

The X62DF upgrade

WinGD X62DF-1.1 / X62DF-2.1

Contents

1	Introduction	1
1.1	Engine designation	2
1.2	Overview of the technical upgrades.....	2
2	Main engine parameters	3
2.1	X62DF-1.1/2.1 engine features.....	3
3	Timeline information.....	3
4	Interface with the WinGD X-DF2.0 technology (iCER system)	4
5	Appendix.....	5
A	Rating field comparison.....	5
A.1	WinGD portfolio engine rating field, with the new X62DF-1.1 and X62DF-2.1 (iCER) engine.....	5
B	Key engine figures	6
B.1	X62DF-1.1 Key dimensions and consumption figures	6
B.2	X62DF-2.1 Key dimensions and consumption figures	7

1 Introduction

WinGD, the marine industry's leading low-speed engine developer, introduces a new version of the popular X62DF engine model, which is prepared for the optional iCER (Intelligent Control by Exhaust Recycling) technology. The new engine will be designated either as the X62DF-1.1 (the non-iCER version) or the X62DF-2.1 (with the iCER application), highlighting a major step in the product development. The new engines follow the engine designation of WinGD. More details of the engine designation are available in the online [Low-speed Engines 2021 booklet](#).

The primary applications for the X62DF-1.1/2.1 engines follow the path of the X62DF, while introducing the new engine control system, WiCE (WinGD Integrated Control Electronics) which is a precondition for the optional iCER (X-DF2.0) interface. In addition, WinGD implemented several upgrades to the engine design with a strong focus on optimising the production costs.

1.1 Engine designation

The technology level is based on today's X62DF engine, shown in the 'X62DF-1.X' in the first digit. The second digit was chosen for the revision level, introducing the WiCE engine control system to the X62DF, and by these purposes becoming an 'X62DF-1.1'. In conjunction with the iCER (X-DF2.0 technology application), the engine will be named as the X62DF-2.1 version.

1.2 Overview of the technical upgrades

The X62DF-1.1/2.1 engines contain several design upgrades which were already validated on other X-DF engines, along with some enhancements based on service experience learnings. Some of these include, for example:

- WinGD's new control system WiCE
- The new bedplate (lightweight) flexible main bearing girder design, and a shorter thrust section which reduces the overall engine length
- A compact supply unit from the X62-S engine
- A modular scavenging concept
- Several smaller updates (not listed in detail here)

Table 1-1: Comparison of the new X62DF engine executions

Engine name	X62DF-1.1	X62DF-2.1
Available cylinder numbers	5 to 8	5 to 7 ^{*)}
Rating field	Full size (e.g. as X62DF)	Full size (e.g. as X62DF)
Bedplate concept	Flexible main bearing girders, plus a shorter thrust section, resulting in reduced total engine length (approx. 300 mm)	Flexible main bearing girders, plus a shorter thrust section, resulting in reduced total engine length (approx. 300 mm)
Engine control system	WiCE	WiCE
Supply Unit (SU) concept	Compact X62-S based SU with small size fuel pumps	Compact X62-S based SU with small size fuel pumps
Fuel gas supply system	GVU or iGPR	GVU or iGPR
Integrated Cylinder lubricant Auto Transfer (iCAT) system	Optional	Optional
iCER (X-DF2.0) application	No	Yes

^{*)} For non-iCER versions, the 5- to 8-cylinder engines can be selected. For iCER versions, the 5- to 7-cylinder engines, with one turbocharger, can be selected

2 Main engine parameters

The X62DF-1.1 rating field will remain with the same power output and maximum cylinder pressure (200 bar) as the X62DF. The X62DF-1.1 will be available with 5 to 8 cylinders, while the X62DF-2.1 will be offered with 5 to 7 cylinders. Optimisation for the key components of the engine structure such as a shorter thrust section, a smaller supply unit and an adopted gear drive have been implemented.

2.1 X62DF-1.1/2.1 engine features

For the X62DF-1.1/2.1 engine launch, the performance figures of the X62DF will be used. These figures will be updated in one of the next GTD releases (expected late 2021-Q1), after having evaluated the full potential from a higher compression ratio concept.

