C02FS Series Current Sensor

The C02FS series current sensor provides efficient and precise sensor solutions for AC, DC and pulse currents in industrial, commercial and communications systems. It consists of three main components: an accurate low-temperature drift linear hall sensor, a flux collector and a current transformer. It offers markedly low resistance, reducing power loss and temperature drift to deliver exceptional performance.

Features

- Non-contact measurement of high current
- Output voltage proportional to carried current
- Max. nominal range ±1200A (DC or AC peak)
- High output range up to ±2000 mV/I_{pn}
- Ratio metric output from supply voltage
- Electrical isolation between the primary conductor and the sensor output
- Superior temperature stability and linearity
- Compact size for applications with limited space
- RoHs compliance (Lead-Free)

Advantages

- Accurately measures AC, DC and pulse currents
- No insertion losses
- High immunity from external interference
- Excellent current overload capacity
- High ESD sensitivity (Human Body Model) 4kV

Applications

- Home appliances
- Load detections and managements
- Intelligent power/battery management systems
- Welding applications
- Variable speed drives

Standards

- EN 50178:1997
- IEC 60950-1:2006
- IEC 61010-1:2010

Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Unit
$V_{DD\ max.}$	Maximum supply voltage (not destructive)	-0.3	6.5	V
I_{pm}	Maximum measuring current	-1200	1200	A
T_A	Ambient operating temperature	-40	105	°C
T_S	Storage temperature range	-40	105	°C
$V_{ESD-HBM}$	ESD sensitivity HBM (Human Body Model)		4	kV

Stresses above these ratings may cause permanent damage. Exposure to absolute maximum ratings for extended periods may degrade reliability.

Specifications (T_A= 25°C, V_{DD}= 5.0V)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
V_{DD}	Supply voltage		4.5	5	5.5	V
I_C	Current consumption	I_p=0A without load		15	20	mA
I_{Pn}	Current nominal measuring range	C02-400AFS X X X X X	-400		400	A
		C02-500AFS X X X X X	-500		500	
		C02-600AFS X X X X X	-600		600	
		C02-700AFS X X X X X	-700		700	
		C02-800AFS X X X X X	-800		800	
		C02-900AFS X X X X X	-900		900	
		C02-1000AFS X X X X X	-1000		1000	
		C02-1100AFS X X X X X	-1100		1100	
		C02-1200AFS X X X X X	-1200		1200	
R_L	Output load resistance	V_{OUT} to GND	5			kΩ
C_L	Output load capacitance	V_{OUT} to GND		1	10	nF

Specifications (T_A= 25°C, V_{DD}= 5.0V)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
V_0	V_{OUT}(@I_P=0A)	I_P=0A		V_{DD}/2		V
V_{OUT}	Nominal output (customized available)	I_P=I_{PN}		V_0±2		V
V_{OE}	Offset voltage	I_P=0A	-10		10	mV
E_L	Non-linearity error	±I_{PN} without offset	-0.8	0.5	0.8	%/I_{PN}
T_{CV0}	Temperature coefficient of V_0	T_A=-40°C ...105°C	-0.075	0.05	0.075	mV/K
T_{CVOUT}	Temperature coefficient of V_{OUT}	T_A=-40°C ...105°C (except T_{CVOE})	-1.5	1	1.5	%
BW	Frequency bandwidth (-3dB)			40		kHz
T_R	Step response to 90% I_{PN}	(Design target)		3	5	μs

