Net Weight						
0,001						
1	002	107.429.532.500	CONCEPT GUIDANCE Freshwater generation	107.429.532		0,001
1	001	PAAD327151	CENTRAL COOLING WATER SYSTEM	DAAD116044		0,001
Quantity PER ENGINE	SEQ NO	Material ID	Material Name / Dimension, Occ	Standard or Drawing	Basic Material / Material Standard	Weight GR./NET

PAAD327217 (Material ID)

Free space for lic.

Q-Code: XXXXX

Standard: ISO; JIS

Main Drw.: H

Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
A	EAAD095237	29.10.2020						

WIN GD Winterthur Gas & Diesel

Product: W6-9X82-2.0

COOLING WATER SYSTEMS

Kuelwassersystem

Units	mm kg	NX	Basic Material	Net Weight
Made	13.05.2019	dki021 DH.Kim	Scale –	Size A3 / Page 1/1 / Material ID
Chkd	12.07.2019	wwa008 Wang	Design Group 9721	
Appd	12.07.2019	mhu019 Hug	Drawing ID DAAD116090	Rev. A

SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Approved

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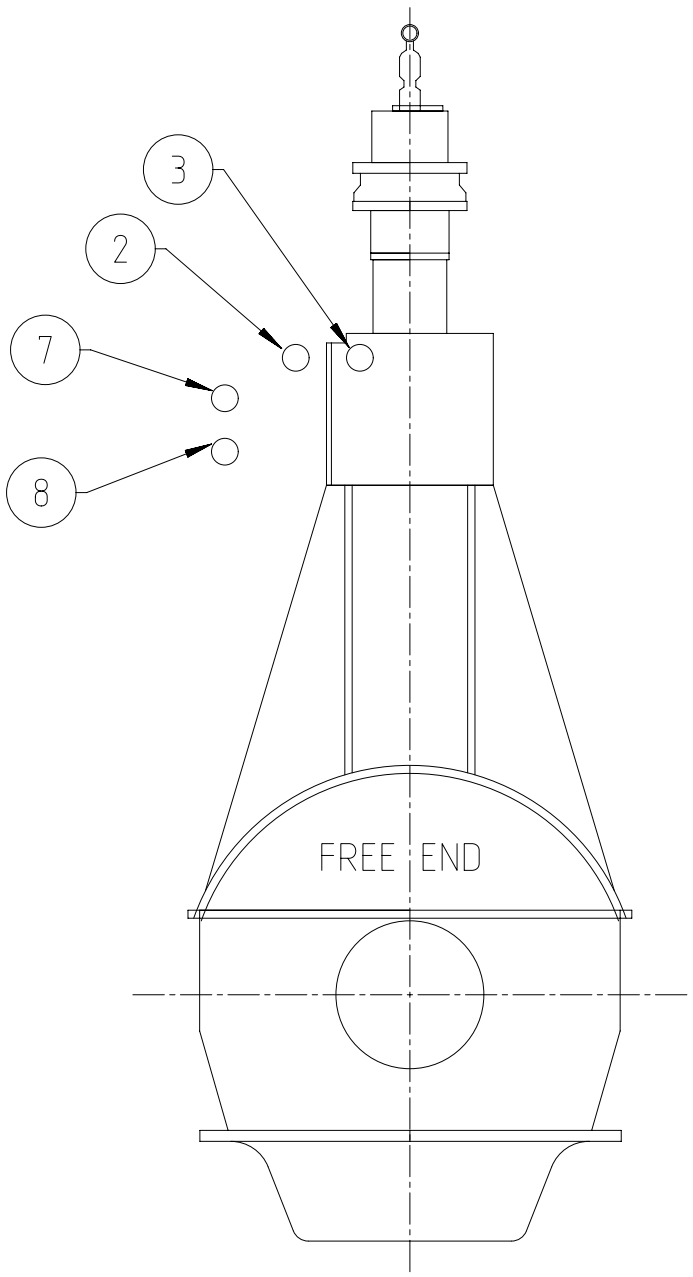

SPECIFICATION which must be met:

2	INLET - Cylinder cooling water (HT water) - Cooling water pressure: 2.0 - 4.0 bar - Cooling water volume flow: according to GTD specification - Cooling water (freshwater) has to be treated according to WinGD specification. - Pre-heating: The engine must be warmed-up by means of heated HT water to min. 60°C before engine start. - HT cooling water amount on engine side: Given in table1 on page 2
3	OUTLET - Cylinder cooling water (HT water) Cooling water temperature - Controller set-point: 90 °C - Steady state condition: 90 ± 2 °C - Transient condition: 90 ± 4 °C
7	INLET - Scavenge air cooler (SAC) cooling water (LT 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) has to be treated according to WinGD specification. - LT cooling water amount on engine side: Given in table1 on page 2
8 B	OUTLET - Scavenge air cooler (SAC) cooling water (LT water) - Cooling water volume flow: according to GTD specification, adjusted by an orifice in the outlet pipe on shipside.

