MAGPOWR TENSION CONTROL

MAXCESS

MAGPOWR

CL Cantilever Load Cells

Instruction Manual

EN

MI 850A192 J 1

CONTENTS

About these operating instructions

All of the information herein is the exclusive proprietary property of Maxcess International, and is disclosed with the understanding that it will be retained in confidence and will neither be duplicated nor copied in whole or in part nor be used for any purpose other than for which disclosed.

Periodically there will be updates to this manual. The latest version is available on our website or by calling the number on the back page of this publication.

These load cell devices must not be installed or used in a machine or system which does not comply with the machinery directive 2006/42/EC.

These load cell devices were designed and manufactured to be installed as Partly Completed Machinery into a machine or partly completed machine.

The instructions must be read and used by all persons who have the responsibility of installing and maintaining these load cell devices.

These instructions must be retained and incorporated in the technical documentation for the machine or partly completed machinery into which the load cell device is installed.

Language

These are the original instructions, written in English.

CE marking

Only the 2006/42/EC Machinery directive applies to these devices and they are not marked with the CE sign.

Electromagnetic Compatibility (EMC)

The load cell device is inherently benign in terms of electromagnetic compatibility and the EMC directive has not been applied. The electromagnetic compatibility of the load cell device can only be assessed in connection with the entire electrical installation including the control. The machine builder who installs this partly completed machinery into a machine is responsible for compliance with the EMC directive.

Conventions used

All dimensions and specifications are shown in the format **millimeters [inches]** unless otherwise specified.

Product overview

The model CL load cell is designed to be mounted on the vertical face of a machine side frame and to incorporate the customer's cantilever shaft and roll assembly. The CL load cell can be mounted on either the inside or outside of the machine side frame as shown in *Figure 1*. The CL load cells are compatible with all MAGPOWR tension readouts and controls.

Theory of operation

The load cell construction consists of a beam with a metal foil strain gage bonded at the bending point of the beam. The spring constant of the beam causes the beam to deflect with the applied force. The beam deflection causes the strain in the metal below the strain gage to vary linearly with the applied force. The strain gage converts the induced strain into an electrical signal which is proportional to the induced strain.

Instructions for use

To ensure safe and problem free installation of the load cell device, the load cell must be properly transported and stored, professionally installed and placed in operation. Proper operation and maintenance will ensure a long service life of the device. Only persons who are acquainted with the installation, commissioning, operation and maintenance of the system and who possess the necessary qualifications for their activities may work on the load cell.

Note: The safety information may not be comprehensive.

Please note the following:

- The content of these operating instructions
- All national, state, and local requirements for installation, accident prevention and environmental protection

Safety symbols

Information about safety instructions

The safety instructions and symbols described in this section are used in these operating instructions. They are used to avoid possible dangers for users and to prevent material damage.

SIGNAL WORD
Source of danger and its results
Avoiding dangers

The signal word **WARNING** refers to the danger of moderate to severe bodily injuries.

The signal word **CAUTION** refers to the danger of slight to moderate bodily injuries or material damage.

Symbols used

The following safety identification symbols are used in these operating instructions.

WARNING/CAUTION – General danger or important note
Reference to general hazards that may result in bodily injuries or damage to device or material.

WARNING/CAUTION – Danger due to crushing
Reference to danger of injury caused by crushing.

WARNING/CAUTION – Danger due to cutting
Reference to danger of injury caused by cutting.

WARNING/CAUTION – Danger due to voltage, electric shock
Reference to danger of injury caused by electric shock due to voltage.

WARNING/CAUTION – Danger due to hot surfaces
Reference to risk of injury caused by burning.

Basic safety information

Proper use

The load cell devices are intended to be used on machines or systems to monitor the tension in a web via the customer's cantilever shaft and roll assembly installed in the load cell.

Indoor operation.

Improper use

Operation outside the technical specifications

Operation in an Ex-area or intrinsically safe area without a proper barrier.

Any other use than the proper use shall be deemed inappropriate

Installation and commissioning

Any load cell device which is damaged must not be installed or put into operation.

Only perform installation, maintenance or repair tasks on the load cell device when the machine has been stopped and is secured from being turned on.

Only perform installation, maintenance or repair tasks on the load cell device when there is no electrical power in the system.

