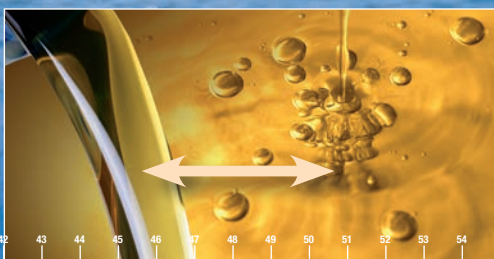
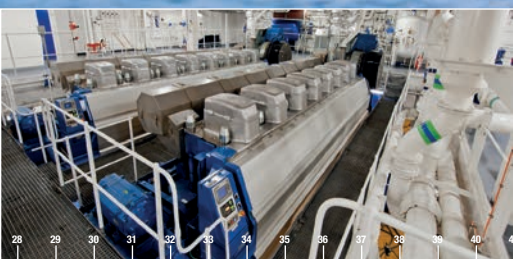


# DIESEL SWITCH

## Change over or blending



### Features

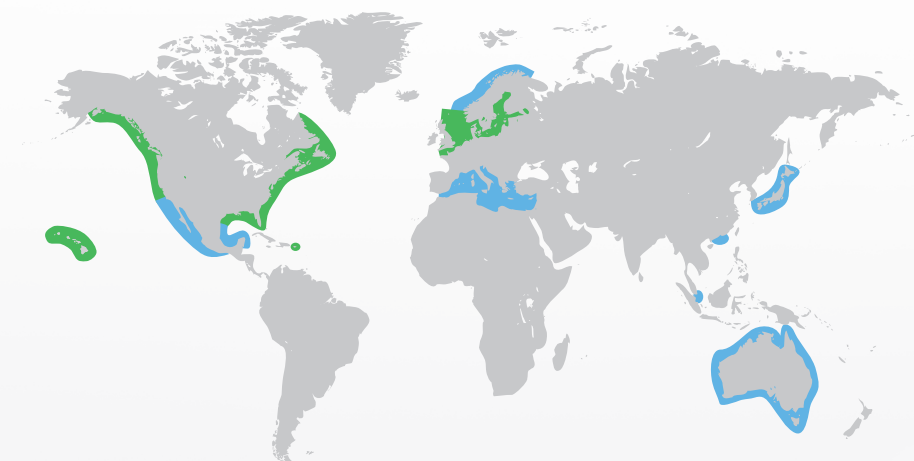
- Automatic fuel change-over or blending
- Simplest and universal design / turn key product
- Optimised control algorithm of fuel temperatures
- Fuel record book (blend or change over)

### Benefits

- Complies with MARPOL regulations
- Easy installation / short downtime
- Prevent thermal damage on engine
- Blending oil saves expensive diesel fuel



## Worldwide emission control areas (ECA)



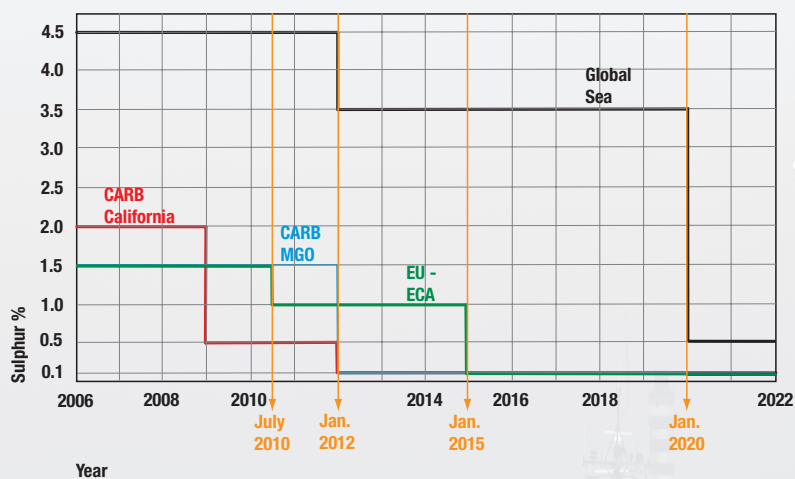
Planned ECA's with different fuel quality:

- Mediterranean Sea
- Coasts of Mexico
- Tokyo Bay
- Singapore
- Hong Kong
- Korea
- Australia
- Black Sea
- Arctic
- Antarctica

