

**VENDORS FRONT SHEET
FOR A4 DOCUMENTS**

PURCHASE ORDER No.:
PO-FF-22-26-1008

PROCUREMENT PACKAGE No.:
MA-008

PAGE 1 OF 5

VENDOR INFORMATION

COMPANY
NAME:

ABB Miljø Norsk Viftefabrikk AS

ADDRESS:

**OLE DEVIKS VEI 10, 0666 OSLO
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PER INGAR VEN

EXT.:

47 22 72 92 83

VENDOR DOCUMENT
NUMBER:

630001-410-001

DOCUMENT TITLE:

**EQUIPMENT DATA SHEET
FINE FILTER VESSEL**

PROJECT DOC. No.:

DS-FF-22-26-8006

FRØY INTEGRATION WORK ON TCP 2

EQUIPMENT DESCRIPTION:

WATER INJECTION-FINE FILTER PACKAGE

PKG. TAG No.: **CQ603**

LOCATION: **M35**

VDRL CODES: **C07**

ITEM TAG Nos.: **CV619A/B/C**

VENDOR SIGNATURE:

Per Ing. Ven

DATE:

04.02.94

P.O. NUMBER

FF-22-26-1008

SEQUENCE No.

C-0007

REV

04

VDRL
CAT.

C



VERITEC

**AS BUILT
SUPPLIER**

Date:

04/02/94

Signature:

[Signature]



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
FINE FILTER VESSEL**

Package No.	CQ603	Doc. No.	DS-FF-22-26-8006	Rev.	04	Page	2 of 5
Tag No	CV619A/B/C			No of units	3		
Service	SEA WATER FILTER			Location	M35		
Size	N/A			P.O. No.	PO-FF-22-26-1008		
Type	REGENERABLE CARTRIDGE			P&ID Doc. No.	FF-22-26-00-8056		
Supplier	ABB MILJØ NV AS				630001-400-001		
Applicable to	<input type="checkbox"/> Proposal			<input type="checkbox"/> Purchase	<input checked="" type="checkbox"/> As built		
01 Process							
02 Filtered liquid	RAW SEA WATER						
03 Suspended solids [mg/l]	0.1-2.0						
04 Particle size range [µm]	FRIGG FIELD QUALITY						
05 Degree of filtration [µm]	100% REMOVAL OF ALL PARTICLES > 5 µm						
06 Density [kg/m3]	1028-1022						
07 Viscosity [cP]	1.44-0.89						
08 Flowrate normal [m3/h]	480						
09 Flowrate design [m3/h]	480 (240 m3/h/VESSEL - 2 VESSELS ONLINE)						
10 Minimum filter flow [m3/h]	40 (SEAWATER FILTRATION PACKAGE)						
11 Maximum filter flow [m3/h]	480/FILTER VESSEL						
12 Filter type	<input type="checkbox"/> Media bed			<input checked="" type="checkbox"/> Cartridge			
13							
14 Anticipated life of cartridge [year]	1						
15 Cartridge type 1. Stage	PALL PART No.: BWAB4P400-XHS						
16 Cartridge type 2. Stage	PALL PART No.: BWAB3P050-XHS						
17 Filtering area [m2] (Note 4)	STAGE 1 : 2190 STAGE 2 : 1260						
18 Nominal pore size [µm]	STAGE 1 : 40 STAGE 2 : 5						
19							
20							
21 DESIGN DATA							
22 Code	BS 5500 Edition 1991						
23 Category	1						
24 Code for design of supports	NS 3472E						
25 Specifications	S-10-26-002/SP-FF-22-26-0014						
26							
27 Wind loading	1.32 kN/m2 (v = 46 m/s)						
28 Explosion blast pressure [barg]	0.2 (external pressure/internal vacuum)						
29 Earthquake loading	N/A						
30 Transportation loading on land	N/A						
31 Transportation loading on sea, accelerations	VERTICAL: 0.6*G + WEIGHT/HORIZONTAL: 0.8*G						
32 Transportation loading on sea, tilt	20°						
33 Operating pressure [barg]	6.5						
34 Design pressure [barg]	10.0						
35							
36							
37 Differential pressure clean [bar]	0.1						
38 Maximum differential pressure dirty [bar]	3.0 (Note 7)						



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

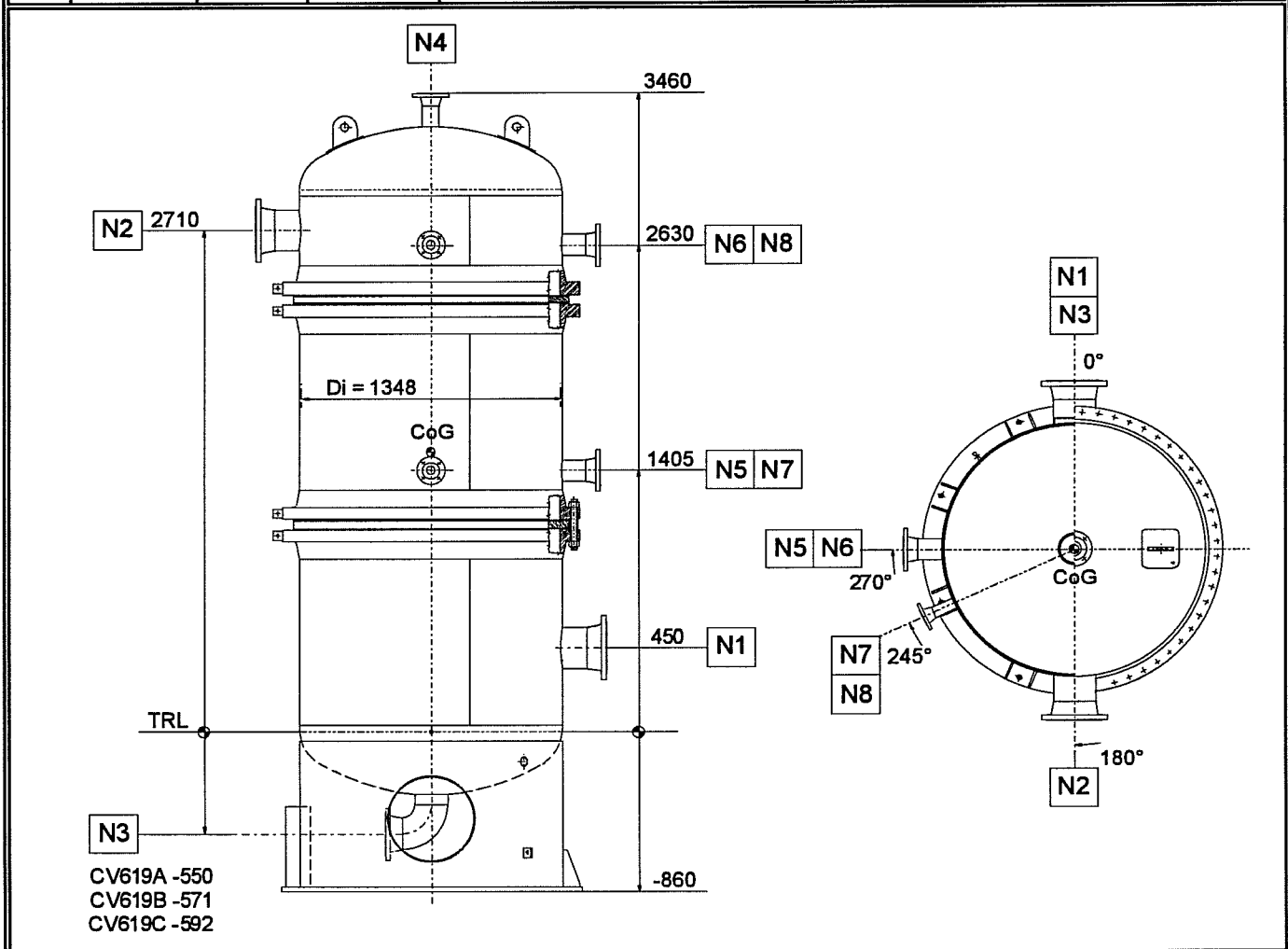
**EQUIPMENT DATA SHEET
FINE FILTER VESSEL**

