

CERTIFICATE NUMBER EFFECTIVE DATE EXPIRY DATE ABS TECHNICAL OFFICE 24-00T2541153-PDA 19-Jul-2024 18-Jul-2029 London Engineering Department

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

DESMI OCEAN GUARD A/S

located at

LUFTHAVNSVEJ 12, , NORRESUNDBY, Denmark, DK-9400

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product:	Ballast Water Treatmen
Model:	Compact Clean
Endorsements:	
Tier:	2 - PDA Issued

This Product Design Assessment (PDA) Certificate remains valid until 18/Jul/2029 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping mohammed abbas

Mohammed K.M. Abbas, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

DESMI OCEAN GUARD A/S LUFTHAVNSVEJ 12 NORRESUNDBY Denmark DK-9400 Telephone: +45 9632 8284 Fax: Email: info@desmioceanguard.com Web: www.desmioceanguard.com

Tier: 2 - PDA Issued

Product:Ballast Water TreatmentModel:Compact CleanEndorsements:

Intended Service:

Ballast Water Management System (BWMS) based on filtration and UV-treatment.

Description:

- Treatment sequence:
- Ballast water uptake: Filtration and UV treatment
- Ballast water discharge: UV treatment

The CompactClean BWMS has the model designation VxxxxFyyyyNS00 for models suitable for non-hazardous areas and VxxxxFyyyyES00 for models suitable for installation in hazardous areas, where Vxxxxx is the applicable UV unit model; Fyyyy is the applicable Filtrex filter model or Byyyy is the applicable BOLLFILTER filter model; S is the skid mounted delivery type, L is the loose component delivery type, D is the deckhouse delivery type and M is the low version of the skid mounted delivery type;

00 is the standard type while B0 or BC is used for BWMS installations with a booster pump and 0C or BC is used for a custom made type (in terms of selected pipe materials).

The CompactClean BWMS is available in two versions: 1) CompactClean (CC): The BWMS can only be operated in US mode.

2) CompactClean OptIMO (OptIMO): The BWMS may be operated either in IMO or US mode.

The CompactClean BWMS applies either filters of the ACB series (20 m woven mesh) manufactured by Filtrex or filters of the aquaBoll BWT BB series (25 m woven mesh) manufactured by Boll & Kirch Filterbau (BOLLFILTER).

Rating:

Treatment Rated Capacity (TRC): 35 – 2500 m3/h Temperature: 0 - 50 °C (treated water) Maximum Operating Pressure- 10 bar

Electrical ratings: Enclosure: IP 44 (panels, IP 55/66 (motors) Hazardous Areas (see ABS Service Restrictions in the Attachment): - main panel and frequency drive - non-hazardous areas only - other components are suitable for installation in Zone 1: IECEx EX II 2G Ex IIB T4 Gb or IECEx EX II 2G Ex IIC T4 Gb or IECEx EX II 2G Ex IIB+H2 T4 Gb (available upon request) Ambient temperature: 0 - 45 °C Power Ratings: 3x 400 - 460 VAC, 50/60 Hz

Cont'd in the Attachment

Service Restriction:

See the Attachment

Comments:

1. Detailed Ship's Installation Arrangement Plans are to be submitted for approval of each installation in accordance with 2022 ABS BWT Guide Section 2/Tables 1 & 2, Sections 4 & 5 as applicable. If there are any changes or revisions to the above-mentioned documents, then the revised documents are to be submitted to ABS for reference/record.

DESMI OCEAN GUARD A/S LUFTHAVNSVEJ 12 NORRESUNDBY Denmark DK-9400 Telephone: +45 9632 8284 Fax: Email: info@desmioceanguard.com Web: www.desmioceanguard.com

Tier: 2 - PDA Issued

2. Minimum required ballast water holding time for treatment efficacy shall be clearly identified in the operating manual to ensure the system is operated in accordance with the Type Approval certificate issued in accordance with MEPC.300(72).