**SO<sub>x</sub> Emission Control Areas (ECAs)**

- Existing ECA area
- Potential future ECA area

## Timeline for sulphur limitations in fuel oil

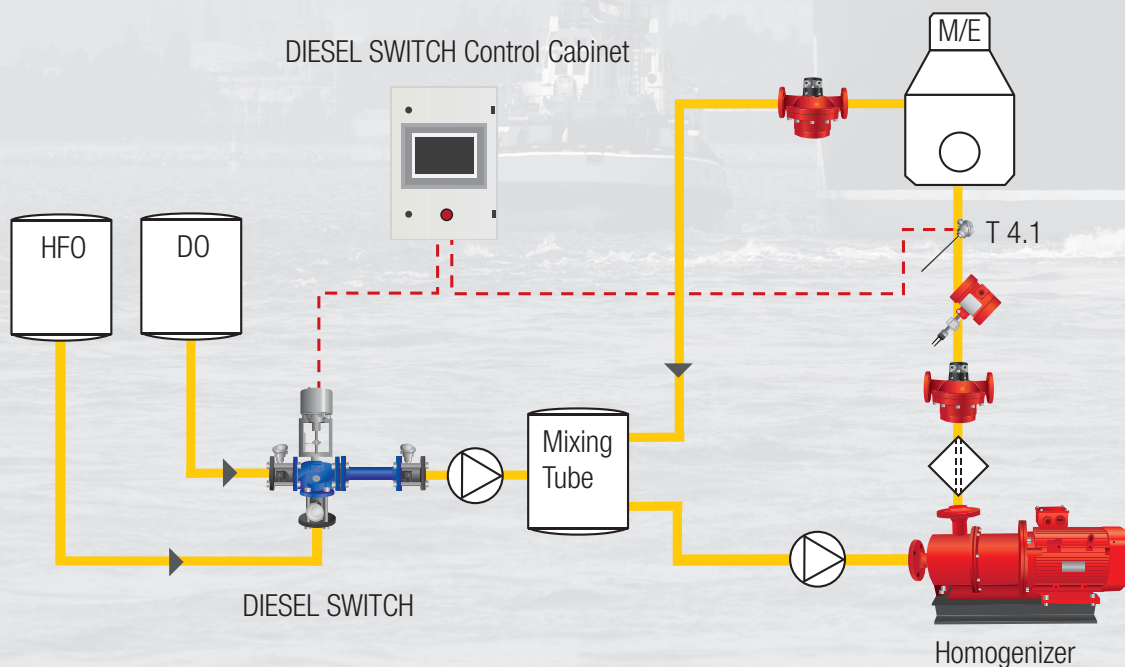


**MARPOL ANNEX VI** Regulation 14 and Regulation 18

**EU Directive** 1999/32/EC and 2005/33/EC for Baltic and North Sea ECA

**CARB** - California Air Resources Board - Regulation 13 CCR §2299.2(e) and 17 CCR § 93118.2(e)

## System Application Layout



## DIESEL SWITCH Technical benefits

### Manual change over valve

- ! risk of incidents due to uncontrolled change over
- ! risk of damages in fuel system due to temperature shocks

### DIESEL SWITCH

- ✓ automatic and safe change over unit with safety functions
- ✓ no risk of incidents
- ✓ improved temperature separation of fuel systems
- ✓ effective change over or blending procedure
- ✓ simple and universal design - easy installation
- ✓ new and improved algorithm for fuel change
- ✓ viscosity monitoring with alarm function

