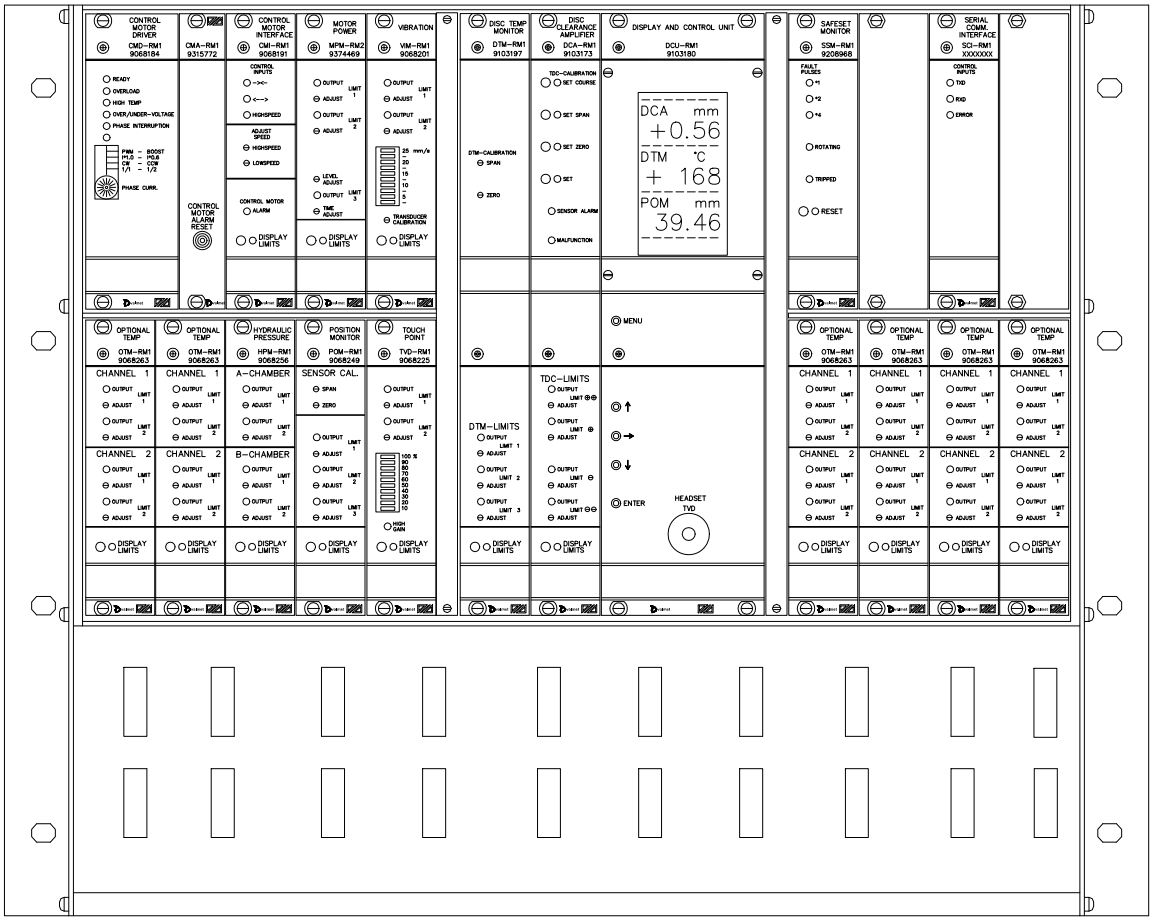
dametric

CALIBRATION
RMS–SD1



Valmet

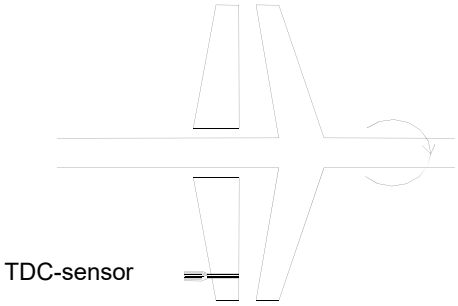
CALIBRATION MANUAL FOR THE RMS-SD1 SYSTEM

Content

1. CALIBRATION OF TDC-SENSOR

1.1. GENERAL

The TDC-sensor should always be calibrated after a segment change and after changing to a new sensor. The sensor is calibrated with the machine unloaded and at a stable temperature. This means that the machine should either be cold, i.e. without flushing steam, or fully warmed up with flushing steam. The latter is recommended.

