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Series 523 Quick Start Guide for Series 523 Wide Range Cold Cathode Transducer

Quick Start Guide
p/n 20002442-Rev. A

This Quick Start Guide is for use with MKS p/n 523210-0-0E-T and 523100-0E



Figure 1: Series 523 Wide Range Cold Cathode Transducer

General Description

The Series 523 Wide Range Cold Cathode Transducer is a modular instrument consisting a cold cathode vacuum gauge and electronics enclosure capable of measuring vacuum pressures from 1 x 10^{-7} Torr to Atmosphere.

Benefits of the design include:

- Compact, convenient, cost saving vacuum measurement
- No hot filament, eliminating filament burnout

Intended Use

The intended use of this instrument is to measure vacuum pressure in the range of 1 x 10^{-7} Torr to Atmosphere. This device is to be used only in accordance with the instructions in this Quick Start Guide.

Improper Use

- Removal of any factory installed components
- Modification of any factory installed components
- Removal of any labeling or warranty seals
- Use of the individual components separately from the Series 523 Cold Cathode Transducer
- Operation of this device in any flammable gas, condensing vapor, or liquid environment
- Operation in explosive environments
- Rotation of the magnet will void the warranty.

Warranty Information

MKS Instruments, Inc. provides an eighteen (18) month warranty from the date of shipment for new products. The MKS Instruments, Inc. General Terms and Conditions of Sale provides the complete and exclusive warranty for MKS products. This document may be located on the MKS web site at www.mksinst.com, or may be obtained by contacting a MKS Customer Service Representative.

Safety Notices

These safety precautions must be observed during all phases of installation, operation, and service of this product. Failure to comply with these precautions or with specific warnings elsewhere in this instruction guide violates safety standards of design, manufacture, and intended use of the instrument. MKS Instruments, Inc. disclaims all liability for the customer's failure to comply with these requirements.

These instructions do not and cannot provide for every contingency that may arise in connection with the installation, operation, or maintenance of this product. If you require further assistance, contact MKS at the address given on this instruction guide.

Safety Symbols



Caution, Warning or Danger indicating a possible hazardous situation which could result in injury or death.

Strong Magnetic Field indicating a possible hazardous situation which can disturb electronic devices such as a pacemaker. See the "Strong Magnetic Field" warning notice on this document.

Figure 2: Safety Symbols on the Series 523 Wide Range Cold Cathode Transducer

CAUTION

General Safety Notices

Do not use this instrument to measure the pressure of flammable or explosive gases. Using the transducer to measure the pressure of flammable or explosive gases can cause a fire or explosion resulting in severe property damage or personal injury.

Exposing the transducer to moisture can cause fire or electrical shock resulting in severe property damage or personal injury. To avoid exposing the gauge to moisture, install it in an indoor environment. Do not install the transducer in any outdoor environment.

To avoid measurement error or product failure due to over pressurization, install pressure relief valves or rupture disks in the system if pressure substantially exceeds 1000 Torr (1333 mbar, 133 kPa).

High Voltage

WARNING

High Voltage in Product
Electrical Shock or Personal Injury

The service and repair information in this instruction guide is for the use of Qualified Service Personnel. To avoid possible electrical shock or personal injury, do not perform any servicing on this product unless you are qualified to do so.

Grounding Requirements

WARNING

High Voltage and Proper Grounding

All components of a vacuum system used with this or any similar high voltage product must be maintained at Earth ground for safe operation.

Be aware that grounding this product does not guarantee that other components of the vacuum system are maintained at Earth ground.

Verify that the vacuum port to which the transducer is mounted is electrically grounded.

Connect power cords only to properly grounded outlets or sources.

Strong Magnetic Field

WARNING

Strong Magnetic Field

The magnet in the product produces strong magnetic fields which can disturb electronic devices like heart pacemakers, or can impair their function. Maintain a safe distance of >10 cm between the magnet and a heart pacemaker.

Keep tools and other metallic objects away from the magnet.

