SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

Available executions

Execution No.	Material ID	Cylinder No.	Attribute 1: Gas pressure regulation		Attribute 2: Gas supply system	
			iGPR	GVU	NG	NG+VOC
1	PAAD283526	6-12	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.

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis		Activity Code	E	C
-	sde101	mhu019	10.11.2021	CNAA000934	new Design	Approved		-	-

WIN GD
Winterthur Gas & Diesel

FUEL GAS SYSTEM

MIDS master drawing

separate BOM available

Dimension

Scale	-	NX	Units [mm] [kg]	Basic Material	Net Weight	0.001
Main Design			Design Group	9727	Q-Code XXXXX	Standard WDS
Qty per			A4	Item ID PTAA016715		Drawing Page/s 1/1

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD282495	FUEL GAS SYSTEM			0.001
2	1	PAAD278947	FLUSHING INSTRUCTION PIPING			0.001
3	1	PAAD149646	ENGINE SAFETY CONCEPT DF ENGINE SAFETY CONCEPT			0.001

Prod.				
	6,7,8,9,10,11,12 X92DF 6,7,8,9,10,11,12 X92DF-2.0			

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
A	sde101	mhu019	10.11.2021	CNAA000939	Main Design/Drawing Introduced		4	3
-	dki021	mhu019	26.01.2018		-		-	-

WIN GD
Winterthur Gas & Diesel

FUEL GAS SYSTEM

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

Dimension

Units	[m] [kg]	Basic Material				Net Weight	0.002
Main Design	Yes	Design Group	9727	Q-Code	XXXXX	Standard	WDS
Qty per	Engine	A4	Item ID	PAAD283526		BOM Page/s	01/01

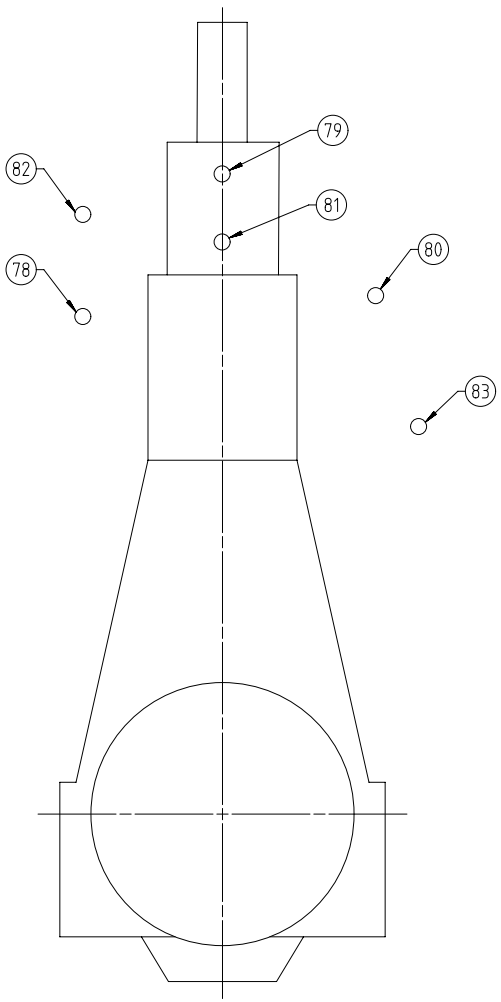
SPECIFICATIONS which must be met:

(82) OUTLET - Gas monitoring, piston underside

- Must not be connected to other venting pipes.
- Gas release to safe area outside of the engine room.
- At the end of the vent pipe, safety devices such as flame arrestors must be installed according to the respective class specification and requirement.

(83) INLET - Inert gas filling flowmeter

Pipe connection: Only to be used / connected for maintenance of the flowmeter.
To be kept closed / blinded off during normal operation
Inert gas quality: According to the specification in the MIM.



