

TECHNICAL DATASHEET

ATC-500K4

Product Code : 10200500020020001

Closed-loop Hall-effect current transducer for high-power applications

The ATC-500K4 is a closed-loop (compensated) Hall-effect current transducer designed for precise measurement of DC, AC and pulsed currents, with a 500 A nominal rating and a ± 700 A measuring range.

Operating from a $\pm 12 \dots \pm 18$ V DC supply, it provides galvanic isolation between the primary and secondary circuits, ensuring reliable and safe operation in high-power industrial applications. Compliant with IEC 60950-1:2001 and EN 50178:1998.

**500 A**

Nominal primary current

 ± 700 A

Measuring range

DC to 100 kHz

Bandwidth (-3 dB)

 $< 1 \mu\text{s}$

Response time

ENGINEERING VALUE

High accuracy — $< \pm 0.5\%$ accuracy with $< 0.1\%$ linearity error and low temperature drift.

Measurement headroom — ± 700 A range around a 500 A nominal current for transient and pulsed currents.

Fast response — Optimized response time ($< 1 \mu\text{s}$, 10–90% of IPN) and 100 kHz bandwidth for dynamic control loops.

Isolation — 5.5 kV RMS dielectric withstand, compliant with IEC 60950-1 and EN 50178.

Easy integration — Compact closed-loop housing with multiple connector options; customizable on request.

BEST-FIT APPLICATIONS

Induction heating — Induction cookers and heating equipment.

Motor control — AC/DC variable-speed drives.

Power supplies — Uninterruptible power supplies and SMPS.

Power conversion — Inverter applications.

Welding equipment — Power supplies for welding applications.

Compliance and warranty markings

**RöHS**
COMPLIANT

Electrical and performance data

Unless otherwise stated: $T_A = +25^{\circ}\text{C}$, $V_{CC} = \pm 15\text{ V}$, $R_L = 10\text{ k}\Omega$.

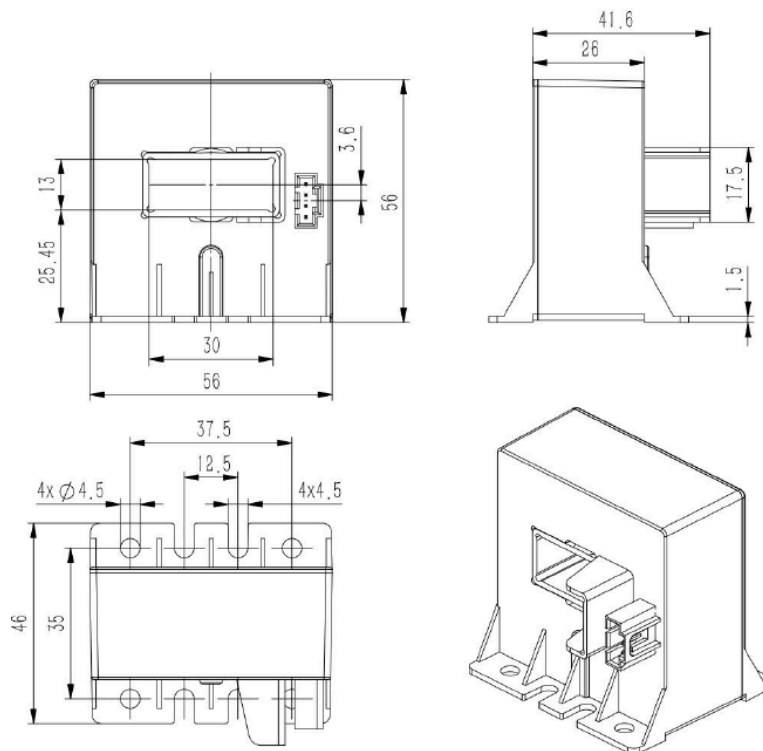
Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Primary nominal RMS current	IPN	-	-	500	-	A
Primary measuring range	IPM	-	-700	-	+700	A
Turns ratio	NP/NS	-	-	1:2000	-	-
Output current RMS	IOUT	$\pm 250 \times \text{IP/IPN}$	-	250	-	mA
Supply voltage	VCC	Tolerance: $\pm 5\%$	-	$\pm 12 \dots \pm 18$	-	V
Secondary coil resistance	RS	-	-	33	-	Ohm
Inside resistance	RM	$[(V_{CC} - 0.5\text{V}) / (I_S \times 0.001)] - R_S$	-	-	-	Ohm
Offset current	IOE	$I_P = 0$, $T_A = 25^{\circ}\text{C}$	-	± 0.2	-	mA
Linearity error	ϵ_L	-	-	< 0.1	-	% FS
Accuracy	XG	$T_A = 25^{\circ}\text{C}$, at IPN	-	$< \pm 0.5$	-	% IPN
di/dt accurately followed	di/dt	$T_A = 25^{\circ}\text{C}$	> 100	-	-	A/ μs
Offset-current temperature coefficient	IOT	$I_P = 0$, -40 to $+85^{\circ}\text{C}$	-	-	$< \pm 0.5$	mA/ $^{\circ}\text{C}$
Thermal drift of output	TC&G	-	-	-	$< \pm 0.05$	%/ $^{\circ}\text{C}$
Power consumption	IC	-	-	$25 + I_S$	-	mA
Isolation voltage	Vd	50/60 Hz, 1 min, AC	-	5.5	-	kV
Response time	tr	10% to 90% of IPN	-	-	1.0	μs
Bandwidth	BW	-3 dB, IPN	DC	100	-	kHz
Operating temperature	TA	-	-40	-	+85	$^{\circ}\text{C}$
Storage temperature	TS	-	-55	-	+125	$^{\circ}\text{C}$
Mass	m	-	-	130	-	g
Plastic material	-	-	-	PBT G30/G15, UL94-V0	-	-

