

1

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7

8

A

B


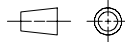
C

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	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET								
PAAD115360	PAAD115359	Free space for lic.					Q-Code XXXXXX	Main Drw.  H								
							Standard ISO; JIS									
Material ID	Modif.	-	EAAD084475	09.04.2013	A	EAAD089971	29.10.2018									
			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		Rev.	A
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	08.04.2013 bha009 Haag													

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DID - DIMENSIONAL DRAWING - Confidential

1

2

3

4

5

6

7

8

SPECIFICATION which must be met: ©

14

OUTLET – Cylinder cooling air vent

– Vented through expansion tank

– Water flow restricted by orifice

RT-flex58T-E

14

1

2

7

5

FREE END

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.

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 lic.

Q-Code

XXXXXX

Standard

ISO; JIS

Main Drw.

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

WIN GD

Winterthur Gas & Diesel

Product

5-8RT-flex58T-E

CENTRAL COOLING WATER SYSTEM

Zentralkuehlwassersystem

Units

mm kg

NX

Basic Material

Net Weight 0,001

Surface protection

05.02.2013

asex06

A.Sekulic

Scale

-

Size

A3

Page

1/2

Material ID

PAAD115326

TOLERANCING PRINCIPLE

05.04.2013

mhu019

Hug

Design Group

9721

Drawing ID

DAAD036161

Rev.

C

GENERAL TOLERANCES

08.04.2013

bha009

Haag

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 lic.

Q-Code

XXXXXX

Standard

ISO; JIS

Main Drw.

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

WIN GD

Winterthur Gas & Diesel

Product

5-8RT-flex58T-E

CENTRAL COOLING WATER SYSTEM

Zentralkuehlwassersystem

Units

mm kg

NX

Basic Material

Net Weight 0,001

Surface protection

05.02.2013

asex06

A.Sekulic

Scale

-

Size

A3

Page

1/2

Material ID

PAAD115326

TOLERANCING PRINCIPLE

05.04.2013

mhu019

Hug

Design Group

9721

Drawing ID

DAAD036161

Rev.

