

isel-CNC Compact Equipment

isel-CNC Machine

CPM 4030

CPM 3020

CPM 2018



Operating and Maintenance Instruction

B.2801xx.06/2002.31/E

Order-number: _____

Serial-number: _____

On this Manual

Various symbols are used in this Manual to quickly provide you with brief information.

Danger	Caution	Note	Example	Additional Information
				

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Despite all care, printing errors and mistakes cannot be ruled out completely. Suggestions for improvement and notes on errors are always welcomed.

 **isel** machines and controllers are CE compliant and are marked accordingly. Any other machine parts and components subject to the CE safety guidelines may not be commissioned unless all relevant standards are fulfilled.

 **iselautomation** shall not accept any liability for any modifications on the device by the customer.

 The limit values specified in the Certificate of Conformity only apply to the original configuration from works.

Manufacturer: Co. **iselautomation** KG

E-Mail: system-sales@isel.com
<http://www.isel.com>

This manual includes the instructions for all machines of the CPM type.
The CPM is provided in three different system configurations.

The CPM as a compact equipment

The complete installation (mechanics, electronics, tooling machine and software (ISY-CAM + REMOTE, I5DRV)) is immediately ready after commissioning.

At every expansion level, the CPM is a compact machine that offers an abundance of possibilities for processing work pieces.

As a prerequisite for your work with the CPM and depending on the implementation, you require basic knowledge in CNC engineering and PC application, a computer, a mains socket, and some creativity.

Please, consider these short instructions to

- properly commission the equipment,
- fast, safely, and effectively work,
- keep away dangers of persons,
- and thus exploit the full potential.

We wish you a lot of success. Enjoy your future working with the CPM.

Contents

1	Intended use .....	.5
2	Notes on safety .....	.6
3	Set up and connecting .....	.8
4	Cleaning / maintenance .....	.10
5	Commissioning .....	.12
5.1	Preparations .....	.12
5.2	Adjustments .....	.13
5.3	Important operating information .....	.15
5.4	First commissioning .....	.17
6	Troubleshooting .....	.18
7	Technical data / accessory .....	.20
7.1	Accessory .....	.20
7.2	Pin assignment .....	.21
7.2.1	For the CPM with elektronik .....	.21
8	Appendix .....	.23
	Certificate of conformity .....	.23
	Service waybill .....	.24

1 Intended use

The CPM is a machine tool with three linear axes that can electronically be controlled. A further (rotary) axis is available in addition.

- The machine is planned for training and the small assembly line production.
- It is designed for the application in dry rooms, business rooms, living and training areas and in labs and small firms (min. 10°C / max. 40° C).
- The machine is suitable for milling, boring, cutting, engraving, proportioning, metering, positioning, and many similar applications.
- You can install the most different suitable tooling tools or mount instruments, appropriate for the above mentioned applications.
- Suitable tooling materials are aluminium, PVC, glass, printed circuit materials. (Please ask us for further treatment materials)
For safety reasons, graphite is not permissible (danger of explosion) as material.
Also not admissible are materials that produce health-endangering gases during processing.
- The machine is prepared for a suction apparatus. With preference, this suctioning is suitable for dry dust kinds.

With the ISY CAD/CAM software, you can directly pass on the previously generated CNC data to the machine and initiate the processing of the work piece via a corresponding controller program.

2 Notes on safety



- The machine must not be operated in a blast capable atmosphere.
- The machine is completely encapsulated. The casing protects you against moving tools, decreases the operating noise level, and restrains the chips.
- While tooling, the hood is locked and can not be opened.
You may neither remove nor modify this protection measure (only type 2 and 3).
- Hardware and software are included in the safety circuit i.e. the machine functions only with the appropriate and intact controller heart on the printed circuit board (only type 2 and 3).
- For emergency situations, you find an Emergency-Off switch on the front-panel of the machine.
It interrupts the power supply to the power module and tooling machine.
However, the software - machine communication remains possible for fault tracing (only type 2 and 3).
- Only experts and trained persons may handle the keyswitch since a higher risk exists in test mode (only type 2 and 3).
Please, keep the alternative key under lock and key.
- All 230 V loads are only single-pole switched. You must assume that an interrupted load is not necessarily voltage-free (only type 2 and 3).
- Ensure sufficient ventilation at dust or gas development that is caused by processing the materials.
- For cooling, no flowing water may be used but only a sprinkle/chilling appliance with which a spray causes the cooling effect (see accessories).
No drops may form themselves and flow under the clamping plate.
- Do not use spirit as coolant (danger of explosion!).
- Clean the machine regularly and remove chips and dust deposits.



Aging of Safety Panes

Investigations, accomplished by the Association of German Machine Tool Factories (VDW) in connection with the responsible employer's liability insurance association have pointed out new aspects about the aging of polycarbonate as material for safety panes at machine tools. Although polycarbonate worked very good for this purpose, these panes sometimes substantially lose their ability to hold back flying around parts, especially under the influence of cooling lubricants. At longer term, polycarbonate panes that are double-sided protected against the effects of splinters, cooling lubricants, detergents, steams, etc. have hereby shown the highest resistance.

