



Air Cooled Diesel Engines

2.8-10 kw | 3.8-13.6 hp

# Single Cylinder Air-Cooled Diesel Engines

## Standard Equipment

- Recoil starter with manual decompression system
- Forced air-cooling by flywheel fan
- Iron air shroud
- Iron fuel tank
- In-tank pick-up mesh fuel strainer
- In-tank fuel filter
- Fuel cock
- Fuel tank drain plug
- Dry air cleaner
- Muffler with guard
- Manual speed and stop control panel
- Forced lubrication with oil pump
- Mesh oil strainer
- Oil dipsticks on both sides for easy checks
- Oil drain plug
- Internal dynamic balancer
- Die-cast aluminum alloy engine block with  
-integrated boron iron cylinder liner
- Die-cast aluminum alloy cylinder head
- Built-in rigid feet
- Top lifting eye
- Owner's manual
- Spare parts catalog
- 18 months warranty



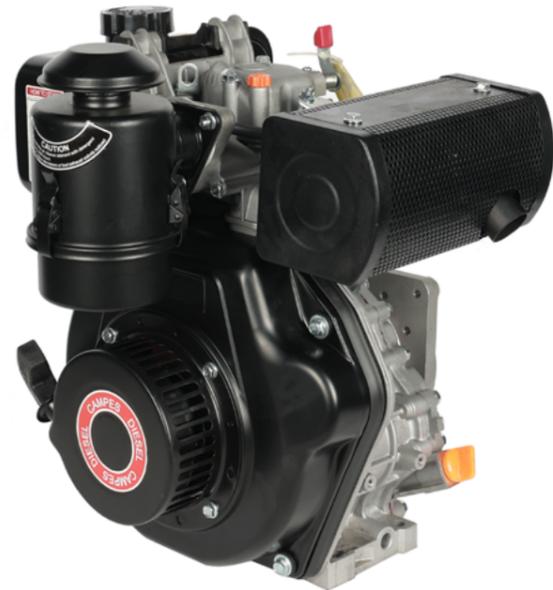
# Single Cylinder Air-Cooled Diesel Engines

## Accessories on demand

- Manual rope starter (wrap-rope type)
- Recoil starting with automatic decompression system
- Plastic air shroud
- Plastic fuel tank
- Plastic fuel tank upper support
- External fuel filter
- Oil bath or/and lateral air cleaner
- Lateral muffler with guard
- Stainless air intake pipe (w/o air filter, w/ air intake filter gasket)
- Stainless exhaust pipe (w/o muffler)
- Plastic protection top cover
- Plastic protection top cover support base
- Half speed cam driven option
- Power take-offs with flanging and special shaft
- Glow plug on air intake manifold
- Electric start 12 V / 24 V
- Charging alternator with voltage regulator 12 V / 24 V
- Key switch
- Stop through electrovalve
- Oil level sensor
- Oil drain plug extension
- EU STAGE V emission compliance

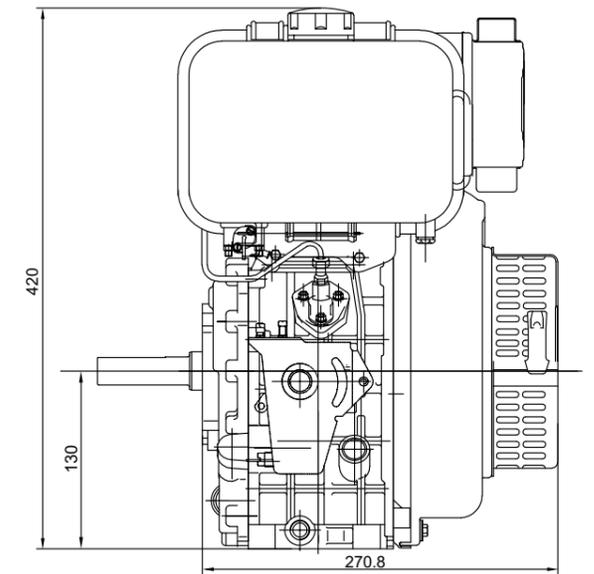
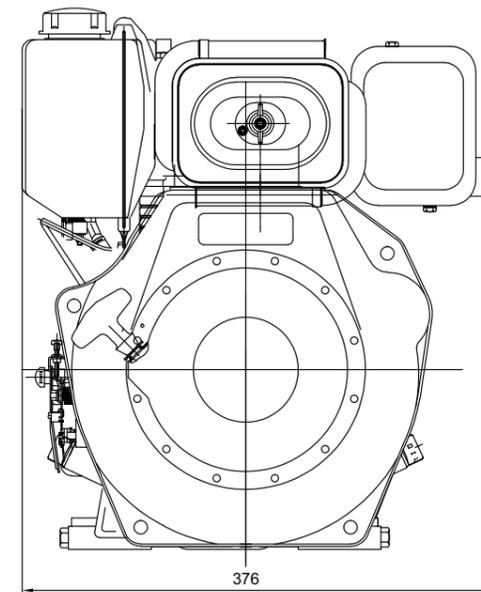


# D170F



## Data

Dimension (mm)

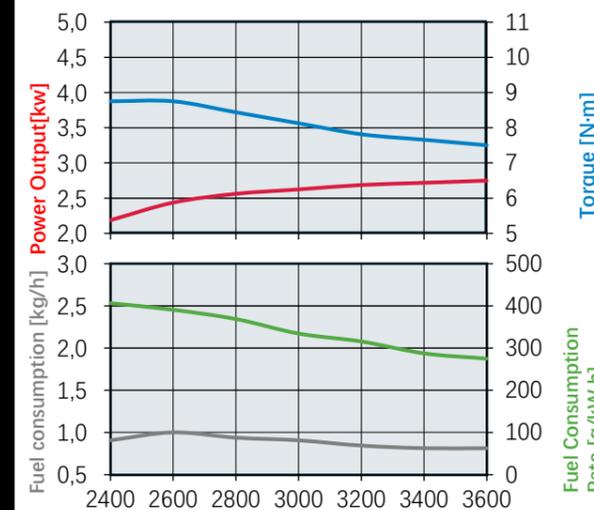


| QUICK SPECIFICATIONS             | D170F                             |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 2.8 (3.8) @3600                   |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.211                             |
| Cooling                          | Air-Cooled                        |

## Performance curves

(ACCORDING TO ISO 14396)

D170

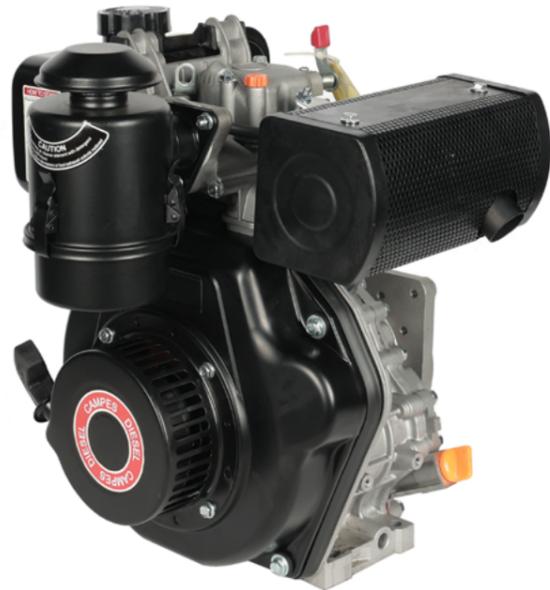


The information described in Principal Engine Specifications is for a "standard" engine. To obtain the information for the engine installed in your driven machine, please refer to the manual provided by the driven machine manufacturer.

2. Engine rating conditions are as follows (SAE J1349, ISO 3046/1):

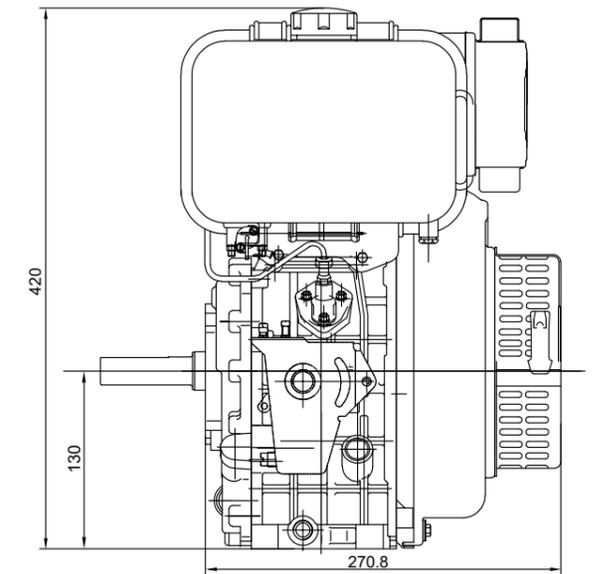
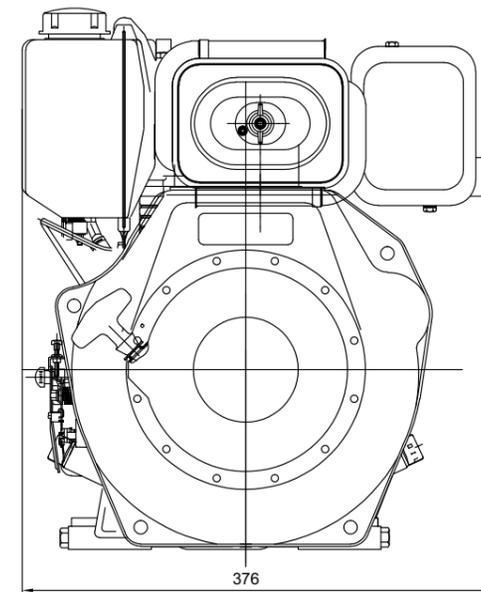
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D173F



