



# There's a better way to predict the future.

## The PHD **IMPACT** Sensor



KG Impact Sensor  
(actual size)

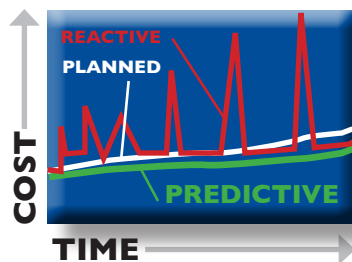


Programmer defines what levels of impact require a warning or a machine stop.

### Predict. Plan. Prevent.

The PHD Series KG Impact Sensor provides monitoring of your equipment performance. Early detection of potential failures allows you to avoid or prepare for a downtime - ultimately saving money. Let's face it, waiting for a failure to occur, or switching out parts whether or not they are needed is not the best solution! **Over time, predictive maintenance provides the lowest cost of ownership.**

Expect lower costs when using a predictive maintenance approach.



### Use it on just about anything that moves!

#### Predictive Maintenance Device

- Minimizes unnecessary maintenance
- Reduces unanticipated downtime
- Detects changes in impact caused by failing equipment

#### Productivity Tripwire

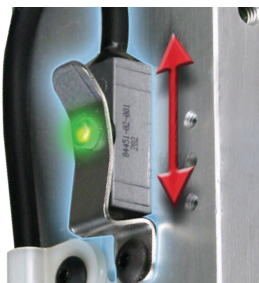
- Stops production of bad parts
- Flags appropriate personnel of machine crash
- Indicates time and level of machine crash

#### Benchmarking

- Programmer measures impact
- Monitors centripetal forces
- Counts impacts or extreme vibration



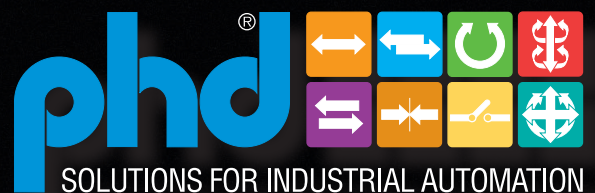
Sensing in a linear direction, the KG easily attaches to the moving part of your machine or device with a bracket. It monitors the impact of moving mass force at the moment of stopping and compares measured impact (in Gs) of internal set points assigned by you. Once the points are set and attached to your PLC or logic system, it is in service.



For more information, call 1-800-624-8511 or visit [phdinc.com/pd1112](http://phdinc.com/pd1112)



Since 1957, PHD has designed and produced high-precision, reliable products for industry. Our products, supported by our strong commitment to delivery, service, and quality have made us a leader in the automation industry. If you don't know about PHD, check us out!



