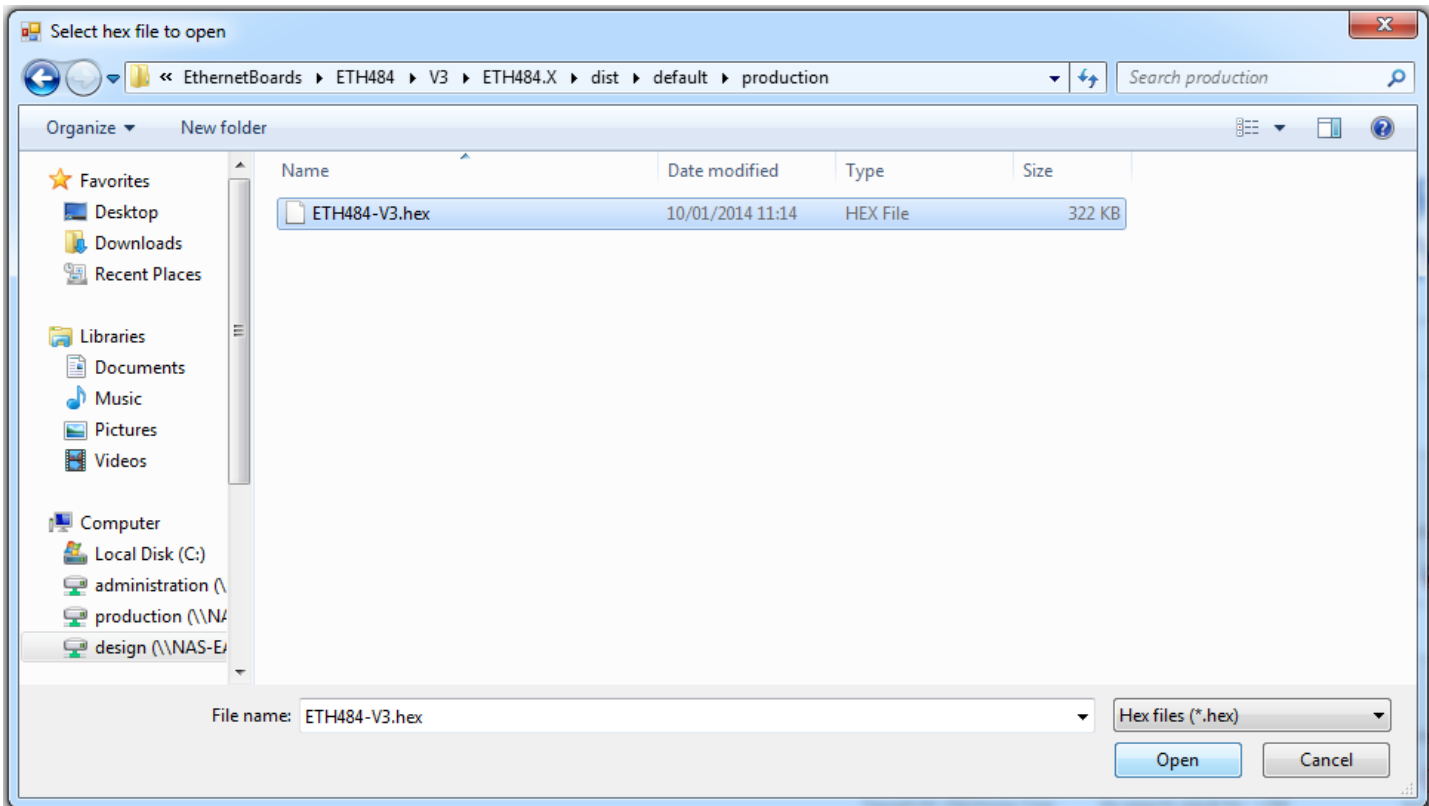
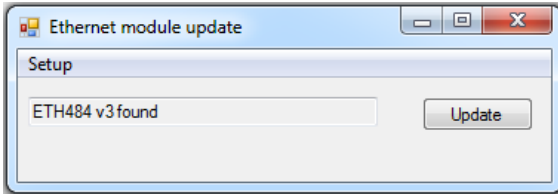
Next you will need to specify what port the board is located on, this will be 17494 unless you have changed it in the settings.



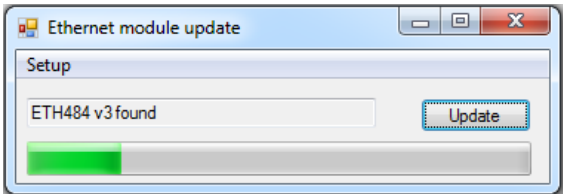
If there is a TCP/IP password the program will require it to be entered by clicking the password button.



Following a successful connection you will now be able to click the update button to select a file



Once the file has been opened the programming sequence will now begin, it's fairly short and following it's completion the board will reset (automatically) and the LED will flash quickly while the programming sequence completes. Do not turn the power off in this sequence.



ETH008 Command Set

The ETH008 has a new and enhanced command set designed to provide consistent expansion and new features. They are sent over TCP/IP on port 17494 (0x4456). This is the default port, it can be changed in the configuration settings.

Command		Action
dec	hex	
16	10	Get Module Info, returns 3 bytes. Module Id (19 for ETH008), Hardware version, Firmware version.
32	20	Digital active - follow with 1-8 to set relay on, then a time for pulsed output from 1-255 (100ms resolution) or 0 for permanent Board will return 0 for success, 1 for failure
33	21	Digital inactive - follow with 1-8 to turn relay off, then a time for pulsed output from 1-255 (100ms resolution) or 0 for permanent Board will return 0 for success, 1 for failure

35	23	Digital set outputs - the next single byte will set all relays states, All on = 255 (11111111) All off = 0 Board will return 0 for success, 1 for failure
36	24	Digital get outputs - sends a single byte back to the controller, bit high meaning the corresponding relay is powered
58	3A	ASCII text commands (V4+) - allows a text string to switch outputs, see section below
119	77	Get serial number - Returns the unique 6 byte MAC address of the module.
120	78	Get Volts - returns relay supply voltage as byte, 125 being 12.5V DC
121	79	Password entry - see TCP/IP password
122	7A	Get unlock time - see section below
123	7B	Log out - immediately re-enables TCP/IP password protection

Digital Active/Inactive

This is a 3 byte command:

The first byte is the command, 32 (active means on) or 33 (inactive).

Second byte is the relay number (1-8).

Third byte is the on time. Set this to zero for un-timed operation, or 1-255 for a pulse in 100mS intervals (100mS to 25.5 seconds).

For example:

0x20 - turn the relay on command

0x03 - relay 3

0x32 (50) - 5 seconds (50 * 100ms)

Board will return 0 for success, 1 for failure

Note - All bytes in a command must be sent in one TCP/IP packet .

TCP/IP Password

If this option is enabled in the http configuration page then a password will be required to be entered before relay states can be changed. In the following example the password was set to "apple":

0x79 - 1st byte in frame sent to ETH008 to indicate password entry

'a' (0x61) - 2nd byte in frame (ASCII hex equivalent in brackets, full table is available at <http://www.asciitable.com/>)

'p' (0x70) - 3rd byte in frame

'p' (0x70) - 4th byte in frame

'l' (0x6C) - 5th byte in frame

'e' (0x65) - 6th byte in frame

These 6 bytes are then transmitted in the same transaction to the ETH008 and if the password is correct then 1 will be transmitted back, a failure will send 2.

