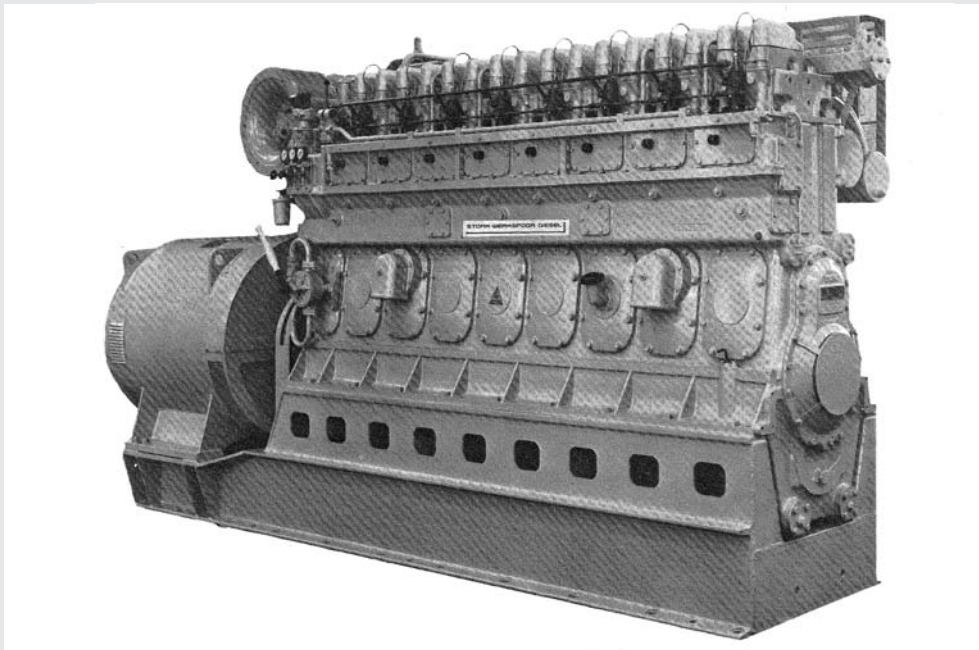


R210

79-800 kW at 500-900 min⁻¹

TOTAL SERVICE



WÄRTSILÄ ENGINES

CHARACTERISTICS

- Medium speed 3-, 4-, 5-, 6- and 8-cylinder in-line engines.
- Turbocharged and intercooled versions for the 6- and 8-cylinder engines.
- Four stroke, Ricardo swirlchamber with 1-hole fuel injection technology.
- The crankcase consists of bedplate and cylinder block.
- Cylinder head with interchangeable exhaust and inlet valves, one of each per cylinder.
- Counter-clockwise (standard) or clockwise rotation.

BENEFITS

- Easy maintenance and long component life.
- Low fuel oil consumption.
- Low lubricating oil consumption.
- Reliable and long life.
- Designed for operation on heavy fuel oil with specifications meeting ISO 8217:2005(E), ISO-F-RMH 700.



ENGINE DESCRIPTION

Bedplate	Rigid U-shape bedplate, which is made of cast iron.
Cylinder block	The cylinder block is made of cast iron, incorporating the camshaft casing and individual cylinder water jackets. Bedplate and cylinder block are pressed together by tie rods.
Crankshaft	The one-piece crankshaft is made of forged steel. Counterweights are fitted on each crank web. The crankshaft is amply dimensioned, which makes it possible to take off a certain amount of power at the non-flywheel side.
Torsional vibration damper	If required, a torsional vibration damper is fitted at the free end of the engine.
Cylinder liner	The cylinder liner is made of special, pearlitic cast iron.
Connecting rod	The connecting rod is made of high-tensile steel forging.
Piston	The one-piece piston consists of cast iron and has 5 piston rings and an oil scraper ring. The piston pin is of the floating type. The piston is oil cooled.
Cylinder head	The cylinder head is made of cast iron. The cylinder head is provided with one exhaust and one inlet valve. These valves are interchangeable. It also accommodates a fuel injector and a starting air valve. Rotocaps can be fitted on the exhaust valves.
Camshaft	The camshaft with hardened steel cams is gear driven.
Injection pump	Each cylinder has an individual fuel pump operating at relatively low injection pressure.
Governor	The engine has a governor of the hydraulic type with pneumatic or electric speed setting device.
Fuel system	The fuel injectors of one-hole type inject at relatively low pressure.
Lubricating oil system	The crankshaft, main bearings, connecting rod bearings, pistons, gear train, camshaft bearings, inlet valve seats, camshaft with valve mechanism and fuel pumps are pressure lubricated by a circulating pump. The sump serves as lube oil tank. A second pump can be fitted in case of a dry sump system.
Starting system	The engine is started by compressed air via the starting air valve on each cylinder.
Cooling system	The cooling water system comprises a low temperature (LT) circuit and a high temperature (HT) circuit. The LT-system may be seawater cooled.
Exhaust gas system	A casing with heat-insulating materials is mounted around the exhaust gas piping from the cylinders to the turbocharger.
Charge air system	Charge air coolers are applied on engines with 'K' in the engine type designation.
Turbocharging	Engines with 'o' in the type designation have a turbocharger, located at flywheel side. Cleaning devices for compressor and turbine side of the turbocharger are applied at HFO operation.
EIAPP	The engine can be issued with an EIAPP certificate if it complies with the NO _x Technical Code according IMO regulations MARPOL 73/78 - annex VI.