The load cell device must be securely mounted before being placed in operation.

No modifications may be made to the load cell device.

Do not place electrical cables under mechanical strain.

Maintenance and repair

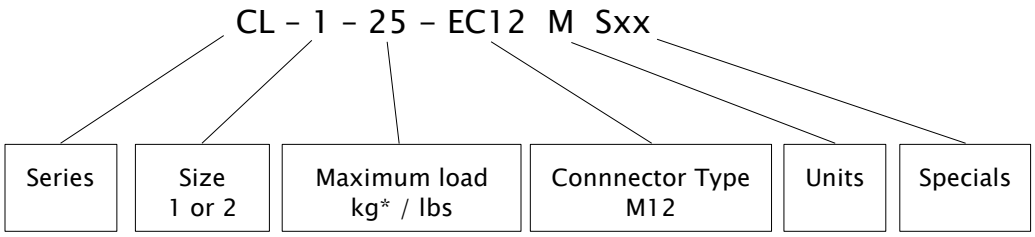
WARNING – Danger of injury from crushing.

Maintenance and repair tasks on the load cell device must be performed only when the machine has been stopped and has been secured from being turned on again.

Decommissioning

The load cell must be disposed of in accordance with all the applicable national, state and local regulations.

Model number key



* kg if 'M' is present in 'Units'

Standard models

M12 Connector

English Shaft Bore

Size 1

Model	Force Rating
CL1-5-EC12	5 lb
CL1-15-EC12	15 lb
CL1-50-EC12	50 lb

Size 2

Model	Force Rating
CL2-15-EC12	15 lb
CL2-50-EC12	50 lb
CL2-150-EC12	150 lb
CL2-500-EC12	500 lb

Metric Shaft Bore

Size 1

CL1-2-EC12M	2 kg
CL1-7-EC12M	7 kg
CL1-25-EC12M	25 kg

Size 2

CL2-7-EC12M	7 kg
CL2-25-EC12M	25 kg
CL2-75-EC12M	75 kg
CL2-250-EC12M	250 kg

When purchasing an EC12 version of the load cell to replace a non-EC12 version, you must either:

A) Purchase a LCC style load cell cable to replace the SCE style cable, or,

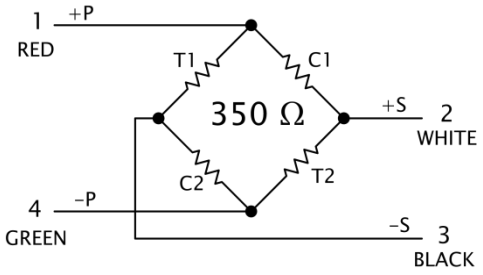
B) Purchase a SCA cable adapter use the EC12 load cell with the old SCE style cable.

Information about connecting cables begins on page 3-2.

Connecting cables

M12 cables (standard)

Model	Length (meters)	Max Temperature
LCC5M	5	80 °C
LCC10M	10	
LCC15M	15	
LCC20M	20	
LCC25M	25	
LCC30M	30	
LCC35M	35	
LCC40M	40	
LCC45M	45	
LCC50M	50	
LCC55M	55	
LCC60M	60	



Pin		
1	red	+ power
2	white	+ signal
3	black	− signal
4	green	− power

Legacy models

Obsolete and non-stock

Size 1

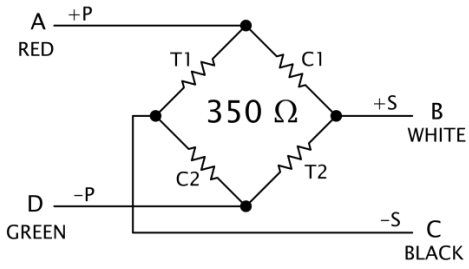
Model	Force Rating
CL1-5	5 lb [2.27 kg]
CL1-15	15 lb [6.8 kg]
CL1-50	50 lb [22.7 kg]

Size 2

Model	Force Rating
CL2-50	50 lb [22.7 kg]
CL2-150	150 lb [68.0 kg]
CL2-500	500 lb [226.8 kg]

Connector cables (legacy)

