



ACP 15 / 28 / 40

Dry compact Multi-stage Roots pumps.
Clean vacuum. High reliability.

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The multi-stage Roots pump technology of the ACP series meets the requirements of applications where clean and dry vacuum is needed.

No particle contamination

The frictionless pumping module is optimized to operate without internal lubricant and provides outstanding oil-free vacuum with no hydrocarbon vapor backstreaming. Without any seals between rotor and stator no particles are generated.

High reliability

The absence of wearing parts inside the pumping module allows for unsurpassed long-term stability and high reliability in even the most demanding applications.

Constant performances

The frequency converter driven motor provides constant rotational speed, thus stable pumping speed and consistent ultimate pressure are achieved all over the world.

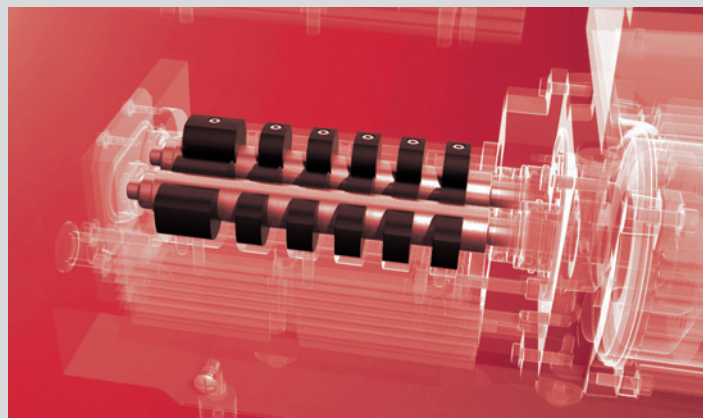
Low maintenance costs

Our ACP pumps require overhaul only every 22,000 hours of operation for the ACP 28/40 and 20,000 hours of operation for the ACP 15 resulting in low cost of ownership.

Condensable vapor ability

High flow gas ballast ports and drainable silencers allow the ACP to pump high amounts of condensable vapors (up to 1,000 g/h of pure water vapor).

Pfeiffer Vacuum has been an industry leader in multi-stage Roots pumping technology since 1988





Advantages at a glance

- Best solution
 - Air cooling
 - Frequency converter
 - Several gas port options
 - Universal power supply
 - Standards
- Ideal replacement for oil-sealed pumps
 - No installation and operational costs for water supply
 - Hour meter, remote operation mode (RS-485, dry contacts, multiple rotational speed selection (power saving, noise reduction, adaptation to application cycle)
 - Purge gas, gas ballast, other specific ports according to application
 - Wide voltage supply 50/60 Hz single-phase and three-phase
 - Compliance with CE standards, UL/CSA certified, SEMI S2 certified

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Typical applications of ACP pumps

Analytical instruments

- Electron microscopes
- Surface analyzers
- Leak detectors
- Mass spectrometers
- Optical spectrometers

R & D

- Particle accelerators
- Turbo pumping stations
- Laboratories

Industry

- Lamp manufacturing
- Vacuum coating
- Cryo pumps regeneration
- Plasma cleaning
- Drying
- Load-lock



R & D applications
(HiCube pumping station with ACP 40)

Specific applications need special solutions

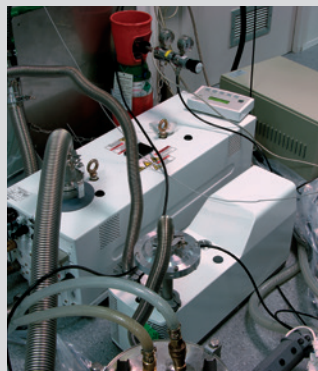
Special versions have been developed for:

- Helium recirculation in a closed-loop
- Backing turbopumps in UHV systems

Please contact us for special versions.



Analytical instruments



Industrial applications



Semiconductor tool



Plasma cleaning machine

Several versions for a wide range of applications

Standard version

(ACP 15 / ACP 28 / ACP 40)

The SD version is designed for applications that require pumping of clean (dust-free) and non-corrosive gases. Standard pumps are equipped with a gas ballast device to improve pumping of light gases and avoid vapor condensation inside the pump. Three gas ballast options are available to satisfy customer needs.