Location of the Series 523 Cold Cathode Transducer on the Vacuum Chamber

- Locate the transducer away from devices sensitive to magnetic fields such as RGAs, hot cathodes, and mag-lev turbo pumps.
- Locate the transducer where it can be easily accessed.
- For greatest accuracy and repeatability, locate the transducer in a stable, room-temperature environment. Ambient temperature should not exceed 40 °C (104°F) operating, non-condensing, or 70 °C (158 °F) non-operating.
- Locate the transducer away from internal and external heat sources and in an area where ambient temperature remains reasonably constant. Do not mount the transducer above other equipment that generates excessive heat.
- Do not locate the transducer directly below the chamber which may allow sputtering particles or other contamination to fall into the gauge.
- Do not locate the transducer near the pump, where gauge pressure might be lower than system vacuum pressure.
- Do not locate the transducer near a gas inlet or other source of contamination.
- Do not locate the transducer where it will be exposed to corrosive gases.

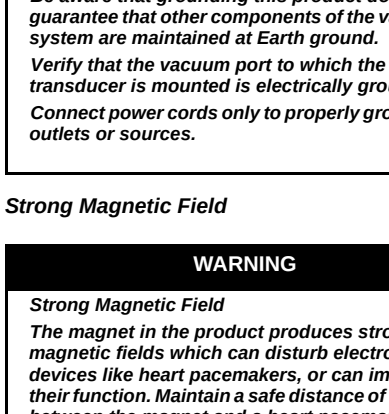


Figure 3: Dimensions of the Cold Cathode Gauge (with NW25KF Flange)

Attach the transducer to the Vacuum Chamber

Connect the transducer Gauge to the vacuum system flange using the appropriate gasket and mounting hardware.

The NW25KF style flange requires a self-centering O-ring between mating flanges.

Attach the transducer to the mating NW-style connector on the vacuum chamber.

Electrical Requirements and Connections

Electrical power to the Series 523 Wide Range Cold Cathode Transducer should be provided only by an approved, SELV power supply that meets the input specifications of the product, and is equipped with reinforced insulation between the main power supply and the output to the transducer.

1. Connect 24 Vdc to pin 4 with respect to pin 2. See Figure 4.

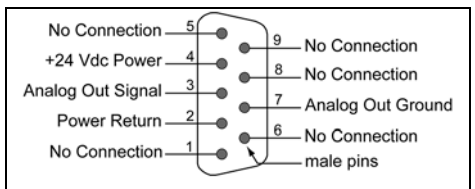


Figure 4: 9-pin Electrical Connector



Figure 5: Status LED and Electrical Connector

Setup & Use of the Transducer

1. Apply 24 Vdc power to pins 4 and 2 to power the unit.
2. Verify that the LED status is Green.
3. Measure voltage across pins 3 and 7.
4. See Figure 6 to convert the voltage signal to a pressure.

Table 1: Transducer LED Status

LED Color	Analog Out Vdc	Condition
Green	0.5 - 9.0	Normal operation
Yellow	10.5	Above operating range
Yellow	10.5	Below operating range or waiting for discharge to start

NOTE:

The transducer will report 10.5 Vdc and the LED will display Yellow if plasma is OFF.

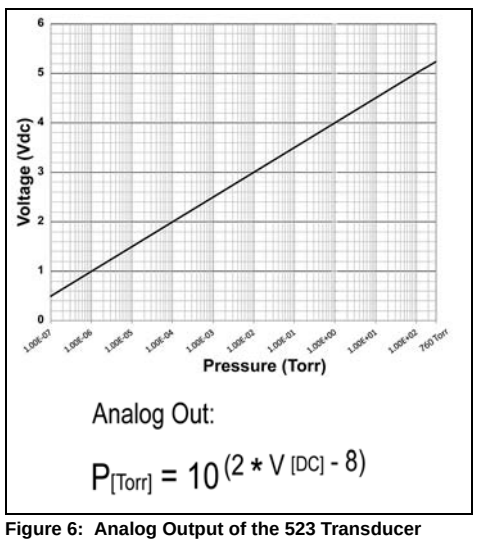


Figure 6: Analog Output of the 523 Transducer

Product Specifications

Parameter	Specification
Measurement Range for N_2 / Air [1]	See note 1, below
Torr	1x10^{-7} Torr to Atmosphere
mbar	1.33x10^{-7} mbar to Atmosphere
pascal	1.33x10^{-5} Pa to Atmosphere
Accuracy (N_2)	+/- 50% (5x10^{-7} to 1x10^{-2} Torr) +/- 50% (Over 10 Torr)
Input power	24 Vdc, 2.5 W continuous
Weight	< 400 g
Operating temperature	0 ºC to +40 ºC (32 ºF to 104 ºF) ambient, indoor use only, ordinary protection from moisture
Operation humidity	0 to 90%
Non-operating temperature	0 ºC to +70 ºC (32 ºF to 158 ºF)
Mounting orientation	Any
CE Compliance	EMC: EN61326-1
Environmental	RoHS
Materials exposed to gas	Polypropylene, 304 stainless steel
Specifications and dimensions are subject to change without notice.	

