

User's Guide

PRESSURE INDICATOR™



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1. PRESSURE INDICATOR™ for Cylinder Nips

Print quality depends on best possible transfer of the ink and water emulsion - from the plate cylinder, to the blanket and finally the paper.

Thanks to the new, innovative PRESSURE INDICATOR™, it is for the first time possible to quickly measure the nip pressure between cylinders, rather than the height of the blanket, which is an indirect measurement.

With Nip Control's *Pressure Indicator*, it is easy to monitor how the nip pressure changes over time, or how the nip pressure changes with different underpackings and blanket compressibility.

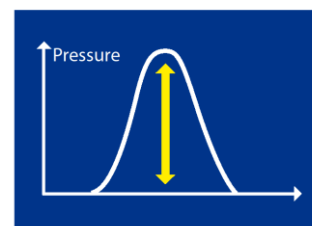
1.1. The System

The *Pressure Indicator* measuring system consists of a hand device, a flexible sensor blade and a calibration tool.



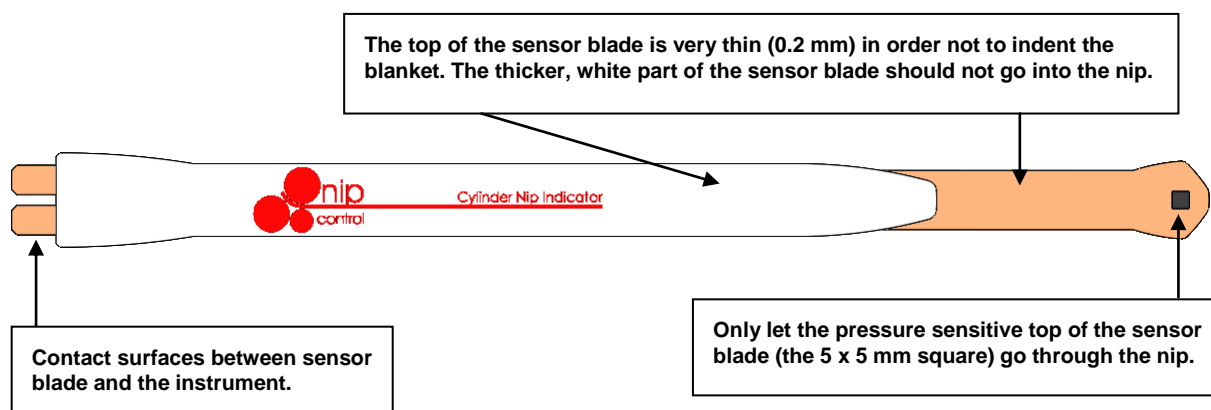
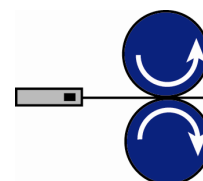
1.2 Peak Value

All nips have a pressure curve. The *Pressure Indicator* monitors how the pressure increases when the sensor blade is moving through the cylinder nip (Rolling Nip™). The instrument then shows the peak pressure value on the display.

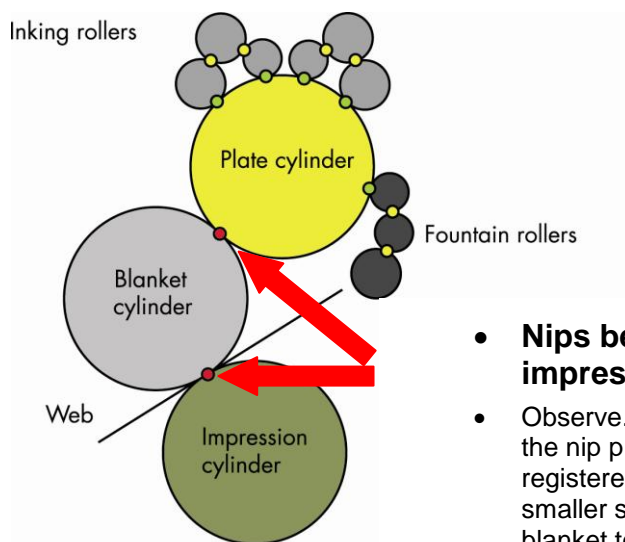


1.3 Easy to Use

Let the cylinders pull the top of the extra thin sensor blade through the nip, and in the display you will instantly see the nip pressure.



