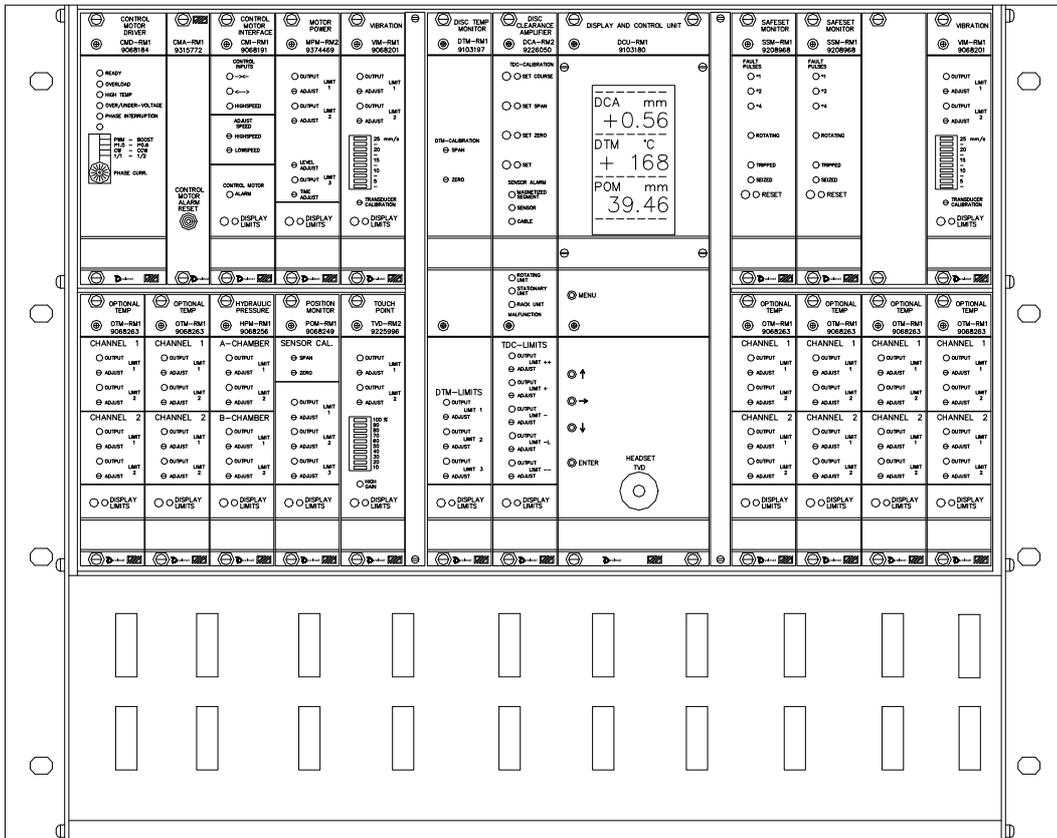




# PROGRAMMING RMS-DD1



## PROGRAMMERS MANUAL

## FOR THE RMS-DD1 SYSTEM

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**1. DCU DISPLAY READ-OUT**

**1.1 NORMAL READ-OUT**

DCA	mm
2.23	
DTM	°C
168	
POM	mm
39.46	
SETP	DCA
I	1.00mm
XXXXXXXXXX	

- MENU**    **Select MENU**
- ↑            **Deactivates the special regulator menu**
- **No function**
- ↓            **Activates the special regulator menu**
- ENT**      **No function**

XXXXXXXXXX

SETP DCA X.XX is the regulator set-point. I means internal value, E indicates that the setpoint is external and is generated from a remote equipment.

NOT READY indicates that the DCU-RM1 unit is not ready. This indicates an internal alarm but is also activated during the first 8 seconds after power-up.

REG.ACTIV indicates that the internal gap-regulator is activated.

FEEDG.ACT indicates that the feed-guard retraction function is activated.

**1.2 WITH RMS-UNIT LIMITS**

DCA	2.23
DTM	168
POM	39.46
HPMA	22.5
Lim1	30.0
Lim2	25.0
HPMB	40.5
Lim1	45.0
Lim2	42.5
	*

- MENU**    **Return to NORMAL READ-OUT (The display is turned off automatically after approx. 2 min.)**
- ↑            **No function**
- **Disables the display auto-turn-off**
- ↓            **No function**
- ENT**      **No function**

The "DISPLAY LIMITS" on the HPM-unit is activated in this example.

\* This indicates that the auto-turn-off is not in use.

## 2 MAIN MENU

- MAIN -
- MENU -
<b>UNITS</b>
RANGE
DCA CAL.
REGULATOR
FG SETTING
FG RESULTS
ALARM LIST

<b>MENU</b>	<b>Return to NORMAL READ-OUT</b>
↑	<b>Move cursor up</b>
→	<b>No function</b>
↓	<b>Move cursor down</b>
<b>ENT</b>	<b>Enter selected menu</b>

UNITS	Enable/disable units in the system
RANGE	Set ranges
DCA CAL.	Set parameters for DCA calibration
REGULATOR	Set disc gap regulator parameters
FG SETTING	Set the parameters for the feed guard retraction function
FG RESULTS	Read the feed guard retraction results.
ALARM LIST	Displays the sum alarm units.