In order to set you in the position to carry out your care business, we would like to point out that safety panes made of polycarbonate are therefore to be examined regularly for their retaining abilities and to be changed if necessary. Additionally, such safety panes are to be classified as wearing parts in future. Beyond that, when you sale it, you are also obligated to inform the possible buyer of such a machine accordingly about that.

Even with consideration of these new realizations polycarbonate will be further used as material for safety panes in mechanical engineering due to its extremely high retaining ability. Spare panes ready to be installed can therefore be ordered from us at any time. In order to increase the necessary exchange intervals, we can also offer a retrofit kit for an additional protection on the operator side if desired.

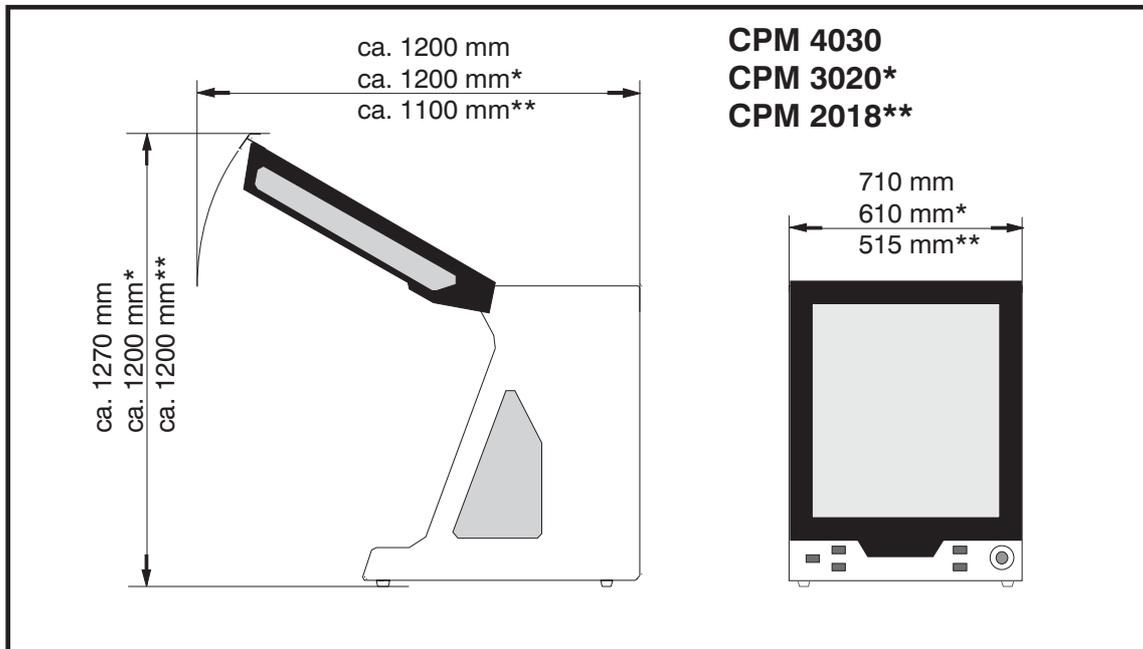
3 Set up and connecting

The machine is provided completely mounted on a palette.

Contained in **scope of delivery** of the CPM are:

- machine case with three linear axes included
 - complete controller electronics
 - drilling and milling machine with 3 mm split chuck - as a standard
- key for split chuck, spanner SW 17
- clamping set (hand lever, stop bars, 5 mm socket spanner)
- triangular wrench for unlocking the hood switch
- AC power cable, PC - machine data cable
- 4-fold socket outlet with illuminated mains switch
- software according equipment package
- and these service and maintenance instructions
- the parts of the scope of delivery can be variant by special systems

The **space requirement** of the machine is limited to the external measurements and to sufficient room in front of the machine in order to operate and arrange the processing, plus approx. 10 cm behind the machine to allow for connectors. The hood of the housing opens upwards. Thus, the required total height is approx. 1,2 meters.



Dimensions and space requirement

Remove the sheet steels of the feet of the machine with which it is secured on the palette.

Then, set up the machine horizontally onto a flat, fixed face.

You can compensate for small unevenness of the base area at the feet.

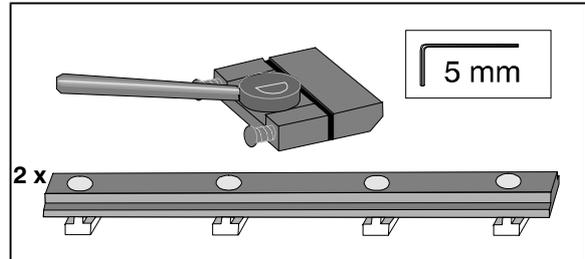
During transportation, please pay attention to the supply and connection cables (remove if needed) so that they are not damaged. Use only suitable lifting devices.

Above all, keep the triangular wrench always **outside of the machine** during transportation.



The **clamping set** is made up by a hand lever clamping assembly and two stop bars with mounting hardware for the T-slot plate.

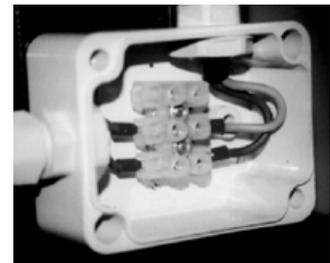
Always ensure that the workpieces are properly secured.



