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

Available executions

Execution No.	Material ID
001	PTAA036169

NOTE
The above executions can be configured using the Engine Configurator.
Detailed guidance for the executions is provided within the Marine Installation Manual (MIM). If a specific execution of interest is not shown in the above table, then it may still be under development or not available. For further information or in case of a project-specific request, WinGD must be contacted directly.

Prod. X82DF-2.0

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
–	mhu019	dst009	22.06.2022	CNAA002074	new Design	Approved	-	-

WIN GD
Winterthur Gas & Diesel

CENTRAL COOLING WATER SYSTEM

MIDS master drawing

Dimension

Scale 1:1 NX	Units [mm] [kg]	Basic Material	Net Weight	0.001
Main Design	Design Group 9721	Q-Code XXXXX	Standard	WDS
Qty per	A4	Item ID PTAA024773	Drawing Page/s	1/1

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PTAA036137	COOLING WATER SYSTEMS iCER off-engine + HT CW buffer unit			0
3	1	107.429.532.500	CONCEPT GUIDANCE			0.001

Prod.	6,7,8,9 X82DF-2.0			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
-	dki021	dst009	21062022	CNAA002059	Main Design/Drawing Introduced Approved		-	-

WIN GD
Winterthur Gas & Diesel

COOLING WATER SYSTEMS

iCER off-engine + HT CW buffer unit

Bill **O**f **M**aterial

Dimension	iCER off-engine + HT CW buffer unit					
Units	[m] [kg]	Basic Material			Net Weight	0
Main Design	Yes	Design Group	9721	Q-Code XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PTAA036169	BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
015	1	107.245.626.500	BUFFER			0.001
016	1	107.245.419.500	EXPANSION TANK			0.001

Prod.	X82DF-2.0							

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
D	sde101	mhu019	31.03.2023	CNAA003486	Drawing Updated		4	3
C	npa101	mhu019	24.03.2023	CNAA003461	Drawing Updated		4	3
B	rth101	mhu019	22.11.2022	CNAA002751	Drawing Updated		4	3
-	dki021	dst009	21.06.2022	CNAA002059	new Design		-	-

Approved

WIN GD
Winterthur Gas & Diesel

COOLING WATER SYSTEMS

iCER off-engine + HT CW buffer unit

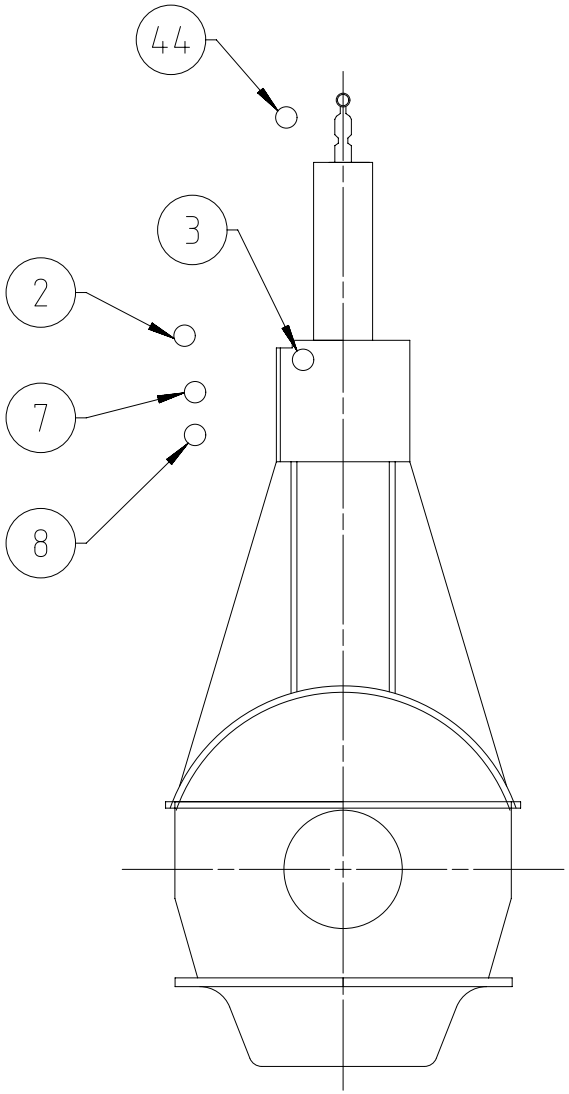
Bill **O**f **M**aterial

Dimension	iCER off-engine + HT CW buffer unit				
Units [m] [kg]	Basic Material				Net Weight 0
Main Design	Design Group 9721	Q-Code XXXXX			Standard WDS
Qty per	A4	Item ID PTAA036137			BOM Page/s 01/01

SPECIFICATIONS which must be met:

(44) OUTLET - Cylinder cooling water air venting

- To be vented to a safe area outside of the engine room.



(2) INLET - Cylinder cooling water (HT water)

- Cooling water pressure: 3.0 - 5.0 bar
- Cooling water volume flow: As specified in the GTD
- Cooling water (freshwater) must be treated according to WinGD specification.
- A buffer unit must be installed.
- The static pressure at the engine inlet must be adjusted by buffer unit pressure setting.
- Before starting the engine, the engine must be heated-up to 60 °C via heated HT water.
- HT cooling water volume on engine side: Provided in table 1 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: maximum 36 °C when the seawater temperature is at 32 °C. Controller set-point: 25 °C.
- Cooling water volume flow: As specified in the GTD
- Cooling water (freshwater) must be treated according to WinGD specification.
- LT cooling water volume on engine side: Provided in table 1 on page 2.

(8) OUTLET - Scavenge air cooler (SAC) cooling water (LT water)

- Cooling water volume flow: As specified in the GTD, adjusted by an orifice in the outlet pipe on shipside.

Prod.: X82DF-2.0

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
D	sde101	mhu019	31.03.2023	CNAA003486	Drawing Updated		4	3
C	npa101	mhu019	24.03.2023	CNAA003461	Drawing Updated		4	3
B	rth101	mhu019	22.11.2022	CNAA002751	Drawing Updated		4	3
-	dki021	dst009	21.06.2022	CNAA002059	new Design		-	-

WIN GD Winterthur Gas & Diesel

COOLING WATER SYSTEMS

iCER off-engine + HT CW buffer unit

separate BOM available

Dimension	iCER off-engine + HT CW buffer unit				
Scale – NX	Units [mm] [kg]	Basic Material		Net Weight	0.000
Main Design	Design Group 9721	Q-Code XXXXX		Standard	WDS
Qty per	A3	Item ID PTAA036137		Drawing Page/s	1/3

SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

SYSTEM PROPOSAL FOR SINGLE ENGINE

NOTE
Further installation details and variants can be found listed in the Marine Installation Manual (MIM), which provides also the acronyms used in this drawing set. The piping symbols are explained by the piping symbol key as included in the drawing set "Various Installation Items".

Table 2: EGC circulation water pipe sizes

EGC Size	Pipe Dimension "L"	Pipe Dimension "K"
EGC 14	DN300	DN150
EGC 18	DN300	DN150
EGC 23	DN350	DN200
EGC 30	DN350	DN200
EGC 38	DN450	DN250
EGC 51	DN450	DN250

Table 1: Water volume 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.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Manual vent valve, each cylinder *15)
EC03	Air separator

