

SPECIFICATIONS

Item No.：AKE392B

Description：MEMS Digital Type Accelerometer

Version：Ver.06

Production implementation standard reference

- Enterprise quality system standards: ISO9001: 2008 standard (certification number: 128101)
- Tilt sensor production standards: GB / T 191 SJ 20873-2003 inclinometer general specification of Level
- The Academy of metrology and quality inspection Calibrated in accordance to: JJF1119-2004 Electronic Level calibration Specification
- Gyro accelerometer test standard: QJ 2318-92 Gyro accelerometer test methods
- Software development reference standard: GJB 2786A-2009 military software development General requirements
- Product environmental testing standards: GJB150
- Electromagnetic anti-interference test standards: GB / T 17626

AKE392B-MEMS Digital Type Accelerometer



General Description

AKE392B three-axis accelerometer sensor series products is RION company imported the Switzerland patented technology to produce for using widely, suitable for vibration testing, impact testing and more fields. The product uses a digital interface output, RS232/485/TTL optional, can be set to a different address code, long distance series with multiple sensors to facilitate multi-point measurement and data analysis.AKE392B is a monocrystalline silicon capacitive sensor, composed by a silicon chip of micro-mechanical treatment, low power ASIC for the signal adjustment, a microprocessor for storing compensation value and a temperature sensor. The product with low power consumption, after calibration, firm structure, stable output . New electronic configuration reset to provide a solid-state power, to provide comprehensive protection for over current. Scale factor in the full range of long-term stability and the deviation is typically less than 0.1%.This series products with firm structure,low power consumption, excellent deviation stability .etc characteristics to guarantee the reliability of outstanding output .

Key Features

●Three axis measurement optional (X、Y、Z)　　●Output signal：RS232/RS485/TTL

●Voltage supply：9-36V　　●Shock resistance：2000G

●Measuring range optional：±01G；±02G；±04G；±08G；±16G；±32G；±40G

●Excellent deviation stability　● Good environment performance shock，vibration and temperature）

●Size：L47×W47×H38mm　　●Weight：100g

●Working temperature：-40°C to +85°C　　●Storage temperature：-55°C to +100°C

Application

● Crash records, fatigue monitoring and forecasting

● Traffic system monitoring, the roadbed analysis and high-speed railway fault detection

● Military and civilian flight simulator　　● The shipboard satellite tracking system

● Low frequency vibration and automatic monitoring



Technical Data

AKE392B Three-axis accelerometer				
	AKE392B-02	AKE392B-08	AKE392B-40	Unit
Measuring range	±2	±08	±40	g
Deviation calibration	<2	<5	<10	mg
48h deviation stability	0.5	<2	<4	mg typical value
Meausring Axis	X,Y,Z	X,Y,Z	X,Y,Z	Axis
Annual deviation stability[2]	1.5 (<5)	7.5 (<25)	22 (<75)	mg typical value(Maximum value)
Power on/off repeatability	<10	<10	<20	mg(Maximum value)
Deviation temperature coefficient[3]	0.1	0.5	1.5	mg/℃ typical value
	±0.4	±2	±6	mg/℃ typical value
Annual scale factor stability	300 (< 1000)	300 (< 1000)	300 (< 1000)	ppm typical value
Scale factor temperature coefficient	100	100	100	ppm/℃（typical value）
	-50 / 250	-50 / 250	-50 / 250	（Minimum/Maximum value）
Resolution/threshold (@ 1Hz)	< 1	< 5	< 15	mg(Maximum value)
Nonlinearity	<0.1	<0.5	<0.6	% FS（Maximum value）
	<0.02	<0.09	<0.27	g(Maximum value)
Bandwidth[4]	1~≥400	1~≥400	1~≥400	Hz
Resonance frequency	1.6	6.7	6.7	kHz
Output rate	5Hz、15Hz、35Hz、50Hz、100Hz、300Hz can be set			
Output interface	RS232/RS485/RS422/TTL/PWM/CAN			
Reliability	MIL-HDBK-217，Grade two			
Shock resistance	100g@11ms、3Times/Axis(half sinusoid)			
Recovery time	<1ms(1000g, 1/2 sin 1ms, impact in I shaft)			
Vibration	20g rms,20~2000Hz (Random noise，o ,p,I each shaft effect 30 minutes)			
LCC sealed	Meet MIL-STD-833-E			
Input（VDD_VSS）	9-36 VDC.			
Output voltage range	0~5 VDC @12VDCInput voltage（ 0 g as 2.5V±10mV）			
Operating current consumption	<3mA @ 12 VDC			
Output resistance/load	The lowest 10kΩ, as Vout(pin 32) and VAGND(pin 38) , the highest 50pF, as Vout(pin 32)；The maximum 100 μF, as VAGND(pin 38)			
Weight	Typical value：100g			
Size	Typical value: L47×W47×H38mm，			
Unless other specified，all the parameter values were tested under ±20℃（±68℉）and 12VDC conditions.				