Package No.	CQ603	Doc. No.	DS-FF-22-26-8006	Rev.	04	Page	3 of 5
39	Operating temperature min/max [°C]			5/25			
40	Design temperature [°C]			-10/60			
41	Operating volume [m3]			3.85 (INTERNALS INSTALLED)			
42	Total volume [m3]			4.43			
43	Inside diameter [mm]			1348			
44	Height tan/tan [mm]			2930			
45	Horizontal or vertical vessel			VERTICAL			
46	Type of heads			TORISPHERICAL			
47	One piece or welded heads			ONE PIECE			
48	Corrosion allowance [mm]			3.0			
49	Shell thickness incl. corrosion allowance [mm]			12.0			
50	Head thickness incl. corrosion allowance [mm]			MIN. 12.0			
51	Skirt thickness [mm]			6.0			
52	Skirt height to bottom tangent line [mm]			760			
53	Saddle plate thickness [mm]			N/A			
54	Lifting lugs			2 OFF			
55	Platform supports			N/A			
56	Ladder attachments			N/A			
57	Free height required for maintenance [mm]			100 (Note 5)			
58	Free space required in any direction [mm]			(Note 8)			
59	Earthing lugs			2 OFF			
60	WEIGHTS (PER FILTER VESSEL)			(Note 10)			
61	Total weight, empty (Ex. internals)		[kgs]	3217			
62	Total weight, operating		[kgs]	9141			
63	Total weight, hydrotest (Ex. internals)		[kgs]	7565			
64	Total weight, shipping (Incl. internals)		[kgs]	4793			
65	Weight of internals		[kgs]	1576			
66	Weight of middle/top section w/elements 2. stage			2858			
67	Weight of filter cartridges		[kgs]	1ST STAGE : 572, 2ND STAGE : 521 (Note 2)			
69	MATERIALS	MATERIAL DESIGNATION		CERTIFICATE TYPE		REFERENCE	
70	Shell	RAEX 385P		DIN 50049-3.1B		NGS 1205 (Note 1)	
71	Heads	RAEX 385P		DIN 50049-3.1B		NGS 1205 (Note 1)	
72	Nozzle neck plates	N/A					
73	Nozzle neck pipes	API 5L X52 Modified		DIN 50049-3.1B			
74	Forged nozzles	N/A					
75	Forged flanges	ASTM A 350-89a Gr. LF2		DIN 50049-3.1B			
76	Forged body flange	ASTM A 694-F52		DIN 50049-3.1B		API 605	
77	Reinforcement pads	RAEX 385P		DIN 50049-3.1B		NGS 1205 (Note 1)	
78	Saddle doubl. plate	N/A					
79	Saddles	N/A					
80	Skirt	RAEX 385P		DIN 50049-3.1B		NGS 1205 (Note 1)	
81	Brackets/supports	N/A					
82	Ladders/platforms	N/A					
83	Name plate	ASTM A 240 - 316		DIN 50049-2.2			
84	Bolt for ext. flanges	ASTM A 320-90 Gr. L7		DIN 50049-2.2		Note 9	
85	Nuts for ext. flanges	ASTM A 194-90 Gr. 7		DIN 50049-2.2		Note 9	
86	Bolt for internals	UNS S31254		DIN 50049-2.2			
87	Nuts for internals	UNS S31254		DIN 50049-2.2			

Package No. CQ603	Doc. No. DS-FF-22-26-8006	Rev. 04	Page 4 of 5
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PROTECTIVE COATING	
88 Surface preparation inside	Sandblasting to SA 2.5/priming/lining (Note 3)
89 Paint inside	N/A
90 Surface preparation outside	To Spec. S-10-00-0010 Appendix 5 (Carboline)
91 Paint outside	To Spec. S-10-00-0010 Appendix 5 (Carboline)

NOZZLE LIST FINE FILTER VESSEL					FLANGES (ANSI B16.5)		NOZZLE PIPE	
	NOZZLE	No. OFF	DN	SERVICE	RATING	TYPE	NPS	SCH.
92	N1	1	8"	WATER INLET	150#	WNRF	8"	XS
93	N2	1	8"	WATER OUTLET	150#	WNRF	8"	XS
94	N3	1	6"	DRAIN	150#	WNRF	6"	XS
95	N4	1	3"	VENTILATION	150#	WNRF	3"	XS
96	N5	1	4"	AIR INLET 1ST ST. (NOTE 6)	150#	WNRF	4"	XS
97	N6	1	4"	AIR INLET 2ND ST. (NOTE 6)	150#	WNRF	4"	XS
98	N7	1	2"	ACID INLET, 1ST STAGE	150#	WNRF	2"	160
99	N8	1	2"	ACID INLET, 2ND STAGE	150#	WNRF	2"	160
100								
101								





**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
FINE FILTER VESSEL**

Package No. CQ603	Doc. No. DS-FF-22-26-8006	Rev. 04	Page 5 of 5
FABRICATION, INSPECTION AND TESTING			
102 Inspection Authority	DnV		
103 Post weld heat treatment	NOT REQUIRED		
104 Radiographic inspection of butt welds	100%		
105 Ultrasonic inspection of butt welds	Ref. US of nozzle shell connections.		
106 Ultrasonic inspection of nozzle/shell connections	100%		
107 MPI of nozzle/shell connections	100%		
108 Hydrostatic test pressure	17.4 BarG		
109 Production test	N/A		
110 Lifting lugs	100% US & MPI		
NOTES			
<ol style="list-style-type: none">1. According to Nordic Group for Steel Regulations.2. Complete cartridge bundle.3. Filter vessel lined internally with 4 mm elastomer Chlorosulfonated Polyethylene, (HYPALON) to BS 6374 Part 5. Flange facings lined with 2 mm elastomer (HYPALON).4. Total filtering area for 3 filter vessels.5. Required lifting height for vessel sections. Required height for lifting equipment to be added. For withdrawal of filter cartridges, ref Doc. No. FF-22-26-00-8052, Dismantling, Fine Filter Vessel.6. Nozzle pipe internally lined with HYPALON. Protruding part of nozzle pipe also lined externally.7. The process has accepted max. 3.0 Bar due to up-stream conditions. The filter cartridge itself can absorb higher dP.8. Refer Doc. No. FF-22-26-00-8047, General Arrangement, Plan9. Hot dip galvanized10. For weights of complete package, ref. Doc. No. DS-FF-22-26-8005, Weight Data Sheet			

**VENDORS FRONT SHEET
FOR A4 DOCUMENTS**

PURCHASE ORDER No.:
PO-FF-22-26-1008
PROCUREMENT PACKAGE No.:
MA-008

PAGE 1 OF 6

VENDOR INFORMATION

COMPANY
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ABB Miljø Norsk Viftefabrikk AS

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VENDOR DOCUMENT
NUMBER:

630001-440-001

DOCUMENT TITLE:

**EQUIPMENT DATA SHEET
GAS CYCLONE**

PROJECT DOC. No.:

DS-FF-22-26-8007

FRØY INTEGRATION WORK ON TCP 2

EQUIPMENT DESCRIPTION:

WATER INJECTION-FINE FILTER PACKAGE

PKG. TAG No.: **CQ603**

LOCATION: **M35**

VDRL CODES: **C07**

ITEM TAG Nos.: **CV620**

VENDOR SIGNATURE:

Ingar Ven

DATE:

04.02.94

P.O. NUMBER

FF-22-26-1008

SEQUENCE No.

