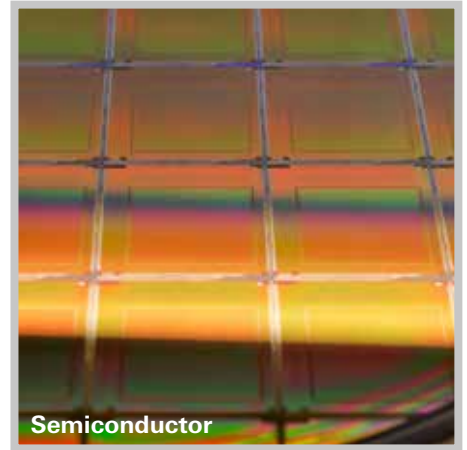




## ACP 15 / 28 / 40

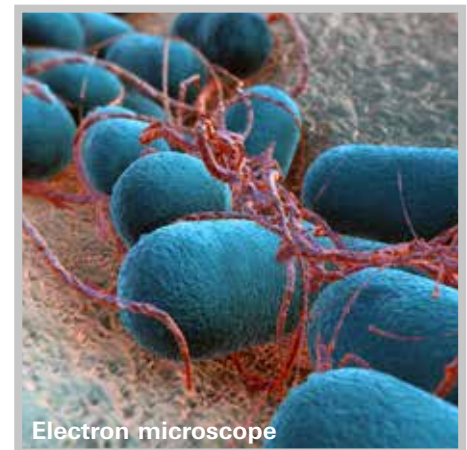
Dry compact Multi-stage Roots pumps.  
Clean vacuum. High reliability.



Semiconductor



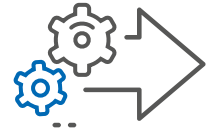
Plasma cleaning



Electron microscope

# ACP 15 / 28 / 40

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



Flexible use

Your added value

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**

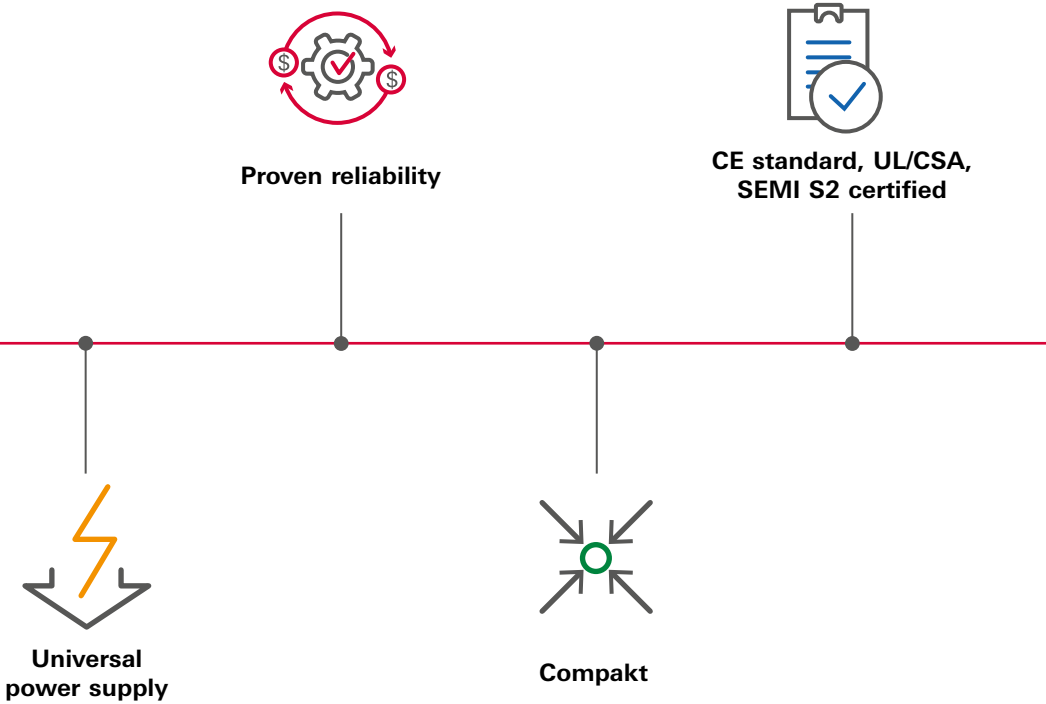
The frictionless pumping module is optimized to operate without internal lubricant and provides outstanding oil-free vacuum with no hydrocarbon vapor backstreaming. Without any seals between rotor and stator no particles are generated.

