KHTB-250

Technical Specification

Board Mount Precision Current Transducer: KHTB – 250

The KHTB series current sensors are designed for precise electronic measurement of **DC, AC, pulsed, and mixed currents**, providing galvanic isolation between the primary (high-power) and secondary (electronic) circuits.

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RoHS COMPLIANT

General Features:

- **Rated Current Range:** 100A, 150A, 200A, 250A.
- **Galvanic Isolation:** Reliable separation between primary and secondary circuits for enhanced safety.
- **Low Power Consumption:** Ideal for energy-efficient applications.
- **Compact Design:** Suitable for environments with limited space.
- **Proportional Output:** Accurate and linear output signal corresponding to the measured current.

Main Applications:

- Power inverters.
- Electric vehicle (EV) power systems.
- Industrial electronics and motor control.
- Renewable energy systems, such as solar panels and wind turbines.

Key Advantages:

- **Exceptional Accuracy:** High linearity ensures reliable measurements in demanding environments.
- **Durability:** Resistant to electromagnetic interference and harsh environmental conditions.
- **Versatility:** Broad compatibility with various electronic system configurations.

Technical Specifications:

- **Supply Voltage:** 5V ±5%.
- **Operating Temperature Range:** -40°C to +85°C.
- **Isolation Voltage:** Up to 4 kV. At (50 Hz,1mn)
- **Output Signal:** Analog.

Mounting:

- Compatible with busbars or primary cables.
- Simple and robust installation suited for industrial environments.

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Technical Specification

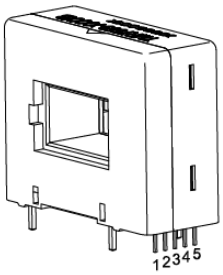
Features :

- **High accuracy**
- **Excellent linearity**
- **Low temperature coefficient**
- **Fast response time**
- **Galvanic isolation**
- **RoHS & REACH compliant**

Applications:

- Solar inverter
- Direct-current dynamo
- Uninterruptible power supplies (UPS)
- Switched model power supplies (SMPS)
- Variable frequency drive (VFD)

Part Number	Rated nominal current I_{PN} (A)	Measuring Range I_{PM} (A)	Supply Voltage Vcc (V)
KHTB-100	100A	±300 A	5 ±5%
KHTB-150	150A	±450 A	5 ±5%
KHTB-200	200A	±500 A	5 ±5%
KHTB-250	250A	±500A	5 ±5%



Pin No	Pin Name
1	Vcc
2	GND
3	V_{OUT}
4	V_{REF}
5	NC

Parameters Definition and Formula

1) Output Voltage

$$V_{OUT} = V_{OFF} + S \times I_P$$

V_{OUT} stands for current sensor output voltage at given primary current, V_{OFF} stands for offset voltage, S stands for sensitivity, I_P stands for primary current.

2) Accuracy

$$X_G = \underset{I_P \in [-I_{PN}, I_{PN}]}{MAX} \left(\frac{(V_{OUT} - V_{REF}) - (S \times I_P)}{S \times I_{PN}} \times 100\% \right)$$

I_{PN} stands for nominal primary current.

3) Hysteresis

$$V_{OH} = MAX\ \Delta H$$

ΔH is the maximum residual output current between full scale positive and negative nominal current.

4) Offset Voltage

$$V_{OE} = V_{OUT(@\ I_P = 0)} - V_{REF}$$

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- ENVIRONMENTAL AND MECHANICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Dielectric Strength	V_D	-	4	-	KV (50Hz,1mn)
Insulation Resistance	R_{IS}	-	1000	-	MΩ
Creepage Distance	d_{CP}	-	22	-	mm
Clearance	d_{CL}	-	14.5	-	mm
Ambient Operating Temperature	T_A	-40	…	+85	°C
Ambient Storage Temperature	T_{STG}	-50	…	+105	°C
Mass	m	-	60	-	g

