



Patent No.:ZL 201830096101.2

V1.5

**MEMS VOLTAGE ACCELEROMETER**

**RION AKF390**

**TECHNICAL MANUAL**

## **AKF390 MEMS VOLTAGE ACCELEROMETER**



### **RION QUALIFICATION CERTIFICATION**

- Quality management system certification: GB/T19001-2016 idt ISO19001:2015 standard (certificate No.: 128101)
- High-tech Enterprise (Certificate No.: GR201844204379)
- CE certification: registration No. ATSAHE190625020
- ROHS certification: registration No. AT18300RC105892
- China National Intellectual Property Appearance Patent (Patent No.: ZL 201830752896.8)
- Revision time:2022-3-10
- Product functions, parameters, appearance, etc. will be adjusted as technology upgrades. Please contact our pre-sales business to confirm when purchasing.

# AKF390 MEMS VOLTAGE ACCELEROMETER



MEMS MICROMECHANICAL  
ACCELERATION SENSOR

- ★ HIGH PRECISION
- ★ HIGH STABILITY
- ★ HIGH FREQUENCY RESPONSE



## ▶ PRODUCT INTRODUCTION

The AKF390 triaxial accelerometer is a voltage output type accelerometer independently developed and produced by RION Technology, which can be used in many fields such as vibration test and impact test. The product adopts analog voltage output, different address codes can be set, and multiple sensors are connected in series for a long distance, which is convenient for multi-point measurement and data analysis. AKF390 is a single crystal silicon capacitive sensor, which consists of a silicon chip processed by micro-machines, a low-power ASIC for signal adjustment, a microprocessor for storing compensation values, and a temperature sensor. This product has low power consumption, calibrated, sturdy structure and stable output. The new electronic configuration provides solid-state power for reset and comprehensive protection from over-voltage. The products have the characteristics of sturdy structure, low power consumption, excellent deviation stability, etc., to ensure the reliability of product output.

## ▶ PRODUCT FEATURES

- ★ three axis (X、Y、Z)
- ★ power supply: 9-36V
- ★ working temperature: -40°C ~ +85°C
- ★ excellent bias stability
- ★ Good environmental performance (impact, vibration and temperature)
- ★ output voltage: 0~5V
- ★ anti-impact: 2000G
- ★ store temperature: -40°C ~ +85°C

## ▶ APPLICATION

- ★ Crash record, fatigue monitoring and prediction
- ★ Traffic system monitoring, roadbed analysis and high-speed railway fault detection
- ★ Large machinery, engine
- ★ Low frequency vibration and automatic monitoring
- ★ Bridge
- ★ Vehicle
- ★ Wind power generation
- ★ Medical equipment
- ★ Road roller

