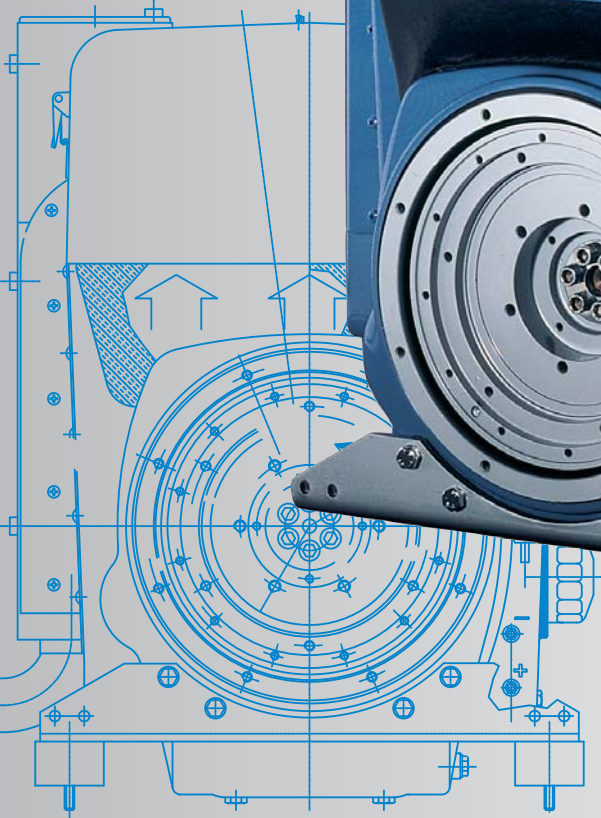




L-series



2L41C • 3L41C • 4L41C

2L41C • 13.5 - 27 kW    3L41C • 20.6 - 40.9 kW    4L41C • 27.0 - 54.2 kW

# SilentPACK

THE EXTREMELY SILENT INDUSTRIAL  
MULTI-CYLINDER DIESEL ENGINE

**The HATZ Silent Pack is the quietest engine for equipment installation in its class – and it's ready for immediate application.**

**The Hatz Silent Pack has every conceivable feature that an optimal built-in diesel engine should possess by today's standards.**

### **Extremely quiet**

The capsule reduces the engine noise by 90 % to 10 % = 10 dBA.

### **Ready for operation**

With an air cleaner attached, exhaust silencing and a cable loom for starting and monitoring). Nothing is loose, everything is ready for installation.

### **Easily accessible**

Provided with servicing points easily accessible from the outside or under a cover with quick release fasteners; hydraulic pumps can also be installed under the sound-absorbing enclosure to reduce noise emissions.

### **Noise insulation**

Supported on feet that are insulated against structure-borne noise and can be mounted on frames or plates (which means that hardly any structure-borne noise is transferred to the equipment).

### **Balancer shafts**

Equipped with additional mass balancer shafts which suppress disturbing vibration before it can even arise.

### **Low installed dimensions**

Designed to occupy only a minimum of space, since the noise-protection capsule fits closely around the engine block.

### **Optimum cooling air flow**

Equipped with cool-air ducting that regulates thermal conditions in the noise-protection capsule so that the Silent Pack can be operated in all known climate zones (in a hot, dusty desert or in Alaska's icy winter).

### **Friendly to the environment**

HATZ has achieved significant success in the reduction of noise and exhaust gas emissions.

The engines are certified by: EU Directive 97/68, step 3A, ECE-R24 EPA Tier II, Regulation 40 CFR Part 89 / CARB Tier II and from 2008 Interim Tier IV.