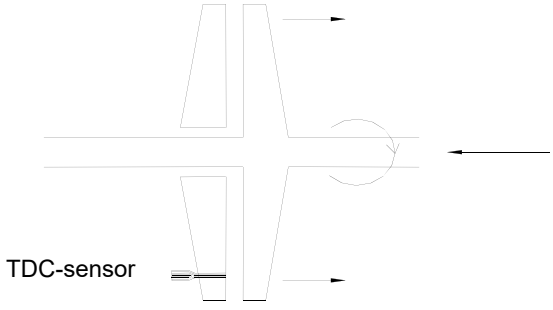


Unloaded refiner

Since both flat and conical segments are used, extra attention must be paid to the touch point during the calibration. This is due to a difference in the contact point between unloaded and loaded refiners. Tests has shown that the difference is 0.40 mm for flat zone refiners.
For Conflo refiners, the difference is 0.60 mm.

The DCA-RM1 unit must be preset for a flat zone refiner or a Conflo refiner. See the manual for the unit.

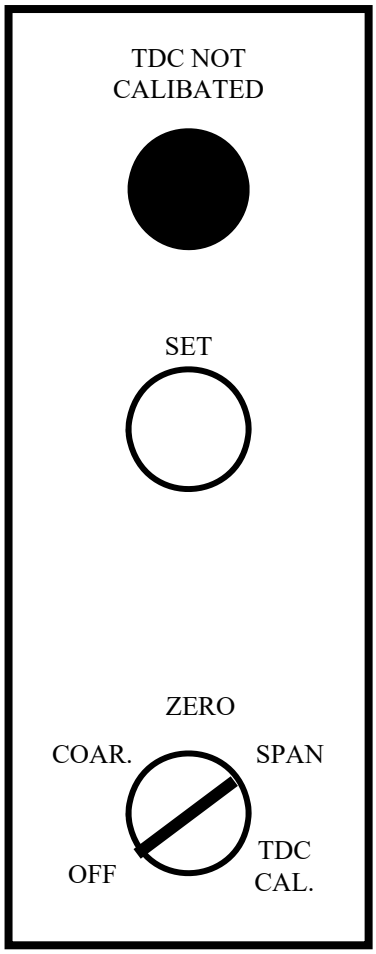
The adjustment is carried out on the DCA-RM1 unit through switches in the front of the panel.



Loaded refiner

1.2. CALIBRATION WITH A PDU-DISPLAY UNIT

PRE-CALIBRATION



- Check that the TDC-sensor is mounted in line with the refining segments, and that it is fully tightened.
- When the "TOUCHPOINT-POSITION" key-switch is set to "ON" position, the info-display of the PDU unit will indicate "TVD LIMIT XX %". When the TVD-level has passed the limit during the touch point procedure, the display will instead indicate a relative POM-value (this is related to the rotor position value at the touch point position.
- The reading will go out when the "TOUCH-POSITION" key-switch is set to the "OFF" position.

COARSE CALIBRATION

- This is only needed when a new sensor has been mounted.
  If the DCA-unit is re-calibrated, continue with the zero calibration.
- Turn the key-switch for TDC calibration to the "COARSE" position.
- Move the plates until the plate-gap is larger than 8 mm.
- Press the "SET" switch and the DCA-unit is set to the coarse value (3.00 for the 0-2mm range, 4.50 for the 0-3mm range or 2.50 for the Conflo refiner type).

