

# Technical Data D1-30

## Rating

### General

4-stroke in-direct injected, diesel engine

|  |                           |              |
|--|---------------------------|--------------|
| Number of cylinders                            |                           | 3            |
| No of valves                                   |                           | 6            |
| Displacement, total                            | litres<br>in <sup>3</sup> | 1,13<br>69,1 |
| Firing order                                   |                           | 1-2-3        |
| Rotational direction, viewed from the front    |                           | Clockwise    |
| Bore   | mm<br>in                  | 77<br>3,03   |
| Stroke   | mm<br>in                  | 81<br>3,19   |
| Compression ratio                              |                           | 23,5:1       |
| Compression pressure at 240 rpm                | MPa<br>psi                |              |
| Maximum forward inclination:                   | °                         | 0            |
| Max. intermittent backward tilt while running: | °                         | 25           |
| Max. intermittent side tilt while running:     | °                         | 35           |
| Idling speed                                   | rpm                       | 850 ± 25     |
| Rated speed                                    | rpm                       | 3200         |
| Propeller selection range                      | rpm                       | 2800-3200    |
| Dry weight engine BT                           | kg<br>lb                  | 127<br>280   |

| Performance                                      |  | Rating | r/min | 1200  | 1400  | 1600  | 1800  | 2000  | 2200  | 2400  | 2600  | 2800  | 3000  | 3200 |
|--|--|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Crankshaft power 1), 5)                          |  | kW     | 7,5   | 9,5   | 11,2  | 12,8  | 14,7  | 16,4  | 17,8  | 18,5  | 19,3  | 20    | 20,9  |      |
|  |  | hp     | 10,2  | 12,92 | 15,23 | 17,41 | 19,99 | 22,3  | 24,21 | 25,16 | 26,25 | 27,2  | 28,42 |      |
| Propeller shaft power 1) (At full load)          |  | kW     | 7,2   | 9,12  | 10,75 | 12,29 | 14,11 | 15,74 | 17,09 | 17,76 | 18,53 | 19,2  | 20,06 |      |
|  |  | hp     | 9,792 | 12,4  | 14,62 | 16,71 | 19,19 | 21,41 | 23,24 | 24,15 | 25,2  | 26,11 | 27,29 |      |
| Propellershaft power at prop.load x <sup>3</sup> |  | kW     | 1,1   | 1,7   | 2,5   | 3,6   | 4,9   | 6,5   | 8,5   | 10,8  | 13,5  | 16,6  | 20,1  |      |
|  |  | hp     | 1,4   | 2,3   | 3,4   | 4,9   | 6,7   | 8,9   | 11,5  | 14,7  | 18,3  | 22,5  | 27,3  |      |
| Torque at crankshaft 2)                          |  | Nm     | 59,68 | 64,8  | 66,85 | 67,91 | 70,19 | 71,19 | 70,82 | 67,95 | 65,82 | 63,66 | 62,37 |      |
|  |  | lbf ft | 44    | 48    | 49    | 50    | 52    | 53    | 52    | 50    | 49    | 47    | 46    |      |
| Mean piston speed                                |  | m/s    | 3,2   | 3,8   | 4,3   | 4,9   | 5,4   | 5,9   | 6,5   | 7,0   | 7,6   | 8,1   | 8,6   |      |
|  |  | ft/s   | 10,6  | 12,4  | 14,2  | 15,9  | 17,7  | 19,5  | 21,3  | 23,0  | 24,8  | 26,6  | 28,3  |      |
| Effective mean pressure 2)                       |  | MPa    | 0,66  | 0,72  | 0,74  | 0,75  | 0,78  | 0,79  | 0,79  | 0,75  | 0,73  | 0,71  | 0,69  |      |
|  |  | psi    | 96,1  | 104,4 | 107,7 | 109,4 | 113,1 | 114,7 | 114,1 | 109,4 | 106,0 | 102,5 | 100,5 |      |

1) ISO 3046, fuel temp 40°C.

ISO 8665 (=SAE J 1228=ICOMIA 28-83)

2) At power according to 1).

3) If reverse gear is used, 4% in heat rejection will be added for its oil cooler.

4) Acc. to ISO 3744

5) At installed back pressure

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## Rating

### Lubricating system

|  |  |        |      |  |  |  |  |  |  |  |  |  |  |
|--|--|--------|------|--|--|--|--|--|--|--|--|--|--|
| Max oil volume excl. filters at following inclination: |  | litres | 3,5  |  |  |  |  |  |  |  |  |  |  |
|  |  | US gal | 0,92 |  |  |  |  |  |  |  |  |  |  |

### Fuel system

|   | Rating | r/min    | 1200  | 1400  | 1600  | 1800  | 2000  | 2200  | 2400  | 2600  | 2800  | 3000  | 3200  |
|---|--------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Specific fuel consumption 2)                  |        | g/kWh    | 275   | 266   | 260   | 258   | 257   | 257   | 258   | 260   | 261   | 264   | 270   |
|   |        | lb/hph   | 0,446 | 0,431 | 0,421 | 0,418 | 0,416 | 0,416 | 0,418 | 0,421 | 0,423 | 0,428 | 0,437 |
| Fuel consumption at prop. load x <sup>3</sup> |        | l/h      | 0,8   | 1,0   | 0,9   | 1,5   | 1,9   | 2,4   | 2,9   | 3,6   | 4,4   | 5,5   | 6,7   |
|   |        | US gal/h | 0,2   | 0,3   | 0,2   | 0,4   | 0,5   | 0,6   | 0,8   | 0,9   | 1,2   | 1,5   | 1,8   |
| Fuel consumption at full load                 |        | l/h      | 2,5   | 3,0   | 3,5   | 4,0   | 4,5   | 5,0   | 5,5   | 5,8   | 6,0   | 6,3   | 6,8   |
|   |        | US gal/h | 0,7   | 0,8   | 0,9   | 1,0   | 1,2   | 1,3   | 1,5   | 1,5   | 1,6   | 1,7   | 1,8   |

