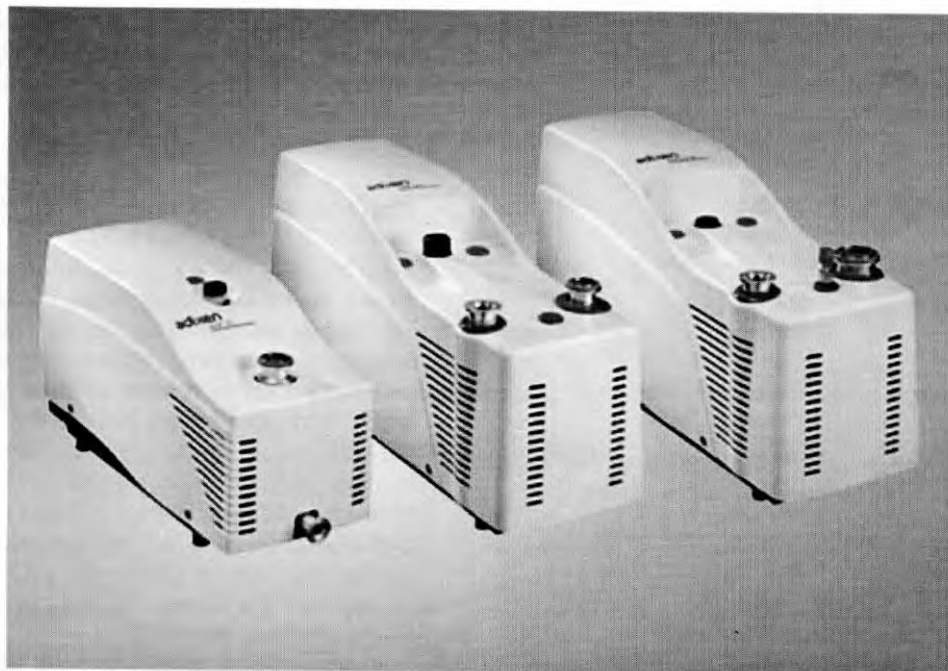


ACP 15 / 28 / 40 Series 2

DRY PRIMARY PUMPS



User's Manual

adixen
by Alcatel Vacuum Technology

idealvac.com
Ideal
vacuum products
(505)872-0037
idealvac.com

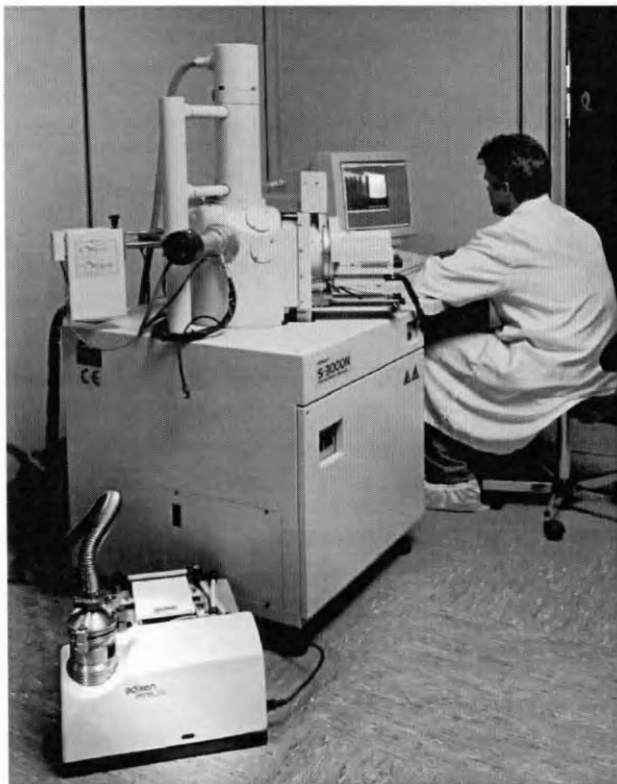


Alcatel Vacuum Technology, as part of the Alcatel-Lucent Group, has been supplying vacuum pumps, helium and hydrogen leak detection systems, plasma sensors, vacuum measurement for several years.

Thanks to its complete range of products, the company has become an essential player in multiple applications : instrumentation, Research & Development, industry and semiconductors.

Alcatel Vacuum Technology has launched Adixen, its new brand name, in recognition of the company's international standing in vacuum position.

With both ISO 9001 and 14001 certifications, the French company is an acknowledged expert in service and support, and Adixen products have the highest quality and environmental standards.



With 45 years of experience, AVT today has a worldwide presence, through its international network that includes a whole host of experienced subsidiaries, distributors and agents.

The first step was the founding of Alcatel Vacuum Products (Hingham- MA) in the United States, thirty years ago, reinforced today by 2 others US subsidiaries in Fremont (CA) and Tempe (AZ).

In Europe, AVTF-France headquarters and its subsidiaries, Alcatel Hochvakuumtechnik (Germany), Alcatel Vacuum Technology UK (Scotland), Alcatel Vacuum Technology Benelux (Netherlands), Alcatel Vacuum Systems (Italy) and more recently Adixen Sensistor AB in Sweden (in 2007) form the foundation for the European partner network.

In Asia, our presence started in 1993 with Alcatel Vacuum Technology (Japan), and has been strengthened with Alcatel Vacuum Technology Korea (in 1995), Alcatel Vacuum Technology Taiwan (in 2001), Alcatel Vacuum Technology Singapore, Alcatel Vacuum Technology Shanghai (China) (in 2004).

This organization is rounded off by more than 40 representatives based in a variety of continents.

Thus, whatever the circumstances, the users of Adixen products can always rely on quick support of our specialists in Vacuum Technology.



User's manual

ACP series dry primary pumps

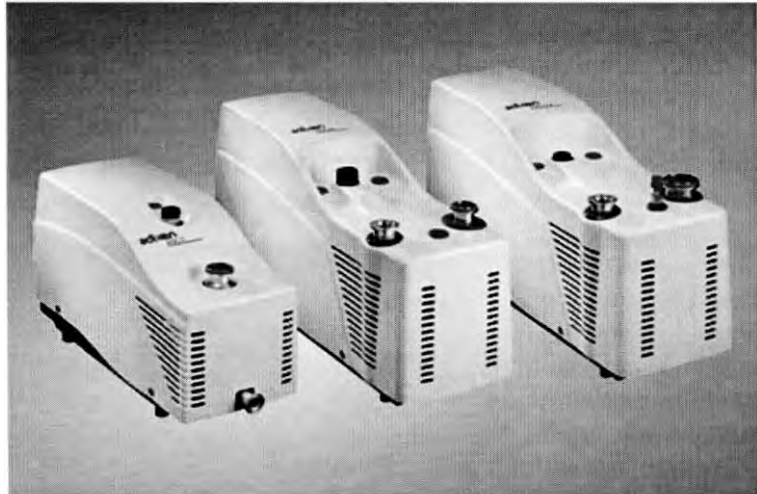
Welcome

Dear customer,

You have just purchased an Adixen dry primary pump. We would like to thank you and are proud to include you among our customers.

This product benefits from Alcatel Vacuum Technology's many years of experience in producing vacuum products in many applications like Instrumentations, R & D, Semi-conductors process. In the last field, thousands of dry pumps, based on the ACP technology are currently running.

In order to guarantee performance and obtain full satisfaction from this equipment, we suggest that you study this manual, particularly chapter B devoted to installation and start-up, before installing or performing maintenance on your pump.



