Load Cell Instruction Manual

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ZHONGHANG ELECTRONIC MEASURING INSTRUMENTS CO., LTD

Instruction Manual for Using Products

1. Introduction

These Instruction Manual refer to ZHONGHANG ELECTRONIC MEASURING INSTRUMENTS CO., LTD. Transducers load cells for potentially explosive atmospheres. These load cells are certified according to ATEX Directive 94/9/EC. Please read the whole instruction before taking load cells into service. Never work on load cells for potentially explosive atmospheres if you do have the knowledge, competence or authorization to do so.

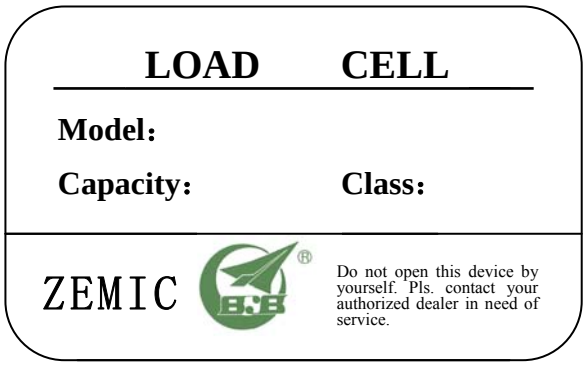
Load cells may only be used for their intended purpose and in the circumstances specified. ZHONGHANG ELECTRONIC MEASURING INSTRUMENTS CO., LTD. Transducers cannot be held liable for damage and injuries resulting from use other than those intended. Load cells must only be used in their correct technical condition and whilst conforming to the instructions of relevant application notes.

1.1 Product Description

Load cell convert mechanical force into an electrical signal. The element deforms elastically when subjected to a weight. ZHONGHANG ELECTRONIC MEASURING INSTRUMENTS CO., LTD. Transducers has load cells which are certified for use in a potentially explosive atmosphere. These load cells have a special mark:

1.2 Products Labeling

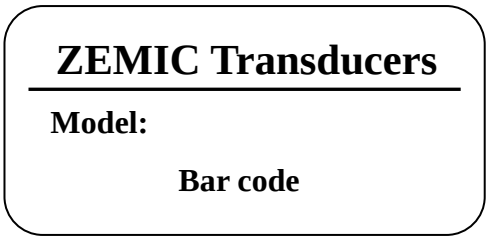
1.2.1 Internal Label in English：



Note1: Model and Capacity and Class.

Note2: ZEMIC is the trademark of ZHONGHANG ELECTRONIC MEASURING INSTRUMENTS CO., LTD.

1.2.2 External Label in English：



Note1: Model.

Note2: Bar code.

1.2.3 FM and ATEX and CSA Labeling

See the attachment 1.

1.3 Product identification and technical Specifications

Load cell specific information is printed on the Calibration Certificate. If this certificate is not included, contact

your supplier.
Cable colour codes should be checked against the Calibration Certificate.

2. Special conditions for safe use

If a load cell is used as EEx ia or EEx ib, then it must be connected to certified intrinsically safe circuits. Terminals used in between, must comply to EN 60079-11. For EEx nA, 1D, 2D, or 3D use of load cells the free end of the permanently connected cable must be connected outside the hazardous area or, when inside the hazardous area, in an enclosure with a suitable type of explosion protection and in accordance with the requirements of the type of protection applied. For the parameters of the intrinsically safe circuits, refer to the electrical data at the installing drawing 521302.

3. Installation

Install in hazardous (classified) locations / explosive atmospheres per drawing 521302.
Rick to life!: Never use load cells in a potentially explosive atmosphere which are not correctly certified. Use shunt-diode barriers for load cell installation in potentially explosive atmospheres. When using more than one barrier channel in a circuit, ensure that the combination of voltages and currents can be safely applied in that particular hazardous area. Install load cells in accordance with the applicable EU. The circuit is to be considered as being connected to earth due to surge protection.
To prevent load cell from being damaged during installation, it is strongly recommended to use dummy load cells or mounting assemblies that can be “locked”. Load cells should be handled with care, especially those with a low rated capacity or with metal bellows construction. When connecting polarized shunt-diode barriers, do not connect the wrong polarity. It will destroy the barrier! Cables used must always be suitable for the environment in which they are to be used. Many indicators compensate for line voltage losses by increasing their voltage output. Do not pass the compensation limit of the indicator! Never carry load cells by their cables.
Avoided electric welding after installation of load cells. If welding is necessary and the load cells can not be removed then disconnect each individual load cell cable from the junction box or measuring device. In order to avoid a current path through the load cells, place an earthing clamp in the close proximity of the weld. Furthermore, connect a flexible copper lead over each load cell.
Never use mounting bolts to pull uneven surfaces together-use shims as appropriate. Never use excessive force when fitting or tightening mounting bolts or hardware, especially on low capacity cells. Do not twist “S” cells when tightening threaded fittings.