ZERO CALIBRATION

- Turn the key-switch for TDC calibration to the "ZERO" position.
- Run carefully the grinding discs together until the touch point is detected.
  The relative POM is preset to -0.10.
- Run the discs apart until the relative POM reads 0.00.
- Press the "SET" switch and the DCA-unit is set to the “zero” value (0.50 for the 0-2mm range, 0.75mm for the 0-3mm range or 0.70 for the Conflo refiner type).

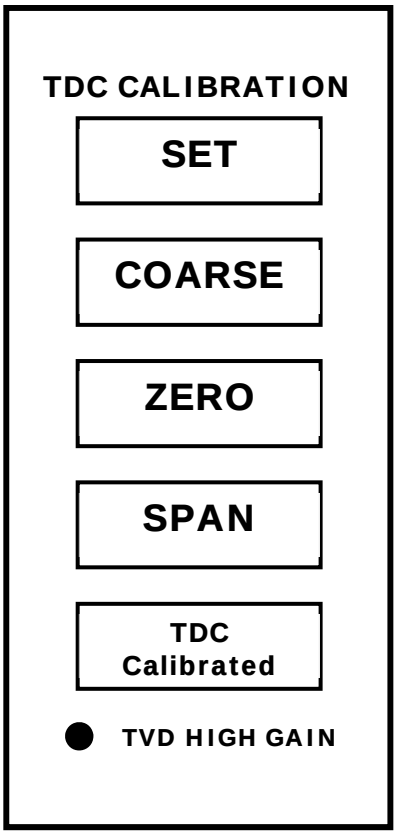
SPAN ADJUSTMENT

- Turn the key-switch for TDC calibration to the "SPAN" position.
- Run the discs 1.00 mm further apart until the relative POM reads +1.00.
- Press the "SET" switch and the DCA-unit is set to the span value (1.50 for the 0-2mm ragne, 2.25 for the 0-3mm ragne or 1.70 for the Conflo refiner type).

CALIBRATION COMPLETED

- Turn the key-switch for TDC calibration to the "COMPLETE" position.
- Set the "TOUCH-POSITION" key-switch to the "OFF" position.
- Press the "SET" switch (the indicator “TDC NOT CALIBRATED” will go off).
- Turn the key-switch for TDC calibration to the "OFF" position.

1.3. CALIBRATION WITH AN OPERATORS PANEL



PRE-CALIBRATION

- Check that the TDC-sensor is mounted in line with the refining segments, and that it is fully tightened.
- Select “TDC CALIBRATION” on the operators panel to show the calibration window. The information text for RMS will indicate the value of the TVD limit, "TVD LIMIT XX %". When the TVD-level has passed the limit during the touch point procedure, the display will instead indicate a relative POM-value (this is related to the rotor position value at the touch point position.
- Push the “TOUCHPOINT ON” to activate the calibration buttons and to setup the refiner interlocking for the touchpoint procedure.

COARSE CALIBRATION

- This is only needed when a new sensor has been mounted. If the DCA-unit is re-calibrated, continue with the zero calibration.
- Move the plates until the plate-gap is larger than 8 mm.
- Push the "COARSE" button.
- Push the "SET" button and the DCA-unit is set to the coarse value (indicates 3.00 for the 0-2mm range, 4.50 for the 0-3mm range or 2.50 for the Conflo refiner type).

ZERO CALIBRATION

- Push the "ZERO" button.
- Run carefully the grinding discs together until the touch point is detected. The relative POM is preset to -0.10.
- Run the discs apart until the relative POM reads 0.00.
- Push the "SET" button and the DCA-unit is set to the “zero” value (indicates 0.50 for the 0-2mm range, 0.75mm for the 0-3mm range or 0.70 for the Conflo refiner type).

SPAN ADJUSTMENT

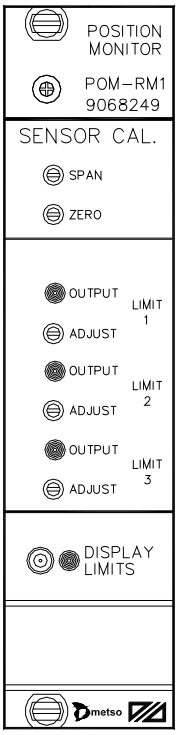
- Push the "SPAN" button.
- Run the discs 1.00 mm further apart until the relative POM reads +1.00.
- Push the "SET" switch and the DCA-unit is set to the span value (indicates 1.50 for the 0-2mm range, 2.25 for the 0-3mm range or 1.70 for the Conflo refiner type).

