SIEMENS

SINUMERIK

SINUMERIK 808D
Mechanical Installation Manual

Operating Instructions

Valid for:
SINUMERIK 808D Turning (software version: V4.4.2)
SINUMERIK 808D Milling (software version: V4.4.2)

Target group:
Mechanical engineers and mechanical assembly

01/2015
6FC5397-2EP10-0BA0

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Industry Sector
Postfach 48 48
90026 NÜRNBERG
GERMANY

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Preface

SINUMERIK 808D documentation

The SINUMERIK 808D documentation consists of the following components:

- Operating Instructions
  - Mechanical Installation Manual
  - Electrical Installation Manual
  - PLC Subroutines Manual
  - Function Manual
  - Parameter Manual
- Diagnostics Manual
- Commissioning Manual
- Programming and Operating Manual (Turning)
- Programming and Operating Manual (Milling)
- Manual Machine Plus (Turning)
- Online Help for Programming and Operating (Turning)
- Online Help for Programming and Operating (Milling)
- Online Help for Manual Machine Plus (Turning)

My Documentation Manager (MDM)

Under the following link you will find information to individually compile your documentation based on the Siemens content:

www.siemens.com/mdm

Target group

This manual is intended for use by mechanical engineers and mechanical assembly workers.

Benefits

This manual enables the intended target group to properly install and remove the SINUMERIK 808D control system.

Technical support

Hotline:	+86 400-810-4288
Service and Support	• China: www.siemens.com.cn/808D • Worldwide: http://support.automation.siemens.com

EC Declaration of Conformity

The EC Declaration of Conformity for the EMC Directive can be found on the Internet at http://www.siemens.com/automation/service&support.

Here, enter the number **67385845** as the search term or contact your local Siemens office.

Licensing provisions

The SINUMERIK 808D software is protected by national and international copyright laws and agreements. Unauthorized reproduction and distribution of this software or parts thereof is liable to prosecution. It will be prosecuted both according to criminal and civil law and may result in severe penalties or claims for compensation.

In the SINUMERIK 808D software, open source software is used. The licensing provisions for this software are included on the Toolbox DVD and are to be observed accordingly.

Table of contents

Safety instructions

1

General

⚠ WARNING

Death or serious injury may occur.

Only qualified personnel should be allowed to work on this control system, and only after becoming acquainted with all the safety notices regarding installing as set out in this manual.

Failure to observe these notices contained in this manual can result in death, severe personal injury or considerable damage to property.

Without prior authorization, you are not allowed to perform any modification on the machine.

Identification

NOTICE

Property loss

Deliverables received should be complete and intact. Exercise caution to ensure that you do not put a damaged device into service.

Otherwise, you may suffer property loss.

Make sure that the PPU, the MCP and the cables received correspond with the specific package you ordered from Siemens.

Transport and storage

Note

Transport and storage should meet specified environmental conditions.

Mechanical installation

⚠ DANGER

Death or serious injury from electric shock

The equipment which is not disconnected from the mains or properly protected contains hazardous voltage.

Such a voltage may lead to death or serious injury.

Before installing or removing the components of the control system, make sure that the system is disconnected from the mains. In addition, do install the control system in a distribution cabinet with an adequate protection level.

⚠ DANGER

Death or serious injury from fire or electric shock

If the equipment operates in an area subject to inflammables or combustibles, water or corrosion hazards, it contains high risk of fire or electric shock.

The fire or electric shock may lead to death or serious injury.

Do install the control system in an area free of inflammables or combustibles, water or corrosion hazards.

Note

When dimensioning the control cabinet, make sure that the installed components do not exceed the permissible ambient temperature, even if the outside temperature is high.

Electrical installation

⚠ CAUTION

Damage to the control system

The high-voltage components have strong interference in 24 V DC power supply.

If the 24 V DC power supply is not isolated from high-voltage components, the control system may be damaged.

The 24 V DC protective extra-low voltage **must** be generated as a protective extra-low voltage with safe electrical isolation (to IEC 204-1, Section 6.4, PELV), and grounded by with a PELV M signal connection to the central grounding point of the system.

⚠ DANGER

Death or serious injury from electric shock

The equipment which is not disconnected from the mains contains hazardous voltage.

Such a voltage may lead to death or serious injury.

Before connecting the modules, first disconnect the equipment from the mains!

NOTICE

EMC requirements will not be met.

The unshielded or ungrounded FAST I/O cable is very sensitive to ambient electromagnetic interference.

In this case, relevant EMC requirements will be not be met.

In order to meet IEC/CISPR requirements, the FAST I/O cable must be shielded and grounded.

Commissioning

Note

Do not forget to back up data after completing the commissioning work.

Note

Clear the manufacturer password before the machine is delivered; otherwise, end users can start the controller with the standard data, which can initialize the SINUMERIK 808D control system. As a consequence, the machine will not run.

Carrying out of repairs

⚠ DANGER

Carrying out of repairs

Anywhere in the automation equipment where faults might cause physical injury or major material damage, in other words, where faults could be dangerous, additional external precautions must be taken, or facilities must be provided, that guarantee or enforce a safe operational state, even when there is a fault (e.g. using an independent limit value switch, mechanical locking mechanisms, EMERGENCY STOP/EMERGENCY OFF devices).

Identification

2

The SINUMERIK 808D control system is delivered in various packages. Please check the components according to the tables below.

Table 2- 1 PPU package

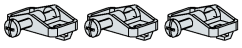
Component	Illustration	Quantity (pieces)	Order number
Panel Processing Unit (PPU)		Turning, 1	6FC5370-1AT00-0AA0 (English)
			6FC5370-1AT00-0CA0 (Chinese)
		Or	
		Milling, 1	6FC5370-1AM00-0AA0 (English)
			6FC5370-1AM00-0CA0 (Chinese)
Mounting clamps with screws		8	-
Lithium battery		1	6FC5247-0AA18-0AA0
Connectors	-	• I/O connectors: 7 • 24 V power input connector: 1	-

Table 2- 1 MCP package

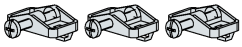
Component	Illustration	Quantity (pieces)	Order number
Machine Control Panel (MCP)		1	6FC5303-0AF35-0AA0 (English) 6FC5303-0AF35-0CA0 (Chinese)
USB cable		One (for connecting the MCP to the PPU, max. 30 cm)	-
Mounting clamps with screws		6	-
Pre-printed MCP strips, Milling		1 set of 6 pieces	-
Blank strip paper, A4 size		1	-
Product Information for MCP		1	-

Table 2- 2 Accessories

Component	Illustration	Remarks	Order number
Setpoint cable to SINAMICS V60 (for feed axis) [1]		5 m	6FC5548-0BA00-1AF0
		7 m	6FC5548-0BA00-1AH0
		10 m	6FC5548-0BA00-1BA0
Setpoint cable to Siemens inverter or third-party drive (for spindle)		3 m	6FC5548-0BA05-1AD0
		5 m	6FC5548-0BA05-1AF0
		7 m	6FC5548-0BA05-1AH0
		10 m	6FC5548-0BA05-1BA0
		20 m	6FC5548-0BA05-1CA0

[1] For turning machines, you need two setpoint cables for the connection between the controller and the SINAMICS V60 drives; for milling machine, you need three setpoint cables.

