

## The CDF Modules –To Upgrade your EBBWCS MK I to a MK III CD Model



Flocculation unit type CDF 2.0

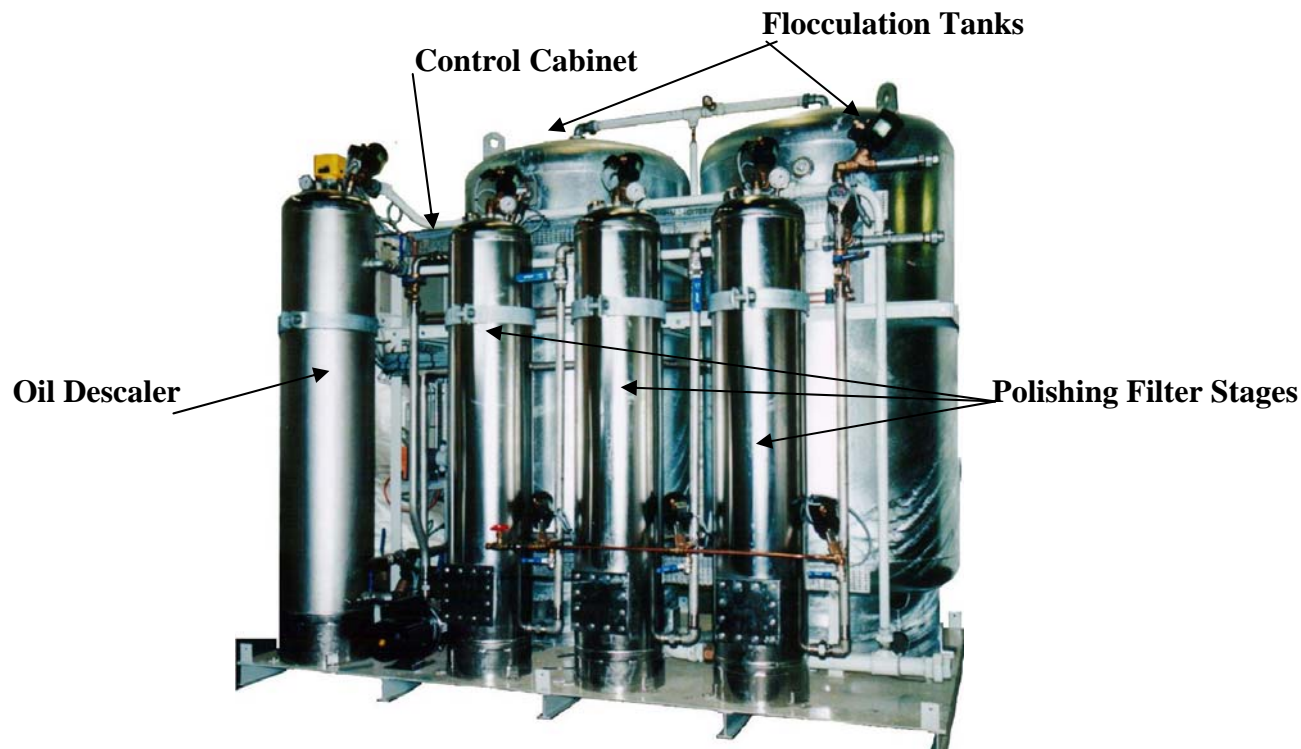


Control cabinet type CD

- Meet MEPC 107 (49), Upgrade your EBBWCS MK I system unit to a EBBWCS MK III CD model.
- The MK III CD reduces your water in oil/sludge release to a minimum
- The MK III CD is less sensitive to tensides, soot, fibres and chemicals.
- The MK III CD is less sensitive to the ships movement.
- The MK III CD execution increases the capacity/flow rate by up to 100%
- The effluent water still contains < 5 PPM of oil.
- Same floor foot prints, less height and weight.

