



HEFEI BLUES ELECTRIC TECHNOLOGY CO.,LTD

Supporting Facilities and Product Introduction in the Nuclear Field



2025

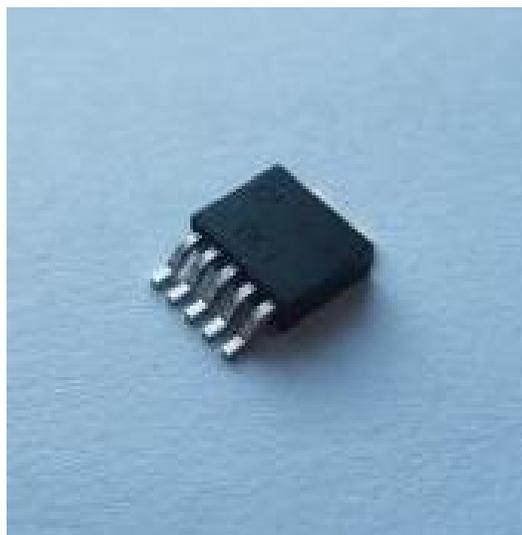
BLUES IS BASED ON A SIMPLE PATTERN EASY TO PLAY BUT HARD TO FEEL

BEU5001 Acceleration Sensor

Product overview

The BEU5001 acceleration sensor, developed for the China Academy of Engineering Physics, is a physical quantity measurement element for acceleration.

Based on the fundamental characteristic that the resistance of silicon-based materials changes with acceleration, this product uses MEMS technology. It undergoes processes such as photolithography, plasma etching, evaporation, deep silicon etching, and bonding to form an acceleration-sensitive chip. The final production of the acceleration sensor is completed through lead welding, 5-wire plastic encapsulation, and marking processes.



Key specifications

Main parameter	Performance index
Product model	BEU5001 series
Measuring range	0~ 100000g
Excitation power supply	(3.3~ 5.5) VDC
Output form	Voltage output
Zero output	(-15~15) mV
Sensitivity	(0.500~0.900) μ V/g
Thermal zero drift	0.2%FS/ $^{\circ}$ C
Zero drift	5%FS
Nolinear	5%FS
Cross sensitivity	5%FS
Working temperature	-55 $^{\circ}$ C ~ 85 $^{\circ}$ C

BEU6001/6006/6007/6005/6004 Liquid Alkali Metal High Temperature Pressure Sensor

Product overview

The sensor developed for the China Institute of Atomic Energy utilizes the pressure difference between the liquid alkali metal in the sensing chamber and the reference vacuum chamber. This pressure difference causes the free end of the sensing component to convert pressure into displacement via a central connecting rod. The core connecting rod structure then drives the core of the vacuum-isolated differential transformer to deviate from the midpoint, generating an output voltage that is linearly proportional to the cores displacement.



Key specifications

Main parameter	Performance index
Product model	BEU6001/6006/6007/6005/6004
Measure working medium	liquid metal
Measurement method	Contact conduction type
Sensory unit	differential transformer
Pressure sensing element	Bellows composite spring assembly
Temperature resistance of sensitive components	$\geq 350^{\circ}\text{C}$ (long term)
Range	0~250kPa
Resolution ratio	0.1kPa
Measurement error	$\leq \pm 1.5\%$ local value
Overvoltage tolerated	$\geq 350\text{kPa}$
Pressure relief (single side)	$\geq 0.5\text{MPa}$
Long term stability	$\leq 0.2\%$ FS/year
Response time	$\leq 1\text{s}$
Outer diameter of sensor	$\leq 76\text{mm}$ (sensor size depends on manufacturer)
source	24V/DC

BEU6002/6003 Liquid Alkali Metal High Temperature Pressure Differential Sensor

Product overview

The sensor developed for the China Institute of Atomic Energy utilizes the pressure difference between the liquid alkali metal in the sensing chamber and the reference vacuum chamber. This pressure difference causes the free end of the sensing component to convert pressure into displacement through a central connecting rod. The core connecting rod structure then drives the core of the vacuum-isolated differential transformer to deviate from its midpoint, generating an output voltage that is linearly proportional to the cores displacement.



