

OPTICAL ENCODER KIT

Installation Manual

LS-CS-M-028



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Document Status

Document Reference Code: LS-CS-M-028
Version: 1.02
Released: 30/03/2015

Document Revision History

Date	Version	Summary of Change
16-03-2010	1	New manual
28-10-2013	1.01	Added instructions for folding machine installation.
30/03/2015	1.02	Updated copyright notice, front cover

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1 About This Manual

This chapter contains information about this manual, containing the following elements:

- Document Organisation
- Document Objectives
- Related Documentation
- Guide to Notes, Notice and Cautions
- Obtaining Technical Assistance.

1.1 Document Organisation

This manual is organised into the following chapters:

1. About This Document (this chapter)
2. General Overview
3. Before you start
4. Installation

1.2 Document Objectives

This manual provides information on the installation of the rotary optical encoder that is supplied with applicable LZS Series guarding systems.

1.3 Related Documentation

This manual should be used in conjunction with;

- The relevant LZS Series guarding system installation manual

1.4 Guide to Notes, Notice and Cautions



Note:

This symbol indicates helpful information that helps you make better use of your Lazer Safe product.



Caution

This symbol alerts you to situations that could result in equipment damage.



Warning

This symbol indicates danger or a situation that could cause bodily injury.

1.5 Obtaining Technical Assistance

For technical support contact your supplier or email customerservice@lazersafe.com.au detailing your specific requirements.

2 General Overview

Lazer Safe LZS Series guarding systems use encoder feedback to monitor the movement, speed and stopping performance of the machine during operation. Applicable LZS Series systems are supplied with a rotary optical encoder, mounting brackets and hardware.

The encoder is installed to a fixed part of the machine using the supplied mounting brackets. A chain and spring assembly is also installed with the chain fixed to the pressing beam/ram (moving part) and the spring fixed to a non moving part of the machine. The chain runs over a sprocket that is attached to the encoder shaft.

As the pressing beam/ram moves up and down the sprocket is rotated. The encoder signals are fed back to the LZS Series controller and processed for monitoring of movement, speed and stopping performance.

