YUANTAI CRANE

Double Girder Gantry Crane with Hook specification

- Strong lifting capacity, large span, good stability, varieties.
- Novel structure, attractive appearance, good usability.
- Standardization, universalization and serialization of parts.
- Flexible operation, safe and stable.
Part 1 Product Overview

◆ In General
(1) Strong lifting capacity, large span, good stability, varieties
(2) Novel structure, attractive appearance, good usability
(3) Standardization, universalization and serialization of parts
(4) Flexible operation, safe and stable

◆ Supply scope
Lifting capacity: 5t~500t, span: 18m~35m, lifting height: 1m~40m, medium working duty (A5);
Non-standard products could also be designed and manufactured as your demands.

◆ Main Application
(1) Applied to open storage or railway for loading & unloading, handling goods;
(2) Equipped with special lifting appliances for special use;
(3) Prohibited for lifting high temperature solution, flammable, explosive, corrosion, overloading, dust and other dangerous operations.

◆ Working atmosphere and condition
This crane is used in ambient temperature of -25°C~+40°C, humidity ≤ 85%, elevation under 1000m, power supply is 3-ph, 380V, 50HZ(can change as user demand).

◆ Product Specifications
Mark: for example 5t lifting capacity, 18m span double girder gantry crane with hook shows as MG5t-18m.

◆ Main Structure and Feature
Main composed of gantry mounting, trolley & crane traveling mechanisms and electric parts.

Gantry Mounting
1. "A" type structure, using tack bolts and connecting bolts to settle main parts;
2. Provided max. room between legs to ensure the objects could be lifted between legs at the cantilever end;
3. All partial rail box beam structure main girder, the camber meet national standard (0.9~1.4)/1000S, flange and bolts connect main girders and legs;
4. Box structure legs, both sides connect separately with main girders and lower separators.
5. Q235B or Q345B materials (similar as Fe37 or Fe52).

Trolley
Consists of trolley frame, lifting mechanism and trolley traveling mechanism, etc.
**Lifting Mechanism**

1. One set of independent driving device for single hook and two separate driving device for double hook (main and auxiliary).
2. Lifting mechanism working principle, through high speed rotating of YZR type crane special motor, and gear coupling drive involute gear reducer. Then the low speed shaft of reducer turn the wire rope drum. As long as the control of motors and its positive and negative rotation, can achieve the lifting function of the hook.
3. In order to ensure the security and reliable of lifting mechanism, the brake is installed on the high speed shaft of reducer. And the load limiter is installed on the bearing pedestal which supports the drum to avoid overload. The mechanical drawing as follows:

1. Main overload limitation;
2. Main lifting motor;
3. Main lifting gear coupling;
4. Main lifting drum;
5. Main lifting brake wheel coupling;
6. Main lifting brake;
7. Main lifting reducer
**Crane Traveling Mechanism**

1. Separately drive
2. Vertical trinity drive, compact and safe;
3. Interference fit key link the wheels and axles, angle bearing box for wheel group;
4. Two sets outage terminal limiter and backstop device with buffer, for accurate positioning of crane;
5. Equipped rail clamp and anchorage for wind and storm proof.

**Trolley**

1. Trolley traveling mechanism working principle, the involute vertical gear reducer driven by motor. The low speed shaft of reducer connects to active wheel of trolley frame in the way of centralized driving. The motor adopt double-output gear and there is a brake on one end of it.
2. There are four wheels installed under the trolley. Two of them are active wheels and the others are driven wheels. Driving devices include 1. Motor; 2. Brake; 3. Reducer; 4. Compensating shaft; 5. Coupling; 6. Wheels, etc. are shown in the mechanical drawing as follows:

![Trolley mechanism diagram]

**Distribution & Security Protection**

Distribution system is composed of master breaker, master power contactor and main circuits of mechanisms, so that the subcircuit out of work could be maintained isolated. There are starting & emergency switches, power indicator, safe and limit switches for master power, and short circuit, over current, overload & voltage protections in distribution control circuit, which switch off when power interrupts. Zero protection for mechanisms. If the handles are not back in zero position when fault recovery, they cannot auto start.
1. Overload & Short Circuit Protection
   Master air switch in master circuit, small air switch or fuse protection as overload and short
   circuit protection in control circuit. Over current & overload protect functions are set in all
   control cabinets.

2. Zero Position Protection
   Every controller should be back to zero position, then restart master contactor when the crane
   start or restart to work.

