PITSID

Polygraphische innovative
Technik Leipzig

Operating Manual
BIND CONTROL

for examining the pull-out strength of adhesive-bound products

Polygraphische innovative Technik Leipzig GmbH
Mommsenstrasse 2; 04329 Leipzig; Germany
Tel +49 (0) 341 . 25942-0; Fax +49 (0) 341 . 25942-99
info@pitsidleipzig.com; www.pitsidleipzig.com

Content

1. General Information

Important!

To ensure personal safety and proper usage of the product, please read this section as well as the other sections marked with warnings found throughout this documentation carefully.

The device may only be used for the intended applications in compliance with technical parameters as stated in the documentation. This device was built using state-of-the-art techniques and follows acknowledged safety regulations and is safe to operate.

Under consideration of documented regulations for the intended operation, maintenance and safety guidelines, this product poses no danger to property or to personal health.

Disclaimer

Any deviating application or other use which is not in accordance with the specifications specified in this operating manual is prohibited. It is also prohibited to modify, bypass or disable any functionality on the device which may alter its proper purpose as well bypassing the use of active and passive safety features.

When the BIND CONTROL is not used as intended, all liability of the manufacturer is excluded and the full responsibility is solely the operators.

In Addition

- Country-specific safety regulations must be observed.
- Device operation may only be carried out by trained or instructed personnel.
- Any unauthorized modifications to the device will void the warranty.
- Responsibilities and task assignments must be clearly defined and controlled.
- This operating manual must be kept in a central location so that it is always accessible to operating personnel.

Warning Symbols

DANGER!
Risk of electric shock due to high voltage.

CAUTION!
Possible danger for the BIND CONTROL and possible subsequent danger for the operator.

ATTENTION!
Important information operating the device.

2. General Specifications

2.1 Product Features and Applications

The BIND CONTROL is a special measuring device which was developed for the qualitative examination of adhesive bound products which are cut to a test size of 10 cm spine length and 11 to 13 cm page width.

NOTICE!
For hard cover bound products, the book cover has to be removed prior to cutting.

Because of its objective operation and the reproducibility of the measured values, the BIND CONTROL can be used primarily for quality control and verification of products in the book bindery.

2.2 CE – Conformity

The BIND CONTROL is in conformity with the relevant standards.

2.3 Copyright/Proprietary Rights

- The BIND CONTROL measurement methods and algorithms of the evaluation software are copyright protected.
- The protective rights of the sub-components in the BIND CONTROL, including the standard software, are registered at their respective manufacturer.
- The names of the sub-components in the BIND CONTROL, including the standard software, are generally registered trademarks of their respective manufacturer.

3. Special Safety Information

The BIND CONTROL contains components which belong to protection class I. In this case, all non-voltage-carrying metal parts that can be touched are connected to a protective ground conductor in case they are placed under voltage due to an error.

Only open the covers or panels when it is not possible to correct a problem by hand or other special tools.

When covers are opened or parts are removed, voltage-carrying parts may be exposed. Likewise, any connection points may carry voltage.

Therefore keep in mind:

Opening the device should only be made by qualified specialists. It also needs to be ensured that the safety of the device is not compromised. This is especially the case with ground connections, device covers or anything similar.

In this case please note:

Before opening the BIND CONTROL, it is essential to guarantee that the device is voltage-free by unplugging the device from the electrical socket.

If it is assumed that the safe operation of the BIND CONTROL is not possible, it must be turned off or not be put into operation to begin with. Make sure that the device cannot be operated unintentionally. It is assumed that safe operation of the device is no longer possible, if, among other things,

- the device shows visible damage,
- the fuse burns-out repeatedly,
- for no apparent reason the device does not work at all,
- it has been stored for an extended period in unfavourable conditions,
- the device was exposed to heavy transport stresses,
- fluids have penetrated into the device.

Only connect the BIND CONTROL to a properly grounded electrical outlet. Otherwise, there is a risk of fire or electric shock if there are faults in the device.

Do not operate the BIND CONTROL in hazardous areas.
Adhere to the operating conditions (Section: 5. Operating conditions).