Mechanical Parameters

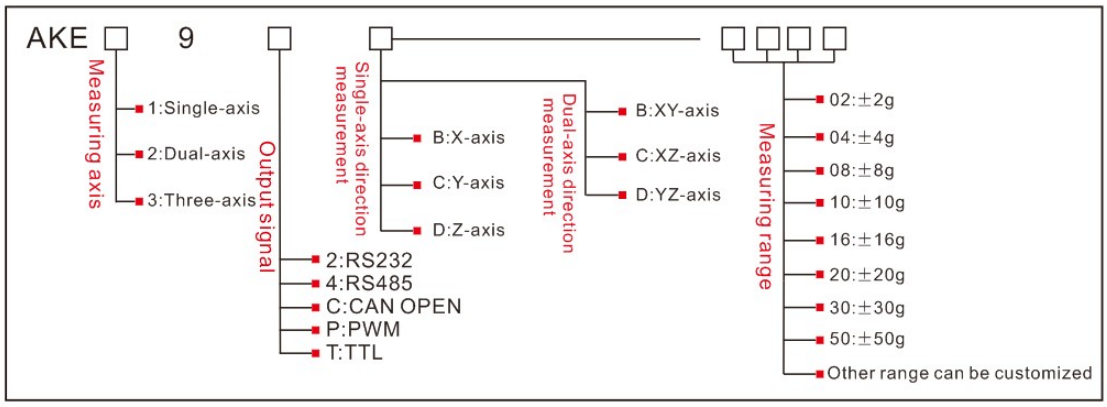
○ Connectors：waterproof air-plug

○ Protection class：IP67

○ Enclosure material：Aluminum Oxide

○ Installation：2XM4 screws

Ordering Information



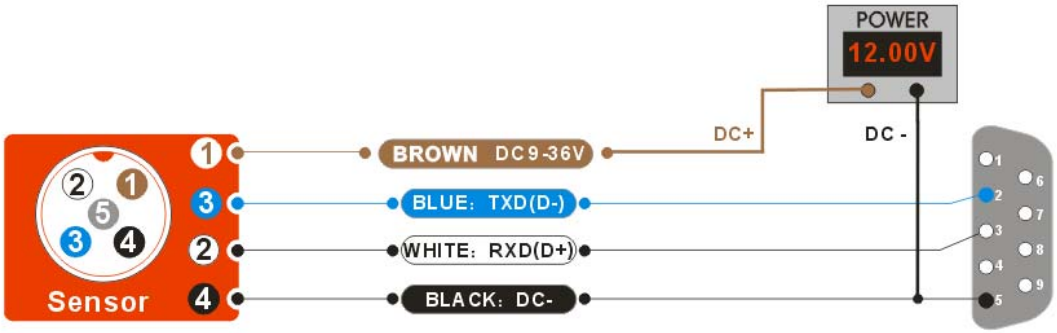
E.g：AKE192B-02：single-axis、X Axis direction measurement、RS232 signal output、+/-2g selection

AKE294B-04：dual-axis、XY Axis directions measurement、RS485 signal output、+/-4g selection

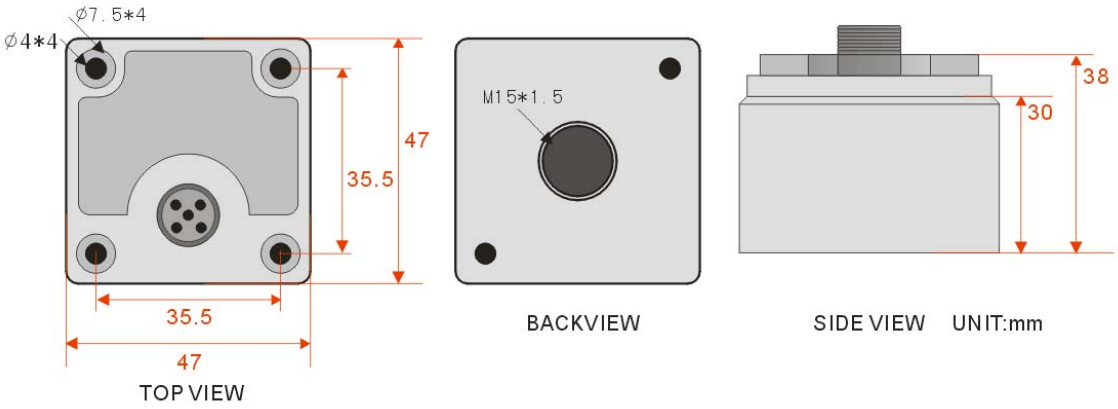
AKE39TB-08：three-axis、XYZ Axis directions measurement、TTL signal output、+/-8g selection

