

# PRODUCT MANUAL

LYNX™ 50-INCH STROKE/VELOCITY  
ENCODER

LE-R-50-REVA



RTG

*TRAINING AND TECHNOLOGY FOR INJECTION MOLDING*



# PRODUCT MANUAL

## LYNX™ 50-INCH STROKE/VELOCITY ENCODER

### LE-R-50-REVA

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### LE-R-50-REVA

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## INTRODUCTION

Read, understand, and comply with all following instructions. This guide must be kept available for reference at all times.

## DISCLAIMER

Inasmuch as RJG, Inc. has no control over the use to which others may put this material, it does not guarantee that the same results as those described herein will be obtained. Nor does RJG, Inc. guarantee the effectiveness or safety of any possible or suggested design for articles of manufacture as illustrated herein by any photographs, technical drawings, and the like. Each user of the material or design or both should make his own tests to determine the suitability of the material or any material for the design as well as the suitability of the material, process, and/or design for his own particular use. Statements concerning possible or suggested uses of the material or designs described herein are not to be construed as constituting a license under any RJG, Inc. patent covering such use or as recommendations for use of such material or designs in the infringement of any patent.

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## ALERTS

The following three alert types are used as needed to further clarify or highlight information presented in the manual:



### **Term**

*A definition of a term or terms used in the text.*



**NOTE** *A note provides additional information about a discussion topic.*



**CAUTION** *A caution is used to make the operator aware of conditions that can cause damage to equipment and/or injury to personnel.*

## ABBREVIATIONS

DIA	diameter
MIN	minimum
MAX	maximum
R.	radius



## PRODUCT DESCRIPTION

The Lynx™ 50-inch stroke/velocity encoder LE-R-50-REVA is a molding machine-mountable, linear position/velocity sensor designed for use with the RJG, Inc. eDART® and CoPilot™ systems. The stroke/velocity encoder can be used to monitor standard screw position and speed on most injection molding machines.

## APPLICATIONS

The eDART and CoPilot systems require various inputs from the injection molding machine in order to accurately calculate significant process values for control; one of those required inputs is the “screw run” machine sequence signal. The screw run signal indicates that the screw is currently rotating/building the next shot for injection. A screw run signal may be obtained directly from the injection molding machine in some cases. For those machines which do not provide a screw run signal, a stroke/velocity encoder must be installed to fulfill the systems’ requirements.

## STROKE (SCREW) POSITION

The eDART and CoPilot system use stroke (screw) position to calculate shot volume and cushion.

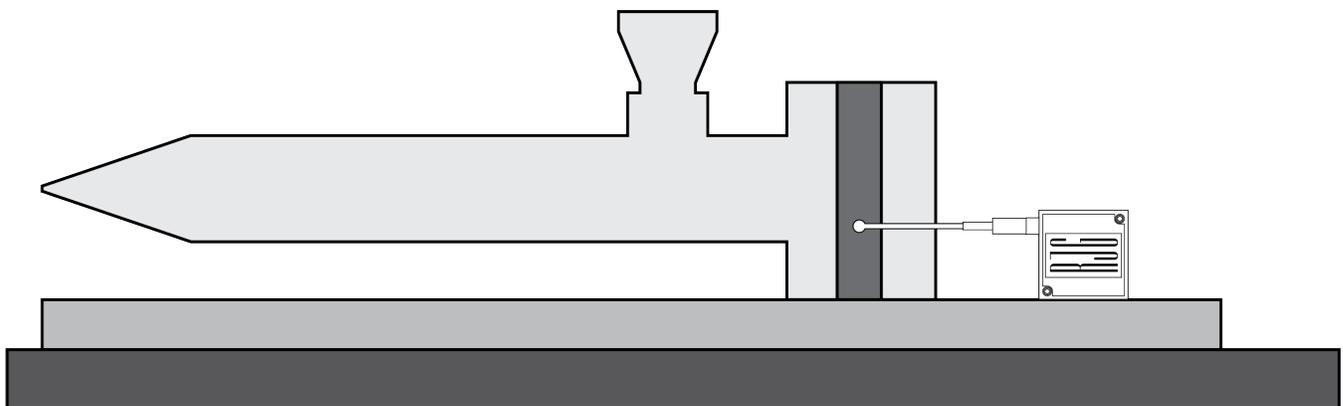
## VELOCITY (SPEED) MEASUREMENT

The eDART and CoPilot systems use velocity (speed) measurements to calculate injection velocity and plasticizing rates.

