1 Supplement to installation and operating instructions of the BE00000347[1]

1.1 Additional information on the RS485 bus: J302 to J301 and the use of a filter on the coil of contactors / auxiliary relays

1.1.1 Bus communication jumper changed

ATTENTION
Connections for bus communication (RS485 A/B) to frequency converter are moved from J302 to J301 (see drawing fig.: 1 Connections for bus communication (RS485 A/B))

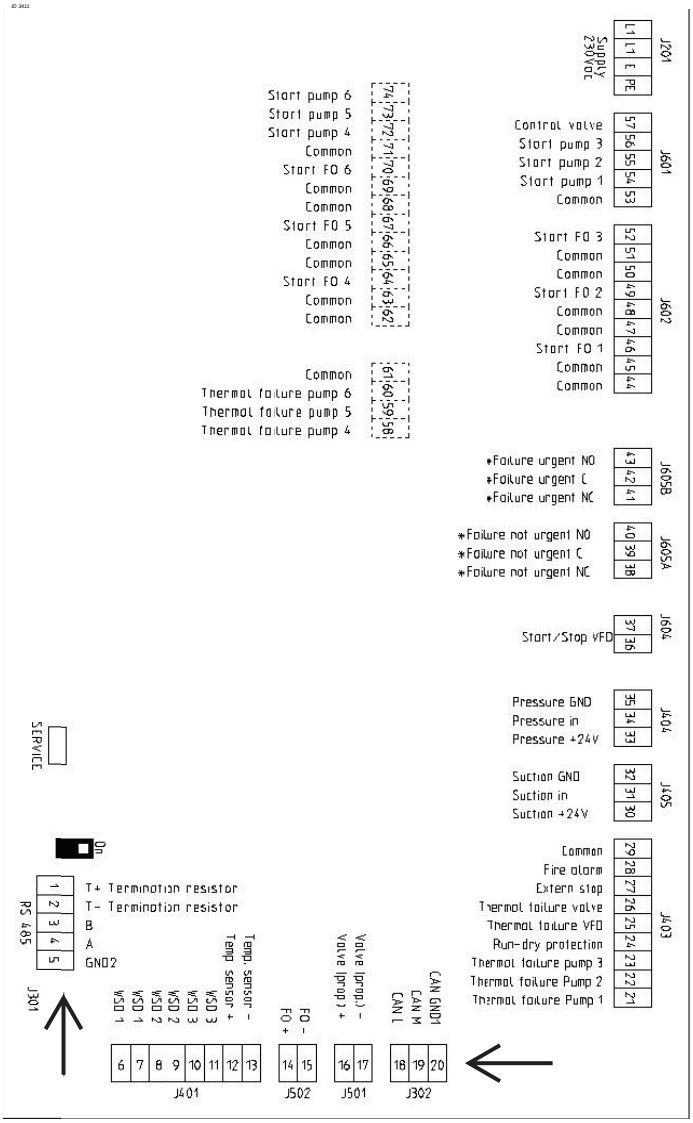


Figure 1: Connections for bus communication (RS485 A/B)

ATTENTION
Changes to the DIP switch settings of the bus termination of the frequency converter becomes effective only after switching off and then on again of the frequency converter.

01

1. Megacontrol

1.1.2 Recommended RS485-termination for MCIII (b)

The new board for MCIII (b) is based on a new hardware platform. One new feature is, that the clamps for the external RS485-bus (J301) will now benefit the advantage of galvanic isolated bus- and GND-lines.

A RS485-termination with 1…6 “DANFOSS Micro-Drives”

1 MCIII (b) : keep the termination clamps on the MCIII (b) T+ / T- open
2 Microdrives: switch the bus termination to position on, on each Micro Drive.

B1 RS485-termination with 1…2 “DANFOSS AQUA Drives”

1 MCIII (b) : keep the termination clampson the MCIII (b) T+ / T- open
2 AQUA Drive: switch the bus termination to position on, on each AQUA Drive

B2 RS485-termination with 3…6 “DANFOSS AQUA Drives”

1 MCIII (b) : keep the termination clamps on the MCIII (b) T+ / T- open
2 AQUA Drive: set the bus termination only on the last AQUA Drive
3 External termination: Place, near to the MCIII (b), an external active bus termination, like normally used for Profibus, for example: 6ES7 972-0DA00-0AA0[1] or FBCon DP M12 Term 24V[2]

1. Siemens profibus terminator: „6ES7 972-0DA00-0AA0“. http://cache.automation.siemens.com/dnl/DM/DM3NTIxAAAA_19102444_HB/3B_812_6727-10a_Terminator.pdf
2. Weidmüller: „FBCon DP M12 Term 24V“. http://catalog.weidmueller.com/catalog/Start.do?localeId=de_DE&ObjectID=8564330000

1.1.3 Parameter settings of the frequency converters

02

By selecting a type of frequency converter in parameter 3-4-3-1 and selecting also the VFD Fixed All configuration in parameter 3-3-3 it will be possible to set the following parameters by Megacontrol. Before setting the parameters: Turn off each pump in parameter 1-2-1. Then set the parameters in the following sequence.

Megacontrol parameter:
1 3-4-3-13 P nominal of VFD
2 3-4-3-14 U nominal of VFD
3 3-4-3-15 F nominal of VFD
4 3-4-3-16 I nominal of VFD
5 3-4-3-17 RPM nominal of VFD

After entering these parameters, the other parameters can be set at their discretion. Always check the correct setting of the frequency converters parameters.

1.1.4 Using contactors

ATTENTION
Always place, using contactors and/or auxiliary relays, a suitable RC filter or varistor across the coil, e.g. Siemens 3RT29-16-1CD00

2 Supplement bedienings- en bedrijfsvoorschriften bij BE00000351[2]

2.1 Aanvullende info. over de busverbinding RS485: J301 en het gebruik van een filter over een spoel van de magneetschakelaars / hulprelais

2.1.1 Bus communicatie verplaatst

ATTENTION
Aansluitingen voor de buscommunicatie (RS485 A/B) naar de frequentieomvormer zijn verplaatst van J302 naar J301 (zie Fig. 1 Connections for bus communication (RS485 A/B))

