DNV·GL

Certificate No:
MEDB00006K4

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV GL AS under the authority of the Government of Norway.

This is to certify:

That the Oil discharge monitoring and control system for an oil tanker

with type designation(s)
Oil Discharge and Control System (ODME), Type "CleanTrack 1000 B"

Issued to
Brannstrom Sweden AB
GOTHENBURG, Sweden

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2019/1397,**
item No. MED/2.5. Marpol 73/78 as amended, Annex I Regulation 31, IMO Res. MEPC.108(49) as amended by MEPC.240(65) and IMO MEPC.1/Circ.858

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2025-03-26**.
Issued at **Høvik** on **2020-03-27**

DNV GL local station:
Sweden CMC

Approval Engineer:
Erik Istad

Notified Body
No.: **0575**

for **DNV GL AS**

Roald Vårheim
Head of Notified Body

NORWEGIAN ACCREDITATION PROD 019

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

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Product description

The CleanTrack 1000 B is intended for installation onboard oil tankers for oil contaminated water monitoring/ alarm - max. 30 litres of oil per nautical mile at discharge overboard (ODME).
The oil content meter is tested and approved for crude oils, "black" and "white" products, as well as blends of petroleum oil and bio-fuels as given below.
The system consists of an analyser unit and a sample pump installed in pump room or on deck (hazardous area), a converting unit intended for installation in engine room, and a computer unit intended for installation in cargo control room.

Application/Limitation

Arrangement drawing and certificate for intrinsically safe equipment (equivalent to EEx ia IIC T4) is to be submitted for each installation. Inspection of intrinsically safety is to be carried out upon installation on board.

The oil content meter is tested and approved for crude oils, "black" and "white" products as per IMO Resolution MEPC.108(49).

The oil content meter is also tested and approved for the blends of petroleum oil* and bio-fuels as given in IMO MEPC.240(65) and MEPC.1/Circ.761 and Annex 11 of MEPC.2/Circ.22/Corr.1 to meet the requirements for testing bio-fuel blends containing 99% and 75% or more of petroleum oil.

*Petroleum oil includes Energy rich fuel as per MEPC.1/Circ.879

ODME CLEANTRACK 1000B:
The oil content meter is tested and approved for crude oils, "black" and "white" products as per IMO Resolution MEPC.108(49), and the blends of petroleum oil* and bio-fuels as given in IMO MEPC.240(65) and MEPC.1/Circ.761 and Annex 11 of MEPC.2/Circ.23 to meet the requirements for testing bio-fuel blends containing 99% and 75% or more of petroleum oil.

Tested and approved for the following blends of 99%-75% petroleum and 1%-25% bio-fuel:

- Alkanes (C4-C12), linear, branched and cyclic
- Alkanes (C5-C7), linear and branched
- ~~Alkanes (C9-C24), linear, branced and cyclic with a flashpoint ≤ 60°C~~
- Alkanes (C9-C24), linear, branched and cyclic with a flashpoint > 60°C
- Alkanes (C10-C17), linear and branched
- Alkanes (C10-C26), linear and branched with a flashpoint > 60°C
- Alkanes (C10-C26), linear and branched with a flashpoint ≤ 60°C
- Ethyl alcohol
- Fatty Acid Methyl Esters (FAME)
- Tert-Amyl Ethyl Ether
- Vegetable oils

*Petroleum oil includes Energy rich fuel as per MEPC.1/Circ.879

Type Examination documentation

Drw. No.	*Date/ Rev.*	*Title;*
CTB10001	160704/ E	Computer unit ll(3 shts.)
CTB10001p	160704/ E	Computer unit - Printer version (3 shts.)