Table 2- 4 Options

Type	Component	Language version	Order number
Software	MM+ (for turning only)	-	6FC5800-0AP07-0YB0
	Additional axis (for turning only)	-	6FC5800-0AK70-0YB0
	Toolbox	-	6FC5811-0CY00-0YA8
Documentation	*Operating Instructions*	English	6FC5397-2EP10-0BA0
		Chinese	6FC5397-2EP10-0RA0
	Diagnostics Manual	English	6FC5398-6DP10-0BA0
		Chinese	6FC5398-6DP10-0RA0
	Commissioning Manual	English	6FC5397-4EP10-0BA0
		Chinese	6FC5397-4EP10-0RA0
	Programming and Operating Manual (Turning)	English	6FC5398-5DP10-0BA0
		Chinese	6FC5398-5DP10-0RA0
		Russian	6FC5398-5DP10-0PA0
		Portuguese	6FC5398-5DP10-0KA0
	Programming and Operating Manual (Milling)	English	6FC5398-4DP10-0BA0
		Chinese	6FC5398-4DP10-0RA0
		Russian	6FC5398-4DP10-0PA0
		Portuguese	6FC5398-4DP10-0KA0
	Manual Machine Plus (Turning)	English	6FC5398-3DP10-0BA0
		Chinese	6FC5398-3DP10-0RA0

Note

The emergency stop button is not included in the scope of delivery. You can, if necessary, contact your local Siemens sales person for it.

SINAMICS V60 and 1FL5 motor packages

You can find the delivery information about the SINAMICS V60, 1FL5 motors and relevant cables from the tables below.

Table 2- 5 SINAMICS V60 package

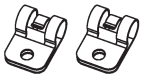
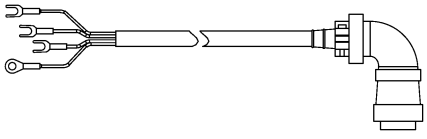
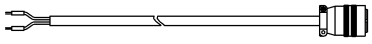
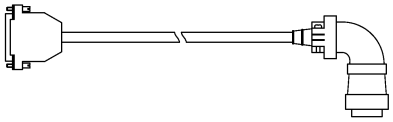
Component	Illustration	Remark	Order number
SINAMICS V60		4 A	6SL3210-5CC14-0UA0
		6 A	6SL3210-5CC16-0UA0
		7 A	6SL3210-5CC17-0UA0
		10 A	6SL3210-5CC21-0UA0
Getting Started		1 piece	- -
Cable clamps		2 pieces	- -

Table 2- 6 1FL5 motor package

Component	Illustration	Remark		Order number
1FL5 motor	Motor without brake 	4 Nm	With key	1FL5060-0AC21-0AA0
			Without key	1FL5060-0AC21-0AG0
		6 Nm	With key	1FL5062-0AC21-0AA0
			Without key	1FL5062-0AC21-0AG0
		7.7 Nm	With key	1FL5064-0AC21-0AA0
			Without key	1FL5064-0AC21-0AG0
		10 Nm	With key	1FL5066-0AC21-0AA0
			Without key	1FL5066-0AC21-0AG0

Component	Illustration	Remark		Order number
	Motor with brake 	4 Nm	With key	1FL5060-0AC21-0AB0
			Without key	1FL5060-0AC21-0AH0
		6 Nm	With key	1FL5062-0AC21-0AB0
			Without key	1FL5062-0AC21-0AH0
		7.7 Nm	With key	1FL5064-0AC21-0AB0
			Without key	1FL5064-0AC21-0AH0
		10 Nm	With key	1FL5066-0AC21-0AB0
			Without key	1FL5066-0AC21-0AH0
Data sheet for 1FL5 motor		1 piece		- -

Table 2- 5 Cables individually packaged

Component	Illustration	Remark	Order number
Power cable (unshielded)	Drive end (to motor interface U, V, W)  Motor end (to motor socket)	3 m	6FX6002-5LE00-1AD0
		5 m	6FX6002-5LE00-1AF0
		7 m	6FX6002-5LE00-1AH0
		10 m	6FX6002-5LE00-1BA0
Brake cable (unshielded)	Drive end (to motor brake interface X3)  Motor end (to motor brake socket)	3 m	6FX6002-2BR00-1AD0
		5 m	6FX6002-2BR00-1AF0
		7 m	6FX6002-2BR00-1AH0
		10 m	6FX6002-2BR00-1BA0
Encoder cable (shielded)	Drive end (to encoder interface X7)  Motor end (to encoder socket)	3 m	6FX6002-2LE00-1AD0
		5 m	6FX6002-2LE00-1AF0
		7 m	6FX6002-2LE00-1AH0
		10 m	6FX6002-2LE00-1BA0

