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From Components to Systems



CNC Machine EuroMod 45 with tooling spindle and 4th Axis (Rotational axis)

www.isel.com

Assembly Instruction for CNC base machinery (partly completed machinery)

Operating Instruction for CNC machinery (complete machinery)

Type: EuroMod ®

Models: EuroMod 30, 45, 65

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About this manual

Used shortcuts

MD **Machinery Directive 2006/42/EC**
SCM **Safety Circuit Module**

Used symbols

You will find different symbols in this manual that signalizes important information/ facts and danger.



Warning!
This symbol indicates dangers that cause damages for person's health, physical injury or death.



Warning! Dangerous voltage!
Warning of danger from electricity. Ignoring can lead to serious injury or death.



Attention!
This Symbol indicates important notes. Ignoring this symbol leads to damages and malfunctions of the machinery.



Information:
This symbol indicates important information and notes.

Observe the safety instructions



Before you put into operation the CNC machine / CNC base machine EuroMod, work with the machine or make additions or changes to/with the wiring of the machines electrical control cabinet / in the housing of the machine, make sure to read carefully:

- **the safety instructions in this manual (Chapter 3) and**
- **the safety instructions for DC / AC Power amplifiers in the Operating manuals for Servo positioning modules with CANopen Interface /1.1/ resp. /1.2/**

This Operating instruction has to be found near the CNC machine, so it has to be guaranteed that the user has always access to the information inside it.

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Despite all care, printing errors and mistakes cannot be excluded. For suggestions and information on errors, we are grateful.

CE mark for (complete) CNC machinery:
isel CNC machinery are CE compliant and marked accordingly. For these machinery the CE declaration of conformity is valid.

No CE mark for partly completed CNC machinery:
Partly completed machinery (definition from EC machinery directive 2006/42/EC) has no CE mark.

For partly completed machinery the declaration of incorporation (referred to in Annex II, part 1, section B) is valid.

For all other machinery parts and components, be applied to the CE safety directives, initial operation are prohibited until all appropriate requirements are met.

The company isel Germany AG assumes no responsibility or liability if you make any changes without the consent of the manufacturer of the machine that affect the CE-conformity of the machine.

The EMC test is valid only for the controller's original configuration ex works, i.e. the delivery state.

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Technical specifications subject to change. Up to date Operating instructions and manuals for download you can find here:

www.isel-data.de/manuals

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1 Introduction

All ***isel*** CNC base machinery (corresponding MD 2006/42/EC **partly completed machinery**) respectively ***isel*** CNC machinery (corresponding MD 2006/42/EC **complete machinery**) of type EuroMod (evenso machinery of type FlatCom, OverHead and ModuStar) are proven CNC machinery. They provide the user a wide range of possibilities for 2D or 3D processing of work pieces.

Machinery are constructed in different sizes and accomplishments. The base are exactly fitted and variable mountable standard profiles and drive units. Depending from the machinery demands according kinematics the units are mounted. The appearance of machine of one type is always the same. Applications of a concrete machine respectively the tool mounted on the Z axis are variously.

All CNC base machinery / CNC machinery of type **EuroMod** have a unique control and safety concept as well as a unique design of the mechanics. Each single machine becomes configured, measured and tested for many hours before delivery to the customer.

For every delivered CNC base machine / CNC machine a check protocol is archived under the special order number at the manufacturer isel Germany AG. The customer can request this protocol. All CNC base machinery / CNC machinery are surveyed with circle form tester QC10 from ***Renishaw***® in all three interpolation planes resp. Laser interferometer.

As presupposition for your work you need basic knowledges in CNC technics and PC application. It would be good to know also the terminology of the current valid MD:
- **MD** 98/37/EU **applicable** until 28.12.2009
- **MD** 2006/42/EU from 29.12.2009 **obligingly by law**

Please note this manual that you
- install and do commissioning of CNC base machine / CNC machine correctly
- can work safety, fast and effectively
- keep away danger from persons and the equipment
- can fully profit from the capabilities of CNC base machine / CNC machine

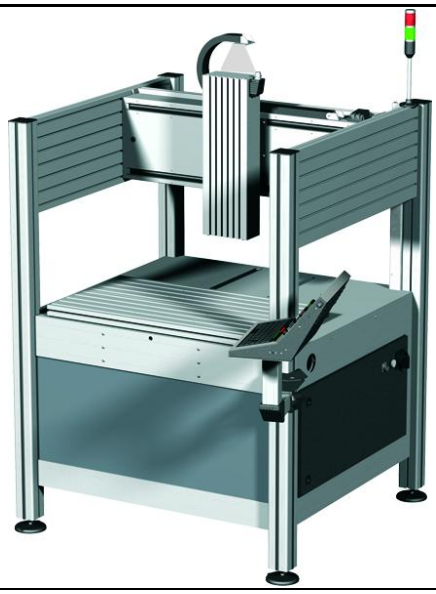
The statements in this manual orientate to a standard complexity of deliver the CNC machine is ready for operation. Notes not related to the machine (e.g. accessory or software) you can skip when reading the manual the first time.

The statements in this manual are basing on the following configuration / technical state of the CNC machine control system:
- all motor amplifiers have **monitoring of standstill state**
- Operator software is: ***ProNC /6/ or / Remote /7/ higher then version 1.45.6.0***

For installation and commissioning the software or accessory please note the supplemental manuals. They are composed in the bibliography of this manual.

Example **CNC base machine** EuroMod 45:

- **partly completed machine**
- equipped **without tool**, no clearly definition of application purpose
- this CNC base machine is delivered **without CE mark**
- for this CNC base machine the **Declaration of Incorporation** is valid



Example **CNC machine** EuroMod 45:

- **complete machine**
- equipped **with tool** milling spindle, so applicable for milling or drilling
- this CNC machine is delivered **with CE mark**
- for this CNC machine the **Declaration of Conformity** is valid



2 Intended use and reasonably foreseeable misuse

isel CNC machinery / *isel* CNC base machinery are CNC controlled machinery with more than one linear axis resp. one or two optional rotation axis. The motor power amplifiers will be driven via a PC based CAN-CNC-control (CANopen standard). All control and power electronics for the axis is mounted in a control cabinet.

Differences between CNC-machine and CNC-base-machine:

***isel* CNC machine:**
In the new, at 29.12.2009 legally binding machine directive 2006/42/EC, is the term "**machinery**" defined as follows (quote from EC directive, acticle 2, letter a):

„*machinery*"

an assembly, fitted with or intended to be fitted with a drive system other than directly applied human or animal effort, consisting of linked parts or components, at least one of which moves, and which are joined together for a specific application.

Each isel-CNC-machine delivered **with a tool** (e.g. milling or engraving spindle, metering device, measuring device like CCD camera or triangulation laser, water jet nozzle, plasma burner), is for the purpose of the directive 2006/42/EC a machine, because she was manufactured for a specific purpose resp. specific application **and therewith a specific usage.**

The usage results from the kind of tool which is mounted on a moveable axis, e.g.:

tool = milling tool	→ usage for milling, drilling
tool = engraving tool	→ usage for engraving
tool = metering device	→ usage for metering
tool = water jet nozzle	→ usage for water jet cutting

The manufacturer isel Germany AG is able to effect a legal prescribed risk assessment for the CNC-machines. CNC-machines will be delivered with a machinery enclosure.

***isel* CNC base machine:**
In the new, at 29.12.2009 legally binding machine directive 2006/42/EC, is the term "**partly completed machinery**" defined as follows (quote from EC directive, acticle 2, letter g):

„partly completed machinery"

An assembly which is almost machinery but which cannot in itself perform a specific application. A drive system is partly completed machinery. Partly completed machinery is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment, thereby forming machinery to which this Directive applies;

Each **isel-CNC-base-machine** delivered **without a tool** and therefore not for a specific application is for the purpose of the directive 2006/42/EC a **partly completed machine**.

- The CNC-machine / CNC-base-machine is used for work in dry rooms (workshops, laboratories) and industrial firms (max. ambient temperature: 40°C)
- **CNC-machine:**
  - The **CNC-machine (complete machine**) is according to the type mounted on the machine tool **appropriately** used. That is, the concrete tool of the CNC machine specifies the intended use of the machine within the meaning of the Machinery Directive (Annex I, Section 1.1.2). Under this premise, the CNC-machine is suitable for milling, drilling, cutting, engraving, metering, measuring or water jet cutting. The CNC-machine is not suitable for graphite machining.

- Appropriate processing materials are light metals, plastics, wood, glass, platinum materials, etc.
- Not permitted are materials which produces during processing harmful gases
- The CNC-machine is prepared for an extraction unit device. This extraction unit is preferably suitable for dry dust (wood dust, fiberglass / fiberglass dust, platinum dust, etc.).

- The **CNC base machine** (partly completed machine) can be added by you as the buyer of the base-machine with a variety of appropriate processing tools to a CNC-machine (complete machine) in compliance with the requirements of the machinery directive. You are responsible for CE certification if you use the machine itself resp. sell (bring to market). The CE certification also includes the legally required identification of a safe machine by the CE mark.
- CNC-machinery for milling processes:
  - The CNC-milling-machines are designed for milling/drilling of the following materials: **aluminum, copper, brass, plastics (e.g. GRP / fiberglass), wood**
  - The processing of magnesium is prohibited because of fire.
  - During the processing of steel / stainless steel only engraving or a processing with low cutting forces is possible.
  - It shall not be used milling spindles with a toolholder greater than ISO 25 or HSK 25 (hollow shank taper). The speed of the spindle drive may not be higher than the corresponding processing speed for the material.
  - All machines are designed for milling spindles (spindle machining, induction motor) with a maximum of 3 kW drive power.
  - Cutters and drills may be used up to a maximum shaft diameter of 12 mm.
  - The tools form cutters and conical formers for timber industry may be used up to a maximum cutting diameter of 45mm and a shaft diameter of 12 mm.
- The rapid traverse velocity should not exceed the values of 150mm/sec till 200mm/sec depending on the machine size.
- The feed rate of the processing tool in the material must be determined technologically and should be smaller than the rapid traverse speed.
- For the secure clamping of the tools in the tool holder, the user is responsible.
- To the reasonably foreseeable misuse belongs the operation of the machine by two persons. It is prohibited that one person presses in test-mode (see also 6.2 Operation modes) the acknowledge button (ACK) and another person is touching into the machines workspace or do work in another way when the safety door is open and an axis movement is going on.
- There must be no manipulations on the locking of the safety door.

3 Safety information



- The machine must not be used in explosion endangered environment.

- The CNC machine has an enclosure resp. sliding door around, but not above the working area. The clear panes (material: Polycarbonate) are fixed in the machine frame resp. sliding door. They guarantee the protection against moving parts and breaking parts of tool or work piece possibly ejected out of the working area inside. The CNC machine is open to top, so there is no complete protection against breaking parts (**Residual risk**). The enclosure reduces noise level and keeps slivers in milling or drilling operation. **During operation** the sliding door is **kept shut** (closed and locked) and so it can not be opened. This safety module (door interlocking, the so called ***Schmersal***) must not be manipulated or removed.
  Without complete, intact enclosure resp. sliding door including undamaged Polycarbonat panes a CNC machine delivered with CE mark must not be put into operation.

- The CNC base machine without enclosure resp. sliding door is a partly completed machine due to MD 2006/42/EU and is delivered without CE mark. The **Declaration of Incorporation** is valid.
  As operator of the CNC base machine you are responsible for implementation of suitable protection actions as result of your risk assessment. Those actions have to comply with all safety requests of MD 2006/42/EU.

- Be always careful that work pieces are tightly clamped. The use of ***save and suitable*** parts / devices for work piece clamping is one of the tasks of the operator. ***Unsave or not suitable*** devices for work piece clamping can cause unfasten of work piece from device during operation. This can result in heavy damage and accidents with fatality or personal damages. In this case injury of tool, work piece, clamping device or other parts of the machine can occur.

- In emergency the Emergency HALT switch is to be pushed. Pushing this switch results in disconnection of the power supply for power electronics in the motor amplifiers resp. the frequency converter for the working spindle by the main relay controlled by the safety module. Emergency stop complies with Stop category 1 due to EN 60204-1:2006 (controlled stop and subsequent switch off the power supply for motor amplifiers).

- The key switch on the CNC operator panel may be used only by knowledgeable and instructed persons, because in TEST mode there is an increased risk of damage. Please keep the replacement key switch under your personal check.

- The operator has guarantee sufficient ventilation according accruement of dust or gas, caused by the operation process of working pieces.

- If the sound pressure level near the machine should be higher then 70 dB(A) the operator has to wear an applicative ear protection.

- The work at and with the machine is only allowed for authorized, knowledgeable and instructed persons. Those persons have to be informed by a special instruction about possibly appearing endangerments (especially residual risk).



- Flowing water must not be used for cooling. For cooling purpose only special cooling equipment (refer to the chapter accessory) may be used. This cooling equipment has to generate water fog or an air flow for cooling effect. No drops of cooling medium may appear or flow under the clamping plate.

