






## Quick measurement of form in cylinder bores

Precision measurement in seconds of

- roundness
- form
- diameter

in production areas

-  Roundness
-  Straightness
-  Cylindricity
-  Parallelism
-  Inner diameter



**P-INCOMETER**  
Probe TK-5 with electronics



### P-INCOMETER

Quick and reliable generation of cylinder bore data accurate to microns, directly in the production area.

#### Rugged and highly precise

The P-INCOMETER was conceptualized after the long established V-INCOMETER in order to utilize proven technical features, i.e. the connection of the measuring head to the engine block to safeguard against vibration. Also, the "self-adjusting" principle is integrated so that the manual adjustment of the probe to the bore is not necessary. These fundamental features give the system high accuracy even in harsh production environments.

#### High flexibility

The modular design of the measuring system enables quick and simple adaptation to different bore sizes. By simply exchanging the measuring probe and fixing plates, different engines can be measured without the need for special installation tools. The measuring head is equipped with up to 7 sensors positioned according to customers specifications.

#### Simple operation

The clearly structured menus of the control and evaluation software INCOWIN enable easy, error-free operation without requiring extensive training. Measurement results can be printed at the end of each cycle.

#### Mobile use

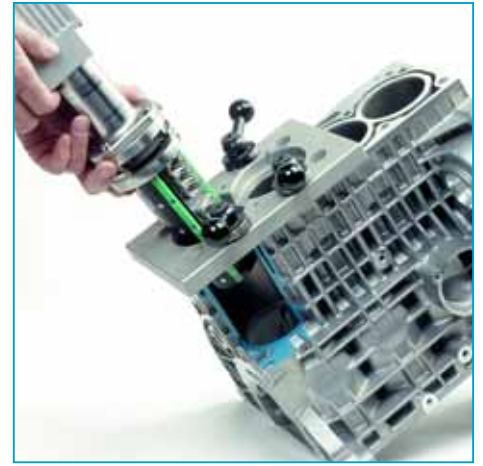
Due to the small size and light weight of the P-INCOMETER, the system is ideal for use on different production lines around the plant.

#### Easy handling

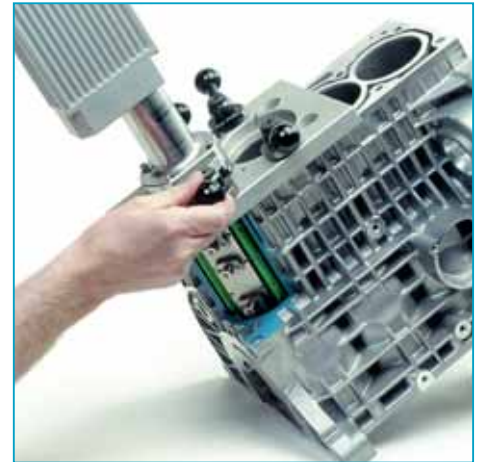
To take a measurement the P-INCOMETER is inserted into the cylinder bore.

Plastic guide rails are integrated into the measuring head to avoid damage to the cylinder wall. A centering collar on the P-Incometer unit and a fixture plate mounted on the engine block are coupled together by the use of a clamping lever. This ensures that the P-INCOMETER is in the correct measuring position on the engine block.

After starting a measurement, the measuring head begins a scanning rotation of 360°. Measurement values from each sensor are taken simultaneously at a constant speed. After the measurement, which only takes a few seconds, the calculations are computed and the results are printed.



Inserting of the probe



Fixing of the probe

#### PROTOCOL OF A CYLINDER MEASUREMENT

##### ROUNDNESS (0...6 µm)

Level 1,	10 mm	: 5.8 µm	-----x-
Level 2,	30 mm	: 4.4 µm	-----x-
Level 3,	50 mm	: 4.3 µm	-----x-
Level 4,	70 mm	: 4.2 µm	-----x-
Level 5,	90 mm	: 5.1 µm	-----x-

##### STRAIGHTNESS (0...6 µm)

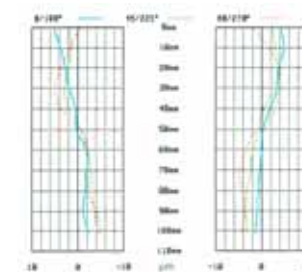
Angle 0°	: 2.3 µm	-----x-
Angle 90°	: 5.5 µm	-----x-
Angle 180°	: 1.7 µm	-----x-
Angle 270°	: 4.9 µm	-----x-

##### PARALLELISM (0...12 µm)

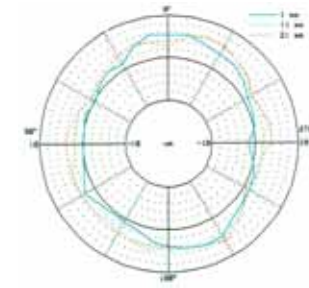
Angle 0 / 180°	: 8.8 µm	-----x-
Angle 90 / 270°	: 13.5 µm	-----x-

##### CYLINDER FORM (0...12 µm)

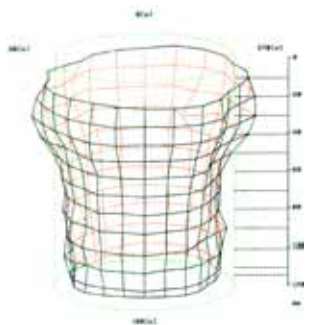
	: 11.9 µm	-----x-
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Axial plot of a cylinder bore



Radial plot of chosen levels



Isometric plot of cylinder bore