Note - Machine without enclosure for illustration only

### TECHNICAL DATA OF MACHINE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Main Drive Motor Capacity</td>
<td>2x55 KW</td>
</tr>
<tr>
<td>Cutting Speed while Profiling</td>
<td>25 to 80 m/min</td>
</tr>
<tr>
<td>Tool Post Feed for Wheel Profiling</td>
<td>0.1 to 4 mm/rev</td>
</tr>
<tr>
<td>Tool Post Rapid Speed for Both Axes</td>
<td>4500 mm/min</td>
</tr>
<tr>
<td>Max. Chip Cross Section while Profiling</td>
<td>32 – 50 mm²</td>
</tr>
<tr>
<td>Cycle Time / Wheelset</td>
<td>8 – 12 mins</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>415 VAC, 50 Hz*</td>
</tr>
</tbody>
</table>

*Special Electrical supply can be considered, if required.

### WHEEL SET DATA FOR MACHINING

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Tread Diameter</td>
<td>1250 mm</td>
</tr>
<tr>
<td>Min. Tread Diameter</td>
<td>700 mm</td>
</tr>
<tr>
<td>Wheel Width</td>
<td>75 to 145 mm</td>
</tr>
<tr>
<td>Max. Axle Length</td>
<td>2750 mm**</td>
</tr>
<tr>
<td>Min. Axle Length</td>
<td>1850 mm**</td>
</tr>
<tr>
<td>Max. Weight of Wheel Set</td>
<td>50 KN</td>
</tr>
<tr>
<td>Max. Dia. for Brake Disc Machining</td>
<td>700 mm</td>
</tr>
<tr>
<td>Min. Dia. for Brake Disc Machining</td>
<td>250 mm</td>
</tr>
</tbody>
</table>

**Depends on Track Gauge**
### ACCURACIES OF WHEEL SET

#### Wheel Profiling
- Difference in Dia. of Both Wheels: <0.15 mm
- Accuracy of Wheel Profile when Compared with Standard Gauge: <0.2 mm
- Radial Run Out of Wheel: <0.1 mm
- Axial Run Out of Wheel: <0.2 mm
- Profile Surface Finish: <12.5 \( \mu \text{m} \) Ra

#### Brake Disc Machining (Optional)
- Surface Finish: <2.5 \( \mu \text{m} \) Ra
- Flatness of Surface: <0.1/100 mm
- Lateral Wobble: <0.2 mm

### STANDARD EQUIPMENT WITH MACHINE
- CNC Controlled wheel profile, Diameter & Wear Measurement
- Remote Diagnosis Software For Troubleshooting
- Machine Enclosure With Transparent Window
- Siemens 840D sl / Fanuc FS 0i-TF With Panel I CNC System With Software
- Wheel Set For Machine Calibration
- Chip Conveyor With Trolley (Bin)
- Cutting Tools & Tool holders
- Centres (60° or 90°)
- Electrical Cabinet
- Hydraulic Power Pack
- Hydraulic Oil Cooler / Heater
- Oil Filtration Unit
OPTIONAL EQUIPMENT

- Brake Disc Machining Arrangement
- Dust & Fume Extraction System
- Additional Profile Machining Program
- Digital Camera For Monitoring Cutting Area
- Laser Measurement
- Software For Centralized Data For Wheel Management of The Region

CNC PORTAL WHEEL LATHE

CNC Portal Wheel Lathe is an automatic machine in portal construction with roll through movement of wheel sets. It is suitable for simultaneous re-profiling of new or worn-out wheels when disassembled from railways vehicles like locomotives, electrical & diesel multiple units, coaches, wagons, metro & tram coaches, etc.

This extremely rigid machine is capable of taking min. 0.5mm to max. 15mm depth of cut simultaneously on both the wheels of a wheel set.