For the **accessories**, different parts are already pre-installed or prepared for mounting.

For this purpose, also read the information in the appendix.

You can connect the cable of a tooling machine to the coupler terminal block in the branch box at the side of the Z-axis.



4 Cleaning / maintenance



Open the hood before switching off the machine using the mains switch. After this, this is no more possible.



Switch off the mains switch before any cleaning and any maintenance. Also, pull the power plug in order to prevent an inadvertent starting.

Clean the machine regularly with a broom or vacuum cleaner of all chips (no compressed air). That protects the mechanics against early wear.

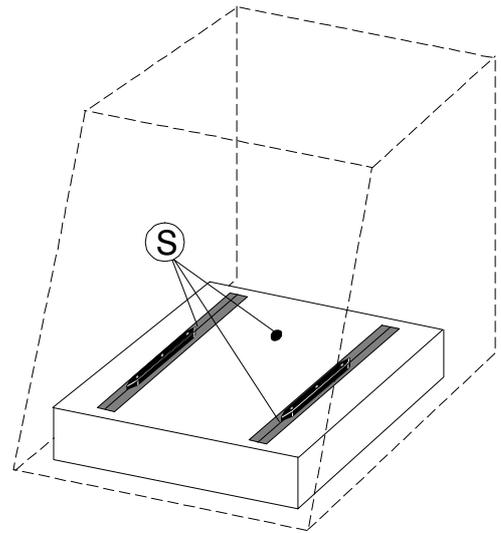
- With frequent machining operations and very fine chips (dusts), you should regularly remove the cover plate of the Y-axis below the T-slot plate and remove possibly penetrated chips and/or dusts.
- The sealing lips include a Teflon component and require no special maintenance.
- Clean the perspex windows with a non-abrasive fluid cleaner.
- The shaft guides and drive shafts are provided with a long-term lubrication ex works. Depending on the load, you should grease the shaft guides and drive shafts approx. all 500-1000 operating hours. Use usual rolling bearing grease for that purpose. Ex works, the shaft guides and shafts are lubricated using GP00/000F-20 sodium soap grease according to DIN 51 502. Please, you lubricate all 100-200 operating hours if you use oil. At first, make a reference movement for lubricating the driving axis. Then, open the hood and only now switch off the machine.

In order to lubricate the Y-axis, you must completely push* the T-slot plate to the back. Next, unscrew (six screws) it from the Y-axis.

Remove the plastic plug lying under it and lubricate through the now visible lubricating nipple.

You reach the shaft guides through the sealing lips.

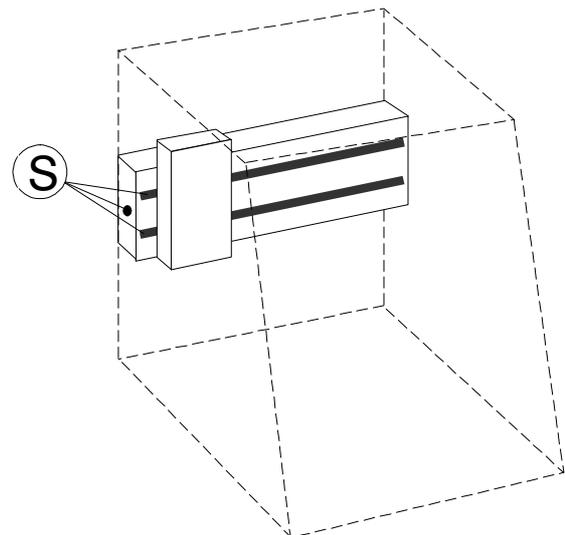
Loosen the all around holding-down screws in order to remove the cover sheet of the Y-axis.



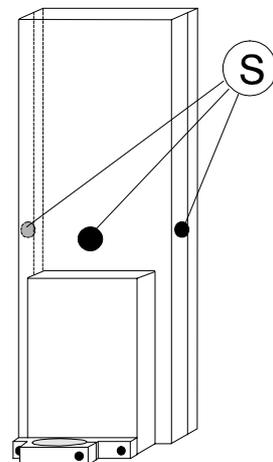
 (S) in all drawings is the characterize accesses to the greasing points.

To lubricate the X-axis, move the sledge to the left*. Remove the plastic plug on the left side of the machine and lubricate through the now visible lubricating nipple.

You access the shaft guides again through the sealing lips.



At the Z-axis, you must first take the tooling machine from its support. Remove the three plugs and push the sledge completely down*. You can apply some oil onto the shaft guides through the two side holes. The lubricating nipple for the drive is now behind the front opening.



* You can displace the sledge using the hand if the machine is off.

5 Commissioning

5.1 Preparations

For controlling the CNC machine and/or the FLASH EPROMs, you require one IBM compatible computer with a free serial interface.