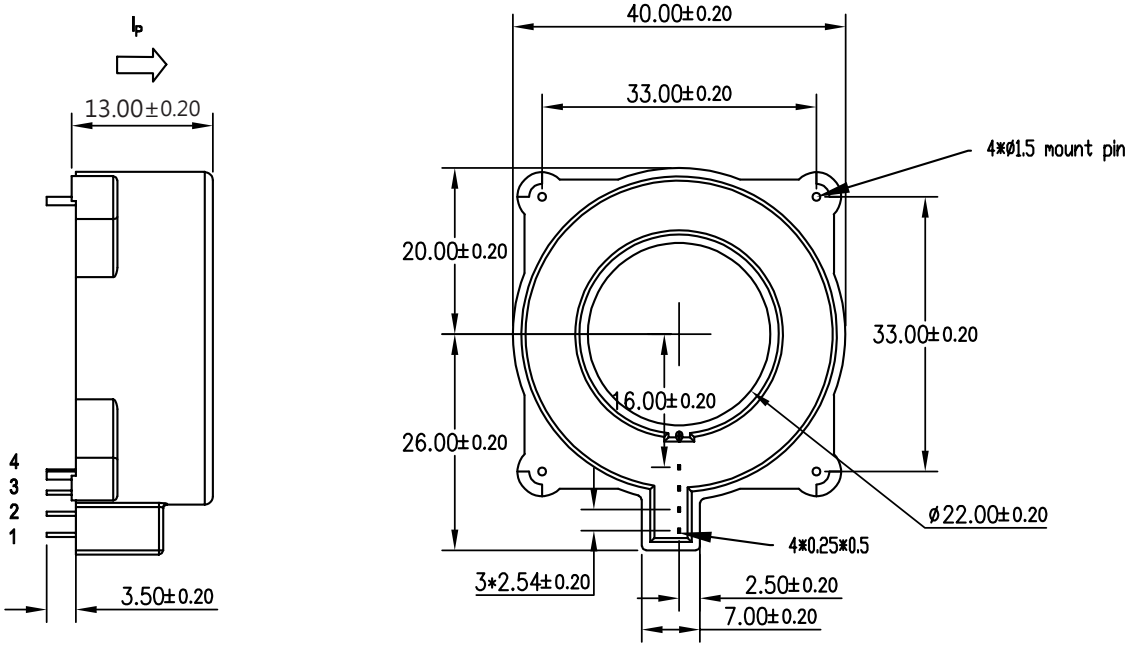
Insulation characteristics

Symbol	Parameter	Value	Unit	Comment
V_D	Insulation voltage for isolation, 50Hz, 1 min	1500	V	
R_{ISO}	Isolation resistance @500VDC	>500	MΩ	

General characteristics

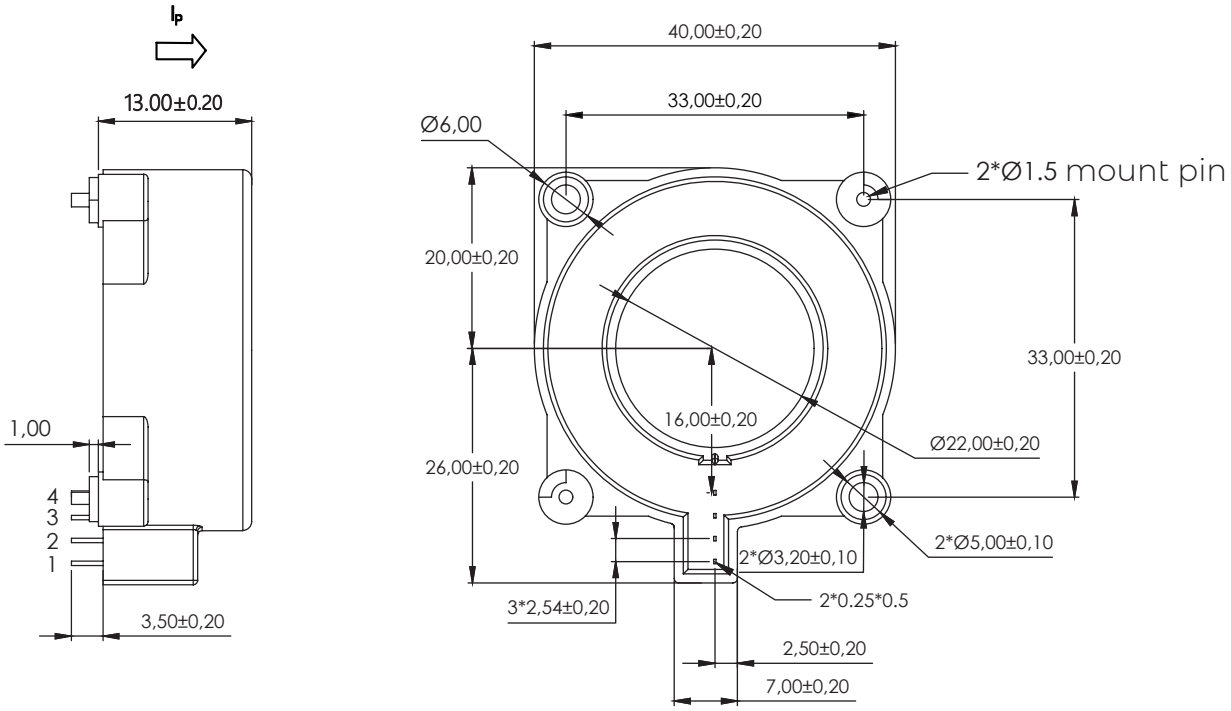
Symbol	Parameter	Value	Unit	Comment
M-HSE	Housing material	V0		Flame retardant UL 94-V0 (PBT)
M-FC	Flux collector material	Silicon steel		

