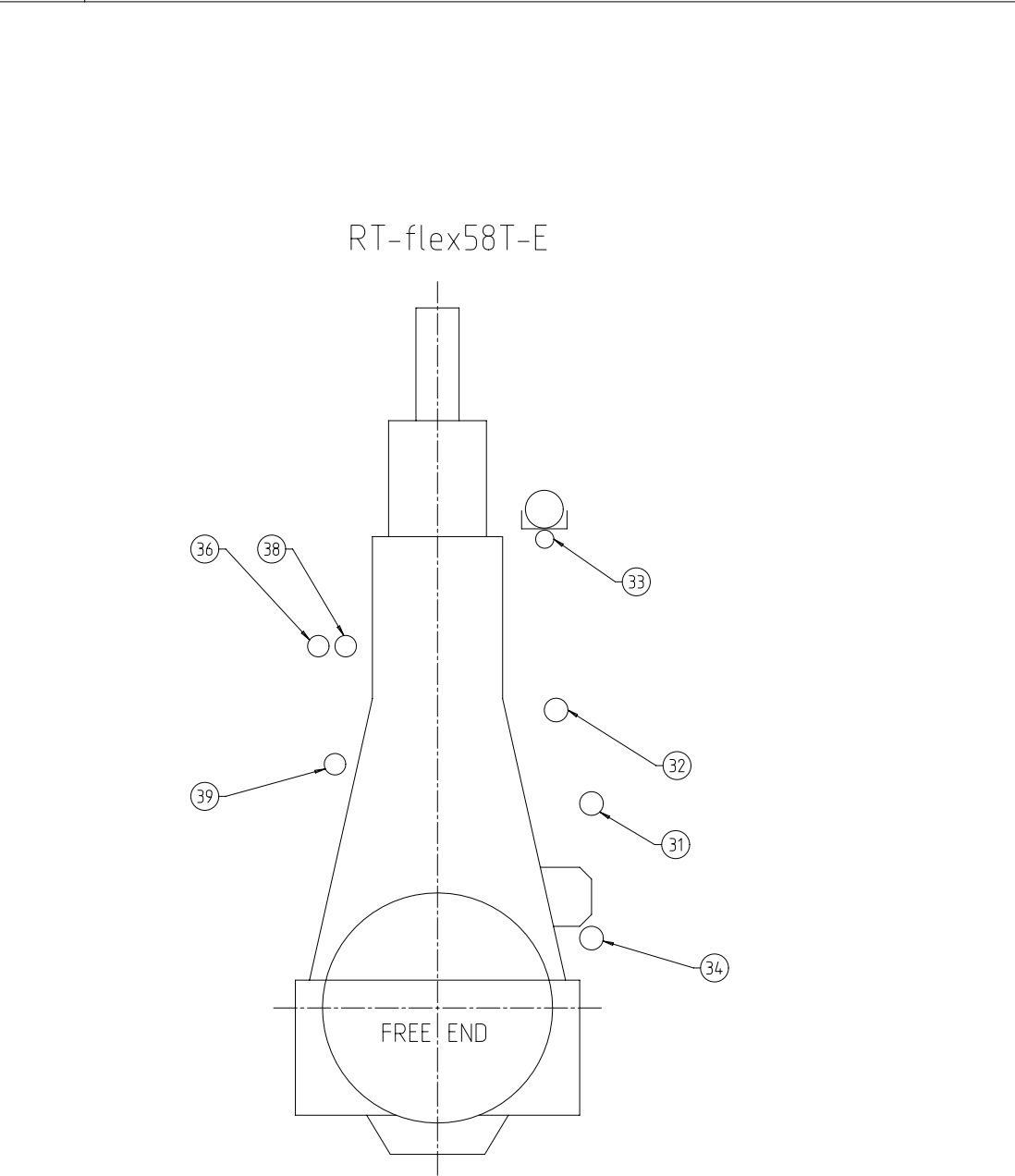




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SPECIFICATION which must be met

38	OUTLET - Heating medium for fuel oil trace heating - Connected to condensate manifold or thermal oil return
39	OUTLET - Heating medium for fuel oil trace heating - Connected to condensate manifold or thermal oil return