APPLICATIONS:

ACP 15, ACP 28 AND ACP 40 DRY PRIMARY PUMPS FOR (CLEAN) APPLICATIONS

- Instrumentation
- Research and Development
- Semi-conductors: Load lock - Transfer chamber

ACP 15 G, ACP 28 G, ACP 40 G DRY PRIMARY PUMPS FOR THE PUMPING OF CORROSIVE GAS TRACES.

FEATURES:

MULTI-STAGE ROOTS TECHNOLOGY
UNIVERSAL SINGLE PHASE ELECTRICAL SUPPLY
AIR COOLED

User's manual

ACP series dry primary pumps

This product complies with the requirements of European Directives, listed in the Declaration of Conformity contained in G100 of this manual. These Directives are amended by Directive 93/68/E.E.0 (E.C. Marking).

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 Alcatel Vacuum Technology France.

Specifications and information are subject to change without notice by Alcatel Vacuum Technology France.

ACP Series User's Manual

Chapter 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

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

Chapter C

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

Chapter D

MAINTENANCE - TROUBLESHOOTING

- D 20** - Instructions for cleaning

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MAINTENANCE SHEETS

- E 00** - Maintenance safety instructions

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- F** - Non used

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- G 10** - ACP 15 / 15 G - Pumping curves
- G 11** - ACP 28 / 28 G - Pumping curves
- G 12** - ACP 40 / 40 G - Pumping curves
- G 100** - European Declaration of Conformity
- G 101** - S2 Semi certificate
- G 200** - Safety questionnaire

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.

ACP Series User's Manual

WARNING

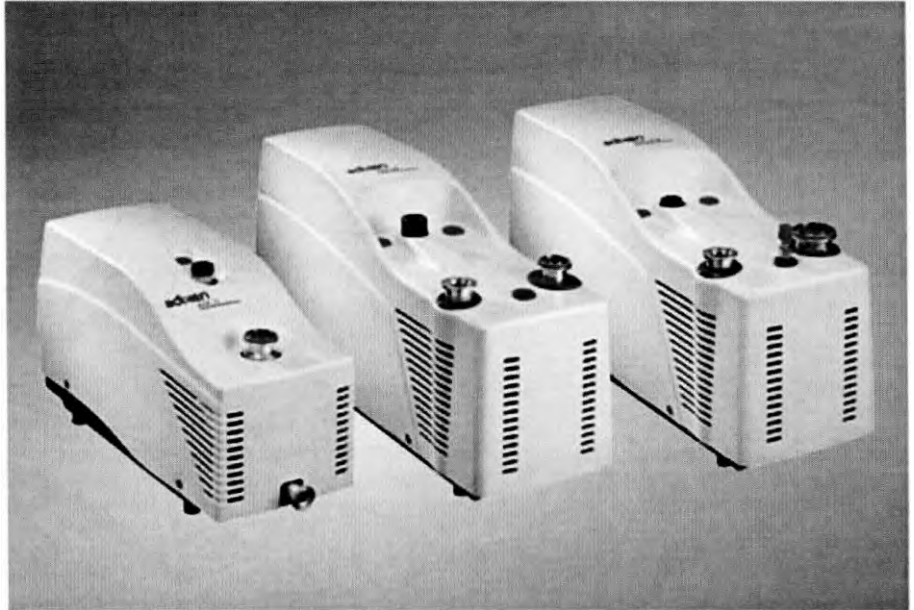
Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury.