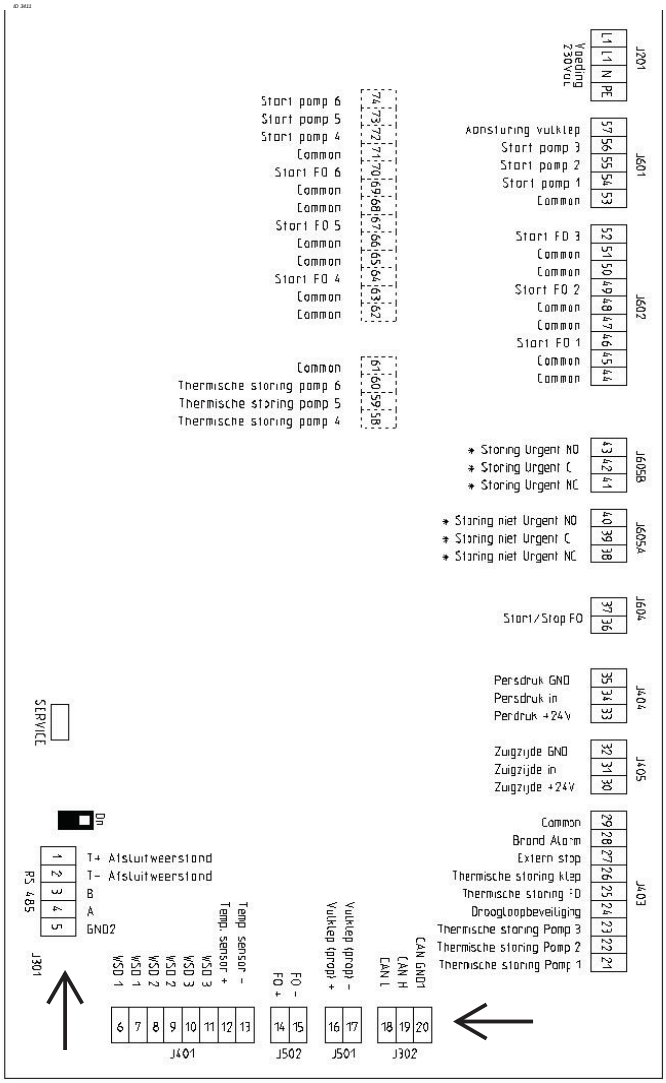


Figure 2: Aansluitingen voor de buscommunicatie (RS485 A/B)

ATTENTION
Maak de frequentie-omvormers spanningvrij voor het omschakelen van de jumpers van de frequentieomvormer. Wijzigingen in de DIP-switch instellingen van de eindafsluitweerstand worden pas van kracht na het uitschakelen en vervolgens weer inschakelen van de frequentieomvormer.

2. megacontrol

2.1.2 Aanbevolen RS485-eindafsluitklem voor de MCIII (b)

De nieuwe printplaat voor MCIII (b) is gebaseerd op een nieuw hardware platform. Nieuw is dat de klemmen voor de Externe RS485-bus gebruik zullen maken van de galvanisch gescheiden bus- en aarde lijnen.

A RS485-eindafsluiting bij 1…6 “DANFOSS Micro-Drives”

1 MCIII (b) : Laat de eindafsluitweerstand aan de MCIII (b) T+ / T- open;
2 Micro Drives: zet de eindafsluitweerstandjumper op “aan”, aan iedere Micro Drive.

B1 RS485-eindafsluiting bij1…2 “DANFOSS AQUA Drives”

1 MCIII (b) : Laat de eindafsluitweerstand aan de MCIII (b) T+ / T- open;
2 AQUA Drive: zet de eindafsluitweerstand op “aan”, op iedere AQUA Drive

B2 RS485-eindafsluiting bij 3…6 “DANFOSS AQUA Drives”

1 MCIII (b) : Laat de eindafsluitweerstand aan de MCIII (b) T+ / T- open;
2 AQUA Drive: zet de eindafsluiterweerstand op “aan”, alleen op de laatste AQUA Drive;
3 Externe eindafsluiting: Plaats, in de nabijheid van de MCIII (b), een externe actieve bus afsluitweerstand, zoals gebruikelijk is bij de Profibus, bijvoorbeeld: 6ES7 972-0DA00-0AA0[1] or FBCon DP M12 Term 24V[2]

1. Siemens profibus terminator: „6ES7 972-0DA00-0AA0“. http://cache.automation.siemens.com/dnl/DM/DM3NTIxAAAA_19102444_HB/3B_812_6727-10a_Terminator.pdf
2. Weidmüller: „FBCon DP M12 Term 24V“. http://catalog.weidmueller.com/catalog/Start.do?localeId=de_DE&ObjectID=8564330000

2.1.3 Het parametreren van de frequentieomvormers

In de configuratie VFD fixed all, parameter 3-3-3, is het mogelijk om het type frequentieomvormer, gekozen met parameter 3-4-3-1, te parametreren. Voordat de frequentieomvormers geparametreerd kunnen worden moet, in parameter 1-2-1, per pomp de pompmodus buitenbedrijf (uit) gekozen te worden.

Bij het parametreren van de frequentieomvormers via de megacontrol moet de volgende volgorde van parametreren aangehouden worden.
megacontrol parameter:

1 3-4-3-13 P nominal of VFD
2 3-4-3-14 U nominal of VFD
3 3-4-3-15 F nominal of VFD
4 3-4-3-16 I nominal of VFD
5 3-4-3-17 RPM nominal of VFD

Na het invoeren van de deze parameters kunnen de andere parameters naar eigen inzicht worden ingesteld. Er moet altijd een controle plaats te vinden of alle parameters in de frequentieomvormers juist zijn ingevoerd.

2.1.4 Het gebruik van magneetschakelaars

ATTENTION
Bij gebruik van een magneetschakelaar en/of hulprelais moet er over de spoelaansluiting van deze onderdelen altijd een geschikt RC-filter of varistor geplaatst te worden. Bijvoorbeeld Siemens 3RT29-16-1CD00

ATTENTION
Wijzigingen in de DIP-switch instellingen worden pas van kracht na het uitschakelen en vervolgens weer inschakelen van de frequentieomvormer.