(78) INLET - Gas supply

INNER GAS PIPE
Gas quality: According to the specification in the MIM.
Gas pressure: Design pressure based on GTD requirement for the selected rating and selected minimum LHV plus system pressure drop. Operational variation via the engine control system possible.
Permissible gas pressure fluctuation: ± 0.6 bar (across all frequencies).
Mass flow: According to GTD.
For the gas temperature: 0 - 60°C
NOTE: Regarding gas temperature vs. ventilation air temperature and methods to avoid / handle condensation in the annular space, refer to the specification for connection 81 and remarks on page 2.
Pipe connection: Inner pipe connected to the gas supply line from gas storage / handling system via flange connection (please refer to the "Pipe Connection Plan").

Inert gas supply: An inert gas supply must be connected piping to the iGPR right after the master gas fuel supply valve to enable purging of the whole system and engine piping
Inert gas quality: According to the specification in the MIM.
Inert gas pressure: Can be selected between 3 and 15 bar(g). Once set-pressure is selected, deviation of ± 10% is allowed, though not below 3 bar.
Inert gas volume engine side: Provided in Table 1 on page 2.

OUTER PIPE (annular space) - ventilation air outlet
Ventilation air quantity and quality: Refer to the connection 81, "INLET - Ventilation air annular space".
Pipe connection: Outer pipe is connected to the annular space of the supply pipe via flange connection (please refer to the "Pipe Connection Plan").

Gas detection: A gas detector must be installed in the venting line, at a max. distance of 2 m from the engine inlet, and has to be placed right next to the outer pipe (annular space) connection on the side closest to the engine inlet.
Interruption of the gas supply: The main gas supply line to each consumer or set of consumers must be equipped with a manually operated stop valve and an automatically operated "master gas valve". The stop valve and the "master gas valve" can be installed either in series or can be executed as a combined manually and automatically operated valve. The valves must be located in the part of the piping, which is situated outside of the machinery space that contains gas.

(79) OUTLET - Gas / inert gas release, engine driving end

- Can be connected to the gas / inert gas release, engine free end (connection 80), but must not be connected to other venting pipes.
- No additional valves are allowed in the venting pipeline.
- Gas release to the safe area outside of the engine room.
- At the end of the vent pipe, safety devices such as flame arrestors must be installed according to the respective class specification and requirement.

(80) OUTLET - Gas / inert gas release, engine free end

- Can be connected to the gas / inert gas release, engine driving end (connection 79), but must not be connected to other venting pipes.
- No additional valves are allowed in the venting pipeline.
- Gas release to the safe area outside of the engine room.
- At the end of the vent pipe, safety devices such as flame arrestors must be installed according to the respective class specification and requirement.

(81) INLET - Ventilation air annular space

- Location and execution according to the "2-S Dual-Fuel Safety Concept" as linked in the MIM.
- The ventilation air dew point must be lower than the gas temperature. If the ambient air is not sufficiently dry, then dry air must be supplied. Please refer to the remarks and proposals on page 2.
- Sufficient ventilation air (min. 30 air exchanges per hour) must be sucked by the extraction fan from a safe area into the annular space of the main engine's internal and external piping.
- For the volume of the ventilation air on the engine side, refer to Table 1 on page 2.

Prod.

Change History

Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C
L	npa101	mhu019	14.11.2024	CNAA007091	Drawing updated		4	3
K	sde101	mhu019	10.11.2021	CNAA000939	Drawing Updated		4	3
J	sde101	mhu019	26.04.2021	EAAD095579	Legacy information. See corresponding ChangeNotice		4	3
-	dki021	mhu019	26.01.2018	EAAD782287	-		-	-

Approved

WIN GD

FUEL GAS SYSTEM
Gas Pressure Regulation: iGPR

Dimension

Scale - NX | 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	9727	Q-Code X X M	Standard WDS
Qty per	A2	Item ID PAAD282495		Drawing Page/s 1/3

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".