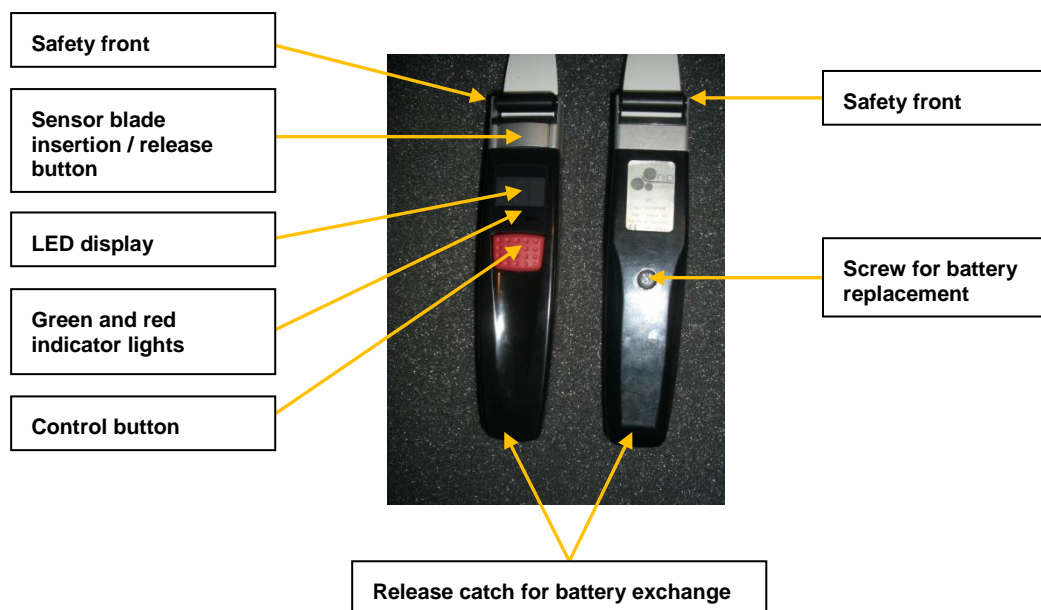
2. Where to measure in the printing press



- **Nips between plate, blanket and impression cylinders**
- Observe. On certain presses and press designs the nip pressure is low, and a value may not be registered by the instrument. Primarily this is for smaller sheet fed presses and presses with blanket to blanket printing (see page 8).

3. Product Description

The *Pressure Indicator* is easy to use and is designed to be handled by a single operator.



