



ACP Series

Multistage Roots Dry Pumps

Operating instructions

Translated from original version

ACP Series Operating Instructions

Chapitre A

INTRODUCTION

- A 10** - ACP Series dry primary pumps overview
- A 20** - Operating principle
- A 30** - Dry primary pump applications
- A 40** - Technical characteristics - ACP 15
- A 41** - Technical characteristics - ACP 28, ACP 40
- A 50** - Accessories

Chapitre B

INSTALLATION

- B 00** - Safety instructions for pump installation
- B 10** - Installation of ACP Series pumps
- B 20** - Mechanical connections
- B 30** - Electrical connections
- B 40** - Remote control connector wiring
- B 41** - RS 485 serial link wiring
- B 50** - Inert gas purge connection (G version)

Chapitre C

UTILISATION

- C 10** - Pump operation
- C 20** - Detailed description of RS 485 commands

Chapitre D

MAINTENANCE - RECHERCHE DES DÉFAUTS

- D 10** - Maintenance frequency and cleaning instructions
- D 30** - Trouble Shooting

Chapitre E

FICHES D'INTERVENTIONS

- E 00** - Maintenance safety instructions

Chapitre F

COMPOSANTS

- F** - Not Used

Chapitre G

ANNEXES

- G 100** - European Declaration of Conformity
- G 200** - Service

Translated from original version

ACP Series Operating instructions

This product complies with the requirements of European Directives, listed in the Declaration of Conformity contained in G100 of this manual.

Copyright/Intellectual property:
The use of adixen products are subject to copyright and intellectual property rights in force in any jurisdiction.
All rights reserved, including copying this document in whole or any part without prior written authorization from adixen Vacuum Products.

Information and drawings are not contractual and can be modified without notice by the manufacturer.

Labelling

Operating instructions - ACP Series

CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in property damage.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in moderate or minor injury. It may also be used to alert against unsafe practices.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury.

DANGER




Indicates an imminently hazardous situation that, if not avoided, will result in death or severe injury (extreme situations).

Before switching on the product, study the operating manual and make sure you follow the safety instructions . You can recognise these by the 'Caution', 'Warning' and 'Danger' symbols. Good practice tips and manufacturer's recommendations are in a blue box.


The performance and operational safety of this product are guaranteed provided it is used normally in the operating conditions defined in this manual.

It is the customer's task to:

- train operators to use the product if they do not speak the language the manual is written in,
- ensure operators know the safe practices to apply when using the product.

Symbol / Label	Description
	Warning: high temperature hazard
	Warning: electrical shock hazard
	Warning: refer to the operating instructions
I	Power ON switch
O	Power OFF switch
INLET	Inlet of the pump
PUMP EXHAUST	Exhaust of the pump

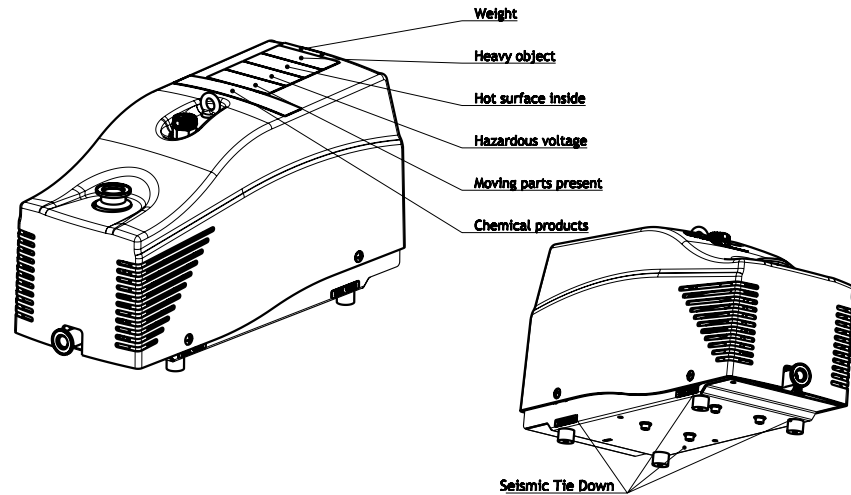
Manufacturer label (example)

adixen Vacuum Products			2012
F - 74009 Annecy Made in France			
Type	V5SATSBAF	6000 rpm	
P Max	1013 mBar	N°	AC 664831

Labelling

Operating instructions - ACP Series

Pump labels



WARNING
HOT SURFACE
Contact with pump bodies may cause burn.
Switch off and wait until pumps cooled before servicing.

Located on the cover of the pump, this label warns the user against possible risk of injury due to any hand contact with hot surfaces. It states that protective gloves should be used before performing any intervention.



WARNING
HEAVY OBJET
Can cause muscle strain or back injury.
Use lifting aids and proper lifting techniques when removing or replacing.

Located on the upper cover, this label indicates that due to its heavy weight, the product should not be handled manually, but always through appropriate handling devices.



WARNING
HAZARDOUS VOLTAGE
Switch off the pump and disconnect the main power cable before opening the power box cover.

Located on the upper cover, this label indicates that some of the internal parts are energized and could cause electrical shocks in case of contact. It advises to disconnect the pump before any intervention or to properly lock-out and tag-out the equipment breaker before any intervention on the pump.



WARNING
MOVING PARTS PRESENT
Moving parts can crush and cut.
Keep hands or feet away from moving parts.

Located on the upper cover, this label informs the user that moving parts present inside the pump could cause personal injury, like crushing or cutting. The user must keep all body parts away from moving parts.

SEISMIC TIE DOWN

Located on the lower part of the pump, these labels indicate the location of the holes for the anti earthquake holding device (accessory).

ATTENTION
THIS PUMP HAS BEEN PREPARED FOR PERFLUORINATED POLYESTER FLUID

This label indicates that the pump is filled with required PFPE synthetic oil.



Introduction

ACP Series Operating instructions Detailed contents

A 10

ACP Series dry pump overview

- Superior technology
- Model ACP 28 / 28G / 40 / 40G overview
- Model ACP 28CV / 40CV overview
- Model ACP 15 / 15G overview

A 20

Operating principle

- Multi-stage Roots principle

A 30

Dry primary pump applications

- Standard version for "clean vacuum" applications
- G version for pumping of corrosive gas traces
- CV version for pumping of condensable vapors

A 40

Technical characteristics - ACP 15 model

- Specifications
- Dimensional drawing - Gravity center

A 41

Technical characteristics - ACP 28/40 models

- Specifications
- Dimensional drawing - Gravity center

A 50

Accessories

- Inlet filters
- Exhaust silencer
- Sound inclosure
- Frequency converter interface plug
- Pump holding device
- Wheel kit

ACP Series dry primary pump overview



This product is designed to generate vacuum by pumping on gases, but not liquids neither solids. It is dedicated for running in industrial environments.

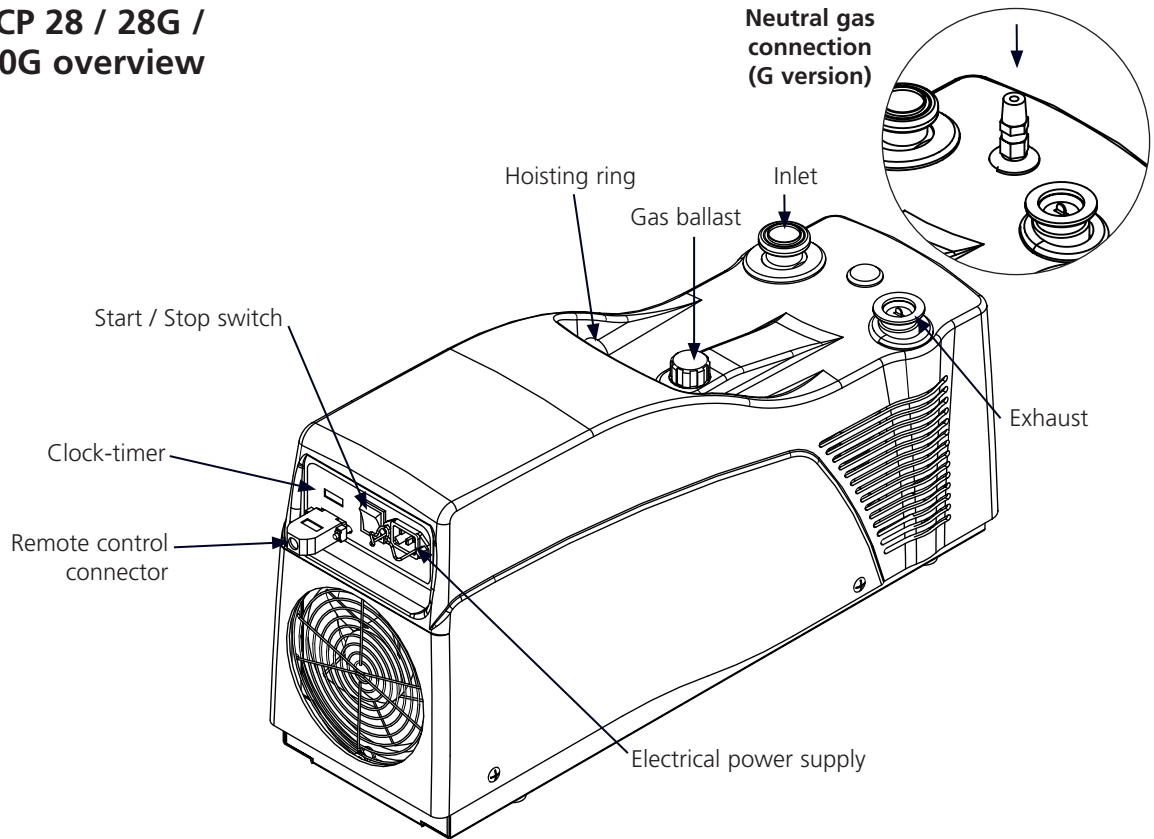
The pumps must not be operated in an area with risk of explosion. Consult the nearest support service to study a solution.

Superior technology

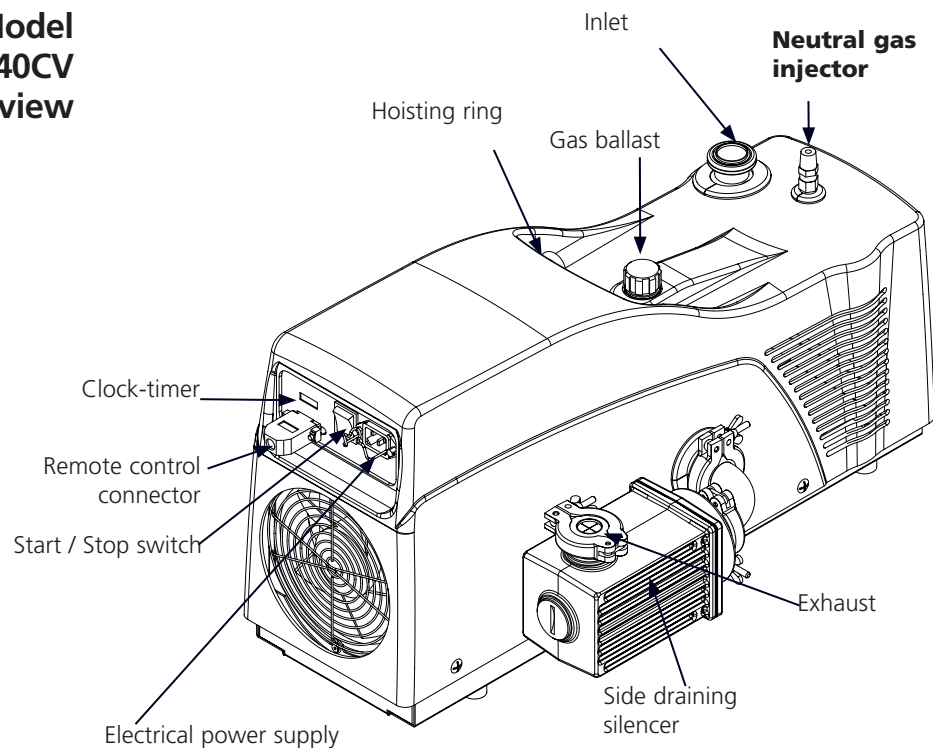
- Type Multistage Roots dry pump
 - frictionless technology,
 - reliability,
 - aluminium pump body.
- Dry and clean vacuum
 - no particulate contamination,
 - residual gas spectrum free of traces of hydrocarbons.
- Sealed air-cooled motor
 - permanent air cooling (built-in fan),
 - safety: certified leaktight.
- Single-phase or three-phase frequency converter
 - multi-voltage, dual frequency 50/60 Hz,
- Several models according to different applications
- Thermal protection based on temperature sensors.
- RS 485 Serial link