Rating plates (example) for the SINUMERIK 808D

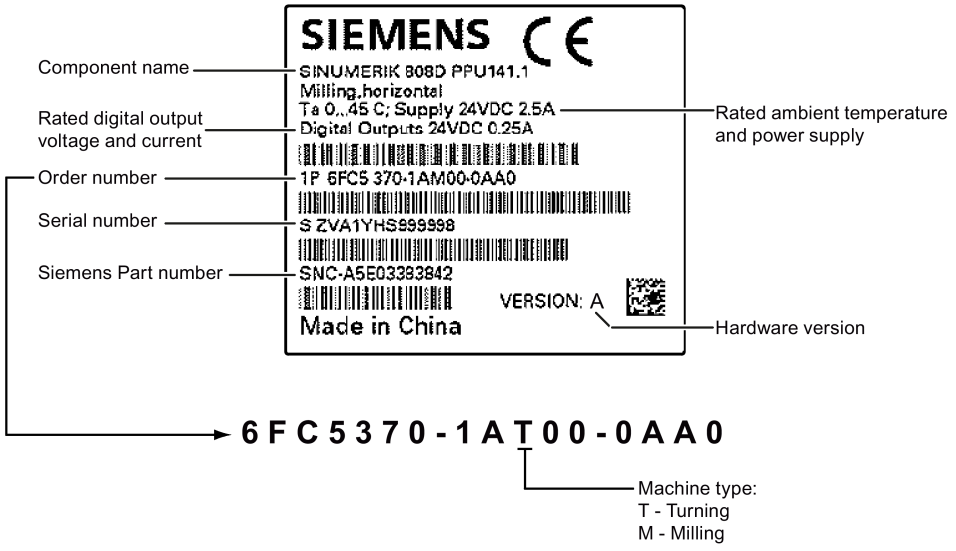
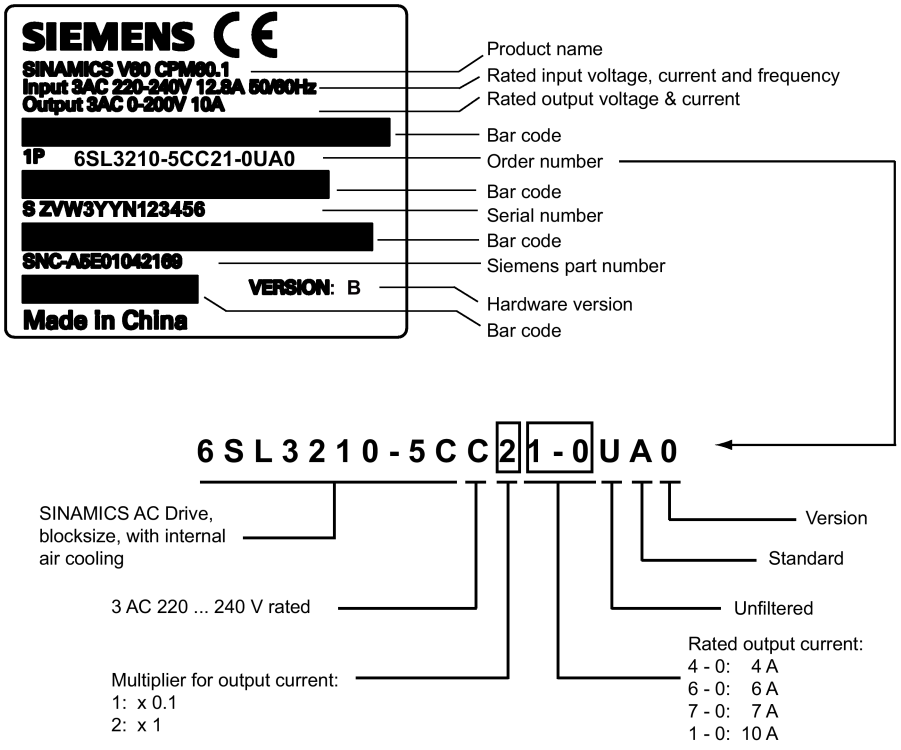


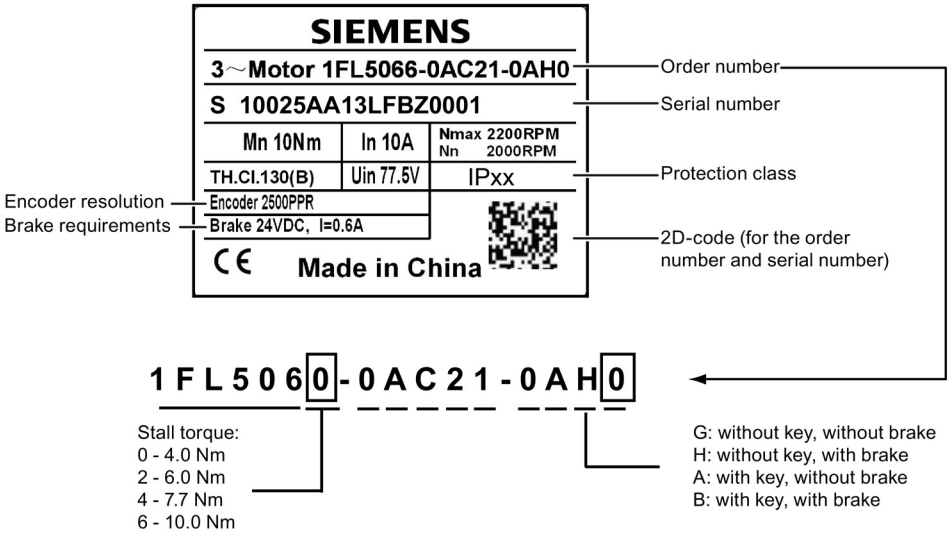
Figure 2-1 Rating plate (PPU)

Figure 2-2 Rating plate (MCP)

Rating plate (example) for the SINAMICS V60 drives



Rating plate (example) for the 1FL5 motors



Mounting

3

3.1 Mounting the CNC

Cut-out dimensions

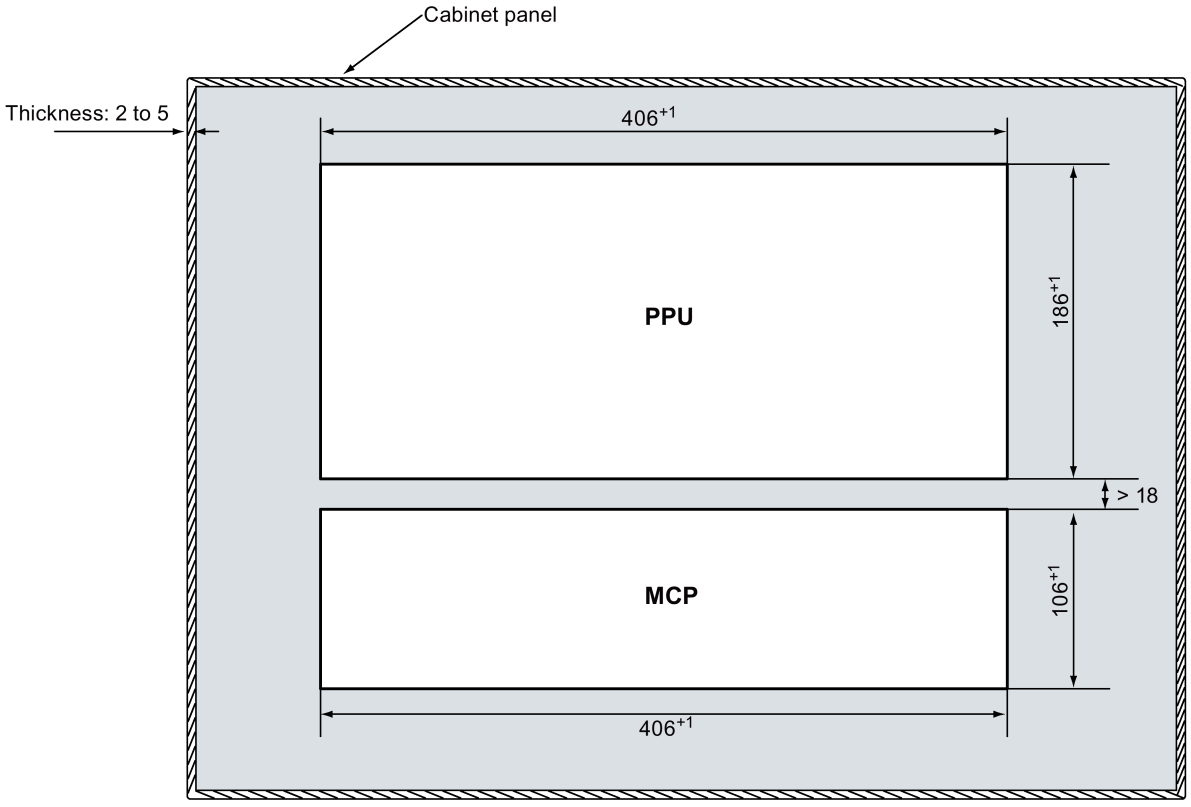


Figure 3-1 Cut-out dimensions (in mm)

Note

Make sure there is enough space around the PPU and the MCP for tightening the screws in the control cabinet.