**The Hatz Silent Pack is a perfect example of what we mean when we say:**

**„Mount it, bolt it on, start it up and hear just how pleasant it sounds.“**

Exhaust reduced types on request

**EPA TIER II**

**CARB TIER II**

**ECE-R24**

**97/68/EG-III A**

as from 2008

**EPA TIER IV**

**EPA interim TIER IV**

2L41C • 3L41C • 4L41C

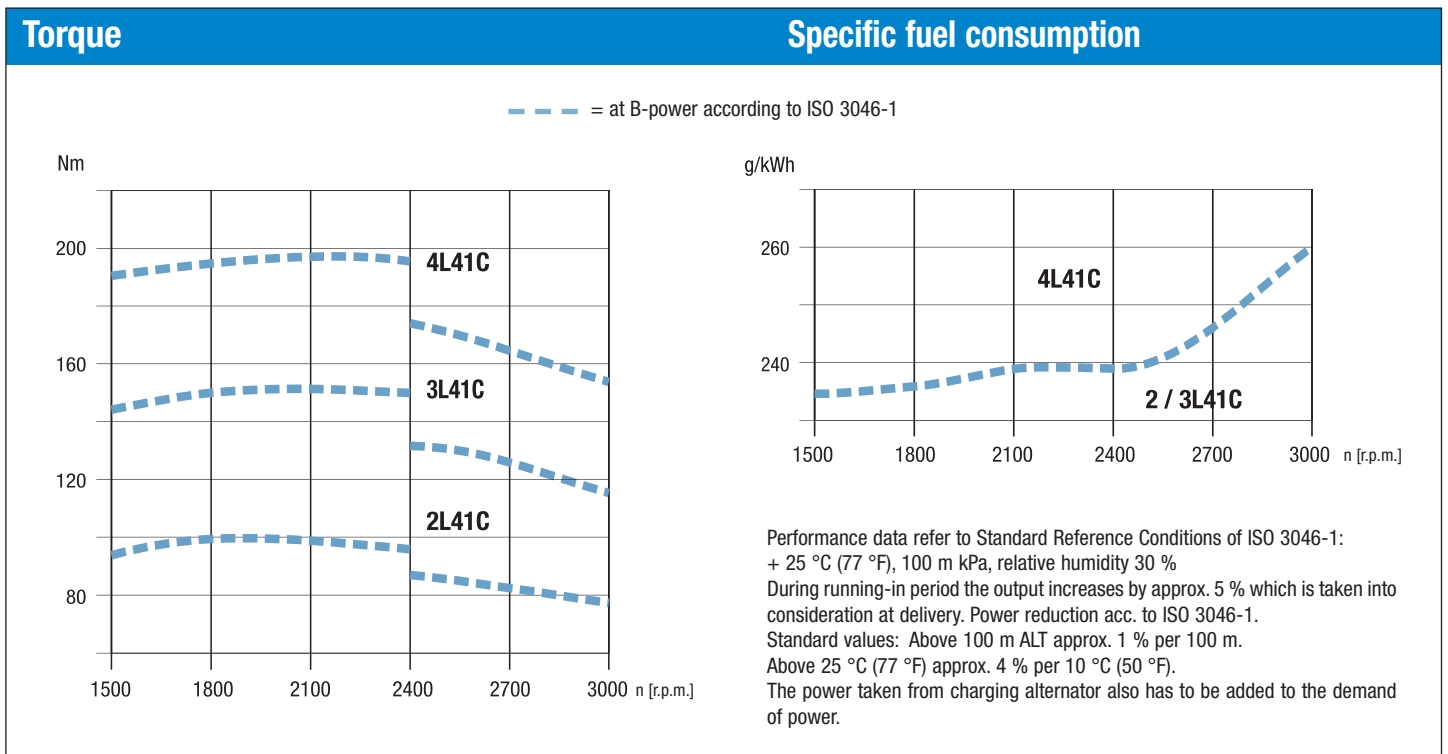
## **Design**

- Aircooled 2-, 3- and 4-cylinder fourstroke Diesel engines, modular design.
- Grey cast iron crankcase, vertical in-line cylinders.
- Crankshaft and conrod running on shell-bearing.
- Individual cylinders (grey cast iron), individual cylinder-heads (light metal) and individual injection pumps.
- Dismantling of piston and conrod possible in upwards direction.
- Direct injection with multi-hole nozzle.
- Valve control via camshaft, tappets, rocker and pushrod.
- Separate camshaft for drive of injection pump with centrifugal variable speed governor and automatic injection timer.
- Pressure feed lubrication with gear pump. Oilcooler and filter in main flow.
- Axial-type blower fan with incorporated alternator.
- The Silent Pack is an engine of family L with noise-proof capsule.
- The easy accessibility of maintenance and operating points remains unchanged also with the Silent Pack engines.