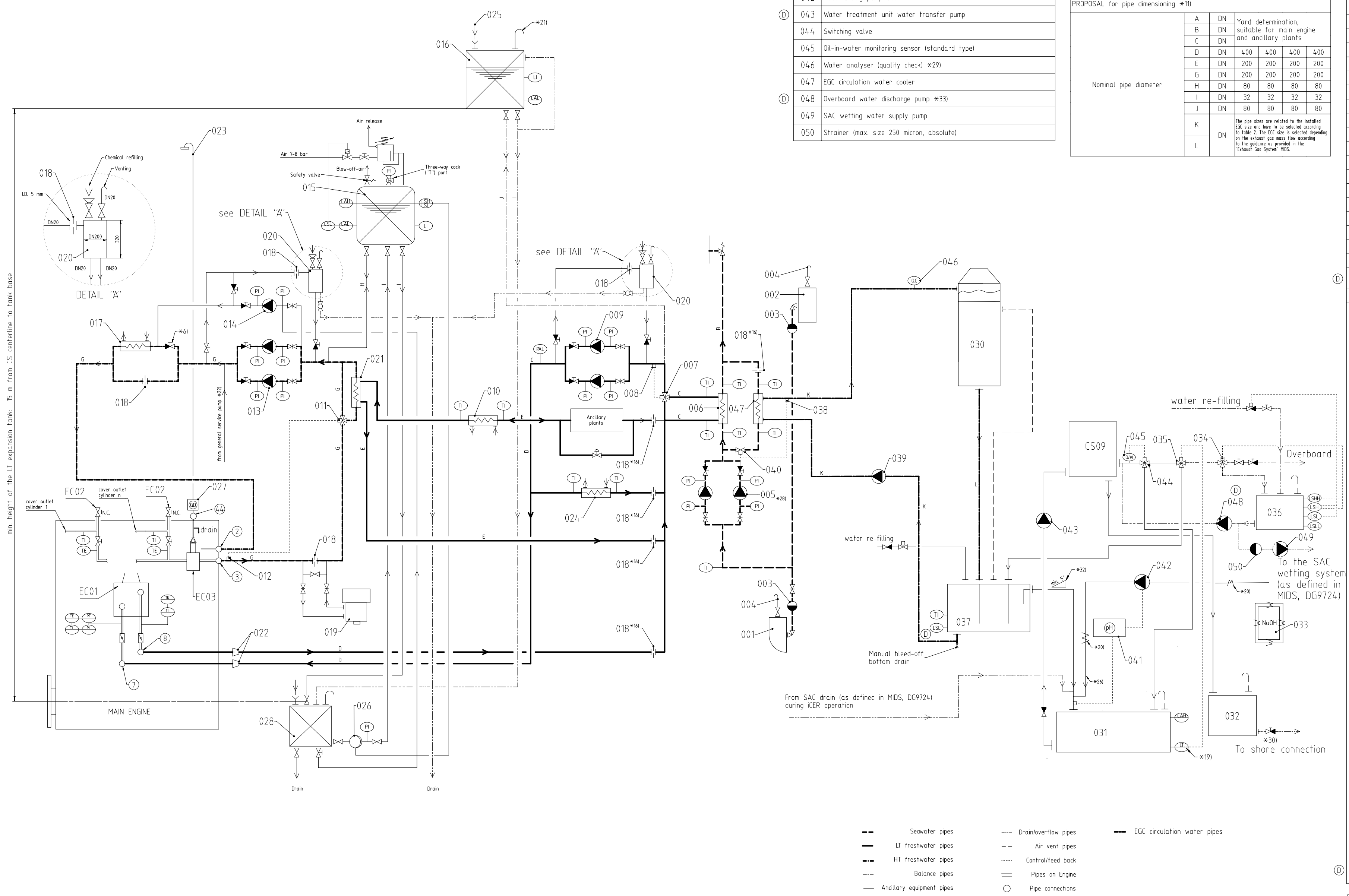
Pos.	COMPONENTS from certified suppliers *12)
CS09	Water treatment unit *24)

	Pos.	SYSTEM COMPONENTS *1)
	038	EGC circulation water temperature control sensor *17) *18)
D	039	EGC circulation water pump (frequency controlled) *17) *23) *27)
	040	Seawater flow control valve *17) *18)
	041	Water analyser (pH check)
	042	NaOH dosing pump unit
D	043	Water treatment unit water transfer pump
	044	Switching valve
	045	Oil-in-water monitoring sensor (standard type)
	046	Water analyser (quality check) *29)
	047	EGC circulation water cooler
D	048	Overboard water discharge pump *33)
	049	SAC wetting water supply pump
	050	Strainer (max. size 250 micron, absolute)

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)

Number of cylinders			6	7	8	9
Main engine X82DF-2.0 R1 rated	power	(kW)	25920	30240	34560	38880
	speed	(rpm)	84			
Buffer unit for HT circuit	Cap.	(m^3)	1.2	1.2	1.2	1.2
Cylinder cooling water feed tank only min.	Cap.	(m^3)	2.5	2.5	2.5	2.5
CCW feed and drain tank (combined) min.	Cap.	(m^3)	5	5	6	6
Cooling water expansion tank (LT)	Cap.	(m^3)	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	DN				
	C	DN				
	D	DN	400	400	400	400
	E	DN	200	200	200	200
	G	DN	200	200	200	200
	H	DN	80	80	80	80
	I	DN	32	32	32	32
	J	DN	80	80	80	80
	K	DN	The pipe sizes are related to the installed EGC size and have to be selected according to table 2. The EGC size is selected depending on the exhaust gas mass flow according to the guidance as provided in the "Exhaust Gas System" MIDS.			
	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
	006	Central seawater cooler
	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 (CCW) pump for HT circuit
	014	Pre-heating circulating pump (optional), cap. 10% from cylinder cooling pump *8)
	015	Buffer unit for HT circuit (link to detail drawing on the partlist of this drawing)
	016	LT water expansion tank (link to detail drawing on the partlist of this drawing)
	017	Pre-heater for main engine (HT circuit)
	018	Throttling disc *5) *16)
	019	Freshwater generator
	020	Chemical treatment refill unit *4)
	021	HT cooling water cooler
	022	Transition piece (adapter) *9)
	023	Cylinder cooling water air venting line *10)
	024	MDO/MGO cooler
	025	Filling pipe / inlet chemical treatment
	026	Supply pump, automatic level control (0.5 m^3/h at 4 bar)
	027	Gas detector *10)
	028	Cylinder cooling water (CCW) feed and drain tank
	030	Exhaust Gas Cooler (EGC)
	031	Wastewater holding tank
	032	iCER sludge tank
	033	NaOH storage tank *20)
	034	Automatic 3/2 valve
	035	Flow regulating valve
D	036	Combined clean water holding tank (for zero discharge area) and SAC wetting buffer tank
	037	EGC circulation water tank



Remarks:

- Air vent and drain pipes are not shown on this drawing. They must 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 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 aftertreatment during regular engine operation. Convenient dimensions are provided in view "A". Other designs are possible.
*5) When using a valve, lock it in proper position to prevent incorrect use.
*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 must also be equipped with a gas detector.
*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 the GTD.
*12) To be supplied by a certified supplier. Ordering to be coordinated between shipyard and engine builder.
*13) A constant temperature at engine (SAC) inlet must be maintained. The controller set-point for main engine operation is 25 °C. If the ancillary plants require a higher or lower LT temperature, then a separate LT water supply with the different temperature set-point must be installed (please refer to the system proposals in the MIM).
*14) A constant temperature at engine outlet must be maintained. The controller set-point for main engine operation is 90 °C.
*15) Only to be used for manual venting of isolated cylinders after maintenance. To be kept closed during engine operation.
*16) Optional, only to be installed if necessary for hydraulic balancing.
*17) Controlled by the EGC control unit, which is a sub-system of the iCER control system.
*18) Controlled based on the EGC circulation water temperature after the EGC circulation water cooler.
*19) The level transmitter is used to maintain a constant level within the tank (e.g. 30% of total filling volume).
*20) For solutions of 50% m/m NaOH, a storage and handling temperature in the range of 16 °C to 45 °C is required. For solutions of maximum 30% m/m NaOH, storage at normal engine room ambient temperature is sufficient.
*21) 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.
*22) Optional connection to the general service pump. To be considered if requested by class rules for emergency engine cooling.
*23) The maximum permissible pump suction and delivery heights must be acquired from suppliers specification. In cases where alternative pump specifications are required the new selection must be agreed upon with the supplier.
*24) With coagulant dosing if required. As an alternative to the shown arrangement, an iCER drainage system with two separate water treatment units for bleed-off water and EGC circulation water can be considered.
*26) NaOH dosing into the collection pipe. Alternatively, the dosing can be also done directely into the wastewater holding tank, provided the tank is coated (laid out for pH 3-4).
*27) The required max. flow rate, based on the EGC size, is provided by table 2.
*28) Alternatively to the shown layout, which uses only the common seawater pump(s), the EGC circulation water cooler can by fed also by separate seawater pump(s).
*29) Not required if the water treatment system is continuosly in operation
*30) According to resolution MEPC 307(73), the sludge from the water treatment system must be collected in a dedicated iCER sludge tank and must be disposed of ashore. The amount of sludge produced is dependent on the selected water treatment system and must be considered for the sizing of the iCER sludge tank. For further details, please refer to the supplier of the water treatment unit.
*32) The overflow pipe from the EGC circulation water tank to the wastewater holding tank must have the following minimum slope: At least 5°, even under the maximum rolling and pitching angles as defined by class rules (e.g 22.5° rolling and 5° pitching at the same time.)
D *33) If 036 is designed as a dedicated wetting buffer tank instead of a clean water holding tank, the pump for overboard discharge is not required.

