GRANLUND





DGM100M Program (Granlund mandrel test)

DGM100M Ver 6.67 is a measure- and registry program especially adapted for Granlund mandrel test fixture and Mitutoyo laser scan micrometer. The program inputs diameter values, including run-outs from a mandrel part, and show the deviation compared to a nominal form. The nominal form can be setup alternative as a tapered curve, or an exponential form. For the later the curve is input (created) from Granlund GGS grinding program.

The measure program (position control) is also directly input from the GGS program together with the form curve.

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Curve presentation (mandrel sections)

The form curve deviation is shown in 15 points from T0 to Es with separate tolerance limits. If the deviation is zero, the curve is presented as a straight line.

T0 Reference section (option).
T1 Tape 1 (straight or tapered part).
T2 Tape 2 (straight or tapered part).
0.0 - 1.0 Working section (fine to rough).
Es Max part (entry section.
R.O. Run-out (section 0.0).
dX Die P Die point deviation.

Internet: www.granlund.se E-Mail: info@granlund.se

Die and work points

Both the die point and work point are calculated from the input curve. The work point shows the center deviation from the grinding work point, and the die point shows the deviation of the curve sections regard the reference point.

Die point correction

When measuring a part with die point deviation, the first run shows the error. The curve is not straight. After a 2: nd run, the deviation can be corrected by the program.

Input measure values are saved in a database (register). The registry is compatible with Microsoft Access V3.6 and organized in the following tables: Note: Password and a logbook are also included.

 Batches 	max 9 999 records
- Articles	max 9 999 records

- Articles

- Tests max 300 000 records per article.

Programming (measure articles)

A measure article is defined by setting a unique article number, the nominal curve form and tolerance limits.

A date, serial number, test number, quality value and result so on, are saved for each measurement. The register shows 10 tests in order for quick compare including a graphic result statistics for current number of OK, not OK.

Presentation

All gauges are shown with a label and unit including a normalized bar graph to the current tolerances. If a series is included, the Cpk values and a line graph can also be shown As standard a test number system is included. Each test can be registered with a unique test number, charge and/or test data. Also a manufacturing number MO (or order number) can be included for DGM100E (extended).

Operato	ir / Provdata [ange st	artvärden för pro	v]		
OP-ID:	Prov.nr:	ök Batch:	TO: INGEN	ald master: Ingen Lätartikel:	OK (START)
	- PROV-1	- Kund-1		L23606DA-7	 Avbryt
	Charge.Nr.	Batch	Avsluta Batch	Ny Mätartikel Granska	Återställ
	Provvikt (kg)		2	K-gen Dashpot mude	
	Manuella värden: <u>1</u> Anges efter start		2	3	
	Anges eiter statt	72 72 00 10	0.000 0.000 0.00	0.000.000.10710	Visa Stat

Client Access (connections to IBM AS/400)

DGM100 is technically prepared for connection (as option) to any external system via IBM Client Access. Primary for read/reporting of manufacturing orders, including all measure data, and generating/printing custom certificates. Connection to other system can be offered.

SPC-system

A standard SPC-control is included, based on Mitutoyo STATPAC for calculation of control limits, capability and analyze. The following SPC statistics are shown as numerical values and/or bar graphs: Also including automatic analyzes and warnings.

Vval	Single gauge value.
Xval	X-diagram value (sample).
Rval	R-diagram value (variance).
Cpk	Corrected process capability value.
MC	Target centering in percent.
ANALYZE	SPC Analyze due to rule; 1, 2 and 3.

Statistics

A frequency- and time serial diagram (curve) is included for showing the statistical results of a specific gauge, or the total quality value Qval from the register. A batch, test status, date interval or last numbers can be selected;

Shows the distribution in % for a selection. Frequency Time series Shows the serial curve. Q-Tal Shows (serial) the total quality Qval.

Edit

Shown measure values can be copied alternative as text data or sheet (for ex. Excel).

Menu functions

File	Refresh, New Register Open, Save, Clear Last Year As Define Article Remove Article, Save Articles Add New Article Define Batch / Customer Save Batch, Clear Batch Delete; Test, Article, Batch Print Screen data, Print Setup Compress Database
Edit	Copy Data; As Text, To Sheet Re-do, Delete Measurement Logbook, Fault Remark, Article Label Operator / Test data User-Setup +, ++) Test list +) Run list +) MO / Spec-Data +) Sorting +) Search/Show Test number
View	CLS Restore (Cancel) Show Tolerances, Registration, Measure Show Sample-Test Show Measure control Capability (SPC); Cpk, TC and ANALYZE Show Deviation Show Measure data (Register) Show Inp-ID, Result Cpk (series) List: Vval, Xval, Rval, SPC-Values Show Statistics
Options	Register Setup SPC Setup Run Setup CA-Setup +) Certificate Setup +) Connect Units Calibrating ++) Control-Setup ++)
Graph	Activate manual inputShow Series/ClassesShow Graph (polar/XY)Show Nominal, Centered GraphShow Form curve (ovality)+++)Print out Graph, Save Graph As+++)
Protocol	Print out Protocol ++)
Help	Contents (technical explanations) About Program Program log; (Show, Delete) Machine log, (Show, Delete)
+) Only vali ++) Only vali	d for DGM100E (extended version) d for DGM100M (locked version) d for DGM100/M (polar/XY-graph)

- ²⁾ Following data can be printed out; *Tolerances, Sample-*
- Tests, Measure result, Control report, SPC Analyze etc.