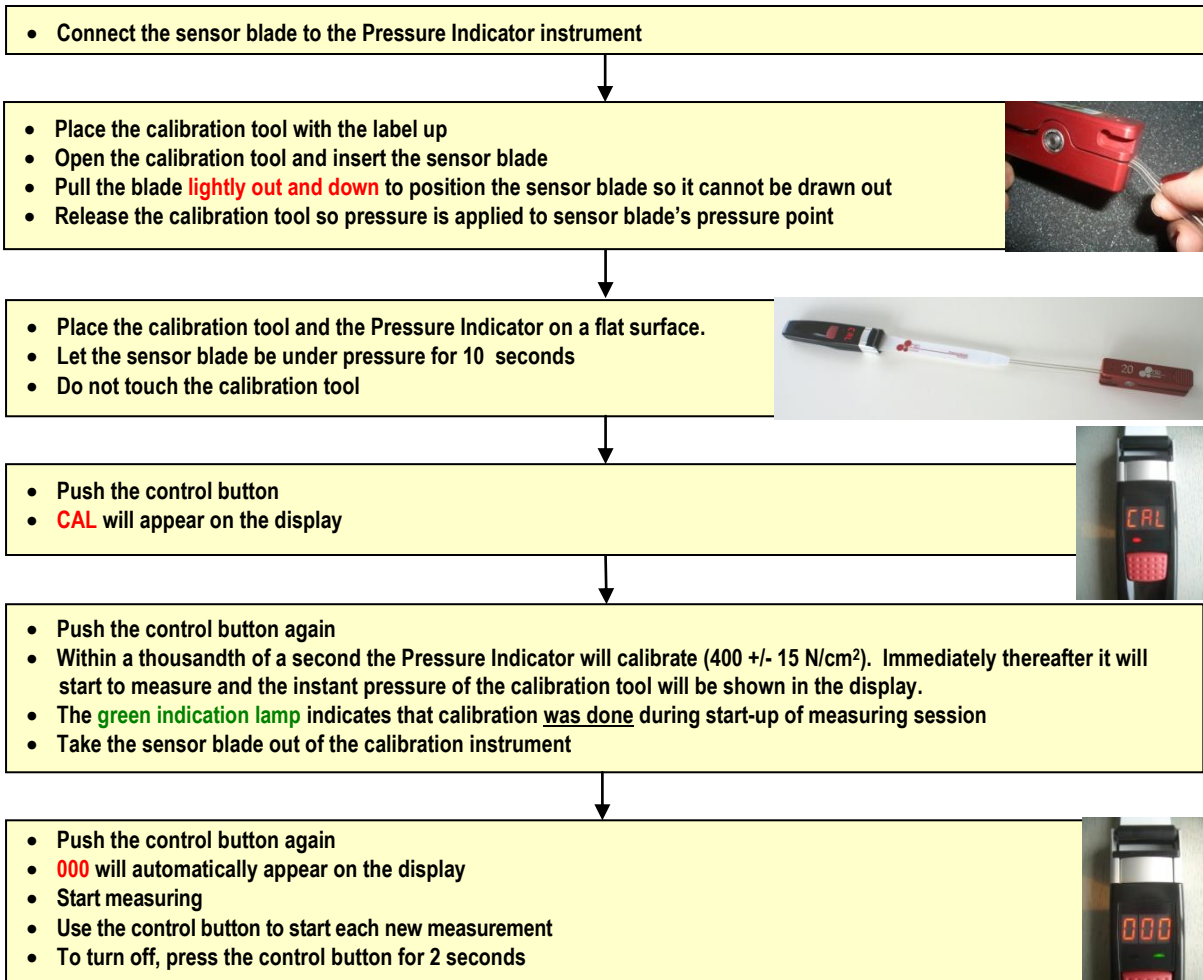
4. Start-up **WITH** CALIBRATION

IMPORTANT

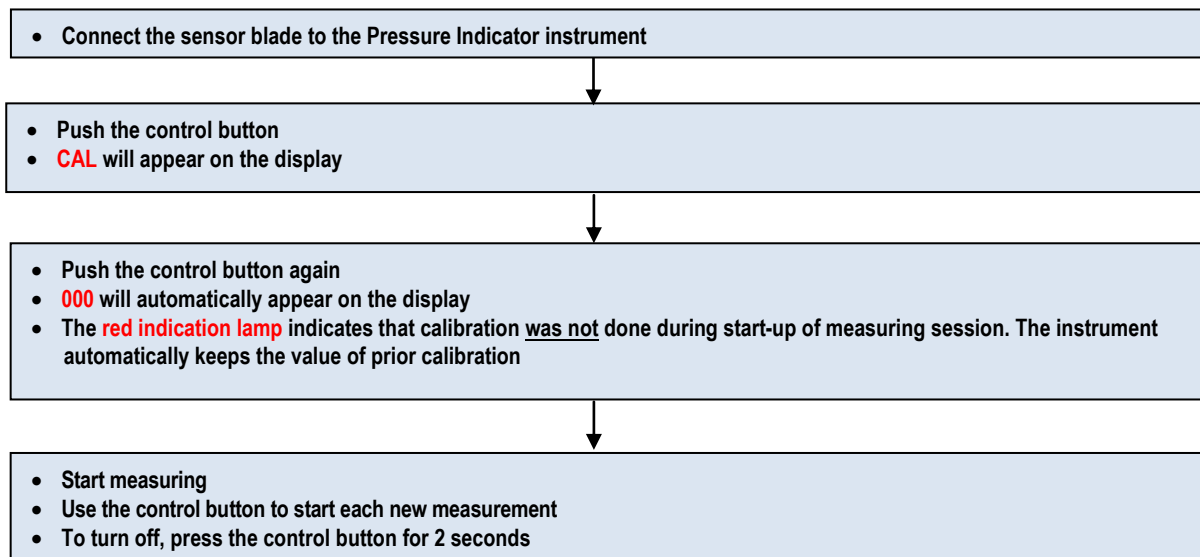
For optimal results, calibrate before a new measurement series is started

The sensors are highly compressible and very sensitive. If the sensor blade is left unused, pressure sensitive components inside the sensor blade will gradually start to expand. Calibration assures that the instrument always shows correct pressure value.

Implement a routine to always calibrate each day before new measurements are to start



5. Start-up **WITHOUT** CALIBRATION



6. Display and Indicator Lights

- The **green indication lamp** indicates that calibration was done during start-up of measuring session
- The **red indication lamp** indicates that calibration was not done during start-up of this measuring session and the instrument automatically keeps the value of prior calibration