3. An operating manual describing safe operations of the equipment, safe testing and maintenance of the equipment is to be provided. It is to be kept updated and available in a location known to the operating personnel. The operating manual is to include, but not limited to, the following aspects:

Cont'd in the Attachment

Notes/Drawing/Documentation:

Drawing No. 470300, Compact Clean Generic P&ID, Revision: 1, Pages: 1

Drawing No. ID 146181, Dimensional drawing Z188878_aquaBoll BWT BB 700x1250 DN350, Revision: 00, Pages:

Drawing No. 117-36341-1, IACS E10 Rev 6 Test Report, FORCE Technology Norway AS, 28.02.2019, Revision: 1, Pages: 1

Drawing No. 210609, COMPACTCLEAN IMO-SCALING Test, Revision: 1, Pages: 1

Drawing No. ID 146185, Dimensional drawing Z189114_aquaBoll BWT BB 1000x1535 DN500, Revision: 00, Pages: 1

Drawing No. ID 146187, Dimensional drawing Z189151_aquaBoll BWT BB 1200x1535 DN600, Revision: 00, Pages: 1

Drawing No. ID 146184, Dimensional drawing Z189069_aquaBoll BWT BB 830x1550 DN400, Revision: 00, Pages:

Drawing No. ID 146172, Dimensional drawing Z189053_aquaBoll BWT BB 240x230 DN80, Revision: 00, Pages: 1 Drawing No. 11824997, LR land-based test, Revision: 1, Pages: 1 Drawing No. ID 146177, Dimensional drawing Z188904_aquaBoll BWT BB 540x840 DN250, Revision: 00, Pages: 1 Drawing No. 161335, Operation Maintenance and Safety Manual - OMSM, Revision: e, Pages: 1

Drawing No. design, Design Study Filtrex vs Boll, Revision: 1, Pages: 1

Drawing No. ID 146176, Dimensional drawing Z188922_aquaBoll BWT BB 430x730 DN200 - 725454, Revision: 00. Pages: 1

Drawing No. DNV TAC, DNV TAC, Revision: 1, Pages: 1

Drawing No. 11825920, Biological efficacy performance evaluation of CompactClean Ballast Water Management System in land-based test, Revision: 1, Pages: 1

Drawing No. ID 146174, Dimensional drawing Z189029_aquaBoll BWT BB 330x300 DN100, Revision: 00, Pages: 1 Drawing No. Biological efficacy performance evaluation of CompactClean Ballast Water Management System in landba, Biological efficacy performance evaluation of CompactClean Ballast Water Management System in landbased

test, Revision: 1, Pages: 1

Drawing No. ID 146175, Dimensional drawing Z188964 aquaBoll BWT BB 400x410 DN150, Revision: 00, Pages: 1 Drawing No. ID 146179, Dimensional drawing Z188847_aquaBoll BWT BB 580x1150 DN300, Revision: 00, Pages:

Drawing No. 118259200, Biological efficacy performance evaluation of CompactClean Ballast Water Management System in land-based test - Additional test cycles with Bollfilter, Revision: 1, Pages: 1

Drawing No. 28144225, Evaluation test report - Equivalence of the aquaBoll BWT, BWT RB and 6.18.3 filter designs, Revision: 1, Pages: 1

Drawing No. 11821290, DNV land-based test, Revision: 1, Pages: 1

Cont'd in the Attachment

Terms of Validity:

This Product Design Assessment (PDA) Certificate remains valid until 18/Jul/2029 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable

DESMI OCEAN GUARD A/S LUFTHAVNSVEJ 12 NORRESUNDBY Denmark DK-9400 Telephone: +45 9632 8284 Fax: Email: info@desmioceanguard.com Web: www.desmioceanguard.com

Tier: 2 - PDA Issued

Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

STANDARDS

ABS Rules:

2024 Rules for Conditions of Classification: 1A-1-4/7.7, 1A-1-A3 and 1A-1-A4, which covers the following:

2024 Rules for Building and Classing Marine Vessels: 4-6-2/3, 4-6-2/5, 4-8-3/1.7, 4-8-3/1.11, 4-9-3/5.1.1, 4-9-3/5.1.8, 4-9-3/7, 4-9-3/9, 4-9-3/11, 4-9-9/13.1, 4-9-9/ Table 1, Table 2.

2022 Guide for Ballast Water Treatment

National: NA

International:

IMO Resolution MEPC.300(72), Code for Approval of Ballast Water Management Systems (BWMS Code), adopted on 13 April 2018 IACS UR E10, Rev. 8: 2021

Government:

NA

EUMED:

NA

OTHERS:

NA



Ratings (cont'd from the Certificate):

Treatment Rated Capacity:

For the ballast water uptake, the Treatment Rated Capacity (TRC) of a specific CompactClean BWMS model is limited by the maximum flow rate of either the selected UV unit model or the selected filter model.