System demands

Hardware:	Pentium 800MHz, 128MB RAM
Software:	Windows 98, NT 6.0, XP, 2000

Documentation

Each program is supplied as standard with a custom Run operating instruction in Swedish or English.

Out prints of measure registration (numerical result)

Granlund Tools AB

Measure program	DGM100M, Ver 6	5.67 2009-09-12, GRA	NLUND	OP-I	D:	/ Page: 1	
Outprint: Measure registration				Date	: 2009-	05-13 16:05	
Err.Rem: *				Batc	h: *TOT	AL	
Mätning: Ant cyl:4 st Spec-Data: TESTABTIKEI				Art.n	: GRAN	NLUND-CNC	25
TO/Datum: /2006-10-26				Ser.	no: 1280	(OK)	
Osman data (I		t no: D000_1000]		I			
Common data: [N	IU: INGEN Tes	LIIO: H292-1262J					
Pnt= 01 N		Common data and Re	sults				
Gauge Points: Serial Points:		Not a	17 ctive				
Draw/Rev.No:		1325344	A				
Tol.Limit TL:		14,483 - 14,503	3 mm				
MesFN, line 1:			<u>.</u>				
MesFN, line 2:		0.000/.0	000				
Ser-avg/std=		0,000/ 0	,000				
Qval(tot)=			0,55				
Gauge code: Serial code:		A Nota	ctive				
Graph display:	[Bar gauge]						
UTL							
	3						
TV - 1	2 4	5 6 7 8 9	10 11	12 13	14 15	16 17	
1.11							
LIL .							
	Tool no. Dool	1000					
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MO: "INGEN Measure values: Pnt Label 1 Diam T0 2 Diam T1 3 Diam T2 4 Diam 0	Test.no: R293 (standard) MesV 14,495 14,495 14,495 15,242	BarV RSC C	CpkV	Tole 14,483 - 14,483 - 15,233 - 15,470	rances 14,503 14,503 15,253 15,400	Unit Note mm mm mm	:
MO: "INGEN Mo: "INGEN Measure values: Pnt Label 1 Diam T0 2 Diam T1 3 Diam T2 4 Diam 0.0 5 Diam 0.1	Test.no: R29 (standard) MesV 14,495 14,495 15,242 15,484 16,439	BarV RSC C -+#+- G -+ #+- G -+#-+- G -+#-+- G	CpkV	Tole 14,483 - 14,483 - 15,233 - 15,470 - 16,425 -	rances 14,503 14,503 15,253 15,490 16,445	Unit Note mm mm mm mm mm	:
MO: "INGEN MO: "INGEN Measure values: Pnt Label 1 Diam T0 2 Diam T1 3 Diam T2 4 Diam 0.0 5 Diam 0.1 6 Diam 0.2	Test.no: R29/ (standard) MesV 14,495 14,495 15,242 15,484 16,439 17,396	BarV RSC C -+ #+ G -+ #+ G -+ #+ G -+#-+ G -+#-+ G	CpkV	Tole 14,483 - 14,483 - 15,233 - 15,470 - 16,425 - 17,380 -	rances 14,503 14,503 15,253 15,490 16,445 17,400	Unit Note mm mm mm mm mm mm	:
MO: "INGEN MO: "INGEN Measure values: Pnt Label 1 Diam T0 2 Diam T1 3 Diam T2 4 Diam 0.0 5 Diam 0.1 6 Diam 0.2 7 Diam 0.3 8 Diam 0.4	Test.no: R292 (standard) MesV 14,495 14,495 15,242 15,484 16,439 17,396 18,350 19,303	BarV RSC C -+ #+ G -+ #+ G -+#-+ G -+#-+ G -+#-+ G -+#-+ G -+ # G	CpkV	Tole 14,483 - 14,483 - 15,233 - 15,470 - 16,425 - 17,380 - 18,295 - 19,250 -	rances 14,503 14,503 15,253 15,490 16,445 17,400 18,395 19 350	Unit Note mm mm mm mm mm mm mm	:
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Out prints of measure registration (mandrel curve)

