

WATER SUPPLIES DEPARTMENT
STANDARD SPECIFICATION EM-02-07
WEIGHING SCALE FOR CHLORINE CONTAINERS

1. **GENERAL**

The specification covers the technical requirements for weighing scale used for different types of chlorine containers.

2. **DESIGN AND CONSTRUCTION**

All weighing scales including the associated pressure transmitter and indicator, if required to be provided, shall be suitable for use in an environment which is subject to chlorine corrosion attack. Degree of protection for the enclosure of the pressure transmitter and indicator shall be IP67 to IEC 60529. Accuracy of the measuring system including the load cell shall be $\pm 0.5\%$ of the measurement span or better.

2.1 **Weighing Scale**

Unless otherwise specified, the weighing scales provided shall meet one of the following container type arrangements, which shall be specified in the Particular Specification.

(a) **Single Cylinder or Twin Cylinders**

For uninterrupted chlorine supply, two single chlorine cylinders (one duty and one standby), each of capacity 50 kg and dimensions 230mm (dia.) x 1700mm (H) approximately, shall be connected together to form a draw-off unit for automatic changeover. Each chlorine cylinder shall be provided with one weighing scale and one indicator. One common platform shall be provided for the two weighing scales to form a draw-off unit. A general arrangement of the weighing scales for a draw-off unit is shown in **Appendix I**.

For larger chlorine draw-off rate, two twin chlorine cylinders will be connected together to form a draw-off unit. Each pair of chlorine cylinders shall be provided with one weighing scale and one indicator. The weighing scale platform shall be capable of mounting two chlorine cylinders.

(b) **Multiple Chlorine Cylinders in a Bank of Five**

For chlorine installations with higher draw-off rate, chlorine supply in cylinders shall be in cages in a bank of five to facilitate handling and transportation. The overall dimensions for a bank of five cylinders in a cage are approximately 1450mm (L) x 315mm (W) x 1800mm (H). A general arrangement is shown in **Appendix II**.

Two banks of five chlorine cylinders in cages shall be connected together to form a draw-off unit. Each bank of chlorine cylinders shall be provided with one weighing scale and one indicator. The platform of each weighing scale shall be suitable for placement of the cage with dimensions given above. Where specified, a stainless steel tray of grade 316 shall be provided for collection of condensed water with pipes connected to the nearest drain.

(c) Drums

Two chlorine drums, each of capacity 1,000 kg and dimensions 820mm (dia.) x 2080mm (L) approximately, shall be connected together to form a draw-off unit. Each chlorine drum shall be provided with one weighing scale and one indicator and each weighing scale shall have a trunnion set mounted on the platform. The trunnion set shall have 4 castors for supporting the steel rings of the chlorine drum at a centre-to-centre distance of about 1.17 m and rotation of the drum in case of emergency.

A general arrangement of the trunnion set on the weighing scale is shown in **Appendix III**. Where specified, a stainless steel tray of grade 316 shall be provided for collection of condensed water with pipes connected to the nearest drain.

2.2 Load Cell

Unless otherwise specified in the Particular Specification, the weighing scale shall operate on either electronic or hydraulic load cell with separate wall/stand mounted indicator. The electronic and hydraulic load cell shall withstand a shock loading up to 3 times and 6 times of its measuring range respectively.