CTB10030	130123/ C	Computer unit - Mounting
CTB10020	110701/ A	Measuring cell (3 shts.)
P3711036	150629/ C	Measuring cell – free Mounting
CTB10021	180316/ C	Connection Box (2 shts.)
CTB10003	181219/ D	Converting unit (4 shts.)
CTB110627.1el	180705/ E	Converting unit - Electric sample pump motor – Internal cable diagram
CTB110627.1 elext	190111/C	Converting unit – Electric sample pump motor, internal cable diagram with inverter.
CTB110627.1pn	130426/ B	Converting unit - Pneumatic sample pump motor – Internal cable diagram
CTB110627.1pnz	170829/ B	Converting unit - Manually controlled pneum. sample pump motor - Int. cable diagram
CTB10012	110525/ A	Analysing unit - Electric sample pump type (5 shts.)
CTB10015	180307/ D	Analysing unit – Skid electrical Ex motor sample pump type (4 shts.)
CTB10010	160202/ F	Analysing unit – Air motor sample pump type (5 shts.)
CTB110701.1	110701/ A	Sample probes - Installation arrangements
CTB891216.1	110701/ K	Sample probes - Installation arrangements
CTB10601	160701/ C	Partnames - Partnames of typical arrangement
CTB10914	170917/ A	General arrangement - Electric sample pump system with fresh water
CTB10917	160630/ B	General arrangement – Skid electric sample pump system with fresh water
CTB10927	170921/ A	General arrangement – Skid electric sample pump system with indicated fresh water valve
CTB10918	071013/ A	General arrangement – Exd Electric sample pump system with fresh water
CTB10905	170919/ D	General arrangement - Bulkhead penetrating sample pump system
CTB10911	170919/ C	General arrangement – Controlled Pneumatic sample pump system with fresh water
CTB10921	170919/ B	Controlled Pneumatic sample pump system with indicated fresh water valve
CTB10902	170619/ C	General arrangement - Manual pneumatic sample pump system
CTB10903	171919/ D	General arrangement - Pilot controlled pneumatic sample pump system
CTB110204.1el	180827/ N	Cable diagram - Electric sample pump system
CTB110204.1pn	180327/ G	Cable diagram - Pneumatic sample pump system
CTB110204.1bh	180827/ I	Bulkhead sample pump system cable diagram
CT891211.1	041004/ H	Sample pump unit - Bulkhead mounted type model P06D
CT041029.1	060904/ C	Sample pump unit - Bulkhead mounted type model 32MED22
CS-32MED001	060307/ 1	Pump model 32MED22
P3715089	180207/ C	Pump model SPP-100
P3714073	170830/ C	Section view SPP-100
RD12.11.408	090211	Pump model Y-2951
B-CTS 63E		Pump model T63
4.93.450.01	110505	Pump model T61
CS-NPD13-01		Pump model NPD

Tests carried out

Tested in accordance with the requirements of the specification contained in Part 1 of the Annex to the Guidelines and Specification contained in IMO Resolution MEPC.108(49), and witnessed by DNVGothenburg, May 2011.

DNV Technical Report No.2011-3155, dated 2011-03-25, Environmental testing of Converting and Analysing Units, CleanTrack 1000 B.

Test records from testing with 5 different blends of bio-fuel and 75% (by volume) diesel/gas oil according to IMO MEPC.1/Circ.761, signed and stamped by DNV Gothenburg, 2011-10-14.

Saybolt Test records, No. 116_30029/14 dated 2014-01-02, from testing with 5 different blends of bio-fuel and 75%/99% (by volume) diesel/gas oil according to IMO MEPC.240(65) and Annex 11 of MEPC.2/Circ.23, signed and stamped by DNV GL Gothenburg, 2014-02-06

SGS Test records, No. 117_4147712 dated 2017-05-02, from testing with 5 different blends of bio-fuel and 75%/99% (by volume) diesel/gas oil according to IMO MEPC.240(65) and Annex 11 of MEPC.2/Circ.23, signed and stamped by DNV GL Gothenburg, 2017-04-26.

PAConsult Test Report No. 18-9981 Oil Discharge Monitor Cleantrack 1000B, dated 2018-03-01 and Test Report "Fluctuation in power supply" testing of Oil discharge Monitor Cleantrack 1000B Computer Unit, signed and stamped by DNV GL Gothenburg, dated 2018-02-20

Marking of product

For traceability to this EC Type-Examination, each unit to be marked with;
- Manufacturer's name and trade mark
- Type designation
- Serial No.
- Mark of Conformity

Mark of Conformity

The manufacturer is allowed to affix the Mark of Conformity according to Article 11 in the Council Directive 96/98/EC on Marine Equipment and shall issue a Declaration of Conformity, only when the module D or E or F of Annex B in the same directive is fully complied with.