## Data

Dimension (mm)

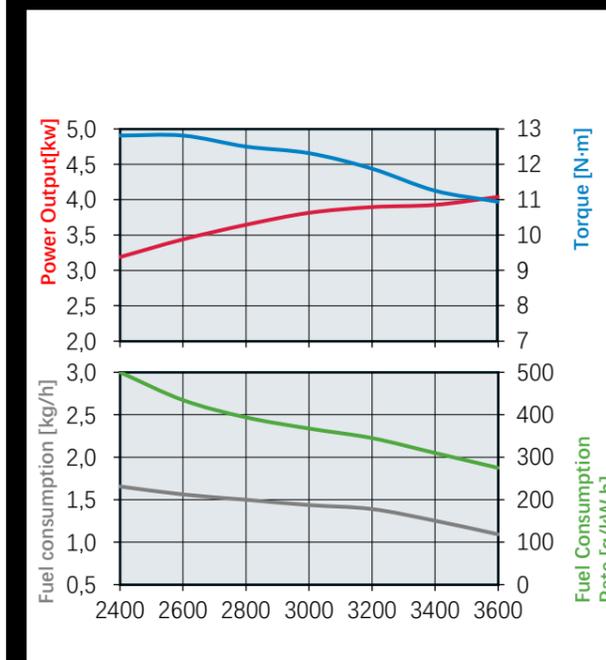


| QUICK SPECIFICATIONS             | D173F                             |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 4.05(5.5)@3600                    |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.247                             |
| Cooling                          | Air-Cooled                        |

## Performance curves

(ACCORDING TO ISO 14396)

D173

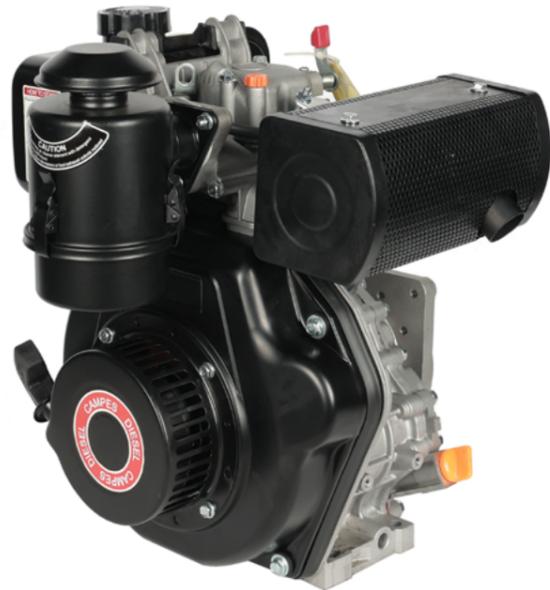


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2. Engine rating conditions are as follows (SAE J1349, ISO 3046/1):

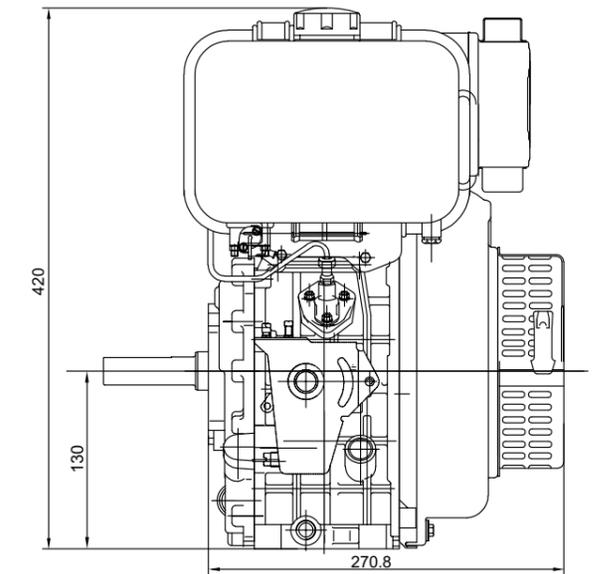
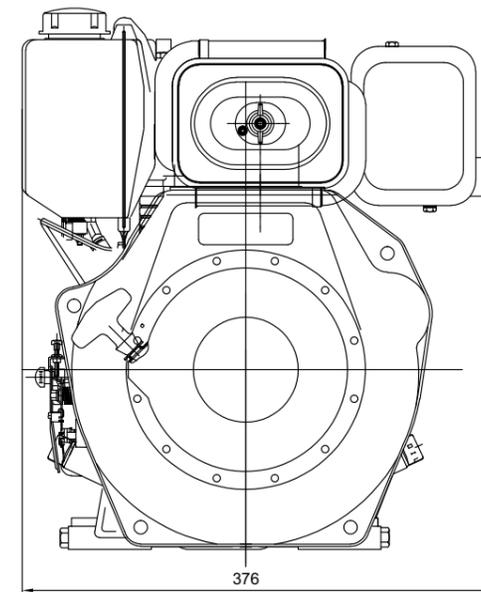
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D178F



## Data

Dimension (mm)

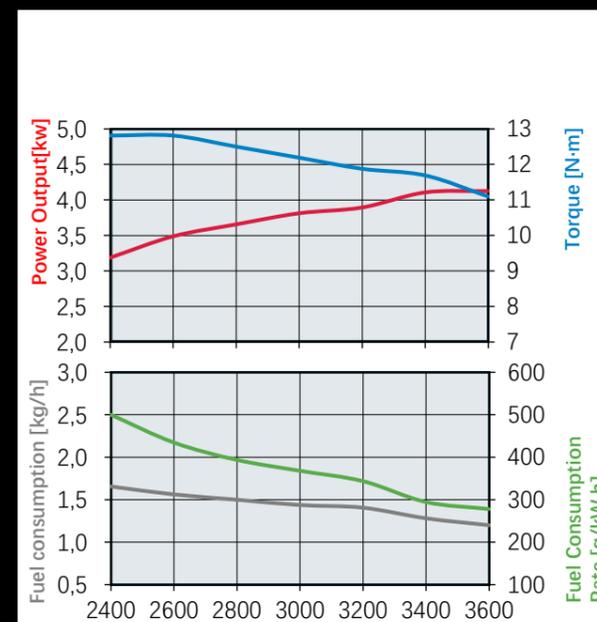


| QUICK SPECIFICATIONS             | D178F                             |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 4.1(5.5)@3600                     |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.296                             |
| Cooling                          | Air-Cooled                        |

## Performance curves

(ACCORDING TO ISO 14396)

D178F

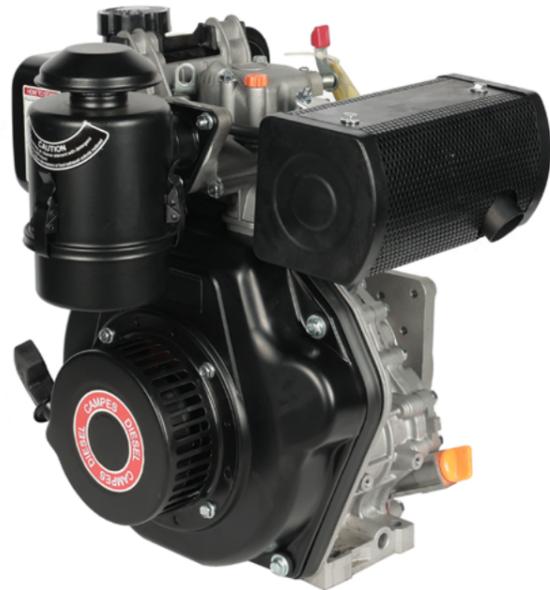


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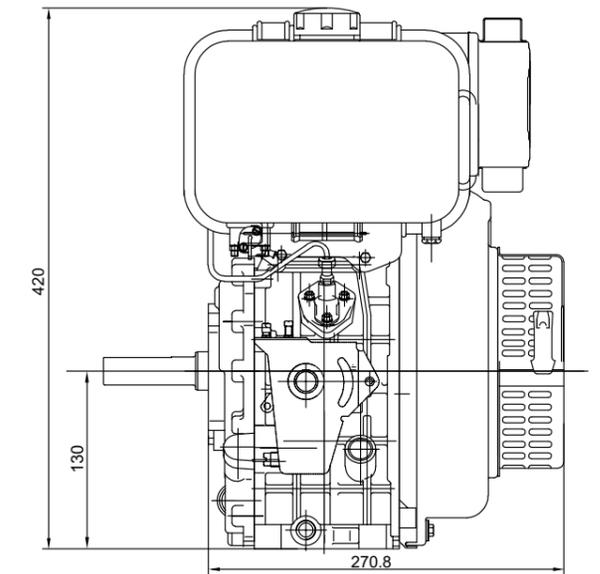
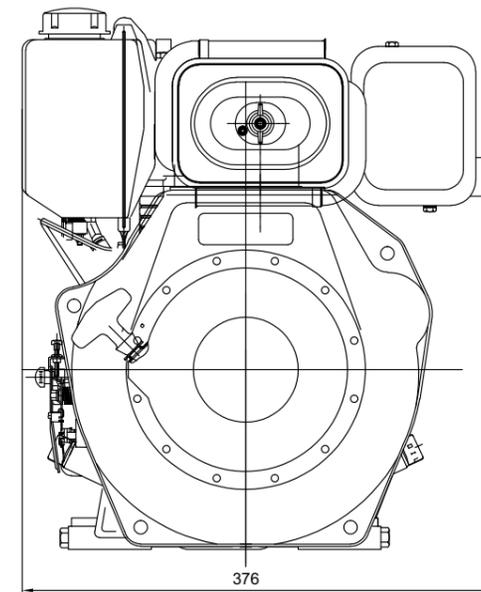
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D180F