4 Scope of delivery / distribution state (QA)

4.1 Standard scope of delivery

The standard scope of delivery regarding CNC machine / CNC Base machine contains:

- Aluminium base frame with
  - enclosure (clear panes, material: Polycarbonate) and (perpendicularly moveable) single piece sliding door (for CNC machine only, not for CNC base machine)
  - machine table (mounted on the Y axis) with a T-Groove plate for clamping the work piece
- Drive axes X, Y, Z including mechanical or magnetic end switches and position feedback controlled Servo motors
- CNC control panel with TFT monitor (Touchscreen), keyboard, mouse or trackball and operation elements
- Control cabinet including:
  - Mains power plug, mains line, net input filter
  - Main switch, lockable in OFF state due to EN 60204-1 (part 1)
  - Servo motor power amplifiers
  - PC based CNC Controller (CAN-PC or Industry-PC)
  - System module ISM10 (Safety module, CAN I/O module, 24 VDC power supply)
- Machinery documentation with the following parts:
  - This Assembly instruction for CNC base machinery / Operating instruction for CNC machinery
  - Operating instruction for system module iSM10, Servo motor power amplifiers iMD10 / IMD20 or IMD40, PC based CNC Controller iSR20 or iSR30 and CNC control panel
  - wiring diagram with part lists



The control software ProNC /6/ or Remote /7/ including CAN CNC Motion Control Software is completely installed on the control PC. The CNC machine was tested factory-made using this software.

The declaration of conformity for CNC machinery is only valid if the CNC machine is used with this control software (ProNC version 1.45.6.1 or newer resp. Remote version 1.45.6.1 or newer).

For Back Up the control software ProNC / Remote is stored on CD-ROM or USB memory stick for the purpose of reinstallation (Setup).

The user is responsible for archiving all his application programs (ISO, PAL, CNC or NCP format) on USB memory stick.



The current scope of delivery of your CNC machine is defined in the packaging note.

4.2 Delivery status from the factory (quality management)

To verify the accuracy of the CNC machine the circular form measuring system Renishaw QC10 is used.

Using this system the accuracy of all axles of all produced CNC machinery / CNC base machinery becomes checked before delivery.

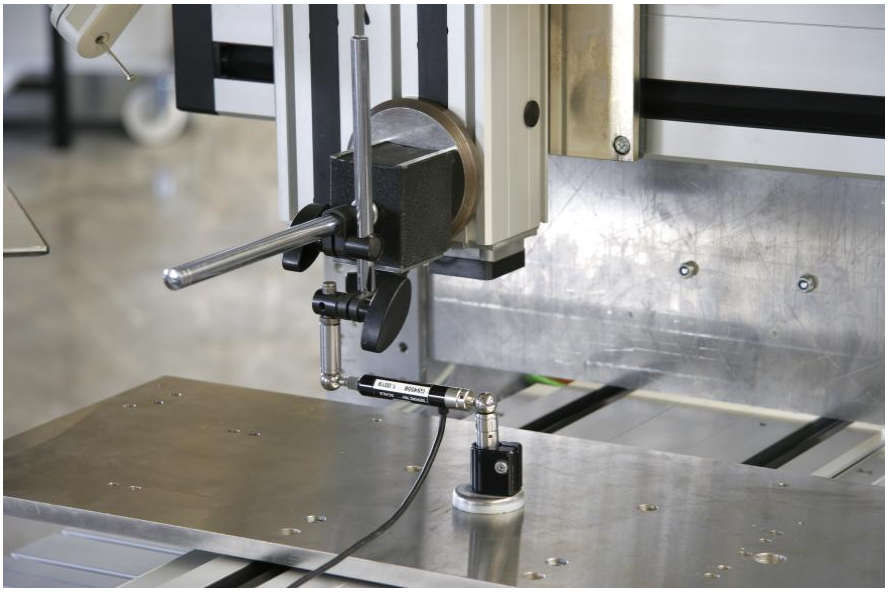
circular form measuring system QC10
The assembly of the QC10 is possible at each machine, and takes only a few minutes to complete. The measuring is controlled via a simple, standard CNC program.
The data are obtained and evaluated in the diagnostic software and the errors with their size and the corresponding impact on the overall accuracy are shown in graphical / tabular form.

The form of recognized circles (in all three interpolation planes XY / XZ / YZ) provides guidance on any existing machine error:

- tracking error / position tolerance
- straightness error / perpendicularity
- measure error / backlash
- quadrant transitional / circular form tolerance

The measurements are made depending on the size of the measured axes with a radius of 50mm, 100mm, 150mm and 300mm. It is always the shortest axis considered.

The delivery of any CNC machine to the customer follows only when all parameters are within the prescribed limit. The results of the measurements are stored and archived according the current machine resp. order.

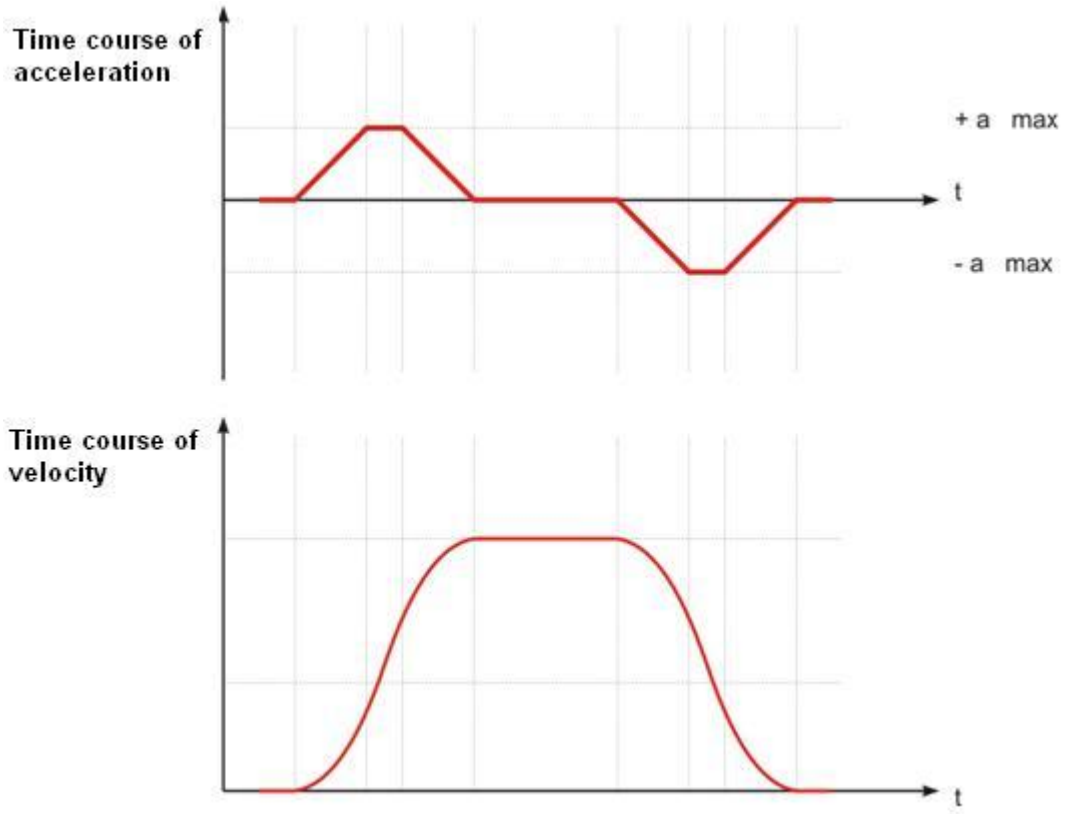


picture: circular form measure with Renishaw QC10

To test the position accuracy the laser interferometer Renishaw XL80 is used.

The laser measuring system allows both the complete testing of complex machine tools and automation systems / special machines as well as simple positioning / motion axes.

With the available lenses extensive opportunities for static and dynamic tests are available, e.g. the identification of the real velocity profile v = v (t) of a linear axis and thus the proof of the continuity of meaningful signal curve:



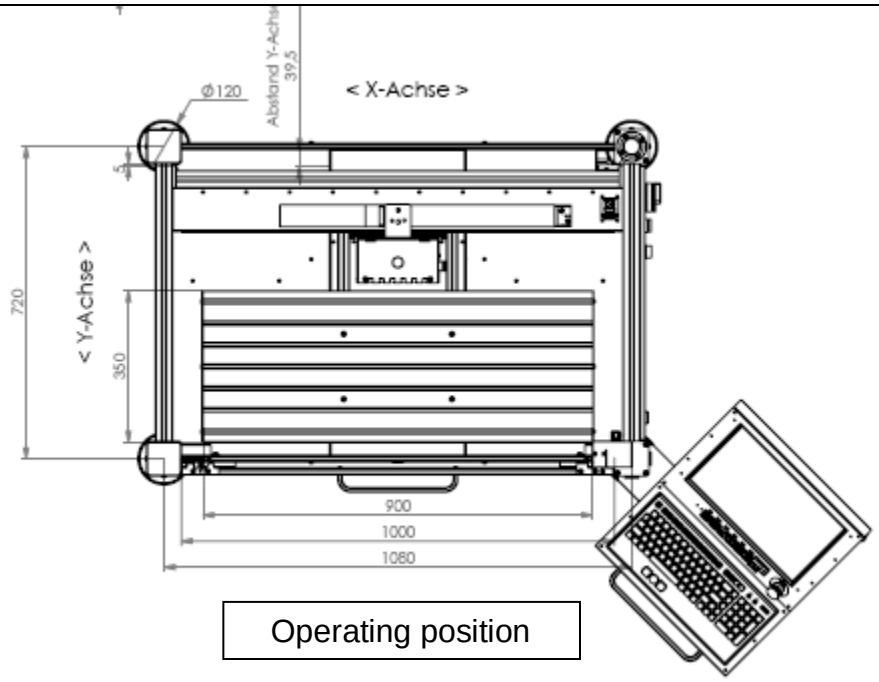
picture: velocity profile of a linear axis with jerk limitation

The position measurement is the most commonly performed measurement on a machine. The laser measuring system measures the **positioning accuracy and repeatability** by comparing the displayed position of the machine with the laser measurement system measured the current position.

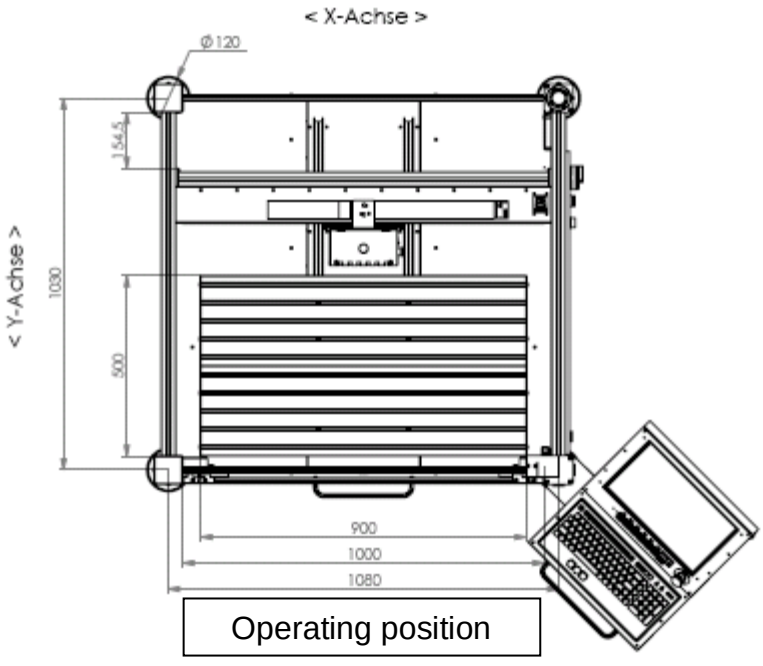
5 Installation and connection of the CNC machine

5.1 Space requirements

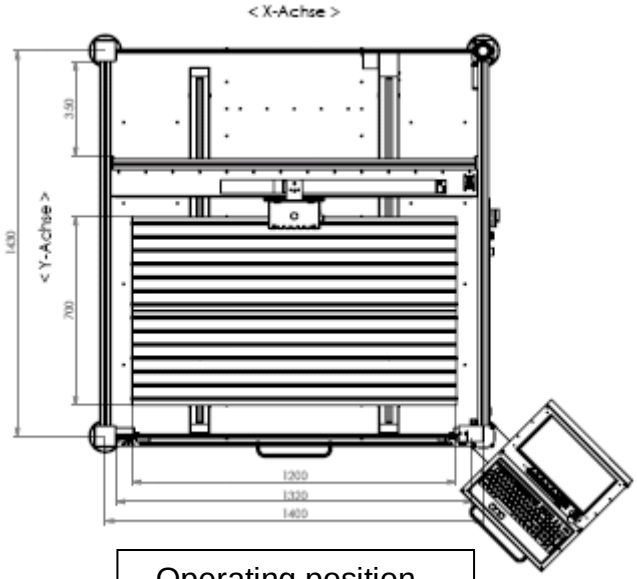
The required space for the machine is limited to the outer dimensions of the machine, the controller cabinet and the CNC control panel as well as enough space in front or side of the machine to operate it and to be able to set up. The sliding door of the machine hood opens downward so you need no additional space above the machine



