

M40079.V03 torque measuring unit with start-torque measuring and AUTOZERO

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The torque measuring unit M40079.V03 stores the torque value average = $((MAX+MIN)/2)$ and the start-torque value during the rotation of the radial joint. Both values will be separately classified. Additional an automatic Zero-point correction will be done during the rotation without any piece, when an AUTOZERO-Cycle is running. During this cycle, the torque value of the measuring contrivance will be taken as offset correction for all following measuring cycles.

The calibration values for up to 32 different models may be stored in the unit. The selection of the actual model will be done by the machine control when starting the measuring.

1. Displays and control elements

front view



- 1 - Display
- 2 - Lamp: Upper class limit
- 3 - Lamp: Measuring value inside class limits
- 4 - Lamp: Lower class limit
- 5 - Pushbutton UP
- 6 - Pushbutton ENTER
- 7 - Pushbutton DOWN
- 8 - Keyswitch SETUP – Operating Mode (AUTO)

Back view parallel interface



- T1 - Input torque sensor
T2...T3 - not used
T4 - DC-Output 5pol. female, Series 680 torque sensor Pin 4: Output +/-10V; Pin2: Signal Ground
X312 - Input from external control unit
X412 - DC-Output 6pol. female, Series 680 torque Pin 5: Output +/-5V; Pin6: Signal Ground
No additional bridge: scale factor 1
Bridge 1-2: scale factor 5
Bridge 1-3: scale factor 10
X401 - Input power supply
X402 - Output printer 9pol. female Sub D Pin3: Output ; Pin7: Signal Ground
RS-232: 9600 Baud, 8 Bit, 1 Stopbit, no parity
S1 - Power supply switch
F1- Power supply fuse
-12V - Indicator -12V supply
+12V - Indicator +12V supply
+ 5V - Indicator + 5V supply

Back view PROFIBUS interface



- T1 - Input torque sensor
- T2...T3 - not used
- T4 - DC-Output 5pol. female, Series 680 torque sensor Pin 4: Output +/-10V; Pin2: Signal Ground
- X312 - Input from external control unit
- X412 - DC-Output 6pol. female, Series 680 torque Pin 5: Output +/-5V; Pin6: Signal Ground
No additional bridge: scale factor 1
Bridge 1-2: scale factor 5
Bridge 1-3: scale factor 10
- X401 - Input power supply
- X402 - Output printer 9pol. female Sub D
Pin3: Output ; Pin7: Signal Ground
RS-232: 9600 Baud, 8 Bit, 1 Stopbit, no parity
- S1 - Power supply switch
- F1- Power supply fuse
- 12V - Indicator -12V supply
- +12V - Indicator +12V supply
- + 5V - Indicator + 5V supply

Display modes

Xav	start-torque (Nm)summary of the last measured values of the torque average (MAX+MIN)/2 and the start-torque MAX value from the measuring cycle
model-nr. 000...031	last selected model. The individual class limits and the zero-offset for the actual torque signal are read out from the memory for this number when leaving this display mode.
torque Max	last measured maximum value.
torque Min	last measured minimum value.
Autozero torque	value of the torque autozero-cycle.
Autozero start-torque	value of the start-torque autozero-cycle.
Act.val. Nm	actual torque value from the sensor
Xav UL	upper class limit for Xav
Xav LL	lower class limit for Xav
Start-torque UL	upper class limit for start-torque

Attention: The pushbuttons UP and DOWN are locked in the Operating-Mode (AUTO), so that the calibration values can only be changed in the SETUP-Mode

2. Power Supply

Connect the measuring equipment at X401 via the power cable (europ. Standard) to a power supply of 230 V, 50-60 Hz and turn the power switch S1 at the back into ON position. To avoid influence of temperature the measuring equipment should be turned on ten minutes before the first measurement.

3. Setup: Keyswitch at the front in position SETUP

3.1 Model-Nr.

First step is to select the model-nr. you wish to work with.

Select the display mode „model-nr.“ with repeated pushing of pushbutton ENTER. Select the necessary value (000...031) by pushing the pushbutton UP or DOWN. The calibration values for 3.4, 3.5 and 3.6 will be read out from the memory when leaving the display mode "model-Nr."

3.2 Torque sensor connection

The sensor has to be connected with connector T1 at the backside.

3.3 Gain adjustment

The calibration may be done only by special educated persons. The calibration is possible at the backside with the hidden adjuster T1. The unit has been calibrated in our factory.

3.4 Zero Point adjustment

Select the display mode „act.val. Nm“ with repeated pushing of pushbutton ENTER.

With exonerated torque sensor the adjustment will be done by positioning the online value display to Zero (Push pushbutton UP or DOWN).

This adjustment will be stored for the actual model-nr. when the keyswitch is turned into position AUTO. Then the value will be preserved even when the power supply is switched off.

3.5 Upper class limit adjustment

Select the display mode „Xav UL“ with repeated pushing of pushbutton ENTER.

Adjust the necessary value by pushing the pushbutton UP or DOWN.

This adjustment will be stored for the actual model-nr. when the keyswitch is turned into position AUTO. Then the value will be preserved even when the power supply is switched off.

3.6 Lower class limit adjustment

Select the display mode „Xav LL“ with repeated pushing of pushbutton ENTER.

Adjust the necessary value by pushing the pushbutton UP or DOWN.

This adjustment will be stored for the actual model-nr. when the keyswitch is turned into position AUTO. Then the value will be preserved even when the power supply is switched off.

