# L-35HS

**CNC HORIZONTAL LATHE**

**TECHNICAL AGREEMENT**

1. **Technical description of equipment**

L-35HS CNC Horizontal Turning Machine features a 35° slant bed structure, providing high rigidity and easy chip removal. This machine adopts a turret structure, offering a compact design and fast movement speed, with a more flexible and diverse layout for tools and functional components. The Z-axis leadscrew adopts a centrally positioned, high-precision structure, ensuring high accuracy and stability. It is suitable for machining short shaft-type (or disc-type) parts with complex geometric shapes, various sizes, and high precision requirements, as well as various cylindrical surfaces, conical surfaces, stepped surfaces, spherical surfaces, and other rotationally symmetric parts. The machine can process both metric and imperial internal and external threads, as well as perform drilling, reaming, honing, rolling, and boring operations. It is equipped with a reserved robotic arm installation interface for easy and quick integration into various automated production lines.

* Overall: The machine features an integrated design combining machine, electrical, and hydraulic systems, with a reasonable layout, compact structure, user-friendly operation, and easy maintenance. The fully enclosed protective design ensures no water or oil leakage, offering an aesthetically pleasing appearance and a comfortable operation experience. The cooling system is equipped with a high-pressure pump and a high-flow, high-power water pump, providing powerful cutting chip removal and cooling effects.
* Spindle: Equipped with a servo motorized spindle, offering high precision, fast acceleration and deceleration, a wide speed range, and the ability to perform stepless speed adjustment and constant surface speed cutting, while saving energy. The entire spindle assembly is completed under constant temperature conditions and undergoes computer balancing calibration and running-in tests to ensure a long service life and high reliability of the spindle..
* Tool turret: This machine is equipped with a 12-position servo (hydraulic) turret. It offers a large tool capacity, short tool change times, and reliable rigidity.
* Drive: The machine uses preloaded linear rolling guides and ball screws, offering fast speeds and high machining accuracy. Both the X and Z-axis ball screws are pre-stretched, and a flexible coupling is used to connect to the feed servo motors. This design ensures strong transmission rigidity, stable precision, and reliable performance.
* Lubrication: The lubrication system adopts an automatic centralized lubrication device, ensuring thorough and reliable lubrication. The lubrication cycle is automatically controlled for optimal performance.
* System: Equipped with high-performance FANUC 0i-TF PLUS (3B) CNC system, optional βi series high-performance AC spindle motor and servo motor, which ensures the stability of machine tool control, as well as the CNC machining functions and auxiliary functions required by users.

The quality of the processed and assembled finished products of all machine tool parts complies with the product drawings and related technical requirements, and complies with the relevant provisions of GB/T17421-2000 "General Inspection of Machine Tools" and GB/T16462-1996 "Accuracy Inspection of CNC Horizontal Lathes".

1. **Parameter and configuration**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Items | | Unit | Parameter | Remarks |
| Processing range | Max. rotation diameter | mm | Φ570 |  |
| Max. processing diameter (axis/plate) | mm | Φ280 |  |
| Max. processing length | mm | 280 | 800 (optional large motor) |
| Max. bar diameter | mm | Φ52 |  |
| Travel | X –axis travel | mm | 200 |  |
| X –axis motor power/stall torque | kW/Nm | 1.8/11 |  |
| Z –axis travel | mm | 300 | 830 (optional large motor) |
| Z –axis motor power/stall torque | kW/Nm | 1.8/11 |  |
| Spindle | Output power(S1/S6) | kW | 15 |  |
| Spindle end form |  | A2-6 |  |
| Spindle rotary speed | r/min | 4300 |  |
| Hole diameter | mm | Φ66 |  |
| Chuck | Hydraulic 3-jaw chuck | inch | 8 | Hollow |
| Guideway  & ballscrew | X-axis guide rail specification | mm | 35 |  |
| Z-axis guide rail specification | mm | 45 |  |
| X-axis screw specification | mm | Φ32/08 |  |
| Z-axis screw specification | mm | Φ32/08 |  |
| Speed | X-axis rapid traverse speed | m/min | 24 |  |
| Z-axis rapid traverse speed | m/min | 24 |  |
| Tool holder | Tool capacity | T | 12 |  |
| Center Height | mm | 80 |  |
| Tool indexing time | sec/bit | 1.2 |  |
| Turning tool holder specification | mm | 25×25 |  |
| Max. boring tool diameter | mm | Φ32 |  |
| Accuracy | X axis positioning accuracy | mm | 0.01 |  |
| Z axis positioning accuracy | mm | 0.01 |  |
| X axis repeatabilitys | mm | 0.01 |  |
| Z axis repeatability | mm | 0.01 |  |
| Others | Power Supply Capacity | kVA | 27 |  |
| Coolant volume | L | 150 |  |
| Dimension | mm | 2180×1640×1700 | Manual Chip Removal Tank |
| Total weight | kg | 3300 |  |