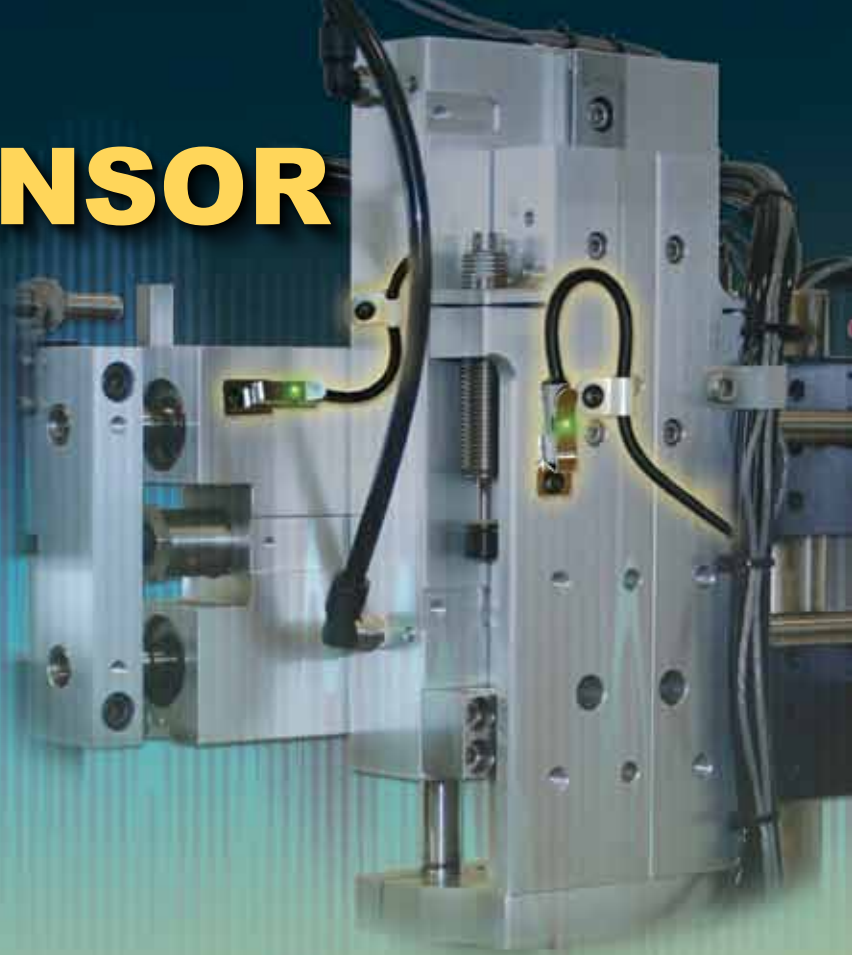
P.O. Box 9070 • Fort Wayne, IN 46899 USA



**SERIES KG**

# **IMPACT SENSOR AND PROGRAMMER**

**Predict  
Plan  
Prevent**




**ISO-9001  
CERTIFIED**  
Quality Management  
System Certified

**KG01**



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# SERIES KG IMPACT SENSOR



## PRINCIPLE OF OPERATION

The Series KG Impact Sensor constantly monitors the impact of the mass to which it is attached. It provides a time-based signal driven by two user-defined set points indicating excessive impact. A PLC can interpret this signal and warn of erratic operation or shut down a system to prevent catastrophic failure.

The signal is fail-safe meaning a normally closed signal is provided during normal operating conditions. Absence of the signal indicates excessive impact or a problem.

When an impact exceeds the non-latching (warning) set point, the signal is momentarily dropped (50ms) and the sensor's LED flashes from green to red. When an impact exceeds the latching (trip) set point, the signal is permanently dropped and the LED remains red until power is cycled, which resets the sensor.

The user defines set point values and whether these points are monitored together or individually. The Series KG Impact Sensor is available preset from the factory or set on-site by the user (programmer required). Set point values can be modified at any time.

The Series KG Impact Sensor is also able to measure an impact and relay that value to the user (programmer required). This is helpful for diagnostics or during initial set up of the Series KG Impact Sensor. Impacts and set points are indicated in g-force.

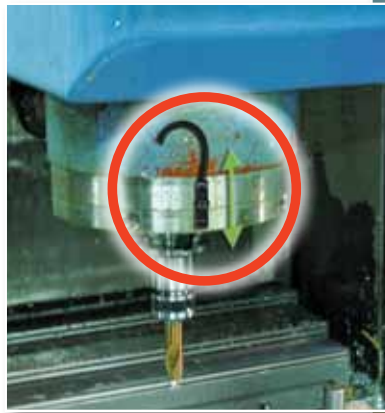


## USES

- **Predictive maintenance device**
  - Detects changes in impact force
  - Can help to reduce unanticipated downtime
  - Minimizes unnecessary preventive maintenance
- **Productivity tripwire**
  - Flags appropriate personnel of machine crash
  - Indicates when machine has crashed
  - Stops production of bad parts as result of miscalibration caused by severe crash
- **Benchmarking**
  - Measures impact (programmer required)
  - Counts impacts or extreme vibration (<400hz)
  - Monitors centripetal forces

