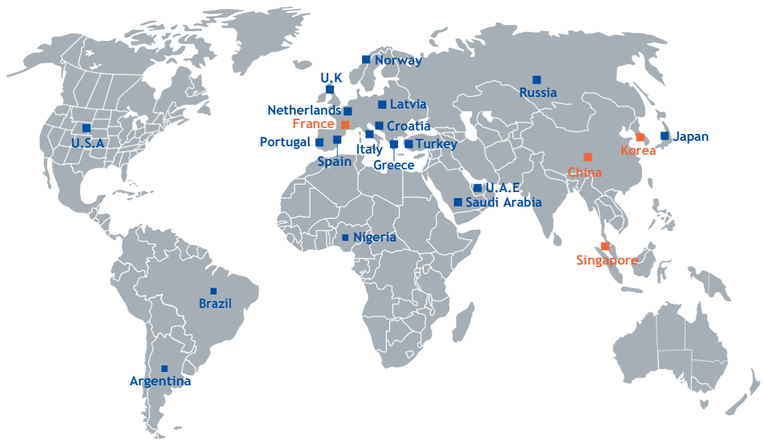
We are here for supporting you



Company Introduction - KSB Seil Co., Ltd.

1990 Establishment of Seil Seres Co., Ltd.
Started local manufacturing of ODME.

1992 Started local manufacturing of VRC System
under the technical license with KSB S.A.S.(Amri)

1999 Obtained ISO 9001 Certiacate from DNV
Succeeded in 100% localization for ODME
Model SS-2000.

2001 Contracted with DSME to supply VRC System
with actuators for 12 shipsets of LNG carriers.

2004 Obtained ISO 14001 Certiacate from DNV.

2005 Established Shanghai branch oface.

2007 Obtained OHSAS Certiacate from DNV.

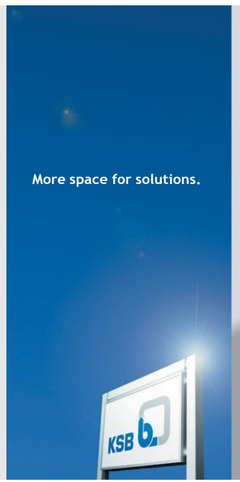
2011 Merged into KSB.

Delivery Reference of O.D.M.E (As of April.2015)

Type / Delivery Year	V.L.C.C	C.O.T	P.C	F.P.S.O	SHUTTLE	DRILL SHIP	OTHERS	TOTAL
~2000	86	131	157	1	7	7	1	390
2001	8	17	23	3	1		1	53
2002	13	29	36		1			79
2003	7	31	68	1	2			109
2004	10	33	65	2	2			112
2005	6	44	93	1				144
2006	9	44	101	2				156
2007	12	30	129		2	5		178
2008	16	40	176		1	5	2	240
2009	16	45	78		2	8	1	150
2010	31	63	64	1	3	11		173
2011	19	57	39		2	3	1	121
2012	2	38	32	2	12	10	1	97
2013	2	16	42		2	7		69
2014	3	24	64		4	4		99
2015	2	32	69					103
2016	2	17	16		1			36
2017		2						
Total	244	693	1,252	13	42	60	7	2,309

KSB

S-3000 - Oil Discharge Monitoring Equipment



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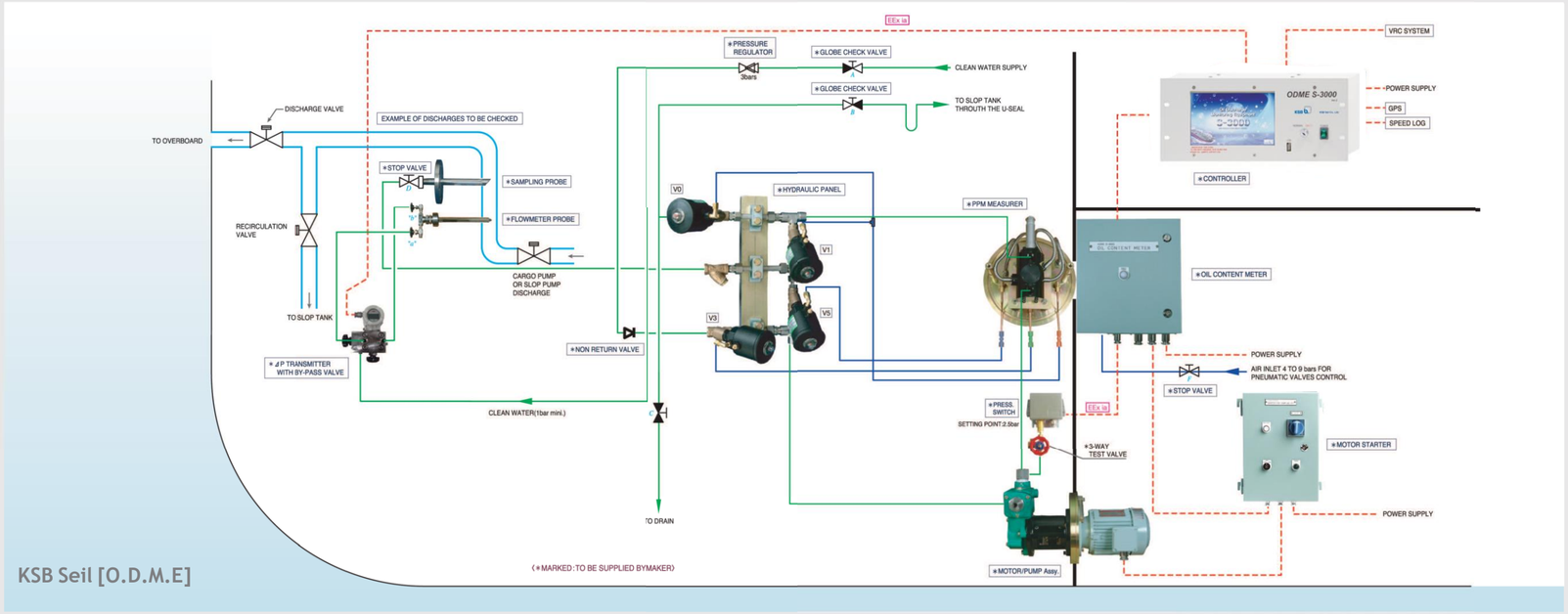
KSB

