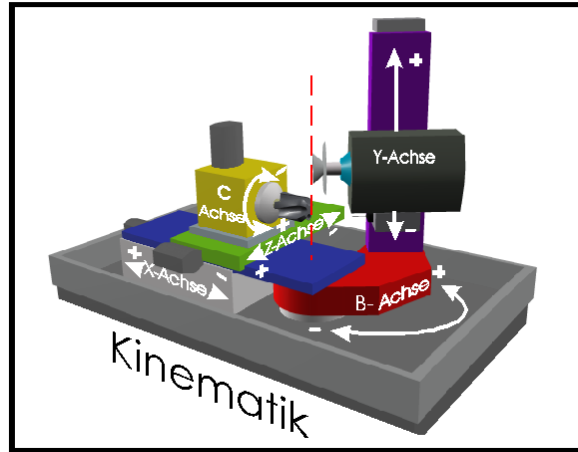




NOVAMATIC 2000 - CNC
5 Axis CNC Tool Grinding Machine

**Measurement of
Machine Home
Positions**



Manufacturer's Number	:	_____
Year of Manufacture	:	_____
Customer Number	:	_____
Customer	:	_____
Date	:	_____
Technician	:	_____

Important Note:

In order to achieve optimal and exact grinding results, the machine must be aligned according to the requirements shown in the Accuracy Test Procedure. The allowable deviations may not be exceeded. These alignments have been undertaken at the factory. Measurements 1, 5, 6 and 8 (see Accuracy Test Procedure) must be repeated by the customer prior to initial start-up, because improper transport may cause changes to the axis alignments.

After these alignments have been undertaken and released, the individual machine home positions must be determined.

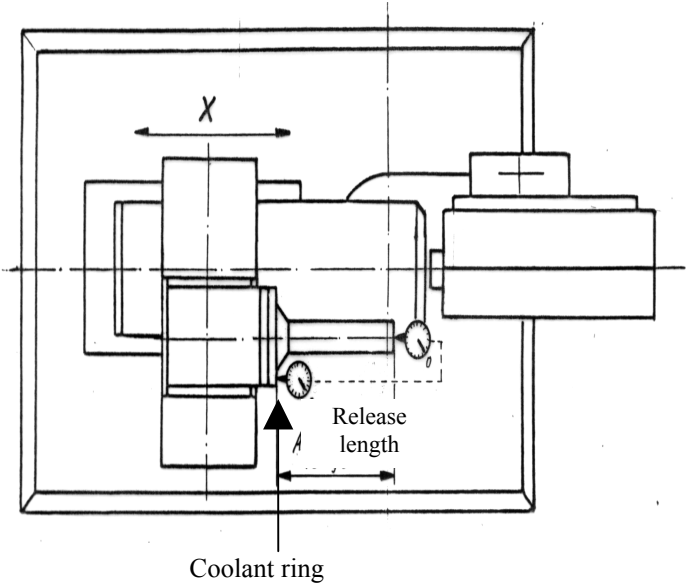
It is absolutely necessary that machine measurements be taken after each and every collision, or after any structural changes to the axes.

Machine Measurements - Novamatic 2000 CNC

1. Measurement of the Release Length of the Test Mandrel in the C Axis

Tools: Dial gauge
 Face ground test mandrel

Sketch : (top view)



- Procedure:
- Set machine to reference positions.
 - Position the X axis such that the ground surface of the test mandrel is aligned to the dial gauge.
 - Set the X axis and the dial gauge to zero.
 - Position the X axis such that the coolant ring (see sketch) is aligned to the dial gauge, and set the dial gauge to zero.
 - Record the „X relative value“ (= release length)

Calculate following values:

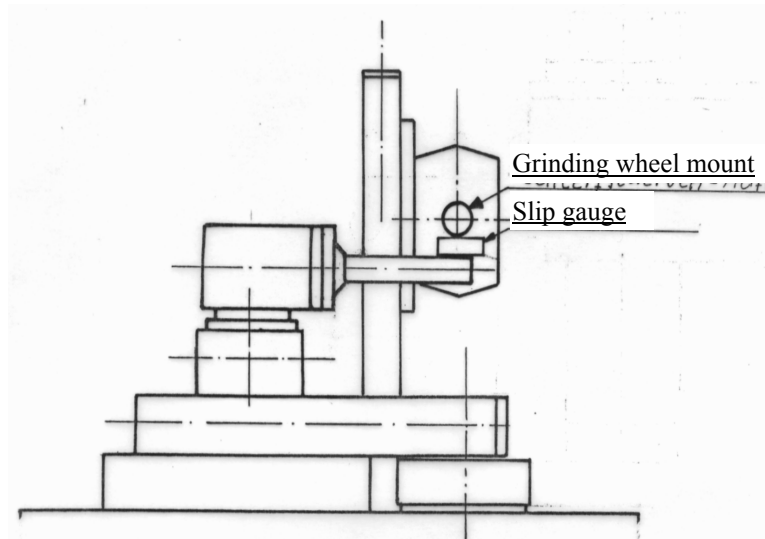
AL = Release length	=	_____.
Test mandrel radius [D/2]	=	_____.
Grinding wheel mount radius [DS/2]	=	_____.

Machine Measurements - Novamatic 2000 CNC

2. Measurement of the Machine Home Position for the Y Axis

- Tools:
- Slip gauge
 - Grinding wheel mount
 - Test mandrel

Sketch : (front view)



Procedure: Position the Y axis as shown in the sketch, so that the slip gauge is positioned between the test mandrel and the grinding wheel mount.

Make the following calculation.

Y value (see display)	=	_____.	_____
+ Grinding wheel mount radius	=	_____.	_____
+ Slip gauge thickness	=	_____.	_____
+ Test mandrel radius	=	_____.	_____

Machine home position, Y axis = _____.

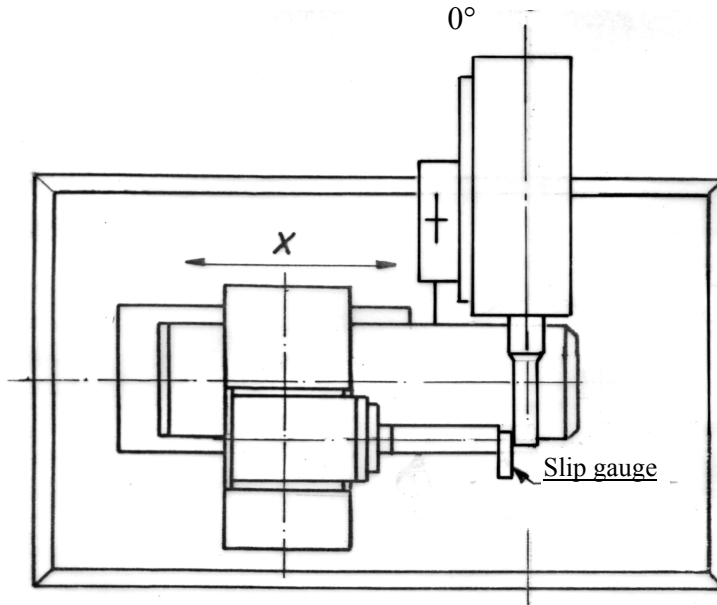
Machine Measurements - Novamatic 2000 CNC

3. Measurement of the Machine Home Position for the X Axis

Tools: same as 2. - machine home position for Y axis

a) Measurement of machine home position for X_0 with B axis at 0°

Sketch:



Procedure:

- Return B axis to home position
- Position the X axis such that the ground surface of the test mandrel is in contact with the slip gauge.

Make the following calculation.