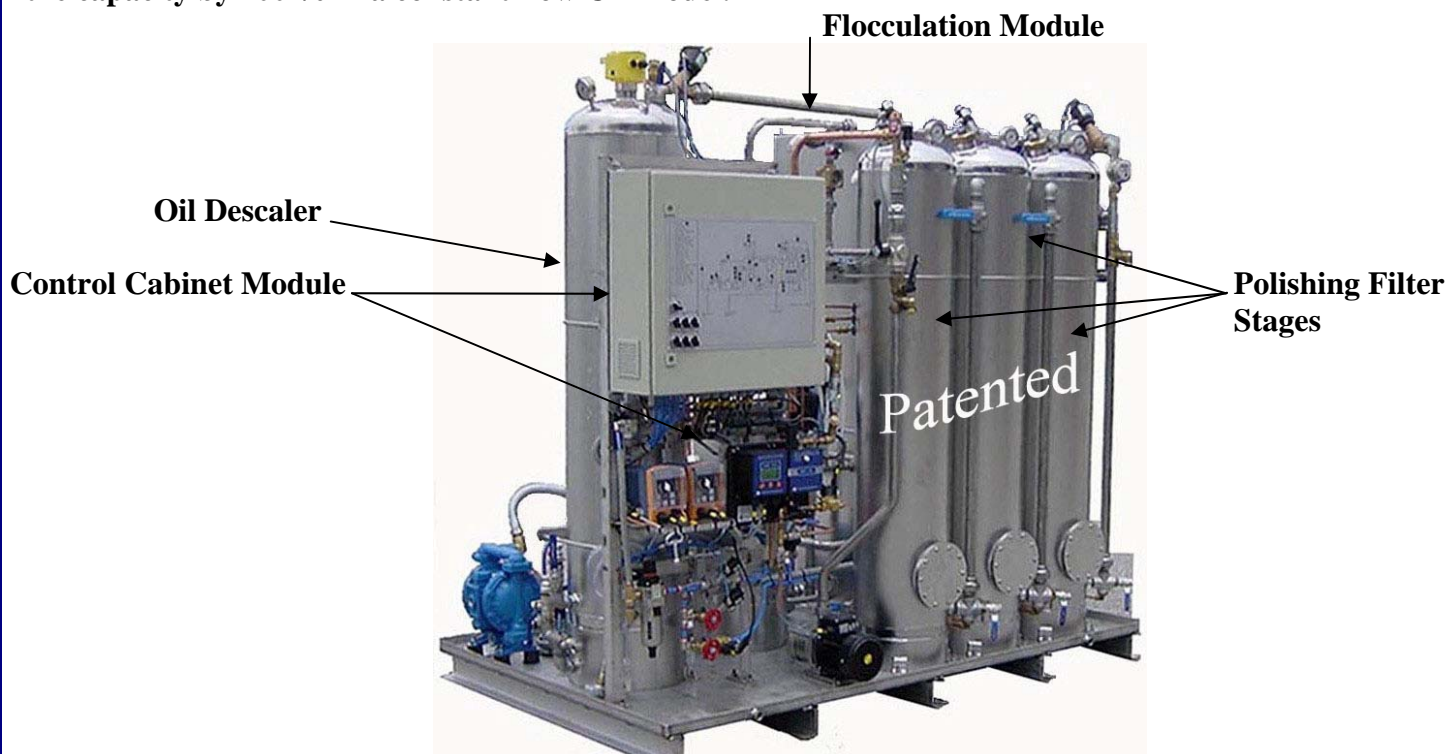
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**The EBBWCS TD-3-100-2.0. Batch- Settling System. Nominal capacity 24 m<sup>3</sup>/24 hours**

**-Just replace the MK I systems flocculation tanks and control cabinet, with the new CD Flocculation Up grading unit and Control Cabinet. Keep the Oil Descaler and Polishing Filter Stages and increase the capacity by 100 % in a constant flow CD model.**