CALIBRATION COMPLETED

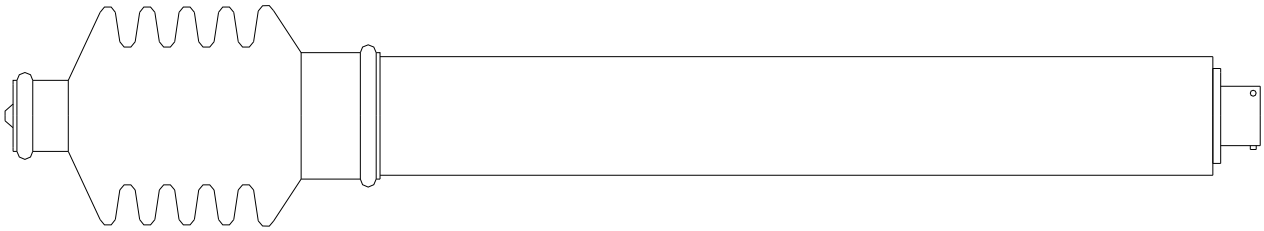
- Push the “TOUCHPOINT OFF” button.
- Push the "TDC Calibrated" button.
- Push the "SET" button. The indicator “TDC CALIBRATED” will change color from red to green and the TDC alarm is reset.

2. CALIBRATION OF THE OF ROTOR POSITION SENSORS

The rotor position sensor has to be recalibrated when it is installed or when the monitor unit, POM-RM1 has been replaced



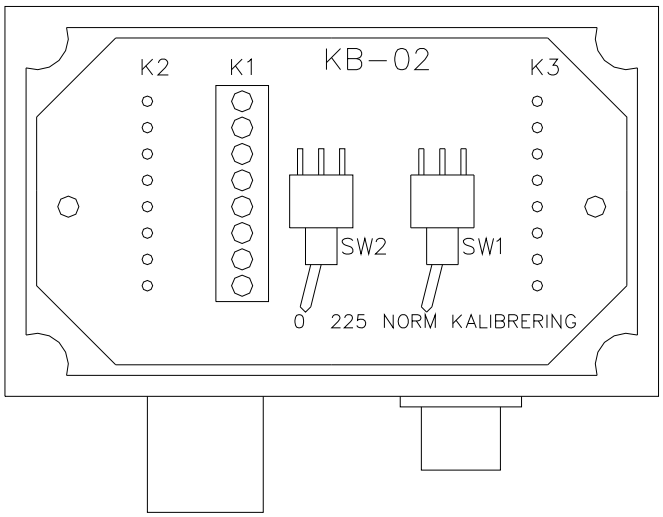
- Remove the sensor from the holder.
- Push the "Display Limits" on the POM-RM1 unit. The POM-value can then be read from the DCU-RM1 unit or from the PDU-RM1 unit.
- Push the measuring rod of the sensor to the fully inner position.
- Adjust the potentiometer "ZERO" on the POM-RM1 unit until the monitor reads 0.00 mm.
- Release the measuring rod so it is fully expanded.
- Adjust the potentiometer "SPAN" until the monitor reads 50.00 mm.
- Set the rotor position to its absolute adjustment position according to the refiner instruction manual. Mount the sensor to the holder on the refiner and adjust the sensor until the monitor displays the value according to the refiner instruction manual. Fix the sensor in this position.
- The sensor is mechanically limited to 50 mm stroke length. It is essential that the refiner’s stroke length is within that of the sensor. If the sensor is forced beyond the inner endpoint, it will be destroyed.