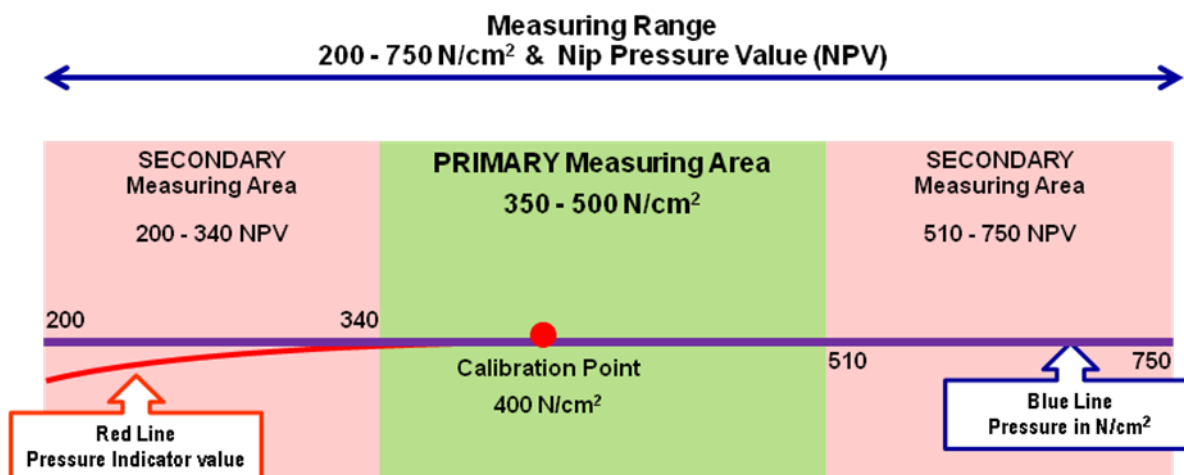


7. Calibration

- Never change sensor blades without calibrating. The *Pressure Indicator* software determines sensor characteristics when calibrating, which are unique for each sensor.
- For best result, use the same calibration tool when calibrating.
- Never calibrate with dried ink on the top of the sensor blade. The high-tech nano-technology used is very sensitive to pressure, and dried ink on the measuring area will affect the calibration (page 11).
- It is recommended to send-in the calibration tool to Nip Control for control calibration every 18 months. This is mandatory for companies that follow ISO 9000.
- When ordering a second Pressure Sensor, always indicate the serial number of the prior sensor blade. The reason is that there can be a slight deviation between different sensor blades in the Secondary Measuring Areas (page 8). This ensures that all of your sensor blades have similar characteristics.



8. Measurement Principles



DEFINITIONS

- ▶ Primary Measuring Area = *Pressure Indicator* values between 350 - 500 N/cm² are in N/cm² (Newton/cm²).
- ▶ Secondary Measuring Areas = The further away the *Nip Pressure Value (NPV)* is from the calibration point, the higher the deviation (the difference) from N/cm².

However, the deviation is always the same, which means that the NPV value in the display always will be the same for the same pressure (repeatability).

For this reason, pressure values between 200 - 340 and 510 - 750 are called Nip Pressure Value (NPV), and not N/cm².

- ▶ Calibration Point = The pressure level of the calibration tool is 400 +/- 15 N/cm². Within a thousandth of a second the *Pressure Indicator* will calibrate. Immediately thereafter it will start to measure and the instant pressure of the calibration tool will be shown in the display. You will see the display value increase slightly as the rubber inside the calibration tool reacts to the constant pressure.

- ▶ Blue Line = Represents N/cm².
- ▶ Red Line = Represents the value that is presented in the *Pressure Indicator*.
- ▶ Pressure values between 200 and 750 are shown in the display. If a registered value is between 100 and 190 NVP, the symbol “-LP” (Lower Pressure) is displayed. If the registered value is above 750 NVP, “-HP” (Higher Pressure) is displayed.
- ▶ Between 200 and 340NPV (Lower Secondary Area), the instrument is extra sensitive for change in pressure. For example, a 20 N/cm² change in pressure will increase the NPV value with approx. 30 NVP.
- ▶ Between 660 and 750NPV (Higher Secondary Area), the instrument is less sensitive for change in pressure. For example, a 20 N/cm² change in pressure will increase the NPV value with approx. 10 NVP.

As always when measuring, it is recommended to create an average to ensure minimum measurement inaccuracy and best trend data. You may also decide to monitor if the spread between min & max values in your measuring series is changing over time (see Trend Analysis sheet).