The board will now accept changes from the device that entered the password. If communication becomes idle for more than 30 seconds then the password protection is re-enabled. There is also a log-out command of 0x7B to enable the protection immediately.

Get Unlock Time

Returns TCP/IP password protection status:

0 - password protection is enabled and password entry is required before changes can be made

1 to 30 - seconds until TCP/IP password protection is re-enabled. All authorised commands set the timer back to 30 seconds (including this one).

255 - TCP/IP password is not enabled.

ASCII text commands DOA and DOI (V4+ firmware needed)

Following customer request we have added a feature that allows the outputs to be switched using an ASCII string, devices like a Mobotix camera can now switch relays with simple strings.

The string for activating output 1 for 5 seconds is formatted using comma separated variables with the following syntax:

":DOA,1,50,password"

To break this down ":" (hex 3A) at the start of the string indicates that there is an ASCII message to follow, "DOA" is digital output active, "1" is the output number, then "50" for 5 seconds (50x100ms) and finally the TCP password (if applicable).

If I wanted to make output 2 inactive for 3 seconds I would use:

":DOI,2,30,password"

To break this down ":" (hex 3A) at the start of the string indicates that there is an ASCII message to follow, "DOI" is digital output inactive, "2" is the output number, then "30" for 3 seconds (30x100ms) and finally the TCP password (if applicable).

Assuming no password is used the previous command would simply be:

":DOI,2,30 "

TCP/IP Legacy Commands

The ETH008 supports the full legacy ETH-RLY16 command set.

HTML commands DOAx and DOIx (V4+ firmware needed)

Another customer requested feature, allowing the digital outputs to be switched by the http get function such as used in some voice over ip phones (VOIP). You can use the http get function to write to the io.cgi file with the following syntax:

192.168.0.200/io.cgi?DOA2=10

This would use the default address (192.168.0.200) and make output 2 active for 1 second.

Another example would be to set output 1 inactive for 10 seconds:

192.168.0.200/io.cgi?DOI1=10

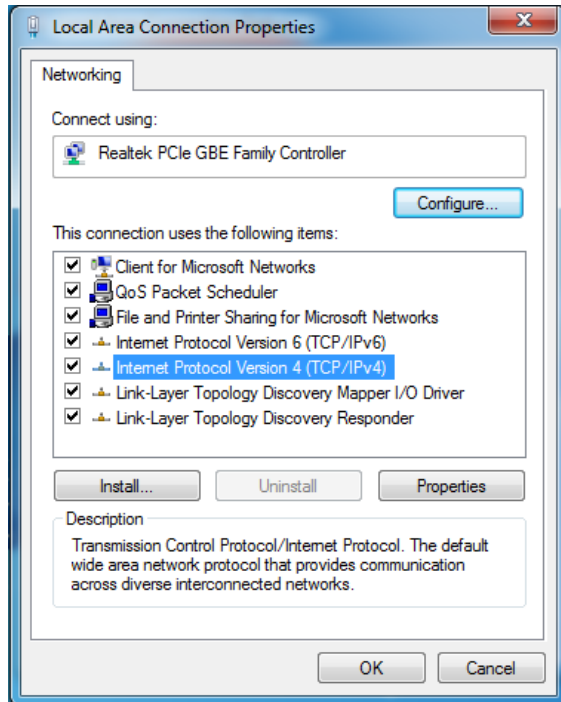
You can test these functions by typing them directly into the address bar of most internet browsers. Also be aware that you may need to disable http authentication in the http configuration if your control device does not support it.

The easiest way to use the ETH008 is to connect it to a network with a DHCP server. In this case the ETH002 will have its IP address assigned automatically by the DHCP server.

If there is no DHCP server on the network, then a fixed IP address of 192.168.0.200 is used. To control the ETH008 using this fixed IP address your computer MUST be on the same subnet.

The next step is to set your computers IP address to 192.168.0.x where x is in the range of 1 to 255 but not 200 (the ETH008 is there!) or any other used IP addresses on the network.

The subnet mask dictates what IP addresses the PC can communicate with, we set this to 255.255.255.0 so the PC can talk to any module with an IP address of 192.168.0.x



This image is for a PC running Windows 7.

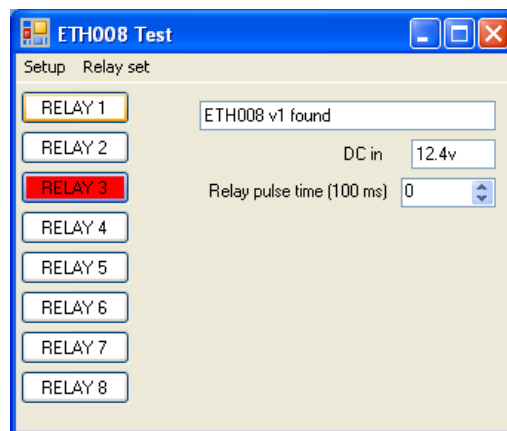
To get to the TCP/IP properties screen, go to:

Control Panel->Network and Sharing Center->Local Area Connection->Properties. Select Internet Protocol Version 4(TCP/IPv4) from the scroll box and click Properties.

That gets you to the dialog box shown left.

Test program and example source code

To get the ETH008 up and running in the minimum amount of time we have put together an example program to demonstrate the functionality of the module. We provide the full source code for this program. You may examine this code to see how it works or use it as a starting point for your own application.



Visual studio express C# examples

The test program is available as Visual C# express ready built installation files [here](#), or as Visual C# express project with source files [here](#).

Visual studio express is provided free from Microsoft: <http://www.microsoft.com/exPress/download/>

Access from the Internet

The ETH008 can be controlled over the internet almost as easily as on your local network. Your network will most likely be connected to the internet with a broadband router. This will provide NAT (Network Address Translation) and Firewall services. To access the ETH008 from the internet you will need to open up port 17494 (0x4456) to allow incoming TCP connections. Be careful not to open up any other ports. There are a wide variety of routers and we cannot give details for all of them. If in doubt ask your system administrator for assistance. The following shows how to open up a port on a Netgear DG834 router.

Add Services

Service Definition

Name:

Type:

Start Port:

Finish Port:

After logging on to your routers setup page, the first thing to do is create a new service. Click on the "Services" menu then "Add Custom Service". Enter a name for the service, select TCP and enter the ETH008's port address for both the start and finish ports. Click "Apply".

Inbound Services

Service:

Action:

Send to LAN Server: . . .

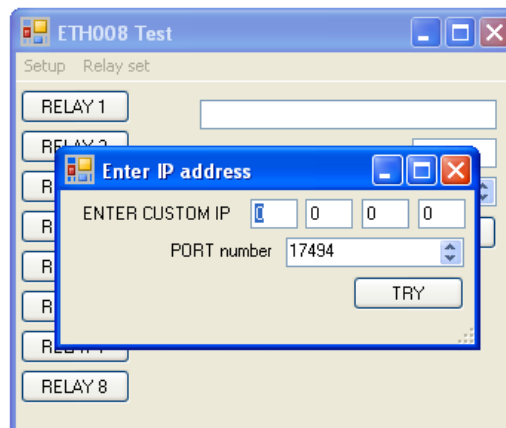
WAN Users:

start: . . .

finish: . . .

