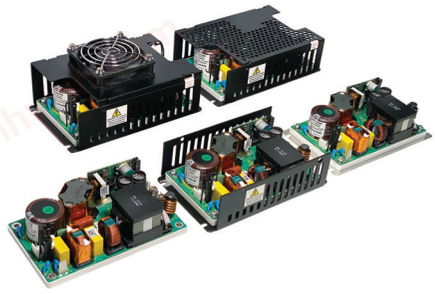
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TDK·Lambda

CUS400M Series

3 x 5” 400W AC-DC Power Supplies

https://product.tdk.com/en/power/cus-m
www.emea.lambda.tdk.com/cus400m



Medical Industrial Test LED COMM Broadcast

The compact CUS400M is packaged in the industry standard 3x5” footprint. The series can deliver 400W with forced air or 250W when convection cooled with a 400W peak power for extended periods of time (minutes). Cooling is also assisted via conduction through the base into the equipment chassis. With Medical & ITE certifications, the units can be used in both Class I & Class II (no ground wire) applications, and meets Class B Conducted and Radiated EMI. Options include a standby voltage, signals and multiple case options.

Features	Benefits
• 250W Convection / Conduction Cooled with 400W Peak for Extended Time Periods	• Quiet Operation
• 400W with Forced Air	• Can Utilise System Airflow or Integrated Fan
• Medical Certifications (2 x MOPP)	• Suitable for B and BF Type Medical Equipment
• Class B Conducted and Radiated EMI	• Easier System EMC Compliance
• Suitable for Class I and Class II installations	• Flexible Utilisation
• Compact 3 x 5 x 1.55” Size	• Space Saving in End Equipment
• Enclosure & Signal Options	• Versatile Application

Model Selector

Model	Nominal Output Voltage (V)	Output Adjustment (V)	Maximum Current Convection (A)	Maximum Current Forced Air (A)	Peak Current (A) Convection cooled ≥115Vac input (See derating curve section)	Maximum Power Convection (W)	Maximum Power Forced Air (W)
CUS400M-12	12	12 - 13.2	20.83	33.33	33.33	250	400
CUS400M-15	15	15 - 16.5	16.67	26.67	26.67	250	400
CUS400M-19	19	19 - 20.9	13.16	21.05	21.05	250	400
CUS400M-24	24	24 - 26.4	10.42	16.67	16.67	250	400
CUS400M-28	28	28 - 30.8	8.93	14.29	14.29	250	400
CUS400M-36	36	36 - 39.6	6.94	11.11	11.11	250	400
CUS400M-48	48	48 - 49.9	5.21	8.33	8.33	250	400

CUS400M-	12	/	U	M	E	X5	-

Output voltage 12, 15, 19, 24, 28, 36, 48

blank	open frame with plastic baseplate
C	open frame with plastic baseplate and M3 threaded inserts for under side mounting
U	U channel chassis
B	open frame with metal baseplate
A	U channel chassis with cover
F	U channel chassis, cover and top fan

Blank	JST Connectors
M	Molex type input connector

blank	dual fuses
E	single input fuse in line (AC input only)

blank	Standard leakage current (<250uA)
R	Reduced leakage current <150uA (Contact Technical Sales)

blank	No options
X2	5V 2.0A standby supply, remote on/off (enable), remote sense, DC-OK, AC Fail
X3	12V 0.83A standby supply, remote on/off (enable), remote sense, DC-OK, AC Fail
X5	5V 2.0A standby supply, remote on/off (inhibit), remote sense, DC-OK, AC Fail
X6	12V 0.83A standby supply, remote on/off (inhibit), remote sense, DC-OK, AC Fail

Example: CUS400M-15V25/FEX5 = 15.25V factory output voltage set point, U chassis, cover and fan, single fuse, X5 standby and signals

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Specifications

Model		CUS400M
Input		
Input Voltage Range (Operating)	Vac	85 - 264 (Derate output by 1% / 1Vac below 115Vac input)
Nominal Input Voltage Range	Vac	100 - 240 (Note: Safety certified for 90-264Vac)
Input Frequency	Hz	47 - 440 (Certified to the 62368-1 standard only)
Input Current (100Vac)	A	< 5.0
Inrush Current at 264Vac, 63Hz (Cold Start)	A	<40
Leakage Current (1)	uA	<250
Touch Current (Enclosure Leakage) (1)	uA	<100
Power Factor (100Vac, 47-63Hz) (2)	-	> 0.97 (>20% load)
Harmonic Compliance (50-60Hz)	-	IEC61000-3-2 Class A
No Load Power Consumption	W	<1.3 when output is inhibited (230Vac input). <10 without output inhibited
Hold Up Time at 115Vac Input	ms	>16 (400W load) (CUS400M-15 >12ms)
Efficiency	%	Up to 94
Average Efficiency	%	>87. Measured at 25%, 50%, 75% and 100% load conditions
Conducted & Radiated EMI	-	EN55032/EN55011-B (See application notes for conditions)
Immunity	-	Compliant with EN60601-1-2;2015 (Edition 4), see immunity table
Insulation Class	-	Construction suitable for Class I or Class II installation
Safety Certifications and Markings	-	IEC/EN/UL/CSA62368-1, 60950-1, IEC/EN60601-1, ES60601-1, CE Mark and UKCA Mark