Table 2-1: X62DF-1.1/2.1 summary values for maximum continuous rating

X62DF-1.1/2.1 rating field	R1	R2	R3	R4
rpm	103	103	80	80
kW / cylinder	2385	1985	1850	1540

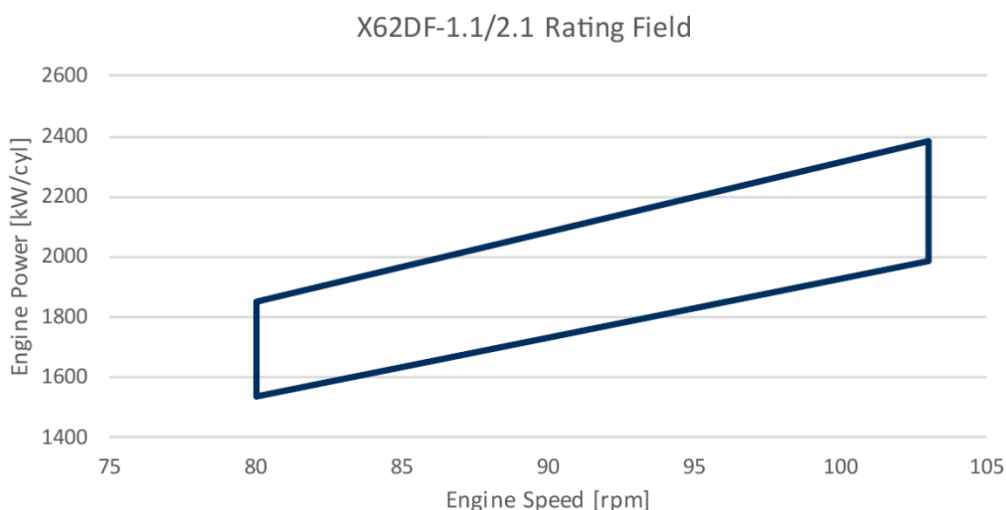


Figure 2-1: The layout field of both the X62DF-1.1 (5 to 8 cylinders) and the X62DF-2.1 (5 to 7 cylinders).

3 Timeline information

The first engine shop test is targeted for 2022-Q2 with delivery expected to be in early 2022-Q3. The first cylinder configuration planned will be a 7-cylinder standard execution. Both the X62DF-1.1 and the X62DF-2.1 will have the same drawing schedule.

Table 3-1: Project planning tools availability

Engine	X62DF-1.1	X62DF-2.1
GTD	2021-03	
MIM	2021-03	
MIDS	2021-03	
OM, MM, SPC	Subject to order	2022-06

4 Interface with the WinGD X-DF2.0 technology (iCER system)

The engine upgrades introduced with the X62DF-1.1 are fully compatible with the optional X-DF2.0 technology that includes the introduction of the iCER system. Since several design groups are affected this must be checked in detail then.

The engine naming follows the concept mentioned in the Introduction part of this document.