Log:

Now go to the "Firewall Rules" menu and click "Add" in the Inbound services section. Select the ETH008 service and ALLOW always. The "Send to LAN Server" IP address is the ETH008's IP address, 192.168.0.99 in the example above but check what it is on your network. Click "Apply" and that's it. The ETH008 is now accessible over the internet. Before you close the routers setup pages, go to the "Router Status" menu and make a note of its ADSL port IP address. This is the routers internet facing IP address.

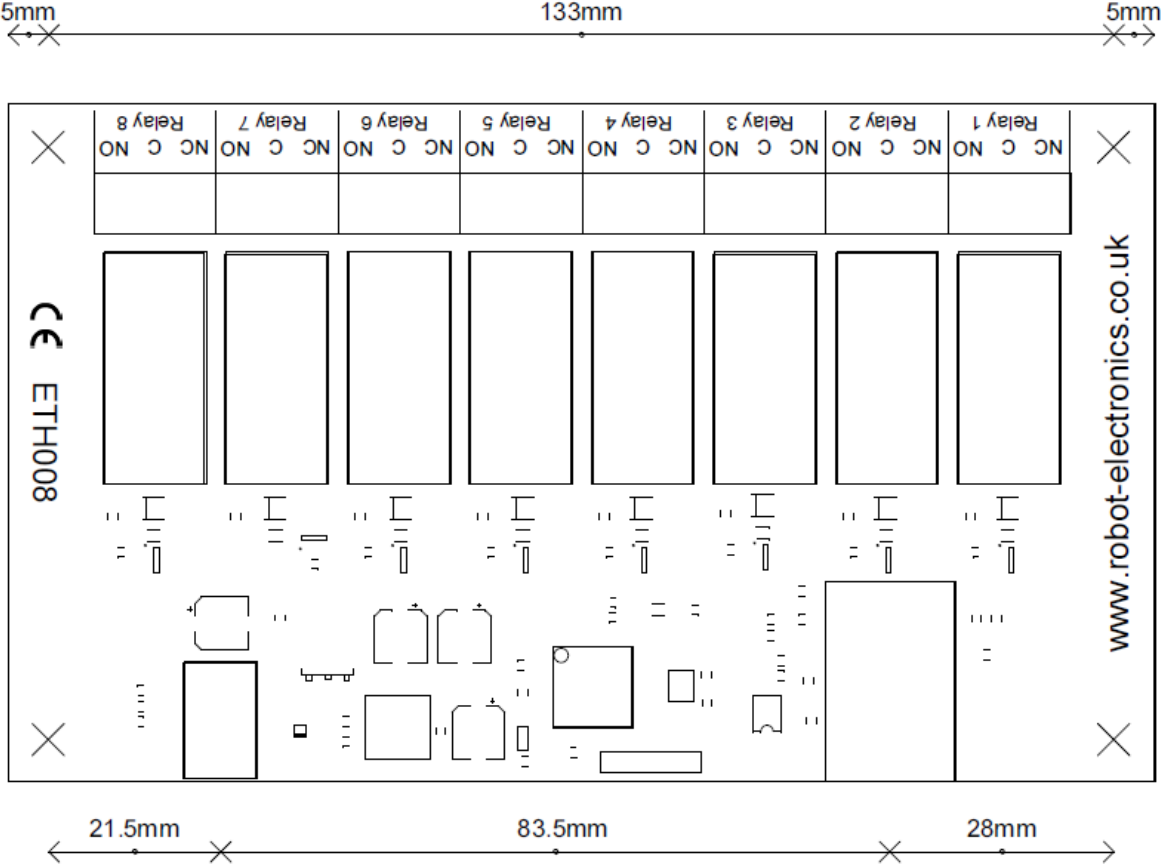


To test this you will need a computer that has its own internet connection and is NOT connected to the same network as the ETH008. Download and run the test program above and select Custom IP. In the pop-up box enter your routers internet facing IP address. Click on "Try IP" and it will connect you to the ETH008 just as if it were on your own network.

Android & iPhone Apps.

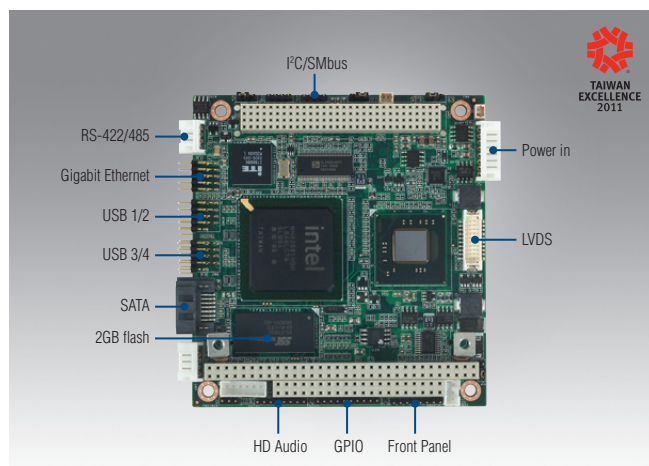
We have a free app **IO network** available for Android and iPhone to remotely control your relays, download from Google Play or iTunes. Search for "Devantech" and you will find the app.

Board dimensions



PCM-3362

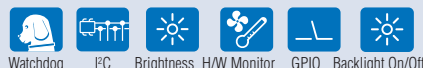
Intel® Atom™ N450 PC/104-Plus SBC, VGA, LVDS, Ethernet, USB, COM, SATA, Onboard Flash



Features

- Intel® Atom™ N450 1.66 GHz Processor and DDR2 667 MHz SDRAM up to 2 GB
- Supports extended temperature -40 ~ 85° C
- Standard 96 x 90 mm dimensions and PC/104-Plus expansion connector
- Onboard 2 GB flash (4 GB optional)
- Supports SUSIAccess and Embedded Software APIs

Software APIs:



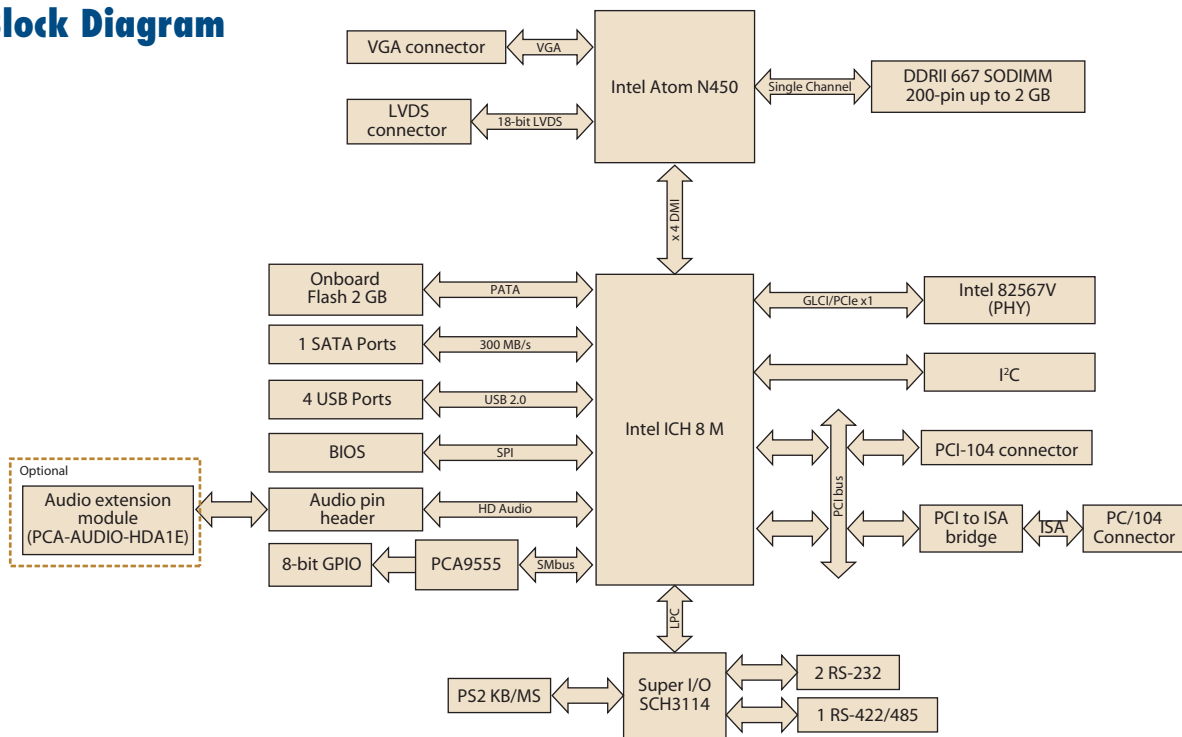
Utilities:



Specifications

Processor System	CPU	Intel Atom N450 1.66 GHz
	Frequency	1.66 GHz
	L2 Cache	512 KB
	System Chipset	Intel Atom N450 + ICH8M
	BIOS	AMI 16 Mbit
Memory	Technology	DDR2 667 MHz
	Max. Capacity	2 GB
	Socket	1 x 200-pin SODIMM
Display	Chipset	Intel Atom N450 1.66 GHz
	VRAM	Shared system memory up to 224 MB
	Graphics Engine	Intel Gen 3.5 graphic core, DX9 compliant, MPEG2 Hardware Acceleration
	LVDS	Single channel 18-bit LVDS up to WXGA 1366 x 768
	VGA	Supports up to SXGA 1400 x 1060 at 60 Hz
Ethernet	Dual Display	VGA+LVDS
	Speed	10/100/1000 Mbps
	Controller	ICH8M + Intel 82567V (PHY), supports Wake-on-LAN
Watchdog Timer	Connector	Pin Header
		Output System Reset Programmable counter from 1 ~ 255 minutes/ seconds
Storage	SATA	1 SATAII, up to 3.0 GB/s (300 MB/s)
	Onboard Flash	2 GB (Up to 4 GB)
Internal I/O	USB	4 x USB 2.0
	Serial	2 RS-232 from COM1/2, 1 RS-422/485 from COM3 (ESD protection for RS-232: Air gap ±15 kV, Contact ±8 kV)
	Keyboard/Mouse	1
	GPIO	8-bit general purpose input/output
	I2C	1
	Audio	Intel High Definition audio interface
Expansion	PC/104-Plus Slot	1
Power	Power Type	AT/ATX
	Power Supply Voltage	5 V ± 5% only to boot up (12 V is optional for LCD inverter and add-on card)
	Power Consumption (Typical)	2 A @ +5 V, 5 mA @ +12 V (10.06 Watts)
	Power Consumption (Max, test in HCT)	2.37 A @ +5 V, 7 mA @ +12 V (11.93 Watts)
	Battery	Lithium 3 V / 210 mAh
Environment	Power Management	ACPI/ APM 1.2
	Operational	0 ~ 60° C (32 ~ 140° F) (Operational humidity: 40° C @ 85% RH non-condensing)
Physical Characteristics	Non-Operational	-40° C ~ 85° C and 60° C @ 95% RH non-condensing
	Dimensions (L x W)	96 x 90 mm (3.8" x 3.5")
	Weight	0.664 kg (1.46 lb) (with heat-sink)
	Height	Top side: 14.4 mm, 19.4 mm (Z & Z2); Bottom side: 10.6 mm

Block Diagram



Ordering Information

Part No.	CPU	Memory	On board Flash	VGA	LVDS	Gigabit Ethernet	USB 2.0	RS-232	RS-422/485	Expansion	Thermal Solution	Operating Temp.
PCM-3362N-S6A1E	Atom N450	SODIMM	2 GB	Yes	18-bit	1	4	2	1	PC/104+	Passive	0 ~ 60° C
PCM-3362N-S6F4A1E	Atom N450	SODIMM	4 GB	Yes	18-bit	1	4	2	1	PC/104+	Passive	0 ~ 60° C
PCM-3362Z-1GS6A1E	Atom N450	1 GB bundle	2 GB	Yes	18-bit	1	4	2	1	PC/104+	Passive	-20 ~ 80° C
PCM-3362Z2-1GS6A1E	Atom N450	1 GB bundle	2 GB	Yes	18-bit	1	4	2	1	PC/104+	Passive	-40 ~ 85° C

Note: Wide temperature version is bundled with extended temperature grade memory module

Note: Passive = fanless; Active = with fan

Packing List

Part No.	Description	Quantity
	PCM-3362 SBC	
	Startup Manual	
	Utility CD	
1700000898	VGA cable D-SUB 15P(F)/12P-1.25 mm15 cm	1
1700003491	AT power cable 1 x 8P-2.0/B4P-5.08 x 2 15 cm	1
1700060202	Cable 6P-6P-6P PS/2 KB & Mouse 20 cm	1
1703040157	RS-422/485 W/D-SUB COM 4P 15 cm	1
1703060053	PS2 cable 6P (MINI-DIN)-6P (Wafer 2.0 mm) 6 cm	1
1700002332	ATX power cable 20P-13P/8P/3P/3P 13 cm	1
1703100260	USB cable 2 ports 2.0 mm pitch w/ bracket 26 cm	1
1700071000	SATA data cable 7p 100 cm	1
1703150102	SATA power cable B4P-5.08/SATA 15P 10 cm	1
1701200220	RS-232 x 2 ports 2.0 mm 22 cm	1
1700017863	LAN cable RJ-45/2 x 5P-2.0 15 cm	1
9660104000	PC/104 screw and copper post package	1
1960045487T001	Heatsink for PCM-3362 (79.66 x 77.97 x 12.22 mm)	1
1960046618T001	Heatsink for PCM-3362Z&Z2 series only (79.66 x 77.97 x 17.22 mm)	1

Optional Accessories

Part No.	Description
1960047106T001	Heat spreader (79.66 x 77.98 x 10.32 mm) of PCM-3362
1653130421	PCI-104 connector 120-pin (Long pin)
165313222B	PC/104 connector 64-pin (Long pin)
165312022B	PC/104 connector 40-pin (Long pin)
PCA-AUDIO-HDA1E	Audio extension module with bracket
1700018427	Audio cable connecting PCM-3362 and PCA-AUDIO-HDA1E