Immunity

Test	Standard	Test Level	Criteria	Notes (the power stated below is total power (main power + fan output))
ESD	IEC61000-4-2	3	A	-
Radiated Susceptibility	IEC61000-4-3	3	A	Includes proximity field requirements of IEC60601-1-2:2015
Electrical Fast Transient Burst	IEC61000-4-4	4	A	(AC Port, 5kHz and 100kHz)
Surge	IEC61000-4-5	3	A	-
Conducted Susceptibility	IEC61000-4-6	3	A	-
Magnetic fields	IEC61000-4-8	4	A	-
Voltage Dips and Input Interruptions	IEC61000-4-11 Class 3 Industrial, incl EN55024	0% for 1/2 cycle	A	-
		0% for 1 cycle	A/B	A up to 290W, B above 290W
		40% for 10/12 cycles	A/B	A up to 100W, B above 100W
		70% for 25/30 cycles	A/B	A up to 250W, B above 250W
		80% for 250/300 cycles	A/B	A up to 270W, B above 270W
		0% for 250/300 cycles	B	-
	IEC60601-1-2:2015	0% for 1/2 cycle	A	Customer to consider essential performance of end equipment
		0% for 1 cycle	A/B	A up to 290W, B above 290W
		70% for 25/30 cycles	A/B	A up to 250W, B above 250W
		0% for 250/300 cycles	B	-
	IEC61000-6-2	0% for 1 cycle	B	-
		40% for 10/12 cycles	C	-
		70% for 25/30 cycles	C	-
		0% for 250/300 cycles	C	-
	IEC61204-3	0% for 1/2 cycle	B	-
		0% for 1 cycle	B	-
		70% for 25/30 cycles	C	-
		0% for 250/300 cycles	C	-
Ringwave Test	IEC61000-4-12	3	A	-
Voltage Fluctuations	IEC61000-4-14	Class 3	A	-

Notes:
(1) Applies to standard leakage version, 47-63Hz.
(2) Power factor is degraded at input frequencies above 63Hz
See website for detailed specifications, test methods and installation manual
Specification parameters apply at 25°C ambient temperature unless otherwise stated.

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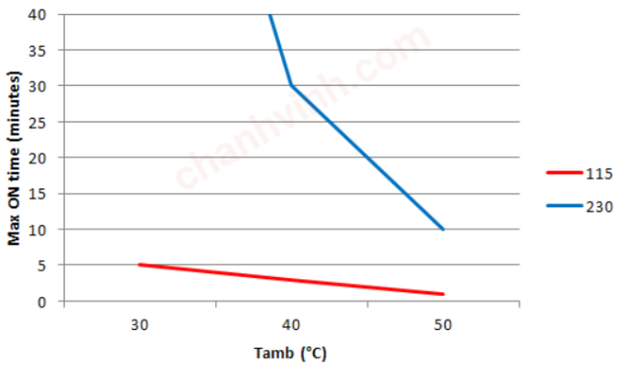
Specifications

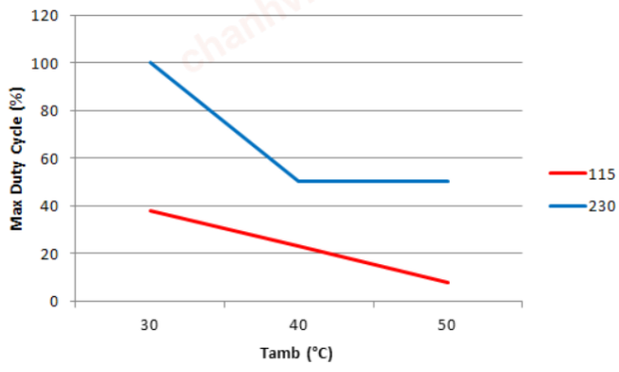
Model		CUS400M
Output		
Line Regulation	%	0.5 (85 - 264Vac)
Load Regulation	%	1.0 (0 - 100% load)
Ripple & Noise	%	<1
Temperature Coefficient	%/°C	±0.02
Minimum Load	-	No minimum load required
Overcurrent Protection	%	101 to 170. Hiccup mode, automatic recovery
Overvoltage Protection	-	Latching (unit shutdown), cycle AC input to reset
Overtemperature Protection	-	Latching (unit shutdown), cycle AC input to reset
Remote Sense	-	See model selector (requires X option) 0.5V total compensation Voltage at output terminals must remain within the range specified in the model selector
Remote On/Off	-	Opto-isolated. Inhibit: High = OFF, Low = ON, Enable: High = ON, Low = OFF
DC Good	-	Opto isolated, >20ms after output good
AC Fail	-	Opto isolated, 5ms warning before DC loss
Fan Supply	-	7 to 13.2V, 0.3A. (Variable with main output load, see application notes)
Parallel Operation	-	Not possible
Series Operation	-	Please contact Technical Sales for guidance
Environmental		
Operating Temperature (-30°C start-up)	°C	-20°C to +70°C, derate linearly above 50°C to 50% load
Storage Temperature	°C	-40°C to +85°C (70°C maximum for fan version /F)
Operating Humidity (non condensing)	%RH	5 - 95%RH (15 - 90%RH for /F fan version)
Cooling	-	Convection cooling or forced air (0.3m/s required for 400W output at 115Vac input)
Altitude	m	5,000m. Operating, transportation and storage
Withstand Voltage (For 1 minute)	Vac	Input to Ground 1.5kVAC (1xMOPP), Input to Output 4kVAC (2xMOPP), Output to Ground 1.5kVAC (1xMOPP)
Isolation Resistance	MΩ	>100MΩ at 25°C & 500Vdc
Vibration (Operating)	-	2G, 10-200Hz for 1 hour. Conforms to EN60068-2-6, IEC68-2-6, MIL-STD-810G
Shock	-	30G, 11ms half sine. Conforms to EN60068-2-27, EN60068-2-47, IEC68-2-27, IEC68-2-47, MIL-STD-810G
Other		
Weight (max)	g	440g (open frame version with plastic baseplate), /B: 495g, /C: 445g, /U: 530g, /A: 550g, /F: 605g
Size (WxLxH)	mm in	Open frame version with plastic baseplate: 128 x 77.5 x 39.5 Open frame version with plastic baseplate: 5 x 3 x 1.55
Connectors	-	Input: JST VAR-2, Output: M4 screws, Fan: Molex 51191-0200, Signals: Molex 51110-1051
Warranty	yrs	5