### Intake and exhaust system

|  | Rating | r/min      | 1200  | 1400  | 1600  | 1800  | 2000  | 2200  | 2400  | 2600  | 2800  | 3000  | 3200  |  |
|--|--------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.           |        | °C         | 407   | 441   | 463   | 476   | 507   | 530   | 523   | 540   | 537   | 522   | 511   |  |
|  |        | °F         | 765   | 826   | 865   | 889   | 945   | 986   | 973   | 1004  | 999   | 972   | 952   |  |
| Permitted back pressure in the exhaust line at rated speed.<br>(Installed back pressure)     |        | kPa        |       |       |       |       |       |       |       | Max   | 20    |       |       |  |
|  |        | psi        |       |       |       |       |       |       |       |       | 2,9   |       |       |  |
|  |        | kPa        |       |       |       |       |       |       |       | Min   |       |       |       |  |
|  |        | psi        |       |       |       |       |       |       |       |       |       |       |       |  |
| Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%. |        | m³/min     | 0,567 | 0,667 | 0,75  | 0,833 | 0,917 | 1     | 1,117 | 1,167 | 1,25  | 1,35  | 1,45  |  |
|  |        | cu.ft./min | 20,01 | 23,54 | 26,49 | 29,43 | 32,37 | 35,31 | 39,43 | 41,2  | 44,14 | 47,67 | 51,21 |  |
| Exhaust gas flow   |        | m³/min     | 1,45  | 1,75  | 2,017 | 2,267 | 2,567 | 2,817 | 3,067 | 3,217 | 3,4   | 3,55  | 3,65  |  |
|  |        | cu.ft./min | 51,21 | 61,8  | 71,22 | 80,05 | 90,64 | 99,47 | 108,3 | 113,6 | 120,1 | 125,4 | 128,9 |  |

### Cooling system

|   | Rating | r/min               | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
|---|--------|---------------------|------|------|------|------|------|------|------|------|------|------|------|
| Radiated heat in percent of crankshaft power.   |        | %                   | 13   | 12   | 12   | 13   | 14   | 14   | 13   | 12   | 14   | 16   | 16   |
|   |        |                     |      |      |      |      |      |      |      |      |      |      |      |
| Coolant heat rejection to HE, excl. oil- and aftercooler, in percent of crankshaft power.               |        | %                   | 138  | 128  | 122  | 116  | 112  | 111  | 110  | 113  | 112  | 113  | 117  |
|   |        |                     |      |      |      |      |      |      |      |      |      |      |      |
| Available pumphead of freshwater circulation pump. At least 70% must be utilized to get turbulent flow. |        | kPa                 | 27,2 | 32,1 | 37   | 41,8 | 46,8 | 51,7 | 56,6 | 61,6 | 66,7 | 71,7 | 76,5 |
|   |        | In H <sub>2</sub> O | 109  | 129  | 149  | 168  | 188  | 208  | 227  | 247  | 268  | 288  | 307  |
| Sea water pump flow.  |        | m³/h                | 1,1  | 1,2  | 1,3  | 1,3  | 1,4  | 1,6  | 1,7  | 1,8  | 2,0  | 2,1  | 2,2  |
|   |        | foot³/h             | 39   | 43   | 47   | 46   | 50   | 55   | 60   | 65   | 69   | 73   | 77   |
| Fresh water circulation pump flow   |        | m³/h                | 1,6  | 1,9  | 2,2  | 2,5  | 2,8  | 3,1  | 3,4  | 3,7  | 4,0  | 4,3  | 4,6  |
|   |        | foot³/h             | 58   | 68   | 78   | 89   | 99   | 110  | 120  | 131  | 141  | 152  | 162  |
| Max permissible temperature on fresh water circulation outlet from the engine                           |        | °C                  | 105  |      |      |      |      |      |      |      |      |      |      |
|   |        | °F                  | 221  |      |      |      |      |      |      |      |      |      |      |
| Coolant content engine, incl. heat exchangers and air cooler  |        | litres              | 4,1  |      |      |      |      |      |      |      |      |      |      |
|   |        | U.S. gal.           | 1,08 |      |      |      |      |      |      |      |      |      |      |

### Emissions

|                                    | Rating | r/min | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
|------------------------------------|--------|-------|------|------|------|------|------|------|------|------|------|------|------|
| Smoke at prop. load x <sup>3</sup> |        | *BSU  | 0,2  | 0,3  | 0,4  | 0,3  | 0,3  | 0,4  | 0,6  | 0,6  | 1,4  | 1,5  | 1,4  |

\*NB.! BSU are calculated values. Measured values are acc. to ISO 10054 in FSN units

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ISO 8665 (=SAE J 1228=ICOMIA 28-83)

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3) If reverse gear is used, 4% in heat rejection will be added for its oil cooler.

4) Acc. to ISO 3744

5) At installed back pressure