ACP Series dry primary pump overview

Model ACP 28 / 28G / 40 / 40G overview

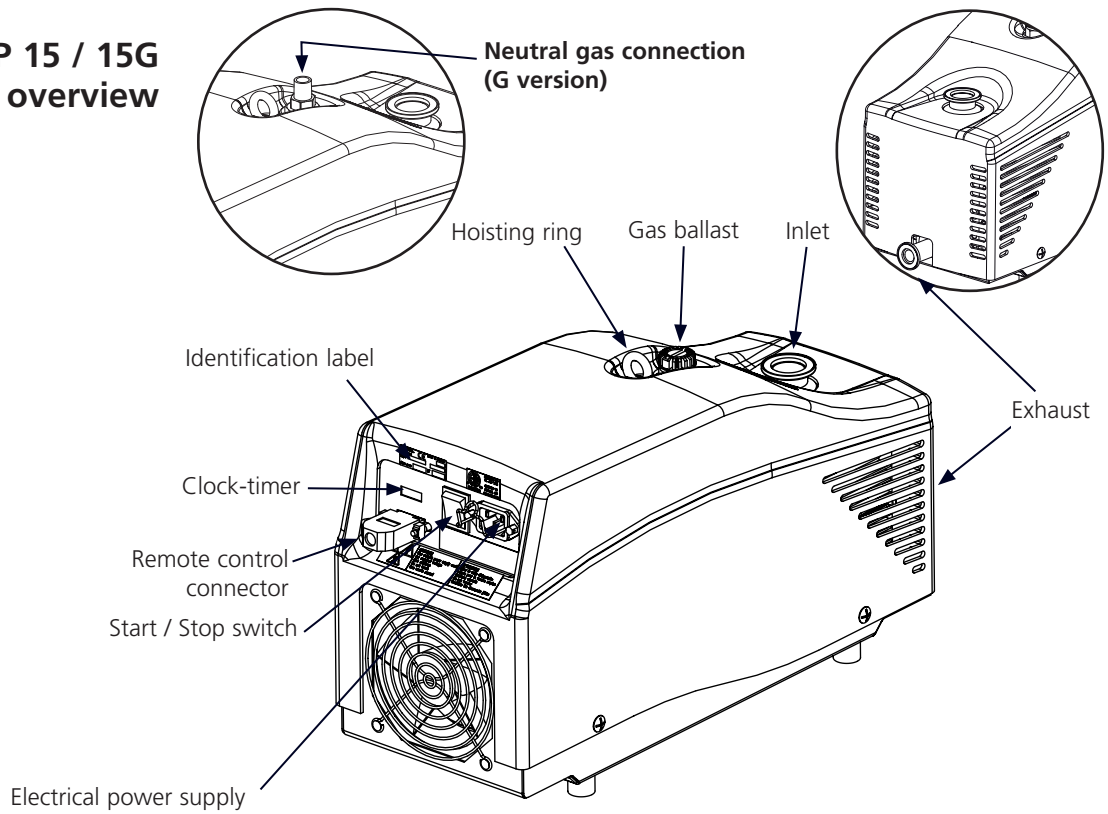


Model ACP 28CV / 40CV overview



ACP Series dry primary pump overview

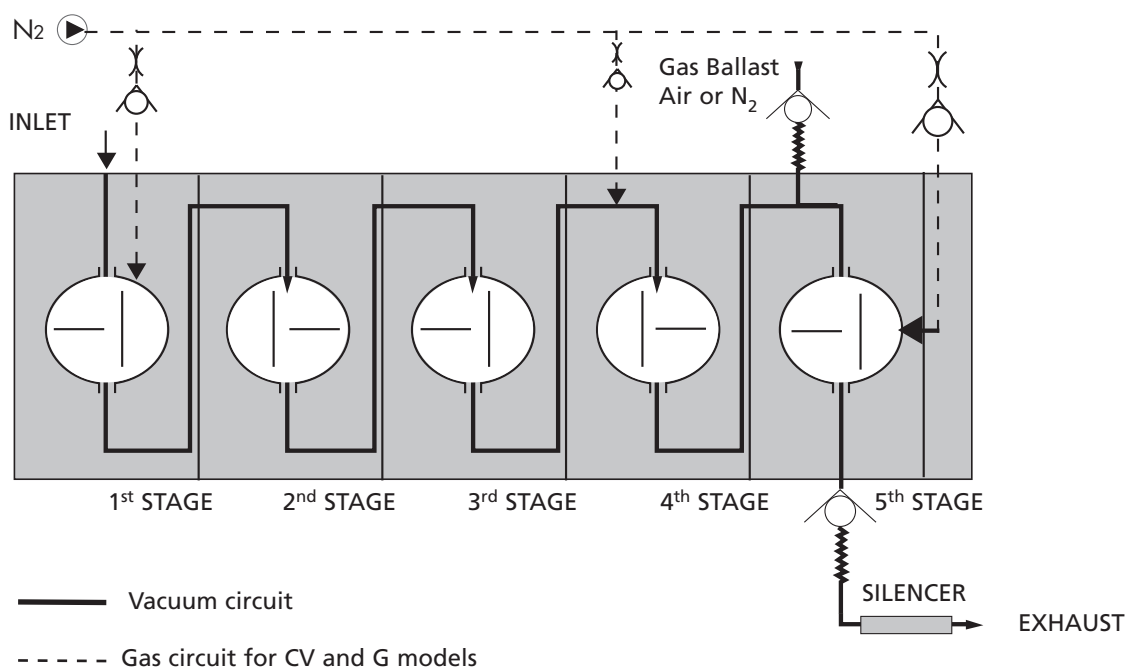
Model ACP 15 / 15G overview



Operating principle

Multi-stage Roots principle

- The ACP pumps are composed of 5 or 6 Roots type stages, connected in series.
- No contact design: the rotors do not touch each other or the housing.



- The standard pumps can be equipped with a gas ballast device to improve pumping of light gases and reduce condensation of condensable vapors pumped gases into the pump.

Multistage Roots dry pumps applications

Standard version for "clean vacuum" applications

The pump is designed for applications that require the pumping of clean (dust-free) and non-corrosive gases. Examples are:

- Instrumentation:
 - Gas analysis.
 - Electronic microscope.
 - X-ray spectrometer.
 - Leak detection.
 - Surface analyzer.
- Research and Development
- Semiconductor Fabrication:
 - Load lock and transfer chamber pumping.
 - Wafer back pumping.

G version for pumping of corrosive gas traces

G version pump is compatible with the pumping of corrosive **traces**. It is equipped with 3 gas purge circuits used to withstand gas traces, to protect the LP and HP ball bearings. This pump model can be used in applications such as:

- Process monitoring.
- Load lock pumping.
- Transfer chamber pumping.
- Focused Ion Beams.

For corrosive gas pumping, contact the manufacturer.

CV version for pumping of condensable vapors

CV version pump model mainly dedicated to the following applications:

- Freeze drying
- Drying in ovens after cleaning and rinsing of substrates,
- Cleaning/distillation processes
- Coating preparation with liquid organic precursors.

Technical characteristics - ACP 15

Product Characteristics	Units	ACP 15	ACP 15G
Weight	Kg (lbs)	23 (50.7)	23 (50.7)
Inlet port		DN 25 ISO-KF	
Exhaust port		DN 16 ISO-KF	
Fan flow rate	m ³ /h	180	
Oil capacity ⁽³⁾	cm ³	20	
Tightness	hPa.l/s	5 · 10 ⁻⁷	
Ultimate pressure ⁽¹⁾ : - Standard model: with gas ballast closed - G Model : without purge	hPa	3 · 10 ⁻²	
Ultimate pressure ⁽¹⁾ : - Standard model : with gas ballast opened - G Model : with purge (300 mbar relative pressure)	hPa	1 · 10 ⁻¹	-
	hPa	-	1 · 10 ⁻¹
Maximum ultimate pressure : - Standard model: with gas ballast closed - G model : without purge	hPa	5 · 10 ⁻²	
Maximum ultimate pressure : - Standard model: with gas ballast opened - G model : with purge	hPa	3 · 10 ⁻¹	3 · 10 ⁻¹
Maximum pressure at inlet (absolute)	hPa	1013	
Maximum exhaust pressure (absolute)	hPa	1200	
Typical sound level at ultimate pressure (with gas ballast and purge closed)	dB (A)	61	
Maximum pumping speed (gas ballast closed with or without purge)	m ³ /h (cfm)	14	14
Pumping steam capacity (at 20°C ambient temperature)	g/h	80 (at 10 hPa)	-
Gas ballast flow at atmospheric pressure	m ³ /h	0.5	-
N ₂ flowrate ⁽²⁾	slm	-	5

⁽¹⁾ Typical value obtained after minimum 1 hour of pump warm up time.

⁽²⁾ Relative nitrogen pressure 300 hPa

⁽³⁾ Oil charge has been introduced into oil casing at factory. Don't modify this oil level.

Technical characteristics - ACP 15

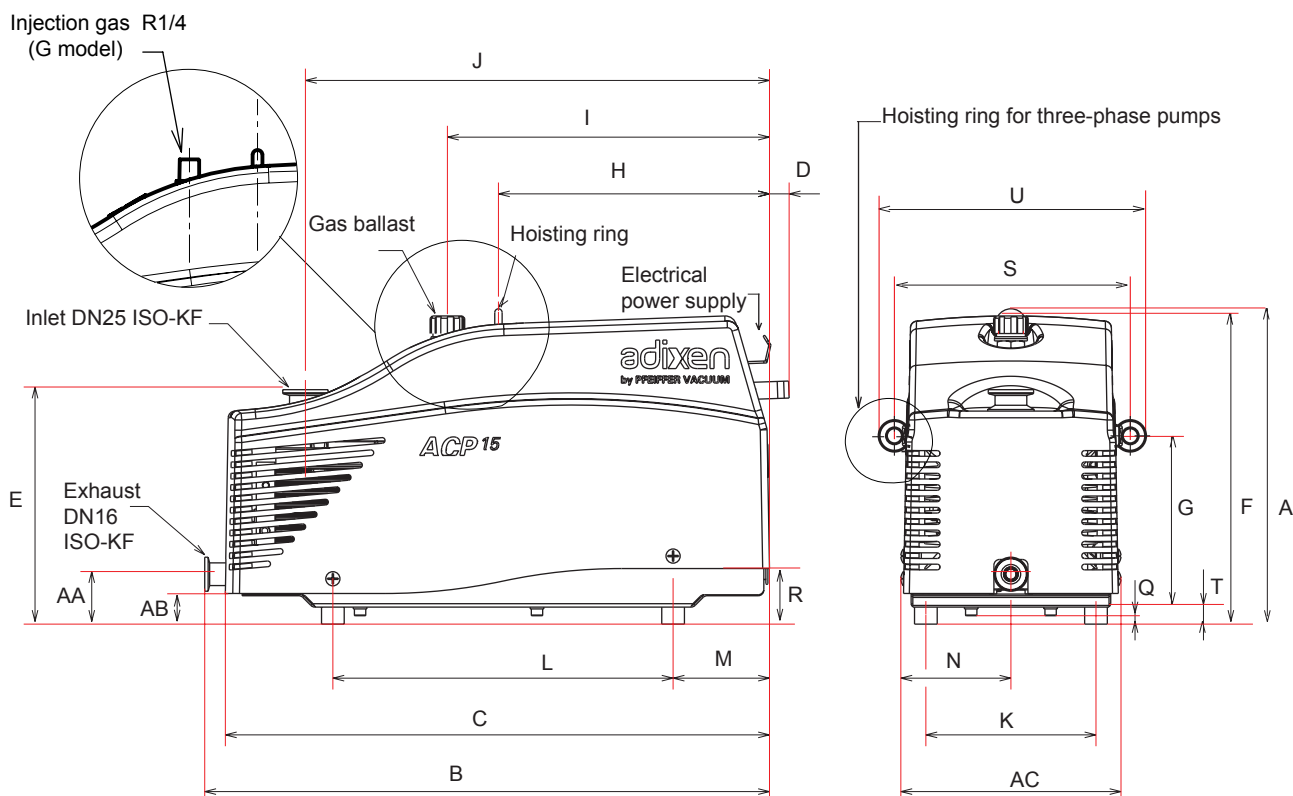
Electrical characteristics	Units	ACP 15	ACP 15G
Single-phase power *		110 - 230 V \pm 10% - 50/60 Hz 15/10 A - 1150 VA	
Three-phase power*		200 - 440 V \pm 10% - 50/60 Hz 15/10 A - 1200 VA	
Single fault condition	mA	< 3.5	
Leakage current	mA	< 5	
Power consumption (1) ...at ultimate pressure ...at atmospheric pressure	W	450 550	

Environnemental conditions	Units	ACP Series (all models)
Use of the product		Inside
Altitude	m (ft)	up to 2000 (6561)
Transient overvoltage:		II
Pollution degree		2
Protection degree (IP)		IP 20
Storage temperature	°C (°F)	mini -10 (+14) / maxi +60 (+140)
Ambient operating temperature	°C (°F)	mini +12 (+54) / maxi +40 (+104)
Maximum relative humidity		80 % for temp. > 31 °C (87 °F) decreasing linearly to 50 % at 40 °C (104 °F)

* Depends on the ordering specifications.