Notes:
(1) Applies to standard leakage version
See website for detailed specifications, test methods and installation manual
Specification parameters apply at 25°C ambient temperature unless otherwise stated.

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Peak Power Rating Curves. U chassis configuration, convection cooled on metal baseplate



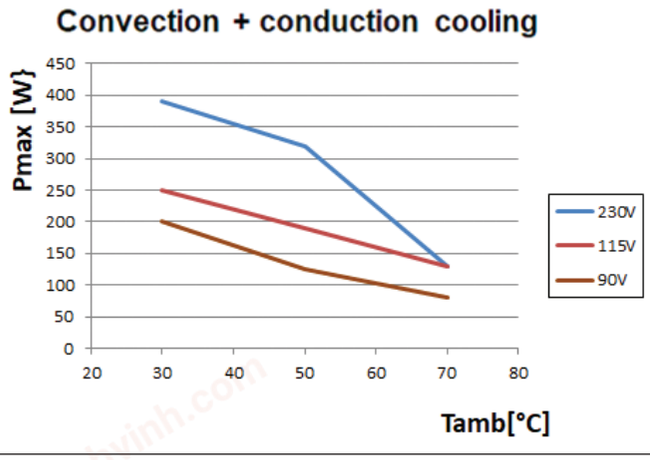


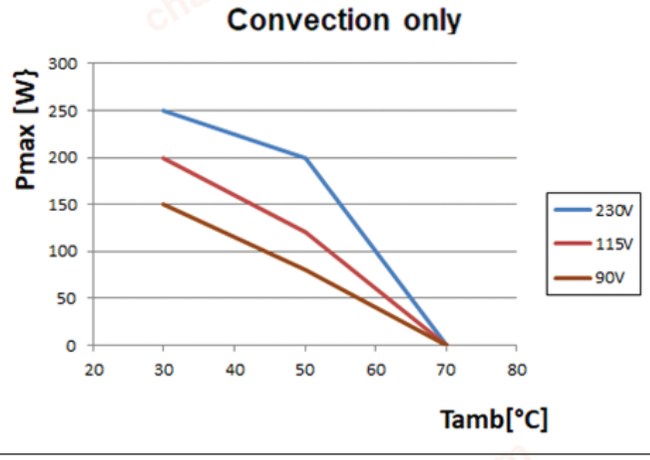
Ambient Temperature (°C)	AC Line Input (Vrms)	Maximum ON time (minutes)	Maximum Duty Cycle (%)	Maximum achievable output power
30	85	18	47	250W peak power
30	115	5	38	400W peak power
30	230	∞	100	400W Continuous
40	230	30	50	400W peak power
50	85	0	0	No peak rating
50	115	1	8	400W peak power
50	230	10	50	400W peak power

The curves below are guidelines only. The actual performance should be tested in the application.

See application notes for all mechanical formats.

