

# **SPECIFICATION OF ROBOT**

**YS002NDE91**

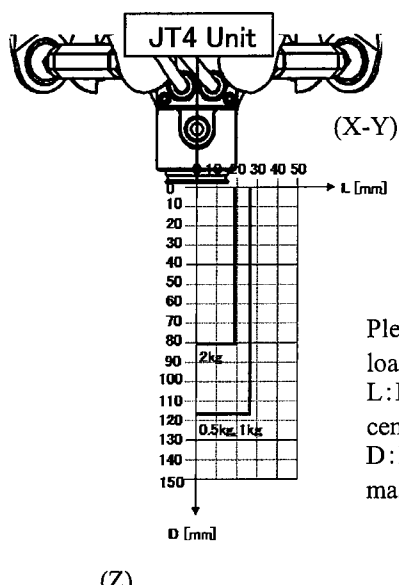
**1st Edition : Nov.7.2012**

KAWASAKI HEAVY INDUSTRIES LTD.  
ROBOT DIV.

Doc. No: 90101-2100DEA

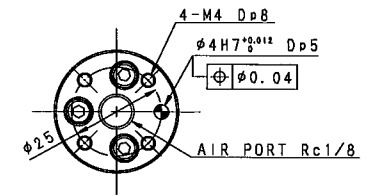
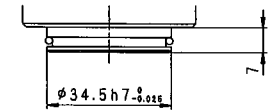
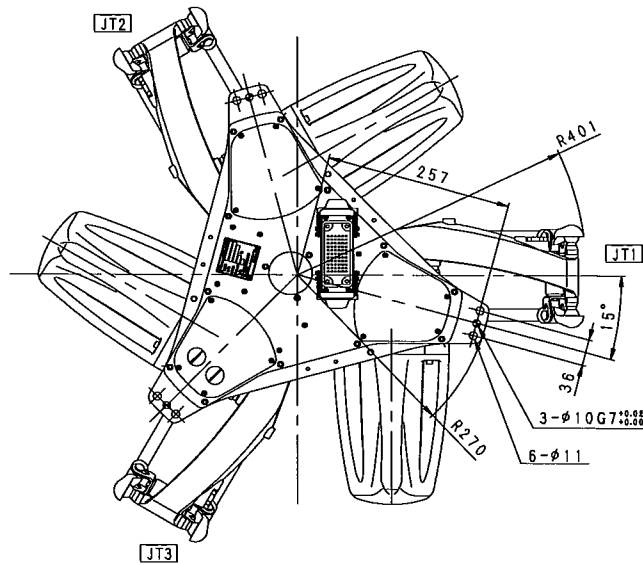
# 1. Specification of Robot

