

1 2 3 4 5 6 7 8

A
B
C
D
E
F

PAAD115359	Central cooling water system with separated HT-circuit
PAAD115360	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	PAAD115353	CENTRAL COOLING WATER SYSTEM			DAAD036166						0,001
-	1	001	PAAD115326	CENTRAL COOLING WATER SYSTEM			DAAD036161						0,001
Quantity PER ENGINE		SEQ NO	Material ID	Material Name			Standard or Drawing	Basic Material Material Standard		Weight GR./NET			
PAAD115360	PAAD115359	Free space for litc.				Q-Code XXXXXX		Main Drw. H					
Material ID	Modif.	EAAD084475	09.04.2013	A	EAAD089971	29.10.2018							
		Number	Drawn date		Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	
				Product 5-8RT-flex58T-E		COOLING WATER SYSTEMS Kuehlwassersystem							
				Units mm kg		NX		Basic Material		Net Weight			
SURFACE PROTECTION SEE GROUP 0344		Made		04.02.2013 asex06 A.Sekulic		Scale -		Size A3		Page 1/1		Material ID	
TOLERANCING PRINCIPLE ISO8015		Chkd		05.04.2013 mhu019 Hug		Design Group		9721		Drawing ID		DAAD036170	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd		08.04.2013 bha009 Haag								Rev. A	

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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

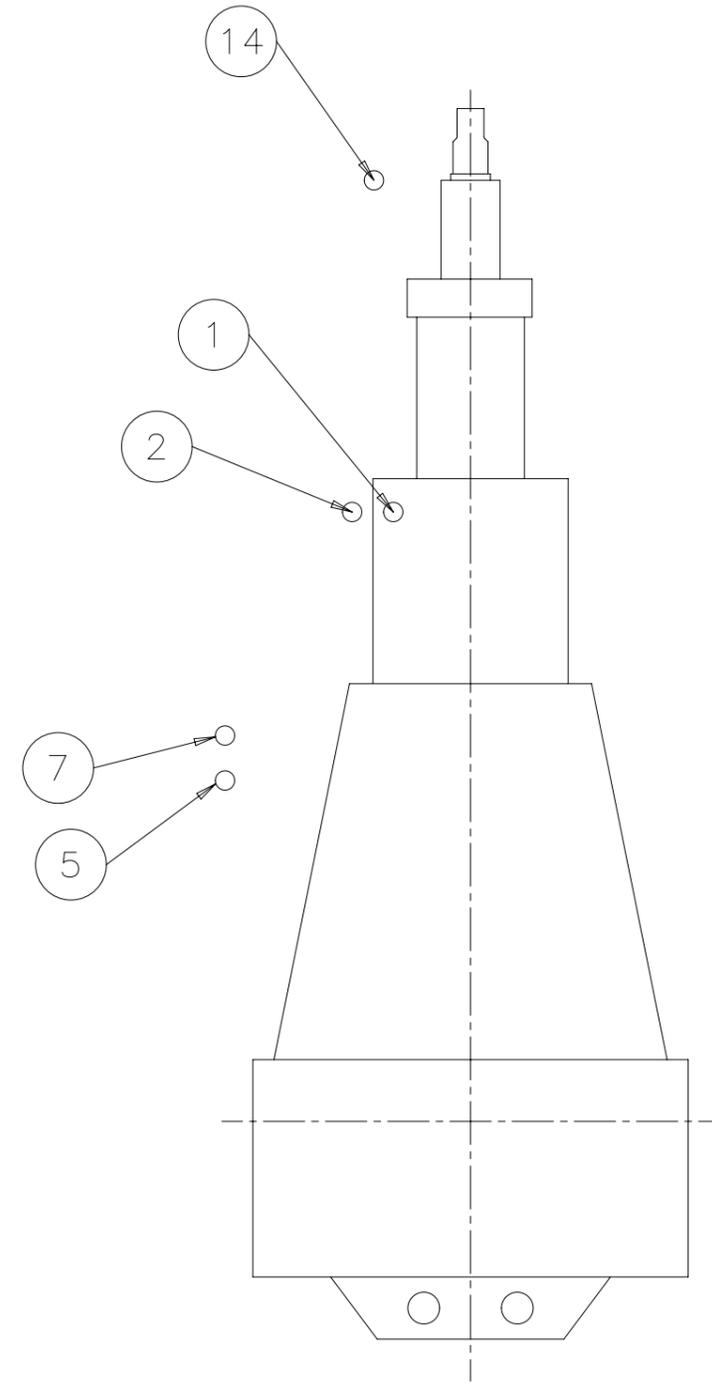
1 INLET - Cylinder cooling water
 - Cooling water pressure: 3.0 - 5.0 bar
 - Cooling water volume flow: according to GTD specification.
 - Cooling water (freshwater) must be treated according to WinGD's specification.