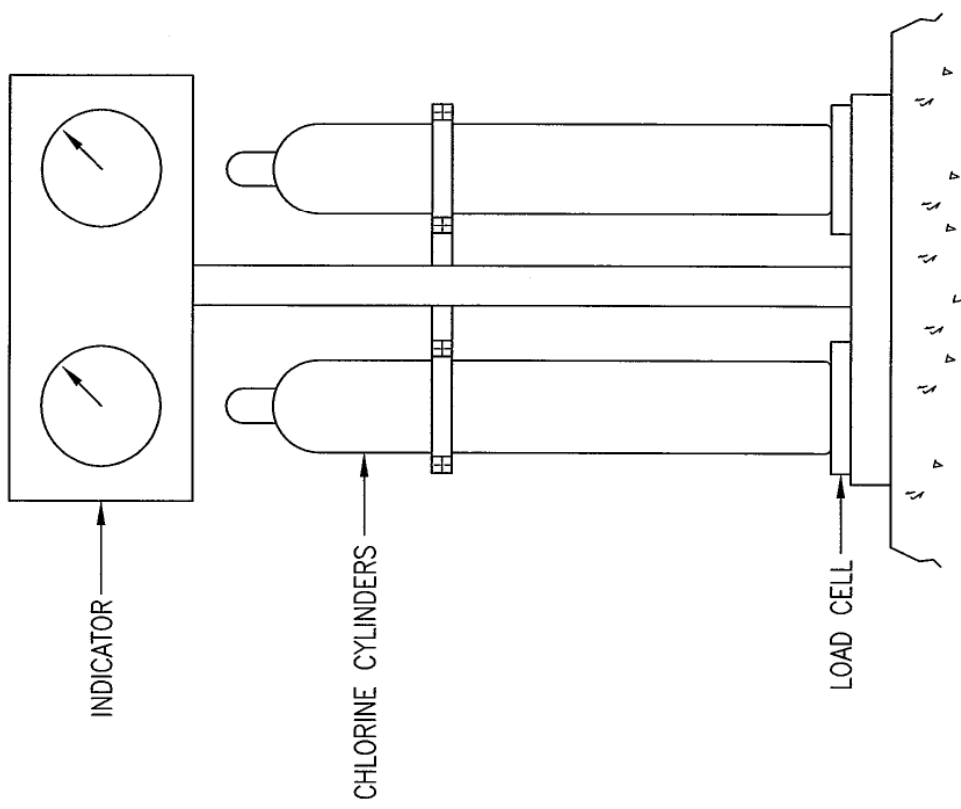
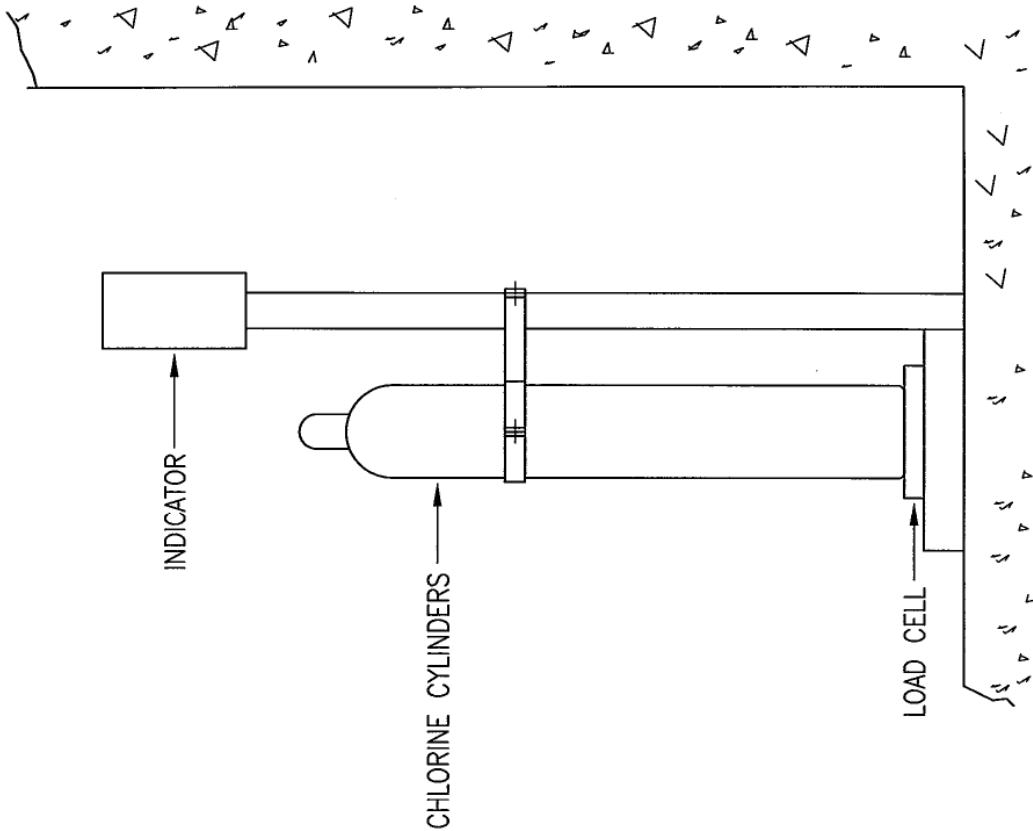
For electronic load cell, it shall be suitable for a power supply of 220V 50 Hz.