Technical characteristics - ACP 15

Dimensional drawing standards and G versions



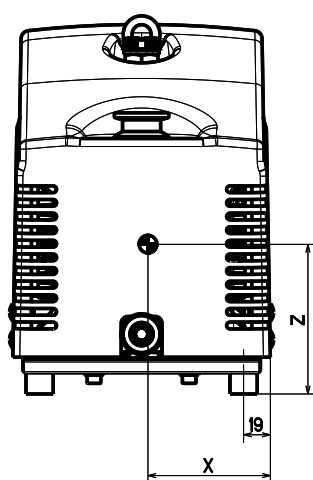
Units / mm	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Q	R	S	T	U	AA	AB	AC
ACP 15/ ACP 15G Single-phase	272	498	475	11	207	-	-	239	284	409	150	300	85	93	7	-	-	15	-	44	-	190
ACP 15/ ACP 15G Three-phase	272	497	477	18	207	266	170	238	283	408	150	300	84	95	7	52	208	15	235	44	30	190

Units / inch	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Q	R	S	T	U	AA	AB	AC
ACP 15/ ACP 15G Single-phase	10.7	19.6	18.7	0.4	8.1	-	-	9.4	11.2	16.1	5.9	11.8	3.34	0.2	-	-	0.6	-	1.7	-	7.5	
ACP 15/ ACP 15G Three-phase	10.7	19.5	18.8	0.7	8.1	10.4	6.7	9.3	11.1	16	5.9	11.8	3.3	3.7	0.2	52	8.2	0.6	9.2	1.7	1.2	7.5

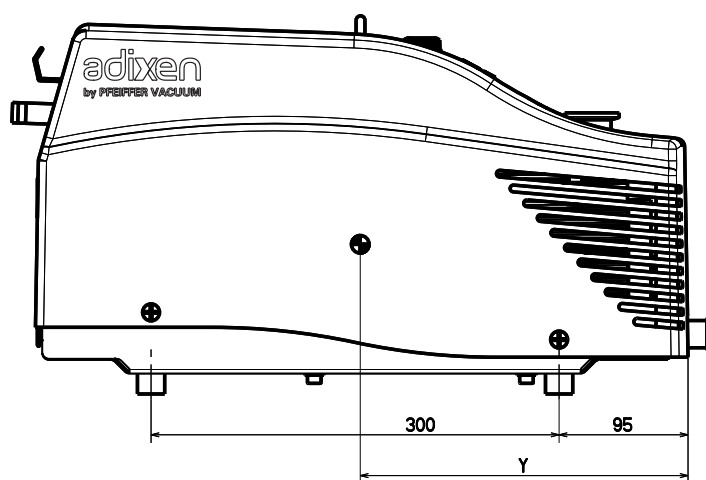
Technical characteristics - ACP 15

Gravity center and weight distribution

Right view



Front view

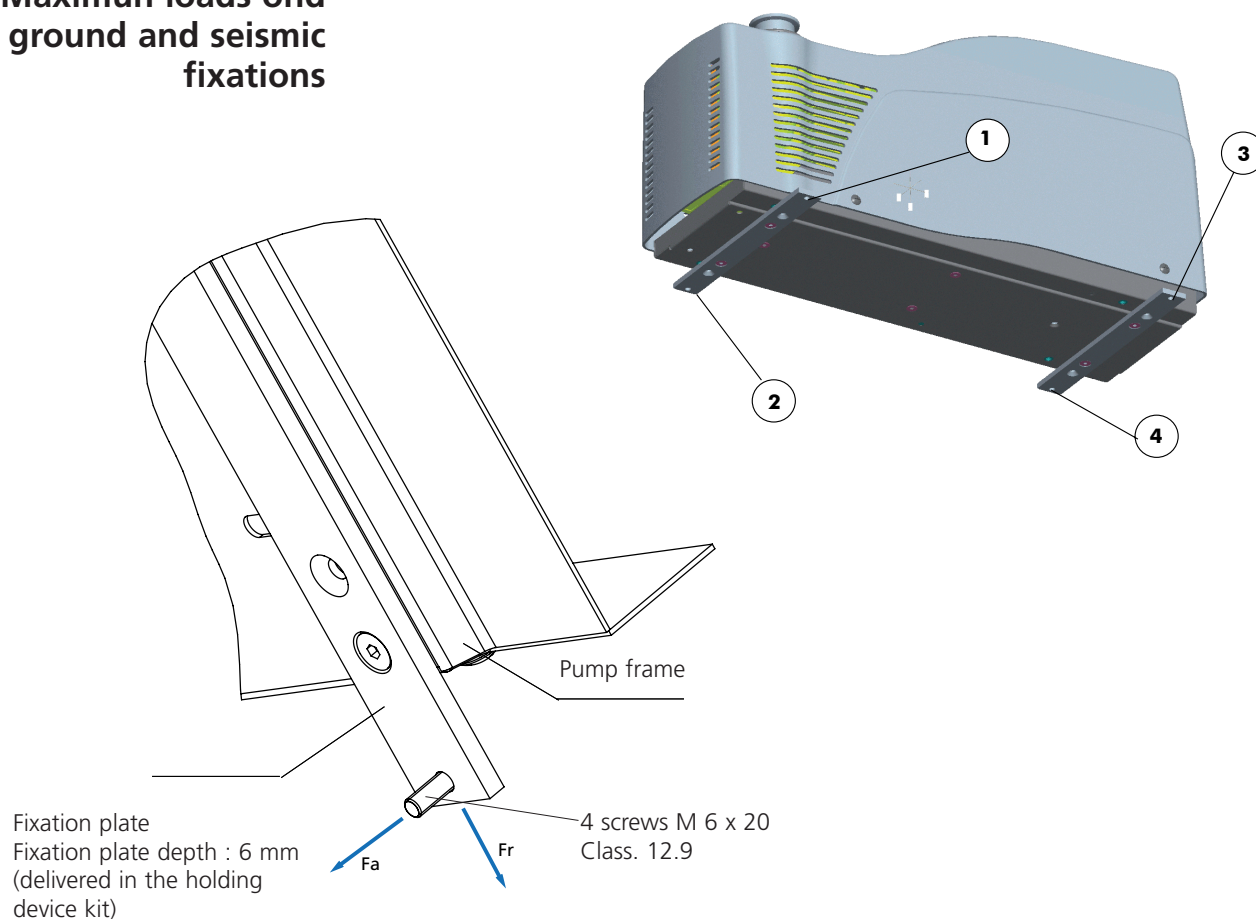


Center of gravity (mm/ inch)			
	X	Y	Z
ACP 15 /15G Single-phase	84 / 3.30	239 / 9.4	110 / 4.33
ACP 15 /15G Three-phase	86 / 3.38	238 / 9.37	116 / 3.38

	Load by foot (kg)			
	Foot 1	Foot 2	Foot 3	Foot 4
ACP 15 /15G Single-phase	6.2	4.5	7.1	4.9

Technical characteristics - ACP 15

Maximum loads on ground and seismic fixations



CAUTION

We strongly advise you to secure the pump on the tool with 4 M6x20 screws (2 screws per fixation plate minimum recommended). Screw material must comply with foot load specifications, given in the table below.

		Load by foot (N)			
		Foot 1	Foot 2	Foot 3	Foot 4
ACP 15 /15G Single-phase	Tension (Fa)	120	-13	72	31
	Shearing (Fr)	85	25	87	52

Technical characteristics ACP 28 / ACP 40

Product Characteristics	Units	ACP 28	ACP 28G	ACP 28CV	ACP 40	ACP 40G	ACP 40CV
Weight	Kg (lbs)	30 (66)			32 (70)		
Inlet port		DN 25 ISO-KF		DN 40 ISO-KF			
Exhaust port		DN 25 ISO-KF					
Fan flow rate	m ³ /h	410					
Oil capacity (3)	cm ³	25					
Tightness	hPa.l/s	5 · 10 ⁻⁷					
Ultimate pressure (1) : - Standard model and gas ballast closed - G Model : without purge	hPa	3 · 10 ⁻²					
Ultimate pressure (1) : - Standard model : with gas ballast opened - G Model : with purge (300 hPa relative pressure)	hPa	1 · 10 ⁻¹	-	1 · 10 ⁻¹		-	1 · 10 ⁻¹
	hPa	-	1 · 10 ⁻¹	2 · 10 ⁻¹	-	1 x 10 ⁻¹	2 · 10 ⁻¹
Maximum ultimate pressure : - Standard model and gas ballast closed - G model without purge	hPa	4 · 10 ⁻²					
Maximum ultimate pressure : - Standard model with gas ballast opened - G model with purge	hPa	3 · 10 ⁻¹	-	5 · 10 ⁻¹	3 · 10 ⁻¹	-	5 · 10 ⁻¹
Maximum pressure at inlet (absolute)	hPa	1013					
Maximum exhaust pressure (absolute)	hPa	1200					
Typical sound level at ultimate pressure (with gas ballast and purge closed)	dB (A)	61					
Maximum pumping speed (gas ballast closed)	m ³ /h	27	27	27	37	37	37
Pumping steam capacity (at 20 °C ambient temperature)	g/h	120 (at 10 hPa)		700 (at 70 hPa)	120 (at 10 hPa)		700 (at 70 hPa)
Gas ballast flow at atmospheric pressure	m ³ /h	1.2	-	2.4	1.2	-	2.4
N ₂ flowrate ⁽²⁾	slm	-	3.7	3.7	-	3.7	3.7

⁽¹⁾ Typical value obtained after minimum 1 hour of pump warm up time.

⁽²⁾ Relative nitrogen pressure 300 hPa.

⁽³⁾ Oil charge has been introduced into oil casing at factory. Don't modify this oil level.

Technical characteristics

ACP 28 / ACP 40

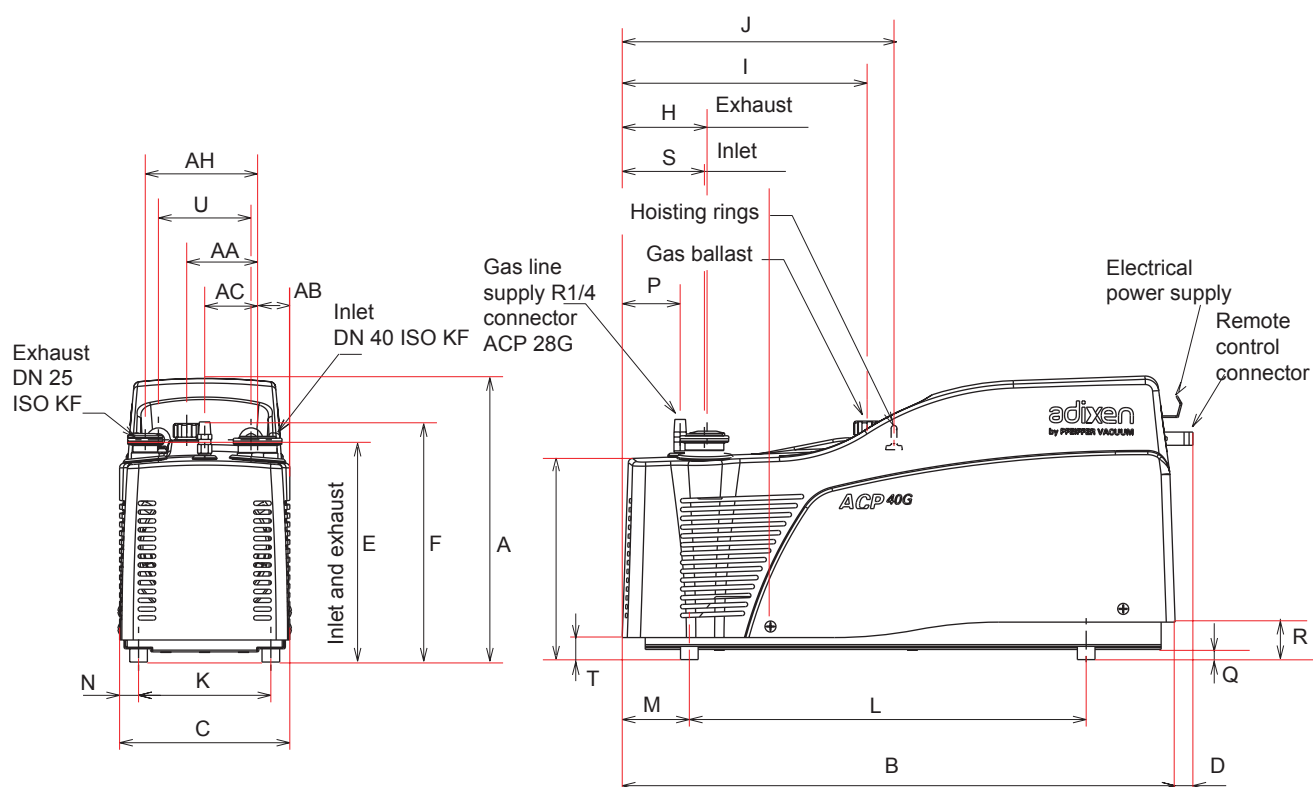
Electrical characteristics	Units	ACP Series (all models)
Single-phase power *		110 - 230 V \pm 10% - 50/60 Hz 15/10 A - 1150 VA
Tree-phase power *		200 - 440 V \pm 10% - 50/60 Hz 15/10 A - 1200 VA
Single fault condition	mA	< 3.5
Leakage current	mA	< 5
Power consumption ⁽¹⁾ ...at ultimate pressure ...at atmospheric pressure	W	700 1050

Environnemental conditions	Units	ACP Series (all models)
Use of the product		Inside
Altitude	m (ft)	up to 2000 (6561)
Transient overvoltage:		II
Pollution degree		2
Protection degree (IP)		IP 20
Storage temperature	°C (°F)	mini -10 (+14) / maxi +60 (+140)
Ambient operating temperature	°C (°F)	mini +12 (+54) / maxi +40 (+104)
Maximum relative humidity		80 % for temp. > 31 °C (87 °F) decreasing linearly to 50 % at 40 °C (104 °F)

* Depends on the ordering specifications.

