
MAXICAM CNC ROUTER



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ELECTRICAL ENCLOSURE AND RELATED MACHINE WIRING

Identified risk – Electric shock

The following measures have been taken to avoid this hazard :-

- 1) Connection to the factory 400V AC supply is made via industry standard 32 amp 3-phase 5 pin socket.
- 2) All high voltage connections (except for Spindle motor and vacuum pump) are made within the electrical panel.

The spindle motor connection is via an industry standard flexible cable. The socket which is used to connect to the spindle has no exposed live terminals (even when disconnected).

The mains socket for the vacuum pump is not accessible unless fixed covers have been removed. The socket does not expose any live terminals even when disconnected.

Where possible shrouded terminals have been used within the electrical panel to reduce the risk of accidental contact by qualified service personnel working within the panel.

Electrical cabinet cannot be accessed whilst under power

An electrical warning sign “Mains Supply” has been displayed above the key entry position to identify the danger within.

An electrical warning sign “Isolate elsewhere” has been displayed on the electrical enclosure.

All panel structural components have been earth bonded. All machine structures have been earth bonded.

An isolator is provided to disconnect the machine from the mains supply.

Identified risk – Fire due to electrical short circuit

The following measures have been taken to limit this risk :-

- 1) All circuits have been protected by circuit breaker or fuse to ensure that the current rating of the device or the cable to the device is not exceeded in the event of a short circuit.
- 2) The cable from the factory to the machine is rated for 32 amps in accordance with the rating for an industrial 32 amp 400v ac mains socket.

Identified risk – Electrical noise disturbance to the factory mains network

A mains filter rated for 32 amps has been fitted to ensure that any electrical noise generated by the systems within the panel is not distributed into the factory mains system.

RISKS RELATED TO MACHINE OPERATION

Identified risk – trapping or pinch points

The following measures have been taken to reduce this hazard :-

- 1) The machine is fitted with a photo-electric guard to ensure that no access is possible to moving parts during automatic functions.
- 2) Access is required for setting purposes, part loading/removal and machine cleaning. While the access guard is open only manual movements can be invoked. These are operated at reduced feedrates to avoid any sudden movements at high speed.
- 3) It is not possible to unlock the guard while an automatic program is in progress.

Identified risk – Spindle rotation at high rpm

The following measures have been taken to avoid this hazard :-

- 1) The spindle cannot be run with the access guard open. This protects against both accidental contact with the running spindle and arrests any broken tool fragments should that occur.
- 2) On Emergency stop or serious fault the spindle is decelerated as quickly as possible using the residual energy stored in the spindle inverter.
- 3) It is not possible to unlock the access guard while the spindle is running.

Identified risk – Axis travel limits

Each axis has been fitted with travel limit switches to prevent an axis exceeding the designated working envelope.

Software limits are also active once the axes have been homed. An automatic move cannot be carried out until the axis have been homed.

Identified risk – Emergency protection

The control design includes a category 4 safety relay to manage the emergency stop circuit. The emergency circuit includes a dual circuit Emergency stop pushbutton and a manual reset facility for the safety relay. When tripped the safety relay will remove all dangerous voltages from the machine (with the exception of the Panel PC 230 vac supply) and disables / disconnects power supplies from the spindle and axis drive modules.

Identified risk – Dust from the process

The machining process produces fine dust, extraction has been provided to reduce this hazard from

the working environment. Due to the vast array of materials being processed the customer should seek external advice regarding hazards to the materials being processed to avoid injury or death by airborne dust particles.

Identified risk – Noise

The machining process can cause excessive noise and it's recommended to make the machine room a compulsory ear defender zone.