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-E



FREE END

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 XXXXXX	Main Drw.						
						Standard ISO; JIS							
Modif.	A	EAAD085793	01.06.2015	B	EAAD086766	15.09.2016	C	EAAD089971	01.11.2018				
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date					
			Product 5-8RT-flex58T-E	CENTRAL COOLING WATER SYSTEM									
				Zentralkuehlwassersystem									
Units	mm kg	NX	Basic Material				Net Weight 0,001						
SURFACE PROTECTION SEE GROUP 0344		Made	05.02.2013	asex06	A.Sekulic	Scale	-	Size	A3	Page	1/2	Material ID	PAAD115326
TOLERANCING PRINCIPLE ISO8015		Chkd	05.04.2013	mhu019 Hug		Design Group	9721	Drawing ID	DAAD036161		Rev.	C	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	08.04.2013	bha009 Haag									

Approved

DID - DIMENSIONAL DRAWING - Confidential

SYSTEM PROPOSAL

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

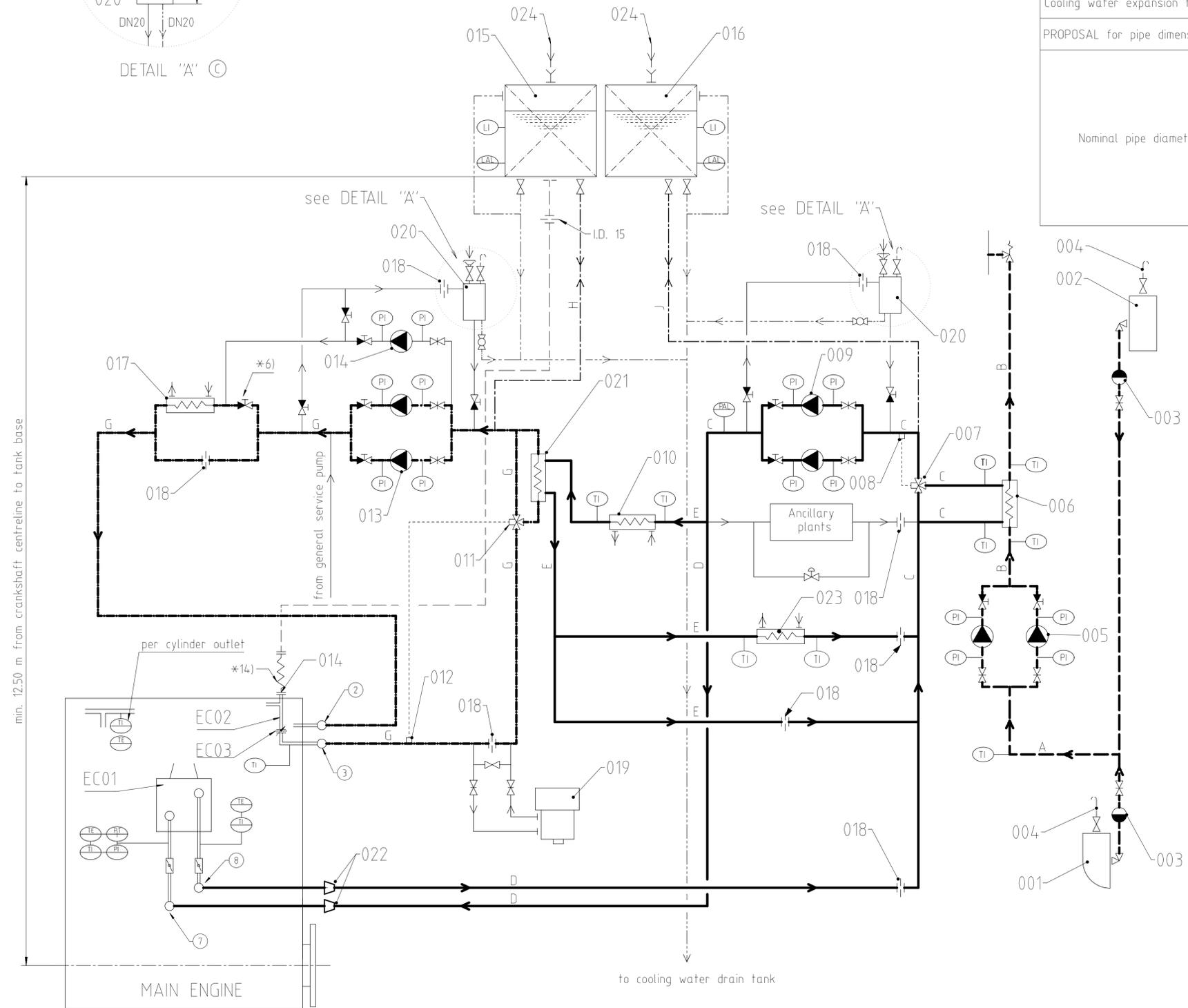
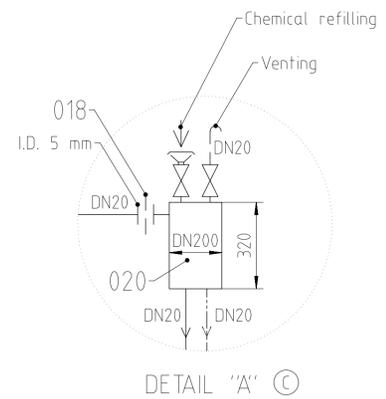
Pos.	ENGINE CONNECTIONS *2) (C)
①	INLET - HT cooling water (free or driving end)
②	OUTLET - HT cooling water (free or driving end)
⑤	INLET - Scavenge air cooler, LT cooling water *7)
⑦	OUTLET - Scavenge air cooler, LT cooling water and air vent *7)
⑭	OUTLET - Cylinder cooling water air vent *14)