QTY	SEQ NO	Material ID	Material Name / Dimension, Occ	Standard or Drawing	Basic Material / Material Standard	Weight GR./NET
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

Free space for lic.

Q-Code: XXXXX

Standard: ISO; JIS

Main Drw.

Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
A	EAAD091029	19.06.2020	B EAAD092431	19.07.2020				

WINGD Winterthur Gas & Diesel

Product: 6-9X82-2.0

CENTRAL COOLING WATER SYSTEM
HT_static-pressure: EXP tank
Zentralkuehlwassersystem

Units mm kg | NX | Basic Material | Net Weight 0,001

SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Made	10.05.2019	dki021 DH.Kim	Scale -
Chkd	12.07.2019	wwa008 Wang	Design Group 9721
Appd	12.07.2019	mhu019 Hug	

Size A3 | Page 1/2 | Material ID PAAD327151

Drawing ID DAAD116044 | Rev. B

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SYSTEM PROPOSAL

Pos.	ENGINE COMPONENTS *3)
EC01	Automatic venting unit
EC02	Scavenge air cooler (SAC)
EC03	Air separator
(B) EC04	Manual vent valve, for each cylinder *14)

Pos.	ENGINE CONNECTIONS *2)
(2)	INLET - Cylinder cooling water (HT water)
(3)	OUTLET - Cylinder cooling water (HT water)
(7)	INLET - Scavenge air cooler (SAC) cooling water (LT water) *7)
(8)	OUTLET - Scavenge air cooler (SAC) cooling water (LT water) *7)

Number of cylinders			6	7	8	9
Main engine X82-2.0 (B) (R1 rated)	power	(kW)	33000	38500	44000	49500
	speed	(rpm)	84			
Cooling water expansion tank (HT)	Cap.	(m^3)	Depending on ancillary plants min. 10% of HT cooling water			
Cooling water expansion tank (LT)	Cap.	(m^3)	Depending on ancillary plants min. 10% of LT cooling water			
PROPOSAL for pipe dimensioning *10)						
Nominal pipe diameter	A	DN	Yard determination, suitable for main engine and ancillary plants			
	B	DN				
	C	DN				
	D	DN	250	300	250	250
	E	DN	200	200	200	200
	G	DN	200	200	200	200
	H	DN	65	80	80	80
	J	DN	125	125	125	125

(B)