DANGER

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

ACP Series dry primary pump overview

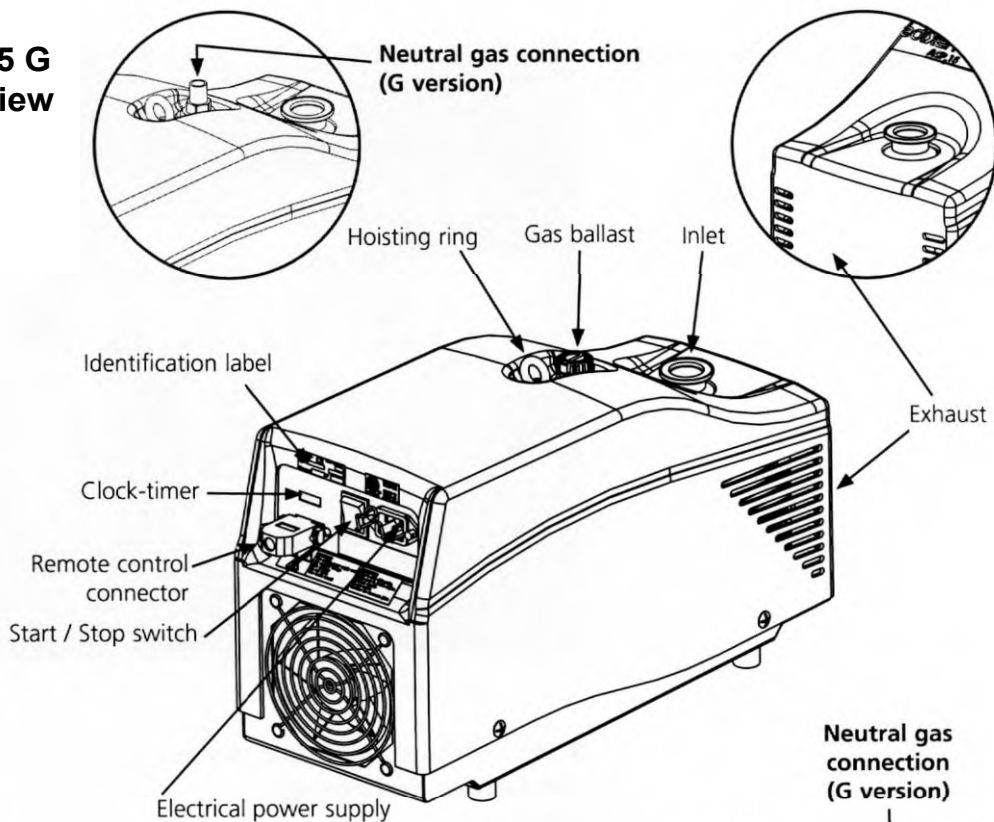
Superior technology



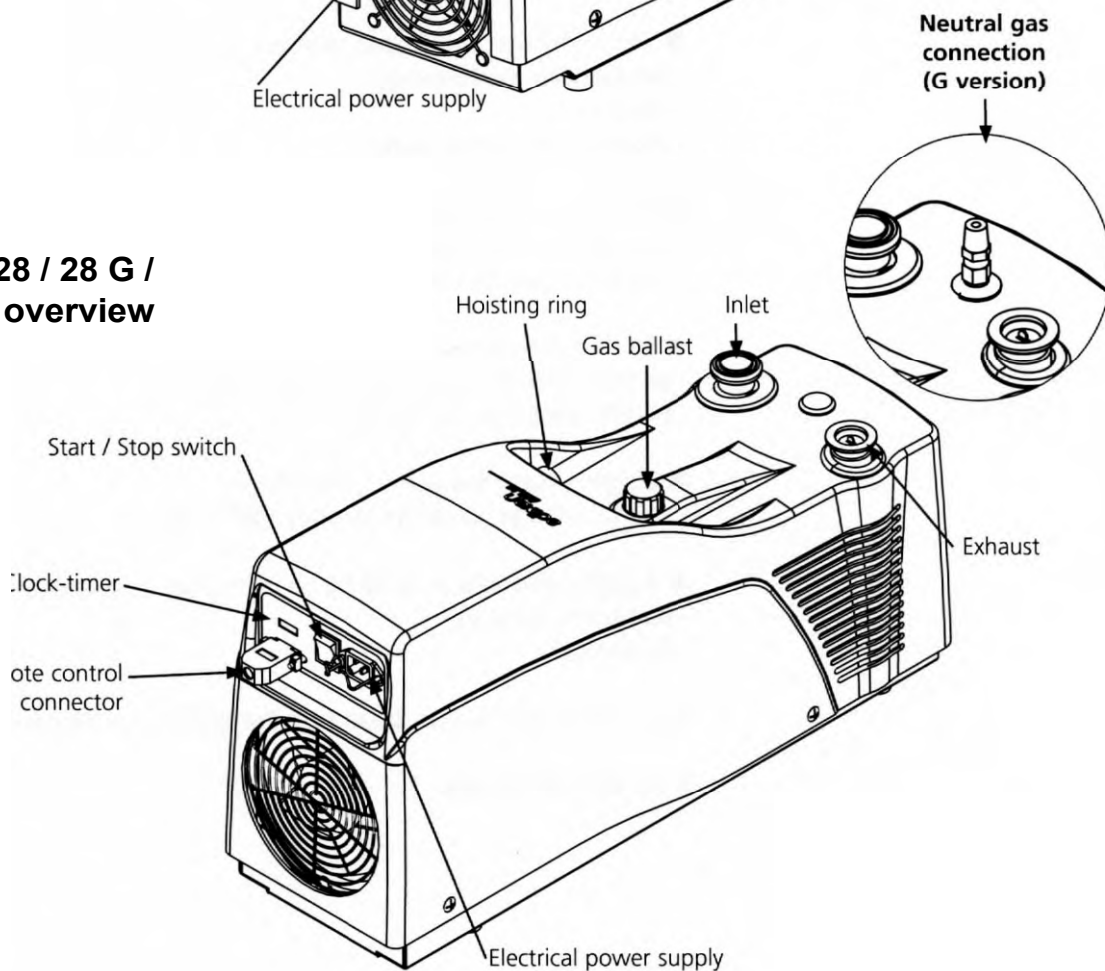
- Type Multi-stage Roots primary pump
 - frictionless technology,
 - reliability,
 - aluminium pump body.
- Dry and clean vacuum
 - no particulate contamination,
 - residual gas spectrum free of traces of hydrocarbons.
- Sealed air-cooled motor
 - permanent air cooling (built-in fan),
 - safety: certified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

ACP Series dry primary pump overview

Model ACP 15 / 15 G overview



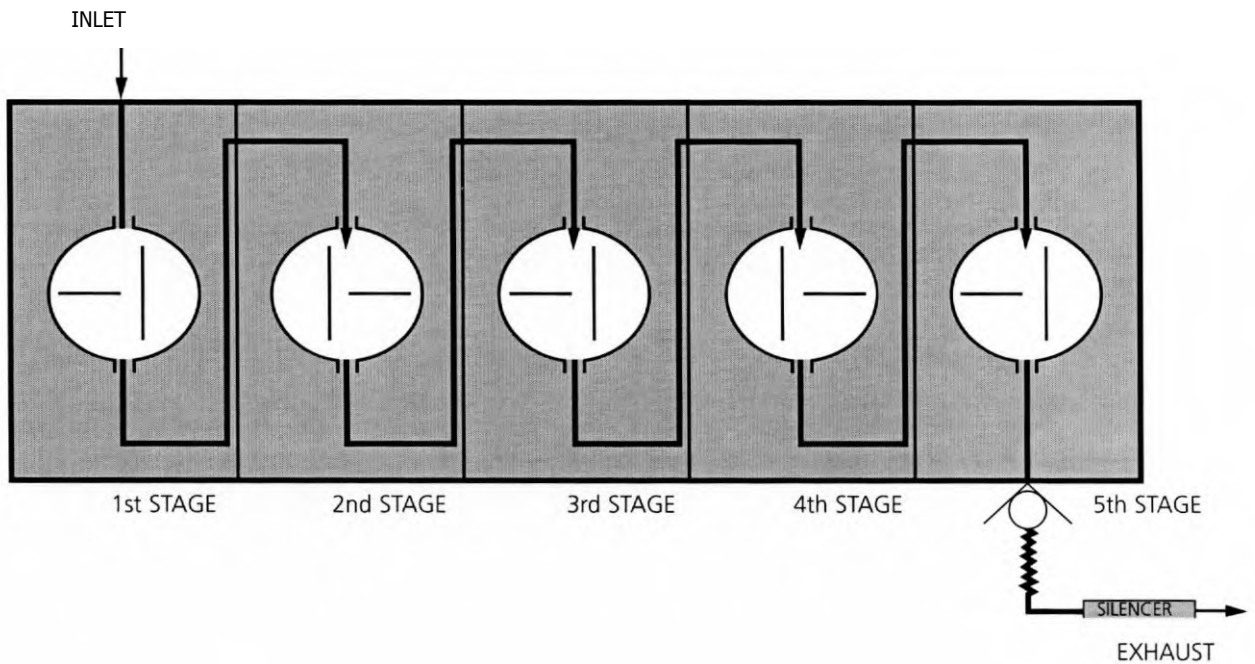
Model ACP 28 / 28 G / 40 / 40 G overview



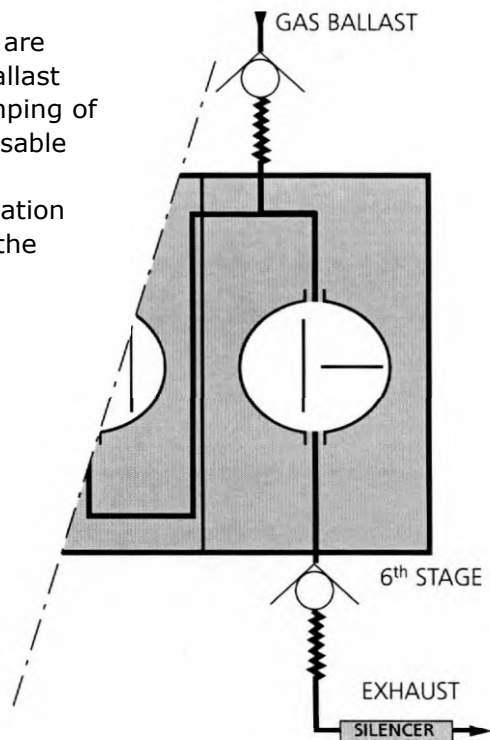
Operating principle

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 are equipped with a gas ballast device to improve pumping of light gases and condensable vapors. Thus avoiding condensation of pumped gases into the pump.



Dry primary pump 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 or condensable gas

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, and the pump tightness is reinforced. 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.