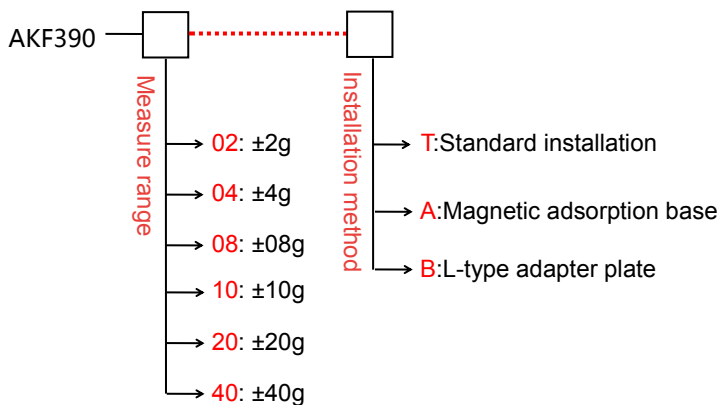


# AKF390 MEMS VOLTAGE ACCELEROMETER

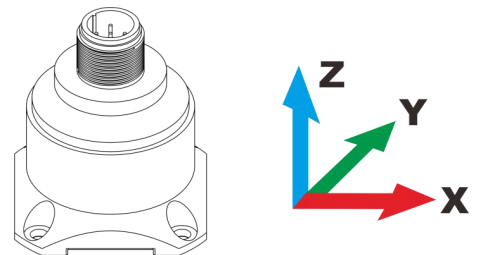
## ▶ PRODUCT PARAMETERS

AKF390	PARAMETER						UNIT
Range	±2	±4	±8	±10	±20	±40	g
Deviation Calibration	<1	<1	<1	<1	<1	<1	mg
Measuring Axial	X,Y,Z	X,Y,Z	X,Y,Z	X,Y,Z	X,Y,Z	X,Y,Z	Axis
Up/Off Power Repeatability	<2	<2	<2	<2	<2	<2	mg(max)
Sensitivity (± 10%)	1250	625	312.5	250	125	62.5	mv/g
Deviation temp. coefficient	0.01	0.01	0.01	0.05	0.05	0.05	%/°C
Resolution/Threshold (@ 1Hz)	< 1	< 1	< 1	< 1	< 1	< 1	mg(max)
Nonlinearity	<0.5	<0.5	<0.8	<1	<1	<1	% FS(max)
Frequency response	500	500	500	500	500	500	Hz
Bandwidth (3DB)	1000	1000	1000	1000	1000	1000	Hz
Cross-axis sensitivity	1	1	1	2	2	2	%
Lateral vibration sensitivity ratio	1	1	2	5	5	5	%
Resonance frequency	2.4	2.4	2.4	5.5	5.5	5.5	kHz
Noise density	21	21	21	86.6	86.6	86.6	µg/√Hz
0g output 2.5V	<0.01	<0.01	<0.01	<0.008	<0.008	<0.008	mV
The output voltage	0~5V						
Reliability	MIL-HDBK-217, Grade 2						
Shock Resistance	100g@11ms、 3 Axial Direction (Half Sinusoid)						
Recovery Time	<1ms(1000g, 1/2 Sin 1ms,Shock Acting On The i Axis)						
Vibrate	20g Rms,20~2000Hz (Random Noise , o ,p,i Per Axis For Action 30 Minutes )						
Input(Vdd_Vss)	9~36 VDC						
Current Consumption	<60mA @ 12 VDC						
Connector	Industrial Standard M12 Connector						
Protection grade	IP67						
Weight	Product net weight: 82g, magnetic base: 48g, L-shaped adapter plate 20g						
Dimension	Product size: 34.3*34.3*38.5mm Magnetic adsorption base size: 34.23*34.23*6mm L-shaped adapter plate size: 36*44*15mm						

## ▶ ORDER INSTRUCTION



## ▶ MEASURING DIRECTION



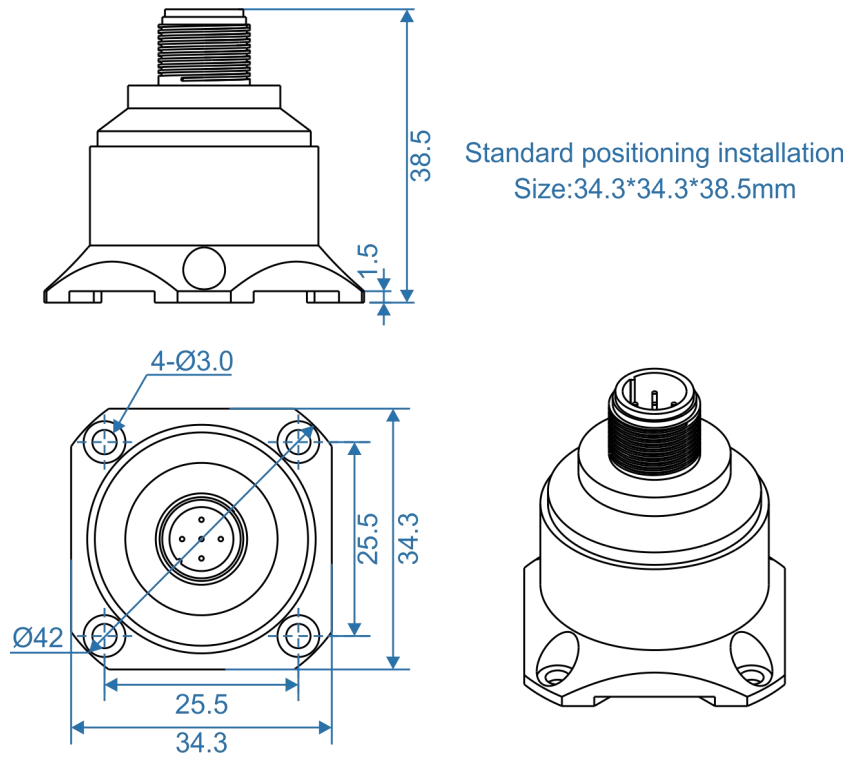
Eg : AKF390-02-T : indicate ±2g range, standard installation.