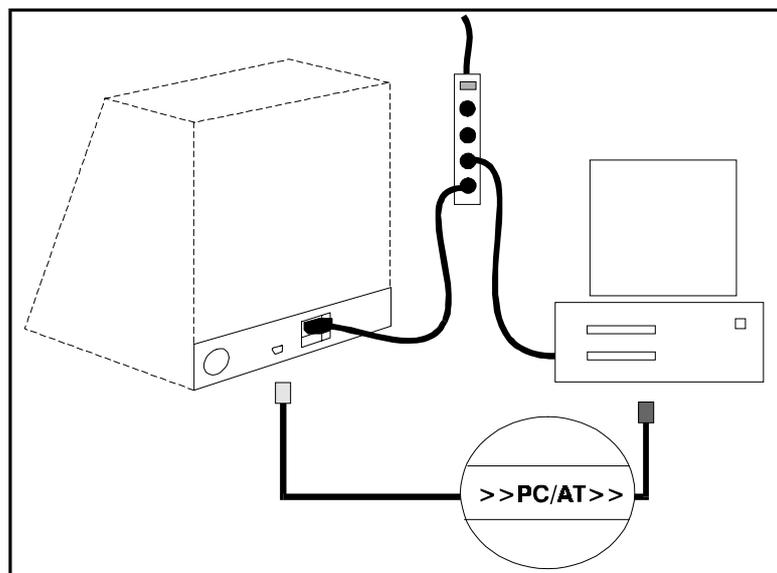
The system requirements of the control PC depends on the respective operating system and the interpreter software (control software)

Connecting cables

The serial port is used as an interface of the machine to the computer using the enclosed cable (max. three meters in length, you find the pin assignment of the 9-pin Sub D connector in the Specification section).

Connect the red connector of this cable to the PC. This side of the cable is again marked with <<PC/AT<<. Connect the gray coupler on the reverse side of the CPM.

Use the multiple socket strip for connecting power to the computer and to the machine. Connect the power cable only if the machine is ready for commissioning.



Mount the **axis of rotation** (optional) onto the T-slot plate in accordance with the assembly and operating instructions of the axis of rotation in the appendix. Connect the cable to the axis of rotation and the female Sub D-9 connector in the rear wall of the working space. How to precisely set up the axis of rotation is also described in the assembly and operating instructions in the appendix.

5.2 Adjustments

Setting of the transfer rate (baud rate) and/or of the delay period.

With the H1 jumper field, you can set the transfer rate (9 600 or 19 200 bauds) and/or the delay period of the hood switch (1 or 5 seconds).

- The baud rate is the transfer rate of the serial interface of the computer communicating with the controller (see the manual for further information).
- Delay is the time passing by between the switching-off of the tooling machine (or the end of tooling) and the releasing of the COVER button for opening the hood. Delay is used to wait for the running out of the tooling machine to avoid dangers. Especially with educational and training applications, 5 seconds of delay are reasonable and should also be set.

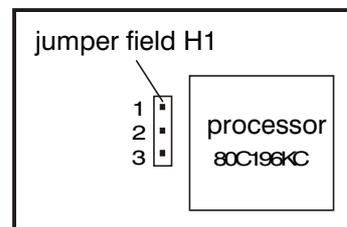
Pull the power plug before you place jumpers or remove them.

The jumper field is on the printed circuit board (in the figure on page 19, position 12).

- Ex works, all jumpers are open, i.e. the baud rate is set to 19 200 bauds and the delay to approx. 1 second.
- A jumper between pin 1 and pin 2 sets a baud rate of 9 600 bauds.
- A jumper pin 1 and 3 between extends the delay period to approx. 5 seconds.

The new setting is taken over with the powering-up of the machine.

All other jumpers on the printed circuit board must not be modified!



Tooling machine (only in the case of type 3)

In the collet ④, the standard tooling machine can take tools with a maximum shaft diameter of 6.35 mm (standard 3 mm, other diameters see Accessory). Use the sickle spanner and the spanner SW 17 open end wrenches for changing the collet.

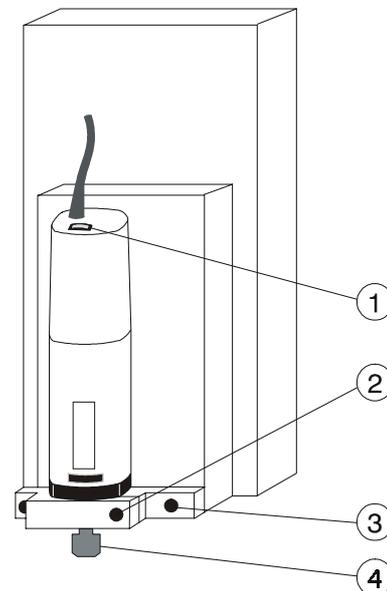
The current for the tooling machine is only enabled by the software. You can manually adjust the rotation speed of the machine using the ① wheel.

Switch off the main switch of the CPM for dismantling the tooling machine. Remove the electricity cable from the coupler terminal block, loosen the clamping screw ② and take the tooling machine from the holder.

For dismantling the machine with the holder, remove the electricity cable, the two outside screws ③ (loosen only, do not screw very out) and remove the machine with holder and T-slot stones downwards.

Using corresponding holders, you can also attach many other tools, measuring instruments (laser), or other suitable equipment to the T-slot plate of the Z-axis. Use the branch box at the Z-axis for the electrical connection.

If you want to mount the tooling machine or other tools again, you must realign the holder parallel to the XY-plane.