3 Parameter list

3.1 Parameter list

ATTENTION
Level(read) e = every body s = service f = factory c = user
Level(wright) e = every body s = service f = factory c = user n = none

3.1.1 Operation (Quick access button “pump”)

Table 1: Parameter list quick access pump

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
1	Operation				Operating status and information
1-1	System				Information on the operating status and measurements of the complete system
1-1-1	System pressure		e	n	Actual system pressure (discharge side)
1-1-2	System load		e	n	Actual load in % of all pumps in operation (100% is one pump full speed)
1-1-3	RDP switch	not present,**present**	e	n	Presence of a run dry protection signal by means of a pressure switch or float switch
1-1-4	Inlet pressure		e	n	Actual pressure at the inlet connection (suction side)
1-1-5	Level content in %		e	n	Actual water level in the receiver tank in % of the content (Storage tank at suction side)
1-1-6	Level height		e	n	Actual water height in the receiver tank (storage tank at suction side)
1-1-7	Ambient temp. (WSD)		e	n	Actual ambient temperature when temperature sensor is available (WSD functionality)
1-1-8	Digital inputs	0 = not active 1 = active	s	s	Displaying the activity status of all the digital inputs
1-1-9.2	Position suppl.valve	closed,**open**	e	n	Position of the supply valve 1 = open 2 = closed
1-1-9.1	Position suppl.valve		e	n	Position of the supply valve proportional 0% ... 100%
1-1-10	Power down speed		s	n	Calculated power down speed if NFD is running in energy saving mode
1-1-11	state NFC	nfdMax,nfdFinished,nfdGoingDown,nfdStableTime,nfdInactive,**nfdMin**	f	n	Shows the current state of the no flow detection.
1-1-12	used setpoint		f	n	used setpoint
1-1-13	NTC Temperature		f	n	On board NTC temperature
1-2	Pumps				Information on the operating status and measurements of the selected pump
1-2-1	Operating mode		e	e	Displaying operating mode of the selected pump
1-2-1	Pump number	Min1 Max 3	e	e	Selection of the pump of which the operating mode is required
1-2-1	Operating mode	Disabled (off),Manual (on 10s),**Automatic**	e	e	Operating mode of the selected pump (continuous active) - Automatic - Manual (on) - Disabled (off)

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
1-2-2	Pump load		e	n	Displaying the load of the selected pump
1-2-3	Thermal fail. flags	0 = not active 1 = active	s	n	Displaying the activity status of all thermal protection inputs
1-2-4	Running hours pump		e	n	Displaying the total running hours per pump in HHHHHH MM
1-2-5	Number of pump-starts		s	n	Displaying the total numbers of starts per pump
1-3	Time and statistics				Operating time and statistics
1-3-1	Act runtime Op hours		e	n	Operating hours of the system in HHHHHH
1-3-2	Time to service		e	n	Period of time until next service / maintenance
1-3-3	Act Minimum Runtime		e	n	Actual minimum pump runtime in seconds

3.1.2 Diagnosis  (Quick access button "traffic light")

Table 2: Parameter list traffic light

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
2	Diagnosis		e	c	Monitoring and diagnosis
2-1	General		e	c	General diagnosis and monitoring functions
2-1-1	Active Messages		e	c	Actual failure and warning messages
2-1-2	History		e	n	History of all failure and warning messages
2-1-3	Acknowledge All		e	e	Accept / Acknowledge all failure and warning messages
2-1-4	Clear History		s	s	Deleting the history of all failure and warning messages

3.1.3 Settings  (Quick access button "tool set")

Table 3: Parameter list tool set

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3	Settings				Settings
3-1	HMI				Human Machine Interface (HMI)
3-1-1	Basic settings				Basic settings for HMI
3-1-1-1	Language	Francais,Nederlands,Deutsch,**English**	e	e	Language settings
3-1-1-2	Backlight				Backlight settings
3-1-1-2-1	Mode	**Timed off**,Always on	e	e	The configuration of the display backlight (Note: a long-term illumination will shorten the life time)

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-1-1-2-2	Backlight Time	Min. 10 **600** Max 999	e	s	Timer setting for automatic ending the back-light after use
3-1-1-3	Displayed units				Setting of the required units in which the system values will be displayed
3-1-1-3-1	Pressure	mwc,feet,PSI,bar,**kPa**	e	s	Unit for the pressure values
3-1-1-3-2	Height	m,**cm**	e	s	Unit for the values of the water level height in the receiver tank (storage tank at suction side)
3-1-1-3-3	Temperature	F,**C**	e	s	Unit of the temperature when temperature sensor is available (WSD functionality)
3-1-1-4	LCD Contrast		e	e	Setting of the LCD contrast
3-1-1-4	contrast	Min. 5 **13** Max 20	e	e	
3-1-2	Fieldbus				Fieldbus Settings
3-1-2-1	Fieldbus Type	Modbus,Profibus,**no module**	e	e	Type of the connected fieldbus module
3-1-4	Logo				Setting of the required logo at system (reboot)
3-1-4-1	Logo	None,	s	s	Setting of the required logo at system (reboot
3-2	Device				Device-specific settings
3-2-1	Login				Login to have access to the required user level
3-2-1-1	PIN		e	n	Enter access level and personal identification number
3-2-1-1	Access Level	Service Level,factory Level,**User Level**	e	e	Access Level
3-2-1-1	PIN acceptance	Max. 9999	e	e	PIN acceptance message
3-2-1-1	Login	Login failed,**Login ok**	e	e	Login
3-2-1-1.2	PIN		f	n	
3-2-1-1.2.1	Access Level	Service Level,Development Level,Factory Level,**User Level**	f	f	
3-2-1-1.2.2	PIN acceptance	Max. 9999	f	f	
3-2-1-1.2.2	Login	Login failed,**Login ok**	f	e	
3-2-1-2	Login required	**yes**,no	c	c	Setting of the required logo at system (reboot
3-2-2	Service				Service settings
3-2-2-1	Factory setting		c	c	Reset to factory basic / default parameter settings
3-2-2-1	Reset default param.	No set available,**Reset ok**	c	c	Reset to basic / default parameter settings
3-2-2-2	Reset Srv Interval		s	s	Reset the service interval
3-2-2-2	Reset Srv Interval	Failed,**OK**	s	s	Reset the service interval
3-2-2-3	Customer setting		c	c	Load locally saved parameters
3-2-2-3	Load loc. param.	No set available,**Reset ok**	c	c	Load locally saved parameters
3-2-2-4	Save custom. setting		c	c	Save of the customer setting
3-2-2-5	Save factory setting		f	f	Save of the factory settings
3-2-2-6	Default setting		s	s	Reset to default setting
3-2-2-6	Reset default param.		s	s	Reset to basic / default parameter settings
3-2-2-7	Edit Pump Opera. hrs		s	s	Edit Pumps operating hours
3-2-2-7	Pump number	**1** 3	s	s	Pump number
3-2-2-7	Hours		s	s	Hours
3-2-2-7	Minutes		s	s	Minutes
3-2-2-7	Seconds		s	s	Seconds