## Data

Dimension (mm)

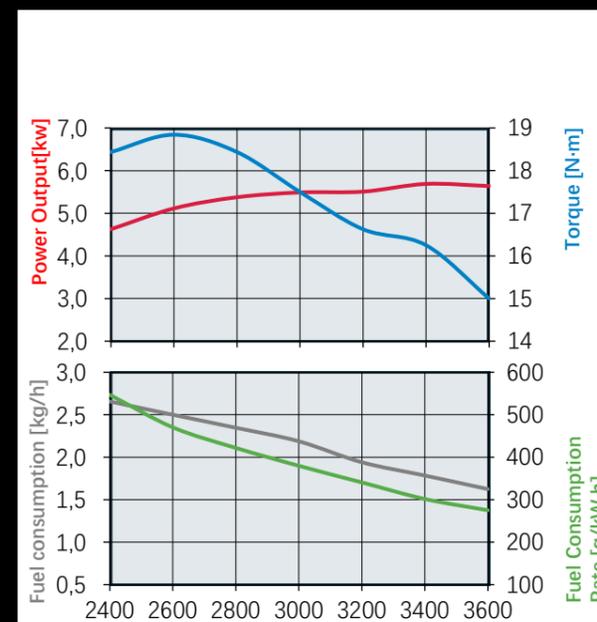


| QUICK SPECIFICATIONS             | D180F                             |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 5.6(7.6)@3600                     |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.337                             |
| Cooling                          | Air-Cooled                        |
| Max Torque Nm@rpm                | 16.6 Nm @≤ 2880rpm                |

## Performance curves

(ACCORDING TO ISO 14396)

D180F

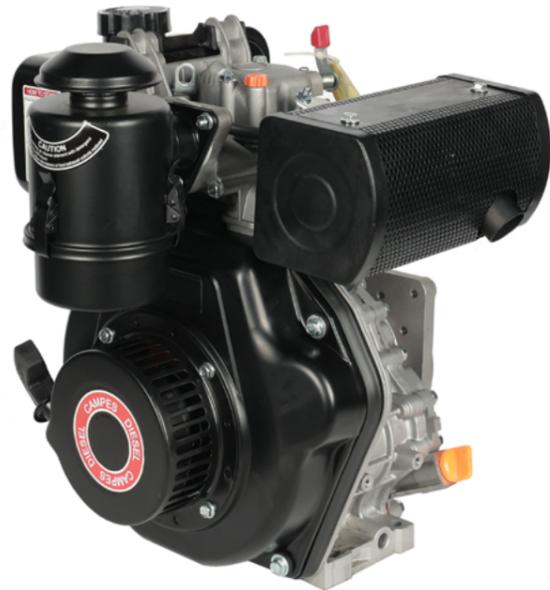


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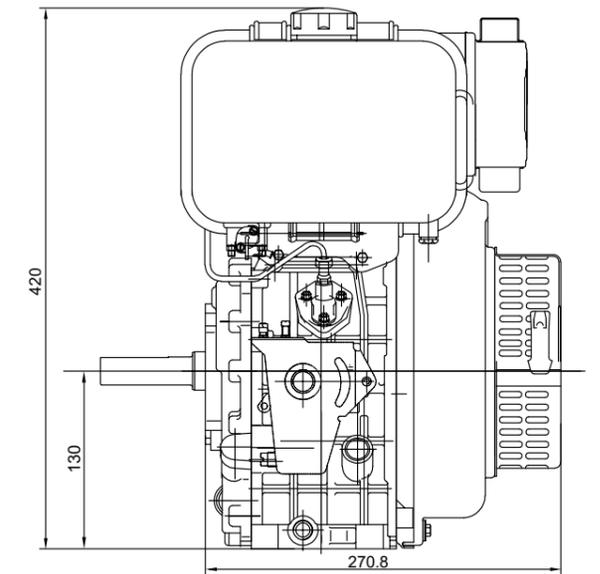
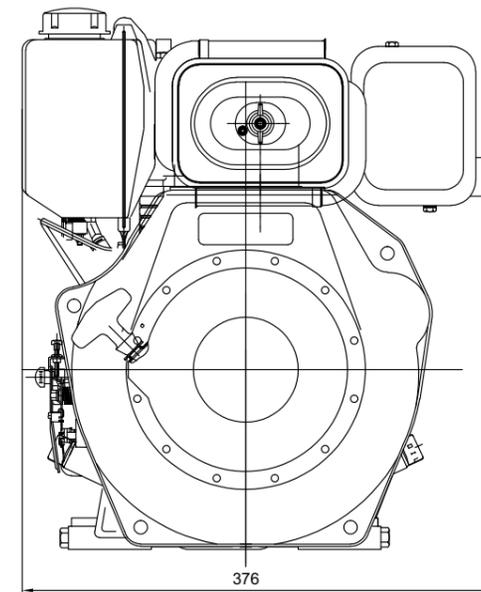
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D186F



## Data

Dimension (mm)

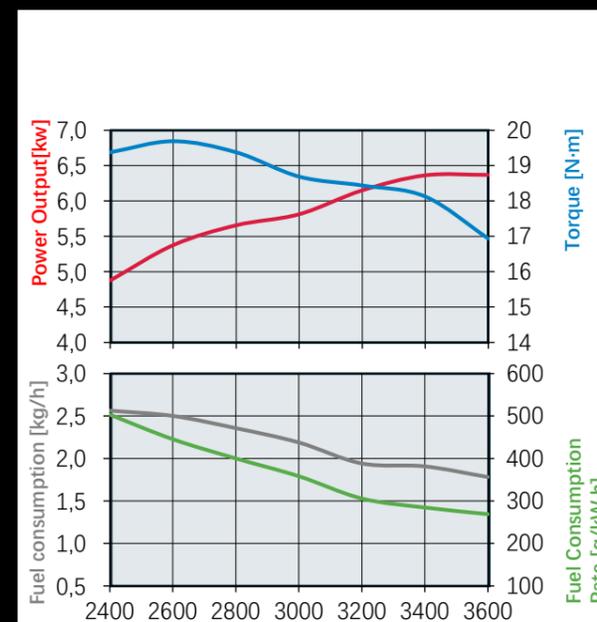


| QUICK SPECIFICATIONS             | D186F                             |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 6.3(8.4)@3600                     |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.406                             |
| Cooling                          | Air-Cooled                        |
| Max Torque Nm@rpm                | 18.7 Nm @≤ 2880rpm                |

## Performance curves

(ACCORDING TO ISO 14396)