5.3 Important operating information

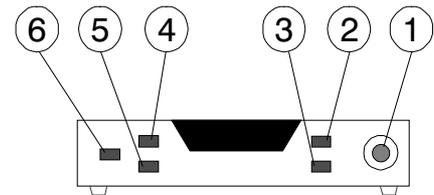
Push-buttons and switches

The black **mains switch** is located on the rear side of the machine directly beside the mains connection.

Using the switches and/or push-buttons on the front side, you can switch the machine on and off and start and stop the processing in a purposeful manner.

① Emergency-off

Abort of all functions; the error status remains testable using the software; after a delay, the hood can be opened using the ⑥ push-button. Releasing Emergency-Off by turning to the right.



② POWER

You can only turn on the power stage if Emergency-Off is released.

③ Keyswitch

Using the key, you can switch between test and automatic operation.

AUTO = processing mode

In the automatic mode, the machine either works stand-alone based on the program that is stored in the FLASH EPROM (CNC mode) or via the connected supervisory computer (DNC mode). You can interrupt tooling using STOP and continue to work using START.

TEST = test mode

In this operating mode, you can open the hood at any time if the tooling machine is switched off. You can continue to process the programs. However, the tooling machine is switched off if the hood is opened and can not be switched on again. The sledge remains freely moveable also with manual traversing (teaching).



Take care of the mobile sledge: Danger of bruising!

Pay attention to the moving-in depth: Collision danger with the work piece!

④ START

- If a program is stored on the FLASH EPROM then the program is started by pressing this button independently of whether a computer is connected or not.

- After a hold using the button ⑤, the machine restarts the stopped movement exactly at the location where it was interrupted provided that tooling has not being terminated via the man-machine interface.

⑤ **STOP**

Execution of the current program is immediately stopped and remains at the (program) location. The tooling machine is switched off. In the DNC mode, you can issue further commands via software. This is not possible in the CNC mode.

After a time delay of 1 or 5 seconds, the COVER button lights up and you can open the hood. With a closed hood, you can continue the program by pressing the START button.

⑥ **COVER**

Only if the button is lit, you can open the hood by pressing this button (first, press the button, then pull simultaneously at the grip!). In the unfavorable case if you set only a delay period of one second, the spindle can continue to rotate for a few seconds.

Do not reach into the still revolving tool.



5.4 First commissioning

During the first commissioning, you should carry out the following steps:

- For the first opening of the hood, connect the power cable and turn on the mains switch. The COVER button ⑥ should light up now; you can open the hood if this button is lit.
- Emergency-Off must be released for all following functions.
- Close the hood and turn on the power stage using the POWER push-button ②; the push-button must light up.
- You can execute the software at any time. However, an error message is displayed if the machine is not operational (power stage turned on).
- You can start a program stored on FLASH-EEPROM by pressing the START button. Of course, the machine must first be set up correspondingly.
- The hood is locked while tooling. You can only open the hood after the machine stands still, the tooling machine is off, and the software enables the opening of the hood (the COVER button lights up).
- You must press the COVER button for opening the hood. The hood is automatically locked after closing. To start the machine, you must press the START button again.

Please, refer to the corresponding software manual for all further information on working with the software.

Keyswitch

For debugging the program, you can nevertheless open the hood during the operation if you turn the keyswitch to TEST (test operation). In this case, the tooling machine must be switched off but the work program is continued.

Take care to retract the tool from the work piece!



This key may only be used by expert and authorized personnel since no protection against moving machine parts is available anymore after opening the hood.

Machining machine

The tooling machine is directly wired and switchable using the software.

The same applies to the three other switchable outputs (optional) that you can use to switch optional devices (refer to the technical data).

The tooling machine can only be turned on if the POWER button is lit, the hood is locked close, the rotary switch at the machine is set to ON, and the software controls the machine.

6 Troubleshooting

Fault	Cause	Remedy
Equipment can not be turned on	No mains power is available	check the mains circuit, power plug, multiple socket outlet
	Mains switch is not turned on	turn on the mains switch
	Fuse is defective	Pull the power plug replace the fuse (see below)
POWER button does not function	Hood not closed	close the hood
	Emergency-Off not released	release Emergency-Off
	Fuse is defective	Pull the power plug replace the fuse (see below)
Software does not work correctly	Equipment not turned on	turn on the equipment (mains switch)
	Power stage not turned on	activate power stage (POWER button)
	Driver not loaded	install the driver
	Connection is not correct	check the cable connectors
Tooling machine (spindle) does not function	Not released by the software	reset the equipment and perform a reference movement
	Rotary switch at the tooling machine is off	turn on the tooling machine
	Fuse is defective	Pull the power plug replace the fuse (see below)
Scaling of the axes is not correct	Leadscrew pitch does not correspond to the setting in the software	Change the leadscrew pitch in the driver program to 4 or 10 mm
First movements do not correspond to the programm	EPROM contents a program	Delete the EPROM (s. page 16)

