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Datasheet

Microprocessor controlled evaluation

GMV2-K

ideal for mobile use in the outdoor area:
Building sites, Off-shore, Shipyards, Mining, ...

robust ✓
impact resistant ✓
waterproof ✓



Application range:

- **Tool testing**
- **production monitoring**
- **Documentation according to DIN EN ISO 9001**
- **quality assurance**

Standard equipment for active sensors

- Detection of torque, angle and speed
- Measurement types: idler, peak (forward / reverse), wrenches
- USB interface
- Integrated performance
- Menu-driven operation and adjustment
- RS 232C interface to 19200 baud
- 1000 measured values storable

- 50 parameter sets can be programmed
- Software ‚GMV2-PC-Trans'
- Networking (Option: 4 hours battery mode)
- tightening controller
- AC adapter / charger
- Output to Digimatic mini-processor printer
- multilingual

The GMV2-K is a microprocessor-controlled supply and display unit for various applications in torque-measurement. In screwing sector with appropriate sensors detected measurement values for torque and angle, speed and power can be displayed, evaluated conforming to pre-set limits and stored. The handling using a self-explanatory menu is carried out in simple steps. Using a torque transducer with integrated recognition chip the sensor data will be transmitted automatically into the parameter set by connecting the transducer to GMV2. For better distinction the parameter-sets and data-sets can be named with text. The access to the general settings can be limited by using passwords in three levels. The measured values will be internal stored in combination with date and time and they can be printed out by an external printer or transmitted to an existing EDP.

Option: A hydraulic screwdriver can be controlled via a potential-free output.

Option: Integrated power section for the operation of an electric screwdriver 230 V max. 16 A.

Technical Specifications

Supply voltage	
Power supply:	100 V - 240 V / 50 Hz - 60 Hz über Kaltgerätestecker
Operating mode:	Simultaneous network and charging with battery

Sensor supply	
for torque transducers	12 V DC / 200 mA
INPUT activ:	free programmable
Input sensitivity:	from ± 1,25 V to ± 10 V
Input resistance:	1 MΩ
Zeropoint-tare:	approx. ± 7 % of full scale

Transformation	
Pulse rise rate:	10 % - 90 %: 0,25 ms
Max. measuring frequency	3 KHz Sinuspulse

Accuracy	
Tracking:	≤ 0,1 % ± 2 Digit
Peak measurement:	≤ 0,3 % ± 2 Digit
Torque Wrench measurement:	≤ 0,3 % ± 2 Digit
Speed at n ≤ 10.000 min-1: at n ≤ 20.000 min-1:	 ≤ ± 2 Digit ≤ ± 3 Digit
Angle:	± 0,25° to 100° then 1°
Zero error:	≤ 0,05 %
Memory:	50 measuring programs 1000 measured values
Display:	Grafic-LCD with 240 x 64 pixels
Data output:	RS 232 interface 9 pol. connector (DEE) 1200 – 19.200 Baud USB 1.1/2.0
Comp.temperature range:	0 - 45°C
Humidity:	< 75 % (constantly)
Protection:	Open suitcase IP 54 Closed Case IP 65 DIN 40050
Dimensions:	330 x 234 x 152 mm (BxHxT)
Weight:	approx. 5,5 kg with Battery

Color	
Case:	yellow
Front panel:	grey

Angle Option	
Input signals:	2 tracks 360 pulses / revolution with Approx. 90 degree phase offset
Resolution:	0,25 degrees
Counting range:	± 6000 degrees

Battery Option	
Power supply:	Battery 2 x 6 V / 3,4 Ah
Operating time:	with continuous operation approx. 4 h (with transducer)

Option - Control output hydraulic screwdriver	
Relay output:	Shut-off screwdriver
U max :	25 V AC / 30 V DC
I max:	1 A
Switching delay:	≤ 1,6 ms

Option - Control electric screwdriver	
Voltage output:	100 - 240 V AC (same as supply voltage GMV2-K)
Switching current:	max. 16 A
Switching delay:	≤ 0,2ms
Response time Switch-off:	≤ 0,5 ms