Pos.	SYSTEM COMPONENTS *1) (C)
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-E (R1 rated)	power (kW)	11750	14100	16450	18800
	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) (C)

Nominal pipe diameter	Yard determination, suitable for main engine and ancillary plants			
	A	B	C	D
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



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

Remarks: (C)

- 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")

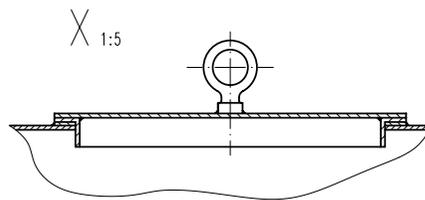
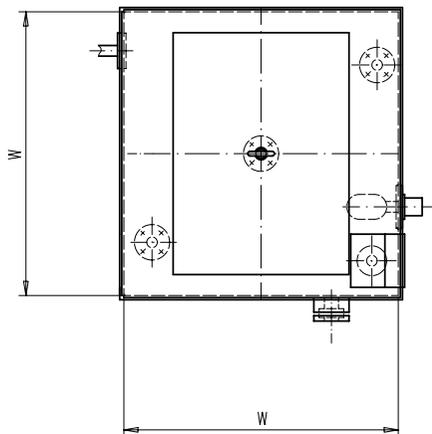
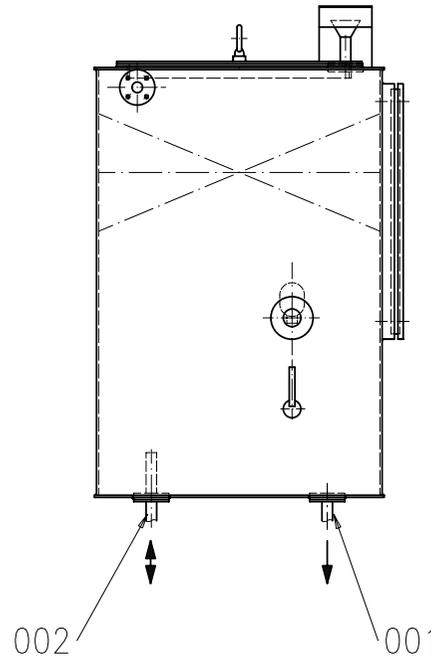
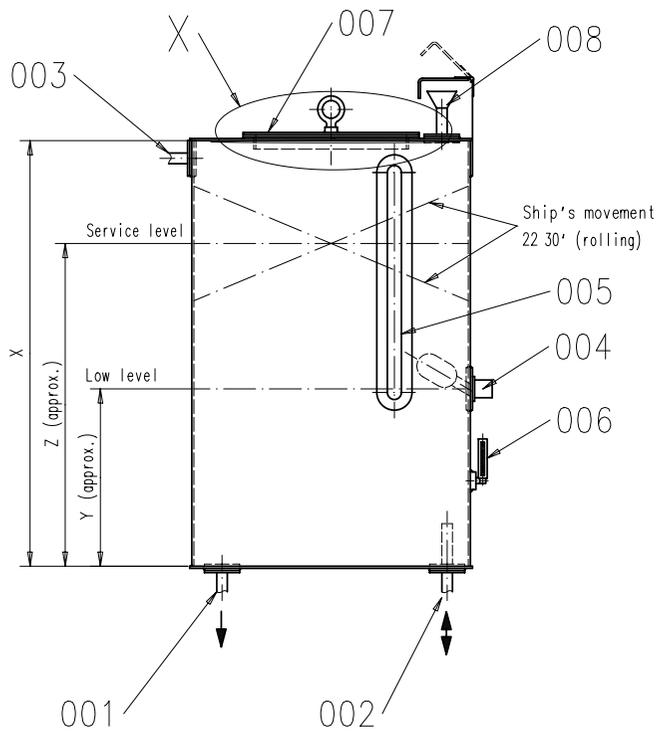
*11) All given diameters are valid for the mentioned rating and serve just as an example. To make the layout for the project specific rating please refer to DG9730 "Fluid velocities and flow rates, recommended values for pipework of diesel plants" for selecting the appropriate pipe diameter. Rating specific 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 XXXXX		Main Drw.
Standard ISO, JIS			
Modif. A	EAAD085793	01.06.2015	asex06 A.Sekulic
Modif. B	EAAD086766	15.09.2016	
Modif. C	EAAD089971	01.11.2018	
Product	5-BRT-flex58T-E		
Product	CENTRAL COOLING WATER SYSTEM		
Product	Zentralkuehlwassersystem		
Units	mm kg	NX	Basic Material
Units	mm kg	NX	Net Weight 0,001
Surface protection	SEE GROUP 0344		
Tolerancing principle	ISO8015		
General tolerances	ACCORDING TO ISO2768-mK		
Scale	-		
Size	A1	Page	2/2
Material	PAAD115326		
Design Group	9721		
Drawing ID	DAAD036161		
Rev.	C		