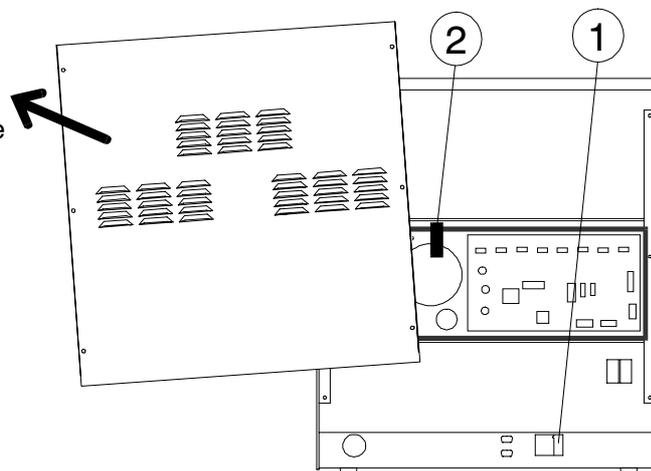
Fuse replacement



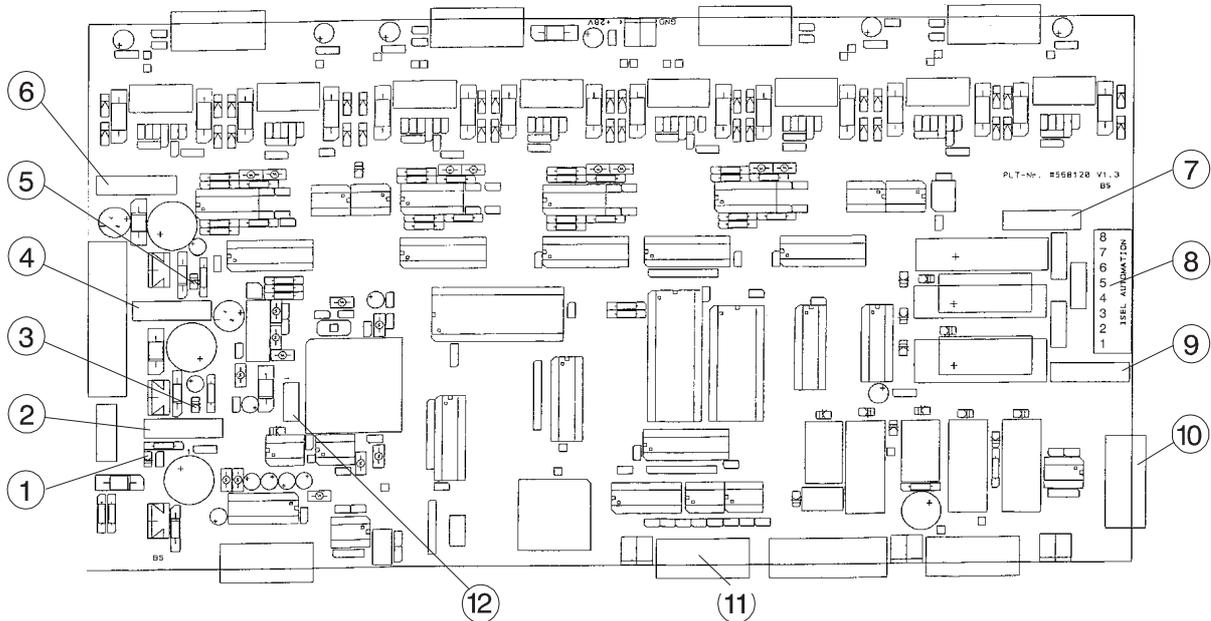
Pull the power plug before changing any fuse!

The main fuses of the machine ① are amenable from the outside. They are located directly beside the power plug.

Remove the large rear-panel for changing the other fuses. You find the main fuse for the motor voltage ② in front of the transformer in the black plastic holder (① + ②: 6.3 A each). The remaining fuses are located on the controller printed circuit board.



Please refer to the following drawing for the positions of fuses (②, ④, ⑥, ⑦, ⑨) and LED's (①, ③, ⑤).



Controller printed circuit board behind the rear-panel

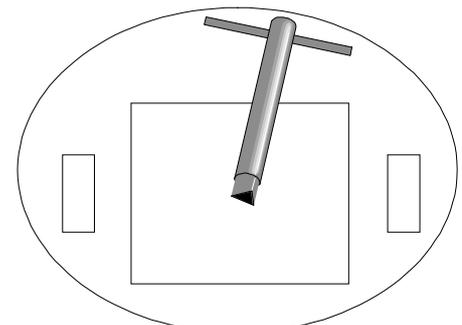
① Controller LED	Processor supply voltage 10 V/5 V
② Input fuse	1,25 Amp, slow ones
③ Controller LED	24 V I/O voltage
④ Input fuse	1,25 Amp, slow-blow
⑤ Controller LED	24 V safety circuit voltage
⑥ Input fuse	1,25 Amp, slow-blow
⑦ Supplementary output fuse	230 V, 1,25 Amp, slow-blow HBD
⑧ Supplementary output connector	230 V
⑨ Tooling machine fuse	230 V, 5 Amp, slow-blow HBD
⑩ suppl. outp. 9-pin Sub-D f. con.	15 mA max.
⑪ suppl. inp. 9-pin Sub-D fem. con.	
⑫ H1 jumper field	

For special cases (if a switch is defective or in case of power failure etc.), you can manually open the hood interlock using the triangular wrench.