Space requirement EuroMod 30



Space requirement EuroMod 45

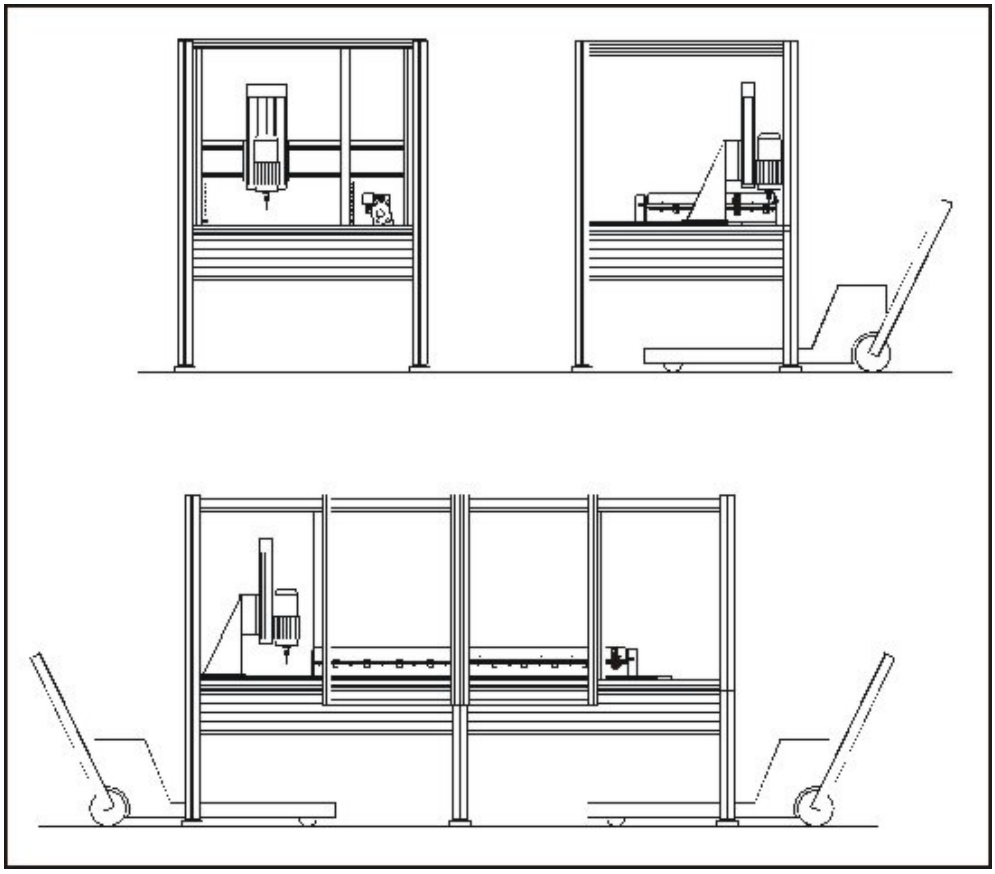


Operating position

Space requirement EuroMod 65

5.2 Transport of the CNC machine

When transporting the machine pay attention according its weight and size. Remove the transport lock from the frame feeds. Use only appropriate lifting equipment (fork lift, trucks, see picture). Lift the machine only from below and do not pull up on the cover.



In case of a later transfer, please make sure that the net cable and connection cables are not damaged.



Unplug the power supply cable before each transport



Take care during transport that the machine is not suspended to heavy vibrations.



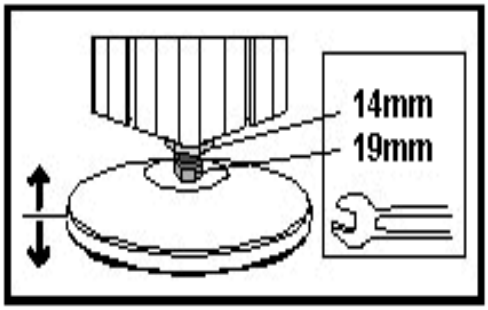
Keep the triangular key for manual unlock of the door outside the machine.

5.3 Put up the CNC machine

The clamping / processing area of the CNC machine and all axes are aligned precisely at right angles from the factory.

Never loosen the fastenings of the axles or the mounting bracket, in which the transverse axis (X-fitted axis). Otherwise, the machine must be re-measured by a technician from manufacturer isel Germany AG.

Place the machine on a plane and solid area. You can compensate the unevenness of the floor / table with the adjustable feet. For precise alignment of the machine you need a spirit level with an accuracy of at least 0.1 mm / m. Save the height of the machine feet with the lock nut.



For safe installation of your new CNC machine on site, we offer the following service:

CNC base machine / CNC machine measuring / calibration with laser interferometer at the customer / end-user site (article number: 991300 0001).



Picture: Laser measurement of an isel base machine in plant Dermbach in Thuringia

5.4 Enclosure

5.4.1 Enclosure with sliding door and safety interlock on CNC machinery

CNC machinery of type EuroMod have a homogeneous machine frame, e.g. the enclosure is not removeable.
The transparent panes (material: polycarbonate) mounted in the machine frame resp. in the door ensure during operation of the machine (setup or working process) protection against moving machine parts as well as eventually thrown work piece fragments from the work area.



You are not allowed to put a CE marked CNC machine into operation if the enclosure is not complete, intact or the polycarbonate panes are damaged.

5.4.2 Mounting of suitable protective measures at CNC base machinery

The delivered CNC base machinery **without** safety door / hood resp. **without** in the machine frame fixed transparent panes are **partly completed machinery** for the purpose of the directive 2006/42/EC. They are delivered without a CE marking.

It applies the declaration of incorporation and the assembly instruction.



You are not allowed to put the delivered CNC base machine into operation if you have not mounted* appropriate *protective measures.

As the operator of the CNC base machine, you are responsible for taking appropriate protective measures based on your risk assessment to comply the requirements for the machine according to Machinery Directive 2006/42/EC.

5.5 Cabling and compressed air connection

The CNC machine is controlled by a control PC /3/ and a power electronics for the servo motors (motor drives /1.1/ /1.2/). The complete control – integrated in a control cabinet /5/ – is completely cabled with the axes and electrical components of the machine.

The wiring diagrams reflecting cabling of components are part of the machine documentation /5/.

The mains plug of the control cabinet is to be plugged first if the machine is ready for initial operation.

Information for compressed air connection of accessories:
To use the optional vacuum clamping system or the tool changer and collets of the working spindle it's necessary that the location of the machine has a compressed air connection.

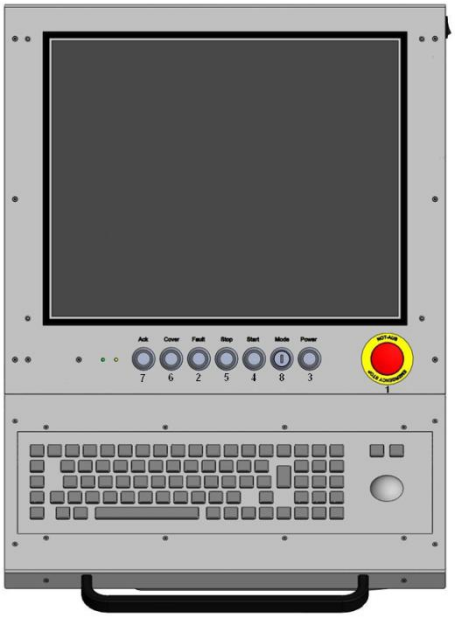
accessories	air pressure	air consumption
pneumatic vacuum pump	4 - 6 bar	100-150 l/min (1 nozzle)
cold air nozzle	3 - 10 bar	100-150 l/min
cover of the tool changer	3 - 6 bar	impulse
milling spindle with automatic tool change	> 7.5 bar	impulse
on the milling spindle mounted swivel unit for exhaust (specially for woodworking)	2 bar	impulse

6 Initial operation

6.1 Preliminary

6.1.1 Operating elements

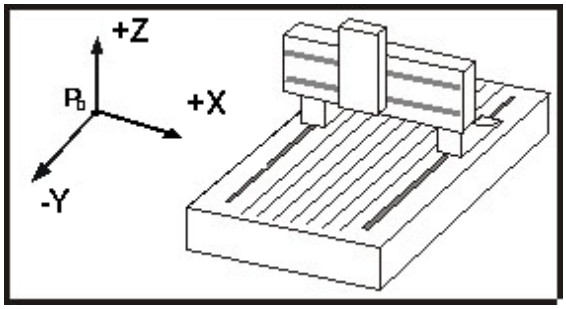
The following figure shows the operating elements on the CNC control panel. The use of each single element is explained in chapter 6.4.



CNC control panel

6.1.2 Coordinate system and work piece zero point

The coordinate system of the CNC machine is set as a right system as shown in the picture.



The **work piece zero point** P0 can be defined by the software (e.g. via teach in) or is freely programmed in the application program.

A **yellow** label on each axis marks both the axes (X, Y or Z as axis letter for linear axes, A, B or C as axis letter for rotation axis) as well as the positive / negative axis direction of linear axis resp. positive / negative rotation direction or rotation axis.

If you need to change the arrangement of the coordinates, please read the manuals for the motor power amplifiers IMD10 /1.1/, IMD20 or IMD40 /1.2/ or contact our technical support.

6.1.3 Assignment of the motion axes

The assignment of the motion axes depending from the operator position is:

- On **flatbed machinery**:
  X-axis = transverse axis (+X right; -X left)
  Y-axis = longitudinal axis **(+Y away from the operator**; **-Y to the operator**)
  Z-axis = lift axis (+Z up; -Z down)

- On **portal machinery (e.g. type EuroMod)**:
  X-axis = transverse axis (+X right; -X left)
  Y-axis = longitudinal axis **(+Y to the operator**; **-Y away from the operator**)
  Z-axis = lift axis (+Z up; -Z down)

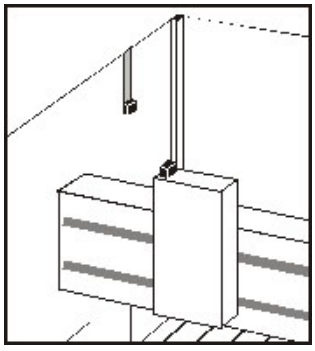
6.1.4 Reference point, machine zero point and home position

The **Reference point** of the machine **(identically to the machine zero point)** is ex factory at the following axes positions:

- At the back (Y-axis)
- left (X-axis)
- at the top (Z-axis)

The **reference point** is set by the hardware limit switches (factory set).

Former EuroMod machines had a **home position** sensor to signal this special position to the controller. This sensor was needed because the motor power amplifiers did not have the feature to supervise the standstill of the driven single axis / motor.



The Home position sensor is not needed for EuroMod machinery because of the feature of supervising standstill of axis in the motor power amplifiers.

6.1.5 Work piece mounting resp. clamping

When you set up your machine you have to use only suitable and safe clamping tools (see also chapter accessories).

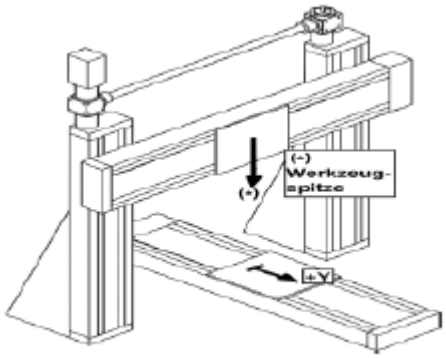
Note that the work pieces are always solid fixed..

6.1.6 Portal machinery (CNC machinery of type EuroMod)

A **portal machine** has the following characteristic:
The machine frame carries the Y axis with the **moveable machine table / clamping plate for the work piece**.

So a Y motion of the **work piece** (related to the tools top) in positive Y direction (+Y) happens **toward to the operator**.



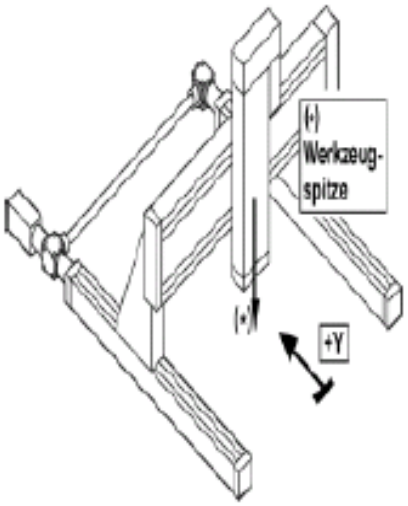


6.1.7 Flatbed machinery (CNC machinery of type FlatCom or OverHead)

A **flatbed machine** has the following characteristic:
The **clamping plate for the work piece** is mounted tightly on the machine frame. The work piece is not moved.

So a Y motion of the **tool** (that is the tools top) in positive Y direction (+Y) happens **away from the operator**.





Axis direction always is to be seen according the tool tip, so the coordinate system has to be a XYZ orthogonal system (remember the right hand rule).

6.2 Operation modes

• Operation mode AUTO = AUTOMATIC = Processing mode

In operation mode AUTO you can process a selected (i.e. opened) application program (ISO- / PAL- / NCP- or CNC file) on your CNC machine and so the work piece becomes processed. The door / cover is locked while processing is active, that is the axes of the machine are moving.

In operation mode AUTO you can open the door / cover of the CNC machine at first when all axes do not move (standstill monitoring) **and** the working spindle (e.g. the milling spindle of a CNC milling machine) does not rotate (speed = 0 Rpm), i.e. also is switched off.

For opening the door / cover the operator has to push the COVER button.

When the door / cover is closed again it will be locked automatically by the safety interlock.

• Operation mode TEST = TEST = Setup mode

For test and monitoring purposes the operation mode TEST can be used.