The menus can not be entered when the feed guard, the regulator or the touchpoint-function is activated.

If no button is pushed within five minutes, the program automatically returns to NORMAL READ-OUT.

If "DISPLAY LIMITS" is pushed on any unit, the program escapes from the menus and shows the limits for the chosen unit.

The menus will not be interrupted, when you are changing a value of a menu function and when a menu function is changed without having saved the change.

### 3 UNITS

MENU 2
UNITS
ALL OFF
ALL ON
DTM       on
HPM       on
MPM       on
-
OTM6      off
POM       on
TVD       on
VIM       on
VIMf      off

<b>MENU</b>	<b>Return to MAIN MENU (With executed selections)</b>
↑	<b>Move cursor up / scroll up</b>
→	<b>Toggle on/off at cursor</b>
↓	<b>Move cursor down / scroll down</b>
<b>ENT</b>	<b>Return to previous menu</b>

This menu is used to enable/disable units that will be included in the internal sum alarm check system. The CMD, CMI and DCA unit are not included in this system, they have their own check system.

The TVD unit must be on to be able to use the touchpoint function and the MPM unit must be on to be able to show the ++Limit display mode.

The "ALL OFF" function will set all units to the off state.

The "ALL ON" function will set all units to the on state.

VIMf can only be set on when the RMS SYSTEM menu is set to RMS-DD1 (See 4.6). MENU 3





## 6. REGULATOR SETTINGS

MENU 4
REGULATOR
SETTINGS
<u>DEADBAND</u>
INTERVAL
GAIN
FILTER
OVER ALARM
SPEED LIM.
UNDER ALRM
LOW A-PR.
DEFAULT
0.05

MENU	Return to MAIN MENU
↑	Move cursor up
→	No function
↓	Move cursor down
ENT	Enter selected function

Use the "↑" and "↓" buttons to select a function and then press ENTER. The bottom line will then be displayed in reversed video, indicating that the value can be changed.

Now change the value with the "↑" and "↓" buttons, and press ENTER again to set the value.

When exit this routine, an additional question will be asked if to save the changed settings.

Modifications cannot be done while the regulator is active.

**"DEADBAND"**. The DEADBAND sets the allowed difference between the set point value and the TDC-value without a regulation action. Max:  $\pm 0.25$ , min:  $\pm 0.01$ , default:  $\pm 0.05$ , step:  $\pm 0.01$  mm.

**"INTERVAL"**. The INTERVAL sets the time between regulation actions. The interval value defines the maximum value of the filter factor. This parameter also affects the flat-zone filter factor. Max: 20 s, min: 2 s, default: 10 s, step: 1 s.

**"GAIN"**. The GAIN sets the duration of the output regulation action. It is normally set to 100 % but can be set to higher value to over-compensate or to lower values to under-compensate. Max: 120, min: 40, default: 100, step: 5 %.

**"FILTER"**. Sets the filtering factor of the DCA-signal.

DCA-values are read with an interval of one second. The filter factor sets the number of readings to use when calculating the mean value. 1 means therefore no filter. The numbers within brackets are the maximum setting of the filter factor, and are limited by the interval setting to maintain stability. (Interval value divided with 2, rounded to the nearest highest integer. Ex. interval = 11 =>> max filter factor = 6). Max: 10, min: 1, default: 5, step: 1 s

**"OVER ALARM"**. Over alarm is the maximum allowed regulation distance together by the regulator, and is in percent of the set limit value or by the adjusted absolute distance in mm (0.00 disables the function). The function is reset when the regulator is started, and will monitor the sum of the regulation distance together and apart. If the distance together exceeds the distance apart with the preset over alarm distance, the regulator is prevented from moving plates together and an alarm is generated. A set point change larger than  $\pm 0.03$  mm, will also reset the function. The register is also decreased by a clock signal, which is calculated by the speed limit setting. When properly set, this function will then generate alarm for eventual TDC-sensor malfunction, but not when the regulator compensates for changes due to the heating of the refiner. Max: 95%/1.00mm, min: 5%/0.00mm, default: 50 %, step: 5%/0.05mm.

**”SPEED LIMIT”.** This parameter sets the maximum speed allowed for the regulator.  
Max = 1.00 mm/min, min: 0.02 mm/min, default: 0.1 mm/min, step: 0.02 mm/min.

**”UNDER ALRM”.** This sets the permitted regulation intervals in succession not reaching the dead band, without any alarm generated. A counter is increased one step for each interval period, when the DCA-value is not within the dead band. An alarm output is activated if the counter exceeds the setting. Any interval period with the DCA-value within or passing the dead band, resets the counter. A set point change bigger than  $\pm 0.03$  mm, resets the register.  
Max: 20, min: 5, default: 10, step: 1.

**” LOW A-PR.”.** The parameter is set to “enabled” to prevent the regulator from regulate together at a low A-chamber pressure.  
Max: ”enabled”, min: ”disabled”, default: ”disabled”.