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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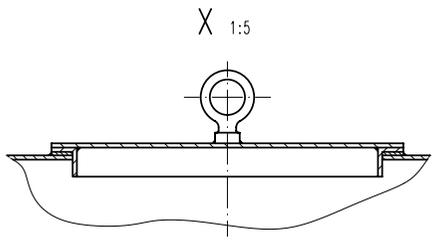
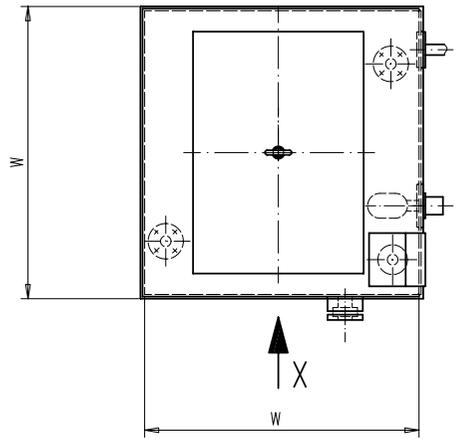
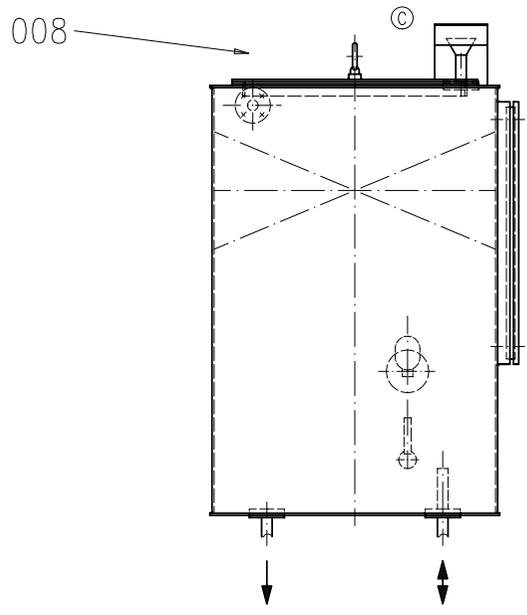
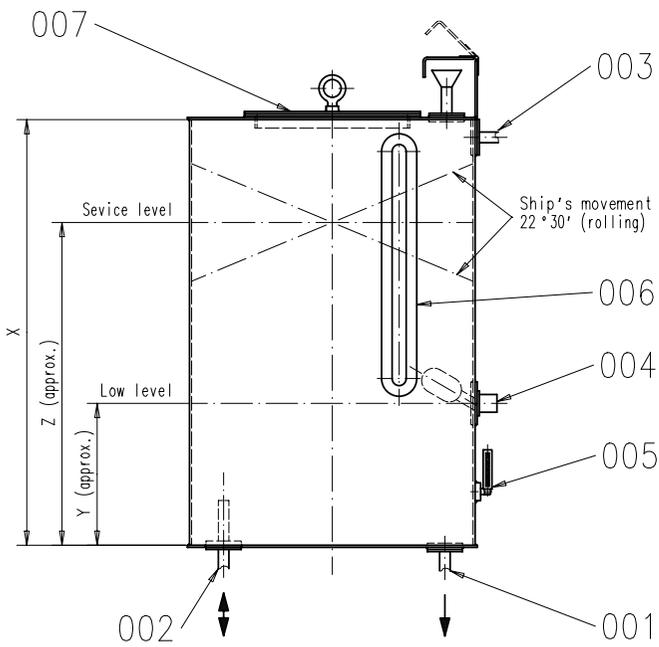
Design group: 9721