2.3 Particular Requirements

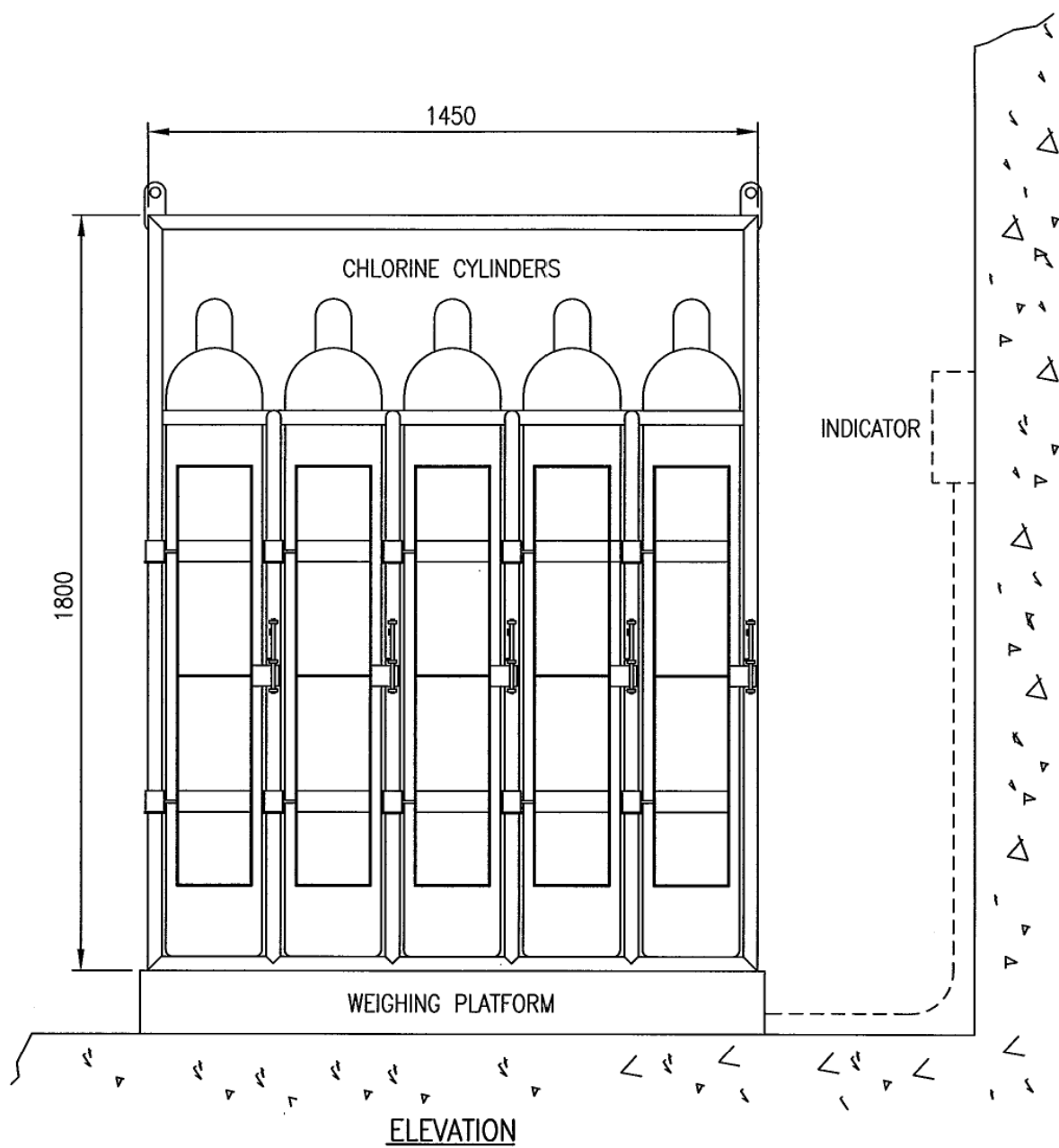
The weighing scale shall also meet the following particular requirements.

Load Cell	Electronic	Hydraulic
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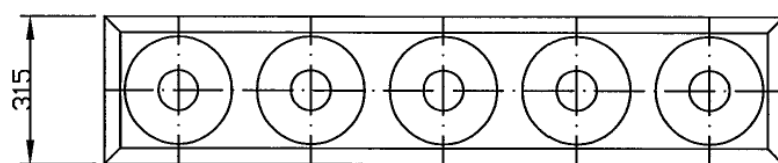
Indicator	Digital	Dial
Span	Drum: 2,000 kg Single cylinder: 150 kg Twin cylinder: 200 kg Cylinders in a bank of five: 1,000 kg	Same as electronic load cell.
Resolution of indicator	Drum: 0.5 kg Single or twin cylinder(s): 0.1 kg Cylinders in a bank of five: 0.2 kg	Drum: 5 kg Single or twin cylinder(s): 0.5 kg Cylinders in a bank of five: 2.5 kg
Container tare weight adjustment	Tare weight adjustment for computing the net weight of chlorine in container(s) for remote indication and alarms shall be provided. The tare weight setting shall be retrievable after adjustment.	Same as electronic load cell.
Local display on indicator	The local indicator for showing the net weight of chlorine in or the gross weight of the container(s) shall have a backlit display of character height not less than 10mm.	The local dial indicator for showing the net weight of chlorine in or the gross weight of the container(s) shall be not less than 300mm in diameter.
Remote indication of measurements	A 4-20mA signal proportional to the net weight of chlorine in container(s) on the weighing scale shall be provided for remote indication.	Same as electronic load cell.
Output signal for remote alarms	Two volt-free output contacts of rating 2A at 30V shall be provided for generation of remote alarms of "container nearly empty" and "container empty".	The pressure transmitter and the associated power supply for producing the 4-20mA signal for remote indication of measurements and alarms shall be in compliance with WSD Standard Specification E-82-01 and E-86-03 respectively.
Monitor unit for remote indication of measurements and alarms	Where specified, a monitor unit for remote indication of measurements and alarms shall be housed in an IP 54 enclosure installed in the nearby chlorine control room.	
Power supply	220V 50 Hz	Same as electronic load cell.