Technical characteristics - ACP 15 / ACP 15 G

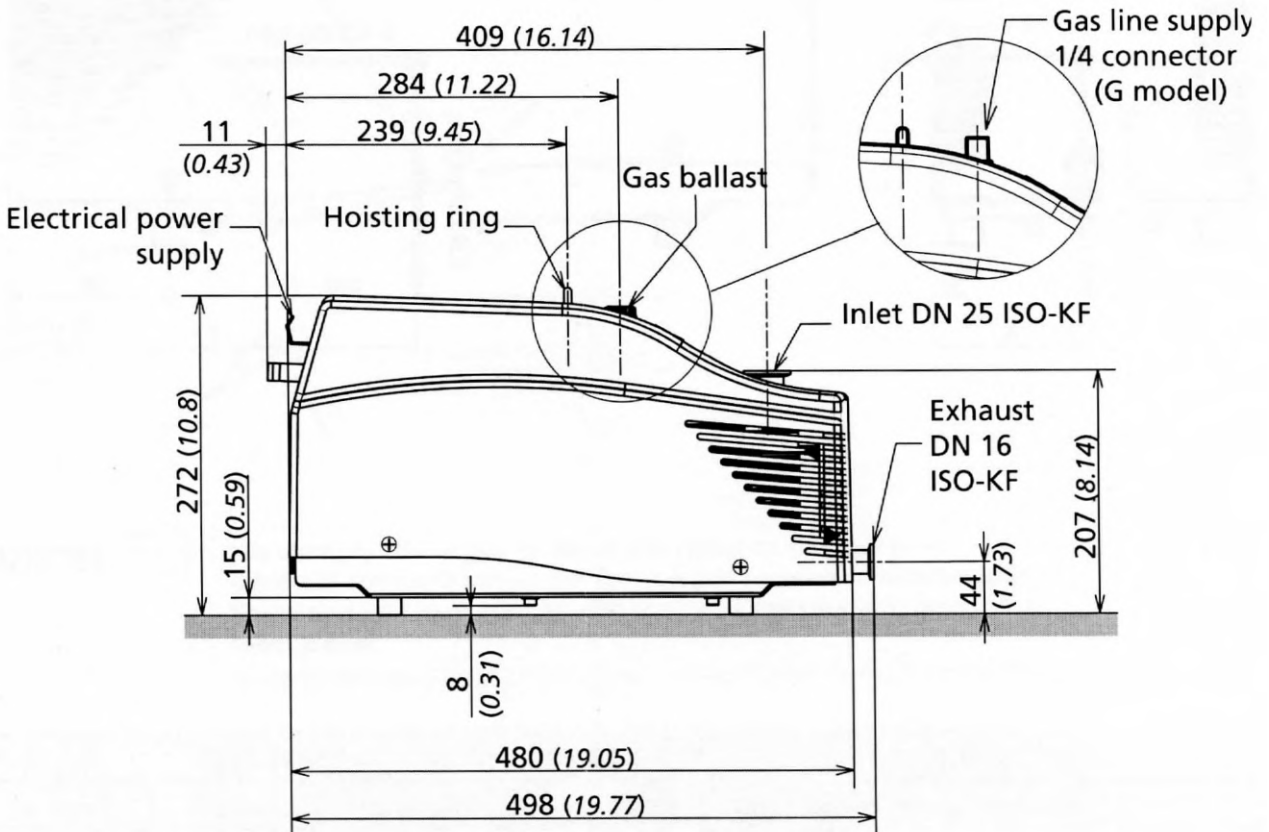
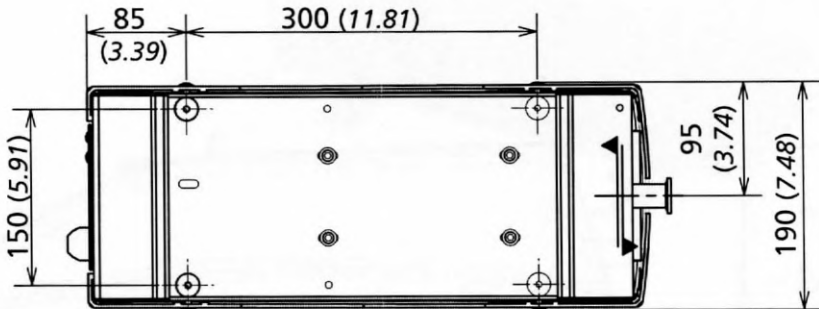
Specifications	Unit	ACP 15	ACP 15 G
Utilization		Indoor	
Functioning altitude	m (ft)	< 2000 (6561)	
Installation category		II	
Pollution degree		2	
Ultimate pressure ⁽¹⁾ - Standard model: with gas ballast closed - G model: without purge	mbar (Torr)	5 x 10 ⁻² (3.8 x 10 ⁻²)	5 x 10 ⁻² (3.8 x 10 ⁻²)
Maximum ultimate pressure - Standard model: with gas ballast closed - G model: without purge	mbar (Torr)	6 x 10 ⁻² (4.5 x 10 ⁻²)	6 x 10 ⁻² (4.5 x 10 ⁻²)
Ultimate pressure ⁽¹⁾ - Standard model: with gas ballast opened - G model: with purge (300 mbar relative pressure)	mbar (Torr)	3 x 10 ⁻¹ (2.25 x 10 ⁻¹)	-
	mbar (Torr)	-	3 x 10 ⁻¹ (2.25 x 10 ⁻¹)
Maximum pressure at inlet (absolute)	mbar (Torr)	1013 (760)	
Maximum exhaust pressure (absolute)	mbar (Torr)	1200 (900)	
Ambient operating temperature	°C (°F)	Min. + 12 (+ 54) Maxi. + 40 (+ 104)	
Leakage current	mA	< 5	
Power consumption ⁽¹⁾at ultimate pressure gas ballast closed or without purge gas ballast opened or with purge at atmospheric pressure	W	500 550 600	
Gas ballast flowrate	m3/h	0.5	-
N2 flowrate ⁽²⁾	slm	-	5
Single phase power Automatic switch voltage (high or low)		110 - 230 V ± 10% - 50/60 Hz 10/15 A - 1150 VA	
Fan flow rate	m3/h	180	
Inlet port		DN 25 ISO-KF	
Exhaust port		DN 16 ISO-KF	
Oil capacity ⁽³⁾	cm3	20	
Weight	Kg (lbs)	21 (46.29)	
Storage temperature	°C (°F)	mini -10 (14) / maxi 60 (140)	
Maximum relative humidity		80% up to 31°C Linear decrease up to 50% up to 40°C	

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

(2)Relative nitrogen pressure 300 mbar.

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

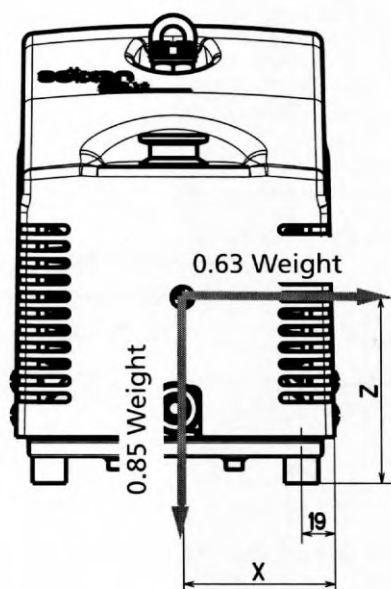
Dimensional drawing
mm (inch)