Features

- 1000 measured value memory
- 50 freely adjustable measuring programs
- Self explanatory menu structure in several languages
- Protection of device settings by password in 3 levels
- Automatic transfer of transducer data and control the parameter set sensors with chip
- Detection of torque, speed and power
- With adjustable filter
  - for torque and speed
  - power measurement from 1 mW to 20.000 kW
  - Continuous measurement output or storage at intervals
- Peak value measurement in clockwise / anti-clock wise direction
  - with status display of the peak value measurement
  - adjustable correction factor for pulse tools
  - adjustable sliding averaging of the torque
  - sensor overload monitoring
- Adjustable deletion and start-times
- Knick key measurement with display of the peak value in the kinking point
- RS232C interface up to 19200 baud
- USB interface 1.1 / 2.0
- Waterproof housing
- Power supply 100 - 240 V

Optional additional equipment

- Detection of rotation angles
- Screw control via integrated power section
- Battery operated for 4 hours, Charger / power supply installed
- Control output for hydraulic screwdrivers
- **Special options on request!**

Ordering Code

GMV2-K-■-■-■

- 0 ⇨ without control output
- 1 ⇨ control for hydraulic unit
- 2 ⇨ integrated power section (electric screwdriver)
- 3 ⇨ control for hydraulic drive + integrated. power unit

- 0 ⇨ without battery
- 1 ⇨ with battery

- 1 ⇨ speed and torque measurement
- 2 ⇨ rotation angle, speed and torque measurement

PAR	DS	SP	Wert / Einheit	Wert GW min	Wert GW max	Winkel / Grad	Wi.-GW min	Wi.-GW max	Uhrzeit	Datum	DS-Kennz.	Werker-Nr.	PAR-Bezeichnung
3	1	1	54,5 Nm	54	61	28	22,5	30,25	14:52	26.06.17	LAGER 1	521	MOTOR 623
3	1	2	55,1 Nm	54	61	24,75	22,5	30,25	14:52	26.06.17	LAGER 1	521	MOTOR 623
3	1	3	55,5 Nm	54	61	35,5	22,5	30,25	14:52	26.06.17	LAGER 1	521	MOTOR 623
3	1	4	54,5 Nm	54	61	27,5	22,5	30,25	14:52	26.06.17	LAGER 1	521	MOTOR 623
3	1	5	55 Nm	54	61	24	22,5	30,25	14:53	26.06.17	LAGER 1	521	MOTOR 623
3	1	6	53,4 Nm	54	61	22,75	22,5	30,25	14:53	26.06.17	LAGER 1	521	MOTOR 623
3	2	1	54,1 Nm	54	61	33,5	22,5	30,25	14:53	26.06.17	LAGER 2	521	MOTOR 623
3	2	2	54,4 Nm	54	61	24,75	22,5	30,25	14:53	26.06.17	LAGER 2	521	MOTOR 623
3	2	3	55,5 Nm	54	61	24,25	22,5	30,25	14:54	26.06.17	LAGER 2	521	MOTOR 623
3	2	4	56,3 Nm	54	61	30	22,5	30,25	14:54	26.06.17	LAGER 2	521	MOTOR 623
3	2	5	55,1 Nm	54	61	25,75	22,5	30,25	14:54	26.06.17	LAGER 2	521	MOTOR 623
3	2	6	55,9 Nm	54	61	23	22,5	30,25	14:54	26.06.17	LAGER 2	521	MOTOR 623
3	3	1	52,1 Nm	54	61	28	22,5	30,25	14:55	26.06.17	LAGER 3	521	MOTOR 623
3	3	2	54,1 Nm	54	61	23	22,5	30,25	14:55	26.06.17	LAGER 3	521	MOTOR 623
3	3	3	54,1 Nm	54	61	23,5	22,5	30,25	14:55	26.06.17	LAGER 3	521	MOTOR 623
3	3	4	54,4 Nm	54	61	29,75	22,5	30,25	14:55	26.06.17	LAGER 3	521	MOTOR 623
3	3	5	54,1 Nm	54	61	25	22,5	30,25	14:55	26.06.17	LAGER 3	521	MOTOR 623
3	3	6	55,8 Nm	54	61	27,5	22,5	30,25	14:56	26.06.17	LAGER 3	521	MOTOR 623

