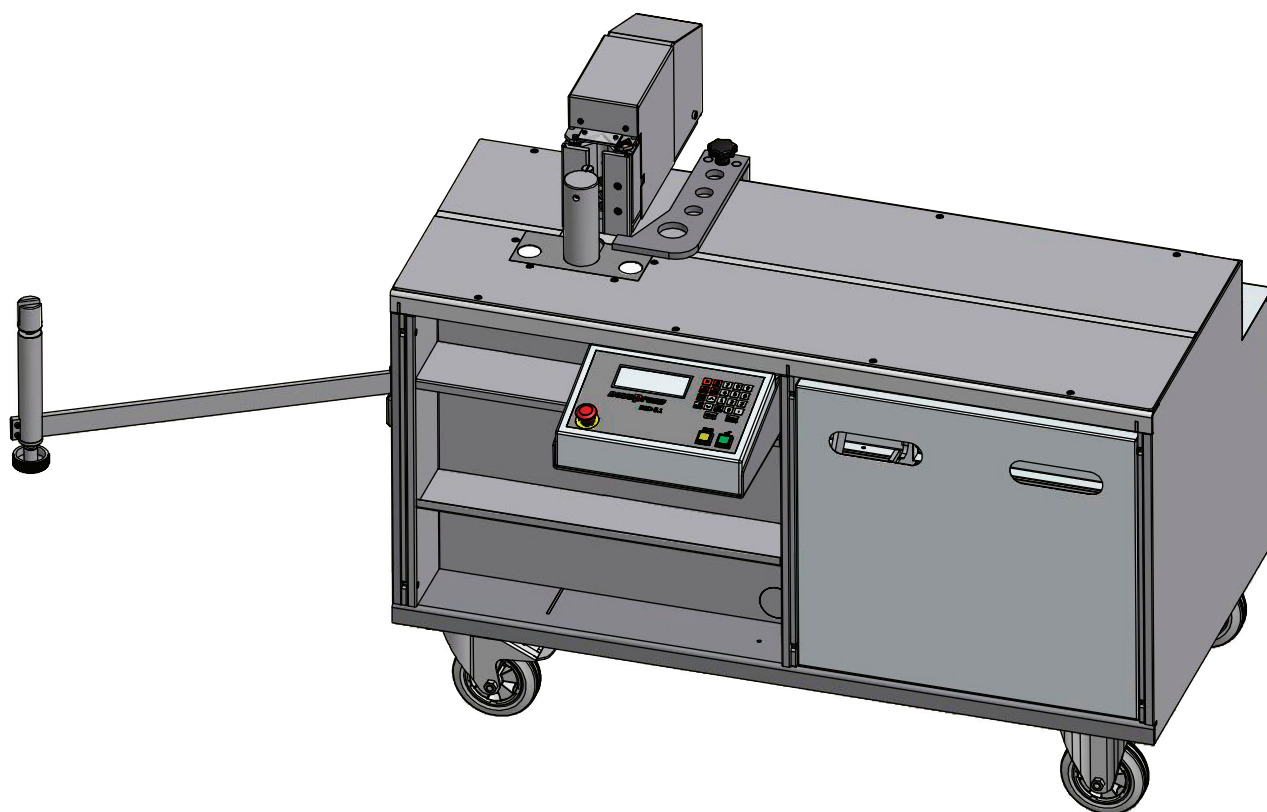


Operating Manual
for



novopress

Bending Table
BGD-5.1



EN English
Translation of the original Operating Manual

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GENERAL SAFETY REGULATIONS

Read all safety regulations and instructions!

1. Keep the place of work clean.
Disorderly work-places and work-benches invite accidents.
Ensure that lighting is good.
2. Keep children away.
Do not allow unauthorised persons to touch the device or the cable.
Keep unauthorised persons away from your place of work.
3. Wear suitable working clothing.
Do not wear any wide clothes nor jewellery - they may get caught up in moving parts.
When working in the open it is recommended that you wear rubber gloves and non-slip footwear. Wear a hair- net if you have long hair.
4. Always be alert.
Only use a device after having been instructed in its operation.
Concentrate on your work. Proceed sensibly.
Do not use the device when you are distracted.
5. Do not lean too far forward. Avoid abnormal stance.
Make sure that you have a secure standing position, and maintain balance at all times.
6. Leave safety devices where they belong.
7. Hand tools may not be installed as fixtures.
8. Repair and maintenance.
Have repairs and maintenance work carried out in an authorised NOVOPRESS specialist workshop.
Only use original and identical NOVOPRESS spare parts.
We reject all responsibility and liability for work carried out by third- party personnel.
9. Our machines are not UL certificated. They may not be exported and used for USA and Canada.

SAFETY INSTRUCTIONS FOR HYDRAULIC EQUIPMENT

1. Please read the operating instructions.
Acquaint yourself with the hydraulic equipment.
2. Provide the equipment with the necessary care.
Always keep the equipment in operational condition.
Cleanness is an essential requirement for good and safe working.
3. Switch off the electric power supply to the hydraulic equipment,
 - when the equipment is not in use
 - when maintenance work is to be carried out.
4. Avoid unintentional switching - on.
Keep hands and feet away from the switch when the equipment is not being used.
5. Do not use the equipment in a manner in contravention of the instructions.
Never carry the equipment by the pipe or pull on the pipe.
Protect the piping from heat, oil, sharp edges and high levels of weight strain.
6. Use only piping, fittings and accessories which have been designed for the operating pressure of the hydraulic unit.
BURSTING PRESSURE OR TEST PRESSURE IS NOT OPERATING PRESSURE!
Avoid squashing or bending of the piping.
Piping must not be painted over.
7. Replace the hydraulic piping
 - when cracks, squashed or bent points are to be seen
 - when blistering is established
 - when hydraulic fluid escapes
 - when pipe fittings are damaged
 - when discolouration is established on the outer layer, e.g. due to the influence of solvents.
8. The hydraulic fluid used in the system is kerosene-based.
This requires particular care and attention.
 - Avoid continuous contact with the skin
 - ensure that the hydraulic fluid does not get into the eyes or mouth.Hydraulic pipes have to be replaced after 5 years of usage, despite of the circumstance that no damages should be remarkable.
9. The equipment must not be operated, if it has leaks and there is a danger of hydraulic fluid coming into contact with persons, open fire, heating equipment, electric cabling, ground water, foods and other substances which are intended for human consumption.
10. Hydraulic units with petrol engines
 - must not be operated in closed rooms, due to the **DANGER OF INTOXICATION!**
 - do not pour in petrol while the motor is running or in the vicinity of open fire. **DANGER OF EXPLOSION!**

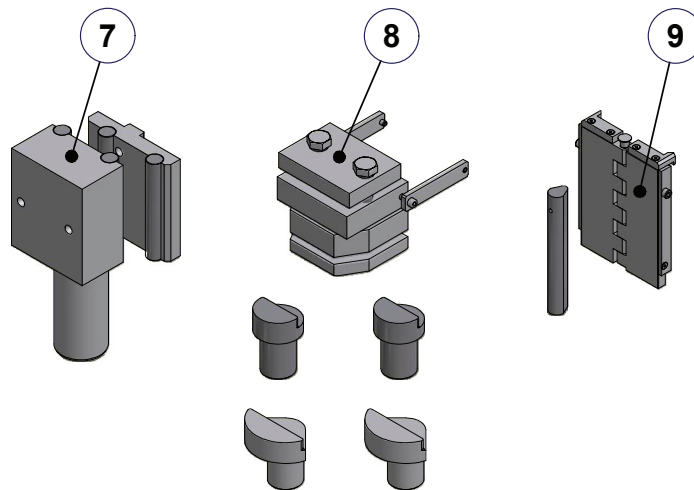
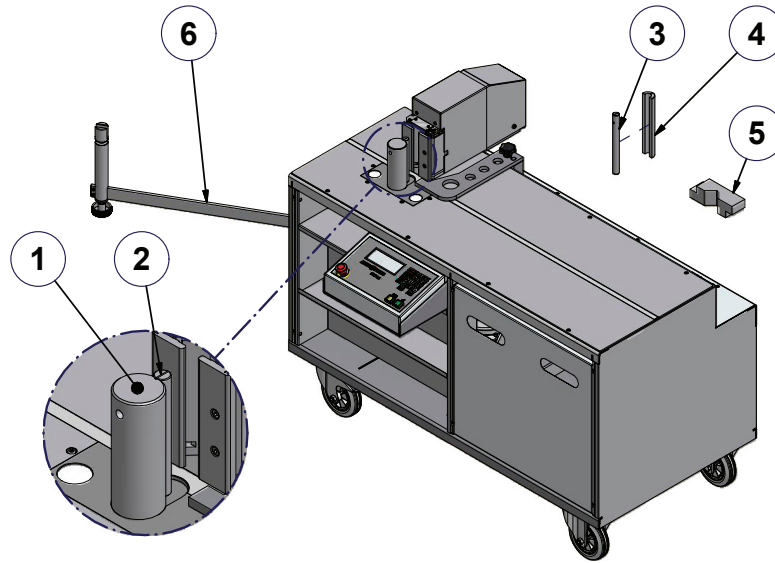
SAFETY TIPS FOR ELECTRIC TOOLS

ATTENTION: In order to avoid electric shock, danger of injury and burning the following basic safety measures are always to be taken when using electric tools. Read and observe the notes before using the device. Keep the safety tips in a safe place.

1. Take influences of the surroundings into account.
Do not expose electric devices to rain.
Do not use electric devices in damp or wet surroundings.
Do not use electric devices in the vicinity of flammable liquids or gases.
2. Protect yourself from electric shock.
Do not fix additional rating plates or symbols with rivets or screws.
Use adhesive signs. When working with electric devices avoid body contact with earthed objects such as pipes, heating appliances, refrigerators etc.
3. Use the correct tools.
Only use the tools and accessories outlined in the operating instructions.
Do not use the electric device to do work for which it is not intended.
4. Secure the work piece.
Use gripping devices or vice grips to hold the work piece steady.
It is more securely held than by hand and you can operate the device with two hands.
5. Do not overload your electric device.
You can work better and more securely in the indicated power range.
6. Do not use the cable for purposes for which it is not intended.
Do not carry the electric device by the cable.
Do not use the cable in order to pull the plug out of the socket. Protect the cable from heat, oil, acids and sharp edges.
For working in wet rooms or in the open only use the authorised extension cables with the corresponding marking.
7. Avoid unintentional starting.
Ensure that the electric device is switched off before connecting the mains plug.
Do not carry the electric device in such a way as that your finger is on the switch.
Do not use the electric device if the ON/OFF switch does not work perfectly.
8. Disconnect the mains plug:
 - if the device is not in use
 - before maintenance of the electric device
 - when changing tools
9. Carefully maintain the electric device. The best and most secure work is guaranteed if you:
 - keep the electric device clean
 - observe the instructions for greasing, changing the tools and ancillary equipment
 - regularly check the connection cable and the extension cable
 - have damaged cables repaired by a specialist
 - keep hand grips dry, clean and free from oil and fat
 - have the electric device examined and cleaned by a specialist after 900 operating hours.