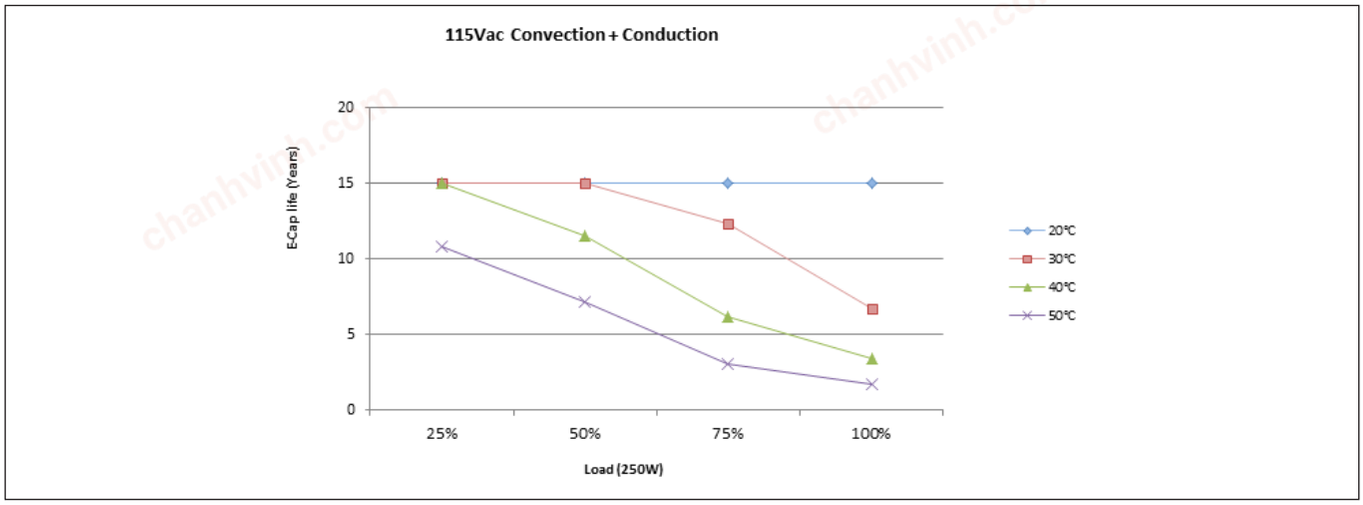
Output Power vs Ambient Temperature Open Frame Unit (mounted on a 300 x 300 x 1 mm aluminum plate)



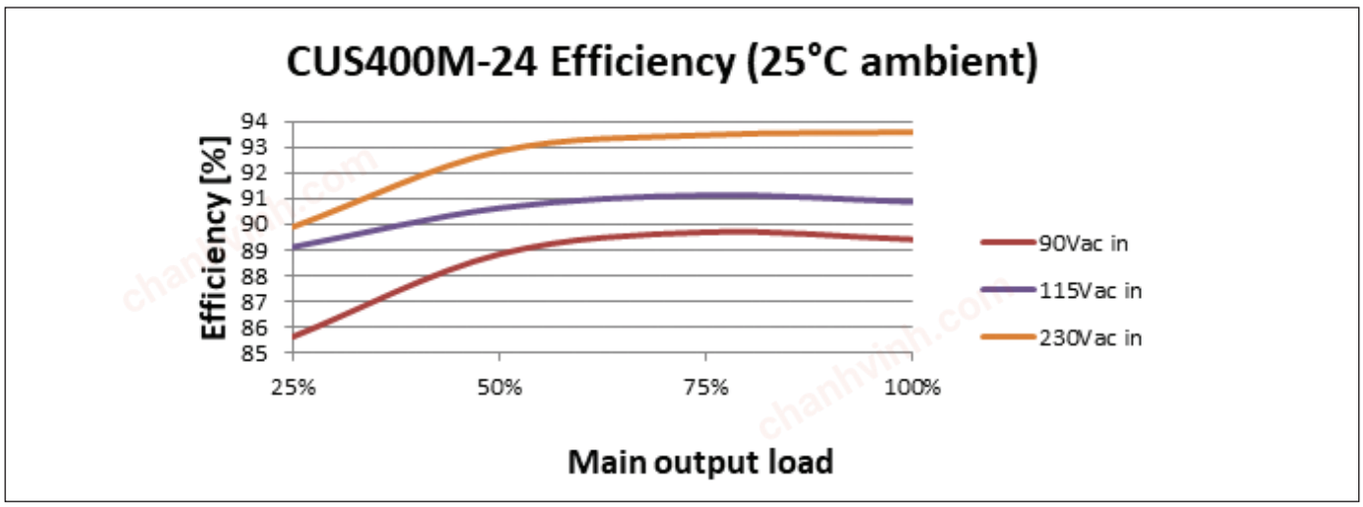


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Electrolytic Capacitor Life (CUS400M-12 Open Frame Unit Convection and Conduction Cooled)