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

Change	D	sde101	mhu019	31032023	CNAA003486	Drawing Updated		4	3
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code E	C

[mm] [kg] - NX A0 Item ID PTAA036137 Drawing Page/s 2/3

SYSTEM PROPOSAL FOR TWIN ENGINES iCER

NOTE
Further installation details and variants can be found listed in the Marine Installation Manual (MIM), which provides also the acronyms used in this drawing set. The piping symbols are explained by the piping symbol key as included in the drawing set "Various Installation Items".

Pos.	COMPONENTS from certified suppliers *6)
CS09	Water treatment unit *12)

Table 2: EGC circulation water pipe sizes

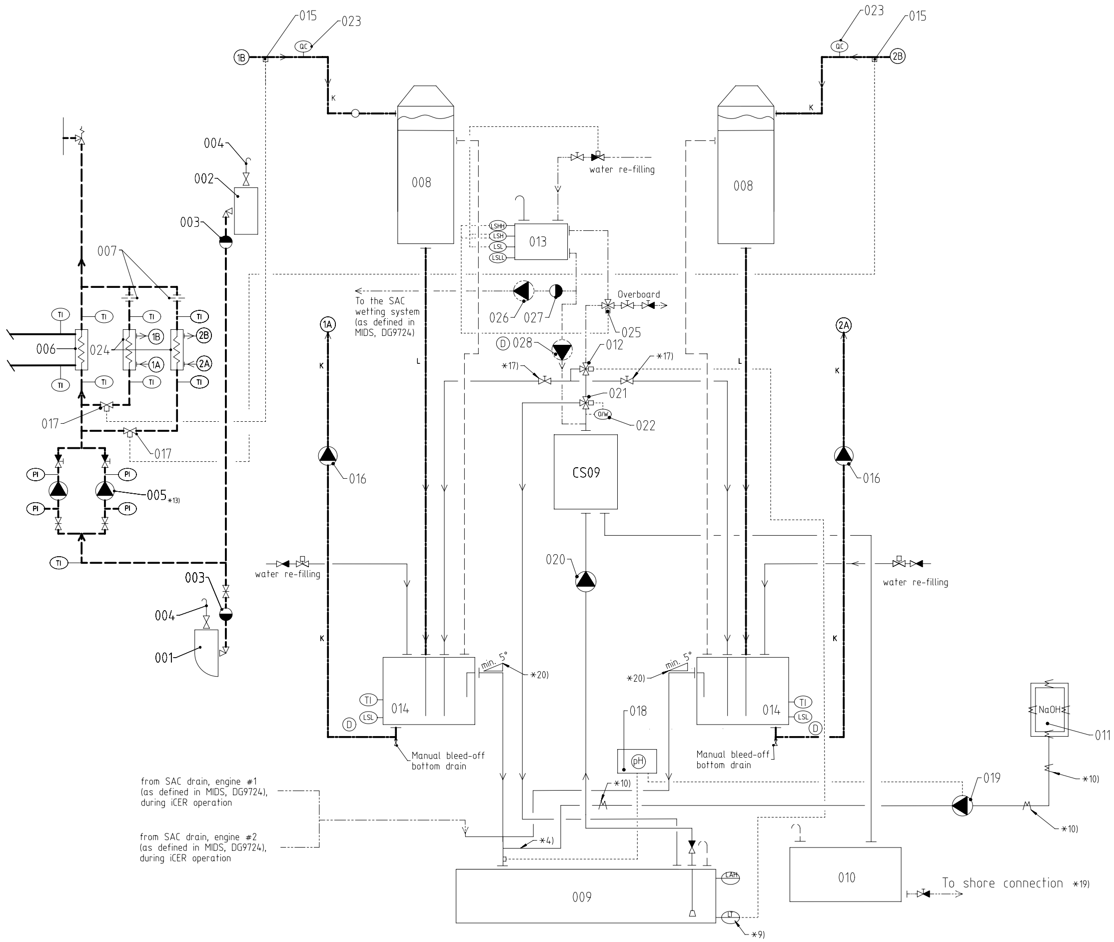
EGC Size	Pipe Dimension "L"	Pipe Dimension "K"
EGC 14	DN300	DN150
EGC 18	DN300	DN150
EGC 23	DN350	DN200
EGC 30	DN350	DN200
EGC 38	DN450	DN250
EGC 51	DN450	DN250

	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	Throttling disc *5) *7)
	008	Exhaust Gas Cooler (EGC)
	009	Wastewater holding tank
	010	iCER sludge tank
	011	NaOH storage tank *4) *10)
	012	3/2-way valve
D	013	Combined clean water holding tank (for zero discharge area) and SAC wetting buffer tank
	014	EGC circulation water tank
	015	EGC circulation water temperature control sensor *15) *16)
D	016	EGC circulation water pump (frequency controlled) *8) *11) *15)
	017	Seawater flow control valve *15) *16)
	018	Water analyser (pH check)
	019	NaOH dosing pump unit
D	020	Water treatment unit water transfer pump
	021	Switching valve
	022	Oil-in-water monitoring sensor (standard type)
	023	Water analyser (quality check) *18)
	024	EGC circulation water cooler
	025	Automatic 3/2 valve
	026	SAC wetting water supply pump
	027	Strainer (max. size 250 micron, absolute)
D	028	Overboard water discharge pump *21)

Remarks:

- Air vent and drain pipes are not shown on this drawing. They must 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 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) NaOH dosing into the collection pipe. Alternatively, the dosing can be also done directely into the wastewater holding tank, provided the tank is coated (laid out for pH 3-4).
*5) When using a valve, lock it in proper position to prevent incorrect use.
*6) To be supplied by a certified supplier. Ordering to be coordinated between shipyard and engine builder.
*7) Optional, only to be installed if needed for hydraulic balancing.
*8) The required max. flow rate, based on EGC size, is provided by table 2.
*9) The level transmitter is used to maintain a constant level within the tank (e.g. 30% of total filling volume).
*10) For solutions of 50% m/m NaOH, a storage and handling temperature in the range of 16 °C to 45 °C is required. For solutions of maximum 30% m/m NaOH, storage at normal engine room ambient temperature is sufficient.
*11) The maximum permissible pump suction and delivery heights must be acquired from suppliers specification. In cases where alternative pump specifications are required the new selection must be agreed upon with the supplier.
*12) With coagulant dosing if required. As an alternative to the shown arrangement, an iCER drainage system with two separate water treatment units for bleed-off water and EGC circulation water can be considered.
*13) Alternatively to the shown layout, which uses only the common seawater pump(s), the EGC circulation water cooler can by fed also by separate seawater pump(s).
*15) Controlled by the EGC control unit, which is a sub-system of the iCER control system.
*16) Controlled based on the EGC circulation water temperature after the EGC circulation water cooler.
*17) Used for hydraulic balancing. The valve must be locked in proper position to prevent incorrect use. As an alternative to the valve a throttling disc can be installed.
*18) Not required if the water treatment system is continuosly in operation
*19) According to resolution MEPC 307(73), the sludge from the water treatment system must be collected in a dedicated iCER sludge tank and must be disposed of ashore. The amount of sludge produced is dependent on the selected water treatment system and must be considered for the sizing of the iCER sludge tank. For further details, please refer to the supplier of the water treatment unit.
*20) The overflow pipe from the EGC circulation water tank to the wastewater holding tank must have the following minimum slope: At least 5°, even under the maximum rolling and pitching angles as defined by class rules (e.g 22.5° rolling and 5° pitching at the same time.)
D *21) If 036 is designed as a dedicated wetting buffer tank instead of a clean water holding tank, the pump for overboard discharge is not required.