## **Characteristics**

- The Diesel engine ready for installation and operation
- All-Purpose industrial Diesel engines.
- Extremely low fuel- and oil consumption.
- Exhaust emission well below all valid limits for operating machines in EU, USA and Japan.
- Robust, and long life-engine.
- Extensive parts interchangeability due to modular system.
- Low repair cost due to individual cylinders, individual cylinder-heads and individual injection-pumps.
- Unusual reliability because of:
  - Automatic belt control
  - Automatic extra fuel device
  - Dry-type airfilter, protected against severe contamination.
  - Camshaft and oil pump driven by gear wheel
- Easy to service because of:
  - Automatic injection pump bleeding
  - Operating and maintenance points at one engine side only
  - Hydraulic belt tensioner
- The most silent industrial Diesel engine of its class.
- The capsule reduces the engine noise by 90%.
- Noisy auxiliary drives can be incorporated in the capsule.
- The exhaust silencer is integrated into contour of the capsule.

| Technical data                   |                    | 2L41C   | 3L41C       | 4L41C       |
|----------------------------------|--------------------|---|-------------|-------------|
| Number of cylinders              |                    | 2   | 3           | 4           |
| Bore x stroke                    | mm                 | 102 x 105   | 102 x 105   | 102 x 105   |
|                                  | inches             | 4.02 x 4.13   | 4.02 x 4.13 | 4.02 x 4.13 |
| Displacement                     | l                  | 1.716   | 2.574       | 3.432       |
|                                  | cu.in.             | 104.7   | 157.0       | 209.4       |
| Mean piston speed at 3000 r.p.m. | m/s                | 10.5  | 10.5        | 10.5        |
|                                  | ft/min             | 2067  | 2067        | 2067        |
| Compression ratio                |                    | 20.0  | 20.0        | 20.0        |
| Sub. oil consumption             |                    | approx. 0.5 % of fuel consumption, related to full load |             |             |
| Sub. oil capacity max. / min.    | l                  | 4.5 / 2.5   | 8.0 / 5.0   | 13.0 / 5.0  |
|                                  | US qts             | 4.8 / 2.6   | 8.5 / 5.3   | 13.7 / 5.3  |
| Speed control                    | lowest idle speed  | approx. 900 r.p.m.                                      |             |             |
|                                  | static speed droop | approx. 5% at 3000 r.p.m.                               |             |             |