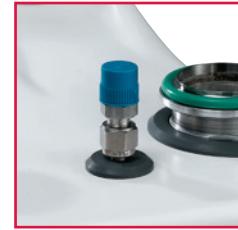
- 1 Permanently open inlet filter
- 2 Manual gas ballast knob (open/close)
- 3 Blanked-off (closed by plug)



Version for corrosive gases

(ACP 15 G / ACP 28 G / ACP 40 G)

The G version pump is compatible with traces of corrosive gases. Three purge gas jets protect low and high pressure bearings and dilute trace amounts of corrosive gases.



Purge port R 1/4"

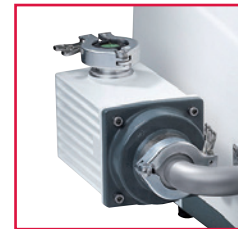
Version for condensable vapors

(ACP 28 CV / ACP 40 CV)

The CV version is specially designed to avoid vapor condensation inside the pumping module with:

- A high gas ballast flow to warm up the pump and dilute condensable gases
- An external drainable silencer to remove liquid from the lowest point of the exhaust stage.
- A gas purge to protect lip seals and ball bearings from condensable vapors.

CV versions extend the pure water vapor capacity up to 1,000 g/h.



Drainable silencer

Version for gas re-circulation or recovery

(ACP 28 CP / ACP 40 CP)

To match with the features asked for gas recirculation (He_3/He_4 refrigerators, lasers...), the ACP CP version has been developed. The pumps were defined to match with an unequaled vacuum leak tightness (better than $5 \cdot 10^{-8}$ mbar·l/s). The ACP CP version is also equipped with an additional vacuum port to make initial evacuation of the pump easy and fast. These pumps are also very popular for gas recovery applications, for example noble gas recovery.



Additional port

In collaboration with large R&D centers, Pfeiffer Vacuum has defined various pumping solutions based on our proven ACP technology for particle accelerators and other R&D applications:

Fluorine free version

(ACP 28 SH / ACP 40 SH)

The SH version is designed for applications that require pumping of clean (dust-free) and non corrosive gases where presence of Fluorine is not permitted. SH pumps are equipped with a gas ballast device to improve pumping of light gases and avoid condensation vapors inside the pump.



Gas ballast port

Version for radiating environments

(ACP 28 R / ACP 40 R)

The ACP R version is based on the SH version, therefore Fluorine free, and equipped with remote electronics. This can be an important factor when a pump is installed close to an environment emitting radiation, for example in particle accelerators.



Remote electronics

ACP 15 / 28 / 40

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Technical data

| Description | Unit | ACP 15 | ACP 28 | ACP 40 |
|--|-------------------|------------------------|-----------------------------|------------------------|
| Pumping speed, max. | m ³ /h | 14 | 27 | 37 |
| | cfm | 8.2 | 16 | 22 |
| Ultimate pressure without purge gas ¹⁾ | mbar | 5 · 10 ⁻² | 4 · 10 ⁻² | 4 · 10 ⁻² |
| | torr | 3.8 · 10 ⁻² | 3.0 · 10 ⁻² | 3.0 · 10 ⁻² |
| Ultimate pressure with ²⁾ purge gas ¹⁾ For G version only ³⁾ | mbar | 0.3 | 0.2 | 0.2 |
| | torr | 0.23 | 0.15 | 0.15 |
| Ultimate pressure with open gas ballast ¹⁾ For SD version only | mbar | 0.3 | 0.2 | 0.2 |
| | torr | 0.23 | 0.15 | 0.15 |
| Maximum continuous inlet pressure | mbar | 1,013 | 1,013 | 1,013 |
| | torr | 750 | 750 | 750 |
| Max. pure water vapor tolerance (measured) with open gas ballast (SD version) | g/h | 80 | 120 | 120 |
| Power supply | | | | |
| 1-phase | | | 100-230 V +/-10 %, 50/60 Hz | |
| 3-phase | | | 200-440 V +/-10 %, 50/60 Hz | |
| Power consumption ¹⁾ | | | | |
| at ultimate pressure | W | 450 | 700 | 700 |
| at atmosphere | W | 550 | 1,050 | 1,050 |
| Ambient temperature | °C | | 12 to 40 | |
| | °F | | 54 to 104 | |
| Flange in | ISO-KF | DN 25 | DN 25 | DN 40 |
| Flange out | ISO-KF | DN 16 | DN 25 | DN 25 |
| Max. Helium leak rate ⁴⁾ | mbar l/s | < 5 · 10 ⁻⁷ | < 5 · 10 ⁻⁷ | < 5 · 10 ⁻⁷ |
| Weight | kg | 23 | 30 | 32 |
| | lbs | 51 | 66 | 70.5 |
| Overall dimensions (L x W x H) | | | | |
| 1-phase motor | mm | 514 x 190 x 270 | 647 x 193 x 322 | 647 x 193 x 322 |
| | inches | 20.2 x 7.5 x 10.6 | 25.4 x 7.6 x 12.6 | 25.4 x 7.6 x 12.6 |
| 3-phase motor | mm | 497 x 190 x 266 | 612 x 187 x 314 | 612 x 187 x 314 |
| | inches | 19.5 x 7.5 x 10.4 | 24.1 x 7.36 x 12.3 | 24.1 x 7.36 x 12.3 |