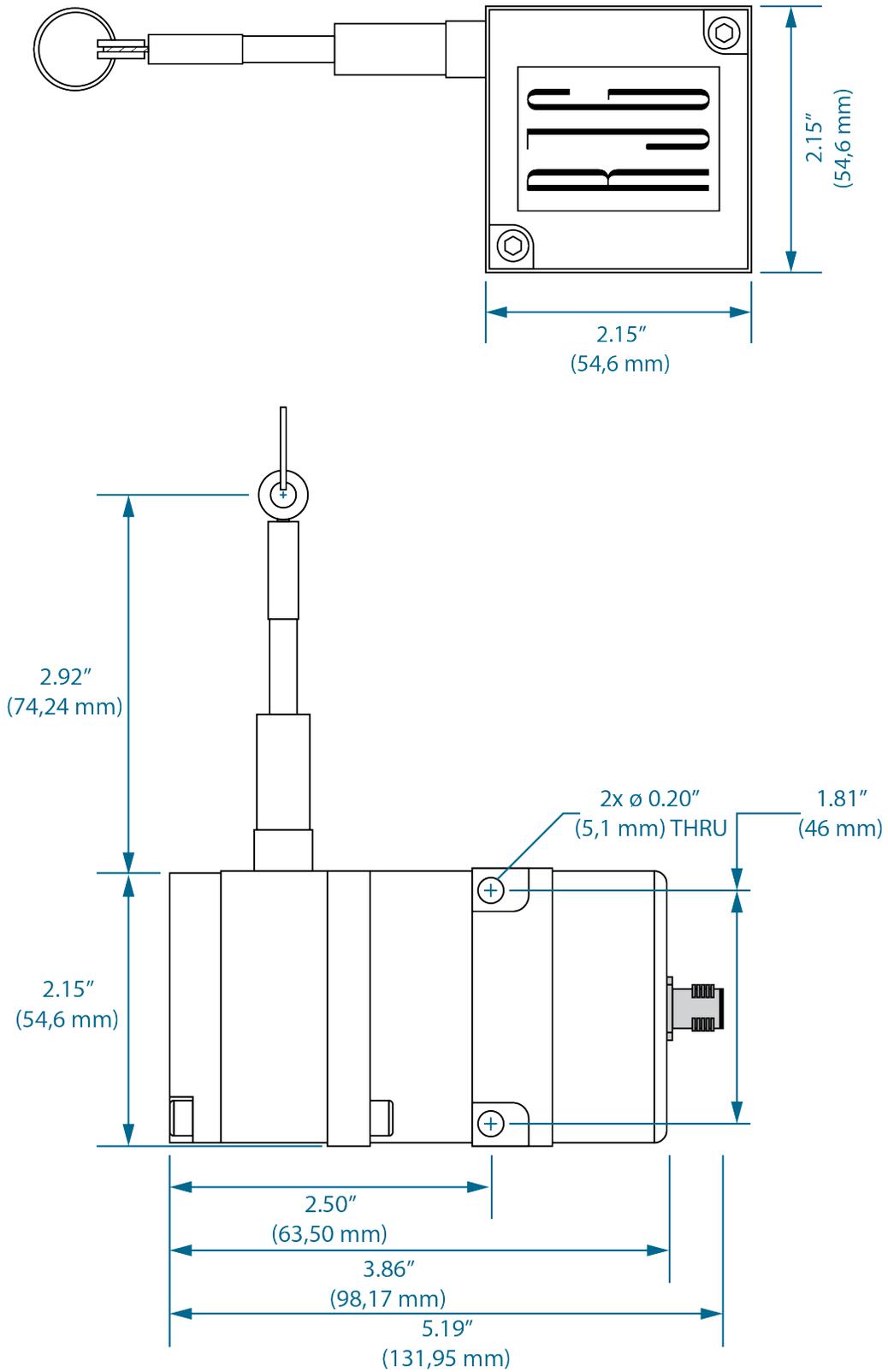


## OPERATION

The LE-R-50-REVA is mounted on the injection unit sled near the back. As the screw moves forward, the cable is pulled out until the screw reaches bottom—or the “zero” position. The sensor will detect the movement of the screw, but not the movement of the sled. As the screw moves backward, the sensor cable is retracted.



## DIMENSIONS



# INSTALLATION

## INSTALLATION OVERVIEW

Read all instructions before installing hardware and related components. Contact RJG, Inc. Customer Support for any questions regarding installation. Follow all installation instructions, notes, and cautions.

## INSTALLATION SPECIFICATIONS

### REQUIREMENTS

Determine a mounting location for the LE-R-50-REVA; the location must provide the following:

- fixed position on injection unit sled
- a clear, straight, unobstructed cable path to and from the LE-R-50-REVA body



**NOTE** The stroke/velocity sensor cable must enter the nylon cable bushing straight to eliminate wear on the cable and prevent erroneous readings.

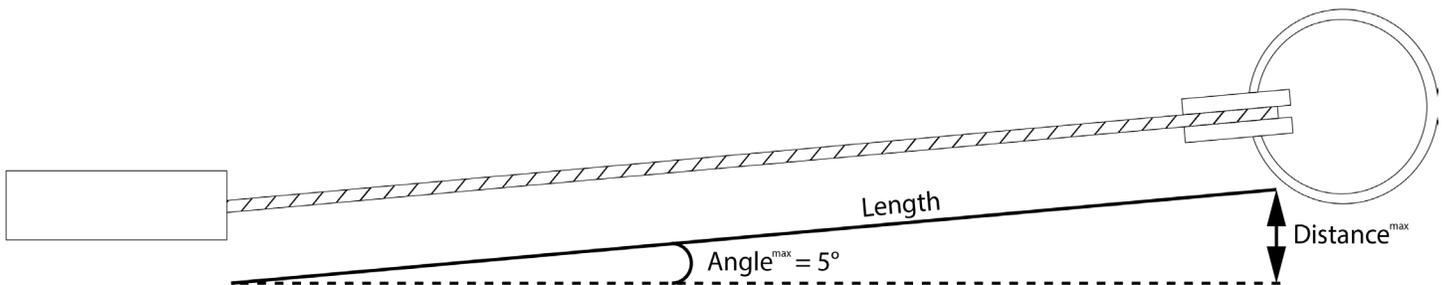


**CAUTION** Screw travel must not exceed 50" (1,27 mm). Failure to comply will result in personal injury and damage or destruction of equipment.

The maximum off-center degree allowable is 5°, and is measured as a distance using the following equation:

$$\text{Distance}^{\max} = 0.087 \times \text{Cable Length}$$

For example, if the cable is extended 20" at 5°, then  $0.087 \times 20" = 1.74"$ ; 1.74" is the  $\text{Distance}^{\max}$ , or maximum height of the cable as measured from the center,

