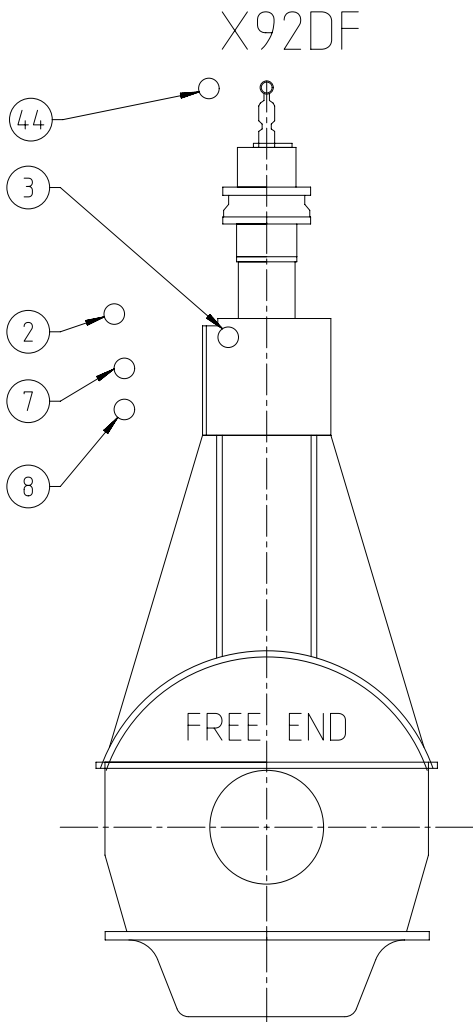


SPECIFICATION which must be met:

8	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.
44	OUTLET - Cylinder cooling water air venting - To be vented to a safe area outside of engine room.



2	INLET - Cylinder cooling water (HT water) - Cooling water pressure: 4.0 - 5.0 bar - Cooling water volume flow: according to GTD specification - Cooling water (freshwater) has to be treated according to WinGD specification. - A buffer unit must be installed. - The static pressure at engine inlet must be adjusted by buffer unit pressure setting. - 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 E	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: controller set point: 25 °C, max. 36 °C when seawater temperature at 32 °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.

1	021	107.245.419.500	EXPANSION TANK	107.245.419		0,001
1	020	107.245.626.500	BUFFER	107.245.626		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 XXXXX Standard ISO; JIS	Weight GR./NET Main Drw.

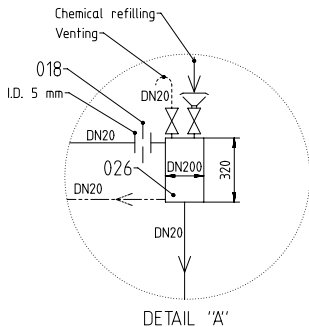
Modif.	B	EAAD089971	25.11.2018	C	EAAD090593	29.08.2019	D	EAAD092431	05.10.2020	E	EAAD095915	15.02.2021
		Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Drawn date

Product 6-12X92DF		CENTRAL COOLING WATER SYSTEM HT_static-pressure: Buffer-unit Zentralkuehlwassersystem	
Units mm kg NX		Basic Material	

Scale -	Size A3	Page 1/2	Material ID PAAD282065	Net Weight 0,001
Design Group 9721	Drawing ID DAAD095643	Rev. E		

SURFACE PROTECTION SEE GROUP 0344	Made 23.03.2018 dki021 DH.Kim
TOLERANCING PRINCIPLE ISO8015	Chkd 05.04.2018 wwa008 Wang
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd 05.04.2018 mhu019 Hug

SYSTEM PROPOSAL



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)
④④	OUTLET - Cylinder cooling water air venting *10)

Pos.	ENGINE COMPONENTS *3) (E)
EC01	Scavenge air cooler (SAC)
EC02	Automatic venting unit
EC03	Air separator
EC04	Manual vent valve, for each cylinder 16*)

Number of cylinders	6	7	8	9	10	11	12
X92DF	31920	37240	42560	47880	53200	58520	63840
R1 rated							
power (kW)	1.2	1.2	1.2	1.2	1.2	1.2	1.2
speed (rpm)	80	80	80	80	80	80	80
Buffer unit for HT circuit	Cap. (bar)	1.2	1.2	1.2	1.2	1.2	1.2
Cylinder cooling water feed tank only min.	Cap. (m³)	2.5	2.5	2.5	2.5	2.5	2.5
CCW feed and drain tank (combined) min.	Cap. (m³)	8	8	9	10	11	12
Cooling water expansion tank (LT)	Cap. (m³)	Depending on ancillary plants					