IMO RES. MEPC.108(49) & MEPC.240(65) ODME S-3000



KSB Seil [O.D.M.E]

Controller

- 344 × 142.5 × 175, 2.1kg
- 32bit CPU S3C6410 ARM microprocessor
- 7" TFT LCD touch screen (800 × 480)
- Save log-ale to USB flash drive
- Thermal transfer printer(option)

Oil Content Meter

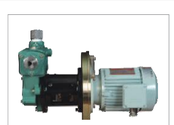
- 400 × 400 × 300, 24kg
- Scattered I.R. Light method
- Multi cell sensor (Si-photodiode)
- Protected vibration
- 5-way Pneumatic Solenoid v/v with manifold

Motor Starter

- 250 × 300 × 180, 10 kg
- MCCB for maintenance.
- Auto/Manual key switch
- Overload relay

Pressure Switch

- 151 × 151 × 130, 2 kg
- Measuring range: 0~16 bar
- Automatic pump shut-down
- Set point : 2.5 bar



Motor/Pump Assy.

- 2.2 kW, D.O.L Motor
- Centrifugal type pump
- Pump suction head: Max. 8 m
- Class certifi ed bulkhead penetration

PPM Measurer

- 360 × 283 × 180, 30 kg
- 4 optical fi bers
- Self cleaning system
- Class certiaed bulkhead penetration plate

Hydraulic Panel

- 600 × 404 × 580, 15 kg
- 4 pneumatic valve
- Sample water fi lter
- 4-9 bar air supply

Sampling Probe

- 16K 65A for cargo system
- 5K 65A for ballast system

Flowmeter & Probe

- 311 × 104 × 102, 9 kg
- fl owmeter
- Pitot-tube type probe
- Intrinsically safe type (EEX ia IIC)
- Below ±1% accuracy

Company Introduction - KSB Seil Co., Ltd.

Guidelines and speci1cations for oil discharge monitoring and control system for above 150 gross tons tankers.

- The Oil Discharge Monitoring Equipment(ODME) S-3000 continuously samples the oil-mixture water being discharged overboard, measures the oil content and controls the discharge of the oil-mixture water and plays therefore a central role in the O.D.M.E.
- The ODME S-3000 has been tested and approved for crude oils, "black" and "white" products as per IMO Resolution MEPC.108(49). And it has also been tested and approved for the blends of petroleum oil and bio-fuels as given in IMO Resolution MEPC.108(49) & MEPC.240(65).
- The U-seal must be installed in accordance with MEPC 108(49) 6.3.10, 'Sample water returning to the slop tank should not be allowed to free-fall in to the tank. In tankers equipped with an inert gas system a U-seal of adequate height should be arranged in the piping leading to a slop tank.'

MEPC 108(49)

Features

- Can be as dirty and clean ballast,
- monitor control system.
- Intrinsically safe type, DP transmitter.
- Near and far infra-red detector using for Si-photodiode.
- Short response time(15sec)
- Automatic back-flushing sequence of the
- complete hydraulic panel.
- Automatic zeroing and calibration.
- Self-cleaning measuring cell design.
- All information displayed in 40 x 4 LCD.
- Microprocessor technology with RTC chip memories
- Y2K compliance.
- Communication between operators console
- and oil content meter by a current loop method.
- Insensitive to ships motion and vibration.
- Accuracy better than IMO RES. MEPC.108(49) requirements.
- Easy installation requiring little work & time.
- Flowmeter working by differential pressure.
- Log input by electrical or dry contract impulse.
- Automatic monitoring of up to multi channels(option).

Alarms

- Oil content meter failure.
- Sample pump not powered.
- No sample.
- Clean water failure.
- Flowmeter failure.
- Printer paper failure.
- Calibration failure.

MEPC 240(65)

Features

- The measuring range is 0~1000PPM
- Ship's position indication(GPS-NMEA0183)
- Ship's speed(200PPNM or GPS)
- Log input by electrical or dry contract impulse.
- Easy to operate and intuitive menu design.
- All information displayed in 7" TFT LCD touch screen.
- Download log-ales into a USB flash drive.
- Thermal transfer printer(option)

Alarms

- Overboard valve wrongly open.
- Oil content meter failure.
- PPM range exceeded(15PPM exceeded in clean ballast mode)
- Flowmeter and GPS signal failure.
- Flow range exceeded.
- Speed low and signal failure.
- Oil limit and L/NM exceeded.
- Sample pump no powered.
- Sample pump wrongly powered (monitor under power when it should be stopped)
- Cleaning water and calibration failure.

Notiaed Body No. 0575

ISO 9001