- SPECIFICATIONS: T_A = 25°C , V_{CC} = ± 5V , R_L = 10kΩ **unless otherwise noted**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Primary nominal current	I_{PN}		-	250	-	A
Measurement Range	I_{PM}		-500	-	500	A
Sensivity	S		-	2.7	-	mV/A
Supply Voltage		± 5%	-	5	-	V
Offset voltage	V_{OFF}		-	2.5	-	V
Accuracy	X_G	I_P = 0 to ±I_{PN}	-0.8	-	0.8	% I_{PN}
		T_A = 85 °C, I_P = 0 to ±I_{PN}	-2.5	-	2.5	
Linearity error	ε_L	IP = 0 to ±IPN	-	±0.15	-	% I_{PN}
Reference Output Voltage	V_{REF}		2.485	2.5	2.515	V
Output Voltage	V_{OUT}	I_P = 0 to ±I_{PM}	-	V_{OFF} + S × I_P	-	V
Current Consumption	Ic	I_P=0	-	16	-	mA
Symmetry	ε_{SYM}	T_A = -40 °C to +85 °C, I_P = 0 to ±I_{PN}	99	100	101	%
Offset Error	V_{OE}	T_A = +25 °C, I_P = 0	-	-	5	mV
Response Time	t_R	di/dt > 50 A/µs, 10% to 90% of I_{PN}	-	1	-	µs
Bandwidth	BW	-3 dB	DC	300	-	kHz

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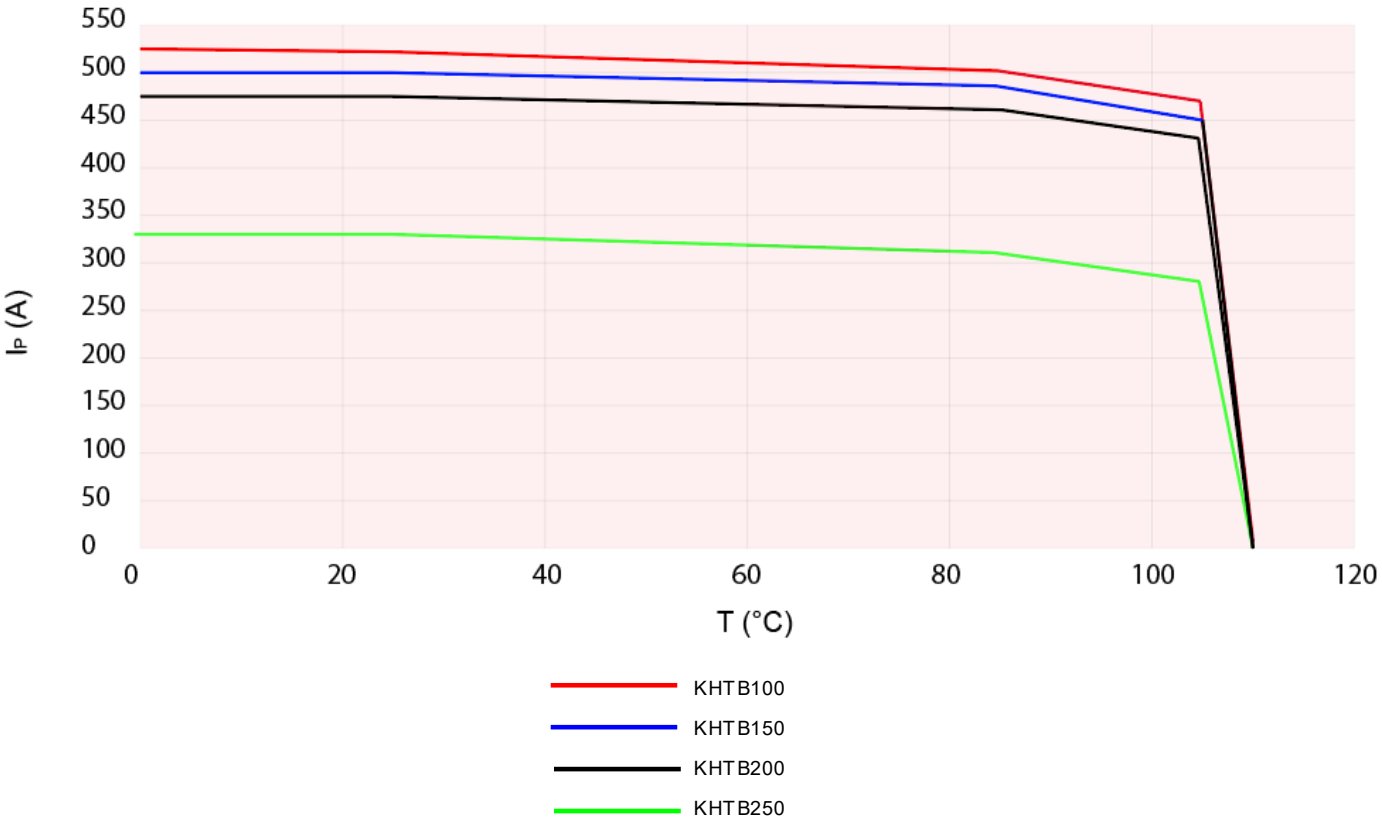
- **Maximum Continuous DC Primary Current**