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-2-2-8	Reset Sys. Oper. hrs		s	s	Reset the system operating hours
3-2-2-8	Reset Oper. hours	Failed,**OK**	s	s	Reset the system operating hours
3-2-3	Factory Test		f	f	
3-2-3-1	Factory Test		f	f	
3-2-3-1	Test result	Passed,**Failed**	f	f	
3-3	Configuration				System configuration
3-3-1	Number of pumps	**Min. 1** Max. 6	e	s	Total number of pumps in the system
3-3-2	Inlet	Level / valve prop.,Level / valve on-off,Flow Control,Pressure,**Switch**	e	s	Setting of the applicable configuration at the inlet connection (suction side of the system)
3-3-3	Discharge	VFD fixed all,VFD changover,Two jockey,One jockey,**Fixed speed**	e	s	Setting of the applicable configuration at the discharge connection (pressure side of the system)
3-3-4	WSD	Temperature,3 tanks + temp,2 tanks + temp,1 tank + temp,3 tanks,2 tanks,1 tank,**OFF**	e	s	Setting of the applicable configuration of the WSD: (membrane tank refreshments and ambient temp.)
3-3-5	Leakage detection	**OFF** on	e	s	Leakage detection
3-3-6	MPO Functionality	ON,**OFF**	f	f	Synchron pump operation
3-3-7	PumpMode int/ext	External,**Internal**	e	s	Pump mode is either Internaly (Via HMI or Service) or externaly (via digital input) changed.
3-4	System settings				System parameter settings
3-4-1	Inlet				Parameter setting for the inlet connection (suction side of the system)
3-4-1-1	Sensor press. 4 mA	-100 Max. 1000	e	s	Measured value at 4mA
3-4-1-2	Sensor press. 20 mA	Min. 1000 Max. 9999	e	s	Measured value at 20mA
3-4-1-4	Level config				Parameter setting for the level control in the receiver tank (storage tank at suction side)
3-4-1-4-1	0% level	Max. 99	e	s	Lowest possible level in the receiver tank at which no air is sucked in. In relation to the bottom
3-4-1-4-2	100% level	Min. 200 Max. 999	e	s	Highest possible level in the receiver tank before overflow is triggered. In relation to the bottom.
3-4-1-4-3	Sensor level	Min. -100 Max. 999	e	s	The position where the level sensor is located in the receiver tank. In relation to the bottom.
3-4-1-4-4	Low level shut down	Min. 10 Max. 99	e	s	Low water level to protect the pumps for dry running. (system shut down)
3-4-1-4-5	Low level reset	Min. 15 Max. 99	e	s	Reset level to reset the system after low level shut down
3-4-1-4-6	Critical water level	Min. 30 Max. 99	e	s	Critical level at which the tank threatens to become empty. (back-up storage left)
3-4-1-4-7	High water level	Min. 105 Max. 199	e	s	High water level at which the tank threatens to become over-full
3-4-1-4-8	Threshold				Menu for having one or two extra contacts switched at a level set as required
3-4-1-4-8-1	Threshold 1 ON	Min. 50 Max. 99	f	s	Water level at which the relays output becomes high

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-4-1-4-8-2	Threshold 1 OFF	Min. 50 Max. 99	f	s	Water level at which the relays output becomes low
3-4-1-4-8-3	Threshold 2 ON	Min. 40 Max. 99	f	s	Water level at which the relays output becomes high
3-4-1-4-8-4	Threshold 2 OFF	Min. 40 Max. 99	f	s	Water level at which the relays output becomes low
3-4-1-4-9	Supply valve ON/ OFF				The supply valve open/closed with which the receiver tank is filled
3-4-1-4-9-1	Level 1 open	Min. 70 Max. 99	e	s	Level in the receiver tank at which the supply valve is opened
3-4-1-4-9-2	Level 1 closed	Min. 90 Max. 99	e	s	Level in the receiver tank at which the supply valve is closed
3-4-1-4-9-3	Level 1A open	Min. 90 Max. 99	e	s	Alternative level (Clock alternated) in the receiver tank at which the supply valve is opened
3-4-1-4-9-4	Level 1A closed	Min. 60 Max. 99	e	s	Alternative level (Clock alternated) in the receiver tank at which the supply valve is closed
3-4-1-4-10	Supply valve prop.				The supply valve proportional opened with which the receiver tank is filled
3-4-1-4-10-1	Level setpoint 1	Min. 80 Max. 99	e	s	Maximum level in the receiver tank at which the proportional valve is fully closed
3-4-1-4-10-2	Level setpoint 1A	Min. 40 Max. 99	e	s	Alternative level (Clock alternated) in the receiver tank at which the proportional valve is fully closed
3-4-1-4-10-3	Hysteresis	Min. 15 Max. 99	e	s	Differential level in the receiver tank at which the proportional valve is fully opened
3-4-1-4-10-4	Sample time	Min. 10 Max. 99	e	s	Time between the level measurements controlling the proportional valve position
3-4-1-5	Auto. Setpoint Redu.				Automatic setpoint reduction by low inlet pressure
3-4-1-5-1	ASR function	ON,OFF	e	s	Automatic setpoint reduction function
3-4-1-5-2	Inlet Set point	Min. 100 Max. 400	e	s	Inlet setpoint used for automatic reduction by low inlet pressure
3-4-1-5-3	Proportional const.	Min. 3 Max.10	e	s	Proportional amplification factor the system pressure is controlled with
3-4-1-5-4	Integral time	Min. **0.9** Max. 60	e	s	Speed with which the deviation of the required system pressure is adjusted
3-4-1-5-5	Differential time	Max. 99.99	e	s	The level of damping with which the deviation of the required system pressure is controlled
3-4-1-5-6	ARW delay factor	Min. **5** Max. 100	f	f	Setting for ARW control, sampletime factor tarw >= 5 * ts
3-4-1-5-7	Differential time				The level of damping with which the deviation of the required system pressure is controlled
3-4-1-5-8	ARW delay factor				Setting for ARW control, sampletime factor tarw >= 5 * ts
3-4--1-5-9	Switch On time				Switching on time after Automatic setpoint reduction shutdown alarm
3-4-1-5-10	Switch On time				Shutdown is not actived if the inlet pressure is not less then set value for switch-off time
3-4-2	Discharge				Discharge pressure settings
3-4-2-1	Sensor press. 4 mA	Min. -100 Max. 1000	e	s	Measured value at 4mA
3-4-2-2	Sensor press. 20 mA	Min. **1000** Max. 9999	e	s	Measured value at 20mA

