

1 2 3 4 5 6 7 8

A
B
C
D
E
F


SCR	Without		X
	LP SCR	X	

Net Weight	
0,001	0,001

1	1	001	PAAD283800	Exhaust System with one turbocharger	DAAD096535		0,001
Quantity PER ENGINE	SEQ NO	Material ID	Material Name	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET

PAAD284289	PAAD284288	Free space for litc.	Q-Code XXXXXX				Main Drw. H
			Standard ISO; JIS				

Material ID	Modif.	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
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	Product 5-8RT-flex48T-D	Exhaust System Abgassystem
	Units mm kg	NX

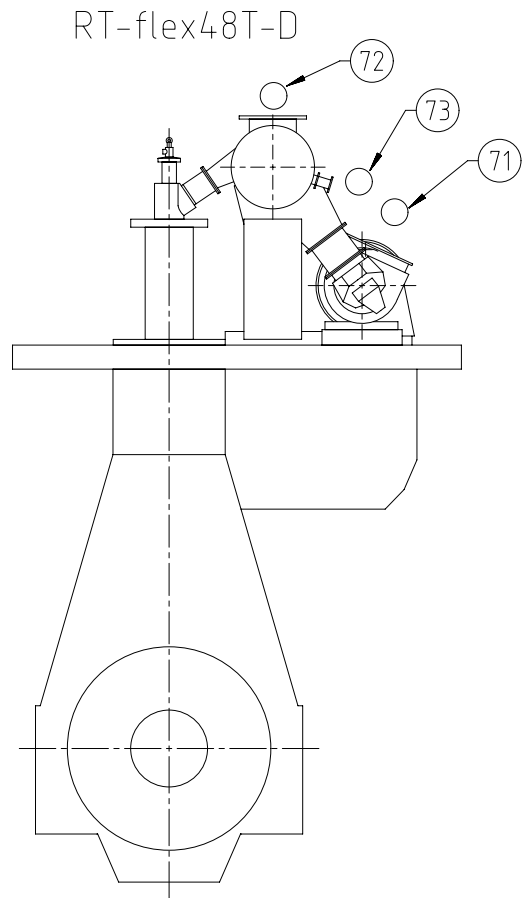
SURFACE PROTECTION SEE GROUP 0344	Made	03.05.2018 dki021 DH.Kim	Scale	-	Size	A3	Page	1/1	Material ID	
TOLERANCING PRINCIPLE ISO8015	Chkd	20.04.2018 wwa008 Wang	Design Group	9726	Drawing ID	DAAD096539		Rev.	-	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	20.04.2018 mhu019 Hug								

Approved

DID - DIMENSIONAL DRAWING - Confidential

Specifications which must be met:

- 72) OUTLET - Exhaust gas by-pass
 - The installation of a by-pass line between exhaust gas manifold and turbocharger may be requested by owner and class if only one turbocharger is installed. Its purpose is to allow engine operation even after a turbocharger failure.
 - Blinded off during normal operation.
- 73) OUTLET - Exhaust gas manifold waste gate
 - Size and layout of connection flange is provided in the "Pipe Connection Plan"
 - Pipe diameter according to parameter "B" on page 2.
 - Waste gate connection pipe to main exhaust gas pipe must be kept as short as possible to avoid swirl and extensive back pressure.