Electrical Connection

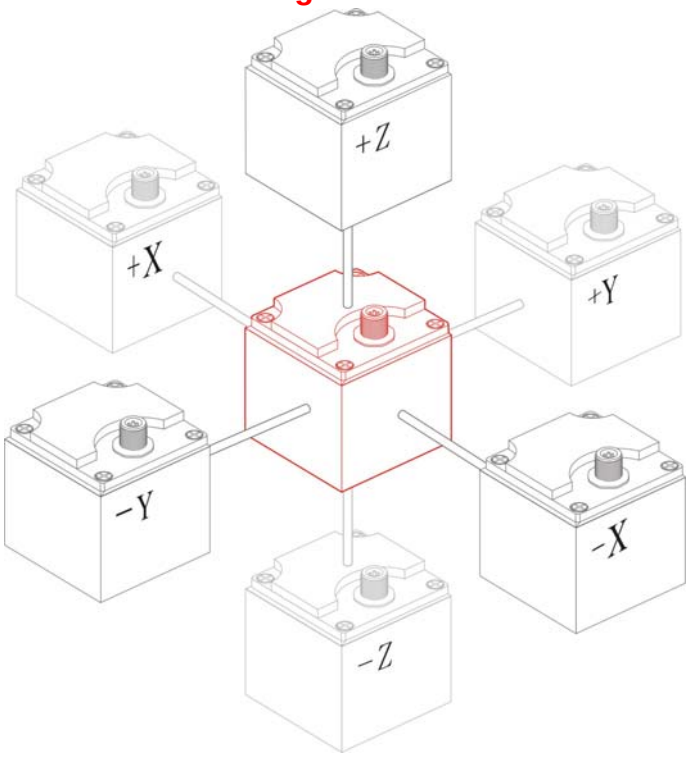
Line Color	BLACK	WHITE	BLUE	BROWN	GRAY
Function	GND Power negative	RS232(RXD) RS485(D+)	RS232(TXD) RS485(D-)	Vcc 9～36V Power supply positive	FACTORY USE only



Dimension



Products measuring directions



Product Protocol

1.DATA FRAME FORMAT:

（8 bits date，1 bit stop，No check，Default baud rate 9600）

Identifier (1byte)	Date Length (1byte)	Address code (1byte)	Command word (1byte)	Date domain	Check sum (1byte)
68H					

Identifier：Fixed68H

Data length：From data length to check sum（including check sum）length

Address code：Accumulating module address，Default :00

Date domain will be changed according to the content and length of command word

Check sum：Data length、Address code、Command word and data domain sum,No carry.

Unit: G

2、COMMAND word analysis

Desc.	Meaning/Example	Description
0X04	**Meanwhile reading the angle command** E.g: ***68 04 00 04 08***	Data domain(0byte) No Data domain command
0X84	Sensor answer reply E.g: **68 0D 00 84 00 20 10 10 58 00 04 05 00 32**	Data domain（9byte） AA AB BB CC CD DD EE EE EE AA AB BB: three character means X axis CC CD DD:three character means Y axis EE EF FF: three character means Z axis The angle on the left example is: X axis acceleration=02.010 g Y axis acceleration=-05.800g Z axis acceleration=40.500g 32: check sum , the sum of all the data in hexadecimal without prefix 68 , it is effective to take the low position if for the decade .
0X0B	**Setting communication rate** **E.g: *68 05 00 0B 03 13*** The command setting is effective after power off then restart (power off with save function)	Data domain（1byte） Baud rate：default :9600 00 means 2400 01 means 4800 02 means 9600 03 means 19200 04 means 38400 05 means 115200
0X8B	Sensor answer reply command E.g: **68 05 00 8B 90**	Data domain（1byte） Data domain in the number means the sensor response results 00 Success FF Failure
0X0C	**Setting sensor output mode** Response rule; Need upper computer send reading angle command , the sensor answer the corresponding angle Automatic output rule: The sensor with power on can Automatically output X,Y angle , output frequency is 20HZ (Power off with save function) E.g: ***68 05 00 0C 00 11***	Data domain （1byte）Factory default: 00 00 Answer reply mode 01 5Hz Automatical output mode 02 15Hz Automatical output mode 03 25Hz Automatical output mode 04 35Hz Automatical output mode 05 50Hz Automatical output mode 06 100 Hz Automatical output mode 07 200 Hz Automatical output mode 08 300 Hz Automatical output mode
0X8C	Sensor answer reply command E.g: **68 05 00 8C 00 91**	Data domain（1byte） Data domain in the number means the sensor response results 00 Success FF Failure
0X0F	**Setting module address command**	Data domain （1byte）XX Module address

	The sensor default address is 00, 1, such as a plurality of sensor to be connected with a bus cable, e.g RS485.requires each sensor is set to a different address, in order to achieve control and response angle . 2, If successfully changed the new address, follow all of the commands and responding Packet address code has to switch to the new address code which already changed then to be effective, otherwise the sensor will not respond to commands.(power off with save function) E.g: ***68 05 00 0F 01 15*** Setting the address to 01 ***68 05 FF 0F 00 13*** Use the common address to reset address to 00	Address from 00 to EF range Note: All products have a common address :FF, If forget the address what has been set during operation , can use FF address to operate the product can still normally respond
0X8F	The sensor answer reply command E.g: 68 05 00 8F 94	Data domain（1byte）, Data domain in the number means the sensor response results 00 Success FF Failure

※More products information, please refer to the company's Website : www.rion-tech.net



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✓三维电子罗盘 ✓加速度计 ✓航姿参考系统 ✓寻北仪

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