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-4-2-3	Pumps ON sensor fail	Max. 3	e	s	Number of pumps that is started in case of a failure of the pressure sensor on the discharge side.
3-4-2-4	Max power	Min. **600** Max. 600	e	s	Limitation of the maximum power / maximum system load (1 pump is 100%)
3-4-2-5	Max power ext. oper.	Min. **600** Max. 600	e	s	Limitation of the maximum power / maximum system load, when external power supply operation is active
3-4-2-6	Damp. Time P. Sensor	Min. 100 **200** Max. 2000	f	f	Damping time for smoothing the measured value, to compensate peaks in the measured values
3-4-3	Variable freq. drive				Configuration of variable frequency drive
3-4-3-1	Communication	Danfoss AquaDrive,Danfoss MicroDrive,Danfoss VLT 2800,PumpDrive,Analog 4-20mA,**None**	e	s	Configuration of the communication protocol of the frequency converter
3-4-3-2	Proportional const.	**3** Max. 100	e	s	Proportional amplification factor the system pressure is controlled with
3-4-3-3	Integral time	**0.9** Max. 60	e	s	Speed with which the deviation of the required system pressure is adjusted
3-4-3-4	Differential time	Max. 99.99 **0**	e	s	The level of damping with which the deviation of the required system pressure is controlled
3-4-3-5	No flow detection				
3-4-3-5-1	No flow bandwith	**6** Max. 50	s	s	Bandwith of the no flow detection
3-4-3-5-2	No flow time	**16** Max. 60	s	s	Time of the no flow detection in s
3-4-3-5-3	No flow step	**1** Max. 50	s	s	Step height of the no flow detection in %
3-4-3-5-4	No flow max. power	Min. 1 Max. **100**	s	s	No flow detection is active below this Pump load in %
3-4-3-9	VFD Ramp-Up	Min. 0.1 **3** Max. 999	e	s	Setting of the ramp-up of the VFD
3-4-3-10	VFD Ramp-Down	Min. 0.1 **3** Max. 999	e	s	Setting of the ramp-down of the VFD
3-4-3-11	VFD min. frequency	Min. 30 Max. 50	e	s	Minimum frequency of the VFD
3-4-3-12	VFD max. frequency	Min. 30 **50** Max. 60	e	s	Maximum frequency of the VFD
3-4-3-13	P nominal of VFD	**1500** Max. 100000	e	s	nominal power of the VFD
3-4-3-14	U nominal of VFD	**400** Max. 500	e	s	nominal voltage of the VFD
3-4-3-15	F nominal of VFD	Min. **50** Max. 60	e	s	nominal frequency of the VFD
3-4-3-16	I nominal of VFD	**4.4** Max. 450	e	s	nominal current of the VFD
3-4-3-17	RPM nominal of VFD	**2880** Max. 10000	e	s	nominal speed of the VFD
3-4-3-18	BCC Failure DelayCnt	**1** Max. 200	f	f	BCC Failure Delay Count
3-4-3-19	ARW delay factor	**Min. 5** Max. 100	f	f	Setting for ARW control, sampletime factor tarw >= 5 * ts

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-4-3-20	Motor Speed Unit	Hz,**RPM**	e	s	Unit of motor speed
3-4-3-21	Digital I/P 33 func.	Coasting stop inv.,**No Function**	e	s	Selection of digital input
3-4-3-22	Digital I/P 29 func.	Jog Function,Jog Function,**No Function**	e	s	Selection of digital input
3-4-3-23	Jog frequency	Min. 30 Max. **50**	e	s	Motor speed manual mode
3-4-3-24	Jog ramp time	Min. 0.05 **5** Max. 3600	e	s	Ramp time
3-4-3-25	Costing select	**Digital Or Bus**,Digital And Bus,Bus,Digital Input	e	s	Selection manual mode
3-4-3-26	Start select	**Digital Or Bus**,Digital And Bus,Bus,Digital Input	e	s	Selection start signal
3-4-3-27	Slip Compensation				Slip Compensation of the VFD
3-4-3-27	Slip Compensation	Min. -400 **0** Max. 399	e	s	Slip Compensation of the VFD
3-4-4	WSD settings				WSD functionality settings
3-4-4-1	Nbr of refreshments	**30** Max. 99	e	s	Numbers of refreshments of the membrane tank. (water entering the tank)
3-4-4-2	Refresh time span	**24** Max. 999	e	s	Time span of the numbers of refreshments
3-4-4-3	Average room temp.	**25** Max. 50	e	s	Average (pump) room temperature.
3-4-4-4	Room temp. time span	**24** Max. 999	e	s	Time span of average (pump) room temperature
3-4-5	MPO settings				
3-4-5-1	High Load Profile	Cube,**Linear**	c	c	High load profile
3-4-5-2	Rated Freq	Min. 45 **50** Max. 65	e	s	
3-4-5-3	Switch On Freq.	Min. 31 **49** Max. 50	e	s	
3-4-5-4	Switch Off Freq.	Min. 30 **31** Max. 49	e	s	
3-4-5-5	Cubic setting				Cubic Paramter settings
3-4-5-5-1	Power 1	Min. **1.5** Max. 100	e	s	
3-4-5-5-2	Power 2	Min. **1.5** Max. 100	e	s	
3-4-5-6	Linear setting				Linear Paramter settings
3-4-5-6-1	Power 1	Min. **1.5** Max. 100	e	s	
3-4-5-6-2	Power 2	Min. **1.5** Max. 100	e	s	
3-4-5-6-3	Power 3	Min. **1.5** Max. 100	e	s	
3-4-5-6-4	Power 4	Min. **1.5** Max. 100	e	s	
3-4-5-7	Motor settings				Motor Paramter settings
3-4-5-7-1	Rated Motor Power	Min. **1.5** Max. 110	e	s	Motor rating plate