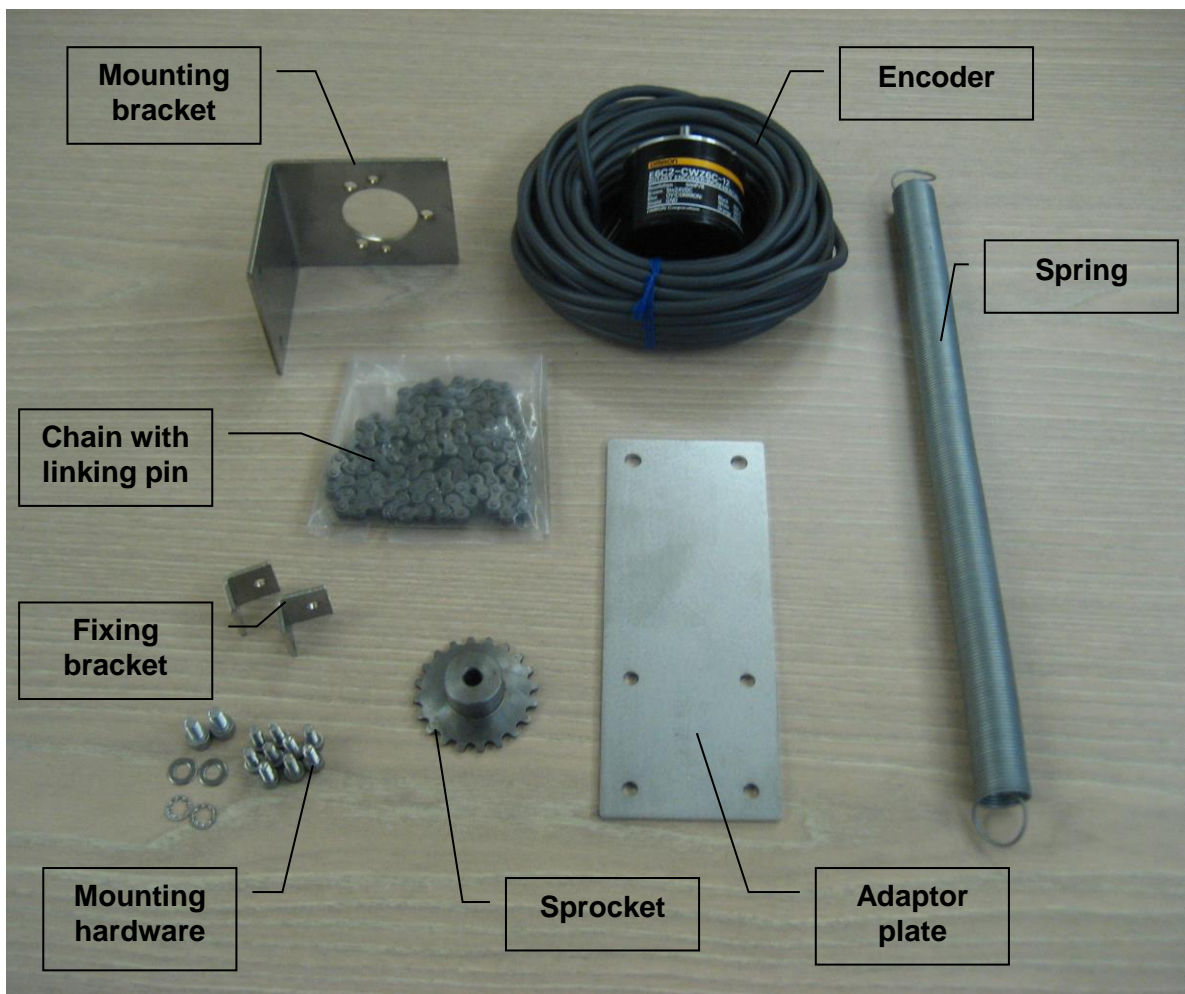


Figure 1: Encoder and accessories kit

3 Before you start

Before commencing installation ensure that you have all the required components and tools.

3.1 Components

Refer to the following tables for a complete list of supplied components.

Omron encoder kit			
ID	Component	Product code	Qty
1	Omron 500 PPR encoder w/10m cable	0012061200	1
2	Mounting bracket - right angle	0012061600	1
3	Adaptor plate	0012061500	1
4	Fixing bracket	0032005400	2
5	Chain with linking pin	0032005500	1
6	Spring	0032005700	1
7	Sprocket – 20 tooth 6mm bore	0032005600	1
8	Mounting hardware M3 x 8 socket head cap screw (2) M4 x 10 socket head cap screw (9) M5 x 10 socket head cap screw (2) M5 flat washer (2) M5 internal tooth washer (2)		1

Table 1:

IFM encoder kit			
ID	Component	Product code	Qty
1	IFM 500 PPR encoder w/10m cable	0012061300	1
2	Mounting bracket - right angle	0012061600	1
3	Adaptor plate	0012061500	1
4	Fixing bracket	0032005400	2
5	Chain with linking pin	0032005500	1
6	Spring	0032005700	1
7	Sprocket – 20 tooth 6mm bore	0032005600	1
8	Mounting hardware M3 x 8 socket head cap screw (2) M4 x 10 socket head cap screw (9) M5 x 10 socket head cap screw (2) M5 flat washer (2) M5 internal tooth washer (2)		1

Table 2

3.2 Additional components

Additional components may be required for some encoder installations. While the supplied mounting brackets are suitable for most machines, some applications may require modified or customised brackets. These brackets if required should be manufactured by the installer and are not supplied with the encoder kit.

3.3 Tools required

Refer to Table 3 for a list of tools required for encoder installation. Please note that the listed tools are not supplied with the encoder kit.

Item #	Tools required for encoder installation
1	Electric drill
2	Drill bits and taps to suit M4 and M5 hole sizes
3	Wire cutters
4	Long nose pliers
5	Flat blade terminal screw driver
6	Metric Allen key set
7	Tape measure

Table 3**Warning**

Ensure that adequate body and eye protection is used during encoder installation where the use of power tools is required. Failure to do so may result in injury.