Technical characteristics ACP 28 / ACP 40

Dimensional drawing ACP 28 / ACP 40 standards and G versions

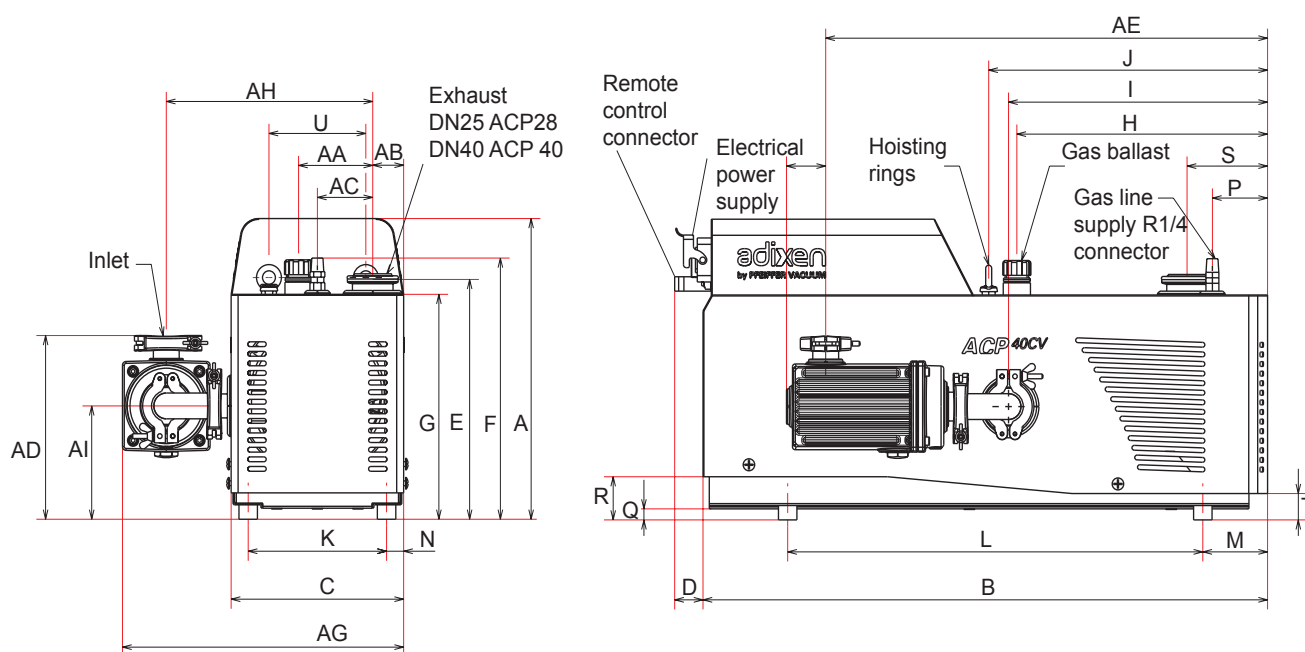


Units / mm	A	B	D	C	E	F	G	K	J	I	H	L	M	N	P	Q	R	S	T	U	AA	AB	AC	AH
ACP 40 / 40G																								
ACP 28 / 28G	322	627	20	193	250	272	235	150	308	278	96	450	76	22	66	12	43	93	25	105	80	-	60	127
Single-phase																								
ACP 40 / 40G																								
ACP 28 / 28G	314	612	31	187	250	272	235	150	302	272	90	450	70	19	60	12	45	88	28	105	80	34	60	127
Three-phase																								

Units / mm	A	B	D	C	E	F	G	K	J	I	H	L	M	N	P	Q	R	S	T	U	AA	AB	AC	AH
ACP 40 / 40G																								
ACP 28 / 28G	12.6	24.7	0.8	7.6	9.8	10.7	9.2	5.9	12.1	10.9	3.8	17.7	3	0.8	2.6	0.5	1.7	3.6	0.9	4.1	3.1	-	2.3	5
Single-phase																								
ACP 40 / 40G																								
ACP 28 / 28G	12.3	24	1.2	7.3	9.8	10.7	9.2	5.9	12.1	10.7	3.5	17.7	2.7	0.7	2.4	0.5	1.8	3.4	1.1	4.1	3.1	1.3	2.3	5
Three-phase																								

Technical characteristics ACP 28 / ACP 40

Dimensional drawing ACP 28CV / ACP 40CV versions



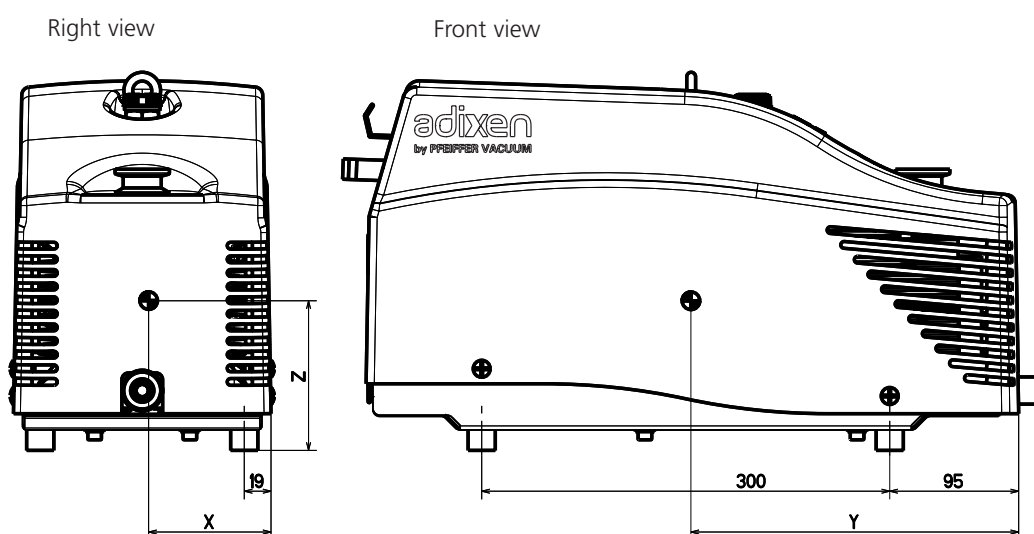
Example of a three-phase model

Units / mm	A	B	D	C	E	F	G	K	J	I	H	L	M	N	P	Q	R	S	T	U	AA	AB	AC	AD	AG	AE	AF	AH	AI	
ACP 28CV																														
ACP 40CV	322	627	20	193	250	272	228	150	308	287	278	450	76	22	66	12	43	94	25	105	80	33	60	192	308	485	43	224	118	
Single-phase																														
ACP 28CV																														
ACP 40CV	314	612	31	187	250	272	235	150	302	281	272	450	70	18.5	60	12	45	88	28	105	80	34	60	192	305	479	43	224	118	
Three-phase																														

Units / inch	A	B	D	C	E	F	G	K	J	I	H	L	M	N	P	Q	R	S	T	U	AA	AB	AC	AD	AG	AE	AF	AH	AI	
ACP 28CV																														
ACP 40CV	12.7	24.7	0.8	7.6	9.8	10.7	8.9	5.9	12.1	11.3	10.9	17.7	3	0.9	2.6	0.5	1.7	3.7	0.9	4.1	3.1	1.3	2.3	7.5	12	19	1.7	8.8	4.6	
Single-phase																														
ACP 28CV																														
ACP 40CV	12.4	24.1	1.2	7.4	9.8	10.7	9.2	5.9	11.9	11.1	10.7	17.7	2.7	0.7	2.3	0.5	1.8	3.5	1.1	4.1	3.1	1.3	2.3	7.5	12.1	18.8	1.7	8.8	4.6	
Three-phase																														

Technical characteristics ACP 28 / ACP 40

Gravity center and weight distribution

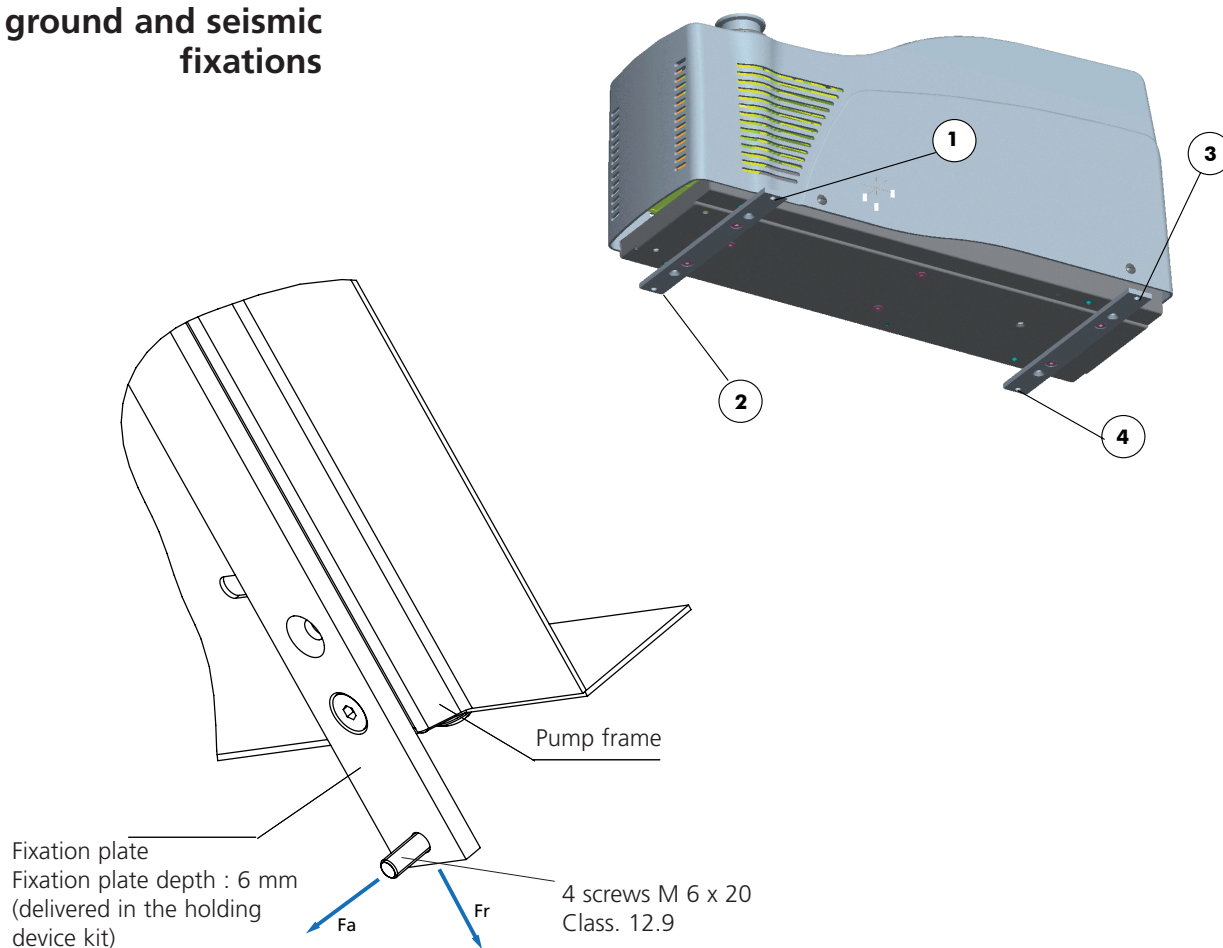


Center of gravity (mm/ inch)			
	X	Y	Z
ACP 28/40 - ACP 28G / 40G Single-phase and three-phase	91/ 3.58	301/ 11.85	130/ 5.11
ACP 28 CV / ACP 40CV Single-phase	91/ 3.58	312/ 12.3	130/ 5.11
ACP 28 CV / ACP 40CV three-phase	92/ 3.6	305/ 12	136/ 5.35

	Load by foot (kg)			
	Foot 1	Foot 2	Foot 3	Foot 4
ACP 28/40 - ACP 40/28G Single-phase and three-phase	8.6	8.3	7.1	7

Technical characteristics ACP 28 / ACP 40

Maximum loads on ground and seismic fixations



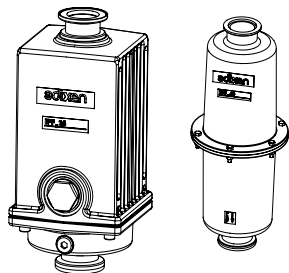
CAUTION

We strongly advise you to secure the pump on the tool with 4 M6x20 screws (2 screws per fixation plate minimum recommended). Screw material must comply with foot load specifications, given in the table below.

		Load by foot (N)			
		Foot 1	Foot 2	Foot 3	Foot 4
ACP 28/40 - ACP 28G/40G	Tension (Fa)	15	184	27	167
Single-phase and Three-phase	Shearing (Fr)	284	512	291	436

Accessories

Inlet filter

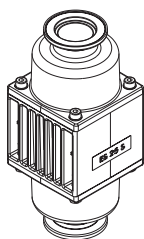


The inlet filter is installed on the pump inlet and collects particles with a diameter greater than 25 microns (vacuum packing, metallurgy, lamp manufacture, evaporation, etc. in clean applications).

Model	Part number
IPF 25 (for ACP 15/28)	111 649
IPF 40 (for ACP 40)	111 647

Refer to inlet filter operating instruction's manual delivered with the accessory.

Exhaust silencer

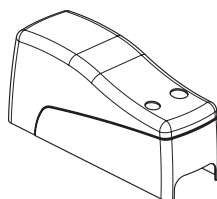


In order to reduce noise level at the exhaust when the pump is operated at high pressures, on clean applications.

Model	Part number
Noise level reduction (-12 dBA) at atmospheric pressure	
Silencer ES25S	109 873

Refer to exhaust silencer operating instruction's manual delivered with the accessory.

Sound inclosure



In order to reduce significantly noise level.

Model	Part number
Noise level reduction (-5 dBA) in max. ambient temperature of 35°C	
NRC 15 for ACP 15	111 968
NRC 28-40 for ACP 28/ACP 40	112 637
Noise level reduction (-10 dBA) in max. ambient temperature of 32°C	
SEK 15 for ACP 15	112 779
SEK 28/40 ACP 28/40	114 379

Frequency converter interface plug

In order to recover the information «pump at speed» (📖 B 40) and to pilot a power supply up to 6 A.

