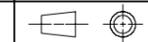


1 2 3 4 5 6 7 8

A
B
C
D
E
F

PAAD311150	Central cooling water system with separated HT-circuit
PAAD311152	Central cooling water system with integrated HT-circuit

Net Weight												
0,001	0,001											
1	1	003	107.429.532.500	CONCEPT GUIDANCE Freshwater generation	107.429.532						0,001	
1	-	002	PAAD311131	CENTRAL COOLING WATER SYSTEM	DAAD108107						0,001	
-	1	001	PAAD311132	CENTRAL COOLING WATER SYSTEM	DAAD108108						0,001	
Quantity PER ENGINE		SEQ NO	Material ID	Material Name	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET				
PAAD311152	PAAD311150	Free space for lit.					Q-Code XXXXXX	Main Drw. H				
Material ID	Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date			
		Product	5-8RT-flex58T-D		COOLING WATER SYSTEMS Kuehlwassersystem							
Units	mm kg	NX			Basic Material				Net Weight			
SURFACE PROTECTION SEE GROUP 0344		Made	01.11.2018 Sudant Deogade		Scale	-	Size	A3	Page	1/1		
TOLERANCING PRINCIPLE ISO8015		Chkd	29.11.2018 wwa008 Wang		Design Group		9721		Material ID		DAAD108118	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	30.11.2018 mhu019 Hug		Drawing ID		DAAD108118		Rev. -			

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DID - DIMENSIONAL DRAWING - Confidential

SPECIFICATION which must be met:

14 OUTLET - Cylinder cooling air vent
 - Vented through expansion tank
 - Water flow restricted by orifice

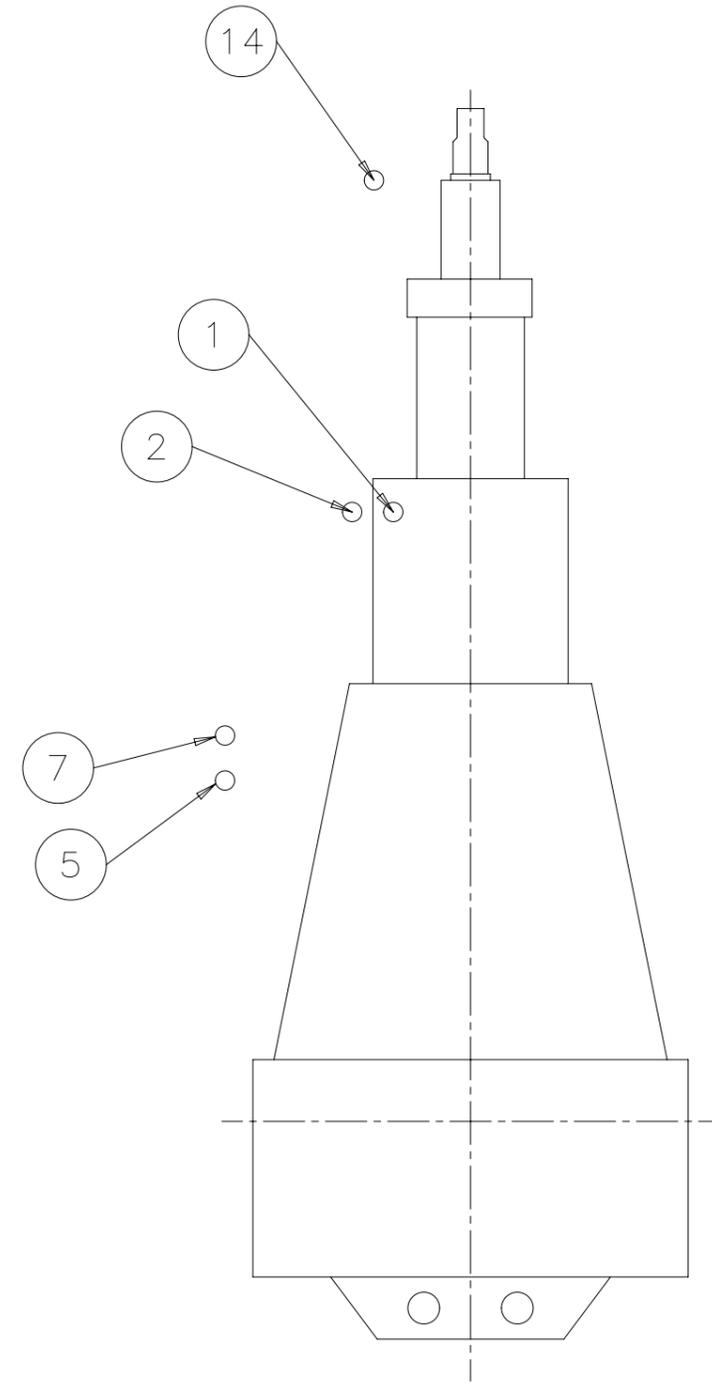
1 INLET - Cylinder cooling water
 - Cooling water pressure: 3.0 - 5.0 bar
 - Cooling water volume flow: according to GTD specification.
 - Cooling water (freshwater) must be treated according to WinGD's specification.

2 OUTLET - Cylinder cooling water
 - Cooling water temperature
 Controller set-point: 90 °C (Controller type: PI)
 Steady state condition: 90 ± 2 °C
 Transient condition: 90 ± 4 °C

5 INLET - SAC LT cooling water
 - Cooling water pressure: 2.0 - 4.0 bar
 - Cooling water temperature: 25 - 36 °C
 - Cooling water volume flow: according to GTD specification.
 - Cooling water (freshwater) must be treated according to WinGD's specification.

7 OUTLET - SAC LT cooling water
 - Cooling water volume flow: according to GTD specification, adjusted by orifice in outlet pipe on plant side.