## Saving potentials considering fuel oil blending

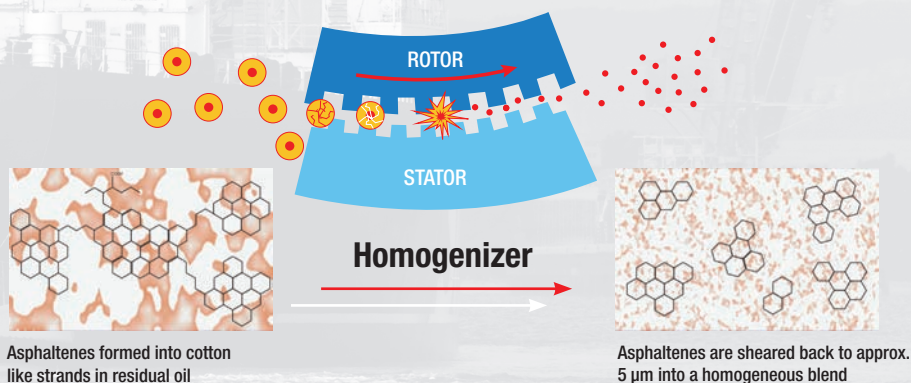
### Example

- Sulphur-limit of 1 % in ECA
- Price of MDO EURO 750.-/mt, price of HFO EURO 480.-/mt
- 3 % Sulphur in HFO, 0.3 % Sulphur in MDO
- Price of blend oil EURO 680.-/mt (Ratio = 26:74 = HFO:MDO)

Engine consumption	Savings (time in ECA Zone)			
	per hour	per day	per 10 days	per 20 days
2 t/hr	140.- €	3'360.- €	33'600.- €	67'200.- €
4 t/hr	280.- €	6'720.- €	67'200.- €	134'400.- €
6 t/hr	420.- €	10'080.- €	100'800.- €	201'600.- €

ROI will be between 3...12 months!

### Homogenizer (optional)

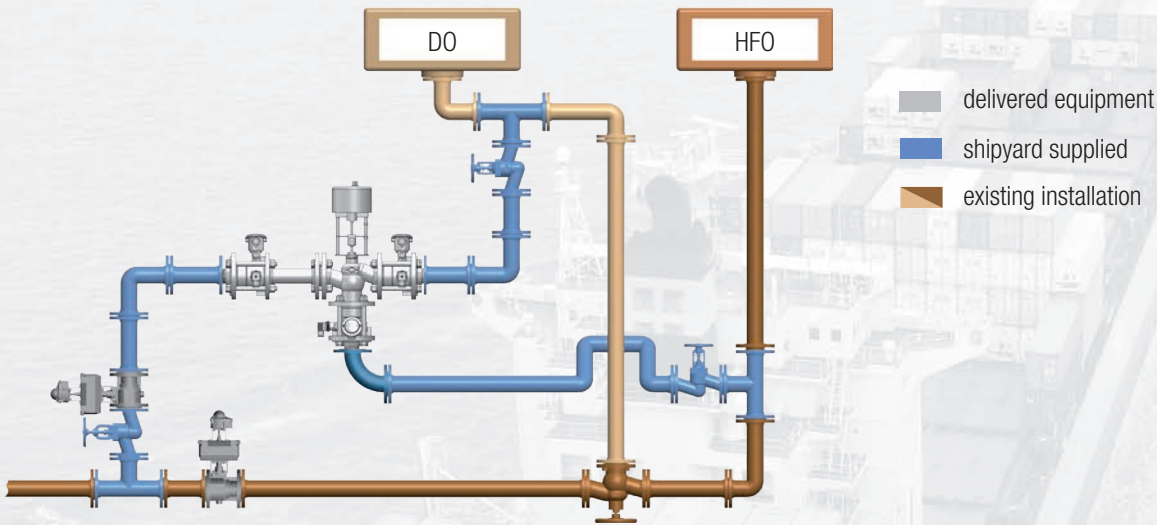


### Homogenizing of fuel oil and fuel oil blends

- Continuous HFO homogenizing on board
- Pure mechanical and no chemical treatment
- Improved combustion process
- Reduced exhaust emissions

## Specifications and ordering information

### DIESEL SWITCH



<b>Power supply</b>	230VAC; 50/60Hz; 80W	
<b>Air supply</b>	6bar dry and clean air (for pneumatic shut off valve)	
<b>Size / type</b>	<b>Flange connections</b>	<b>Art. No.</b>
DIESEL SWITCH DN32	DN32; PN16	94716
DIESEL SWITCH DN40	DN40; PN16	94717
DIESEL SWITCH DN50	DN50; PN16	94718
DIESEL SWITCH DN65	DN65; PN16	94719
DIESEL SWITCH DN80	DN80; PN16	94720

<b>Options</b>	<b>Art. No.</b>
Fuel Compatibility Kit	94721
Profibus - cable	80682
Temperature transmitter T4.2 (DN32-50)	80782
Temperature transmitter T4.2 (DN65-80)	80786
Record Book	94722
2nd display	94728
GPS option	95190
Valve Position Switch Box V5	95306
Valve Position Relay Box V5	95317
Manual Shut off valves available	

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