4. Delivery of the BIND CONTROL

4.1 Scope of Delivery

- Measuring device BIND CONTROL with transport safeguard
- Power cable and plug
- USB cable
- Operating manual
- Customer documentation

4.2 Dimensions / Weight

Dimensions: 285 mm x 255 mm x 300 mm
Weight: 8.6 kg

4.3 Transport

The unit has to be operated and stored in a dust and humidity protected environment. Strong impact and vibration effects on the device should be avoided.

Transport and storage of the device in extreme temperatures are to be avoided.

If the transport or delivery of the device is necessary (e.g. in case of repair to be returned to the manufacturer), the device must be correctly packed as follows:

- Wrap with plastic foil (dust protection), then
- place in double-walled corrugated box and
- embed with foam plastic packing material (surrounded on all sides with 5 cm of material)

4.4 Device Placement

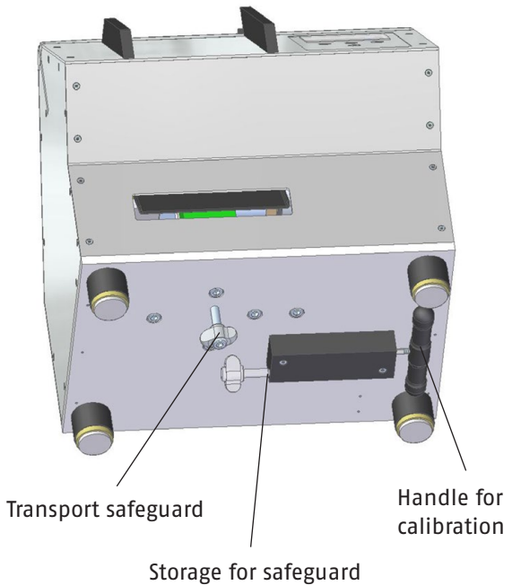
Place the unit on a firm, safe surface (table, etc.).

The power connection for the delivered power cable and the on and off switch is located on the back of the device.

On the bottom of the instrument is a mounting bracket with a screw threaded handle for verifying the calibration (see Section 10). In addition, the

transport safeguard in the form of a wing screw can be found there. Before first use, the wing screw must be removed.

Please be sure to save the screw. The transport safeguard must be reattached before shipping. Possible damage resulting from improper safeguarding is at the expense of the customer.



5. Operating Conditions

The BIND CONTROL has been designed for continuous operation.

The device operates in a temperature range of +5°C to +35°C. To ensure a stable and reproducible measurement accuracy, measurements should be made at an ambient temperature of 20°C to 25°C as well as with a relative air humidity of 45% to 60%. (The device has a maximum limit of 85% relative air humidity).

The device must not be used in hazardous areas (flammable gases, vapours or solvents).

During operation, shocks ≥ 5 G are not permitted.

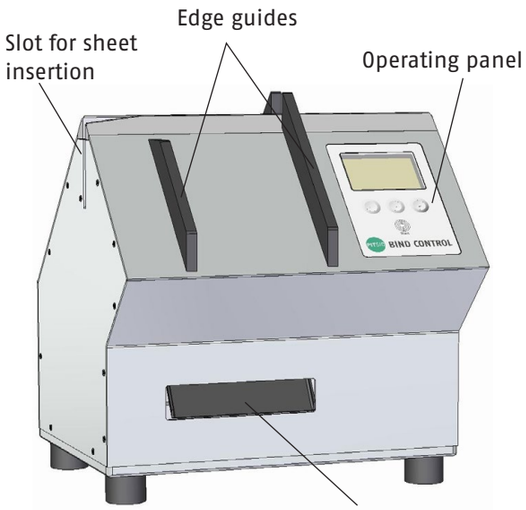
The various components of the electrotechnical equipment of the BIND CONTROL have a protection class of at least IP 20.

