

DEMINERALIZATION STATION

INSTRUMENT SETPOINT LIST 1 (2)

NO	DESIGNATION	SETPOINT	REMARKS
FS 1701	Main flow	20 m3/h (20%)	Range: 0-100 m3/h (Limit valve sensor, Pos. 6 in control panel)
FS 1705	Acid dilution flow	8 m3/h	Range: 2-18 m3/h Design flow: 11 m3/h
FS 1706	Caustic dilution flow	7.5 m3/h	Range: 2-18 m3/h Design flow: 9.7 m3/h
LS 1702	Level in acid measuring tank	Distance be- tween H- and L-contact: 780 mm	<p><i>F 1703 = ~1400 l/2</i></p> <p>Total volume: 900 l Reg. volume: 590 l</p>
LS 1704	Level in caustic measuring tank	Distance be- tween H- and L-contact: 710 mm	<p><i>F 1704 = ~55%</i></p> <p>Total volume: 500 l Reg. volume: 340 l</p>

DEMINERALIZATION STATION

INSTRUMENT SETPOINT LIST 2 (2)

NO	DESIGNATION	SETPOINT	REMARKS
CS 1701	Conductivity after anion filter	Alarm 1: 5 us/cm Alarm 2: 8 us/cm	Range: 0-10 uS/cm
CS 1702	Conductivity after polishing cation filter	Alarm 1: 0.5 us/cm Alarm 2: 0.8 us/cm	Range: 0-1 us/cm
QS 1701	Silica after anion filter	15 ppb	Range: 0-50 ppb (During reg. sample is taken after the P1703 pumps)



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DEMINERALIZATION STATION

BASIC POSITION LIST FOR VALVES

NO	C	O	P	CH	S	REMARKS
V 1701		x				
V 1702						Solenoid valve
V 1703		x				
V 1704						Solenoid valve
V 1705	x					
V 1706	x					
V 1701	x					
V 1708	x					
V 1709						NU
V 1710						NU
V 1711			x			
V 1712						NU
V 1713	x					
V 1714	x					
V 1715			x			
V 1716			x			
V 1717						
V 1718	x					
V 1719				x		
V 1720						NU

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 DEMINERALIZATION STATION

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BASIC POSITION LIST FOR VALVES (cont'd)

NO	C	O	P	CH	S	REMARK
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V 1741		x				
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V 1742				x		
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V 1743		x				
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V 1744		x				
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V 1745				x		
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V 1746		x				
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V 1747		x				
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V 1748				x		
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V 1749		x				
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V 1750						NU
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V 1751		x				
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V 1752				x		
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V 1753		x				
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V 1754		x				
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V 1755				x		
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V 1756		x				
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V 1757						NU
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V 1758						NU
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V 1759						NU
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V 1760			x			
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BASIC POSITION LIST FOR VALVES (cont'd)

NO	C	O	P	CH	S	REMARK
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V 1761				x		
V 1762		x				
V 1763			x			
V 1764				x		
V 1765			x			

V 1766				x		
V 1767		x				
V 1768			x			
V 1769				x		
V 1770		x				

V 1771			x			
V 1772		x				
V 1773		x				
V 1774		x				
V 1775		x				

V 1776		x				
V 1777			x			
V 1778			x			
V 1779				x		
V 1780		x				



BASIC POSITION LIST FOR VALVES

NO	C	O	P	CH	S	R	REMARK
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V 1781 x

V 1782 x

V 1783 x

V 1784 x

V 1785 x

V 1786 x

V 1787 x

V 1788 x

V 1789 x

V 1790 NU

V 1791 x

V 1792 x

V 1793 x

V 1794 x

V 1795 x

V 1796 x

V 1797 x

V 1798 x

V 1799 NU

C = closed

O = open

P = pneumatic actuator

CH= check valve

S = safety valve

R = reduction valve

NU= number not used

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 DEMINERALIZATION STATION
 AKVAPUR 901116

ALARM LIST I (2)