## [1] Robot Arm

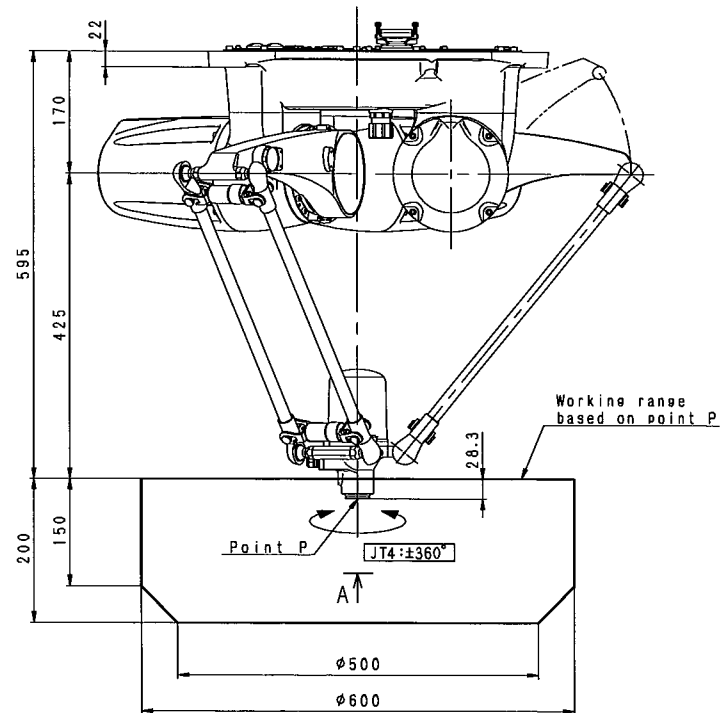
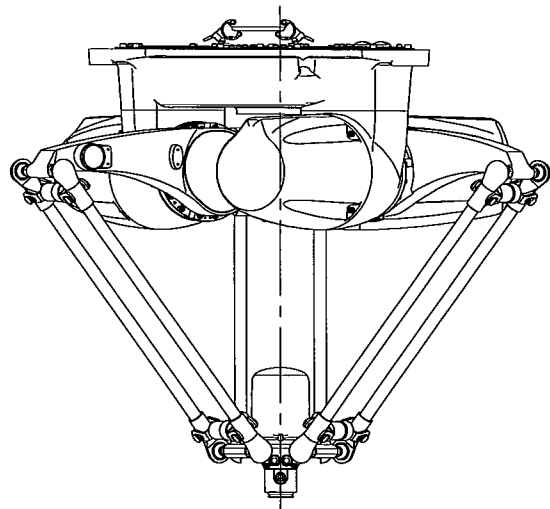
| 1. Model                          | YS002N-B  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
|-----------------------------------|---|----------------------|------------|----------|-----------------|-----------------|-------|------|------|-----|------|------|-----|------|------|
| 2. Type                           | Delta Parallel Robot  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 3. Degree of freedom              | 4 axes  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 4. Axis specification             | Operating axis  | Max. operating range | Max. speed |          |                 |                 |       |      |      |     |      |      |     |      |      |
|                                   | Arm rotation 1 (JT1)  | +77° ~ -34.5°        | 490 °/s    |          |                 |                 |       |      |      |     |      |      |     |      |      |
|                                   | Arm rotation 2 (JT2)  | +77° ~ -34.5°        | 490 °/s    |          |                 |                 |       |      |      |     |      |      |     |      |      |
|                                   | Arm rotation 3 (JT3)  | +77° ~ -34.5°        | 490 °/s    |          |                 |                 |       |      |      |     |      |      |     |      |      |
|                                   | Wrist twist (JT4)   | +360° ~ -360°        | 1714.3 °/s |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 5. Palletizing Capacity (Maximum) | <p>Approx. 200 pieces/min (0.5kg weight, only robot arm)<br/>           Approx. 166 pieces/min (2kg weight, only robot arm)<br/>           On the condition that robot moves 25 mm stroke in up-down direction and 305 mm stroke in right-left direction.<br/>           *1 Excluding picking up and placing time<br/>           *2 With a limit in continuous operations</p>   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 6. Position Repeatability         | ±0.04mm   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 7. Angular Repeatability          | ±0.10°  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 8. Max. payload                   | 2kg   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 9. Max. liner speed               | 3300mm/sec  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 10. Load capacity of wrist        | <div style="display: flex; align-items: center;">  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>load [-]</th> <th>Max Torque [Nm]</th> <th>Max Moment [Nm]</th> </tr> </thead> <tbody> <tr> <td>0.5kg</td> <td>0.13</td> <td>0.57</td> </tr> <tr> <td>1kg</td> <td>0.25</td> <td>1.15</td> </tr> <tr> <td>2kg</td> <td>0.37</td> <td>1.57</td> </tr> </tbody> </table> </div> <p style="margin-left: 20px;">Please put the center of mass inside of the line of the each load capacity.<br/>           L: Distance in X-Y dimension from Z-axis to the mass center of gravity of the load.<br/>           D: Distance in Z dimension from X-Y dimension to the mass center of gravity of the load.</p> |                      |            | load [-] | Max Torque [Nm] | Max Moment [Nm] | 0.5kg | 0.13 | 0.57 | 1kg | 0.25 | 1.15 | 2kg | 0.37 | 1.57 |
| load [-]                          | Max Torque [Nm]   | Max Moment [Nm]      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 0.5kg                             | 0.13  | 0.57                 |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 1kg                               | 0.25  | 1.15                 |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 2kg                               | 0.37  | 1.57                 |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 11. Driving motor                 | Brushless AC Servomotor   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 12. Working range                 | See attached drawing  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 13. Mass                          | 60 kg (without options)   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 14. Color                         | Munsell 10GY9/1 equivalent  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 15. Installation                  | Ceiling mounting  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 16. Environment cond.             | (Temperature) 0 ~ 40 °C, (Relative Humidity) 35 ~ 85 % (non-condensation)   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 17. Degree of Protection          | IP65 equivalent   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 18. Built-in utilities            | none  |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 19. Options                       |   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |
| 20. Others                        | Consult Kawasaki about maintenance parts and spare parts.   |                      |            |          |                 |                 |       |      |      |     |      |      |     |      |      |