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

E-Code for lib.	XXXXXX				Main Dw.						
	Standard ISO JIS										
Modif.	A	7-14.356	11.06.1997	B	7-37.090	26.09.2005	C	EAAD083145	14.09.2011		
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	

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		Mod	11.06.1997	T.LANDERT	Scale	1:10
Tolerancing Principle	ISO8015		Chkd			Size	A2
General Tolerances	ACCORDING TO ISO2768-mK		Appd	16.06.1997	wdms2 Administrator	Page	1/1
						Material ID	107.245.419.500
						Design Group	9721
						Drawing ID	107.245.419
						Rev.	C

SPECIFICATION which must be met: ©

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

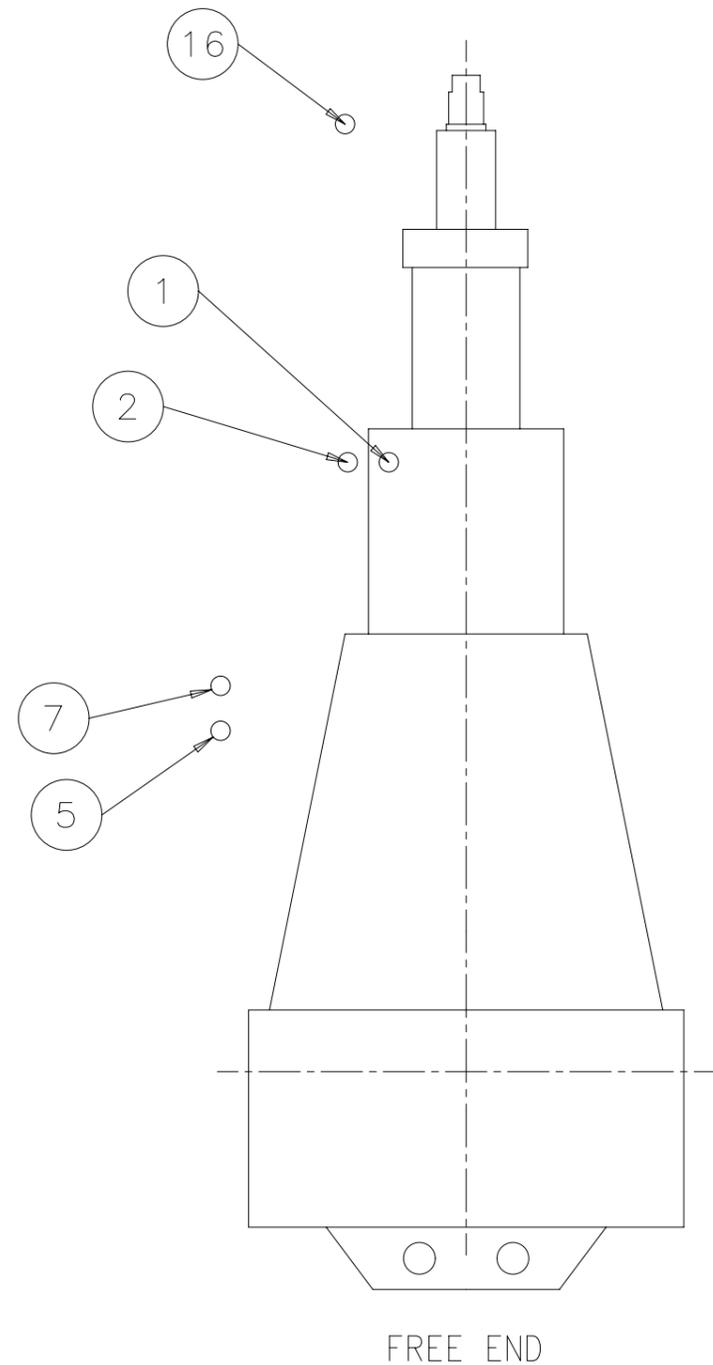
1 INLET - Cylinder cooling water
 - Cooling water pressure: 3.0 - 5.0 bar
 - Cooling water volume flow according to GTD specification.
 - Cooling water (freshwater) must be treated according to WinGD's specification.