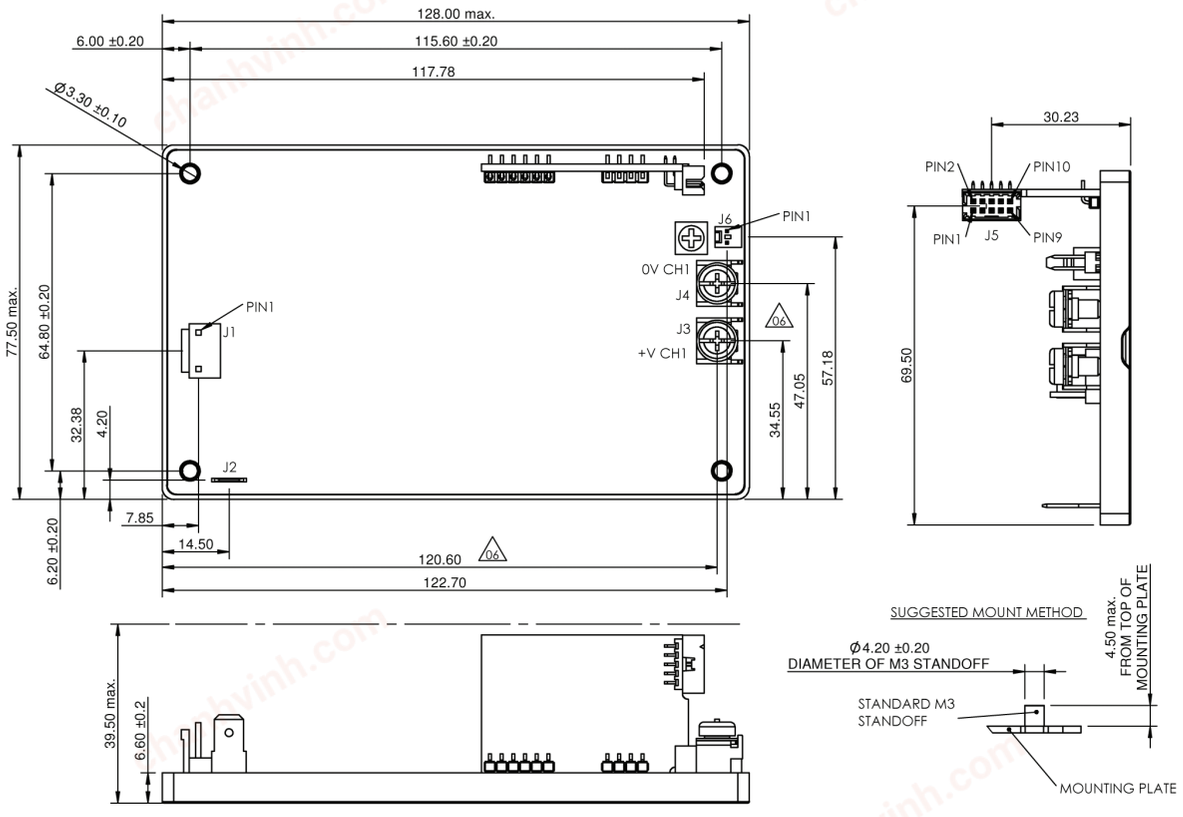
Efficiency (CUS400M-24)



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Mechanical Specification

Outline Drawing CUS400M Open Frame Unit



J5 OPTION ONLY

PIN	CONNECTION
1	0V STANDBY (1)
2	REMOTE ON/OFF -
3	+V STANDBY
4	+ SENSE
5	REMOTE ON/OFF +
6	- SENSE
7	AC FAIL-COLLECTOR
8	DC OK COLLECTOR
9	AC FAIL-EMITTER
10	DC OK EMITTER

MATING CONNECTORS AND PINS

CONNECTOR	MANUFACTURER	HOUSING	CRIMP PIN
J1	JST	VAR-2	SVA-41T-P1.1
J2	TYCO	N/A	2-520407-2
J3 & J4	MOLEX	N/A	TAG 19073-0165
J5	MOLEX	51110-1051	50394
J6	MOLEX	51191-0200	50802

J1

PIN	CONNECTION
1	NEUTRAL
2	NOT CONNECTED
3	LIVE

J6

PIN	CONNECTION
1	+V FAN
2	0V FAN (2)

