



## XVIII. Inspection program QMSOFT®/QM-BORE

The program **QMSOFT®/QM-BORE** serves as a computer support program for the inspection of Bore gauges with 2-Point contact – with split ball or moveable measuring bolt – and for the inspection of indicating plug gauges based at the regulations of the German VDI 2618 rules, Page 13.2.

The use of the program itself, however, requires little knowledge of computers. An extensive help text as well as the integration of thorough safety measures ensures quick a simple operation of the program.

Measurement data can be taken over directly from an Online connected measuring unit or from the keyboard. Against the type of the bore gauge the program does determine the gauge parameters "Maximum error of indication **G**" and "Repeatability **r**" based on the measuring data.

The evaluation results can be re-produced on the screen and/or the printer. Tolerance excesses will be shown. The program does enable the gauge valuation according to the VDI 2618 rules, Page 13.2 as well as according to your own factory tolerances. The management of these customized tolerance tables is a part of the program.

The program **QMSOFT®/QM-BORE** can be started directly out of the database program **QMSOFT®/QM-MANAG** - also offered by L&W GmbH - and provided with initial data (such as ID-number, measuring range and graduation of the product to be inspected etc.), in this case the inspection results are directly transmitted back to the database.

### XVIII.1.Programmstart

You can start the QM-BORE program directly from the QMSOFT command Shell (click the corresponded symbol in the shell). The other way is to start the program through the WINDOWS file manager or the explorer.

Before working with the program you have the possibility to customise some things according your individual needs and wishes.

The following program settings you have to do:

- **Configuration of the Online Interface:**

If you use a direct linkage between the computer and your measuring machine to transfer measuring values, at first you should start the indication program required (RS232DRV, IK220 depended on the device and the interface connection you use) and set the correct parameters for the Online Interface (see also the manual of the used program).

- **Program settings and inspection conditions:**

Here you can set some general things for the program environment; for example: the default way to transfer measuring values (machine or keyboard) or the unit used for the evaluation. See section XVII.2 for this.

**Attention:** An incorrect selection of the parameters for the online connection (e.g. for the serial port) can produce a system crash while measure data input ! Make sure that you are informed about your computer system and the correct name of the serial port for on-line interface.

## **XVIII.2. Settings**

Working with the program you should make different settings to define the program environment and especially program conditions. Use the menu "Settings" to do this.

### **XVIII.2.1. Settings | Program settings**

Using this option you have the following registers to change program settings:

#### **Register „General“**

Here you can choose the program language, switch on/off the help text and select the default data input device (keyboard of the computer, on-line measuring machine). If you set "Online" as the default device the Online connection will be started automatically if a gauge measurement will start and "Online" measurement is possible for the type of inspection.

Please pay also attention to enter a reasonable value for the "Plausibility limit". Measuring values which are exceed this limit will be refused by the program.

#### **Register „Inspection procedures“**

Here you can enter for each bore gauge type a reference to a corresponded text file including the inspection procedure as a text. Enter your own text for the procedures here.

Note that this "inspection procedure" does not influence the inspection process. The measuring positions will be set using the option "Inspection conditions".

#### **Register „Directories“**

For some functions (indicating of measuring values; creation and edit of certificate layouts) external programs will be used. Here you have to enter the directory where the corresponded program can be found.

While doing the program installation all directories will be set to a correct value!