The treatment flow rate is monitored by a flowmeter at the BWMS inlet (before filter). The maximum flow rate of the different UV models, Filtrex ACB filter models and BOLLFILTER aquaBOLL BWT BB filter models are stated below.

UV unit	Maximum flow rate [m3/h]		
model	IMO mode	US mode	
V10024	60	40	
V15044	135	85	
V15064	240	160	
V20066	370	250	
V20086	510	340	
V25126	750	500	
V30186	1200	870	
V35246	1650	1180	
V40366	2500	1740	

Filter model	Filtrex filter model	Maximum flow rate [m3/h]
F0035	ACB-903-65	35
F0055	ACB-904-80	55
F0087	ACB-906-100	87
F0135	ACB-910-150	135
F0190	ACB-915-150	190
F0255	ACB-935-200	255
F0340	ACB-945-200	340
F0515	ACB-955-250	515
F0770	ACB-985-300	770
F1040	ACB-999-350	1040
F1500	ACB-9100-400	1500
F2100	ACB-9120-500	2100
F3000	ACB-9200-600	3000



Filter model	BOLLFILTER filter model	Maximum flow rate [m3/h]
B0065	aquaBoll BWT BB 240x230	65
	DN80	
B0125	aquaBoll BWT BB 330x300	125
	DN100	
B0220	aquaBoll BWT BB 400x410	220
	DN150	
B0430	aquaBoll BWT BB 430X730	430
	DN200	
B0770	aquaBoll BWT BB 540x840	770
	DN250	
B1000	aquaBoll BWT BB 580x1150	1000
	DN300	
B1350	aquaBoll BWT BB 700x1250	1350
	DN350	
B1900	aquaBoll BWT BB 800X1235	1900
	DN400	
B2600	aquaBoll BWT BB 1000x1535	2 600
	DN500	
B3200	aquaBoll BWT BB 1200x1535	3 200
	DN600	

<u>Pressure</u>

The minimum and maximum system operating pressure and the differential pressure triggering backflushing are listed below.

Minimum pressure at filter inlet	Maximum operating pressure	Filter differential pressure triggering backflushing	Maximum filter differential pressure
1.3 bar	10 bar	0.3	1.1 bar
(2 bar recommended)			



System Design Limitations (DESMI):

UV-Intensity (UVI):

The CompactClean system will operate at full flow with a UV Intensity higher than or equal to the TRC. The BWMS monitors UV intensity (UVI) and automatically dims the UV lamp power (maximum dimming is 20% of maximum rated lamp power) when UVI exceeds a defined UVI limit in order to maintain a constant UVI at that limit.

At lower UVT levels, the CompactClean BWMS automatically adjusts the flow rate with the flow control valve W1-RM2. Optionally, the ballast water flow rate may also be controlled through an additional variable frequency drive installed on the ballast water pump.

Flow Rate (Treatment Rated Capacity - TRC):

The flow rate is measured in [m3/hr] by the flow meter placed on the inlet side of the filter.

Pressure:

The maximum pressure rating for CompactClean BWMS is 10bar.

Salinity:

The CompactClean BWMS is intended to be used for treatment of all 3 water salinities: fresh water with a practical salinity unit (PSU) of 0, brackish water and high salinity water with a PSU of 40 or more.

Holding Time:

The CompactClean BWMS, when operated in the IMO or US mode, has demonstrated performance to the discharge standard with a minimum holding time between uptake and discharge of 24 hours in land-based testing in each of the three salinity ranges. UV treatment is instant and does not require any hold time in a ballast tank to render organisms non-viable. Therefore, holding time is not found to be a limiting condition for the BWMS.

Compliance Modes:

The CompactClean BWMS has two compliance modes: IMO mode and US mode. The UVI limits for dimming of the UV lamp power, the UVI limits for operating at TRC of the UV unit and the lowest UVI for which the BWMS is type approved are stated below for these two compliance modes. The same UVI limits apply to all UV unit models.

The CompactClean OptIMO BWMS may be operated in either the IMO mode or the US mode.

Compliance mode	UVI limit for dimming	UVI limit for	Lowest UVI limit for
	of the UV lamp	operating at TRC of	which BWMS is type
	power [W/m2]	UV unit (1) [W/m2]	approved (2) [W/m2]
IMO mode	900	800	170
US mode	1000	880	227

(1) As per the CFD analyses provided, this UVI limit corresponds to an UVT of 62% (IMO mode) or 65% (US mode).