31	INLET - Fuel oil
A	Fuel oil quality at engine inlet: according to specification in Marine Installation Manual (MIM) Pressure at engine inlet: stopped engine: 10 bar running engine: 7-10 bar Volume flow: according to GTD Viscosity: - Viscosity for HFO: 10-20 cSt (recommendation: 13-17 cSt) - Viscosity MDO/MGO: 2-20 cSt Filtration: - At least one filter unit close to the engine inlet. - One filter unit with max. 10 micron (absolute, sphere passing mesh) in the fuel system (either in feed- or booster circuit) - Bypass filter in parallel to the main fuel oil filter with max. 25 micron (absolute, sphere passing mesh) Fuel change-over: - Max. temperature gradient during fuel change-over: 2 °C/min - Fuel amount on engine side: mentioned in table 1 on page 2. - Fuel amount on system side: according to project specific system layout.
32	OUTLET - Fuel return
A	- Normal operation condition: Returning to mixing unit. - During fuel change-over while engine is not in service: returning to service tank.
33	OUTLET - Drain rail-unit (dirty)
A	- Dirty fuel: Mixed drain (LO,FO) from rail-unit, not for re-use - Free flow by gravity to sludge oil tank or appropriate tank. - Pipe insulated and heated up (50-95 °C)
34	OUTLET - Fuel return, pressureless (clean)
A	- This pressureless fuel return consists of the following 2 types of clean fuel, namely: <u>'Normal drainage'</u> Expected (design) fuel return from the fuel pump and injection control side during normal operation. <u>'Leakage'</u> Unexpected fuel return from an emergency situation only (e.g. high pressure pipe damage). - Clean fuel must be collected in a drain tank (or appropriate tank) by gravity free flow - Piping must be insulated and heated (50-95°C)
36	INLET - Heating medium for fuel oil trace heating - Connected to steam or thermal oil supply

1	008	107.246.320.500	MIXING UNIT			107.246.320		0,001		
QTY	SEQ NO	Material ID	Material Name			Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET	
Free space for lic.						Q-Code XXXXXX			Main Drw.	
						Standard ISO; JIS				
	Modif.	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date		
 Winterthur Gas & Diesel		Product 5-8RT-flex58T-E			FUEL OIL SYSTEM HFO&MDO&MGO Brennstoffsystem					
Units	mm kg	NX			Basic Material				Net Weight 0,001	
Made	27.09.2018	dki021 DH.Kim			Scale	-	Size	A2	Page 1/2	Material ID PAAD303903
Chkd	27.09.2018	wwa008 Wang			Design Group		9723		Drawing ID DAAD104607	Rev. A
Appd	01.10.2018	mhu019 Hug								

SYSTEM PROPOSAL - Main fuel oil supply and fuel oil treatment

Pos.	ENGINE COMPONENTS *3)
EC01	Fuel rail unit
EC02	Fuel supply unit

Possible tank arrangements:	
Option 1)	HFO: 1 settling tank, 1 service tank LSHFO: 1 settling tank, 1 service tank MDO: 1 settling tank, 1 service tank
Option 2)	HFO: 2 settling tanks, 1 service tank LSHFO: 2 settling tanks, 1 service tank MDO: 1 settling tank, 1 service tank
Option 3)	HFO & LSHFO combined: 2 settling tanks HFO: 1 service tank LSHFO: 1 service tank MDO: 1 settling tank, 1 service tank

Table's fuel amount on engine side

Cylinder	Volume
5	11 l
6	11 l
7	11 l
8	11 l

Pos.	ENGINE CONNECTIONS *2)
31	INLET - Fuel oil
32	OUTLET - Fuel return
33	OUTLET - Drain rail-unit (dirty)
34	OUTLET - Fuel return, pressureless (clean)
35	INLET - Heating medium for fuel oil trace heating
36	OUTLET - Heating medium for fuel oil trace heating
37	OUTLET - Heating medium for fuel oil trace heating

Number of cylinders		5	6	7	8
Main engine RT-flexS8T-E (R1 rated)	power (kW)	11750	14100	16450	18800
	speed (rpm)	105			

Proposal for dimensioning *4)		acc. to separate drawing			
Mixing unit	volume (m³)	17	21	24	28
HFO settling tank	volume (m³)	17	21	24	28
HFO service tank	volume (m³)	19	23	26	30
MDO/MGO service tank	volume (m³)	19	23	26	30
MDO/MGO drain tank *10	volume (m³)	19	23	26	30
Nominal pipe diameter	A	DN 50	50	65	65
	B	DN 32	40	40	40
	C	DN 40	50	50	50
	D	DN 45	65	80	80
	E	DN 50	65	65	65