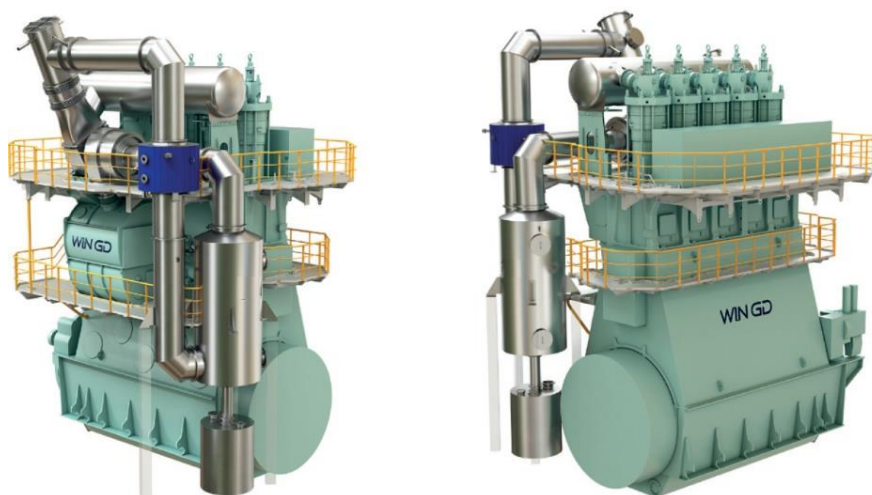
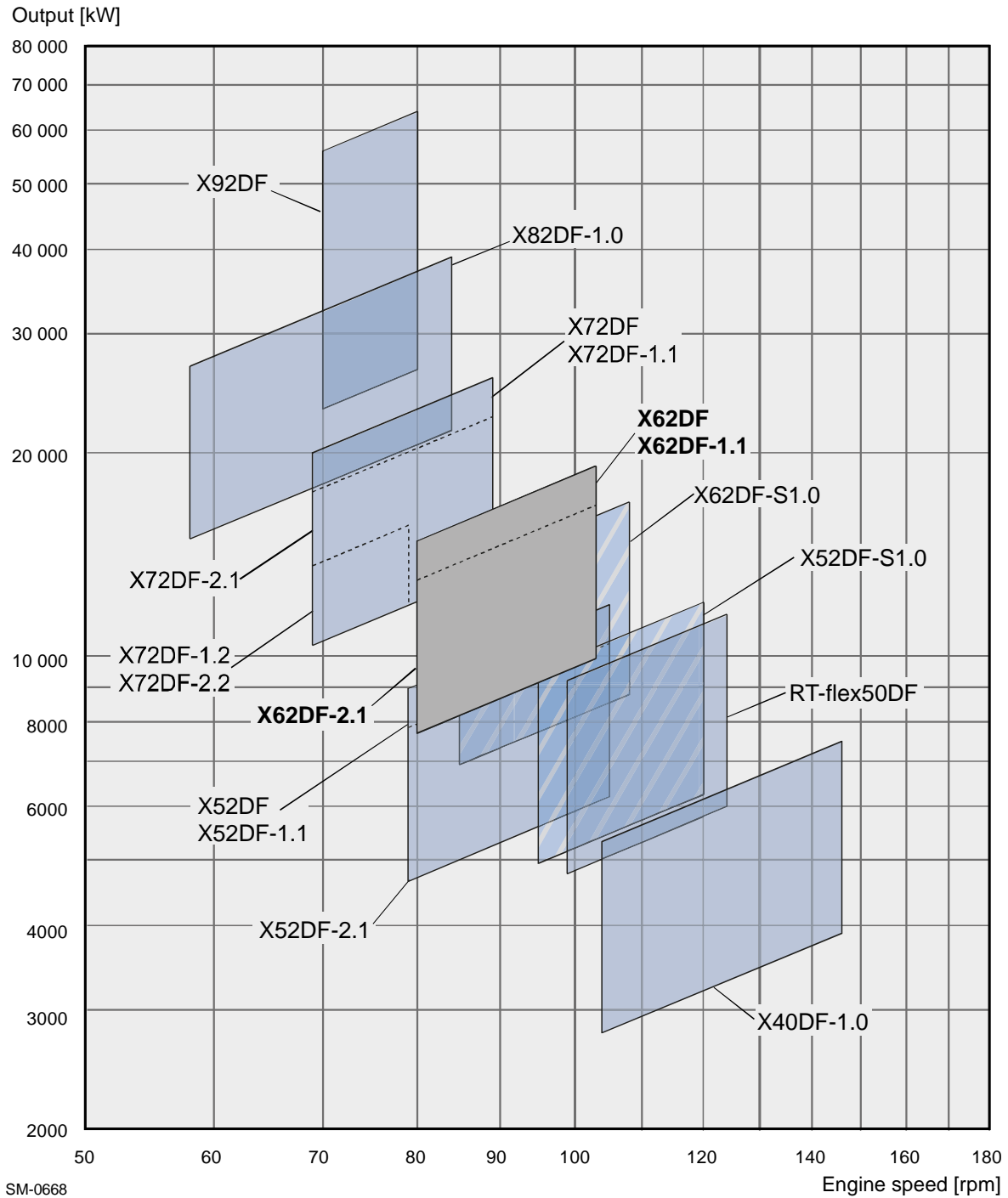