| [2] Controller                    |  |   |
|-----------------------------------|--|---|
| 1. Model                          | E91  |   |
| 2. Enclosure                      | Enclosed, indirect cooling type  |   |
| 3. Dimensions                     | See attached drawing   |   |
| 4. Number of controlled axes      | Max.6 axes   |   |
| 5. Servo control and drive system | Full Digital Servo System  |   |
| 6. Type of control                | Teach mode   | Joint, Base, Tool, Fixed Tool (option) operation mode |
|                                   | Repeat mode  | PTP, CP control mode                                  |
|                                   |  | Joint, Linear, Circular (option) interpolation        |
| 7. Teaching method                | Teaching or AS language programming  |   |
| 8. Memory capacity                | 8 MB   |   |
| 9. External operation signals     | External Motor Power Off, External Hold, etc.  |   |
| 10. General purpose signals       | Input signals  | 32 channels (Includes dedicated signals)              |
|                                   | Output signals   | 32 channels (Includes dedicated signals)              |
| 11. Operation panel               | FastCheck/Teach/Repeat SW, Emergency Stop SW, Control power lamp   |   |
| 12. Cable length                  | Power/Signal cable   | 10 m  |
|                                   | Teach Pendant cable  | 10 m  |
| 13. Mass                          | See attached drawing   |   |
| 14. Power requirement             | AC200 V - AC230 V±10%, 50/60 Hz, 1 phase, Max. 4 kVA   |   |
| 15. Ground                        | Less than 100 Ω (robot dedicated ground)<br>Leakage current: max. 100 mA   |   |
| 16. Ambient temperature           | 0 - 40°C   |   |
| 17. Relative humidity             | 35 - 85 % (non-condensation)   |   |
| 18. Surface Treatment             | Munsell: 10GY9/1   |   |
| 19. Teach Pendant                 | TFT color display (6.4 inch LCD) with touch panel<br>Emergency Stop, Teach Lock and Deadman Switches(3 position) |   |
| 20. Safety Circuit                | Category: 3, Performance Level: d (EN ISO13849-1: 2008) ★  |   |
| 21. Options                       |  |   |
| General purpose signals           | Input signals  | 64/96 channels  |
|                                   | Output signals   | 64/96 channels  |
| I/O connector                     | D-SUB 37pin(male,female) with cover  |   |
| Power/Signal cable                | 5m, 15m  |   |
| Teach Pendant cable               | 5m, 15m  |   |
| Motor brake release               | Manual brake release switch BOX  |   |
| Auxiliary storage                 | USB memory   |   |
| PC cable                          | 1.5 m, 3 m   |   |
| Teach Pendant option              | Connector for TP less  |   |
| Others                            | Field BUS, Software PLC, Analog input/output, Conveyor Synchronization, Vision and so on                         |   |
| 22. Others                        | Consult Kawasaki about maintenance parts and spare parts.  |   |

★ Category and Performance level (PL) are determined by the whole system and conditions.  
The safety circuit of this controller is available in the system of category: up to 3, PL: up to d.