TECHNICAL DATA

TECHNICAL DATA						
Engine type		(A/B)R213	(A/B)R214	AR/BR(o)215 & RHo215(K)	AR(o)/BR(o)/ ABR(o)216(K) & DR(o)/RHo216(K)	AR(o)/BR(o)/ ABR(o)218(K) & DR(o)/RHo218(K)
Model		in-line	in-line	in-line	in-line	in-line
Number of cylinders		3	4	5	6	8
Bore / stroke	mm	210 / 300	210 / 300	210 / 300	210 / 300	210 / 300
Displacement	l	31.2	41.6	52	62.4	83.2
Direction of rotation		Clockwise or counter-clockwise				
Maximum power ratings						
Engine speed	min ⁻¹	600 - 750	600 - 750	600 - 750	550 - 900	500 - 900
Engine output (MCR ¹⁾)	kW	79 - 124	124 - 188	115 - 331	191 - 650	221 - 800
Mean effective pressure	bar	6.2 - 6.5	6.2 - 6.5	6.2 - 6.5	6.2 - 12.4	6.2 - 12.4
Mean piston speed	m/s	7.2 - 9	7.2 - 9	7.2 - 9	7.2 - 9	7.2 - 9
Specific fuel consumption ²⁾	g/kWh	231	231	231	238	231
Lubricating oil consumption ³⁾	l/h	0.75	0.75	0.75	0.75	1.0

1) Maximum Continuous Rating.

2) According to ISO 3046/1, lower calorific value 42,700 kJ/kg, at nominal engine speed. Tolerance +5%.

3) Lubricating oil consumption at 100% load. Tolerance approximately 25%.

A = First design.

B = Second design.

D = Third design.

H = Turbocharger (high pressure) mounted on the engine.

o = Turbocharger mounted on the engine.

K = Charge air cooler mounted on the engine.

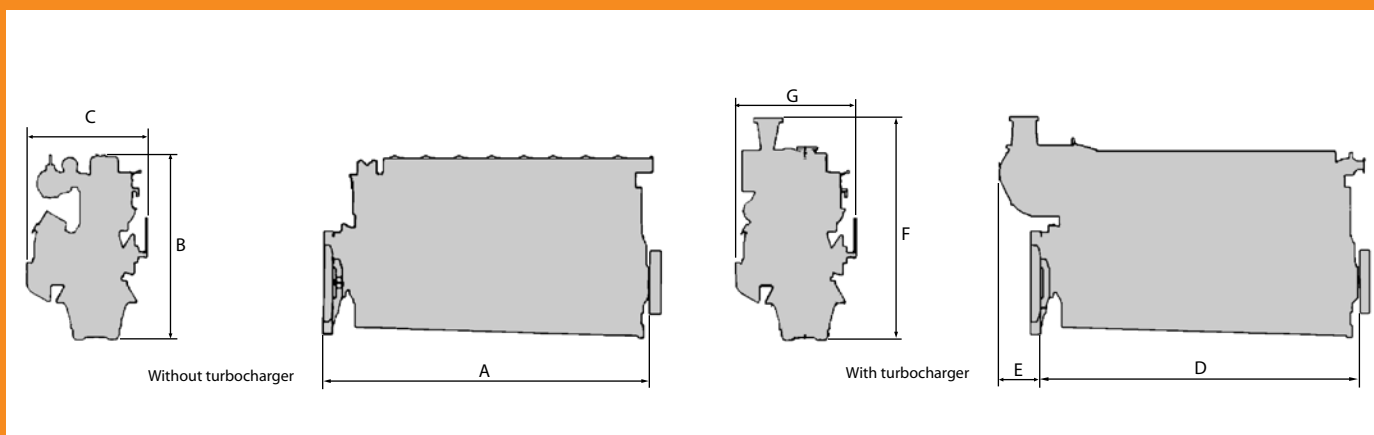
R = Ricardo Swirl chamber.

Note:

The values given in this document are for information purposes only and not binding.



DIMENSIONS



PRINCIPAL ENGINE DIMENSIONS (mm) AND WEIGHTS (t)

Engine type	A	B	C	D	E	F	G	Weight
(A/B)R213	1713	1975	1205	-	-	-	-	4.2 - 4.3
(A/B)R214	2053	1975	1205	-	-	-	-	5.1
AR/BR(o)215 & RHo215(K)	2415	1975	1205	2384	580	2280	1300	5.8 - 6.2
AR(o)/BR(o)/ABR(o)216(K) & DR(o)/RHo216(K)	3083	1990	1290	2663	420	2322	1290	6.5 - 7.6
AR(o)/BR(o)/ABR(o)218(K) & DR(o)/RHo218(K)	3813	1990	1290	3343	470	2410	1290	7.9 - 9.6

Values informative

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