C

GENERAL TOLERANCES

08.04.2013

bha009

Haag

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Approved

DID - DIMENSIONAL DRAWING - Confidential

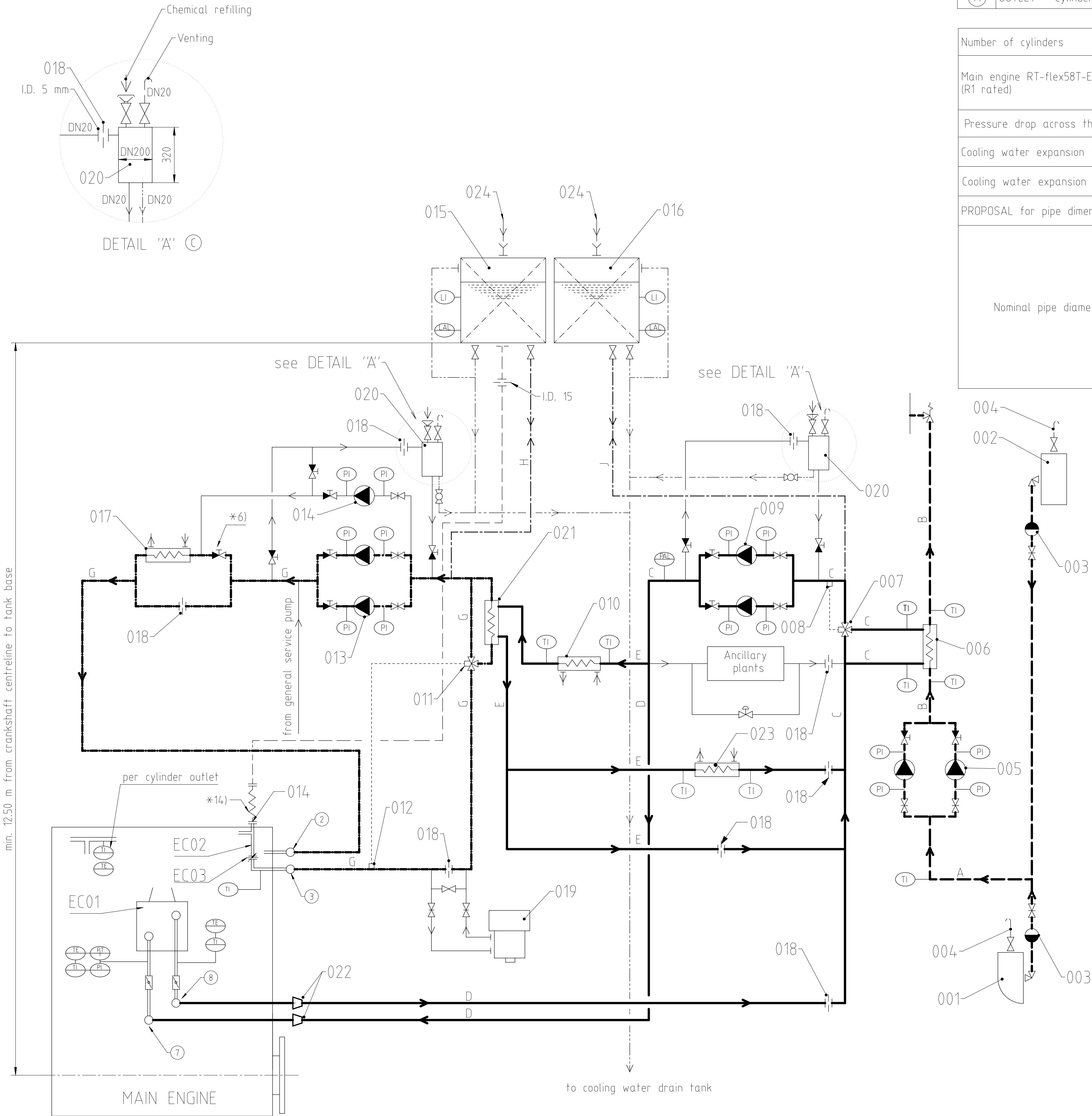
SYSTEM PROPOSAL

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)
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-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) <span>Ⓒ</span>						
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



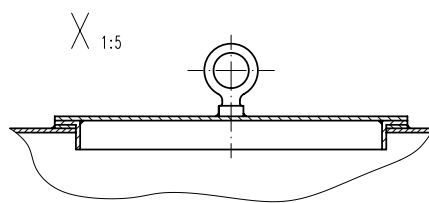
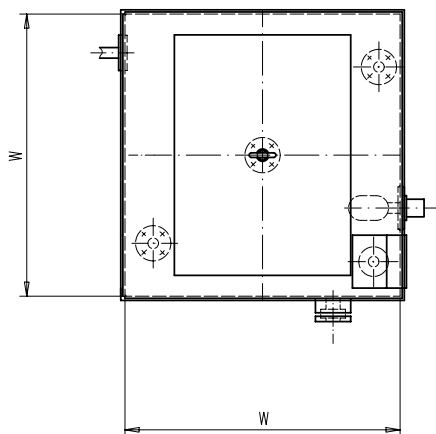
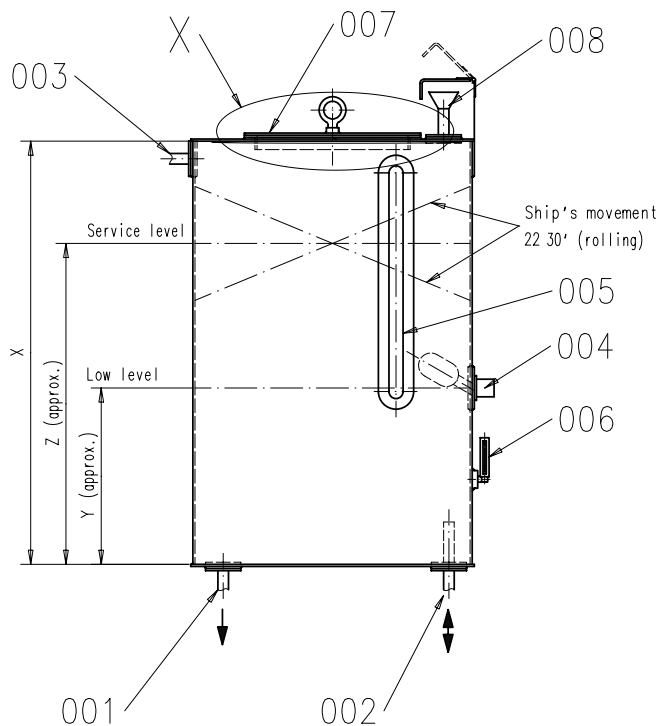
Remarks: ©

- 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 MM)  
\*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.