**The EBBWCS CD-2.0 Constant Flow- Floatation System. Nominal capacity: 2 m<sup>3</sup>/h (48m<sup>3</sup>/24 hrs)**

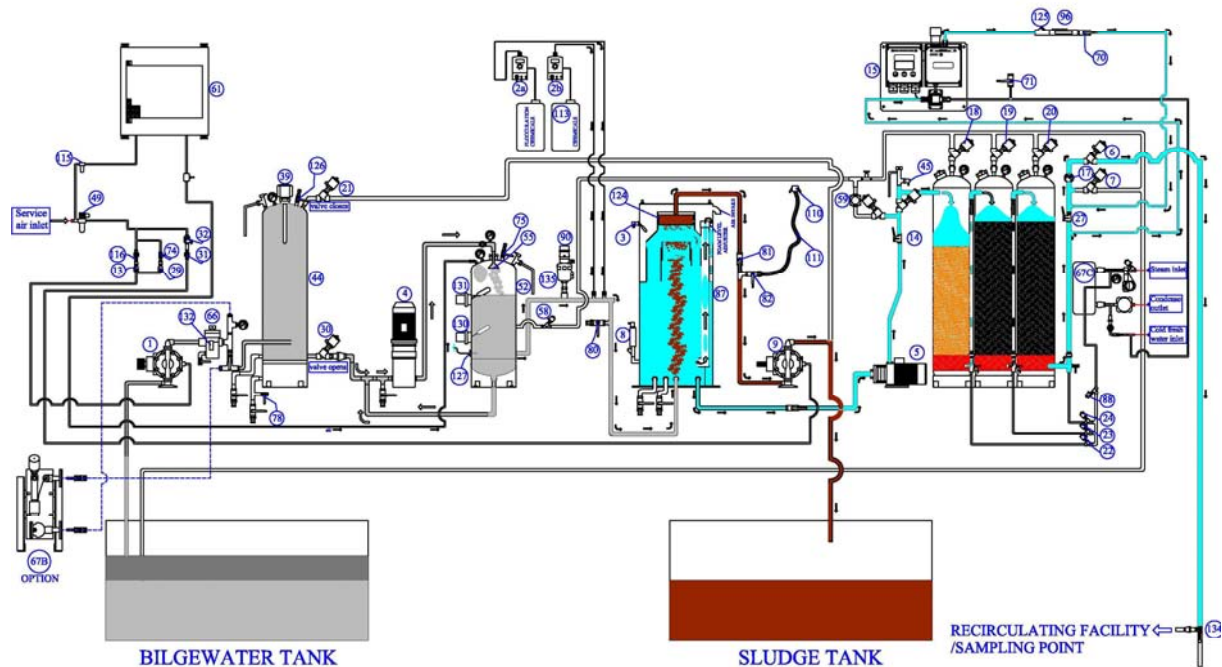
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### Principle Diagram and brief description of the complete EBBWCS CD

Ver. 1.7 2006-05-05

#### MARINFLOC CD MODELS FLOW CHART



The Marinfloc EBBWCS Type CD is a constant flow system, that means the influent water capacity is equal to the effluent (discharge) water capacity.

The influent preheated (> +40 C <+60C) Bilge Water, is drawn by the feed pump (01) from the Bilge Water Holding Tank (BWHT) or preferably from a Settling/Primary Tank and via a strainer (66) and then fed into the Oil Descaler (44) for the separation of free oil.

The free oil will automatically be led of to the Sludge Tank while the remaining, emulsified, Bilge Water will be led in to the circulation tank (4). A flocculent (and when necessary a polymer) will automatically (2a & 2b) be fed into the emulsified Bilge Water. A very small amount of service air is fed into the water (patented part). A circulation pump (52) mixes the Bilge Water, flocculent and air. The flocculation process is almost instant, and thus the emulsions are broken in a very short period of time. The mixture of water, flocks and air, is then fed into the expansion tank and sludge chamber (87) where the flocks will be skimmed off by the sludge/drain pump (9) (patented part). The almost cleaned water will be fed into the three polishing filter steps (10, 11, 12), by the discharge pump (5). Cleaned, effluent Bilge Water (guaranteed and tested to contain < 5 PPM of oil) passes out of the filters.

However before this water can be pumped over board, it has to be checked by the PPM monitor (15). When < 15 PPM (or <5 PPM if set to 5 PPM) the water will, be discharged over board, via the flow meter (17).

If for any reason the PPM value is > 15 (or >5 PPM if set to 5 PPM) the effluent water will be returned to the BWHT or Settling/Primary Tank and the CD unit will go into an alarm position.

The Filters stages 10, 11, 12 are equipped with an automatic back flushing device including a pre heater (67C).

The filter materials in the filters (10, 11,12) can be regenerated on site and after regeneration the same filter material may be reused. In this way the filter materials only have to be topped up when necessary.

The total cost for running a Marinfloc EBBWCS type CD (excluding the costs for pre-heating if not produced by heat recovery systems) is approx USD 3.- / m3 Cleaned Bile Water.

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