Model	Part number
Frequency converter interface plug	112 851

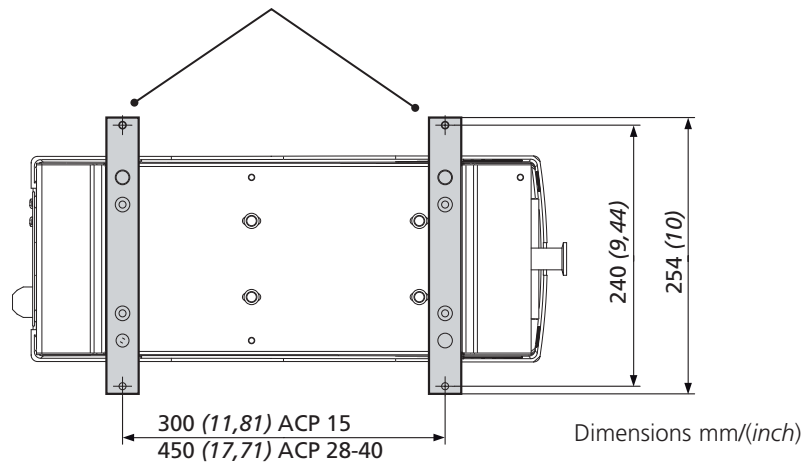
Accessories

Pump holding device

It includes holding plates to fasten to the pump body on the equipment (M6 screw customer supplied).

Description	Part number
Pump holding device	112 846

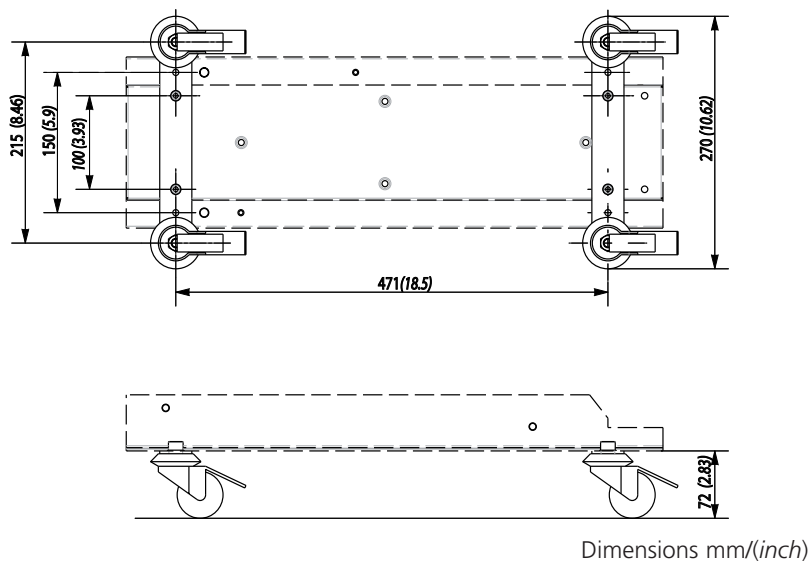
Holding plates



Wheel kit

This kit includes 4 free castoring wheels and connecting accessories that can be installed on pump frame, and allows pump easy movement through an around cluttered areas. It is compatible with ACP 15, ACP 28 and ACP 40 pump models.

Description	Part number
Wheel kit	1111385





Installation

ACP Series Operating instructions Detailed contents

B 00	<i>Safety instructions for pump installation</i>
	<ul style="list-style-type: none">- Unpacking- Installation and start-up
B 10	<i>Installation of ACP Series pump</i>
	<ul style="list-style-type: none">- Unpacking- Equipment storage- Ventilation- Installation safety instructions
B 20	<i>Mechanical connections</i>
	<ul style="list-style-type: none">- Inlet- Exhaust
B 30	<i>Electrical connections</i>
	<ul style="list-style-type: none">- General- Rear panel of the pump- Single-phase version- Three-phase version
B 40	<i>Remote control connector wiring</i>
	<ul style="list-style-type: none">- Remote control principle- Wiring of the remote control plug- Wiring of output S2
B 41	<i>RS 485 serial link wiring</i>
	<ul style="list-style-type: none">- Factory configuration- RS 485 connector wiring- RS 485 serial link
B 50	<i>Inert gas purge connection (G version)</i>
	<ul style="list-style-type: none">- Gas line connection- Nitrogen flowrate adjustment

Safety instructions for pump installation

CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in property damage.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in moderate or minor injury. It may also be used to alert against unsafe practices.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury.

DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or severe injury (extreme situations).

Before switching on the product, study the operating manual and make sure you follow the safety instructions. You can recognise these by the 'Caution', 'Warning' and 'Danger' symbols. Good practice tips and manufacturer's recommendations are in a blue box.

Unpacking

We took care to provide you with a clean product. To keep it in this condition, unpack it only in contamination free area and at final place of use.

Make sure the equipment shows no sign of transport damage. If it has been damaged, take the necessary steps to record this with the carrier and inform the manufacturer. In all cases, we recommend keeping the packaging (reusable materials) for further transport of the equipment or for prolonged storage.

Installation - Start up

For emergencies and breakdowns, contact the manager of your local service center (see addresses at back of manual or on our website).

CAUTION

Ensure that the product is connected to an electrical installation:
- in compliance with the local and national safety requirements,
- equipped with electrical protection (fuses, circuit breaker, ...) which has a suitable earth (ground) point, properly connected.

Our products are designed to comply with current EEC regulations. Users making their own modifications to the product are liable to break its compliance with these regulations, degrade its EMC (electromagnetic compatibility) rating, and make it unsafe to use. The manufacturer declines all liability for the consequences of such operations.

WARNING

Maintenance must be performed by a skilled maintenance operator trained in the relevant health and safety aspects (EMC, electrical hazards, chemical pollution, etc.). Isolate the product from all energy sources (mains electricity, compressed air, water, gas ...) before starting work.

Safety instructions for pump installation

Installation - Start up (ctd)

WARNING

Electric shock hazard.
Some components have capacitors charged to over 60VDC. When power is switched off, they keep their charge for a time. Residual voltages from the filter capacitors can cause electric shocks all the way back to the mains plug. Wait 5 minutes after power-off before commencing any work on the product.

CAUTION

The product's EMC rating is obtained on the understanding that it is installed in compliance with EMC rules.
Specially in environments that are prone to emit interference, use shielded cables and connections on interfaces.

WARNING

Do not expose any part of the human body to vacuum.
The product is supplied with the inlet and exhaust sealed. Remove these blanking plates when you are ready to connect the product on your vacuum system.
As well as, don't operate the product unless the inlet and exhaust are connected to a vacuum and exhaust pumping line.

DANGER

Indicates Electric shock hazard.
The voltages and currents in use can induce electric shock.
Isolate and lock out power line to the product before maintaining it /or removing the cover.
Only skilled, authorized people may carry out maintenance work.
If a main isolator is installed by the customer, it must be in compliance with local regulations, with a minimum interrupting short circuit current of 10kA.

WARNING

This pump is not equipped with an EMO device because it is designed for use on process tools and integration with the process tool EMO. The pump must be protected by an EMO provided by the user equipment/host tool, located in a non hazardous area and within 3 m (10 ft) of the pump. The reset must not restart the tool.
This EMO mustn't restart the equipment/host tool after a reset.

CAUTION

Fire protection:
The pump is not intended to be installed on process containing flammable materials or in hazardous atmosphere.
The pump body is made of aluminium. The main part enclosure and the majority of all the non metallic parts (mainly electrical components and frequency converter) have a fire rating of UL94V0 and/or are UL approved.

Smoke hazard due to the presence of electrical components.
The smoke hazard is low due to the use of approve components and the containment smoke in the pump cover.

Safety instructions for pump installation

Installation - Start up (ctd)

CAUTION

The pump is delivered with filled oil charge: do not modify the oil level. The oil drain will be done during pump overhaul by the manufacturer's trained personnel.

The safety data sheets for oil is available on our website

⚠ WARNING

Lock out/tag out (LO/TO) N₂ supplies.

The end user needs to provide a dedicated source of Nitrogen equipped with a manual valve that can be locked out within 3m (10 ft) of the tool.

⚠ WARNING

Risk of tilting.

Although the product meets EEC safety regulations (topple angle $\pm 10^\circ$), it is advisable to guard against the risk of tilting during handling, installation, and use. Refer to chapter A of the operating manual for location of the center of gravity.

- don't place the product on a tilted surfaces,
- locate it on flat, hard ground,
- do not push it sideways

The product is not designed to withstand loads and is not for use as a seat or step.

Operation

⚠ WARNING

The vacuum pump is also a compressor: incorrect use may be dangerous. Study the operating instruction manual before starting up the pump.

⚠ CAUTION

Make sure that the parts or chambers connected to the inlet of our products withstand a negative pressure of 100 kPa in relation to the atmospheric pressure.

⚠ WARNING

The air tightness of the products is guaranteed when they leave the factory for normal operating conditions. It is the user's responsibility to maintain the level of airtightness particularly when pumping dangerous gases.

⚠ WARNING

The ACP Series G version are made to pump on corrosive gas traces.

The user and /or OEM are ultimately responsible for operating the equipment in a safe manner. The manufacturer has no control over the types of gases exposed to this pump. This is the user and/or the OEM's responsibility to follow the necessary safety requirements.

Frequently process gases are toxic, flammable, corrosive, explosive and/ or otherwise reactive.

Toxic gases can cause serious injury or death. Operators and users must take the appropriate safety recommendations to prevent injury. Consult the responsible department for instructions and safety information.

Hazardous gases through the pump can cause serious injury or death. It's mandatory by regulations to connect the pump's exhaust to a facility hazardous gas exhaust system which incorporates appropriate filters, scrubbers, etc. This system must meet all air and water regulations.

Check that pump is correctly connected to the equipment (B 60).

Safety instructions for pump installation

Operation (ctd)

DANGER

For G pumps only.

If loss of purge flow creates a significant risk, then the purge flow must be monitored externally and a response to loss of purge flow must be provided by the process equipment and interlocked if necessary. If pyrophoric materials above the LEL (lower explosive limit) are sent to the pump then nitrogen should be supplied at a rate to ensure that concentration is diluted to be below the LEL, in addition an interlock should be provided to ensure that gas flow to the pump is stopped when nitrogen is lost.

DANGER

If any corrosive, reactive, flammable, pyrophoric, oxidizing processes can be sent to the pump, then an exhaust monitor should be used in the secondary exhaust to ensure that gas flow to the pump is stopped when secondary exhaust is lost.

If flammable materials are sent to the pump, the customer will need to provide a hardware based LEL detection in the secondary exhaust (detection capability at 25% of the LEL) that will stop chemical supply to the pump when gas is detected at 25% of LEL for that flammable material.

WARNING



The products are designed so as not to present a thermal risk for the user's safety. However, specific operating conditions may exist that require extra caution from users due to the high temperatures (external surfaces > 70 °C) : wear protective gloves and leave the pump to cool before working on the product.

Decontamination – product dismantling

According to the regulations 2002/96/CE about Waste of electrical and electronical equipments, and 2002/95/CE about Restriction of Hazardous substances, the manufacturer provides a recycling paid service for the end of-life of waste electrical and electronic equipment.

Any obligation of the manufacturer to take back such equipment shall apply only to complete not amended or modified equipment, using adixen Vacuum Products original spare parts, delivered by adixen Vacuum Products, containing i.e. all its components and sub-assemblies.

This obligation will not cover the shipping cost to a service center take back facility.

Before returning the product, fill in the "declaration of contamination" form available on the website. Refer to G200 for service conditions.

Attach it to the product before shipping to the service-repair office closest to you.

Installation of ACP Series pumps

Unpacking

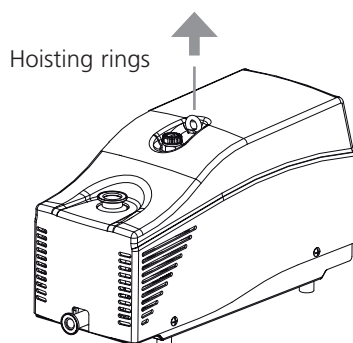
Make sure the equipment shows no sign of transport damage. If it has been damaged, take the necessary steps to record this with the carrier and inform the manufacturer. In all cases, we recommend keeping the packaging (reusable materials) for further transport of the equipment or for prolonged storage.

⚠ WARNING

Heavy product
This product needs special handling precautions due to its weight. It should be removed from its crate only by staff trained in heavy materials handling : use the lifting rings and devices provided with the product. The maker can not be held liable for the consequences of using other rings.

⚠ CAUTION

The product is supplied with the inlet and exhaust sealed. These are to prevent foreign bodies entering the pump during transport and storage. Do not remove these blanking plates until you are ready to install the product on the vacuum line.



Model type	Weight
ACP 15/15G	21 kg
ACP 28/28G	30 kg
ACP 40/40G	31 kg

- If necessary the hoisting rings can be removed from the housing.

Installation of ACP Series pumps

Equipment storage

Storage of new pumps as well as used:

If the pump is to be stored, we guarantee the reliability of our equipment without particular storage precautions for up to 1 year (storage temperature between 14°F (-10 °C) and 140°F (60 °C) and pump sealed).

For storage period of over 1 year we recommend to run the pump:

- approximately 30 minutes with gas ballast opened or with a dry air flow (case of G model),
- and 30 minutes at ultimate pressure (inlet, gas ballast and gas line ports blocked).

Then, stop the pump and store it with the inlet, the exhaust, the gas port orifices blocked: clamping ring, centering ring blank off flange....

Warning : It is recommended to repeat these above instructions every year because factors such as temperature, degree of humidity, salt air... may cause the deterioration of the pump components.