***#:* No further notice will be given for the change of machine tool dimensions due to configuration.**

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1. **Standard configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Name | Quantity | Remarks |
| 1 | FANUC 0i—TF PLUS（3B） | 1 |  |
| 3 | Manual chip removal & coolant tank components | 1 | Manual Rear Chip Removal |
| 4 | 12-station hydraulic servo turret | 1 |  |
| 5 | 8-inch 3-jaw hollow hydraulic chuck | 1 |  |
| 6 | Cooling system | 1 |  |
| 7 | Automatic lubrication system | 1 |  |
| 8 | Hydraulic system | 1 |  |
| 9 | Three-color light | 1 |  |
| 10 | Lighting system | 1 |  |
| 11 | Attachment | 1 | According to packing list |
| 12 | Machine standard technology document | 1 |  |
| 13 | Basic installation kit | 1 |  |

1. **Optional configuration. (Additional charge required)**

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Optional item | Whether | Remarks |
| 1 | 8-inch Hollow Chuck / Hollow Hydraulic Cylinder |  |  |
| 2 | Automatic chip removal + chip accumulation trolley (rear row) |  | Dimensions (L×W×H): (Approx.) 2180×2800×1700 mm |
| 3 | Tool Setter |  | Specifications depend on chuck size |
| 4 | Air Gun |  |  |
| Note: If this configuration is selected, mark √ in the corresponding item. | | | |

1. **Turret standard tool holder, boring tool set configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| NAME & SPECIFICATION | | QUANTITY | REMARK |
| Tool holder | 25×25 end turning tool holder | 1 |  |
| Ф32 boring tool holder | 4 |  |
| External circular tool pressing block | 12 |  |
| Boring tool sleeve | Ø16 boring tool sleeve | 1 |  |
| Ø25 boring tool sleeve | 2 |  |
| Ø20 boring tool sleeve | 1 |  |
| If there are other tool holder requirements, please specify in the remarks section. | | | |

1. **Mechanical accessories list**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Category | Name | Specifications | Quantity | Remarks |
| Foundation Components | Anchor Bolt | M18×80; GB786-88 | 4 |  |
| Shims | 1012 | 4 |  |
| Wrench (Dual-use) | 24-27 | 1 piece |  |
| Allen Wrench | - | 1 set |  |
| Flathead Screwdriver | 5˝ (inch) | 1 piece |  |
| Phillips Screwdriver | 5˝ (inch) | 1 piece |  |

1. **Brands of main parts of equipment**

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Description | Brand | Remark |
| 1 | CNC system | FAUNC 0i—TF PLUS（3B） |  |
| 2 | Motorized spindle | Domestic |  |
| 3 | Spindle bearing | NSK/SKF/NTN/FAG | Japan/Germany |
| 4 | Ball screw | PMI/HIWIN/THK | C3 level or equivalent quality universal interchange |
| 5 | Roller Linear Guides | PMI/HIWIN/THK | P grade or equivalent quality universal |
| 6 | Hydraulic chuck | Domestic |  |
| 7 | Cylinder | Domestic |  |
| 8 | Turret | Domestic |  | |
| 9 | Lubrication system | Domestic |  | |
| 10 | Tri-color light | Domestic |  | |
| 11 | Main electrical components | Schneider/LS |  | |
| 12 | Hydraulic station | Domestic |  | |
| 13 | Water pump | Domestic |  | |
| Note: When supply is insufficient, other brands of products will be used instead, but the quality will not be lower than the listed configurations. | | | | |