○Inclinometer ○3D compass ○Digital inclinometer ○Accelerometer ○Gyro ○North finder ○INS&IMU

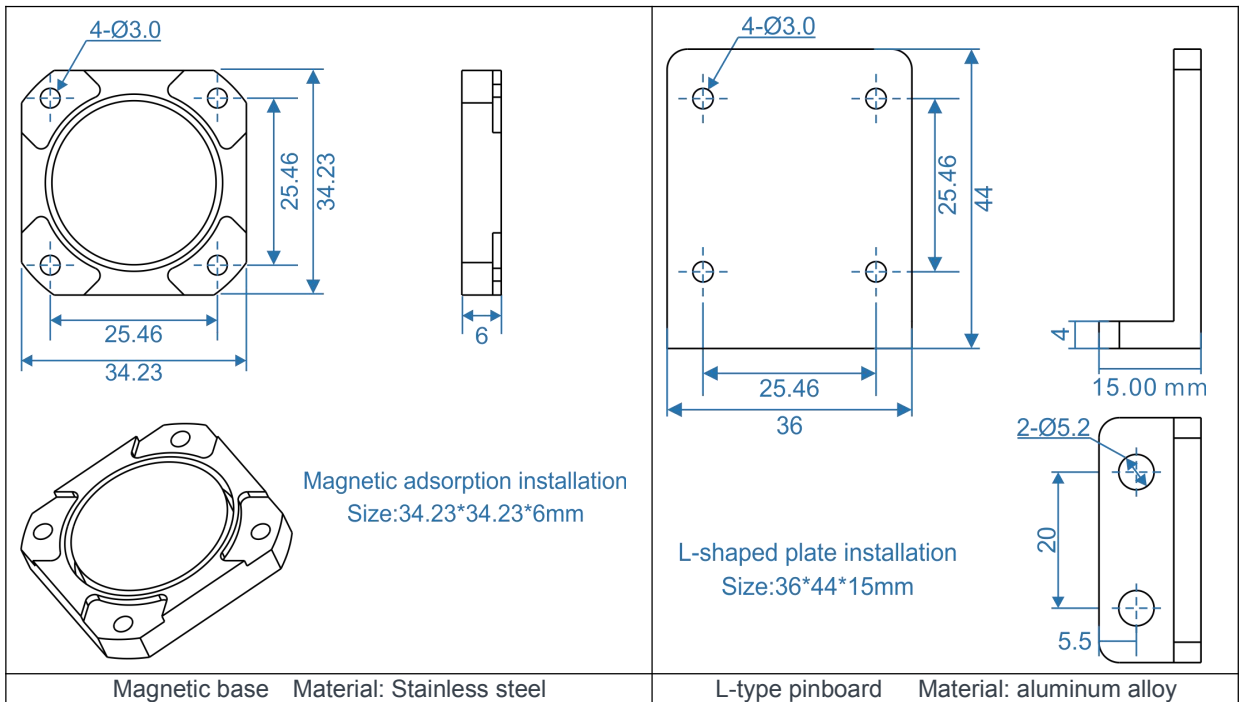
RION TECHNOLOGY SINCE 2008 · Attitude measure solution provider