Table 1: Water content on engine side

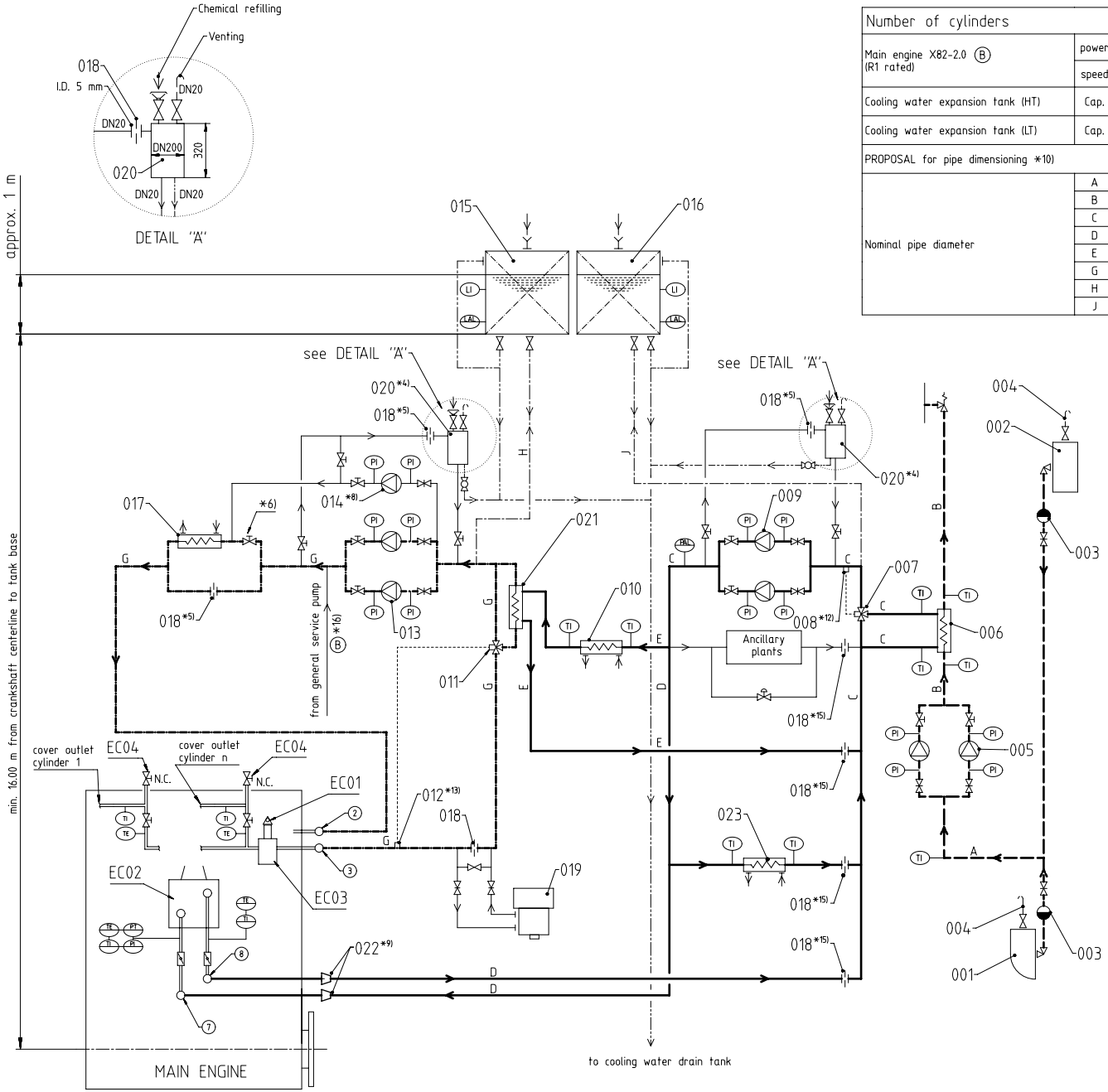
Cylinder	HT circuit Cyl. C.W. Volume (l)	LT circuit SAC Volume (l)
6	2300 l	1120 l
7	2700 l	1120 l
8	3050 l	1200 l
9	3400 l	1200 l

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
(B) 006	Central cooler (LT cooling water)
007	Automatic temperature control valve for LT circuit *12)
008	Temperature sensor of regulating system *12)
009	Cooling water pump for LT circuit
010	Lubricating oil cooler
011	Automatic temperature control valve for HT circuit *13)
012	Temperature sensor of regulating system *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

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 approriate pipe diameter. Rating specific flow rates are provided by GTD.
(B) *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 temperature lower or greater than the LT water set-point, 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) Only to be used for manual venting of isolated cylinders after maintenance. To be kept close during engine operation.
*15) Optional, only to be installed if needed for hydraulic balancing.
(B) *16) Optional connection, To be installed if requested by class rules for emergency engine cooling.



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 Nr.								Q-Code XXXXX		Main Drw.
								Standard ISO; JIS		
Modif.	A	EAAD091029	19.06.2020	B	EAAD092431	19.07.2020				
	Number		Drawn date	Number		Drawn date	Number	Drawn date	Number	Drawn date

WIN GD Winterthur Gas & Diesel

Product 6-9X82-2.0

CENTRAL COOLING WATER SYSTEM
HT_static-pressure: EXP tank
Zentralkuehlwassersystem

Units	mm kg	NX	Basic Material			Net Weight 0,001	
SURFACE PROTECTION SEE GROUP 0344	Made	10.05.2019	dki021 DH.Kim	Scale	-	Size A1	Page 2/2
TOLERANCING PRINCIPLE ISO8015	Chkd	12.07.2019	wwa008 Wang	Design Group	9721	Material ID	PAAD327151
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	12.07.2019	mhu019 Hug	Drawing ID	DAAD116044	Rev.	B