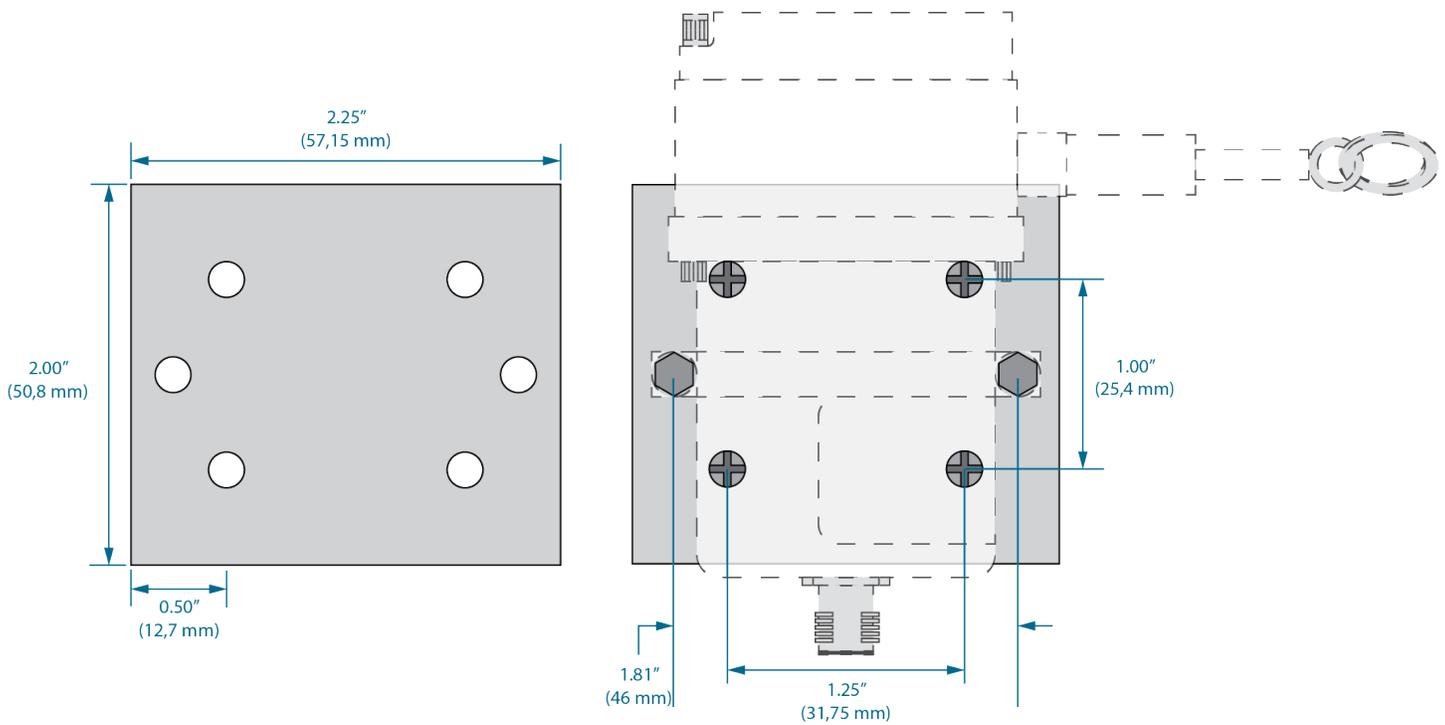


## INSTALLATION SPECIFICATIONS (continued)

### MOUNTING

Mount the included plate on the molding machine injection unit sled. Use the included plate to determine the correct installation position.

Mount included plate on the molding machine injection unit sled using the four included 8-32 x 1/2" screws. Mount the LE-R-50-REVA on the plate using the two included 10-24 x 2" cap screws.



## INSTALLATION SPECIFICATIONS (continued)

### CONNECTIONS

The LE-R-50-REVA is connected to the eDART or CoPilot system with a single Lynx cable (CE-LX5-4M-F90) featuring a 90° female end for ease of installation.

Install the Lynx cable female end on the LE-R-50-REVA connector.

Install the Lynx cable male end on the appropriate junction for the eDART or CoPilot connector.

There must not be movement between the cable plug and the connector, as it may have a tendency to wear on the connector insert and cause premature failure.