NOTE:

1. *Do NOT use the Series 523 Wide Range Cold Cathode Transducer with flammable or explosive gases.*

Sensor Replacement Procedure

1. To remove the sensor, rotate lock collar 75° counterclockwise until full stop. Pull the sensor out of the module. Discard the old sensor in accordance with local ordinances.
2. Place the new sensor into the module.

   Note: Do not rotate the magnet which is set at the factory. Rotation will void the warranty.

   The sensor is keyed and the module is designed to accept the sensor only in the correct orientation.

   Push on the KF25 fitting until the electrodes are pressed into place. The sensor will now be below the lock collar tabs.
3. Turn the lock collar 75° clockwise until full stop. The sensor is now in place and the transducer is ready to install on the vacuum system.

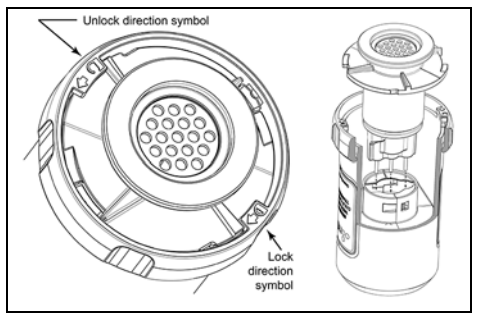


Figure 7: Sensor Replacement - p/n 523100-0E

Declaration of Conformity



mks

Document P/N: 20002495
Revision: A

EU Declaration of Conformity

Application of Council Directive(s): ☒ 2014/30/EU Electromagnetic Compatibility Directive (EMCD)
☐ 2014/35/EU Low Voltage Directive (LVD)
☐ 2014/68/EU European Pressure Equipment Directive (PED)
☒ 2011/65/EU Restriction of Hazardous Substances Directive (RoHS)

Standard(s) to which conformity is declared: ☒EN 61326-1:2013 (EMC); ☐EN 61326-2-3:2013 (EMC);
☐EN 61010-1:2010 (Safety);
☐PED Module SEP (Sound Engineering Practices); 2014

Emissions:
☒CISPR 11:2015 Industrial, Scientific and Medical Equipment Radio-Frequency Disturbance Characteristics - Limits and Methods of Measurement
☒IEC 61000-3-2:2014 EMC/Limits for Harmonic Current Emission[(1)]
☒IEC 61000-3-3:2013 EMC/Limitations of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems[(1)]
☒IEC 61000-3-3:2013 EMC/Limitations of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems[(1)]
☒EN 55011: 2009+A1:2010[(1)]
☐FCC 47 CFR Part 18: 2015

Immunity:
☒IEC 61000-4-2:2008 EMC/Electrostatic Discharge Immunity Test
☒IEC 61000-4-3:2006 2006+AMD1:2007+AMD2:2010 EMC/Radiated Radio - Frequency Electromagnetic Field Immunity Test
☒IEC 61000-4-4:2012 EMC/Electrical Fast Transient/Burst Immunity Test
☒IEC 61000-4-5:2014 EMC/Surge Immunity Test[(1)]
☒IEC 61000-4-6:2013 EMC/Conducted Disturbances induced by Radio Frequency Fields Immunity Test
☒IEC 61000-4-8:2009 EMC/Power Frequency Magnetic Field Immunity Test
☒IEC 61000-4-11:2004 EMC/Voltage Dips, Short Interruptions and Variations Immunity Test[(1)]
☒IEC 61000-4-34:2005+AMD1:2009 EMC/Voltage Dips, Short Interruptions and Variations Immunity Test[(1)]

Manufacturers Name: MKS Instruments, Inc. Andover, MA, USA

Importer's Name & Location: _____

Equipment Type/Description: 523 Wide Range Cold Cathode Transducer

Model Number(s)[(2)]: 523###-#-##-#, 523###-##

MKS confirms that, with respect to the products listed above, it believes it is in conformity with the selected European Union harmonization legislation. MKS product conforms to the above Directive(s)and Standard(s) only when installed in accordance with manufacturer's specifications. This declaration has been issued under the sole responsibility of the manufacturer.