Embedded OS/API

Embedded OS/API	Part No.	Description
WinCE	2070009692	CE 6.0 Pro PCM-3362 V1.3 ENG
Win XPE	2070011081	WinCE 7.0 Pro PCM-3362 V1.0 ENG
QNX	2070010323	XPE WES2009 MUI24 6.5
Linux		Ubuntu 10.04.1
VxWorks		6.8
Software API	205E362000	SUSI 3.0 SW API for PCM-3362 B:20091015 XP

3DM-GX3[®] -25

Miniature Attitude Heading Reference System

The **3DM-GX3[®] -25** is a high-performance, miniature Attitude Heading Reference System (AHRS), utilizing MEMS sensor technology. It combines a triaxial accelerometer, triaxial gyro, triaxial magnetometer, temperature sensors, and an on-board processor running a sophisticated sensor fusion algorithm to provide static and dynamic orientation, and inertial measurements.



Features & Benefits

Best in Class

- precise attitude estimations
- high-speed sample rate & flexible data outputs
- high performance under vibration and high *g*

Easiest to Use

- smallest, lightest industrial AHRS available
- simple integration supported by SDK and comprehensive API

Cost Effective

- reduced cost and rapid time to market for customer's applications
- aggressive volume discount schedule

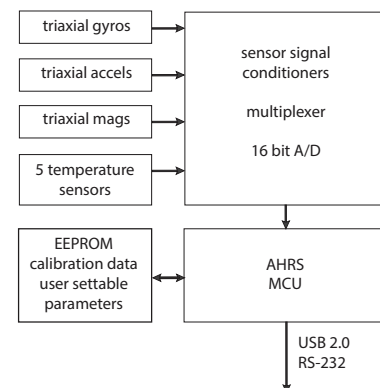
Applications

Accurate guidance, orientation and positioning under dynamic conditions such as:

- Inertial Aiding of GPS
- Unmanned Vehicle Navigation
- Platform Stabilization, Artificial Horizon
- Antenna and Camera Pointing
- Health and Usage Monitoring of Vehicles
- Reconnaissance, Surveillance, and Target Acquisition
- Robotic Control
- Personnel Tracking

System Overview

The **3DM-GX3[®] -25** offers a range of fully calibrated inertial measurements including acceleration, angular rate, magnetic field, deltaTheta and deltaVelocity vectors. It can also output computed orientation estimates including Euler angles (pitch, roll, and heading (yaw)), rotation matrix and quaternion. All quantities are fully temperature compensated and are mathematically aligned to an orthogonal coordinate system. The angular rate quantities are further corrected for *g*-sensitivity and scale factor non-linearity to third order. The 3DM-GX3[®] -25 architecture has been carefully designed to substantially eliminate common sources of error such as hysteresis induced by temperature changes and sensitivity to supply voltage variations. Gyro drift is eliminated in AHRS mode by referencing magnetic North and Earth's gravity and compensating for gyro bias. On-board coning and sculling compensation allows for use of lower data output rates while maintaining performance of a fast internal sampling rate. For those users, integrators or OEMs who develop their own orientation and navigation applications, the 3DM-GX3[®] -25 is shipped with a complete Data Communications Protocol guide that provides access to the powerful LORD MicroStrain[®] Inertial Packet Protocol (MIP). Applications of your own design can readily be developed in any coding language and on any computing platform including microprocessors. The 3DM-GX3[®] -25 is initially sold as a starter kit consisting of an AHRS+GPS module, RS-232 or USB communication and power cable, software CD, user manual and quick start guide.



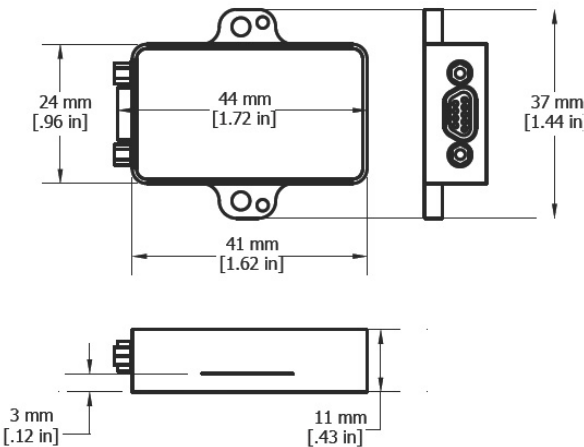
Specifications

AHRS Specifications

Attitude and Heading	
Attitude heading range	360° about all 3 axes
Accelerometer range	±5g standard
Gyroscope range	±300°/sec standard
Static accuracy	±0.5° pitch, roll, heading typical for static test conditions
Dynamic accuracy	±2.0° pitch, roll, heading for dynamic (cyclic) test conditions and for arbitrary angles
Long term drift	eliminated by complimentary filter architecture
Repeatability	0.2°
Resolution	<0.1°
Data output rate	up to 1000 Hz
Filtering	sensors sampled at 30 kHz, digitally filtered (user adjustable) and scaled into physical units; coning and sculling integrals computed at 1 kHz
Output modes	acceleration, angular rate, and magnetic field deltaTheta, deltaVelocity, Euler angles, quaternion, rotation matrix
General	
A/D resolution	16 bits SAR oversampled to 17 bits
Interface options	USB 2.0 or RS232
Baud rate	115,200 bps to 921,600 bps
Power supply voltage	+3.2 to +16 volts DC
Power consumption	80 mA @ 5 volts with USB
Connector	micro-DB9
Operating temperature	-40° C to +70° C
Dimensions	44 mm x 24 mm x 11 mm - excluding mounting tabs, width across tabs 37 mm
Weight	18 grams
ROHS	compliant
Shock limit	500 g
Software utility	CD in starter kit (XP/Vista/Win7/Win8 compatible)
Software development kit (SDK)	complete data communications protocol and sample code

Senor Specifications

	Accels	Gyros	Mags
Measurement range	±5 g	±300°/sec	±2.5 Gauss
Non-linearity	±0.1 % fs	±0.03 % fs	±0.4 % fs
In-run bias stability	±0.04 mg	18°/hr	—
Initial bias error	±0.002 g	±0.25°/sec	±0.003 Gauss
Scale factor stability	±0.05 %	±0.05 %	±0.1 %
Noise density	80 µg/√Hz	0.03°/sec/√Hz	100 µGauss/√Hz
Alignment error	±0.05°	±0.05°	±0.05°
User adjustable bandwidth	225 Hz max	440 Hz max	230 Hz max
Sampling rate	30 kHz	30 kHz	7.5 kHz max
Options			
Accelerometer range	±1.7 g, ±16 g, ±50 g		
Gyroscope range	±50°/sec, ±600°/sec, ±1200°/sec		

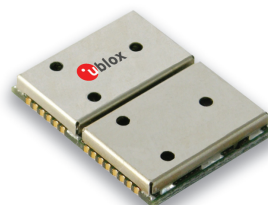


LEA-5 module series

u-blox 5 GPS and GALILEO receivers

Product description

The LEA-5 module series brings the high performance of the u-blox5 positioning engine to the industry standard LEA form factor. These versatile, stand-alone receivers combine an extensive array of features with flexible connectivity options. Their ease of integration results in fast times-to-market for a wide range of automotive, consumer and industrial applications with strict size and cost requirements.