4. Use and Maintenance

4.1 Please note that load cells may be damaged because of (shock) overloading, lightning strikes or heavy surges. In current, chemical or moisture ingress, mishandling (dropping, lifting with cable, etc), vibration, seismic, seismic events or internal component malfunction, Inspect load also before and after the seasons. Give special care and attention to critical areas of the load cell such as metal bellows, seals etc. Regularly inspect for corrosion damage to the load cell and mounting hardware. If practical, carry out cleaning and any remedial work (paint or other protective coating). Do not allow build up of debris around load cells or mounts.

4.2 Maintenance Tools and the essential characteristics of tools which may be fitted to the equipment contains:

a) A $4\,^{1}/_{2}$ digital avometer to measure resistance, voltage, current and capacitance, etc.
b) An all-around composite screwdriver to open integrated weighing instruments, the specification includes 4”，6”，8”;
c) A tweezers, the specification includes 6”，8”;

d) A long nosed pliers, the specification includes 6”，8”;

e) A 30w internal heating type earthing electric iron, rosin and soldering wires.

f) A pair of scissors, the specification includes 5”，7”;

g) An assorted file, the specification includes 4”，6”;

h) A standby Load cell and a set of weights.

4.3 Maintenance and Service Proceedings

In order to ensure the instruments, scale to be used normally and prolong their lifetime, we must obey to the following rules:

(1) Do not use indicators under strong sunlight, the placing area should be flat

(2) When Load cell is putted it in a place full of dusts, please remove dust termly.

(3)Weight（including tare weight）forbids exceeding maximum rated amount.

(4) If the machine can’t be used for a long time, power supply switch should be taken off from power supply which can be very good connection to earth.

(5)Forbid using strong solvent (e.g.) to clean shell.

(6) Forbid soaking water in indicator.

(7)If there is some problem occurring in the process of using, please cut power supply and stop trying if he is non-professional operators and give indicator to repair in professional office.

(8)Don’t change circuit or some electronic parts of an apparatus models connected with circuit.

4.4 Repairmen and maintaining service

(1)Our company can provide one year maintaining guarantee service for selling products (including some platform scale, table scale, truck scale, vehicle scale and so on. The maintaining guarantee service begins from selling day and each year our company will provide technical service after sales for all the products sometime.

(2)During maintaining guarantee service time if our products exist problems which are caused not by customers’ wrong operation or non-force majeure natural disaster, our company will have responsibility to repair.

(3)Our company doesn’t agree customers to repair by themselves to avoid expand problems. If due to customers’ repairman occurs extra problems even it is in maintaining guarantee service time our company will not provide free service.

(4)Generally speaking, when non- load cells customers or non- weighing instrument customers use our products if the problems occur, the products should be sent to company or inform company engineers’ problems condition by fax to solve the problem in short time and correct methods.

5. Failure Analysis and guidance on potential misuse

5.1 Failure phenomenon

5.2 Cause analysis

5.3 Guidance

Failure phenomenon	Cause analysis	Guidance
After assemble scale, the reading of empty load is big and hard to set zero	Overload or impact makes load cells plastic deformation permanently.	Raise and let down the scale carefully and slowly; level up it many times after mounting and let bearing point's load capacity close to each other, thus avoid above half-capacity load to some bearing point or several bearing points when being suspended.
Weighing capacity error varies directly with the increase of load, use avometer to measure input and output impedance, one line or several lines and other lead wires' resistances are very large.	Load cells' outgoing lines or connection terminals are being stroke, pressed or stretched and make the circuit in the wire brake.	The outgoing line should be protected with spring sheath, thus avoid the lead wire from being extended or pressed to slot. Because of foundation pit, do trial assembly many times and remove load cells if possible.
Use avometer to measure input and output impedance, the resistances are 1100-1410Ω(bridge resistance 700Ω)or 500-710Ω(bridge resistance 350Ω)	Being lighted or stroke by strong current or voltage impulse, bridge arm is burned.	Adapt up-side-down mounting, that is to say, backward under the weighing platform; give priority to ground mounting by setting slope to two ends. If designing foundation pit, blowing pipe diameter should meet the demand for water discharge on rainy days.
Lower sensitivity, poor interference-resistant, widespread fluctuation of weighing capacity data.	The shield connected to other resources (with charge).	If the shield is not needed, pack it with insulating tape and put it into junction box to avoid the touch with bridge-type connection terminal.
No zero return	The speed on vehicle scale may be too fast.	This speed should be limited within 10km/h.