Prüfbedingungen

Temperatur	22,5 °C	**Rel. Luftfeuchte**	10 (<= 90%)
Sensor		**Messgerät**	
Hersteller:	ETH	**Hersteller:**	ETH
Typ	DRT x	**Typ**	GMV2 (aktiv)
Serien Nr.:	654321	**Serien Nr.:**	543210
nächste Prüfung	11. Jun. 2018	**nächste Prüfung**	11. Jun. 2018
Messunsicherheit mit ErweiterungsfaktorK=			< ±1%

Drehmomentwerkzeug

Hersteller:	XY	**Typ**	2
Artikelbezeichnung:	MD-Schlüssel	**Klasse:**	A
Serien Nr.:	123456	**max. Drehmoment:**	100,0
Inventarnummer:	123456	**Einheit:**	Nm
zulässige Toleranz:	<= ±4%	**Skaleneinteilung:**	≤ 5%

Prüfablauf

Vorbereitung:	**-GMV2: Knickschlüsselmessung** **-5* mit max. Drehmoment auslösen**
Prüfung:	**1.) 5 x <= 20,00 Nm** **2.) 5 x ca. 60,00 Nm** **3.) 5 x 100,00 Nm**

Ergebnisse

1.Einstellwert	20,00Nm	2.Einstellwert	60,00Nm	3.Einstellwert	100,00Nm
Kalibrierwert	**Fehler**	**Kalibrierwert**	**Fehler**	**Kalibrierwert**	**Fehler**
20,00 Nm	0,00 %	59,80 Nm	0,33 %	101,50 Nm	-1,48 %
20,50 Nm	-2,44 %	60,10 Nm	-0,17 %	101,00 Nm	-0,99 %
19,50 Nm	2,56 %	60,50 Nm	-0,83 %	100,30 Nm	-0,30 %
20,30 Nm	-1,48 %	60,00 Nm	0,00 %	101,00 Nm	-0,99 %
19,80 Nm	1,01 %	59,40 Nm	1,01 %	99,20 Nm	0,81 %
maximaler Fehler:		**2,56 %**		**Kalibrierung:**	**IO**

Bestätigung der Kalibrierung nach ISO 6789 Datum, Name, Unterschrift

Überprüfung

vom: 26.06.17
bis: 26.06.17

Werkzeug / (Werkstück)

Bezeichnung:	VK-623	**Messprog. Name:**	MOTOR 623
Typ:	RS25	**Datensatz-Kennz.:**	LAGER 1
Hersteller:	Hudelmaier	**Werkernummer:**	521
Serien Nr.:	2564482	**zuletzt geprüft:**	-------
Inventarnummer:	3684423	**Kalibrierintervall (Mon.):**	-------
Einsatzort:	Ulm	**nächste Prüfung:**	--------

Messmittel

Sensor		**Messgerät:**	
Bezeichnung:	Drehmomentsensor 1/2"	**Bezeichnung:**	GMV2
Typ:	DRFN-100-w	**Typ:**	GMV2-2.1.1.0.000
Hersteller:	ETH	**Hersteller:**	ETH
Toleranz:	0,15%	**Toleranz:**	0,30%
Serien Nr.:	625735845	**Serien Nr.:**	625735762
Inventarnummer:	75-5567	**Inventarnummer:**	75-5568
Kalibrierung gültig bis:	01.08.18	**Kalibrierung gültig bis:**	31.08.19