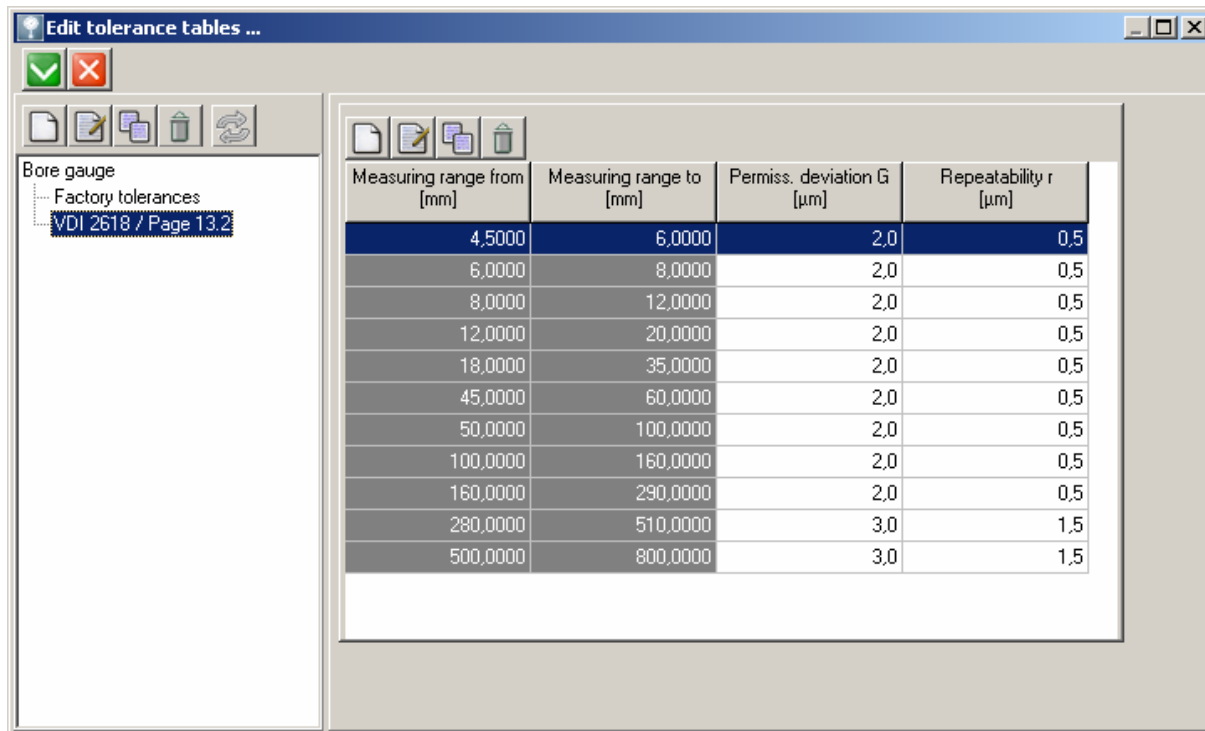
**ATTENTION:** Make sure that these entries are correct. Errors while operating the program may be caused by incorrect settings in the screen "Directories".

#### **Register „Set graphic colours“**

Inspecting a bore gauge you will get a calibration curve on the screen which you can also print out on your certificate. Here you can set the colours for the graphic elements. Please note that you can made this settings different for the "Screen" and the "Print".

## XVIII.2.2. Settings | Edit factory tolerances

If you want to value a bore gauge in accordance to your own factory tolerance you have here the possibility to enter and manage the related tolerance values. Select the menu "Settings | Factory tolerances" to show the list of existing tolerance tables and related entries (see Figure ).



**Figure:** Entering of factory tolerances

Here you can insert new tolerances, delete existing tolerances or change it.

With the functions "Copy the tolerance table" and "Create a new factory tolerance table" you can copy a tolerance table.

The tolerance tables will be saved in the file „**TOLERANCES.XML**". When doing a bore gauge inspection according factory standard this values are used for the valuation of the bore gauge being inspected. The entered values are related to the values „ Measuring range from" and " Measuring range.to".

If you want to do a inspection acc. to „Factory standard" make sure that a corresponding tolerance entry is available. Otherwise the „Continue" button will be locked.

### XVIII.3. Certificate layout files

The program gives you the possibility to customise the layout of your calibration certificates. The layout of these certificates is based on the so called "certificate layout file" (template). This file contains all information about the form of the certificate and the values that should appear in this. By editing this certificate layout file you can change the layout. Saving this file with another file name gives you the possibility to work with different record layouts.

All certificate layout files you have created will be saved in the selected directory (see program settings). The files have the extension ".L32".

Using the option "**Certificate layouts / Show / edit a certificate layout**" you can load an existing certificate layout file into the editor program.

**ATTENTION:** Do not open a certificate layout file ("L32" extension) directly with the QMSOFT editor or with any other program! In this case the program dependent fields will be removed !!

A certificate layout file is consisting of three different types of information:

- "normal" text: is text information just like in a known text processing application; you can change the text as you want and you can set the different text parameters;
- "Placeholders" ("Fields"): a "Field" is including a variable information about the gauge, the measuring process or the measuring environment. A "field" will be fulfilled with the actual information while executing the program. Editing a certificate layout file you can change "field" positions, delete "fields" (if you do not need the related information) and insert new "fields". To insert a new "field" in your certificate layout use the menu "Insert | Fields". Using this menu you can also see all available "Fields" and the related information. For numerical fields you can set the number of decimal points using the menu "Insert | Fields".
- "Line conditions": A line condition gives you the possibility to control the certificate layout in dependence of different program situations. A text or field following to a line condition will be printed out on the certificate only if the condition is "true". For example you can print a special text only if an "External measurement" was done. Please open an existing certificate layout and see the comments for the "Line conditions" available.

## XVIII.4. Doing a bore gauge inspection

### XVIII.4.1. Entering of gauge parameters

After selecting the bore gauge type in the main menu a series of parameters must be entered that describe the bore gauge and the inspection conditions. The input of these parameters is done in a separate dialog box with a corresponding number of input fields.

If you start the program via the QMManage program some of these parameters are filled with the related information coming from the database.