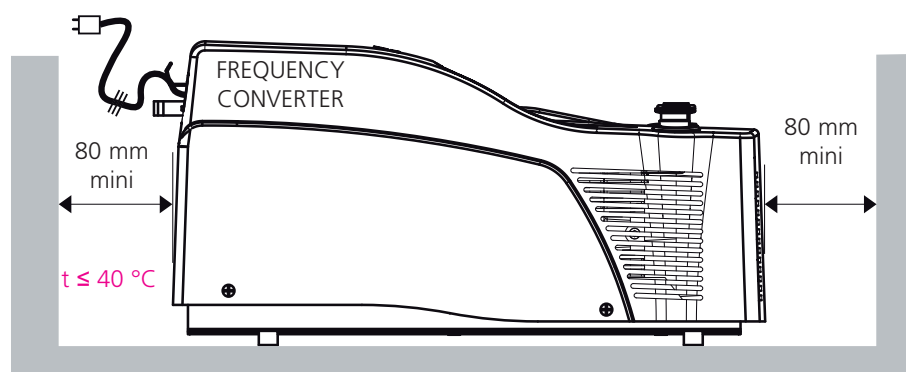
For a storage period of over 4 years, it is recommended to make a pump overhaul to replace among other, the seals, the ball bearings (new pump as well as used).

For this contact your local service center (address of the main contacts on our web site).

Ventilation Vents at both ends of the pump.

Place the pump at least 80 mm from the stationary section.

The ambient air temperature particularly near the fan must be less than 40 °C.



Installation of ACP Series pumps

Installation safety instructions

The performance of the pump depends on the type of accessories used and the quality of the mechanical connections.

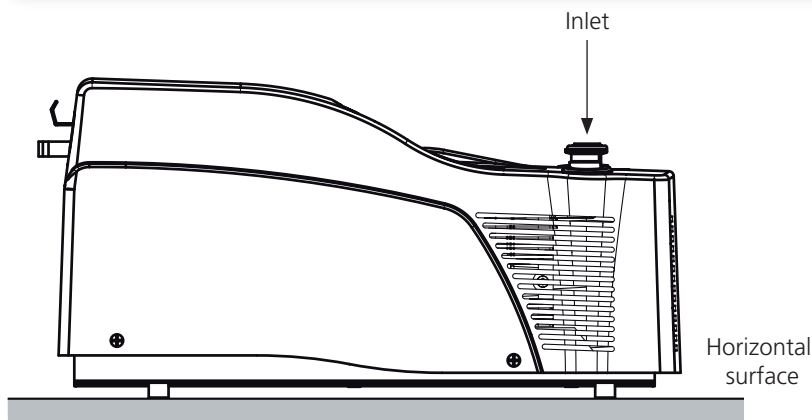
- inlet, exhaust and intermediate port connections mustn't generate constraints causing leaks on the pumping line or overpressure at the exhaust

- Incorporate flexible stainless steel flanged bellows in the pumping line exhaust to reduce the transmission of vibration.

- Determine where the pump will be placed. Refer to dimensional diagram in section **A 40** or **A 41**.
- Install the pump in a way that the Start/Stop switch of the pump is accessible for the operator.
- After pump connection, it is necessary to perform a leak tightness test.

CAUTION

The product must be operated in the horizontal position in support on its feet, with the pumping axis vertical and the inlet operating upwards.



Mechanical connections

WARNING

The product is supplied with the inlet and exhaust sealed. These are to prevent foreign bodies entering the pump during transport and storage. Do not remove these blanking plates until you are ready to install the product on the vacuum line.

WARNING

For safety reasons, use accessories on the inlet and exhaust lines whose materials and sealing properties are compatible with the gases being used.

Inlet

Connect the pump inlet to the equipment with connecting accessories (see manufacturer's catalog).

Connection type

- ACP 15 / 28 model: **DN 25 ISO-KF**.
- ACP 40 model: **DN 40 ISO-KF**.

CAUTION

The inlet pressure must be no higher than atmospheric pressure. Too high pressure can damage the product.

CAUTION

If the product is used in applications where dust or solid particles are present, we advise protecting it with an inlet filter (see section A of the operating manual). Always use clean pipes and fittings in the pumping installation.

Exhaust

WARNING

When pumping on corrosive gas traces, or aggressive gases (pump G version), the gas can cause injury or death. The exhaust of the pump must be connected to an exhaust stack or an evacuation duct.

CAUTION

Make sure the exhaust pressure does not exceed 120 kPa (absolute). Too high a pressure can damage the product. Check that the exhaust pipes are not clogged and the purge is running (on G model).

ACP 28 / 40: pump exhaust is equipped with an anti-noise device. In case of connection to an exhaust stack or piping, remove this device from the exhaust port.

Connection type

- ACP 15 model: **DN 16 ISO-KF**.
- ACP 28 / 40 model: **DN 25 ISO-KF**.

Several fitting accessories are available in the manufacturer's catalog.

After connecting the product to the pump ing line, check for leaks along the entire line to ensure proper connections (pump, pipes, valves, etc.).

Electrical connections

General

CAUTION

Ensure that the product is connected to an electrical installation:

- in compliance with the local and national safety requirements,
- equipped with electrical protection (fuses, circuit breaker, ...) which has a suitable earth (ground) point, properly connected.

CAUTION

The EMC performance of the product is obtained on the condition that the installation complies with the EMC rules. In particular, in disturbed environments, it is essential to use shielded cables and connections for interfaces.

CAUTION

Lock out/tag out (LO/TO) electrical device.
In order to properly secure the pump for installation and/or maintenance, it is required to lock out/tag out the pump properly in accordance with OSHA requirement 29 CFR.1910.147.

WARNING

Electric shock hazard.
Some components have capacitors charged to over 60VDC. When power is switched off, they keep their charge for a time. Residual voltages from the filter capacitors can cause electric shocks all the way back to the mains plug. Wait 5 minutes after power-off before commencing any work on the product.

WARNING

Operation in local mode
There is no device to warn that the pump operates in local mode. When the pump is not integrated in the equipment/host tool, the user must provide a device to warn that the pump operates in local mode.

WARNING

Installation protection with circuit breaker
The user must supply the product from facilities equipped with main circuit breaker, curve D (IEC 60947-2), in accordance with local regulations and with a minimum interrupting short circuit current of 10kA.
This protection device should be easily accessible by an operator, in close proximity to the pump (no further than 7m (25 ft) and visibly marked as a electrical interrupting device of the product.

Electrical connections

Rear panel of the pump

DANGER



- In accordance with recommendations of EN 61010-1+ A2, the following warning symbol is on the variator inside the pump.

Electric shock hazard.

The voltages and currents in use can induce electric shock.

Isolate and lock out power line to the product before maintaining it /or removing the cover.

Only skilled, authorized people may carry out maintenance work.

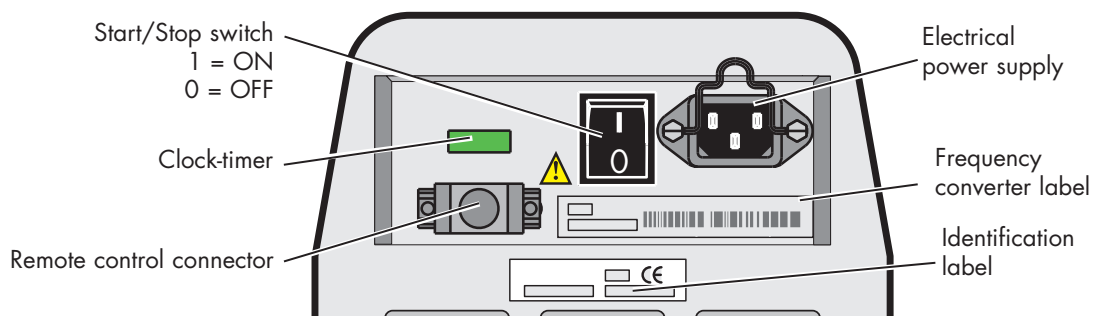
If a main isolator is installed by the customer, it must be in compliance with local regulations, with a minimum interrupting short circuit current of 10kA.

- The motor is equipped with an electrical frequency converter which allows automatically low or high voltage pump running, according to range voltage (see tables below).

- The pump supplying cable is provided with the pump delivered. The earthing of the pump (frequency converter, covers, body of the pump) is realized by the cable connected with the network customer. The network customer should have himself a connection in the ground.

The pump is equipped with thermal sensors which keeps pump from starting-up depending on the temperature (C 10).

Single phase version



- Electrical frequency converter is in accordance with CE standards and offers the following voltage range:

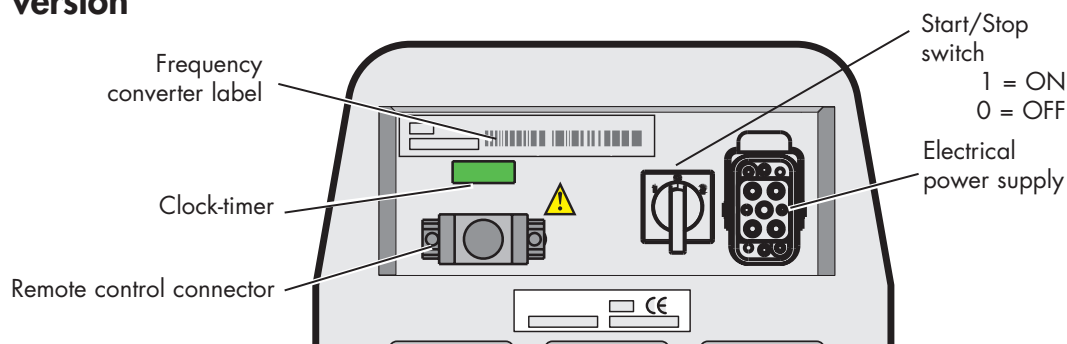
Main supply	Voltage range		
Single phase	110 V - 230 V 50/60 Hz	15 A / 10 A	1150 VA

Circuit breaker

- A 6 A circuit breaker is recommended for high voltage, 230 VAC + 10 %.
- A 12 A circuit breaker is recommended for low voltage, 110 VAC + 10 %.

Electrical connections

Three phase version



- Electrical frequency converter is in accordance with CE standards and offers the following voltage range:

Main supply	Voltage range		
Three phase	200 V - 440 V 50/60 Hz	15 A / 10 A	1200 VA

- A 3 A circuit breaker is recommended for high voltage, 440 VAC + 10 %.
- A 5 A circuit breaker is recommended for low voltage, 200 VAC + 10 %.

Remote control connector wiring

In accordance with advice of EN 61010-1+A2 the following warning symbol is near the remote control connector:

WARNING



Before switching on the pump, the user should study the manual and follow the safety instructions listed in this manual.

Remote control principle

The pump can be used in remote mode using the "Sub-D" connector at the rear of the pump.

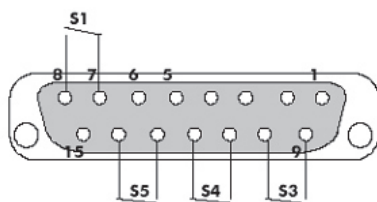
Used by means of dry contacts:

- The remote control of the "Start / Stop" function (S1).
 S1 = 0 → Stop S1 = 1 → Start.

- Rotation speed remote control according to the table below:
 (0 = open, 1 = closed):

ACP 15 Model				
S3	S4	S5	Rotation speed	
Contact status	Contact status	Contact status	Hz	rpm
S3 = 1	S4 = 0	S5 = 1	60	3 600
S3 = 1	S4 = 0	S5 = 0	70	4 200
S3 = 0	S4 = 1	S5 = 1	80	4 800
S3 = 0	S4 = 1	S5 = 0	90	5 400
S3 = 0	S4 = 0	S5 = 1	95	5 700
S3 = 0	S4 = 0	S5 = 0	100	6 000

DB 15 pins, male connector



ACP 28 - ACP 40 Model				
S3	S4	S5	Rotation speed	
Contact status	Contact status	Contact status	Hz	rpm
S3 = 1	S4 = 1	S5 = 0	40	2 500
S3 = 1	S4 = 0	S5 = 0	50	3 000
S3 = 0	S4 = 1	S5 = 0	65	3 900
S3 = 0	S4 = 0	S5 = 0	80	4 800

CAUTION

For pump safety, do not exceed the maximum frequency:
 → 100 Hz for ACP 15 models,
 → 80 Hz for ACP 28/40 models.

Note: Changing the rotational speed will affect the pumping speed and the ultimate pressure.

Remote control connector wiring

Wiring of the remote control plug

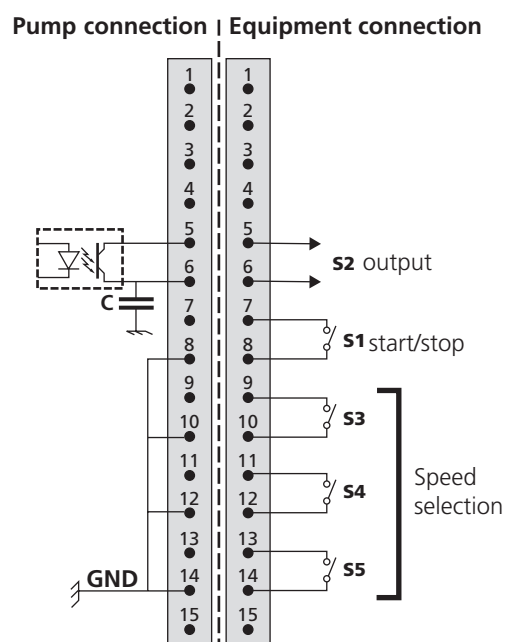
S1, S3, S4 and S5 are inputs.
S2 is an output (open collector).

S1: start/stop

S2 closed:
pump at speed

S3, S4, S5:
rotational speed selection

Pin 8, 10, 12 and 14 are connected to the ground of the control unit.



CAUTION

Do not add any strap except S1, S3, S4 and S5.