10. Keep electric devices in a safe place.
Store electric tools and accessories out of the reach of children, in dry, high-lying places or in locked rooms.
11. Electric devices are often used by more than one person. Therefore before beginning to work you should check:
 - the socket to ensure it is securely fixed and is not damaged in such a way as can be seen from the outside
 - the connection cable for outward damage to the insulation and for sharp kinks
 - that the cable is securely fixed to the device and whether the insulating plastic tube is damaged
 - that the switch is secure and shows no outward signs of damage
 - whether protective appliances or damaged parts function properly
 - whether movable parts jam or are damaged
 - do not use the device in the event of finding defects
 - only allow the device to be repaired by a specialist or in an authorised NOVOPRESS specialist work-shop
 - only use original and identical NOVOPRESS spare parts.

1 Scope of supply



BGD 5.1 (1) with hydraulic unit attached

Bending radii 7.5 mm (3), 10 mm (2) and 15 mm (4)

Block/control bar (5)

Accessories:

Step bending tools (7):

Small

Order no.: 31671

Large

Order no.: 31188

Upright bending tool (8)

Order no.: 31221

Bending hinge (9)

Order no.: 31850

2 Basic safety information

The following pictograms are used to highlight sections of text. Please follow these instructions and act with particular caution in these cases. Pass all health and safety instructions on to other users and technicians.

**Caution:**

For your own safety and to protect your bending table, the instructions in the text passages marked with this symbol must be complied with.

**Note:**

This information is directly linked to the description of a function or an operating sequence.

Please read this Operating Manual carefully.

The safety instructions it contains must be observed.

Compliance with local safety regulations is essential.

Symbols on the device

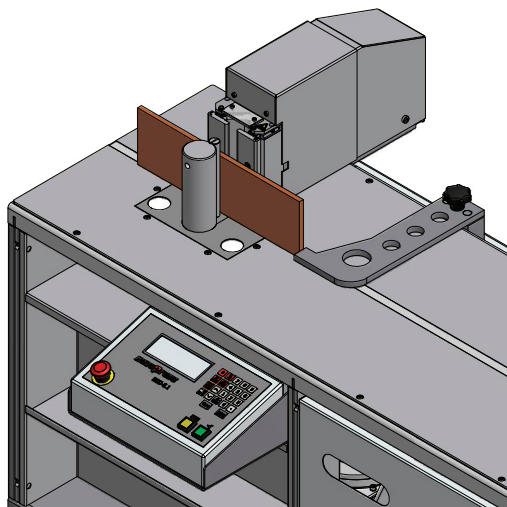
**Warning: Hand risks being crushed**

Keep hands away from the working area of the bending table.


3 Proper use

It is possible to bend the following using this bending table:

- Copper and aluminium busbars up to a max. of 160 x 13 mm.
- Flat steel bars up to 100 x 10 mm with a strength of up to a max. of 370 N/mm².



If no special tool is used, the bars may only be inserted and bent in the manner shown.

	<p>Caution:</p> <ul style="list-style-type: none">• Upright bending of bars is only permitted when using the upright bending tool.• Once bent, a bar may not be bent back again.• A bent arm must not be positioned on the length stop. <p>Non-compliance will result in damage to the BGD.</p>
---	--

Any use beyond or different to that described here shall be regarded as improper use.

Novopress is not liable for any resulting consequences or damage. Neither is it liable in the event of the use of tools from other manufacturers nor for any damage caused by such tools.

Novopress is not liable for damage resulting from

- Non-compliance with these instructions
- Improper use
- Deployment of non-trained staff
- Use of tools from other manufacturers
- Unauthorised modifications
- Technical changes
- Use of unauthorised spare parts

Proper use also includes compliance with the Operating Manual, adherence to the inspection and maintenance conditions as well as compliance with all the relevant safety regulations.

4 Technical data

BGD-5.1

Height:	approx. 1,095 mm
Width:	approx. 1,375 mm
Depth:	approx. 900 mm
Table height:	approx. 860 mm
Voltage:	see rating plate
Max. compression force:	150 kN
Max. stroke:	95 mm
Max. feed rate:	<10 mm/s
Emission noise pressure level:	<70 db(A)
Voltage:	see rating plate (neutral conductor used)
Type of protection:	IP44
Ambient temperature:	+5 °C to +40 °C
Relative humidity:	max. 95 % non-condensing
Installation location of BGD-5.1:	max. 2000 m above sea level

Only store and operate the BGD-5.1 in closed rooms.

HA3-BGD 400V hydraulic unit

Electrics:

Motor:

Supply voltage:	see rating plate
Frequency:	see rating plate

Frequency:	50 Hz	60 Hz
RPM:	2,800 rpm	3,300 rpm
Power consumption:	750 W	750 W

Hydraulics:

Pump:

Frequency:	50 Hz	60 Hz
Delivery rate:	3.5 l/min	3.3 l/min

Operating pressure: max. 200 bar

Dimensions:

Height:	approx. 460 mm
Width:	approx. 250 mm
Depth:	approx. 290 mm

Hydraulic oil: Oil used at the factory for this unit:
ISO VG 32 DIN 51519
(suitable for ambient temp. range of +5 to +40 °C)

Oil suitable for use: Oil with viscosity class:
ISO VG DIN 51519 from 10 to 46
(viscosity in CSt 7.4 -30 at 50 °C)

5 Special safety instructions

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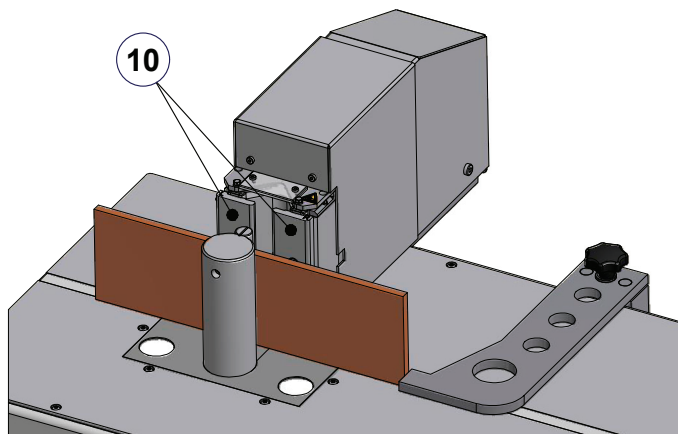
Caution:

- Busbars more than 13 mm in thickness may not be bent.
- Upright bending of bars is only permitted when using the upright bending tool.
- Once bent, a bar may not be bent back again.
- A bent arm must not be positioned on the length stop.

Non-compliance will result in damage to the BGD.

6 Important general information on bending

6.1 Thrust pads (10)



Caution:

- **Bars with a width > 120 mm or with a thickness > 10 mm**
These bars must be bent without thrust pads (10).
- **Bars up to 120 mm in width or up to 10 mm in thickness (inclusive)**
These bars must be bent with attached thrust pads (10).

Non-compliance will result in damage to the BGD.

Example>

Bar	40 x 8	with thrust pads (10)
Bar	120 x 12	with thrust pads (10)
Bar	100 x 13	without thrust pads (10)
Bar	160 x 10	without thrust pads (10)
Bar	160 x 13	without thrust pads (10)

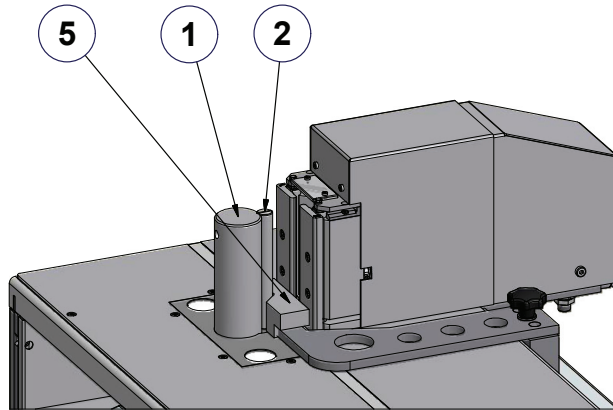
Procedure for attaching and removing the thrust pads (10):

- Switch off the emergency stop button (push) (see Section 6.12).
- Unscrew the thrust pads (10).
- Calibrate the length stop and angle (see Section 8).
- Perform bending operation.


When bending is completed, reattach the thrust pads (10) for smaller bars.

- Switch off the emergency stop button (push).
- Screw on the thrust pads (10).
Ensure that there is no dirt between the thrust pads.
- Calibrate the length stop and angle (see Section 8).
- Perform bending operation.


6.2 Bending radius (2) and bending mandrel (1)



When delivered, the 10 mm bending radius (2) is attached to the bending mandrel (1).

	<p>Caution:</p> <ul style="list-style-type: none">• Calibration may only be performed with the 10 mm bending radius.• There is a straight pin located in the bending mandrel for aligning the bending mandrel to the bending tool. This straight pin must engage in the hole of the bending mandrel mounting. <p>Non-compliance will result in damage to the BGD.</p>
---	---

6.3 Control bar (5)

	<p>Caution:</p> <p>The control bar must only be used for calibration.</p> <p>Non-compliance will result in damage to the BGD.</p>
---	--

Only a slight amount of force is needed for calibration.
The bending operation produces a maximum force of 150 kN.

6.4 Measuring scale

In order to determine the arm length more easily, a measuring tape is fitted into the workplate.

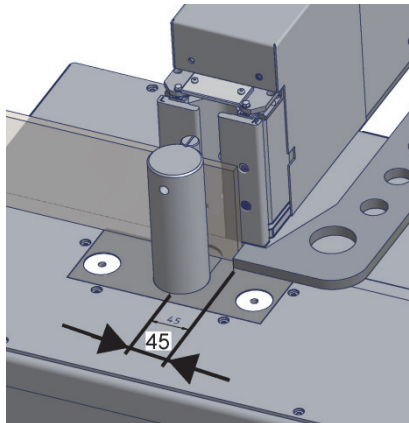
6.5 Smallest bending radius

Cu bars: Bending radius no smaller than thickness of the bar.

Al bars: Bending radius no smaller than 1.5 x the thickness of the bar.

6.6 Smallest arm length

45 mm



6.7 Bending angles

Values between 0.5° and 93.0° may be entered.

6.8 Bending rails with a thickness of less than 6 mm

For these bars the springback cannot be measured accurately.

After the bending operation, measure the bent angle and enter a larger angle if necessary before bending again. Repeat this procedure until the required angle has been attained.

6.9 Bend button

To perform a bending operation, press the “**Bend** button” on the control unit.