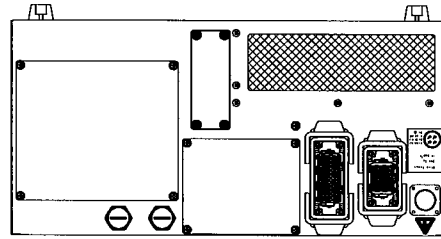
VIEW A



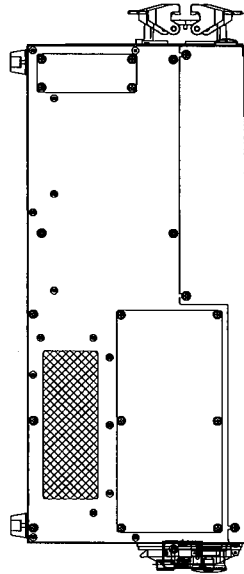
YS002N-B  
WORKING RANGE

E91 CONTROLLER

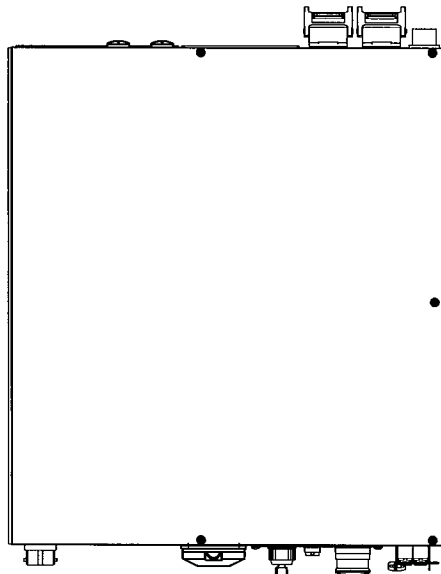
MASS : 40 K g



REAR VIEW

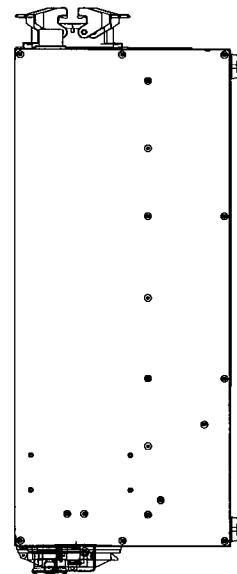


SIDE VIEW

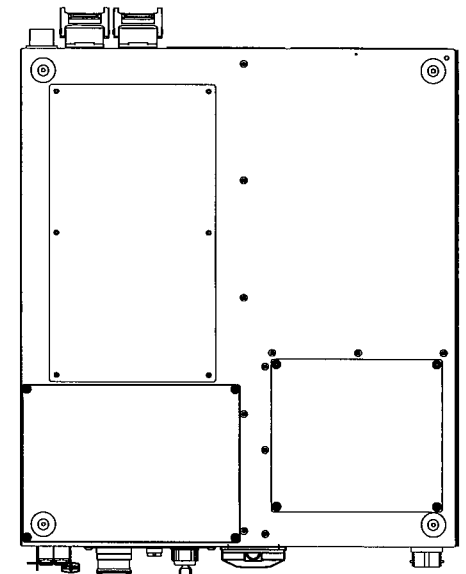


TOP VIEW

(50)  
580  
(34)

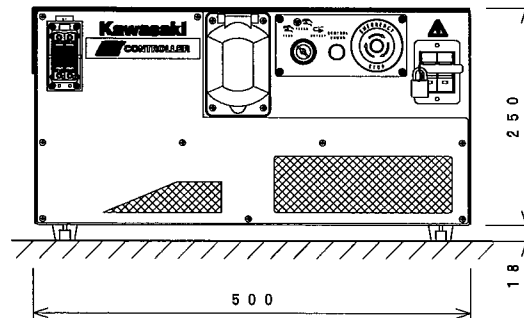
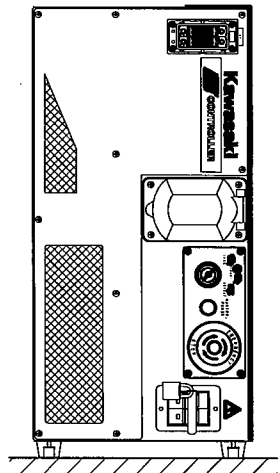


SIDE VIEW



BOTTOM VIEW

Vertical Mount  
縦置の場合



FRONT VIEW

250  
18  
500