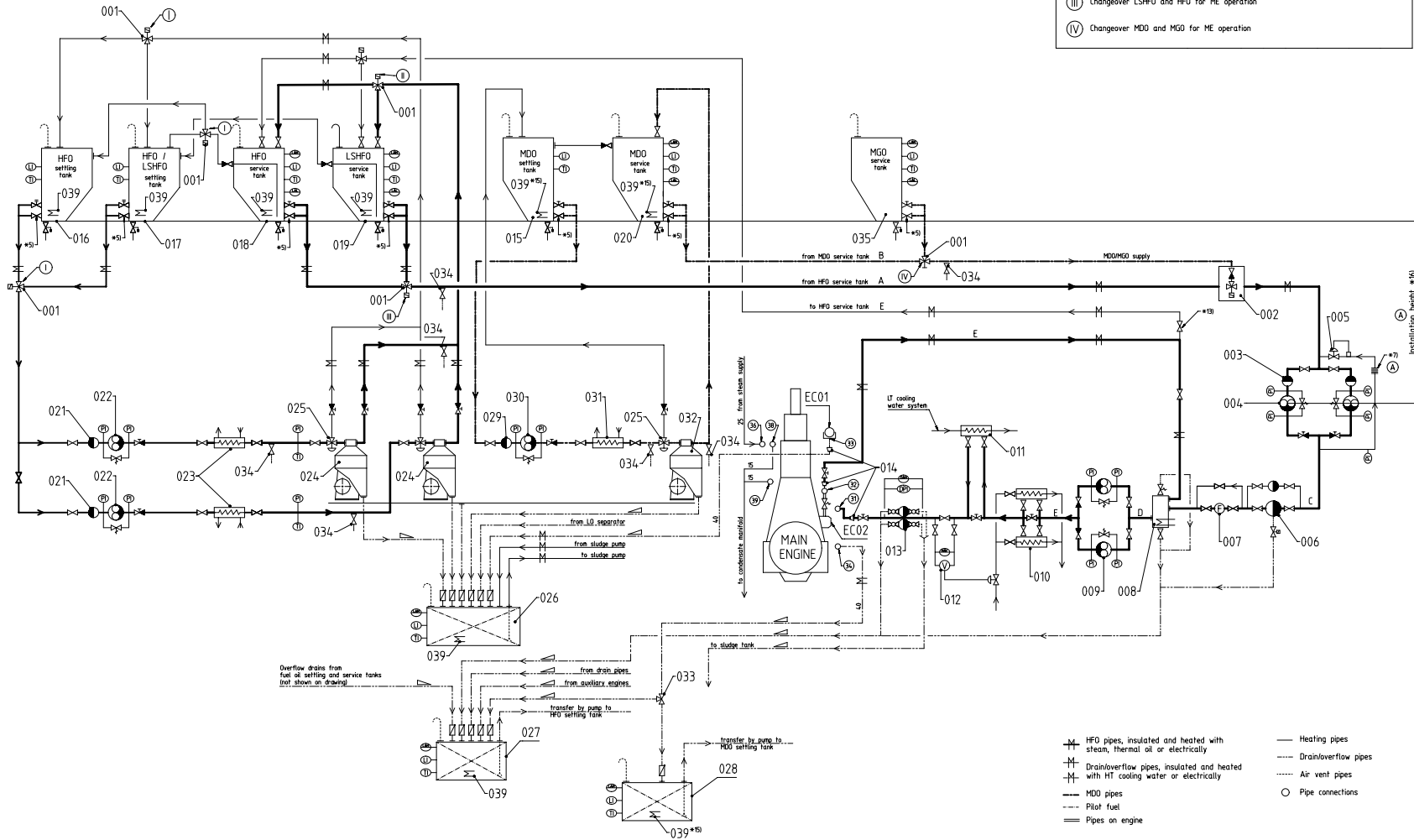
- ① Both valves to be interconnected
- ② Changeover LSHFO and HFO for fuel treatment
- ③ Changeover LSHFO and HFO for ME operation
- ④ Changeover MDO and MGO for ME operation