Rick to life! : Under no circumstances should fault location and trouble-shooting be attempted in a hazardous area where there is danger of explosion. ZHONGHANG ELECTRONIC MEASURING INSTRUMENTS CO., LTD. Transducers authorized personnel may only carry out trouble-shouting and repair. Should a load cell cease to function, do not just reconnect: Mechanical failure may have catastrophic effects.

Never use a Megohmmeter to measure input or output resistance, as they normally operate at voltages far in excess of maximum load cell excitation voltages!

6. The standards

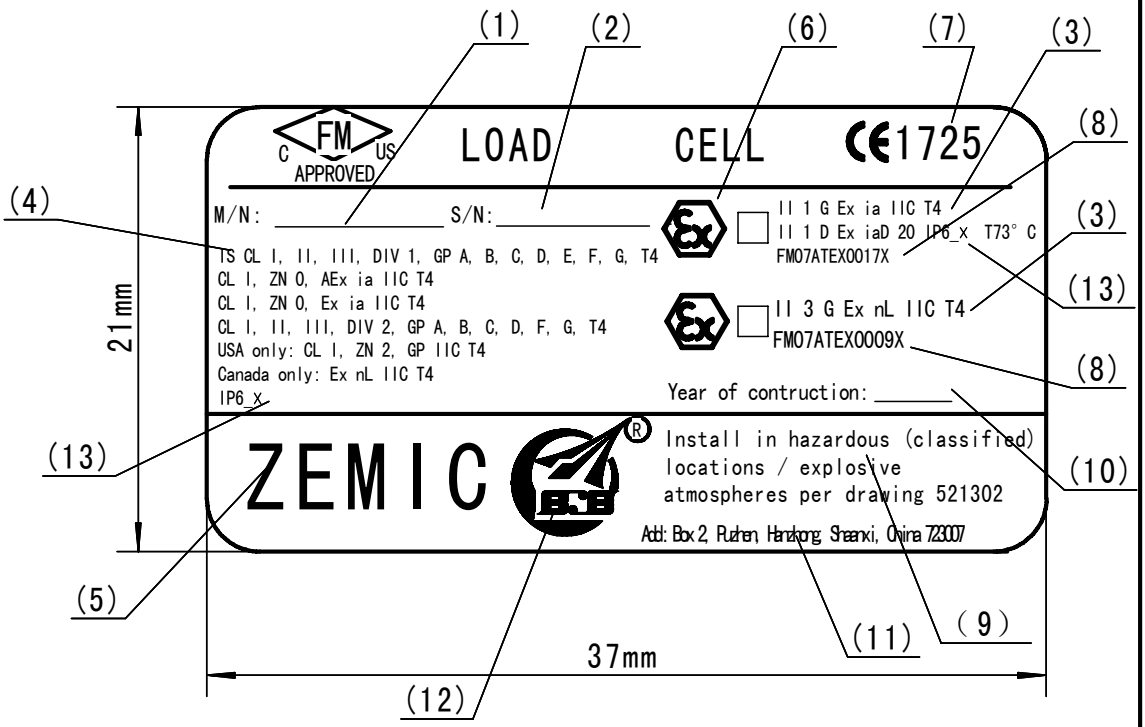
Title	Standard No.	Date
Electrical Equipment for Use in Hazardous (Classified) Locations, General Requirements	FM - 3600	November 1998
Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, & III, Division 1 and Class I, Zone 0 & 1 Hazardous (Classified) Locations	FM - 3610	January 2007
Nonincendive Electrical Equipment for Use in Class I and II, Division 2, and Class III, Division 1 and 2 Hazardous (Classified) Locations	FM - 3611	December 2004
Electrical and Electronic Test, Measuring and Process Control Equipment	FM - 3810	January 2005
Degrees of protection provided by enclosures (IP code)	ANSI/IEC	2004
Intrinsically Safe and Nonincendive Equipment for use in Hazardous Locations	CSA C22.2 No.157	1992 (Reaffirmed 2006)
Nonincendive Electrical Equipment for use in Class I, Division 2 Hazardous Locations	CSA C22.2 No. 213	1987 (Reaffirmed 2004)
Safety Requirement for Electrical Equipment for Measurement, Control and Laboratory use – Part 1 General Requirements	CSA C22.2 No.1010.1	July 2004
Degrees of protection provided by enclosures (IP code)	CSA C22.2 No. 60519	July 2005
Electrical Apparatus for Explosive Gas Atmospheres – Part 11: Intrinsic safety “i”	CSA-E60079-11	2002 (Reaffirmed 2006)
Electrical Apparatus for Explosive Gas Atmospheres – Part 0: General Requirements	CSA-E60079-0	2002 (Reaffirmed 2006)
Electrical Apparatus for Explosive Gas Atmosphere Type of Protection “n”	CSA E60079-15	2002
Electrical apparatus for explosive gas atmospheres – Part 0: General requirements	EN 60079-0	July 2006
Explosive atmospheres – Part 11: Equipment protection by intrinsic safety ‘i’	EN 60079-11	January 2007
Electrical apparatus for explosive gas atmospheres – Part 15: Construction, test and marking of type of protection ‘n’ electrical apparatus (IEC 60079-15: 2005)	EN 60079-15	2005
Electrical apparatus for use in the Presence of combustible dust – Part 0: general requirements	EN 61241-0	2004
Electrical apparatus for use in the presence of combustible dust – Part 11: protection by Intrinsic Safety ‘iD’	EN 61241-11	2005
Degrees of protection provided by enclosures (IP code)	EN 60529	October 1991 Amendment 1 February 2000