C-0008

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VERITEC

**AS BUILT
SUPPLIER**

Date:

04/02/94

Signature:

[Signature]



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
GAS CYCLONE**

Package No. CQ603	Doc. No. DS-FF-22-26-8007	Rev. 03	Page 2 of 6
Tag No CV620		No of units 1	
Service GAS CLEAN UP		Location M35	
Size N/A		P.O. No. PO-FF-22-26-1008	
Type N/A		P&ID Doc. No. FF-22-26-00-8056	
Supplier ABB MILJØ NORSK VIFTEFABRIKK AS		630001-400-001	
PROCESS DATA			
01 Fluid	AIR WITH ENTRAINED SULFURIC ACID		
02 Max. spec. gravity (15.6/15.6) [°C]	1.0		
03 Operating volume [m3]	0.32/100%		
04 Operating pressure [barg]	0.012		
05 Design pressure internal/external [barg]	3.5/0.2		
06 Operating temperature [°C]	+5/+60		
07 Design temperature [°C]	-10/+75		
08			
09 ENGINEERING DATA			
10 Inside diameter [mm]	495		
11 Length tan/tan [mm]	N/A		
12 Elevation [mm]	3395		
13 Corrosion allowance [mm]	NIL		
14 Insulation [mm]	N/A		
15			
16 CASE			
17 HYDROCARBON LIQUID			
18 Flow [kg/h]	N/A		
19 Specific gravity (15.6/15.6) [°C]	N/A		
20 Density at T and P [kg/m3]	N/A		
21 Viscosity [cp]	N/A		
22 Surface tension [dyn/cm]	N/A		
23 GAS VAPOR			
24 Flow [10³ Sm³/h]	0.48		
25 Molecular weight	28.9		
26 Density at T and P [kg/m3]	1.0		
27 Viscosity [cp]	0.0185		
28 WATER VAPOR			
29 Flow [kg/h]	N/A		
30 Specific gravity (15.6/15.6) [°C]	N/A		
31 Density at T and P [kg/m3]	N/A		
32 Viscosity [cp]	N/A		



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
GAS CYCLONE**

Package No. CQ603		Doc. No. DS-FF-22-26-8007		Rev. 03		Page 3 of 6	
01 GAS CYCLONE				DESIGN DATA			
02	Code	BS5500 Edition 1991					
03	Code for design of supports	NS 3472E					
04	Specifications	S-10-26-002/SP-FF-22-26-0014					
05	Nozzle loads (terminal points only)	S-10-26-002					
06	Category	1					
07	Wind loading	1.32 kN/m ² (v = 46 m/s)					
08	Explosion blast pressure [barg]	0.2 (external pressure/internal vacuum)					
09	Earthquake loading	N/A					
10	Transportation loading on land	N/A					
11	Transportation loading on sea	ACCELER. VERT/HOR : 0.6*G + WEIGHT/0.8*G					
12	Horizontal or vertical vessel	VERTICAL					
13	Type of heads	N/A					
14	One piece or welded heads	N/A					
15	Bracket support height	1170					
16	Lifting lugs	N/A (Note 1)					
17	Platform supports	N/A					
18	Ladder attachments	N/A					
19	Insulation supports	N/A					
20	Earthing lugs	2 OFF					
21							
22				VESSEL DATA			
23	Shell thickness incl. C.A. [mm]	6	Head thickness incl. C.A. [mm]	N/A			
24	Skirt thickness [mm]	N/A	Saddle plate thickness [mm]	N/A			
25	Weight dry/test/operation [kgs]	477/915/477					
26				INTERNALS			
27	Trays	N/A	No. required	N/A			
28	Type	N/A	No. of passes	N/A			
29	Mist extractor type	DEMISTER	Mesh density [kg/m ³]				
30	Mesh thickness [mm]	250	Mesh wire diameter [mm]				
31	Splash cone dia/angle [mm/deg]	N/A					
32							
33				FABRICATION, INSPECTION AND TESTING			
34	Heat treatment of heads after forming	N/A					
35	Post weld heat treatment	N/A					
36	Radiographic inspection of butt welds [%]	100	Ultrasonic insp. of butt welds	N/A			
37	Ultrasonic insp. of nozzle/shell conn. [%]	100	DPI of nozzle/shell conn. [%]	100			
38	Hydrostatic press. at top of vessel [barg]	4.5	DPI/Visual	[%]	100		



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
GAS CYCLONE**

Package No. CQ603		Doc. No. DS-FF-22-26-8007		Rev. 3		Page 4 of 6	
01 GAS CYCLONE				MATERIALS			
02	MATERIAL DESIGNATION		CERTIFICATE TYPE	REFERENCE			
03	Shell	ASTM A 240-90 UNS S31254	DIN 50049-3.1B	NGS 1605 (Note 2)			
04	Heads	ASTM A 240-90 UNS S31254	DIN 50049-3.1B	NGS 1605 (Note 2)			
06	Nozzle neck plates	ASTM A 240-90 UNS S31254	DIN 50049-3.1B	NGS 1605 (Note 2)			
07	Nozzle neck pipes						
08	Forged nozzles	N/A					
09	Forged flanges	ASTM A 182 - F44	DIN 50049-3.1B	NGS 1605 (Note 2)			
10	Shell flanges	ASTM A 240-90 UNS S31254	DIN 50049-3.1B	NGS 1605 (Note 2)			
11	Reinforcement pads	ASTM A 240-90 UNS S31254	DIN 50049-3.1B	NGS 1605 (Note 2)			
12	Saddle doubling plate	N/A					
13	Saddles (except doubling plates)	N/A					
14	Skirt	N/A					
15	Legs	N/A					
16	Base ring and chairs	N/A					
17	Base plate	N/A					
18	Brackets/supports	ASTM A 240-90 TYPE 316L	DIN 50049-3.1B				
19	Ladder and platforms	N/A					
20	Insulation supports	N/A					
21	Name plate	ASTM A 240-90 316L	DIN 50049-2.2				
22	Bolts for external flanges	ASTM A 193-90 Gr. B8M Gr. 2	DIN 50049-2.2				
23	Nuts for external flanges	ASTM A 194-90 Gr. 8M	DIN 50049-2.2				
24	Bolts for int. flanges and attach.	N/A					
25	Nuts for int. flanges and attach.	N/A					
26	Splash cones	N/A					
27	Baffles and weirs	N/A					
28	Mist extractor mesh	N/A					
29	Mist extractor ring	N/A					
30	Trays	N/A					
31	Tray support	N/A					
32	Lifting lugs	N/A					
33	Gaskets	VITON/GRAPHITE					
34	External paint	Note 4					
35	Internal paint/lining	Note 4					
36	Preservation coating (storage)						
37	Earthing lugs	2 OFF					



Package No. CQ603	Doc. No. DS-FF-22-26-8007	Rev. 03	Page 6 of 6
<p>NOTES</p> <ol style="list-style-type: none">1. Vessel to be lifted by 2 off eye bolts fastened to body flange.2. According to Nordic Group for Steel Regulations.3. Made from plate with nominal thickness 6 mm.4. Extent of surface preparation of vessel to be limited to cleaning and pickling of welds.			