Module D: The quality system for production and testing shall be approved by the Notified Body.

Module E: The quality system for inspection and testing shall be approved by the Notified Body.

Module F: Compliance of the products to type as described in this EC Type-Examination Certificate must be verified by the Notified Body who also shall issue a Certificate of Conformity.

APPENDIX

TEST DATA AND RESULTS OF TESTS CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1 OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS CONTAINED IN IMO RESOLUTION MEPC.108(49)

Oil content meter submitted by	BRANNSTROM SWEDEN AS
Test Location	GOTHENBURG, Sweden
Method of sample analysis	ISO 9377-2:2000
Samples Analysed by	Saybolt Sweden AB / SGS Organic Lab, Taunusstein

Environmental testing of the electronic section of the oil content meter has been carried out in accordance with part 2 of the annex to the Guidelines and Specifications contained in IMO resolution MEPC.108(49). The equipment functioned satisfactorily on completion of each test specified in the environmental test protocol.

Note: *If alternative oils covering the same range of properties as the crude oils listed are used, these should be substituted where applicable.*

		Readings (ppm)				
		Indicated	Measured	Grab sample	**REMARKS**	
CALIBRATION AND	0	0	0	0		
ZERO TEST	15	15	18	7		
	50	51	54	22		
	100	99	105	48		
	200	202	213	96		
	400	408	412	138		
	600	600	597	226	TEST WATER TEMPERATURE	7,5^{0}C
	800	802	821	344		
	1000	1000	995	474	RE-ZERO	~~YES~~/NO
					RECALIBRATE	~~YES~~/NO

RESPONSE TESTS

NO.1 CRUDE OIL					**REMARKS**	
	15	17	17	8		
	100	99	99	53	RE-ZERO	~~YES~~/NO
90% M.F.S.V. =	900	903	883	615	TIME	- mins
RECORDED ZERO		0			RECALIBRATE	~~YES~~/NO
					TIME	- mins
					CLEAN	~~YES~~/NO
					TIME	- mins

NO.2 CRUDE OIL					**REMARKS**	
	15	15	20	9		
	100	101	103	43	RE-ZERO	~~YES~~/NO
90% M.F.S.V. =	900	898	901	479	TIME	- mins
RECORDED ZERO		0			RECALIBRATE	~~YES~~/NO
					TIME	- mins
					CLEAN	~~YES~~/NO
					TIME	- mins

NO.3 CRUDE OIL					**REMARKS**	
	15	17	17	8		
	100	97	102	40	RE-ZERO	~~YES~~/NO
90% M.F.S.V. =	900	920	909	390	TIME	- mins
RECORDED ZERO		0			RECALIBRATE	~~YES~~/NO
					TIME	- mins

					CLEAN	~~YES~~/NO
					TIME	- mins
NO.4 CRUDE OIL					**REMARKS**	
	15	19	18	12		
	100	100	104	87	RE-ZERO	~~YES~~/NO
90% M.F.S.V. =	900	880	867	801	TIME	- mins
RECORDED ZERO		0			RECALIBRATE	~~YES~~/NO
					TIME	- mins
					CLEAN	~~YES~~/NO
					TIME	- mins
NO.5 CRUDE OIL					**REMARKS**	
	15	14	15	6		
	100	100	101	38	RE-ZERO	~~YES~~/NO
90% M.F.S.V. =	900	901	920	380	TIME	- mins
RECORDED ZERO		0			RECALIBRATE	~~YES~~/NO
					TIME	- mins
					CLEAN	~~YES~~/NO
					TIME	- mins

MARINE RESIDUAL FUEL OIL RMG 35-ISO 8217					**REMARKS**	
	15	17	16	11	RE-ZERO	~~YES~~/NO
	100	100	104	84	TIME	- mins
90% M.F.S.V. =	900	900	906	783	RECALIBRATE	~~YES~~/NO
RECORDED ZERO		2			TIME	- mins
					CLEAN	~~YES~~/NO
					TIME	- mins
AUTOMOTIVE GASOLINE					**REMARKS**	
	15	16	16	1	RE-ZERO	~~YES~~/NO
	100	97	92	9	TIME	- mins
90% M.F.S.V. =	900	930	901	43	RECALIBRATE	~~YES~~/NO
RECORDED ZERO		1			TIME	- mins