This button is green.

Hereinafter referred to as the “**Bend** button”.

6.10 Drive button

To move the automatic length stop, press the “**Drive** button” on the control unit.



This button is yellow.

Hereinafter referred to as the “**Drive** button”.

6.11 Stand-by

The zero point has to be reset every time there is an interruption to the power supply, including after the emergency off button has been pressed.

To avoid having to do this the bending table can be put in stand-by. The display will then be empty.

To switch the stand-by function on press



The display will then be empty.

To end the stand-by function press

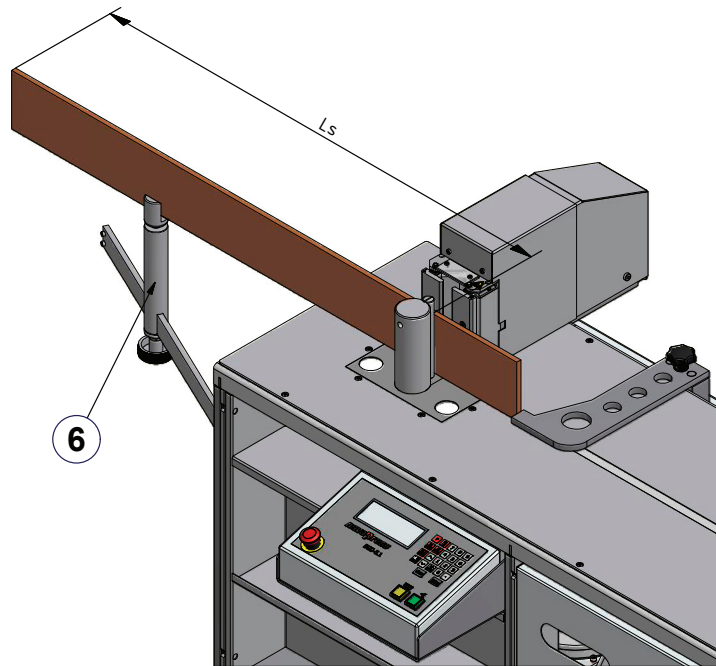


6.12 Emergency stop button

Pressing the emergency stop button shuts off the motor, the solenoid valve and the length stop. The length stop comes to a halt at its current location. The tool holder returns to its starting position.

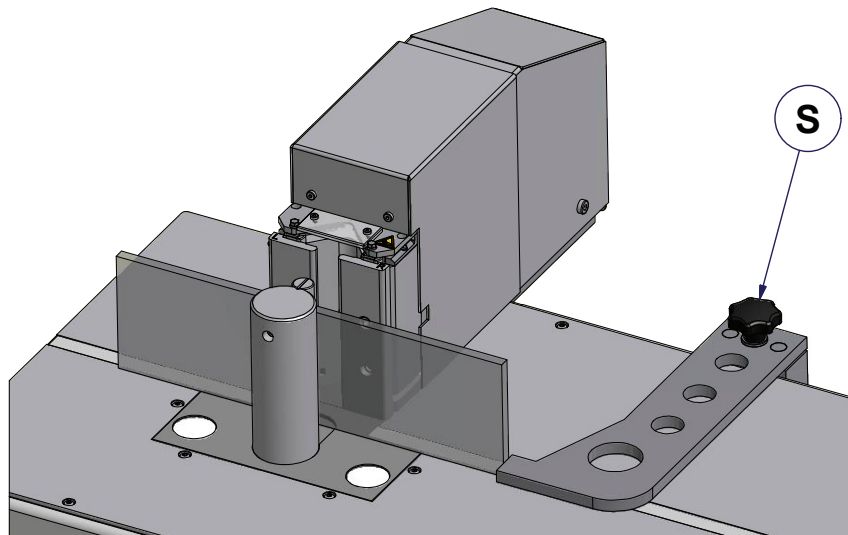
6.13 Support arm

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Use the support arm (6) for arm lengths "Ls" from 1 m to 2 m.
For arm lengths "Ls" of more than 2 m, support the end of the bar with a stand or something similar.

6.14 Length stop





The length stop is used to position the bar before bending, thus enabling you to insert the bar into the bending table quickly, with the correct dimensions. During the bending operation, the length stop moves approx. 15 mm backwards so that the bar does not damage the length stop when bending is carried out. Before complicated shapes are bent, you must carefully consider whether the bar could strike against the length stop during the bending operation. If there is a


EN

risk that this may occur, either move the length stop out of the at-risk zone if possible or remove the length stop.

Values between 45 mm and 800 mm may be entered.

	<p>Caution: In the event of adverse combinations of arm lengths and angles, collisions with bending table attachments or the bar to be bent could occur during the bending operation.</p> <p>Action:</p> <ul style="list-style-type: none"> • Release the Bend button immediately. • If possible, move the length stop away from the at-risk zone or dismantle it before bending. <p>Non-compliance will result in damage to the BGD.</p>
---	---

	<p>Caution:</p> <ul style="list-style-type: none"> • Do not lay or leave any objects on the workplate. • Only insert a bar after the length stop has reached the desired position. • A bent arm must not be positioned on the length stop. <p>Non-compliance will result in damage to the length stop</p>
---	--

	<p>Caution: If the bending tool has not yet retracted fully and the Drive button has been pressed too soon the length stop may collide with the bending tool in the event of values of less than 70 mm.</p> <p>Action:</p> <ul style="list-style-type: none"> • Only press the Drive button when the bending tool has retracted fully. <p>Non-compliance will result in damage to the BGD.</p>
---	---

6.14.1 Removing the length stop

- Unscrew the star-shaped grip (S).
- Remove the length stop.

6.14.2 Installing the length stop

- Position the length stop again and screw it on tightly using the star-shaped grip.

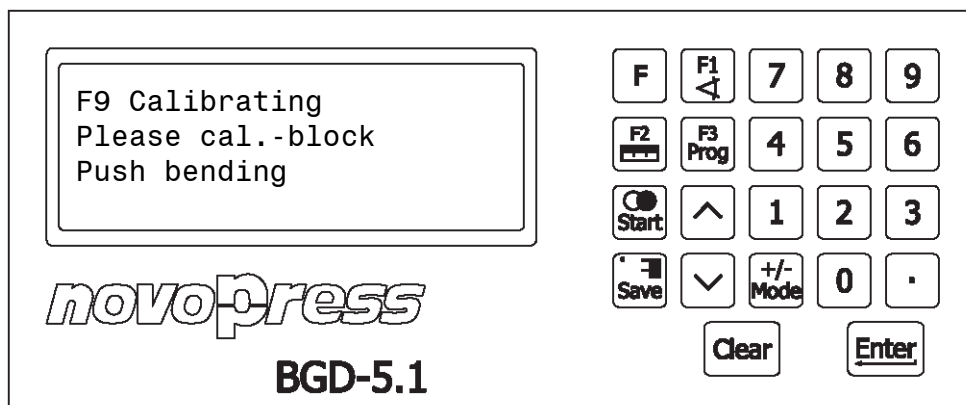
7 Characters in this manual and keyboard description












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Characters in this manual

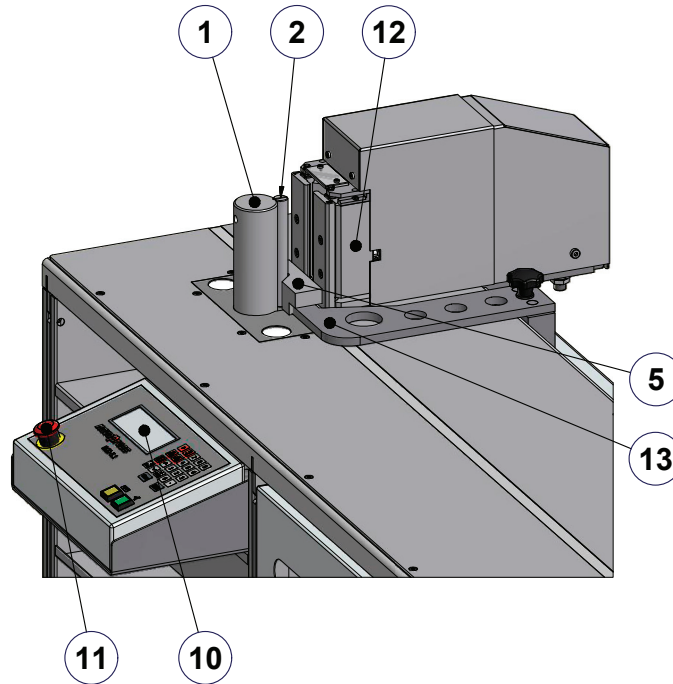
Bold print	In the following text, the keys which need to be pressed are indicated by bold type, e.g. F , Enter etc.
Italics	Text printed in italics, e.g. <i>The following will appear</i> , contains instructions or movement sequences related to the previously described operation.

Keyboard description



	Bending + Compensation
	Stroke
	Run program
	Repeat of F1. Bending is performed without compensation.
	Allows the input of code numbers
	Deletes an input
	Input confirmation
	Menu access
	Changes the prefix
	Is used to enter a value after the decimal point
	Are used to scroll forwards or backwards

8 Daily commissioning



- Connect the BGD to the power supply (for voltage see rating plate).
- If necessary, activate the emergency stop button (11) (pull).

The following appears on the display:


F9 Calibrating
Length stop
Press yellow key to
start length stop.


- Press the **Drive** button until the image below appears.
- The length stop moves to the calibration position.

After the calibration position has been reached the following appears:

F9 Calibrating
Please cal.-block
Push bending

EN


	<p>Note! <i>Always use the control bar supplied to set the zero point. The 10 mm bending radius (2) must be attached to the bending mandrel (1).</i></p>
---	---

	<p>Note! The control bar must only be used for setting the zero point. Only a slight amount of force is needed for calibration when setting the zero point. The bending operation produces a maximum force of 150 kN. Non-compliance with this instruction will result in damage to the control bar and the BGD.</p>
---	--

- Insert block/control bar (5) with the V groove pointing towards the bending mandrel (1).
- Press the **Bend** button.
*The tool holder (12) moves to the block/control bar (5) and then moves back again.
The following will appear on the display:*

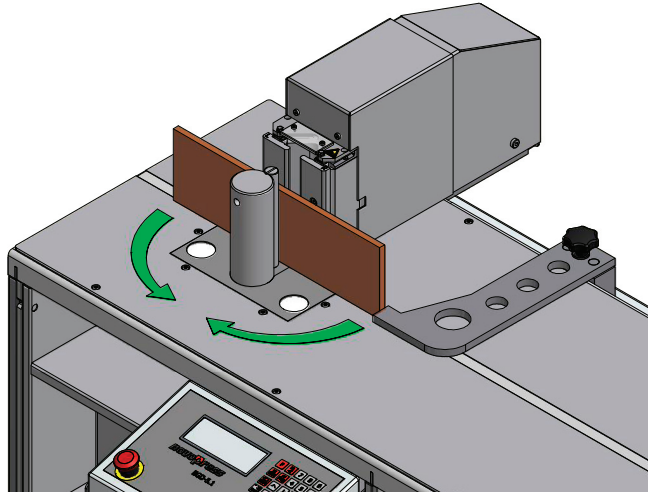
F1 Bending + Comp. F2 Stroke F3 Run program F4 Program editor
--

- Remove the control bar (5).
The bending table is now ready for operation.