Key specifications

Main parameter	Performance index
Product model	BEU6002/6003
Measure working medium	liquid metal
Measurement method	Contact conduction type
Sensory unit	differential transformer
Pressure sensing element	Double bellows composite spring assembly
Temperature resistance of sensitive components	$\geq 350^{\circ}\text{C}$ (long term)
Range (3 types)	0~150kPa/0~60kPa/0~2kPa
Resolution ratio	0.1kPa
Measurement error	$\leq \pm 1.5\%$ local value
Overvoltage tolerated	$\geq 350\text{kPa}$
Pressure relief (single side)	$\geq 0.5\text{MPa}$
Long term stability	$\leq 0.2\%$ FS/year
Response time	$\leq 1\text{s}$
Pressure sensing chamber constant temperature control	$250^{\circ}\text{C} \pm 1^{\circ}\text{C}$
Outer diameter of sensor	$\leq 76\text{mm}$ (sensor size depends on manufacturer)

BEU6008/6009/6010 Liquid Metal Single Point/Continuous Level Sensor

Product overview

The sensor developed for the China Institute of Atomic Energy utilizes the pressure difference between the liquid alkali metal in the sensing chamber and the reference vacuum chamber. This pressure difference causes the free end of the sensing component to convert pressure into displacement through a central connecting rod. The core connecting rod structure then drives the core of the vacuum-isolated differential transformer to deviate from its midpoint, generating an output voltage that is linearly proportional to the cores displacement.



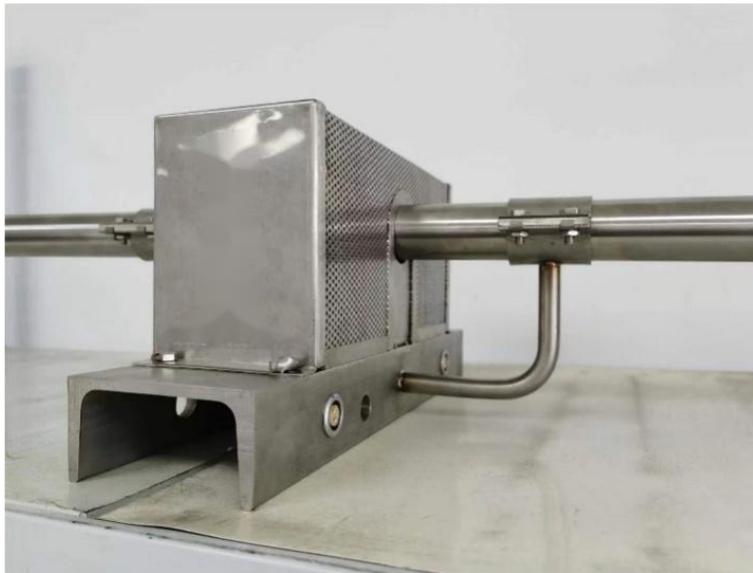
Key specifications

Main parameter	Performance index
Product model	BEU6008/6009/6010
Measure working medium	liquid metal
Working voltage	220V /AC combined battery power supply
Working temperature of probe	500°C long term / 600°C short term
Measuring range	(30-600) mm/(30-1200) mm (customizable)
Accuracy of liquid level measurement	±3mm/1%FS
Indicator	LCD/OLED multi-parameter and curve display
Electrical output	Relay normally open contact
Numeric output	RS485 MODBUS RTU
Probe diameter	Φ14mm

BEU6011/6012 Liquid Alkali Metal Permanent Magnet Flow Meter

Product overview

The flow meter developed for China Institute of Atomic Energy is based on the principle of electromagnetic induction, that is, a conductor placed in a changing flux will produce an electromotive force, which is called induced electromotive force; at the same time, to ensure the fluidity of lithium liquid, a heating device is added.