1/4-turn circular connector

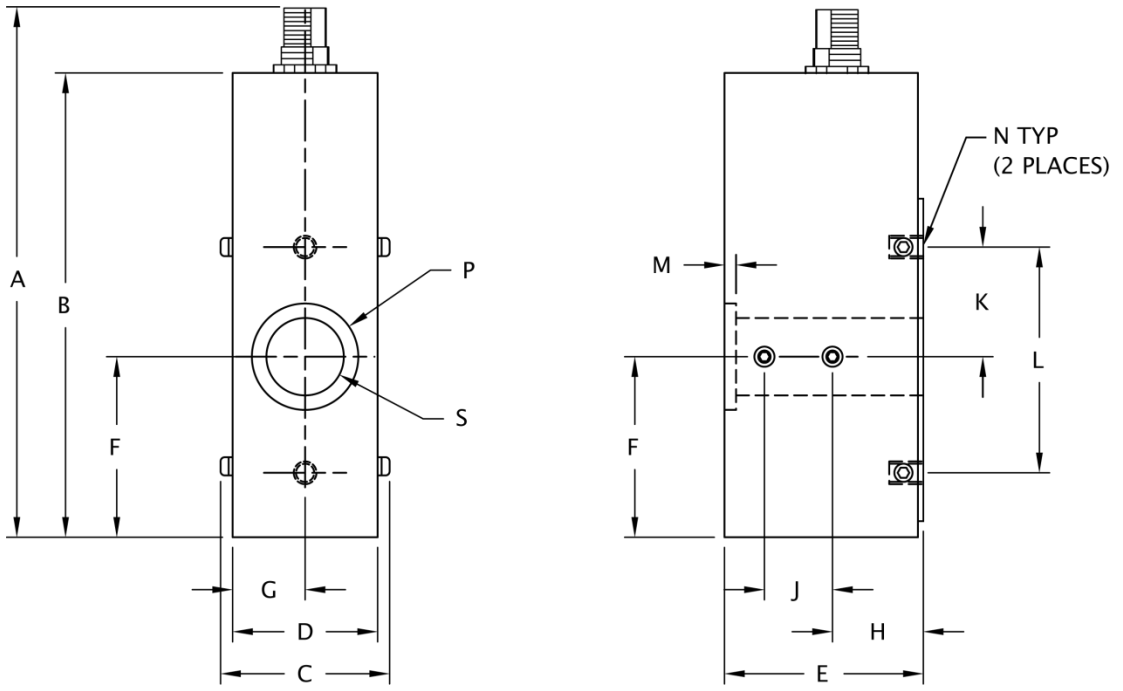


Pin	
A	+ power
B	+ signal
C	- signal
D	- power

Model	Length (feet)	Max Temperature
SCE-15	15	80 °C
SCE-20	20	
SCE-25	25	
SCE-35	35	
SCE-50	50	
SCE-75	75	
SCE-100	100	
SCE-115	115	
SCE-120	120	
SCE-150	150	
SCE-200	200	
SCE-15HT	15	105 °C
SCE-20HT	20	
SCE-25HT	25	
SCE-35HT	35	
SCE-50HT	50	
SCE-75HT	75	
SCE-100HT	100	
SCE-115HT	115	
SCE-120HT	120	
SCE-150HT	150	
SCE-200HT	200	

Product dimensions

Standard models



	CL1-5-EC12	CL1-2-EC12M	CL2-15-EC12	CL2-7-EC12M
	CL1-15-EC12	CL1-7-EC12M	CL2-50-EC12	CL2-25-EC12M
	CL1-50-EC12	CL1-25-EC12M	CL2-150-EC12	CL2-75-EC12M
			CL2-500-EC12	CL2-250-EC12M
A	113.8 [4.48]	113.8 [4.48]	143.5 [5.65]	143.5 [5.65]
B	95.8 [3.77]	95.8 [3.77]	126.2 [4.97]	126.2 [4.97]
C	37.8 [1.49]	37.8 [1.49]	51.6 [2.03]	51.6 [2.03]
D	31.0 [1.22]	31.0 [1.22]	43.7 [1.72]	43.7 [1.72]
E	54.6 [2.15]	54.6 [2.15]	61.0 [2.40]	61.0 [2.40]
F	41.4 [1.63]	41.4 1.63]	56.4 [2.22]	56.4 [2.22]
G	15.5 [0.61]	15.5 [0.61]	21.8 [0.86]	21.8 [0.86]
H	25.4 [1.00]	25.4 [1.00]	28.7 [1.13]	28.7 [1.13]
J	19.1 [0.75]	19.1 [0.75]	19.1 [0.75]	19.1 [0.75]
K	25.4 [1.000]	25.4 [1.000]	34.9 [1.375]	34.9 [1.375]
L	50.8 [2.000]	50.8 [2.000]	69.85 [2.750]	69.85 [2.750]
M	3.8 [0.15]	3.8 [0.15]	3.8 [0.15]	3.8 [0.15]
N	1/4-20 X 0.38 DP	M6x1.0 X 9.7 DP	3/8-16 X 0.50 DP	M10x1.5 X 12.7 DP
P	22.4 [0.88]	22.4 [0.88]	31.8 [1.25]	31.8 [1.25]
S	.625 - 0.627 inch	16.00 - 16.05	1.000 - 1.002	25.00 - 25.05