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-4-5-7-2	Rated Motor Speed	Min. 300 **1450** Max. 3600	e	s	Motor rating plate
3-4-5-7-3	Rated Freq	Min. 45 **50** Max. 65	e	s	Motor rating plate
3-4-5-7-4	Rated Current	Min. 0.1 **10** Max. 999	e	s	Motor rating plate
3-4-5-7-5	Rated Cosphi	Min. 0.1 **0.81** Max. 0.99	e	s	Motor rating plate
3-4-5-8	Pump parameters				Pump Paramters settings
3-4-5-8-1	Nominal Voltage	**400** Max. 65535	c	c	Pump rating speed
3-5	Pressure				System pressure settings
3-5-1	Set point	**400** Max. 1000	e	c	System pressure set point
3-5-3	Bandwidth	**5** Max. 999	e	c	A dead area in which the power to the VFD remains constant independent from pressure fluctuations.
3-5-4	Accumulation press.	**30** Max. 999	e	c	Membrane tank (water) pressure accumulation prior to the system switch-off
3-5-5	Max.set point	Min. 400 **Max. 1000**	e	s	Upper limit for the setpoint value to be set by the customer
3-5-9	Adapt. setpoint	**400** Max. 1000	e	c	Alternative setpoint alternating by clock set-tings.
3-5-10	Delta p	Min. -999 Max. 999	e	c	Quadratic (+) or linear (-) function to correct the setpoint when a pump is switching on or off
3-5-11	High pressure alarm	Min. 400 Max. **1000**	e	c	Upper limit value for the system pressure to shut down or notification only (signal)
3-5-12	High pressure action		e	c	Selection parameter to define the action at system over-pressure (shut down or signal only)
3-5-12	High pressure action	only message,**shutdown pumps**	e	c	Selection parameter to define the action at system over-pressure (shut down or signal only)
3-5-13	Low pressure alarm	Max. 400	e	c	Under limit value for the system pressure to shut down or notification only (signal)
3-5-14	Low pressure action		e	c	Selection parameter to define the action at system under-pressure (shut down or signal only)
3-5-14	Low pressure action	only message,**shutdown pumps**	e	c	Selection parameter to define the action at system under-pressure (shut down or signal only)
3-5-15	Shut down RDP	**20** Max. 80	e	e	Low inlet pressure or level to protect the pumps for dry running. (system shut down)
3-5-16	Reset RDP	Min. 20 **80** Max. 999	e	e	Reset pressure or level to reset the system after run dry protection shut down
3-5-17	Press. Flow Control	**100** Max. 1000	e	s	Failure no water available gets active if set-point - adjusted pressure is exeeded
3-6	Timer settings				Timer parameter configuration

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-6-1	Opt. pump starts /h	**10** Max. 99	e	s	The optimum nrs of pump starts per hour. The minimum run time will be automatically corrected.
3-6-2	Min. run time	**180** Max. 999	e	c	The minimum time of the pump to run. (the run time correction will not drop below this value)
3-6-3	Min. run time corr.	**10** Max. 99	e	s	Adapting the Minimum run time to optimize the required number of pump starts per hour.
3-6-4	Max. run time	**86400** Max. 356400	e	s	Maximum continuous run time of the pump. After this time the pump will be forced to change over.
3-6-5	Start delay	**1** Max. 999	e	s	Start delay to switch the pumps on when pressure remains low
3-6-6	Stop delay	**1** Max. 999	e	s	Stop delay to switch the pumps off when pressure remains high.
3-6-8	RDP delay	**10** Max. 999	e	s	Delay time after run-dry protection to shut down the system
3-6-9	High/low alarm delay	Min. 10 **60** Max. 999	e	s	Permitted time of setpoint pressure deviation > too high or too low system pressure.
3-6-10	WSD 1 pulse length	**4** Max. 99	e	s	Length in time of the water flow detection device (flow position) digital input 1
3-6-11	WSD 2 pulse length	**4** Max. 99	e	s	Length in time of the water flow detection device (flow position) digital input 2
3-6-12	WSD 3 pulse length	**4** Max. 99	e	s	Length in time of the water flow detection device (flow position) digital input 3
3-6-13	Sys. start up delay	**10** Max. 32	s	s	Delay time for starting up system
3-6-14	Jockey min. run time	Max. 999	s	s	The minimum time of the Jockey pump to run.
3-7	Time/Date				Date and time
3-7-1	Date		e	c	Setting the date
3-7-1	Year	Min. 1970 **2007** Max. 2099	e	c	Setting the actual Year
3-7-1	Month	**1** 12	e	c	Setting the actual Month
3-7-1	Day	**1** 31	e	c	Setting the actual Day
3-7-2	Time		e	c	Setting the time
3-7-2	Time	Max. 86399	e	c	Setting the time HH:MM:SS
3-7-3	Check run mode	Time of week based,Time of day based,**Interval based**,Digital Input,OFF	e	c	Select how and when a checkrun should be performed. (check run only on pumps which did not run)
3-7-4	Check run interval	**86400** Max. 1000000	e	s	The interval between the check runs Applicable for pumps not operation for 24h.
3-7-5	Check run at		e	c	Setting the clock when a check run is required. Applicable for pumps not operation for 24h.
3-7-5	Hours	Max. 23	e	c	Setting the hours of the check run clock
3-7-5	Minutes	Max. 59	e	c	Setting the minutes of the check run clock
3-7-6	Check run at		e	c	Setting the date and clock when a check run is required. Applicable for pumps not operation for 24h.
3-7-6	Hours	Max. 23	e	c	Setting the hours of the check run clock
3-7-6	Minutes	Max. 59	e	c	Setting the minutes of the check run clock

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-7-6	Day	Saturday,Friday,Thursday,Wednesday,Tuesday,Monday,**Sunday**	e	c	Setting the day of the check run clock
3-7-7	Check run duration	Max. **30**	e	s	The check-run time per pump. (one at the time and alternating)
3-7-8	Clock adapt setp.				
3-7-8-1	Adaptation mode	Adapt.ON/OFF per day,Adapt ON/OFF ev. day,**OFF**	e	c	Setting the adaptation mode of the alternative setpoint.
3-7-8-2	Change on/off times		e	c	The alternation to an alternative setpoint becomes active/ will be undo at the selected time.
3-7-8-2	Hours adapt setp.ON	Max. 23	e	c	Setting the hours at which the alternation to a alternative setpoint becomes active
3-7-8-2	Min adapt setp.ON	Max. 59	e	c	Setting the minutes at which the alternation to a alternative setpoint becomes active
3-7-8-2	Hours adapt setp.OFF	Max. 23	e	c	Setting the hours at which the alternation to a alternative setpoint will be undo
3-7-8-2	Min adapt setp.OFF	Max. 59	e	c	Setting the minutes at which the alternation to a alternative setpoint will be undo
3-7-8-3	Select day of week	Saturday,Friday,Thursday,Wednesday,Tuesday,Monday,**Sunday**	e	c	Setting the day at which the alternation to a alternative setpoint becomes active
3-7-8-4	Change on/off times		e	c	The setpoint alternation becomes active/ will be undo at the selected time of the selected day's)
3-7-8-4	Hours adapt setp.ON	Max. 23	e	c	Setting the hours at which the alternation to a alternative setpoint becomes active
3-7-8-4	Min adapt setp.ON	Max. 59	e	c	Setting the minutes at which the alternation to a alternative setpoint becomes active
3-7-8-4	Hours adapt setp.OFF	Max. 23	e	c	Setting the hours at which the alternation to a alternative setpoint will be undo
3-7-8-4	Min adapt setp.OFF	Max. 59	e	c	Setting the minutes at which the alternation to a alternative setpoint will be undo
3-7-9	Date adapt level On		e	c	The level setpoint alternation becomes active at the selected day's) and Month's)
3-7-9	Month adapt level On	December,November,October,September,August,July,June,May,April,March,February,January,**OFF**	e	c	The level setpoint alternation becomes active at the selected Month's
3-7-9	Day adapt level On	Min. **1** Max. 31	e	c	The level setpoint alternation becomes active at the selected day of the selected Month's)
3-7-10	Date adapt level Off		e	c	The level setpoint alternation will be undo at the selected day's) and Month's)
3-7-10	Month adapt lev Off	December,November,October,September,August,July,June,May,April,March,February,January,**OFF**	e	c	The level setpoint alternation will be undo at the selected Month's
3-7-10	Day adapt level Off	Min. **1** Max. 31	e	c	The level setpoint alternation will be undo at the selected day of the selected Month's)
3-7-11	Maintenance interval		s	s	Setting the service / maintenance days left for the system.
3-7-11	Maintenance interval	Max. 3000	s	s	Setting the service / maintenance days left for the system.