**VENDORS FRONT SHEET
FOR A4 DOCUMENTS**

PURCHASE ORDER No.:
PO-FF-22-26-1008
PROCUREMENT PACKAGE No.:
MA-008

PAGE 1 OF 6

VENDOR INFORMATION

COMPANY
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VENDOR DOCUMENT
NUMBER:

630001-710-001

DOCUMENT TITLE:

**EQUIPMENT DATA SHEET
ACID DAY TANK**

PROJECT DOC. No.:

DS-FF-22-26-8008

FRØY INTEGRATION WORK ON TCP 2

EQUIPMENT DESCRIPTION:

WATER INJECTION-FINE FILTER PACKAGE

PKG. TAG No.: **CQ603**

LOCATION: **M35**

VDRL CODES: **C07**

ITEM TAG Nos.: **CV611**

VENDOR SIGNATURE:

Per Ing. Ven

DATE:

04.02.94

P.O. NUMBER

FF-22-26-1008

SEQUENCE No.

C-0009

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CAT.

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VERITEC

AS BUILT

SUPPLIER/

04/02/94

Date:

Signature: *[Signature]*



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
ACID DAY TANK**

Package No.	CQ603	Doc. No.	DS-FF-22-26-8008	Rev.	04	Page	2 of 6
Tag No	CV611	No of units	1				
Service	ACID DAY TANK	Location	M35				
Size	3.0 m ³	P.O. No.	FR-22-26-1008				
Type	N/A	P&ID Doc. No.	FF-22-26-00-8057				
Supplier	ABB MILJØ NORSK VIFTEFABRIKK AS		630001-700-001				
PROCESS DATA							
01	Fluid	SULFURIC ACID UN No. 1830					
02	Max. spec. gravity (15.6/15.6) [°C]	1.84					
03	Operating volume [m3]	2.7 AT 90% FILLING					
04	Operating pressure [barg]	ATMOSPHERIC					
05	Design pressure internal/external [barg]	4.0/0.2 (Note 1)					
06	Operating temperature [°C]	+5/+35					
07	Design temperature [°C]	-10/+60					
08							
09 ENGINEERING DATA							
10	Inside diameter [mm]	1259					
11	Length tan/tan [mm]	2100					
12	Elevation [mm]	1741					
13	Corrosion allowance [mm]	NIL					
14	Insulation [mm]	N/A					
15 CASE							
16 HYDROCARBON LIQUID							
17	Flow [kg/h]	N/A					
18	Specific gravity (15.6/15.6) [°C]	N/A					
19	Density at T and P [kg/m3]	N/A					
20	Viscosity [cp]	N/A					
21	Surface tension [dyn/cm]	N/A					
22							
23 GAS VAPOR							
24	Flow [kg/h]	N/A					
25	Molecular weight	N/A					
26	Density at T and P [kg/m3]	N/A					
27	Viscosity [cp]	N/A					
28 WATER VAPOR							
29	Flow [kg/h]	N/A					
30	Specific gravity (15.6/15.6) [°C]	N/A					
31	Density at T and P [kg/m3]	N/A					
32	Viscosity [cp]	N/A					



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
ACID DAY TANK**

Package No. CQ603		Doc. No. DS-FF-22-26-8008		Rev. 04		Page 3 of 6	
01 ACID DAY TANK				DESIGN DATA			
02	Code	BS5500 Edition 1991					
03	Category	1					
04	Code for design of supports	BS 5500/NS 3472E					
05	Specifications	S-10-26-002/SP-FF-22-26-0014					
06	Wind loading	1.32 kN/m ² (v = 46 m/s)					
07	Explosion blast pressure	[barg]	0.2 (EXTERNAL PRESSURE/INTERNAL VACUUM)				
08	Earthquake loading	N/A					
09	Transportation loading on land	N/A					
10	Transportation loading on sea, accelerations	VERTICAL: 0.6*G + WEIGHT/HORIZONTAL: 0.8*G					
11	Transportation loading on sea, tilt	20°					
12	Horizontal or vertical vessel	HORIZONTAL					
13	Type of heads	TORISPHERICAL					
14	One piece or welded heads	ONE PIECE					
15	Saddle height	[mm]	344/303 (Note 6)				
16	Lifting lugs	4 OFF					
17	Platform supports	N/A					
18	Ladder attachments	N/A					
19	Insulation supports	N/A					
20	Earthing lugs	YES - 2 OFF					
21	Corrosion allowance	[mm]	NIL				
22				VESSEL DATA			
23	Shell thickness incl. C.A. [mm]	8	Head thickness incl. C.A. [mm]	8			
24	Skirt thickness [mm]	N/A	Saddle plate thickness [mm]	12			
25	Weight dry/test/operation [kgs]	1120/4119/6638					
26				INTERNALS			
27	Trays	N/A	No. required	N/A			
28	Type	N/A	No. of passes	N/A			
29	Mist extractor type	N/A	Mesh density [kg/m ³]	N/A			
30	Mesh thickness [mm]	N/A	Mesh wire diameter [mm]	N/A			
31	Splash cone dia/angle [mm/deg]	N/A					
32							
33				FABRICATION, INSPECTION AND TESTING			
34	Heat treatment of heads after forming	NONE					
35	Post weld heat treatment	N/A					
36	Radiographic inspection of butt welds [%]	100 (Note 5)	Ultrasonic insp. of butt welds	N/A			
37	Ultrasonic insp. of nozzle/shell conn. [%]	100 (Note 5)	DPI of nozzle/shell conn. [%]	100			
38	Hydrostatic press. at top of vessel [barg]	5.1	DPI/Visual [%]	100			



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
ACID DAY TANK**

Package No. CQ603		Doc. No. DS-FF-22-26-8008		Rev. 04		Page 4 of 6	
01 ACID DAY TANK				MATERIALS			
02	MATERIAL DESIGNATION		CERTIFICATE TYPE		REFERENCE		
03 Shell	UNS N08904		DIN 50049-3.1B		NGS 685 (Note 2)		
04 Heads	UNS N08904		DIN 50049-3.1B		NGS 685 (Note 2)		
06 Nozzle neck plates							
07 Nozzle neck pipes	UNS N08904		DIN 50049-3.1B		NGS 685 (Note 2)		
08 Forged nozzles	N/A						
09 Forged flanges	UNS N08904		DIN 50049-3.1B		NGS 685 (Note 2)		
10 Blind flanges	UNS N08904		DIN 50049-3.1B		NGS 685 (Note 2)		
11 Reinforcement pads	N/A						
12 Saddle doubling plate	UNS N08904		DIN 50049-3.1B		NGS 685 (Note 2)		
13 Saddles (except doubling plates)	RAEX 385P		DIN 50049-3.1B		NGS 1205 (Note 2)		
14 Skirt	N/A						
15 Legs	N/A						
16 Base ring and chairs	N/A						
17 Base plate	N/A						
18 Brackets/supports	ASTM A 240-316L		DIN 50049-3.1B				
19 Ladder and platforms	N/A						
20 Insulation supports	N/A						
21 Name plate	ASTM A 240-316		DIN 50049-2.2				
22 Bolts for external flanges	ASTM A 320-B8M		DIN 50049-2.2				
23 Nuts for external flanges	ASTM A 194-8M		DIN 50049-2.2				
24 Bolts for int. flanges and attach.	N/A						
25 Nuts for int. flanges and attach.	N/A						
26 Splash cones	N/A						
27 Baffles and weirs	N/A						
28 Mist extractor mesh	N/A						
29 Mist extractor ring	N/A						
30 Trays	N/A						
31 Tray support	N/A						
32 Lifting lugs	UNS N08904		DIN 50049-3.1B		NGS 685 (Note 2)		
33 Gaskets	GRAPHITE						
34 External paint	Note 4						
35 Internal paint/lining	Note 4						
36 Preservation coating (storage)							
37 Earthing lugs	ASTM A 240-316L		DIN 50049-3.1B				



NOTES

1. Design pressure includes static pressure due to liquid height during transfer of acid.
2. According to Nordic Group for Steel Regulations.
3. Made from plate with nominal thickness 8 mm.
4. Surface preparation/painting of saddle acc. to Spec. S-10-00-0010 Appendix 5.
Extent of surface preparation of vessel to be limited to cleaning and pickling of welds.
5. Extent of radiography on saddle : 20%.
Extent of ultrasonic examination of saddle : 20%.
Extent of ultrasonic examination of lifting lugs: 100%.
6. Different saddle height due to slope of vessel.