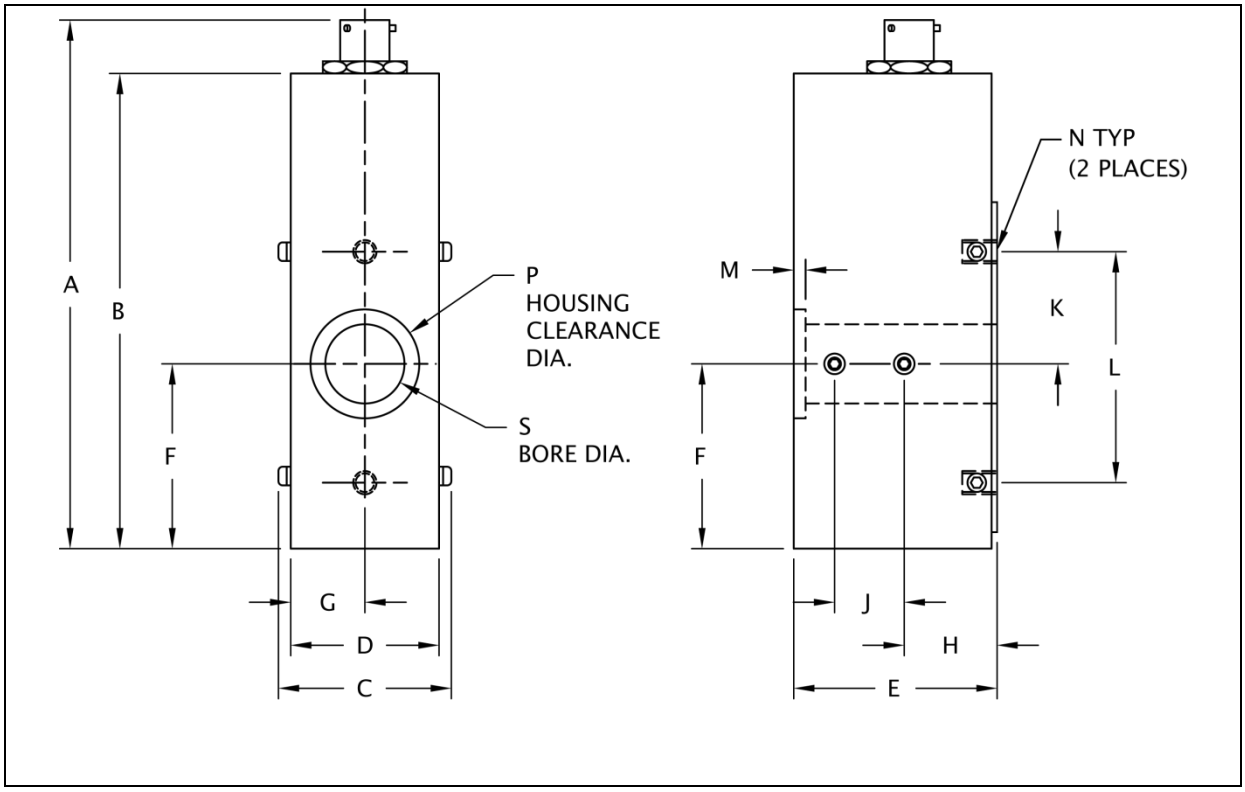
N = typical (2 places)