PROPOSAL for pipe dimensioning *11)

Nominal pipe diameter		Yard determination, suitable for main engine and ancillary plants						
		A	B	C	D	E	F	G
	DN	300	350	400	450	500	550	600
	DN	200	250	300	350	400	450	500
	DN	200	250	300	350	400	450	500
	DN	32	32	32	32	32	32	32
	DN	80	80	80	80	80	80	80
	DN	20	20	20	20	20	20	20

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 cooler (LT cooling water)
007	Automatic temperature control valve for LT circuit *13)
008	LT water temperature sensor *13)
009	Cooling water pump for LT circuit
010	Lubricating oil cooler
011	Automatic temperature control valve for HT circuit *14)
012	HT water temperature sensor *14)
013	Cylinder cooling water pump for HT circuit
014	Pre-heating circulating pump (optional), cap. 10% from cylinder cooling pump *8)
015	Pre-heater for main engine (HT circuit)
016	Solenoid valve (air inlet to be interlocked with min. water level)
017	Control air valve with air release function *15) (to be adjusted to ensure CW pressure at ME inlet 4 - 5 bar(g))
018	Throttling disc *5)
019	Freshwater generator
020	Buffer unit for HT circuit (link to detail drawing on page 1)
021	LT water expansion tank (link to detail drawing on page 1) *20)
022	Filling pipe / inlet chemical treatment
023	Cylinder cooling water feed & drain tank (or feed tank only)
024	Cylinder cooling water cooler
025	Supply pump, automatic level control (0.5 m³/h at 4 bar)
026	Chemical treatment refill unit *4)
027	Transition piece (adapter) *9)
028	MDO/MGO cooler
029	Gas detector *10)

Remarks:

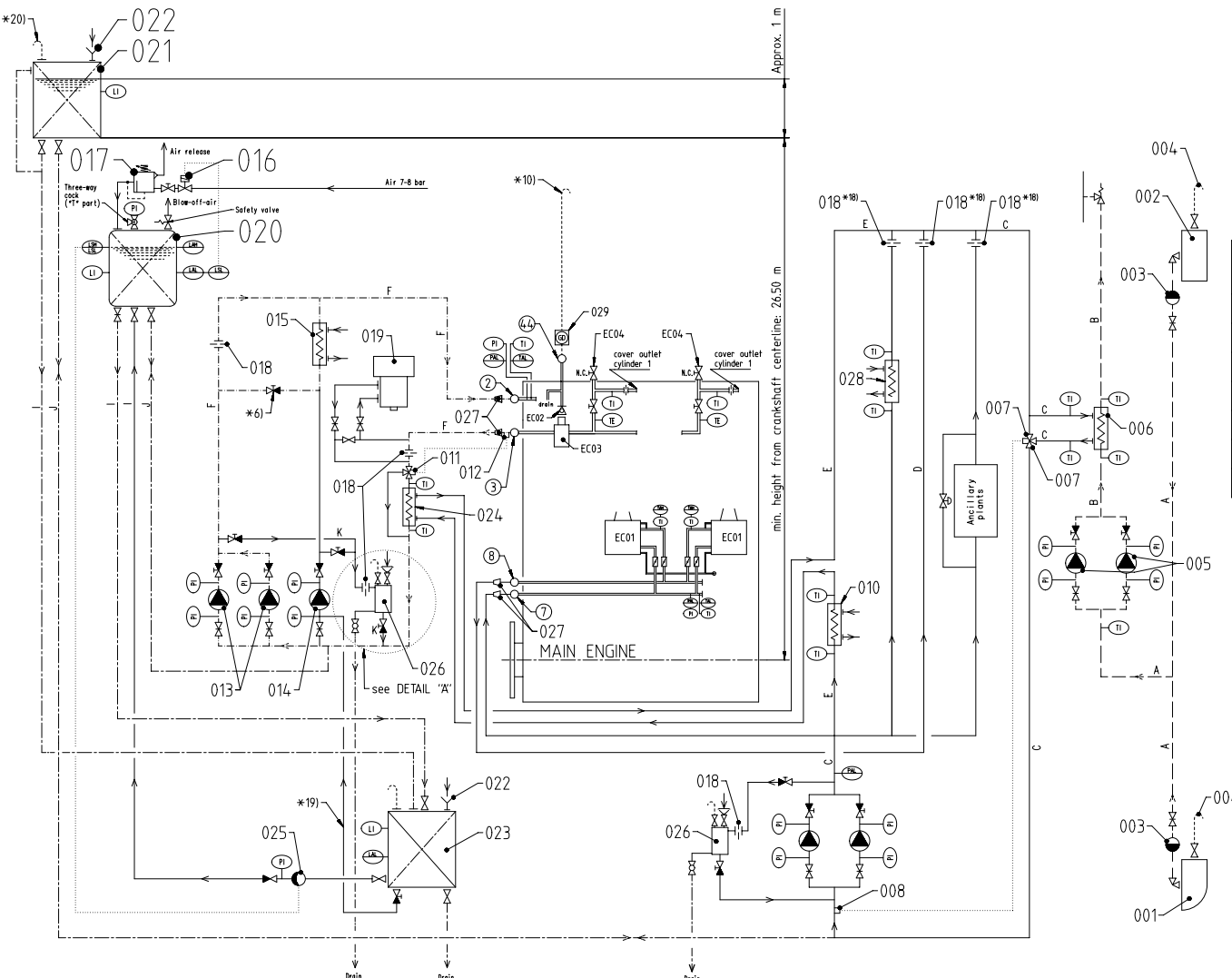
- Air vent and drain pipes not shown on drawing. Shall be installed where required.
- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational.
- *1) To be delivered by external supplier and to be installed by the shipyard.
- *2) 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) To be vented to a safe area outside of engine room. In addition, depending on flag state and/or class requirement, the venting line may also be equipped with a gas detector in order to achieve IGC compliance.
- *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 (SAC) inlet must be maintained. Required controller set-point for main engine operations is 25 °C. 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).
- *14) A constant temperature at engine outlet must be maintained. Required controller set-point for main engine operations is 90 °C.
- *15) If the selected control air valve does not have the integrated air release functionality a separate air release valve can be installed as alternative on the top of the buffer unit.
- *16) Only to be used for manual venting of isolated cylinders after maintenance. To be kept close during engine operation.
- *18) Optional, only to be installed if needed for hydraulic balancing.
- *19) Optional filling line to enable fast system re-filling (e.g. after complete system drainage) by means of the pre-heating pumps.
- *20) If gas driven auxiliaries are connected to the LT circuit, the LT expansion tank must be gas tight and has to be vented to a safe area outside of engine room.

