

# Technical Specification for Robot for Rake and Tele, rev.1 from 27.07.2023.

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## **1 DISCLOSURES AND TERMINOLOGY:**

### **1.1 Disclosures and compliance**

- 1.1.1 This Specification, and the information contained herein, is the property of Nexteer. It shall be considered confidential and must not be made public or copied.
- 1.1.2 This specification was developed without considering whether restrictive patents may or may not be involved. In all cases, therefore, the supplier shall be required to assume patent liability.
- 1.1.3 All documents (paper and electronic) and products transferred from Nexteer shall be considered confidential. The OEM shall be responsible to protect these items and return them upon completion of the project. All unauthorized copies of electronic and paper product prints shall be destroyed upon completion of the project.
- 1.1.4 Compliance to this Test Equipment Purchase Specification is mandatory. The quotation must contain the statement: **"We agree to conform to Nexteer Test Equipment Purchase Specification."** Any deviations from these specifications, for any reason, must be submitted in writing to the Nexteer Engineer in Charge and be clearly documented in the quotation.
- 1.1.5 If a conflict exists between any of the contained specifications, including this purchase specification, the supplier shall contact the Nexteer Engineer in Charge for clarification.
- 1.1.6 The potential supplier, or manufacturer which is represent by the supplier, must prove that he has built at least three (3) machines during last three (3) years, in operation, of equal or greater complexity that have been operating satisfactory for a minimum period of one year. The engineer in charge is to determine that the potential supplier is regularly engaged in this type of machine design and has the capability to successfully complete the project in a timely manner.
- 1.1.7 Although Nexteer may specify concepts, potential suppliers are encouraged to propose alternative ideas, which might provide a cost savings or performance enhancement. The equipment should be quoted as specified with alternative ideas quoted as options
- 1.1.8 Nothing in this specification shall relieve the supplier of the responsibility for successful performance of the equipment after it is installed. The supplier shall be responsible for inspection, and equipment checkout under operating conditions at the customer's facility.
- 1.1.9 Complete advance information shall be furnished on all services required for the installation. Maximum system thermal exchange requirements, inrush current requirements and normal full load current requirements shall be included.

### **1.2 Terminology**

- 1.2.1 General
  - Engineer in charge: The Nexteer Engineer in Charge
  - Nexteer: This refers to the Tychy, Towarowa 6 site of Nexteer Automotive.
  - Project: The machine build resulting from the specification, request for quote (RFQ), and resulting purchase order.
  - Buyer: Nexteer purchasing department representative
  - Supplier: The successful equipment manufacturer who is issued a Purchase Order
  - Vendor: General term for a machine supplier
  - Bidder: A potential supplier who responds to a RFQ
- 1.2.2 Validation or testing
  - ETS (Engineering Test Specification)  
Parameters and instructions for validation testing of specific Nexteer products/platforms

- DAQ (Data Acquisition) Refers to the test stand measurement system
  - DUT – Device Under Test
  - SD – Nexteer Automotive Global Machinery and Equipment Specification
- 1.2.3 Project Specific
- HWA – Hand Wheel Actuator
  - EPS – Electric Power Steering System
  - DUT – Device Under Test
  - CU – Conditioning Unit
  - Non condensing – No visible moisture will collect on the test part or chamber surfaces.

## **2 INTRODUCTION AND SCOPE**

### **2.1 Introduction**

- Nexteer is requesting for three Robot units. The robot includes the price of the mechanical unit, programming console, controller, wires, appropriate software tools and options.  
The proposed equipment will be located at Nexteer Engineering Validation Laboratory in Tychy, Poland.
- 2.1.2 It is Nexteer's intent, to procure fully functional conditioning unit per all requirements outlined in the specification for the lowest possible overall cost.
- 2.1.3 Supplier shall prepare quotation in accordance with Nexteer's General Manufacturing Equipment Specification (SD-001). A line-up meeting (teleconference possible) will be necessary to ensure all parties involved understand the requirements of the specification.
- 2.1.4 Questions:  
Any questions regarding this specification are preferred in writing and may be directed to:

**Pawel Imielski**

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## **2.2 Product Description**

- 2.2.1 Each robot will be part of a separate machine dedicated to testing Hand Wheel Actuator Column, Electric Power Steering Systems (EPS), Power Column and Manual Column. For each EPS Nexteer produce Left Hand Drive and Right Hand Drive models.