P = housing clearance diameter

S = bore diameter

Product dimensions

Legacy (obsolete)



	CL1-5 CL1-15 CL1-50		CL2-50 CL2-150 CL2-500	
A	129.8	[5.11]	159.3	[6.27]
B	113.0	[4.45]	142.5	[5.61]
C	37.8	[1.49]	51.6	[2.03]
D	31.0	[1.22]	43.7	[1.72
E	54.6	[2.15]	61.0	[2.40]
F	41.4	[1.63]	56.4	[2.22]
G	15.5	[0.61]	21.8	[0.86]
H	25.4	[1.00]	28.7	[1.13]
J	19.1	[0.75]	19.1	[0.75]
K	25.4	[1.000]	34.9	[1.375]
L	50.8	[2.000]	69.85	[2.750]
M	3.8	[0.15]	3.8	[0.15]
N	1/4-20 X 0.38 DP		3/8-16 X 0.50 DP	
P	22.4	[0.88]	31.8	[1.25]
S	0.625 -0.627		1.000 - 1.002	

Mechanical and electrical installation

CAUTION – Possible damage to load cell.
Do not hammer on the load cell.

CAUTION – Possible damage to load cell.
Do not disassemble the load cell; there are no serviceable parts inside.

WARNING – Danger of injury from crushing.
Maintenance and repair tasks on the load cell device must be performed only when the machine has been stopped and has been secured from being turned on again.

Mounting

1. Remove the envelope containing 4 set screws from the bore and install into sensor as shown in *Figure 1*.
2. Select a clean flat surface where the wrap angle of the web does not change.
3. Locate the centerline of the CL load cell mounting holes, so that it bisects the wrap angle of the web.
4. Fasten with two cap screws making sure the cap screw penetration does not exceed dimension 'N' shown on the outline dimension drawing (*page 4-1*).

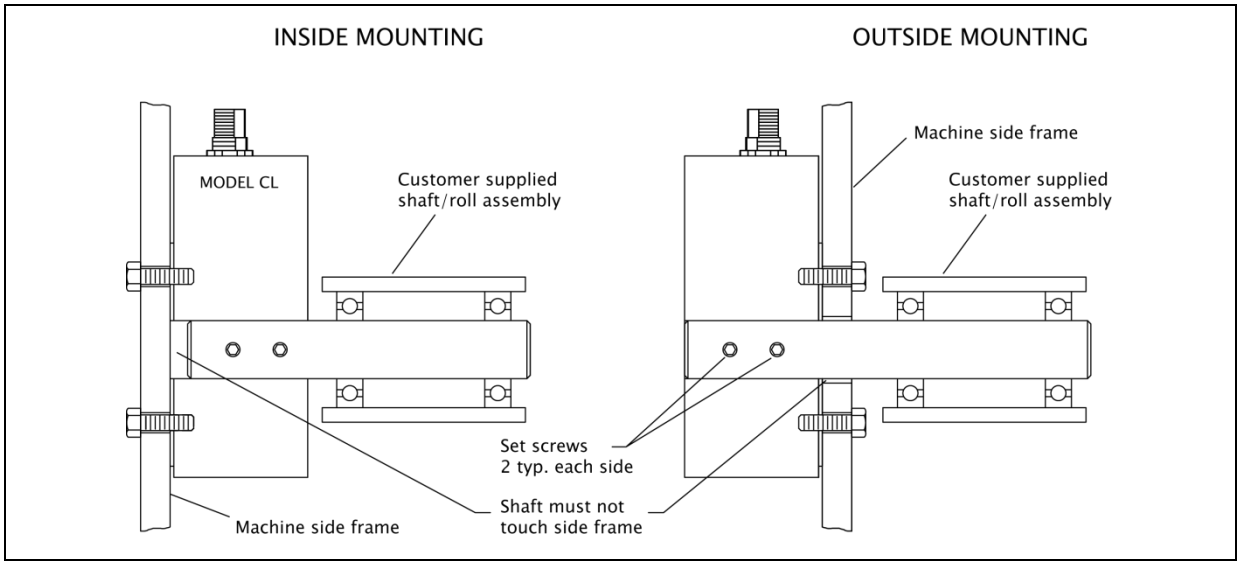


Figure 1. Mounting

Mounting continued

The force direction arrow should also bisect the wrap angle of the web, and point in the same direction as the resultant tension force as shown in *Figure 2.*