RT-flex58T-D



1	016	107.245.419.500	EXPANSION TANK	107.245.419		0,001	
1	015	107.413.097.500	EXPANSION TANK	107.413.097		0,001	
QTY	SEQ NO	Material ID	Material Name	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET

Free space for litc.	Q-Code				Main Drw.
	XXXXXX				
Standard					
ISO; JIS					

Modif.	Number	Drawn date						
--------	--------	------------	--------	------------	--------	------------	--------	------------

WINGD
Winterthur Gas & Diesel

Product: 5-8RT-flex58T-D

CENTRAL COOLING WATER SYSTEM WITH SEPARATED HT CIRCUIT
Zentralkuehlwassersystem

Units	mm kg	NX	Basic Material	Net Weight 0,001
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SURFACE PROTECTION SEE GROUP 0344	Made	01.11.2018	Sudant Deogade	Scale	-	Size	A3	Page	1/2	Material ID	PAAD311132
TOLERANCING PRINCIPLE ISO8015	Chkd	29.11.2018	wwa008 Wang	Design Group	9721	Drawing ID	DAAD108108	Rev.	-		
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	30.11.2018	mhu019 Hug								

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SYSTEM PROPOSAL

Pos.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Air vent pipe CCW system
EC03	Throttling disc (adjustable orifice)

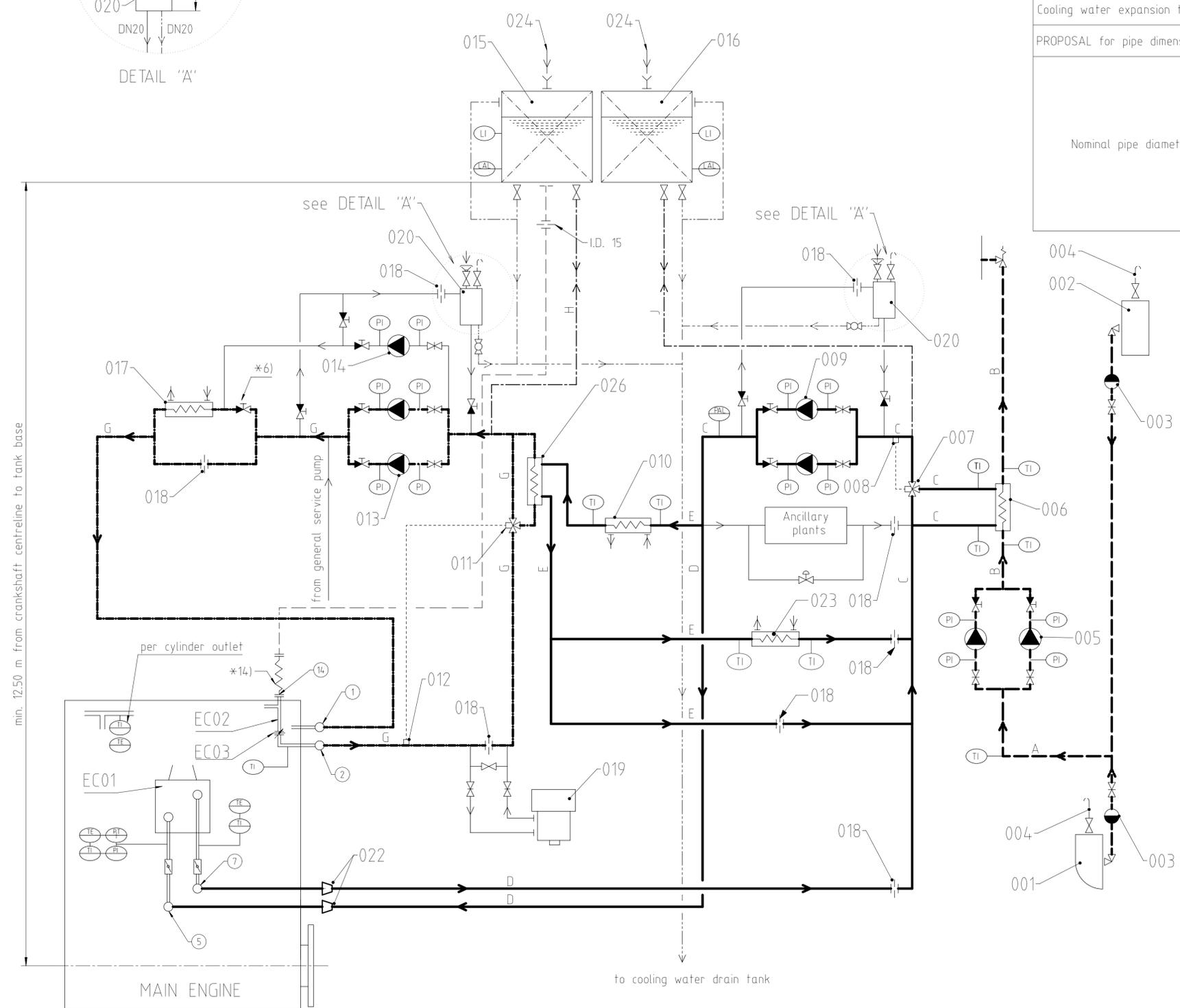
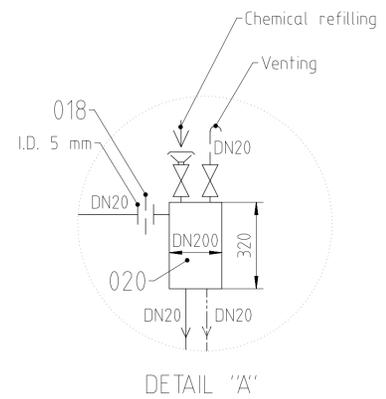
Pos.	ENGINE CONNECTIONS *2)
①	INLET - HT cooling water (free or driving end)
②	OUTLET - HT cooling water (free or driving end)
⑤	INLET - Scavenge air cooler, LT cooling water *7)
⑦	OUTLET - Scavenge air cooler, LT cooling water and air vent *7)
⑭	OUTLET - Cylinder cooling water air vent *14)