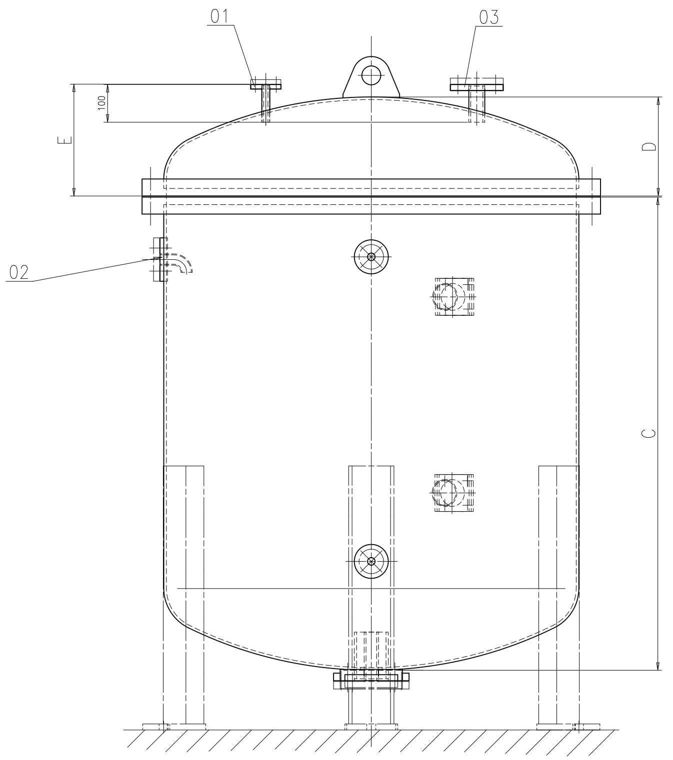
Legend		
Seawater pipes	Drain/overflow pipes	EGC circulation water pipes
LT freshwater pipes	Air vent pipes	
HT freshwater pipes	Control/feed back	
Balance pipes	Pipes on Engine	
Ancillary equipment pipes	Pipe connections	

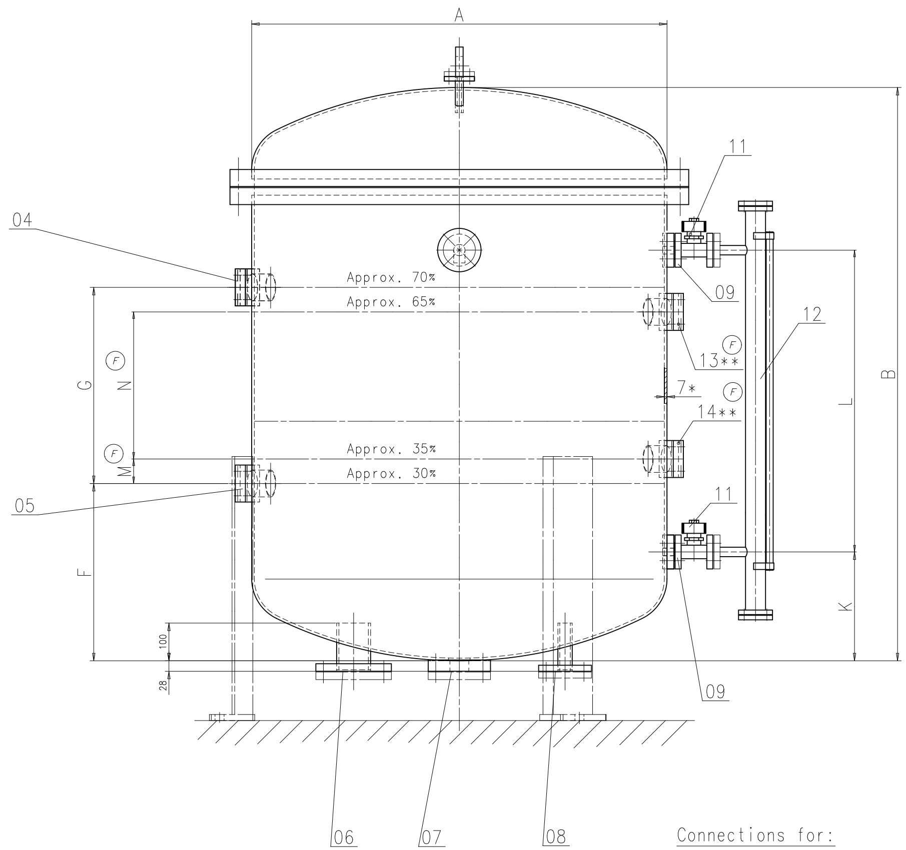
SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

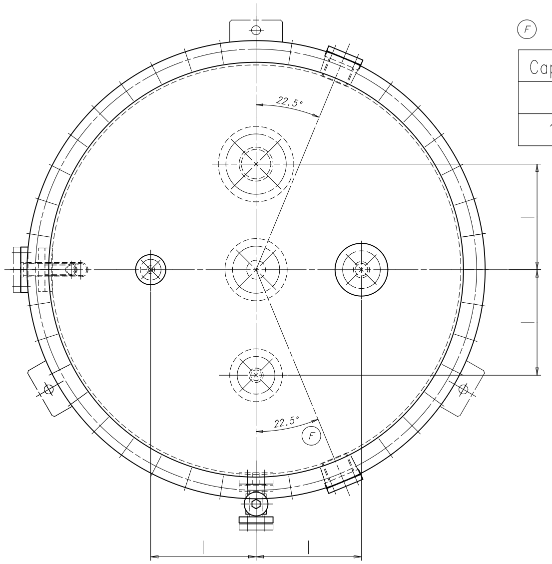
Change	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
	D	sde101	nhu019	31.03.2023	ONAA003486	Drawing Updated	Approved	4	3

[mm] [kg] – NX A0 Item ID PTAA036137 Drawing Page/s 3/3

Tank Proposal (F)







(F)

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

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
- (F) 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 **

Drawn for 1200l capacity

Working pressure : 5 bar

* Wall thickness and test pressure : according to relevant classification society/rules

Service temperature : max. 95°C

(F) ** Tank volume between LSH and LSL shall be no less than 150 litres.

Free space for lic.							Q-Code XXXXX	Main Drw.
							Standard ISO	
Modif.	C 7-61.644 (Number)	05.03.2008 (Drawn date)	D EAAD084051 (Number)	14.08.2012 (Drawn date)	E EAAD085172 (Number)	22.04.2014 (Drawn date)	F EAAD087035 (Number)	12.10.2016 (Drawn date)