### **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).

# ACP 15 / 28 / 40

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

## 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 15G / ACP 28G / ACP 40G)

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  
R 1/4"

### Version for condensable vapors

(ACP 28CV / ACP 40CV)

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 ( $\text{He}_3/\text{He}_4$  refrigerators, lasers...), the ACP CP version has been developed. The pumps were defined to match with an unequalled 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:**



Gas ballast port

**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.

**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

**Typical applications of ACP pumps**

**Analytical instruments**

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

**Industry**

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

**F & D**

- Particle accelerators
- Turbo pumping stations
- Laboratories

**Specific applications need special solutions**

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



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

# ACP 15 / 28 / 40

Technical data,  
Pumping speed, Pressure drop

## Technical data

	Unit	ACP 15	ACP 28	ACP 40	
Pumping speed, max.	m <sup>3</sup> /h	14	27	37	
	cfm	8.2	16	22	
Ultimate pressure without purge gas <sup>1)</sup>	mbar Torr	$5 \cdot 10^{-2}$ $3,8 \cdot 10^{-2}$	$4 \cdot 10^{-2}$ $3,0 \cdot 10^{-2}$	$4 \cdot 10^{-2}$ $3,0 \cdot 10^{-2}$	
Ultimate pressure with <sup>2)</sup> purge gas <sup>1)</sup> For G version only <sup>3)</sup>	mbar Torr	0.3 0.23	0.2 0.15	0.2 0.15	
Ultimate pressure with open gas ballast <sup>1)</sup> For SD version only	mbar Torr	0.3 0.23	0.2 0.15	0.2 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		100-230 V +/-10%, 50/60 Hz 200-440 V +/-10%, 50/60 Hz			
Power consumption <sup>1)</sup> at ultimate pressure	W	450	700	700	
	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 <sup>4)</sup>	mbar l/s	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	
Weight	kg	23	30	32	
	lbs	51	66	70.5	
Overall dimensions (L x B 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	24.1 x 7.36 x
			12.3	12.3	12.3

<sup>1)</sup> Maximum values obtained after minimum 1 hour of pump warm up time

<sup>2)</sup> 5.000 sccm for ACP 15; 3.700 sccm for ACP 28/40

<sup>3)</sup> relative nitrogen pressure 300 mbar

<sup>4)</sup> Except CP version ( $5 \cdot 10^{-8}$  mbar-l/s)