Date: 3/1/2017

(Signature)
Chris Stone
(Full Name)
GM, IPS & P&VM Indirect Gauge Products
(Title)

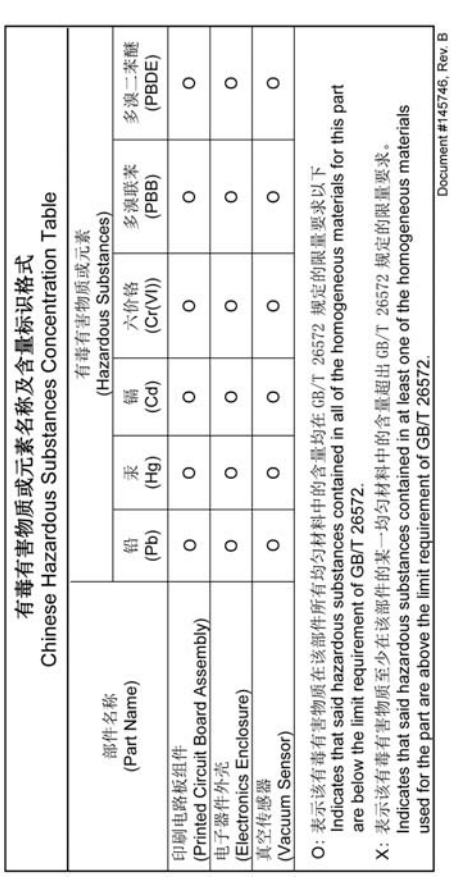
1) Applicable to AC powered product only. Class B
2) Applicable to AC powered product. IEC powered connections must not connect to DVC distribution network. I/O Signal and Control Lines must be less than 10m and not exit the building
3) Applicable to AC powered product. DC powered connections and may connect to DVC distribution network.
4) Class A, Group 1
5) Applicable to AC powered product only.
6) Compliance of the above model numbers requires the use of a braided shielded cable properly terminated at both ends – if so noted in the MKS Instruction Manual.

MKS Instruments, Inc.
Andover, MA USA

MKS CONFIDENTIAL

Document Number: MKS-CR-1197
Revision: B

Chinese Hazardous Substances Concentration Table



Chinese Hazardous Substances Concentration Table
有毒有害物质或元素名称及含量标识格式

部件名称 (Part Name)	有毒有害物质或元素 (Hazardous Substances) 铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板组件 (Printed Circuit Board Assembly)	O	O	O	O	O	O
电子器件外壳 (Electronics Enclosure)	O	O	O	O	O	O
真空传感器 (Vacuum Sensor)	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有均匀材料中的含量均在 GB/T 26572 规定的限量要求以下
Indicates that said hazardous substances contained in all of the homogeneous materials for this part are below the limit requirement of GB/T 26572.

X: 表示该有毒有害物质至少在该部件的某一均匀材料中的含量超出 GB/T 26572 规定的限量要求。
Indicates that said hazardous substances contained in at least one of the homogeneous materials used for the part are above the limit requirement of GB/T 26572.

Document #145746, Rev. B

Service and Maintenance

If the product requires service, contact the MKS Technical Support Department at 1-303-652-4400 for troubleshooting help over the phone.

If the product must be returned to the factory for service, request a Return Material Authorization (RMA) from MKS, which can be completed at https://www.mksinst.com/service/servicehome.aspx. Do not return products without first obtaining an RMA. In most cases a hazardous materials disclosure form is required. The MKS Customer Service Representative will advise you if the hazardous materials document is required.

When returning products to MKS, be sure to package the products to prevent shipping damage. Damaged returned products as a result of inadequate packaging is the Buyer's responsibility.

Customer Service / Technical Support

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June 2017

Template p/n DR100019-Rev. F

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