	<p>Note! The zero point has to be reset every time there is an interruption to the power supply, including after the emergency off button has been pressed. To avoid having to do this the bending table can be put in stand-by. The display will then be empty.</p>
---	---

9 Bending

EN



9.1 Bending + Compensation (function F1)

Procedure:

- Press .


The following will appear on the display:

F1	< Act:	0.0°
	< Nom:	0.0°
	- Act:	70.0mm
	- Nom:	0.0mm



Note!


Values between 45 mm and 800 mm may be entered.

- Enter the arm length (-| Nom) and confirm using .



Note!

Values of between 0.5 and 93.0 degrees may be entered.

- Enter the bending angle (< Nom) and confirm using .
- Press the **Drive** button until the stop has reached the required position.
- Insert the bar and align it to the length stop.
-



Note!

*During the bending process, the bar arms move in the direction indicated by the arrows.
Protect this area when bending long bars.*

- Press the **Bend** button and hold it down until the bending tool has retracted fully.

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Bending operation sequence

- Press the **Bend** button and hold it down.
- The bar is pre-bent.
- The computer interrupts the bending process for a short while and measures bar springback.
- The bar is repeatedly bent until the angle value entered is attained.
- Once the bending operation is complete, release the **Bend** button.

Re-bending bars already bent (compensation)

If a bar that has already been bent has to be bent again, enter the required angle and bend

using .

- Example:*
- Re-bend by 11 degrees
 - Bar is already bent to 30 degrees
 - Enter 41 degrees

9.2 Return stroke limit (function F6)

The return stroke limit ensures that the tool holder does not return to the starting position but only travels a shorter distance. This saves time taken by the return stroke. The return stroke limit is only active with the function F1 “Bending + Comp.”. It is shown on the display with the SI affix.




When the return stroke limit is set, the tool holder retracts up to the entered value in front of the cylinder. For a bar with a thickness of 10 mm, the return stroke can be limited to approx. 20 mm. If the bar is thinner, a larger return stroke can be set, e.g. 5 mm bar with 25 mm return stroke.

The return stroke must be entered first, then bending can commence.

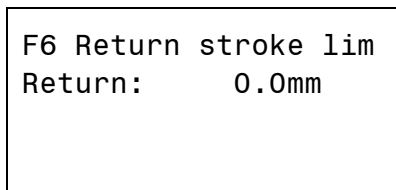
The return stroke limit value is stored until the bending table is disconnected from the electricity supply. To switch off the return stroke limit, set the value of the return stroke to zero.


The tool holder returns to its starting position as soon as you exit function F1.

Procedure:

- Press  and then .
- Press .

The following will appear on the display:





- Enter the return stroke, e.g. 20 mm, and confirm with .

- Press .

The following will appear on the display:

F1	< Act:	0.0°
	< Nom:	0.0°
	-l Act:	0.0mm
S1	-l Nom:	0.0mm

- Enter the arm length (-l **Nom**) and confirm using .
- Enter the bending angle (< **Nom**) and confirm using .
- Press the **Drive** button until the stop has reached the desired position.
- Insert the bar and align it to the length stop.
- Perform the bending operation.

When bending is complete, the tool holder moves up to 20 mm towards the cylinder.



Clearing the entered return stroke limit

To clear the return stroke limit, set the value that you entered via function F6 to zero.

- Press  and then .
- Press .

The following will appear on the display:

F6 Return stroke lim
Return: 20.0mm

- Enter a return stroke of 0 mm and confirm with .
- Press  to exit.

The return stroke limit is now deactivated.

EN 9.3 Bending using the Repeat key 

By activating the repeat function, bars of the same material and with the same cross section can be bent to the value entered, without compensation. Bending using the Repeat key is only possible with function F1 "Bending + Comp.". Pressing the Repeat key is shown on the display with the Rt affix.



Bend a bar using the F1 function.

The corrected bending angle of the bar bent last will be stored.

After this, bars made of the same material and with the same cross section can be bent without measuring the springback.


In order to do this, first press the Repeat key  and then actuate the **Bend** button.

Procedure:

1. Bend the bar using .
2. Remove the bar. Insert a new bar.
3. Press the Repeat key .

The following will appear on the display:

F1	< Act:	0.0°
Rt	< Nom:	0.0°
	-l Act:	70.0mm
	-l Nom:	0.0mm

4. Press the **Drive** button until the stop has reached the desired position.
5. Insert the bar and align it to the length stop.
6. Press the **Bend** button and hold it down.
The bar will be bent.
7. Release the **Bend** button as soon as the bending operation is complete.
8. Remove the bar. Insert a new bar.
9. Repeat points 4. to 8. as often as required.
10. To exit the repeat function press .

9.4 Bending bars with a thickness of less than 5 mm (F8 Bending without compensation)

For these bars the springback cannot be measured accurately.


The bars are bent without measuring the springback. Then measure the bent angle and enter a larger angle if necessary before bending again. Repeat this procedure until the required angle has been attained.

- Press **F** and then **8**.
- Press **Enter**.

The following will appear on the display:

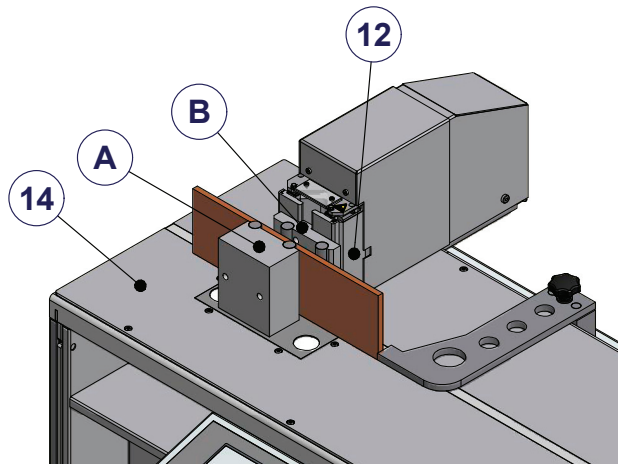
F8	< Act:	0.0°
	< Nom:	0.0°
	-l Act:	70.0mm
	-l Nom:	0.0mm

- Enter the arm length (-l Nom) and confirm using **Enter**.
- Enter the bending angle (< Nom) and confirm using **Enter**.
- Press the **Drive** button until the stop has reached the desired position.
- Insert the bar and align it to the length stop.
-

	<p>Note!</p> <p><i>During the bending process, the bar arms move in the direction indicated by the arrows.</i></p> <p>Protect this area when bending long bars.</p>
---	---

- Press the **Bend** button and hold it down until the bending tool has retracted fully.
- Remove the bar.
Check the bending angle.
- If the required angle was not achieved, set a larger angle.
- Repeat the procedure for as long as necessary until the required bending angle is attained.

10 Step bending tools



10.1 Scope of application

Copper and aluminium bars can be bent using the step bending tools.

The maximum cross section is as follows:

For step bending tool (small), order no.: 31671	
for aluminium	120 x 10
for copper	80 x 8
	60 x 10
For step bending tool (large), order no.: 31188	
for aluminium	120 x 10
for copper	120 x 10

The maximum step height for the relevant cross sections can be taken from the table.

Smaller step heights can also be achieved by limiting the stroke accordingly.

The stroke settings for

step height = material thickness

are also listed in the table.




The values shown in the table are only intended as guidelines. The precise settings depend on the individual material and must be determined by means of test bends.


10.2 Installing the step bending tool

- Pull the bending mandrel out of the workplate (19).
- Affix part no. 2 of the step bending tool (B) onto the tool holder (2) (M6 x 70 screw).
- Insert part no. 1 of the step bending tool (A) into the bending mandrel holder.

10.3 Bending

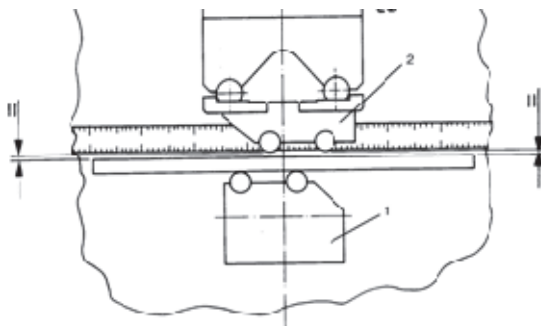
Procedure:

Step bending can be carried out using the functions  Stroke or Inching mode ( + ).



Note:




Bending tool part no. 1 shall be adjusted parallel to the table measuring tape with the aid of the bar to be bent, before each bending operation.



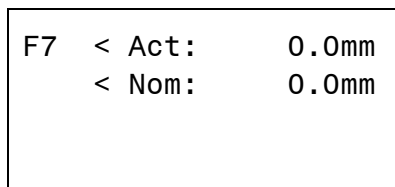
Disregarding this instruction will falsify the bending operation.


10.3.1 Inching mode

If you would like to gradually work towards the required step, operate the bending table in inching mode. In order to do this, select the **Inching mode** programme. With this programme, the tool holder comes to a halt as soon as the **Bend** button is released.

- Remove the length stop (see Section 6.14.1 Removing the length stop
-).
- Press  and  .
- Press  .

The following will appear on the display:



- Enter the stroke (< Nom) and confirm using .
- Insert the bar.
- Adjust the length of the arm using the measuring tape.
- Press and hold the **Bend** button until the required step is bent.

The tool holder (2) moves forwards for as long as the **Bend** button is pressed. As soon as the **Bend** button is released, the tool holder stops.

or:

The tool holder moves forwards until the stroke entered has been attained and then comes to a halt.

- Release the **Bend** button.
The tool holder (2) stops.

- Press .

The tool holder (2) returns.

Or:


10.3.2 Stroke

- Press .

The following will appear on the display:

F2	< Act:	0.0mm
	< Nom:	0.0mm
	-l Act:	130.0mm
	-l Nom:	0.0mm

- Enter the arm length (-l Nom) and confirm using .

- Enter the stroke (< Nom) and confirm using .

- Press the **Drive** button until the stop has reached the desired position.
- Insert the bar.
- Press and hold the **Bend** button until the required step is bent.