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: 10 - 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-E



1	002	107.413.098.500	EXPANSION TANK	107.413.098		0,001							
QTY	SEQ NO	Material ID	Material Name	Standard or Drawing	Basic Material Material Standard	Weight GR./NET							
Free space for litc.					Q-Code XXXXXX	Main Drw.							
					Standard ISO; JIS								
Modif.	A	EAAD085793	01.06.2015	B	EAAD086766	15.09.2016	C	EAAD089971	01.11.2018				
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date					
			Product 5-8RT-flex58T-E	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	05.02.2013	asex06	A.Sekulic	Scale	-	Size	A3	Page	1/2	Material ID	PAAD115353
TOLERANCING PRINCIPLE ISO8015		Chkd	05.04.2013	mhu019 Hug		Design Group	9721	Drawing ID	DAAD036166		Rev.	C	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	08.04.2013	bha009 Haag									

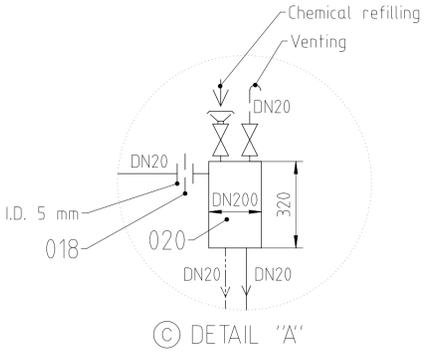
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SYSTEM PROPOSAL

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

Pos.	ENGINE CONNECTIONS *2) (C)
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 *15)

Pos.	SYSTEM COMPONENTS *1) (C)
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 *13)
010	LT water temperature sensor *13)
011	Cooling water pump for LT circuit
012	Lubricating oil cooler
013	Automatic temperature control valve for HT circuit *14)
014	HT water temperature sensor *14)
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