Pos.	SYSTEM COMPONENTS *1)
001	Low sea chest
002	High sea chest
003	Seawater strainer
004	Air vent (air vent pipe or equal venting system acc. to shipyard's design)
005	Seawater circulating pump
006	Central seawater cooler
007	Automatic temperature control valve for LT circuit *12)
008	LT water temperature sensor *12)
009	Cooling water pump for LT circuit
010	Lubricating oil cooler
011	Automatic temperature control valve for HT circuit *13)
012	HT water temperature sensor *13)
013	Cylinder cooling water pump for HT circuit
014	Pre-heating circulating pump (optional), cap. 10% from cylinder cooling pump *8)
015	HT water expansion tank (link to detail drawing on page 1)
016	LT water expansion tank (link to detail drawing on page 1)
017	Pre-heater for main engine (HT circuit)
018	Throttling disc *5)
019	Freshwater generator
020	Chemical treatment refill unit *4)
021	HT cooling water cooler
022	Transition piece (adapter) *9)
023	MDO/MGO cooler
024	Filling pipe / inlet chemical treatment

Number of cylinders		5	6	7	8
Main engine RT-flex58T-D (R1 rated)	power (kW)	11300	13560	15820	18080
	speed (rpm)	105			
Pressure drop across the engine	(bar)	1.3			
Cooling water expansion tank (HT)	Cap. (m³)	Recommended: 1.0 m³ min. 10% of HT cooling water			
Cooling water expansion tank (LT)	Cap. (m³)	Depending on ancillary plants min. 10% of LT cooling water			

PROPOSAL for pipe dimensioning *11)

Nominal pipe diameter	A	DN	Yard determination, suitable for main engine and ancillary plants			
			B	C	D	E
	D	DN 200	200	200	200	300
	E	DN 125	125	125	150	150
	G	DN 125	150	150	150	150
	H	DN 65	80	80	100	100
	J	DN 65	80	80	100	100
	K	DN 50	50	50	50	50



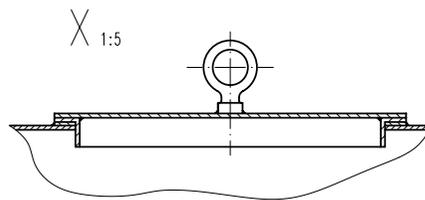
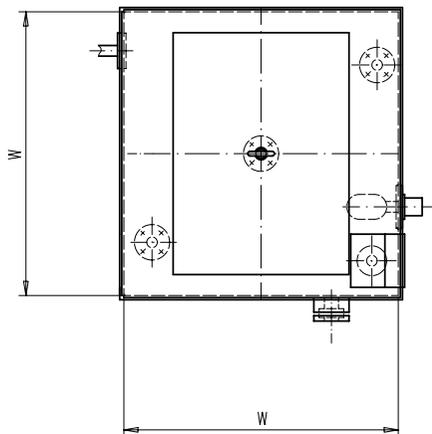
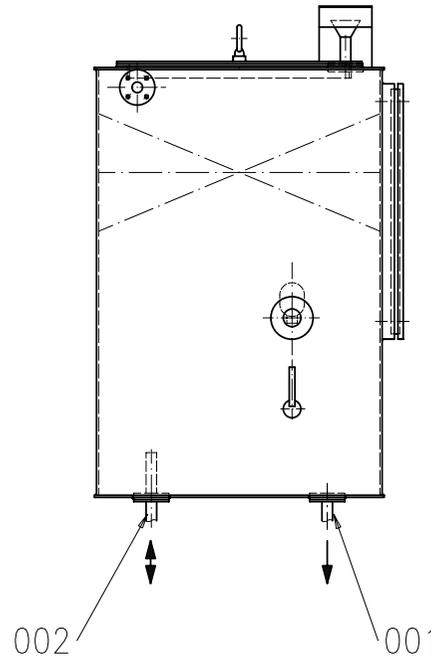
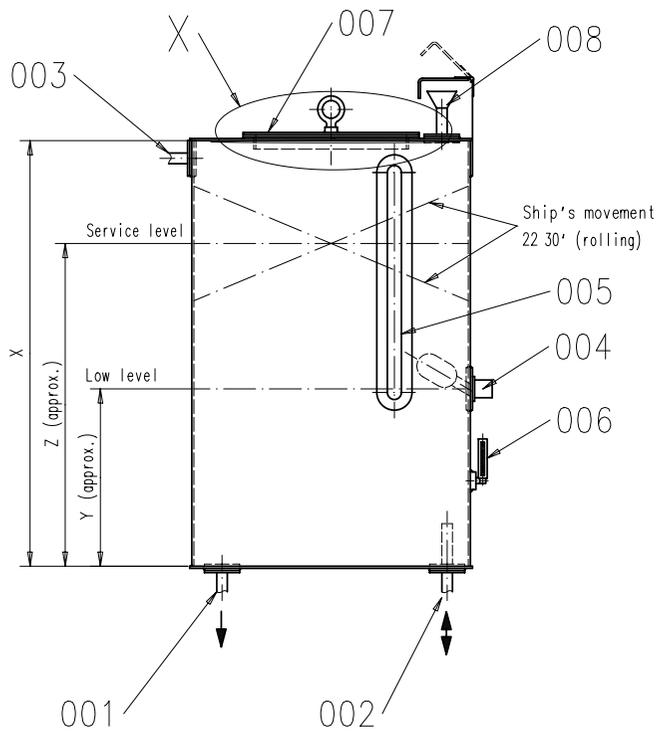
- Seawater pipes ---
- LT freshwater pipes —
- HT freshwater pipes ==
- Balance pipes (dotted)
- Ancillary equipment pipes — (thin)
- Drain/overflow pipes - - - -
- Air vent pipes - -
- Control/feed back (dotted)
- Pipes on Engine ==
- Pipe connections ○

Remarks:

- Air vent and drain pipes not shown on drawing. Shall be installed where required.
- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational.