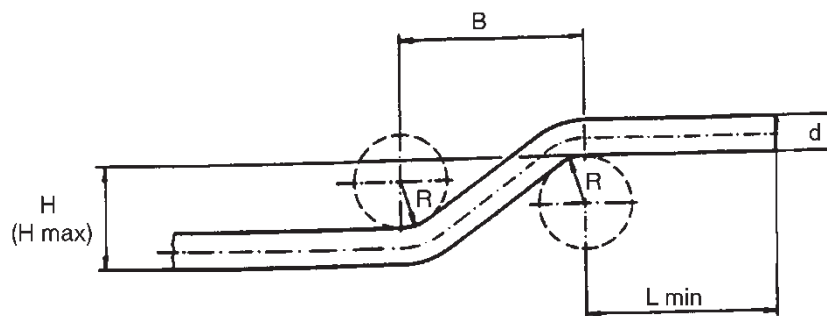
The tool holder (2) moves forwards for as long as the **Bend** button is pressed. As soon as the **Bend** button is released, the tool holder is moves back.

or:

The tool holder moves forwards until the stroke entered has been attained and then moves back.

- Release the **Bend** button.
The tool holder (2) returns now if it has not done so before.

10.4 Step bending tool (small), order no.: 31671



Min. length for insertion L min = 23 mm
 Bending radius R = 7.5 mm
 Width of step W = 21 mm

Material	Width x thickness	Max. step height Hmax (mm)	Step height H (mm)	Stroke (mm) to be set in order to bend step height H
Aluminium	50 x 4	16	4	9
	40 x 8	18	8	6.8
	80 x 8	18	8	6.8
	60 x 10	21	10	5.8
	120 x 10	9	-	-
Copper	60 x 5	17.5	5	7.8
	40 x 8	20	8	6.8
	80 x 8	18	8	6.8
	40 x 10	19	10	6
	60 x 10	10	10	6

The values shown in the table are only intended as guidelines. The precise settings depend on the individual material and must be determined by means of test bends.

10.5 Step bending tool (large), order no.: 31188

Min. length for insertion L min = 39 mm

Bending radius R = 10 mm

Width of step W = 37 mm

Material	Width x thickness	Max. step height Hmax (mm)	Step height H (mm)	Stroke (mm) to be set in order to bend step height H
Aluminium	50 x 4	22	4	9
	40 x 8	25	8	6.2
	80 x 8	25	8	6.2
	120 x 10	28	10	4.2
Copper	40 x 6	23.5	6	6.8
	80 x 6	23.5	6	6.8
	60 x 8	25	8	6
	80 x 8	25	8	6
	40 x 10	26	10	4.8
	120 x 10	25.5	10	4.8

The values shown in the table are only intended as guidelines. The precise settings depend on the individual material and must be determined by means of test bends.

11 Upright bending tool, order no. 31221

11.1 Scope of application

Copper and aluminium bars with a max. cross section of 50 x 10 mm can be bent using the upright bending tool.

The max. bending angle depends on the bar width.

Width	Thickness	Max. bend angle
up to 40 mm	up to 10 mm	90°
50 mm	up to 10 mm	45°

The bar width determines which thrust pads (15) are to be used.

There is a set of thrust pads available for bars with widths of 20 mm and 30 mm and one for those with widths of 40 mm and 50 mm.

The bar width is indicated on the thrust pads (15).

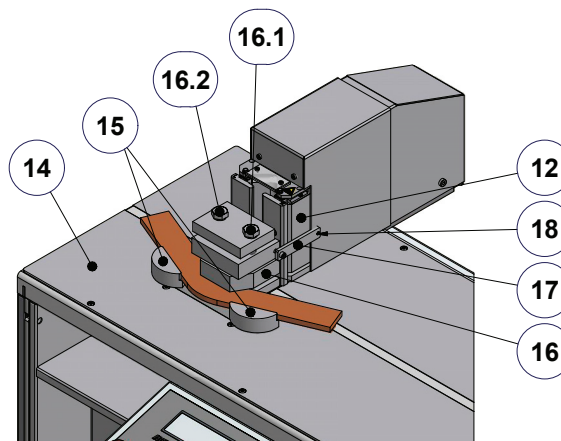


Caution

In the event of adverse combinations of arm lengths and angles, collisions with bending table attachments or the bar to be bent could occur.

Release the **Bend** button immediately. Non-compliance will result in damage to the BGD.

11.2 Installing the upright bending tool



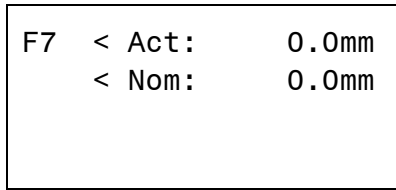
- Pull the bending mandrel and both plastic plugs out of the workplate (14).
- Put the upright bending tool on the workplate (14).
- Pull the securing plates (17) apart and move the upright bending tool towards the tool holder (12).
- Release the plates (17).
The holding pins (18) on the securing plates (17) should engage behind the tool holder (12).
- Insert the required thrust pads (15), e.g. for the bars with a width of 40/50 mm, with the face towards the bar.
Use the thrust pads for bars with a width of 20/30 mm to bend Z angles if the stroke does not suffice.

EN **11.3 Bending**


Only the Inching mode function **F** + **7** may be used for upright bending.

- Push the bar into the upright bending tool.
- Determine the arm length.
- Fix the bar in the bending tool by tightening the clamping screws (16.1) and (16.2) slightly.
- Press **F** and **7**.
- Press **Enter**.

The following will appear on the display:



- Enter the stroke (< Nom) and confirm using **Enter**.
- Press the **Bend** button and hold it down until the hydraulic unit switches off.
- After the bending operation, the upright bending tool comes to a halt.

	<p>Caution: First loosen screw 16.1, then screw 16.2.</p>
---	--

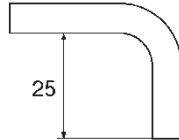
- Loosen the clamping screws.
 - Press **Clear**.
- The tool holder (12) returns to its starting position.*
- Remove the bar from the upright bending tool.
Check the angle bent.
 - Increase the stroke if necessary.
 - Repeat until the required bending angle is achieved.

	<p>Note: When the upright bending tool is dismantled, insert the two plastic plugs into the workplate.</p>
---	---

12 Additional bending tool for small lug lengths, order no.: 31850

12.1 Scope of application

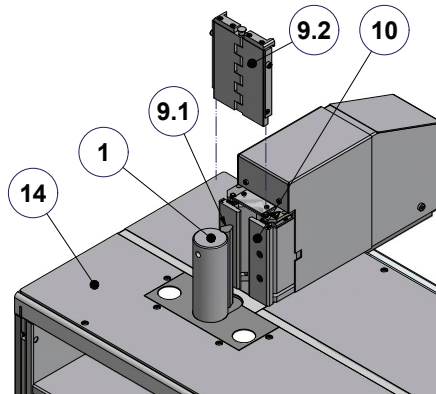
Using the additional bending tool, order no.: 31850, small lug lengths up to 25 mm can be bent.



The maximum cross section is as follows

for aluminium	120	x	10
for copper	120	x	6
	80	x	8
	60	x	10

12.2 Installing the additional bending tool



- Pull the bending mandrel (1) out of the workplate (14).
- Unscrew the bending radius (round) (9.1).
- Screw on the drop-shaped bending radius.
- Insert the bending mandrel (1) into the workplate (14).
- Position the additional bending tool (9.2) in front of the thrust pads (10). Ensure that the additional bending tool grips behind the thrust pads from above.


**Note:**


Use drop-shaped bending radius only in conjunction with the additional bending tool.





12.3 Bending

See Section 9 Bending, page 15.

13 Table of functions/brief instructions

A function is selected by pressing the  key and entering a number.

The following keys are available for functions F1, F2 and F3: , , 



Fct	Meaning
F0	Stand-by
F1 or 	Bending + Comp. Enter angle. Press the Bend button. The bar springback is measured. The bar is bent until the angle entered is attained.
F2 or 	Stroke For step bending, enter the stroke. The tool holder moves forwards as long as the Bend button is pressed or until the stroke set is attained. After the Bend button has been released or the stroke set has been attained, the tool holder retracts.
F3 or 	Run program
F4	Program editor
F5	Actual Angle is displayed if a bar is pressed against the thrust pieces.
F6	Return stroke lim Enter the stroke value for the return stroke limit. After the next bending operation the bending tool comes to a halt at the stroke value entered.
F7	Inching Mode For step and upright bending, enter the stroke. The tool holder moves forwards as long as the Bend button is pressed or until the stroke set is attained. After the Bend button has been released or the stroke set has been attained, the tool holder comes to a halt. Press the  key in order for the tool holder to return to its starting position.
F8	Bending Enter the angle. Press the Bend button. The bar is bent to the angle entered without measuring and adjusting the springback (for bars with a thickness of less than 5 mm).


Fct	Meaning
F9	Calibrating Insert the control bar. Press the Bend button. The bending tool's zero position is reset.

14 Setting options for the user in the menu




You can use the menu to change some of the BGD settings, such as language, unit of measurement for length etc.

You only have access to "User Level" and "Setter Level". The other menu items are blocked and cannot be accessed by the user.

Use the  and  keys to move from one parameter to the next.

Press  to save newly entered values.

You should note down any values that you change so that you can reset the bending table to the default values if necessary.

If you do not want to save the newly entered value, do not press . Press the  or  keys instead. The original value is kept.

14.1 User Level

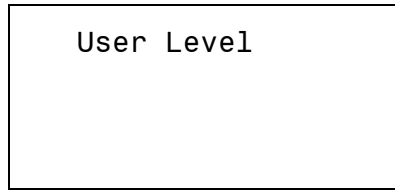
Parameters and input options for “User Level”


Parameter	Function						
P 0	Factor for the bending operation (to adjust the factor see page 29)						
P 1	Factor for the stroke (default value 1800)						
P 2	Switching from inch to mm <table border="1" data-bbox="810 568 1157 725"> <thead> <tr> <th>Setting</th> <th>Display in</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>mm</td> </tr> <tr> <td>1</td> <td>inch</td> </tr> </tbody> </table>	Setting	Display in	0	mm	1	inch
Setting	Display in						
0	mm						
1	inch						
P 3	Activating/deactivating the length stop <table border="1" data-bbox="791 808 1176 965"> <thead> <tr> <th>Setting</th> <th>Length stop</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Off</td> </tr> <tr> <td>1</td> <td>On</td> </tr> </tbody> </table>	Setting	Length stop	0	Off	1	On
Setting	Length stop						
0	Off						
1	On						
P 5	Language <table border="1" data-bbox="801 1034 1166 1191"> <thead> <tr> <th>Setting</th> <th>Language</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>English</td> </tr> <tr> <td>1</td> <td>German</td> </tr> </tbody> </table>	Setting	Language	0	English	1	German
Setting	Language						
0	English						
1	German						
P 6	Unit code, indicates the hardware version (cannot be changed)						
P 7	Current software version of the unit (cannot be changed)						
P 40	Number of decimal places with the length stop						
P99	Total number of strokes/ bends performed (cannot be changed)						

Proceed as follows to access “User Level”.