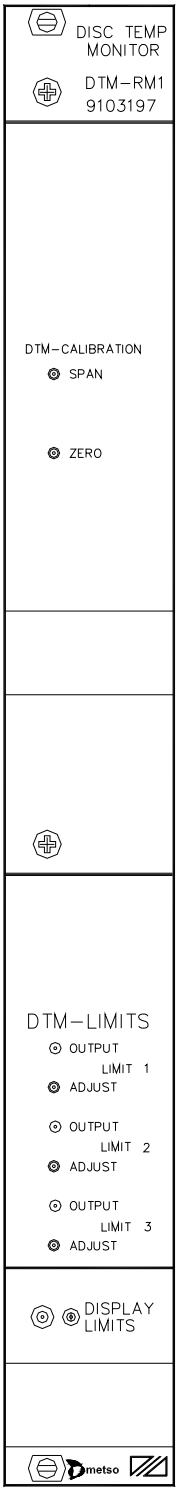


3. CALIBRATION OF THE DTM-UNIT

The DTM-RM1 is adjusted together with the KB-02, connection box. The KB-02 is mounted on the refiner stand close to the TDC-sensor.
Using precision resistors inside the box does the calibration. Switches select the resistors, and they replace the PT-100 temperature element inside the TDC-sensor.

- Push the "Display Limits" on the DTM-RM1 unit. The DTM-value can then be read from the DCU-display.
- Connection box KB-02:
  Remove the plastic cover.
  Set the “SW1” switch, in the position "KALIBRERING".
  Set the “SW2” switch in the position "0".
- DTM-RM1:
  Adjust the potentiometer "ZERO" until a "000" reading.
- KB-02:
  Set the “SW2” switch in the position "225".
- DTM-RM1:
  Adjust the potentiometer "SPAN" until a "225" reading.
- KB-02:
  Set the “SW1” switch, in the “NORM” position.
  Set the SW2-switch in the “0” position.
  Mount the plastic cover.





4. ADJUSTMENT OF THE RMS UNITS - GENERAL

Select the chosen RMS-unit to the DCU-display by the push-button "DISPLAY LIMITS" on the RMS-unit. The display is activated for about 2 minutes after the "DISPLAY LIMITS" buttons was activated, and will then automatically be turned off.
If the "→" push-button on the DCU-RM1 is activated, the auto-turnoff is disabled. This is indicated by a "*" in the lower right corner of the display.
The auto turnoff is reactivated if the "DISPLAY LIMITS" is pressed again.
Press the "MENU" button to return to the normal readout.

5. ADJUSTMENT OF THE CMI-RM1 UNIT

Push **"DISPLAY LIMITS"** on the CMI-RM1 unit and the DCU-display will indicate the limit values for high speed and low speed.

DCA	2.23
DTM	168
POM	39.46
CMI	%
H-sp.	100
L-sp.	100
DIFF	+0
ENABLED	

HIGH SPEED

Read the high-speed value and adjust the high-speed potentiometer. Values can be adjusted between 50 and 150%. If 100% is chosen, the speed of the axial movement will be 0.25 mm/s. If the stepping motor is working while adjusting, the change will be affected first upon the next activation.

LOW SPEED

Read the low-speed value and adjust the low-speed potentiometer. Values can be adjusted between 50 and 150%. If 100% is chosen, the speed of the axial movement will be 0.05 mm/s. If the stepping motor is working while adjusting, the change will be affected first upon the next activation.

6. ADJUSTMENT OF THE MPM-RM2 UNIT

Push **"DISPLAY LIMITS"** on the MPM-RM2 unit and the DCU-display will indicate the measured value and the limit values.
All values are related to the programmed nominal main motor power (see the programmers manual, PRO-SD1).

DCA	2.23
DTM	168
POM	39.46
MPM	MW
MPM	7.50
Low	2.1
Lowlow	1.8
Level	1.0
Time	3.0

MEASURED VALUE

The measured value is indicated by "MPM".

ADJUST LIMIT 1

Read the value at "Low" and adjust the potentiometer "LIMIT 1" to desired value. Values can be adjusted between 0 and 100% of the nominal main motor power.