**VENDORS FRONT SHEET
FOR A4 DOCUMENTS**

PURCHASE ORDER No.:
PO-FF-22-26-1008
PROCUREMENT PACKAGE No.:
MA-008

PAGE 1 OF 6

VENDOR INFORMATION

COMPANY
NAME:

ABB Miljø Norsk Viftefabrikk AS

ADDRESS:

**OLE DEVIKS VEI 10, 0666 OSLO
P.O. BOX 6260 ETTERSTAD, 0603 OSLO NORWAY**

TELEFAX:

47 22 65 10 94

TELEPHONE

47 22 72 90 00

VENDOR DATA
CONTROL
CONTACT:

PER INGAR VEN

EXT.:

47 22 72 92 83

VENDOR DOCUMENT
NUMBER:

630001-420-001

DOCUMENT TITLE:

**EQUIPMENT DATA SHEET
AIR RECEIVER**

PROJECT DOC. No.:

DS-FF-22-26-8389

FRØY INTEGRATION WORK ON TCP 2

EQUIPMENT DESCRIPTION:

WATER INJECTION-FINE FILTER PACKAGE

PKG. TAG No.: **CQ603**

LOCATION: **M35**

VDRL CODES: **C07**

ITEM TAG Nos.: **CV613**

VENDOR SIGNATURE:

Per Ing. Ven

DATE:

04.02.94

P.O. NUMBER

FF-22-26-1008

SEQUENCE No.

C-0015

REV

03

VDRL
CAT.

C



VERITEC

**AS BUILT
SUPPLIER**

Date:

04/02/94

Signature:

OK



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
AIR RECEIVER**

Package No. CQ603	Doc. No. DS-FF-22-26-8389	Rev. 03	Page 2 of 6
Tag No CV613	No of units 1		
Service AIR RECEIVER	Location M35		
Size 2.4 m ³	P.O. No. FR-22-26-1008		
Type N/A	P&ID Doc. No. FF-22-26-00-8056		
Supplier ABB MILJØ NORSK VIFTEFABRIKK AS	630001-400-001		
PROCESS DATA			
01 Fluid	PLANT AIR		
02 Max. spec. gravity (15.6/15.6) [°C]	0.1		
03 Operating volume [m3]	2.4 AT 100% FILLING		
04 Operating pressure [barg]	3-5		
05 Design pressure internal/external [barg]	10/0.2		
06 Operating temperature [°C]	-10/+35		
07 Design temperature [°C]	-10/+60		
08			
09 ENGINEERING DATA			
10 Inside diameter [mm]	695		
11 Length tan/tan [mm]	6070		
12 Elevation [mm]	1265		
13 Corrosion allowance [mm]	NIL		
14 Insulation [mm]	N/A		
15 CASE			
16 HYDROCARBON LIQUID			
17 Flow [kg/h]	N/A		
18 Specific gravity (15.6/15.6) [°C]	N/A		
19 Density at T and P [kg/m3]	N/A		
20 Viscosity [cp]	N/A		
21 Surface tension [dyn/cm]	N/A		
22			
23 GAS VAPOR			
24 Flow [10 ³ Sm ³ /h]	0.48		
25 Molecular weight	28.9		
26 Density at T and P [kg/m3]	1.0		
27 Viscosity [cp]	0.0185		
28 WATER VAPOR			
29 Flow [kg/h]	N/A		
30 Specific gravity (15.6/15.6) [°C]	N/A		
31 Density at T and P [kg/m3]	N/A		
32 Viscosity [cp]	N/A		



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
AIR RECEIVER**

Package No. CQ603		Doc. No. DS-FF-22-26-8389		Rev. 03		Page 3 of 6	
01 AIR RECEIVER				DESIGN DATA			
02 Code				BS5500 Edition 1991			
03 Category				1			
04 Code for design of supports				BS 5500/NS 3472E			
05 Specifications				S-10-26-002/SP-FF-22-26-0014			
06 Wind loading				1.32 kN/m ² (v = 46 m/s)			
07 Explosion blast pressure [barg]				0.2 (External pressure)			
08 Earthquake loading				N/A			
09 Transportation loading on land				N/A			
10 Transportation loading on sea, accelerations				VERTICAL : 0.6*G+WEIGHT/HORIZONTAL :0.8*G			
11 Transportation loading on sea, tilt				20°			
12 Horizontal or vertical vessel				HORIZONTAL			
13 Type of heads				TORISPHERICAL			
14 One piece or welded heads				ONE PIECE			
15 Saddle height				359			
16 Lifting lugs				NONE			
17 Platform supports				N/A			
18 Ladder attachments				N/A			
19 Insulation supports				N/A			
20 Earthing lugs				YES - 2 OFF			
21 Corrosion allowance				NIL			
22				VESSEL DATA			
23 Shell thickness incl. C.A. [mm]	7.92		Head thickness incl. C.A. [mm]	8			
24 Skirt thickness [mm]	N/A		Saddle plate thickness [mm]	10			
25 Weight Dry/Test/Operation [kgs]	1177/3613/1177						
26				INTERNALS			
27 Trays	N/A		No. required	N/A			
28 Type	N/A		No. of passes	N/A			
29 Mist extractor type	N/A		Mesh density [kg/m ³]	N/A			
30 Mesh thickness [mm]	N/A		Mesh wire diameter [mm]	N/A			
31 Splash cone dia/angle [mm/deg]	N/A						
32							
33				FABRICATION, INSPECTION AND TESTING			
34 Heat treatment of heads after forming				NOT REQUIRED			
35 Post weld heat treatment				N/A			
36 Radiographic inspection of butt welds [%]	100 (Note 2)		Ultrasonic insp. of butt welds	N/A			
37 Ultrasonic insp. of nozzle/shell conn. [%]	100 (Note 2)		DPI of nozzle/shell conn. [%]	100			
38 Hydrostatic press. at top of vessel [barg]	12.7		DPI/Visual	[%]		100	