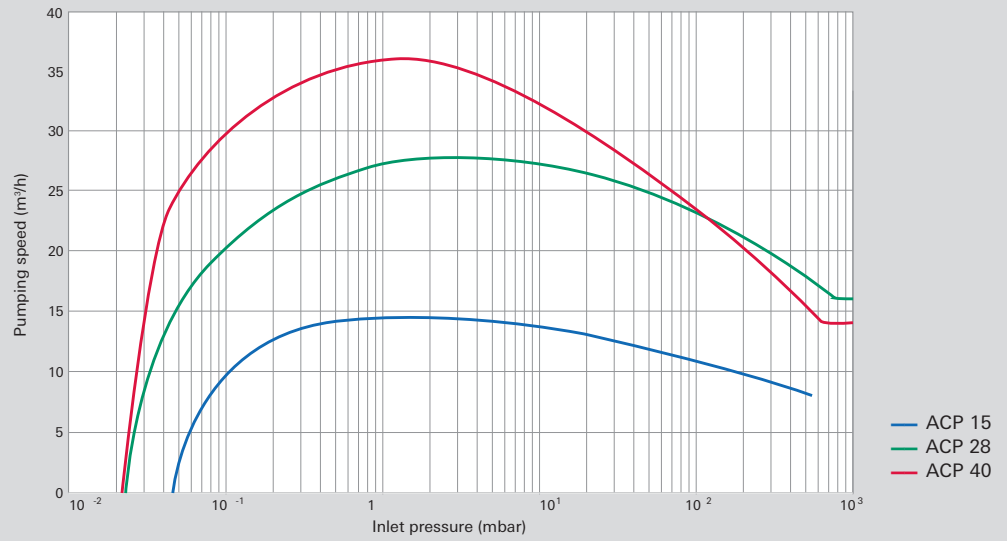
¹⁾ Maximum values obtained after minimum 1 hour of pump warm up time

²⁾ 5,000 sccm for ACP 15; 3,700 sccm for ACP 28/40

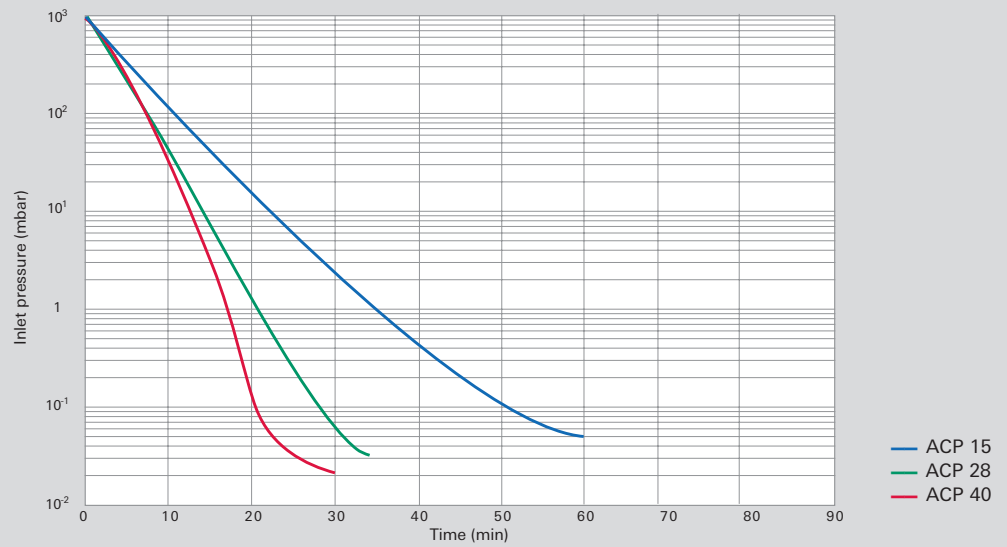
³⁾ relative nitrogen pressure 300 mbar

⁴⁾ Except CP version (5 · 10⁻⁸ mbar · l/s)