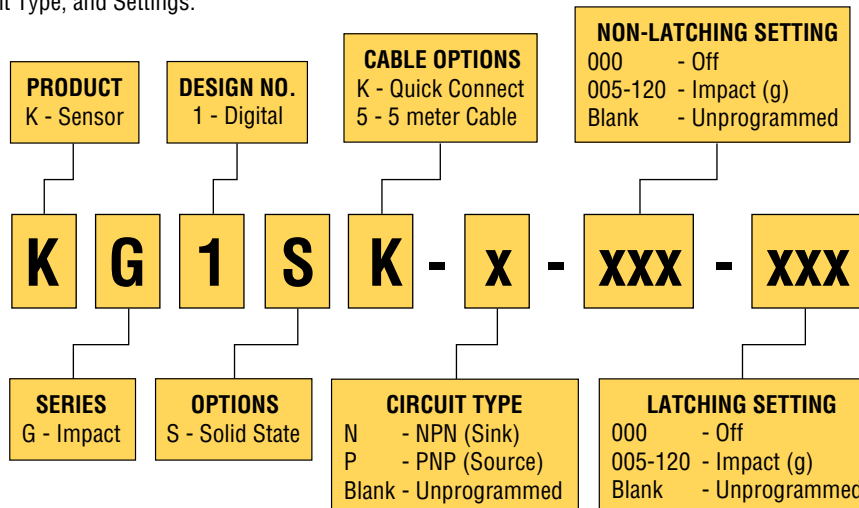
## FEATURES

- Bi-directional/single axis sensitivity
- Single or dual point operation
- User defined, rewriteable set-points (programmer required)
- Attaches easily to moving mass
- Multi-color LED for visual monitoring
- Fail-safe output signal
- Available preset from PHD or field programmable
- 3 pin quick connect option
- Optional programmer available for additional functionality



## TO ORDER SPECIFY:

Product, Series, Design No, Options, Circuit Type, and Settings.



## NOTES:

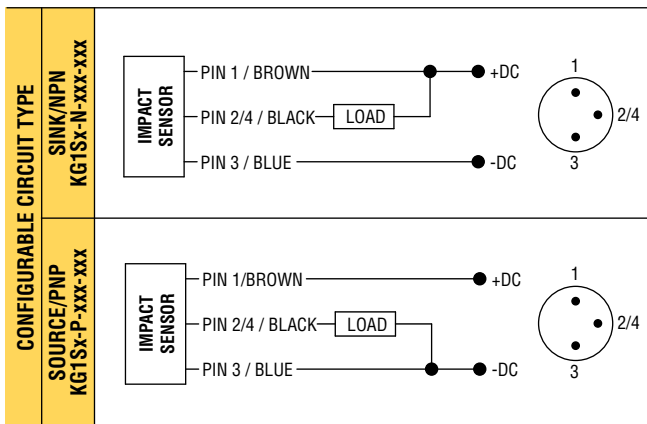
- 1) Circuit type, non-latching setting, and latching setting must be filled out entirely or all three must be left blank.
- 2) '000 - OFF' setting indicates single point operation and must be accompanied with a setting in the adjacent field.
- 3) Non-latching and latching settings specified in increments of 1 using a 3-digit format.
- 4) Standard configuration is KG1SX-P-010-020.
- 5) Programmer sold separately.