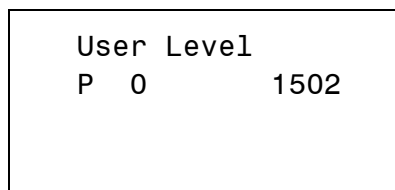
- Press  .

The following will appear on the display:



- Confirm using .

1502, for example, appears on the display




The individual “User Level” parameters can be viewed using the following keys



Changing a parameter

- Enter the new value.

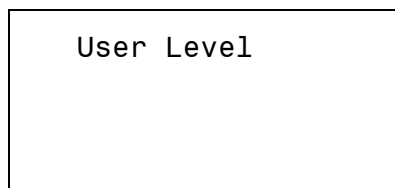
- Confirm using .

The previous value will be overwritten and the next parameter is displayed.

- To exit “User Level”

Press  .

The following will appear on the display:



- Press  again.

The following will briefly appear on the display:

```
User Level  
  
Save to EEPROM
```

The values have now been saved.

You are now in normal operating mode again.

```
F1 Bending + Comp.  
F2 Stroke  
F3 Run program  
F4 Program editor
```

EN 14.2 **Setter Level**

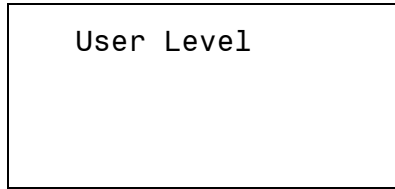
Parameters and input options for “Setter Level”

Parameter	Function															
P1	<p>Alternative springback measurement.</p> <table border="1"> <thead> <tr> <th>Setting</th> <th>Display in</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Default value. Do not change this value.</td> </tr> <tr> <td>1</td> <td>Alternative springback measurement is being developed.</td> </tr> </tbody> </table>	Setting	Display in	0	Default value. Do not change this value.	1	Alternative springback measurement is being developed.									
Setting	Display in															
0	Default value. Do not change this value.															
1	Alternative springback measurement is being developed.															
P2	<p>Length stop reference value. This value must only be changed in the event of repairs.</p>															
P3	<p>Zero point adjustment for stroke. 0.0 mm is the default. After changing the zero point, the bending table has to be switched on and off again so that the change is activated.</p>															
P6	<p>Display of the angle in F1 bending mode</p> <table border="1"> <thead> <tr> <th>Setting</th> <th>Display</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Nominal value only</td> <td> <div style="border: 1px solid black; padding: 5px;"> <p>F1</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div> </td> </tr> <tr> <td>1</td> <td>Nominal value and actual value</td> <td> <div style="border: 1px solid black; padding: 5px;"> <p>F1 < Act: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div> </td> </tr> <tr> <td>2</td> <td>For bending, the springback value after the first bending attempt is displayed. This function is for service purposes</td> <td> <div style="border: 1px solid black; padding: 5px;"> <p>F1 Bend1: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div> </td> </tr> <tr> <td>3</td> <td>The angle actually bent is displayed</td> <td> <div style="border: 1px solid black; padding: 5px;"> <p>F1 Angle: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div> </td> </tr> </tbody> </table>	Setting	Display	Example	0	Nominal value only	<div style="border: 1px solid black; padding: 5px;"> <p>F1</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div>	1	Nominal value and actual value	<div style="border: 1px solid black; padding: 5px;"> <p>F1 < Act: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div>	2	For bending, the springback value after the first bending attempt is displayed. This function is for service purposes	<div style="border: 1px solid black; padding: 5px;"> <p>F1 Bend1: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div>	3	The angle actually bent is displayed	<div style="border: 1px solid black; padding: 5px;"> <p>F1 Angle: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div>
Setting	Display	Example														
0	Nominal value only	<div style="border: 1px solid black; padding: 5px;"> <p>F1</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div>														
1	Nominal value and actual value	<div style="border: 1px solid black; padding: 5px;"> <p>F1 < Act: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div>														
2	For bending, the springback value after the first bending attempt is displayed. This function is for service purposes	<div style="border: 1px solid black; padding: 5px;"> <p>F1 Bend1: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div>														
3	The angle actually bent is displayed	<div style="border: 1px solid black; padding: 5px;"> <p>F1 Angle: 0.0°</p> <p>< Nom: 0.0°</p> <p>-I Act: 0.0mm</p> <p>-I Nom: 70.0mm</p> </div>														

Proceed as follows to access the “Setter Level” menu

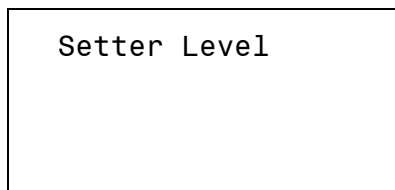
- Press  .

The following will appear on the display:



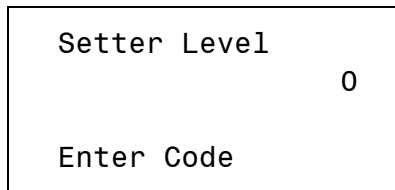
- Press  .

The following will appear on the display:




- Press  .

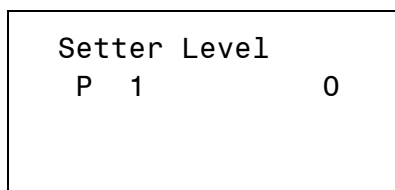
The following will appear on the display:



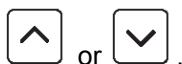
- The code is 4040.

- Confirm using  .


The following will appear on the display, e.g.:



The individual “Setter Level” parameters can be viewed using the following keys



Changing a parameter

- Enter the new value.
- Confirm using .
The previous value will be overwritten and the next parameter is displayed.

- To exit “Setter Level”

Press  .

The following will appear on the display:

```
Setter Level
```

- Press  again.

The following will briefly appear on the display:

```
Setter Level  
  
Save to EEPROM
```

The values have now been saved.

You are now in normal operating mode again.

```
F1 Bending + Comp.  
F2 Stroke  
F3 Run program  
F4 Program editor
```

15 Adjusting the bending factor


If the angle bent is always one constant unit smaller or bigger than the input value,
e.g. bent angle always 59.5°
input angle 60°
then the conversion factor (angular moment/degree) needs to be corrected.
This value has been set at the factory and should only be changed if there actually is a deviation.

Adjusting the bending factor

- Press .

The following will appear on the display:

```
User Level
```

- Confirm using .

The following will appear on the display:

```
User Level  
P 0      1502
```

The factor is displayed: 1502

- Adjust the factor as follows

Difference = input angle minus bent angle

input angle	60 degrees	59.5 degrees
bent angle	-59.5 degrees	-60 degrees
	+ 0.5 degrees	- 0.5 degrees

1 pulse equals 0.06 degrees.

$$\frac{\text{Difference}}{0.06 \text{ degrees}} = \text{Pulses}$$

Example: +0.5 deg.: 0.06 deg. = app. +8 pulses

Example: -0.5 deg.: 0.06 deg. = app. - 8 pulses

This means:
Input factor plus 8
pulses:

If the bent angle is smaller than the input angle, the calculated pulses are added to the input factor.

If the bent angle is larger than the input angle, the calculated pulses are deducted from the input factor.

Input factor minus 8 pulses

Example:

- Input factor is:

$$\begin{array}{r} 1502 \\ \text{plus} \quad 8 \\ \hline 1510 \end{array}$$

$$\begin{array}{r} 1502 \\ \text{minus} \quad 8 \\ \hline 1494 \end{array}$$

- New input factor:

- Enter the new factor. The complete number must be entered.

Note

Only values from 1470 to 1530 inclusive can be entered.

- Confirm using . The next parameter is displayed.

- To save the value you have entered

Press .

The following will appear on the display:

User Level

- Press  again.

The following will briefly appear on the display:

```
User Level  
  
Save to EEPROM
```

The values have now been saved.

You are now in normal operating mode again.

```
F1 Bending + Comp.  
F2 Stroke  
F3 Run program  
F4 Program editor
```

EN 16 Program editor (function F4)

99 programmes may be entered and saved. 25 different bending operations can be entered in one programme. Only lengths up to 800.00 mm are possible.

To create a programme and to run the programme later, you first create an overview of how the bar is to be inserted for the individual bending operations. The programme only displays and runs the values entered.

Keyboard description

	Run program
	Start
	Allows the input of code numbers
	Delete an input
	Input confirmation
	Menu access With programme input: saving and end of programme. All programme steps after the current step are deleted
	Changes from Bending to Stroke and vice versa if the cursor is in the first line
	Decimal point. A value can be entered after the comma if this is pressed
	Are used to move forwards or backwards

Possible display symbols

<	Represents the cursor Indicates the input position
Step	Number of the bend
>>	Means that this step/this bend has not been saved yet
>...<	Means that this step/this bend has been saved

The programme number can be entered directly using the keyboard or selected using

the , buttons.

16.1 Creating a programme

- Press **F** and **4**.
- Press **Enter**.

The following will appear on the display, e.g.:

```
F4 Prog. Number: 1<

Delete Prog.
Program free
```

- Select the required programme number using the keyboard or the **^**, **v** buttons.
- Press **Start**.

The following will appear on the display:

```
F4 < Nom:      0.0°
  -l Nom:      0.0mm
      Mode: Bending
Prog: 1 Step>> 1
```

- Enter the angle (< **Nom**).
- Confirm using **Enter**.
- Enter the arm length (-l **Nom**).
- Confirm using **Enter**.
The next step (Bending or Stroke) can be entered.




Changing from Bending to Stroke

- Press **+/- Mode**.

The following will appear on the display:

```
F4 < Nom:      0.0mm
  -l Nom:      0.0mm
      Mode: Stroke
Prog: 1 Step>> 2
```

- Enter the stroke (< **Nom**).
- Confirm using **Enter**.
- Enter the arm length (-l **Nom**).

- Confirm using .
The next step (Bending or Stroke) can be entered.
- Repeat these steps as often as required.
- Press  to save the programme.
- Press  to end programme input.

The following will appear on the display:

```
F1 Bending + Comp.  
F2 Stroke  
F3 Run program  
F4 Program editor
```

16.2 Deleting a programme

- Press **F** and **4**.
- Press **Enter**.

The following will appear on the display:

```
F4 Prog. Number: 1<

Delete Prog.
Program occupied
```

- Select the required programme number using the keyboard or the **↑**, **↓** buttons.
- Press **Enter**.
- The cursor is on **Delete Prog.**.
- Press **Clear**.

The following will appear on the display:

```
F4 Prog. Number: 1<

Program free
```

EN **16.3 Changing a programme**

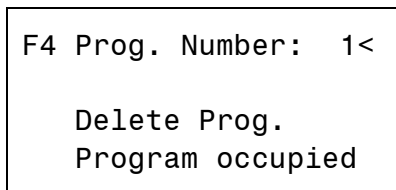
To change a saved programme, move the cursor to the value that is to be changed and write over it. Now press until the next step is accessed. The value entered is saved when you end programme input by pressing the button.