3. Limit Protection
   (1) Limit switch in lifting mechanism break the control circuit when hook get the limitation for
   ensure security.
   (2) Limit switches in both trolley and crane travel mechanisms break control circuit when
   traveling to the limit position. It can only travel to the other side.
   (3) Limit switches are also set in the door of cabin and balustrades. The master power can be
   started when these doors are totally closed.
   (4) Emergency Protection
   Emergency switch could quickly break the power in emergency.
   (5) Overload Protection
   Overload limiter is set in lifting mechanism, it could break power, alarm with sound and light and
   show the number when overloaded.

**Control Mode**

(1) Cabin control, fully enclosed, steel plate bending production with enough strength and stiffness,
   broad vision;
(2) Linkage control design could ensure driver to operate safely and comfortably. Safe and
   convenient passageway, comfortable seat. The cabin is equipped with fire extinguisher, display
   screen of overload limiter.

**Part 2 Drawing**

◆ The Structure Sketch
### Part 3 Tech. Parameter

#### MG Type Main Double Girder Gantry Crane with Hook 5t

<table>
<thead>
<tr>
<th>Span S (m)</th>
<th>18</th>
<th>22</th>
<th>26</th>
<th>30</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifting height m</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Lifting speed m/min</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Trolley speed m/min</td>
<td>37.2</td>
<td>37.2</td>
<td>37.2</td>
<td>37.2</td>
<td>37.2</td>
</tr>
<tr>
<td>Crane speed m/min</td>
<td>37.7</td>
<td>37.7</td>
<td>37.7</td>
<td>40.1</td>
<td>40.1</td>
</tr>
<tr>
<td>Lifting motor kw</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Trolley motor kw</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Total weight kg</td>
<td>48500</td>
<td>52600</td>
<td>57700</td>
<td>65900</td>
<td>74000</td>
</tr>
<tr>
<td>Max Wheel Load KN</td>
<td>217</td>
<td>230</td>
<td>243</td>
<td>266</td>
<td>289</td>
</tr>
<tr>
<td>Track</td>
<td>P43</td>
<td>P43</td>
<td>P43</td>
<td>P43</td>
<td>P43</td>
</tr>
<tr>
<td>Main dimension mm</td>
<td>18</td>
<td>22</td>
<td>26</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>Rail top to main top H</td>
<td>13374</td>
<td>14474</td>
<td>13524</td>
<td>15606</td>
<td>15698</td>
</tr>
<tr>
<td>Wheel base W</td>
<td>7000</td>
<td>7000</td>
<td>8500</td>
<td>8500</td>
<td>8500</td>
</tr>
<tr>
<td>Crane width B</td>
<td>8554</td>
<td>8554</td>
<td>13050</td>
<td>13050</td>
<td>13050</td>
</tr>
<tr>
<td>Hook left limitation S1</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>7500</td>
<td>7500</td>
</tr>
<tr>
<td>Hook right limitation S2</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>7500</td>
<td>7500</td>
</tr>
<tr>
<td>Left cantilever L1</td>
<td>6500</td>
<td>6500</td>
<td>6500</td>
<td>9000</td>
<td>9000</td>
</tr>
<tr>
<td>Right cantilever L2</td>
<td>6500</td>
<td>6500</td>
<td>6500</td>
<td>9000</td>
<td>9000</td>
</tr>
</tbody>
</table>

Note: Control mode for cab operation
<table>
<thead>
<tr>
<th>Span</th>
<th>S (m)</th>
<th>18</th>
<th>22</th>
<th>26</th>
<th>30</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifting height</td>
<td>m</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Lifting speed</td>
<td>m/min</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td>Trolley speed</td>
<td>m/min</td>
<td>43.8</td>
<td>43.8</td>
<td>43.8</td>
<td>43.8</td>
<td>43.8</td>
</tr>
<tr>
<td>Crane speed</td>
<td>m/min</td>
<td>37.7</td>
<td>37.7</td>
<td>40.1</td>
<td>40.1</td>
<td>40.1</td>
</tr>
<tr>
<td>Lifting motor</td>
<td>kw</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Trolley motor</td>
<td>kw</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Total weight</td>
<td>kg</td>
<td>52600</td>
<td>60700</td>
<td>70800</td>
<td>78800</td>
<td>89000</td>
</tr>
<tr>
<td>Max Wheel Load</td>
<td>KN</td>
<td>225</td>
<td>228</td>
<td>245</td>
<td>290</td>
<td>310</td>
</tr>
<tr>
<td>Track</td>
<td></td>
<td>P43</td>
<td>P43</td>
<td>P43</td>
<td>P43</td>
<td>P43</td>
</tr>
<tr>
<td>Main dimension</td>
<td>mm</td>
<td>18</td>
<td>22</td>
<td>26</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>Rail top to main top</td>
<td>H</td>
<td>14580</td>
<td>14580</td>
<td>14580</td>
<td>16590</td>
<td>16590</td>
</tr>
<tr>
<td>Wheel base</td>
<td>W</td>
<td>8000</td>
<td>8000</td>
<td>8500</td>
<td>9500</td>
<td>9500</td>
</tr>
<tr>
<td>Crane width</td>
<td>B</td>
<td>9554</td>
<td>9554</td>
<td>10350</td>
<td>11350</td>
<td>11350</td>
</tr>
<tr>
<td>Hook left limitation</td>
<td>S1</td>
<td>5000</td>
<td>5000</td>
<td>6000</td>
<td>7500</td>
<td>7500</td>
</tr>
<tr>
<td>Hook right limitation</td>
<td>S2</td>
<td>5000</td>
<td>5000</td>
<td>6000</td>
<td>7500</td>
<td>7500</td>
</tr>
<tr>
<td>Left cantilever</td>
<td>L1</td>
<td>6500</td>
<td>6500</td>
<td>7500</td>
<td>9000</td>
<td>9000</td>
</tr>
<tr>
<td>Right cantilever</td>
<td>L2</td>
<td>6500</td>
<td>6500</td>
<td>7500</td>
<td>9000</td>
<td>9000</td>
</tr>
</tbody>
</table>