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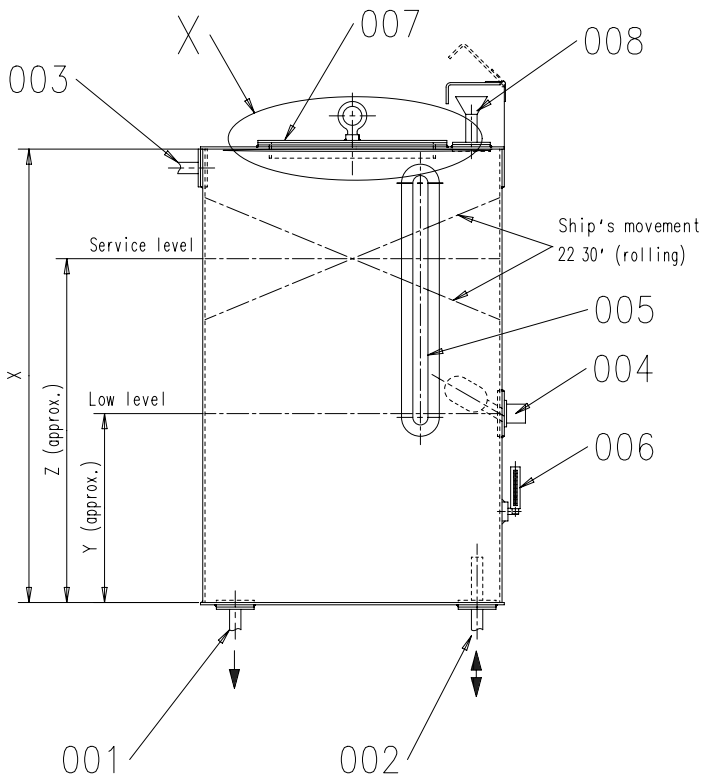

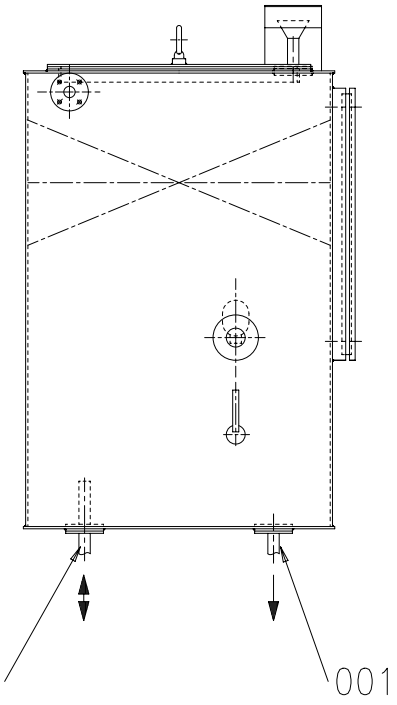

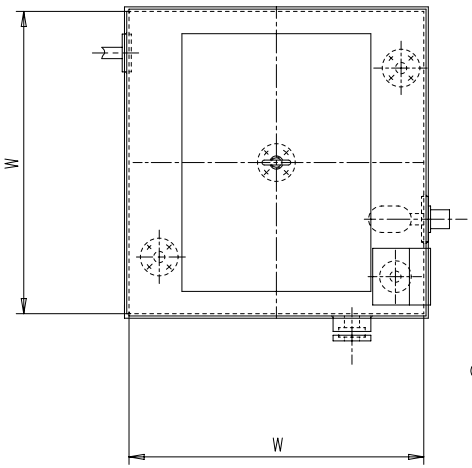

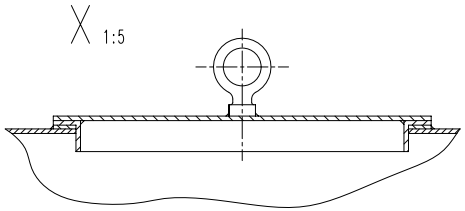

Ⓐ

drawing view shows dimensioning scale 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

- Tank dimensions are defined by the Tank capacity, as seen in Table 1. For capacity and pipe diameter, refer to drawing 'Central 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

Ⓐ

Free space for lic.

Q-Code XXXXX

Main Drw.

Standard ISO; JIS

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Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
A	EAAD091567	15.11.2019						

WIN GD Winterthur Gas & Diesel

Product W-2S

EXPANSION TANK
CENTRAL COOLING WATER HT CIRCUIT
Ausgleichstank
Zentralkuehlwassersystem HT circuit

Units	mm kg	NX	Basic Material	Net Weight 0,001

SURFACE PROTECTION SEE GROUP 0344	Made 16.04.2009 M.PRSTEC	Scale 1:10	Size A2	Page 1/1	Material ID 107.413.097.500
TOLERANCING PRINCIPLE ISO8015	Chkd	Design Group 9721	Drawing ID 107.413.097		Rev. A
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd 30.04.2009 MPR002 Prstec				