3.7 Upper class limit adjustment for start-torque

Select the display mode „start-torque UL“ with repeated pushing of pushbutton ENTER.

Adjust the necessary value by pushing the pushbutton UP or DOWN.

This adjustment will be stored for the actual model-nr. when the keyswitch is turned into position AUTO. Then the value will be preserved even when the power supply is switched off.

3.8 Choice of language version

(from program version > 40079V03 402)

Select the display mode " Xav start-torque (Nm)". Push the pushbuttons arrow UP and DOWN at the same time. The chosen language is shown: DEUTSCH, FRANCAIS, ESPANOL or ENGLISH. Select the language by pushing the pushbutton arrow UP or arrow DOWN. Then push pushbutton arrow RIGHT. The display mode " Xav start-torque (Nm)" is shown again and the chosen options are stored durably.

4. Operating Mode: Keyswitch at the front in position AUTO

The unit is ready for measuring independent of the display mode.

In operating mode only the display mode may be selected. The changing of any adjusted values is locked.

ATTENTION:

After POWER ON an AUTOZERO-Cycle has to be done first, because the autozero-memory does not store its values without power supply.

5. Programming

5.1 Measuring range

By adding different connections in the connector X312, the measuring ranges 2, 5, 10, 20, 50, 100 Nm are programmable (look at 5. schematics).

Without any additional connections the range 5 Nm is selected.

6. Connection schematics

Eingänge von der SPS		Ausgänge zur SPS		Meißstellen Nr.		Bedeutung	
Bit-Nr.	Wort 0	Bit-Nr.	Wort 1	Bit-Nr.	Wort 0	Bit-Nr.	Wort 1
0	Messen Drehmoment	0	Meißstellen Nr. Bit 0	0	Meißinheit BEREIT	0	
1	AUTOZERO Zyklus	1	Meißzyklus Drehmoment läuft	1	Meißzyklus Drehmoment läuft	1	
2	Messen Losbrechmoment	2	Meißzyklus Losbrechmoment läuft	2	Meißzyklus Losbrechmoment läuft	2	Meißwert 10 Bit
3	Typkennung Bit 0	3	Drehmoment Xq > obere Toleranz	3	Drehmoment Xq > obere Toleranz	3	Binär
4	Typkennung Bit 1	4	Drehmoment Xq ist GUT	4	Drehmoment Xq ist GUT	4	0...999
5	Typkennung Bit 2	5	Drehmoment Xq < untere Toleranz	5	Drehmoment Xq < untere Toleranz	5	
6	Typkennung Bit 3	6	Losbrechmoment > obere Toleranz	6	Losbrechmoment > obere Toleranz	6	
7	Typkennung Bit 4	7	Start Meißwertspeicher Drehmoment	7	Start Meißwertspeicher Drehmoment	7	
8	Losbrechmoment invertieren	8	Start Meißwertspeicher Losbrechmoment	8	Start Meißwertspeicher Losbrechmoment	8	
9	Meißbereich 9,99	9		9		9	
10	Dezimalpunkt xx , x	10		10		10	
11	Meißbereich 1,99	11		11		11	
12	Meißbereich 10Nm, Anzeige x,xx ab V405	12		12		12	
13		13		13		13	
14		14		14		14	Vorzeichen: 0=+
15		15	Meißwert ANFORDERN	15	Meißwert ANFORDERN	15	Meißwert BEREIT

Meißwertübertragung (ab Version 413)

MB 10Nm -V405 07.12.01 MAX:MIN -V409 08.05.02 Profibus S.2 14.04.04	Arndt & Voß GmbH Eichhofstr. 7 - D 21255 Tostedt http://www.arndtundvoss.de Tel. ++49 (0) 4182 289 -760 Fax. -761 email: info@arndtundvoss.de	Drehmoment- Losbrechmoment Meißinheit
Größe: A	Datum: 07.12.01 at	Artikel-Nr. M40079.V03
Meißstab:	CAD-Nr. 4 7903b2	Seite 2 von 2

Security comments according to VDE 0411

General technical

time for warming up	20 minutes
temperature	0...+40 Grd C
atmospheric humidity	on to 75% rel.
frequency	50/60 Hz
power supply voltage	230V +/-10%
security	according to VDE 0411, protection class 1

This unit is built and checked under DIN 57411 part 1/VDE 0411 part 1 and left the factory in a safe and perfect condition. To preserve this condition and to guarantee a safe working the user has to follow the comments and warnings which are given in this instructions.

Before turning on the power you have to make sure, that the voltage of operation and the mains voltage correspond.

The mains plug may only be inserted into a socket with ground contact. The safety effect may not be abolished by an extension lead without ground connection.

The opening of covers or removing of components, except if it is possible to do by hand, might uncover parts or connections under dangerous voltage.

Racks may only be used inside a cover.

If an adjustment, a maintenance or a repair at the opened unit under voltage is unavoidable, it may be done only by a qualified employee, who is well acquainted with the dangers involved.

ATTENTION:

After the end of those works, the unit has to be checked according to VDE 0411, part 1.

You have to make sure, that only fuses of the given type and values are taken for replacement. The use of mended fuses or short-circuiting them is inadmissible.

If it is presumed, that a safe work is not possible, you have to take this unit out of work. A safe work may not be possible, if

- there are visible damages at the unit.
- the unit doesn't work.
- after longer storage under unfavourable circumstances.
- after heavy stress of transport.