

1 System data

Hydraulic oil consumers

	Design capacity			Hydraulic data		
Consumers	m³/h	mlc	kg/dm ³	cSt	l/min	bar
12 of Cargo pumps SD300	1250	125	0,75	1,0	1081	243
2 of Slop pumps SD200	500	125	0,75	1,0	573	188
1 of Residual pump SD100	100	125	0,75	1,0	133	179
1 of Portable pump TK150	300	50	0,75	1,0	197	189 (B)
2 of Ballast pumps SB400	1500	35	1,025	1,0	670 (C)	198 (C)
1 of TC pump MA150/200	250	120	1,025	1,0	440	168

Hydraulic oil supply

5 of Electric hydraulic power packs	5 x 820 l/min	= 4100 l/min / 273 bar
3 of Diesel hydraulic power packs	3 x 820 l/min	= 2460 l/min / 273 bar
Total hydraulic oil supply:		= 6560 l/min / 273 bar

Simultaneous operation (design)

6 of Cargo pumps SD300 (7500 m³/h - 125 mlc - 0,75 kg/dm³ - 1,0 cSt) = 6486 l/min / 273 bar

Simultaneous operation (examples)

Number and type of	Max. oil consumption	Number and type of	Max. oil supply
consumers	l/min	power packs	l/min
6 x SD300	6486	5 x Electric + 3 x Diesel	6560
4 x SD300	4324	3 x Electric + 3 x Diesel	4920
2 x SD300	2162	3 x Electric	2460
1 x SD300	1081	2 x Electric	1640
4 x SD300 + 2 x SD200	5470	4 x Electric + 3 x Diesel	5740
4 x SD300 + 2 x SD200	5886	5 x Electric + 3 x Diesel	6560
+ 1 x SB400			

Heat dissipation - Ventilation

Hydraulic power unit heat dissipation:	157 kW
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Recommended ventilation capacity for hydraulic power pack room: 15,2 m³/s

(Based upon inlet temperature 35°C, 10°C temperature rise, specific heat capacity 1,005kJ/kgK and gas constant 0,287kJ/kgK. Combustion air for diesel engines is also included).



2 Component data

Electric motors

	Main	Feed	Hydraulic oil	Fuel filter
Characteristics	power packs	pumps	transfer unit	separator
Number of motors	5	3	1	1
Protection (IP)	55	55	55	55
Power supply (V / Hz / Ph)	440 / 60 / 3	440 / 60 / 3	440 / 60 / 3	440 / 60 / 3
Rated power (see note below) (kW)	425	15,0	1,5	0,3
Required power (kW)	414	15,0	1,5	0,3
Speed at required power (rpm)	1787	3600	1750	1120
Current at required power (A)	666	24	2,84	1,2
Starting current (direct) (A)	3929	187	21,9	3,3
Efficiency at required power (%)	96,2	91	84,2	
Power factor (Cos φ) at required power	0,87	0,9	0,8	
Heating power at 220 V (W)	2 x 65	1 x 25	NA	
Insulation- / Temp. rise class	F/F	F/F	F/B	
Remarks			Cap.: 35 l/min	Fuel flow : 480 l/hour

Note: Maximum, allowable, power output for the type of electric motor at specified conditions, and given on the motor name plate. For design and dimensioning of electric starters, power cables etc., required power (i.e. power output required for the specific order(s)) and corresponding parameters to be used.