- 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 ○

Free space for file		0-Code XXXXX		Main Drw.	
Modif. A		B		C	
EAAD085793		EAAD086766		EAAD089971	
01.06.2015		15.09.2016		01.11.2018	
Number		Number		Number	
Drawn date		Drawn date		Drawn date	
Product 5-8RT-flex58T-E		CENTRAL COOLING WATER SYSTEM		Zentralkuehlwassersystem	
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	
SURFACE PROTECTION SEE GROUP 0344		TOLERANCING PRINCIPLE ISO8015		GENERAL TOLERANCES ACCORDING TO ISO2768-mK	
Size A1		Page 2/2		Material ID	
PAAD115326		DAAD036161		Rev. C	



drawn for 0.75 m<sup>3</sup> 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 <sup>3</sup> )	( 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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First introduced at  
RT-flex82C

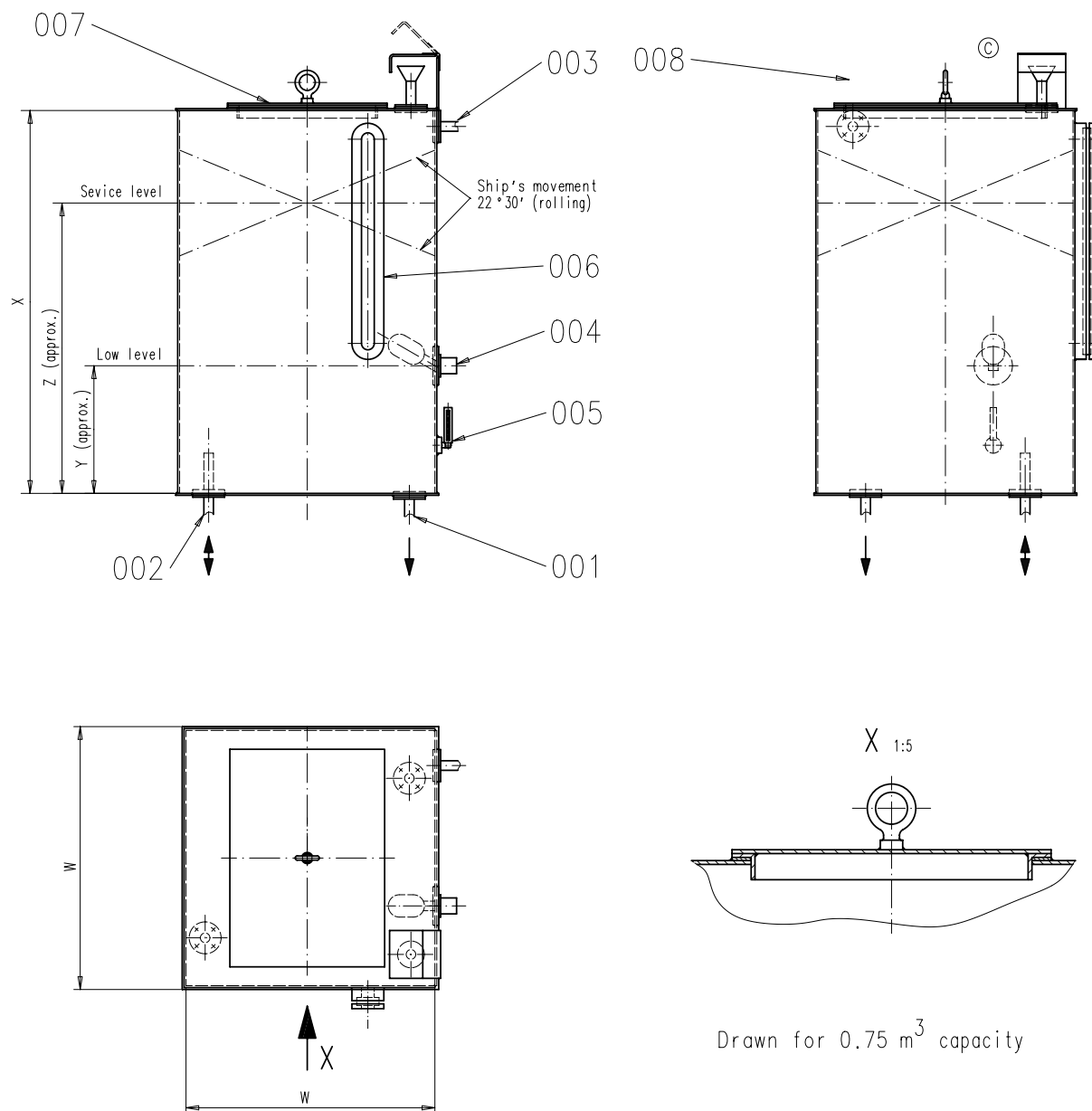
Q-Code	Number	Drawn date	Number	Drawn date	Number	Drawn date
X	X	X	X	X	X	X
Substitute for						Scale 1:10/1:5
Ausgleichstank						Drawn: M.PRSTEC 16.04.09
Zentralkühlwassersystem HT circuit						
EXPANSION TANK						Wärtsilä Switzerland Ltd.
CENTRAL COOLING WATER HT CIRCUIT						CAD
2-107.413.097						Page:

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

Design group  
9721

ISO  
JIS





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	W	X	Y	Z
( m <sup>3</sup> )	( 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

Drawn for 0.75 m<sup>3</sup> capacity

Free space for lib.	Q-Code				XXXXX	Main Dwg.					
	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	
		Product RTMOT RT-flex		EXPANSION TANK CENTRAL COOLING WATER LT CIRCUIT Ausgleichstank Zentralkühlwassersystem LT							
Units	mm kg	IDE	Basic Material					Net Weight 0.001			
Mod	11.06.1997	T.LANDERT	Scale	1:10	Size	A2	Page	1/1	Material ID	107.245.419.500	
Chkd			Design Group	9721	Drawing ID	107.245.419	Rev.	C			
GENERAL TOLERANCES ACCORDING TO ISO2768-mK											

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

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.

OUTLET - Cylinder cooling water

- Cooling water temperature
  - Controller set-point: 90 °C (controller type: PI)
  - Steady state condition:  $90 \pm 2$  °C
  - Transient condition:  $90 \pm 4$  °C

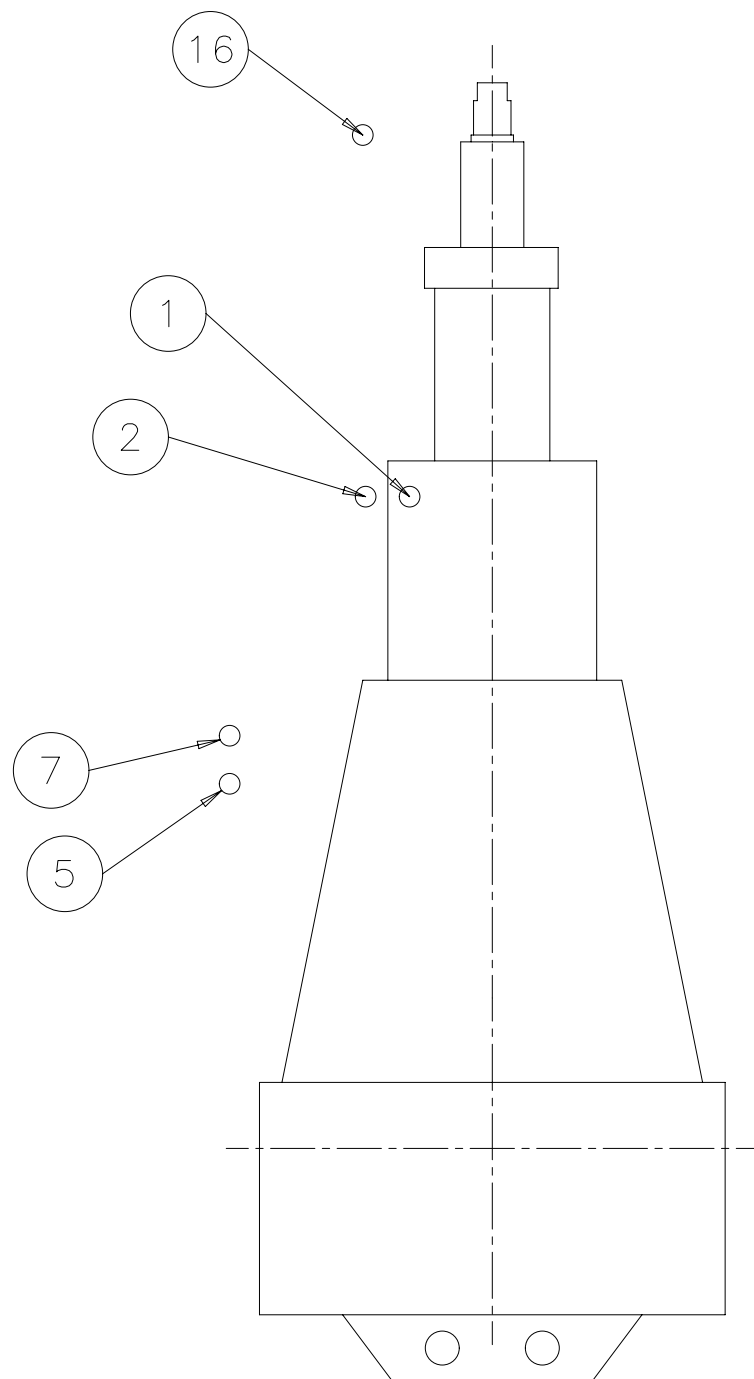
INLET – SAC LT cooling water

- 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.


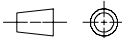
OUTLET – SAC LT cooling water

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

RT-f | ex58T-E



FREE END

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 lic.							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					
Made	05.02.2013		asex06		A.Sekulic		Scale	-	Size	A3	Page	1/2	Material ID	PAAD115353		
Chkd	05.04.2013		mhu019		Hug		Design Group		9721		Drawing ID		DAAD036166		Rev.	C
Appd	08.04.2013		bha009		Haaq											


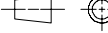
SYSTEM PROPOSAL

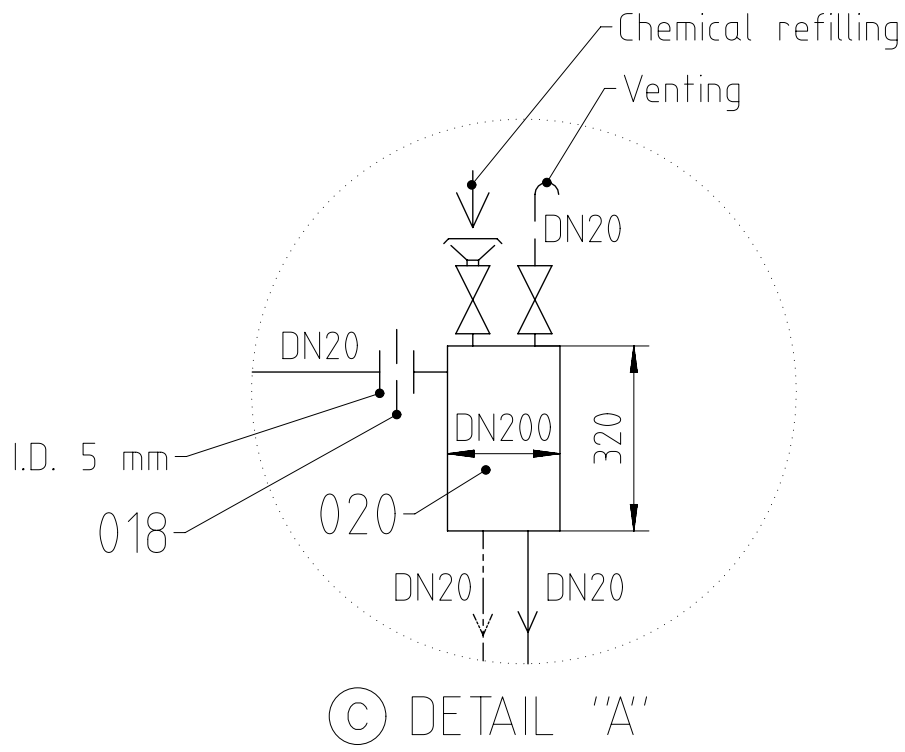
Pos.	ENGINE COMPONENTS *3) (C)
EC01	Scavenge air cooler (SAC)
EC02	Air vent pipe CCW system
EC03	Throttling disc (adjustable orifice)

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)