ACP 15

**$5 \cdot 10^{-2}$  mbar**  
 **$3,8 \cdot 10^{-2}$  Torr**

Ultimate pressure without  
purge gas

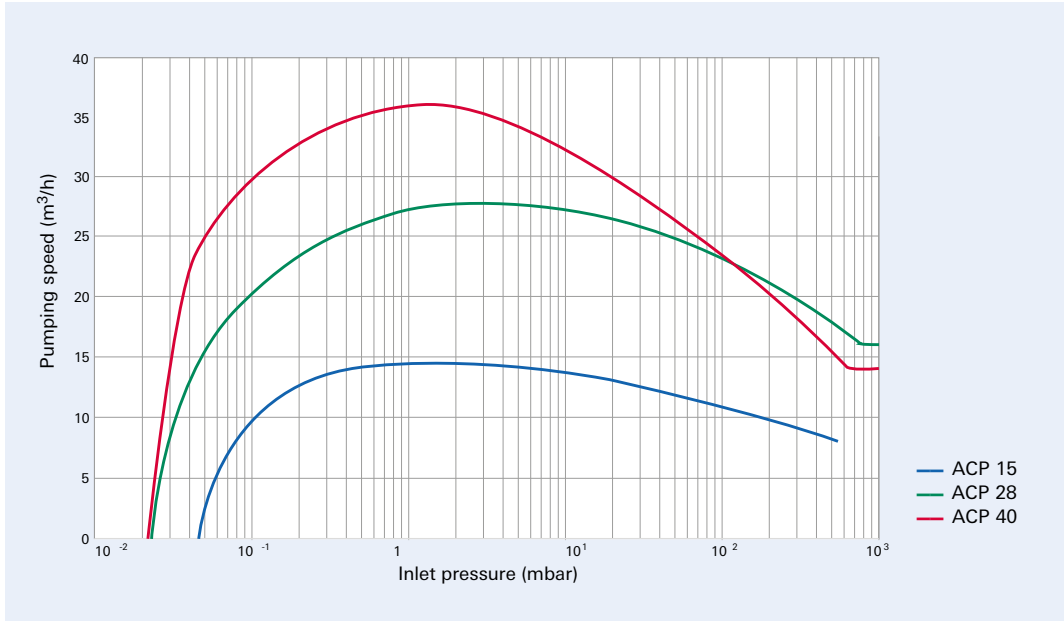
**450 W**

Power consumption  
at ultimate pressure



**Pumping speed**

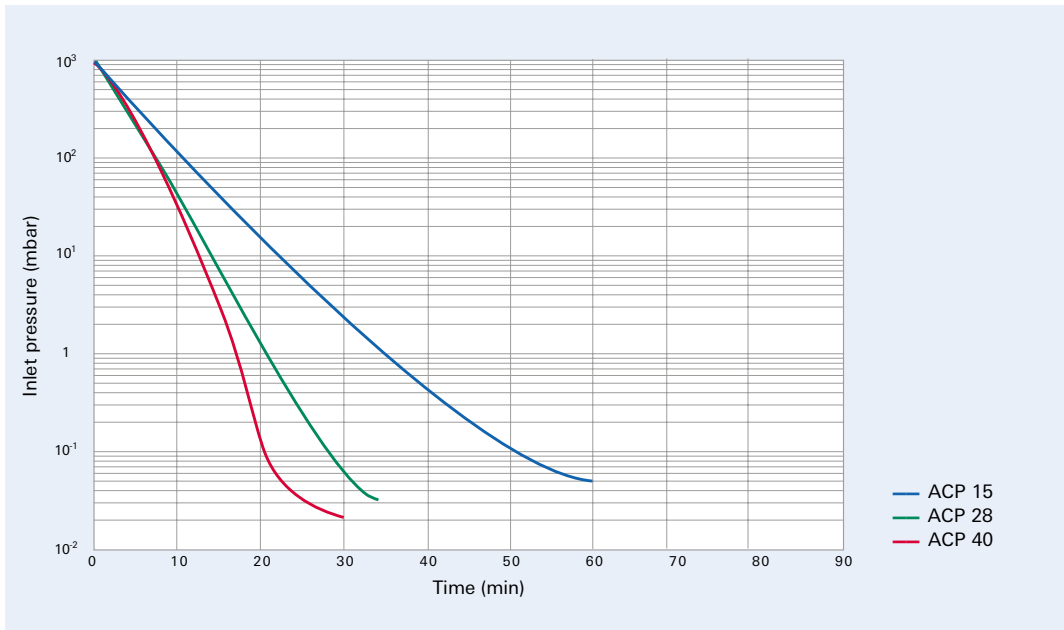
ACP 15 / 28 / 40



**Pressure drop**

(Volume = 1 m³)