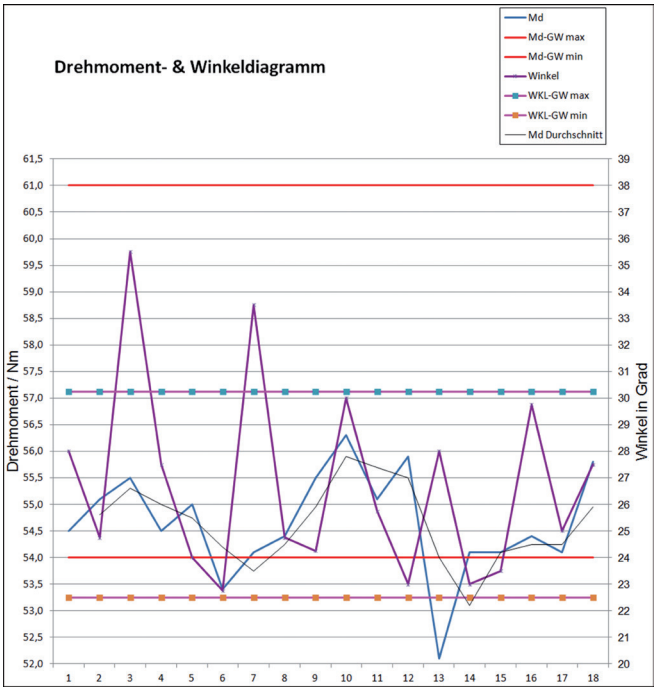
Par.-Nr.: 3 | von DS: 1 | bis DS: 3 | Datensatzlänge: 6

Anzahl Datensätze: 3 Anzahl n: 18

Drehmoment			**Winkel**		
Mittelwert Xquer:	54,661 Nm		Mittelwert Xquer:	26,69 Grad	
Bereich R:	4,200 Nm		Bereich R:	12,75 Grad	
Max:	56,300 Nm		Max:	35,50 Grad	
Min:	52,100 Nm		Min:	22,75 Grad	
Standardabw. (δ):	0,972 Nm		Standardabw. (δ):	3,55 Grad	
±3 δ :	2,917 Nm		±3 δ :	10,64 Grad	
Sigma (s):	1,001 Nm		Sigma (s):	3,65 Grad	
±3 s / % :	3,002 / ±	5,49%	±3 s / % :	10,95 / ±	41,02%
Soll-Drehmoment:			Soll-Winkel:		
Grenzwert max:	61,000 Nm		Grenzwert max:	30,25 Grad	
Grenzwert min:	54,000 Nm		Grenzwert min:	22,50 Grad	
Anzahl > GWmax / %:	0	0,00%	Anzahl > GWmax / %:	2	11,11%
Anzahl < GWmin / %:	2	11,11%	Anzahl < GWmin / %:	0	0,00%
Cm/Cp:	1,2		Cm/Cp:	0,4	
Cmk/Cpk:	0,2		Cmk/Cpk:	0,3	

Gesamt

Anzahl IO / %:	14	77,78%	Cpk gefordert:	Status: NIO
Anzahl NIO / %:	**4**	**22,22%**	1,0	



Prüfprotokoll Drehmomentschlüssel

Sensor

Fabrikat:	ETH	**Serien Nr.:**	7010xxxx
Typ:	DRT x	**Inventarnummer:**	0815
Geprüft Datum:	11. Jun. 17	**Toleranz:**	≤ 0,15 %
Prüfintervall:	1 Jahr	**nächste Prüfung:**	11. Jun. 18

Messgerät

Fabrikat:	ETH	**Serien Nr.:**	7010xxxy
Typ:	GMV2 (aktiv)	**Inventarnummer:**	0816
Geprüft Datum:	24. Jan. 17	**Toleranz:**	≤ 0,3 % ± 2 Digit
Prüfintervall:	1 Jahr	**nächste Prüfung:**	24. Jan. 18

Drehmomentschlüssel

Hersteller:	Hauruck
Artikelbezeichnung:	Drehmomentschlüssel
Serien Nr.:	4711
Inventarnummer:	123456
Drehmomentbereich:	20 - 100 Nm
Skaleneinteilung:	5 Nm
Toleranz:	3%

Messwerte	
	75,00
1. Prüfung	75,20
2. Prüfung	75,80
3. Prüfung	74,80
4. Prüfung	74,40
5. Prüfung	75,00

Ergebnisse	
Mittelwert:	75,04
Abweichung:	0,05%
+/- 3 Sigma:	1,55