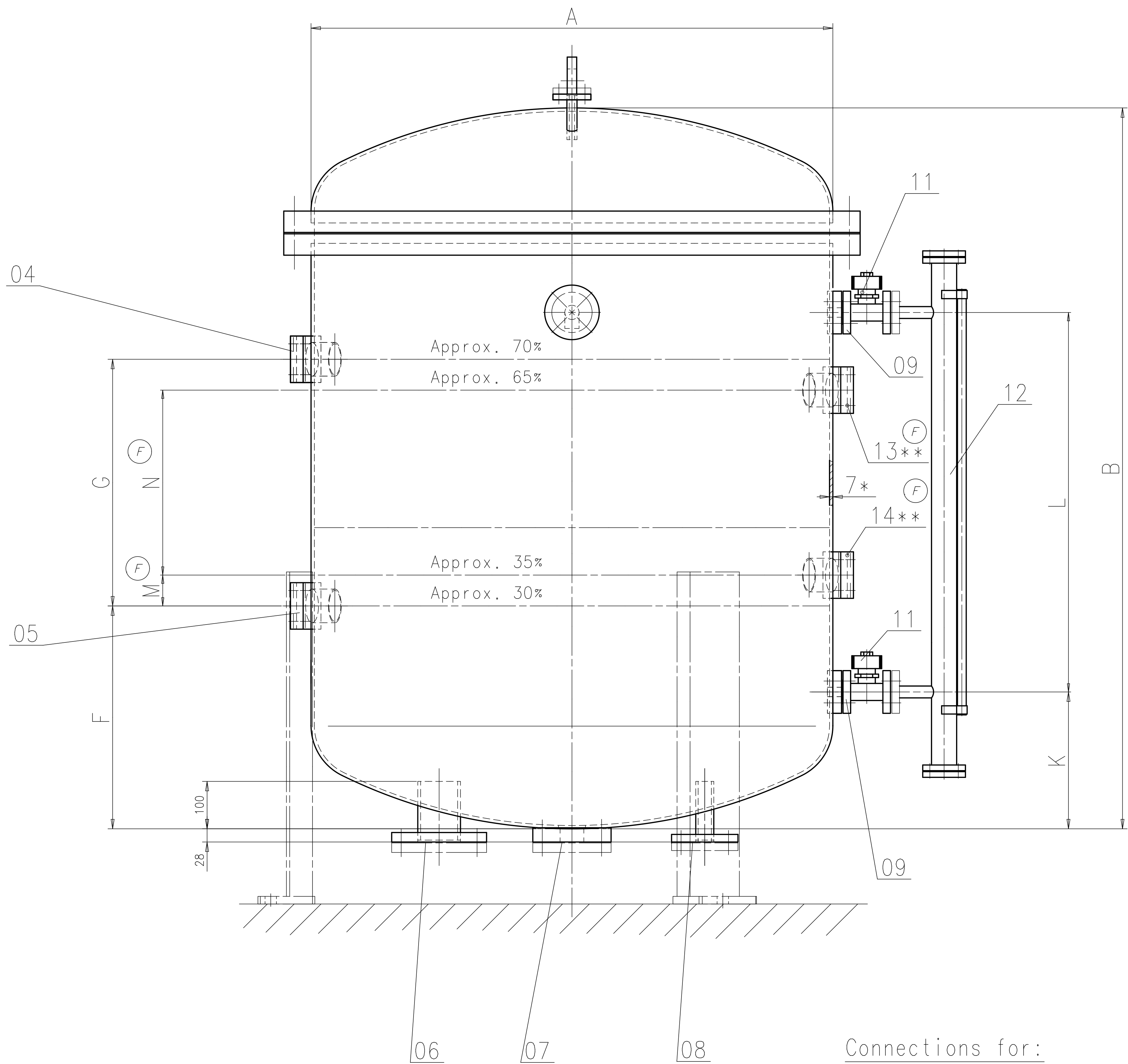