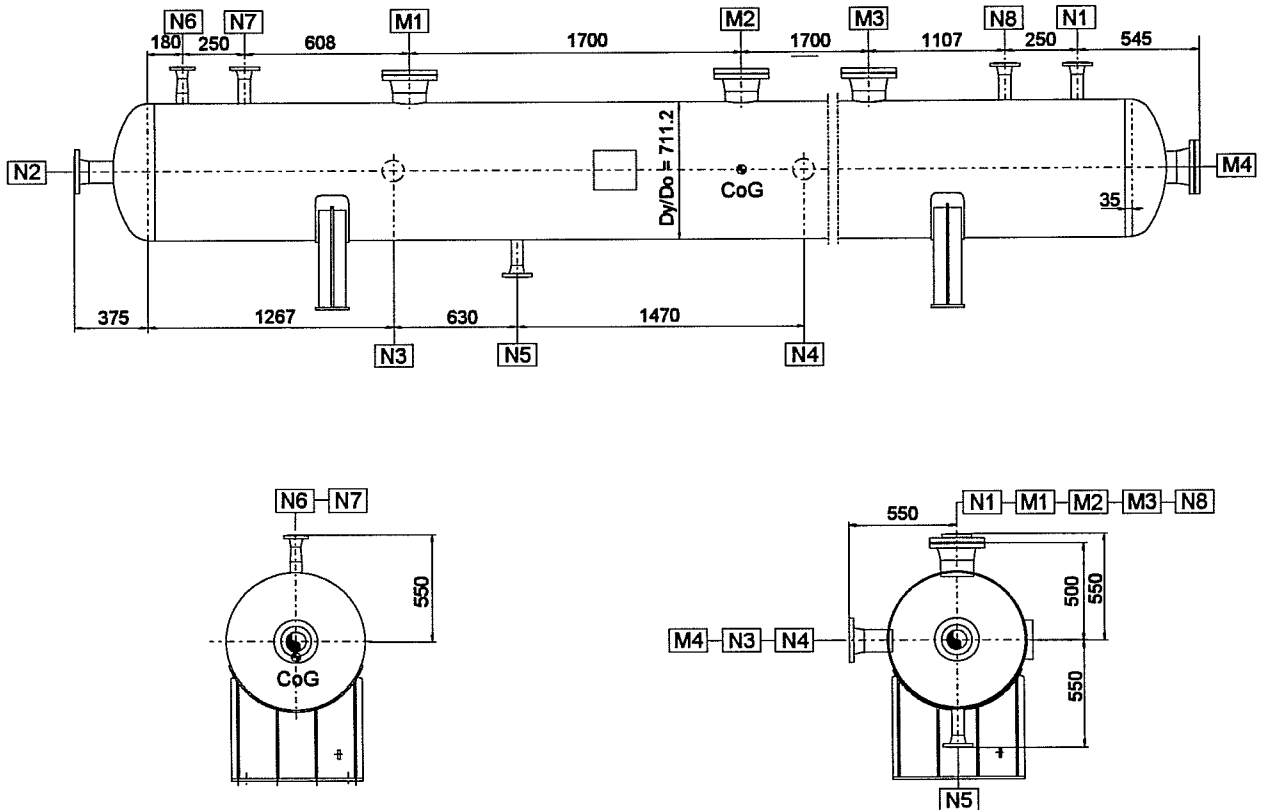
**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
AIR RECEIVER**

Package No. CQ603		Doc. No. DS-FF-22-26-8389		Rev. 03		Page 4 of 6	
01 AIR RECEIVER				MATERIALS			
02	MATERIAL DESIGNATION		CERTIFICATE TYPE	REFERENCE			
03 Shell	ASTM A 312-TP316L		DIN 50049-3.1B	NGS 678 (Note 1)			
04 Heads	ASTM A 240-316L		DIN 50049-3.1B	NGS 674 (Note 1)			
06 Nozzle neck plates							
07 Nozzle neck pipes	ASTM A 312-TP316L		DIN 50049-3.1B	NGS 678 (Note 1)			
08 Forged nozzles	N/A						
09 Forged flanges	ASTM A 182 Gr. F316L		DIN 50049-3.1B	NGS 669 (Note 1)			
10 Blind flanges	ASTM A 240-316L		DIN 50049-3.1B	NGS 674 (Note 1)			
11 Reinforcement pads	N/A						
12 Saddle doubling plate	ASTM A 240-316L		DIN 50049-3.1B	NGS 674 (Note 1)			
13 Saddles (except doubling plates)	ASTM A 240-316L		DIN 50049-3.1B	NGS 674 (Note 1)			
14 Skirt	N/A						
15 Legs	N/A						
16 Base ring and chairs	N/A						
17 Base plate	N/A						
18 Brackets/supports	ASTM A 240-316L		DIN 50049-3.1B				
19 Ladder and platforms	N/A						
20 Insulation supports	N/A						
21 Name plate	ASTM A 240-316		DIN 50049-2.2				
22 Bolts for external flanges	ASTM A 320-B8M		DIN 50049-2.2				
23 Nuts for external flanges	ASTM A 194-8M		DIN 50049-2.2				
24 Bolts for int. flanges and attach.	N/A						
25 Nuts for int. flanges and attach.	N/A						
26 Splash cones	N/A						
27 Baffles and weirs	N/A						
28 Mist extractor mesh	N/A						
29 Mist extractor ring	N/A						
30 Trays	N/A						
31 Tray support	N/A						
32 Lifting lugs	N/A						
33 Gaskets	(Note 4)						
34 External paint	N/A (Note 3)						
35 Internal paint/lining	N/A (Note 3)						
36 Preservation coating (storage)							
37 Earthing lugs	2 OFF						

Package No. CQ603		Doc. No. DS-FF-22-26-8389		Rev. 03		Page 5 of 6	
NOZZLE LIST, AIR RECEIVER				FLANGES (ANSI B16.5)		NOZZLE PIPE	
NOZZLE	No. OFF	DN	SERVICE	RATING	TYPE	NPS	SCHED.
M1	1	6"	INSPECTION OPENING	150#	WNRF	6"	40S
M2	1	6"	INSPECTION OPENING	150#	WNRF	6"	40S
M3	1	6"	INSPECTION OPENING	150#	WNRF	6"	40S
M4	1	6"	INSPECTION OPENING	150#	WNRF	6"	40S
N1	1	2"	AIR INLET	150#	WNRF	2"	80S
N2	1	4"	AIR OUTLET	150#	WNRF	4"	40S
N3	1	4"	AIR OUTLET	150#	WNRF	4"	40S
N4	1	4"	AIR OUTLET	150#	WNRF	4"	40S
N5	1	2"	DRAIN	150#	WNRF	2"	80S
N6	1	2"	PSV CONNECTION	150#	WNRF	2"	80S
N7	1	2"	INSTRUMENT CONNECTION	150#	WNRF	2"	80S
N8	1	2"	INSTRUMENT CONNECTION	150#	WNRF	2"	80S

NOZZLE LOCATION AIR RECEIVER





Package No. CQ603	Doc. No. DS-FF-22-26-8389	Rev. 03	Page 6 of 6
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NOTES

1. According to Nordic Group for Steel Regulations.
2. Extent of radiography on saddle : 20%.
Extent of ultrasonic examination of saddle : 20%.
Extent of ultrasonic examination of lifting lugs: 100%.
3. Extent of surface preparation/painting of vessel to be limited to cleaning and pickling of welds.
4. Gaskets 4.5 mm thk. SPW 316L w/Exp. Graphite internal/external ring 316SS.

**VENDORS FRONT SHEET
FOR A4 DOCUMENTS**

PURCHASE ORDER No.:
PO-FF-22-26-1008

PROCUREMENT PACKAGE No.:
MA-008

PAGE 1 OF 4

VENDOR INFORMATION

COMPANY
NAME:

ABB Miljø Norsk Viftefabrikk AS

ADDRESS:

**OLE DEVIKS VEI 10, 0666 OSLO
P.O.BOX 6260 ETTERSTAD, 0603 OSLO NORWAY**

TELEFAX:

47 22 65 10 94

TELEPHONE

47 22 72 90 00

VENDOR DATA
CONTROL
CONTACT:

PER INGAR VEN

EXT.:

47 22 72 92 83

VENDOR DOCUMENT
NUMBER:

630001-761-001

DOCUMENT TITLE:

**EQUIPMENT DATA SHEET
THREE-PHASE INDUCTION MOTOR**

PROJECT DOC. No.:

DS-FF-22-26-8012

FRØY INTEGRATION WORK ON TCP 2

EQUIPMENT DESCRIPTION:

WATER INJECTION-FINE FILTER PACKAGE

PKGE TAG No.: **CQ603**

LOCATION: **M35**

VDRL CODES: **C07**

ITEM TAG Nos.: **CM628A/B**

VENDOR SIGNATURE:

Per Ingvar Ven

DATE:

04.02.94

P.O. NUMBER

FF-22-26-1008

SEQUENCE No.