In order to change from operation mode AUTO to operation mode TEST turn the key in the key switch on the operator panel to right, i.e. to position TEST.

In operation mode TEST you can process a selected (i.e. opened) application program (ISO- / PAL- / NCP- or CNC file) on your CNC machine even when the door / cover is open, but with the following **two restrictions**:

1st restriction: When the door / cover is open, the application program is processed as long as the ACK-button (ACKnowledge button) keeps pushed by the operator.

2nd restriction: Operation mode TEST has no influence on the velocity (as normal motion as fast motion) of the axes, the current velocity keeps unchanged. But the working spindle will not turn because the frequency converter is disabled in this mode.

Releasing the **Acknowledge-button (ACK-Button)** when the door / cover is open causes an EMERGENCY STOP and therewith a switch off the power voltage supply for the motor power amplifiers and for the frequency converter(s) driving the working spindle(s). In TEST mode the switch on of the working spindle is scotched by the safety circuit module.



Attention! Risk of injury!

The key switch = mode selection switch may be used only by authorized and knowledgeable staff, because there is no protection against moving machinery axes when the door / cover is opened in TEST mode.

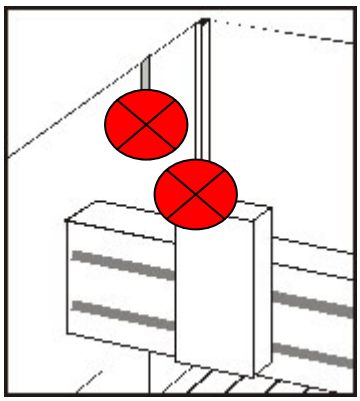
6.3 Cover lock, Cover unlock, Cover interlock

The cover interlock is a basically safety relevant function.

A special **Home position** is not watched by the CNC controller (i.e. safety circuit module). So **Home position** has **no influence on cover lock / cover unlock**.

Rather standstill monitoring (integrated in the motor power amplifiers) is relevant. This **standstill monitoring** is implemented redundantly in accordance with EN ISO 62061 (VDE 0113-50) (cross contact recognition). All motor power amplifiers (e.g. IMD10 /1.1/ or IMD20 /1.2/), integrated in the Control cabinet /5/ of the CNC machine, are switched in line according safety.
They **feed forward the clock signals** (the 1st from the Safety Circuit Module, the last to the Safety Circuit Module) when the amplifier recognizes that the driven servo motor **is not outside a position feed back controlled limit**.
The Safety Circuit Module generates (i.e. transmits) two clock signals over two outputs and receives / monitors those two clock signals on two inputs. When standstill of all servo motors / machine axes in **AUTOMATIC mode** the cover is **unlocked**.

Home-Position-Sensor not available, rather standstill monitoring in all axes !



Basically: All linear axes (X, Y, Z) of the CNC machine and all optional rotation axes (A, B, C) have to remain stationary in order to be able to open the door / cover in operation mode **AUTOMATIC** (i.e. the key switch is in position **AUTO**).

key switch = mode selection switch

In Setup mode **(key switch = mode selection switch** in position **TEST)** the cover can always be opened**,** independent of the current position or standstill of all linear axes (X, Y, Z) of the CNC machine and all optional rotation axes (A, B, C).

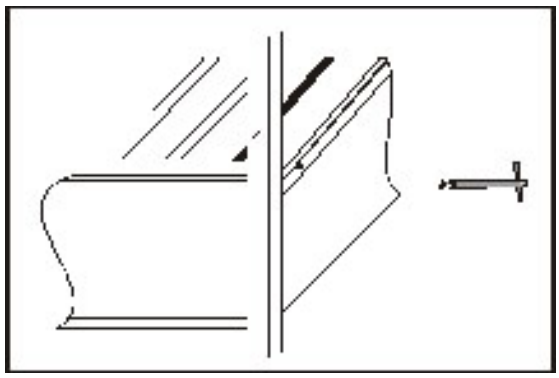
The cover control (as a part of SCM) monitors the sensor and controls the actuator (**safety interlock**) for cover lock / unlock:

- Sensor function of **safety interlock**:
  1. Cover closed / open
  2. Cover locked / unlocked

- Actuator function of **safety interlock**:
  Cover lock

How to do cover unlock manually ?
For special cases (e.g. door lock defect or loss of power supply voltage of the machine) you can use the triangular key (enclosure of the CNC machine) to open the door / cover lock manually.

1. Switch off the machine.
2. Turn the triangular key – without using great force- a half turn to the left and open the door.



The servo motors of the machine are <u>not powered</u>.

3. Turn the triangular key back to the right.

In the state

safety interlock manually unlocked

you must not operate the machine.

6.4 CNC operating panel

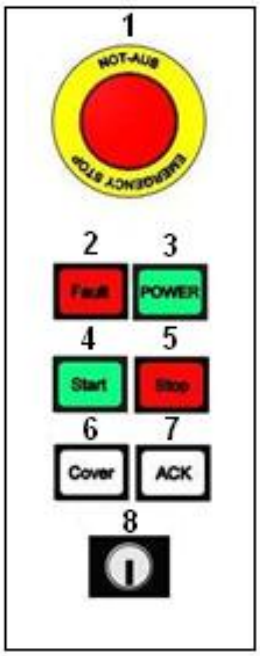
6.4.1 CNC operating panel – right side: button for PC boot / shut down

Having switched on the main switch on the control cabinet /5/ you can boot the Windows operating system of your Control-PC (inside the control cabinet).
Push the button on the right side of CNC operating panel to boot or shut down.

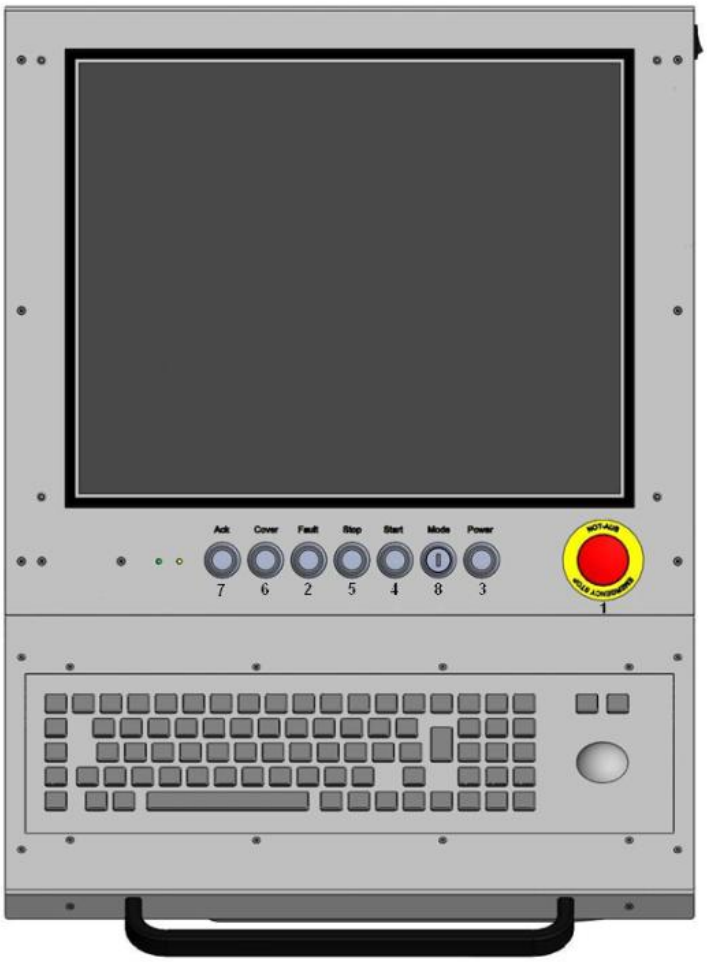


6.4.2 CNC operating panel – front side: operating elements

The operation of the CNC machine takes place using the buttons on the external hand control unit or optionally via the buttons on the CNC operating panel /4/, the keyboard, the mouse/trackball or via touchscreen.



external hand control unit



CNC operating panel

1 - Emergency stop switch

When pushed: Turns off the power supply for the servo motor power amplifiers and the working spindle (**controlled stop 1 = STOP1 corresponding EN 60204-1**).
Push this switch in case of any danger. This means dangers for the users health or machine safety. The safety circuit module (SCM) in the control cabinet is applicable till safety category 3 (DIN EN945-1). To unlock the switch turn it to right (clockwise).



If you push the emergency stop switch the servo motor power supply will not be switched off immediately (EN 60204-1, stop category 1 = STOP1) so any axes motion can be stopped until standstill.
The main power supply voltage of 115/230VAC lies still inside the control cabinet, only the motor power supply voltage for the amplifiers is switched off.

2 - Fault-lamp

The fault lamp indicates an error within the safety circuit module (SCM).
All servo motor power amplifiers and the frequency converter are disabled.

3 - POWER button

Use this button to switch on motor power supply voltage for the servo motor power amplifiers.

Conditions for switch on:
- Main power switch on the control cabinet is switched on
- Emergency stop button is pulled out



Note /2/, there chapter 4.1.4 Dialog for Status request !

If power supply voltage is successfully switched on the power button is lighted green.

4 - Start-button

If you press the start button the currently selected (opened) application program (ISO, PAL, CNC or NCP format) is started or a stopped motion of the machinery axes or the application program is continued, even from the point where is was stopped by pushing the stop button.

5 - Stop-button

If you press the stop button the currently started application program (ISO, PAL, CNC or NCP format) and therewith any motion of the machinery axes is stopped.
The current line in the application program keeps marked /6/ /7/.

If the SCM recognizes standstill of all machinery axes and also standstill of the working spindle, the **cover button** is enabled. In this state the cover can be unlocked by pressing the cover button so the door / cover can be opened.

You can continue the execution of the user program by pressing the start button or you can abort program execution by pressing the ESC button on the keyboard.

6 - Cover-button

Use this button to open the machines cover or safety door. This is only possible if the conditions from point “8 – mode selection switch“ are complied. An enable for opening of the cover or safety door is signalized by a white lighted cover button.

7 - ACK-button (ACKnowledge-button)

In the operation mode **TEST** this button has to be pushed as long as the machinery axes are moving **and** the door / cover is open.
Releasing the **Acknowledge-button (ACK-Button)** when the door / cover is open causes an EMERGENCY STOP and therewith a switch off the power voltage supply for the motor power amplifiers and for the frequency converter(s) driving the working spindle(s).

8 - Mode selection switch = key switch

Use this switch to change between **AUTO (processing mode)** and **TEST (setup mode)**.



In **AUTO** you can **open** the **cover or safety door** of the machine **only** if **no axis is in motion** and the mounted **working spindle** is **switched off** (means that spindle does not turn).

In **TEST** you can **open** the **cover or safety door** of the machine **only** if the mounted **working spindle** is **switched off** (means that spindle does not turn). You can just **move the axes at opened cover or safety door** if you **press** the **ACK button**.

Ensure that in setup-mode (key switch on TEST) only authorized personal operates on the machine.



In which operation mode the working spindle can be switched on ?

- **Operation mode AUTO = AUTOMATIC = Processing mode**

Any switch on resp. turning on to target speed the working spindle **is possible if the door / cover is closed and locked**.

- **Operation mode TEST = TEST = Setup mode**

Any switch on resp. turning on to target speed the working spindle **is generally impossible**.



Operating mode alternation AUTO ——► TEST :
Operating mode alternation AUTO ——► TEST while processing the work piece causes rev down the working spindle to 0 rpm (when frequency converter with enable input drives the working spindle) resp. the working spindle is switched off.



Operating mode alternation TEST ——► AUTO:
Operating mode alternation TEST ——► AUTO causes rev up the working spindle to previous target rpm resp. the working spindle is switched on.



Operating mode alternation is permitted only in STOP-state of the CNC machinery axes !

If operating mode alternates not in* STOP-state of the CNC machinery axes *this can damage the working spindle or the work piece.



Attention! Risk of injury!

The key switch = mode selection switch may be used only by authorized and knowledgeable staff, because there is no protection against moving machinery axes when the door / cover is opened in TEST mode.

6.4.3 CNC operating panel – left side: USB connectors (female)

The two USB connectors can be used to plug in USB devices like USB memory stick, the WIBU-USB-dongle for ProNC /6/ or an external CD/DVD drive.

This is the interface to transfer any NC data like NCP, ISO, PAL or CNC application programs or drawings from/for a CAD/CAM system from the users Desktop-PC to the Control-PC /3/.



If you want to execute an ISO or PAL application program with ProNC /6/ a so called WIBU-USB-dongle has to be plugged to one of the two USB connectors.

For the execution of ISO or NCP programs with Remote /7/ no WIBU-USB-dongle is needed.

6.5 CNC control software: Installation and starting

You can choose between the CNC control software:

- Process automation software **ProNC** /6/
- Control software **Remote** /7/

The CNC control software (part of scope of delivery of your CNC machine)

- **ProNC** including Remote part number: **Z11-333500** or
- **Remote** part number: **Z12-334500**

including the corresponding manuals

- **ProNC: Operating and programming instruction /6/**
- **Remote: Operating instruction /7/**

in PDF format is stored on the corresponding marked installation CD and the delivered USB memory stick.



Use the USB memory stick also to archive your application programs and initalisation files *.ini resp. configuration files *.cfg .