Ordering information

Part number	Product code	Nominal current	Measuring range	Output
ATC-500K4	10200500020020001	500 A	-700 to +700 A	250 mA at IPN

The specified measurement performance is achieved only when the sensor is used within the stated electrical, thermal and load conditions.

Mechanical dimensions and electrical connection

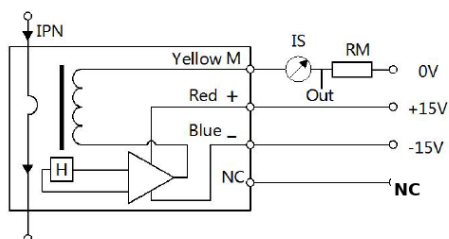


All dimensions are in millimetres. General tolerance: $< \pm 0.5$ mm unless otherwise specified. Primary through-hole: 13×30 mm (± 0.15 mm). Secondary pin: MOLEX 70543-0003.

Terminal definition

Marking	Function	Description
+ (Red)	Positive supply	+VCC
- (Blue)	Negative supply	-VCC
M (Yellow)	Measurement output	Current output; connect the external measurement resistor R_M from terminal M to 0 V
NC	Not connected	-

Electrical connection and signal conversion



Installation essentials

- Signal output:** the primary current is measured as a voltage across the external measurement resistor R_M , connected between terminal M and 0 V.
- Dynamic performance:** di/dt and response time are best when the primary hole is completely filled by a single busbar.
- Thermal limit:** the primary conductor temperature must remain below 100°C .
- Customization:** custom designs are available on request for different rated input currents and output voltages.

Safety, compliance and quality information

Safety information

The ATC-500K4 is a component intended for integration into electrical and electronic equipment by qualified personnel. The equipment manufacturer is responsible for the risk assessment, insulation coordination, protective measures and regulatory conformity of the final system. Do not touch live conductors. Disconnect all power sources before installation, inspection or maintenance. Operate the transducer only within its specified limits.

Compliance and environmental information

Subject	Information
Electrical safety	Designed for integration into equipment assessed to applicable electrical-safety requirements, including IEC 60950-1:2001 and EN 50178:1998 where relevant to the end application.
Materials	Housing in PBT GF30/GF15, UL 94-V0. Further product material and flammability information is available from ADISENS on request.
CE	EU conformity information and the applicable Declaration of Conformity are available from ADISENS on request.
RoHS / REACH	Product environmental declarations are available from ADISENS on request.
Disposal	Dispose of the product in accordance with local requirements for electrical and electronic equipment. Do not incinerate.

Three-year commercial warranty



ADISENS provides a three-year commercial warranty from the date of delivery, subject to the applicable ADISENS warranty terms and conditions. The warranty does not cover incorrect wiring, operation outside specified ratings, unsuitable environmental exposure, unauthorized modification, mechanical damage or improper system integration.

Document identification and control

Document reference	Revision	Issue date	Language	Product code
FT-ATC-500K4	V1.0	April 2024	English	10200500020020001

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