If the mode of a bending operation is to be changed from Bending to Stroke, the cursor must be in the first line of this bending operation/step. The mode can now be changed by pressing the button. If the cursor is in a different line it is not possible to change the mode.

End the programme changing function by pressing the button. If you press the button, all the programme steps that were saved after the bend currently shown on the display are deleted.

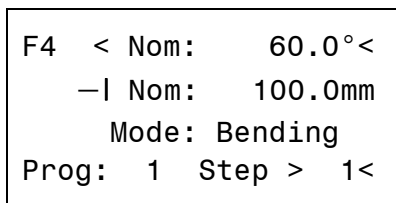
- Press and .
- Press .

The following will appear on the display:






- Select the required programme number using the keyboard or the , buttons.
- Press .

The following will appear on the display:






- Select the step that is to be changed. In this case **< Nom 60.0°**
- Change the value.
- Confirm using .

	<p>Note Changes to the angle/the stroke (< Nom) are only saved if the value of the length stop (I Nom) has also been saved using Enter.</p>
---	---

- Also confirm **I Nom** using . Otherwise the change will not be saved.
- Press .
The changes are saved.

16.4 Deleting programme steps




It is possible to delete the last programme steps. Individual programme steps in the middle of a programme cannot be deleted. To delete the last programme steps, go to the step that is still to be bent and save the programme. All the steps after this step are then deleted.

- Press  and .
- Press .

The following will appear on the display:



```
F4 Prog. Number: 1<

Delete Prog.
Program occupied
```

- Select the required programme number using the keyboard or the ,  buttons.
- Press .

The following will appear on the display:


```
F4 < Nom: 60.0°
  -l Nom: 100.0mm
    Mode: Bending
Prog: 1 Step > 1<
```

- Go to the step that is to be kept.
 - Press .
 - Press .
- The changes are saved.

17 Run program (function F3)






The programmes entered are run using the F3 function. To do this, enter the number of the required programme or select the programme. The number of bars to be bent is then entered. When the programme is started, the angle that is being bent and the dimension that the length stop moves to is displayed. Once the bending operation for a bar has been completed, the programme automatically starts from the beginning again until the number of bars entered is reached.

To run a programme proceed as follows

1. Press .
2. Press .

The following will appear on the display, e.g.:


```
F3 Prog. Number: 1<
Quantity: 1
Program occupied
```

3. Select the required programme number using the keyboard or the ,  buttons.
4. Press .
5. Enter the number of bars to be bent under **Quantity:**.
6. Press .
7. Press .

The following will appear on the display, e.g.:

```
F3 < Nom: 20.0°
  -l Nom: 100.0mm
Mode: Bending
Prog: 1 Step 1
```

8. Press the **Drive** button until the stop has reached the required position.
9. Insert the bar and align it to the length stop.

 **Note**
*During the bending process, the bar arms move in the direction indicated by the arrows.
Protect this area when bending long bars.*

10. Press the **Bend** button and hold it down until the bending tool has retracted fully.
11. Remove the bar.
12. The next bending operation is displayed.

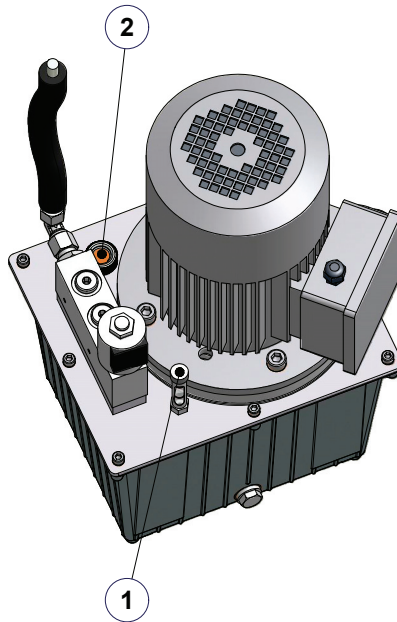
The following will appear on the display, e.g.:

```
F3 < Nom:    20.0mm
    -l Nom:   190.0mm
      Mode: Stroke
Prog:  1 Step  2
```

13. Repeat points 8 to 12 as often as the programme specifies.
14. Once the programme has been completed the start screen automatically appears on the display again.

```
F1 Bending + Comp.
F2 Stroke
F3 Run program
F4 Program editor
```


18 HA3 BGD 400V hydraulic unit



Construction

An oil-filling screw with bleeder valve (2) and an oil gauge (1) are mounted on the oil tank cover.

Oil gauge (1)

The oil gauge dipstick must be between the two markings. If the dipstick is at the lowest marking, oil needs to be added.

Bleeder valve (2)

The bleeder valve closes if the tank is on a slant (no oil can emerge).

In vertical position (operating position), a slight oil vapour may be carried with the escaping air. The oil film which is thus created on hydraulic equipment should be removed from time to time.



Caution

The unit *must not* be switched on when lying horizontally. There is a risk that the pump will not draw in oil and is damaged as a result.

Operation

- Pressing the **Bend** button on the BGD bending table puts the unit into operation.



Note

- Care should be taken to ensure that the oil temperature does not exceed 70 °C during operation.
- Pressure can only be built up again once the button has been released and pressed again.

EN **19**

Error messages

BGD display	Description	Remedy
<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p>Hint: Bending aborted Press Clear button to close message</p> </div>	<p>The bending operation was not completed. The Bend button was released too early.</p>	<p>Press the Bend button again and hold it down until bending has been completed.</p>
<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p>Hint: Max: 100.0 Press Clear button to close message</p> </div>	<p>The stroke entered is too large. A max. of 100 mm is possible.</p>	<p>Enter a smaller stroke.</p>
<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p>Hint: Min: .0.5 Press Clear button to close message</p> </div>	<p>The angle entered is too small. A min. of 0.5° is possible.</p>	<p>Enter a larger angle.</p>
<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p>Hint: Max: 93.0 Press Clear button to close message</p> </div>	<p>The angle entered is too large. A max. of 93° is possible.</p>	<p>Enter a smaller angle.</p>
<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p>Hint: Reference aborted Press Clear button to close message</p> </div>	<p>The zero point has not been set. The Bend button was released too early.</p>	<p>Press the Bend button and hold it down until the bending tool retracts.</p>
<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p>Setter Level 4711 Enter Code</p> </div>	<p>The code has been entered and the display does not change for the next stage. The code was wrong.</p>	<p>Enter the correct code.</p>

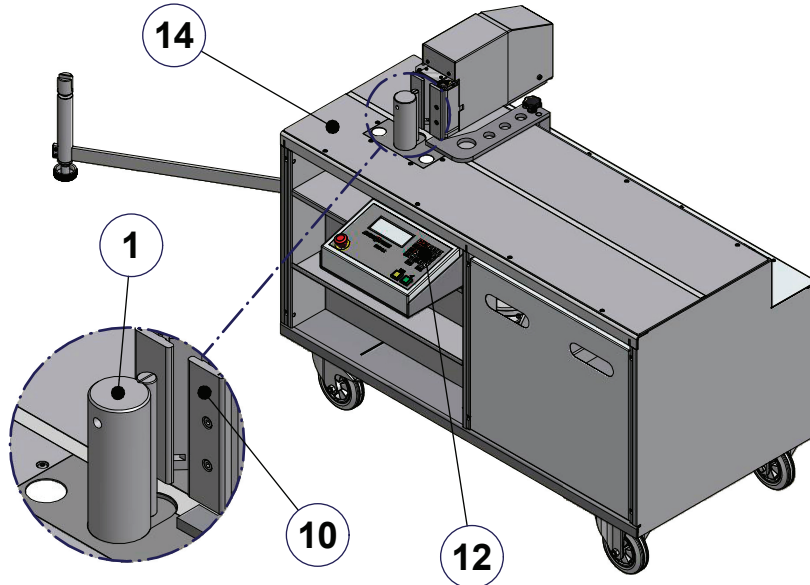
20 Maintenance of the bending table

EN



Caution

BEFORE MAINTENANCE OR REPAIR WORK, ALWAYS PULL OUT THE MAINS PLUG



When dirty:

Clean area between bending mandrel (1) and tool holder (10).

Every week:

Clean the entire bending table.

Grease workplate (14).

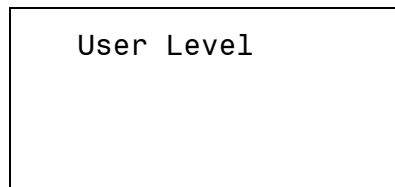
Clean keyboard (12) with a mild cleaning agent, e.g. a solution of water and kitchen detergent, using a slightly moist cloth.

After approx. 1000 bending ops: Check the bend angle by means of a test bend. If it is different to the angle entered the bending factor must be adjusted. See Section 15, page 37.

Displaying the number of previous bends


- Press  .

The following will appear on the display



- Confirm using .
P0 will appear on the display.

User Level
P 0 1502

- Now move on to parameter 99.
- The number of previous bending operations will be displayed.
- Press  twice to access the normal operating mode.

21 Maintenance of the HA3 BGD 400V hydraulic unit

We recommend that our authorised NOVOPRESS specialist workshops be used for repair and maintenance work.

Have the unit maintained by a specialist **only**.



Caution

ALWAYS PULL OUT THE MAINS PLUG BEFORE CARRYING OUT MAINTENANCE AND REPAIR WORK.

Checking the oil level

The dipstick of oil gauge (4) must be between the two markings. If the dipstick is at the lowest marking, oil needs to be added.

Top up the oil if necessary.

Oil change

First oil change:	After about 1,000 starts or after 3 months
Subsequent oil changes:	After every 15,000 starts but at least once a year
Oil volume:	5.5 litres
Hydraulic oil:	See Technical data
Oil filter:	The oil filter is the suction strainer with a mesh width of 0.06 mm.

- Unscrew the oil-filling screw with bleeder valve (3) on the oil tank cover.
- Draw off the old oil by means of suction.
- Fill with new oil.

Note

The dipstick of oil gauge (4) must be between the two markings.

Cleaning

Remove the oil film from the hydraulic unit every month.

Hydraulic hose

The hydraulic hose must be checked for damage every month.

Replace the hydraulic hose

- If any cracks, crush points or kinks are visible on the outer layer
- If blister formation is visible
- If pressurised fluid is escaping
- If the hose connector is damaged
- If any discolouration of the outer layer is visible, e.g. due to the effects of solvents

Hydraulic hoses must be replaced after 5 years, even if no damage is visible.