J2 - EARTH

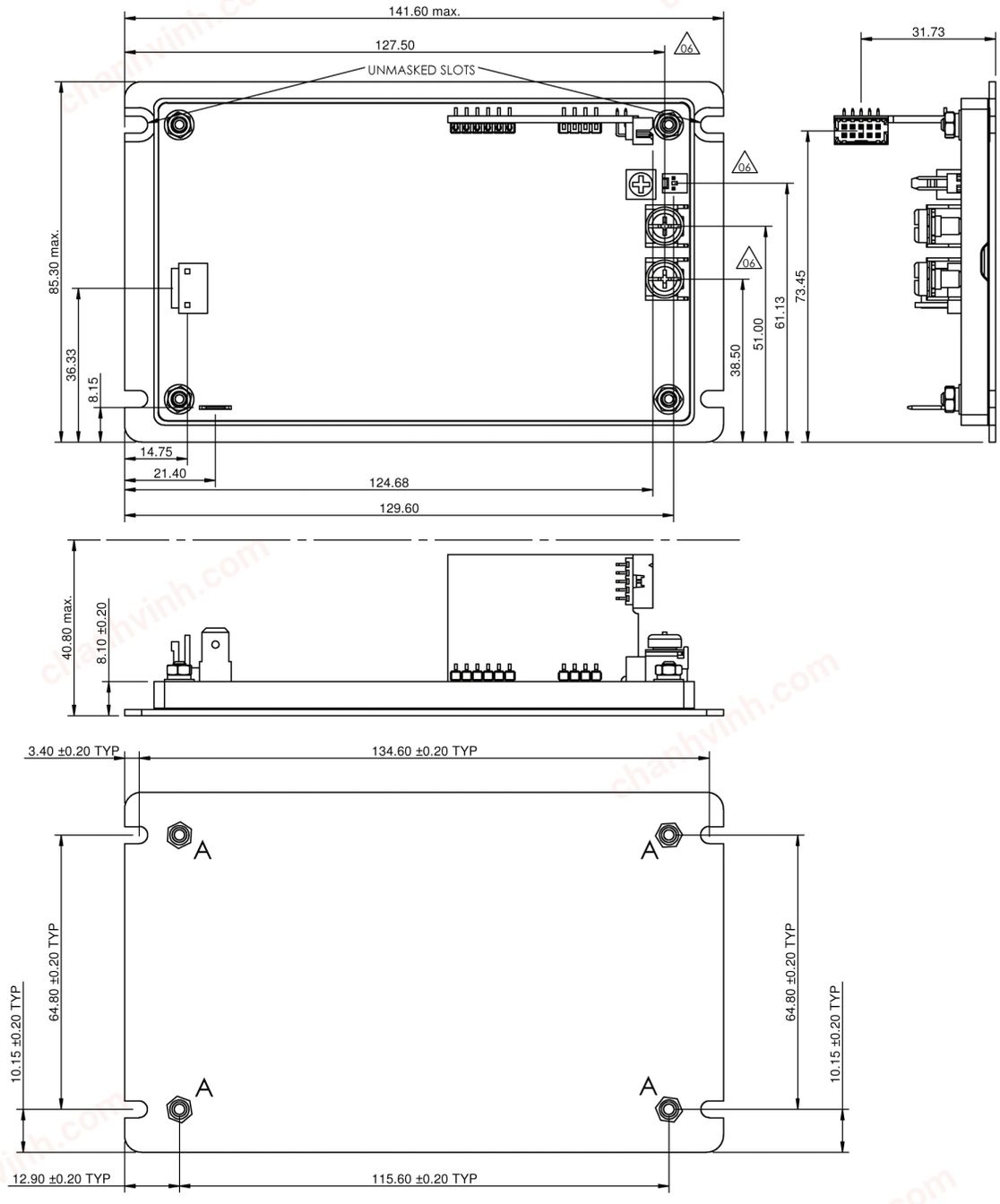
J3	+V CH1
J4	0V CH1

NOTE:
(1). '0V STANDBY' AND '0V CH1' ARE ISOLATED
(2). '0V FAN' AND '0V CH1' ARE INTERNALLY CONNECTED
△06 ALL UNSTATED TOLERANCES +/-0.5mm
ALL UNSPECIFIED DIMENSIONS IN mm.