WIN GD Winterthur Gas & Diesel

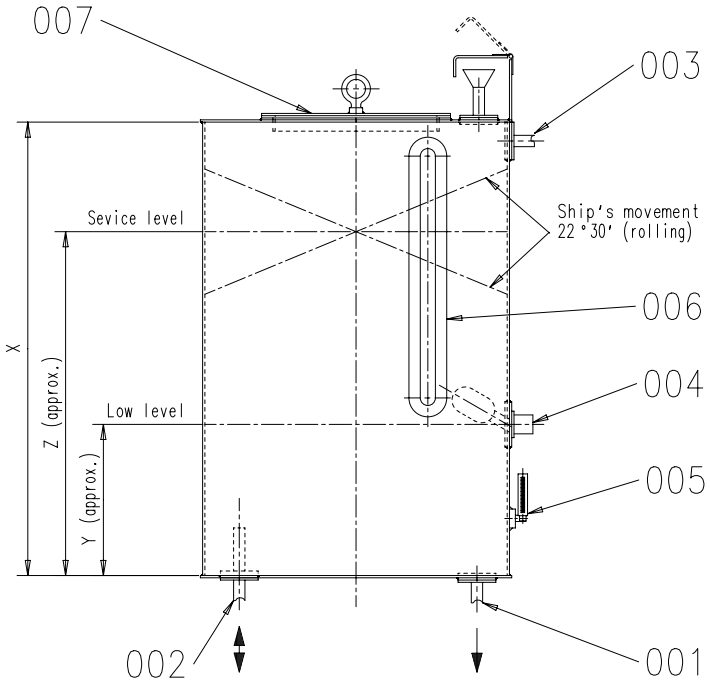
Product: W-2S

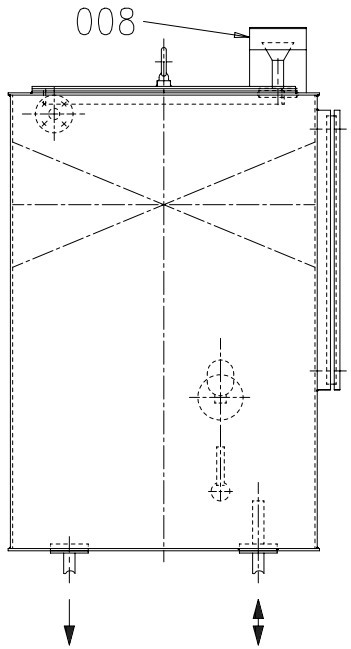
BUFFER
TO CYL.COOLING WATER SYS
Puffer

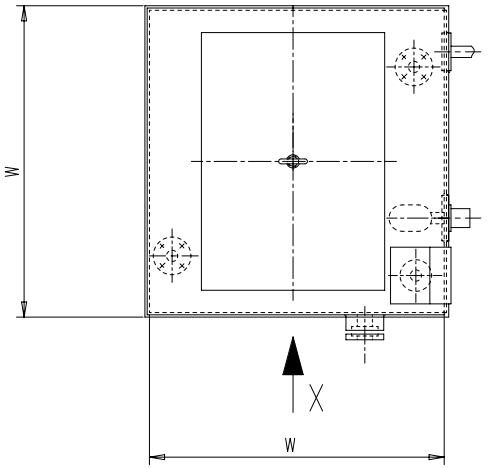
SURFACE PROTECTION SEE GROUP 0344	Units mm kg	IDE	Basic Material		Net Weight 0.001
	Made 22.09.00 S.STYLIANOU		Scale 1:5	Size A0	Page 1/1	Material ID 107.245.626.500
TOLERANCING PRINCIPLE ISO8015	Chkd		Design Group 9721	Drawing ID 107.245.626	Rev. F
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd				

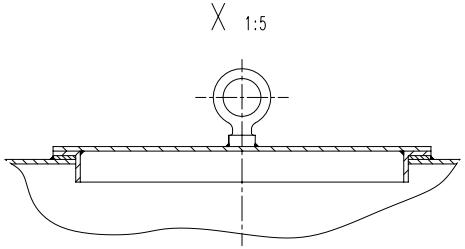
DID - DIMENSIONAL DRAWING - Confidential

Approved









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

Approved

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			

DID - DIMENSIONAL DRAWING - Confidential

NOT VALID for new projects

The following pages are provided only as reference
for projects which had been contracted before April 2022

NOT VALID for new projects

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

Available executions

Execution No.	Material ID	Cylinder No.	Attribute 1: HT_static-pressure		Attribute 2: XDF-2.0 technology	
			Buffer unit	Exp. tank	iCER gas	iCER diesel
001	PTAA004089	6-9	X		X	
002	PTAA026608	6-9	X			X

NOTE
The above executions can be configured using the Engine Configurator.
Detailed guidance for the executions is provided within the Marine Installation Manual (MIM). If a specific execution of interest is not shown in the above table, then it may still be under development or not available. For further information or in case of a project-specific request, WinGD must be contacted directly.

Prod. X82DF-2.0

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
-	dki021				new Design			

WIN GD
Winterthur Gas & Diesel

CENTRAL COOLING WATER SYSTEM

MIDS master drawing

separate BOM available

Dimension

Scale	Units	Basic Material	Net Weight
- NX	[mm] [kg]		0.001

Main Design	Design Group	Q-Code	Standard
	9721	XXXXX	WDS

Qty per		Item ID	Drawing Page/s
	A4	PTAA016057	1/1

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PTAA004040	CENTRAL COOLING WATER SYSTEM			0.001
3	1	107.429.532.500	CONCEPT GUIDANCE			0.001

Prod.	6,7,8,9 X82DF-2.0			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis		Activity Code	E	C
-	dki021	mhu019			new Drawing	30.09.2021		-	-

WIN GD
Winterthur Gas & Diesel

COOLING WATER SYSTEMS

HT_static-pressure: Buffer-unit

Bill Of Material

Dimension								
Units	[m] [kg]	Basic Material					Net Weight	0.002
Main Design	Yes	Design Group	9721	Q-Code	XXXXX		Standard	WDS
Qty per	Engine	A4	Item ID	PTAA004089			BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
015	1	107.245.626.500	BUFFER			0.001
016	1	107.245.419.500	EXPANSION TANK			0.001

Prod.	X82DF-2.0							

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
B	sde101	mhu019	02.03.2022	CNAA001058	Drawing Updated	4	4	3
A	mhu019	dst009	20.12.2021	CNAA001054	Drawing Updated	4	4	3
-	dki021	mhu019	30.07.2021	CNAA000472	new Design	-	-	-

WIN GD
Winterthur Gas & Diesel

CENTRAL COOLING WATER SYSTEM

HT_static-pressure: Buffer-unit, X-DF2.0: iCER Gas

Bill Of Material

Dimension					
Units [m] [kg]	Basic Material			Net Weight	0
Main Design	Design Group	9721	Q-Code XXXXX	Standard	WDS
Qty per	A4	Item ID PTAA004040		BOM Page/s	01/01

SPECIFICATION which must be met:

8 OUTLET - Scavenge air cooler (SAC) cooling water (LT water)

- Cooling water volume flow: As specified in the GTD, 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 the engine room.

2 INLET - Cylinder cooling water (HT water)

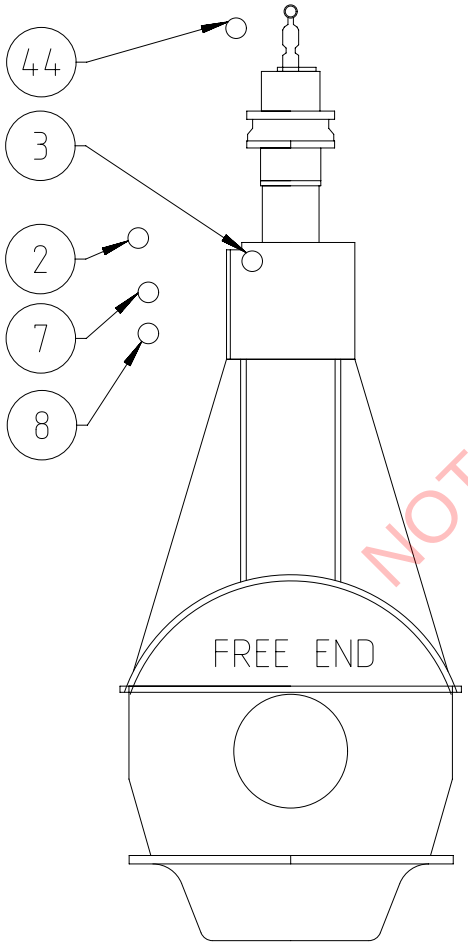
- Cooling water pressure: 4.0 - 5.0 bar
- Cooling water volume flow: As specified in the GTD
- Cooling water (freshwater) must be treated according to WinGD specification.
- A buffer unit must be installed.
- The static pressure at the engine inlet must be adjusted by buffer unit pressure setting.
- Before starting the engine, the engine must be heated-up to 60 °C via heated HT water.
- HT cooling water amount on engine side: Given in table 1 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: maximum 36 °C when the seawater temperature is at 32 °C. Controller set-point: 25 °C.
- Cooling water volume flow: As specified in the GTD
- Cooling water (freshwater) must be treated according to WinGD specification.
- LT cooling water amount on engine side: Given in table 1 on page 2.



Prod. X82DF-2.0

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E	C
B	sde101	mhu019	02.03.2022	CNAA001508	Drawing Updated			4	3
A	mhu019	dst009	20.12.2021	CNAA001054	Drawing Updated			4	3
-	dki021	mhu019	30.07.2021	CNAA000472	new Design			-	-

WIN GD Winterthur Gas & Diesel

CENTRAL COOLING WATER SYSTEM

HT_static-pressure: Buffer-unit, X-DF2.0: iCER Gas

separate BOM available

Dimension

Scale - | dst009 02.03.2022 | NX CNAA001508 | Units [mm] [kg] | Basic Material | Net Weight 0.000

SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Main Design	Design Group 9721	Q-Code XXXXX	Approved / Standard WDS
Qty per	A3	Item ID PTAA004040	Drawing Page/s 1/2

SYSTEM PROPOSAL

NOTE
Further installation details and variants can be found listed in the Marine Installation Manual (MIM), which provides also the acronyms used in this drawing set. The piping symbols are explained by the piping symbol key as included in the drawing set "Various Installation Items".