1. **FANUC System Main Function List (Some functions require host machine configuration to be enabled)**

| **No.** | **Function** | **Description** | **Remarks** |
| --- | --- | --- | --- |
| 1 | Number of control axes | 10 axes | Maximum total number of controlled axes + dedicated PMC controlled axes |
| 2 | Simultaneous control of the number of axes | 7 axes | 5 feed axes, 2 spindles |
| 3 | axis name | XYZ、UVW、ABC any |  |
| 4 | Minimum input unit | 0.001mm |  |
| 5 | Dual position feedback |  | Optional |
| 6 | High Response Vector Control | HRV control |  |
| 7 | Imperial/Metric Conversion |  |  |
| 8 | Machine interlock |  |  |
| 9 | emergency stop |  |  |
| 10 | Overtravel Alarm |  |  |
| 11 | Stored stroke check |  |  |
| 12 | mirror |  |  |
| 13 | location tracking |  |  |
| 14 | Abnormal load detection |  |  |
| 15 | automatic running |  |  |
| 16 | MDI operation |  |  |
| 17 | DNC operation |  |  |
| 18 | Program number search |  |  |
| 19 | Sequence number search |  |  |
| 20 | program restart |  |  |
| 21 | dry run |  |  |
| 22 | single block |  |  |
| 23 | JOG (jog) feed |  |  |
| 24 | Manual reference point return |  |  |
| 25 | handwheel feed | 1 |  |
| 26 | Handwheel feed rate | ×1，×10，×100 |  |
| 27 | Nano imputation |  |  |
| 28 | position | G00 |  |
| 29 | Accurate stop method | G61 |  |
| 30 | Tapping method | G63 |  |
| 31 | Cutting method | G64 |  |
| 32 | accurate stop | G09 |  |
| 33 | Linear interpolation | G01 |  |
| 34 | Circular interpolation | G02、G03 |  |
| 35 | pause | G04 |  |
| 36 | Thread cutting, synchronized feed |  |  |
| 37 | Multi-start thread cutting |  |  |
| 38 | Continuous thread cutting |  |  |
| 39 | Variable pitch thread cutting |  |  |
| 40 | Polygon processing |  |  |
| 41 | Polygon machining between spindles |  |  |
| 42 | skip function | G31 |  |
| 43 | return to reference point | G28 |  |
| 44 | Back to reference point check | G27 |  |
| 45 | Return to the second reference point | G30 |  |
| 46 | Rapid traverse override | F0、25、50、100% |  |
| 47 | feed per minute |  |  |
| 48 | feed per revolution |  |  |
| 49 | Automatic acceleration/deceleration |  |  |
| 50 | Feedrate override |  |  |
| 51 | JOG feed override |  |  |
| 52 | tape code | Automatic recognition of EIA/ISO |  |
| 53 | logo skip |  |  |
| 54 | parity check | Horizontal and vertical parity check |  |
| 55 | Control input/output |  |  |
| 56 | Select block skip |  |  |
| 57 | maximum command value | ±9 digits |  |
| 58 | Program number search |  |  |
| 59 | Sequence number | N8 digits |  |
| 60 | Absolute/incremental instructions | Can be mixed in the same |  |
| 61 | decimal point programming |  |  |
| 62 | Diameter/Radius Designation |  |  |
| 63 | plane selection | G17、G18、G19 |  |
| 64 | Rotation axis specification |  |  |
| 65 | Coordinate system setting |  |  |
| 66 | Automatic coordinate system setting |  |  |
| 67 | Workpiece coordinate system | G52~G59 |  |
| 68 | Workpiece coordinate value preset |  |  |
| 69 | Direct input of workpiece origin offset |  |  |
| 70 | Direct input of drawing size |  |  |
| 71 | Chamfer/Corner R |  |  |
| 72 | Programmable data input | G10 |  |
| 73 | Programmable parameter input |  |  |
| 74 | subroutine call | 10 levels of nesting |  |
| 75 | User macro program |  |  |
| 76 | canned cycle |  |  |
| 77 | Arc radius R command |  |  |
| 78 | Coordinate system offset |  |  |
| 79 | Coordinate system offset direct input |  |  |
| 80 | Accessibility | M8 digits |  |
| 81 | Spindle function | S5 digits, binary output |  |
| 82 | Spindle serial output | S5 digits, serial output |  |
| 83 | Spindle analog output | S5 digits, analog output, only1 |  |
| 84 | Spindle override | 0~120% |  |
| 85 | Spindle positioning | 1 |  |
| 86 | Spindle synchronization control |  |  |
| 87 | Tool function |  |  |
| 88 | Number of tool compensations | 128 |  |
| 89 | Tool position offset |  |  |
| 90 | Tool diameter, tool nose radius compensation |  |  |
| 91 | Tool geometry/wear compensation |  |  |
| 92 | Direct input of tool offset measurements |  |  |
| 93 | Tool life management |  |  |
| 94 | Extended tool life management |  |  |
| 95 | Backlash compensation |  |  |
| 96 | Rapid traverse/feed backlash compensation |  |  |
| 97 | Number of login programs | 1000 |  |
| 98 | Workpiece program editing |  |  |
| 99 | program protection |  |  |
| 100 | Password function |  |  |
| 101 | extension editor |  |  |
| 102 | Background editing |  |  |
| 103 | Status Display |  |  |
| 104 | Clock function |  |  |
| 105 | Current location display |  |  |
| 106 | Program comment display | Program name 31 |  |
| 107 | Parameter setting display |  |  |
| 108 | Parameter checksum function |  |  |
| 109 | Alarm display |  |  |
| 110 | Alarm history display |  |  |
| 111 | Operation history display |  |  |
| 112 | Working time/number of parts display |  |  |
| 113 | actual speed display |  |  |
| 114 | Actual spindle rotation number/T code display |  |  |
| 115 | program directory display |  |  |
| 116 | Operation monitor screen |  |  |
| 117 | Servo adjustment screen |  |  |
| 118 | Spindle adjustment screen |  |  |
| 119 | Servo waveform display |  |  |
| 120 | Maintenance information screen |  |  |
| 121 | display language |  |  |
| 122 | data protection key |  |  |
| 123 | Help function |  |  |
| 124 | Self-diagnostic function |  |  |
| 125 | Hardware/Software System Configuration |  |  |
| 126 | External data input |  |  |
| 127 | external program input |  |  |
| 128 | External part number search |  |  |
| 129 | External program number search |  |  |
| 130 | Memory card input/output |  |  |
| 131 | Screen hard copy |  |  |
| 132 | Embedded Ethernet |  |  |
| 133 | Data automatic backup |  |  |
| 134 | PMC system |  |  |
| 135 | AC Servo Amplifier |  |  |
| 136 | AC Servo Spindle Amplifier |  |  |
| **Special Note: For more functions, please refer to the FAUNC 0i—TF PLUS series specification selection guide. Due to changes in machine tool configuration and differences in design, please refer to the agreement when ordering** | | | |