Pumping speed



Pressure drop (volume = 1 m³)

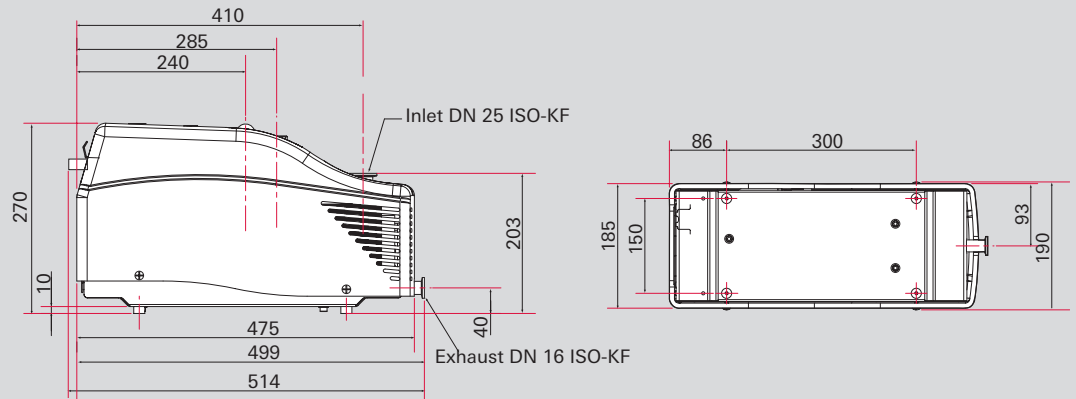


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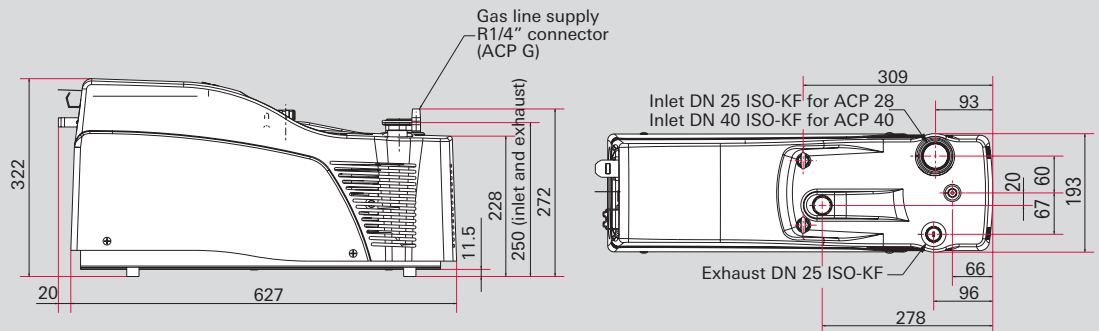
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Dimensions

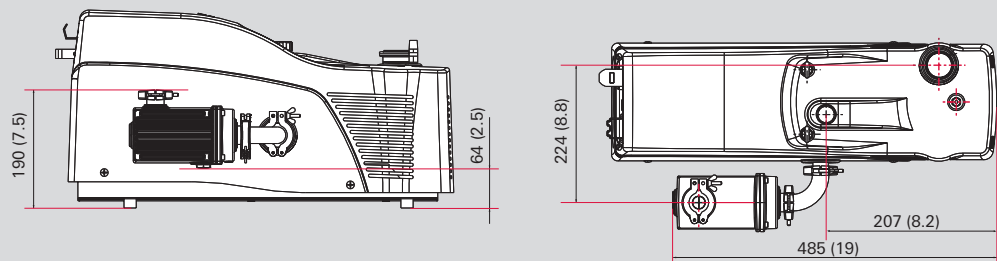
ACP 15
1-phase motor¹⁾



ACP 28/40
1-phase motor¹⁾



ACP 28 CV / 40 CV²⁾



1) 3-phase versions are shorter and smaller. See technical specification table.
2) CV versions are wider due to the side mounted external silencer.