| Performance table   |                 |        | 2L41C |      | 3L41C |      | 4L41C |      |
|---|-----------------|--------|-------|------|-------|------|-------|------|
|   | Hatz-Stand.     | r.p.m. | kW*   | HP*  | kW*   | HP*  | kW*   | HP*  |
| Vehicle output acc. to DIN ISO 1585.  | F               | 3000   | 27.0  | 36.7 | 40.9  | 55.6 | 54.2  | 73.7 |
|   |                 | 2600   | 25.3  | 34.4 | 38.2  | 51.9 | 50.8  | 69.1 |
|   |                 | 2350   | 23.1  | 31.4 | 35.3  | 48.0 | 46.3  | 63.0 |
| ISO net brake fuel stop power (IFN) for strongly intermittent load acc. to ISO 3046-1.  | B <sub>Si</sub> | 3000   | 25.7  | 35.0 | 38.8  | 52.8 | 51.5  | 70.0 |
|   |                 | 2600   | 24.5  | 33.3 | 37.1  | 50.5 | 48.5  | 66.0 |
|   |                 | 2350   | 22.5  | 30.6 | 34.4  | 46.8 | 45.0  | 61.2 |
| ISO net brake fuel stop power (IFN) for intermittent load acc. to ISO 3046-1.   | B               | 3000   | 24.4  | 33.2 | 36.7  | 49.9 | 48.8  | 66.4 |
|   |                 | 2600   | 23.2  | 31.6 | 35.2  | 47.9 | 45.9  | 62.4 |
|   |                 | 2300   | 23.5  | 32.0 | 35.9  | 48.8 | 47.0  | 63.9 |
|   |                 | 2000   | 20.9  | 28.4 | 31.2  | 42.4 | 41.0  | 55.8 |
|   |                 | 1800   | 18.7  | 25.4 | 28.0  | 38.1 | 37.0  | 50.3 |
|   |                 | 1500   | 15.0  | 20.4 | 22.9  | 31.1 | 30.0  | 40.8 |
| ISO-standard power (ICXN) (10 % overload permissible) and ISO-standard fuel stop power (no overload permissible) acc. to ISO 3046-1. For constant speed and constant load (ICFN). | S               | 3000   | 22.0  | 29.9 | 33.0  | 44.9 | 43.9  | 59.7 |
|   |                 | 2600   | 20.9  | 28.4 | 31.7  | 43.1 | 41.3  | 56.2 |
|   |                 | 2300   | 21.2  | 28.8 | 32.3  | 43.9 | 42.3  | 57.5 |
|   |                 | 2000   | 18.8  | 25.6 | 28.1  | 38.2 | 36.9  | 50.2 |
|   |                 | 1800   | 16.8  | 22.8 | 25.2  | 34.3 | 33.3  | 45.3 |
|   |                 | 1500   | 13.5  | 18.4 | 20.6  | 28.0 | 27.0  | 36.7 |

\* Performance specifications without exhaust certificates. Performance tables with exhaust certificates upon request.

| Installation data  |                         | 2L41C  | 3L41C  | 4L41C   |
|--|-------------------------|--|--|---|
| Combustion air required at 3000 r.p.m. approx. <sup>1)</sup> | m <sup>3</sup> / min    | 2.6  | 3.9  | 5.2   |
|  | cu.ft./min              | 92   | 138  | 184   |
| Combustion air required at 3000 r.p.m. approx. <sup>1)</sup> | m <sup>3</sup> / min    | 29   | 39   | 42  |
|  | cu.ft./min              | 1024   | 1377   | 1483  |
| Permanent tilting  | max. degrees            | 30° <sup>2) 3) 4) 5)</sup>                       | 25° <sup>2) 3) 4) 5)</sup> 30° <sup>5)</sup>     | 25° <sup>4) 30° <sup>5)</sup> 15° <sup>2) 18° <sup>3)</sup></sup></sup> |
| Moment of inertia  | SAE-flywheel 8"         | 0.64 kgm <sup>2</sup> (15.2 lb.ft <sup>2</sup> ) | 0.65 kgm <sup>2</sup> (15.4 lb.ft <sup>2</sup> ) | 0.67 kgm <sup>2</sup> (15.9 lb.ft <sup>2</sup> )                        |
|  | flywheel for F+S clutch | 0.49 kgm <sup>2</sup> (11.6 lb.ft <sup>2</sup> ) | 0.50 kgm <sup>2</sup> (11.9 lb.ft <sup>2</sup> ) | 0.51 kgm <sup>2</sup> (12.1 lb.ft <sup>2</sup> )                        |
| Starter motor  |                         | 12 V - 2.7 kW (3.7 HP) — 24 V - 4.0 kW (5.4 HP)  |  |   |
| Alternator charging current at 3000 / 1500 r.p.m.            |                         | 14 V - 60 / 42 A — 28 V - 40 / 28 A              |  |   |
| Battery capacity   | min / max. Ah           | 12 V - 88 / 143 Ah — 24 V - 55 / 110 Ah          |  |   |

<sup>1)</sup> For other r.p.m. there is a linear reduction of the air requirement <sup>2)</sup> Applicable for flywheel up <sup>3)</sup> Applicable for flywheel low  
<sup>4)</sup> Applicable for oilfilter low <sup>5)</sup> Applicable for oilfilter up

## Permissible load on power-take-off points

- Flywheel: Power-take-off axial and radial at full engine torque.

