

NOT LISTED SPRINKLER SOLUTIONS

4D24/A OPERATION DATASHEET – RAW WATER COOLED

ENGINE GENERAL DATA

THERMODYNAMIC CYCLE	DIESEL - 4 STROKE
ENGINE ARCHITECTURE	4 CYLINDERS, IN LINE
FIRING ORDER	1 - 3 - 4 - 2
AIR INTAKE	NA
COOLING	WATER
CHARGE AIR COOLING SYSTEM	N/A
COMPRESSION RATIO	17,5:1
INJECTION SYSTEM	MECHANICAL ROTARY PUMP
COMBUSTION	DIRECT INJECTION
ENGINE DISPLACEMENT	2.4 l
VALVES PER CYLINDER	2
INTAKE	1
EXHAUST	1
ROTATION (VIEWED FROM ENGINE FLYWHEEL)	CCW
ENGINE CRANKCASE VENTILATION SYSTEM	RECIRCULATED
ENGINE WEIGHT	240 kg

ENGINE PERFORMANCE

ENGINE SPEED [rpm]	NET POWER RATING [kW (cv) (1) (2) (3)]	FUEL CONSUMPTION RATE [l/h]
1500 rpm	25,1 (34)	7
1750 rpm	28,5 (38)	7,7
2000 rpm	32,2 (44)	8,8
2250 rpm	35,3 (48)	9
2500 rpm	36,8 (50)	10,5
2750 rpm	36,8 (50)	10,2
3000 rpm	36,8 (50)	10

(1) Power at flywheel according to 97/68 EC (without fan), after 50 hours running, 3% tolerance, fuel Diesel EN 590

(2) Power derating conditions: see chart below

(3) Performance evaluated with intake restrictions and exhaust backpressures values as shown.

EXHAUST SYSTEM

ENGINE SPEED [rpm]	EXHAUST MAX TEMPERATURE [°C]	MAX ALLOWABLE BACK PRESSURE [kPa]	EXHAUST GASES FLOW [kg/h]
1500 rpm	500	3	116
1750 rpm	590	3	126
2000 rpm	650	3	142
2250 rpm	720	3	162
2500 rpm	760	3	180
2750 rpm	770	3	180
3000 rpm	770	3	180

LUBRICATION SYSTEM

LUBRICATION OIL MINIMUM PRESSURE @ IDLE SPEED	0,7 bar
LUBRICATION OIL MAXIMUM PRESSURE @ RATED SPEED	4,5 bar
LUBRICATION OIL MAXIMUM TEMPERATURE	120°C
LUBRICATION CIRCUIT FULL CAPACITY	9,5 l

ELECTRIC SYSTEM

VOLTAGE	12V
ALTERNATOR	40A
STARTER MOTOR	2,3 kW
BATTERIES PER BANK	1
BATTERY CABLES MAX RESISTANCE	0,0013 ohm
BATTERY CABLES MIN ALLOWED SIZE (4)	
1 M TO 3 M	AWG 0
3 M TO 4 M	AWG 00
4 M TO 5 M	AWG 000
BATTERY CCA @ -18° C (5)	1000 A
RESERVE CAPACITY (5)	430 min - 180 Ah

(4) Length combination of positive and negative cables.

(5) Parameters evaluated according to SAE Standard J537.