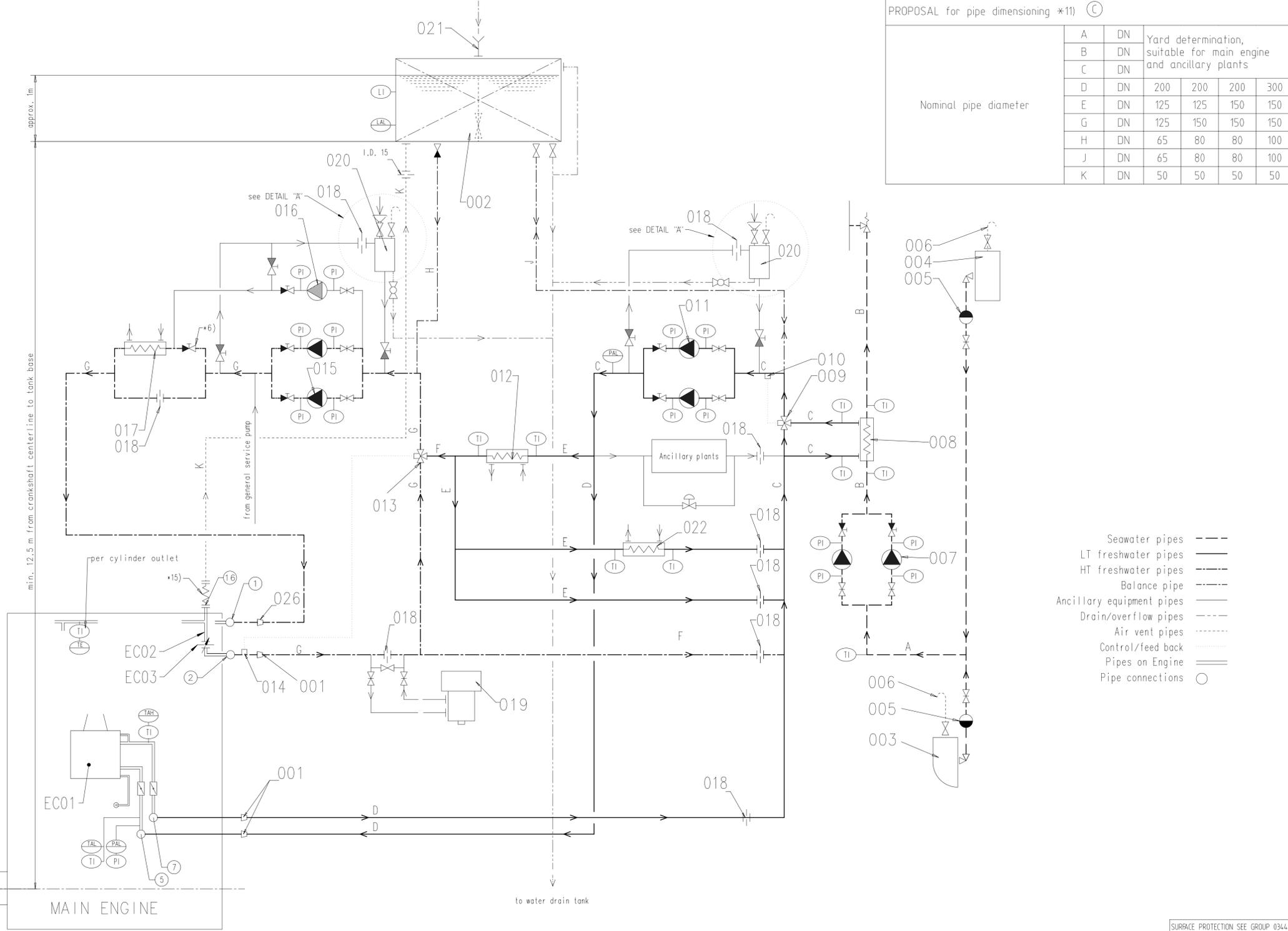
Number of cylinders		5	6	7	8
Main engine RT-flex58T-E (R1 rated)	power (kW)	11750	14100	16450	18800
	speed (rpm)	105			
Pressure drop across the engine	(bar)	1.3			
Cooling water expansion tank (HT)	Cap. (m³)	Recommended: 1.0 m³ min. 10% of HT cooling water			
Cooling water expansion tank (LT)	Cap. (m³)	Depending on ancillary plants min. 10% of LT cooling water			

PROPOSAL for pipe dimensioning *11) (C)						
Nominal pipe diameter	A	DN	Yard determination, suitable for main engine and ancillary plants			
	B	DN				
	C	DN				
	D	DN	200	200	200	300
	E	DN	125	125	150	150
	G	DN	125	150	150	150
	H	DN	65	80	80	100
	J	DN	65	80	80	100
	K	DN	50	50	50	50