Figure 4-1: Example of an iCER system arrangement

5 Appendix

A Rating field comparison

A.1 WinGD portfolio engine rating field, with the new X62DF-1.1 and X62DF-2.1 (iCER) engine



B Key engine figures

B.1 X62DF-1.1 Key dimensions and consumption figures

Note: Data will be updated in 2021-03

X62DF-1.1

IMO Tier III in gas mode

Cylinder bore	620 mm
Piston stroke	2 658 mm
Speed	80–103 rpm
Mean effective pressure at R1	17.3 bar
Stroke / bore	4.29

RATED POWER, PRINCIPAL DIMENSIONS AND WEIGHTS

Cyl.	Output in kW at				Length A mm	Weight tonnes
	103 rpm	80 rpm				
	R1	R2	R3	R4		
5	11 925	9 925	9 250	7 700	6 700	318
6	14 310	11 910	11 100	9 240	7 810	370
7	16 695	13 895	12 950	10 780	8 915	428
8	19 080	15 880	14 800	12 320	10 020	475

Dimensions (mm)	B	C	D	G
	F1	F2	F3	
	4 200	1 360	9 580	
	11 775	11 775	10 950	2 110

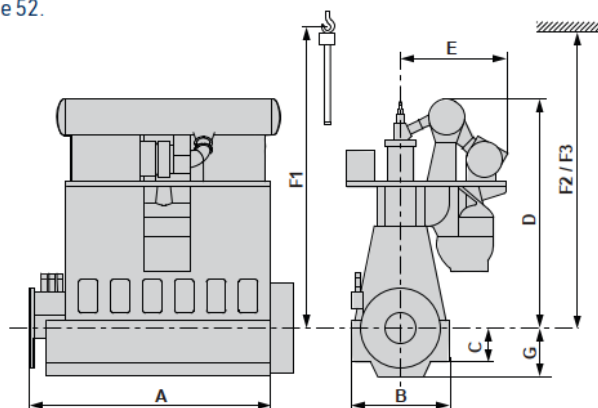
BRAKE SPECIFIC CONSUMPTIONS IN GAS MODE

Rating point		R1	R2	R3	R4
BSEC (energy)	kJ/kWh	7 167	6 928	7 269	7 026
BSGC (gas)	g/kWh	142.5	137.5	144.5	139.5
BSPC (pilot fuel)	g/kWh	1.0	1.2	1.0	1.2

BRAKE SPECIFIC FUEL CONSUMPTION IN DIESEL MODE

Rating point		R1	R2	R3	R4
BSFC (diesel)	g/kWh	182.0	180.0	182.0	180.0

For definitions see page 52.



B.2 X62DF-2.1 Key dimensions and consumption figures

Note: Data will be updated in 2021-03

X62DF-2.1

IMO Tier III in gas mode

Cylinder bore	620 mm
Piston stroke	2 658 mm
Speed	80-103 rpm
Mean effective pressure at R1	17.3 bar
Stroke / bore	4.29

RATED POWER, PRINCIPAL DIMENSIONS AND WEIGHTS

Cyl.	Output in kW at				Length A mm	Weight tonnes
	103 rpm	80 rpm				
	R1	R2	R3	R4		
5	11 925	9 925	9 250	7 700	6700	318
6	14 310	11 910	11 100	9 240	7810	370
7	16 695	13 895	12 950	10 780	8915	428

Dimensions (mm)	B	C	D	G
	4 200	1 360	9 580	
	F1	F2	F3	
	11 775	11 775	10 950	2 110

BRAKE SPECIFIC CONSUMPTIONS IN GAS MODE (FIGURES TO BE UPDATED)

Rating point		R1	R2	R3	R4
BSEC (energy)	kJ/kWh	7 036	6 797	7 139	6 895
BSGC (gas)	g/kWh	139.9	134.9	141.9	136.9
BSPC (pilot fuel)	g/kWh	1.0	1.2	1.0	1.2

BRAKE SPECIFIC FUEL CONSUMPTION IN DIESEL MODE (FIGURES TO BE UPDATED)

Rating point		R1	R2	R3	R4
BSFC (diesel)	g/kWh	179.2	173.2	181.2	177.2

For definitions see page 52.