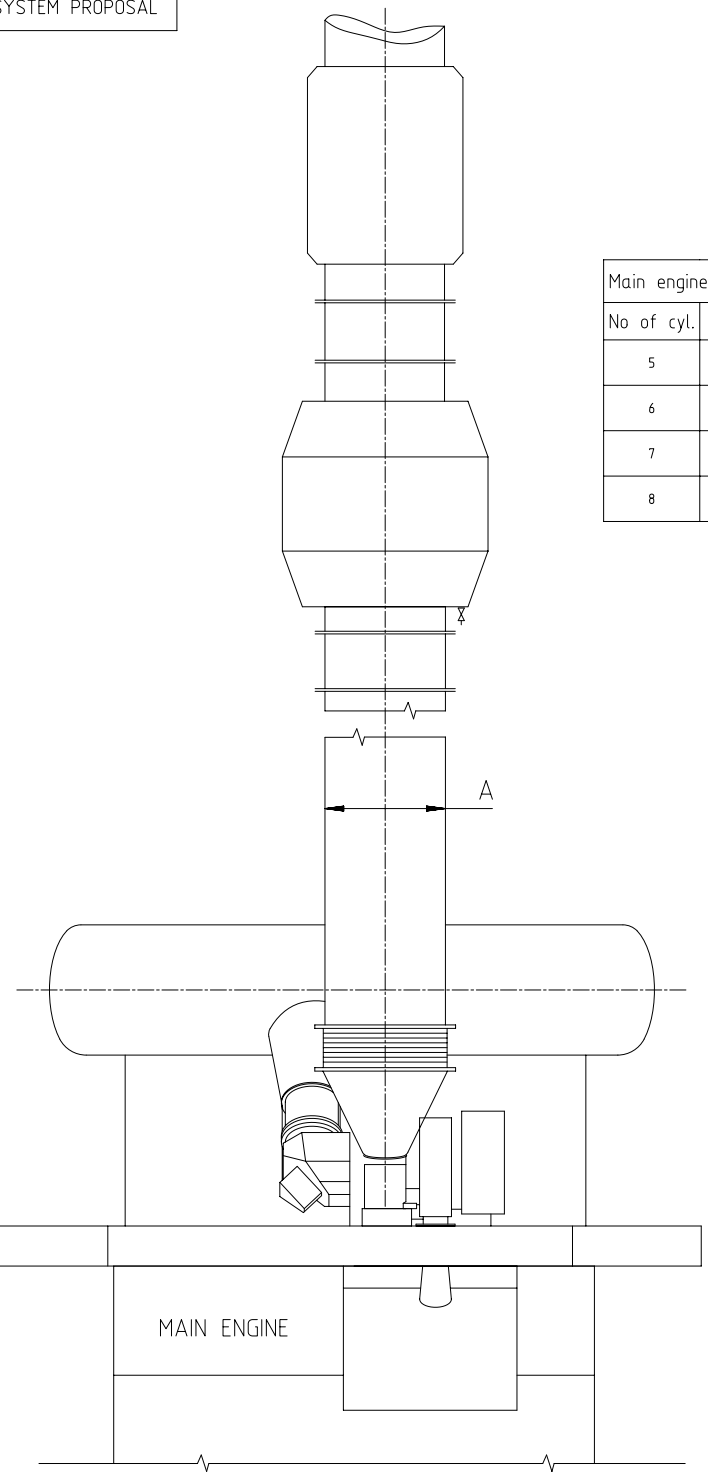


- 71) OUTLET - Exhaust gas turbocharger
 - B) - Exhaust gas temperature and volume flow: according to GTD
 - The total back pressure of the exhaust gas system must be kept in the admissible range of:
Design maximum (new condition) without exhaust gas treatment system: 30 mbar
Design maximum (new condition) with exhaust gas treatment system: 60 mbar