1. Switch off the machine and lift the machine.
2. Remove the four screws and the shield in the bottom plate.
3. Insert the triangular wrench into the interlock from below and turn it around half a turn to the left without applying excessive force.

You may not operate the machine in this state.

The tooling machine remains de-energized.



Hole to the keyswitch (from below)

7 Technical data / accessory

	CPM 2018	CPM 3020	CPM 4030
Measurements w x d x h [mm]	515 x 580 x 615	610 x 655 x 705	710 x 820 x 750
Movement areas X/Y/Z [mm]	200/175/90	295/200/130	395/300/140
maximum axis speeds [mm/s] (without a load)	50	50	50
Pass-through height [mm]	90	115	160
Clamping table [mm]	250 x 425	250 x 500	375 x 600
T-slot raster [mm]	25	25	25
Type 2 and 3	all axes with 10 mm leadscrew pitch		
Approx. weight [kg]	71	76	89
Sound pressure level	78 decibel (A)	78 decibel (A)	78 decibel (A)
Mains rating	230 V, 50 Hz, 16 Amp		
Max. power consumption	1150 W		
Fusing	power input 2 x 6.3 Amps, slow-blow HBD		
Earthing	corresponds to protection class I.		
Electric connections	2 x 24 V, optional, switchable, 20 mA via optical isolator 1 x 230 V, optional, switchable, 100 W 1 x 230 V, switchable for the tooling machine		
Tooling machine (model 3)	500 W, 11.000 - 25.000 r.p.m., firmly wired		
EMC test according to	EN 55011-B and EN 50082-1		

Technical subject to change

7.1 Accessories

You can order the following accessories that matches the CPM:

- additional collets for the spindle:

1 to 5 mm in 0,5 mm steps, 6 mm and 1/8"

- additional mounting hardware for the T-slot plate

- working area light (not for type 1)

- suction apparatus

- vacuum cleaner

- engraving spindle (25 000 r.p.m.) with mech. high offset

- engraving pad

- sprinkle/chilling appliance

- axis of rotation

- grease gun

- length measurement unit

Order no.:

e. g. 239 110 3000

e. g. 290 002

280 1XX 9004

280 1XX 9001

425 005

421520

280 1XX 9003

280 1XX 9002

on inquires

931 170

280 110 9010

With every accessory, pay attention to an expert assembly and consider the valid standards and safety regulations.

In the appendix, you find the assembly and operating instructions for the accessories.

For further information and/or purchase orders, please turn to **Technical consulting**

CNC systems phone +49-6672-898-218, -489, -215

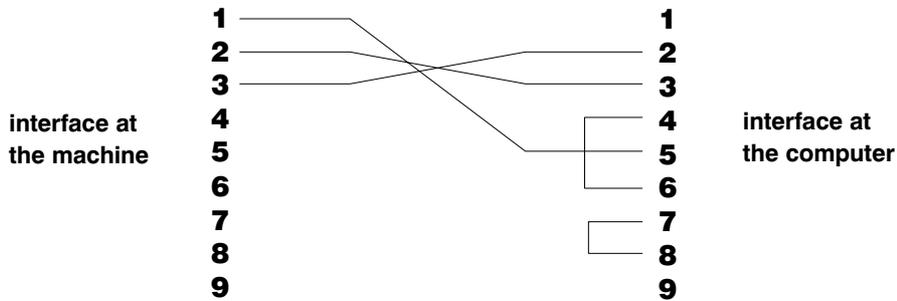
fax +49-6672-898-222

email system-sales@isel.com

7.2 Pin assignment

7.2.1 For the CPM with elektronik

The pin assignment of the connection cable for the serial interface:



Please, consider the following notes if you want to custom-specifically setup the optional supplementary inputs/outputs:



Let only specialists carrying out the work since otherwise danger exists for your life!

The numbers in the circles refer to the figure of the controller printed circuit board (page 19).

To the 24 V outputs:

You can tap the voltage at the 9-pin Sub D connector ⑩.

The switching outputs OPTO-5 and OPTO-6 are carried out with optical isolators with emitters led outwards. They are available for signaling. These outputs are not disconnected in case of Emergency-Off.

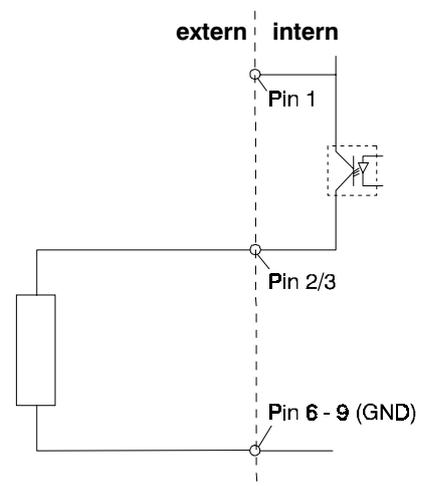
You must connect your loads against GND 24 V I/O (pins 6 to 9).

The maximum switching current should not exceed 15 mA!

The switching outputs are not short-circuit-protected.