The maximum continuous DC primary current plot outlines the region where all the following conditions are simultaneously satisfied:

- The primary current I_P is less than I_{PM}.
- The junction temperature Tj remains below 125°C.
- The primary conductor temperature T_A stays under 110°C.

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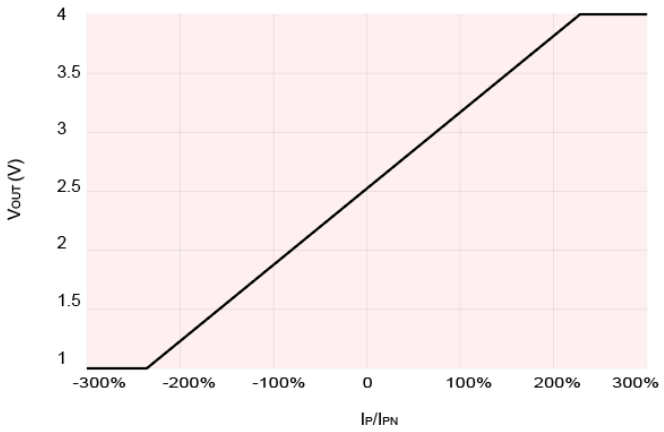
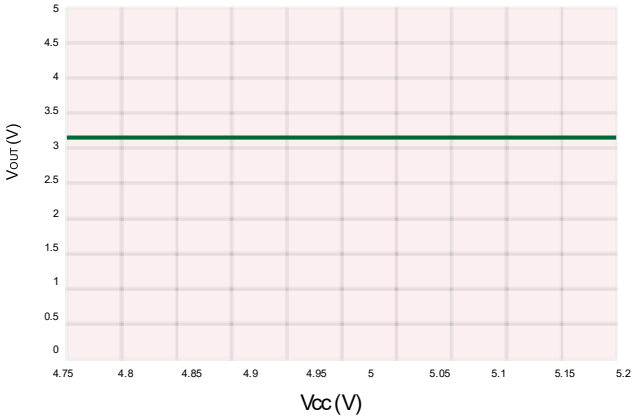
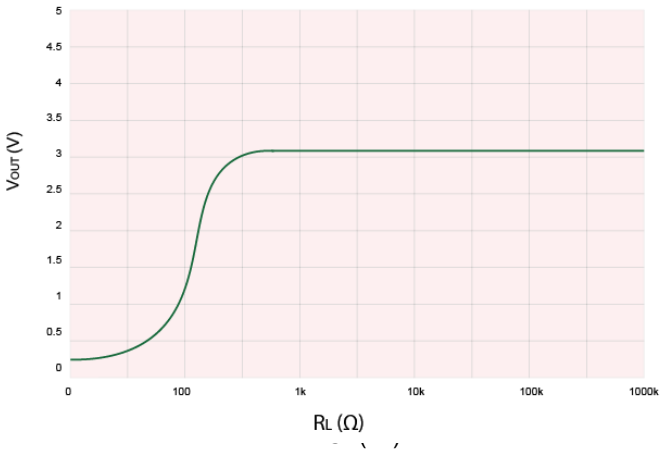