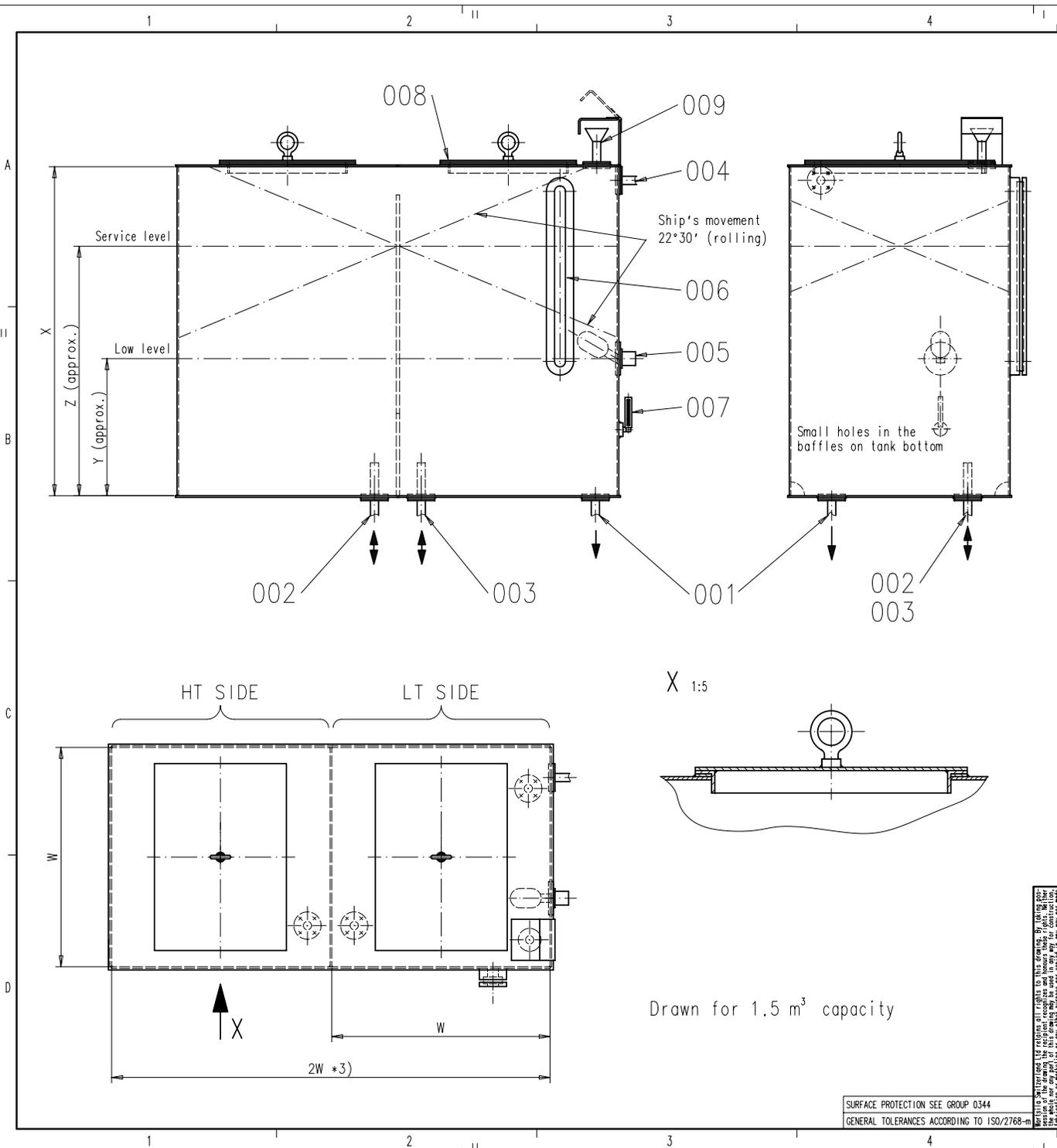
Remarks: (C)

- 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.
 *13) 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)
 *14) A constant temperature at engine outlet must be maintained. Required controller set-point for main engine operation is 90 °C.
 *15) Depending on vibration a flexible hose connection may be recommendable.



Free space for lic.	0-Code XXXXX	Main Drw.
Standard ISO, JIS		
Modif. A	EAAD085793	01.06.2015
Modif. B	EAAD086766	15.09.2016
Modif. C	EAAD089971	01.11.2018
Product	5-BRT-flex58T-E	
Product	CENTRAL COOLING WATER SYSTEM WITH INTEGRATED HT CIRCUIT	
Product	Zentralkuehlwassersystem	
Units	mm kg NX	Basic Material
Scale	-	Scale
Size	A1	Page 2/2
Material	PAAD115353	Rev. C
Surface protection	SEE GROUP 0344	
Tolerancing principle	ISO8015	
General tolerances	ACCORDING TO ISO2768-mK	
Units	mm kg NX	Basic Material
Made	05.02.2013 asex06 A.Sekulic	Scale -
Chkd	05.04.2013 mhu019 Hug	Design Group
Appd	08.04.2013 bha009 Haag	Drawing ID DAAD036166
Net Weight	0,001	



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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Free space for UIC

First introduced at
RT-flex82C

Modification	Number	Drawn date	Number	Drawn date	Number	Drawn date
Q-Code	X	X	X	X	X	X

Substitute for

Scale 1:10/1:5

Drawn: M.PRSTEC 16.04.09

Wartsila Switzerland Ltd

CAD

WARTSILA

Design group 9721 ISO JIS 2-107.413.098 Page:

Drawn for 1.5 m³ capacity

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

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

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2017-05-29	DRAWING SET	First web upload
2018-12-13	DAAD036170 DAAD036161 DAAD036166	Main and system drgs - new revision

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