4 Installation

The encoder must be installed in a way that ensures the chain runs parallel with the pressing beam/ram for the entire stroke (Figure 2 and Figure 3). If the chain is not parallel with the pressing beam, then incorrect position information will be processed by the LZS Series guarding system that may result in incorrect operation.

4.1 Installation specifications

Spring deflection

Minimum 5mm (250g tension)

Maximum 960mm

Chain travel

Chain must run parallel with moving part of machine +/- 3 degrees.

4.2 Press brake installation

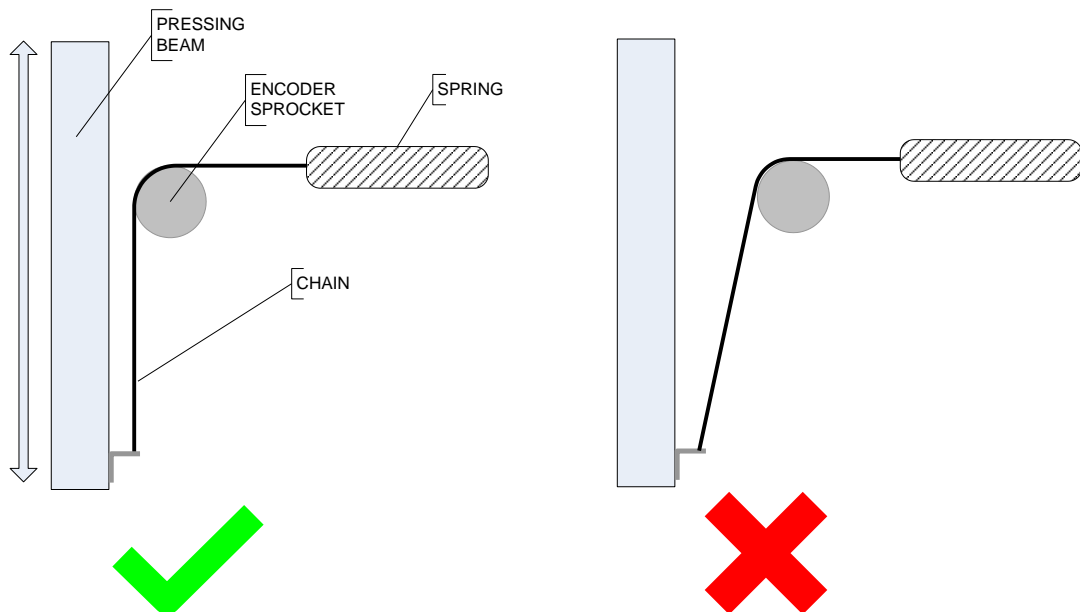


Figure 2: Encoder chain must be installed parallel with pressing beam



Caution:

When installing the encoder kit care should be taken to ensure that it does not come in contact or interfere with any other part of the press brake. Ensure the encoder cable does not come into contact with any moving part of the machine that may cause damage to the cable.