**NOTE** Strain-relieve the Lynx cable so that movement of the sled does not place strain on the LE-R-50-REVA connector.

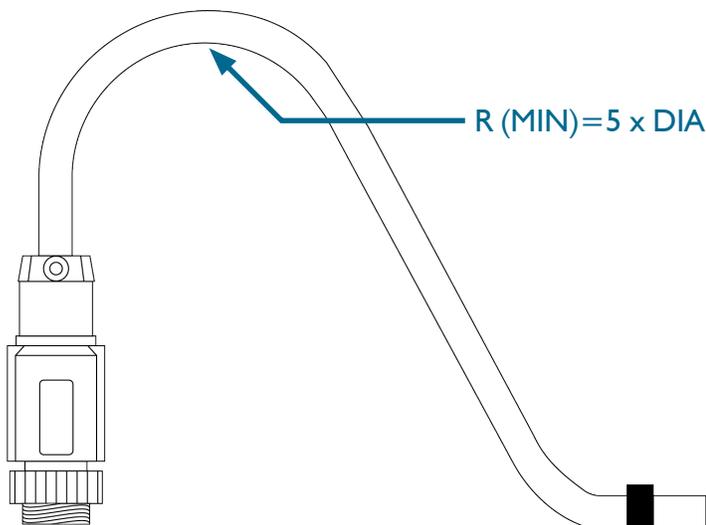
#### 1. Fixed Installation

Fix the cable so that the bend radius is no smaller than five times the cable diameter—1.25" (31,75 mm)—to ensure a long service life.

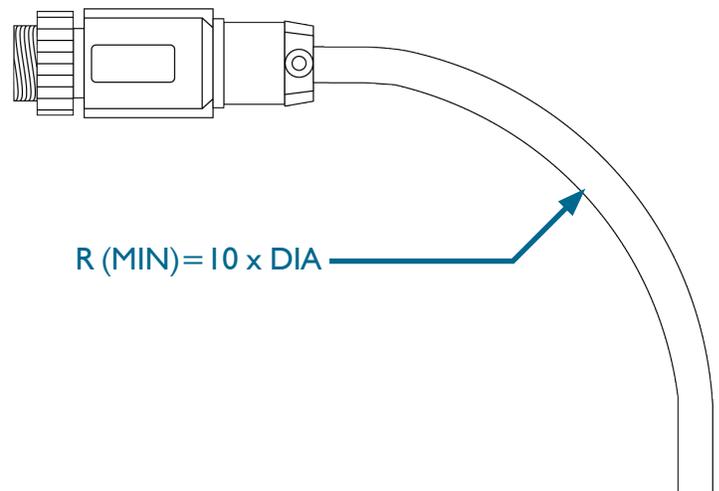
#### 2. Flexible Installation

The cable length must be sufficient to adequately absorb the tensile loads; the bend radius is no smaller than ten times the cable diameter—2.5" (63,5 mm)—to ensure a long service life.

FIXED INSTALLATION



FLEXIBLE INSTALLATION



## ALTERNATE INSTALLATIONS

In the event that the recommended installation method is not possible, the LE-R-50-REVA may be installed using either the preferred alternate installation, or if also not possible, the alternate installation. Do not use either of the following two methods if the recommended installation method is possible.