ACP 15 / 28 / 40

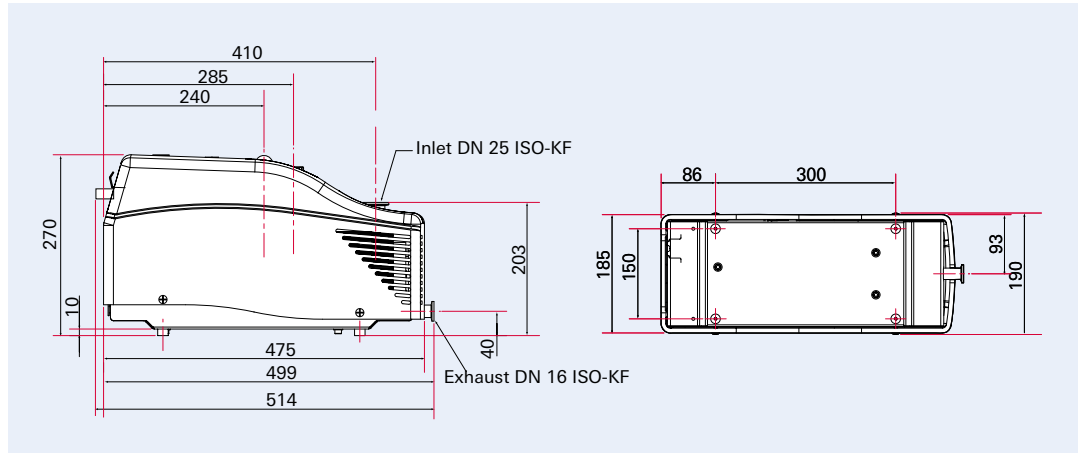


# ACP 15 / 28 / 40

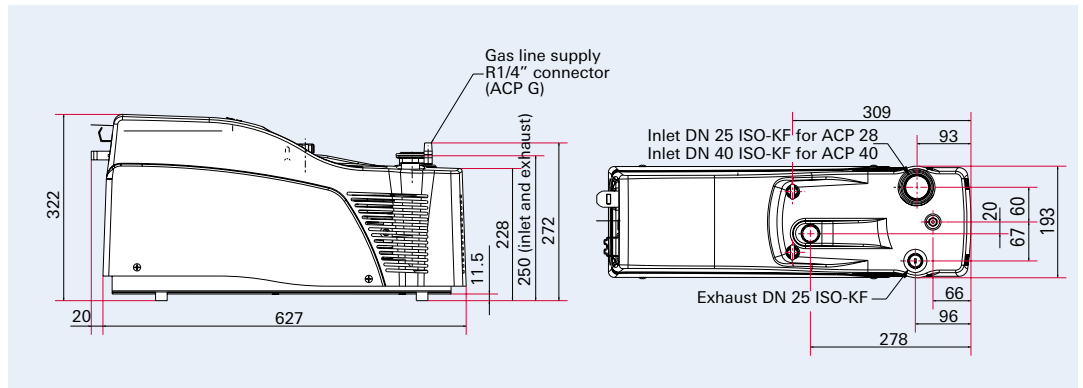
## Dimensions and Order numbers

### Dimensions

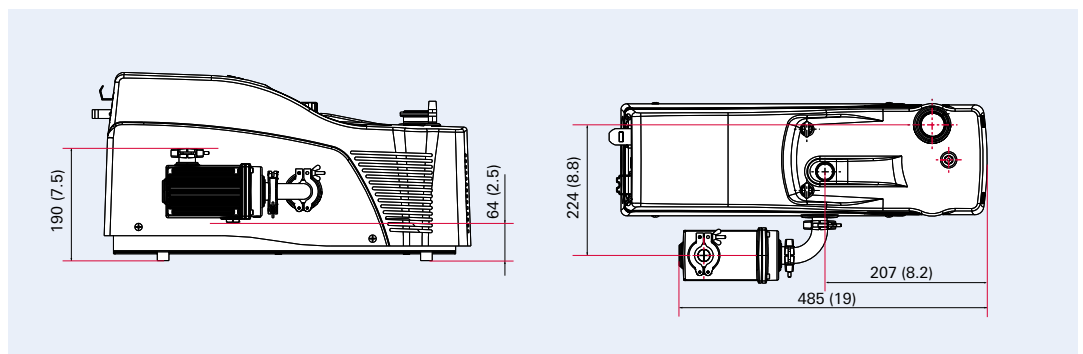
ACP 15  
1-phase motor<sup>1)</sup>



ACP 28/40  
1-phase motor<sup>1)</sup>



ACP 28CV/40CV<sup>2)</sup>



<sup>1)</sup>3-phase versions are shorter and smaller. See technical specification table.