For installation of **ProNC** please read the operating instruction ProNC chapter 3.4.4 “configuration dialog“ /6/.

For installation of **Remote** please read the operating instruction REMOTE chapter 2.8.3.1 „ configuration “ /7/.

Further informations about the CNC-Software can be found in the corresponding manuals resp. ReadMe files on the installations CD.



Alternatively you can start the installation assistant.

This assistant will guide you through the setup process.

7 Accessories

Matching for each CNC machine, you can order the following accessories:

- clamping set (clamp lever SH1,SH2, 2 stop rails, hexagon socket wrench)
- additional mounting material for T-groove panel
- bench vise 1, 2
- additional collet chucks for working spindle
- tool kit cutter, driller, graver
- three different tool changers (linear, direct or round changer) with high frequency main spindle drive, option: length measurement button
- rotation axis(axes)
- main spindle drive iSA 500, 750, 900
- working spindle UFM 500, UFM 1050
- vacuum clamping system ***isel-Vakufit***
- pneumatics accessories
- cold air cooling ***isel-CoolMin:*** cooling unit with cold air nozzle (up to -20°C)
- exhaust unit
- industrial vacuum cleaner
- engraving spindle
- diamond engraving head
- spray-/cooling unit, cooling medium HL4
- ***isel***-special grease for central lubrication
    - fat cartridge: article number: 299032 0002
    - greaser: article number: 299032 0003
- CAD/CAM software isyCAD/CAM 2.5, Galaad/Kay/Lancelot, ProNC /6/, Remote /7/



Information for compressed air connection of accessories:
To use the optional vacuum clamping system or the tool changer and collets of the working spindle it's necessary that the location of the machine has a compressed air connection.

accessories	air pressure	air consumption
pneumatic vacuum pump	4 - 6 bar	100-150 l/min (1 nozzle)
cold air nozzle	3 - 10 bar	100-151 l/min
cover of the tool changer	3 - 6 bar	impulse
milling spindle with automatic tool change	> 7.5 bar	impulse
on the milling spindle mounted swivel unit for exhaust (specially for woodworking)	2 bar	impulse



The necessary software for tool changing inclusive tool length measurement is a part of the control- and programming software Remote / ProNC.



Look at all accessories for a professional installation and note the applicable standards and safety regulations.

7.1 Dust extraction (optionally)

For integration the dust suction into your machine (in the case of retrofit) please use the

Assembly instruction

for this accessory.



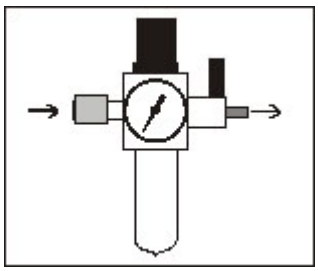
7.2 Tool changer (standard accessory or optionally)

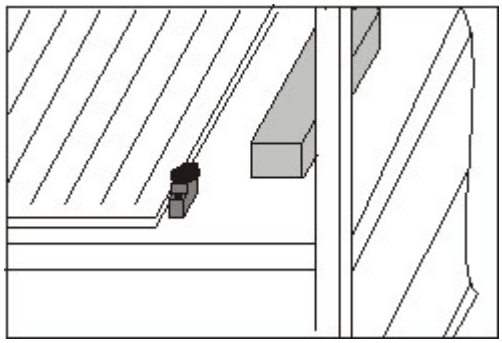
The tool changer (in case of standard accessory) is assembled and connected primed factory-made.

The operation air pressure is > 7.5 bar.

The tool length measuring sensor (in case of standard accessory) for automatically tool length measurement before or behind the tool change is mounted on the right front side of the clamping plane.

For setup the tool changer system including tool length measurement please pay attention to the operating instruction manuals for ProNC / Remote.
Those manuals are stored in PDF format on the installations CD resp. the delivered USB memory stick.





8 Technical support and sale

If you need engineering support resp. sale informations please contact:

Technical support and sale:

Jürgen Balzer	+49 (0) 6659 / 981-774	juergen.balzer@isel.com
Steffan Gaerth	+49 (0) 6659 / 981-773	steffan.gaerth@isel.com
Andreas Schaub	+49 (0) 6659 / 981-525	andreas.schaub@isel.com
Andreas Trabert	+49 (0) 6659 / 981-769	andreas.trabert@isel.com
Fred Reinhard	+49 (0) 6659 / 981-771	fred.reinhard@isel.com
Fax.:	+49 (0) 6659 / 981-776	

Engineering support:

Frank Hecht	+49 (0) 6659 / 981-763	frank.hecht@isel.com
Frank Jansen	+49 (0) 6659 / 981-765	frank.jansen@isel.com

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9 Cleaning, lubrication and maintenance



Switch off the main switch and unplug the mains plug before every cleaning or maintenance to avoid an accidental switching on.

9.1 Cleaning

- Clean the machine regularly with a hand brush or vacuum cleaner (no compressed air) from all chips. This protects the mechanics from premature wear.
- The seal lips include a Teflon component and require no special maintenance.
- Clean the polycarbonate panes with a not scouring plastic cleaner.

9.2 Lubrication and maintenance

- The guide rails and drive shafts are fitted from the factory with a long-term central lubrication. Depending on the strain, you should regrease the guides and drive shafts in an interval of about 500-1000 hours of operation. Please use the grease gun available as accessories for centralized and the associated specialty grease.
- If you use oil, please lubricate in an interval of about 100-200 hours of operation.
- Lubricate not too much at once, the wave rails and steel rails must not swim in the grease.

9.2.1 Basic lubrication

The drive components are lubricated at the factory with *isel* special grease. You can immediately drive the axis.

The EC-Safety data sheet according directive 93/112/EU and ISO 11014-1 can be sent to you on demand.

9.2.2 Later lubrication

For the lubrication of linear bearings with waves is only the *isel* special grease used.

Under the following article numbers the grease can be ordered:

- 299032 0002 grease cartridge
- 299032 0003 grease gun

Depending on the application is recommended that every 500 to 1000 operating hours you have to lubricate the axles.



Unplug the power supply cable of the machine before each lubrication process.

Grease properties:
The *isel* special grease has the following properties:

- Enormously wearout reduction
- less grease consumption
- mixable with lithium and calcium greases
- water resistant
- highly resistant against cold- hot- and salt-water as well as solvent
- temperature range: –25°C till 200°C
- fail safe >300°C
- up to six fold service life extension
- extremely good adhesion to metal surfaces

Classification and marking complies with the EC directives 67/548/ EC and 88/379/ EC – water hazard class 1.

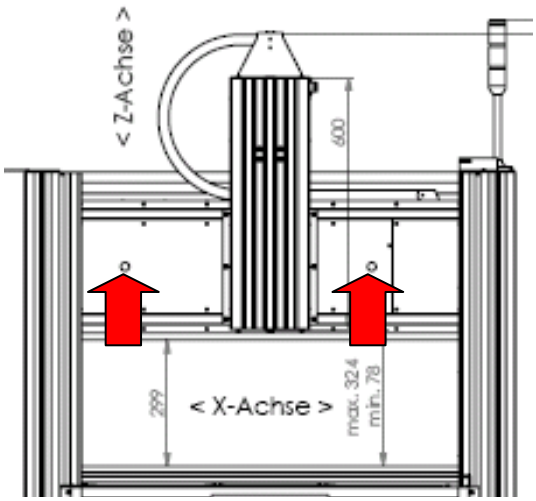
Before you start up lubrication of the axis

1.) Move the X-axis and Y-axis to the centre of the traversing area and the Z-Axis up to their reference position.

2.) Open the safety door / cover of the machine and switch off the main switch of the control.

3.) Unplug the main power supply cable of the machine from AC net.

9.2.3 Lubrication of the X axis



EuroMod 30/45/65: Grease nipples at the X axis

At the X axis (on the machine frame fix mounted traverse axis) there are two black or white plastic stoppers. They can be reached from the operating position when the door / cover is open.

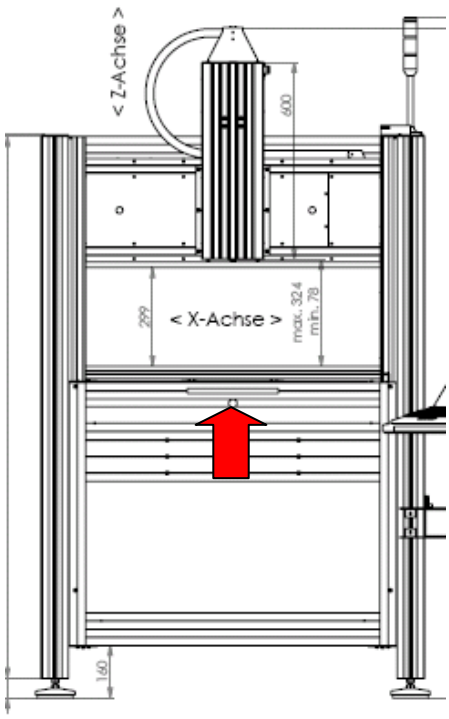
Under the plastic stoppers there are the grease nipples for the X axis central lubrication.



Pull the stoppers out and lubricate the axis: Put the grease gun over the viewable and accessable grease nipples and press the grease gun.

When finished push the stoppers back into their original position.

9.2.4 Lubrication of the Y axis



EuroMod 30/45: Grease nipple at the Y axis

At the Y axis (this axis moves the clamping plate forwards and back) there is one black or white plastic stopper. It can be reached from the operating position when the door / cover is open.

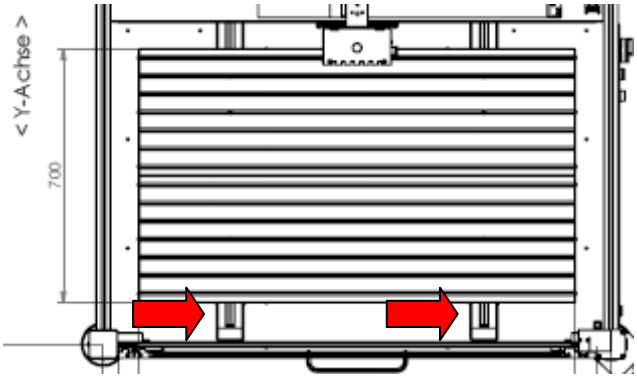
.

Under the plastic stopper there is the grease nipple for the Y axis central lubrication.



Pull the stopper out and lubricate the axis: Put the grease gun over the viewable and accessable grease nipple and press the grease gun.

When finished push the stopper back into their original position.



EuroMod 65: Grease nipples at the Y axis

At both linear units of Y axis (this axis moves the clamping plate forwards and back) there is each one black or white plastic stopper. It can be reached from the operating position when the door / cover is open.

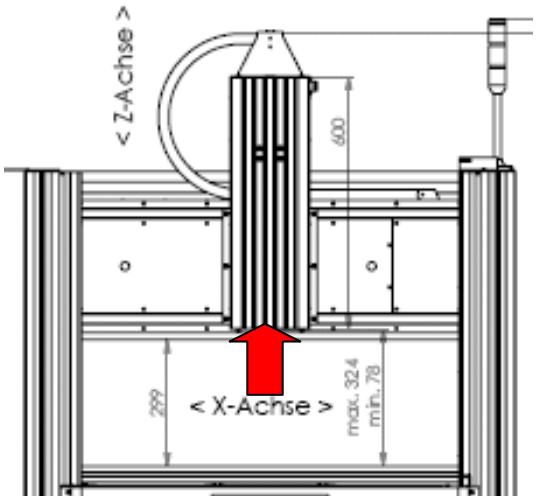
Under the plastic stopper there is the grease nipple for the Y axis lubrication.



Pull each of the stoppers out and lubricate the axis: Put the grease gun over the viewable and accessable grease nipple and press the grease gun.

When finished push the stoppers back into their original position.

9.2.5 Lubrication of the Z axis



EuroMod 30/45/65: Grease nipple at the Z axis

At the Z axis (vertically mounted at the slide panel of the X axis) there is one black or white plastic stopper at the lower side of linear unit.
It can be reached from the operating position when the door / cover is open.

Under the plastic stopper there is the grease nipple for the Z axis central lubrication.



Pull the stopper out and lubricate the axis: Put the grease gun over the viewable and accessable grease nipple and press the grease gun.

When finished push the stopper back into its original position.