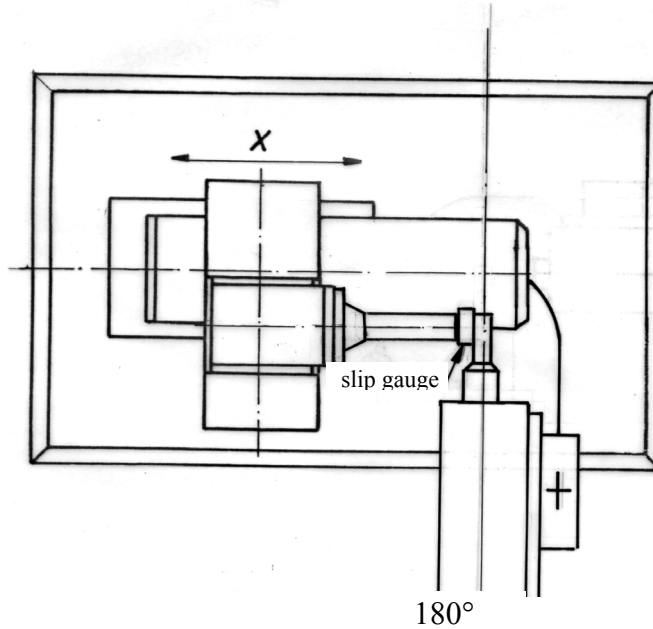
X value (see display)	=	_____.
+ Release length AL	=	_____.
+ Slip gauge thickness	=	_____.
+ Grinding wheel mounting mandrel radius	=	_____,_____

Machine home position, X_0 = _____.

Machine Measurements - Novamatic 2000 CNC

b) Measurement of machine home position for X_{180} with B axis at 180°

Sketch: (top view)



Procedure:

- Position the B axis at 180° .
- Position the X axis such that the ground surface of the test mandrel is in contact with the slip gauge.

Make the following calculation.

X value (see display)	=	_____.
+ Release length AL	=	_____.
+ Slip gauge thickness	=	_____.
+ Grinding wheel mounting mandrel radius	=	_____.

Machine home position, X_{180} = _____.

Machine Measurements - Novamatic 2000 CNC

c) Calculation of the machine home position for the X axis (X-MHP)

$$X\text{-MHP} = (X_0 + X_{180}) / 2 = \boxed{}$$

This value is entered into the machine measurements (Software from Unger).

d) Calculation of the spindle vector for the X axis [SVX]

$$SVX = (X_0 - X_{180}) / 2 = \boxed{}$$

This value is entered into the spindle data (Software from Unger).
Caution: observe plus or minus sign.

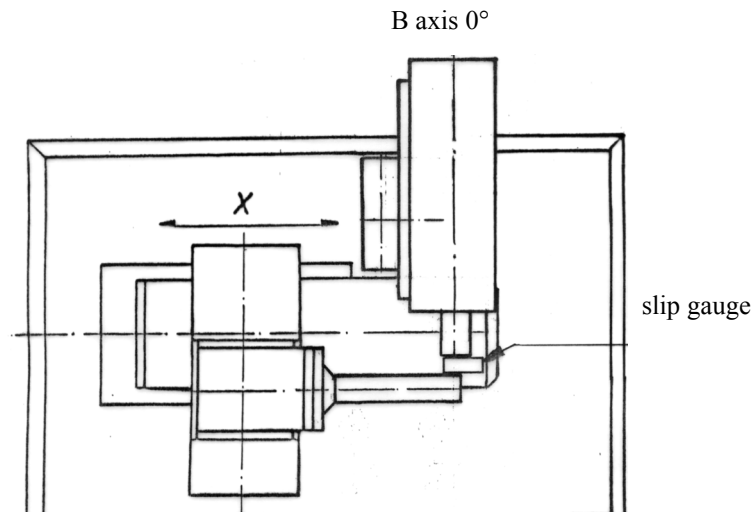
Machine Measurements - Novamatic 2000 CNC

4. Measurement of the Machine Home Position for the Z Axis

Tools: same as 2. and 3.
but without grinding wheel mount

a) Measurement of machine home position for Z_0 with B axis at 0°

Sketch: (top view)



Procedure:

- Position the Z axis such, that the ground surface of the test mandrel is in contact with the slip gauge, and the slip gauge is aligned to the ground surface of the mandrel.