ALARM NO	INSTRUMENT NO	DESIGNATION	ACTIVATED	REMARKS
1	CS 1701	High conductivity after anion filter	During service	H1 sets alarm H2 stops prod. in AUTO
2	CS 1702	High conductivity after polishing cation filter	During service	H1 sets alarm H2 stops prod. in AUTO
3	QS 1701	High SiO ₂ content	During service	
4	QS 1701	Silicometer failure	Always	
5	-	Cond. for reg. start Long filling time	When starting regeneration When filling measure vessels.	
6	-	Long chemical injection time	During acid and caustic injection	
7a	FS 1705	Low dilution flow HCl	During acid injection and slow rinse cation F	Closes valve V 1763
7 b	FS 1706	Low dilution flow NaOH	During caustic injection and slow rinse anion F	Closes valve V 1768



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DEMINERALIZATION STATION

ALARM INSTRUCTION

(see ALARM LIST and INSTRUMENT SETPOINT LIST)

1. HIGH CONDUCTIVITY AFTER ANION FILTER

1.1 Reset alarm.

1.2 If about 680 m³ water has been produced during the cycle:

Start regeneration.

1.3 If only a small amount of water has been treated since the last regeneration and production continues:

Check the conductivity. See below.

If service has been stopped (manually or automatically):

Start rinse as follows:

- Push MAN REG.

- Push CIRCULATION

The line is now rinsing.

After 10-15 minutes, check if the conductivity is going down. If so, continue circulation until accepted conductivity.

- Push STOP/RESET twice to go back to OFF position.

If conductivity remains high, go back to OFF position (see above) and start automatic regeneration.

NOTE: The alarm signals cannot be activated during the first hour of service.

There are two alarm levels:

H1: which generates alarm.

H2: which stops service in AUTO position.

2. HIGH CONDUCTIVITY AFTER POLISHING CATION FILTER

2.1 Reset alarm.

2.2 If about 680 m³ water has been produced during the cycle:

Start regeneration.

2.3 If only a small amount of water has been treated since the last regeneration and production continues:

Check the conductivity (see below).

If service has been stopped (manually or automatically):

Start rinse as follows:

- Push MAN REG.
- Push CIRCULATION.

The line is now rinsing.

After 10-15 minutes, check if the conductivity is going down. If so, continue circulation until accepted conductivity.

- Push STOP/RESET twice to go back to OFF position.

If conductivity remains high, go back to OFF position (see above) and start automatic regeneration.

NOTE: There are two alarm levels:

- H1: which generates alarm or prolongs rinse at the end of regeneration or start rinse.
- H2: which stops service in AUTO position.

3. HIGH SiO₂ CONTENT

3.1 Reset alarm.

3.2 High silica content may occur at the end of the production period and then most probably after that the strong anion resin has been used for some years.

Control the calibration and the function of the silica meter (see instruction).

If possible take a sample for lab test.

Regenerate the line.

If the alarm appears several times at the end of the production periods and lab tests confirm silica leakage the strong anion resin may be re-conditioned by an alkaline brine wash. If that does not help the strong anion resin probably has to be exchanged.

4. SILICOMETER FAILURE

4.1 Reset alarm.

4.2 Consult the manual for the silica meter. Check the levels for sample, reagent and calibration solution.

5. CONDITION FOR REGENERATION START
 LONG FILLING TIME

5.1 Reset alarm.

5.2 If alarm appears at regeneration start:

 Control the level in the demin storage
 tanks H 1706 A/B.

 Control the levels in the acid and caustic
 measuring vessels.

 If alarm appears at the end of or after regene-
 ration:

 Control the filling of measuring vessels for
 acid and caustic from the chemical storage
 tanks.

6. LONG CHEMICAL INJECTION TIME

6.1 Reset alarm.

6.2 Control the acid flow on FI 1703 and the caustic
 flow on FI 1704.

 Compare with figures for the flows showed on the
 service and regeneration diagram. Check valve
 positions.

- 7A LOW DILUTION FLOW HCl (ACID)

- 7B LOW DILUTION FLOW NaOH (CAUSTIC)

- 7.1 Reset alarm.

- 7.2 Check positions of valves and flow through FI
 1705 (acid) and FI 1706 (caustic).

- 8. LONG RINSE PERIOD (CIRCULATION)

- 8.1 Reset alarm.

- 8.2 Continue to rinse 25 min. Check the flow and see
 if conductivity goes down.