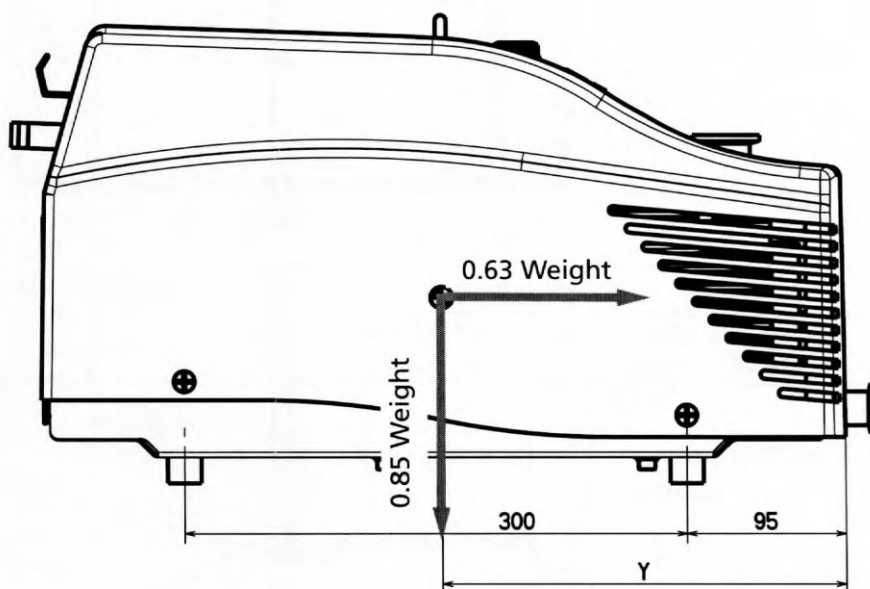
Technical characteristics - ACP 15 / ACP 15 G

Gravity center and weight distribution

Right view



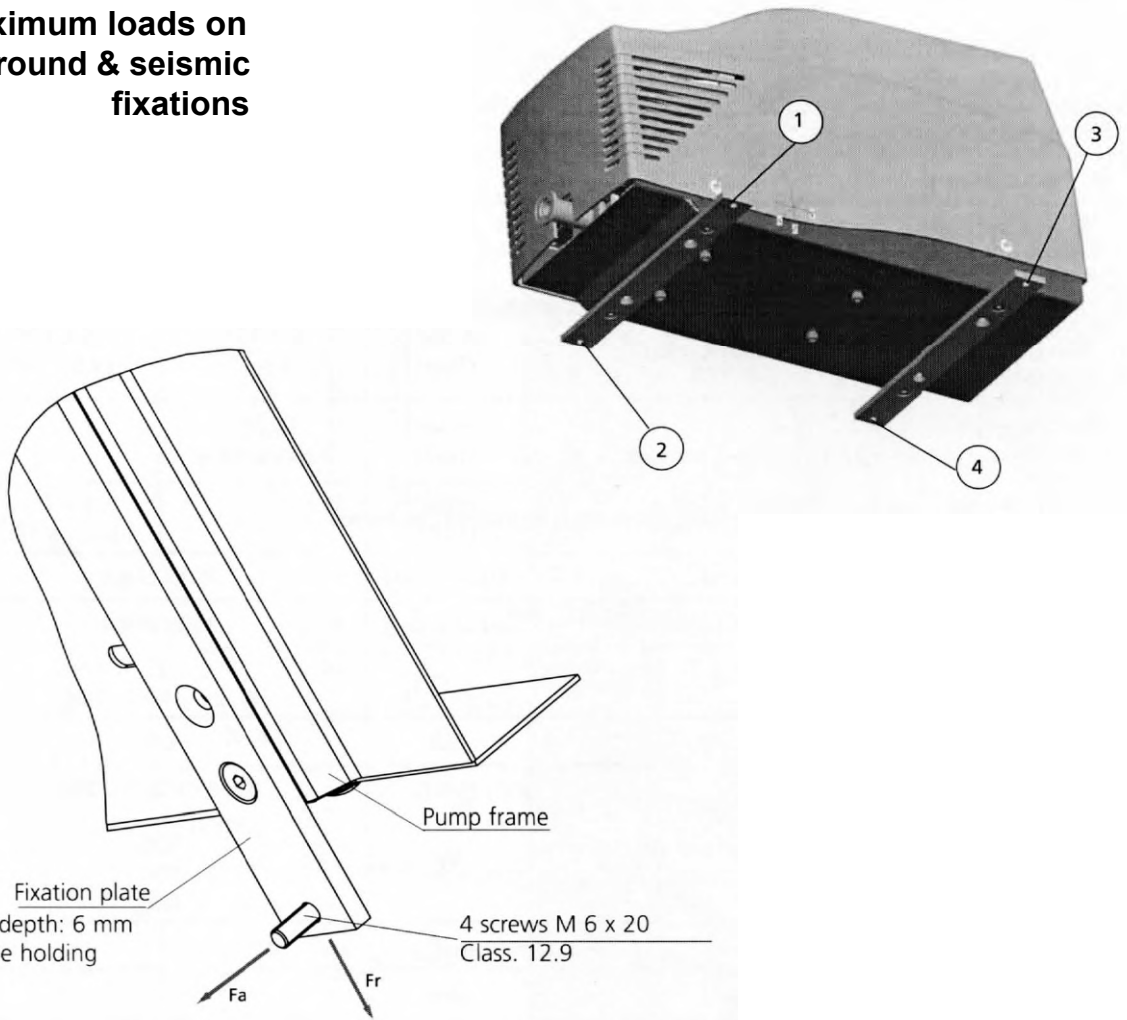
Front view



ACP 15/ACP 15G	
	Center of gravity (inch/ mm)
X	0.29 / 90
Y	0.79 / 241
Z	0.36 / 110

Load by foot (kg)			
Foot 1	Foot 2	Foot 3	Foot 4
6.2	4.5	7.1	4.9

Maximum loads on ground & seismic fixations



CAUTION

We strongly advise you to secure the pump on the tool with 4 M6 x20 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	Foot3	Foot 4
Tension (Fa)	120	-13	72	31
Shearing (Fr)	85	25	87	52