Dimensions in mm

Order numbers

ACP 15 pumps

| Type | Versions | Inlet port | Exhaust port | Gas ballast | Frequency converter | Power cord | Options |
|------------|---------------------------------|------------|--------------|--|--------------------------|---|----------------|
| V5: ACP 15 | SA: SD version GA: G version | T: DN 25 | S: DN 16 | M: Manual (On/Off) B ²⁾ : Blanked R: R 1/4" port (GA version) F: Permanent filter (mesh) | G: 1-phase T: 3-phase | K: UK A: US S: Switzerland J: Japan (1 cable LV only) E: Europe Z: Without R ¹⁾ : 3-phase (without plug) | F: Rubber feet |
| V5 | SA | T | S | M | F | E | F |

Example: **V5SATSMFEF**

ACP 28/40 pumps

| Type | Versions | Inlet/Exhaust | Motor | Frequency converter | Power cord | Gas ballast | Options |
|--------------------------|--|--|--|--|---|--|-----------------------------|
| V6: ACP 28 V8: ACP 40 | SA: SD version GA: G version GV: Condensable vapor SC: CP version SH: Fluorine (F ₂) free version SR: Fluorine (F ₂) free version with remote electronics | T: ACP 28 C: ACP 40 P ⁵⁾ : ACP 28 F ₂ free R ⁵⁾ : ACP 40 F ₂ free ACP 28 = DN 25/DN 25 ACP 40 = DN 40/DN 25 | S: Standard E ⁴⁾ : Leaktight | G: 1-phase T: 3-phase D ⁶⁾ : Remote 1-p | K: UK A: US S: Switzerland J: Japan (1 cable LV only) E: Europe Z: Without R ¹⁾ : 3-phase (without plug) | M: Manual (On/Off) B ⁴⁾ : Blanked F: Permanent filter (mesh) V ³⁾ : Manual (On/Off) (CV version) H ³⁾ : Permanent filter (CV version) | F: Rubber feet R: Wheels |
| V6 | SA | T | S | F | E | M | F |

Example: **V6SATSFEMF**

¹⁾ **R** is the only option for 3-phased version

²⁾ **R** is the only option for G version

³⁾ **V** or **H** are the only options for CV versions

⁴⁾ **E** is the only option for CP version

⁵⁾ **P** and **R** are the only options for SH or SR version

⁶⁾ **D** is the only option for SR version



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Accessories

Inlet particle filter

Inlet particle filters will prevent solid particles from entering the ACP pumps.

For ACP 15 and ACP 28, the suitable filter is IPF 25:

- Inlet/exhaust ports: DN 25 ISO-KF

For ACP 40, the suitable filter is IPF 40:

- Inlet/exhaust ports: DN 40 ISO-KF

Filtration threshold: 25 µm

| Inlet particle filter | Order number |
|----------------------------------|--------------|
| IPF 25 | 111649 |
| IPF 40 | 111647 |
| Replacement cartridge for IPF 25 | 111650 |
| Replacement cartridge for IPF 40 | 111648 |

External silencer

Use of the external exhaust silencer ES 25S will significantly reduce the noise level when operating ACP pumps at high pressures:

- Inlet/exhaust ports: DN 25 ISO-KF

ES 25S can be used at the exhaust of ACP 15, ACP 28 and ACP 40.

Delivered with all necessary fittings for connection at the exhaust port for all ACP pumps.

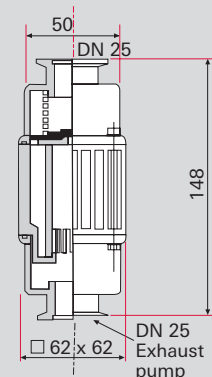
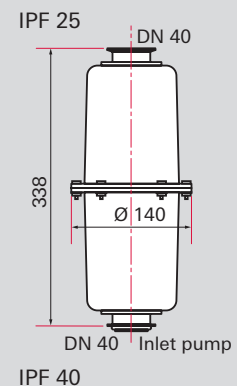
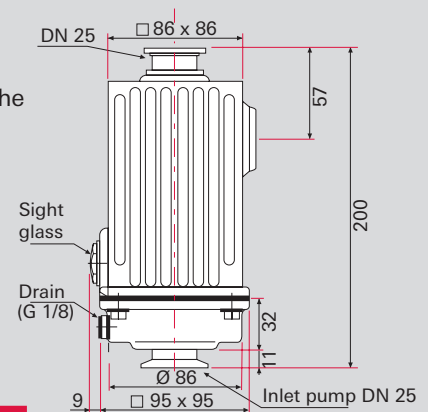
| External silencer | Order number |
|----------------------------------|--------------|
| ES 25S | 109873 |
| Replacement cartridge for ES 25S | 109797 |