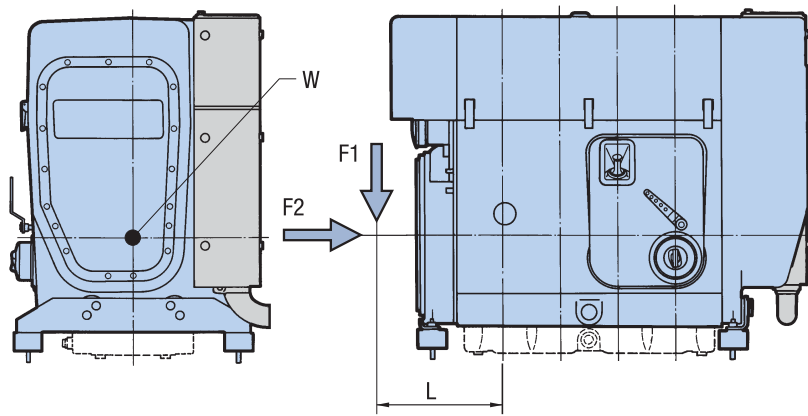
### Max. permissible radial force F1:

$$F1 = \frac{400\,000}{L \text{ (mm)} - 73} \text{ (N)}$$

### Max. permissible axial force F2:

$$F2 = 2700 \text{ N}$$

- Shaft W: Suitable for axial power-take-off, for example adaption of a hydraulic pump. Max. torque 70 Nm drive with engine speed. Axial and radial forces not permitted.

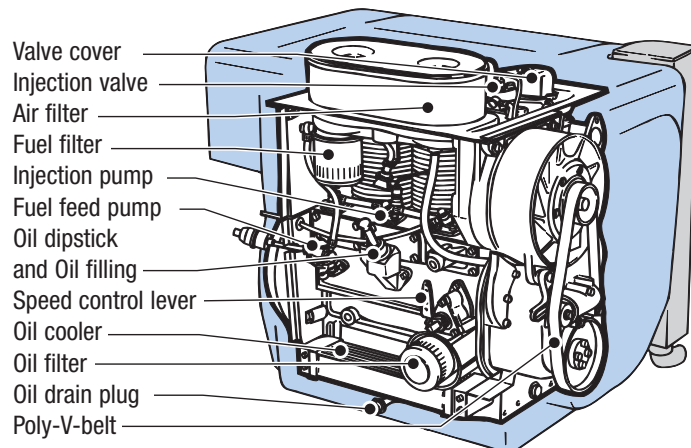


## Maintenance and operating points

For the engine to achieve its maximum life, it is essential for it to be serviced meticulously at regular intervals.

The better the accessibility, the more promptly and conscientiously the engine will be maintained.

Please convince yourself personally that all service and operation points are easily accessible before delivering your machine to the customer.



## Electrical equipment

The engine-mounted components, such as starter, alternator and switches, are connected to the instrument box by means of a 2 m cable harness. The engine is started and controlled from this instrument box. Instrument box and cable harness are part of the additional equipment and supplied according to the number of electrical safety features which are required.

If the engine has to be started at temperatures below - 10 °C, it must be equipped with a pre-heating system (glow plug) (additional equipment). Further additional equipment includes automatic start and stop, remote control etc.

Please ask for drawings and wiring diagrams.

[www.hatz-diesel.com](http://www.hatz-diesel.com)

## Power-Take-Off and Sense of Rotation

- Power-take-off on flywheel-side (pict. 1).
- Power-take-off on governor side with engine speed, max. torque 70 Nm, axial and radial force not permitted (pict. 2/W).
- Rotation see pict. 1 and 2.
- Engine flangeable at flywheel-side.

## Engine model

- with capsule, with counter balance shaft („U“ pict. 3).