*1) To be delivered by external supplier and to be installed by the shipyard.
 *2) Refer to the "Pipe Connection Plan" for the execution and location of the engine pipe connection.
 *3) To be delivered by the engine manufacturer, i.e. already equipped on engine side.
 *4) To be installed for cooling water after-treatment during regular engine operation. Convenient dimensions are provided in view "A". Other designs are possible.
 *5) When using a valve, lock in proper position to avoid mishandling.
 *6) Only when pos. 014 is installed.
 *7) The inlet and outlet pipes to SAC must be designed to allow engine thermal expansion, or be fitted with expansion pieces.
 *8) For guidance only, final layout according to actual engine pre-heating requirements.
 *9) Installed as required (check with "Pipe Connection Plan")
 *10) All given diameters are valid for the mentioned rating and serve just as an example. To make the layout for the project specific rating please refer to DG9730 "Fluid velocities and flow rates, recommended values for pipework of diesel plants" for selecting the appropriate pipe diameter. Rating specific flow rates are provided by GTD.
 *11) A constant temperature at engine inlet must be maintained. Temperature set-point can be selected between 10 - 36 °C. WinGD recommends a set-point of 25 °C. A lower LT water temperature assists the main engine to reach lower BSFC. If the ancillary plants require a lower or greater LT water temperature a separate water supply system with different temperature set-point has to be installed (please refer to the system proposal in MIM)
 *12) A constant temperature at engine outlet must be maintained. Required controller set-point for main engine operation is 90 °C.
 *13) A constant temperature at engine outlet must be maintained. Required controller set-point for main engine operation is 90 °C.
 *14) Depending on vibration a flexible hose connection may be recommendable.

Free space for file	O-Code XXXXX		Main Drw.
Standard ISO, JIS			
Modif. Number	Drawn date	Number	Drawn date
Product 5-8RT-flex58T-D	CENTRAL COOLING WATER SYSTEM WITH SEPARATED HT CIRCUIT		
Zentralkuehlwassersystem		Net Weight 0,001	
Units mm kg NX	Basic Material	Scale -	Size A1 Page 2/2 Material PAAD31132
Made 01.11.2018 Sudant Deogade	Design Group	Drawing ID DAAD108108	Rev. -
Chkd 29.11.2018 wwa008 Wang	Appd 30.11.2018 mhu019 Hug	9721	
SURFACE PROTECTION SEE GROUP 0344			
TOLERANCING PRINCIPLE ISO8015			
GENERAL TOLERANCES ACCORDING TO ISO2768-mK			



drawn for 0.75 m³ capacity

Pos.	Description
001	Drain from HT circuit
002	Balance pipe from HT circuit
003	Overflow/air vent
004	Low level alarm
005	Level indicator *1)
006	Thermometer
007	Inspection cover *2)
008	Filling pipe/inlet chemical treatment *2)

Remarks:

- *1) Level indicator can be omitted if an alternative is fitted.
- *2) Other designs like hinged covers, etc. are also possible
- For capacity and pipe diameters refer to drawing 'Central cooling water system' and 'Jacket cooling water system'

Table 1: Tank dimensions

HT Tank capacity	W	X	Y	Z
(m ³)	(mm)	(mm)	(mm)	(mm)
0.5	800	800	330	640
0.75	800	1200	500	960
1.0	800	1600	670	1280
1.25	1000	1250	530	1000
1.5	1000	1500	630	1200
1.75	1000	1750	730	1400
2.0	1000	2000	830	1600

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Free space for UIC

First introduced at
RT-flex82C

Modification	Number	Drawn date	Number	Drawn date	Number	Drawn date

G-Code: X|X|X|X|X|X Substitute for

Scale: 1:10/1:5

Drawn: M.PRSTEC 16.04.09

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CAD

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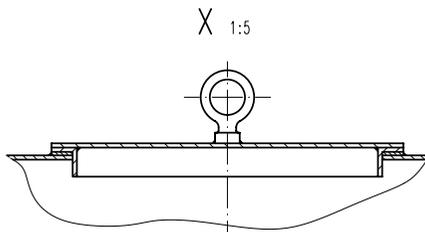
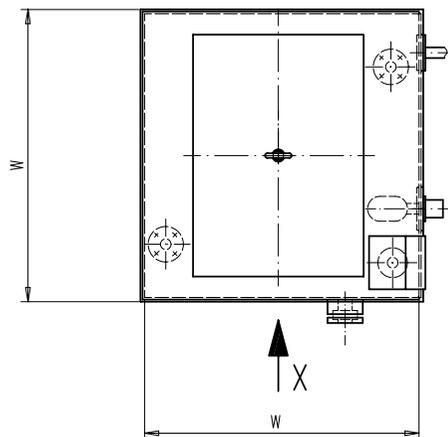
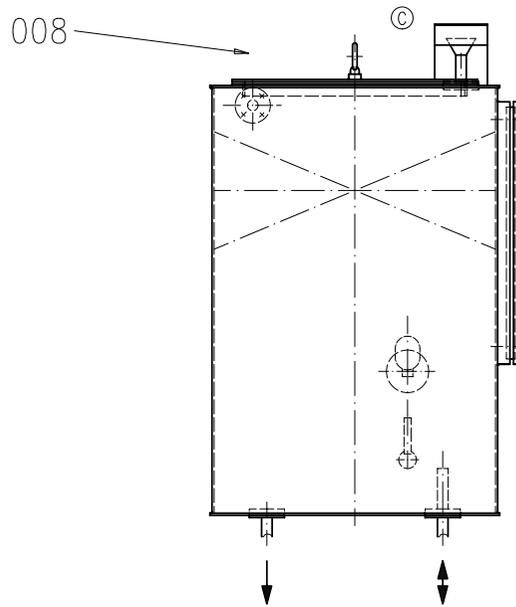
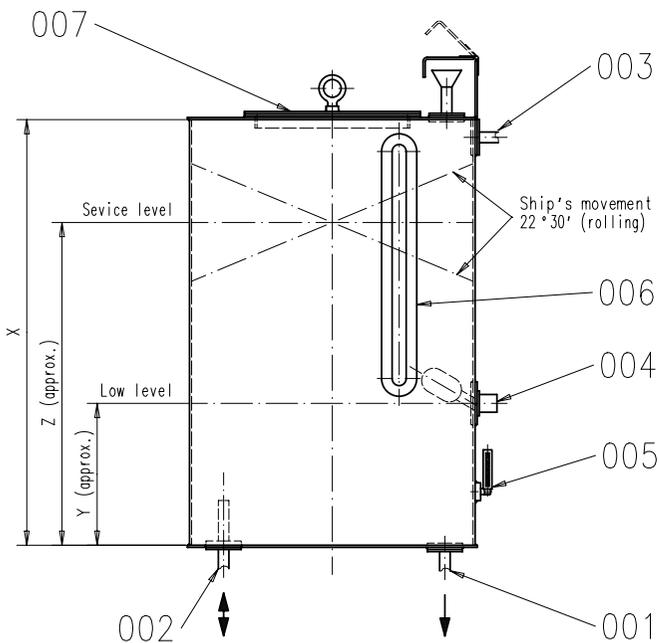
Design group: 9721