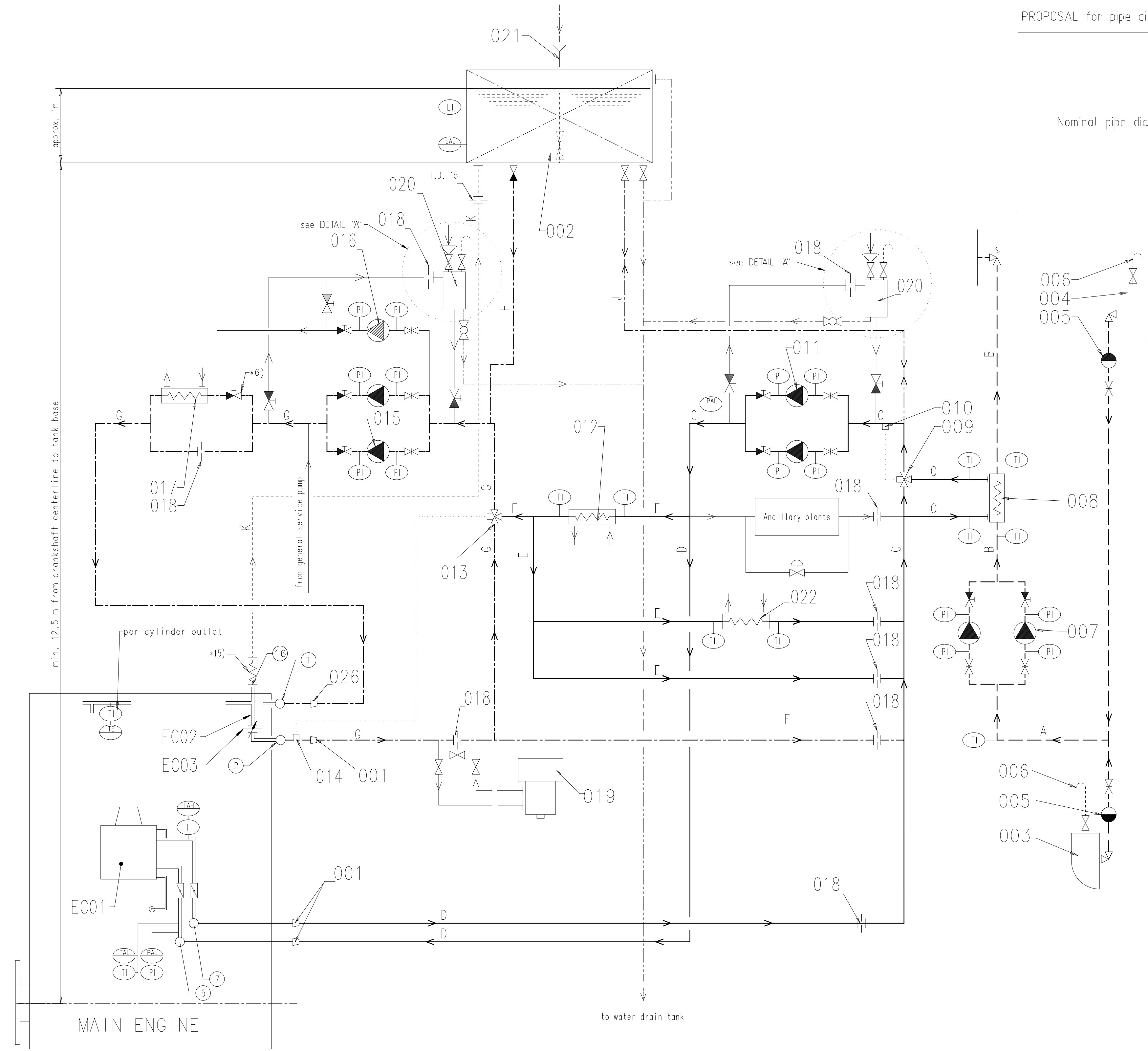
Pos.	SYSTEM COMPONENTS *1) (C)
001	Transition piece (adapter) *9)
002	HT / LT expansion tank (detail drawing linked by partlist on page 1)
003	Low sea chest
004	High sea chest
005	Seawater strainer
006	Air vent (air vent pipe or equal venting system acc. to shipyard's design)
007	Seawater circulating 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

- 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 Conection 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.