(2) The lowest UVT at which land-based tests confirmed treatment in compliance with the discharge standard was 35% (IMO mode) or 40% (US mode).



ABS SERVICE RESTRICTIONS / COMMENTS:

A. Service Restrictions:

- i. Where a vessel is fitted with a ballast water management system (BWMS) and the "BWT" or "BWT+" Notation is not being pursued, the installed BWMS is to comply with the requirements in Sections 4 and 5 of the ABS Ballast Water Treatment Guide and to be verified by an ABS Surveyor during installation. All plans and information are to be submitted to ABS Engineering Office for review of each individual application of this Ballast Water Management System (BWMS) onboard ABS Classed vessels and units to verify the service restrictions stated below and compliance with the requirements in the Rules and relevant Regulations.
- Unit Certification is not required for the BWMS unless the vessel is receiving BWT+ notation. ii. However, for any Computer-Based or PLC hardware of the BWTS, when BWT or BWT+ notation is assigned for a specific vessel, the tests in 4-9-3/17 of the Marine Vessels Rules are to be witnessed by a Surveyor. In addition, the main components of a BWTS, as defined by ABS Guide for Ballast Water Treatment, section 1/7.1.2 (such as filters) which are subjected to or rated at a pressure greater than 6.9 bars as defined in MVR 4-4-1/Table 1 & Table 2, are required to be "Unit Certified" to the satisfaction of an ABS Surveyor for all installations.
- iii. The installation of the BWT system is to have approval of the vessel's Flag administration and is to comply with the applicable requirements of the ABS BWT Guide.
- iv. Ex certification is not covered by this certificate. Ex installations to be approved in each case according to the Rules and Ex-Certification/Special Condition for Safe Use listed in valid Excertificate issued by a notified/recognized Certification Body. Please note that for U.S. Flagged Vessels, equipment certified under ATEX Directive does not comply with 46CFR 111.105-7(a), unless it has IECEx Conformity approval by a USCG accepted laboratory.
- BWTS locations and the relevant ventilations requirements are to be complied with 4/3.1 ٧. through 4/3.5 of the ABS BWT Guide.
- Where the cables (not supplied by DESMI) fed from non-hazardous area are terminated at the vi. equipment in hazardous area, the cable are to be of extruded impervious inner sheath type or the cables at the termination point are to be fitted with the gas-tight sealing grand in order to prevent migration of gas through these cables in accordance with 4-8-3/9.1 of the ABS MVR.
- Suitable provisions acceptable to ABS are to be provided for cable or piping penetrations vii. through the deck/bulkhead between "hazardous" (non-safe) areas and "non-hazardous" (safe) areas to avoid the possible migration of hydrocarbon or other flammable liquids or vapors as well as sustain the fire and water integrity of the deck/bulkhead. viii.

When

the software and/or hardware are modified, the revised documents are to be presented to the Surveyor, when requested, and the performance test after the modification is to be witnessed by the Surveyor in accordance with 4-9-3/Table 5 as a Category II system of the ABS MVR. Software version records shall be available for ABS Surveyor witness per 4-9-3/Table 4 as a Category II system of the ABS MVR. No modification to hardware other than replacement with identical components is allowed. Any modification to the hardware required shall be in accordance with 4-9-3/Table 4 and 4-9-3/Table 5 of the ABS Marine Vessel Rules as a Category Il system.



Compact Clean, Ballast Water Management System 24-00T2541153-PDA, Issue Date: 19-JUL-2024, Exp date: 18-JUL-2029, Rev. 0

DESMI OCEAN GUARD A/S (417151)

- ix. The main source of electrical power is to have sufficient capacity for the maximum electrical load of the BWTS. This is to be indicated in the electrical load analysis for the system to be installed.
- x. The attending Surveyor onboard is requested to verify the following:
 - a. On-board Test as per 4-9-3/Table 2 and Table 3 as a Category II system of the ABS Marine Vessels Rules:
 - i. Complete system test.
 - ii. Integration test
 - iii. Wireless Data Communication test

b. The BWMS is in conformance with the Type Approval Certificate issued by the Administration or its representative.

c. The installation of the complete BWMS has been carried out in accordance with the manufacturer's equipment specification and the above service restrictions.

d. Any operational inlets and outlets are located in the positions indicated on the drawing of the pumping and piping arrangements.

e. The workmanship of the installation is satisfactory and, in particular, that any bulkhead penetrations or penetrations of the ballast system piping are in accordance with ABS Rules.

f. The control and monitoring equipment operates correctly.

g. A copy of the Type Approval certificate should be carried on board a vessel fitted with the BWMS at all times. A reference to the test protocol and a copy of the test results should be available for inspection on board the subject vessel.

h. A booklet identifying all equipment in the hazardous areas and the particulars of the equipment that should be maintained on board for future reference. The booklet is to include a list of all electrical equipment/instruments in the hazardous areas along with evidence of certification.