ADJUST LIMIT 2

Read the value at "LoLow" and adjust the potentiometer "LIMIT 2" to desired value. Values can be adjusted between 0 and the nominal main motor power.

ADJUST LIMIT 3, LEVEL

Read the value at "Level" and adjust the potentiometer "LEVEL ADJUST" to the desired value. Values can be adjusted between 0 and 100% of the nominal main motor power.

ADJUST LIMIT 4, TIME

Read the value at "Time" and adjust the potentiometer "TIME ADJUST" to desired value. Values can be adjusted between 0 and 10.0 s.

7. ADJUSTMENT OF THE VIM-RM1 UNIT

Push **"DISPLAY LIMITS"** on the VIM-RM1 unit and the DCU-display will indicate the measured value and the limit values.

DCA	2.23
DTM	168
POM	39.46
VIM	mm/s
MPM	3.5
Lm 1	12.0
Lm 2	10.0

MEASURED VALUE
The measured value is indicated by "VIM".

ADJUST LIMIT 1
Read the value at "Lm 1" and adjust the potentiometer "LIMIT 1" to desired value. Values can be adjusted between 0 and 25 mm/s.

ADJUST LIMIT 2
Read the value at "Lm 2" and adjust the potentiometer "LIMIT 2" to desired value. Values can be adjusted between 0 and 25 mm/s.

8. ADJUSTMENT OF THE OTM-RM1 UNITS

Up to 6 units can be used in the system. The DCU-unit indicates the selected unit by
"OTM-1" thru "OTM-6". OTM-1 and OTM-2 is on the left hand side of the rack while OTM-3 thru OTM-6 is on the right hand side.
Push **"DISPLAY LIMITS"** on the chosen OTM-RM1 unit and the DCU-display will indicate the measured values and the limit values. The values are related to the nominal temperature setting, 100 or 200 °C.

DCA	2.23
DTM	168
POM	39.46
OTM-1 (100)	°C
Ch 1	55.5
Lm 1	60.0
Lm 2	55.0
Ch 2	53.6
Lm 1	60.0
Lm 2	55.0

MEASURED VALUES
The measured value for channel 1 is indicated by "Ch 1"
The measured value for channel 2 is indicated by "Ch 2"

ADJUST CHANNEL-1 LIMIT 1
Read the value at "Ch 1, Lm 1" and adjust the potentiometer "CHANNEL 1, LIMIT 1" to desired value. Values can be adjusted between 0 and 100% of nominal temperature.

ADJUST CHANNEL-1 LIMIT 2
Read the value at "Ch 1, Lm 2" and adjust the potentiometer "CHANNEL 1, LIMIT 2" to desired value. Values can be adjusted between 0 and 100% of nominal temperature.

ADJUST CHANNEL-2 LIMIT 1
Read the value at "Ch 2, Lm 1" and adjust the potentiometer "CHANNEL 2, LIMIT 1" to desired value. Values can be adjusted between 0 and 100% of nominal temperature.

ADJUST CHANNEL-2 LIMIT 2
Read the value at "Ch 2, Lm 2" and adjust the potentiometer "CHANNEL 2, LIMIT 2" to desired value. Values can be adjusted between 0 and 100% of nominal temperature.

9. ADJUSTMENT OF THE HPM-RM1 UNIT

Push **"DISPLAY LIMITS"** on the HPM-RM1 unit and the DCU-display will indicate the measured value and the limit values. All indicated values are recalculated according to the programmed nominal A and B-chamber pressure. The nominal pressure is programmable in the DCU unit (see PRO-SD1 Programming manual).

DCA	2.23
DTM	168
POM	39.46
HPM	ton
Ch A	33.5
Lm 1	22.0
Lm 2	20.0
Ch B	15.6
Lm 1	14.5
Lm 2	13

MEASURED VALUE

"Ch A" indicates the measured value for the A–chamber pressure.
"Ch B" indicates the measured value for the B–chamber pressure.

