

# Coby-CNC Information

## Information regarding the automation solution

### 1. Power

System	Power supply	Description
Coby (stacker + robot)	220-230V AC	Single phase supply from type E of type F(Schuko) wall socket
CobyBox	24V DC, max current drawn 2A	DC power supply, could be provided from the machine or another source

The wall socket for Coby must be positioned in the neighbourhood of the Coby CNC installation. Our systems will be delivered with a flexible electric cable of about 5m.

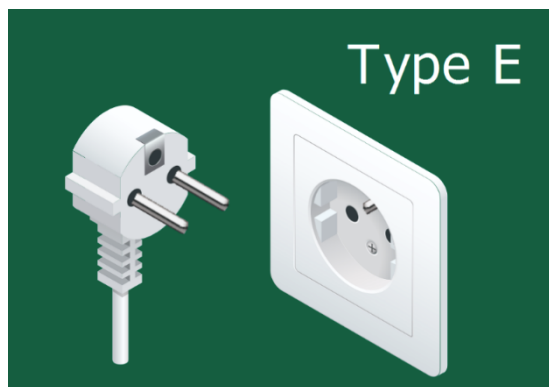


Figure 1-Type E socket

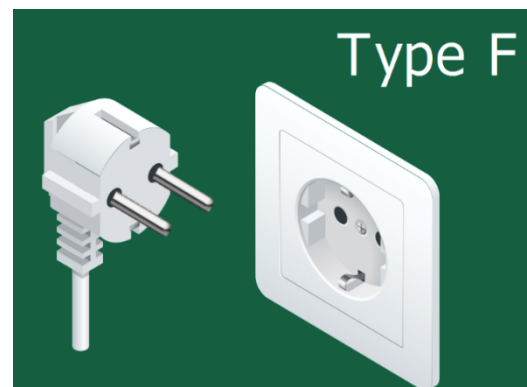


Figure 2-Type F socket

**Wall sockets must be installed and protected in accordance with the standards and regulations applicable in the country where the system is installed.**

### 2. Air supply

System	Air supply	Description
Coby (stacker + robot)	2.5 – 8.0 bar (36 – 116 psi)	The air <b>must be conditioned, it must be dried</b> and can be lubricated. Grippers are rated up to 8 bar (116 psi) and have very low air consumption. The “airblow” option results in a higher air consumption when in use.
CobyBox	/	/

The air supply connection point must be positioned in the neighbourhood of the robot or the stacker table. The system will come with a 10m tube (Ø8mm).

### 3. Machine

## Interfacing - CobyBox

The CobyBox only supports **I/O interfacing**. This means that the required machine signals should come through a *physical wire* to attach them to the contacts on the CobyBox.

Pressing physical buttons on the control panel (no touch panel) to perform certain functions is another possibility. For this you can mount *button pushers* over the buttons to link the necessary function to the CobyBox.

Other types of interfacing (e.g., Ethernet/IP, Fieldbus, Profibus, etc.) are **not supported**. For these types of interfacing there are 2 possibilities:

1. Adjust and transform the digital signals to a physical contact (e.g., use a PLC to make a bridge between the machine interface and CobyBox).
2. Contact RoboJob ([www.robojob.eu](http://www.robojob.eu)) for another product that does support this type of interfacing.

The CobyBox is installed to operate the machine, it will call some functions to perform machine actions and will monitor signals coming back from the machine to know its state. The following signals must be made available for the Coby CNC system to provide you with an automation solution:

“Machine action”	“Machine state”
Cycle start	In Cycle
	Cycle is finished
Open door request	Door is open
Close door request	Door is closed
Open fixture 1 request	Fixture 1 is open
Close fixture 1 request	Fixture 1 is closed
Open fixture 2 request (only for lathes with a subspindle)	Fixture 2 is open (only for lathes with a subspindle)
Close fixture 2 request (only for lathes with a subspindle)	Fixture 2 is closed (only for lathes with a subspindle)
	Alarm

To connect the CobyBox to your machine, read the wiring diagrams and signal list. It is the customer’s responsibility to make sure all necessary signals are retrieved from the machine and connected to the CobyBox.

## Calibration between robot and machine

For the Coby system to know where the robot is we need to reference the position of the fixture inside the machine. Depending on the installation at a lathe or milling machine our software system will guide you through the installation process to reference the fixture.