					CLEAN	~~YES~~/NO
					TIME	- mins
KEROSENE					**REMARKS**	
	15	15	13	10		
	100	101	98	61	RE-ZERO	~~YES~~/NO
90% M.F.S.V. =	900	915	888	670	TIME	- mins
RECORDED ZERO		0			RECALIBRATE	~~YES~~/NO
					TIME	- mins
					CLEAN	~~YES~~/NO
					TIME	- mins
MARINE DISTILLATE FUEL OIL					**REMARKS**	
	15	16	16	13		
	100	100	100	91	RE-ZERO	~~YES~~/NO
90% M.F.S.V. =	900	920	900	889	TIME	- mins
RECORDED ZERO		0			RECALIBRATE	~~YES~~/NO
					TIME	- mins
					CLEAN	~~YES~~/NO
					TIME	- mins

M.F.S.V = Maximum Full Scale Value

INDIVIDUAL BIOFUEL BLENDS AND CONCENTRATIONS

		Readings (ppm)				
		Indicated	Measured	Grab sample		
BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% Alkanes (C4-C12) linear, branched and cyclic					RE-ZERO	~~YES~~/NO
	15	14	14	<5	TIME	- mins
	100	98	100	<5	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	873	900	14,8	TIME	- mins
RECORDED ZERO		1			CLEAN	~~YES~~/NO
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Diesel						
1% Alkanes (C4-C12) linear, branched and					RE-ZERO	~~YES~~/NO

cyclic						
	15	15	17	<5	TIME	- mins
	100	102	101	<5	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	907	907	21,6	TIME	- mins
RECORDED ZERO		1			CLEAN	~~YES~~/NO
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% Alkanes (C5-C7), linear and branched					RE-ZERO	~~YES~~/NO
	15	15	20	<5	TIME	- mins
	100	97	100	<5	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	851	891	22	TIME	- mins
RECORDED ZERO		1			CLEAN	~~YES~~/NO
					TIME	- mins

BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Naphtha						
1% Alkanes (C5-C7), linear and branched					RE-ZERO	~~YES~~/NO
	15	15	18	<5	TIME	- mins
	100	99	99	<5	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	907	905	18,5	TIME	- mins
RECORDED ZERO		1			CLEAN	~~YES~~/NO
					TIME	- mins
~~**BIO-FUEL BLEND**~~					~~**REMARKS**~~	
~~**75% Petroleum Oil***~~						
~~75% Diesel~~						
~~25% Alkanes (C9-C24) linear, branched and cyclic with a flash point ≤60^{0}C~~					~~RE-ZERO~~	~~YES/NO~~
	~~15~~	~~-~~	~~-~~	~~-~~	~~TIME~~	~~- mins~~
	~~100~~	~~-~~	~~-~~	~~-~~	~~RECALIBRATE~~	~~YES/NO~~
~~90% M.F.S.V. =~~	~~900~~	~~-~~	~~-~~	~~-~~	~~TIME~~	~~- mins~~

~~RECORDED ZERO~~		~~-~~			~~CLEAN~~	~~YES/NO~~
					~~TIME~~	~~- mins~~
~~BIO-FUEL BLEND~~					**~~REMARKS~~**	
~~99% Petroleum Oil~~*						
~~99% Diesel~~						
~~1% Alkanes (C9-C24) linear, branched and cyclic with a flash point ≤60^{0}C~~					~~RE-ZERO~~	~~YES/NO~~
	~~15~~	~~-~~	~~-~~	~~-~~	~~TIME~~	~~- mins~~
	~~100~~	~~-~~	~~-~~	~~-~~	~~RECALIBRATE~~	~~YES/NO~~
~~90% M.F.S.V. =~~	~~900~~	~~-~~	~~-~~	~~-~~	~~TIME~~	~~- mins~~
~~RECORDED ZERO~~		~~-~~			~~CLEAN~~	~~YES/NO~~
					~~TIME~~	~~- mins~~

BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% Alkanes (C9-C24) linear, branched and cyclic with a flash point >60^{0}C					RE-ZERO	~~YES/NO~~
	15	15	16	15,9	TIME	- mins
	100	96	102	90,1	RECALIBRATE	~~YES/NO~~
90% M.F.S.V. =	900	893	907	848	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES/NO~~
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Diesel						
1% Alkanes (C9-C24) linear, branched and cyclic with a flash point >60^{0}C					RE-ZERO	~~YES/NO~~
	15	15	16	15,8	TIME	- mins

	100	100	96	81,7	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	950	909	797	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES~~/NO
					TIME	- mins

BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% Alkanes (C10-C17), linear and branched					RE-ZERO	~~YES~~/NO
	15	15	17	14,3	TIME	- mins
	100	98	104	86,4	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	885	900	721	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES~~/NO
					TIME	- mins

BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Diesel						
1% Alkanes (C10-C17), linear and branched					RE-ZERO	~~YES~~/NO
	15	17	17	12,7	TIME	- mins
	100	101	101	82,1	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	936	906	750	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES~~/NO
					TIME	- mins

BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% Alkanes (C10-C26) linear and branched with a flash point >60^{0}C					RE-ZERO	~~YES~~/NO
	15	14	17	16	TIME	- mins
	100	108	104	97	RECALIBRATE	~~YES~~/NO

90% M.F.S.V. =	900	900	904	930	TIME	- mins
RECORDED ZERO		1			CLEAN	YES/~~NO~~
					TIME	15 mins
BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Diesel						
1% Alkanes (C10-C26) linear and branched with a flash point >60^{0}C					RE-ZERO	~~YES~~/NO
	15	15	14	7,3	TIME	- mins
	100	100	95	51	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	916	896	544	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES~~/NO
					TIME	- mins

BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% Alkanes (C10-C26) linear and branched with a flash point ≤60^{0}C					RE-ZERO	~~YES~~/NO
	15	13	16	14	TIME	- mins
	100	108	102	77	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	905	893	755	TIME	- mins
RECORDED ZERO		1			CLEAN	~~YES~~/NO
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Diesel						
1% Alkanes (C10-C26) linear and branched with a flash point ≤60^{0}C					RE-ZERO	~~YES~~/NO
	15	14	14	7,2	TIME	- mins
	100	101	100	54	RECALIBRATE	~~YES~~/NO

90% M.F.S.V. =	900	895	895	489	TIME	- mins
RECORDED ZERO		0			CLEAN	YES/NO
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Gasoline					RE-ZERO	~~YES~~/NO
25% Ethyl Alcohol					TIME	- mins
	15	14	18	1	RECALIBRATE	~~YES~~/NO
	100	103	104	16	TIME	- mins
90% M.F.S.V. =	900	873	896	59	CLEAN	YES/NO
RECORDED ZERO					TIME	- mins
					RE-ZERO	~~YES~~/NO

BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Gasoline						
1% Ethyl Alcohol					RE-ZERO	~~YES~~/NO
	15	14	13	1,9	TIME	- mins
	100	101	95	6,0	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	863	887	33	TIME	- mins
RECORDED ZERO		1			CLEAN	YES/NO
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% F.A.M.E					RE-ZERO	~~YES~~/NO
	15	13	16	14	TIME	- mins
	100	98	102	67	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	906	906	702	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES~~/NO
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	

99% Petroleum Oil						
99% Diesel						
1% F.A.M.E					RE-ZERO	~~YES~~/NO
	15	13	14	6,5	TIME	- mins
	100	101	102	48	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	889	901	792	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES~~/NO
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% Tert-Amyl Ethyl Ether					RE-ZERO	~~YES~~/NO
	15	14	19	<5	TIME	mins
	100	96	100	<5	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	844	898	12,2	TIME	mins
RECORDED ZERO		1			CLEAN	~~YES~~/NO
					TIME	Mins

BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Diesel						
1% Tert-Amyl Ethyl Ether					RE-ZERO	~~YES~~/NO
	15	15	18	<5	TIME	- mins
	100	100	96	<5	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	943	900	16,3	TIME	- mins
RECORDED ZERO		1			CLEAN	~~YES~~/NO
					TIME	- mins
BIO-FUEL BLEND					**REMARKS**	
75% Petroleum Oil						
75% Diesel						
25% Vegetable Oil					RE-ZERO	~~YES~~/NO
	15	14	16	10	TIME	- mins
	100	101	103	62	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	886	894	702	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES~~/NO
					TIME	- mins