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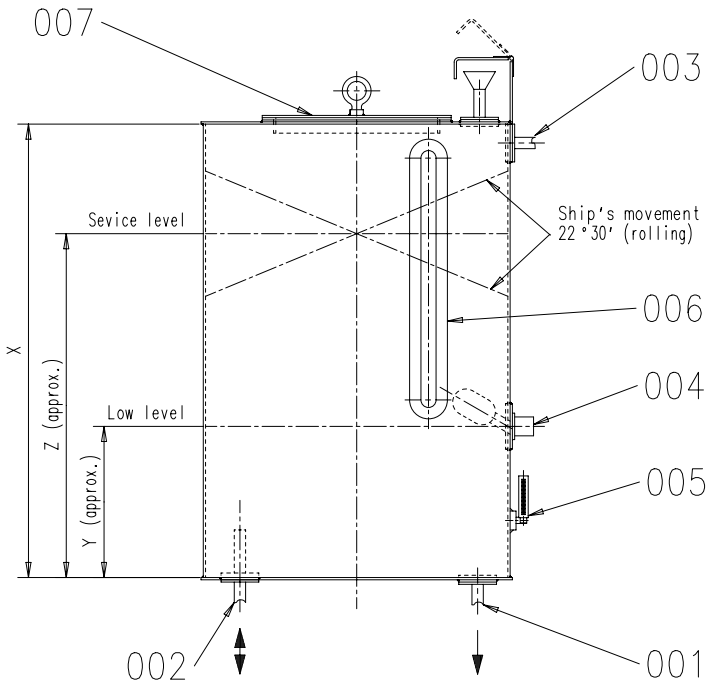

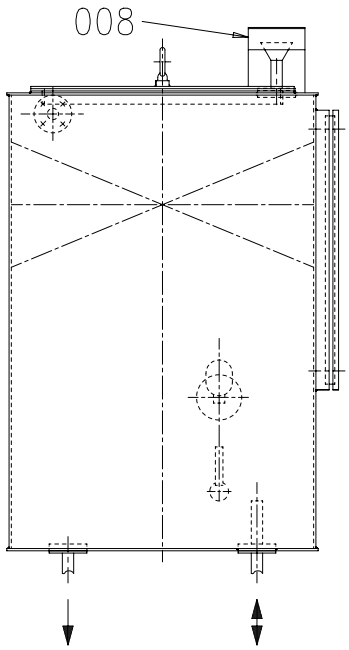

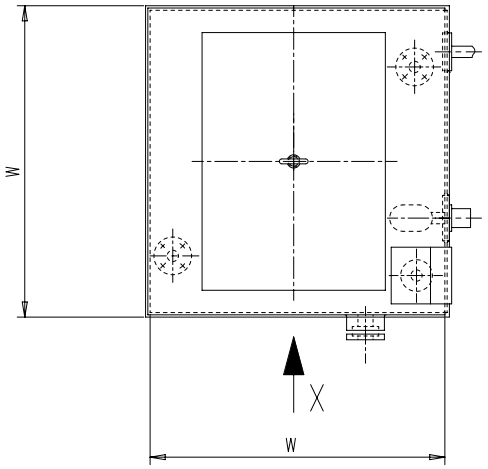

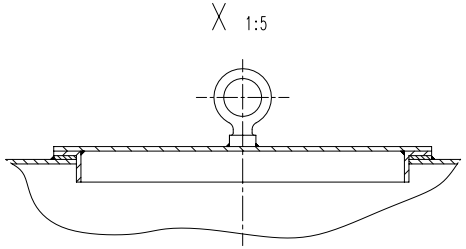

Drawn for 0.75 m^3 capacity

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)

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^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 lic.

Q-Code XXXXX

Standard ISO; JIS

Main Drw.

Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
A	EAAD014356	16.06.1997	B 7-37.090	16.08.2007	C EAAD083145	25.01.2012	D EAAD091029	12.09.2019

WIN GD Winterthur Gas & Diesel

Product W-2S

EXPANSION TANK
CENTRAL COOLING WATER LT CIRCUIT
Ausgleichstank
Zentralkuehlwassersystem LT

Units	mm kg	NX	Basic Material	Net Weight 0,001
SURFACE PROTECTION SEE GROUP 0344	Made 11.06.1997 T.LANDERT	Scale 1:10	Size A2	Page 1/1	Material ID 107.245.419.500
TOLERANCING PRINCIPLE ISO8015	Chkd	Design Group 9721	Drawing ID 107.245.419	Rev. D
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd 11.06.1997 WCH001 Service User			

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WinGD X82-2.0 – Cooling Water System (DG9721)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2019-07-12	DRAWING SET	First web upload
2020-08-21	DAAD0116044 107.413.097 107.245.419	System drgs – new revision
2021-02-24	DAAD116090 DAAD116044	Main and system drgs – new revision

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