Pos.	SYSTEM COMPONENTS *1)
001	Three-way valve, manually or remotely operated
002	Automatic fuel change-over unit
003	Suction strainer (mesh size acc. to pump suppliers requirement)
004	Low pressure feed pump
005	Pressure regulating valve
006	Automatic self-cleaning filter, 10 micron, heated (trace heating acceptable)
007	Flowmeter
008	Mixing unit, heated and insulated (according to separate drawing as linked on page 1)
009	High pressure booster pump
010	Fuel oil end-heater (A)
011	MDO/MGO heat exchanger (A)
012	Viscometer
013	Fuel oil filter, 25 micron, heated (trace heating acceptable)
014	Transition Piece (adapter) *10)
015	MDO settling tank, heated and insulated
016	HFO settling tank, heated and insulated
017	LSHFO settling tank, heated and insulated
018	HFO service tank, heated and insulated
019	LSHFO service tank, heated and insulated
020	MDO service tank
021	Suction strainer (mesh size acc. to pump suppliers requirement)
022	HFO/LSHFO separator supply pump, with safety valve
023	HFO/LSHFO pre-heater
024	Self-cleaning HFO/LSHFO separator *6)
025	Three-way valve, diaphragm operated
026	Sludge tank
027	Fuel oil drain tank *12)
028	MDO/MGO drain tank *10) *12) (A)
029	Suction strainer (mesh size acc. to pump suppliers requirement)
030	MDO separator supply pump, with safety valve
031	MDO pre-heater
032	Self-cleaning MDO separator *6)
033	Three-way valve for switching between fuel drain tank and MDO/MGO clean leakage tank *9)
034	Fuel sampling cock *8)
035	MGO service tank
039	Heating coil

Remarks (A)

- All heaters to be fitted with thermometers, relief valves, drains and drip trays. Not shown on drawing.
- Steam tracers on main engine are laid out for 7 bar saturated steam.
- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational.
- Overflow and drain pipes for fuel oil tanks are not shown

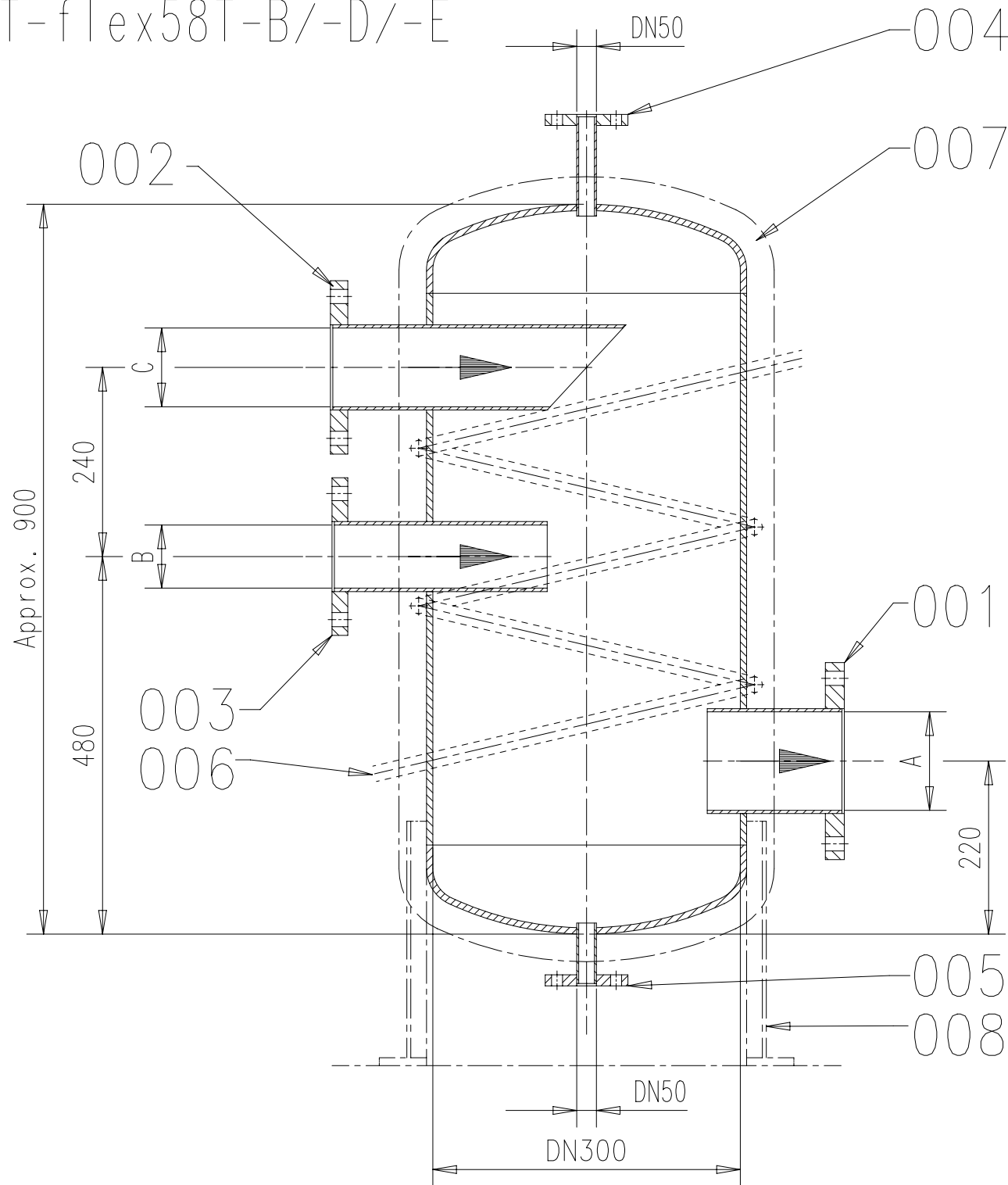
- *1) To be delivered by external suppliers and to be installed by the shipyard.
- *2) Refer to the "Pipe Connection Plan" for the execution and location of the engine pipe connections.
- *3) To be delivered by the engine manufacturer, i.e. already equipped on engine side.
- *4) All capacities and the given diameters are valid for the mentioned engine rating and serve just as an example. The given tank capacities are based on 8 h settling tank change-over intervals. To make the layout for the project, specific rating please refer to design group 739 "Fluid velocities and flow rates, recommended values for pipework of diesel plants". Rating specific flow rates are provided by GTO.
- *5) Valve to be kept closed during normal engine operation. For draining only.
- *6) Separator capacity related to viscosity; layout according to certified flow rate (CFR) recommended.
- *7) The return line must be fully exposed to air without any insulation and equipped with cooling ribs or other type of radiative cooler.
- *8) Recommended position for fuel oil sampling to check fuel oil quality.
- *9) Just to be applied if in addition to the fuel drain tank a separate tank for collection of clean MDO/MGO is installed to enable the switching between the different tanks depending on the fuel in use.
- *10) Installed as required (check with "Pipe Connection Plan").
- *11) The normal drainage rate of MDO/MGO is significantly higher than the normal drainage rate of HFO. Therefore during long-term operation on MDO/MGO the collection of clean MDO/MGO in a separate drain tank is highly recommended. Regarding the tank size we recommend a volume which is approx. 10% of the volume of the MDO/MGO service tank. The design volume of the MDO/MGO drain tank considers a combination of normal drainage and unexpected emergency leakage.
- *12) The tank sited only to be equipped with a swing check valve to avoid inadmissible backpressure.
- *13) Close during normal engine operation.
- *14) A heating coil in the MDO tank is required when DMB is used. Target heating temperature: 40 °C.
- *15) The location of pump's installation must comply with the supplier's requirements by considering the relative height between the pump and the service tank, in combination with the pressure drop of the piping.



