SKM 2

Closing Force Meter

Original Operating Instructions

BAZ72201-en

Contents

1 Description

1.1 Intended Use

This device is used to measure the closing force of power-controlled doors.
Any further uses beyond this range of application are prohibited.

1.2 Components

A	Measuring Unit with Display	C	Power Supply Unit
B	Force Sensor	D	Handling Box

1.3 Specifications

Measuring range ..... 0…995 N
Accuracy ..... ± 10 N
Temperature range ..... +5...+ 40 °C
Height of measuring cell ..... 115 mm
Diameter of measuring cell ..... 100 mm
Display resolution ..... 64 x 128 pixels
Supply voltage of internal NiMh battery ..... 6 V; 700 mA
Supply voltage of power supply unit ..... 230 V DC/ 12 V AC
Weight including handling box ..... approx. 3.5 kg

2 Operation

2.1 Button Assignment

	Left-hand button	Right-hand button
Push and hold button (2 sec)	• Open the service menu (when connecting power supply unit) • Exit menu item or service menu • Save contrast or variable value	• Display battery voltage / version number (when connecting power supply unit) • Change variable value • Move cursor position to the right
Push button briefly	• Page backward • Reduce contrast or variable value • Delete input • Move cursor position to the left	• Open menu item • Page forward • Increase contrast or variable value

2.2 Switching On / Off

- To switch on press either one of the buttons.
- The device switches off automatically when the switch-off time has expired. The switch-off time can be set using EEPROM variable 4.

2.3 Connecting the Force Sensor

- Connect the force sensor to the 9-pin D-sub connector.
- The offset adjustment is carried out.

If the offset adjustment is not possible, the message "Offset error" appears on the display and the offset adjustment is repeated.

No load must be applied to the force sensor during the offset adjustment.

The offset adjustment can also be started by pressing either button for at least 2 seconds.

- The device switches off automatically when the switch-off time has expired, provided the force value does not exceed 20 N during this period. The switch-off time can be set using EEPROM variable 4.
- The maximum value memory on the display is deleted when the device switches off or either button is pressed.

2.4 Opening the Service Menu

The programming is done at the factory. Any changes to the preset variables may result in malfunction.

1 Press the left-hand button.
2 Connect the power supply unit.
3 Hold the left-hand button, until the Menu Selection appears.
4 Remove the power supply unit.

2.5 Setting the Contrast

1 Open menu item "Contrast" using the right-hand button.
2 Reduce the contrast using the left-hand button, increase it using the right-hand button.
3 Save your setting by pressing the left-hand button for 3 s.
4 Exit the service menu by pressing the left-hand button for 3 s again.

2.6 Setting the EEPROM User Variables

1 Open menu item "EEPROM User Variables" using the right-hand button.
2 Select the desired varaible using the left- or right-hand button.
3 Press the right-hand button for 2 s.
4 Press the right-hand button briefly to increase the variable value.
5 Press the right-hand button for 2 s to jump to the next input position.

To delete erroneous inputs, briefly press the left-hand button.

6 Save your changes by pressing the left-hand button for 2 s.
7 Exit the menu item/service menu by pressing the left-hand button for 2 s again.

List of EEPROM User Variables

	Name			
1	PED 200 or SKM 2 0 = PED 200 1 = SKM 2	1	0	1
2	Variable not used	-1		
3	Variable not used	-1		
4	Switch-off time in seconds	60	10	65535
5	Pedal force meter Factor	1000	900	1100
6	Illumination status 0 = Illumination always OFF 1 = Illumination ON with Pedal force meter 2 = Illumination always ON	1	0	2
7	Signal sensor status 0 = No signal sensor 1 = Signal sensor for buttons enabled	1	0	1

	Name			
8	RS232 Baud rate 0 = 4800 1 = 9600 2 = 19200 3 = 38400	3	0	3
9	Variable not used	-1		
10	Language 0 = German 4 = Dutch 8 = Czech 1 = English 5 = Spanish 9 = Polish 2 = French 6 = Norwegian 10 = Danish 3 = Italian 7 = Croatian 11 = Finnish	0	0	12
11	Variable not used	-1		
12	Pedal force meter Resolution 0 = Resolution 5 N 1 = Resolution 1 N	1	0	1
13	Position detection, only for SKM 2 0 = Position detection disabled 1 = Position detection enabled	1	0	1
14	Offset adjustment with buttons allowed	1		
15	Threshold in N 0 = Force is measured > 0 N 5 = Force is measured > 5 N	5	0	10
16	Variable not used			
17	Variable not used			
18	Variable not used			
19	Pattern to recognize an empty EEPROM with 65535; Reset only for User variables	-23206		