D186F

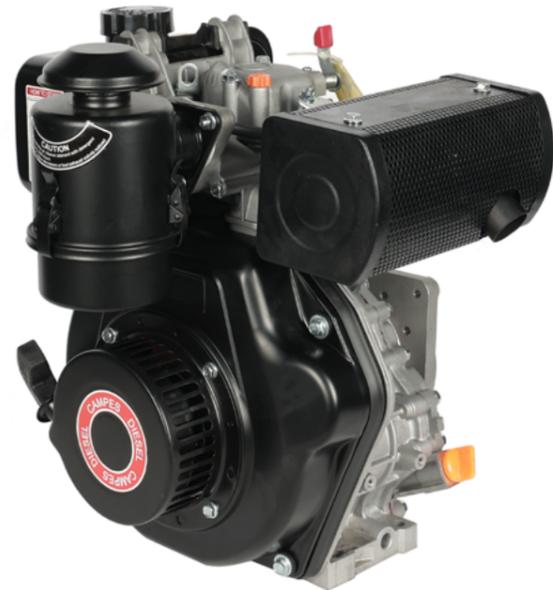


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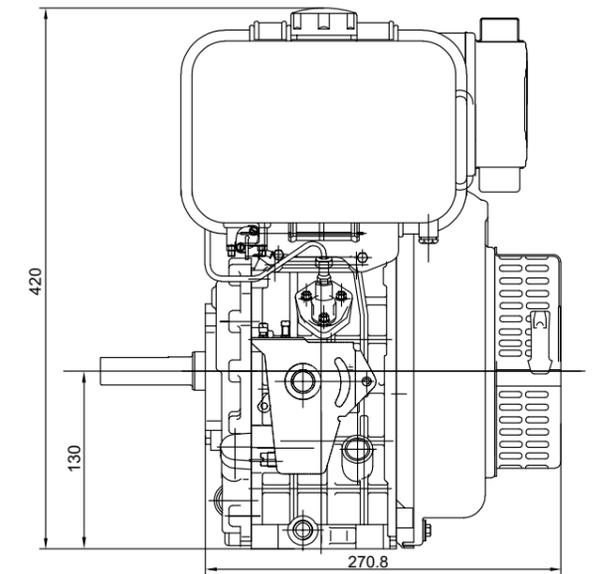
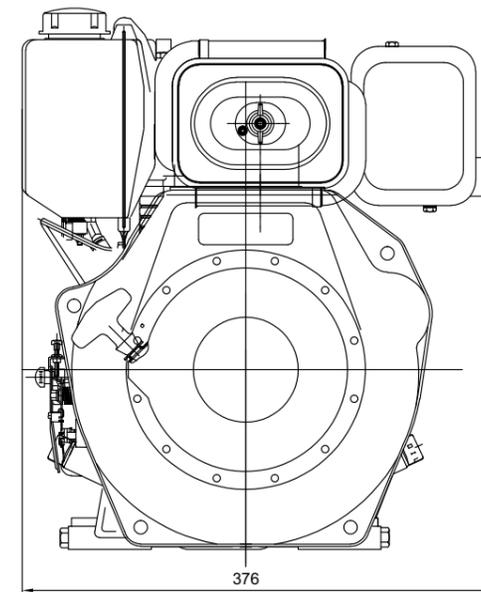
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D186FA



## Data

Dimension (mm)

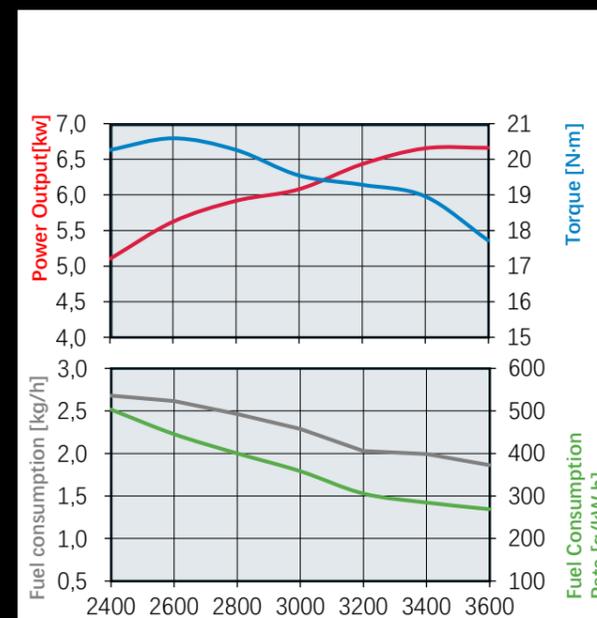


| QUICK SPECIFICATIONS             | D186FA                            |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 6.6(9.0)@3600                     |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.418                             |
| Cooling                          | Air-Cooled                        |
| Max Torque Nm@rpm                | 18.7 Nm @≤ 2880rpm                |

## Performance curves

(ACCORDING TO ISO 14396)

D186FA

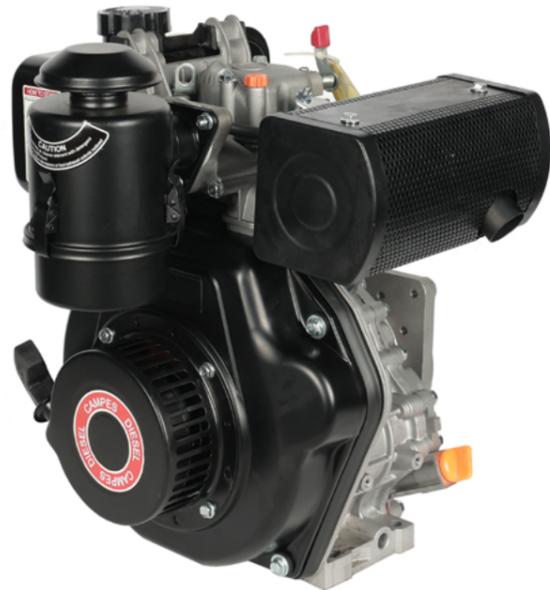


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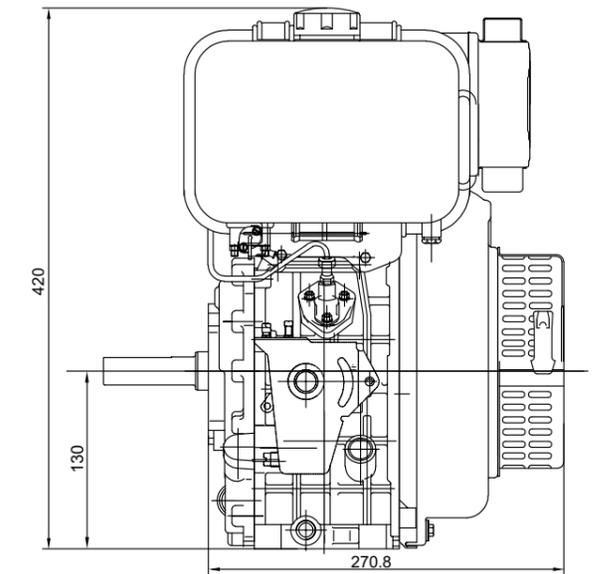
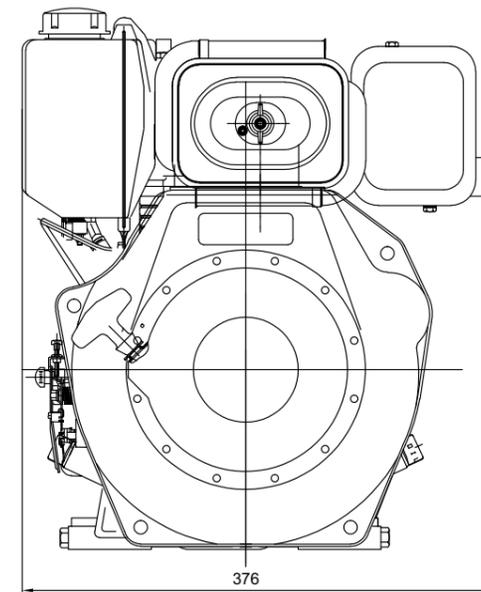
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D188F



## Data

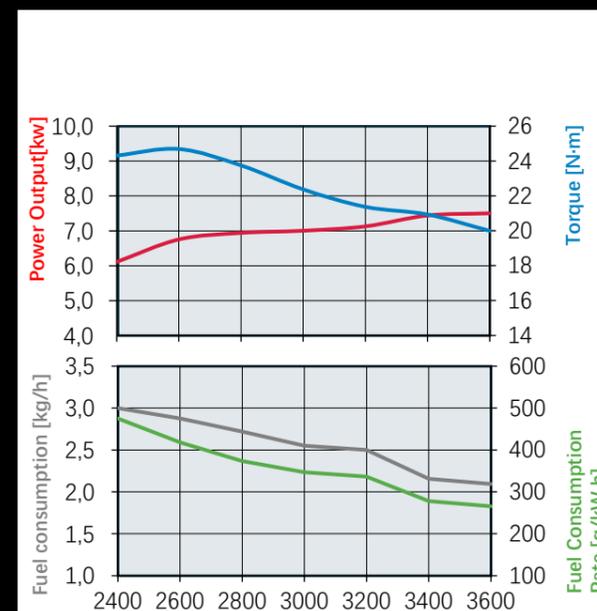
Dimension (mm)



| QUICK SPECIFICATIONS             | D188F                             |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 7.5(10.2)@3600                    |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.456                             |
| Cooling                          | Air-Cooled                        |
| Max Torque Nm@rpm                | 22.2 Nm @≤ 2880rpm                |