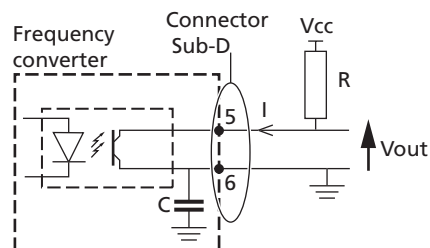
CAUTION

Output S2:
Do not connect a relay between the pins 5 and 6.
The relay coil induces a current which may result in damage of the frequency converter unit.
Wiring of output S2:
The maximum value of the current in the output must be of 35 mA.

Wiring of output S2

S2 is an open collector output and must be wired as shown below.

Vcc is a direct voltage (between 7 and 30VDC) supplied by the user.
The value of the resistance **R** depends on the customer installation.



Remote control connector wiring

CAUTION

V_{cc} and R values must be calculated so as not to exceed a current value of 35 mA. Higher current will damage the frequency converter.

When the nominal speed is reached, the transistor becomes conductive («on-state») and $V_{out} = 0$ V.

As long as the nominal speed is not reached, the transistor is blocked («off-state») and $V_{out} = V_{cc}$.

This circuit can not be used for power transfer. For switching of power circuits an amplification stage is required.

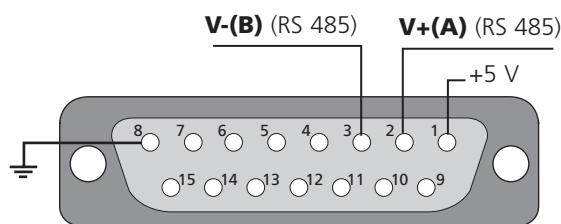
RS 485 serial link wiring

Factory configuration

The serial link allows to control and monitor several pump in a network.

- Transmission speed: **9600 bauds**
- Data length: **8 bits**
- Parity: **none**
- Stop bit: **1**

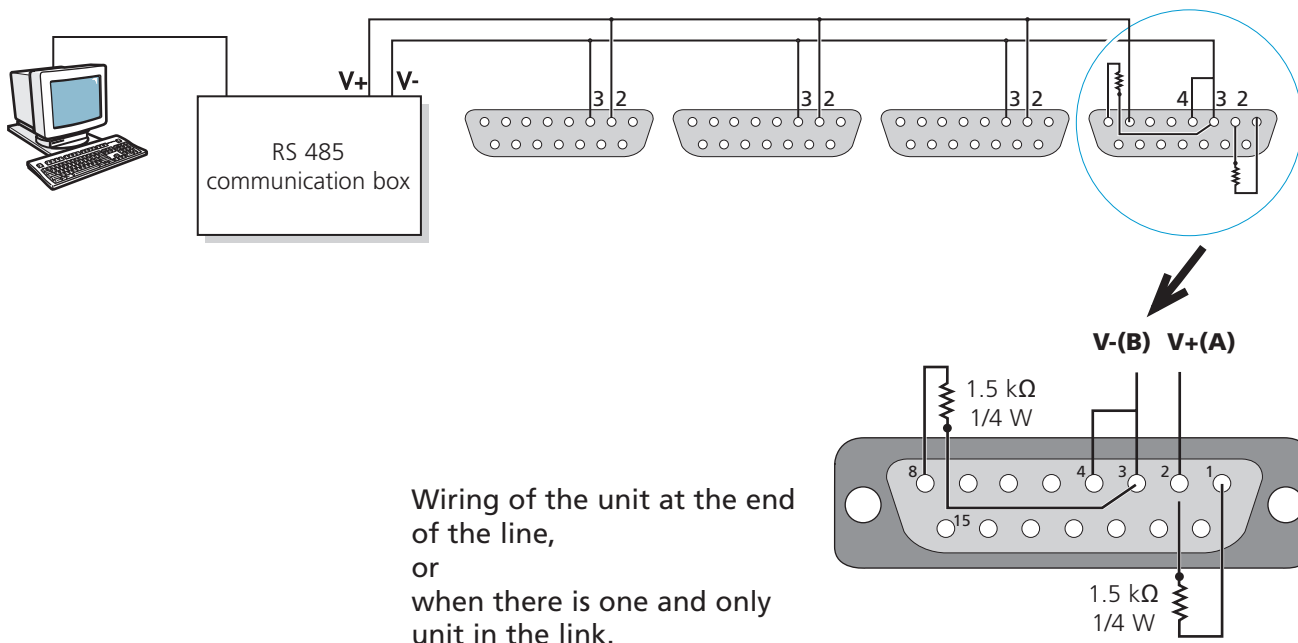
RS 485 connector wiring



DB 15 pins, male connector (soldered view)

RS 485 serial link

Several units (up to 255) can be controlled on a single link. It's a parallel type connection which allows communication in the network even if a pump is disconnected.



Wiring of the unit at the end of the line, or when there is one and only unit in the link.

Inert gas purge connection (G version)

Gas line connection

- For optimum performances -ball bearing protection-, the nitrogen supply should have the following characteristics:
 - H₂O concentration : < 1 ppm
 - O₂ concentration : < 1 ppm
 - Maximum moisture rate: 5 ppm of water
 - Dust < 1µm
 - Oil < 0.1 ppm
 - Pressure: 150 kPa absolute (before the gas pressure reducing valve, customer supply)

- Connect the gas line supply to the R 1/4 connector provides on purpose with flexible or stainless steel pipe (customer supply).

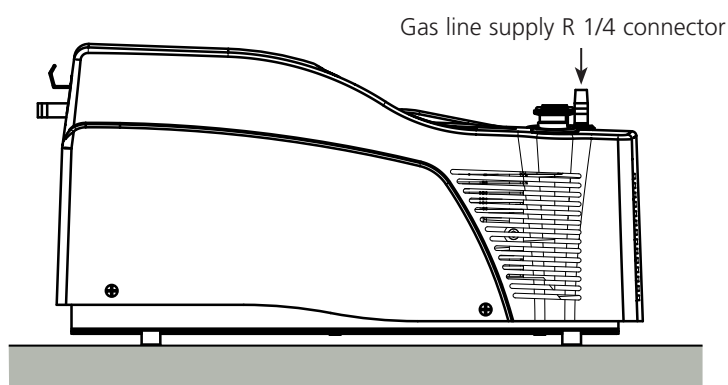
Note : we recommend to install an isolation valve on the gas supply line, nearest the inlet gas port to allow pump performance recovering when the gas line is not used (📖 A 40, A 41).

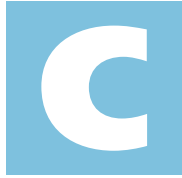
- For optimum ball bearing protection, the neutral gas pressure must be set to 300 hPa (relative pressure) according to the flowrate value given in the table below:

Nitrogen flowrate adjustment

	ACP 15	ACP 28 /40
Flowrate max (slm)	5	3.7
Ultimate pressure (hPa)	$3 \cdot 10^{-1}$	$2 \cdot 10^{-1}$

e.g: ACP 28 G





Operation

ACP Series Operating instructions Detailed contents

C 10

Pump operation

- Pump temperature for start-up condition
- Operation in local mode
- Operation in remote mode
- Pump start-up
- Pumping of condensable vapors
- Operation for gas ballast
- Pump stop

C 20

Detailed description of RS 485 commands

- Conventions applicable to the syntax of all commands
- The commands

Pump operation

The performance and operational safety of this product are guaranteed provided it is used normally in the operating conditions defined in this manual.

It is the customer's task to:

- train operators to use the product if they do not speak the language the manual is written in,
- ensure operators know the safe practices to apply when using the product.

CAUTION

The amount of oil required for pump operation is set at the factory. Do not modify this oil level.
The oil drain will be done during pump overhaul by the manufacturer's trained personnel.

Pump temperature for start-up condition

The pump is equipped with thermal sensors.

When switching on the pump, if the temperature is:

- less than 12 °C,
- or over 40 °C,

the pump doesn't start, but the fan is energized. The pump will start automatically when the ambient temperature is back in the authorized temperature range.

DANGER

Auto-restart

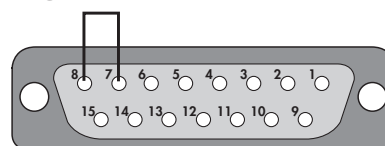
When the pump is stopped with an overtemperature issue, it will restart automatically when ambient temperature has decreased until the restart value.

It is the responsibility of the user to take all the measures required to prevent risks resulting from this type of operation. The user must provide a device (integrated in the equipment/host tool) to warn or to avoid this restart.

Operation in local mode

In local mode, the pump can run only if the cover plug (delivered with the pump) is fitted on the remote control connector.

Wiring of the Remote cover plug





DB 15 pins, male connector (soldered side view). Factory wired with appropriate jumper for local operation.

Pump operation

Operation in remote mode

The pump can be used in remote mode:

- if the Remote control plus is wired according to instructions given in  **B 40**.
- if the RS485 serial link is wired ( **B 41**).

Note

It's the origin of **Start/Stop** control which has priority on the speed selection:

- when the Start/Stop is made by the remote control cover plug, the selected speed corresponds to the dry contact setting,
- when the Start/Stop is made by RS485 serial link, the speed corresponds to the speed set point defined on serial link.

Pump start-up

Pump is equipped with a main power switch. The pump starts up when the power line cord is connected, and main switch is on "1" position.

A time counter displays the pump running time in hour.

CAUTION

- Avoid sudden changes in ambient temperature when the pump is running.
- Neutral gas purging is imperative for the pumping of corrosive gas traces.



WARNING
HOT SURFACE
Contact with pump bodies may cause burn.
Switch off and wait until pumps cooled before servicing.

The products are designed so as not to present a thermal risk for the user's safety. However, specific operating conditions may exist that require extra caution from users due to the high temperatures (external surfaces > 70 °C) : wear protective gloves and leave the pump to cool before working on the product.

Pumping of condensable vapours

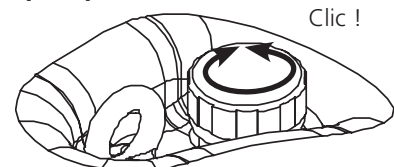
In order to better handle condensable vapours, it is necessary to pump with a hot pump. It is recommended to isolate the pump from the installation and let the pump run for at least 1 hour, with gas ballast opened.

Then open the isolation valve, the pump will operate in optimized conditions, thus reducing the risk of condensation inside the pumping module.

When the quantity of condensable vapor is important, it is recommended to use a CV version pump.

Operation of gas ballast


- Knob screwed: gas ballast closed.
- Knob unscrewed: gas ballast opened.




Pump stop

Before switching off, isolate the pump from the installation and let it run for 1 hour with gas ballast opened.

Put the main switch on «0» position or press the circuit breaker of the customer's installation.

When the pump is remote controlled, the pump will be stopped by opening the « Start/Stop » contact ( **B40**).

When the pump is controlled by RS 485 serial link, the pump will be stopped by sending the appropriate command ( **C 20**).

Detailed description of RS 485 commands

Conventions applicable to the syntax of all commands

Adr = address, from 000 to 255
 <CR> Carriage return (ascii 13)
 <LF> line Feed (ascii 10), between square brackets.
 # hash sign (ascii 35)
 , comma (ascii44)

Status values

Ok : command executed correctly

Error messages

Err0: adjustment error (out of bounds)
 Err1: context error command error (syntax)
 Err2: parameter error (eg. Non-hexadecimal character.)
 Err3: command error (syntax)
 Err4: reserved

ADR Specifies the address of the device for networking**Syntax**

#adr**ADR**aaa<CR>[<LF>]
 adr = product address before the command
 aaa = new address of the product
 condition : $000 \leq \text{aaa} \leq 255$

Result

#aaa,ok or #adr, Err x (x = 0,1,2,3,4).
 This command is used to allocate a specific number to each of the products making up a network.
 It's important to record each product address.
 When the address of the product is unknown, it's possible to recover the product address using ADR command but only this pump must be connected on the link RS 485.
 This command can be used only when the pump is stopped.

Syntax

???**ADR** <CR>[<LF>]
 ??? chain of three ascii characters.

Result

#adr,ok or #adr, Err x (x = 0,1,2,3,4).
 OK means command received, adr is the product address.

IDN Identifies the device which is communicating and its software version**Syntax**

#adr**IDN**<CR>[<LF>]

Result

#adr, VPxxxxx – Vy.zz
 Return the type of pump, ACP15, ACP28 or ACP 40 depending on the variator, the software version (y) and software release (zz).
 Ex : #004,ACP28– VB.05: product address 004 controls ACP 28 with a software release VB.05.

Detailed description of RS 485 commands

NSP Switches the speed set point to the nominal speed value

- Syntax** #adrNSP<CR>[<LF>]
This command allows to restore the nominal speed to the default value : (80 Hz for ACP 28/40 and 100 Hz for ACP 15).
- Result** #adr, ok or #adr, Err x (x = 0,1,2,3,4).

ACP Defines the operating status of the pump

- Syntax** #adr**ACP**ON<CR>[<LF>] : start pump rotation
#adr OFF<CR>[<LF>] : stop pump
- Result** #adr, ok or
#adr, Err x (x=0,1,2,3,4 ; x=3 if the pump is already in the requested state).