Dimension (mm) : Pin Type



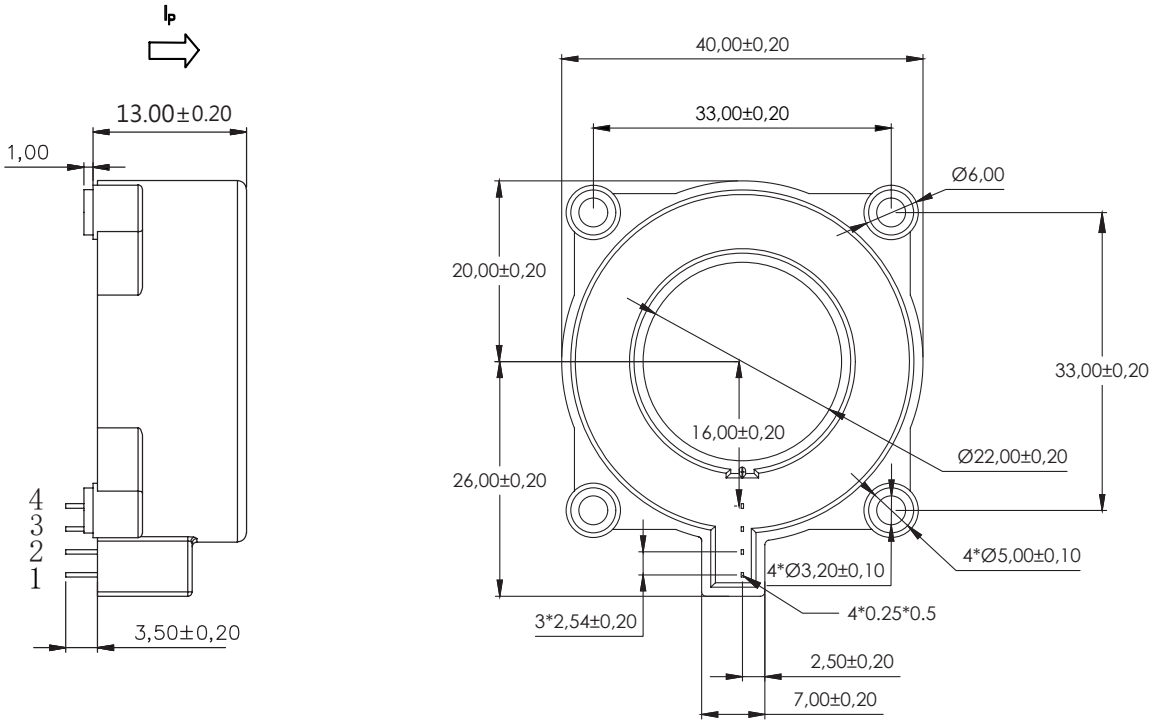
Pin	Symbol
1	V_{DD}
2	GND
3	V_{OUT}
4	NC

Dimension (mm) : Screw-in and Pin Type



Pin	Symbol
1	V_{DD}
2	GND
3	V_{OUT}
4	NC

Dimension (mm) : Screw-in Type



Pin	Symbol
1	V_{DD}
2	GND
3	V_{OUT}
4	NC

Name Guide Description

C02 - XXAFS X X X X X

Series

C02: Open-Loop current sensor

Nominal range

400: ± 400A 500: ± 500A 600: ± 600A
700: ± 700A 800: ± 800A 900: ± 900A
1000: ± 1000A 1100: ± 1100A 1200: ± 1200A

Supply voltage

Null: 5.0V
33: 3.3V

Current Directionality

Null: Bidirectional
U: Unidirectional

Gain, I_P=I_{PN}

(Bidirectional version)
Null: 2000 mV(5V), 1320 mV(3.3V)
G: 460 mV H: 625 mV I: 800 mV J: 1250 mV

(Unidirectional version)
Null: 4000 mV(5V), 2640 mV(3.3V)

Installation

Null: Pin 02: Screw-in 12: Screw-in and Pin

Extra code

Notes

The content of this document is subject to revision without notice. Luksens shall have no liability for any error or damage of any kind resulting from the use of this document.

Safety and Environment

The product is to be installed by manufacturer trained personnel or competent person trained in accordance with manufacturer installation instructions.

With respect to applicable standards IEC 61010-1/ EN 61010-1 *safety requirements for electrical equipment for measurement, control and laboratory use part 1 general requirements*, the product should be used in limited energy secondary circuits.

Risk of electrical shock

Certain parts of the module can carry hazardous voltage during the operation process of the product because hazardous live voltage of primary conductor, power supply occurs, injury and/or serious damage will be caused if this warning is ignored.

Conducting parts must be inaccessible after installation of the product. Additional protection including shield or protective housing could be used according to IEC 60664 Insulation coordination for equipment within low-voltage supply systems.

Disconnection of the main supply will protect against possible injury and serious damage.

ESD protection

Damage from an ESD event will occur if the personnel is not well grounded when handling.

Important notice

Luksens reserves the right to change the specifications, including all statements and data appearing in Luksens' catalogues, data sheets and advertisements, without notice. Luksens will publish the modified specifications on its website. If such changes to specifications are made, Luksens shall have no obligation to provide the change on Products previously purchased. The information included herein is believed to be accurate and reliable. However, since additional design, measure, production, quality control take effect in the end product, therefore Luksens shall have no liability for any potential hazards, damages, injuries or less of life resulting from the end product. Luksens products are not to be used in any equipment or system, including but not limited to life support equipment or systems, where failure of Luksens products may cause bodily harm.