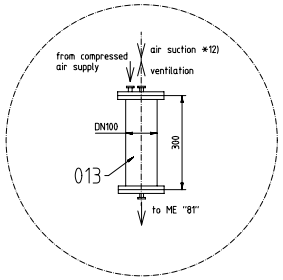
Double-wall pipes: (normal operation: inner pipe – gas, annular space – air; inerting procedure: inner pipe – nitrogen, annular space – air)
Vent pipes
Air pipes
Pipe connections
Orifice

ENGINE ROOM
MAIN ENGINE AREA

Pos.	System Components *2)
001	Gas handling room/cargo machinery room
002	Extraction fan
003	Master gas fuel supply valve
004	Adjustable orifice
005	Pressure regulating valve air supply for pressure test
006	Master gas fuel engine valve *22) *14)
007	Engine room ventilation fan
008	Purging valve
009	Flow indicator
010	Condensate water trap
011	Gas detector engine room *7.2)
012	Venting valve
013	Venting box
014	Shut-off valve, compressed air supply
015	Non-return valve
016	Shut-off valve (double well execution)
018	Intermediate piece
019	Gas detector ship side *7.4)
020	Gas detector engine side *7.1)
021	Manual shut-off valve engine gas supply *20)
022	Manual shut-off valve ancillary gas supply
023	Pressure regulating valve ancillary gas supply
024	Pressure regulating valve annular space air supply
025	Inert gas supply system *17)

Pos.	Engine Components *3)
EC01	Gas filter
EC02	Flowmeter
EC03	Shut-off valve
EC04	Inert gas shut-off valve
EC05	Pressure regulating valve
EC06	Vent / purging valve
EC07	Shut-off valve gas rail pipe
EC08	Gas detector piston underside
EC09	Vent valve

Pos.	Engine Connections *1)
78	INLET – Gas Supply
79	OUTLET – Gas / Inert gas release, engine driving end
80	OUTLET – Gas / Inert gas release, engine free end
81	INLET – Ventilation air annular space
82	OUTLET – Gas monitoring, piston underside
83	INLET – Inert gas filling flowmeter *16)