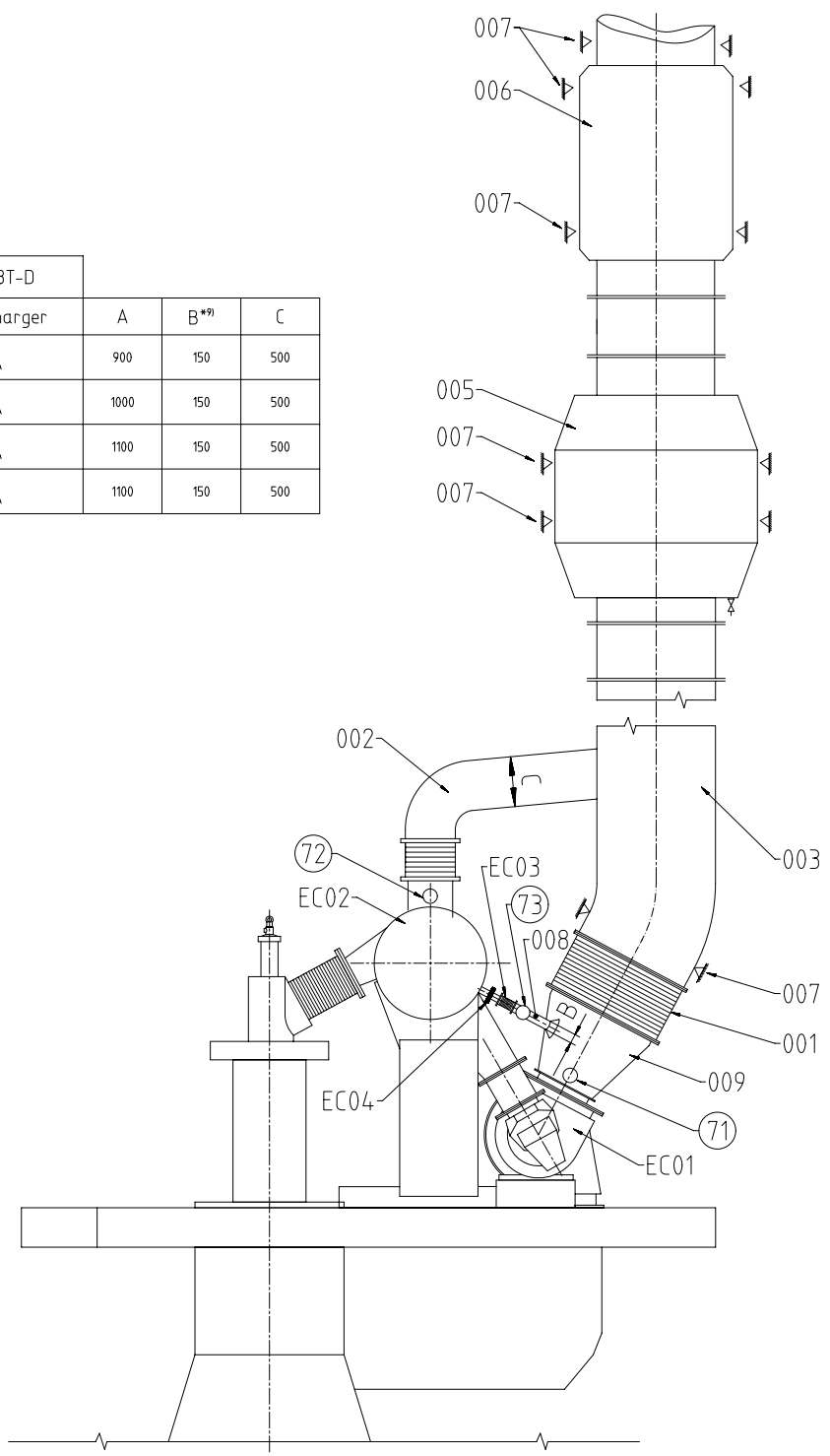
Operational maximum (fouled condition) without exhaust gas treatment system: 50 mbar
Operational maximum (fouled condition) with exhaust gas treatment system: 80 mbar
 - Pipe dimensions laid out according to the recommended gas velocities provided in the the Marine Installation Manual (MIM) and by GTD.
 - The exhaust piping must be arranged in a way to avoid gases from accumulating.
 - The piping layout must consider the thermal expansion and vibration from turbocharger (TC) and main engine (ME). Thermal expansion of the ME to be calculated according to the formula in MIM, TC specific thermal expansion are provided by the TC supplier.
 - Supports (fixation points) for carrying piping and exhaust gas system components deadweight must be installed in sufficient size and amount. Inadmissible tensions in the piping and forces acting on the turbocharger are not acceptable.
 - Exhaust gas pipes of several engines must not be connected.
 - Drains in adequate size and amount must be installed in the exhaust gas piping.
 - When the noise level on the bridge wing exceeds the class requirement (normally 60 - 70 dB(A)) a silencer must be applied.