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

a) Values for executions with 1 scavenge air cooler.
b) Values for executions with 2 scavenge air cooler.

Pos.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Manual vent valve, each cylinder *15)
EC03	Air separator

Pos.	COMPONENTS from certified suppliers *12)
CS01	Exhaust Gas Cooler (EGC)
CS02	EGC circulation water tank
CS03	EGC circulation water pump unit with - frequency controlled pumps *23) - bleed valves *19)
CS04	EGC circulation water cooler
CS05	Seawater flow control valve *17)
CS06	EGC circulation water temperature control sensor *18)

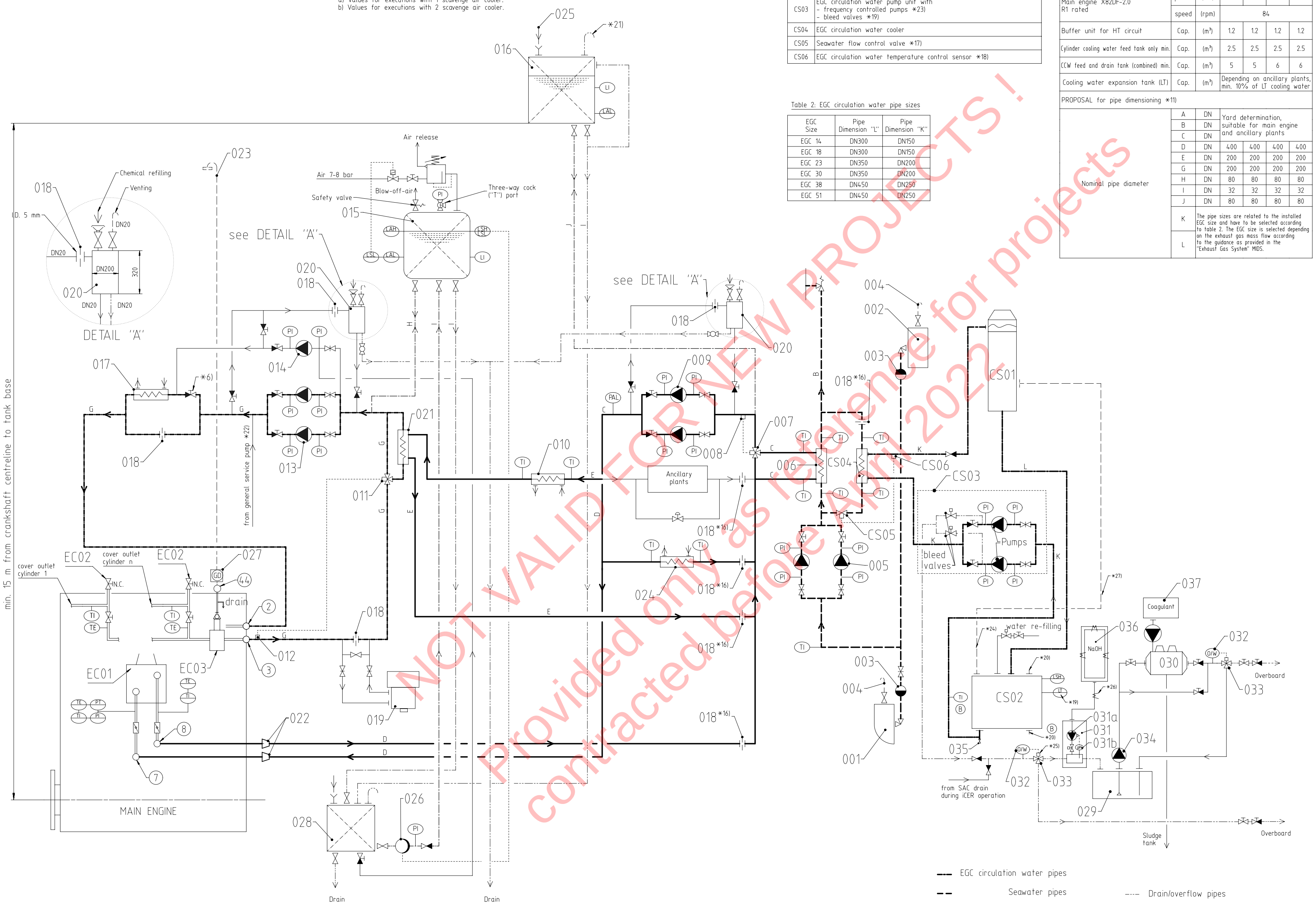
Table 2: EGC circulation water pipe sizes

EGC Size	Pipe Dimension "L"	Pipe Dimension "K"
EGC 14	DN300	DN150
EGC 18	DN300	DN150
EGC 23	DN350	DN200
EGC 30	DN350	DN200
EGC 38	DN450	DN250
EGC 51	DN450	DN250

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)

Number of cylinders			6	7	8	9
Main engine X82DF-2.0 R1 rated	power	(kW)	25920	30240	34560	38880
	speed	(rpm)	84			
Buffer unit for HT circuit	Cap.	(m^3)	1.2	1.2	1.2	1.2
Cylinder cooling water feed tank only min.	Cap.	(m^3)	2.5	2.5	2.5	2.5
CCW feed and drain tank (combined) min.	Cap.	(m^3)	5	5	6	6
Cooling water expansion tank (LT)	Cap.	(m^3)	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	DN				
	C	DN				
	D	DN	400	400	400	400
	E	DN	200	200	200	200
	G	DN	200	200	200	200
	H	DN	80	80	80	80
	I	DN	32	32	32	32
	J	DN	80	80	80	80
	K		The pipe sizes are related to the installed EGC size and have to be selected according to table 2. The EGC size is selected depending on the exhaust gas mass flow according to the guidance as provided in the "Exhaust Gas System" MIDS.			
	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
006	Central seawater cooler
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 (CCW) pump for HT circuit
014	Pre-heating circulating pump (optional), cap. 10% from cylinder cooling pump *8)
015	Buffer unit for HT circuit (link to detail drawing on the partlist of this drawing).
016	LT water expansion tank (link to detail drawing on the partlist of this drawing)
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	Cylinder cooling water air venting line *10)
024	MDO/MGO cooler
025	Filling pipe / inlet chemical treatment
026	Supply pump, automatic level control (0.5 m^3/h at 4 bar)
027	Gas detector *10)
028	Cylinder cooling water (CCW) feed and drain tank
029	EGC water drain tank
030	Oily water separator
031	pH-neutralisation dosing unit with 31a - NaOH dosing pump 31b - pH sensor
032	Oil-in-water monitoring sensor (UV-type)
033	3/2-way valve
034	EGC bleed-off water transfer pump
035	Manual bleed-off water bottom drain (DN25)
036	NaOH storage tank *26)
037	Coagulant dosing unit *28)



Remarks:

- Air vent and drain pipes are not shown on drawing. They must 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 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 aftertreatment 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 prevent incorrect use.
*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 must also be equipped with a gas detector.
*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) To be supplied by a certified supplier. Ordering to be coordinated between shipyard and engine builder.
*13) A constant temperature at engine (SAC) inlet must be maintained. Controller set-point for main engine operation is 25 °C. If the ancillary plants require a greater or lower LT temperature a separate LT water supply with the different temperature set-point must be installed (please refer to the system proposals in the MIM).
*14) A constant temperature at engine outlet must be maintained. The controller set-point for main engine operation is 90 °C.
*15) Only to be used for manual venting of isolated cylinders after maintenance. To be kept closed during engine operation.
*16) Optional, only to be installed if needed for hydraulic balancing.
*17) Controlled by the iCER control system.
*18) To be installed after the EGC circulation water cooler to transmit the EGC circulation water temperature to the iCER control system.
*19) If the value transmitted by the level transmitter exceeds the maximum value which is defined in the software, then the EGC circulation water pump will pump out water from the EGC circulation water tank to the EGC drain tank until a specific level has been reached. If required, the water removal can also be manually activated due to water contamination or other reasons. For safety purposes, in case the automatic drainage system fails, a high-level switch is installed to the EGC drain tank to initiate a shutdown.
*20) Connections for an optional water treatment system.
*21) If gas-driven auxiliaries are connected to the LT circuit, the LT expansion tank must be gas tight and vented to a safe area outside of the engine room.
*22) Optional connection to the general service pump. To be considered if requested by class rules for emergency engine cooling.
*23) The maximum permissible pump suction and delivery heights must be acquired from the suppliers specifications. In cases where alternative pump specifications are required the new selection must be agreed upon with the supplier.
*24) The degassing pipe must be connected to the EGC for degassing through it.
*25) Automatically controlled based on the oil content with manual override function if forced drainage to the EGC drain tank is required, e.g. in some ECA it is not allowed to pump obverboard even if the oil content is below 15 ppm.
*26) If the caustic soda water solution has a mass fraction of 50% m/m NaOH, then the tank and supply line must be trace heated and insulated to keep the caustic soda temperature in the range of 27 - 37 °C. If the caustic soda water solution has a mass fraction of max. 30% m/m NaOH then no heating is required.
*27) The piping between the EGC outlet and the circulation water tank inlet should be routed as vertical as possible. If a horizontal offset between the EGC outlet and the circulation water tank inlet cannot be avoided, then the circulation water return pipe must have the following minimum slope:
At least 5°, even under the maximum rolling and pitching angles as defined by the class rules (e.g. 22.5° rolling and 5° pitching at the same time).
*28) Depending on the type of oily water separator, a coagulant dosing unit may be required. For details please refer to the oily water separator supplier.

EGC circulation water pipes
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

SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK
Drawing Updated
PTAA004040
2/2

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PTAA026126	CENTRAL COOLING WATER SYSTEM			0.001
3	1	107.429.532.500	CONCEPT GUIDANCE			0.001

Prod.	6,7,8,9 X82DF-2.0							
Change History								
-	sde101	mhu019	02.03.2022	CNAA001589	Main Design/Drawing Introduced		-	-
Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C

WIN GD
Winterthur Gas & Diesel

COOLING WATER SYSTEMS

HT_static-pressure: Buffer-unit, X-DF-S2.0: iCER Diesel

Bill Of Material

Dimension								
Units	[m] [kg]	Basic Material					Net Weight	0.001
Main Design	Yes	Design Group	9721	Q-Code	XXXXX		Standard	WDS
Qty per	Engine	A4	Item ID	PTAA026608			BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name / Dimension	Standard-ID	Basic Material	Net Weight
015	1	107.245.626.500	BUFFER			0.001
016	1	107.245.419.500	EXPANSION TANK			0.001

Prod.

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E	C
-	sde101	dst009	02.03.2022	CNAA001508	new Design			-	-

CENTRAL COOLING WATER SYSTEM

HT_static-pressure: Buffer-unit , X-DF2.0: iCER Diesel

Bill Of Material

Dimension

Units [m] [kg]	Basic Material			Net Weight	0.001
Main Design	Design Group	9721	Q-Code XXXXX	Standard	WDS
Qty per	A4	Item ID PTAA026126		BOM Page/s	01/01

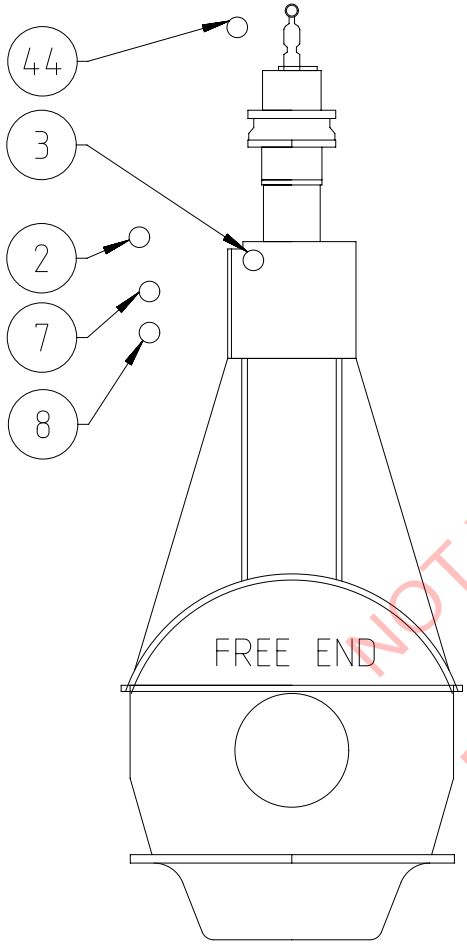
SPECIFICATION which must be met:

8 OUTLET - Scavenge air cooler (SAC) cooling water (LT water)

- Cooling water volume flow: As specified in the GTD, 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 the engine room.



2 INLET - Cylinder cooling water (HT water)

- Cooling water pressure: 3.0 - 5.0 bar
- Cooling water volume flow: As specified in the GTD
- Cooling water (freshwater) must be treated according to WinGD specification.
- A buffer unit must be installed.
- The static pressure at the engine inlet must be adjusted by buffer unit pressure setting.
- Before starting the engine, the engine must be heated-up to 60 °C via heated HT water.
- HT cooling water amount on engine side: Given in table 1 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: maximum 36 °C when the seawater temperature is at 32 °C. Controller set-point: 25 °C.
- Cooling water volume flow: As specified in the GTD
- Cooling water (freshwater) must be treated according to WinGD specification.
- LT cooling water amount on engine side: Given in table 1 on page 2.

Prod.

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E	C
-	sde101	mhu019	02.03.2022	CNAA001508	new Design			-	-

WIN GD
Winterthur Gas & Diesel

CENTRAL COOLING WATER SYSTEM

HT_static-pressure: Buffer-unit , X-DF2.0: iCER Diesel

separate BOM available

Dimension

Scale -

dst009 02.03.2022 NX CNAA001508

Units [mm] [kg]

Basic Material

Net Weight .0.001

SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Main Design	Design Group	9721	Q-Code XXXXX	Approved	Standard WDS
Qty per	A3	Item ID PTAA026126			Drawing Page/s 1/2

SYSTEM PROPOSAL

NOTE
Further installation details and variants can be found listed in the Marine Installation Manual (MIM), which provides also the acronyms used in this drawing set. The piping symbols are explained by the piping symbol key as included in the drawing set "Various Installation Items".

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.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Manual vent valve, each cylinder *15)
EC03	Air separator

Pos.	COMPONENTS from certified suppliers *12)
CS01	Exhaust Gas Cooler (EGC)
CS02	EGC circulation water tank
CS03	EGC circulation water pump unit with - frequency controlled pumps *23) - bleed valves *19)
CS04	EGC circulation water cooler
CS05	Seawater flow control valve *17)
CS06	EGC circulation water temperature control sensor *18)
CS07	Water Analyser (pH and quality check)
CS08	NaOH dosing pump
CS10	Water treament unit circulation water feed pump
CS11	Water treatment unit *27)
CS12	Switching valve
CS13	Oil-in-water monitoring sensor (standard type)

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)

Number of cylinders			6	7	8	9
Main engine X82DF-2.0 R1 rated	power	(kW)	25920	30240	34560	38880
	speed	(rpm)	4			
Buffer unit for HT circuit	Cap.	(m³)	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
CCW feed and drain tank (combined) min.	Cap.	(m³)	5	5	6	6
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	DN				
	C	DN				
	D	DN	400	400	400	400
	E	DN	200	200	200	200
	G	DN	200	200	200	200
	H	DN	80	80	80	80
	I	DN	32	32	32	32
	J	DN	80	80	80	80
	K		The pipe sizes are related to the installed EGC size and have to be selected according to table 2. The EGC size is selected depending on the exhaust gas mass flow according to the guidance as provided in the "Exhaust Gas System" MIDS.			
	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
006	Central seawater cooler
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 (CCW) pump for HT circuit
014	Pre-heating circulating pump (optional), cap. 10% from cylinder cooling pump *8)
015	Buffer unit for HT circuit (link to detail drawing on the partlist of this drawing)
016	LT water expansion tank (link to detail drawing on the partlist of this drawing)
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	Cylinder cooling water air venting line *10)
024	MDO/MGO cooler
025	Filling pipe / inlet chemical treatment
026	Supply pump, automatic level control (0.5 m³/h at 4 bar)
027	Gas detector *10)
028	Cylinder cooling water (CCW) feed and drain tank
029	Oil-in-water monitoring sensor (UV type)
030	Manual bleed-off water bottom drain (DN25)
031	EGC drain tank
032	EGC sludge tank
033	NaOH storage tank *20)
034	3/2-way valve