ADJUST A-CHAMBER LIMIT 1

Read the value at "Ch A, Lm 1" and adjust the potentiometer "A-CHAMBER, LIMIT 1" to the desired value. Values can be adjusted between 0 and 100% of nominal A-chamber pressure.

ADJUST A-CHAMBER LIMIT 2

Read the value at "Ch A, Lm 2" and adjust the potentiometer "A-CHAMBER, LIMIT 2" to the desired value. Values can be adjusted between 0 and 100% of nominal A-chamber pressure.

ADJUST B-CHAMBER LIMIT 1

Read the value at "Ch B, Lm 1" and adjust the potentiometer "B-CHAMBER, LIMIT 3" to the desired value. Values can be adjusted between 0 and 100% of nominal B-chamber pressure.

ADJUST B-CHAMBER LIMIT 2

Read the value at "Ch B, Lm 2" and adjust the potentiometer "B-CHAMBER, LIMIT 4" to the desired value. Values can be adjusted between 0 and 100% of nominal B-chamber pressure.

10. ADJUSTMENT OF THE POM-RM1 UNIT

Push **"DISPLAY LIMITS"** on the POM-RM1 unit and the DCU-display will indicate the measured value and the limit values.

DCA	2.23
DTM	168
POM	39.46
POM	mm
Lm 1	42.0
Lm 2	10.0
Lm 3	4.5

MEASURED VALUE

The measured value is indicated by "POM".

ADJUST LIMIT 1

Read the value at "Lm 1" and adjust the potentiometer "LIMIT 1" to the desired value. Values can be adjusted between 0 and 50.00 mm.

ADJUST LIMIT 2

Read the value at "Lm 2" and adjust the potentiometer "LIMIT 2" to the desired value. Values can be adjusted between 0 and 50.00 mm.

ADJUST LIMIT 3

Read the value at "Lm 3" and adjust the potentiometer "LIMIT 3" to the desired value. Values can be adjusted between 0 and 50.00 mm.

11. ADJUSTMENT OF THE TVD-RM1 UNIT

Push **"DISPLAY LIMITS"** on the TVD-RM1 unit and the DCU-display will indicate the measured value and the limit values.

MEASURED VALUE
The measured value is indicated by "TVD".

ADJUST LIMIT 1
Read the value at "Lm 1" and adjust the potentiometer "LIMIT 1" to the desired value. Values can be adjusted between 0 and 100%.

ADJUST LIMIT 2
Read the value at "Lm 2" and adjust the potentiometer "LIMIT 2" to the desired value. Values can be adjusted between 0 and 100%.

DCA	2.23
DTM	168
POM	39.46
TVD	%
TVD	0.0
Lm 1	60.0
Lm 2	50.0

12. ADJUSTMENT OF THE DTM-RM1 UNIT

Push **"DISPLAY LIMITS"** on the DTM-RM1 unit and the DCU-display will indicate the measured value and the limit values.

MEASURED VALUE
The measured value is indicated by "DTM".

ADJUST LIMIT 1
Read the value at "Lm 1" and adjust the potentiometer "LIMIT 1" to the desired value. Values can be adjusted between 0 and 225 °C.

ADJUST LIMIT 2
Read the value at "Lm 2" and adjust the potentiometer "LIMIT 2" to the desired value. Values can be adjusted between 0 and 225 °C.

ADJUST LIMIT 3
Read the value at "Lm 3" and adjust the potentiometer "LIMIT 3" to the desired value. Values can be adjusted between 0 and 225 °C.

DCA	2.23
DTM	168
POM	39.46
DTM	°C
Lm 1	200
Lm 2	185
Lm 3	100

13. ADJUSTMENT OF THE DCA-RM1 UNIT

Push **"DISPLAY LIMITS"** on the DCA-RM1 unit and the DCU-display will indicate the measured and the limit values.
The DCA linear nominal range can be set to 2.00 or 3.00 mm (by DIP-settings) and must also be programmed in the "RANGE"-menu in the DCU-unit (See PRO-SD1).