AIR INDUCTION SYSTEM

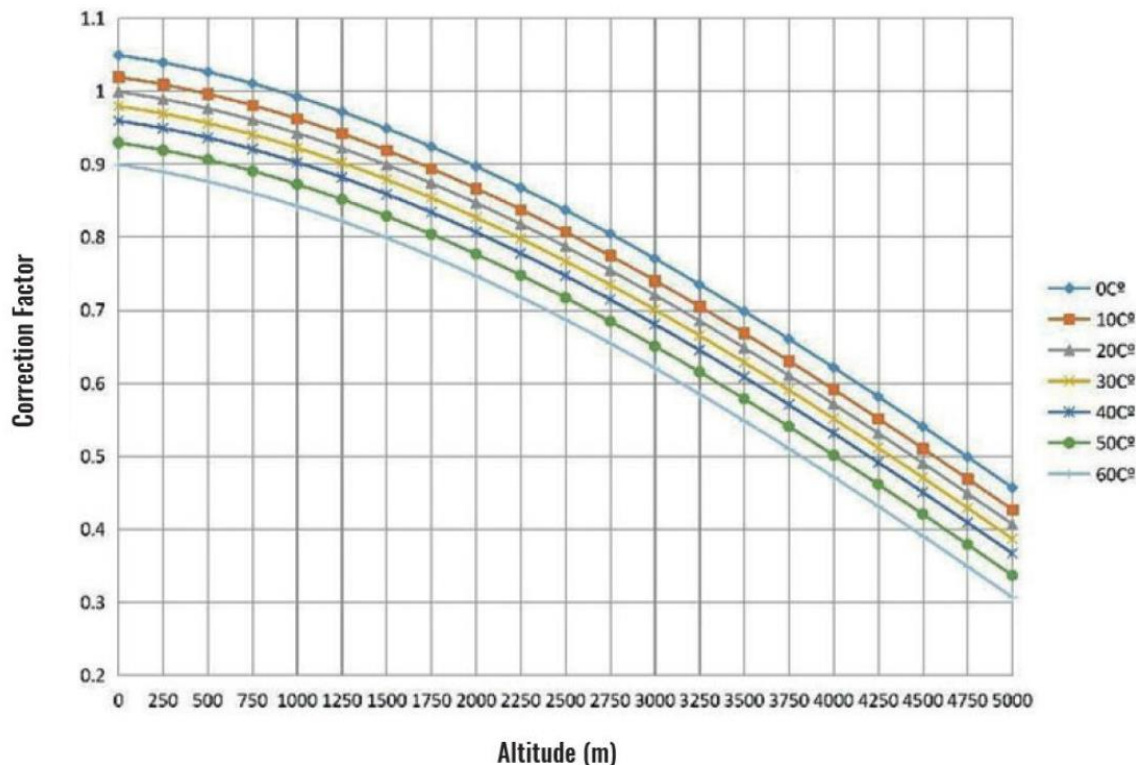
ENGINE SPEED [rpm]	COMBUSTION AIR FLOW [kg/h]	MAX INLET TEMPERATURE [°C]	MAX ALLOWED RESTRICTION (CLEAN FILTER) [kPa]	MAX ALLOWED RESTRICTION (DIRTY FILTER) [kPa]
1500 rpm	110	50	1	2
1750 rpm	120	50	1	2
2000 rpm	135	50	1	2
2250 rpm	155	50	1	2
2500 rpm	170	50	1	2
2750 rpm	170	50	1	2
3000 rpm	170	50	1	2

COOLING SYSTEM

ENGINE SPEED [rpm]	REJECTED HEAT [kW]	REQUIRED RAW WATER FLOW @ 15°C [l/min]	REQUIRED RAW WATER FLOW @ 38°C [l/min]	ENGINE RADIATED HEAT [kW]
1500 rpm	24	28	31	6
1750 rpm	27	30	33	6
2000 rpm	30	33	37	7
2250 rpm	31	35	40	8
2500 rpm	32	35	40	9
2750 rpm	32	35	40	10
3000 rpm	32	35	40	10

THERMOSTAT START OPENING 71°C
 FULL OPENING 83°C
 PRIMARY COOLANT TEMPERATURE RANGE 71-83°C
 PRIMARY COOLANT MAXIMUM TEMPERATURE 98°C
 PRIMARY COOLANT CAPACITY 11 l
 PRIMARY COOLANT PRESSURE (CAP) 0,7 bar
 SECONDARY CIRCUIT MAXIMUM PRESSURE 3 bar

POWER DERATING ACCORDING TO ALTITUDE AND ENVIRONMENTAL TEMPERATURE



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LIQUID HEATERS (OPTIONAL)

COOLANT EXTERNAL HEATER (39-49°C HYSTERESIS CYCLE)	750W – 230V	750W – 120V
COOLANT EXTERNAL HEATER (49-59°C HYSTERESIS CYCLE)	1500W – 230V	1500W – 120V
LUBRICATION OIL HEATER	350W – 230V	

FUEL SYSTEM

FUEL PUMP MAX INTAKE RESTRICTION	0 bar
MAX ALLOWABLE FUEL HEAD ABOVE FUEL PUMP	1 m
MINIMUM FUEL LINE INTERNAL DIAMETER	10 mm

ENGINE SELECTION CRITERIA

THIS ENGINE MUST BE SELECTED BY DETERMINING THE MAXIMUM POWER ABSORBED BY THE FIRE PUMP AT THE TOP OF THE APPROPRIATE IMPELLER CURVE AND ADD A 10% MARGIN TO THIS POWER REQUIREMENT. THIS VALUE NOW DETERMINES THE MINIMUM POWER REQUIREMENT FOR A FIRE PUMP DUTY.

STANDARD CONFIGURATION

SAE#4 FLYWHEEL HOUSING
 7,5" FLYWHEEL – z = 109
 DRY AIR FILTER
 FUEL FILTER
 LUBE OIL FILTER
 ENGINE RIGID SUPPORTS
 FUEL METAL CONNECTIONS
 HIGH WATER TEMPERATURE SWITCH AND SENSOR
 LOW OIL PRESSURE SWITCH AND SENSOR
 12V STARTER
 12V ALTERNATOR
 12V ENERGIZE TO STOP FUEL SOLENOID
 MANUAL ENGINE STOP

OPTIONS

SECONDARY COOLANT COOLING LOOP	EXHAUST COMPENSATOR
ENGINE CONTROL PANEL	COOLANT EXTERNAL HEATER
LUBE OIL 220V HEATER	LUBE OIL HEATER
EXHAUST MUFFLER	ENGINE WIRING
ETR STOP SOLENOID	CRANK MANUAL CONTACTORS
OIL DRAIN PUMP	EXHAUST MUFFLERS



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