22.4 x 17 x 3 mm

Highlights

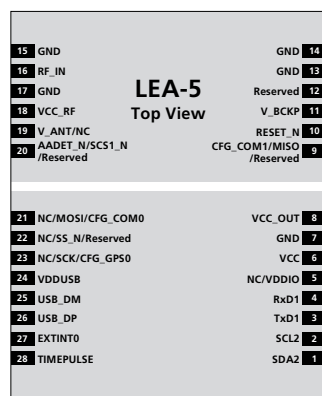
- 50-channel u-blox5 engine with over 1 million effective correlators
- < 1 second Time-To-First-Fix for hot and aided starts
- -160 dBm SuperSense® sensitivity
- Accelerated startup at weak signals with KickStart feature
- Up to 3 serial interfaces: 1 UART, 1 USB, 1 DDC (I²C compliant). 1 SPI planned.
- Supports AssistNow Online and AssistNow Offline A-GPS services; OMA SUPL compliant
- High immunity to jamming
- Hybrid GPS, GALILEO and SBAS (WAAS, EGNOS, MSAS, GAGAN) engine
- Up to 4 Hz position update rate
- GALILEO-ready (LEA-5H)

Features

Series	Power	Size	Memory	Function					Antenna		Input / Output					
	Voltage range [V]	Thickness [mm]	Programmable (Flash) FW update	Power save mode	KickStart	Dead Reckoning	Raw data	Precision Timing	Antenna supply	Antenna supervisor	UART	USB	SPI	DDC (I ² C compliant)	Reset input	Configuration pin
LEA-5H	2.7 - 3.6	3	●	●	●				●	●	1	1		1	●	
LEA-5S	2.7 - 3.6	3		P	●				●	●	1	1		1	●	1
LEA-5A	2.7 - 3.6	3		P					●	●	1	1		1	●	1
LEA-5Q	2.7 - 3.6	2.4		P	●						1	1	P	1	●	3
LEA-5M	2.7 - 3.6	2.4		P							1	1		1	●	2

P = Planned

Mechanical data



Dimensions
22.4 x 17 x 3 mm

Weight
2.1 g

Electrical data

Power supply	2.7 to 3.6 V
Power consumption ¹	69 mW @ 3.0V Power Save mode 129 mW @ 3.0V Eco mode 135 mW @ 3.0V Max. Performance mode
Backup power	1.4 V to 3.6 V, 25µA
Antenna power	External or internal VCC_RF
Antenna supervision	Integrated short-circuit detection and antenna shutdown, open circuit detection is supported with AADET_N input and little external circuitry

Support products

EVK-5H	u-blox 5 Evaluation Kit with KickStart suitable for: LEA-5H, LEA-5S, LEA-5Q
EVK-5P:	u-blox 5 Evaluation Kit with SuperSense® suitable for: LEA-5A, LEA-5M

Ordering information

LEA-5H-0	Progr. u-blox 5 GPS Module with KickStart
LEA-5S-0	ROM-based u-blox 5 GPS Module with KickStart
LEA-5A-0	u-blox 5 ROM-based GPS Module
LEA-5Q-0	ROM-based u-blox 5 GPS Module with KickStart
LEA-5M-0	ROM-based u-blox 5 GPS module

Available as samples and tape on reel (250 pieces)

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Interfaces

Serial interfaces	1 UART 1 USB V2.0 full speed 12 Mbit/s 1 DDC (I ² C compliant) 1 SPI (planned)
Digital I/O	Configurable time pulse 1 EXTINT input 1 Reset 1 config. pin (LEA-5A, LEA-5S)
Serial and I/O voltages	2.7 to 3.6 V
Protocols	NMEA, UBX binary

Receiver performance data

Receiver type	50-channel u-blox 5 engine GPS L1 C/A code GALILEO L1 open service (with upgrade) SBAS: WAAS, EGNOS, MSAS, GAGAN	
Max. update rate	4 Hz (ROM version), 2 Hz (Flash version)	
Accuracy ¹	Position	2.5 m CEP
	SBAS	2.0 m CEP
Acquisition ¹	LEA-5H/5S/5Q	LEA-5A/5M
	Cold starts:	29 s
	Warm starts:	29 s
	Aided starts ² :	< 1 s
	Hot starts:	< 1 s
Sensitivity ³	LEA-5H/5S/5Q	LEA-5A/5M
	Tracking:	-160 dBm
	Reacquisition:	-160 dBm
	Cold starts:	-144 dBm
Timing accuracy	RMS	30 ns
	99%	< 60 ns
	Granularity	21 ns
Time pulse	Configurable	0.25 to 1000 Hz
A-GPS	Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant	
Operational limits	Velocity:	500 m/s (972 knots)
	Altitude:	50,000 m
Operating temp.	-40° C to 85° C	
Storage temp.	-40° C to 85° C	

¹ All SV @ -130 dBm

² Dependent on aiding data connection speed and latency

³ Demonstrated with a good active antenna

Contact us

HQ Switzerland +41 44 722 7444 info@u-blox.com	China +86 10 68 133 545 info_cn@u-blox.com
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EMEA +41 44 722 7477 info@u-blox.com	Japan +81 3 5775 3850 info_jp@u-blox.com
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Americas +1 703 483 3180 info_us@u-blox.com	Korea +82 02 542 0861 info_kr@u-blox.com
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APAC – Singapore +65 6734 3811 info_ap@u-blox.com	Taiwan +886 2 2657 1090 info_tw@u-blox.com
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Performance & Use



- Faster downloads and online gaming
- Push 'N' Connect – push button security
- Connect to a Wireless-G or Wireless-N network

The NETGEAR Difference - WNA3100

- Faster downloads
- Push 'N' Connect—push button security
- Convenient cradle for use with desktop PCs
- Reliable and compatible
- Easy setup with NETGEAR® genie®

Overview

The NETGEAR N300 WiFi USB Adapter wirelessly connects your notebook or desktop computer to a Wireless-N network for applications such as online gaming and a secure and reliable connection to the Internet. The adapter comes with a convenient cradle for use with desktop PCs. NETGEAR genie® is included for easy installation. With the NETGEAR Push 'N' Connect feature, enjoy a secured wireless Internet connection, at the push of a button.

PUSH 'N' CONNECT—WPS		
A secured connection at the push of a button ¹		
STEP 1	STEP 2	STEP 3
Install CD and push the button on the adapter 	Push the Push 'N' Connect button on the router 	Secure wireless connection 

¹ Works with devices supporting Wi-Fi Protected Setup® (WPS).

Speed

Speed makes all your devices really go. And anyplace you need speed, with NETGEAR you got it. The N300 WiFi USB Adapter delivers N300 Mbps speed.

Better WiFi Speed



N300 WIFI—Faster downloads & Internet gaming

WiFi Range

Homes come in all shapes and sizes. The NETGEAR N300 WiFi USB Adapter boosts WiFi connectivity throughout your home for all your Internet-enabled devices.

