

KES

Over Head Crane

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1. Scope of application

This standard shall be applied to the overhead crane that lift and move the weight or products.

2. Structure of equipment and explanation

(1) Trolley frame

This structure is made of welded shape steel and steel plate, and has enough strength.

A lifting equipment and a moving equipment are placed on upper part.

(2) Girder

This is made of welded shape steel and steel plate, and it has box cross-section. It has enough strength for horizontal force due to inertia, which is generated by horizontal and vertical movement and the other running.

(3) Saddle

This is made of welded shape steel and steel plate, and it is connected with high-tension bolt and reamer bolt to be perpendicular to a girder. It can support horizontal force and return moment due to a girder.

(4) Lift equipment

This is installed on a trolley frame, and it consists of motor, brake, reduction gear, and drum. Drum distribute total load on both girder equally.

Motor torque is changed into vertical lifting force by using reduction gear, drum, and wire rope to lift the load. Control brake system and emergency brake system are installed to ensure braking.

(5) Moving equipment

This is installed on a trolley frame as lift equipment is done. This consists of motor, brake, reduction gear, and wheel. Motor torque goes through the reduction gear, and it is distributed to two wheels to drive trolley for moving.

Thrust brake system is used for slow stopping.

(6) Running equipment

This is fixed on an auxiliary girder and saddle, and it consists of motor, brake, reduction gear, and wheel. In this structure, each electric motor, which is installed on both ends of girder, drive fixed wheel. The same type of braking system is used as used in the moving equipment.

(7) Control pane

Gather and install instruments required for running crane. It should be standalone and anti-shock. This is installed over the ground, and it controls all sorts of movements.

(8) Operating room

Operating room is placed in the bottom of girder, and it should provide enough field of vision for the operator not to move out of the seat for watching left, right, front and rear side.

(9) Rail and power system

Install the rail for moving front-and-rear and left-and-right. Install the front-and-rear rail over girder, which is install on a base beam, by considering the anti-shock. Install left-and-right rail over girder.

Install Sero-bar and Cable Veyor for the power system of front-and-rear and left-and-right movement.

3. Definition of terminology

(1) Span

This is the distance between the rail centers, on which the girder of crane is installed, and it is base figure for designing crane.

(2) Lifting

This is the maximum height that the crane can lift the load on the ground.

(3) Front-and-rear movement

This is horizontal movement along the rail in length direction of a building.

(4) Left-and-right movement

This is horizontal movement of trolley along length direction of girder on a left-and-right rail installed over girder.

(5) Drum

This winds up wire rope for lifting. Diameter of drum should be more than 30 times of wire rope diameter. It contains bolt groove in left and right direction to wind the lifting at one time.

(6) Magnetic brake (DC electric brake)

This is post type brake. It compresses a spring with an electromagnet at the begging of motor starting, and opens brake liner for operation. If the current is broken due to breaking by controller, sudden power failure, and the other reasons, the magnetic force is exterminated and the braking is done by the spring.

Because this can be operated instantly, and guarantees a complete breaking operation, this is used for breaking lifting equipment.

(7) S.C Brake

This is for controlling speed of lifting equipment. This is used to control the speed at minus load. Little lifting force due to inducted current in a motor is applied to friction drum to control the speed.

(8) E.C. Brake

This is used for controlling speed of lifting equipment. If the direct current is placed on a fixed magnetic pole, the drum start rotating and the eddy current is generated on a drum surface. This eddy current makes braking force. The braking force is proportional to rotating speed of a drum and magnetizing current. However, the braking force does not increase and saturate at saturated point of filed although the current and the speed increase.

(9) Thrust Brake (Electric hydraulic compressor brake)

A compressor generates hydraulic pressure at the same time of motor starting, and the compressing force opens braking lining from the drum for operation. If the current is broken due to controller operation and power failure, the hydraulic force is removed, and the lining contacts brake drum by the force of braking spring for braking. This hydraulic compressor type operates fast at opening but slow at braking. Therefore, it is used for left-and-right and front-and-rear movement that needs slow stopping.

4. Shape and size

Refer to the drawing in the additional document for shape and size of crane.

5. Specification of equipment (15/5 Ton, 20/10 Ton Crane)

Spec. Type	Nominal lifting load		Test load (125% of nominal load)		Span	Lifting	
	Main	Aux.	Main	Aux.		Main	Aux.
15/5 Ton	15 Ton	5 Ton	18.75 Ton	6.25 Ton	20.7 m	9 m	9.5 m
20/10 Ton	20 Ton	10 Ton	25 Ton	12.5 Ton	20.7 m	9 m	9.5 m

Spec. Type	Traveling distance	Moving speed		Lifting speed			Rail
		Front-and-rear	Left-and-right	Main	Aux.	Front-and-rear	Left-and-right
15/5 Ton	120 m	40m/min	40m/min	8m/min	12m/min	37kg/m	22kg/m
20/10 Ton	120 m	40m/min	35m/min	6m/min	8m/min	37kg/m	22kg/m

Note (1) This is standard figure according to Japanese Industrial Standard (JIS).
(2) SPAN, lifting, and traveling distance is based on a building structure.