B. Comments:

- 1. For each installation detailed ship's arrangement plans are to be submitted for approval. See Section 2/1.1 and 2/1.3 of ABS Ballast Water Treatment Guide. The plans are to clearly indicate and/or include information such as the following (but not be limited to):
- a) General arrangement of the BWMS, including location/layout and local instrumentation arrangement.
- b) Structural plans showing installation details of attachment supports and foundations of principal components of the BWMS.
- c) The piping system drawings, including BWMS piping system layout/routing, connection arrangement to ship's ballasting system, filling arrangement and booklet of construction details, etc.
- d) Location of ballast water sampling facilities.
- e) Electrical load analysis, circuit drawings and main power cable drawings. The main source of electrical power is to have sufficient capacity for the maximum electrical load of the BWMS, this is to be indicated in the electrical load analysis for the system to be installed. The electrical system associated with the BWMS are to be provided with protections against overload and short circuit by automatic protective devices, so that in the event of an overload or a short circuit, the device will operate to isolate it from the systems. See 4-8-2/9 of the ABS Marine Vessels Rules.
- f) Arrangements and details of all associated control equipment, monitoring equipment and safety system.
- g) Details of all other electrical equipment including power interlock arrangements to be located in or around the BWMS structure.
- h) A booklet identifying all equipment in the hazardous areas and the particulars of the equipment if applicable for the installation. The booklet is to include a list of all electrical equipment/instruments in the hazardous areas along with evidence of certification.
- i) Types and operating controls for system isolation valves, etc.
- j) Personnel Protection Equipment arrangements.
- k) Firefighting measures.
- 2. If installed in a "Hazardous" (non-safe) area, the additional arrangements of Appendix 6 are to be considered and submitted to the Bureau for review/approval, as per 4/3(xiii) of ABS Ballast Water Treatment Guide.
- 3. Cables (i.e., power or control cables) are to be in accordance with IEC Publication 60092-353, IEEE Std-45 or other marine standards acceptable to the ABS as per 4-8-3/9.1 of the ABS MVR.
- 4. At each installation, the vessel is to maintain a Ballast Water Management Plan (BWMP) on board for use by the vessel's Master and crew and the port State authorities.
- 5. Depending on the type of vessel which the system is installed on, the BWTS is to comply with the relevant sections of ABS Ballast Water Treatment Guide.
- 6. The treatment rated capacity (TRC) is to be sufficient to meet the ship's ballast capacity and normal ballast operations rate.
- 7. The arrangements in the ABS Guide for Ballast Water Treatment 4/7.7 are to be verified at each installation.



- 8. BWMS operating manual describing safe operations of the equipment, safe testing, maintenance of the equipment, occupational health hazards relevant to the BWMS and its application to the ballast tank system is to be provided. The BWMS operating manual is to be kept updated and available in a location known to the operating personnel. The BWMS operating manual is to include, but not limited to, the following aspects:
 - a) Inspection and maintenance is to be carried out only by experienced and authorized personnel. Appropriate refresher training shall be given to such personnel on a regular basis.
 - b) Alarms, monitoring and interlocks arrangements are to be periodically tested to ensure correct operation. The inspection and testing methods are to be documented in the BWT system operating manual.
 - c) Post appropriate warning notices of the risk of eye and skin injuries from exposure to UV light are to be posted.
 - d) Detailed procedures for mandatory manual cleaning / back flush of the filter every time the ballast pump stops at each ballasting port.
 - e) Guidance on procedures to be followed in the event of a fault or failure of the BWMS.
- 9. The scope of Type Approval is to comply with "MSC.1/Circ.1221 dated 11 December 2006 Validity of Type Approval Certification for Marine Products".
- 10. The ABS Type Approval verifies that the system satisfies the requirements in the ABS Rules and Guide (pressures, electrical connections, design features). ABS Type Approvals do not consider the efficacy of the system, that is how effective the system is at killing or rendering harmless the organisms and pathogens in the ballast water.