Better WiFi Range



BETTER RANGE - Wireless coverage for small to medium sized homes

Ease Of Use

NETGEAR genie software on a CD makes it easy to connect to a wireless network. Or, use Push 'N' Connect to add devices to your home network with a push of a button.

Simple Network Management



PUSH 'N' CONNECT—Easy push button WiFi connections (WPS)



EASY INSTALL—Includes NETGEAR genie software on a CD for simple installation

Applications

With the WNA3100 N300 WiFi USB Adapter, connect a laptop to your home network for applications such as online gaming and a secure and reliable connection to the Internet.

Ideal Uses



Emailing, chatting, surfing, music and video streaming



Online gaming

WiFi Technology	FEATURES								APPLICATIONS			
	Speed	Range	NETGEAR® genie®	Secure Connection	Easy Install	Desktop Dock	Dual Band	11ac WiFi	Email, Chat, Music, Video	Online Gaming	HD Streaming	Multiple HD Streaming
N150	Up to 150 Mbps†		✓	✓	✓	✓			✓			
N300	Up to 300 Mbps†		✓	✓	✓	✓			✓	✓		
N600	Up to 300/300 Mbps†		✓	✓	✓	✓	✓		✓	✓	✓	
N900	Up to 450/450 Mbps†		✓	✓	✓	✓	✓		✓	✓	✓	✓
AC1200	Up to 300/867 Mbps†		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

† Some Models Supported

PACKAGE CONTENTS

- N300 WiFi USB Adapter (WNA3100)
- Desktop dock
- Installation guide
- NETGEAR® genie® installation CD

WARRANTY

- 24/7 basic technical phone support for 90 days from date of purchase

STANDARDS

- IEEE® 802.11 b/g/n 2.4 GHz

SYSTEM REQUIREMENTS

- Intel® Pentium® class PC
- Available USB 1.1 or USB 2.0 slot
- Microsoft® Windows 7, 8, XP®, Vista®: (32/64-bit)

PHYSICAL SPECIFICATIONS

- Dimensions: 78 x 24 x 9 mm (3.07 x 0.94 x 0.35 in)
- Weight: 12 g (0.43 oz)



Supports Windows 8

This product is packaged with a limited warranty, the acceptance of which is a condition of sale. This product has been tested for quality assurance and it or its components may have been recycled.

†Maximum wireless signal rate derived from IEEE standard 802.11 specifications. Actual data throughput and wireless coverage will vary. Network conditions and environmental factors, including volume of network traffic, interference, and building construction may lower actual data throughput and wireless coverage. NETGEAR makes no express or implied representations or warranties about this product's compatibility with any future standards.

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PRODUCT BRIEF

D54250WYK

Intel® NUC Kit



MINI
HDMI*



CONSUMER
INFRARED
SENSOR

GIGABIT LAN



USB
3.0



MINI DISPLAY
PORT*

The Shape that Fits the Future.



Think you know what small
can do? **Think again.**

Ultra Compact. Ultra Impact.

A revolution in ultra-compact device design, the new Intel® NUC packs more features into an even slimmer form factor. This fully scalable, computing solution is the smallest possible form factor, complete with the latest 4th generation Intel® Core™ i5 processor. The Intel NUC provides a flexible, customizable engine to drive home theater PCs, media center PCs, and intelligent computing for small spaces, or anywhere else you can imagine. The D54250WYK SKU of Intel NUC has many useful features including four USB 3.0 ports, an infrared sensor, a head-phone/microphone jack, and Mini HDMI* and Mini DisplayPort* video interfaces to support a variety of home or small office usages. With that kind of power and size, you'll rethink what's possible. Because the only thing more amazing than Intel® technology is what you'll do with it.

Superior processing and graphics

The D54250WYK is equipped with the 4th generation Intel® Core™ i5-4250U processor with Intel® Turbo Boost Technology 2.0¹, automatically allowing processor cores to safely run faster than the base operating frequency for short durations to maximize performance. It also features visibly smart graphics using Intel® HD Graphics 5000 to provide amazing performance and visually stunning graphics for immersive gaming, media editing with Intel® Quick Sync Video, and HD playback with Intel® Clear Video HD Technology (Intel® CVT HD).

Advanced technologies

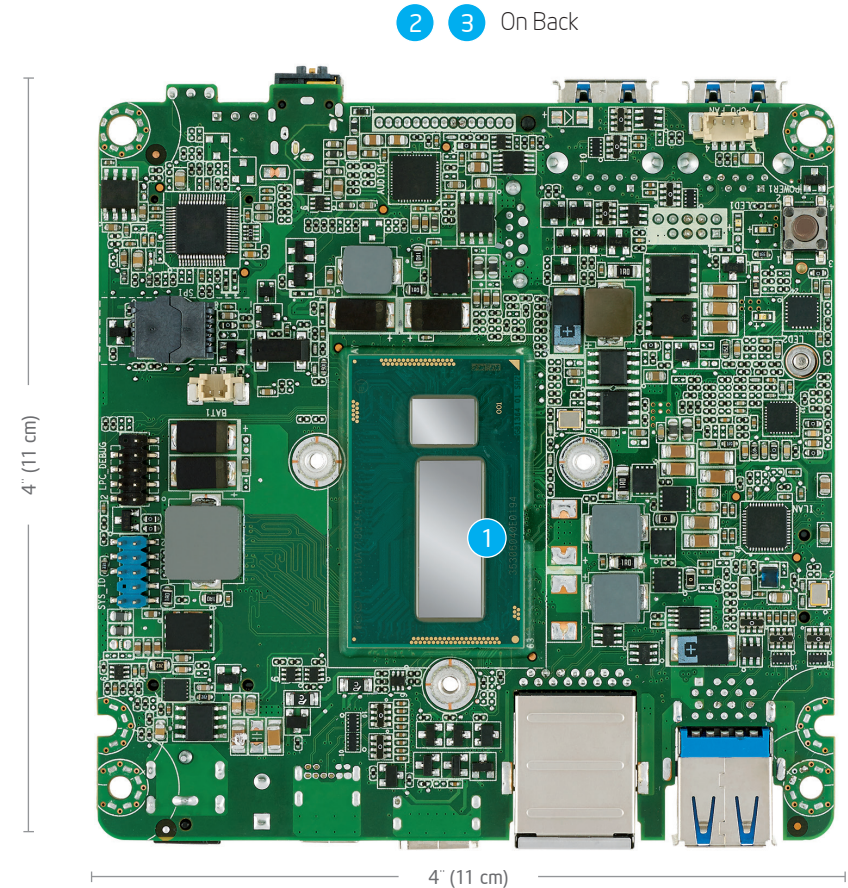
Based on the 4th generation Intel® Core™ processor, you'll get ultra-responsive performance in a highly secure platform. Intel® Rapid Start Technology² ensures you are quickly up and running, and you'll stay up to date with Intel® Smart Connect Technology.³ Also, with Intel® Smart Response Technology⁴ you'll get SSD-like performance from your Intel NUC-based system. And for peace of mind you'll get embedded security that helps keep threats out, user identities and credentials safe, and your data protected.