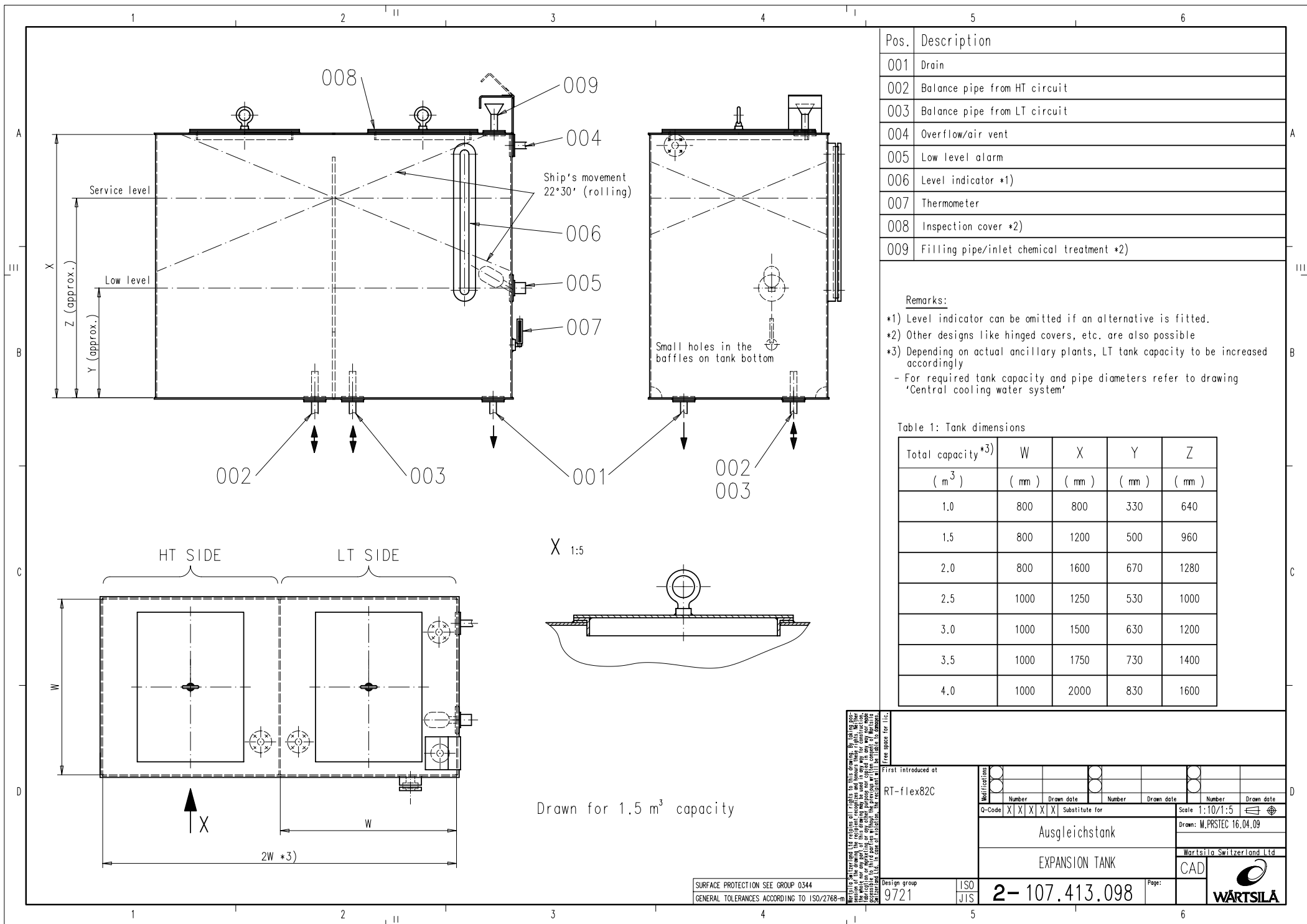
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Modif.	A	EAAD085793	01.06.2015	B	EAAD086766	15.09.2016	C	EAAD089971	01.11.2018		
	Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Drawn date
Product 5-8RT-flex58T-E			CENTRAL COOLING WATER SYSTEM WITH INTEGRATED HT CIRCUIT Zentralkuehlwassersystem								
											
Units		mm kg	NX		Basic Material					Net Weight 0,001	
Made	05.02.2013	asex06	A.Sekulic	Scale	-	Size	A1	Page	2/2	Material ID	PAAD115353
Chkd	05.04.2013	mhu019	Hug	Design Group							
Appd	08.04.2013	bha009	Haag	9721		Drawing ID		DAAD036166		Rev.	C



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



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





## 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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