10 Faults

fault	*reason*	*solution*
machine will not turn on	net input plug not connected	check net input cable connection
	main switch not switched on	switch on main switch
	fuse defect	remove net input plug, renew fuse
power supply voltage cannot switch on by POWER button	at least one motor power amplifier in the control cabinet signalizes FAULT by blinking LEDs	diagnose the cause of the fault and eliminate it /1.1/ and /1.2/
	hood / door is not closed	close hood / door
	Note /2/, there chapter 4.1.4 Dialog for Status request !	**Note /2/, there chapter 4.1.4 Dialog for Status request !**
	Emergency stop switch is unlocked	unlock Emergency stop switch
software works not correctly	main switch not switched on	switch on main switch
	power supply for the power amplifiers not switched on	power amplifiers by pressing POWER-button
	CAN bus connection between the CAN nodes not correctly	check CAN bus cables, plug ins and CAN node addresses resp. terminating resistor at the last CAN node
Servo motor of an axis fails	No power supply for the motor power amplifier	check fuses inside the control cabinet /5/ resp. the motor power amplifier /1.1/ or /1.2/
	temperature protection inside the motor power amplifier is active	- check fan inside the control cabinet - clean the filter in the ventilator device inside the control cabinet
	motor power amplifier defect	change motor power amplifier

fault	*reason*	*solution*
working spindle can not be switched on	**note chapter 6.2 in this manual**	**note chapter 6.2 in this manual**
	no spindle enable from SCM **Note /2/, there chapter 4.1.4 Dialog for Status request !**	check spindle enable from SCM **Note /2/, there chapter 4.1.4 Dialog for Status request !**
	Frequency converter for working spindle defect	Check Frequency converter for working spindle defect
	wrong signaling parameters (Spindle-Start) selected	Check and modify signaling parameters (Spindle-Start)
	mode selection switch in position **TEST**	switch mode selection switch to position **AUTO**
	Door / cover open	Close door / cover
red LED at the frequency converter is blinking	Fault in the frequency converter	Check parameters in the frequency converter
	Overcurrent / low voltage	Check parameters in the frequency converter according AC motor data (note motor data identification plate)

11 Remote diagnosis

For remote diagnosis using the World Wide Web (Internet) please contact our service department:

Frank Hecht	+49 (0) 6659 / 981-763	frank.hecht@isel.com
Frank Jansen	+49 (0) 6659 / 981-765	frank.jansen@isel.com

For remote diagnosis the Windows® program **N**et**V**iewer **O**neTo**O**ne (**NV o2o**) in the current version becomes applicated as communication tool:

The supposition for Remote diagnosis via Internet is:
Connect the Control-PCs /3/ inside the Control cabinet /5/ of your CNC machine / CNC base machine to the Internet. For this purpose every Control-PC is equipped with an Ethernet-Interface.

The connection establishment via Internet is done in three steps:

1st Step:
You get in touch with our service department by telephone or email to demand a consultation / remote diagnosis. The operator (working with the CNC machine) becomes **participant**, the service technician from *isel* Germany acts as **consultant**.

2nd Step:
The **consultant** will send per email the Windows program „NV_o2o_Participant_EN.exe“ to the **participant**. The participant starts this program on the Control-PC inside the control cabinet of his CNC machine / CNC base machine. Once started the program will show the following dialog:



3rd Step:
Now the **consultant** will start the Windows program „NV_o2o_Consultant_EN.exe” on his Desktop-PC. When the connection to the Control-PC of the **participant** via Internet was established**,** the **consultant** gives the session number to the **participant** by phone. Now the **participant** can enter this session number into the edit field, click on the button “Connect” and the Remote diagnosis can start.

12 Technical Data of CNC Machine / CNC Base machine

12.1 Clamping area and traversing range

Model	Width (mm)	Depth (mm)	Hight (mm)	Clamping area W x D (mm)	Traversing range X / Y / Z (mm)	Z opening (mm)
EuroMod 30	1160	800	1700	900x350	650/300/250	350
EuroMod 45	1160	1110	1700	900x500	650/450/250	350
EuroMod 65	1480	1510	1700	1200x700	1000/650/250	350

All machines of type EuroMod, as CNC base machinery (partly completed machinery) as CNC machinery (completed machinery) have model specific the same dimensions.

EuroMod *base machinery* (according to MD 2006/42/EC these are „**partly completed machinery**“) are offered in two variants:

- **open** variant: **without** sliding door / cover and **without** clear panes
- **closed** variant: **with** sliding door / cover and **with** clear panes (material: Polycarbonate)

An **EuroMod *base machine*** is always delivered without a tool. In concordance with MD 2006/42/EC this is the reason why there is no clearly definition of application purpose of this base machine.
So **EuroMod *base machine*** is always delivered **without** CE mark.
For this CNC base machine the **Declaration of Incorporation** is valid.

An **EuroMod *machine*** is always delivered as **closed** variant **with** sliding door / cover **and with** clear panes (material: Polycarbonate) **and with** a tool (e.g. a milling spindle). In concordance with MD 2006/42/EC this **EuroMod *machine*** is useable for a clearly defined application purpose.
The intended (e.g. appropriate) use of **EuroMod *machine*** must be ***safely.*** The manufacturer **isel Germany AG** is responsible for this safety.
So **EuroMod *machine*** is always delivered **with** CE mark.
For this CNC machine the **Declaration of Conformity** is valid.

12.2 Mechanical values / electrical values

Weight:	EuroMod 30:	app. 250 kg
	EuroMod 45:	app. 280 kg
	EuroMod 65:	app. 375 kg

Guides: Linear units with precision steelshafts and ball circulation skid, clearance free adjustable

Drive elements: Ball screw assemblies, adjustable backlash-free

Control cabinet /5.1/ with AC net input (1-phase):
230VAC, 50…60 Hz, 1-phase input L1/N/PE,
Net fuses: 16A, slow

Control cabinet /5.2/ with AC net input (3-phase):
400VAC, 50…60 Hz, 3-phase input L1/L2/L3/N/PE,
Net fuses: 10A, slow

Net fuses inside the System module ISM10 /2/; 2 * 6,3 A (slow)

Contact termination: not fixed installation according to EN 60204-1, section 5.1 *„Net input connectors“*

12.3 Sound pressure level

The sound pressure level varies by application and toolkit.

Sound pressure level without working spindle: **< 75 dB (A)**

Technical changes reserved!

13 Declaration of Conformity or Declaration of Incorporation?

In the new, at 29.12.2009 legally binding machine directive 2006/42/EC, the term "**machinery**" is defined as follows (quote from EC directive, article 2, letter a):

„*machinery*"

- An assembly, fitted with or intended to be fitted with a drive system other than directly applied human or animal effort, consisting of linked parts or components, at least one of which moves, and which are joined together for a specific application.

For each isel CNC machine delivered **with a tool** (e.g. milling or engraving spindle, metering device, measuring device like CCD camera or triangulation laser, water jet nozzle, plasma burner) **the Declaration of Conformity in this manual is valid**.

Those CNC machinery have to be used purposive for a specific application. This application results from the kind of tool mounted on a moveable axis:

tool = milling tool	→ usage for milling, drilling
tool = engraving tool	→ usage for engraving
tool = metering device	→ usage for metering
tool = water jet nozzle	→ usage for water jet cutting

and so on.

In the new, at 29.12.2009 legally binding machine directive 2006/42/EC, the term "**partly completed machinery**" is defined as follows (quote from EC directive, article 2, letter g):

„*partly completed machinery*"

- *An assembly which is almost machinery but which cannot in itself perform a specific application. A drive system is partly completed machinery. Partly completed machinery is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment, thereby forming machinery to which this Directive applies;*

For each isel CNC base machine delivered **without a tool** (e.g. milling or engraving spindle, metering device, measuring device like CCD camera or triangulation laser, water jet nozzle, plasma burner) **the Declaration of Incorporation in this manual is valid**.
These CNC base machinery have no purpose for a specific application.

13.1 Declaration of Conformity for Machinery

EC Declaration of Conformity corresponding Machinery Directive 2006/42/EU, Annex II A

The manufacturer

isel Germany AG
Bürgermeister-Ebert-Straße 40
D-36124 Eichenzell

declares hereby, that the following product

Product designation:	**CNC-Machine EuroMod**	
Types:	**EuroMod MP 30,**	Article Number: **275133 33665**
	EuroMod MP 45,	Article Number: **275143 33665**
	EuroMod MP 65,	Article Number: **275153 33665**

conforms to the safety and health requirements of the **Machinery Directive 2006/42/EU, Annex I** – including those at the time of declaration current alterations.

The following harmonized Standards have been applied:

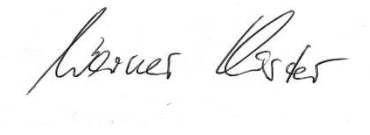
EN ISO 12100-1:2003	Safety of machinery – fundamental terms, general principles of design – Part 1: Basic terminology, methodology
EN ISO 12100-2:2003	Safety of machinery – fundamental terms, general principles of design – Part 2: Technical principles
EN ISO 13857:2008	Safety of machinery – Safety distances to avoid reaching of dangerous regions with upper and lower extremities
EN 349:1993	Safety of machinery – Minimum distances to avoid bruising of parts of the body
EN 953:1997	Safety of machinery – Guards – general requirements for the design and construction of fixed and moveable guards
EN 954-1:1996	Safety of machinery – Safety related parts of control systems, Part 1: General principles for design
EN ISO 13850:2008	Safety of machinery – Emergency-Halt – Design guidelines
EN 14121-1:2007	Safety of machinery – Risk assessment – Part 1: Guidelines
EN 60204-1:2006	Safety of machinery – Electrical equipment of machines, Part 1: General requirements

Also the following EU Directives have been applied:

EMV Directive	2004/108/EU
Low Voltage Directive	2006/95/EU

The **technical documentation** for this machine was created corresponding Annex VII Part A. The manufacturer obligates to provide the technical documentation in electronic mode on demand of authorized governmental agency.
Representative for composition of technical documentation is: **Helmut Danz**

Place, Date: Dermbach, 4.01.2010



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Werner Kister, Managing Board

13.2 Declaration of Incorporation for partly completed Machinery

Declaration of Incorporation corresponding Machinery Directive 2006/42/EU, Annex II B
The manufacturer

isel Germany AG
Bürgermeister-Ebert-Straße 40
D-36124 Eichenzell

declares hereby, that the following product

Product designation:	**CNC-Base Machine (partly completed) EuroMod**	
Types:	**EuroMod MP 30,**	Article Number: **275133 33665**
	EuroMod MP 45,	Article Number: **275143 33665**
	EuroMod MP 65,	Article Number: **275153 33665**

conforms to the safety and health requirements of the **Machinery Directive 2006/42/EU, Annex I** – including those at the time of declaration current alterations.

Also the following EU Directives have been applied:

EMV Directive	2004/108/EU
Low Voltage Directive	2006/95/EU

The following harmonized Standards have been applied:

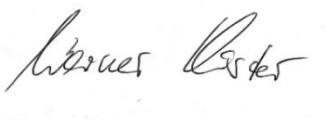
EN 349:1993	Safety of machinery – Minimum distances to avoid bruising of parts of the body
EN ISO 12100-1:2003	Safety of machinery – fundamental terms, general principles of design – Part 1: Basic terminology, methodology
EN ISO 12100-2:2003	Safety of machinery – fundamental terms, general principles of design – Part 2: Technical principles
EN ISO 13850:2008	Safety of machinery – Emergency-Halt – Design guidelines
EN 14121-1:2007	Safety of machinery – Risk assessment – Part 1: Guidelines
EN 60204-1:2006	Safety of machinery – Electrical equipment of machines, Part 1: General requirements

The **technical documentation** for this **partly completed** machine was created corresponding Annex VII Part B. The manufacturer obligates to provide the technical documentation in electronic mode on demand of authorized governmental agency.
Representative for composition of technical documentation is: **Helmut Danz**

The product (partly completed machine) is provided for integration in a machine or to be bonded with other partly completed machine in sense with **Machinery Directive 2006/42/EU**, Article 1, Chapter (1), Character a.

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of **Machinery Directive 2006/42/EU.**

Place, Date: Dermbach, 4.01.2010



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Werner Kister, Managing Board

14 Exploded views / spare parts lists

14.1 **EuroMod 30**

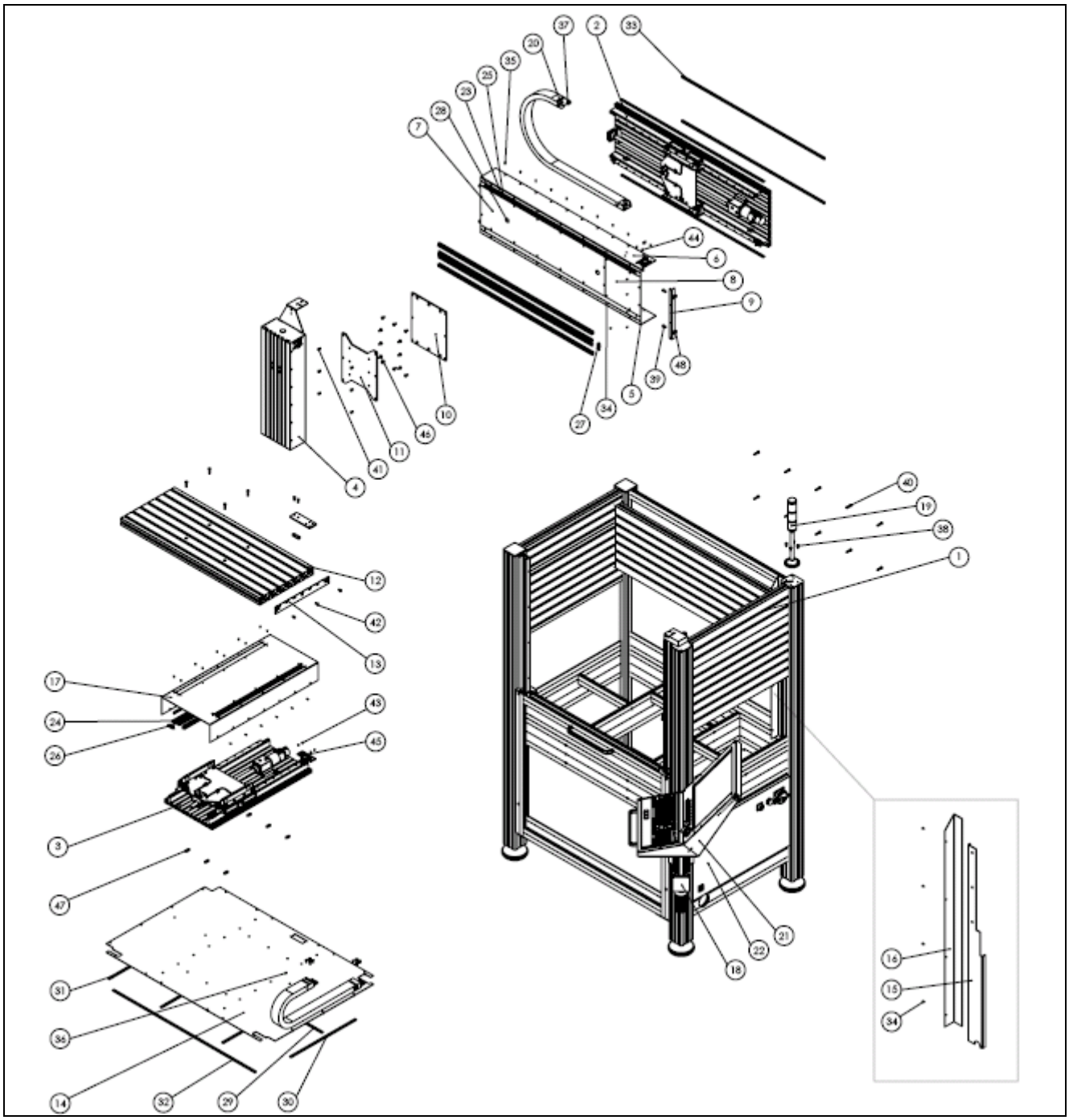


Figure: Exploded view CNC Base machine EuroMod 30 (without tool)