# SPECIFICATIONS & OPERATION: SERIES KG IMPACT SENSOR

SPECIFICATIONS	RANGE	± 5 to 120g Bi-directional/single axis
	ACCURACY	± 5g
	RESOLUTION	1g
	OPERATING FREQUENCY	400Hz
	RESPONSE TIME	10 ms max.
	OPERATING TEMPERATURE	-32°F to 176°F [0°C to 80°C]
	ENVIRONMENTAL PROTECTION	IP67
	SUPPLY VOLTAGE	10 - 30 VDC
	MAX. OUTPUT CURRENT <sup>1</sup>	20 mA
	BURDEN	≤ 20 mA + output load
WEIGHT <sup>2</sup>	KGxSK: 0.027 lbm [0.012 kg]	
	KGxS5: 0.278 lbm [0.126 kg]	
SET POINTS	POINT 1	Non-Latching (Warn) 50ms Output Interruption
	POINT 2	Latching (Trip) Permanent Output Interruption (Cycle power to reset)
MODE	SINGLE POINT A	Non-Latching
	SINGLE POINT B	Latching
	DUAL POINT	Non-Latching and Latching

1) Output is normally closed and opens or turns off when the sensor detects an excessive impact.

2) Includes bracket, fastener, and cable



Proper cable management is critical to the operation of the impact sensor. All cabling must be secured as not to influence the motion of the sensor in any way.

## INSTANTANEOUS IMPACT (Figure 1)

As normal impact increases and exceeds the non-latching point, the fail-safe signal drops for 50 milliseconds with every excessive impact. A PLC monitoring the signal can utilize timer logic to issue an appropriate action, alert, or warning. When the impact increases beyond the latching point, the fail-safe signal permanently drops and the PLC can shut the machine down to prevent catastrophic failure.

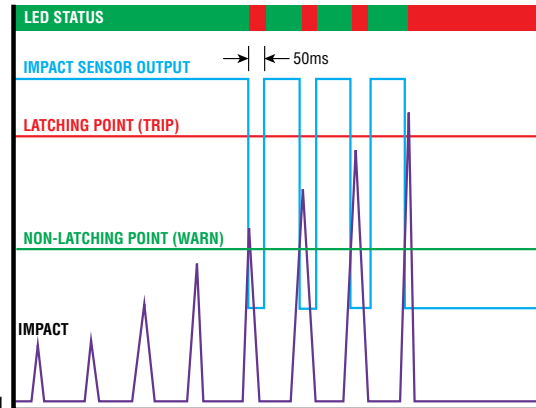


Fig. 1

## CONSTANT FORCE AND CENTRIPETAL MOTION (Figure 2)

In the case of constant force or centripetal motion where the force profile is flat, the fail-safe signal remains low, returning high 50ms after the force falls below the non-latching point. If the latching point is exceeded, the fail-safe signal permanently drops.

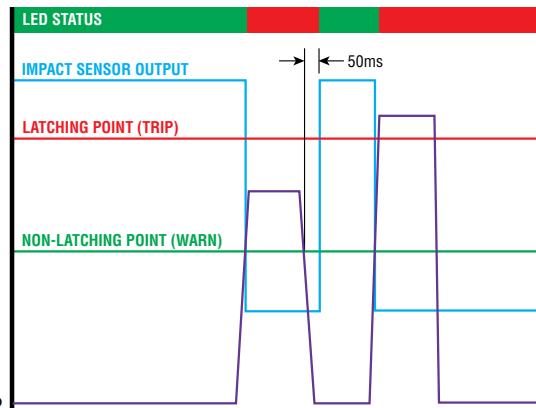
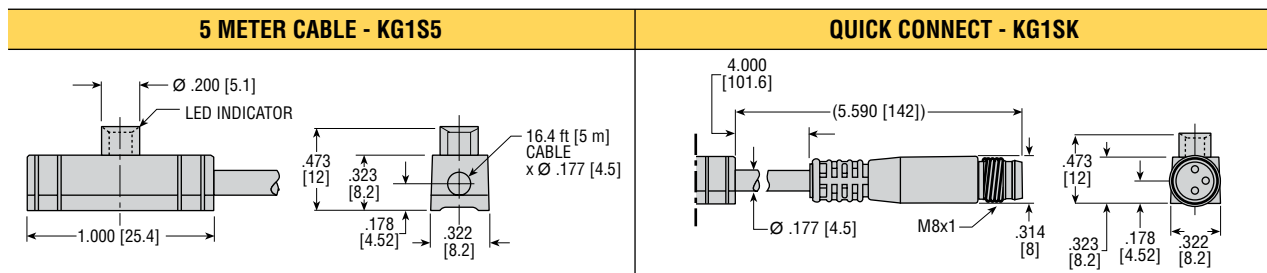


Fig. 2

## SENSOR RESET PROCEDURE

To reset from a latched condition, power must be cycled to the sensor. Allow 200ms for sensor initialization before returning to normal operation.