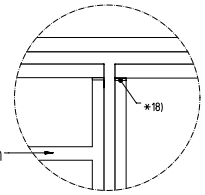


DETAIL A
SCALE 1:6

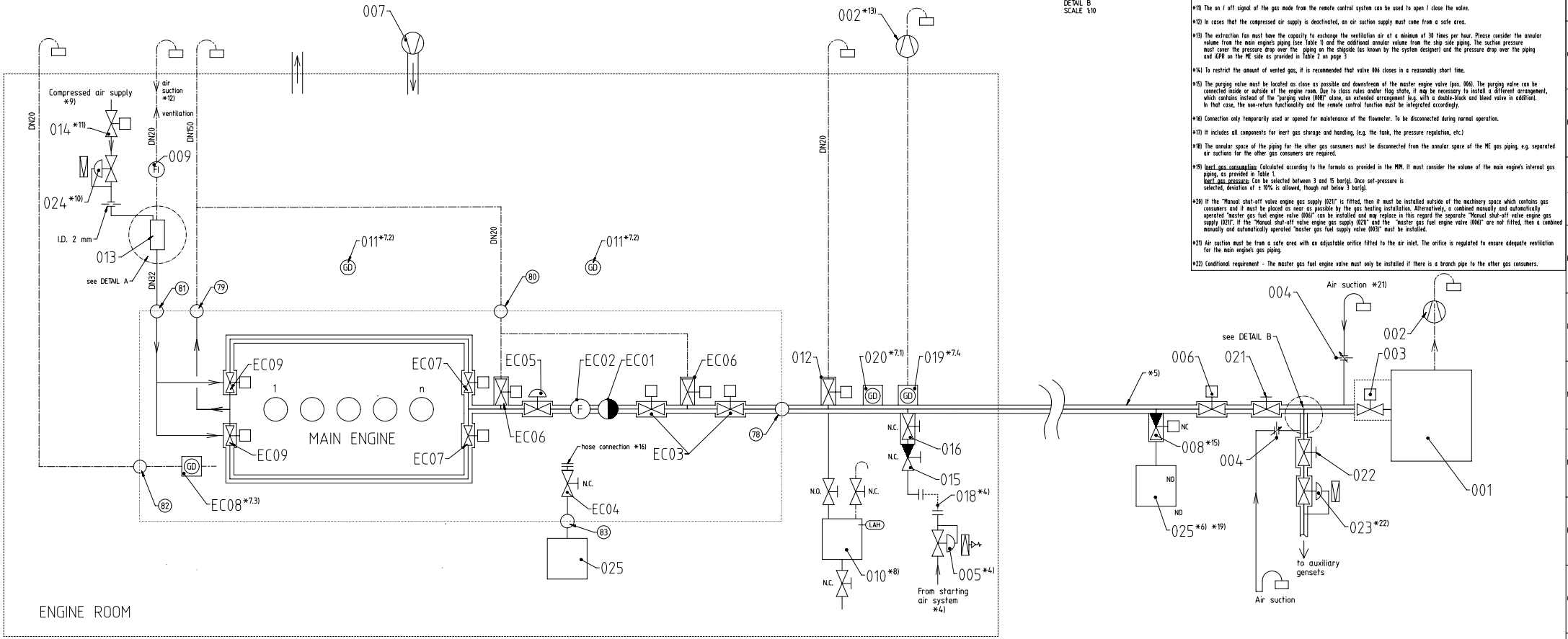
Table 1: Volume of ME internal gas piping

Cylinder	Volume of inner pipe (l)*	Volume of annular space (l)*
6 cyl.	615 l	220 l
7 cyl.	685 l	245 l
8 cyl.	760 l	270 l
9 cyl.	810 l	290 l
10 cyl.	880 l	315 l
11 cyl.	950 l	340 l
12 cyl.	1020 l	365 l

* Reference data for inert gas and ventilation air calculation. Ship side piping shall be considered in addition.