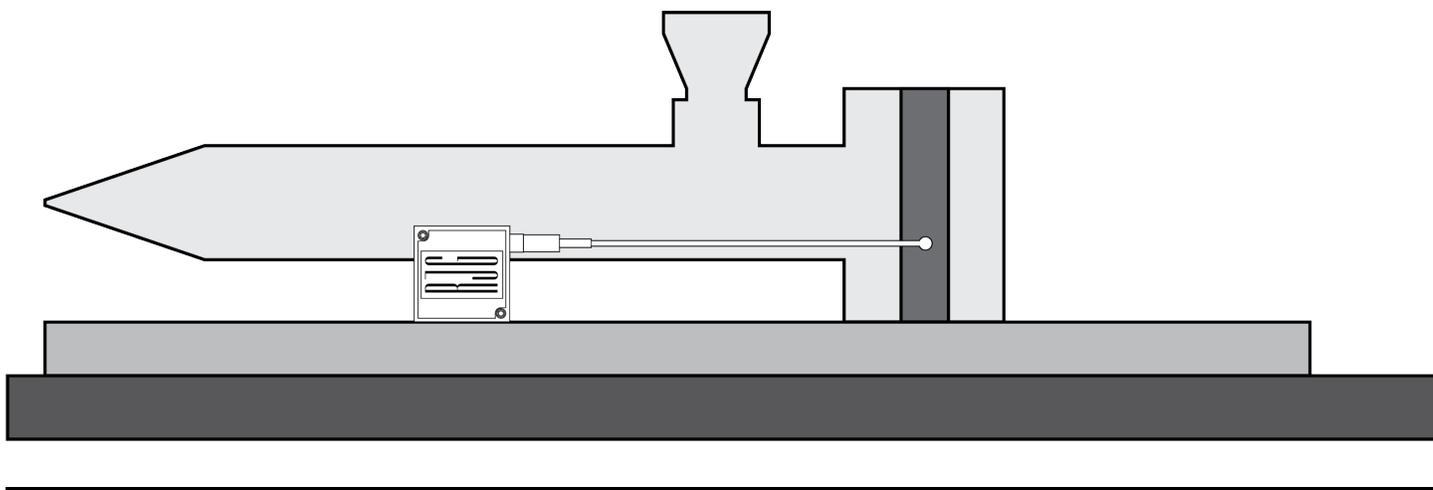
### PREFERRED ALTERNATE INSTALL

The stroke/velocity sensor is mounted on the molding machine injection unit sled near the front (*below, top*). This method enables the stroke/velocity sensor to detect the movement of the screw and not the movement of the sled. However, this method subjects the sensor to higher temperatures due to proximity to the barrel and heater bands. The LE-R-50-REVA must be mounted at least 6–8" (152–203 mm) away from barrel heaters.

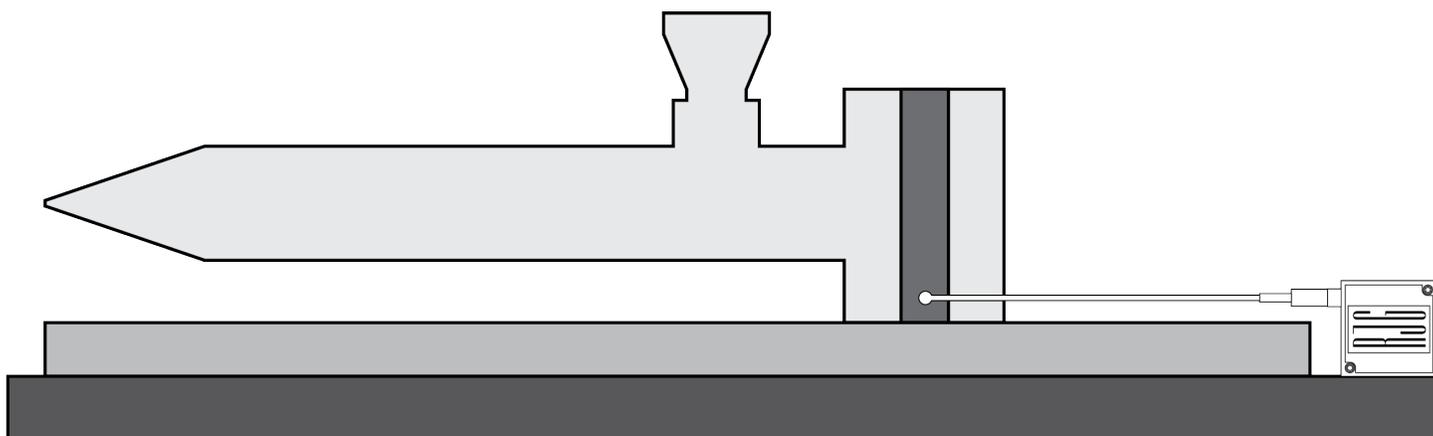
### ALTERNATE INSTALL

The stroke/velocity sensor is mounted to the injection molding machine near the back of the injection unit sled (*below, bottom*). This method enables the stroke/velocity sensor to detect the movement of the screw, but also will detect the movement of the injection unit sled. Also, some loss of the usable length of the sensor's cable will result.