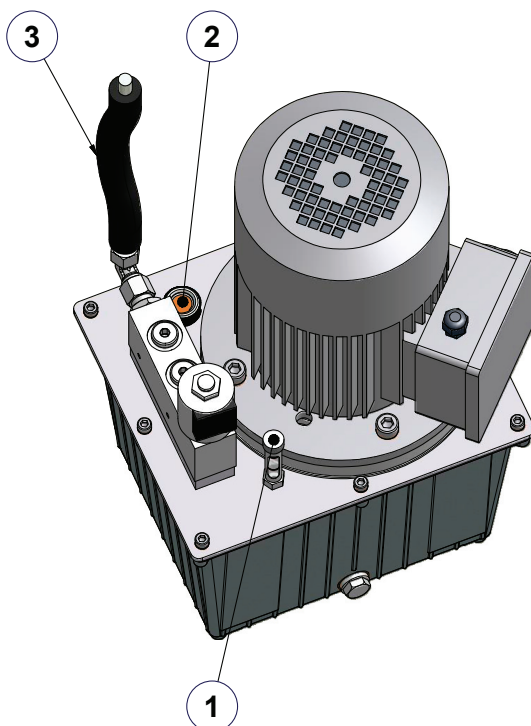
Visual and electrical inspection

- Regularly: Check the mains cable including plug and extension cord with plug connectors for visible damage and have repaired, if necessary.
- Every 6 months: Have an inspection complying with DIN VDE 0701-0702 for electric devices in protection class 1 carried out by a qualified electrician, an authorised workshop or Novopress Neuss.

Hydraulic drive unit

Key

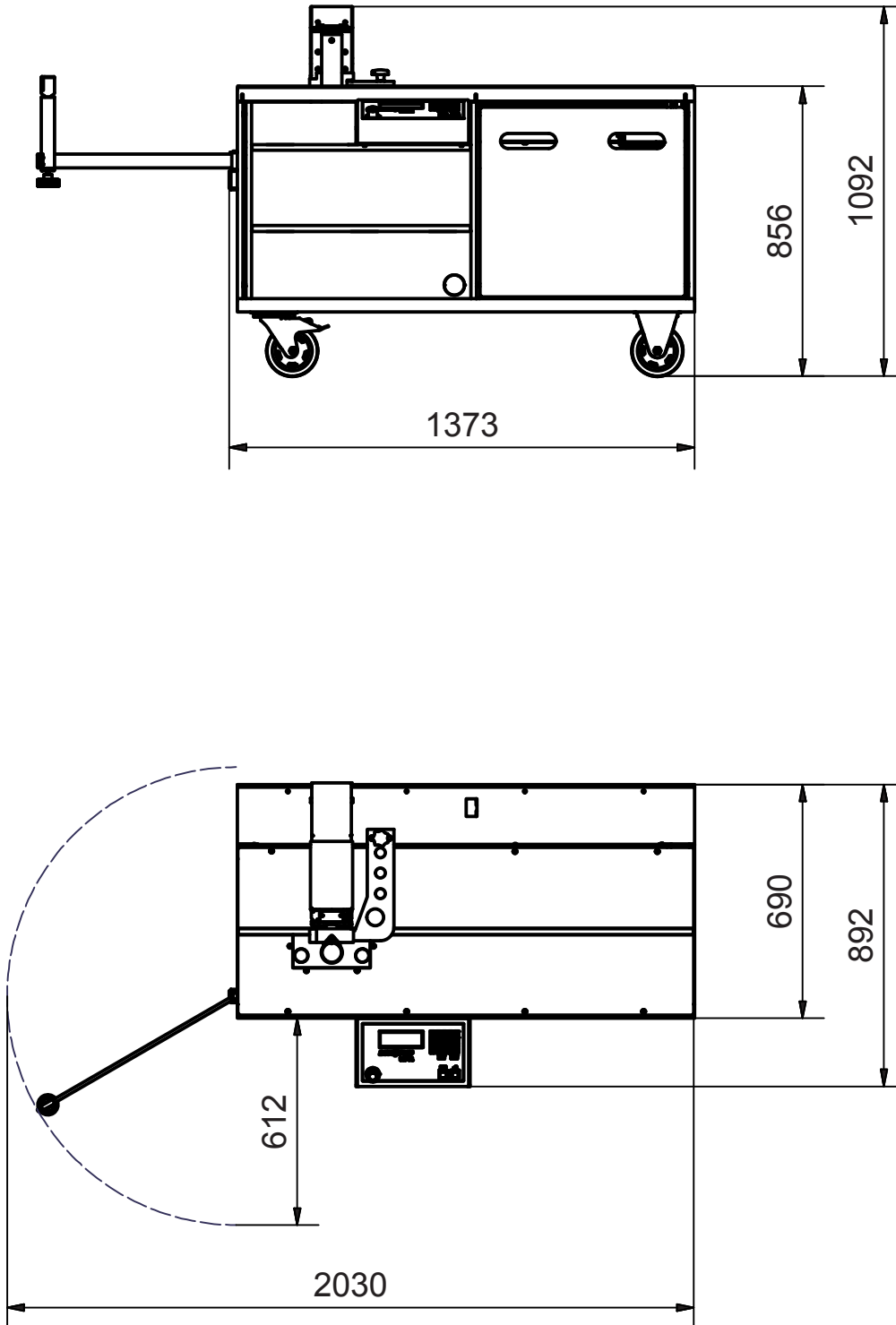
- 3 = Hydraulic hose
- 2 = Bleeder valve
- 1 = Oil gauge



22 Required space, installation and assembly of the control unit

EN

22.1 Required space

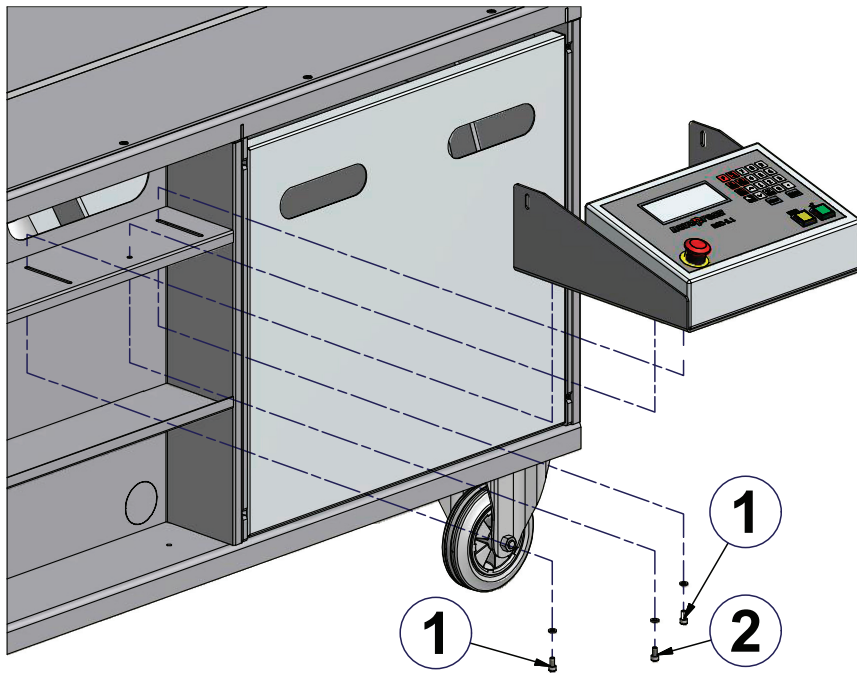


EN 22.2 Installation

- The BGD must
 - Stand on a level surface
 - Be completely stable
 - Have a sufficiently large working area
- The BGD may only be operated with the brake of the relevant rollers engaged
- The plug or socket must be within easy reach

22.3 Installing the control unit

	<p>Caution</p> <p>The mains plug must only be plugged in when all the connectors have been attached to the control unit.</p> <p>Non-compliance will lead to damage to the BGD.</p>
--	---

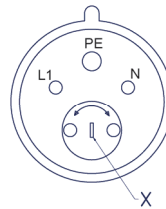


1. Undo the 3 screws together with the washers from the control unit panel.
2. Insert the control unit mains plug through the oval hole.
3. Push the control unit onto the top panel as far as possible.
4. Screw the control unit onto the bending table loosely using the screws (1) and washers.
5. Pull the control unit out of the bending table as far as possible. It is then easier to affix the connectors.
6. All the connectors have a different socket insert. Insert the connectors and screw them on tightly.
7. Push the control unit into the table as far as the stop.
8. Screw in and tighten the screw (2).
9. Tighten the screws (1).
10. Lift the rear removable panel slightly and remove it from its bracket.

11. Route the mains plug and cable, bypassing the hydraulic unit, and remove it from the carriage. The gap between the floor panel of the carriage and the bottom edge of the rear panel is large enough for the cable to fit through it.
12. Attach the panel again.
13. Plug in the mains plug.
14. Pull out the emergency stop button.
15. Set the zero point (see Section 8, page 13).
16. If the motor is running but the BGD's tool holder does not move forwards, the motor's direction of rotation can be changed as follows.
17. Disconnect from mains.

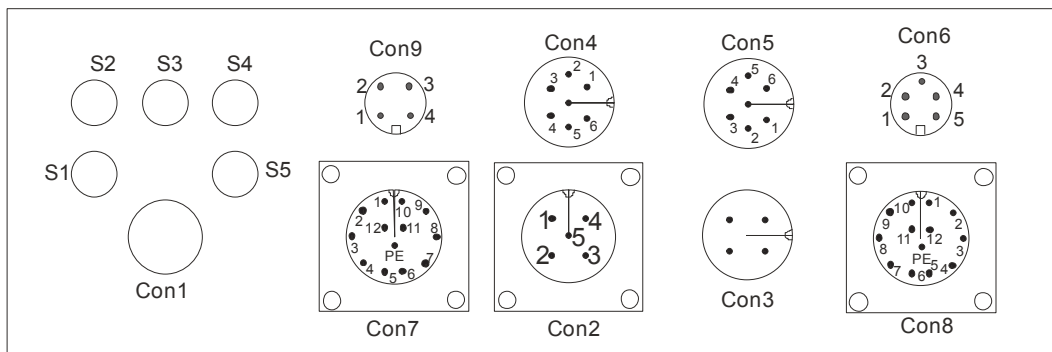
	Note The mains plug must not be dismantled.
---	--

18. There are 2 rotatable plug contacts on the mains plug.
Insert a screwdriver into groove X and rotate the plug contacts by 180°.



19. Plug the mains plug back in.

23 Fuses and pin assignment



Fuses

S1	3.15 A slow blow	Electronics
S2	8 A slow blow	Motor
S3	8 A slow blow	Motor
S4	8 A slow blow	Motor
S5	3.15 A slow blow	Valve

Pin assignment

CON 1	Voltage supply
CON 2	Hydraulic pump switching output
CON 3	Valve output
CON 4	Bending measuring system
CON 5	Stroke measuring system
CON 6	Springback sensor

Repairs / Service

novopress



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