## Performance curves

(ACCORDING TO ISO 14396)  
D188F

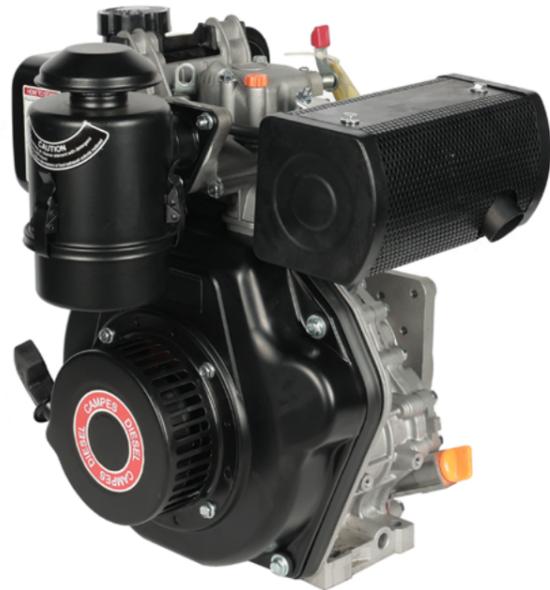


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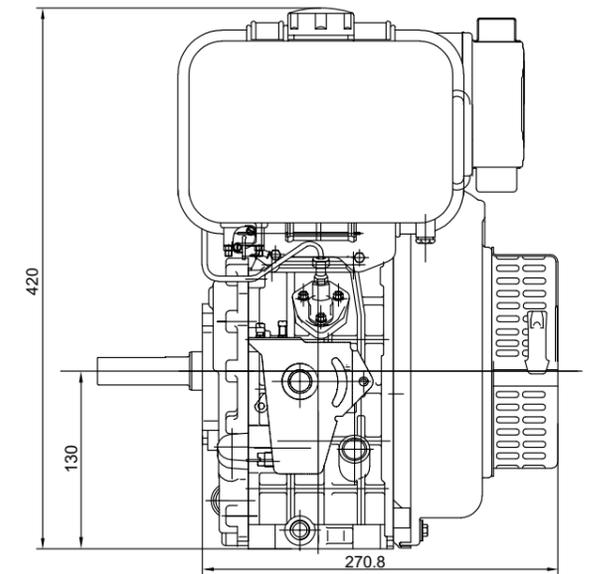
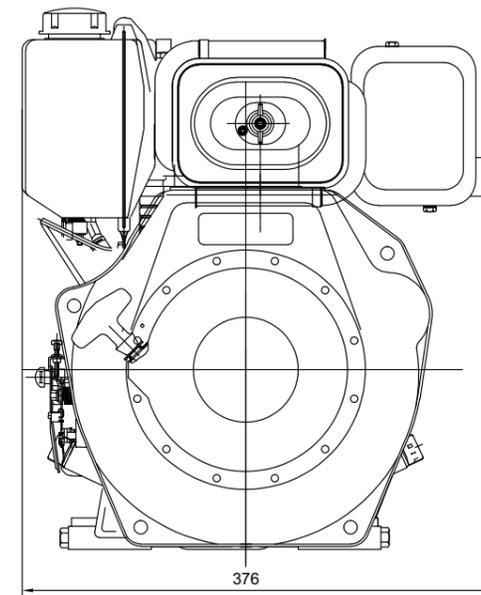
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D192F



## Data

Dimension (mm)

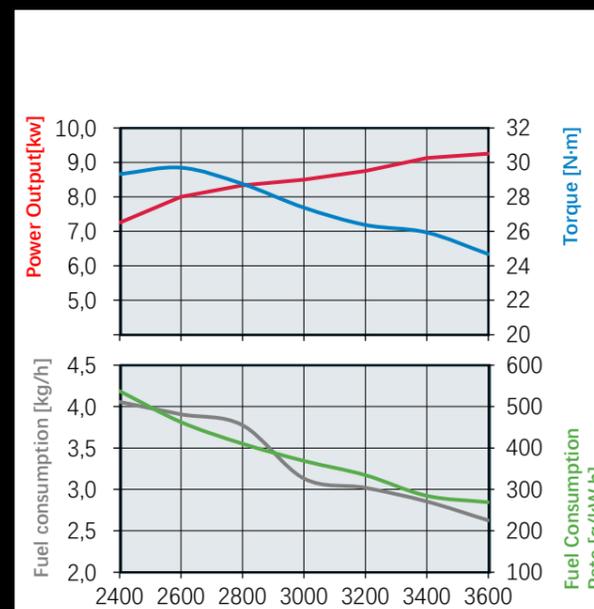


| QUICK SPECIFICATIONS             | D192F                             |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 9.2(12.2)@3600                    |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.498                             |
| Cooling                          | Air-Cooled                        |
| Max Torque Nm@rpm                | 27.3 Nm @≤ 2880rpm                |

## Performance curves

(ACCORDING TO ISO 14396)

D192F

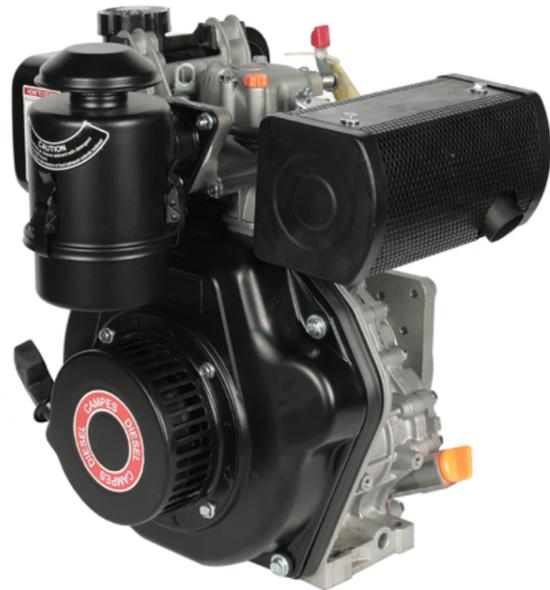


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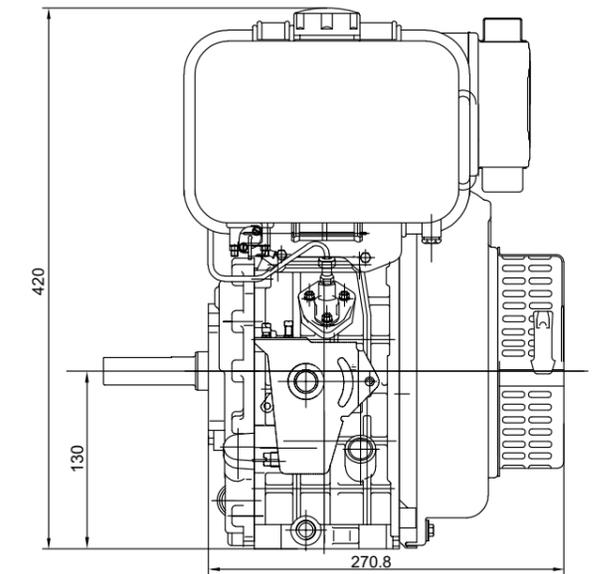
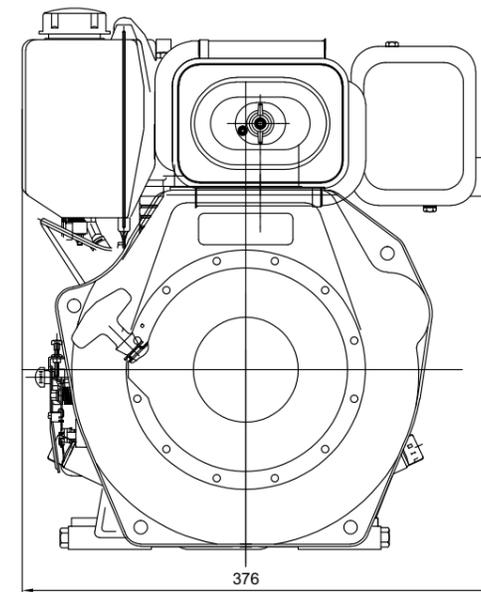
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D195F



## Data

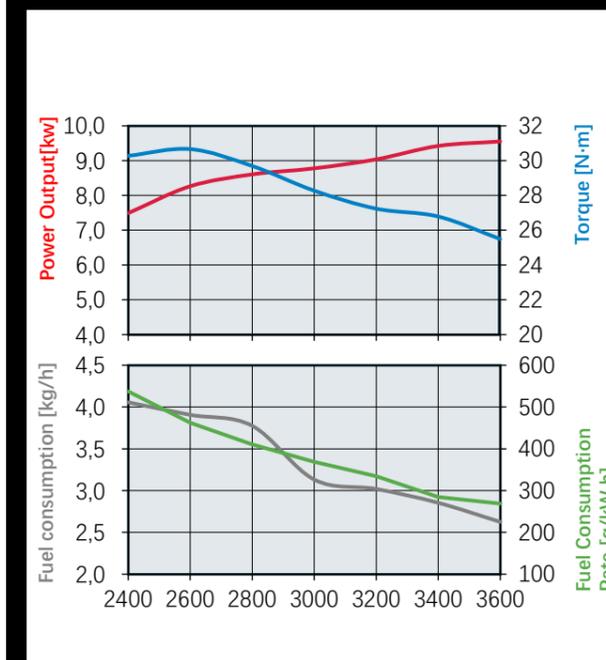
Dimension (mm)



| QUICK SPECIFICATIONS             | D195F                             |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 9.5(13.0)@3600                    |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.532                             |
| Cooling                          | Air-Cooled                        |
| Max Torque Nm@rpm                | 28.2 Nm @≤ 2880rpm                |