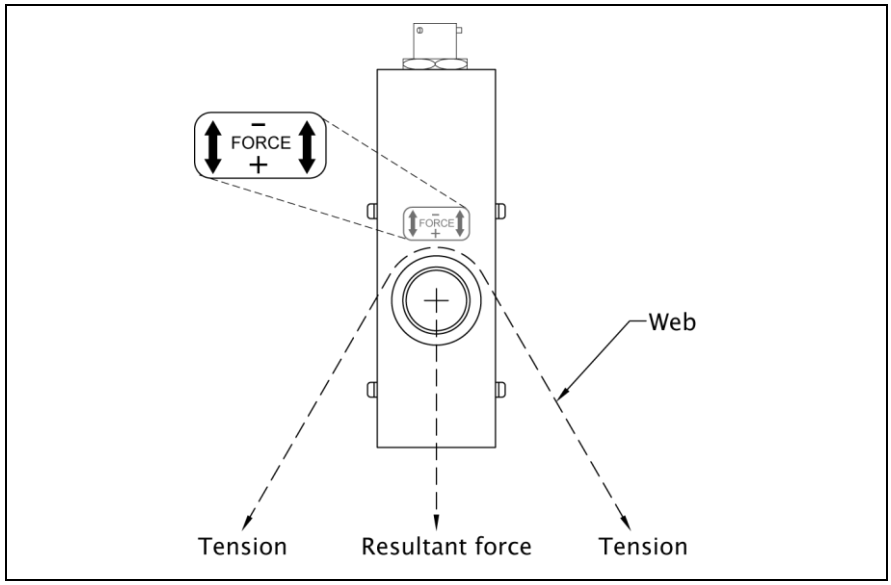


Figure 2. Resultant force alignment

Wiring

See page 3-2.

Shaft and roll assembly

(supplied by customer)

1. Insert the customer's shaft and roll assembly into the CL Load Cell as shown in *Figure 1; page 5-1*.
2. Make sure that neither the shaft nor the roll will interfere with the CL load cell housing or the machine side frame.

   For outside frame mount, the minimum clearance hole diameter in the machine side frame is:

   CL1 models 17.5 mm [0.69 inch]

   CL 2 models 26.9 mm [1.06 inch]
3. Tighten all four set screws securely against the shaft.
4. Connect the CL load cell to the control with shielded cable.

Specifications

WARNING – Do not use the devices outside of their rated specifications.

Gage Resistance	350 ohm
Gage Type	Metal foil, full bridge
Excitation Voltage	10 VDC maximum
Output Signal	21 mVDC maximum at full load rating
Operating Temperature	-30°C to 80°C
Temperature effect on zero	0.02% of rating per °C
Combined non-linearity and hysteresis	0.5% of full scale maximum 1.5% of full scale maximum for CL2-500
Repeatability	0.2% of full scale maximum
Overload stops	105% to 150% of full load rating
Deflection at full load	0.279 mm [0.011 inch]
Weight	CL1-x = 0.45 kg [1.0 lb] CL2-x = 0.82 kg [1.8 lb]
Cable Connector	M12 (standard) *page 3-2*
Climate Class	3K4 (EN60721)
IP Protection Classification	IP67 (EN60529)

Service requests and replacement parts

To request service or to get replacement parts, contact one of the following addresses:

Maxcess Oklahoma
222 West Memorial Rd.
Oklahoma City, OK, 73114, USA
Phone: 1.405.755.1600
Fax: 1.405.755.8425
Web: www.maxcessintl.com

Maxcess Europe

Max Planck Strasse 8
65779 Kelkheim
Deutschland
Telefon: +49.6195.7002.0
Fax: +49.6195.7002.933
Web: www.maxcess.eu

OR

Siemensstrasse 13-15
48683 Ahaus
Deutschland

When ordering replacement parts, please indicate, where possible, part number, drawing number and model description.

If it is necessary to return this product for service, care must be taken to properly package the unit to prevent damage during shipment. If possible, use the original shpping containers.

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