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Mechanical Specification

Outline Drawing CUS400M Open Frame Unit with Baseplate

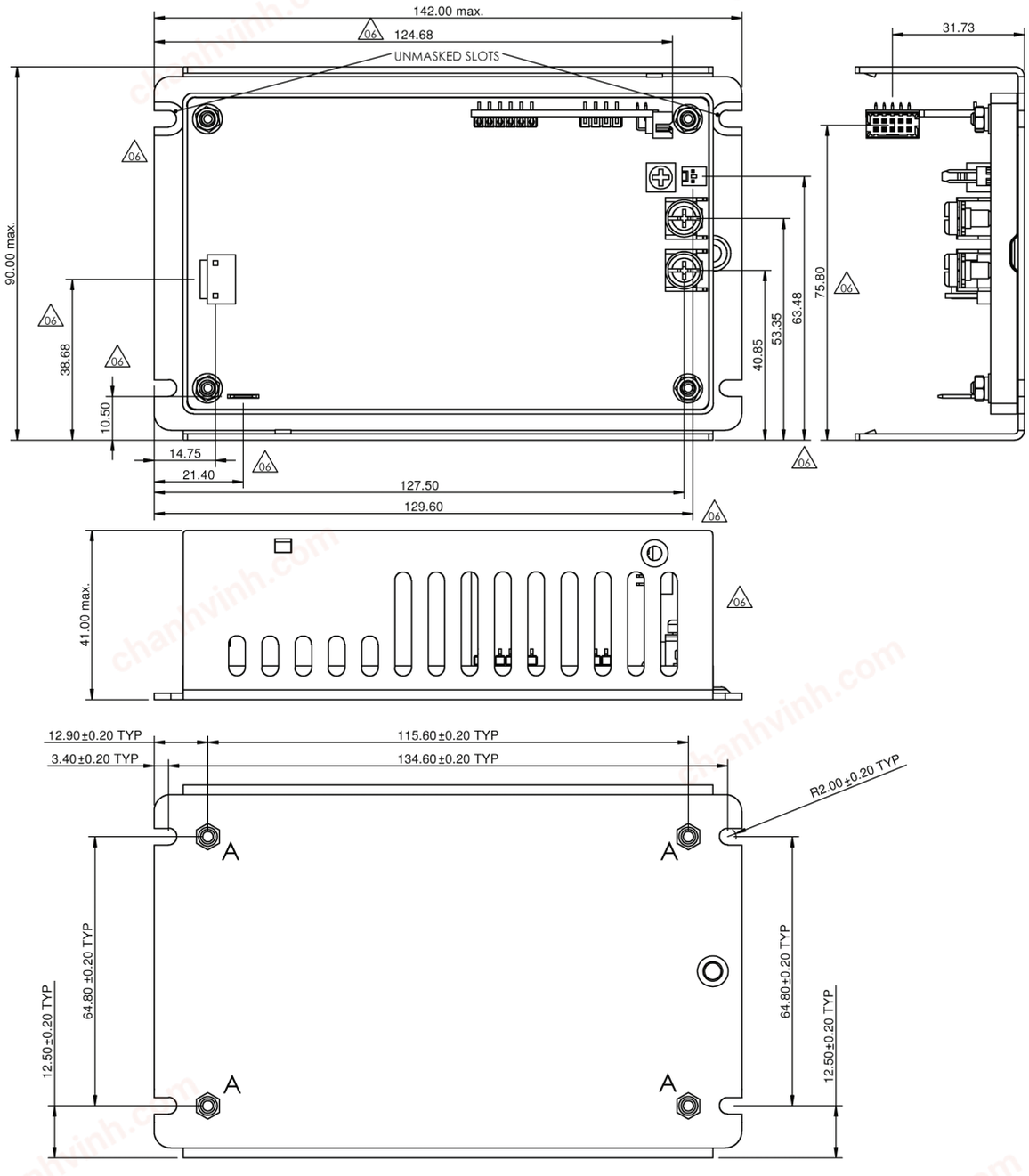


NOTE:
A 4 OFF FIXING HOLES FOR M3, MAXIMUM PENETRATION 4.25mm, MAXIMUM TORQUE 0.5 - 0.6 Nm.
ALL UNSTATED TOLERANCES +/-0.5mm.

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Mechanical Specification

Outline Drawing CUS400M/U (U Channel) Option

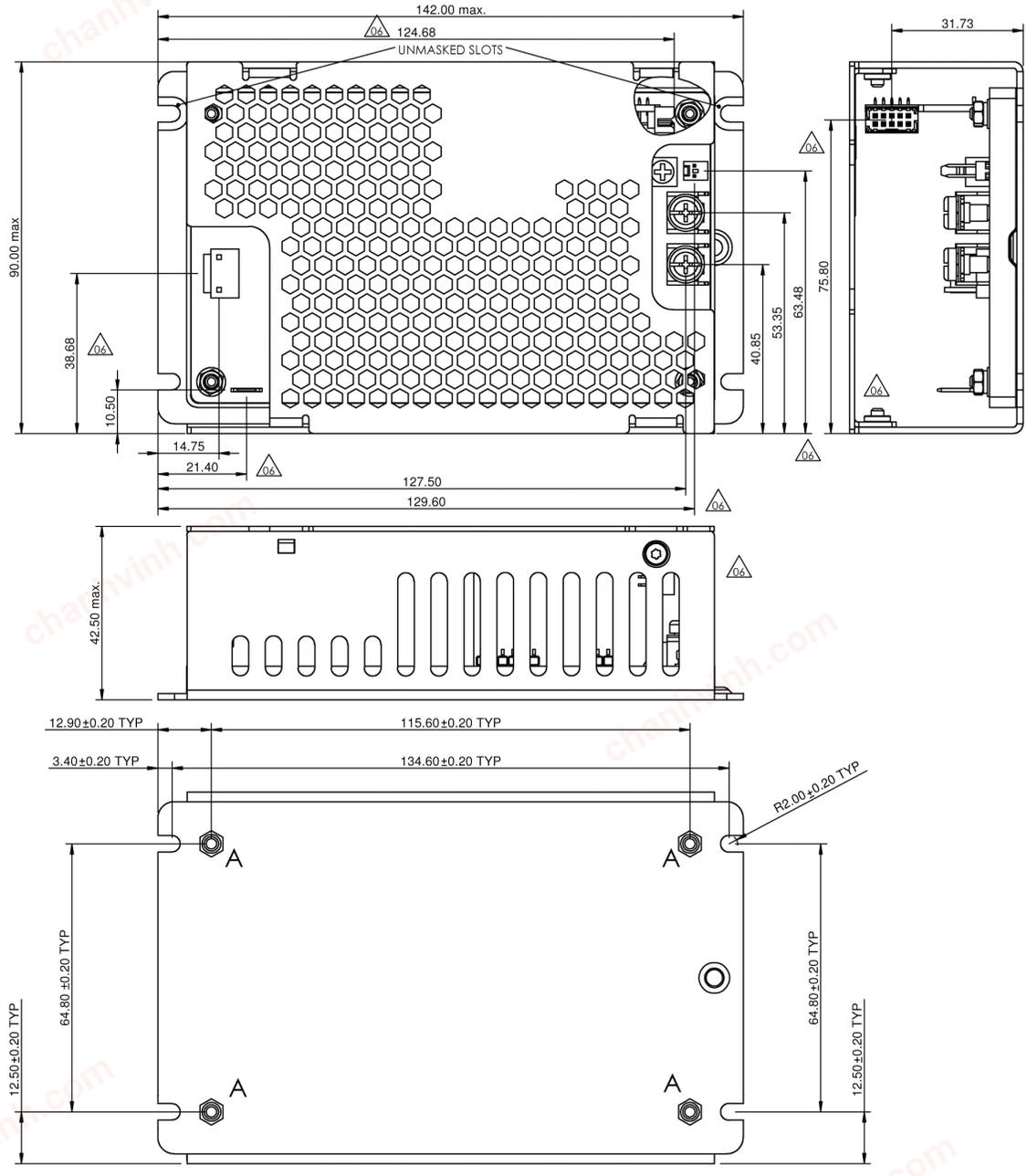


NOTE:
A 4 OFF FIXING HOLES FOR M3, MAXIMUM PENETRATION 4.25mm, MAXIMUM TORQUE 0.5 - 0.6 Nm.
ALL UNSTATED TOLERANCES +/-0.5mm.