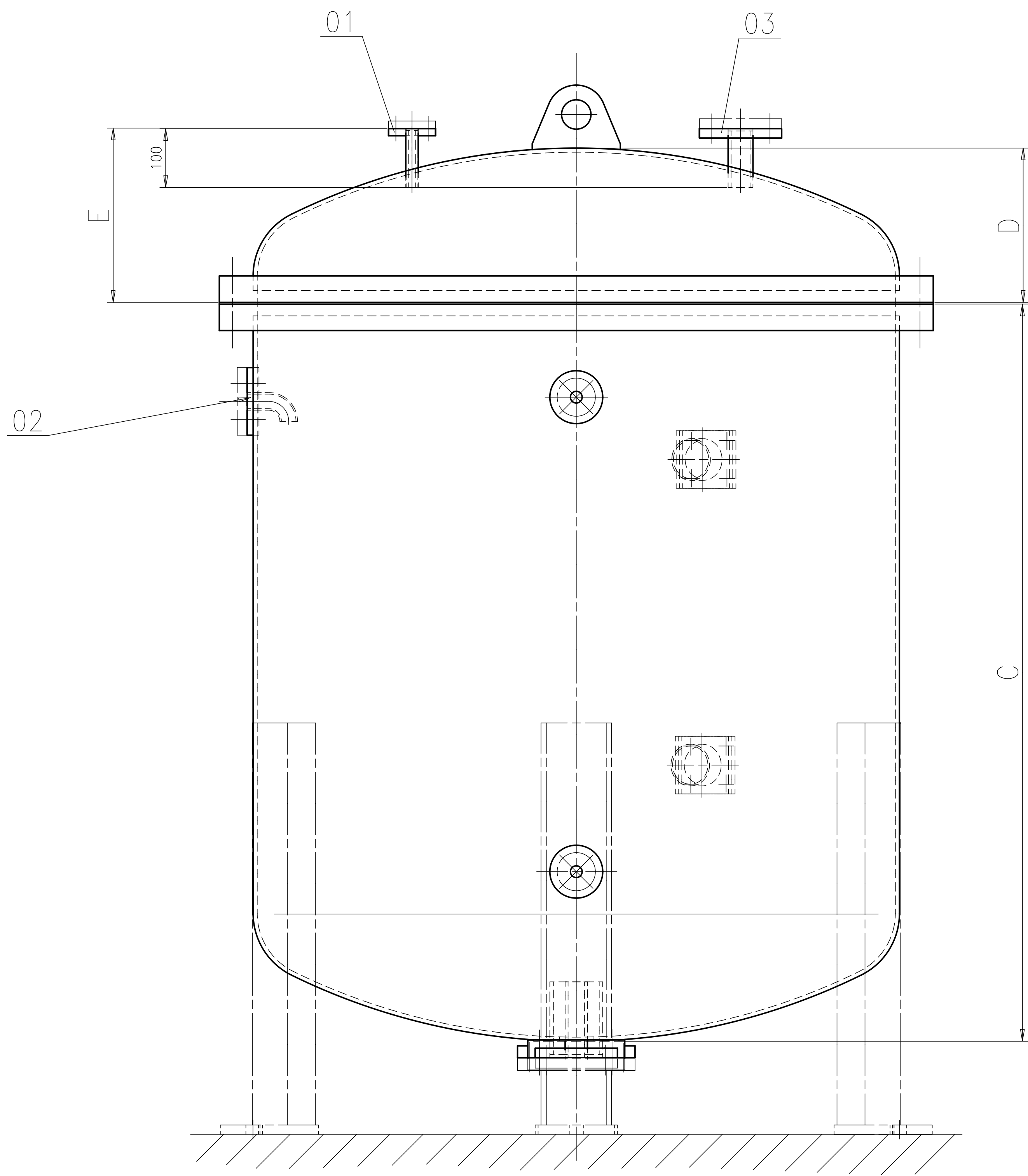
Table 1: Water content on engine side