- Economical, Advanced and Proven Design
- Machine in Sturdy Portal Construction
- Extremely Rigid Structure
- High Productivity & Consistent Accuracies
- Roll Through Movement of Wheel Set
- High Reliability & Long Service Life

DURING THE AUTOMATIC CYCLE, FOLLOWING OPERATIONS ARE PERFORMED:

- Automatic wheel set loading by machine jack.
- Pre-measurement for wear & diameter.
- Machining of tread & flange.
- Post-measurement for profile & diameter.
- Automatic unloading and roll-out of wheel set through machine.
BEST VALUE FOR MONEY

- Automatic roll through arrangement to increase productivity
- All loadbearing structures are built with high strength, close grained cast iron giving dimensional & geometrical stability and efficient vibration damping.
- Electronic wear measurement system for economical depth of cut
- Extremely wear resistant SKC lining for all sliding surfaces
- Sandvik or Kennametal tool inserts
- Auto tool retraction during power failure and emergency
- Siemens 840D sl / Fanuc FS 0i-TF with Panel I CNC system with operator-friendly screens

PORTAL FRAME

- Portal Frame is in rugged honey comb ribbing construction with very high static & dynamic rigidity and is made from close-grained cast iron.
- In slant orientation with hardened & ground wear resistant guide ways on either end for head stock sliding.
- Hardened & ground wear resistant guide ways between head stocks for CNC Tool Post Sliding.
- Extremely rigid structure to absorb the weight of various machine elements and the cutting forces developed during the wheel profiling operation.

HEAD STOCKS

- Two rigid, close-grained cast iron head stocks moving on hardened & ground guide ways provide high life performance.
- They support the spindle assembly rigidly.
- Rigid face chuck made of S. G. Iron, installed is mounted on the spindle assembly with the help of heavy duty thrust bearings and special type of adjustable clearance cylindrical roller bearings.
- The head stocks are hydraulically locked during the wheel set turning process.

SPINDLE ASSEMBLY

- Very rigid spindle made from carbon steel having diameter of 590mm
- It is used for mounting face chuck with large diameter thrust bearing and turn the wheels to the required accuracies.
- Spindle is supported by adjustable clearance cylindrical roller bearing at front end and cylindrical roller bearing with thrust bearing at rear end.
- Helps in resisting heavy axial & radial loads of wheel clamping & cutting even during 10-15mm depth of cut.
SOFTWARE

- The machine is equipped with Siemens SINUMERIK 840D sl CNC controller with open architecture and WIN CC Flex software OR Fanuc FS Qi-TF with Panel I controller with Windows based open architecture software for measurements, operations, displaying parameters and data entry for measurement, operation, displaying parameters and data entry.

- Dedicated control software takes care of various safety measures for safe operation and displays fault messages in normal English text.

- Remote diagnostic software is used for controlling & maintaining the machine from HYT headquarters.

CNC TOOL POST

- Portal Wheel Lathe is equipped with dual CNC Tool Post for turning any wheel profile.

- Made of close-grained cast iron, both the tool posts are mounted rigidly on the portal frame.

- They have two axes each and are driven by Servo Motors for accurate & consistent profile, irrespective of tool wear.

- Hardened, ground, lapped OHNS guide ways with high wear resistance and ball screws are provided for accurate, smooth & controlled movement.

CONVEYOR

- Considering heavy material removal during profile machining operation, a heavy duty steel belt chip conveyor is provided.

- It is installed in a pit below the machine. Necessary chutes are provided to direct the chips on to the conveyor.

- The chips falling on the conveyor belt are carried out of the pit which is then get dropped in bins placed on the ground level for easy disposal.
BRAKE DISC TURNING (OPTIONAL)

- Retractable, rigid, case hardened & ground Ram is mounted on the tool post.
- The Ram is equipped with standard tool holders and inserts for brake disc turning which removes unevenness of surface.
- Tool positioning is done by 'Z' axis of the tool post and machining is carried out by 'X' axis of the tool post.

WHEEL WEAR MEASUREMENT

- Consists of a set of contact type probe rollers which come in contact with the wheel profile at various points to measure wear developed on the profile and also to measure wheel diameter, flange height, flange width, wheel back-to-back distance and wheel width.
- Measurement can be carried out either by taking measurements at pre-determined six positions around the periphery when the wheel is stationary or by taking measurements along the profile during wheel set rotation at a slow speed to cover entire profile.
- Wear data is transmitted to the Siemens 840D sl / Fanuc FS Oi-TF with Panel I CNC Controller for processing.
- Economical material removal and specified accuracies are achieved when the wear measurement program process the wear data and CNC Software suggests the most economical depth of cut.
- Measurement & machining data is stored in the CNC System and can be retrieved whenever required.
HYT ENGINEERING CO. PVT. LTD.

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Goes Global

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