For transport and storage, the following conditions apply:

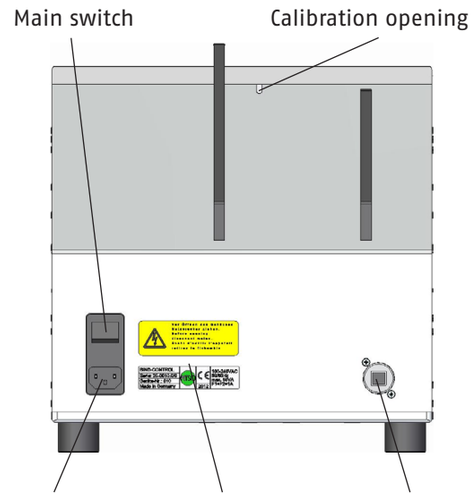
- Environment temperature: -10°C to +50°C
- Relative humidity: 30% to 85%
- Impact stress: ≤ 25 G

6. Technical Design of the Device

6.1 Front View BIND CONTROL



6.2 Back View BIND CONTROL



7. Connection Ports of the BIND CONTROL

7.1 Electrical Connection

The BIND CONTROL operates with AC current. To power the device, please use the supplied and tested power cable and plug. Plug the BIND CONTROL into a grounded power outlet.

The valid input voltage is:
AC supply: **100–240V / 50/60Hz**

The back-up fuse for the power input should be 10A.

Label BIND CONTROL

BIND CONTROL			100 - 240 VAC
Serie: 25-0010.0/0	PITSID	CE	50 / 60Hz
Geräte-S/N: 010			max. 50 VA
Made in Germany		2012	F1=F2 = 1,0 A

Before inserting the power plug into the outlet, please test if the rated voltage matches the specifications as listed above and that the outlet is properly grounded.

The BIND CONTROL has its own main power switch. This main switch disconnects the device from the power source. If the device needs to be free from power (e.g. for service on the device), pull out the plug from the socket.

The following general requirements concerning the power supply are:

A maximum voltage interruption of 20 ms is admissible. A time of more than 1 second must elapse between two consecutive interruptions. Voltage drops must not exceed 20% of the peak voltage of the supply for more than one period. There must be more than 1 second between successive voltage drops.

7.2 Data interface

The USB port is located on the back side of the device. This port is for connecting the device to a PC for transmitting measured values into a protocol for quality assessment.

7.3 Calibration Opening

On top of the device, next to the saddle, there is an opening in the device. This opening is used to verify the calibration of the sensor in the device. A detailed description of the verification is described in Section 10.

8. Operating the BIND CONTROL

8.1 Directions for Use

- Only test book blocks with the correct format!
- Do not move the book block during the test; it will lead to incorrect results.
- Do not insert any other objects other than the pages to be tested in the device.

The warranty is void if the device is damaged due to disregarding the above mentioned warnings.

For data transfer to a PC, the system has an interface whose complete range of functionality is only available after installation of the supplied software package. The installation directions are described in Section 8.3.3.

8.2 Measurement Accuracy

The device has a measurement uncertainty of 0.2 N/cm. In the context of the measurement uncertainty, the measurement result is not influenced by paper properties. A skewed feeding of the page will lead to an inaccurate measurement, because the adhesive binding is not evenly loaded. The parallel position of the page to the guides during feeding must be ensured.

The book blocks to be tested must be cut at a right angle.

8.3 Operation of the BIND CONTROL

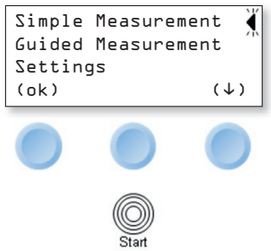
8.3.1 Mode of Operation

- The page insertion slot is on top of the device along with four edge guides. These edge guides are situated at right angles to the slot. The book block has to be cut square and to the correct format. The page to be pulled will be inserted into the slot.
- The book block is now positioned on the top of the device with the spine facing up with the remaining pages resting between the edge guides.
- The inserted page is pulled out vertically downwards. In doing so, the force necessary for removing the page from the block is determined.

8.3.2 Turning the Device On and Off

Turning the device on and off is done with the main power switch located on the back side of the device.

On the display, the following is shown after switching on the device:



Using the button below the arrow, the desired mode can be selected and confirmed with the '(ok)' button.

8.3.3 PC Interface and Data Transmission

The BIND CONTROL has the ability to transmit the measured values to a PC with a Windows® operating system via a USB interface.

Included with the system are protocol files for simple and guided measurements (see description below) which are filled with the measurement results after enabling data transmission. Additional cells (with a blue background) are available for entering administrative information and production conditions.