A “Measuring Tool” and a “Center Finder” will be provided with the system. The “Measuring Tool” is a small piece that can be clamped in the robot jaws and can be inserted into a  $\varnothing 10\text{mmH7}$  hole. The “Center Finder” is a disk  $\varnothing 80\text{mm}$  with a through hole  $\varnothing 10\text{mmH7}$  that serves to reference the fixture in a lathe and as an exercise tool.

Referencing the fixture is done in the following way:

- *Lathe machine*

If the “Center Finder” can be clamped inside your fixture ( $\varnothing 80\text{mm}$ ) use this for the robot calibration. The center hole of the tool should be the center of your fixture.

Otherwise:

Clamp a disk inside your machine and drill out a hole with the  $\varnothing 10\text{mm H7}$  drill bit to a depth of  $\geq 25\text{mm}$ . It can be less but then the hole should be fully through the disk. Chamfer the edges ( $2\text{mm} \times 45^\circ$ ) of the hole to ensure a smooth insertion of the “Measuring Tool”. Use a facing bit to flatten the front of the disk so that the “Measuring Tool” can be flush against the surface of your disk.

- *Milling machines*

To reference the clamp on your machine table we need 4 holes to determine the plane and origin of the reference.

For this we kindly ask you to clamp a square workpiece ( $125\text{mm}$ ) inside your clamp and drill out the 4 holes ( $\varnothing 10\text{mmH7}$ ) according to the delivered pattern. Flatten the front of the workpiece so that the “Measuring Tool” can be put flush against the surface.

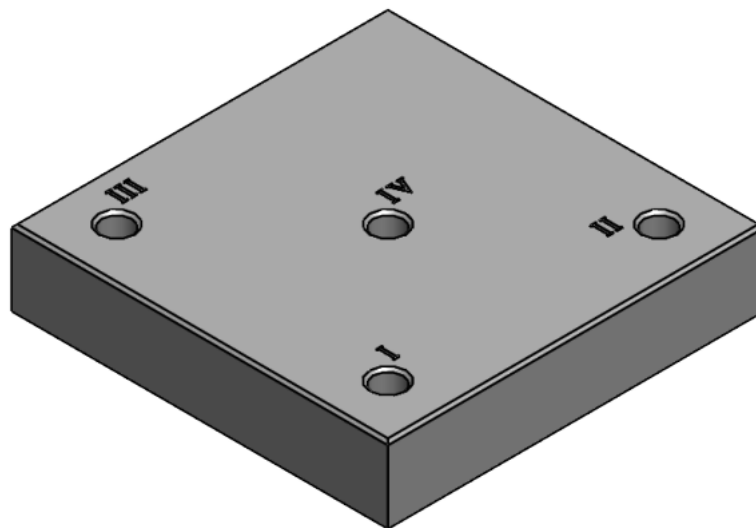


Figure 3-Center Finder Milling

### Clamping devices

Clamping devices must be automated and ready to use. The necessary safety and signals should be dealt with on the side of the machine. The Coby CNC system will not provide any extra safety measures.

Supported clamping mechanisms are:

- Centric clamping
- Fixed leg clamping

Centric clamping is preferred due to fact that workpieces are always centred in the clamp direction.

There should be a clearance of at least *5mm* on each side between the workpiece and clamping system when loading and unloading with the Coby CNC system.

Clamping mechanisms where the fixed leg can be adjusted by hand are **not supported**.

### **Doors**

The door must be automated and ready to use. The necessary safety and signals should be dealt with on the side of the machine. The Coby CNC system will not provide any extra safety measures.

Existing door(s) must be in a good condition and should have no wear on the guides.

### **Machine**

The machine must be in a fully operating state at the start of the installation.

Coby CNC works with the machine according to a START/STOP programming of the NC program. This means that the program should be selected up front before the automation cycle is started with Coby CNC.

The robot will fetch the first raw workpiece from the table, load it into the machine, move out of the machine and then signal the machine to start the cutting program. If the program is done the robot will unload the current workpiece and fetch a new workpiece to load into the machine, etc.

Operators of the machine must be able to program the machine.