Mounting dimensions

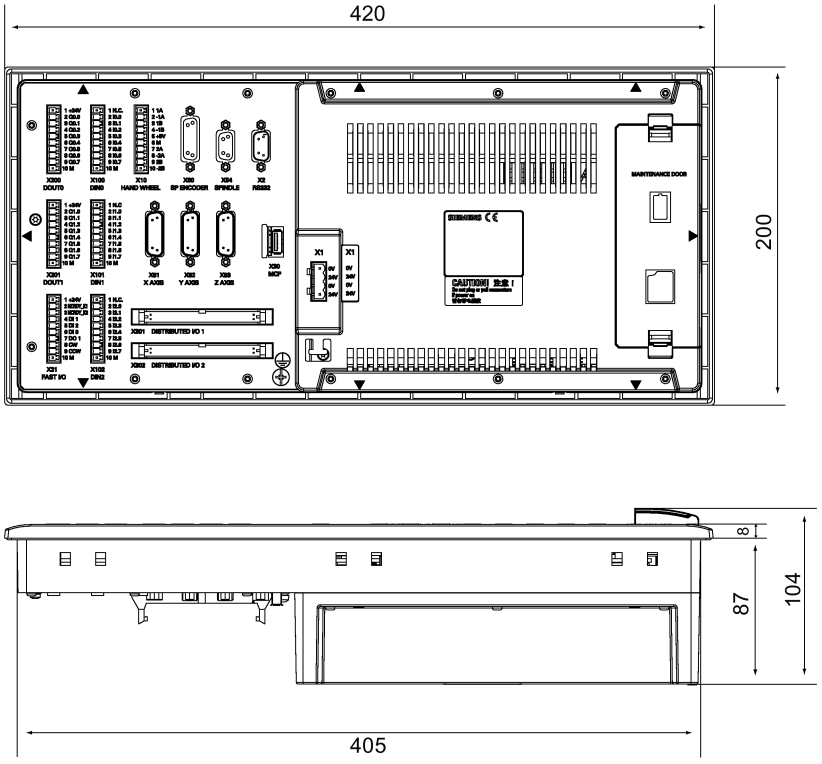


Figure 3-2 Mounting dimensions for PPU (in mm)

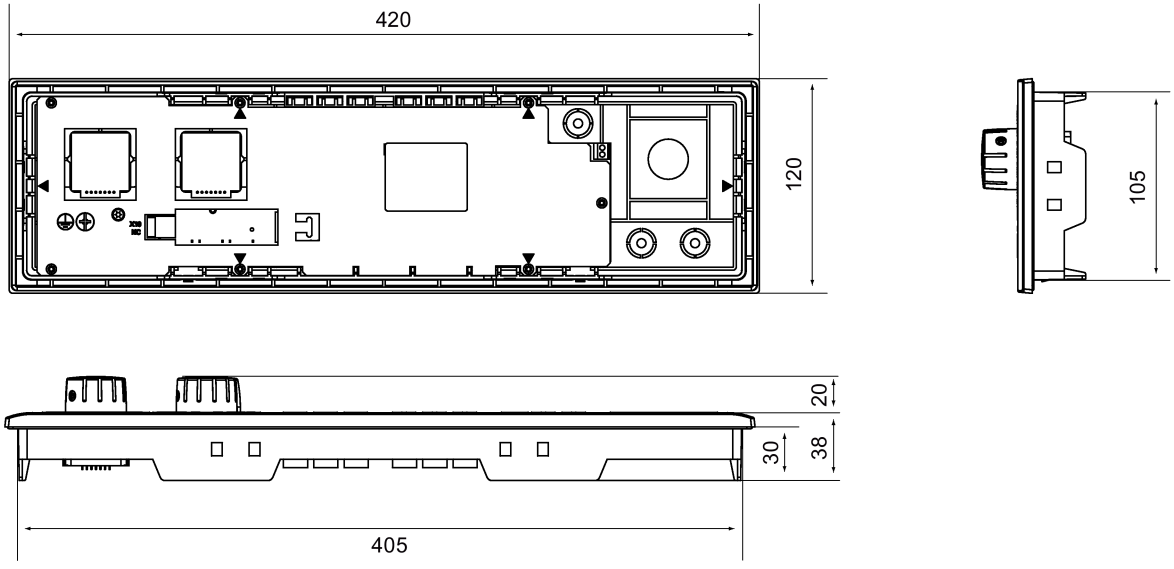
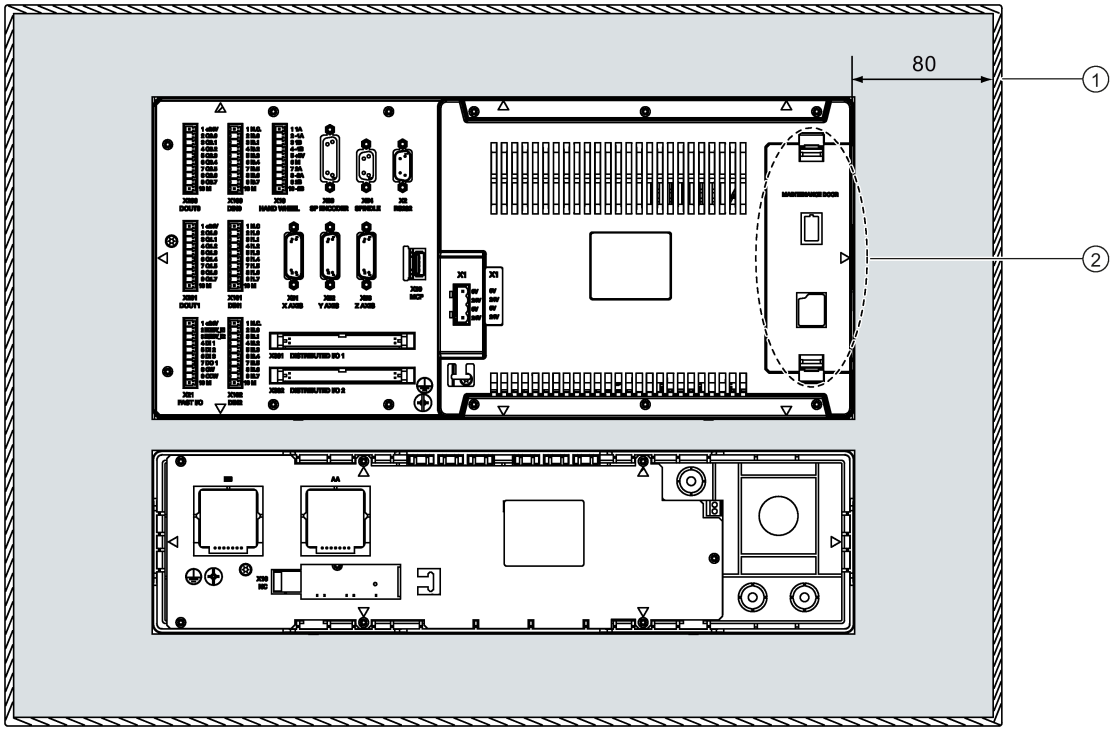