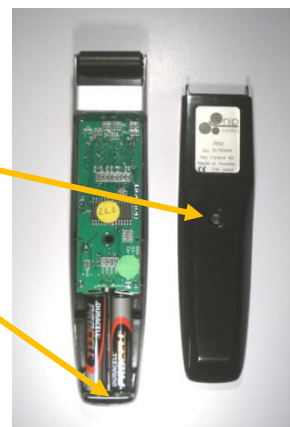
9. Printing Press

- The *Pressure Indicator* is primarily for web and sheet fed offset presses with a pressure level on the sensor blade between 200 and 750 N/cm² & NPV.
- If you do not reach sufficient pressure (> 200 NPV) between the blanket and impression cylinders, or blanket to blanket cylinders, this may be possible by having the printing paper in the nip while measuring.
- Do not measure close to the gap of the blanket cylinder (approx. 5 cm).
- On certain sheet fed presses the diagonal register must be set to zero.
- It is recommended to always measure the same way to ensure best trend analysis as the viscous-elastic properties of the blanket will make the measurement going into the nip slightly higher than when measuring out of the nip. The reason is that the blanket reacts to the extra pressure given by the 0,2 mm thin sensor blade when inserted. Therefore, for example, always do the reading with the sensor blade moving into the nip.

10. Battery replacement

When it is time to change the batteries, “bAt” is shown on the display.

1. Unscrew the screw on the back of the *Pressure Indicator*.
2. Use a tiny, ordinary screwdriver or the short straight side of a metal paperclip, and push to loosen the catch at the bottom of the cover.
3. Lift the back end of the cover approximately one centimeter and pull straight back.
4. Change the batteries (standard AAA alkaline batteries). Observe battery orientation (+ / - poles).



11. User maintenance

- Always carefully wipe off the sensor after measuring.
- If liquid cleaning is necessary, use water, acetone, isopropyl alcohol or “weaker” cleaning agents used on press. Wipe dry after cleaning.
- Do not touch or use liquid on the contact surface (see page 4) on the sensor blade.
- After changing the batteries, if the control button does not make a “clicking” sound when being pushed down, tighten the screw on the back of the instrument.

12. Safety

If the press does not stop, pull the *Pressure Indicator* away from the nip until the sensor blade releases from the nip or from the *Pressure Indicator* to prevent injuries or damages.



Warning!

When measuring, follow strictly the press manufacturer's instructions for handling of the press.

Be careful during measurement.

This manual describes the authorized method to handle the measuring device.

The instrument should exclusively be used as a measuring device.

To protect the user from injury the *Pressure Indicator* has a safety front with three consecutive safety levels.

1. A mechanical safety zone / safety distance is created between the hand and the cylinder.
2. A safety front with small rollers, which will rotate against the printing press cylinders at contact, limits the risk for the instrument to be pulled in between the cylinders.
3. The force needed for the sensor blade to be pulled out of the hand unit (the instrument) has carefully been calculated to automatically release, despite the instruments design, if pulled into the nip.



13. Miscellaneous

13.1. CE

The product conforms to the CE demands of the EMC (Electromagnetic Compatibility) directive.

13.2. RoHS

The product conforms to the demands of the RoHS-directive.

13.3. Environment

The battery used with this product contains chemicals that are harmful to the environment. Dispose in the proper manner according to national and local regulations.

The *Pressure Indicator* should be disposed of as an electronic device.

13.4. International Patent

The product is protected by patent SE-519 918. Patent Pending in Europe & USA.

14. Specification

Pressure Indicator instrument	Part Number P101
Sensor blade	Part Number PS35001
Calibration tool	Part Number C101
<ul style="list-style-type: none"> • Sensor length: 350 mm • Sensor thickness: 0,2 mm • Nip width: > 5 mm • Cylinder diameter: All sizes • Nip temperature: 10 - 70° C • Cylinder surfaces: Metal to Rubber Rubber to Rubber • Rubber hardness: < 95° shore A • Measurements per sensor: > 2.000 • Measuring units (force/area): Newton/cm² (N/cm²) & Nip Pressure Value (NPV) • Measurement range: 200 - 750 N/cm² & NPV onto sensor blade (0.2mm) • Measurement repeatability: Typical deviation +/- 10 N/cm² & NPV Max deviation +/- 15 N/cm² & NPV • Display resolution: 10 N/cm² & NPV • Pressure information (display): 000 0 - 90 NPV; LP 100 - 190 NPV; HP >750 NPV • Display: Bright LED-display for easy readings • Battery: 2 standard AAA (alkaline) • Readings per battery set: > 1 000 • Power save: Turns off automatically when not in use • Sensor position: Sensors can measure with either side toward either cylinder. • Cleaning: Always wipe the sensor clean after measuring. If liquid cleaning is necessary, use water, acetone, isopropyl alcohol or “weaker” cleaning agents used on press. 	

15. Manufacturer

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Nip Control reserves the right to make any changes to the product without notification.

16. Provider for Czech and Slovak Republic



G+P Technik, s.r.o.

Device and sensor, you can order by e-mail address:

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Or by fax: **+420 220 970 658**

Or at the postal address:

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<http://www.gptechnik.cz/>