**”DEFAULT.** Sets the default values.

## 7. GAP GUARD SETTINGS

MENU 11	
GAP GUARD	
SETTINGS	
TIME	
DISTANCE	
GAIN	
<hr/>	
2 ( 4 )	

MENU	Return to MAIN MENU
↑	Move cursor up
→	No function
↓	Move cursor down
ENT	Enter selected function

Use the "↑" and "↓" buttons to select a function and then press ENTER. The bottom line will then be displayed in reversed video, indicating that the value can be changed.

Now change the value with the "↑" and "↓" buttons, and press ENTER again to set the value.

When exit this routine, an additional question will be asked if to save the changed settings.

GapGuard - faster than a regulation and less dramatic than the FeedGuard.

The purpose of the GapGuard is to prevent the flat zone to reach the minus-minus-limit, and thereby preventing a FeedGuard. The GapGuard works with the flat zone regulator and the TDC-value, and the output is to move the rotor quickly apart to increase the plate gap. The GapGuard continuously measures the flat-zone gap and compares it with the set point limit. If the difference is larger than an adjustable value, the DCU will start the GapGuard function. That means that the stepping motor, which controls the rotor position, will move the plates apart at high speed. The distance it will run is proportional to the actual difference between the plate gap and the set point limit. After a GapGuard is started, the DCU will continue to regulate as usual with the first regulation a full regulation interval after GapGuard has finished.

**"TIME"**. The time setting determines the minimum time between two consecutive GapGuards in seconds. It is needed because of the filter time at the TDC-readings. Time is adjustable in the range 1-4 s when the regulator interval is 10s. If the interval is reduced, the maximum allowable setting will also be reduced. Max: 10, min: 1, default: 2, step: 1 s.

**"DISTANCE"**. With DISTANCE you set how much the plate gap of the flat zone can be smaller than the set point limit. E.g. if the set point is 0.8 mm and DISTANCE is set to 0.20 mm, GapGuard will be started if the flat zone plate gap is below 0.60 mm. You can also choose to set the distance to be a percentage of the set point limit. The range of the DISTANCE setting is from 0 to 1.00 mm or 1% to 99% of the set point limit. If you exceed 99% setting or 1.00 mm setting, the unit will automatically switch to the other method. The GapGuard is disabled if the distance is set to 0.00 mm. Max: 99%/1.00mm, min: 1%/0.00mm, default: 25%, step: 1%/0.01mm.

**"GAIN"**.

The distance that the rotor will move when GapGuard is triggered is proportional to the difference between the actual plate gap reading and the set point limit. This difference is then multiplied with the gain setting to enable under- or over-compensation

Max: 250, min: 50, default: 100, step: 1 %.

## 8. FEED GUARD SETTINGS

```

MENU 6
FEED GUARD
SETTINGS
PIST.LENG.
SAFE DIST.
TIMEOUT

1.00

```

**MENU**    **Return to MAIN MENU**  
**↑**        **Move cursor up**  
**→**        **No function**  
**↓**        **Move cursor down**  
**ENT**     **Enter selected function**

Use the "↑" and "↓" buttons to select a function and then press ENTER. The bottom line will then be displayed in reversed video, indicating that the value can be changed.

Now change the value with the "↑" and "↓" buttons, and press ENTER again to set the value.

When exit this routine, an additional question will be asked if to save the changed settings.

**"PIST.LENG."** Sets the rotor movement caused by a release of the feed guard piston value. Max: 5.00, min: 0.00, default: 1.00, step: 0.10 mm.

**"SAFE DIST."** Sets the safe distance for the rotor. The total feed guard movement for the rotor is the safe distance added with the piston length. It is normally set to the same value as the "PIST.LENG" parameter. Max: 5.00, min: 0.20, default: 1.00, step: 0.10 mm.

**"TIMEOUT"**. The timeout sets the total time before the FeedGuard retraction must be completed. If the time has elapsed, without occurrence of the feed guard contact, a timeout alarm is generated. Max: 60, min: 5, default: 10, step: 1 s.

## 9. FEEDGUARD RESULT

MENU 7	MENU	Return to MAIN MENU
FEED GUARD		
RESULTS	↑	No function
Pist.leng.	→	No function
1.00 mm		
Safe dist.	↓	No function
1.00 mm		
Orig. POM	ENT	Return to MAIN MENU
23.45 mm		
Meas. POM		
25.30 mm		
Diff. dist		
1.85 mm		

This menu displays the results of the last feed guard retraction.

**Pist.leng.** is the piston length setting.

**Safe dist.** is the set safe distance setting.

**Orig. POM** is the original rotor position value before the Feed Guard Reset signal was activated.

**Meas. POM** is the rotor position value after a completed Feed Guard Retraction.

**Diff.dist** is the calculated difference between the “Orig. POM” and the “Meas. POM”.

## 10. ALARMLIST

MENU 8	MENU	Return to MAIN MENU
ALARM LIST		
	↑	No function
MPM	→	No function
VIM		
	↓	No function
	ENT	Return to MAIN MENU

This menu displays units that are confirmed as faulted. It also displays units that become faulted when being in this menu. These units are included to the list without any confirmation. If a unit is repaired or replaced, it disappears from the list.