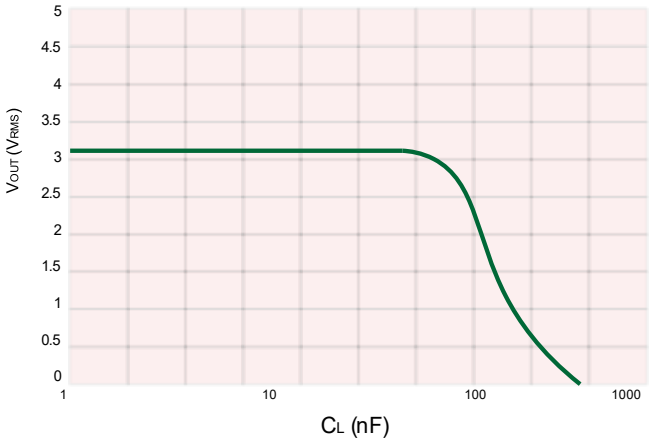
Output Voltage vs Primary Current



Output Voltage vs Supply Voltage (@IP=IPN)



Output Voltage vs Load Resistance (@IP = IPN)



Output Voltage vs Load Capacitance (@IP = IPN)

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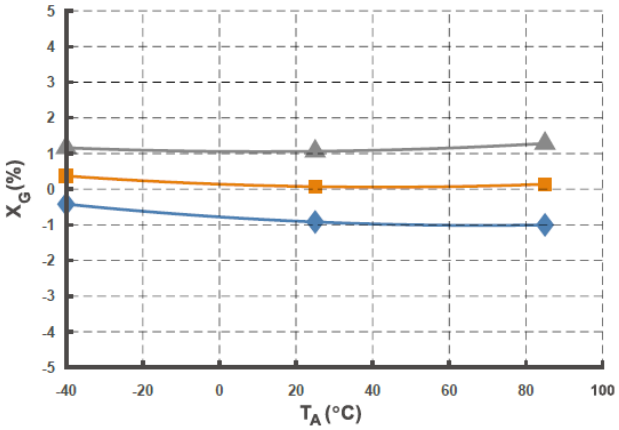
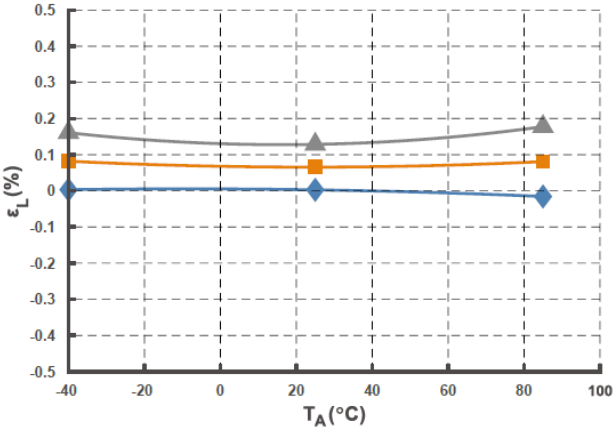
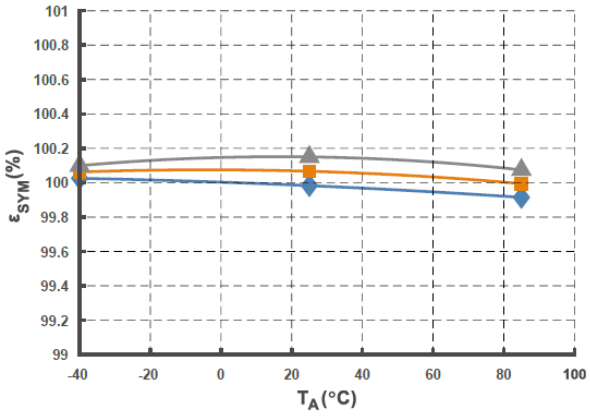
Typical Temperature Characteristics