EuroMod - MP30						
POS-NR.	**Artikelnummer**	**MENGE**	**BENENNUNG**	**Zeich.- Nr.**	**Teileart**	**Oberfläche**
1	675012 0038	1	DZ3703 Untergestell EuroMod - MP30	DZ3703		
2	675012 1045	1	DZ 3255-2 X-Axis LES22 EuroMod L=996	DZ3255	Baugruppe	
3	siehe Tabelle	1	DZ 3206-3 Y-Axis LES 22 EuroMod L=646	DZ3206	Baugruppe	
4	675012 1052	1	DZ3729 Z-Axis - LES21L=596	DZ3729	Baugruppe	
5	675012 3311	1	DZ 3311-3 Abdeckung 1 LES22 EuroMod	DZ3311	Blechteil	eloxiert

6	675012 3312	1	DZ 3312-3 Abdeckung 2 LES22 EuroMod	DZ3312	Blechteil	eloxiert
7	675012 3313	1	DZ 3313-3 Abdeckung 3 LES22 EuroMod	DZ3313	Blechteil	eloxiert
8	675012 3314	1	DZ 3314-3 Abdeckung 4 LES22 EuroMod	DZ3314	Blechteil	eloxiert
9	675012 3315	2	DZ 3315-4 Unterstützung Abdeckung X-Axis EuroMod	DZ3315	Blechteil	blank
10	675012 2080	1	DZ 2080-3 Befestigungsplatte X-Axis	DZ2080	Blechteil	pulverbesch.
11	675012 2082	1	DZ 2082-3 Montageblech Z-Axis	DZ2082	Blechteil	pulverbesch.
12	675012 3243	1	DZ 3243-3 Tischplatte Y-Axis RE40-350 W EuroMod 30	DZ3243		eloxiert
13	675012 3161	2	DZ 3161-3 Seitenabdeckung für 1x RE 40x350 Wechselnut	DZ3161	Blechteil	eloxiert
14	675012 3632	1	DZ3632 Abdeckblech - Mitte EuroMod 30	DZ3632	Blechteil	eloxiert
15	675012 3720	1	DZ3720 Kabelkanal 1 EuroMod 30	DZ3720	Blechteil	eloxiert
16	675012 3721	1	DZ3721 Kabelkanal 2 EuroMod 30	DZ3721	Blechteil	eloxiert
17	675012 37251	1	DZ3725 Abdeckung Y-Axis EuroMod 30	DZ3725	Blechteil	eloxiert
18	371050 0009	1	Bedienterminal Schwenkarm PS80			
19	528500 0002	1	Signal Tower LTA-204 - 24V			
20	219200 / 219201	1	Energiekette 1 - Z-Axis EuroMod			
21	371052 0102	1	17zoll-Bedienpanel 2008 - Az3841	Az 3841		
22	375123 0653	1	Schaltschrank 640x400x300			
23	603014 0998	4	Dichtlippenprofil L - 1000			
24	603014 0578	4	Dichtlippenprofil L - 580			
25	630900 xxxx	4	Dichtlippe L - 990			
26	630900 xxxx	4	Dichtlippe L - 570			
27	639001	8	Endeinfassung			
28	610019 0002	2	Blindstopfen d=16			
29	675012 1722	2	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=225	DZ 1722-3	Blechteil	verzinkt
30	675012 17222	1	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=425	DZ 1722-3	Blechteil	verzinkt
31	675012 17224	5	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=625	DZ 1722-3	Blechteil	verzinkt
32	675012 17227	4	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=925	DZ 1722-3	Blechteil	verzinkt
33	609011 0925	2	Gewindestreifen 10x4 M6 L=925			
34	891201 0061	62	Linsensenkschraube DIN 966 4.8 VZ M 3 x 6			
35	891201 0081	34	Linsensenkschraube DIN 966 4.8 VZ M 3 x 8			
36	891200 0125	35	Linsensenkschraube DIN 966 4.8 VA M 3 x 12			
37	891124 0081	4	Zylinderschraube DIN 6912 8.8 M 6 x 8			
38	891124 0121	4	Zylinderschraube DIN 6912 8.8 M 6 x 12			
39	891124 0141	4	Zylinderschraube DIN 6912 8.8 M 6 x 14			
40	891124 0251	28	Zylinderschraube DIN 6912 8.8 M 6 x 25			
41	891594 0105	6	Linsenkopfschraube DIN 7380 M 6 x 10			
42	891594 0125	9	Linsenkopfschraube DIN 7380 M 6 x 12			
43	891181 0041	4	Linsenschraube DIN 7985 4.8 VZ M 3 x 4			
44	891181 0051	5	Linsenschraube DIN 7985 4.8 VZ M 3 x 5			
45	891181 0061	8	Linsenschraube DIN 7985 4.8 VZ M 3 x 6			
46	891134 0141	12	Senkschraube DIN 7991 M 6 x 14			
47	890325 0002	10	Gleitmutter M6 - L25xB10xH3 5mm	TE0163		
48	890365 0001	8	Gleitmutter M6 - L25xB13xH5mm	TE0596		
49	392810 0200	1	Motorleitung - Achsanschluß			
50	392810 0300	1	Motorleitung - Achsanschluß			
51	392810 0500	1	Motorleitung - Achsanschluß			
52	392740 0200	1	Encoderleitung - Achsanschluß			
53	392740 0300	1	Encoderleitung - Achsanschluß			
54	392740 0500	1	Encoderleitung - Achsanschluß			

Table: Spare part list CNC Base machine EuroMod 30 (without tool)

14.2 **EuroMod 45**

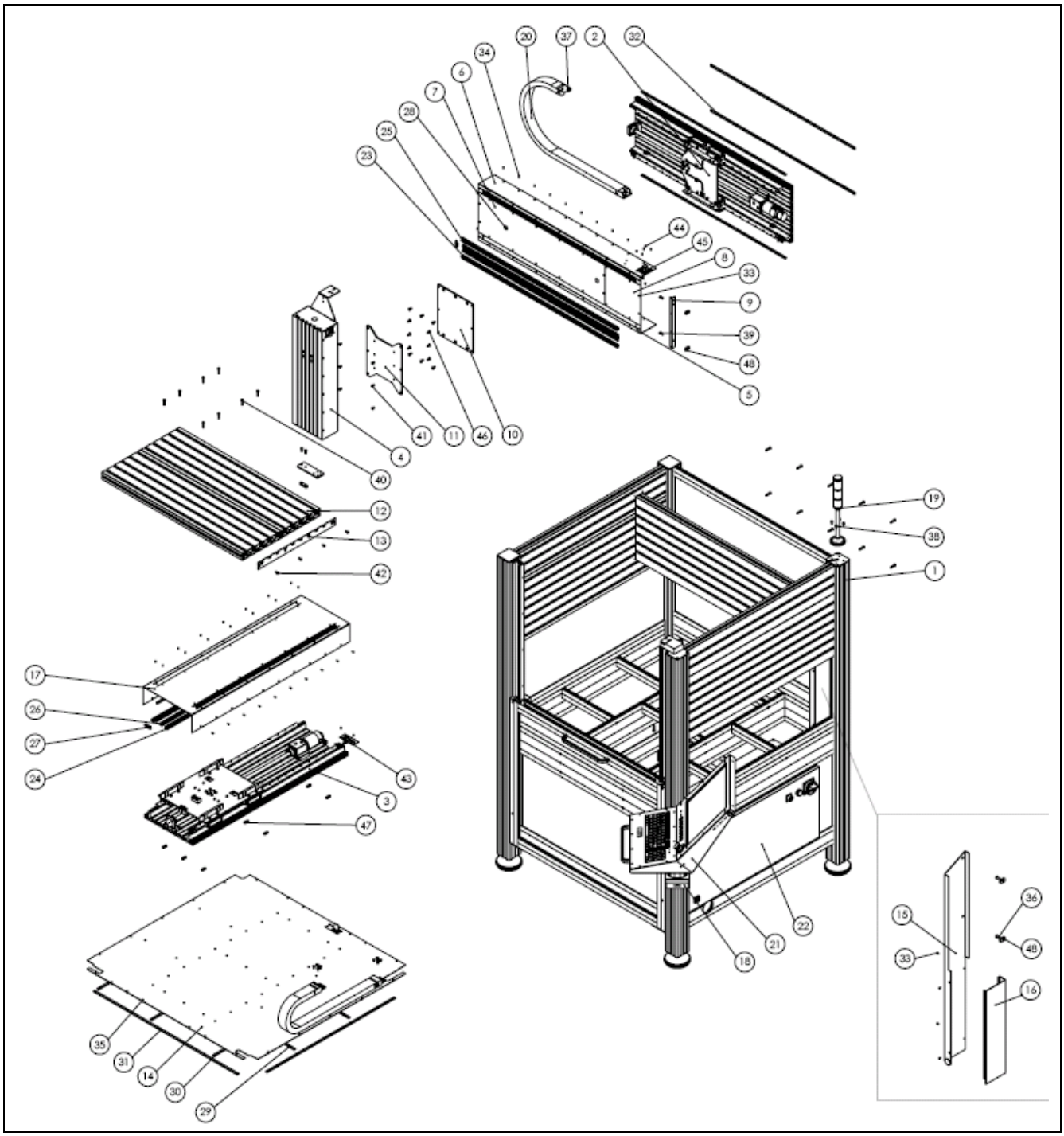


Figure: Exploded view CNC Base machine EuroMod 45 (without tool)

EuroMod - MP45						
POS-NR.	**Artikelnummer**	**MENGE**	**BENENNUNG**	**Zeich.- Nr**	**Teileart**	**Oberfläche**
1	675012 3704	1	DZ3704 Untergestell EuroMod - MP45	DZ3704		
2	675012 1045	1	DZ 3255-2 X-Axis LES22 EuroMod L=996	DZ3255	Baugruppe	
3	675012 1046	1	DZ 3304-3 LES22 - Y-Axis EuroMod 45 L=996	DZ3304	Baugruppe	
4	675012 1052	1	DZ3729 LES21 - Z-Axis L=596	DZ3729	Baugruppe	
5	675012 3311	1	DZ 3311-3 Abdeckung 1 LES22 EuroMod	DZ3311	Blechteil	eloxiert