## **4. INSTALLATION**

### **Location and dimensions**

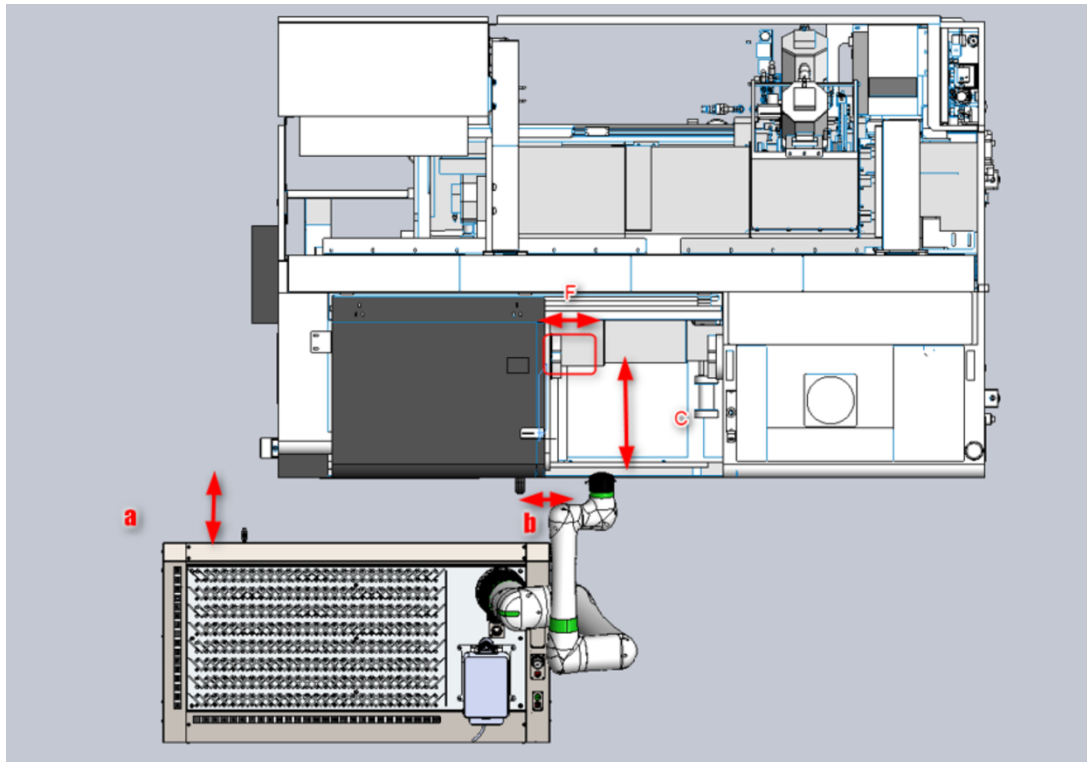


Figure 4-General layout

The Coby CNC system can only be placed on the left side, parallel to the front of the machine as shown in the picture above. (For other solutions please contact RoboJob [www.robojob.eu](http://www.robojob.eu))

Placing the system should happen according to the given dimensions:

- [a] Vertical distance between the back of the stacker table and front of the machine should be:
  - Lathes: **±300mm**
  - Milling: **±350mm**
- [b] Back right corner of the Coby CNC system and the right edge of the open door should be aligned with each other, **0mm**.
- [c] Maximum distance from the front of the machine to the center of the chuck is **550mm**. With this the total distance [a] + [c] should be max **850mm** (lathes) / **900mm** (milling).
- Height of the fixture with respect to the floor should be between **1000mm** and **1300mm**.
- Minimal door opening is **470mm**. At this dimension the Coby CNC system can load and unload a workpiece with a height of **20mm**. For workpieces with a height of **100mm** we would need a minimal door opening of **550mm**, etc.

- Space in front of the machine should cover the footprint and [a]. The system itself has a footprint of **1500mm x 800mm** adding [a] this leads to a total footprint of **1500mm x 1100mm** (lathes) / **1500mm x 1150mm** (milling).

A forklift and pump wagon are necessary to unload the system and move it into position. Hoisting the Coby CNC system (e.g. overhead crane) is **not allowed**.

The floor on the installation site can have a floor flatness tolerance of maximum 9mm per 2m. The floor must be resistant to heavy mechanical loads.

## 5. COMMISSIONING

### Workpieces

Maximum weight	5kg
Workpiece dimensions	3-point grippers: Ø25 – Ø200mm (outer clamping), max height 200mm
	2-point grippers: 8mm – 120mm (outer clamping), max height 150mm

If you require loading and unloading bigger workpieces, contact RoboJob ([www.robojob.eu](http://www.robojob.eu)) to provide you with a different solution than Coby CNC.

### Training

Coby is a Do-It-Yourself system that is backed up with a help center (<https://service.coby-cnc.com/en-us>). Here you can find tutorials and documents concerning the Coby CNC system.