

Explosion Protection Load Cell "DF-KE Series"*

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1 Introduction

In production processes which involve the handling of liquid, powdered and granular raw materials, many tank scales and hopper scales, each provided with a load cell, are used in order to control the stored and blended amounts of such raw materials. When a load cell is installed in a hopper, support systems such as check rods and stay rods are needed to keep the hopper, stable during strong winds, earthquakes, and other such events. Because the fabrication of these support systems increases the cost of equipment and requires troublesome adjustments, there is increasing demand for load cells which do not require support systems. Moreover, in the chemical industry, explosion-protected load cells are used in flammable gas atmosphere so highly accurate, compact load cells are especially desirable there.

To meet such market needs, Kawatetsu Advantech Co., Ltd. developed and commercialized flameproof enclosed load cells which it collectively calls the "DF-KE Series."

2 Description of Product

This is a load cell of small height in which a restraint

system is built between the load cell proper and setting blocks in order to eliminate the need for support systems such as stay rods in a hopper scale. Stainless steel was adopted as the material for the product in consideration of the health regulations in the chemical industry and uses in corrosive gas atmospheres in that and other industries.

The appearance of the product is shown in **Photo 1**. The DF-KE series includes 6 models with a rated load of from 1.96 to 98 kN. The specifications of the products are shown in **Table 1** and an outside view of the load cell is shown in **Fig. 1**. These 6 models are divided into two types: Type I without an upper setting plate, and

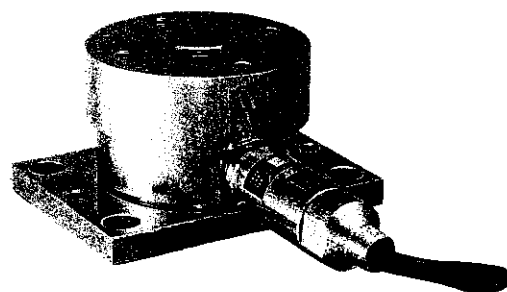


Photo 1 View of DF-2-KE (Type I)

Table 1 Specification of DF-KE series

Model	DF-200L-KE	DF-500L-KE	DF-1-KE	DF-2-KE	DF-5-KE	DF-10-KE
Rated load	1.96 kN	4.9 kN	9.8 kN	19.6 kN	49 kN	98 kN
Rated output	2.0 mV/V					
Nonlinearity	±0.05% R.O.					
Hysteresis	±0.05% R.O.					
Repeatability	0.03% R.O.					
Input/Output resistance	820 ± 40 Ω / 705 ± 5 Ω					
Temperature effect on zero balance	0.05% R.O./10°C					
Temperature effect on output	0.05% Load/10°C					
Compensated temperature range	-10°C ~ +60°C					
Limited overload range	150% R.L.					
Explosion protection	Exd II BT4					

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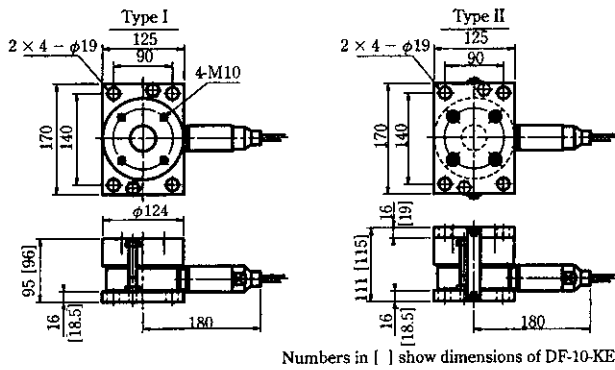


Fig. 1 Outside view of load cell

Type II provided with an upper setting plate as standard.

3 Features of Product

(1) Built-in Restraint System Facilitating Installation

The restraint system is shown in Fig. 2. Horizontal rock is limited in the gap between the load cell and the upper setting block. This eliminates the need for the conventional stay rods shown in Fig. 3 (a) and facilitates installation, thereby reducing the cost of operations. An example of installation of model DF-KE is shown in Fig. 3 (b).

(2) High-accuracy and Compact Flameproof Enclosure Type

The explosionproof structures of load cells are divided into the two major types: the flameproof enclosure type and the intrinsically safe type. The flameproof enclosure type, which is highly resistant to ambient temperature and ensures high accuracy, is adopted in this product. Also, there are two Japanese standards for explosion protection: the conventional construction standard and the more recent New Technical Standard, which conforms to the International Electrotechnical Commission (IEC) Standard. The flameproof enclosure type of the New Technical Standard does not require the terminal compartment that is included in the conventional flameproof enclosure type, making miniaturization possible. The New Technical Standard is adopted in the DF-KE series and the product has passed type tests.

(3) Use of Stainless Steel Capable of Being Washed with Water.

The upper and lower faces of the load cell are provided with upper and lower setting plates as standard

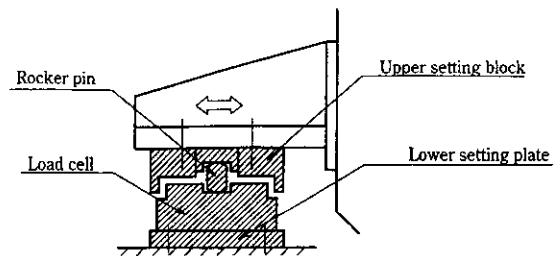


Fig. 2 Controlled movement in all directions

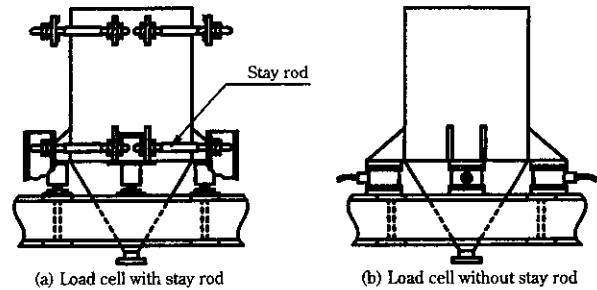


Fig. 3 Typical application

so that the load cell can be directly fixed to hopper brackets and a base frame. These fittings and the load cell proper are made of stainless steel so that they can be washed with water because this is required in the chemical industry.

(4) Low Profile Permitting Space Savings

The height of this product is about half that of a conventional load cell of flameproof enclosure type. Therefore, the space required for installation is small, expanding applications to places where installation had previously been difficult.

4 Concluding Remarks

The "DF-KE Series" explosion protection load cells have a unique structure which incorporated a restraint system. This product is used mainly in hoppers and tank scales. We want to work to extend its applications in the chemical and food processing industries.

For Further Information, Please Contact to:

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