## Performance curves

(ACCORDING TO ISO 14396)  
D195F

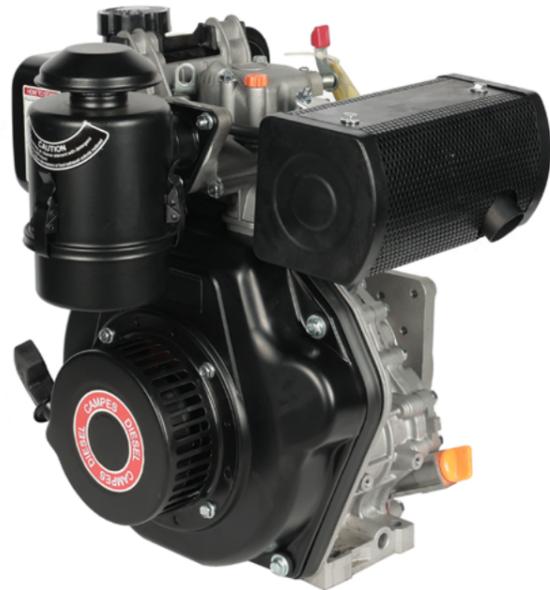


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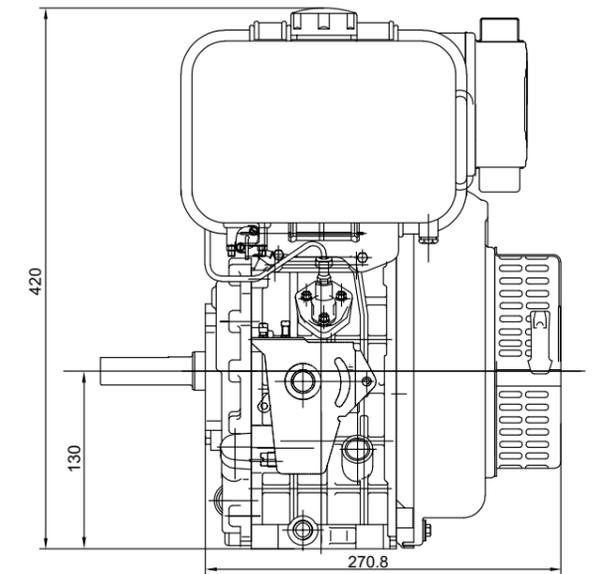
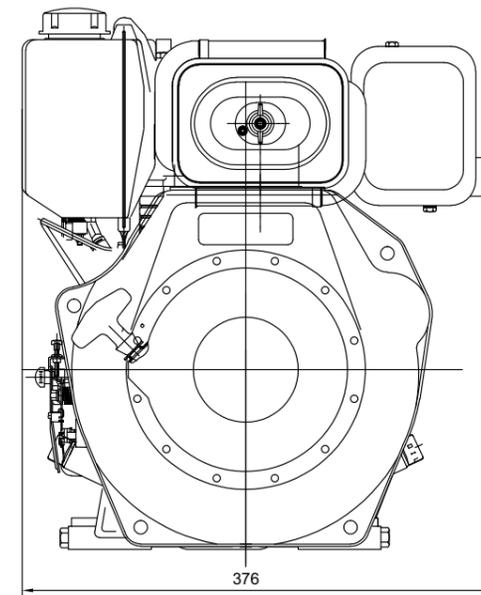
- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

# D1100F



## Data

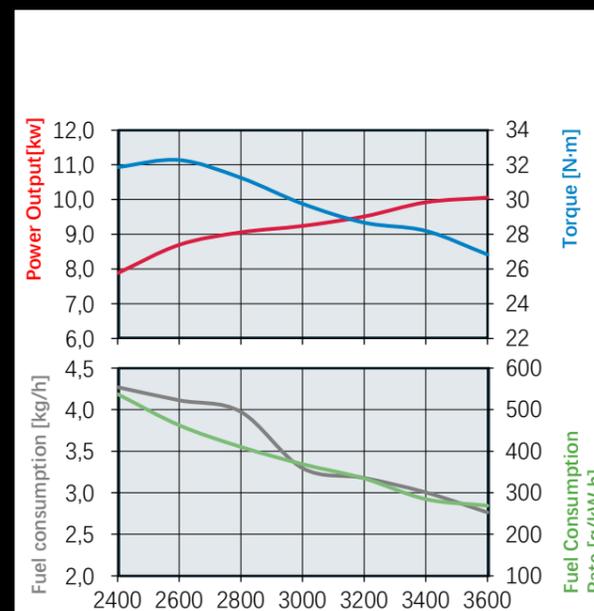
Dimension (mm)



| QUICK SPECIFICATIONS             | D1100F                            |
|----------------------------------|-----------------------------------|
| TYPE                             | Vertical, 4-stroke, diesel engine |
| Rated Output Power kw (hp) @ rpm | 10.0(13.6)@3600                   |
| CYLINDERS                        | Single                            |
| Engine Displacement(liter)       | 0.668                             |
| Cooling                          | Air-Cooled                        |
| Max Torque Nm@rpm                | 29.7Nm @≤ 2880rpm                 |

## Performance curves

(ACCORDING TO ISO 14396)  
D1100F



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2. Engine rating conditions are as follows (SAE J1349, ISO 3046/1):

- Atmospheric Condition: Room temperature 25°C (77°F), Atmospheric pressure 100 kPa (29.53 in Hg, 750mm Hg), Relative humidity 30%
- Fuel Temperature at Fuel Injector Pump Inlet: 40°C (104°F)
- With Cooling Fan, Air Cleaner, Muffler: CAMPES Standard
- After Engine Break-In Period. Output Allowable Deviation: ± 5%
- 1 PS = 0.7355 kW

|  | Keyway shaft<br>F | Taper shaft<br>FG | Thread shaft<br>FP |    | Camshaft<br>FS | Flanges | PTO flages | Speed Control |
|--|-------------------|-------------------|--------------------|----|----------------|---------|------------|---------------|
|  |                   |                   |                    | FW |                |         |            |               |
| D170F<br>D173F                             |                   |                   |                    |    |                |         |            |               |
| D178F<br>D180F                             |                   |                   |                    |    |                |         |            |               |
| D186F<br>D186FA<br>D188F<br>D192F<br>D195F |                   |                   |                    |    |                |         |            |               |
| D1100F                                     |                   |                   |                    |    |                |         |            |               |

**Note:**  
 Keyway (F): Construction/Water Pumps (robust torque).  
 Tapered (FG): Generator Sets (precise fit).  
 Threaded (FP/FW): Water Pumps (easy install).  
 Camshaft power take-off (FS): Tillers (low-speed).  
 More specialized shafts are available.

**Note:**  
 Manual speed and stop control panel(speed control):  
 Type A: Water Pumps.  
 Type B: Generator Sets.  
 Type C: Tillers.  
 Type D: Tillers.