Figure 3-3 Mounting dimensions for MCP (in mm)

Mounting clearance (in mm)

To ensure easy maintenance purpose, you must provide sufficient clearance (recommended distance: 80 mm) between the maintenance door and the cabinet wall for replacing the battery and CF card:



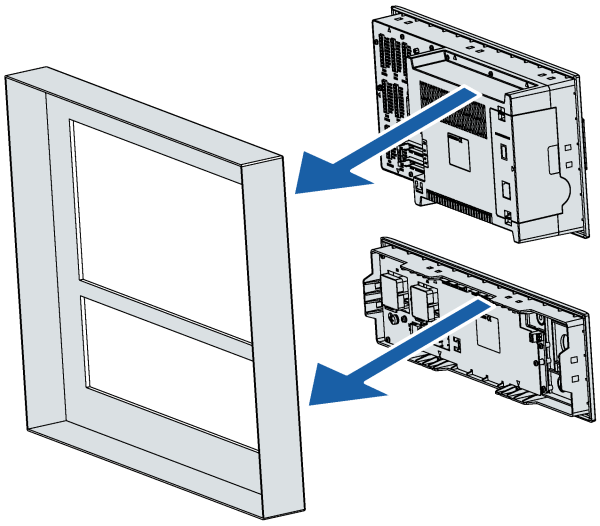
① Cabinet panel

② Maintenance door

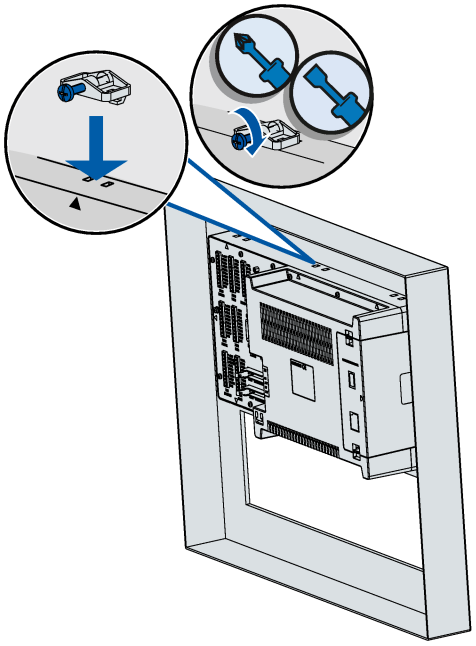
Mounting

You can follow the illustration below when installing the PPU or the MCP:

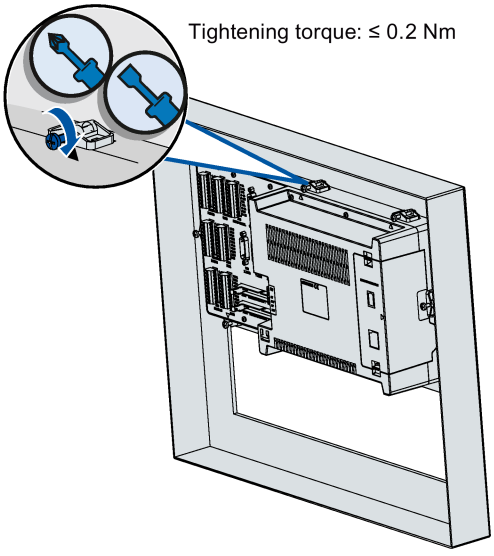
1. Place the PPU/MCP into the cut-out you have prepared.



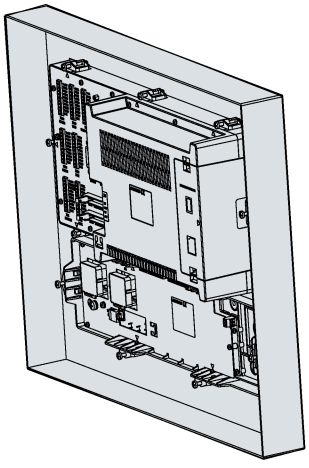
2. Put a clamp with screw into the mounting slots, and pre-tighten the screw with a cross or slotted screwdriver. Eight clamps are available for the PPU, and six for the MCP. All the mounting positions have been marked up by triangles on the PPU or the MCP.



3. After installing and pre-tightening all the clamps for the PPU/MCP, tighten each screw one by one.



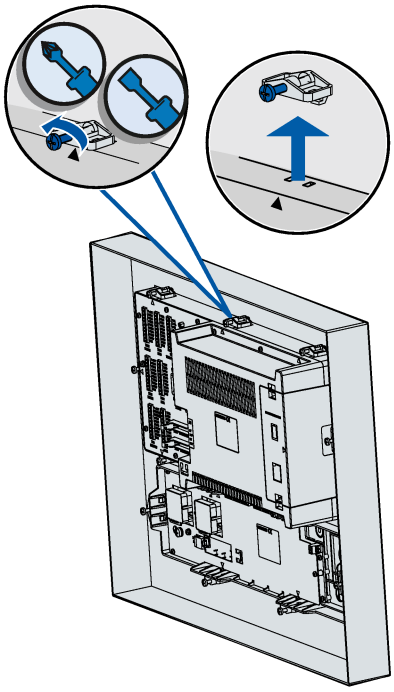
4. Finish mounting the PPU and the MCP.