1. **General requirements for equipment and installation and commissioning**

1. General requirements for equipment

1.1. Equipment use environment: Maintaining a constant ambient temperature is an essential factor for precision machining.

1.2. Working conditions:

(1) Three-phase AC power supply: 380V±5%; 50Hz±1Hz, main power line 10mm² or larger, grounding line 10mm² or larger.

(2) Ambient temperature: The ambient temperature must be maintained at 17~25℃. If the precision requirements for processed parts are not high, it can be relaxed to 5~40℃. Storage or transportation temperature -20~60℃.

(3) Room temperature change: The ambient temperature change within 24 hours is within ±2℃;

(4) Relative humidity: within 75% (no condensation);

(5) Altitude: below 1000m;

(6) Vibration: below 0.2G;

(7) Foundation requirements: Bearing capacity above 50KN/m²;

(8) Keep away from light sources, vibration sources and heat sources, high-frequency generators, discharge motors, welding machines, etc., to avoid electrical interference that may cause the machine tool NC system to malfunction.

1.3. If the voltage in the area of use is unstable, the machine tool should be equipped with a voltage-stabilized power supply to ensure the normal operation of the machine tool.

1.4. The machine tool should have reliable grounding: the grounding wire is a copper wire with a wire diameter of no less than 10mm² and a grounding resistance of less than 4 ohms.

1.5. To ensure the normal operation of the equipment, if the compressed air does not meet the air source requirements, a set of air source purification devices (dehumidification, degreasing, filtration) should be added before the machine tool intake.