Key specifications

Main parameter	Performance index
Product model	BEU6011/6012
Service substance	liquid metal
Range	0~6m ³ /h
Design temperature	≤550℃ (823K)
Design pressure	0.3MPa
Take over the size	Φ20×2.5mm
Main material	S31608, S30408, NiCoAl or SmCo
Procedure linkage	weld
Output signal	mV
Logarithm of the output signal	Two
Form of signal connection	2x2 high temperature connectors
Supply electricity	Self-generated electricity
Repeatability	≤±0.75% local value
Weight	≤12kg

BEU6013 High Temperature Lithium Blocking Meter System

Product overview

The blocking meter, developed for the China Institute of Atomic Energy, is a critical online measurement device used to measure impurities such as hydrogen and oxygen in the medium lithium within the reactor. By measuring the blocking temperature of the lithium flow, the meter calculates the impurity content in the lithium, which helps determine whether the oxygen and hydrogen levels in the lithium circuit meet quality control standards. If the impurity levels do not meet the requirements, the lithium can be purified by lowering the temperature to precipitate the dissolved impurities. The monitoring data from the blocking meter is then used to assess whether the sodium purity meets the required standards, ensuring the safe operation of the reactor.



Key specifications

Main parameter	Performance index
Product model	BEU6013
Service substance	Liquid metallic lithium
Measurement capability	Better than 50ppm
Working temperature	$\leq 450^{\circ}\text{C}$ (773K)
Design pressure	0.1MPa
Working pressure	$\leq 50\text{kPa}$
Design flow	0.5 m ³ /h
Line size	$\Phi 20 \times 2.5\text{mm}$
Main material	S31608、 S30408
Type of attachment	Swagelok-VCR-12 (lithium inlet and outlet)
Request for relief	The blocking hole can be heated independently, and the heating temperature is greater than or equal to 400°C
Preheating capability requirements	$\geq 300^{\circ}\text{C}$
Fan specifications	Maximum air volume is greater than or equal to 600m ³ /h variable frequency fan
Cooling capacity	$0.5^{\circ}\text{C}/\text{min}$ - $5^{\circ}\text{C}/\text{min}$

BEU6014 Cesium Vapor Pressure Sensor

Product overview

The pressure sensor developed by the China Institute of Atomic Energy utilizes the pressure difference between the liquid alkali metal in the sensing chamber and the reference vacuum chamber. This pressure difference causes the free end of the sensing component to convert the pressure into displacement through a central connecting rod. This displacement causes the core of the vacuum-isolated differential transformer to deviate from its midpoint, generating an output voltage that is linearly proportional to the cores displacement.



Key specifications

Main parameter	Performance index
Product model	BEU6014
Measure working medium	Cesium vapor
Measurement method	Contact conduction type
Sensory unit	differential transformer
Pressure sensing element	Bellows composite assembly
Temperature resistance of sensitive components	$\geq 400^{\circ}\text{C}$ (long term)
Range	0~1333Pa
Resolution ratio	3.5Pa
Measurement error	$\leq \pm 1.5\%$ local value
Repetitiveness	$\leq \pm 0.75\%$ local value
Weight	$\leq 15\text{kg}$
Source	24V DC
Output	4~20mA (active)

BEU6015 Photoelectric Transverse Liquid Level Sensor

Product overview

The liquid level sensor developed for the China Institute of Atomic Energy Science features a float equipped with magnets placed inside a non-magnetic metal tube. As the liquid level rises or falls, the float moves up and down within the tube. An external magnetic flip column panel, featuring red and white flip columns, is installed outside the tube. These flip columns contain magnets, and light emitters and receivers are paired and positioned at opposite ends of the columns, ensuring they are perfectly aligned horizontally. The sensor detects the liquid level by blocking the light beam as it rises and falls.



Key specifications

Main parameter	Performance index
Product model	BEU6015
Measure working medium	water
Measurement method	Floating type
Sensory unit	photocell
Working temperature	0°C~150°C (long term)
Working pressure	0~2.0MPa
Range	0mm~1800mm
Accuracy of measurement	≤±20mm
Follow the speed	<0.05m/s
Source	24V DC
Output	4~20mA (active)

BEU6016 Hall Level Sensor

Product overview

The Hall-type level sensor developed for the China Institute of Atomic Energy Science features a magnetic float placed inside a non-magnetic metal tube. As the liquid level rises or falls, the float moves up and down, triggering the Hall switch array on the outer wall of the tube. This array closes or opens the Hall switches, indicating the liquid level and enabling remote transmission. The on-site display unit can be a traditional red and white flip panel or an LED light column panel.