C-0010

REV

02

VDRL
CAT.

C



VERITEC

**AS BUILT
SUPPLIER**

Date: *04/02/94*

Signature: *[Signature]*



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**EQUIPMENT DATA SHEET
THREE-PHASE INDUCTION MOTOR**

Package No.	CQ603	Doc. No.	DS-FF-22-26-8012	Rev.	02	Page	2 of 4
Tag No	CM628A/B	No of units	2				
Service	ACID DOSING PUMP MOTOR	Location	M35				
Size	90	P.O. No.	PO-FF-22-26-1008				
Type	SQUIRREL CAGE	P&ID Doc. No.	FF-22-26-00-8057				
Supplier	ABB		630001-700-001				
REQUIREMENTS AND CONDITIONS (TO BE SUPPLIED BY PURCHASER)							
01	Specification Number			SP-FF-22-23-002			
02	Rating and Class	[kW]		1.5			
03	Supply System			380VAC 3ph 50 Hz			
04	Circuit Protection Method			OVERLOAD PROTECTION DEVICE			
05	System Fault Level						
06	Area Classification			ZONE II			
07	Apparatus Group/Temperature Class			II/T3			
08	Type of Protection	: Casing		Ex(e)			
09	Degree of protection	: Casing		IP55			
10	Type of Protection	: Terminal Box		Ex(e)			
11	Degree of protection	: Terminal Box		IP56			
12	Design Ambient Temperature			40 °C			
13	Method of Cooling			AIR IC0141			
14	Insulation Class/Temperature Rise			F/B			
15	Duty Type			S1			
16	Starting Method			DIRECT ON LINE			
17	Synchronous Speed			1500			
14	Direction of Rotation [CW/CCW]			CCW			
15	Mounting			VERTICAL FLANGE			
16	Slide Rails Required			NO			
17	Heater Required			NO			
18	Thermistors/RTD's Required			NO			
19	Bearing Temperature Detectors Required			NO			
20	Vibration Detectors Required			NO			
21	Cable Details (Size and Cores)	Motor		3 x 2.5 + E			
22		Heater		N/A			
23		Thermistors		N/A			
24	Cable Entry Details	Motor		M25			
25		Heater		N/A			
26		Thermistors		N/A			
27	Terminations			STANDARD			
28	VERITEC Drawing Reference			HOLD			
29							
30							



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

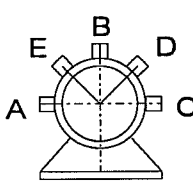
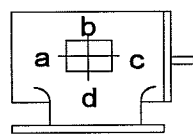
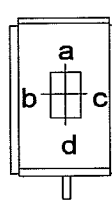
**EQUIPMENT DATA SHEET
THREE-PHASE INDUCTION MOTOR**

Package No.	CQ603	Doc. No.	0	Rev.	02	Page 3 of 4
DATA TO BE SPECIFIED BY SELLER						
31	Certifying Authority					LCIE
32	Frame Reference Number					IEC 90L
33	Outline Dimension Drawing No.					FLF4 374245
34	Dimensions (L x B x H) mm					360 x 197 x 260
35	Rating		[kW]			1.5
36	Full Load Speed		[rpm]			1420
37	Full Load Current (FLC)		[A]			3.6
38	Starting Current		[A]			20
39	Efficiency at 100, 75, 50 [% Full Load]					79.8 / 79 / 77
40	Power Factor at 100, 75, 50 [% Full Load]					0.78 / 0.72 / 0.64
41	Power Factor Starting					0.3
42	Full Load Torque		[Nm]			10
43	Locked Rotor Torque		[%FLT]			250
44	Pull Up Torque		[%FLT]			250
45	Pull Out Torque		[%FLT]			290
46	Thermal Rating Time (te)		[sec]			N/A
47	Safe Stall Time		[sec]			10
48	Insulation Class and Temperature Rise					F/B
49	Winding Connection					Y
50	Heater Rating					N/A
51	Main Terminal Box	Type				EExe
52	Degree of Protection					IP 56
53	Location and Orientation					TOP
54	Direction of Rotation [CW/CCW]					CCW
55	Shaft	Standard/Double End/Extension				STANDARD
56	Bearing Type	Drive End				BALL
57	Bearing Type	Non Drive End				BALL
58	Bearing Make and Ref. No.	Drive End				SKF 6205 ZZC3
59	Bearing Make and Ref. No.	Non Drive End				SKF 6205 ZZC3
60	LUBRICATION DETAILS					LIFETIME
61	Pressure Lube System		[barg]			N/A
62	COOLING DETAILS					
63	Flow		[m ³ /h]			N/A
64	Pressure		[barg]			N/A
65	Inlet Temperature		[°C]			N/A
66	Outlet Temperature		[°C]			N/A
67	Pedestal Insulation (Yes/No)					NO
68	Rotor End Float		[+/-mm]			0.02 / 0.02
69	Rotor End Play		[mm]			

Package No. CQ603	Doc. No. 0	Rev. 02	Page 4 of 4
71	Rotor Air Gap	[mm]	
71	Moment of Inertia	[kgm ²]	0.0043
72	Weight Motor	[kg]	36
73	Weight Rotor	[kg]	14
74	Noise Level	[dBA]	54
75	B.S. Design Letter		N/A
76	Drain/Breather Details		NO
77	Certificate No		LCIE N. 91. C6028
78	Earth Terminals	Internal	YES
79		External	YES
80			
81			
82			
83			
84			
85			
86			

NOTES/HOLDS

- Motors below 30 kW shall be heated when they are stopped by low voltage AC injection current.

<p>TERMINAL BOX LOCATION</p>  <p style="text-align: center;">VIEW FROM NONE-DRIVE END</p>	<p style="text-align: center;">CABLE ENTRY</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>SIDE VIEW</p> </div> <div style="text-align: center;">  <p>VERTIC SPINDL</p> </div> </div>	<p>ABBREVIATIONS</p> <table style="width: 100%; border: none;"> <tr><td>Ex (d)</td><td>FLAMEPROOF</td></tr> <tr><td>Ex (e)</td><td>INCREASED SAFETY</td></tr> <tr><td>Ex (p)</td><td>PRESSURISED</td></tr> <tr><td>TEFV</td><td>TOTALLY ENCLOSED FAN VENTILATED</td></tr> <tr><td>CACA</td><td>CLOSED AIR CIRCUIT AIR COOLED</td></tr> <tr><td>CACW</td><td>CLOSED AIR CIRCUIT WATER COOLED</td></tr> </table>	Ex (d)	FLAMEPROOF	Ex (e)	INCREASED SAFETY	Ex (p)	PRESSURISED	TEFV	TOTALLY ENCLOSED FAN VENTILATED	CACA	CLOSED AIR CIRCUIT AIR COOLED	CACW	CLOSED AIR CIRCUIT WATER COOLED
Ex (d)	FLAMEPROOF													
Ex (e)	INCREASED SAFETY													
Ex (p)	PRESSURISED													
TEFV	TOTALLY ENCLOSED FAN VENTILATED													
CACA	CLOSED AIR CIRCUIT AIR COOLED													
CACW	CLOSED AIR CIRCUIT WATER COOLED													