| Model                    |  | D170F  | D173F  | D178F  |
|--------------------------|--|--|--|--|
| Engine specs             | Vertical 4 stroke air cooled diesel engine                           | •  | •  | •  |
|                          | Anticlockwise rotation viewed from PTO side                          | •  | •  | •  |
|                          | Electric starting and/or recoil starting                             | •  | •  | •  |
|                          | Forced air-cooling by flywheel fan                                   | •  | •  | •  |
|                          | Iron air shroud  | •  | •  | •  |
|                          | Iron fuel tank   | •  | •  | •  |
|                          | In-tank pick-up mesh fuel strainer                                   | •  | •  | •  |
|                          | In-tank fuel filter  | •  | •  | •  |
|                          | Fuel cock  | •  | •  | •  |
|                          | Fuel tank drain plug   | •  | •  | •  |
|                          | Cyclonic dry or oil-bath air cleaner                                 | •  | •  | •  |
|                          | Muffler with guard   | •  | •  | •  |
|                          | Manual speed and stop control panel                                  | •  | •  | •  |
|                          | Forced lubrication with oil pump                                     | •  | •  | •  |
|                          | Mesh oil strainer  | •  | •  | •  |
|                          | Oil dipsticks on both sides for easy checks                          | •  | •  | •  |
|                          | Oil drain plug   | •  | •  | •  |
|                          | Internal dynamic balancer  | •  | •  | •  |
|                          | Die-cast aluminum alloy engine block with integrated boron iron cyli | •  | •  | •  |
|                          | Die-cast aluminum alloy cylinder head                                | •  | •  | •  |
|                          | Built-in rigid feet  | •  | •  | •  |
|                          | Top lifting eye  | •  | •  | •  |
|                          | Owner's manual   | •  | •  | •  |
| Spare parts catalog      | •  | •  | •  |  |
| 18 months warranty       | •  | •  | •  |  |
| Technical features       | Cylinder   | 1  | 1  | 1  |
|                          | Bore (mm)  | 70   | 73   | 78   |
|                          | Stroke (mm)  | 55   | 59   | 62   |
|                          | Engine displacement (cm <sup>3</sup> )                               | 211  | 247  | 296  |
|                          | Injection system   | Direct Injection                                     | Direct Injection                                     | Direct Injection                                     |
|                          | Compression ratio  | 20:1   | 19:1   | 20:1   |
| Performance              | Emission compliance  | EU STAGE V*  | EU STAGE V*  | EU STAGE V*  |
|                          | Rating (kW/PS)   | (3000rpm)2.5/3.4                                     | (3000rpm)3.45/4.7                                    | (3000rpm)3.68/5.0                                    |
|                          | Max (kW/PS)  | (3000rpm)2.75/3.74                                   | (3000rpm)3.8/5.17                                    | (3000rpm)4/5.44                                      |
|                          | Rating (kW/PS)   | (3600rpm)2.8/3.8                                     | (3600rpm)4.05/5.5                                    | (3600rpm)4.1/5.6                                     |
|                          | Max (kW/PS)  | (3600rpm)3.08/4.19                                   | (3600rpm)4.5/6.12                                    | (3600rpm)4.5/6.12                                    |
|                          | Max torque (Nm@rpm)  | ≥8Nm @ ≤ 2880rpm                                     | ≥11.5Nm @ ≤ 2880rpm                                  | ≥11.5Nm @ ≤ 2880rpm                                  |
|                          | Min idling (rpm)   | ≤1800  | ≤1800  | ≤1800  |
| Service features         | Fuel type  | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     |
|                          | Fuel tank capacity (liter)   | 2.5  | 2.5  | 3.5  |
|                          | Fuel consumption (g/kW.h)  | (3000rpm)≤280  | (3000rpm)≤280  | (3000rpm)≤276.1                                      |
|                          | Fuel consumption (g/kW.h)  | (3600rpm)≤288  | (3600rpm)≤288  | (3600rpm)≤285.6                                      |
|                          | Lubricating oil type   | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher |
|                          | Lubricating oil sump capacity (liter)                                | 0.75   | 0.75   | 1.1  |
|                          | Lubricating oil consumption (g/kW-h)                                 | ≤4   | ≤4   | ≤4   |
|                          | Lubricating oil change interval (hr)                                 | 100**  | 100**  | 100**  |
|                          | Lubricating oil filter clean interval-replace if damaged (hr)        | 100**  | 100**  | 100**  |
|                          | Dry air cleaner change interval (hr)                                 | 200**  | 200**  | 200**  |
|                          | Valve adjustment interval (hr)                                       | 500  | 500  | 500  |
|                          | Starting motor capacity  | 12V 1.2kW  | 12V 1.2kW  | 12V 1.2kW  |
|                          | Charging dynamo output   | 18V AC   | 18V AC   | 18V AC   |
|                          | Charging voltage regulator   | 13.5V DC 8.3A 112W                                   | 13.5V DC 8.3A 112W                                   | 13.5V DC 8.3A 112W                                   |
| Physical characteristics | Net dimensions, L × W × H (mm)                                       | 332 × 395 × 420                                      | 332 × 395 × 420                                      | 295.3 × 420 × 450                                    |
|                          | Dry weight w/ recoil starter (kg)                                    | 27   | 28   | 35   |
|                          | Dry weight w/ electric starter (kg)                                  | 33   | 33   | 40   |
|                          | Ambient operating temps (°C)   | -10 to +50   | -10 to +50   | -10 to +50   |
|                          | Gradeability-all round (intermittent -30 min) (deg)                  | 30°  | 30°  | 30°  |
|                          | Gradeability-all round (peak value -1 min) (deg)                     | 35°  | 35°  | 35°  |

\*optional \*\*According to operating conditions

| Model                    |   | D180F  | D186F  | D186FA   |
|--------------------------|---|--|--|--|
| Engine specs             | Vertical 4 stroke air cooled diesel engine                      | •  | •  | •  |
|                          | Anticlockwise rotation viewed from PTO side                     | •  | •  | •  |
|                          | Electric starting and/or recoil starting                        | •  | •  | •  |
|                          | Forced air-cooling by flywheel fan                              | •  | •  | •  |
|                          | Iron air shroud   | •  | •  | •  |
|                          | Iron fuel tank  | •  | •  | •  |
|                          | In-tank pick-up mesh fuel strainer                              | •  | •  | •  |
|                          | In-tank fuel filter   | •  | •  | •  |
|                          | Fuel cock   | •  | •  | •  |
|                          | Fuel tank drain plug  | •  | •  | •  |
|                          | Cyclonic dry or oil-bath air cleaner                            | •  | •  | •  |
|                          | Muffler with guard  | •  | •  | •  |
|                          | Manual speed and stop control panel                             | •  | •  | •  |
|                          | Forced lubrication with oil pump                                | •  | •  | •  |
|                          | Mesh oil strainer   | •  | •  | •  |
|                          | Oil dipsticks on both sides for easy checks                     | •  | •  | •  |
|                          | Oil drain plug  | •  | •  | •  |
|                          | Internal dynamic balancer                                       | •  | •  | •  |
|                          | Die-cast aluminum alloy engine block with integrated boron iron | •  | •  | •  |
|                          | Die-cast aluminum alloy cylinder head                           | •  | •  | •  |
|                          | Built-in rigid feet   | •  | •  | •  |
|                          | Top lifting eye   | •  | •  | •  |
|                          | Owner's manual  | •  | •  | •  |
| Spare parts catalog      | •   | •  | •  |  |
| 18 months warranty       | •   | •  | •  |  |
| Technical features       | Cylinder  | 1  | 1  | 1  |
|                          | Bore (mm)   | 80   | 86   | 86   |
|                          | Stroke (mm)   | 67   | 70   | 72   |
|                          | Engine displacement (cm <sup>3</sup> )                          | 337  | 406  | 418  |
|                          | Injection system  | Direct Injection                                     | Direct Injection                                     | Direct Injection                                     |
|                          | Compression ratio   | 20:1   | 19:1   | 20:1   |
| Performance              | Emission compliance   | EU STAGE V*  | EU STAGE V*  | EU STAGE V*  |
|                          | Rating (kW/PS)  | (3000rpm)4.8/6.5                                     | (3000rpm)5.7/7.7                                     | (3000rpm)6.3/8.6                                     |
|                          | Max (kW/PS)   | (3000rpm)5.28/7.18                                   | (3000rpm)6.27/8.52                                   | (3000rpm)6.9/9.38                                    |
|                          | Rating (kW/PS)  | (3600rpm)5.6/7.6                                     | (3600rpm)6.3/8.6                                     | (3600rpm)6.6/9.0                                     |
|                          | Max (kW/PS)   | (3600rpm)6.16/8.38                                   | (3600rpm)6.9/9.38                                    | (3600rpm)7.2/9.79                                    |
|                          | Max torque (Nm@rpm)   | ≥16.6Nm @ ≤ 2880rpm                                  | ≥18.7Nm @ ≤ 2880rpm                                  | ≥18.7Nm @ ≤ 2880rpm                                  |
|                          | Min idling (rpm)  | ≤1800  | ≤1800  | ≤1800  |
| Service features         | Fuel type   | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     |
|                          | Fuel tank capacity (liter)                                      | 3.5  | 5.5  | 5.5  |
|                          | Fuel consumption (g/kW.h)                                       | (3000rpm)≤276.1                                      | (3000rpm)≤271.5                                      | (3000rpm)≤271.5                                      |
|                          | Fuel consumption (g/kW.h)                                       | (3600rpm)≤285.6                                      | (3600rpm)≤280  | (3600rpm)≤280  |
|                          | Lubricating oil type  | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher |
|                          | Lubricating oil sump capacity (liter)                           | 1.1  | 1.65   | 1.65   |
|                          | Lubricating oil consumption (g/kW-h)                            | ≤4   | ≤4   | ≤4   |
|                          | Lubricating oil change interval (hr)                            | 100**  | 100**  | 100**  |
|                          | Lubricating oil filter clean interval-replace if damaged (hr)   | 100**  | 100**  | 100**  |
|                          | Dry air cleaner change interval (hr)                            | 200**  | 200**  | 200**  |
|                          | Valve adjustment interval (hr)                                  | 500  | 500  | 500  |
|                          | Starting motor capacity   | 12V 1.2kW  | 12V 1.2kW  | 12V 1.2kW  |
|                          | Charging dynamo output  | 18V AC   | 18V AC   | 18V AC   |
|                          | Charging voltage regulator                                      | 13.5V DC 8.3A 112W                                   | 13.5V DC 8.3A 112W                                   | 13.5V DC 8.3A 112W                                   |
| Physical characteristics | Net dimensions, L × W × H (mm)                                  | 295.3 × 442 × 458                                    | 328.8 × 460 × 495                                    | 328.8 × 460 × 495                                    |
|                          | Dry weight w/ recoil starter (kg)                               | 36   | 47   | 47   |
|                          | Dry weight w/ electric starter (kg)                             | 41   | 52   | 52   |
|                          | Ambient operating temps (°C)                                    | -10 to +50   | -10 to +50   | -10 to +50   |
|                          | Gradeability-all round (intermittent -30 min) (deg)             | 30°  | 30°  | 30°  |
|                          | Gradeability-all round (peak value -1 min) (deg)                | 35°  | 35°  | 35°  |