### PREFERRED ALTERNATE INSTALLATION



### ALTERNATE INSTALLATION



## MAINTENANCE

The LE-R-50-REVA does not require maintenance; ensure mounting bolts remain tight to prevent damage or erroneous readings.

### CLEANING

Keep the stroke/velocity sensor's cable clean and free from debris to ensure a long service life.

### WARRANTY

#### RJG, INC. STANDARD PRODUCT WARRANTY

RJG, Inc. is confident in the quality and robustness of the LE-R-50-REVA stroke/velocity sensors, and so are offering a one-year warranty. RJG's stroke/velocity sensors are guaranteed against defects in material and workmanship for one year from the original date of purchase. The warranty is void if it is determined that the sensor was subjected to abuse or neglect beyond normal wear and tear of field use, or in the event that the sensor has been opened by the customer.

### PRODUCT DISCLAIMER

Inasmuch as RJG, Inc. has no control over the use to which others may put this material, it does not guarantee that the same results as those described here will be obtained. Nor does RJG, Inc. guarantee the effectiveness or safety of any possible or suggested design for articles of manufacture as illustrated herein by any photographs, technical drawings, and the like. Each user of the material or design or both should make his own tests to determine the suitability of the material or any material for the design, as well as the suitability of the material, process, and/or design for his own particular use. Statements concerning possible or suggested uses of the materials or designs described herein are not to be construed as constituting a license under any RJG, Inc. patent covering such use or as recommendations for use of such materials or designs in the infringement of any patent.

RJG, Inc. is not responsible for the improper installation of this equipment, or any other equipment RJG manufactures.

Proper RJG equipment installation does not interfere with original equipment safety features of the machine. Safety mechanisms on all machines should never be removed.



## TROUBLESHOOTING

### COMMON INSTALLATION ERRORS

#### 1. Cable Interference

The stroke/velocity sensor is installed so that there is interference along the cable path. Cable interference will cause premature cable wear and erroneous readings.

Remove sensor, then refer to “Installation Specifications” on page 3 to re-install the sensor correctly.

#### 2. Cable is Angled

The stroke/velocity sensor is installed so that the cable exit/enters the sensor body at an angle instead of straight (1 & 2 below). Sensor operation with the cable at an angle will cause erroneous readings and premature wear on the nylon cable bushing.

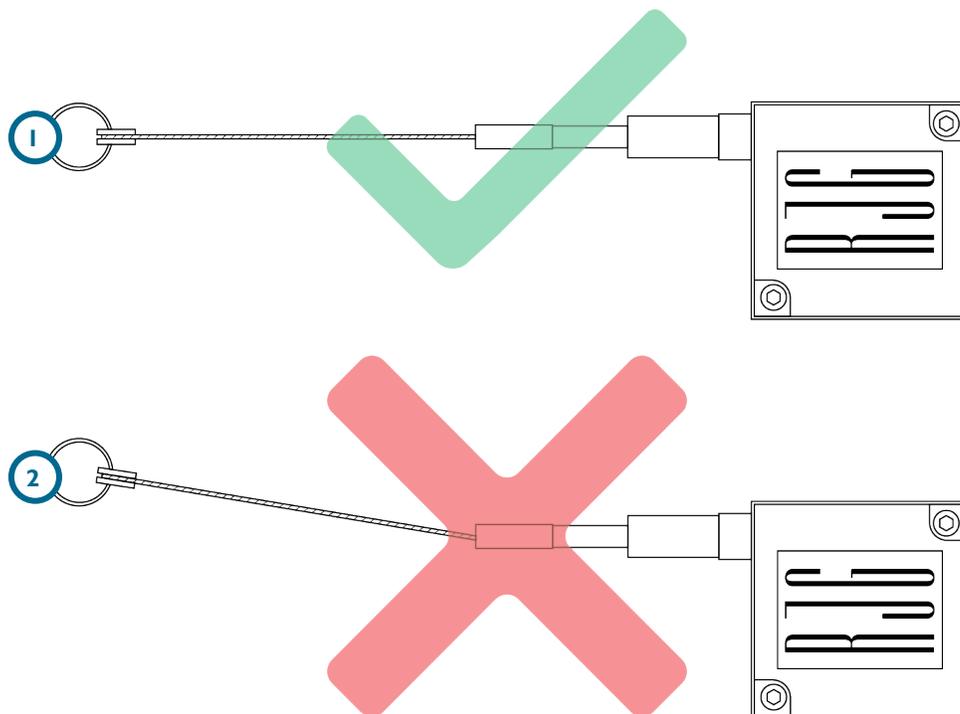
Remove the sensor, then refer to “Installation Specifications” on page 3 to re-install the sensor correctly.