Technical characteristics - ACP 28 / 28 G / 40 / 40 G

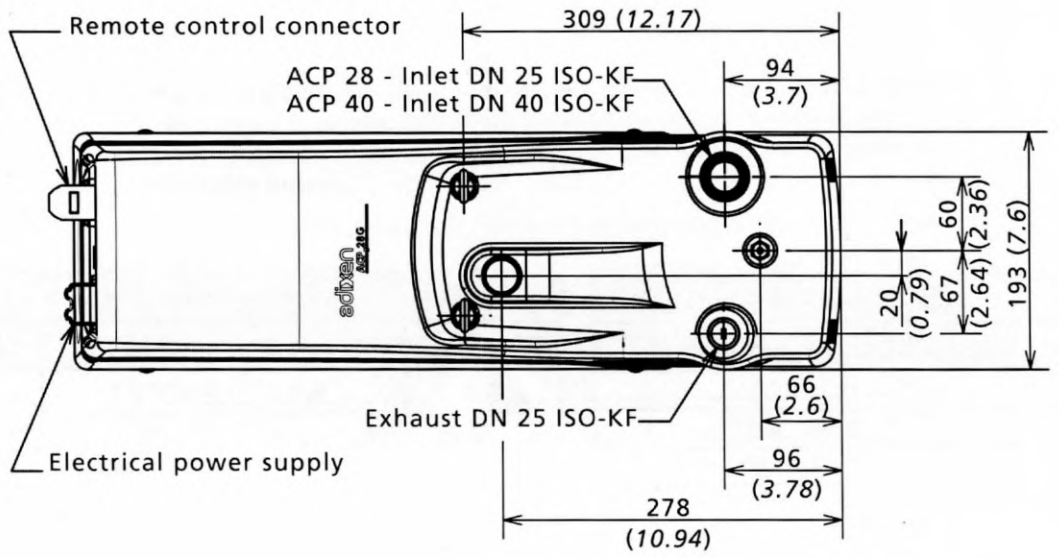
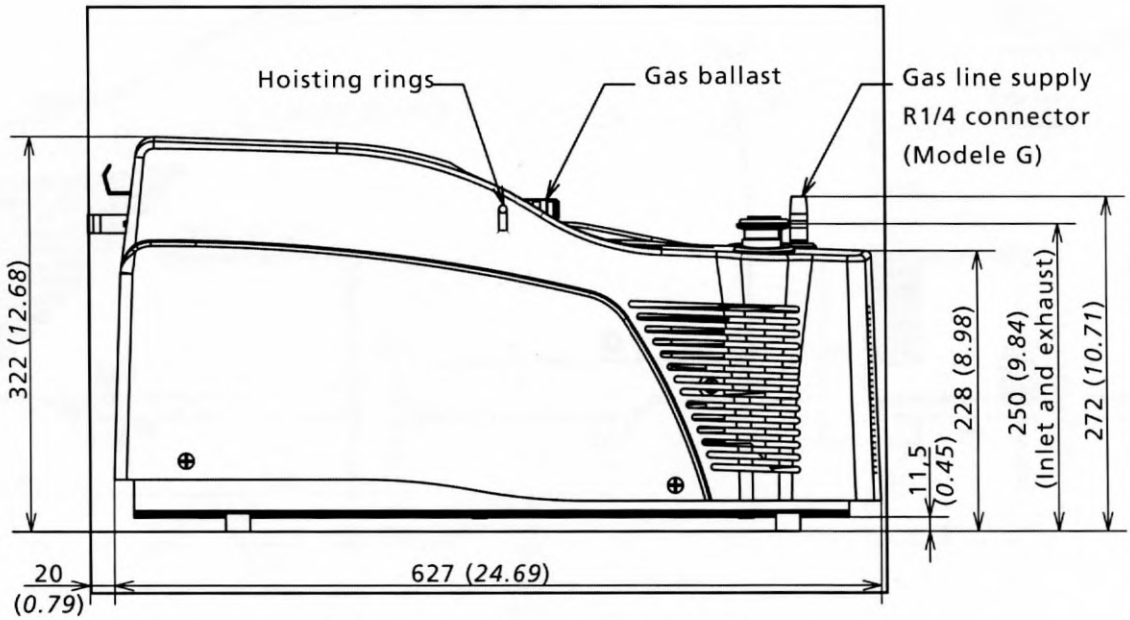
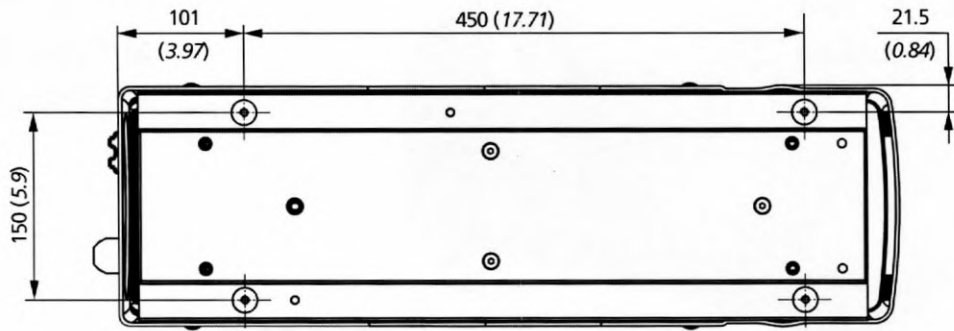
Specifications	Unit	ACP 28	ACP 28G	ACP 40	ACP 40G
Utilization		Indoor			
Functioning altitude	m (ft)	< 2000 (6561)			
Installation category		II			
Pollution degree		2			
Ultimate pressure ⁽¹⁾ - Standard model: gas ballast closed - G model: without purge	mbar (Torr)	3 x 10 ⁻² (2.25 x 10 ⁻²)		3 x 10 ⁻² (2.25 x 10 ⁻²)	
Maximum ultimate pressure - Standard model: gas ballast closed - G model: without purge	mbar (Torr)	5 x 10 ⁻² (3.75 x 10 ⁻²)		5 x 10 ⁻² (3.75 x 10 ⁻²)	
Ultimate pressure ⁽¹⁾ - Standard model: with gas ballast opened	mbar (Torr)	2 x 10 ⁻¹ (1.5 x 10 ⁻¹)	-	2 x 10 ⁻¹ (1.5 x 10 ⁻¹)	-
- G model: with purge (300 mbar relative pressure)	mbar (Torr)		2x10 ⁻¹ (1.5x10 ⁻¹)		2x10 ⁻¹ (1.5x10 ⁻¹)
Maximum pressure at inlet (absolute)	mbar (Torr)	1013 (760)			
Maximale exhaust pressure (absolute)	mbar (Torr)	1200 (900)			
Ambient operating temperature	°C (°F)	Min. + 12 (+ 54) Maxl. + 40 (+ 104)			
Leakage current	mA	< 5			
Power consumption ⁽¹⁾at ultimate pressure gas ballast closed or without purge gas ballast opened or with purge ...at atmospheric pressure	W	700 900 1000			
Gas ballast flowrate	m3/h	1.2	-	1.2	-
N2 flowrate ⁽²⁾	slm	-	3.7	-	3.7
Single phase power Automatic switch voltage (high or low)		110 - 230 V ± 10% - 50/60 Hz 10/15 A - 1150 VA			
Fan flowrate	m3/h	410			
Inlet port		DN 25 ISO-KF		DN 40 ISO-KF	
Exhaust port		DN 25 ISO-KF			
Oil capacity ⁽³⁾	cm3	25			
Weight	Kg (lbs)	30 (66)		31 (68.3)	
Storage temperature	°C (°F)	mini -10 (14) / maxi 60 (140)			
Maximum relative humidity		80% up to 31°C Linear decrease up to 50% up to 40°C			

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

⁽²⁾ Relative nitrogen pressure 300 mbar.

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

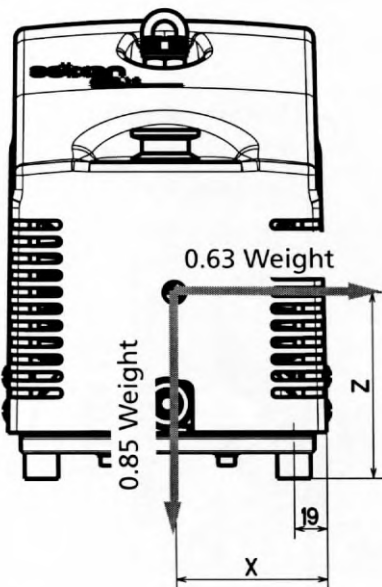
Dimensional drawing
mm (inch)