Free space for lic.							Q-Code XXXXXX	Main Drw.		
							Standard ISO; JIS			
Modif.	A	EAAD089374	11.05.2018	B	EAAD090105	12.11.2018				
		Number	Drawn date		Number	Drawn date				
		Product 5-8RT-flex48T-D		Exhaust System with one turbocharger						
Units	mm kg	NX		Basic Material			Net Weight 0,001			
SURFACE PROTECTION SEE GROUP 0344		Made	23.01.2018	dk1021	DH.Kim		Scale -	Size A3	Page 1/2	Material ID PAAD283800
TOLERANCING PRINCIPLE ISO8015		Chkd	14.02.2018	wva008 Wang		Design Group	9726		Rev. B	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	28.02.2018	mhu019 Hug		Drawing ID	DAAD096535			

SYSTEM PROPOSAL



Main engine RT-flex48T-D				
No of cyl.	Turbocharger	A	B*9)	C
5	1 x A165-L 1 x MET53MA	900	150	500
6	1 x A170-L 1 x MET53MA	1000	150	500
7	1 x A170-L 1 x MET53MA	1100	150	500
8	1 x A170-L 1 x MET60MA	1100	150	500



- | Pos. | SYSTEM COMPONENTS *1) |
|------|-------------------------------------|
| 001 | Compensator *4) |
| 002 | Exhaust gas by-pass line *8) |
| 003 | Exhaust gas pipe *12) |
| 005 | Boiler *11) |
| 006 | Silencer (with spark arrester) *10) |
| 007 | Support *6) |
| 008 | Waste gate pipe |
| 009 | Transition piece *7) |
-
- | Pos. | ENGINE CONNECTIONS *2) |
|------|--|
| (71) | OUTLET - Exhaust gas turbocharger |
| (72) | OUTLET - Exhaust gas by-pass |
| (73) | OUTLET - Exhaust gas manifold waste gate |
-
- | Pos. | ENGINE COMPONENTS *3) |
|------|--------------------------------|
| EC01 | Turbocharger |
| EC02 | Exhaust gas manifold |
| EC03 | Waste gate compensator *4) *9) |
| EC04 | Waste gate valve |
- Remarks:
- Drain plugs and drain cocks to be installed where necessary.
 - *1) Refer to the "Pipe Connection Plan" for the execution and location of the engine pipe connections.
 - *2) To be delivered by external supplier and to be installed by the shipyard.
 - *3) To be delivered by the engine builder, i.e. already equipped on engine side.
 - *4) Dimension of expansion piece (compensator) must be defined by the shipyard taking into account the thermal growth of exhaust manifold and exhaust pipe. Vibrations of the pipe after the compensator must be lower than 45 mm/s RMS (root mean square).
 - *6) Installed as fixed or sliding type in accordance with the requirements. Final amount and position have to be defined by the shipyard under consideration of system layout and requirements based on installation specific calculation.
 - *7) Area ratio between outlet/inlet diameter = 1.1..1.6
Taper angle ≤ 40°
 - *8) Optional, needs just to be installed if requested by owner and class to ensure engine operation even after a turbocharger failure.
 - *9) Pipe dimension on engine side (before compensator) is DN100.
 - *10) Optional, installed as required to meet noise requirements.
 - *11) Optional.
 - *12) The radius of pipe bends should be not smaller than 1.5 x DN.

Free space for stamp	Q-Code XXXXXX	Main Drw.
Model EAAD089374/11.05.2018	Number EAAD090905	Drawn date 12.11.2018
Product 5-BRT-flex48T-D	Exhaust System with one turbocharger	
Units mm kg NX	Basic Material	Net Weight 0,001
Surface Protection SEE GROUP 0344	Made 23.01.2018 dki021 DH.Kim	Scale -
Tolerancing Principle ISO8015	Chd 14.02.2018 wwa008 Wang	Size A1
General Tolerances ACCORDING TO ISO2768-mK	Appd 28.02.2018 mhu019 Hug	Page 2/2
	Design Group 9726	Material ID PAAD283800
		Rev. B
		Drawing ID DAAD096535

MIDS WinGD RT-flex48T-D - EXHAUST SYSTEM (DG9726)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2018-05-25	DRAWING SET	First web upload
2019-01-15	DAAD096535	System drg - new revision

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