<sup>2)</sup>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
<b>V5:</b> ACP 15	<b>SA:</b> SD version <b>GA:</b> G version	<b>T:</b> DN 25	<b>S:</b> DN 16	<b>M:</b> Manual (On/Off) <b>B<sup>2)</sup>:</b> Blanked <b>R:</b> R 1/4" port (GA version) <b>F:</b> Permanent filter (mesh)	<b>G:</b> 1-phase <b>T:</b> 3-phase	<b>K:</b> UK <b>A:</b> US <b>S:</b> Switzerland <b>J:</b> Japan (1 cable LV only) <b>E:</b> Europe <b>Z:</b> Without <b>R<sup>1)</sup>:</b> 3-phase (without plug)	<b>F:</b> Rubber feet
<b>V5</b>	<b>SA</b>	<b>T</b>	<b>S</b>	<b>M</b>	<b>F</b>	<b>E</b>	<b>F</b>

Example: **V5SATSMGEF**

ACP 28/40 pumps

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

Example: **V6SATSGEMF**

- <sup>1)</sup> **R** is the only option for 3-phased version
- <sup>2)</sup> **B** is the only option for G version
- <sup>3)</sup> **V** or **H** are the only options for CV versions
- <sup>4)</sup> **E** is the only option for CP version
- <sup>5)</sup> **P** and **R** are the only options for SH or SR version
- <sup>6)</sup> **D** is the only option for SR version



# ACP 15 / 28 / 40

## Accessories

### 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:

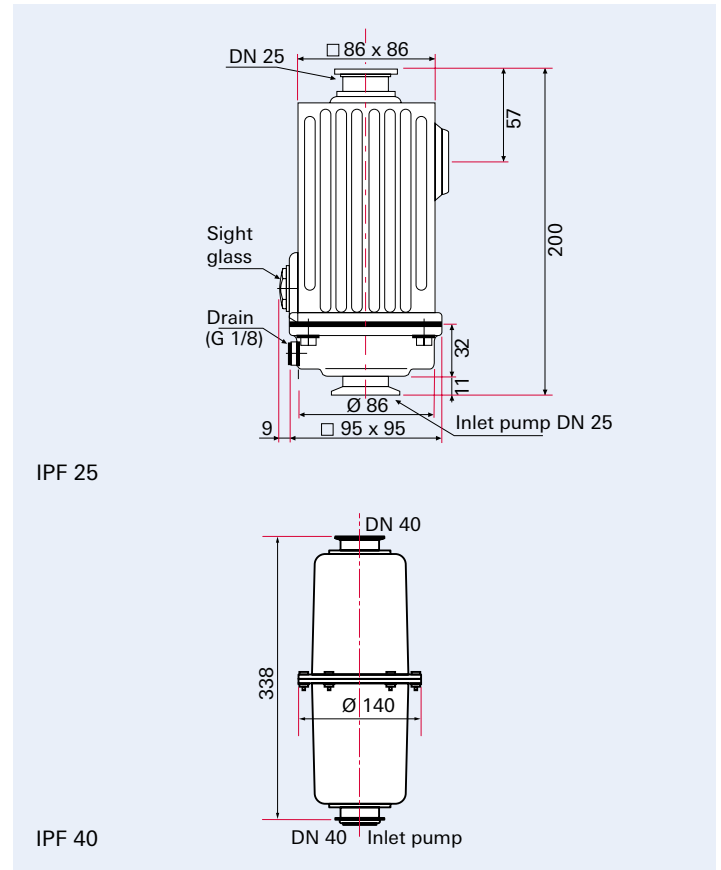
- Inlet/exhaust ports: DN 25 ISO-KF

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

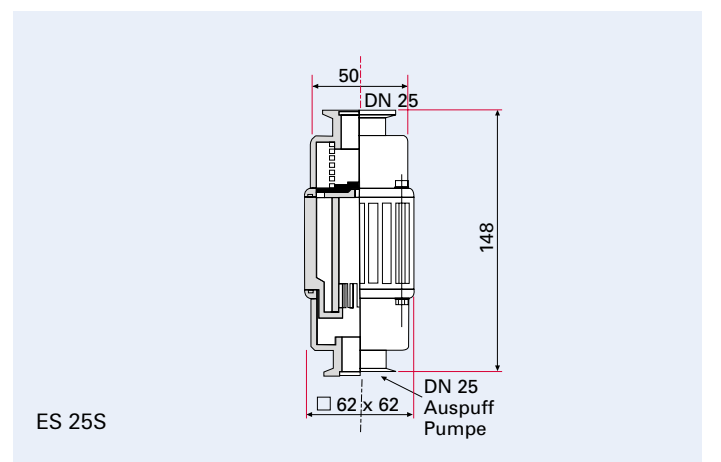
Use of the external exhaust silencer ES 25S will significantly reduce the noise level when operating ACP pumps at high pressures:

- 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 <sup>1)</sup>

<sup>1)</sup> XXXX represents the cable length in decimeter

Dimensions in mm

**Noise reduction covers**

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

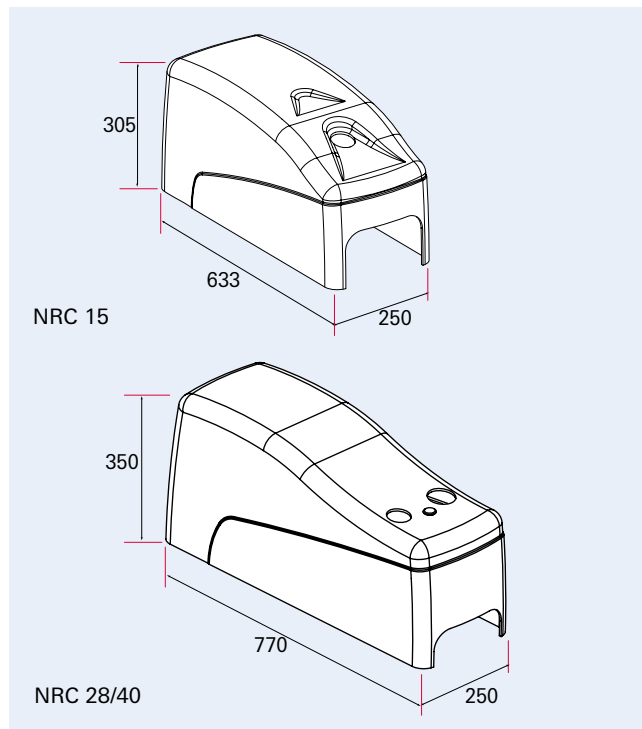
Noise level reduction from 5 to 6 dBA:

- 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.<sup>1)</sup>

<sup>1)</sup> 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



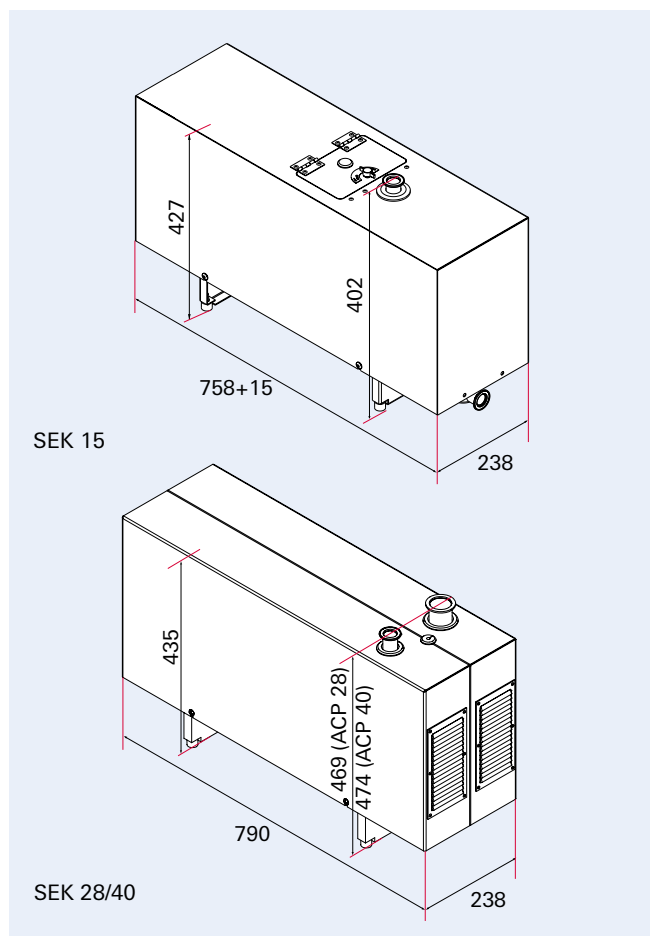
**Sound enclosure kit**

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



Dimensions in mm

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T +49 6441 802-0



Errors excepted. All data subject to change without prior notice. PM 0001 PEN (March 2024/POD)

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