2.7 Test Programs

1 Press the right-hand button.

2 Connect the power supply unit.

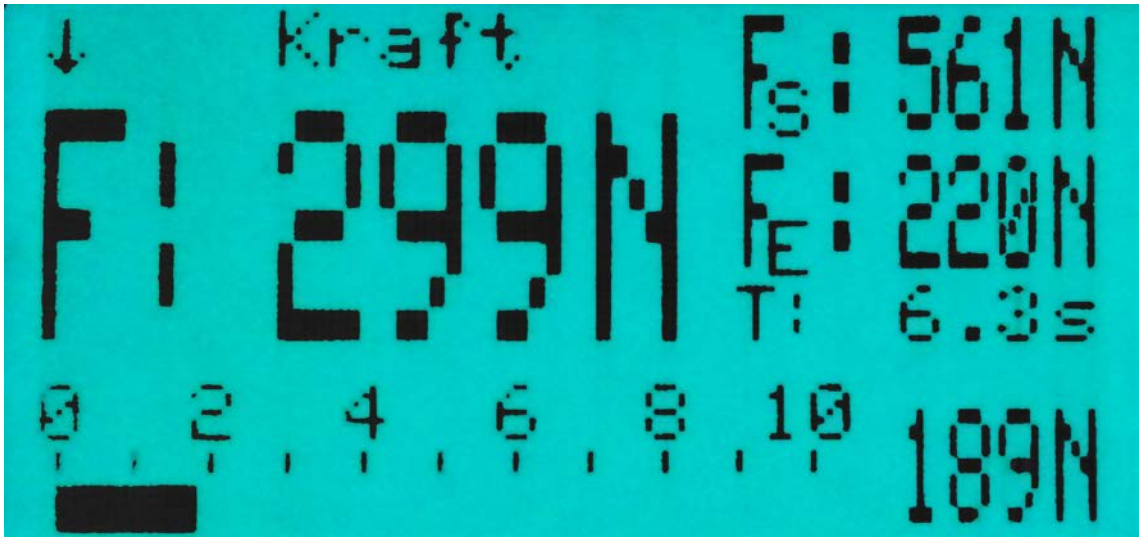
→ The software version number appears on the display.

3 Hold the right-hand button for another 2 s.

→ Battery voltage, charging voltage and charging current appear on the display while the button is held.

4 Release button and remove power supply unit.

2.8 Output Values



The functions described are available in software V0.15 (22.09.2011) or later.

Peak Force F_S (in this example 561 N)

The peak force F_S is the maximum value of the closing force.

If F_S > 999 N, **---N** appears on the display.

Effective Force F_E (in this example 220 N)

The effective force F_E is the mean value of the closing force in relation to the pulse duration.

If F_E > 999 N, **---N** appears on the display.

Pulse duration T (in this example 6.3 s)

The pulse duration starts when the closing force exceeds 50 N and ends when it falls below 50 N.

If T > 99,9 s, **--,-s** appears on the display.

Clamping Force F (in this example 299 N)

The clamping force F is the arithmetic mean of the effective forces.

If F > 999 N, **---N** appears on the display.

Current Force (in this example 189 N)

In the bottom right-hand corner the current force in N is displayed.

Starting a New Measurement

A new measurement is started when

- the measuring unit is switched on.
- the force sensor is connected to the measuring unit.
- the maximum force exceeds 999 N.
- either button is pushed.

Offset Adjustment

An offset adjustment is carried out when

- the measuring unit is switched on.
- the force sensor is connected to the measuring unit.
- either button is pushed for at least 2 seconds.

2.9 Adjustment

If the meter is not exactly adjusted, a correction factor must be entered in variable 5.

1 Load the meter with a known weight (e.g. 30 kg).

The meter display shows the weight in Newton, e.g. 305 N.

In fact, the meter should display 30 kg • 9.81 $\frac{m}{s^2}$ ≈ 294 N.

2 Calculate correction factor:

Correction factor = $\frac{actual\ value}{measured\ value}$ • 1000

In this example: Correction factor = $\frac{294\ N}{305\ N}$ • 1000 ≈ 964

By entering the correction factor in variable 5, the display error can be compensated for.

3 Open the service menu and select menu item "EE-User variables".

4 Press the right-hand key to open the user variable program.

Menu Selection
EE-User Variables

5 Select user variable 5 with the left-hand key (previous variable) or right-hand key (next variable).

6 Open the variable with the right-hand key (long press).

EEPROM Variables		
Factor Force		
Var	5:	1000

7 Use the right-hand key (short press) to increase the variable value.

Use the right-hand key (long press) to select the next entry position.

EEPROM Variables		
Factor Force		
Var	5:	1000
New Value	:	964

A wrong entry can be deleted with the left-hand key.

8 Save your changes using the left-hand key (long press).

9 Exit the menu item or the service menu using the left-hand key (long press).

10 To check the meter, load it again with the known weight (e.g. 30 kg). If necessary, repeat the procedure beginning with step 3.

3 Maintenance

3.1 Spare Parts

To ensure safe and reliable operation, only use original spare parts supplied by the equipment manufacturer.

52 0802

53 2917

52 0801

52 0298

3.2 Maintenance by the Operator

The equipment is maintenance-free. Protect from moisture. Remove dirt using a clean cloth.

3.3 Charging the Battery

The device is charged using the power supply unit. The charging time is approx. 4 h.

4 Disposal

Batteries should not be disposed of in ordinary household garbage. As consumer you are obliged by law to properly dispose of used batteries. These can be dropped off at public collection stations in your community and everywhere where such batteries are sold.

If you want to dispose of the equipment, please contact your MAHA dealer or the following address, indicating equipment type, date of purchase and serial number:

MAHA Maschinenbau Haldenwang GmbH & Co. KG
Hoyen 20
87490 Haldenwang
Germany

Phone: +49 (0) 8374 585 0
Fax: +49 (0) 8374 585 500
Email: altgeraete@maha.de

Alternatively, you may take the equipment to a specialised waste management plant to ensure that all components and operating liquids are properly disposed of.

5 Contents of the Declaration of Conformity

MAHA Maschinenbau Haldenwang GmbH & Co. KG

herewith declares as a manufacturer its sole responsibility to ensure that the product named hereafter meets the safety and health regulations both in design and construction required by the EC directives stated below.
This declaration becomes void if any change is made to the product that was not discussed and approved by named company beforehand.

Model:	SKM 2
Designation:	Closing Force Meter
Directives:	2014/30/EU; 2014/35/EU
Standards:	DIN EN 61000-6-2; DIN EN 61000-6-3

6 Company Information

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Document

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