BIO-FUEL BLEND					**REMARKS**	
99% Petroleum Oil						
99% Diesel						
1% Vegetable Oil					RE-ZERO	~~YES~~/NO
	15	15	15	7,6	TIME	- mins
	100	102	99	51	RECALIBRATE	~~YES~~/NO
90% M.F.S.V. =	900	913	898	522	TIME	- mins
RECORDED ZERO		0			CLEAN	~~YES~~/NO
					TIME	- mins

F.A.M.E = Fatty Acid Methyl Esters

*Crossed out Bio-fuel blends has not been tested and are not covered by the certificate.

RESPONSE TIMES

First detectable reading			3,1	seconds
	63	ppm	6,8	seconds… (1)
	90	ppm	8,9	seconds
Stabilized maximum reading or 100ppm	100	ppm	14,7	seconds
First detectable drop			2,9	seconds
	37	ppm	6,7	seconds… (2)
	10	ppm	9,2	seconds
Stabilized minimum reading	1	ppm	20,2	seconds
RESPONSE TIME= $\frac{(1)+(2)}{(2)}$			6,8	seconds

OIL FOULING AND CALIBRATION SHIFT

10% oil concentration test				
First detectable response			4	seconds
	15	ppm	5	seconds
	100	ppm	6	seconds
Off scale on highest range			7	seconds
On scale on highest range			15	seconds
	100	ppm	45	seconds
	15	ppm	115	seconds
Minimum reading	5	ppm	180	seconds
Further cleaning required	~~YES~~/NO			
Time			-	minutes

100% oil concentration test				
First detectable response			5	seconds
	15	ppm	6	seconds
	100	ppm	7	seconds
Off scale on highest range			8	seconds
On scale on highest range			30	seconds
	100	ppm	55	seconds
	15	ppm	120	seconds
Minimum reading	1	ppm	180	seconds
Further cleaning required	YES/~~NO~~			
Time			1	minutes
Calibration shift	0	ppm		

CONTAMINANT TEST

Meter reading shift with 300 ppm non-oil contaminants mixed with water and No.2 crude oil in oil concentrations of:

• 15ppm	**-1**	ppm
• 100ppm	**+2**	ppm
• 300ppm	**+12**	ppm

AIR ENTRAINMENT TEST

Meter reading shift with 1% air entrained in water and No.2 crude oil added in concentrations of:

• 15ppm	**-2**	ppm
• 100ppm	**0**	ppm
• 300ppm	**+15**	ppm

OIL PARTICLE SIZE TEST

Meter reading shift	**+9**	ppm

TEMPERATURE TEST

Calibration test water temperature	**10**	^{0}C
Meter reading shift at 10^{0}C	**0**	ppm
Meter reading shift at 65^{0}C	**+10**	ppm

SAMPLE PRESSURE OR FLOW TEST

Meter reading shift at 50^{0}C of normal	**+3**	ppm

Meter reading shift at 200^{0}C of normal	**-3**	ppm
Deviations from this test should be stated, if necessary	-	

SHUT-OFF TEST

Meter reading before shut-off	**101**	ppm
Meter reading after start-up (minimum dry period 8 hours)	**103**	ppm

Damage to meter as follows:

UTILITIES SUPPLY VARIATION TEST

110% voltage effects	+2 ppm
90% voltage effects	-7 ppm
110% air pressure effects	0 ppm
90% air pressure effects	0 ppm
110% hydraulic pressure effects	N/A
110% hydraulic pressure effects	N/A

OTHER COMMENTS

The test was carried out without any cleaning system and without any flushing with clean water.

CALIBRATION AND ZERO DRIFT TEST

Calibration Drift	**1**	ppm
Zero Drift	**1**	ppm
Time for warm-up and calibration	**1**	mins

SHUTDOWN AND RE-ENERGIZATION TEST

Calibration Drift	**4**	ppm
Zero Drift	**0**	ppm
Time for warm-up and calibration	**1**	mins