# DIMENSIONS: SERIES KG IMPACT SENSOR



NOTE: ALL DIMENSIONS ARE REFERENCE ONLY UNLESS SPECIFICALLY TOLERANCED.

# ACCESSORIES: SERIES KG

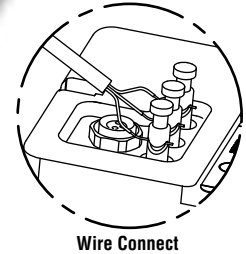
## SERIES KG PROGRAMMER

### FEATURES

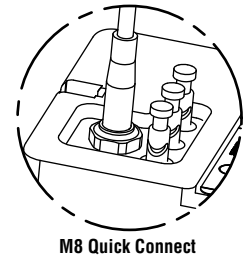
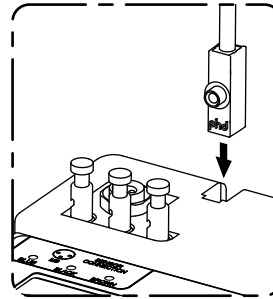
Use of the optional Series KG Programmer unlocks the total potential and flexibility of the Series KG Impact Sensor. With the programmer, the end user is able to modify the circuit type (NPN or PNP), whether the sensor is in dual or single point mode, and what the value of these set points is.

In addition, the programmer simplifies setting up the Series KG Impact Sensor. If the user doesn't know what "normal impact" is or where to start, the programmer has the ability to put the sensor in "learn mode" where the programmer will read the experienced impact. This feature is applicable in learn mode or when a latching point is exceeded.

Lastly, a single programmer has the ability to service an unlimited number of impact sensors throughout an entire plant.



Wire Connect

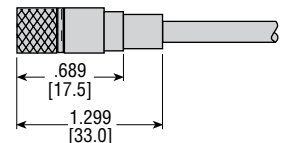
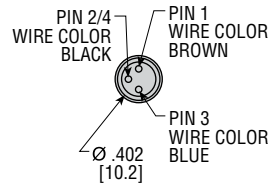


M8 Quick Connect

PART NUMBER	DESCRIPTION
84424-01	Programmer & Power Supply
84440	Programmer Only
84441	Power Supply Only

### CORDSETS

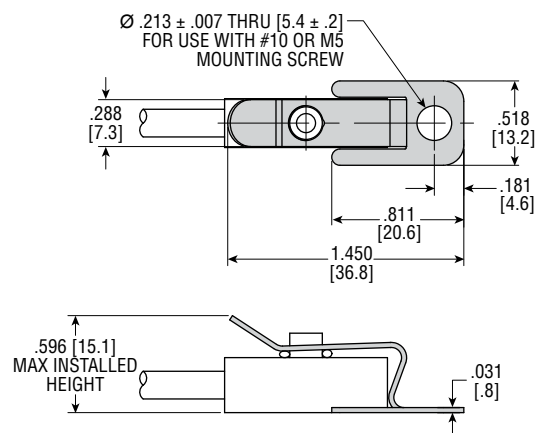
PART NUMBER	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 meter cable
63549-05	M8, 3 pin, Straight Female Connector, 5 meter cable



### MOUNTING BRACKET KITS

PART NUMBER	DESCRIPTION
84462	Bracket
84463	Band Clamp

One bracket provided with each sensor.  
Band clamp will attach KG to rod diameter .875 in [22 mm] min. to 2.875 in [73 mm] max.



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