**Test item "Bore gauge with 2-point contact construction type a (split ball)"**

**Bore gauge**

Identity number: 8999

Application range: 4,500 mm — 6,000 mm

Measuring range: 1,500 mm

Tolerances according to: VDI 2618 / Page 13.2

Error limit G: 2,0 µm

Repeatability r: 0,5 µm

**Indicating instrument**

Mounting type of indicating instrument: Changeable mounted

Identity number: 777888

Type: Dial gauge

Graduation: 0,0100 mm

**Miscellaneous**

Number of probes: 10

Number of distance discs: 0

Number of setting rings: 10

Buttons: Cancel, Manage tolerances, Continue

**Figure :** Entering of bore gauge parameters

#### Input fields „Bore gauge“

**Identity number:**

this field is used to establish an identity for the bore gauge by entering a number. This number will be noted in the record.

**Application range from../to..:**

enter the start and the end value of the application range of the bore gauge.

**Measuring range:**

enter the measuring range of your bore gauge.

**Tolerances acc. to:** Select one of the existing tolerance tables. Selecting "(free tolerance input)" does enable the entering of tolerances in the related fields.

**Error limit G:** Value for the tolerance of the maximum indication error **G**. The value can be entered or will be taken over from the selected tolerance table.

**Repeatability r:** Value for the tolerance limit of Repeatability **r**. The value can be entered or will be taken over from the selected tolerance table.

#### Input fields „Indicating instrument“

**Mounting type:** select the type of mounting of the indicating instrument into the bore gauge.

**Identity number:** in case that you have a "changeable mounted" indication instrument, please enter it's identity number.

**Type:** in case that you have a "changeable mounted" indication instrument, please enter the type of it.

**Graduation:** enter the graduation of the indication instrument.

#### Input fields „Accessories“

Please enter the numbers for the existing accessories.


Press the "Continue" button to go to the next screen.

**Note:** If the „Continue“ – button is not enabled, you has not filled in all the required information!

### **XVIII.4.2. Setting of inspection conditions**

After entering the bore gauge parameters you has now to enter the parameters defining your inspection conditions and the inspection procedure.

Test item "Bore gauge with 2-point contact construction type a (split ball)" - "8999" - Inspection conditions



<b>Error limit G</b> Number of inspection positions <input type="text" value="3"/> Free stroke range <input type="text" value="0.002 mm"/> Inspection range <input type="text" value="0.002 mm"/> — <input type="text" value="1.498 mm"/>	<b>Inspection device</b> Identity number <input type="text" value="788888"/> Type <input type="text" value="Dial gauge"/> Graduation <input type="text" value="0.0100 mm"/>
<b>Repeatability r</b> Number of repetitions <input type="text" value="5"/>	<b>Miscellaneous</b> Measure data file <input type="text" value="Measures.dat"/>

Figure: Inspection conditions

**Fields „Error limit G“**

- Number of positions:** enter the number of inspection positions to determine the maximum indication error **G**.
- "free stroke" range:** enter a "free stroke" range for your bore gauge which should be excluded from your measuring range. This "free stroke" range will be established at the start and the end of your entered measuring range.
- Inspection range:** shows the real inspection range.

**Fields „Repeatability r“**

- Number of repetitions:** enter the number of measures to determine the repeatability **r**.

**Fields „Inspection device“**

These information can be shown on the certificate to record the traceability of your inspection.

- Identity number:** enter the number of identity.
- Type:** enter the type of your inspection device.
- Graduation:** enter the Graduation of your inspection device.

**„Measure data file“**

Here you can enter a file name where all the measuring results will be stored. This file can be used to "recall" an old inspection by using the menu "Inspection | load old inspection data..".

**XVIII.4.3. Visual- and functional inspection**

Before starting the inspection process itself you can here enter the results of the "Visual- " and "Functional-" inspection. Use the option "Scraping record" if the gauge is damaged or can not be calibrated for other reasons to skip the measuring and go directly to the creation of a certificate.

**XVIII.4.4. Entering of measuring values**

The entering of measuring values is divided in the measures to determine the "Maximum indication error G" and the measures for the repeatability. For each kind of measurement a separate dialog box will appear on the screen. The shown nominal values will be read from the inspection positions entered before.

## XVIII.5. Output of results

After entry of the measurement data has been completed, the screen "End of inspection" will appear.

**QMSOFT® - End of inspection / Valuation**

Calibration certificate number:  
2009-06-02-001

Customer:  
Flintstone & Co

Valuation:  
in tolerance

Comments:

Actual Date: 02.06.2009    Next inspection: 02.06.2010    Operator: Strobach

Inspection certificate layout:  
QMBORE\_English

Edit certif. layout

Show certificate

Print certificate

Back    Finish

**Figure:** End of inspection – show / print certificate

If the inspection is finished you get the screen shown above. The summary result of the inspection is shown. Here you can enter the name of the customer, the date for the next inspection and also some remarks to the inspection.

Before creating the calibration certificate you can change the certificate layout file will be used.

To start the output of the results press the "Show certificate" button.

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