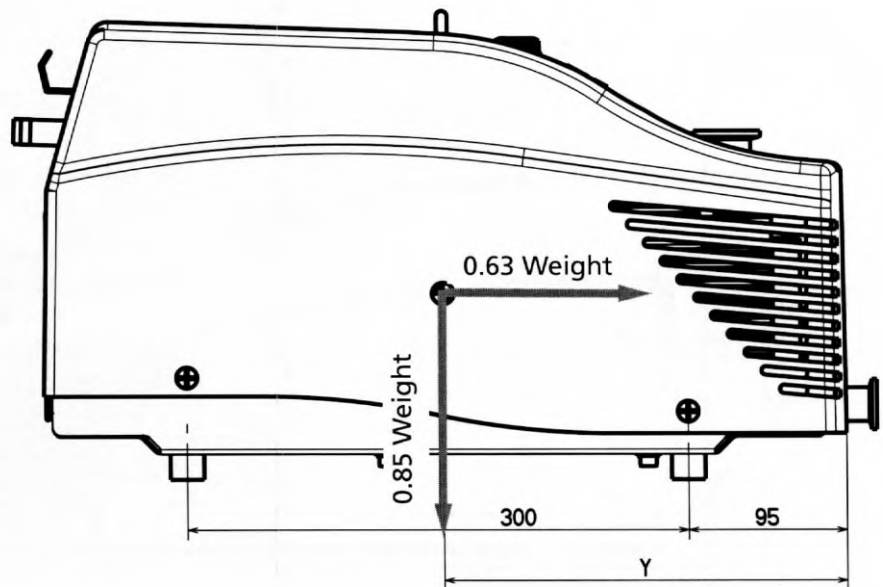
Technical characteristics - ACP 28 / 28 G / 40 / 40 G

Gravity center and weight distribution

Right view



Front view



ACP 28/ACP 40

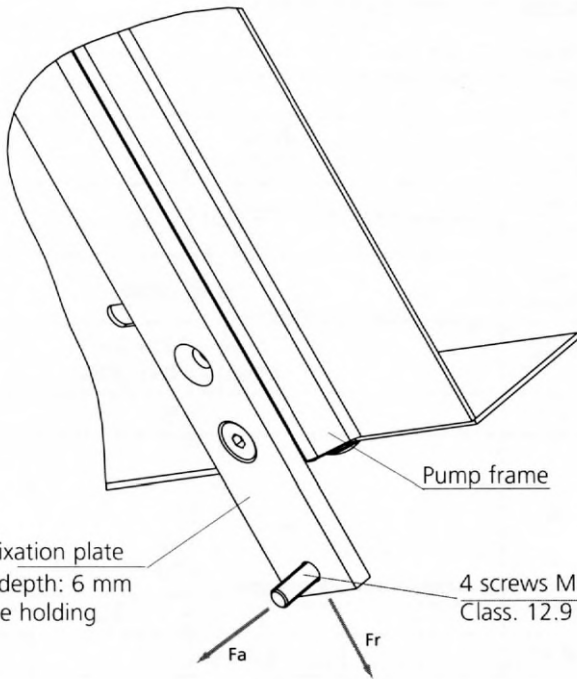
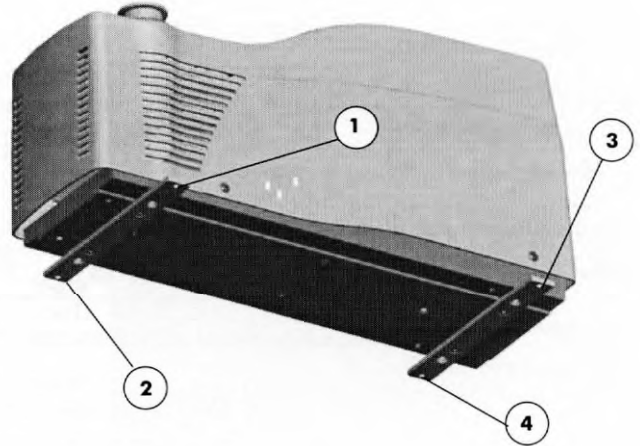
Center of gravity (inch/ mm)

X	0.29 / 91
Y	0.98/ 301
Z	0.43 / 130

Load by foot (kg)

Foot 1	Foot 2	Foot 3	Foot 4
8.6	8.3	7.1	7

Maximum loads on ground & seismic fixations



Fixation plate depth: 6 mm delivered in the holding device kit

4 screws M 6 x 20 Class. 12.9

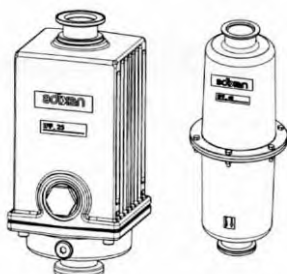
CAUTION

We strongly advise you to secure the pump on the tool with 4 M6 x20 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	Foot3	Foot 4
Tension (Fa)	15	184	27	167
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 user's manual delivered with the accessory.

Exhaust silencer

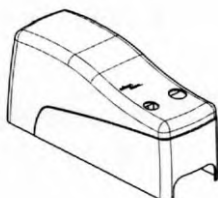


In order to reduce noise level at the exhaust when the pump is operated at high pressures, on clean applications.

Model	Part number
Silencer ES255	109 873

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

Sound inclosure



In order to reduce significantly noise level in high level ambient temperature.

Model	Part number
Noise level reduction (-5dBA) in max. ambient temperature of 35°C	
NRC15 for ACP 15	111 968
NRC 28-40 for ACP28/ACP40	112 637
Noise level reduction (-10dBA) 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).

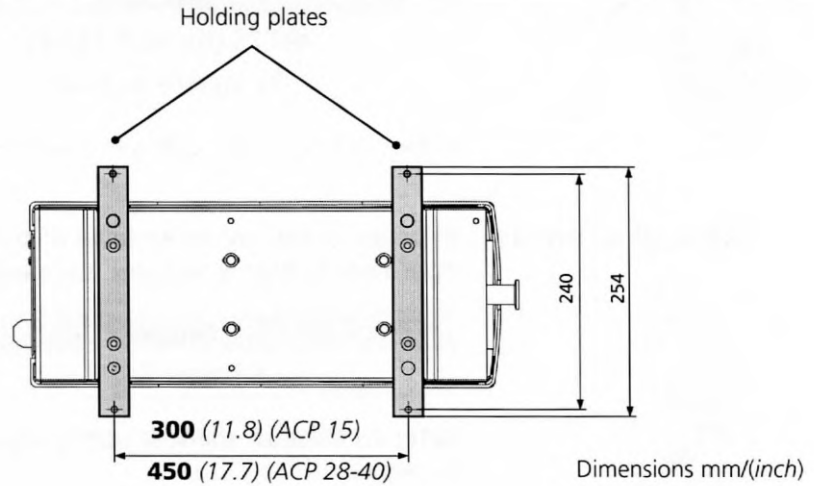
Model	Part number
Frequency converter interface plug	112 851

Accessories

Pump holding device

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

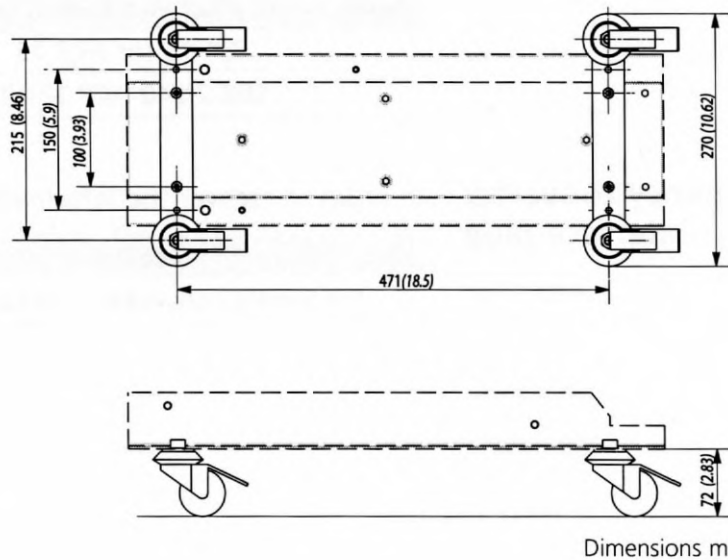
Description	Part number
Pump holding device	112 846



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 ACP15, ACP28 and ACP40 pump models.