8.3.3.1 System Requirements

Processor:	Minimum 1 GHz
RAM:	Minimum 512 MB
Operating systems:	Windows XP 32-Bit, Windows Vista 32-Bit, Windows 7 32-Bit, Windows 7 64-Bit
Installed software:	Microsoft Excel Version 11 or higher (Excel 2003)

8.3.3.2 Installation

For the installation, you need administrator rights for the PC which will be used for the installation. Start the installation by opening the file 'BCDASetup10.msi' and follow the instructions of the installation programme.

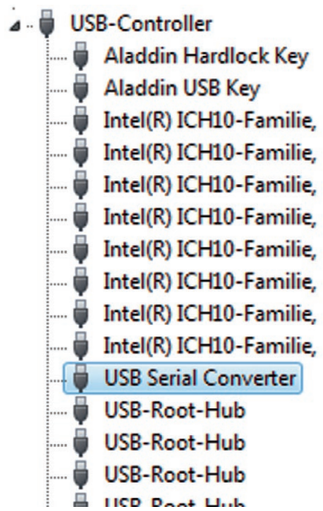
It is possible that the installation programme detects that the .Net-Framework 4.0 is not available on your PC. In this case, you will be asked to install or update this utility. To carry this out, the PC has to be connected to the internet. Please follow the instructions for the installation of the .Net Framework and open the file 'BCDASetup10.msi' again.

8.3.3.3 Initialisation of the BIND CONTROL Interface to the PC

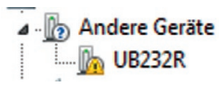
When the device is connected to the PC for the first time with the USB cable, the operating system of the PC will try and install a driver of the USB interface.

If this fails, the drivers will need to be manually installed. You will need administrator rights for the PC to complete this. Please follow the following instructions:

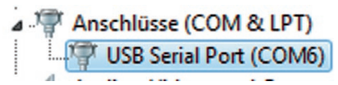
- Keep the USB connected with the BIND CONTROL and the PC.
- Open the Device Manager (Control Panel > Device Manager)
- In the Device Manager directory, you will find 'Other Devices' with the entry 'UB232R'
- Click on 'UB232R' with the right mouse button and select 'Update driver software'.
- In the next step, choose to search for the driver on the computer.
- You will then be asked to enter the path where the driver installation files are located.
- Enter the path for the driver as being the 'Drivers' folder on the installation CD delivered with the device and start the installation.
- After this step has been successfully completed, the Device Manager will show the entry 'USB Serial Converter' in the 'Universal Serial Bus controllers' directory.



- The directory 'Other devices' with the entry 'UB232R' will still be shown with an exclamation point.



- Repeat steps 5 through 7 again.
- After finishing the second installation successfully, the Device Manager directory 'Ports (COM & LPT' will show 'USB Serial Port (COM...)'.



- After these steps are completed, the interface has been installed successfully and the software programme can communicate with the connected BIND CONTROL.

For more detailed instructions, please see the following documents on the supplied CD:

"AN_104_FTDI_Drivers_Installation_Guide_for_WindowsXP.pdf",

"AN_103_FTDI_Drivers_Installation_Guide_for_VISTA.pdf" und

"AN_119_FTDI_Drivers_Installation_Guide_for_Windows7.pdf"

8.3.3.4 Using the Software

The programme is designed as an interface to the BIND CONTROL for the transmission of the measured values to a PC. The data will be written directly into a Microsoft Excel spreadsheet.

Instructions for use:

- Turn on the BIND CONTROL and connect it with your PC using the supplied USB cable.
- Start the programme 'BindControlDataAccess'. The programme will start a new Microsoft Excel file and will establish a connection to the BIND CONTROL.
- As long as there is no connection to the BIND CONTROL, the status display will turn red or will be flashing red. This can last between 10 and 20 seconds, in very few exceptional cases up to 30 seconds.
- As soon as the connection is established the status display will change to green. This is the required status in order to receive measurement data.
- When the status display turns yellow, the PC is in the process of receiving data from the BIND CONTROL. The data will be written into a corresponding Microsoft Excel template and you will be asked to save the data in a folder of your choosing. If you don't save the data, the received values are erased and there is no chance to restore them!
- After saving the Excel sheet you can add any additional information in the protocol.

Additional information:

If the USB connection between the PC and the BIND CONTROL is interrupted or the BIND CONTROL is turned off while the software is connected to the device, the status display will flash red. After re-establishing a connection by once again plugging the USB cable to the device, the connection to the software will take place automatically.