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-8	Definable I/O				Configuration of the relays outputs
3-8-1	Inputs				Configurable inputs
3-8-1-1	Input 1	Ext. power operation,By-pass valve,Remote acknowledge,Leak-age,Alternate Set-point,Check run mode,WSD3,WSD2,WSD1, **None**	s	s	Configuration DI
3-8-1-2	Input 2	Ext. power operation,By-pass valve,Remote acknowledge,Leak-age,Alternate Set-point,Check run mode,WSD3,WSD2,WSD1, **None**	s	s	Configuration DI
3-8-1-3	Input 3	Ext. power operation,By-pass valve,Remote acknowledge,Leak-age,Alternate Set-point,Check run mode,WSD3,WSD2,WSD1, **None**	s	s	Configuration DI
3-8-2	Outputs				Configurable inputs
3-8-2-1	Output 1 (P4)	RDP Alarm O/P,By-pass valve,Input valve,Thresh-old relay 2,Threshold relay 1,**None**	s	s	Configuration DO
3-8-2-2	Output 2 (P5)	RDP Alarm O/P,By-pass valve,Input valve,Thresh-old relay 2,Threshold relay 1,**None**	s	s	Configuration DO
3-8-2-3	Output 3 (P6)	RDP Alarm O/P,By-pass valve,Input valve,Thresh-old relay 2,Threshold relay 1,**None**	s	s	Configuration DO
3-8-2-4	Output 4 (FR4)	RDP Alarm O/P,By-pass valve,Input valve,Thresh-old relay 2,Threshold relay 1,**None**	s	s	Configuration DO
3-8-2-5	Output 5 (FR5)	RDP Alarm O/P,By-pass valve,Input valve,Thresh-old relay 2,Threshold relay 1,**None**	s	s	Configuration DO
3-8-2-6	Output 6 (FR6)	RDP Alarm O/P,By-pass valve,Input valve,Thresh-old relay 2,Threshold relay 1,**None**	s	s	Configuration DO
3-9	Messages				Messages
3-9-1	Message Settings		s	s	List of all alerts
3-9-1	failure id		s	s	
3-9-1	Traffic Light	**Red**,Amber,Green	s	s	Fault classification: warning or alert
3-9-1	Fault on Hold	Enabled,**Disabled**	s	s	With / without automatic re-start
3-10	Root Menu				Settings of Root Menu

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-10-1	Root Menu Settings		c	e	List of all root menu elements
	Root Menu Settings	1-1-1	e	e	System pressure
		1-1-2	e	e	System load
		1-1-3	e	e	RDP switch
		1-1-4	e	e	Inlet pressure
		1-1-5	e	e	Level content in %
		1-1-6	e	e	Level height
		1-1-7	e	e	Amb. temp.
		1-1-9	e	e	Position suppl. valve
		1-3-1	e	e	Act.run time op. hours
		1-3-3	e	e	Actual min. run time
3-10-1	Root Menu Settings		f	f	List of all root menu elements
3-10-1	rootmenu selection	Min. **1** Max. 65	f	f	
3-10-1	Traffic Light	ON,**OFF**	f	f	Fault classification: warning or alert
3-11	Energy Saving Mode				Energy Saving Mode
3-11-1	Energy Saving Mode	ON,**OFF**	s	s	Energy Saving Mode
3-11-2	direct off	ON,**OFF**	s	s	Energy Saving Mode without NFD functionality is executed
3-11-3	Power down speed %	Min. 1 **30** Max. 99	s	s	Calculated power down speed if NFD is running in energy saving mode in %
3-11-4	time direct off	Min. **5** Max. 9999	s	s	Time after the Energy Saving Mode without NFD functionality is executed
3-12	FC failure behavior				FC failure behavior
3-12-1	behavior	Fixed Speed,**OFF**	s	f	behavior
3-12-2	Fixed Speed				Fixed Speed
3-12-2-1	Max power	**300** Max. 600	s	s	Limitation of the maximum power / maximum system load (1 pump is 100%)
3-12-2-2	Set point	**400** Max. 1000	s	c	System pressure set point
3-12-2-3	Bandwidth	**30** Max. 999	s	c	System pressure within doubled bandwidth
3-12-2-4	Min. run time	**30** Max. 999	s	c	The minimum time of the pump to run. (the run time correction will not drop below this value)
3-12-2-5	Max. run time	**86400** Max. 356400	s	s	Maximum continuous run time of the pump. After this time the pump will be forced to change over.
3-12-2-6	Start delay	**2** Max. 999	s	s	Start delay to switch the pumps on when pressure remains low
3-13	Pump Changeover				Pump change due to maximum run time
3-13-1	Supply reaction	Over pressure,**Under pressure**	e	s	Selection Under-/Oversupply
3-13-2	Changeover delay		e	s	Time delay between the changeover
3-14	By Pass Valve				By pass valve connected on the discharge side
3-14-1	Valve Function	Digital Input,PT 1000,Check run,**Off**	e	s	Function of the valve
3-14-2	Open delay	**2** Max. 20	e	s	Time delay for opening the valve