Cylinder	HT circuit Cyl. C.W. Volume (l)	LT circuit SAC Volume (l)
6	4550 l	2200 l
7	5300 l	2550 l
8	6100 l	2700 l a)
9	6850 l	3300 l b)
10	7600 l	3900 l
11	8350 l	3900 l
12	9150 l	4050 l

- a) Value for execution with 2 scavenge air coolers.
- b) Value for execution with 3 scavenge air coolers.

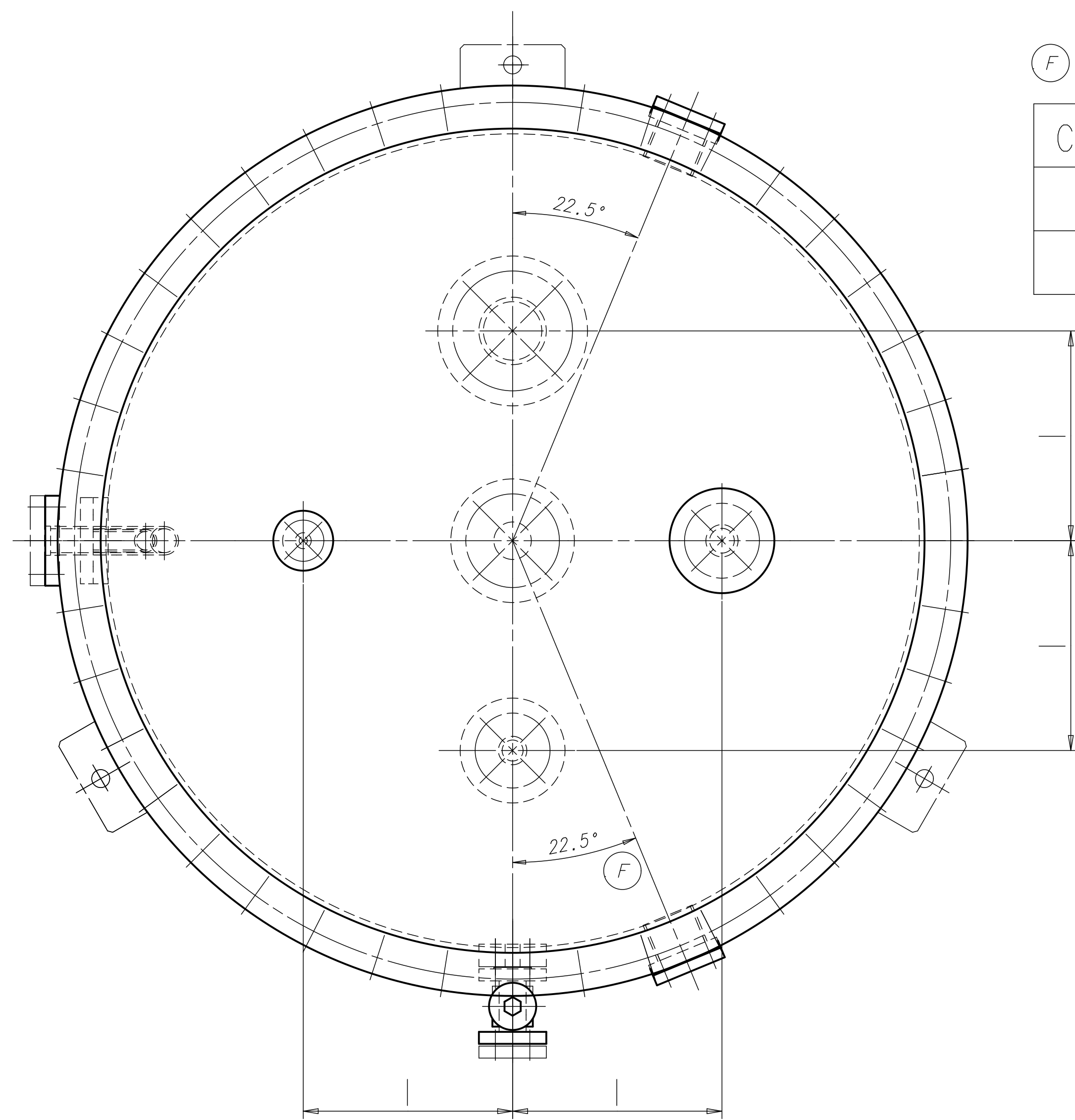
- Seawater pipes ---
- LT freshwater pipes —
- HT freshwater pipes —
- Balance pipes ---
- Ancillary equipment pipes —
- Drain/overflow pipes ----
- Air vent pipes ----
- Control/feed back ----
- Pipes on Engine ==
- Pipe connections ○





Connections for:

- 01 Compressed air supply from control air valve, DN15 with blank flange
- 02 Pressure indicator, DN25 with blank flange
- 03 Safety and relief valve adjustment 5,5 bar DN32 with blank flange
- 04 Level alarm high, with blank flange
- 05 Level alarm low, with blank flange
- 06 Compensation, DN80 with blank flange
- 07 Drain, DN32 with blank flange
- 08 Feed, DN32 with blank flange
- 09 Flanges for level indicator
- 11 Valve for level indicator, self-closing type
- 12 Level indicator
- 13 Level switch high, with blank flange **
- 14 Level switch low, with blank flange **