If the interface is not established after an extended period of time, please check the USB connection and the installation of the driver.

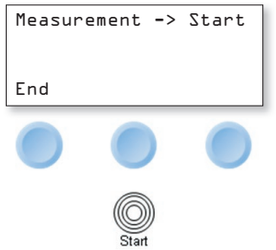
After starting the programme, it will check if the Microsoft Excel version is acceptable before opening. If this is not the case, this will be indicated as a status message and you will not be able to use the programme. If there is a version 11 or higher installed and the programme still cannot be used, please contact the software supplier.

Additionally, the software checks if the necessary Excel templates are present on the computer. If this requirement is not filled, the program will display a status message with this information and you cannot use the software. Contact the software supplier if this is the case.

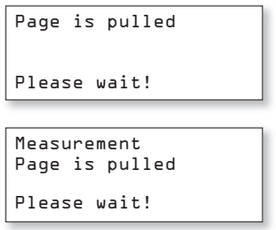
9. Measurement

9.1 The Simple Measurement

Insert one page from a book to be tested into the slot and position the book block with the spine facing up on the device saddle.

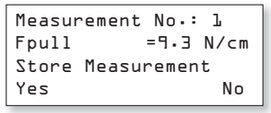


The measurement will begin by pushing the 'Start' button.



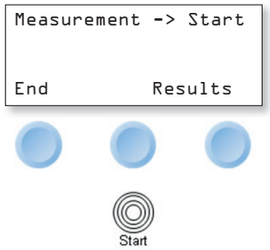
While the message 'Page is pulled' and 'Measurement' is displayed, the book block needs to stay in position on the saddle. Do not move the book block.

After the measurement, the pulled-out page will be ejected via the ejection slot.



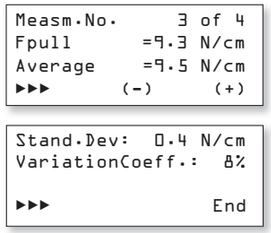
After a successful measurement, the measurement number is shown. The system counts every measurement that has been made and stores the results.

Additionally, the measured pull force will be shown. This value can be saved.



Following this, the next measurement can made.

By pressing the button 'Results', the following will be displayed:



With the '(+)' and '(-)' buttons, you can toggle between the measured values.

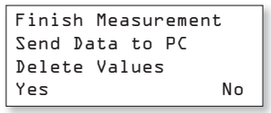
Switching to the second screen is made with the '▶▶▶' button.

On this second screen, the standard deviation (Stand.Dev) and the variation coefficient are shown. Using the '▶▶▶' button, you can toggle between the two displays.

Switch back to measurement mode by pressing 'End' for additional page-pull tests. These measured values will be considered in the statistical analysis.

If a new series of measurements should be started, the already evaluated measurement results have to be erased from the internal storage.

Push 'End'. The device asks for confirmation to avoid the accidental deletion of the collected values.

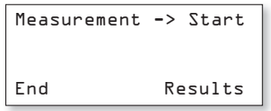


If you confirm with 'Yes', the collected values will be transmitted to the PC via the interface. There, they will be filled into a protocol for quality control.

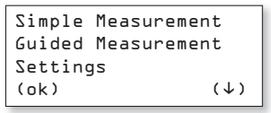
Simultaneously, the collected values will be deleted from the internal storage and a new series of measurements can be started.

Pressing 'No' keeps the data in the device's internal storage and the measurement series can be continued.

End

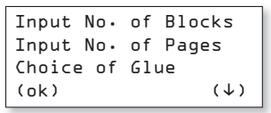


Pressing the 'End' button will complete the current measurement series. After confirmation (see above) the measured values will be deleted! The device returns to its starting state:

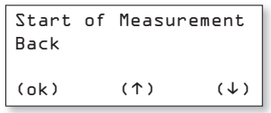


9.2 The Guided Measurement

After choosing 'Guided Measurement' from the menu, the following input possibilities are shown:



as well as



Input Number of Blocks

Within this menu, the number of book blocks to be tested is set. Changing of the number of blocks is done with the buttons '(+)' and '(-)'.