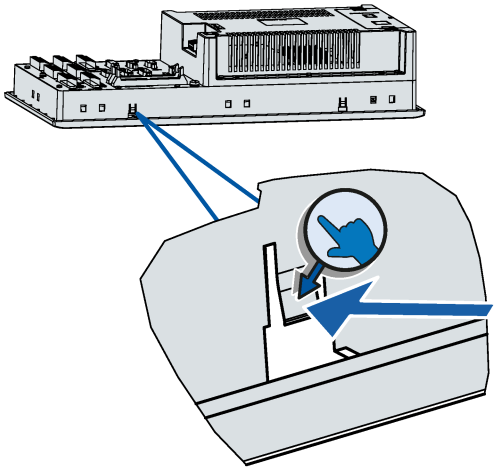
Removing

To remove the PPU or the MCP, proceed as follows:

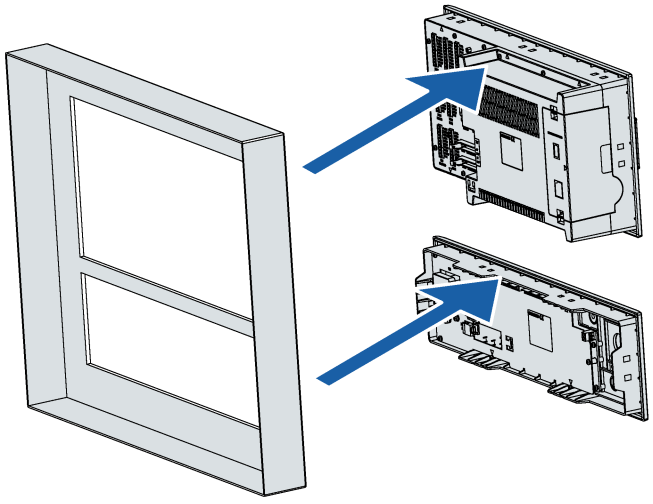
1. Loosen a screw with a cross or slotted screw-driver and remove the clamp from the mounting slots.



2. Two snap-fits are available on the bottom of the PPU/MCP for securing the position. You need to press them inwards so that you can easily remove the PPU/MCP.



3. Remove the PPU/MCP from the cabinet panel.



3.2 Mounting the drive

Cut-outs and mounting dimensions

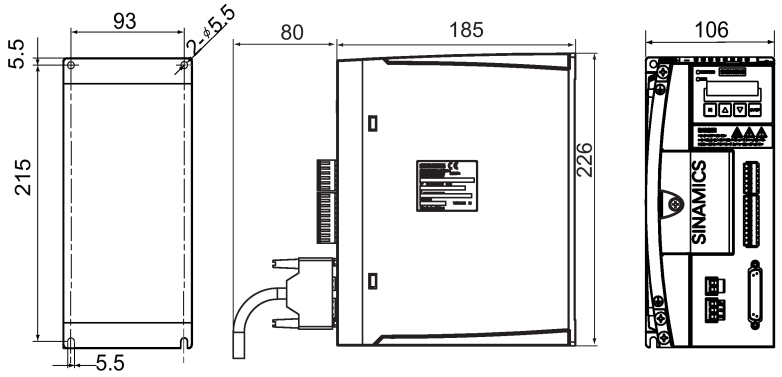


Figure 3-4 4/6/7 A version (in mm)

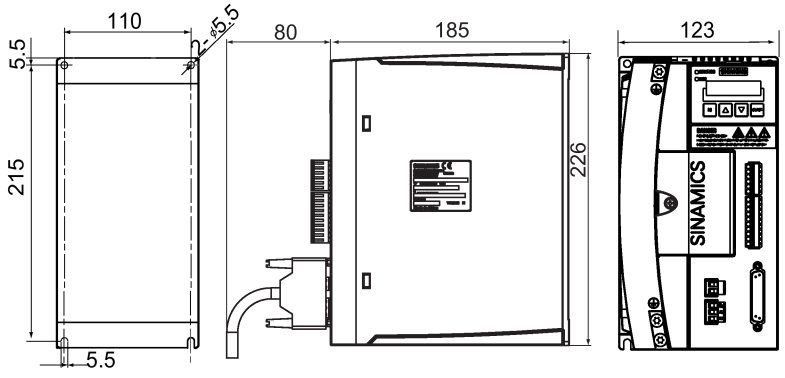


Figure 3-5 10 A version (in mm)

Mounting method

With 4xM5 preassembled screws, the drive can be mounted **vertically** onto the inner panel of the cabinet. The maximum screw torque must be 2.0 Nm.

Minimum mounting clearance

To ensure adequate cooling, as a minimum, maintain the specified clearance between drives, one drive and another device/inner panel of the cabinet.

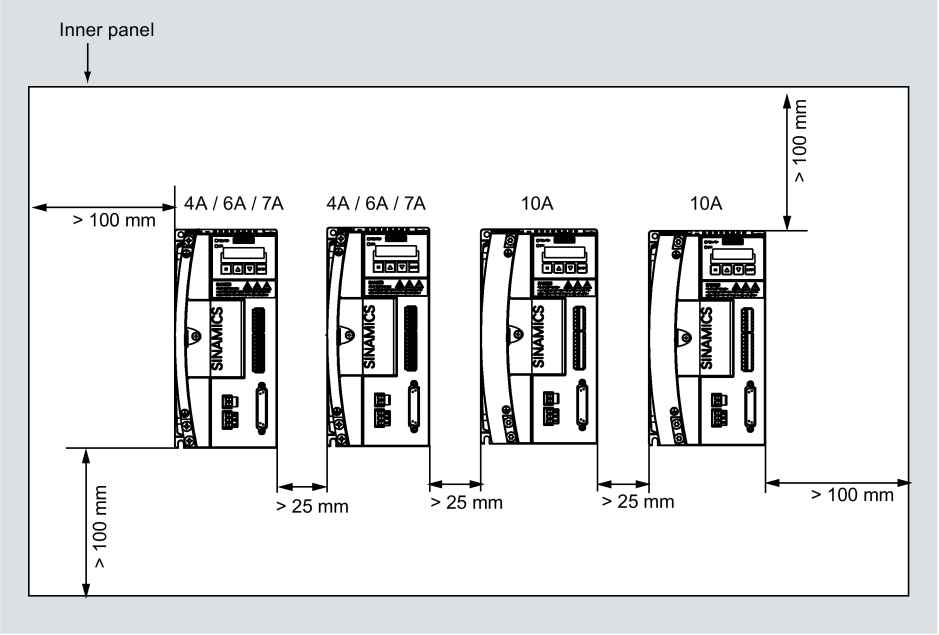


Figure 3-6 Drive mounting clearance (in mm)

Using the cable clamps supplied

If the CE marking requirements for cables are mandatory, the line supply cable and the power cable used must all be shielded cables. In this case, you can use the cable clamps as a ground connection between the cable shield and a common ground point.

Clamps can also be helpful in better fixing cables (the unshielded power cable and the line supply cable) in place.

The illustration below shows you how to use the clamps to fix both cables and to make a shield connection with the cable.