Cable

For ACP R version to place the remote electronics safely away from radiation

| Cable | Order number |
|--------------------------------|----------------------------|
| Remote cable for ACP R version | A334919-XXXX ¹⁾ |

¹⁾XXXX represents the cable length in decimeter



ES 25S

Dimensions in mm

Noise reduction covers

NRC 15 and NRC 28/40 reduce ACP noise levels significantly.

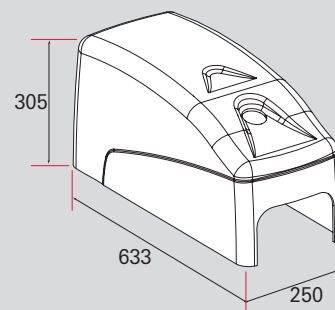
Noise level reduction from 5 to 6 dBA:

- NRC 15 for ACP 15
- NRC 28/40 for ACP 28 and ACP 40
- Max. ambient temperature: 35 °C

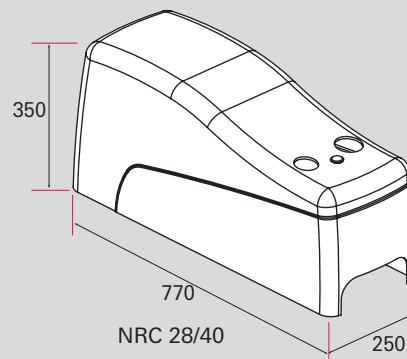
An additional pipe extension is required for each port to connect accessories when NRC is mounted.¹⁾

¹⁾ Pipe extension, centering rings and clamping rings have to be ordered separately.

| Noise reduction covers | Order number |
|-----------------------------|--------------|
| NRC 15 | 111968 |
| NRC 28/40 | 112637 |
| Pipe extension DN 25 ISO-KF | A462855 |
| Pipe extension DN 40 ISO-KF | 303024 |



NRC 15



NRC 28/40

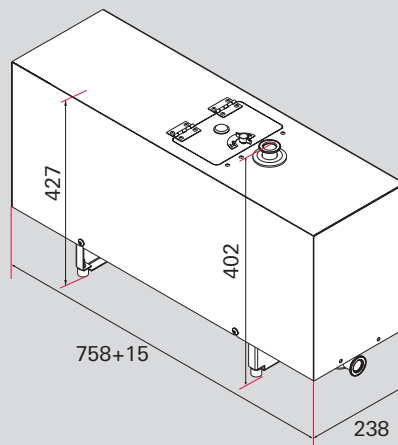
Sound enclosure kit

Sound enclosure kits are the appropriate solution for operating ACP pumps in even the most quiet environments.

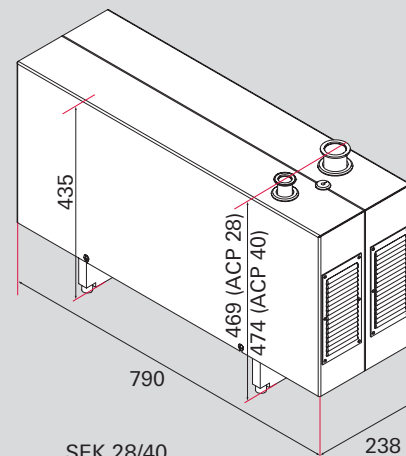
Noise reduction of 10 dBA.

- Max. ambient temperature: 30 °C
- SEK 15 includes dedicated DN 25 exhaust silencer

| Sound enclosure kit | Order number |
|---------------------|--------------|
| SEK 15 | 122480 |
| SEK 28/40 | 114379 |



SEK 15



SEK 28/40

Dimensions in mm

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