Diesel engines

Data based upon ambient temperature 25°C at 760 mmHg and relative humidity of 30%

Characteristics		
Number of engines		3
Power installed:	(kW)	426
Speed	(rpm)	1800
Type of cooling water		Fresh Water
Heat transfer rate	(kW)	284
Cooling water requirement (min./ max.)	(m³/h)	15-24
Cooling water inlet temperature	(°C)	36
Maximum cooling water inlet pressure	(bar)	4
Cooling water pressure drop (min./ max.)	(bar)	1,7 - 4
Specific fuel oil consumption	(g/kWH)	203
Intake air flow	(kg/min)	33
Exhaust gas flow	(kg/min)	32
Exhaust gas temperature	(°C)	496
Maximum exhaust gas back pressure	(mbar)	50
Air start:		
Air consumption for air starter at: 6,2 bar	(m³/s)	0,16
8,3 bar	(m³/s)	0,21
10,3 bar	(m³/s)	0,25
Maximum air inlet pressure	(bar)	10,3



Hydraulic oil coolers

Number of coolers	1	
Type of cooling water:	Fresh	n water
Heat transfer rate:	964	kW
Cooling water inlet temperature:	36	°C
Minimum required cooling water flow:	170	m³/h
Pressure drop at minimum required flow:	16,7	mwc (∆p design)
	10,5	mwc (Δp measuring, $p_1 - p_2$)
Maximum cooling water flow:	220	m³/h
Pressure drop at maximum flow:	28,4	mwc (∆p design)
	17,9	mwc (Δp measuring, $p_1 - p_2$)
Maximum cooling water inlet pressure:	40	mwc

For cooling water pressure drop curve (Δp measuring, $p_1 - p_2$), refer to the dimensional drawing for the cooling water accessories.

The cooling water accessories include a spectacle orifice in the cooling water outlet line, refer to the schematic diagram below.



The "free" bore of the spectacle orifice marked "adjustable" (the smallest of the two) to be modified at site during commissioning and used instead of the one assembled, if required for one of the following reasons:

- measured pressure drop (Δp measuring, $p_1 p_2$) is <u>outside</u> the min./ max. range given above.
- measured pressure drop (∆p measuring, p₁ p₂) is <u>within</u> the min./ max. range given above, but higher cooling water flow than minimum required makes disturbance of the cooling water balance onboard.

Cargo pumps

Inert gas/air consumption for one stripping sequence of each pump SD300: 7,5 Nm³ Inert gas/air consumption for one stripping sequence of each pump SD200: 3.5 Nm³ Inert gas/air consumption for one stripping sequence of each pump SD100: 1 Nm³ Required inert gas/air pressure: 6 - 7 bar Number of stripping sequences for each pump: 2 (max. 3) Duration of each stripping sequence SD300: 4 - 7 min Duration of each stripping sequence SD200: 4 - 7 min Duration of each stripping sequence SD100: 2 - 4 min



Portable winch

Air consumption: Required air pressure: 125 Nm³/h 6-7 bar

Cargo heaters

Design data for heating of HFO -	0 kg/m³ - 1,89 kJ/kg°C	
Characteristics		HE500/1000
Number of cargo heaters		12
Capacity	(kW)	1550
Heating medium data:		
Туре		Saturated steam
Pressure	(barg)	6
Inlet temperature (on heater)	(°C)	165
Outlet temperature	(°C)	95
Consumption	(kg/h)	2360
Cargo data:		
Туре		HFO
Inlet temperature (on heater)	(°C)	55
Viscosity at inlet temperature	(cSt)	370
Flow	(m³/h)	650
Pressure drop	(bar)	3,0



3 Hydraulic oil, Lubricants and Fuel

Hydraulic oil

For type of oil, see separate instruction. Total oil volume in the system except for storage/ drain tank, is approximately XX m³.

Lubricants

Bearing grease for electric motors:

Good quality lithium base or lithium complex grease. Base oil viscosity 100 - 140 cSt at 40°C. Consistency grade 2 or 3. Temperature range -30°C - +120°C continuously.

Lubricating oil for diesel engines:

For type of oil, see separate instruction. Lubricating oil type on engines at delivery:

Shell Rimula R4 15W 40 Total volume: 31 litres/ engine

Fuel

DMA low sulphur marine distillate fuel according to ISO 8217 to be used for diesel engines.

Others

Coolant for diesel engines:

For type of coolant, see separate instruction. Coolant type on engines at delivery:

Scania antifreeze and corrosion inhibitor. Total volume: 65 litres