Make the following calculation.

Z value (see display)	=	_____.
+ Slip gauge thickness	=	_____.
+ Test mandrel radius	=	_____.

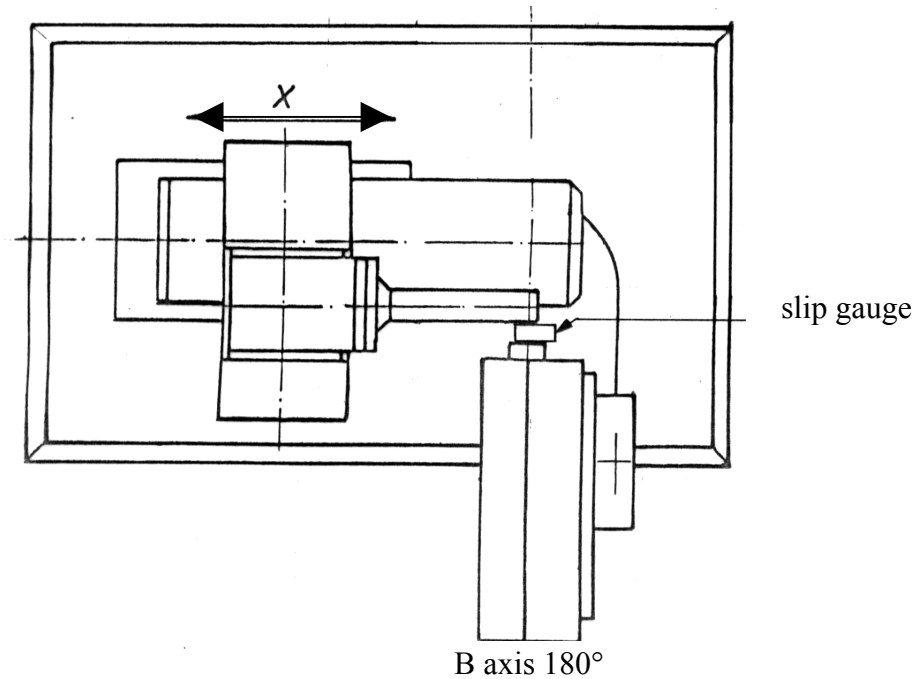
Machine home position, Z_0 = _____.

Z_0 = Grinding wheel flange dimension [FL]

Machine Measurements - Novamatic 2000 CNC

b) Measurement of machine home position for Z_{180} with B axis at 180°

Sketch: (top view)



Procedure:

- Position the Z axis such, that the ground surface of the test mandrel is in contact with the slip gauge, and the slip gauge is aligned to the ground surface of the mandrel.

Record the Z axis value (see display).

Z axis =

Machine Measurements - Novamatic 2000 CNC

c) Calculation of the machine home position for the Z axis (Z-MHP)

$$Z\text{-MHP} = (Z_0 \text{ display} + Z_{180} \text{ display}) / 2 = \boxed{}$$

This value is entered into the machine measurements.

a) Calculation of the spindle vector for the Z axis [SVZ]

$$SVZ = \text{Wheel flange dimension FL} - Z\text{-MHP} = \boxed{}$$

This value is entered into the spindle data. Caution: observe plus or minus sign.

Note: Because the machine measurements have been changed, the measuring probe or probes must be re-calibrated!

Overview of all computed measurement data
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Release length	
Test mandrel radius	
Grinding wheel mount radius	
Machine home position, Y	
Machine home position, X ₀	
Machine home position, X ₁₈₀	
Machine home position, X	
Spindle vector, X axis	
Machine home position, Z ₀	
Machine home position, Z	
Spindle vector, Z axis	