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Mechanical Specification

Outline Drawing CUS400M/A (U Channel with Cover) Option

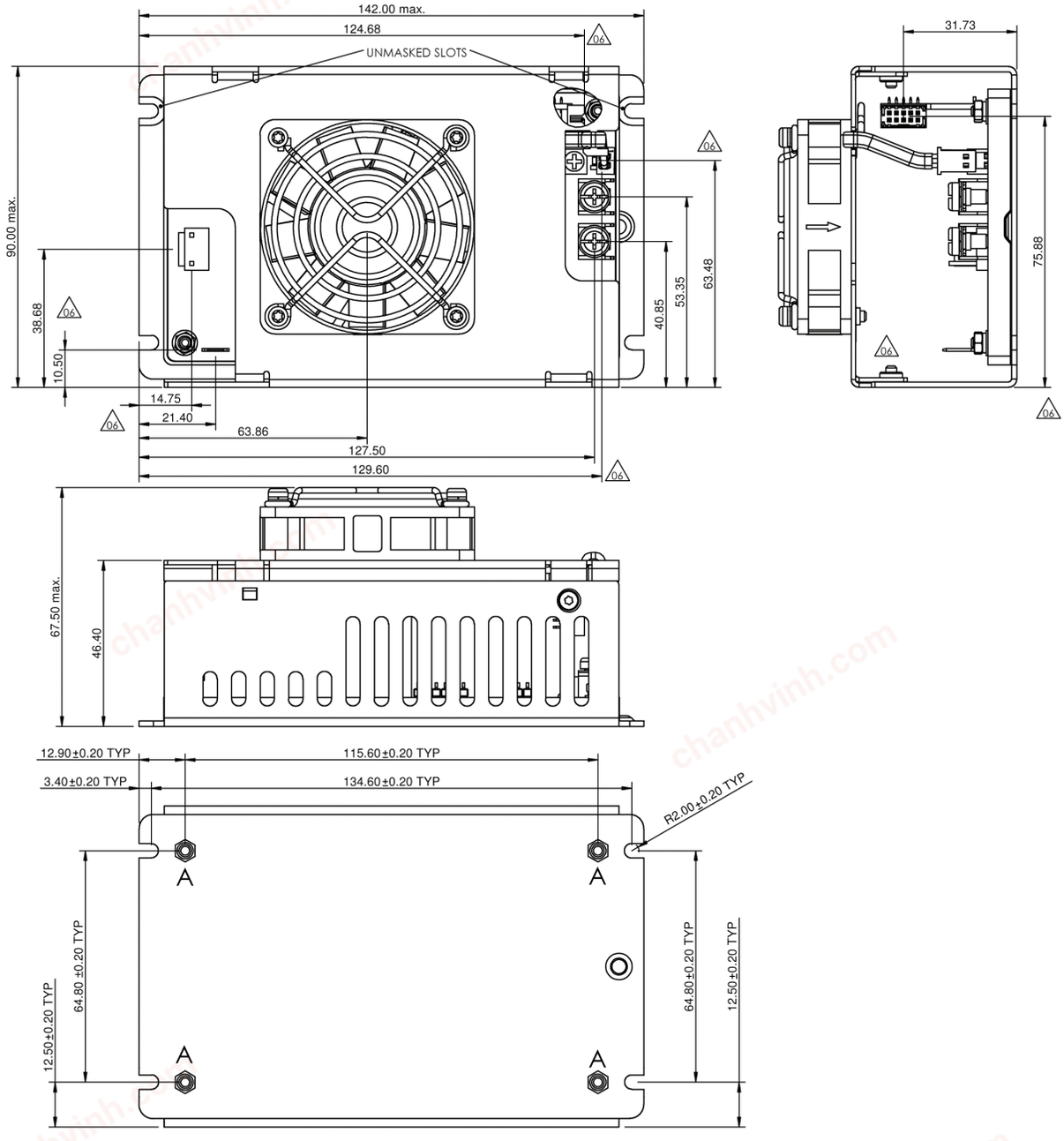


NOTE:
A 4 OFF FIXING HOLES FOR M3, MAXIMUM PENETRATION 4.25mm, MAXIMUM TORQUE 0.5 - 0.6 Nm.
ALL UNSTATED TOLERANCES +/-0.5mm.

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Mechanical Specification

Outline Drawing CUS400M/F (U Channel, Cover and Fan) Option



NOTE:
A 4 OFF FIXING HOLES FOR M3, MAXIMUM PENETRATION 4.25mm, MAXIMUM TORQUE 0.5 - 0.6 Nm.
ALL UNSTATED TOLERANCES +/-0.5mm.

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