- HFO pipes, insulated and heated with steam, thermal oil or electrically
- Heating pipes
- Drain/overflow pipes
- Drain/overflow pipes
- Air vent pipes
- MDO pipes
- Pilot fuel
- Pipes on engine
- Pipe connections

WIND		FUEL OIL SYSTEM		PAAD303903	
HFO/MDO/MGO		HFO/MDO/MGO		PAAD303903	
Brennstoffsystem		Brennstoffsystem		PAAD303903	

RT-flex58T-B/-D/-E



Nominal pipe diameters (DN)

No. of cyls.	A	B	C
	DN	DN	DN
5	65	40	50
6	65	40	50
7	65	50	65
8	80	50	65

Capacity: 65 l
Design pressure: 10 bar
Service temperature: 150 °C

SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Pos.

Description

001

Outlet

002

Inlet, return line

003

Inlet, from feed pump

004

Outlet safety valve

005

Drain

006

Heating coil

007

Insulation

008

Mounting brackets *1)

Remarks:

- Configuration and dimensioning of the mixing unit have to comply with the relevant classification society/rules.
- *1) Mounting brackets for fixation on floor plate. The mixing unit must under no circumstances be fitted unsupported.

Free space
for lic.

Q-Code

XXXXX

Main
Drw.

Standard

ISO; JIS

Modif.

A

7-28.593

09.01.2003

B

EAAD087849

14.06.2017

Number

Drawn date

Number

Drawn date

Number

Drawn date

Number

Drawn date

Units

mm kg

NX

Basic Material

Net Weight 0.001

Made

04.06.1999 S.Stylianou

Scale

-

Size

A3

Page

1/1

Material

107.246.320.500

Chkd

06.04.1999 WCH001 Service User

Design Group

9723

Drawing

ID 107.246.320

Rev.

B

MIDS - WinGD RT-flex58T-E - Fuel Oil System

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2017-08-21	DRAWING SET	First web upload
2018-10-04	DAAD104615 DAAD104607	Main drg – new System drg – new
2020-09-30	DAAD104607	System drg – new revision

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