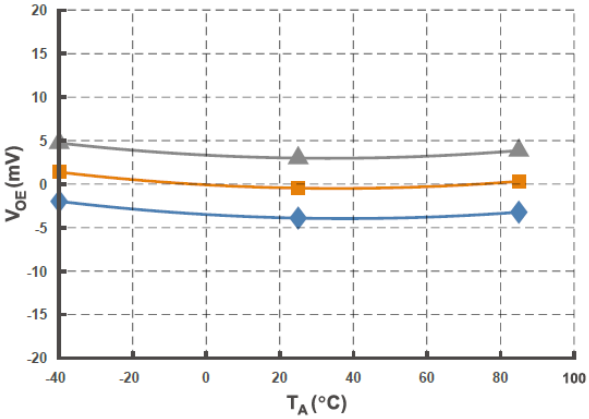
- Accuracy



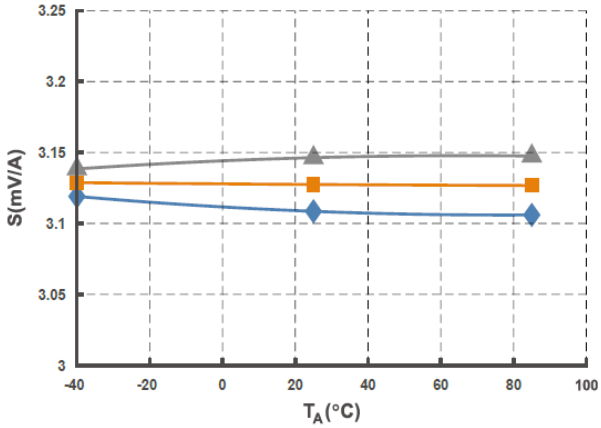
- Linearity Error



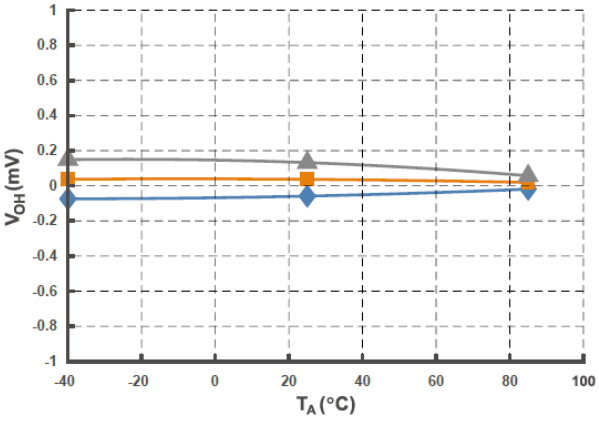
- Symmetry



- Offset Error



- Sensitivity



- Hysteresis

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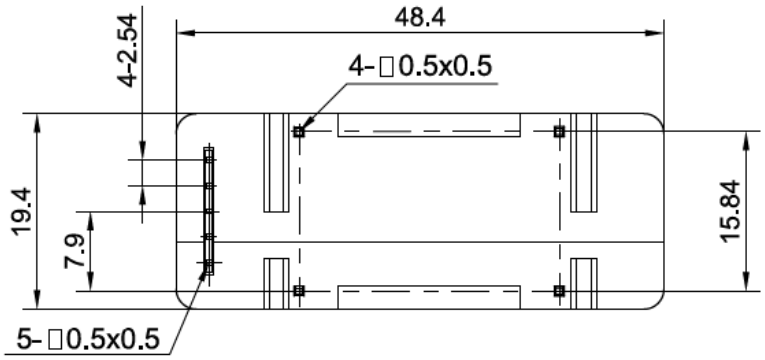
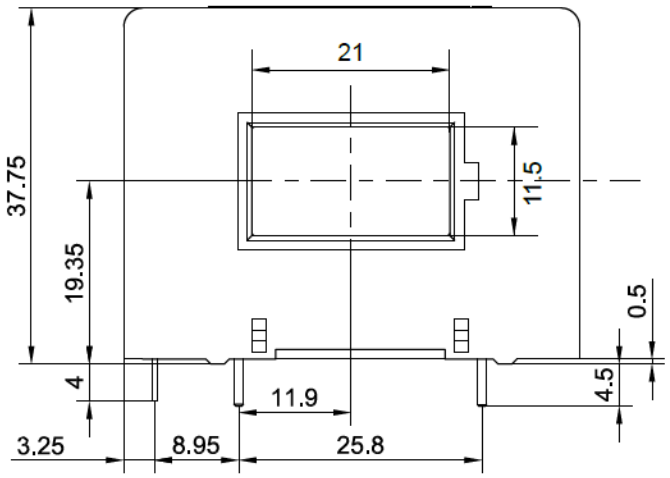
Dimensions :