Detailed description of RS 485 commands

STA	Returns the state of the internal dynamic parameters
-----	--

Syntax #adr**STA**<CR>[<LF>]

Result #adr,xxxxxx,yyyyyy,zzzzz,ssss,iii,www,ppp,vvv,tttt<CR>[<LF>]
adr: address

xxxxxx,yyyyyy,zzzzz codified information under 6 decimal figures
(0 or 1 depending on conditions:

5 4 3 2 1 0

x x x x x x state bits

5 - reserved (0)

4 - reserved (0)

3 - pump running (1), pump stopped (0)

2 - nominal speed reached (1), if not (0)

1 - standby speed (1), if not (0)

0 - reserved (0)

y y y y y y fault bits

5 - power transistor non controlled (copy of red LED =1),
otherwise (0)

4 - motor temperature too high (1) if not (0)

3 - motor current too high (1) if not (0)

2 - reserved (0)

1 - reserved (0)

0 - reserved (0)

z z z z z z alert bits

5 - reserved (0) ; 4 - reserved (0) ; 3- reserved (0) ; 2 - reserved (0) ;

1- reserved (0) ; 0 - reserved (0)

sssss: current speed motor in rpm, codified on 5 decimal figures
(eg: speed 05600 rpm: sssss = 05600)

iiii: Motor power in Watts, codified on 4 decimal figures
(eg: power 450 W: iiii = 0450)

www: reserved, value by default 000

ppp: variator temperature codified on 3 decimal figures
(eg: variator temperature 56 °C: ppp = 056)

vvv: reserved, value by default 000

tttt: pump operating time value (since first start up), codified on
5 decimal figures (eg: operating time 4568 hours: tttt = 04568).



Maintenance - Troubleshooting

Operating instructions ACP Series Detailed contents

D 10


Maintenance schedule

D 30

Troubleshooting

Maintenance schedule

Model	Timing (every...)	Description
ACP 15	20 000 h or 4 years	Complete maintenance:
ACP 28 ACP 40	22 000 h or 4 years	



Call customer Service*

* The manufacturer Center Service adress list is available on our website.

Maintenance frequencies are typical values for non corrosive applications. For applications using G pump versions, these values can be reduced. Contact the support service.

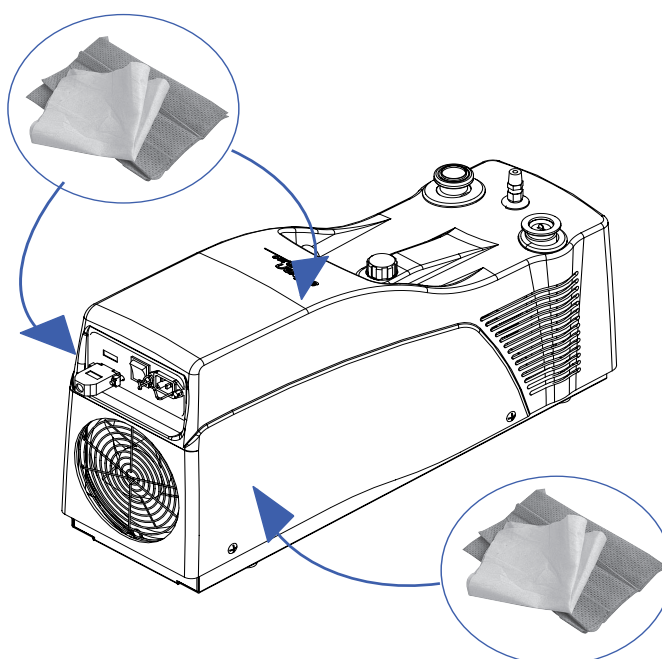
Pump overhaul

The full overhaul must be performed by manufacturer's trained personnel. Contact nearest service center or the service support at the following e-mail address:

support.service@adixen.fr

Instructions for cleaning

■ The outside covers of the pump can be clean with a fluffy free duster. Use a cleaning product avoiding to damage the cover paint and stickers.



M Performed by the manufacturer

Troubleshooting

Symptom	Cause	Solution
Pump doesn't start and the fan doesn't run	<ul style="list-style-type: none"> ▶ Main switch ▶ Power supply ▶ Cable 	<ul style="list-style-type: none"> • Set the main switch to position "1" (On). • Check the network power supply 50/60 Hz. Single-phase supply: 100 - 230 V +/-10% Three-phase supply: 200 - 440 V +/-10% • Check / replace the power supply cable. <p>📞 Call customer service center.</p>

Symptom	Cause	Solution
Pump doesn't start but the fan runs	<ul style="list-style-type: none"> ▶ Temperature ▶ Remote control 	<ul style="list-style-type: none"> • Check the pump ventilation conditions (see section B10). • Wait 1 hour at ambient temperature between 12 °C and 40 °C. The pump must start automatically • Check that the cover plug is correctly plug on the remote connector at the rear of the pump. <p>📞 Call customer service center.</p>

Symptom	Cause	Solution
Periodic operation of the pump	<ul style="list-style-type: none"> ▶ Temperature ▶ Power supply 	<ul style="list-style-type: none"> • Check the pump ventilation conditions (see section B10). • Check the network power supply 50/60 Hz. Single-phase supply: 100 - 230 V +/-10% Three-phase supply: 200 - 440 V +/-10% • Check the installation. <p>📞 Call customer service center.</p>

Troubleshooting

Symptom	Cause	Solution
Abnormal noise	<ul style="list-style-type: none"> ▶ Gas Ballast ▶ The pression doesn't go down. Leak in the installation ▶ Vibration 	<ul style="list-style-type: none"> • Check if the gas ballast is opened Caution : if the application is requiring, gas balast must be opened even if the pump is noisy • Check the pression at the pump inlet. • Check the pump fixing on its frame. <p>☎ Call customer service center.</p>

Symptom	Cause	Solution
The ultimate pressure is not correct	<ul style="list-style-type: none"> ▶ Gas Ballast ▶ Purge (G pump) ▶ Speed rotation ▶ Pumping condensable gas ▶ Gauge ▶ Leak 	<ul style="list-style-type: none"> • Check if the gas ballast is opened Caution : if the application is requiring, gas balast must be open even if the ultimate pressure is not optimum If the purge is used : <ul style="list-style-type: none"> • Check the purge connection between the installation and the pump. If the purge is not used : <ul style="list-style-type: none"> • Check the tightness of the purge plug. If managed by RS485: <ul style="list-style-type: none"> • Check the instruction sent (See C20). If managed by dry contacts : <ul style="list-style-type: none"> • Check contacts configuration (See B40). Reminder standard functioning : ACP28/40 : 4800 tr/min ACP15 : 6000 tr/min • If the application allows it, run the pump for 30 mn / 1 h with the gas ballast opened to evacuate condensable gases. • Check the accuracy of the gauge. • Make a leak detection on the installation. <p>☎ Call customer service center.</p>



Maintenance sheets

ACP Series Operating instructions Detailed contents

E 00

Safety instructions related to maintenance

- Safety instructions
- Procedure for returning vacuum pumps

Safety instructions related to maintenance

Safety instructions

WARNING

Maintenance must be performed by a skilled maintenance operator trained in the relevant health and safety aspects (EMC, electrical hazards, chemical pollution, etc.).
Isolate the product from all energy sources (mains electricity, compressed air, water, gas ...) before starting work.

DANGER

Risk due to pumping conditions.
Remaining process gases in the pump may cause severe injury or death. Before removing the pump from the installation, continue N₂ flow from the process tool for 30 min. Nitrogen pressure and flow rate should be identical to the programmed values during process.

DANGER

During pump removal, operator could be in contact with process residues on the exhaust which could cause severe injury or death. Ask your safety department for instructions according to the local statements.

Recommendations

To purge the pumping installation with neutral gas as dry Nitrogen. Wear gloves, protective glasses, breathing mask, or any appropriated safety equipment.
Ventilate the premises well,
Do not eliminate maintenance waste via standard disposal channels. Have it destroyed by a qualified company if necessary,
Install the inlet and exhaust blanking plates, thus accessories are delivered with the pump or available as accessories (see next page).

Oil drain.
The oil drain is performed during pump overhaul by manufacturer's trained personnel.

Safety instructions related to maintenance

Procedure for returning vacuum pumps

Whenever you return the product to an adixen repair service center, please make sure you follow the «procedure for returning products » and fill in the declaration of contamination found on our website. Refer to G200 for service conditions.

No contaminated pump

■ Close the inlet and exhaust pipe with black plastique cap, supply with the pump.

Contaminated pump

Refer to safety instructions listed on page 1.

■ Close the inlet and exhaust pipe of the pump with the following connecting accessories (available in manufacturer's catalog):

Accessories	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Centering ring with O-ring	068 193	068 189	068 194
Stainless steel blank flange	068 195	068 196	068 197
Clamp	083 333	083 264	087 163

How contact us

The full overhaul must be performed by manufacturer trained personnel. Contact manufacturer nearest service center or the service support at the following e-mail address:

support.service@adixen.fr



Appendix

ACP Series Operating instructions Detailed contents

G 100

Declaration of contamination

G 200

Service

DECLARATION OF CE CONFORMITY

We, adixen Vacuum Products
98, Avenue de Brogny, BP 2069
74009 ANNECY France

ISO 9001 CERTIFIED

declare under our sole responsibility that the following products:

ACP15
ACP28
ACP40

to which this declaration relates are in conformity with the relevant provisions of the following European Directives:

2006/42/EC : Machinery directive

2006/95/EC : Low voltage directive

2004/108/EC : Electromagnetic Compatibility Directive

2002/95/EC : Restriction of Hazardous Substances

when used in accordance with the instruction manual of the product.

Implemented standards

NF EN 1012-2
NF EN 61000-6-4
UL 61010A-1
CSA-C22.2 N° 1010.1-92
SEMI S2-0703

Those products comply with the relevant provisions of the above Directives and carry the CE marking.

Signatures:

Annecy August 11, 2011

Authorized person to compile the relevant technical documentation:


Mr Eric TABERLET
President


Mr Gilles BARET
Products and Technology Director
98, Avenue de Brogny, BP 2069 74009 Annecy, France

Service

Pfeiffer Vacuum offers first-class customer service!

- On-Site maintenance for many products)
- Overhaul / repair in the nearby Service Location
- Fast replacement with refurbished exchange products in mint condition
- Advice on the most cost-efficient and quickest solution

Detailed information, addresses and forms at: www.pfeiffer-vacuum.com (Service).

Overhaul and repair in the Pfeiffer Vacuum Service Center

The following general recommendations will ensure a fast, smooth servicing process:

- ➔ Fill out the «Service Request/Product return» form and send it to your local Pfeiffer Vacuum Service contact.
- ➔ Include the confirmation on the service request from Pfeiffer Vacuum with your shipment.
- ➔ Fill out the declaration of contamination and include it in the shipment (mandatory!). The Declaration of contamination is valid for any product/device including a part exposed to vacuum.
- ➔ Dismantle all accessories and keep them.
- ➔ Close all the ports flange openings by using the original protective covers or metallic airtight blank flanges for contaminated devices.
- ➔ If possible, send pump or unit in its original packaging.

Sending of contaminated pumps or devices

No devices will be accepted if they are contaminated with micro-biological, explosive or radioactive substances. "Hazardous substances" are substances and compounds in accordance with the hazardous goods regulations (current version).

- ➔ Neutralize the pump by flushing it with nitrogen or dry air.
- ➔ Close all openings airtight.
- ➔ Seal the pump or device in suitable protective film.
- ➔ Return the pump/device only in a suitable and sturdy transport container and send it in while following applicable transport conditions.

Pump or device returned without declaration of contamination form fully completed and/or non-secured in a suitable packaging, will be decontaminated and/or returned at the shipper's expense.

Exchange or repaired devices

The factory operating parameters are always preset with exchange or repaired devices. If you use specific parameters for your application, you have to set these again.

Service orders

All service orders are carried out exclusively according to our general terms and conditions for the repair and maintenance, available in our website.

Service

Pfeiffer Vacuum offers first-class customer service!

- On-Site maintenance for many products)
- Overhaul / repair in the nearby Service Location
- Fast replacement with refurbished exchange products in mint condition
- Advice on the most cost-efficient and quickest solution

Detailed information, addresses and forms at: www.pfeiffer-vacuum.com (Service).

Overhaul and repair in the Pfeiffer Vacuum Service Center

The following general recommendations will ensure a fast, smooth servicing process:

- ➔ Fill out the «Service Request/Product return» form and send it to your local Pfeiffer Vacuum Service contact.
- ➔ Include the confirmation on the service request from Pfeiffer Vacuum with your shipment.
- ➔ Fill out the declaration of contamination and include it in the shipment (mandatory!). The Declaration of contamination is valid for any product/device including a part exposed to vacuum.
- ➔ Dismantle all accessories and keep them.
- ➔ Close all the ports flange openings by using the original protective covers or metallic airtight blank flanges for contaminated devices.
- ➔ If possible, send pump or unit in its original packaging.

Sending of contaminated pumps or devices

No devices will be accepted if they are contaminated with micro-biological, explosive or radioactive substances. "Hazardous substances" are substances and compounds in accordance with the hazardous goods regulations (current version).

- ➔ Neutralize the pump by flushing it with nitrogen or dry air.
- ➔ Close all openings airtight.
- ➔ Seal the pump or device in suitable protective film.
- ➔ Return the pump/device only in a suitable and sturdy transport container and send it in while following applicable transport conditions.

Pump or device returned without declaration of contamination form fully completed and/or non-secured in a suitable packaging, will be decontaminated and/or returned at the shipper's expense.

Exchange or repaired devices

The factory operating parameters are always preset with exchange or repaired devices. If you use specific parameters for your application, you have to set these again.

Service orders

All service orders are carried out exclusively according to our general terms and conditions for the repair and maintenance, available in our website.

**Vacuum Solutions
from a single Source**

Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service.

**Complete range
of products**

From a single component to complex systems: We are the only supplier of vacuum technology that provides a complete product portfolio.

**Competence in
theory and practice**

Benefit from our know-how and our portfolio of training opportunities! We support you with your plant layout and provide first-class on-site service worldwide.

**Are you looking for a
perfect vacuum solution?
Please contact us:**

Pfeiffer Vacuum GmbH
Headquarters
T +49 6441 802-0
Info@pfeiffer-vacuum.de