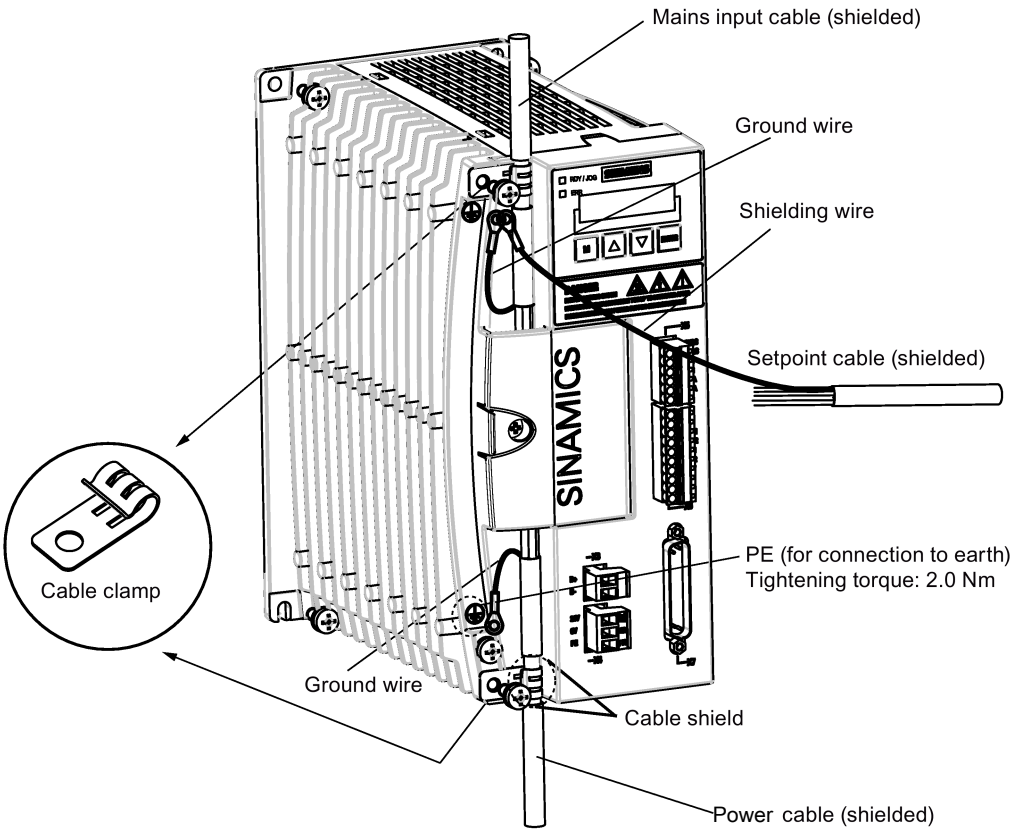


Figure 3-7 Cable fixing with two cable clamps

⚠ CAUTION
Make sure that the clamp for fixing the shielded power cable has a good contact with the cable shield.

Note

Siemens does not provide the shielded power cable. Please prepare the shielded power cable by yourselves for CE certification.

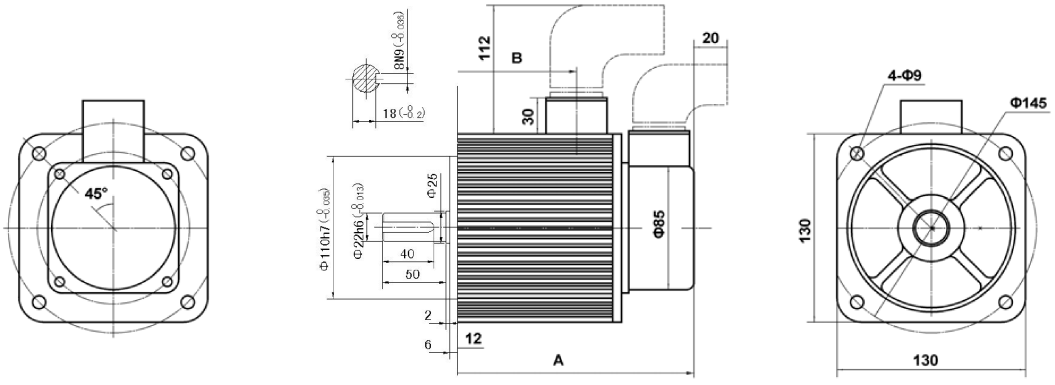
After the installation, it is recommended that the terminal screws should be checked to ensure that they are tight.

Reference

For further information about the drive mounting, refer to the SINAMICS V60 *Getting Started*.

3.3 Mounting the motor

Mounting dimensions (mm)



Motor type	A (in mm)	B (in mm)
4 Nm	163 (205)	80
6 Nm	181 (223)	90
7.7 Nm	195 (237)	112
10 Nm	219 (261)	136

Note

Value in brackets is the length of a motor with a build-in brake unit.

Motors with plain shaft have the same dimensions.

Reference

For further information about the motor, refer to the *1FL5 Motor Technical Data*.

Technical data

4

	PPU	MCP
Design data		
Dimensions (W x H x D) (in mm)	420 x 200 x 104	420 x 120 x 58
Weight (in kg)	3.06	0.86
Cooling method	Self-cooling	Self-cooling
Degree of protection	Front side: IP54 Back side: IP20	Front side: IP54 Back side: IP00
Electrical data		
Supply voltage	24 V DC (permissible range: 20.4...28.8 V)	Powered by PPU
Ripple	3.6 Vpp	-
Current consumption from 24 V	Basic configuration typically 1.5 A (inputs/outputs open)	-
Non-periodic overvoltage	35 V (500 ms duration, 50 s recovery time)	-
Total starting current	1 A	-
Rated input current	2 A	0.5 A
Power loss	max. 50 W	max. 5 W
Interference immunity in accordance with EN 61800-3	≥ 20 µs	≥ 20 µs
Overvoltage category	3	3
Degree of pollution	2	2
Transport and storage conditions		
Temperature	-20 °C to +60 °C	-20 °C to +60 °C
Vibration resistance (transport)	5 Hz~9 Hz: 3.5 mm 9 Hz~200 Hz: 1g	5 Hz~9 Hz: 3.5 mm 9 Hz~200 Hz: 1g
Shock resistance (transport)	10 g peak value, 6 ms duration 100 shocks in each of the 3 axes vertical to one another	
Free fall	< 1m	<1m
Relative humidity	5% to 95%, without condensation	5% to 95%, without condensation
Atmospheric pressure	1060 hPa to 700 hPa (corresponds to an altitude of 3,000 m)	
Ambient operating conditions		
Temperature	0 °C to 45 °C	
Atmospheric pressure	From 1080 hPa to 795 hPa	From 1080 hPa to 795 hPa