## Engine variants (pict. 4)

- **Variant XI:** Engine with electric start 12 V
- **Variant XIII:** Engine with electric start 24 V

## Weight

| 2L41C,<br>Var. XI, XIII |      | 3L41C,<br>Var. XI, XIII |      | 4L41C,<br>Var. XI, XIII |      |
|-------------------------|------|-------------------------|------|-------------------------|------|
| kg                      | lbs. | kg                      | lbs. | kg                      | lbs. |
| 276                     | 608  | 331                     | 730  | 396                     | 873  |

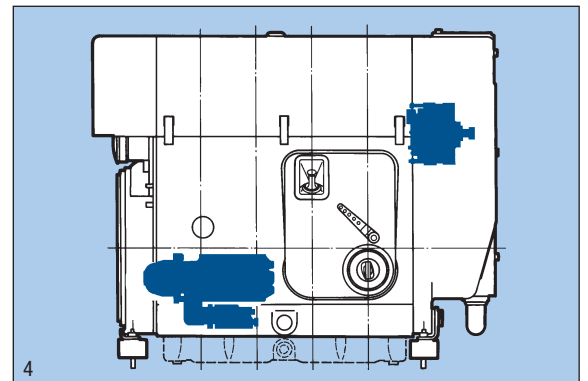
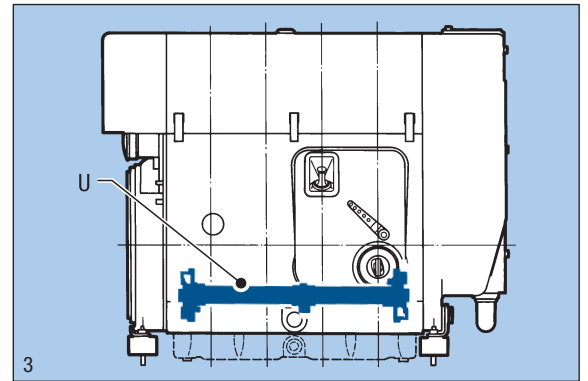
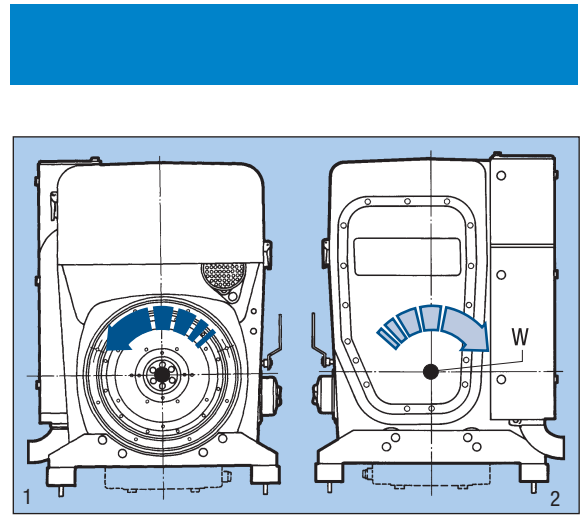
## Scope of delivery of engine

Engine tested for full load on test bench. Engine fitted with blower fan, variable speed governor, injection timer, lubricating oilfilter, dry-type air filter, hydraulic belt tensioner, automatic stop in case of belt failure, automatic extra fuel device, automatic injection pump bleeding, eye hook for transport of engine (only suitable to carry the engine weight). Painting in HATZ standard colours.  
No oil in engine.

**Accessories:** Gasket for 1st maintenance.

Further equipment included in engine variants:

- **Variant XI:** Electric starter 12 V, 2.7 kW, alternator 14 V, 60 A, engine wiring, electric maintenance indicator for airfilter, oil pressure switch, fuel feed pump and fuel filter, exhaust manifold, engine brackets. Additional oil sump (4L41C).
- **Variant XIII:** Same as Variant XI, however electric starter 24 V, 4.0 kW and alternator 28 V, 40 A.