Power, Capabilities, and Performance in Four Inches Square

HIGHLIGHTED FEATURES

- 1 Intel Core i5-4250U processor
- 2 Two SO-DIMM sockets for memory expandability up to 16 GB
- 3 Dual PCIe* mini card connectors for flexible support of wireless and SSD configurations
- 4 One Mini DisplayPort supporting DP 1.2 and one Mini HDMI port supporting HDMI 1.4a
- 5 Dual rear Panel USB 3.0 ports
- 6 Intel® Gigabit LAN
- 7 19V, 65 W DC power connector
- 8 Dual front panel USB 3.0 ports
- 9 Consumer infrared sensor
- 10 Headphone/microphone jack



Intel® NUC Kit D54250WYK

TECHNICAL SPECIFICATIONS

PROCESSOR

- Intel® Core™ i5 4250U Processor (1.3 GHz with turbo capability to achieve 2.6 GHz, Dual-Core processor with 3 MB smart cache)
- Supports Intel® Hyper-Threading Technology⁵
- Supports Intel® 64 architecture⁶

GRAPHICS

- Intel® HD Graphics 5000
- One Mini DisplayPort* 1.2 supporting ultra-high definition 4K displays and multiple monitor functionality
- One Mini HDMI* 1.4a port

PERIPHERAL CONNECTIVITY

- Integrated Intel 10/100/1000 Network Connection
- Four Super Hi-Speed USB 3.0 ports (two back panel ports and two front ports)
- Two additional Hi-Speed USB 2.0 ports via internal header

MEMORY VOLTAGE

- 1.35 V

SYSTEM BIOS

- 64 Mb Flash EEPROM with Intel® Platform Innovation Framework for EFI Plug and Play
- Advanced configuration and power interface V3.0b, SMBIOS2.5
- Intel® Visual BIOS
- Intel® Express BIOS update support

FAST BOOT BIOS

- Optimized POST for almost instant-on access to PC from power on

SYSTEM MEMORY

- Dual-channel DDR3L with two connectors for 1600/1333 MHz memory support (16 GB max)

HARDWARE MANAGEMENT FEATURES

- Processor fan speed control
- Voltage and temperature sensing
- Fan sensor inputs used to monitor fan activity
- ACPI-compliant power management control

INTEL® PRO 10/100/1000 NETWORK CONNECTION

- Low-power design

EXPANSION CAPABILITIES

- One PCI Express* half-mini card connector⁷
- One PCI Express full-mini card connector⁷
- 1x SATA port (6 Gb/s)

AUDIO

- Intel® HD Audio⁸ via Mini HDMI 1.4a and Mini DisplayPort 1.2 output supporting 8 channel (7.1) digital audio
- Intel® HD Audio via stereo analog audio jack (microphone in/headphone out/speaker out)

FRONT-PANEL CONNECTORS

- Reset, HDD LED, Power LEDs, power on/off

MECHANICAL CHASSIS SIZE

- 4.59" x 4.41" x 1.36"
- 116.6mm x 112.0mm x 34.5mm

BOARD SIZE

- 4" x 4"
- 101.6mm x 101.6mm

BASEBOARD POWER REQUIREMENTS

- DC Power 12 - 19 V, 65 W
- Power Cord Options (Types B, E, and G)

ENVIRONMENT OPERATING TEMPERATURE

- 0° C to +50° C

STORAGE TEMPERATURE

- 20° C to +70° C

REGULATIONS AND SAFETY STANDARDS

United States

UL 60950-1

Canada

CAN/CSA-C22.2 No. 60950-1

Europe

(Low Voltage Directive 2006/95/EC)

EN 60950-1

International

IEC 60950-1

EMC REGULATIONS (CLASS B)

United States

FCC CFR Title 47, Chapter I, Part 15, Subparts A, B

Canada

ICES-003

Europe

(EMC Directive 2004/108/EC)

EN 55022 and EN 55024

Australia/New Zealand

EN 55022

Japan

VCCI V-3, V-4

South Korea

KN-22 and KN-24

Taiwan

CNS 13438

International

CISPR 22

ENVIRONMENTAL COMPLIANCE

Europe

Europe RoHS (Directive 2011/65/EU)

China

China RoHS (MII Order #39)

¹ Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit <http://www.intel.com/go/turbo>

² Requires a select Intel® processor, Intel® software and BIOS update, and a Solid-State Drive (SSD) or hybrid drive. Depending on system configuration, your results may vary. Contact your system manufacturer for more information.

³ Intel® Smart Connect Technology requires a select Intel® processor, Intel® software and BIOS update, Intel® Wireless adapter, and Internet connectivity. Solid-state memory or drive equivalent may be required. Depending on system configuration, your results may vary. Contact your system manufacturer for more information.

⁴ Intel® Smart Response Technology requires a Intel® Core™ processor, select Intel® chipset, Intel® Rapid Storage Technology software version 12.5 or higher, and a solid state hybrid drive reporting at least 16 GB capacity and supporting SATA-IO hybrid information feature. Depending on system configuration, your results may vary. Contact your system manufacturer for more information.

⁵ Available on select Intel® Core™ processors. Requires an Intel® HT Technology-enabled system. Consult your PC manufacturer. Performance will vary depending on the specific hardware and software used. For more information including details on which processors support HT Technology, visit <http://www.intel.com/info/hyperthreading>.

⁶ Requires a system with a 64-bit enabled processor, chipset, BIOS and software. Performance will vary depending on the specific hardware and software you use. Consult your PC manufacturer for more information. For more information, visit <http://www.intel.com/info/em64t>

⁷ System resources and hardware (such as PCI and PCI Express*) require physical memory address locations that can reduce available addressable system memory. This could result in a reduction of as much as 1 GB or more of physical addressable memory being available to the operating system and applications, depending on the system configuration and operating system.

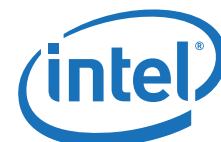
⁸ Requires an Intel® HD Audio enabled system. Consult your PC manufacturer for more information. Sound quality will depend on equipment and actual implementation. For more information about Intel HD Audio, refer to www.intel.com/design/chipset/daudio.htm

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All products, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice. Availability in different channels may vary.

Actual Intel® NUC kit or board may differ from the image shown.



Look Inside.™

Input voltage: DC 10V-32V.

Output voltage: DC12V-35V(adjustable).

Output current: 10A (MAX).

Input current : 16A (MAX) (more than 10A please strengthen heatsink).

Output power: natural cooling 100W (MAX), strengthening cooling 150W (MAX) real power.

Conversion efficiency: 94% (when Input 19V 2.5A Output 16V, Reference).

Output ripple: 2% (MAX).

Working temperature: industrial (- 40 ° c to +85 ° c) (environmental temperature, more than 40 degrees, please reduce power to use, or - enhance cooling).

Full-Load temperature: 45 degrees.

No-load current: 25mA typical.

Voltage regulation: $\pm 0.5\%$.

Load regulation: $\pm 0.5\%$.

Dynamic response speed: 200uS 5%.

Short circuit protection: No (Please install the fuse or protection circuit at input parts).

Input Reverse protection: No (Please comply with a reverse protection or connect a diode at input parts.).