ISO JIS

Page: 2-107.413.097

SURFACE PROTECTION SEE GROUP 0344

GENERAL TOLERANCES ACCORDING TO ISO/2768-m



Drawn for 0.75 m³ capacity

Pos.	Description
001	Drain
002	Balance pipe from LT circuit
003	Overflow/air vent
004	Low level alarm
005	Thermometer
006	Level indicator #1)
007	Inspection cover #2)
008	Filling pipe/inlet chemical treatment #2)
009	

Remarks:
 #1) Level indicator can be omitted if an alternative is fitted.
 #2) Other designs like hinged covers, etc. are also possible
 - For required tank capacity and pipe diameters refer to drawing 'Central cooling water system'

Table 1: Tank dimensions

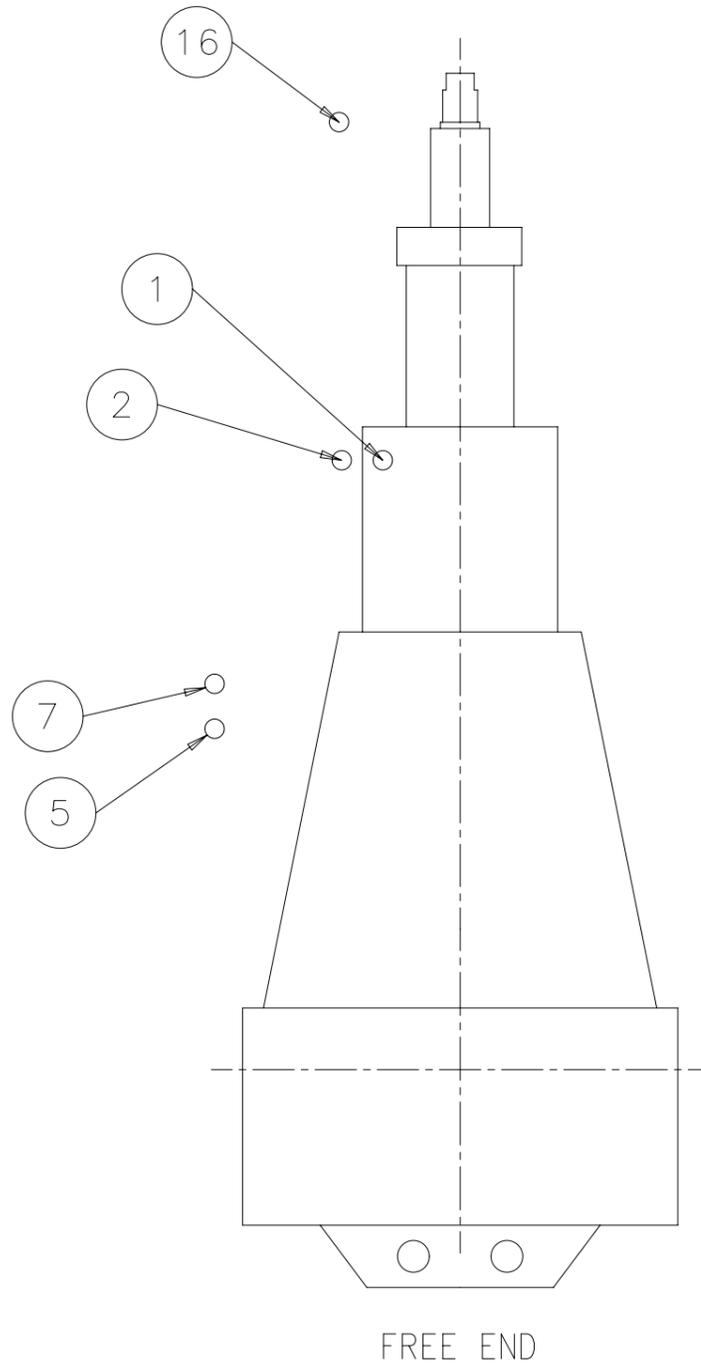
LT tank capacity (m ³)	W (mm)	X (mm)	Y (mm)	Z (mm)
0.5	800	800	330	640
0.75	800	1200	500	960
1.0	800	1600	670	1280
1.25	1000	1250	530	1000
1.5	1000	1500	630	1200
1.75	1000	1750	730	1400
2.0	1000	2000	830	1600