Drawings List (cont'd from the Certificate):

Drawing No.	Rev. No.	Title
ID 145825	00	Data sheet 4500737
ID 145824	00	Data sheet 4500818
ID 145819	00	Data sheet 4500843
ID 145820	00	Data sheet 4500844
ID 145821	00	Data sheet 4500845
ID 145831	00	Data sheet 4500886
ID 145822	00	Data sheet 4500887
ID 145832	00	Data sheet 4500890
ID 145823	00	Data sheet 4500928
ID 161321	5.1	FS Circuit diagram 441403 MAIN PANEL CC1000 NEX
ID 158386	00	FS Circuit diagram ACTUATOR ITQ0160-90000 DC24V
ID 31033	00	HMCX 250M-4 Kw 55 EX
ID 91307	0	MEC00002 Requirement specification for piping systems in steel used for
		BWTS
ID 31052	1	Pressure Transmitter Ex H72329w_EN_8292_EXNT
ID 158677	J	TL Arrangement drawing 441366 BWMS CC 135 NEX EAN LCD NOP
ID 158321	1	TL Arrangement drawing 441367 BWMS CC 340 NEX EAN LCD NOP
ID 158646	K	TL Arrangement drawing 441368 BWMS CC 500 NEX EAN LCD NOP
ID 158769	J	TL Arrangement drawing 441369 BWMS CC 750 NEX EAN LCD NOP
ID 158082	J	TL Arrangement drawing 441370 BWMS CC 1000 NEX EAN LCD NOP
ID 158771	K	TL Arrangement drawing 441371 BWMS CC 1500 NEX EAN LCD NOP
ID 159033	0	TL Arrangement drawing 441480 CC 135 NEX EAN SKM FVZ
ID 162036	A	TL Arrangement drawing 441759 BWMS CC 255 NEX EAN LCD NOP
ID 162041	A	TL Arrangement drawing 441760 BWMS CC 2000 NEX EAN LCD NOP
ID 162042	Α	TL Arrangement drawing 441761 BWMS CC 2500 NEX EAN LCD NOP
ID 162043	1	TL Arrangement drawing 441762 BWMS CC 3000 NEX EAN LCD NOP
ID 159034	L	TL Arrangement drawing 441481 CC 340 NEX EAN SKM FVZ
ID 159030	M	TL Arrangement drawing 441482 CC 500 NEX EAN SKM FZV
ID 158842	L	TL Arrangement drawing 441483 CC 750 NEX EAN SKM FVZ
ID 159037	L	TL Arrangement drawing 441484 CC 1000 NEX EAN SKM FVZ
ID 159038	L	TL Arrangement drawing 441485 BWMS CC 1500 NEX EAN SKM FZV
ID 162266	С	TL Arrangement drawing 441561 BWMS CC 340 IEX EAN LCD NOP
ID 162037	A	TL Arrangement drawing 441755 BWMS CC 35 NEX EAN LCD NOP
ID 162038	A	TL Arrangement drawing 441756 BWMS CC 55 NEX EAN LCD NOP
ID 162039	A	TL Arrangement drawing 441757 BWMS CC 87 NEX EAN LCD NOP
ID 162040	A	TL Arrangement drawing 441758 BWMS CC 190 NEX EAN LCD NOP
161576	1	IECEX CERTIFIED COMPONENTS