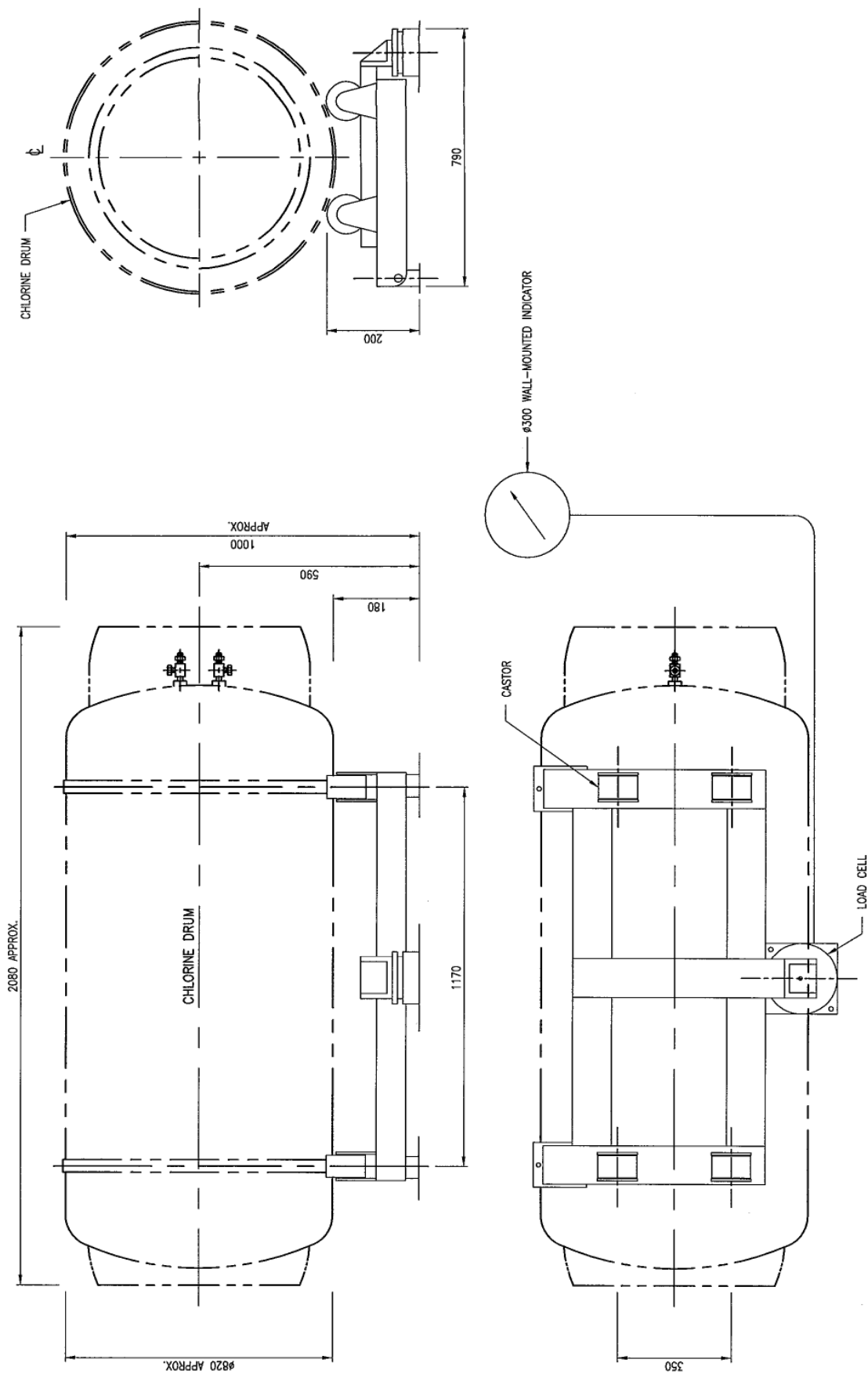
ARRANGEMENT OF 2 OFF 50KG CHLORINE CYLINDERS



ALL DIMENSIONS IN mm.



CAGE FOR 5 OFF 50KG CHLORINE CYLINDERS



ARRANGEMENT OF TRUNNION SET N.T.S.