Granlund Tools AB

Measure program DGM100M, Ver 6.67 2009-09-12, GRANLUND				OP-ID:	/ Page: 1
Outprint: Measure registration				Date: 2009-	05-13 16:05
Err.Rem: *				Batch: *TOT/	AL
Mätning: Ant cyl:4 s	ST IVEI			Art.no: GRAN	LUND-CNC25
TO/Datum: /20	06-10-26			Ser.no: 1280	(OK)
Common data-IM	O: *INGEN_B292-126	21		•	
Edge poor	D1 10.000/D0 1	-]			
Length:	470.000 mm	0,000 mm			
Die point VP:	2,899 mm				
Offset OF:	0,002 mm	tor douation)			
Leaning NO.	0,005 mm/m (ulame	lei devalion)			
Form curve: [Sh	ows mandrel curve (no	minell)]			
V (mm) Sanla: TO	Naminall				
(mm) Scale: TOL 0.10	Nomineli				
5,10 <u>±</u>					
0,08					
0.00 [±]					
0,08 <u>+</u>					
0,04					
‡					
0,02					
0,00	<mark>│ · · · · · ┤ ┬ ┬ ग</mark> ़ैा		TTTT	\ + + + + + + + + + + + + + + + + + + +	┍╪╪╷┤
	0.0	0.1 0.2 0,3 0,	0,5 0,6 0	0,7 0,8 0,9	1,0 Es
-0,02					
-0,04					
<u>+</u>		· · · ·			
-0,00				\mathbf{X}	
-0,08					
-0.10 =					
0 5	0 100 1	50 200	250 3	00 350	400
MO-UNCEN.	Test ps: P202 1262				X (mm)
MU: INGEN	Test.no: H292-1262				
Measure values:	(standard)				
Pnt Label	MesV	BarV RSC Cpk		Tolerances	Unit Note:
1 Diam TO	14,495 -+	#+-G	- 14,4	483 - 14,503	mm
2 Diam 11 3 Diam T2	14,495 -+	#+-G	- 14,4	483 - 14,503	mm
4 Diam 0.0	15,484 -+	#-+- G	- 15,4	470 - 15,490	mm
5 Diam 0.1	16,439 -+	#-+- G	- 16,4	425 - 16,445	mm
6 Diam 0.2 7 Diam 0.3	17,396 -+	#-+-G	- 17,3	380 - 17,400 295 - 18,395	mm
8 Diam 0.4	19,303 -+	-#+- G	- 19,2	250 - 19,350	mm
9 Diam 0.5	20,259 -+	-#+- G	- 20,2	205 - 20,305	mm
11 Diam 0.7	22,170 -+	-#+- G	22.1	115 - 22,215	mm
12 Diam 0.8	23,125 -+	-#+- G	23,0	020 - 23,220	mm
13 Diam 0.9 14 Diam 1.0	24,079 -+	-#+- G	23,9	9/5 - 24,175	mm
15 Diam Es	25,031 -+	-#+- G	- 24,9	930 - 25,130	mm
16 R.O 0.0	0,012	.#+-G	. <u>o</u>	,000 - 0,050	mm Single
17 OX DIE.P	0,064 -+	#+-GZ 0,00	, -0	,100 - 0,100	
-					

Out prints of measure registration (ovality curve)

Granlund Tools AB

Measure program D	GM100M, Ver 6.	67 2009-09-12, GRA	NLUND	OP-ID:	/ Page: 1
Outprint: Measure I	registration			Date: 2009	+05-13 16:05
Err.nem:				Batch: *TO	TAL
Matning: Ant cyl:4 st Spec-Data: TESTAE	TIKEI			Art.no: GRA	NLUND-CNC25
TO/Datum: /200	6-10-26			Ser.no: 1280) (OK)
Common data:[MC Edge pos: Length: Die point VP: Offset OF: Leaning KC: Form curve: [Shor	D: *INGEN R292 D1 = 12,000 / I 470,000 mm 2,899 mm 0,002 mm 0,005 mm/m (c ws diameter form	2-1262] D2 = 10,000 mm liameter devation) n: X= -135,000 mm (nominell)]		
Scale: TOL mm	90				270
Oval= 0,023 mm		X	Ŧ	\mathcal{H}	/
Dmax= 15,613 mm		\bigvee		$\sim \chi/$	
Dmin= 15,590 mm		X	+	X	
Npnt= 067		× \	1	/ '	
1 DIV= 0,010 mm			180 1		
Measure values:	(standard)				
Pnt Label	MesV	BarV RSC	CpkV	Tolerances	Unit Note:
1 Diam T0 2 Diam T1 3 Diam T2 4 Diam 0.0 5 Diam 0.1 6 Diam 0.2 7 Diam 0.3 8 Diam 0.4 9 Diam 0.5 10 Diam 0.6 11 Diam 0.7 12 Diam 0.8 13 Diam 0.9 14 Diam 1.0 15 Diam Es 16 R.O 0.0 17 dX Dia P	14,495 14,495 15,242 15,484 16,439 17,396 18,350 19,303 20,259 21,212 22,170 23,125 24,079 25,032 25,031 0,012 0,054	-+		14,483 - 14,503 14,483 - 14,503 15,233 - 15,253 15,470 - 15,490 16,425 - 16,445 17,380 - 17,400 18,295 - 18,395 19,250 - 19,350 20,205 - 20,305 21,160 - 21,260 22,115 - 22,215 23,020 - 23,220 23,975 - 24,175 24,930 - 25,130 0,000 - 0,050 -0,100 - 0,100	mm mm mm mm mm mm mm mm mm mm mm mm mm