4.3 Folding machine installation

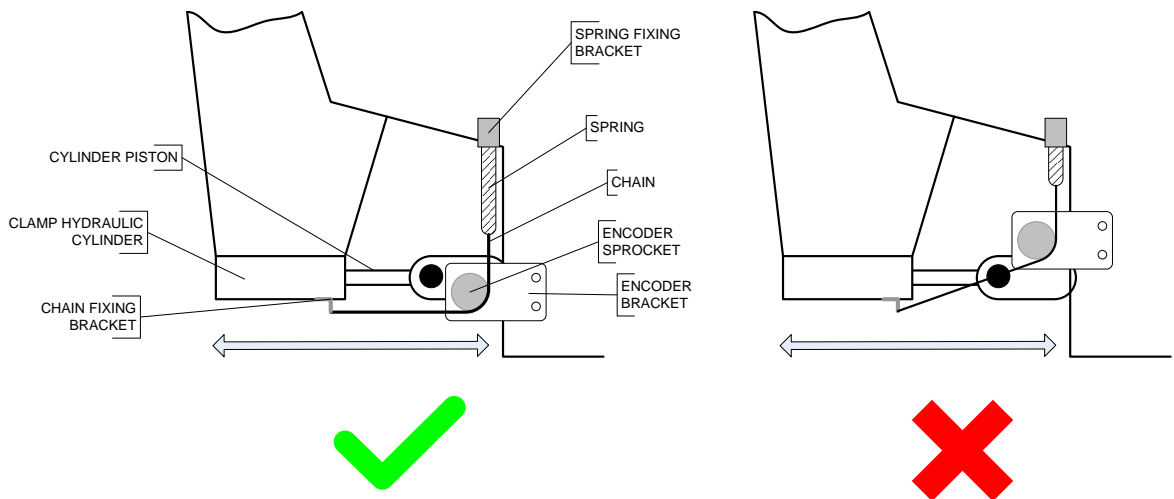


Figure 3: Encoder chain must be installed parallel with the ram movement



Caution:

When installing the encoder kit care should be taken to ensure that it does not come in contact or interfere with any other part of the machine. Ensure the encoder cable does not come into contact with any moving part of the machine that may cause damage to the cable.

4.4 Assemble the mounting bracket and sprocket

1. Insert the encoder shaft through the hole in the right angle bracket. The encoder can be fitted to either side of the bracket as required.
2. Secure with the supplied M4 x 10 screws when using an Omron encoder or M3 x 8 screws when using an IFM encoder.
3. Slide the sprocket onto the encoder shaft with the flat side facing away from the encoder. Leave a small gap between the base of the encoder and the sprocket.
4. Align the grub screw in the side of the sprocket with the flat edge of the encoder shaft then tighten the grub screw.
5. Check that the sprocket is secured to the encoder shaft. Tighten the grub screw if necessary.

**Warning**

Use the supplied sprocket only. Substituting the supplied sprocket with a sprocket of a different size will cause incorrect speed and stopping performance measurements. This will result in unsafe operation that could lead to serious injury.

4.5 Assemble the adaptor plate (optional)

The adaptor plate is supplied as an extension for the right angle bracket. If required secure the adaptor plate to the right angle bracket using the supplied M5 x 10 screws and washers.

4.6 Install the encoder

1. Locate a suitable mounting position on the machine for the encoder bracket and mark the mounting holes.
2. Drill and tap M4 mounting holes as required.
3. If the adaptor plate is not used then the threaded M4 holes in the right angle bracket can be drilled out to allow clearance for M4 mounting screws.
4. Secure the encoder and bracket to the machine.

4.7 Fit the chain and spring

The chain and spring are supplied in fixed lengths and can be shortened to suit the installation.

1. Locate the linking pin on the chain and remove it.
2. Hook one end of the spring through the eye in the end link of the chain.
3. Place the chain over the encoder sprocket. Let the chain hang straight then mark the mounting position for the chain fixing bracket on the pressing beam.
4. Mark a suitable mounting position for the spring.
5. Drill and tap holes for the fixing brackets then secure the fixing brackets to the machine.
6. Secure the chain to the fixing bracket on the pressing beam using the linking pin.
7. Secure the spring to the other fixing bracket.

4.8 Adjust the chain and spring

Once the chain and spring have been installed they must be adjusted to suit the stroke of the machine. The chain must be under constant spring tension. When at the top of the stroke the chain must have enough tension so that it is not loose. When at the bottom of the stroke the chain must be under tension but the spring should not come in contact with the encoder sprocket. Adjust the chain and spring mounting points if required then cut the chain and spring to the required length.

4.9 Encoder wiring

Refer to the LZS Series installation manual for encoder terminal connections. Table 4 shows the encoder signals and wire colours for each encoder type.

Encoder Signal	Omron	IFM
A	Black	Brown
A INV	-	Green
B	White	Grey
B INV	-	Pink
Z	Orange	Red
Z INV	-	Black
Supply +	Brown	Brown/Green
Supply 0V	Blue	White/Green
Sensor +	-	Blue
Sensor 0V	-	White
Error INV	-	Lilac

Table 4