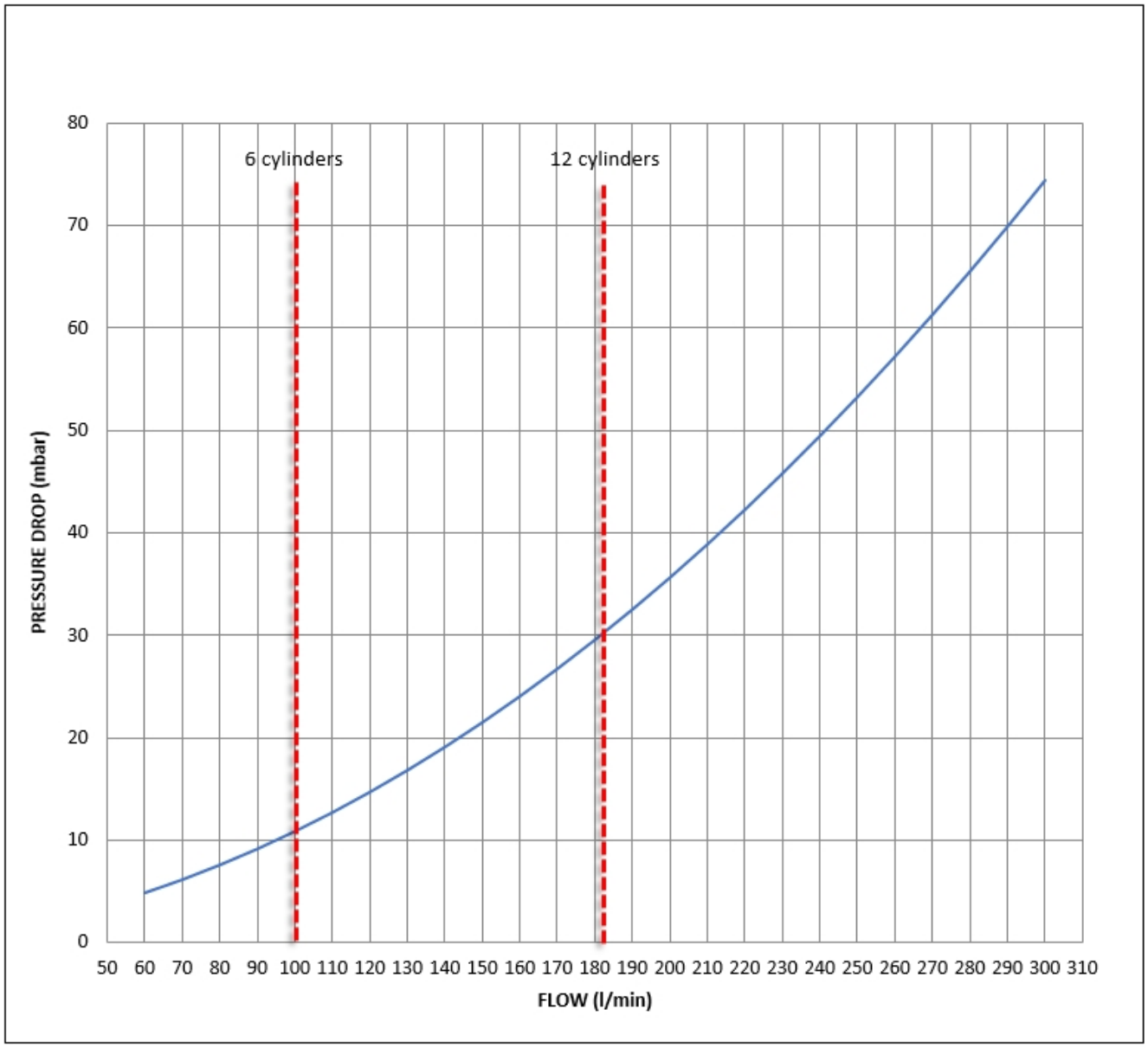
DETAIL B
SCALE 1:10



SURFACE PROTECTION SEE GROUP 8344	Scale	L	mpa101	mhu019	14.11.2024	DNA6007095	Drawing updated
TOLERANCING PRINCIPLE ISO8015	Dwg. Creator		Approved Date	Changes to		Approved	Approved Signature
GENERAL TOLERANCES ACCORDING TO ISO2768-mK							

(mm) (kg) NX A0 Item 0 PAAD282495 Drawing Page 2/3

Table 2: Pressure drop over the annular space on engine side (iGPR + piping)



Change	L	npa101	mhu019	14.11.2024	CNAA007091	Drawing updated		4	3
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E C

SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

[mm] [kg]

NX

A4

Item ID PAAD282495

Drawing Page/s 3/3

MIDS - FUEL-GAS-SYSTEM (DG9727)

WinGD-X92DF / X92DF-2.0

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2018-01-29	DRAWING SET	First web upload
2018-04-25	DAAD095893	New revision
2018-10-01	DAAD095893	New revision
2019-01-31	DAAD095893	New revision
2019-04-10	DAAD095893	New revision
2019-08-23	DAAD095893	New revision
2020-02-28	DAAD095893	New revision
2020-08-19	DAAD095893	New revision
2020-09-08	DAAD095893	New revision
2020-10-21	DAAD095893	New revision
2021-04-27	DAAD095893	New revision
2021-12-06	PAAD283526 PAAD282495	New revision
2024-11-14	PAAD282495-L	New revision

WinGD Ltd.
WinGD AG
WinGD S.A.

Schützenstrasse 3
PO Box 414, CH-8401
Winterthur, Switzerland

Tel. +41 (0)52 264 8844
Fax +41 (0)52 264 8866