The default value is a total of 10 book blocks per measurement series. The maximum number is limited to 99 book blocks. The amount is confirmed by pressing the '(ok)' button.

Input Number of Pages

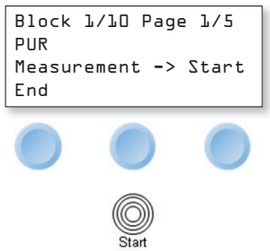
Within this menu, the number of pulled-out pages from one book block is set. Changing the amount of pages is done the '(+)' and '(-)' buttons.

The default value is a total of 5 pages per book block. The maximum number is limited to 10 pages per block. The amount is confirmed by pressing the '(ok)' button.

Choice of Glue

Within this menu, the glue which is used to bind the books is set. The available choices are 'Hot melt', 'PUR' and 'Dispersion'. The selection is done by positioning the '◀' to the chosen glue. The choice is confirmed by pressing the '(ok)' button.

Start Measurement



Upon confirmation with '(ok)', the following is shown on the display depending on the settings determined in the previous steps.

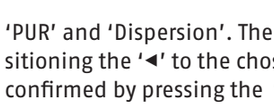
Pressing the 'Start' button begins the first measurement of the measurement series.

After each page has been pulled and the measurement has been finished, you will be asked if you would like to save the measurement.

After saving, the measurement series can be continued by pressing the 'Start' button.

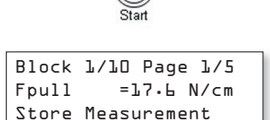
Measurement Statistics

A display of the current measured values as well as an analysis of the measurements can be shown by pressing the 'Results' button.

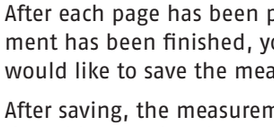


Pressing the '(+)' and '(-)' buttons will toggle between the measured values.
Pressing the '▶▶▶' shows:

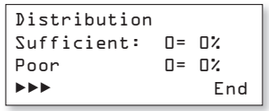
pressing '▶▶▶' again shows



pressing '▶▶▶' again shows

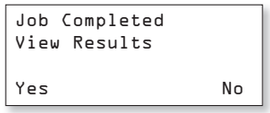


and finally pressing '▶▶▶' again shows



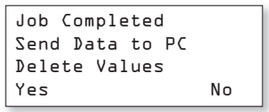
Pressing the 'End' button returns to measurement mode to continue the measurement series.

Upon completing the measurement series and when all the measured values have been determined the following display is shown:



Pressing 'Yes' and following the button sequence 'Results' and 'Statistic' will show the results of the measured series as described above.

Pressing 'End' will complete the measurement series:



If 'No' is chosen, the option to view the measured values will be shown on the display. If 'Yes' is chosen, the values will be transferred to the PC and the values of the measurement series will be deleted from the device memory. A new measurement series can be started.

The selections for block and page totals per block as well as the glue selection remain unchanged and can be used for further guided measurements.

9.3 Settings

In this mode, the data and the default values for the measurements and the analysis can be customised.

The menu consists of the following items:

- Selectable measurement width of 1.0 cm to 10.0 cm
- Change hotmelt quality level
- Change PUR quality level
- Change dispersion glue quality level
- Change the display language

In the three quality level settings, the values of the binding strength can be changed to evaluate the quality of the binding. In the publication [1] "Technical Guidelines for the Assessment of adhesive-bound products using the page-pull test" of the German Association for Printing e. V. in 1992, the following recommended values for binding strength are given. These values are already set as evaluation criteria in the BIND CONTROL.

Assessment of the binding strength	EVA Hotmelt	Dispersion glue/ PUR
Very good	> 7.2 N/cm	> 7.5 N/cm
Good	> 6.2–7.2 N/cm	> 6.5–7.5 N/cm
Satisfactory	> 4.5–6.2 N/cm	> 5.5–6.5 N/cm
Unacceptable	≤ 4.5 N/cm	≤ 5.5 N/cm

The variation coefficient of the measured values must not exceed 20%. [2]

Within this menu, different target values other than those mentioned above can be set if a house standard exists which defines other higher targets.

10. Calibration Verification

In order to easily verify the accuracy of the measured values, the device is equipped with a special testing function. This allows the operator of the device to quickly and easily verify the functionality of the device as well as the accuracy of the used sensor.