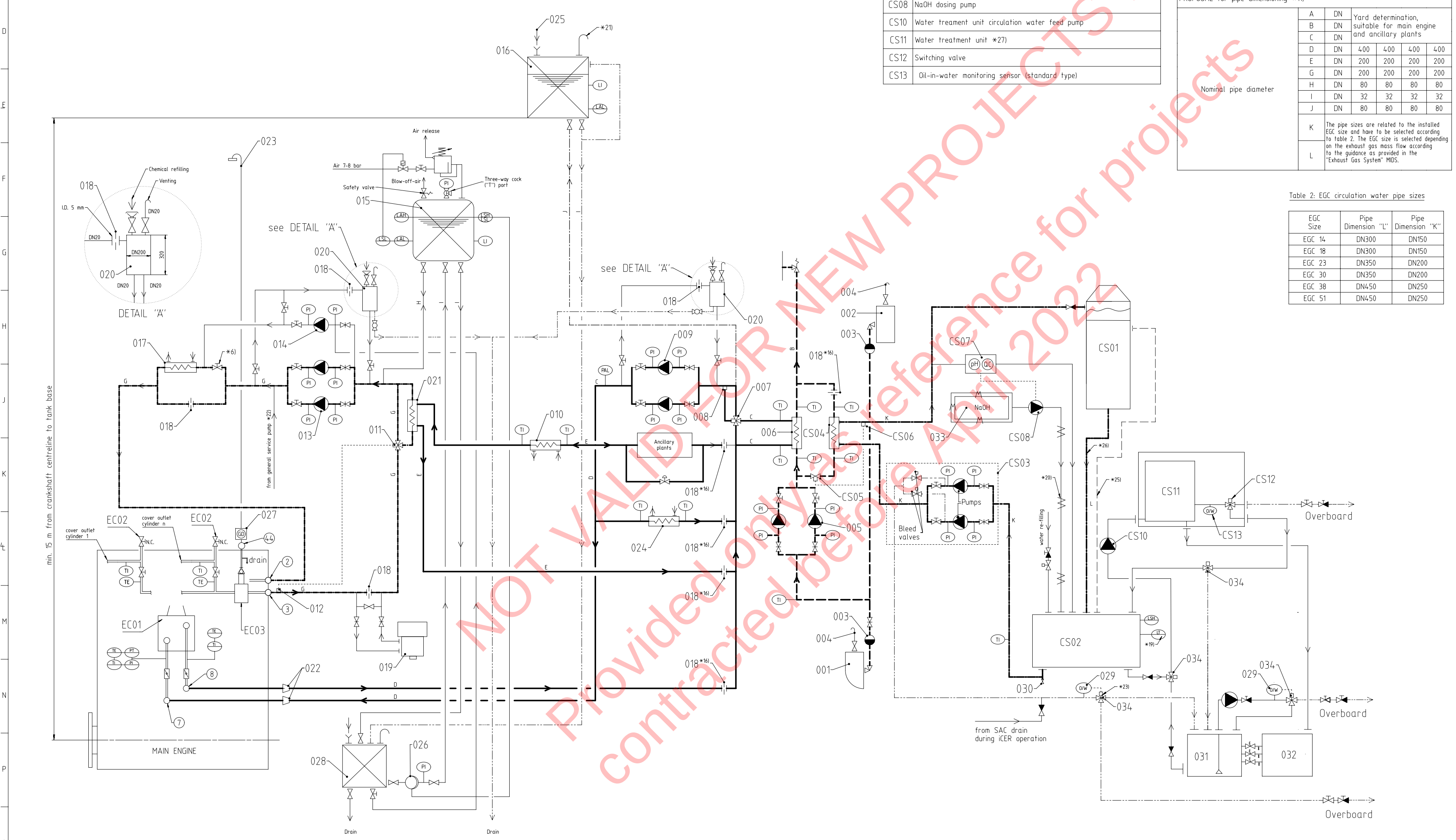


Table 2: EGC circulation water pipe sizes

EGC Size	Pipe Dimension "L"	Pipe Dimension "K"
EGC 14	DN300	DN150
EGC 18	DN300	DN150
EGC 23	DN350	DN200
EGC 30	DN350	DN200
EGC 38	DN450	DN250
EGC 51	DN450	DN250

Seawater pipes
LT freshwater pipes
HT freshwater pipes
Balance pipes
Ancillary equipment pipes
Drain/overflow pipes
Air vent pipes
Controlfeed back
Pipes on Engine
Pipe connections
EGC circulation water pipes

Remarks:

- Air vent and drain pipes are not shown on this drawing. They must 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 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 aftertreatment during regular engine operation. Convenient dimensions are provided in view "A". Other designs are possible.
*5) When using a valve, lock it in proper position to prevent incorrect use.
*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 must also be equipped with a gas detector.
*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 the GTD.
*12) To be supplied by a certified supplier. Ordering to be coordinated between shipyard and engine builder.
*13) A constant temperature at engine (SAC) inlet must be maintained. The controller set-point for main engine operation is 25 °C. If the ancillary plants require a greater or lower LT temperature a separate LT water supply with the different temperature set-point must be installed (please refer to the system proposals in the MIM).
*14) A constant temperature at engine outlet must be maintained. The controller set-point for main engine operation is 90 °C.
*15) Only to be used for manual venting of isolated cylinders after maintenance. To be kept closed during engine operation.
*16) Optional, only to be installed if needed for hydraulic balancing.
*17) Controlled by the iCER control system
*18) To be installed after the EGC circulation water cooler to transmit the EGC circulation water temperature to the iCER control system.
*19) If the value transmitted by the level transmitter exceeds the maximum value, which is defined in the software, then the EGC circulation water pump will pump out water from the EGC circulation water tank to the EGC drain tank until a specific level has been reached. If required, the water removal can also be manually activated due to water contamination or other reasons. For safety purposes, in case the automatic drainage system fails, a high-level switch is installed to the EGC drain tank to initiate a shutdown.
*20) If the caustic soda water solution has a mass fraction of 50% m/m NaOH, then the tank and supply line must be trace heated and insulated to keep the caustic soda temperature in the range of 27 - 37 °C. If the caustic soda water solution has a mass fraction of max. 30% m/m NaOH then no heating is required.
*21) 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.
*22) Optional connection to the general service pump. To be considered if requested by class rules for emergency engine cooling.
* 23) Automatically controlled based on the oil content with manual override function if forced drainage to the EGC drain tank is required, e.g. in some ECA it is not allowed to pump obverboard even if the oil content is below 15 ppm.
*24) The maximum permissible pump suction and delivery heights must be acquired from suppliers specification. In cases where alternative pump specifications are required the new selection must be agreed upon with the supplier.
*25) The degassing pipe must be connected to the EGC for degassing through it.
*26) The piping between the EGC outlet and the circulation water tank inlet should be routed as vertical as possible. If a horizontal offset between the EGC outlet and the circulation water tank inlet cannot be avoided, then the circulation water return pipe must have the following minimum slope: At least 5°, even under the maximum rolling and pitching angles as defined by the class rules (e.g. 22.5° rolling and 5° pitching at the same time).
*27) With coagulant dosing if required. As an alternative to the shown arrangement, an iCER drainage system with two separate water treatment units for bleed-off water and EGC circulation water can be considered.

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

Change	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code		
	-	sde101	[illegible]	02.03.2022	CNAA001508	new Design	Approved	-	-

[mm] [kg] - NX A0 Item ID PTAA026126 Drawing Page/s 2/2

MIDS - WinGD X82DF-2.0 – Cooling Water System (DG9721)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2021-07-30	DRAWING SET	First web upload
2021-12-22	PTAA004040	System drg. – new revision
2022-03-11	PTAA004040 PTAA026608 PTAA026126	System and main drgs. – new revision/new drg
2022-06-23	PTAA036137 PTAA036169	New main and system drg. as replacement for the previous drawing set added
2022-08-24	PTAA036137	System drg. – new revision
2022-12-01	PTAA036137	System drg. – new revision
2023-03-31	PTAA036137	System drg. – new revision

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