Key specifications

Main parameter	Performance index
Product model	BEU6016
Measure working medium	water
Measurement method	Floating type
Sensory unit	Hall element
Working temperature	0°C~150°C (long term)
Working pressure	0~16.2MPa
Range	0mm~4250mm
Accuracy of measurement	≤±25mm
Follow the speed	<0.05m/s
Source	24V DC
Output	4~20mA (active)

BEU6017 Vibration Displacement Sensor

Product overview

The vibration displacement sensor, developed by the China Nuclear Power Research and Design Institute, operates on the LVDT principle and is designed for monitoring vibration parameters in the primary circuit cooling water system. When in use, the sensor's rod end contacts the pipeline, and the rod drives the iron core to move. The rod is equipped with linear bearings and can adjust the spring stiffness and other parameters according to the required pipe wall pressure. This product is designed to match the Russian model 16ИП.00.000 РЭ-А.



Key specifications

Main parameter	Performance index
Product model	BEU6017
Static measurement range	20mV/(mm/s)
Static amplitude linearity	10%
Static amplitude repeatability	2mm
Static zero error	10Hz 1000Hz ($\pm 10\%$)
Static temperature drift	$\pm 5\%$
Dynamic measurement range	$\pm 0.5\text{mm}$
Measure the frequency range	0 200Hz
Excellent γ Irradiation performance	$1 \times 10^6 \text{ Gy}$
Full scale output	$\pm 10\text{V}$
Working temperature	5°C 90°C

BEU6018 Vibration Velocity Sensor

Product overview

The vibration velocity sensor developed by the China Nuclear Power Research and Design Institute is based on Faradays law of electromagnetic induction. When vibration occurs, the coil and permanent magnet move relative to each other, cutting through magnetic flux lines. This results in an output voltage proportional to the vibration speed. By measuring this output voltage, the vibration velocity can be accurately determined. The vibration-sensitive unit is designed with no internal electronic components, featuring a simple structure, high reliability, and strong environmental adaptability. All components are made of materials resistant to γ -rays.



Key specifications

Main parameter	Performance index
Product model	BEU6018
Measure the working medium	Cesium vapor
Measurement method	Contact conduction type
Sensory unit	differential transformer
Pressure sensing element	Bellows composite assembly
Sensitive elements are resistant to temperature	$\geq 400^{\circ}\text{C}$ (long term)
Range	0~1333Pa
Resolution ratio	3.5Pa
Measurement error	$\leq \pm 1.5\%$ local value
Repetitiveness	$\leq \pm 0.75\%$ local value
Weight	$\leq 15\text{kg}$
Source	24VDC
Output	4~20mA (active)

BEU6019 Radiation Resistant Eddy Current Sensor

Product overview

Based on the principle of electromagnetic induction, when an excitation signal is applied to the sensor coil, an alternating magnetic field H1 is generated around the coil. This alternating magnetic field induces an electric field in the surrounding space. When a conductor to be measured approaches the coil, the induced electric field generates an induced current, known as eddy currents. Since these eddy currents are alternating currents, they produce a vortex magnetic field H2. According to Lenz's Law, the direction of the vortex magnetic field H2 is opposite to that of the coil magnetic field H1, thus weakening the coil magnetic field and altering its equivalent impedance.



Key specifications

Main parameter	Performance index
Product model	BEU6019
Measuring range	2mm
Amplitude linearity	±10%
Cross sensitivity	<3%
Frequency range	10Hz 1kHz
Excellent γ Irradiation performance	4.4×10^6 Gy
Output voltage	±10V
Working temperature	-40°C 120°C

BEU6020/6021 Magnetic Field Measuring Sensor

Product overview

This sensor is primarily composed of a linear Hall element and an conditioning circuit. Based on the Hall effect, the Hall element generates a magnetic field signal. This signal is then filtered and amplified by the conditioning circuit, converting it into a stable voltage output for magnetic field measurement. The sensor features a compact design, light weight, low power consumption, and excellent vibration resistance, with a long service life.



Key specifications

Main parameter	Performance index
Product model	BEU6020/6021
Resolution of magnetic fields	The magnetic field change is less than or equal to 0.05mT, and the output change is greater than or equal to 10mV
Zero output	(1±0.1)V
Upper limit output	(5±0.5)V
Output range	(0~ 10)V
Voltage output resolution	>20mV/0.05mT
Working temperature	(-10~+45)°C
Working current	≤25mA
Output impedance	≤3kΩ



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