6	675012 3312	1	DZ 3312-3 Abdeckung 2 LES22 EuroMod	DZ3312	Blechteil	eloxiert
7	675012 3313	1	DZ 3313-3 Abdeckung 3 LES22 EuroMod	DZ3313	Blechteil	eloxiert
8	675012 3314	1	DZ 3314-3 Abdeckung 4 LES22 EuroMod	DZ3314	Blechteil	eloxiert
9	675012 3315	2	DZ 3315-4 Unterstützung Abdeckung X-Axis EuroMod	DZ3315	Blechteil	blank
10	675012 2080	1	DZ 2080-3 Befestigungsplatte X-Axis	DZ2080	Blechteil	pulverbesch.
11	675012 2082	1	DZ 2082-3 Montageblech Z-Axis	DZ2082	Blechteil	pulverbesch.
12	675012 3301	2	DZ 3301-3 Tischplatte RE 40x250 W L=900 EuroMod 45	DZ 3301-3		eloxiert
13	675012 2486	2	DZ 2486-3 Seitenabdeckung für 2x RE 40x 250	DZ2486	Blechteil	eloxiert
14	675012 3631	1	DZ3631 Abdeckblech Mitte - EuroMod 45	DZ3631	Blechteil	eloxiert
15	675012 3723	1	DZ3723 Kabelkanal 2 EuroMod 45-65-120	DZ3723	Blechteil	eloxiert
16	675012 3722	1	DZ3722 Kabelkanal 1 EuroMod 45-65-120	DZ3722	Blechteil	eloxiert
17	675012 3725	1	DZ3725 Abdeckung Y-Axis EuroMod 45	DZ3725	Blechteil	eloxiert
18	371050 0009	1	Bedienterminal Schwenkarm PS80			
19	528500 0002	1	Signal Tower LTA-204 - 24V			
20	219200 / 219201	1	Energiekette 1 kpl - Z-Axis EuroMod - LES 120			
21	371052 0102	1	17zoll-Bedienpanel 2008 - Az3841	Az 3841		
22	375123 0753	1	Schaltschrank 850x400x300 - IMD10-2			
23	603014 0998	4	Dichtlippenprofil L - 1000			
24	603014 0918	4	Dichtlippenprofil L - 920			
25	630900 xxxx	4	Dichtlippe L - 990			
26	630900 xxxx	4	Dichtlippe L - 910			
27	639001	8	Endeinfassung			
28	610019 0002	2	Blindstopfen d=16			
29	675012 1722	4	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=225	DZ 1722-3	Blechteil	verzinkt
30	675012 17226	4	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=825	DZ 1722-3	Blechteil	verzinkt
31	675012 17227	4	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=925	DZ 1722-3	Blechteil	verzinkt
32	609011 0925	2	Gewindestreifen 10x4 M6 L=925			
33	891201 0061	70	Linsensenkschraube DIN 966 4.8 VZ M 3 x 6			
34	891201 0081	40	Linsensenkschraube DIN 966 4.8 VZ M 3 x 8			
35	891201 0121	50	Linsensenkschraube DIN 966 4.8 VZ M 3 x 12			
36	891594 0301	2	Linsenkopfschraube DIN 7380 M 6 x 30			
37	891124 0081	4	Zylinderschraube DIN 6912 M 6 x 8			
38	891124 0121	4	Zylinderschraube DIN 6912 8.8 M 6 x 12			
39	891124 0141	4	Zylinderschraube DIN 6912 8.8 M 6 x 14			
40	891124 0251	27	Zylinderschraube DIN 6912 8.8 M 6 x 25			
41	891594 0105	6	Linsenkopfschraube DIN 7380 M 6 x 10			
42	891594 0121	8	Linsenkopfschraube DIN 7380 M 6 x 12			
43	891181 0041	6	Linsenschraube DIN 7985 4.8 VZ M 3 x 4			
44	891181 0051	5	Linsenschraube DIN 7985 4.8 VZ M 3 x 5			
45	891181 0061	4	Linsenschraube DIN 7985 4.8 VZ M 3 x 6			
46	891134 0141	12	Senkschraube DIN 7991 M 6 x 14			
47	890325 0002	9	Gleitmutter M6 - L25xB10xH3 5mm	TE0163		
48	890365 0001	6	Gleitmutter M6 - L25xB13xH5mm	TE0596		
49	392810 0200	1	Motorleitung - Achsanschluß			
50	392810 0400	1	Motorleitung - Achsanschluß			
51	392810 0500	1	Motorleitung - Achsanschluß			
52	392740 0200	1	Encoderleitung - Achsanschluß			
53	392740 0300	1	Encoderleitung - Achsanschluß			
54	392740 0500	1	Encoderleitung - Achsanschluß			

Table: Spare part list CNC Base machine EuroMod 45 (without tool)

14.3 **EuroMod 65**

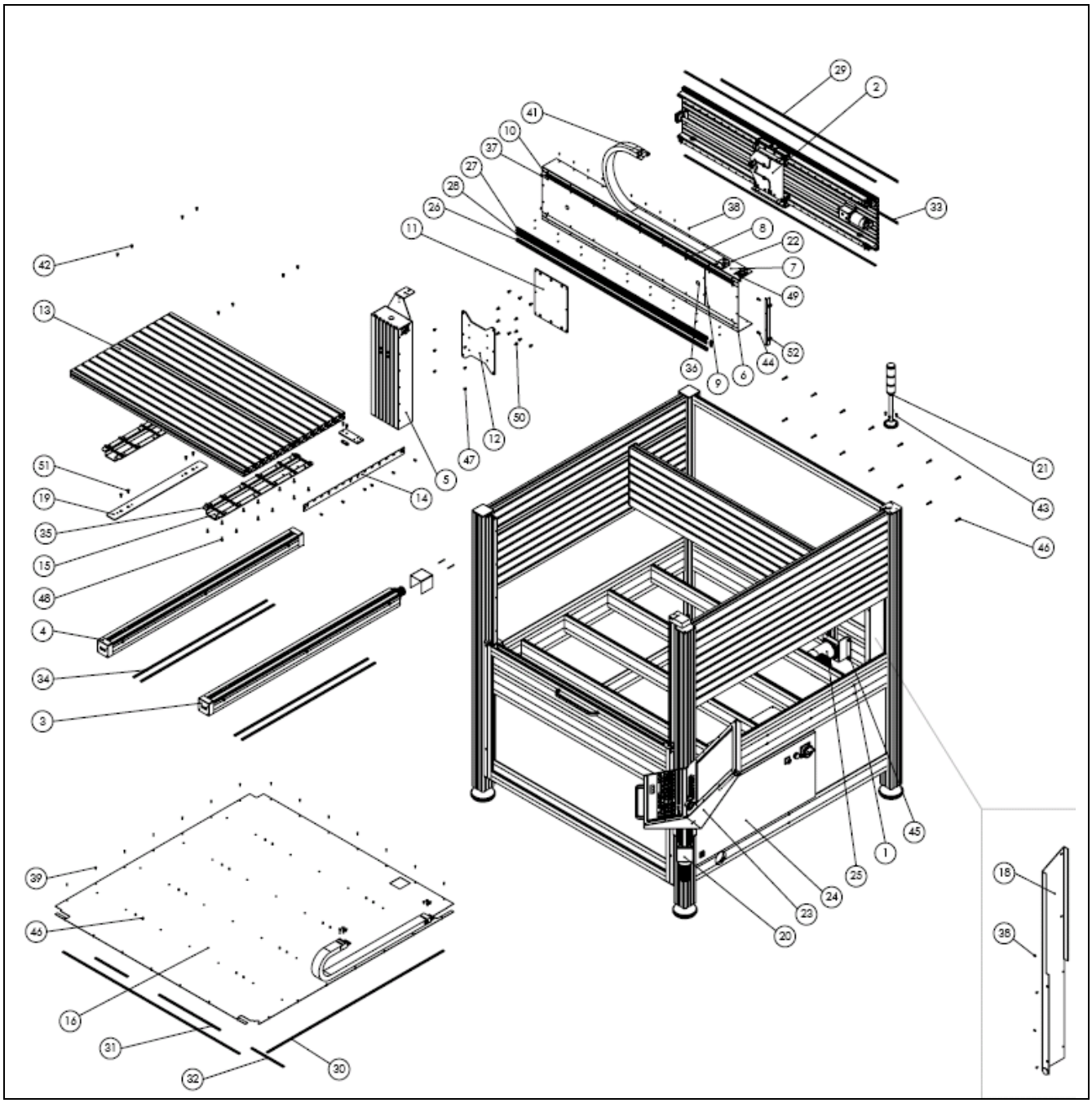


Figure: Exploded view CNC Base machine EuroMod 65 (without tool)

EuroMod - MP65						
POS-NR.	**Artikelnummer**	**MENGE**	**BENENNUNG**	**Zeich.- Nr**	**Teileart**	**Oberfläche**
1	675012 0042	1	DZ3741 Gestell EuroMod - MP65	DZ3741		
2	675012 xxxx	1	DZ3255 X-Achse EuroMod 60 L=1346	DZ3255	Baugruppe	
3	234023 9000	1	DZ3742 Y-Achse - EuroMod - LES4 L=1290	DZ3742	Baugruppe	
4	234020 0129	1	LES 4 ohne Spindel L=1290		Baugruppe	
5	675012 1052	1	DZ3729 Z-Achse - LES21 L=596	DZ3729	Baugruppe	
6	675012 33111	1	DZ 3311-3 Abdeckung 1 LES22 EuroMod	DZ3311	Blechteil	eloxiert
7	675012 33121	1	DZ 3312-3 Abdeckung 2 LES22 EuroMod	DZ3312	Blechteil	eloxiert
8	675012 33131	1	DZ 3313-3 Abdeckung 3 LES22 EuroMod	DZ3313	Blechteil	eloxiert
9	675012 33141	1	DZ 3314-3 Abdeckung 4 LES22 EuroMod	DZ3314	Blechteil	eloxiert

10	675012 3315	2	DZ 3315-4 Unterstützung Abdeckung X-Achse EuroMod	DZ3315	Blechteil	blank
11	675012 2080	1	DZ 2080-3 Befestigungsplatte X-Achse	DZ2080	Blechteil	pulverbesch.
12	675012 2082	1	DZ 2082-3 Montageblech Z-Achse	DZ2082	Blechteil	pulverbesch.
13	675012 3746	2	DZ3746 Tischplatte Y-Achse - EM 60	DZ3746	Frästeil	eloxiert
14	675012 3163	2	DZ 3163-3 Seitenabdeckung für 2x RE 40x350 Wechselnut	DZ3163	Blechteil	eloxiert
15	675012 3747	2	DZ3747 Montageblech Arbeitstisch - EM 60	DZ3747	Blechteil	verzinkt
16	675012 3744	1	DZ3744 Abdeckung 2 - EM 60	DZ3744	Blechteil	eloxiert
17	675012 3722	1	DZ3722 Kabelkanal 1 EuroMod 45-65-120	DZ3722	Blechteil	eloxiert
18	675012 3723	1	DZ3723 Kabelkanal 2 EuroMod 45-65-120	DZ3723	Blechteil	eloxiert
19	675012 3782	2	DZ3782 Unterlage Tischplatte EuroMod	DZ3782	Blechteil	verzinkt
20	371050 0009	1	Bedienterminal Schwenkarm PS80			
21	528500 0002	1	Signal Tower LTA-204 - 24V			
22	219200 / 219201	1	Energiekette 1 kpl - Z-Achse EuroMod - LES 120			
23	371052 0102	1	17zoll-Bedienpanel 2008 - Az3841	Az 3841		
24	375123 0753	1	Schaltschrank 850x400x300 - IMD10-2			
25	675012 3781	1	DZ3781 Antriebsmodul Y-Achse - EM60 - 75	DZ3781		
26	603014 1318	4	Dichtlippenprofil L - 1320			
27	630900 xxxx	4	Dichtlippe L - 1310			
28	639001	4	Endeinfassung			
29	675012 172213	3	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=1325	DZ 1722-3	Blechteil	verzinkz
30	675012 172212	5	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=1225	DZ 1722-3	Blechteil	verzinkt
31	675012 17222	3	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=425	DZ 1722-3	Blechteil	verzinkt
32	675012 1722	8	DZ 1722-3 Gewindestreifen 10x3 M3 Raster100 L=225	DZ 1722-3	Blechteil	verzinkt
33	609011 xxxx	2	Gewindeschiene 10x4 M6 L=1225			
34	609011 0925	4	Gewindeschiene 10x4 M6 L=925			
35	609011 0125	12	Gewindeschiene 10x4 M6 L=125			
36	610019 0002	2	Blindstopfen d=16			
37	891201 0061	50	Linsensenkschraube DIN 966 4.8 VZ M 3 x 6			
38	891201 0081	29	Linsensenkschraube DIN 966 4.8 VZ M 3 x 8			
39	891201 0121	110	Linsensenkschraube DIN 966 4.8 VZ M 3 x 12			
40	891594 0301	2	Linsenkopfschraube DIN 7380 M 6 x 30			
41	891124 0081	4	Zylinderschraube DIN 6912 8.8 M 6 x 8			
42	891124 0101	8	Zylinderschraube DIN 6912 8.8 M 6 x 10			
43	891124 0121	4	Zylinderschraube DIN 6912 8.8 M 6 x 12			
44	891124 0141	4	Zylinderschraube DIN 6912 8.8 M 6 x 14			
45	891124 0161	4	Zylinderschraube DIN 6912 8.8 M 6 x 16			
46	891124 0251	30	Zylinderschraube DIN 6912 8.8 M 6 x 25			
47	891594 0105	18	Linsenkopfschraube DIN 7380 M 6 x 10			
48	891594 0161	24	Linsenkopfschraube DIN 7380 M 6 x 16			
49	891181 0051	4	Linsenschraube DIN 7985 4.8 VZ M 3 x 5			
50	891134 0141	12	Senkschraube DIN 7991 M6 x 14			
51	891134 0161	8	Senkschraube DIN 7991 M6 x 16			
52	890365 0001	6	Gleitmutter M6 - L25xB13xH5mm	TE0596		
53	890315 0002	1	Gleitmutter 2xM6 - L45xB10xH3 5mm	TE0162		
54	392810 0200	1	Motorleitung - Achsanschluß			
55	392810 0300	1	Motorleitung - Achsanschluß			
56	392810 0500	1	Motorleitung - Achsanschluß			
57	392740 0200	1	Encoderleitung - Achsanschluß			
58	392740 0300	1	Encoderleitung - Achsanschluß			
59	392740 0500	1	Encoderleitung - Achsanschluß			

Table: Spare part list CNC Base machine EuroMod 65 (without tool)

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