Pin	Description
1	+ 24 V I/O voltage
2	out OPTO-5 (bit 5) open emitters
3	out OPTO-6 (bit 6) open emitters
4	free
5	+ 24 V I/O voltage
6	GND 24 V
7	GND 24 V
8	GND 24 V
9	GND 24 V

Connection example:

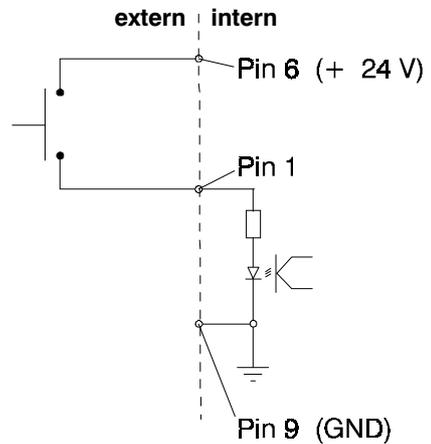


To the 24 V inputs:

Use the 9-pin Sub D connector ⑪ (see image page 19). The input is carried out using an optical isolator with the anode led outwards. The necessary series resistor is available on the printed circuit board.

Pin	Description
1	user input 2
2	user input 1
3	occupied
4	occupied
5	GND 24 V
6	+ 24 V I/O voltage
7	occupied
8	occupied
9	GND 24 V

Connection example:



Use pin 6 for the 24 V control voltage of both inputs.

Pins already used by *isel automation* must not be modified. Otherwise, the machine can not function properly.

230 V output:

Use the ⑧ connector (see image page 19). **The connector carries 230 V potential!**

Terminal	Description
1	230 V, live supply
2	switching output tooling machine
3	switching output 230 V OUT 3 (bit 3)
4	null tooling machine
5	null supply
6	null OUT 3
7	null OUT 4
8	-

You can replace the pre-installed tooling machine on terminals 2 and 4 by another machine (max. power approx. 900 W).

Additional 230 V loads must be connected to terminals 3 and 5 and/or terminals 6 and 8.

A maximum of 1 Amp (200 W) can be drawn from output 3.



All 230 V loads are only single-pole switched. You must assume that an interrupted load is not necessarily voltage-free.

In addition to the fusing ⑦ and ⑨, all 230 V switching outputs (terminals 2, 3 and 8) are protected by a common fuse at the power input.

Certificate of conformity

We **isel automation** KG
Im Leibolzgraben 16
D-36132 Eiterfeld

hereby certify on our own and sole responsibility that the machines

Article Designation: **CNC compact equipment CPM**

Article Numbers:

CPM 2018	CPM 3020	CPM 4030
280 100 2418 / 280 101 2418 280 100 3418 / 280 101 3418	280 110 2030 / 280 111 2030 280 110 3030 / 280 111 3030	280 120 2036 / 280 121 2036 280 120 3036 / 280 121 3036

to which this Certificate refers have been developed, designed and manufactured to comply with the

EC Directive 73/23/EEC ~ 93/68/EEC
EC Directive 89/336/EEC ~ 93/68/EEC
EC Directive 89/392/EEC ~ 93/68/EEC

The following harmonised standards have been applied:

- 1. EN 292 parts 1 and 2**
Safety of machines, generic terms, general design directives
- 2. EN 294**
Safety distances against reaching dangerous locations with the upper limbs
- 3. EN 349**
Safety of machines:
- Minimum distances to avoid bruising of parts of the body
- 4. EN 418**
Safety of machines:
- Emergency stop device, functional aspects, design guidelines
- 5. EN 953**
General demands on the design and of disconnecting protective devices
- 6. EN 954-1**
Safety-related parts of control systems
- 7. EN 60 204 part 1**
Electrical equipment of industrial machines, General requirements
- 8. EN 55011 (VDE 0875)**
Limit values and measuring methods for radio interference suppression of industrial, scientific and medical HF devices (limit class B)
- 9. EN 50082-1**
Electromagnetic compatibility
Basic Specification for noise emission
Part 1: Living areas, business and trade-areas and small firms
- 10. IEC 1000-4 (parts 2-5)**
Testing and measuring methods for noise immunity

Eiterfeld, den 11.07.02



Hugo Isert, General Partner

Please, take note in case of returning the product!

1. Warrantee proof

For the examination of your warranty claim, a copy of the purchase bill or of the receipt is required. We return the product unprocessed against a charge if this proof is missing.

2. Error description

In case of products arriving without precise error description at our facilities (“Defective” or “For Repair” is not sufficient), we have the right to select between carrying out of a liable to pay the costs fault diagnosis or the non-repaired returning against a service charge.

3. Inadmissible complaints

In case of inadmissible complaints (no fault is detectable, probable operator error), the product is self-consciously returned against a service charge.

4. Wrapping

We can only accept returned products in original **isel** packing or equivalent wrapping. The warranty claim is endangered by missing original or inappropriate wrapping. Resulting transport damages cause the expiration of the warranty claim.

5. OEM products

Products which were not delivered by us are returned in a non-repaired manner against a service charge.

6. Transport charges

isela automation carries the transportation charge for returns from warranty claims. The sender bears all other haulage. Product sent in without paid transportation charges can not be accepted for organizational reasons.

7. Sales conditions, delivery conditions, and terms of payment

As for the rest, the sales conditions, delivery conditions, and terms of payment of **isela automation** are valid without change.