Attachment 1

Drawing no.	BP

表面粗糙度	
热处理	
表面处理	

EX



(1).ZEMIC'S TYPE IDENTIFICATION
(2).ZEMIC'S SERIAL NUMBER
(3).ATEX CLASS
(4).FM CLASS
(5).THE ZHONGHANG ELECTRONIC MEASURING INSTRUMENTS CO.,LTD
(6).TARGET DIRECTIVE MARKING
(7).THE NAME OR MARK FO THE ISSUER OF THE CERTIFICATE
(8).FM AND ATEX CERTIFICATION NUMBRE
(9).INSTALLATION DRAWING
(10).YEAR OF CONTRUCTION
(11).ZEMIC'S ADDRESS
(12).REGISTERED TRADEMARK OF ZEMIC
(13).INSERT THE APPROPRIATE IP CODE BY ZEMIC'S MODEL

更改标记	更改单号	签名	日期
设 计			
校 对			
标 检			
质 量			
审 定			
批 准			

Name	Drawing no.
Nameplate	BP
材 料	图样标记 / 重量 / 比例
	共 页 / 第 页 / 第 版
	Ⓑ

日期		
签		
会	金冶	艺工
原图号		
底图号		

Revision: 1.0

EC Declaration of conformity

Issued in accordance with the ATEX directive 94/9/EC

Authorised representative:

Zemic Europe B.V.
Leerlooierstraat 8
4871 EN Etten-Leur
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herewith declares that the listed load cells (used for weighing or force measuring applications):
2H3, B3G, H3G, BM3, H3, H3C, H3A, H3E, H3F, H3J, B8D, B8K, BM8D, BM8F, BM8H, H8, H8B, H8C, H8E, H8K, HM8, HM8C, B6E, B6F, B6G, B6N, B6Q, BM6A, BM6G, H6B, H6E, H6E3, H6F, H6G, H6G5, B9C, B9D, B9E, B6F, B9H, B9J, B9K, H9B, H9C, H9D, HM9B, HM9C, HM9E, BM11, HM11, BM14A, BM14C, BM14D, BM14G, BM14K and HM14C are in conformity with the provisions of the ATEX directive 94/9/EC.

Marking:
Ex II1G Ex ia IIC T4 Ta = -20°C to +40°C; IP6*
Ex II1D Ex iaD 20 T73°C; IP6*
Ex II3G Ex nL IIC T4 Ta = -20°C to +40°C; IP6*

Harmonised standards: EN60079-0:2006, EN60079-11:2007, EN60079-15:2005, EN60079-26:2007, EN61241-0:2004, EN61241-11:2005

Other standards: EN60529:1991+A1:2000

EC type examination certificates:
FM07ATEX0009X + supplement 1
FM07ATEX0017X Issue 2 + supplement 1

Capacity and inductivity: The value of the electric capacitance and induction are directly proportional to the length of the cable. A 200 feet cable has 40µH capacitance and 12nF induction. For application with shorter length cables, the actual capacity and inductivity should be calculated.

Authorized person: Erik van Wijk
Director

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Rev3