	PPU	MCP
Vibration resistance (in operation)	10 Hz~58 Hz: 0.35 mm 58 Hz~200 Hz: 1g	10 Hz~58 Hz: 0.35 mm 58 Hz~200 Hz: 1g
Shock resistance (in operation)	10 g peak value, 6 ms duration 6 shocks in each of the 3 axes vertical to each other	
Lithium battery		
Rated output voltage	3 V	-
Maximum capacity	950 mAh	-
Life time	3 years	-
Certificate	CE	CE

Appendix

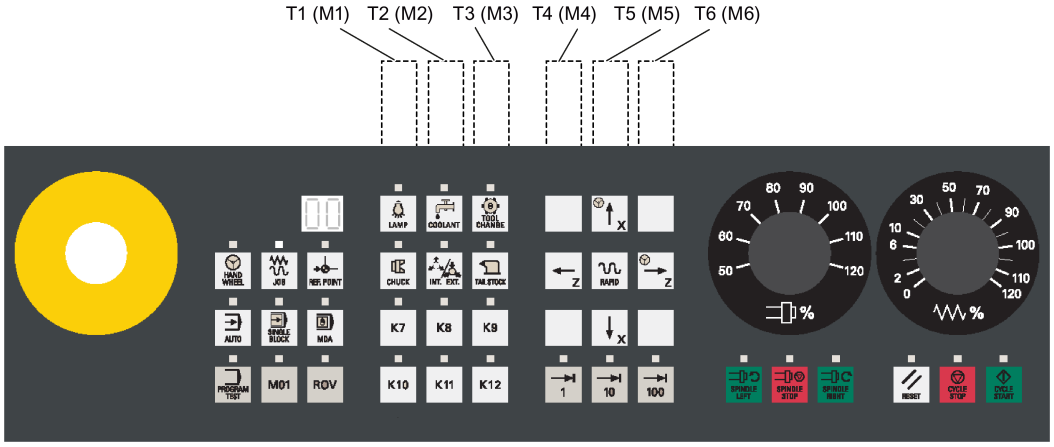
A

A.1 Inserting, printing or cutting the MCP strips

Inserting the MCP strips

The MCP strips for the SINUMERIK 808D of the Turning) are already pre-assembled into the MCP. If you are using the control system of the Milling version, you need to take out these pre-assembled strips firstly, and then insert the MCP strips for the Milling version into the MCP by yourself.

To insert the MCP strips, follow the order shown as follows with reference to the marks (M1 to M6, T1 to T6) on the strips:



Printing customized MCP strips

Siemens provides you a symbol library for customized MCP keys. You can print customized strips with the A4-size blank paper included in the delivered MCP packaged. You can find the symbol library in the Toolbox (...\04040000\examples\MCP).

Siemens also provides you a template file for printing customized strips. Key positions in the template accord with real key layout on the MCP. You can copy symbols from the symbol library and paste them to the key positions that you want to use customized symbols. You can find the template file in the Toolbox (...\04040000\examples\MCP).

Cutting customized MCP strips

The delivered A4-size paper has been pre-cut with boundaries. You just need to tear them off after printing customized symbols.

A.2 Cutting reserved holes

On the MCP, three reserved holes with a standard diameter of **16 mm** are available for you to install necessary devices according to your own needs:

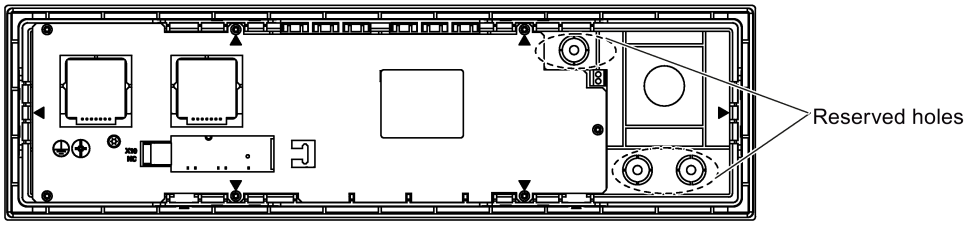
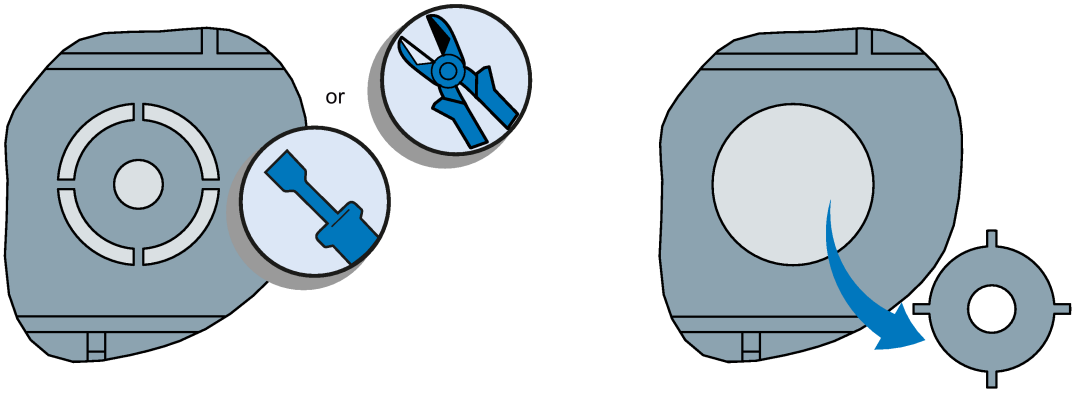


Figure A-1 Reserved holes

To cut a reserved hole, proceed as follows:

1. Prise the plastic ring with a slotted screwdriver or cut it off with a diagonal cutting nippers.



2. Cut the film off with a paper knife. It is recommended to cut the center firstly, then cut the film off right around the hole edge.

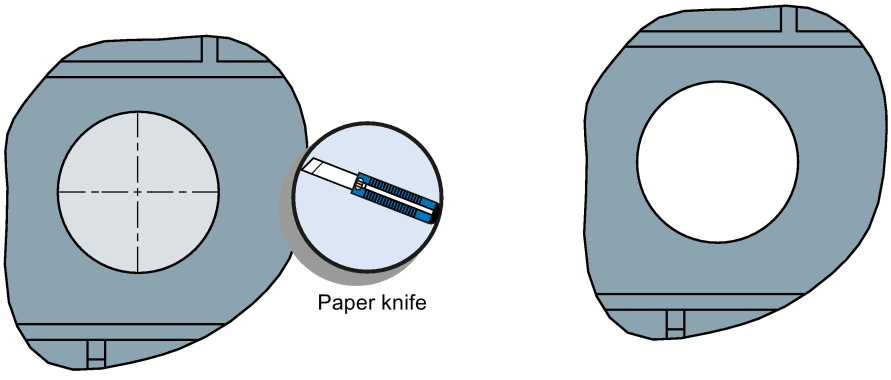


Figure A-2 Cutting reserved holes

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