For verification, a handle is located underneath the device and can be screwed into the calibration opening with its screw thread. Please only lightly tighten the handle.

The device can be changed to System Check mode by turning the device on in an alternative manner. To do this, hold the 'Start' button while the device is being turned on using the main switch and only let go once the following is shown on the display:

```
*** System Check ***
No Measurement Value
Please lift up
```

For verification, the device has to be lifted up until the device is completely lifted off the surface. To minimise the influence of the operator on the result, it is recommended to hang the device on a fixed point.

After the device has been lifted with the handle, the internal verification is carried out. The result is shown as text on the display. When 'Device ok' is shown, the accuracy of the sensor is within its defined tolerances and the functionality of the device is correct.

If 'Please contact service' is shown, please contact the manufacturer.

The calibration itself can only be done by the manufacturer!

The System Check mode is ended by turning off the device with the main switch.

11. Behaviour in Case of Malfunction

11.1 General

When encountering problems with the BIND CONTROL, it is recommended to first look for obvious sources of error, e.g. a defect power supply cable or a blocked ejection slot.

If this does not lead to success, please contact the manufacturer by telephone at +49 34 12 59 42-0. Please provide a detailed description of the malfunction. If this also is not successful in solving the problem, the device should be checked by the manufacturer.

11.2 Repair and Service

Repairs and service on the device may only be completed by the manufacturer.

When returning the unit for service, the transport safeguard must be installed. To do this, tilt the device slightly, insert the wing screw into the corresponding opening on the underside of the device and hand-tighten the screw (see also fig. in Section 4.4).

11.3 Maintenance

If required, the device can be cleaned with a dry or slightly damp cleaning cloth. If the device is very dirty, using cleaning agent is also possible.

Additionally, the page insertion slot may be carefully cleaned with compressed air to remove any existing paper dust.

12. Warranty

The BIND CONTROL device has a warranty period according to the contract. If the device is defect during this time period, please immediately contact the manufacturer:

PITSID – Polygraphische innovative Technik Leipzig GmbH

Mommsenstrasse 2

D-04329 Leipzig, Germany

Phone: +49 34 12 59 42-0

Fax: +49 34 12 59 42-99

The warranty does not apply to devices that have been accidentally or deliberately damaged by misuse or natural disasters or by unauthorized manipulation.

Damages caused by non-compliance with the instructions in the documentation, improper handling, disregard of the operating instructions and changes to the measuring software are also excluded from the warranty.

The warranty applies exclusively to the functionality of the product, but not to consequential damage in connection with the use of the BIND CONTROL.

13. Summary of the Technical Data

General

Name	BIND CONTROL
Series	25 – 0010.0/0
System No.	Please see label
Manufacturer	Polygraphische innovative Technik Leipzig GmbH
Dimensions, weight	285 mm (W) x 255 mm (D) x 300 mm (H) – 8.6 kg
Measurement range	2.5 ... 25 N/cm
Book block dimensions	Spine length: 10 cm, Block width: 11 ... 13 cm
Display	4 lines
Display size	60 x 38 mm
Measurement resolution	0.1 N/cm
Measurement uncertainty	± 0.2 N/cm
Measurement time per page	Approx. 25 s
Power supply	100–240 VAC / 50/60 Hz
Power consumption	< 250 VA
Back-up fuse AC power input	10 A

Operating conditions

Operating temperature	+5° C to +35° C
Storage temperature	–10° C to +50° C
Air humidity	30 % to 85 % non-condensing
Impact stress during use	< 5 G
Vibration during use	Max. 0.7 G (at 5 – 200 Hz)
Impact stress during transport	≤ 25 G

Optimal measurement conditions

Operating temperature	+20°C to +25°C
Air humidity	45% to 60%

Literature

[1] N.N.

Technical Guidelines for the Assessment of adhesive-bound products with page-pull test (German: Technische Richtlinien zur Beurteilung klebegebundener Erzeugnisse mittels Pulltest) Bundesverband Druck E. V., Wiesbaden, 1992

[2] Wulf, Jens

Technical guidelines Book Production and Brochure Production
(German: Technische Richtlinien „Buchherstellung" und „Broschurenherstellung")
IBW, Leipzig, 2001