 If conductivity remains high, stop circulation
 by pushing STOP, S6, twice.

 After a few minutes: Start circulation again and
 see if conductivity shows any sign to go down.

 If conductivity remains high and is not
 acceptable:

 Start a new regeneration and check all functions
 during execution.

- 9. LONG START RINSE PERIOD

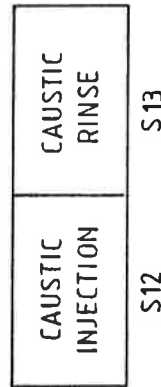
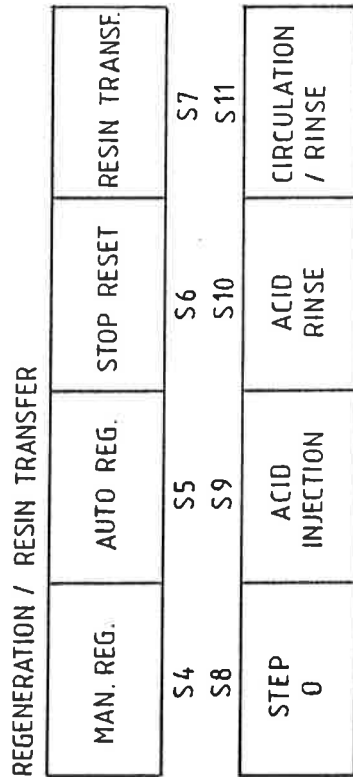
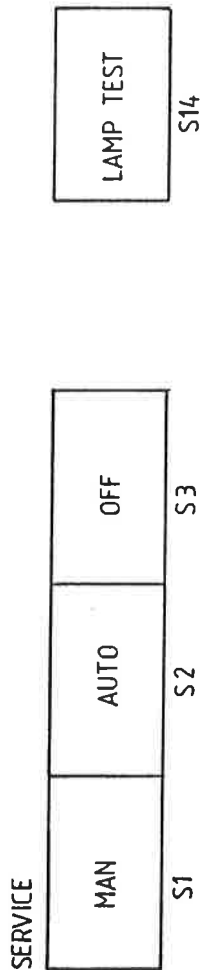
- 9.1 Reset alarm.

- 9.2 See LONG RINSE PERIOD, 8.2.

- 10. DEVIATING VALVE POSITION
 - 10.1 Reset alarm.
 - 10.2 Check positions of valves with pneumatic actuators and compare with service and regeneration diagram.

Control electrical and pneumatic supplies.
- 11. LOW LEVEL DEMIN TANKS H 1706 A/B
 - 11.1 Reset alarm.
 - 11.2 Control the tanks and the flows to and from the tank, valves, pumps etc.
- 12. MCB TRIPPER
 - 12.1 Reset alarm.
 - 12.2 Check which breaker that has tripped.
Check the electrical circuit.
- 13. MOTOR OVERLOAD
 - 13.1 Reset alarm.
 - 13.2 Check the overload position and the electrical circuit. Reset.

- 14. LOW BATTERY CAPACITY PLC
- 14.1 Reset alarm.
- 14.2 Exchange the PLC battery. See PLC manual.



SPOLANA NERATOVICE

DEMINERALIZATION STATION

PUSHBUTTONS FOR SERVICE
AND REGENERATION

DATE

90 12 12

DR'N

SE

CH'D

OBJ. NO

9006

DRWG NO

4F-5951

ISSUE

SPOLANA NERATOVICE
 DEMINERALIZATION STATION
 AKVAPUR 9011116

ALARM LIST 2 (2)

ALARM NO	INSTRUMENT NO	DESIGNATION	ACTIVATED	REMARKS
8	-	Long rinse period	During circulation (at end of regeneration)	Circulation continues
9	-	Long start rinse period	During start rinse (circulation)	Circulation continues
10	-	Deviating valve position	Always	
11	LS 1705.6	Low level demin tank H 1706 A/B	Always	Stops pump P 1702 A/B and P 1703 A/B/C.
12	-	MCB tripped (miniature circuit breaker)	Always	
13	-	Motor overload	Always	
14	-	Low battery capacity PLC	Always	