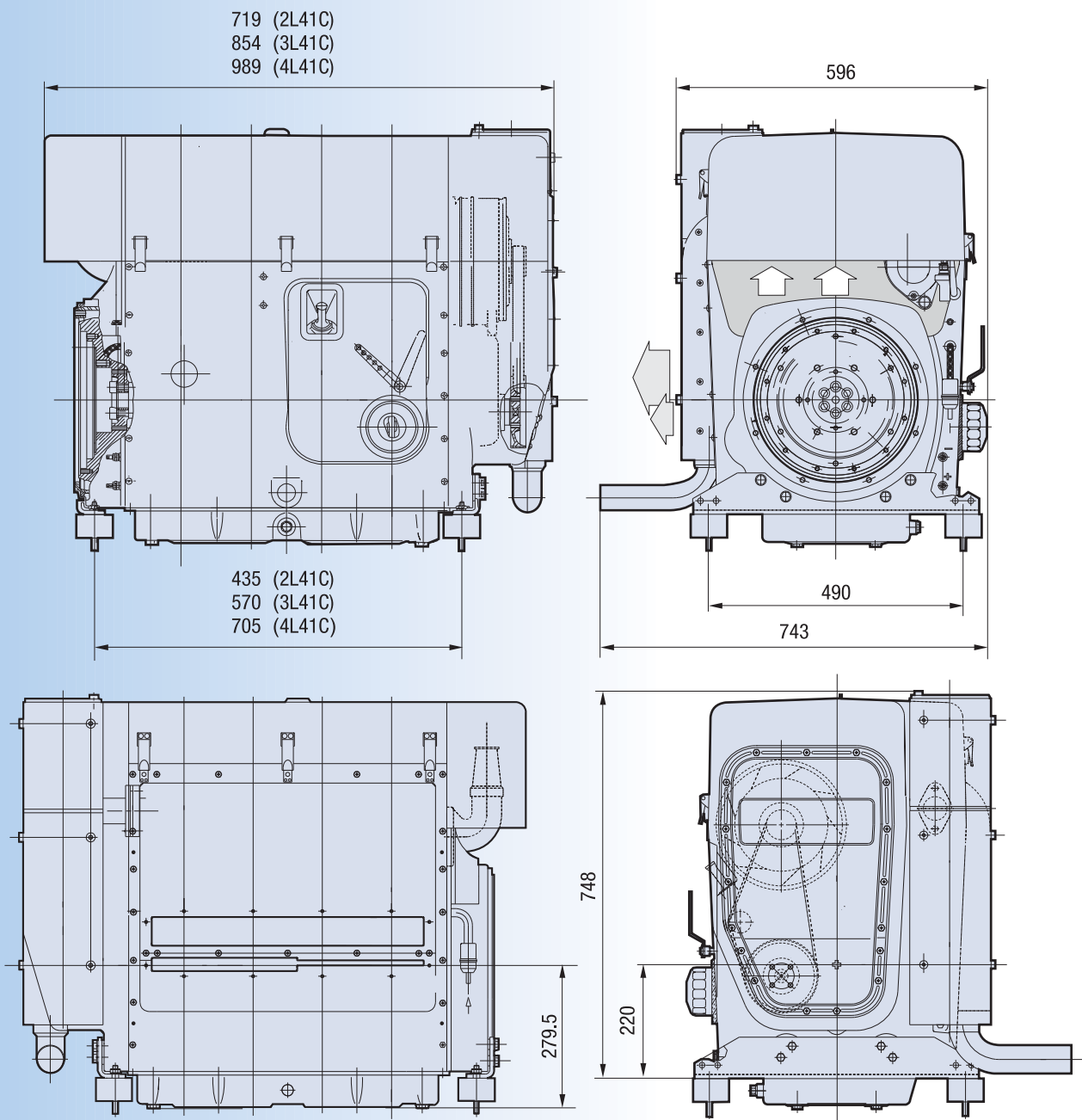
## Additional equipment

Thanks to the complete programme of additional equipment engine can be adapted to the special requirements of every application.

As a minimum every engine needs the “additional equipment, necessary for operation”.

For selection of additional equipment see “Engine and Equipment Survey”.

## Dimensions



Spread at outlines  $\pm 3$  mm due to tolerance.

Drawings with detailed - and connection measures can either be demanded or downloaded as pdf- resp. dxf-file which are shown in the Internet.

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