Free space for lib. Modif.	A 7-14.356 11.06.1997 B 7-37.090 26.09.2005 C EAAD083145 14.09.2011				O-Code XXXXX Standard ISO JIS	Main Drw.
	Number Drawn date	Number Drawn date	Number Drawn date	Number Drawn date	Number Drawn date	Number Drawn date
		Product RTMOT RT-flex		EXPANSION TANK CENTRAL COOLING WATER LT CIRCUIT Ausgleichstank Zentralkuehlwassersystem LT		
Units mm kg IDE		Basic Material	Net Weight 0.001			
SURFACE PROTECTION SEE GROUP 0344 TOLERANCING PRINCIPLE ISO8015 GENERAL TOLERANCES ACCORDING TO ISO2768-mk		Made 11.06.1997 T.LANDERT Chkd Appd 16.06.1997 wdm2 Administrator	Scale 1:10 Design Group 9721	Size A2 Page 1/1 Drawing ID 107.245.419	Material ID 107.245.419.500 Rev. C	

SPECIFICATION which must be met:

<p>16 OUTLET - Cylinder cooling air vent - Vented through expansion tank - Water flow restricted by orifice</p>	<p>1 INLET - Cylinder cooling water - Cooling water pressure: 3.0 - 5.0 bar - Cooling water volume flow according to GTD specification. - Cooling water (freshwater) must be treated according to WinGD's specification.</p>
	<p>2 OUTLET - Cylinder cooling water - Cooling water temperature Controller set-point: 90 °C (controller type: PI) Steady state condition: 90 ± 2 °C Transient condition: 90 ± 4 °C</p>
	<p>5 INLET - SAC LT cooling water - Cooling water pressure: 2.0 - 4.0 bar - Cooling water temperature: 10 - 36 °C - Cooling water volume flow: according to GTD specification. - Cooling water (freshwater) must be treated according to WinGD's specification.</p>
	<p>7 OUTLET - SAC LT cooling water - Cooling water volume flow: according to GTD specification, adjusted by orifice in outlet pipe on plant side.</p>

RT-flex58T-D



1	002	107.413.098.500	EXPANSION TANK	107.413.098		0,001	
QTY	SEQ NO	Material ID	Material Name	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET
Free space for litc.						Q-Code XXXXXX	Main Drw.
						Standard ISO; JIS	
Modif.							
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number
			Product 5-8RT-flex58T-D	CENTRAL COOLING WATER SYSTEM WITH INTEGRATED HT CIRCUIT Zentralkuehlwassersystem			
Units	mm kg	NX	Basic Material			Net Weight 0,001	
SURFACE PROTECTION SEE GROUP 0344		Made	01.11.2018	Sudant Deogade	Scale	-	Size A3
TOLERANCING PRINCIPLE ISO8015		Chkd	29.11.2018	wwa008 Wang	Design Group	9721	Page 1/2
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	30.11.2018	mhu019 Hug	Drawing ID	DAAD108107	Material ID PAAD311131
						Rev.	-

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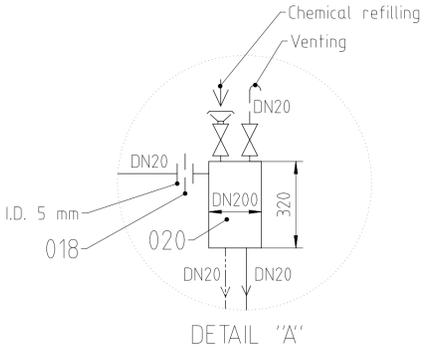
DID - DIMENSIONAL DRAWING - Confidential

SYSTEM PROPOSAL

Pos.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Air vent pipe CCW system
EC03	Throttling disc (adjustable orifice)

Pos.	ENGINE CONNECTIONS *2)
①	INLET - HT cooling water (free or driving end)
②	OUTLET - HT cooling water (free or driving end)
⑤	INLET - Scavenge air cooler, LT cooling water *7)
⑦	OUTLET - Scavenge air cooler, LT cooling water and air vent *7)
⑬	OUTLET - Cylinder cooling water air vent *14)

Pos.	SYSTEM COMPONENTS *1)
001	Transition piece (adapter) *9)
002	HT / LT expansion tank (detail drawing linked by partlist on page 1)
003	Low sea chest
004	High sea chest
005	Seawater strainer
006	Air vent (air vent pipe or equal venting system acc. to shipyard's design)
007	Seawater circulating pump
008	Central seawater cooler
009	Automatic temperature control valve for LT circuit *12)
010	LT water temperature sensor *12)
011	Cooling water pump for LT circuit
012	Lubricating oil cooler
013	Automatic temperature control valve for HT circuit *13)
014	HT water temperature sensor *13)
015	Cylinder cooling water pump for HT circuit
016	Pre-heating circulating pump (optional, cap. 10% from cylinder cooling pump *8)
017	Pre-heater for main engine (HT circuit)
018	Throttling disc *5)
019	Freshwater generator
020	Chemical treatment refill unit *4)
021	Filling pipe/inlet chemical treatment
022	MDO/MGO cooler



Number of cylinders		5	6	7	8
Main engine RT-flex58T-D (R1 rated)	power (kW)	11300	13560	15820	18080
	speed (rpm)	105			
Pressure drop across the engine	(bar)	1.3			
Cooling water expansion tank (HT)	Cap. (m³)	Recommended: 1.0 m³ min. 10% of HT cooling water			
Cooling water expansion tank (LT)	Cap. (m³)	Depending on ancillary plants min. 10% of LT cooling water			