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-14-3	Close delay	**2** Max. 20	e	s	Time delay for closing the valve
3-14-4	Temperature	**20** Max. 40	e	s	Above this temperature the valve will be opened
3-14-5	Flush Time	Min. 10 **120** Max. 600	e	s	Time during the valve is opened
3-14-6	Attemps in 24Hrs	Min. 1 **2** Max. 5	e	s	Number of attempts to open valave before an urgent alarm occurs
3-14-7	Min. open time	**2** Max. 20	e	s	Minimal opening time for the valve
3-15	Fieldbus				Fieldbus Settings
3-15-1	Profibus				Profibus Settings
3-15-1-1	PB Slave Address	Min. 1 **126** Max. 255	c	c	Profibus Slave Address
3-15-2	Modbus				Modbus Settings
3-15-2-1	MB Slave Address	Min. **1** Max. 247	c	c	Modbus Slave Address
3-15-2-2	Baudrate	**38400**,19200,9600	c	c	

3.1.4 Info  (Quick access button "info")

Table 4: Parameter list info

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
4	Info				Information
4-1	Device				Serial number of the control module
4-1-1	Serial Number		e	e	Serial number of the control module
4-1-2	Parameter Set		e	e	HMI parameter set version
4-2	IO Info				
4-2-1	IO Serial Number		e	e	
4-2-2	IO FW-Version		e	e	
4-2-3	IO FW-Revision		e	e	
4-2-4	IO HW-Revision		e	e	
4-3	HMI Info				
4-3-1	HMI Serial Number		e	e	
4-3-2	HMI FW-Version		e	e	
4-3-3	HMI FW-Revision		e	e	
4-3-4	HMI HW-Revision		e	e	
4-4	Profibus Info				
4-4-1	PB FW-Version		e	e	
4-4-2	PB FW-Revision		e	e	
4-4-3	PB HW-Revision		e	e	

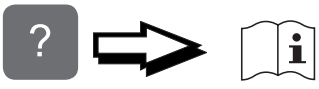
Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
4-5	Modbus Info				
4-5-1	MB FW-Version		e	e	
4-5-2	MB FW-Revision		e	e	
4-5-3	MB HW-Revision		e	e	

3.1.5 Quick menu OK (Quick access button "OK")

Table 5: Parameter list OK

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-2-1-1.1	PIN		e	n	
3-4-1-4-8-1	Threshold 1 ON	Min. 50 Max. 99	f	s	Water level at which the relays output becomes high
3-4-1-4-8-2	Threshold 1 OFF	Min. 50 Max. 99	f	s	Water level at which the relays output becomes low
3-4-1-4-8-3	Threshold 2 ON	Min. 40 Max. 99	f	s	Water level at which the relays output becomes high
3-4-1-4-8-4	Threshold 2 OFF	Min. 40 Max. 99	f	s	Water level at which the relays output becomes low
3-4-1-4-9-1	Level 1 open	Min. 70 Max. 99	e	s	Level in the receiver tank at which the supply valve is opened
3-4-1-4-9-2	Level 1 closed	Min. 90 Max. 99	e	s	Level in the receiver tank at which the supply valve is closed
3-4-1-4-10-1	Level setpoint 1	Min. 80 Max. 99	e	s	Maximum level in the receiver tank at which the proportional valve is fully closed
3-4-1-4-10-3	Hysteresis	Min. 15 Max. 99	e	s	Differential level in the receiver tank at which the proportional valve is fully opened
3-4-1-4-10-4	Sample time	Min. 10 Max. 99	e	s	Time between the level measurements controlling the proportional valve position
3-4-3-2	Proportional const.	**3** Max. 100	e	s	Proportional amplification factor the system pressure is controlled with
3-4-3-3	Integral time	**0.9** Max. 60	e	s	Speed with which the deviation of the required system pressure is adjusted
3-4-3-4	Differential time	Max. 99.99	e	s	The level of damping with which the deviation of the required system pressure is controlled
3-4-3-9	VFD Ramp-Up	Min. 0.1 **3** Max. 999	e	s	Setting of the ramp-up of the VFD
3-4-3-10	VFD Ramp-Down	Min. 0.1 **3** Max. 999	e	s	Setting of the ramp-down of the VFD
3-5-1	Set point	**400** Max. 1000	e	c	System pressure set point
3-5-3	Bandwidth	**5** Max. 999	e	c	A dead area in which the power to the VFD remains constant independent from pressure fluctuations.

Parameter		Value (default = Bold)	Level (read)	Level (write)	Help text
3-5-4	Accumulation press.	**30** Max. 999	e	c	Membrane tank (water) pressure accumulation prior to the system switch-off
3-5-10	Delta p	Min. -999 Max. 999	e	c	Quadratic (+) or linear (-) function to correct the setpoint when a pump is switching on or off
3-5-11	High pressure alarm	Min. 400 Max. **1000**	e	c	Upper limit value for the system pressure to shut down or notification only (signal)
3-5-12	High pressure action		e	c	Selection parameter to define the action at system over-pressure (shut down or signal only)
3-5-13	Low pressure alarm	Max. 400	e	c	Under limit value for the system pressure to shut down or notification only (signal)
3-5-14	Low pressure action		e	c	Selection parameter to define the action at system under-pressure (shut down or signal only)
3-5-15	Shut down RDP	**20** Max. 80	e	e	Low inlet pressure or level to protect the pumps for dry running. (system shut down)
3-5-16	Reset RDP	Min. 20 **80** Max. 999	e	e	Reset pressure or level to reset the system after run dry protection shut down
3-5-17	Press. Flow Control	**100** Max. 1000	e	s	Failure no water available gets active if set-point - adjusted pressure is exeeded
3-6-2	Min. run time	**180** Max. 999	e	c	The minimum time of the pump to run. (the run time correction will not drop below this value)
3-6-5	Start delay	**1** Max. 999	e	s	Start delay to switch the pumps on when pressure remains low
3-6-6	Stop delay	**1** Max. 999	e	s	Stop delay to switch the pumps off when pressure remains high.
3-6-8	RDP delay	**10** Max. 999	e	s	Delay time after run-dry protection to shut down the system
3-6-9	High/low alarm delay	Min. 10 **60** Max. 999	e	s	Permitted time of setpoint pressure deviation > too high or too low system pressure.



READ THE (SUPPLEMENTARY) DOCUMENTATION
Lees de bijbehorende (aanvullende) documentatie.