# AKF390 MEMS VOLTAGE ACCELEROMETER

## ► SIZE



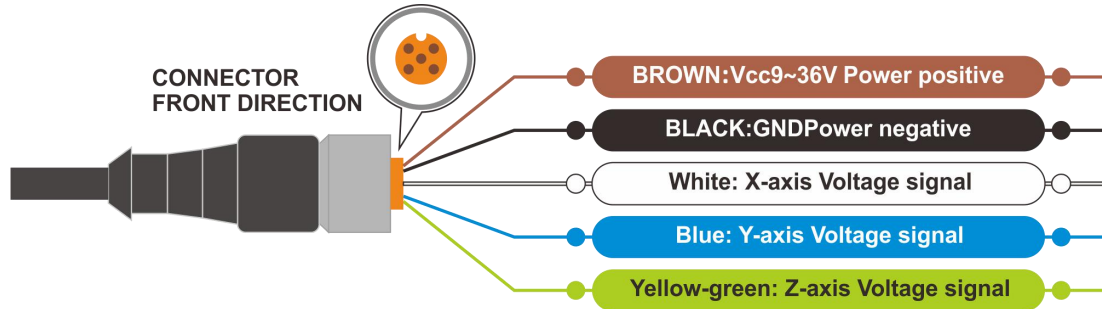
## ► MOUNTING ACCESSORIES SIZE



# AKF390 MEMS VOLTAGE ACCELEROMETER

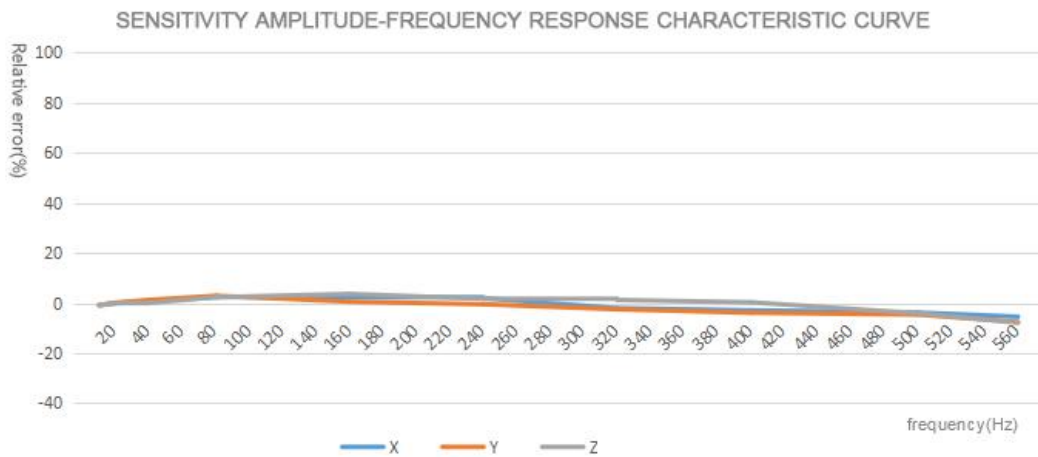
## ► ELECTRICAL CONNECTION

Color	BLACK	WHITE	BLUE	BROWN	OLIVINE
Function	Power GND	X-axis voltage signal	Y-axis voltage signal	Vcc 9~36V Power supply positive pole	Z-axis voltage signal



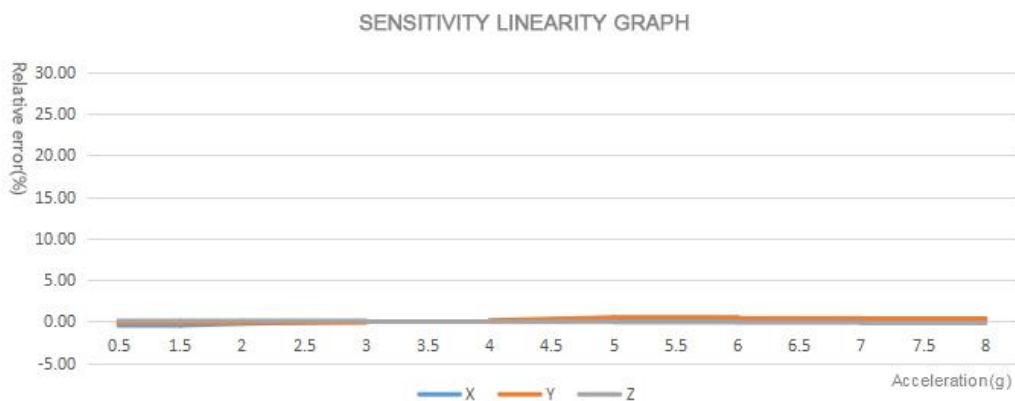
## ► SENSITIVITY AMPLITUDE-FREQUENCY RESPONSE CHARACTERISTIC CURVE

(reference condition:  $f=20.000\text{Hz}$ ,  $a=2.000\text{G}$ )



Reference diagram of measuring range  $\pm 8\text{G}$

## ► SENSITIVITY LINEARITY GRAPH





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