DCA	2.23
DTM	168
POM	39.46
DCA	mm
Lm ++	1.20
Lm +	0.90
Lm -	0.70
Lm - -	0.20

MEASURED VALUE
The measured value is indicated by "DCA".

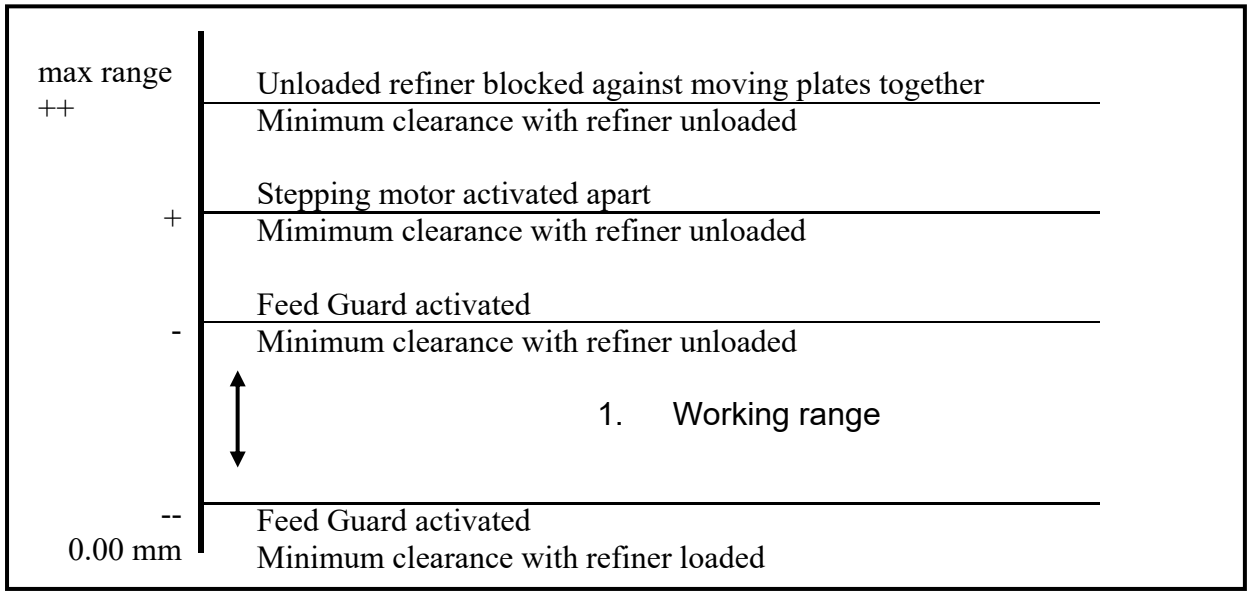
ADJUST LIMIT "+ +"
Read the value at "++" and adjust the potentiometer "+ +" to the desired value. Values can be adjusted between 0.00 and the nominal range.

ADJUST LIMIT "+"
Read the value at "+" and adjust the potentiometer "+" to the desired value. Values can be adjusted between 0.00 and the nominal range.

ADJUST LIMIT "-"
Read the value at "-" and adjust the potentiometer "-" to the desired value. Values can be adjusted between 0.00 and the nominal range.

ADJUST LIMIT "- -"
Read the value at "- -" and adjust the potentiometer "- -" to the desired value. Values can be adjusted between 0.00 and the nominal range.

HOW TO USE THE DCA ALARM LIMITS, DCA-RM1
The 4 separate limits can be adjusted between 0.00 - nominal range. These limits are constantly compared with the DCA-signal, displayed on the DCA panel meter.
These limits are most suitably used in accordance with the chart below.



At the time of delivery, the limits are adjusted as follows (with 2.00 mm range):
++ = 1.20, + = 1.10, - = 0.70, - - = 0.20

14. CONTACT

Sales, development, production and service:

Dametric AB
Jägerhorns Väg 19, 141 75 Kungens Kurva, Sweden
Phone: +46-8 556 477 00 Telefax: +46-8 556 477 29
e-mail: service@dametric.se Web site: www.dametric.se