Unit : mm

Tolerances for scales : ±1 mm

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1. General Safety Warnings

- **Intended Use**: This transducer is designed for installation in electrical and electronic systems. It must be used in compliance with applicable international standards, such as **IEC 61010-1**, as well as local regulations and codes.
- **Applicable Standards**: The transducer must be operated according to the Adisens's operating instructions to ensure compliance with relevant safety standards, including:
    - **IEC 61010-1**: Safety requirements for electrical equipment for measurement, control, and laboratory use.
    - **EN 50178**: Safety requirements for electronic equipment for power installations.
- **Installation by Qualified Personnel**: Only qualified professionals, trained in handling high-voltage systems and electrical components, should install, commission, and maintain the transducer. Misuse or incorrect installation may result in electric shock, fire, or severe equipment damage.

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2. Electrical Shock Risk

- **Risk of Electric Shock**: This transducer operates in high-voltage environments. It must be handled with care to avoid direct contact with live electrical components. There is a risk of serious injury or death from electric shock if proper precautions are not taken.
- **Limited-Energy Secondary Circuits**: To ensure safe operation, this transducer must be used exclusively within limited-energy secondary circuits, as specified by **IEC 61010-1**, which governs the safe design of electrical circuits to reduce the risk of injury and electrical hazards.
- **Isolation Requirements**: This transducer provides galvanic isolation between the primary (high-power) and secondary (low-power) circuits. However, the device should not be assumed to provide absolute protection against electric shock. Always de-energize circuits before installation or maintenance.

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3. Installation Precautions

- **Environmental Conditions**: The transducer is designed to operate in controlled environments. Ensure that the operating temperature, humidity, and surrounding conditions comply with the transducer's specifications provided in the technical datasheet. Avoid exposure to moisture, corrosive environments, or areas prone to electrical interference.
- **Mounting**: Secure the transducer properly in a location that prevents movement or vibration during operation. Improper mounting may cause electrical arcing or contact with live components.
- **Grounding**: Ensure that the transducer is correctly grounded in accordance with the electrical system design. This will help prevent electric shock and improve system safety and performance.

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4. Operational Guidelines

- **Operating Limits**: Operate the transducer strictly within the specified voltage, current, and temperature ranges. Overloading the transducer beyond its rated capacity may result in equipment failure or create safety hazards.
- **Routine Maintenance**: Inspect the transducer regularly for signs of wear, damage, or abnormal operation. Discontinue use if any issues are detected and consult the manufacturer for replacement or repair.

5. Handling and Storage

- **Handling Precautions**: Avoid direct contact with transducer terminals during handling. Always handle the device with protective gear, including insulated gloves, to avoid accidental electric shock.
- **Storage Conditions**: Store the transducer in a clean, dry, and temperature-controlled environment. Prolonged exposure to harsh conditions may degrade performance and compromise safety.

6. Emergency Procedures

- **Power Disconnection**: In case of a malfunction, electrical fault, or other emergency, immediately disconnect the power supply to the transducer and seek professional assistance for inspection and repair.
- **First Aid**: If an electric shock occurs, follow established first aid protocols and seek emergency medical assistance immediately.

7. Disposal

- **Environmental Considerations**: Dispose of the transducer according to local regulations for electronic waste. Do not incinerate, and avoid disposing of the device in general waste, as it may contain hazardous materials.

8. Manufacturer’s Support

For additional information, technical support, or to report any issues with the transducer, please contact un on contact@adisens.fr . Ensure that you have the model number, serial number, and installation details on hand for a prompt response.

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