## **2.3 Description of the robot's functions**

- 2.3.1 Maximum load capacity at wrist: 50 kg
- 2.3.2 Maximum reach: 2050 mm
- 2.3.3 Repeatability not less than:  $\pm 0.03^\circ$
- 2.3.4 Robot footprint: 535x550 mm
- 2.3.5 Robot speeds in the J1-J6 axis, not less than 170°/s in the J20 axis
- 2.3.6 Controller weight not exceeding: 120kg
- 2.3.7 Robot controller with 2 safety programmable inputs and outputs, additionally, as standard, the controller should have an ESTOP input on the board, inputs dedicated to Estop and physical gates.
- 2.3.8 Force sensor integrated into the motherboard for the robot.
- 2.3.9 4 years warranty as standard.

# **3 MACHINE CONTROL**

## **3.1 General Information**

- 3.1.1 The offer should include a fully functional robot with all cables and software.
- 3.1.2 Each robot should contain the following modules:
- 6 axis robot
  - Brakes on all axis
  - Vernier Mark All Axis
  - Lifting eye bolts
  - 7 meter Robot Connection Cable
  - ISO Flange Faceplate
- 3.1.3 Programing and configuration of controller is responsibility of Supplier. Nexteer will support Supplier during controller debug.

## **4 CALIBRATION AND VERIFICATION**

### **4.1 Vendor Responsibilities**

- 4.1.1 Certified calibration data is required for each calibrated parameter. The data shall include the name of the calibration company, calibration method used, applied values and indicated responses, transducer manufacturer, part number and serial number. An example can be supplied by Nexteer

## **5 DOCUMENTATION**

### **5.1 Requirements for Documentation**

- 5.1.1 All mechanical, electrical, etc. prints shall be provided in standard editable format (e.g. dwg, STEP) per SD-003
- 5.1.2 Documentation shall be prepared with metric units.
- 5.1.3 Documentation shall be provided by the vendor as outlined in this specification and SD-003. Any documentation provided by part suppliers used by the vendor shall also conform to this standard.

## **6 REQUIREMENTS AND OTHER OPTIONAL FEATURES**

### **6.1 Recommended equipment**

- 6.1.1 Supplier can use components or equipment different to included in BOM and this specification but has to proof that these elements are equivalent.

### **6.2 Base prices include as additional line items**

- 6.2.1 Start-up on the floor of the Tychy facility by local service organization during the integration of robots with target machines (difference in delivery of robots and machine is possible). Training for personnel (workers and Engineers) at the supplier's headquarters for five people, in programming, service and operation by local service organization. Two years or more warranty for parts and labor with 48h time for first visit.

- 6.2.2 Delivery cost

### **6.3 Requirements**

- 6.3.1 CE certification
- 6.3.2 Polish language labeling and documentation

## 6.4 Shipping

- 6.4.1 Transportation to Buyer's Receiving Location is to be included in Bidder's proposal as a separate line item. Bidder is to note (a list of) probable logistics provider(s) in their proposal. Incoterms for any international shipment will be DAP Nexteer Poland, Tychy.
- 6.4.2 Shipping address is as follows:  
**Nexteer Automotive Poland Sp. z o.o.**  
**ul.Towarowa 6**  
**43-100 Tychy**  
**Poland**
- 6.4.3 The test stand shall be shipped with suitable protective cover to protect the test stand from the environment. Appropriate shipping materials (pallets, bands, wrappings, etc.) shall be used. Special handling devices shall be provided if required to prevent damage during load, unload, and installation.
- 6.4.4 Special instructions for transporting, unloading, or moving the machines must be clearly attached to the outside of the shipping package/container. A copy shall also be sent to the Nexteer Engineer in Charge prior to shipment. This includes a lifting and loading diagram (if applicable). All written instructions shall be provided in Polish.

## 6.5 Delivery

- 6.5.1 All goods have to be delivered to Nexteer no later than November 2023.

## 7 COMMENTS

- 7.1.1 **Any deviation from the above requirements of the specification must be clearly indicated in the offer and agreed with the responsible engineer.**