Note: Control mode for cab operation
Part 4 Manufacturing Process

- **Surface Treatment**
  All panels and profiles are after spot blasting to Sa2.5 level in GB8923-88, then after erosion by machine or hand to make the steel surface get St3 level, paint priming with thickness among 15~20μm. 3 layers finishes with thickness $\geq 120$um. Paint film adhesion accord with level one quality requirement of GB9286.

- **Montage**
  The steel plate after processed should be montaged according length; butt welds of cover plate and sternum of main girder should be detected by ultrasonic or X light to meet the requirements of 1 level in JB1152 or 11 level in GB3323.

- **Gas Cutting**
  Cover plate and sternum of main girder use CNC automatic cutting, common members use Semi-automatic cutting, small size parts use copy cutting.

- **Welding**
  Butt welds of cover plate and sternum of main girder use union melt welding, four main angles welding line use C02 gas protect automatic welding wire welding, common welding line use Manual C02 gas protect welding.

- **Main workpieces**
  Wheel use power frequency quenching, tread hardness reach HB300~380, at 20mm in depth of hardening layer, the hardness should not be less than 260HB. Brake wheel use Intermediate hardening, at 2-3mm in depth of hardening layer, the hardness should not be less than 245-55HRC. Gear ring of coupling use gear shaping or hobbing processing, then high frequency hardening, its hardness reach 33-38HRC.

- **Assembly**
  Wheel axles are assembled with wheels by oil press; axles and bearings are assembled after heated by AUELY. All mechanisms must be operated unloaded after assembled.

Part 5 Quality Control in Producing

- Mental construction of crane use steel pretreatment process, butt welds of cover plate and sternum of main girder should be detected by ultrasonic or X light.

- The wheels of crane and trolley and brake wheel use middle, high frequency heat treatment controlled by Leeb Hardness Tester.
Lateral deviation of the wheels controlled by later deviation tester.

Machine motion noise is measured by precision sound level meter.

Insulation is tested by megger, current is tested by clamp ammeter.

Various parts are tested by measure gauges, plug guages, and general measures.

The camber degree and Static Rigidity are tested by theodolite and balance level.

Special coating thickness gauges test and control the depth of paint films.

Part 6 Main Machine & Electric Suppliers

<table>
<thead>
<tr>
<th></th>
<th>Main Machine &amp; Electric Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducer</td>
<td>Jiangsu Tailong, Jiangsu Taixing</td>
</tr>
<tr>
<td>Motor</td>
<td>Jiamusi, Wuxi New Great Power</td>
</tr>
<tr>
<td>Break</td>
<td>Jiaozuo Break, Jiangxi Huawu</td>
</tr>
<tr>
<td>Wire Rope</td>
<td>Jiangsu Nantong Taili Wire Rope Factory</td>
</tr>
<tr>
<td>Overload limiter</td>
<td>Changzhou Changxin, Henan Hengda</td>
</tr>
<tr>
<td>Steel</td>
<td>Anyang Steel, jinan iron and steel</td>
</tr>
<tr>
<td>electrical elements</td>
<td>Schneider</td>
</tr>
</tbody>
</table>
Henan Yuantai Crane Machinery Import & Export Co., Ltd.

Address: Henghua Business Building 712, Garden Road, Zhengzhou, Henan, China.
Tel: 86-371-65760776
Fax: 86-371-65760775
Web: www.ytcrane.com
Email: yt@ytcrane.com

Tips: You can use the phone dimensional code recognition software to scan the right side of the two-dimensional code, to quickly and easily access our web site for more information.