#### 3. Sensor Plate Not Permanently Mounted

The stroke/velocity sensor mounting plate was never permanently affixed using the supplied hardware; the temporary positioning magnets remain the mounting method.

If the sensor is not permanently affixed the body may move from the desired location, causing erroneous readings, and possibly causing interference with the cable path.

Remove the sensor, then refer to “Installation Specifications” on page 3 to re-install the sensor correctly.



## CUSTOMER SUPPORT

Contact RJG's Customer Support team by phone or email.

RJG, Inc. Customer Support

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### Support

- Overview
- Remote Connect
- Software Downloads
- Contact Support
- RMA Request

### Overview

RJG, Inc. prides itself on fantastic support for our customers. We endeavor to do everything possible to ensure our customers are successful with their application.

This support page is designed to get you in contact with RJG Customer Support directly, supply the latest software upgrades for the various *eDART System™* products, and establish a remote desktop connection with our support staff (prior arrangement with support staff is required for remote desktop help).

For application tips, self-help tools, and other online resources, visit our know how page.



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## RELATED PRODUCTS

### COMPATIBLE PRODUCTS

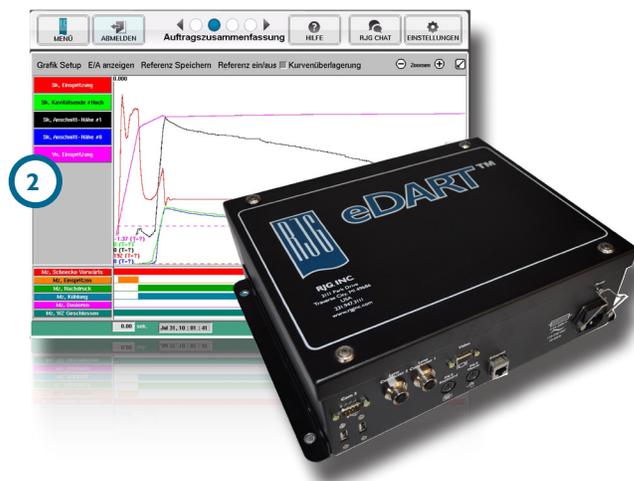
#### LYNX CABLES CE-LX5

The Lynx sensor cable (1 at right) is a polyurethane-coated cable suited for the heat and stress found in injection molding environments. The cable is available in lengths from 11.8– 472.4" (0,3– 12 m), and can be ordered with straight or 90° fittings. One CE-LX5 is required to interface the LE-R-50-REVA with the eDART or CoPilot system.



#### eDART PROCESS CONTROLLER

The eDART process controller (2 at right) is the base hardware unit for the eDART system. The eDART system is the most powerful process control system in the industry, allowing molders to stabilize and control injection molding processes and contain bad parts, ensuring high quality and cost-reduction.



#### CoPilot SYSTEM

The CoPilot system (3 at right) is a process match assistant that monitors process values based on a stable template and provides advice to systematically restore values to the optimal values when changes occur. The CoPilot also provides a process change log that includes detailed date, time, user, problem, solution, and notes of each process change.







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