\*optional \*\*According to operating conditions

| Model   | D188F   | D192F  | D195F  |  |
|---|---|--|--|--|
| Engine specs  | Vertical 4 stroke air cooled diesel engine                      | •  | •  | •  |
|   | Anticlockwise rotation viewed from PTO side                     | •  | •  | •  |
|   | Electric starting and/or recoil starting                        | •  | •  | •  |
|   | Forced air-cooling by flywheel fan                              | •  | •  | •  |
|   | Iron air shroud   | •  | •  | •  |
|   | Iron fuel tank  | •  | •  | •  |
|   | In-tank pick-up mesh fuel strainer                              | •  | •  | •  |
|   | In-tank fuel filter   | •  | •  | •  |
|   | Fuel cock   | •  | •  | •  |
|   | Fuel tank drain plug  | •  | •  | •  |
|   | Cyclonic dry or oil-bath air cleaner                            | •  | •  | •  |
|   | Muffler with guard  | •  | •  | •  |
|   | Manual speed and stop control panel                             | •  | •  | •  |
|   | Forced lubrication with oil pump                                | •  | •  | •  |
|   | Mesh oil strainer   | •  | •  | •  |
|   | Oil dipsticks on both sides for easy checks                     | •  | •  | •  |
|   | Oil drain plug  | •  | •  | •  |
|   | Internal dynamic balancer                                       | •  | •  | •  |
|   | Die-cast aluminum alloy engine block with integrated boron iron | •  | •  | •  |
|   | Die-cast aluminum alloy cylinder head                           | •  | •  | •  |
| Built-in rigid feet                                 | •   | •  | •  |  |
| Top lifting eye                                     | •   | •  | •  |  |
| Owner's manual                                      | •   | •  | •  |  |
| Spare parts catalog                                 | •   | •  | •  |  |
| 18 months warranty                                  | •   | •  | •  |  |
| Technical features                                  | Cylinder  | 1  | 1  | 1  |
|   | Bore (mm)   | 88   | 92   | 95   |
|   | Stroke (mm)   | 75   | 75   | 75   |
|   | Engine displacement (cm <sup>3</sup> )                          | 456  | 498  | 532  |
|   | Injection system  | Direct Injection                                     | Direct Injection                                     | Direct Injection                                     |
|   | Compression ratio   | 19:1   | 19:1   | 19:1   |
|   | Emission compliance   | EU STAGE V*  | EU STAGE V*  | EU STAGE V*  |
| Performance   | Rating (kW/PS)  | (3000rpm)6.8/9.2                                     | (3000rpm)7.9/10.7                                    | (3000rpm)8.5/11.6                                    |
|   | Max (kW/PS)   | (3000rpm)7.5/10.2                                    | (3000rpm)8.6/11.69                                   | (3000rpm)9.3/12.64                                   |
|   | Rating (kW/PS)  | (3600rpm)7.5/10.2                                    | (3600rpm)9.2/12.5                                    | (3600rpm)9.5/12.9                                    |
|   | Max (kW/PS)   | (3600rpm)8.2/11.15                                   | (3600rpm)10.1/13.73                                  | (3600rpm)10.4/14.14                                  |
|   | Max torque (Nm@rpm)   | ≥22.2Nm @ ≤ 2880rpm                                  | ≥27.3Nm @ ≤ 2880rpm                                  | ≥28.2Nm @ ≤ 2880rpm                                  |
|   | Min idling (rpm)  | ≤1800  | ≤1800  | ≤1800  |
|   | Fuel type   | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     |
| Service features                                    | Fuel tank capacity (liter)                                      | 5.5  | 5.5  | 5.5  |
|   | Fuel consumption (g/kW.h)                                       | (3000rpm)≤275  | (3000rpm)≤275  | (3000rpm)≤275  |
|   | Fuel consumption (g/kW.h)                                       | (3600rpm)≤280  | (3600rpm)≤280  | (3600rpm)≤280  |
|   | Lubricating oil type  | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher |
|   | Lubricating oil sump capacity (liter)                           | 1.65   | 1.65   | 1.65   |
|   | Lubricating oil consumption (g/kW.h)                            | ≤4   | ≤4   | ≤4   |
|   | Lubricating oil change interval (hr)                            | 100**  | 100**  | 100**  |
|   | Lubricating oil filter clean interval-replace if damaged (hr)   | 100**  | 100**  | 100**  |
|   | Dry air cleaner change interval (hr)                            | 200**  | 200**  | 200**  |
|   | Valve adjustment interval (hr)                                  | 500  | 500  | 500  |
|   | Starting motor capacity   | 12V 1.2kW  | 12V 1.2kW  | 12V 1.2kW  |
|   | Charging dynamo output  | 18V AC   | 18V AC   | 18V AC   |
|   | Charging voltage regulator                                      | 13.5V DC 8.3A 112W                                   | 13.5V DC 8.3A 112W                                   | 13.5V DC 8.3A 112W                                   |
|   | Physical characteristics  | Net dimensions, L × W × H (mm)                       | 328.8 × 460 × 495                                    | 328.8 × 460 × 500                                    |
| Dry weight w/ recoil starter (kg)                   |   | 47   | 50   | 50   |
| Dry weight w/ electric starter (kg)                 |   | 52   | 55   | 55   |
| Ambient operating temps (°C)                        |   | -10 to +50   | -10 to +50   | -10 to +50   |
| Gradeability-all round (intermittent -30 min) (deg) |   | 30°  | 30°  | 30°  |
| Gradeability-all round (peak value -1 min) (deg)    |   | 35°  | 35°  | 3+F1+K1:059  |

\*optional \*\*According to operating conditions

| Model   | D1100F  |  |
|---|---|--|
| Engine specs  | Vertical 4 stroke air cooled diesel engine                      | •  |
|   | Anticlockwise rotation viewed from PTO side                     | •  |
|   | Electric starting and/or recoil starting                        | •  |
|   | Forced air-cooling by flywheel fan                              | •  |
|   | Iron air shroud   | •  |
|   | Iron fuel tank  | •  |
|   | In-tank pick-up mesh fuel strainer                              | •  |
|   | In-tank fuel filter   | •  |
|   | Fuel cock   | •  |
|   | Fuel tank drain plug  | •  |
|   | Cyclonic dry or oil-bath air cleaner                            | •  |
|   | Muffler with guard  | •  |
|   | Manual speed and stop control panel                             | •  |
|   | Forced lubrication with oil pump                                | •  |
|   | Mesh oil strainer   | •  |
|   | Oil dipsticks on both sides for easy checks                     | •  |
|   | Oil drain plug  | •  |
|   | Internal dynamic balancer                                       | •  |
|   | Die-cast aluminum alloy engine block with integrated boron iron | •  |
|   | Die-cast aluminum alloy cylinder head                           | •  |
| Built-in rigid feet                                 | •   |  |
| Top lifting eye                                     | •   |  |
| Owner's manual                                      | •   |  |
| Spare parts catalog                                 | •   |  |
| 18 months warranty                                  | •   |  |
| Technical features                                  | Cylinder  | 1  |
|   | Bore (mm)   | 100  |
|   | Stroke (mm)   | 85   |
|   | Engine displacement (cm <sup>3</sup> )                          | 668  |
|   | Injection system  | Direct Injection                                     |
|   | Compression ratio   | 19:1   |
|   | Emission compliance   | EU STAGE V*  |
| Performance   | Rating (kW/PS)  | (3000rpm)10/13.6                                     |
|   | Max (kW/PS)   | (3000rpm)11/14.96                                    |
|   | Rating (kW/PS)  | (3600rpm)10/13.6                                     |
|   | Max (kW/PS)   | (3600rpm)11/14.96                                    |
|   | Max torque (Nm@rpm)   | ≥29.7Nm @ ≤ 2880rpm                                  |
|   | Min idling (rpm)  | ≤1800  |
|   | Fuel type   | 0#(summer)<br>-10#(winter)<br>-35#(cold climate)     |
| Service features                                    | Fuel tank capacity (liter)                                      | 5.5  |
|   | Fuel consumption (g/kW.h)                                       | (3000rpm)≤280  |
|   | Fuel consumption (g/kW.h)                                       | (3600rpm)≤280  |
|   | Lubricating oil type  | SAE 10W-30,<br>SAE 15W-40,<br>API grade CF or higher |
|   | Lubricating oil sump capacity (liter)                           | 2.5  |
|   | Lubricating oil consumption (g/kW.h)                            | ≤4   |
|   | Lubricating oil change interval (hr)                            | 100**  |
|   | Lubricating oil filter clean interval-replace if damaged (hr)   | 100**  |
|   | Dry air cleaner change interval (hr)                            | 200**  |
|   | Valve adjustment interval (hr)                                  | 500  |
|   | Starting motor capacity   | 12V 1.4kW  |
|   | Charging dynamo output  | 18V AC   |
|   | Charging voltage regulator                                      | 13.5V DC 8.3A 112W                                   |
|   | Physical characteristics  | Net dimensions, L × W × H (mm)                       |
| Dry weight w/ recoil starter (kg)                   |   | 62   |
| Dry weight w/ electric starter (kg)                 |   | 68   |
| Ambient operating temps (°C)                        |   | -10 to +50   |
| Gradeability-all round (intermittent -30 min) (deg) |   | 30°  |
| Gradeability-all round (peak value -1 min) (deg)    |   | 35°  |

\*optional \*\*According to operating conditions

# Thank You

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