**VENDORS FRONT SHEET
FOR A4 DOCUMENTS**

PURCHASE ORDER No.:
PO-FF-22-26-1008

PROCUREMENT PACKAGE No.:
MA-008

PAGE 1 OF 3

VENDOR INFORMATION

COMPANY NAME: **ABB Miljø Norsk Viftefabrikk AS**

ADDRESS: **OLE DEVIKS VEI 10, 0666 OSLO
P.O. BOX 6260 ETTERSTAD, 0603 OSLO NORWAY**

TELEFAX: **47 22 65 10 94**

TELEPHONE **47 22 72 90 00**

VENDOR DATA CONTROL CONTACT: **PER INGAR VEN**

EXT.: **47 22 72 92 83**

VENDOR DOCUMENT NUMBER: **630001-770-001**

DOCUMENT TITLE: **EQUIPMENT DATA SHEET
ACID DOSING PUMP**

PROJECT DOC. No.: **DS-FF-22-26-8009**

FRØY INTEGRATION WORK ON TCP 2

EQUIPMENT DESCRIPTION:

WATER INJECTION-FINE FILTER PACKAGE

PKG. TAG No.: **CQ603** LOCATION: **M35**

VDRL CODES: **C07**

ITEM TAG Nos.: **CP613A/B**

VENDOR SIGNATURE:

Per Ingar Ven

DATE:

04.02.94

P.O. NUMBER

SEQUENCE No.

REV

VDRL CAT.

FF-22-26-1008

C-0011

06

C



VERITEC

**AS BUILT
SUPPLIER**

Date: *04/02/94*

Signature: *OK*



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**MEMBRANE PUMP
DATA SHEET**

Package No.	CQ603	Doc. No.	DS-FF-22-26-8009	Rev.	06	Page 2 of 3
Tag No	CM628A/B	No of units	2			
Service	ACID DOSING PUMP	Location	M35 ON SKID CQ603			
Size		P.O. No.	PO-FF-22-26-1008			
Type	LEWA ecodos 750-1500S	P&ID Doc. No.	FF-22-26-00-8057			
Supplier	ABB ENVIRONMENTAL		630001-700-001			
1 Applicable to		<input type="checkbox"/> Proposal	<input type="checkbox"/> Purchase	<input checked="" type="checkbox"/> As built		
2 For		No. of motors required				
3 Site		Serial No.				
Operating Conditions						
6 Liquid	SULFURIC ACID	Rated capacity [l/h]	600			
7 Viscosity at PT [cP]	27	Accel. Head [m]				
8 Specific gravity at PT	1840 kg/m3	Vapour pressure at PT [bara]				
9 NPSH available [m] without accel. head	0.3	NPSH available [m] actual				
	Rated	Maximum	Minimum			
10 Capacity at PT [l/h]	600	750	0			
11 Discharge pressure [barg]	0.6	5 (Note 1)	0.6			
12 Suction pressure [barg]	0.03	-0.3	0.03			
13 Differential pressure [bar]	0.57	3.3	0.57			
14 Site temperature [°C]	AMBIENT	40	AMBIENT			
15 Elect. Area	Hazard Zone 2	[T3] Class	[II] Group	<input type="checkbox"/> Division		
16 Location	<input type="checkbox"/> Indoor	<input checked="" type="checkbox"/> Outdoor	<input type="checkbox"/> Heated	<input checked="" type="checkbox"/> Unheated		
17 Corrosion/Erosion caused by:						
Manufacturers Data						
18 NPSH required [m]	POSITIVE HEAD	kW at relief setting				
19 Plunger speed [strokes/min]	113	kW at rated conditions	1,5			
20 Plunger diameter [mm]	N/A	Rated capacity [l/h]	600			
21 Length of stroke [mm]	10	Number of feeds	1			
22 Pump head						
23 Maximum pressure [barg]	5	Hydro test pressure [barg]	6			
Construction Features						
NOZZLE	Size	Rating	Facing	Location		
24 Suction	1"	150lbs	RF	BOTTOM		
25 Discharge	1"	150lbs	RF	TOP		
26 Flush						
Liquid End						
27 Type	<input checked="" type="checkbox"/> Diaphragm	<input type="checkbox"/> Plunger				
28 Diaphragm diameter [mm]	189					
29 No's required	DOUBLE TYPE MEMBRANE					
30 Valves per feed	Suction:	1	Discharge:	1		
32 Type	BALL					



**FRØY TIE-IN PROJECT
WATER INJECTION FINE FILTER PACKAGE**

**MEMBRANE PUMP
DATA SHEET**

Package No.	CQ603	Doc. No	FF-22-26-8009	Rev.	06	Page	3 of 3
Materials							
32	Liquid end	1.4571	Seal Ring	PTFE			
33	Contour plate	N/A	Valve	1.4571/PTFE			
34	Hydr. Diaphragm	N/A	Valve seat	1.4571			
35	Process diaphragm	PTFE	Valve guide	1.4571			
36	Plunger	N/A	Valve body	1.4571			
37	Lantern ring	N/A	Valve gasket	N/A			
38	Packing gland	N/A	Frame	N/A			
Shop Test							
39	Hydrostatic	<input type="checkbox"/> Nonwithnessed	<input checked="" type="checkbox"/> Withnessed				
40	Steady state accuracy	<input type="checkbox"/> Nonwithnessed	<input checked="" type="checkbox"/> Withnessed				
41	Repeatability	<input type="checkbox"/> Nonwithnessed	<input checked="" type="checkbox"/> Withnessed				
42	Linearity	<input type="checkbox"/> Nonwithnessed	<input checked="" type="checkbox"/> Withnessed				
43	Shop Inspection	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No				
44	Dismantle and insp. after test	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No				
Drivers							
46	Motor	ELECTRIC	Manufacturer	ABB	Type	E1S/90L4	
47	Frame No	90	Constant Speed	YES	Variable speed	NO	
48	kW	1.5	rpm	1420	Volts	380	
49	Phase	3	Hertz	50	Service factor	N/A	
50	Enclosure	IP55	Gas driven	N/A	Steam driven	N/A	
Total Weight							
51	Pump, base and driver [kg]	75					
Lubrication Fluid							
52	Crankcase	SAE 80 B2W ISOVG68 2.2L	Hydraulic fluid	N/A			
53	Intermediate	N/A	Other				
Controls							
54	<input checked="" type="checkbox"/> Manual	<input type="checkbox"/> Automatic	N/A	<input type="checkbox"/> Remote	N/A		
55	<input checked="" type="checkbox"/> Local	<input type="checkbox"/> Pneumatic	N/A	<input type="checkbox"/> Electronic	N/A		
56	Stroke control pneumatic	Minimum [barg]	N/A	Maximum [barg]	N/A		
57	Stroke control electronic	Minimum [mA]	N/A	Maximum [mA]	N/A		
Accessories							
58	Speed reducer manufacturer	LEWA					
59	Speed reducer type	<input checked="" type="checkbox"/> Integral	<input type="checkbox"/> Separate				
60	Speed reducer	Model	N/A	Ratio			
61	Baseplate under	Coupling manufactu	N/A	Type	N/A		
62	Vendor furnished relief valve	<input type="checkbox"/> Internal	N/A	<input checked="" type="checkbox"/> External			
63	Relief valve setting [barg]	3.0					
64	Back pressure valve	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No				