nex	1	nex
470540 circuit1	1	FS Circuit diagram 470540 BWMS Compact Clean Systems NEX CBD
		circuit1
654	1	FAT and SAT (HAT) Tests
470541 circuit2	1	FS Circuit diagram BWMS Compact Clean Systems IEX CBD ID 40271
		circuit2
ID 161376	00	DA Datasheet 6ES71936PA000AA0_en
ID 161373	00	DA Datasheet 6ES75121DK010AB0_en
ID 158047	00	DA Datasheet 720871 TEMPERATURE SENSOR G ¹ / ₂ 316
ID 2025	00	DA Datasheet 720914 Level switch
ID 161412	00	DA Datasheet 720914 Level switch
ID 158184	00	DA Datasheet Sensor port 720873
ID 158182	00	DA Datasheet UV Sensor 720872
ID 161370	00	DA Datasheet 6ES79548LC020AA0_en
ID 2045	00	DA Datasheet UV Sensor 720872 NEX
ID 31034	00	721331
ID 161576	00	Component Overview CC190-1500 IEX
ID 162300	00	Component Overview CC2000-3000 IEX
ID 83569	00	DA Automatikfilter aquaBoll DN400-DN500 BWT BB Maßblatt_Z183650
ID 1579	00	DA Data Sheet 721773 UV Sensor IECEx
ID 8956	00	DA Data Sheet drawing A152490-0 ACB-945-200-C 180degree
ID 185264	00	DA Data Sheet drawing A170450-0_ACB-9200-600L
ID 185266	00	DA Data Sheet drawing ACB-9200L (Spec sheet)
ID 31032	00	DA HMCX 200L-4 Kw 30 EX
ID 157378	00	DA ESL40-180N-D12 HMAX3 M90 ATEX
ID 31031	00	DA HMCX 225S-4 Kw 37 EX
ID 31028	00	DA hmcx 315L1-6 Kw 110 EX
ID 31030	00	DA HMCX 315S-6 Kw 75 EX
ID 1602	00	DA Material Safety Data Sheet for Citric acid
ID 31050	00	DA PT100 For Cump
ID 145829	00	Data sheet 4500821
121-28825-1	1	IACS E10 Rev 8 Test Report, FORCE Technology Norway AS,
		01.11.2021
AQA001009	1	Quality Plan
risk	1	risk
470540 cir1	1	FS Circuit diagram 470540 BWMS Compact Clean Systems NEX CBD
		cir1
470541 Cir2	1	FS Circuit diagram BWMS Compact Clean Systems IEX CBD ID 40271
		cir2
risk a	1	risk a



c2	1	c2
c3	1	c3
c4	1	c4
c5	1	c5
c9	1	c9
c10	1	c10
c11	1	c11
c12	1	c12
c13	1	c13
c16	1	c16
c18	1	c18
c20	1	c20
ID 2020	00	DA Datasheet 717641 Pressure transmitter
ID 10054	00	DA Datasheet 717641 Pressure transmitter
(ID 156195) (ID	1	DA Datasheet 717641 Pressure Transmitter 0-16 bar g
2024)		
ID 31012	00	DA Data Sheet DSL350-460.D-G EX
ID 31016	00	DA Data Sheet NSL200-265B.D02
ID 36021	00	DA Data Sheet NSL200-265B.D02
ID 31015	00	DA Data Sheet NSL200-330.D02
ID 31013	00	DA Data Sheet NSL300-418.D02
ID 33644	00	DA Data Sheet S70-50-175N Pump
c21	1	c21
c22	1	c22
c23	1	c23
c24	1	c24
c25	1	c25
c26	1	c26
c27	1	c27
c28	1	c28
ID 9022	00	DA Data Sheet S80-70-175N Pump
ID 9285	00	DA Data Sheet S100-80-175N Pump
ID 161382	00	DA Datasheet 6ES75455DA000AB0_en
c29	1	c29
c30	1	c30
c32	1	c32
c35	1	c35
c36	1	c36
ID 161371	00	DA Datasheet 6AV21818XP000AX0_en
ID 161375	00	DA Datasheet 6ES71316BF010BA0_en



ID 161374	00	DA Datasheet 6ES71316BH010BA0_en
ID 161380	00	DA Datasheet 6ES71326BF010BA0_en
117-36341-1	1	IACS E10 Rev 6 Test Report, FORCE Technology Norway AS,
		28.02.2019
Asbestos Free	-	Asbestos Free Declaration
Declaration		
ABS RL	-	ABS RL T2308073
T2308073		
6310-C-23-027	0	Eng-Sheet for EPL Logger unit
Report for EPL	-	Report for EPL Installation
Installation		
N23-51K-0089E	1	FUNCTION SPECIFICATION with mark
ID 6571	00	DA Datasheet 720871 TEMPERATURE SENSOR G 316
N23-51K-0089F	3	SCHEMATIC DIAGARAM with mark
N23-51K-0089B	3	OUTLINE VIEW with mark
ID 161378	00	DA Datasheet 6ES71326BH010BA0_en
ID 161379	00	DA Datasheet 6ES71326GD500BA0_en
ID 161377	00	DA Datasheet 6ES71556AU000BN0_en
ID 161372	00	DA Datasheet 6ES71936BP000DA0_en
ID 1581	0	DA Datasheet 720871 TEMPERATURE SENSOR G ¹ / ₂ 316
ID 158037	00	DA Datasheet 720871 TEMPERATURE SENSOR G ¹ / ₂ 316