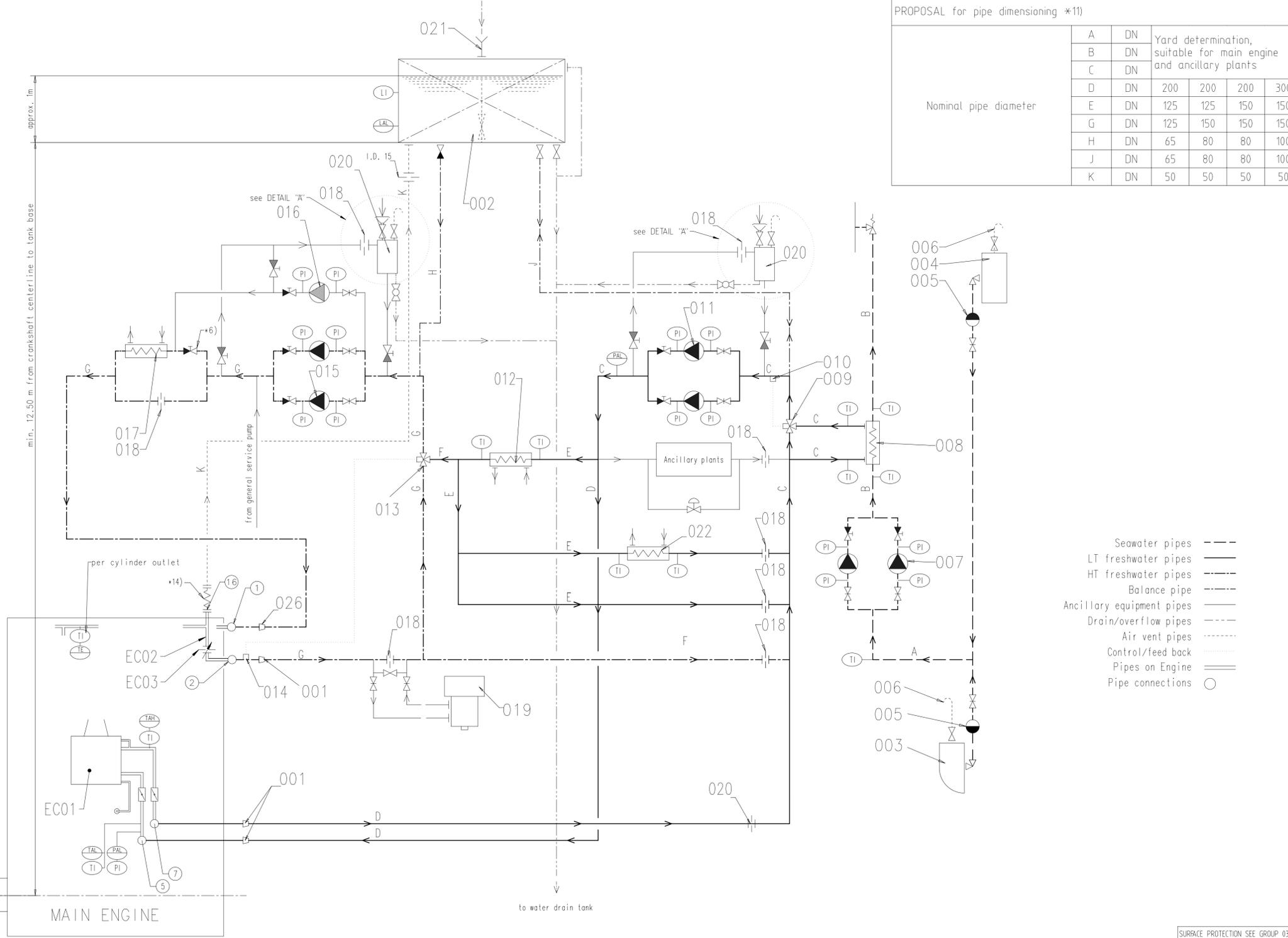
PROPOSAL for pipe dimensioning *11)

Nominal pipe diameter	Yard determination, suitable for main engine and ancillary plants				
	A	B	C	D	E
DN 200	200	200	200	300	
DN 125	125	125	150	150	
DN 125	125	150	150	150	
DN 65	65	80	80	100	
DN 65	65	80	80	100	
DN 50	50	50	50	50	

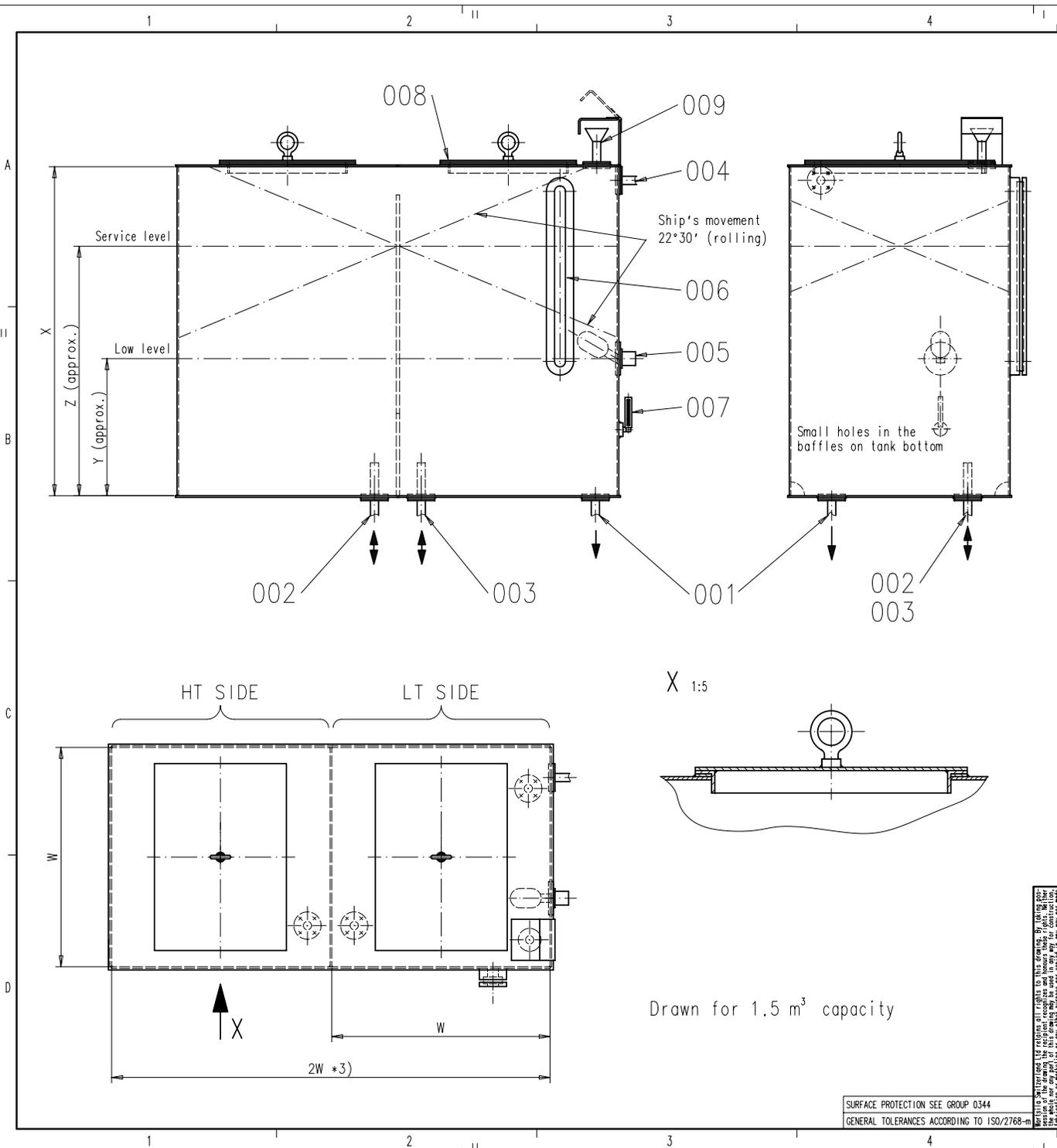
Remarks:

- Air vent and drain pipes not shown on drawing. Shall be installed where required.
- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational.

*1) To be delivered by external supplier and to be installed by the shipyard.
 *2) Refer to the "Pipe Connection Plan" for the execution and location of the engine pipe connection.
 *3) To be delivered by the engine manufacturer, i.e. already equipped on engine side.
 *4) To be installed for cooling water after-treatment during regular engine operation. Convenient dimensions are provided in view "A". Other designs are possible.
 *5) When using a valve, lock in proper position to avoid mishandling.
 *6) Only when pos. 016 is installed.
 *7) The inlet and outlet pipes to SAC must be designed to allow engine thermal expansion, or be fitted with expansion pieces.
 *8) For guidance only, final layout according to actual engine pre-heating requirements.
 *9) Installed as required (check with "Pipe Connection Plan")
 *11) All given diameters are valid for the mentioned rating and serve just as an example. To make the layout for the project specific rating please refer to DG9730 "Fluid velocities and flow rates, recommended values for pipework of diesel plants" for selecting the appropriate pipe diameter. Rating specific flow rates are provided by GTD.
 *12) A constant temperature at engine inlet must be maintained. Temperature set-point can be selected between 10 - 36 °C. WinGD recommends a set-point of 25 °C. A lower LT water temperature assists the main engine to reach lower BSFC. If the ancillary plants require a lower or greater LT water temperature a separate water supply system with different temperature set-point has to be installed (please refer to the system proposal in MIM)
 *13) A constant temperature at engine outlet must be maintained. Required controller set-point for main engine operation is 90 °C.
 *14) Depending on vibration a flexible hose connection may be recommendable.



Free space for lic.	0-Code XXXXXX	Main Drw.
Modif. Number	Drawn date	Number
Product 5-BRT-flex58T-D		0-Code
CENTRAL COOLING WATER SYSTEM WITH INTEGRATED HT CIRCUIT		Main Drw.
Zentralkuehlwassersystem		ISO; JIS
Units mm kg	NX	Basic Material
Scale	Size A1	Page 2/2
Material ID	PAAD311131	Net Weight 0,001
SURFACE PROTECTION SEE GROUP 0344	Chkd 29.11.2018 wwa008 Wang	Design Group
TOLERANCING PRINCIPLE ISO8015	Appd 30.11.2018 mhu019 Hug	Drawing ID DAAD108107
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Rev. -



Pos.	Description
001	Drain
002	Balance pipe from HT circuit
003	Balance pipe from LT circuit
004	Overflow/air vent
005	Low level alarm
006	Level indicator *1)
007	Thermometer
008	Inspection cover *2)
009	Filling pipe/inlet chemical treatment *2)

Remarks:

- *1) Level indicator can be omitted if an alternative is fitted.
- *2) Other designs like hinged covers, etc. are also possible
- *3) Depending on actual ancillary plants, LT tank capacity to be increased accordingly

- For required tank capacity and pipe diameters refer to drawing 'Central cooling water system'

Table 1: Tank dimensions

Total capacity ^{*3)}	W	X	Y	Z
(m ³)	(mm)	(mm)	(mm)	(mm)
1.0	800	800	330	640
1.5	800	1200	500	960
2.0	800	1600	670	1280
2.5	1000	1250	530	1000
3.0	1000	1500	630	1200
3.5	1000	1750	730	1400
4.0	1000	2000	830	1600

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RT-flex82C

Scale 1:10/1:5

Drawn: M.PRSTEC 16.04.09

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CAD

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SURFACE PROTECTION SEE GROUP 0344
 GENERAL TOLERANCES ACCORDING TO ISO/2768-m

Design group 9721 ISO 2-107.413.098 Page:

MIDS - WinGD RT-flex58T-D - Cooling Water System (DG9721)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2017-05-29	DRAWING SET	First web upload
2018-12-13	DAAD108118 DAAD108108 DAAD108107	Main and system drgs - new revision

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