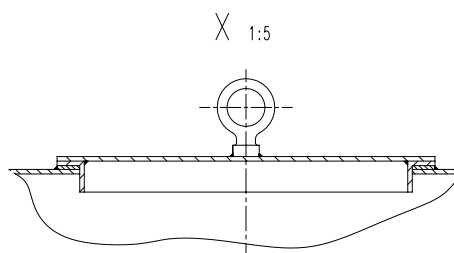
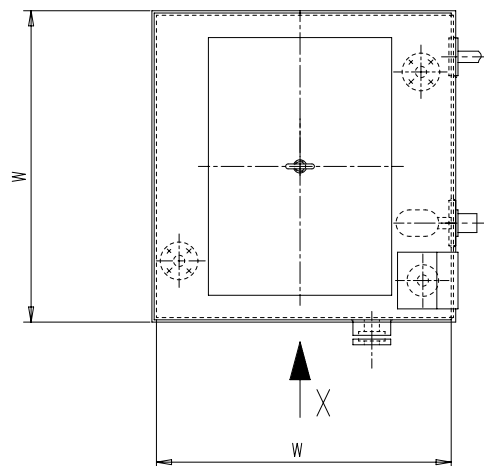
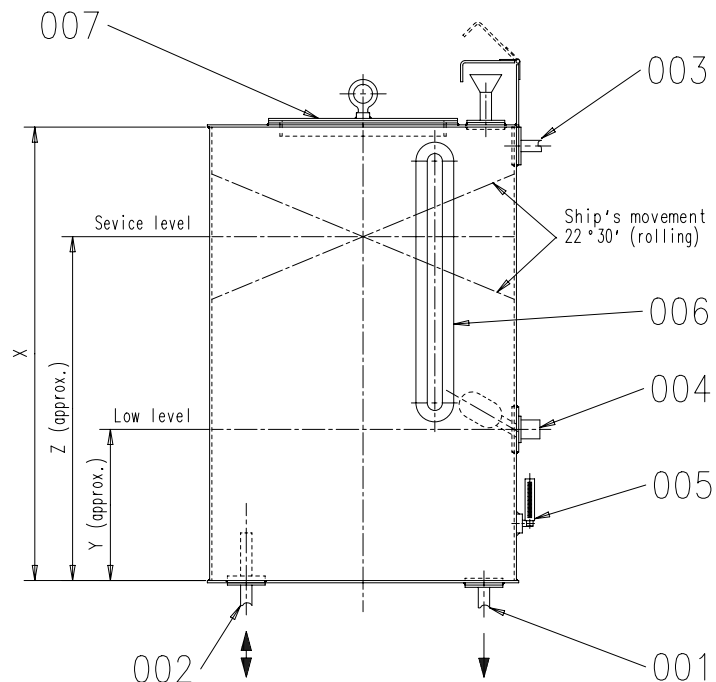


Capacity	A	B	C	D	E	F	G	H	I	K	L	M	N
800l	ø900	1430	1205	222	250	455	520	600	250	250	800	65	390
1200l	ø1100	1520	1255	262	300	470	520	650	280	290	800	65	390

Working pressure : 5 bar
* Wall thickness and test pressure : according to relevant classification society/rules
Service temperature : max. 95°C
** Tank volume between LSH and LSL shall be no less than 150 litres.

Drawn for 1200l capacity

Form approved by: _____		D-Code XXXXX		Mfr Dr.	
Standard ISO					
Model	7-61.644	Date	05.03.2008	Product	W-2S
Number		Drawn date		Number	
Model	E	Date	14.08.2012	Product	W-2S
Number		Drawn date		Number	
Model	F	Date	22.04.2014	Product	W-2S
Number		Drawn date		Number	
WIN G&D Wintertur Gas & Diesel		BUFFER TO CYL. COOLING WATER SYS Puffer			
Units	mm kg	IDE	Basic Material	Net Weight 0,001	
SURFACE PROTECTION SEE GROUP 0344		Scale	1:5	Size	A0
Mod	22.08.00	S. STYL LANGU	Design Group	Page	1/1
Chkd				Material	107.245.626.500
Appd	22.08.2000	WCH001 Service User	9721	Drawing	107.245.626
GENERAL TOLERANCES ACCORDING TO ISO 2768-mS				Rev.	F



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)

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

Modif.	Free space for lic.						Q-Code XXXXXX Standard ISO; JIS	Main Drw.			
	A	EAAD014356	16.06.1997	B	7-37.090	16.08.2007	C	EAAD083145	25.01.2012	D	EAAD091029
Number		Drawn date		Number		Drawn date		Number		Drawn date	
								Product W-25		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	
TOLERANCING PRINCIPLE ISO8015		Chkd				Design Group		Material ID 107.245.419.500		Rev. D	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd 11.06.1997		WCH001 Service User		9721		Drawing ID 107.245.419			

MIDS WinGD-X92DF_ COOLING-WATER-SYSTEM (DG9721)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2018-04-05	DRAWING SET	First web upload
2018-10-18	DAAD095643	System drg – new revision
2018-12-13	DAAD095802 DAAD095643	Main and system drg – new revision
2019-08-29	DAAD095643	System drg – new revision
2020-09-02	107.245.419	System drg – new revision
2020-10-09	DAAD095643	System drg – new revision
2021-05-19	DAAD095643	System drg – new revision

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