Description	Part number
Wheel kit	1111385



Safety instructions

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

Unpacking

To keep your product in the clean condition in which it left our factory, we recommend unpacking the pump at the site of installation.

Make sure that the equipment has not been damaged during the transport. If it has been damaged, take the necessary steps with the carrier and inform the manufacturer if necessary. In all cases, we recommend that you keep the packaging (reprocessing material) to transport the equipment or for prolonged storage.

Installation - Start up

⚠ CAUTION

Our products are designed to comply with current EEC regulations. Any modification of the product made by the user is liable to lead to non-compliance with these regulations, or reduce the EMC (electromagnetic compatibility) performance and the safety of the product. The manufacturer declines any responsibility for such operations.

Safety instructions

Installation - Start up (ctd)

⚠ WARNING

Before performing any maintenance operations on the product, isolate the product from the various energy sources (electricity, compressed air, etc).

⚠ CAUTION

The EMC performance of the product is obtained on the condition that the installation complies with EMC rules.

In particular, in disturbed environments, it is essential to:

- use shielded cables and connections for interfaces,
- stabilize the power supply line with shielding from the power supply source to a distance of 3 m (10ft) from the product inlet.

⚠ WARNING

When switching off an item of equipment containing loaded capacitors at over 60 VDC or 25 VAC, take precautions concerning the access to the connector pins (single-phase motors, equipment with line filter, frequency converter, monitoring unit, etc.). Wait 1 minute after pump switch off before operating on the product.

⚠ 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

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.

No additional fire cautions are required (e.g. fire detection or suppression devices).

The pump body is made of aluminium. The main part enclosure and the majority of 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

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.
Oil medical safety data sheet is available upon request.

⚠ 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 over: although compliance with EEC safety regulations is guaranteed (normal range $\pm 10^\circ$), it is recommended to take precautions against the risk of tilting over during handling, installation and operation.

Operation

⚠ CAUTION

The performance and the operational safety of this product are guaranteed provided that it is used in normal operating conditions.

⚠ WARNING

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

⚠ CAUTION

Make sure that the parts or chambers connected to the inlet of our pumps withstand a negative pressure of 1 bar 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 manufacturer has no control over the types of gases passing through this pump. Frequently, process gases are toxic, flammable, corrosive, explosive or otherwise reactive. Since these gases can cause serious injury or death, it is very important to plumb the exhaust of the pump to the facility's hazardous gas exhaust system which incorporates appropriate filters, scrubbers, etc., to insure that the exhaust meets all air regulations. Check that pump is correctly connected to the equipment.

Safety instructions

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 pumps are designed so as not to present a thermal risk for the user's safety. However, specific operating conditions can generate temperatures which require particular care to be taken by the user (external surfaces > 70°C).

⚠ DANGER

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

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 Alcatel Vacuum Technology original spare parts, delivered by Alcatel Vacuum Technology, containing i.e. all its components and sub-assemblies.

This obligation will not cover the shipping cost to an Alcatel take back facility.

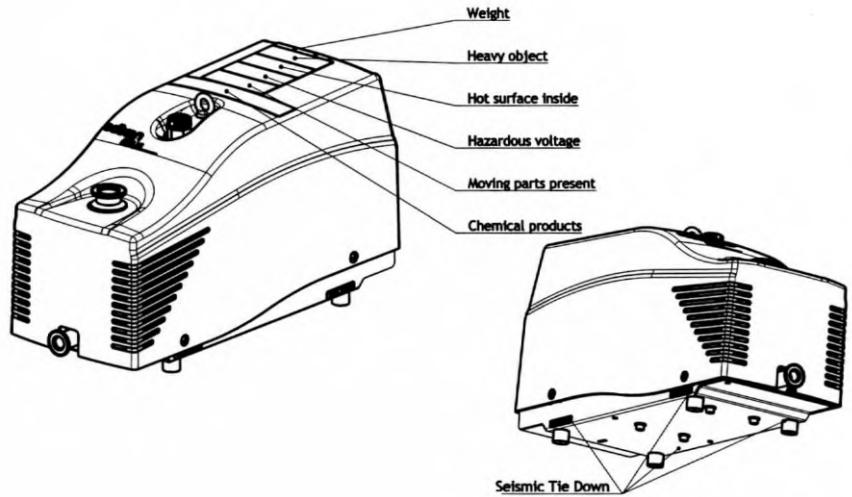
Before returning the product, fill in the safety form, attach it to the product before shipping to the service-repair office closest to you.

Contact in case of emergency

In case of emergency or equipment failure, please contact your service manager of your local service center (see addresses at the back of the manual).

Safety instructions

Pump labels



	<p>WARNING HOT SURFACE Contact may cause burn. Do not touch or wear protective gear before servicing.</p>	<p>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.</p>
--	---	---

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

	<p>WARNING HAZARDOUS VOLTAGE ENCLOSED Voltage or current hazard sufficient to cause shock. Disconnect and lockout power before servicing.</p>	<p>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 advizes to disconnect the pump before any intervention or to properly lock-out and tag-out the equipment breaker before any intervention on the pump.</p>
--	---	--

	<p>WARNING MOVING PARTS PRESENT Moving parts can crush and cut. Keep hands or feet away from moving parts.</p>	<p>Located on the upper cover, this label informs the user that moving parts preent inside the pump could cause personal injury, like crushing or cutting. The user must keep all body parts away from moving parts.</p>
--	--	--

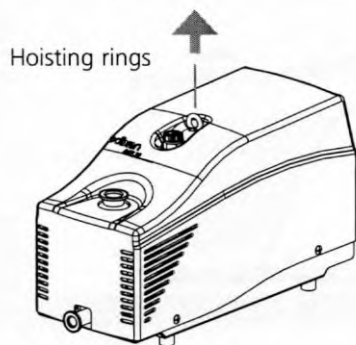
	<p>WARNING FLAMMABLE, CORROSIVE AND TOXIC CHEMICALS LOCATED WITHIN THE ENCLOSURE Exposure may result in severe injury or death. Preventive maintenance must be done by trained personnel only.</p>	<p>Located on the upper cover, this label warns the user against pumped process gas that could be dangerous and toxic and could cause severe injuries or death. It specifies that any preventive maintenance operation can only be performed by trained personnel.</p>
--	--	--

<p>SEISMIC TIE DOWN</p>	<p>Located on the lower part of the pump, these labels indicate the location of the holes for the anti earthquake holding device (accessory).</p>
--------------------------------	---

Installation of ACP Series pumps

Unpacking

When you receive the equipment, unpack it carefully; do not discard the packaging until you have ensured that the pump has not been damaged during transport. Otherwise, take the necessary measures with the transporting company and, if necessary, notify the manufacturer.



For all handling of the equipment, it is highly recommended to use a lifting device. Use the hoisting rings delivered with the pump by screwing them in the threaded holes located on the top side of the pump.

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

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

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 3 months (storage temperature between 14°F (-10°C) and 140°F (60°C) and pump sealed).

For storage period of over 3 months 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 three months because factors such as temperature, degree of humidity, salt air.... may cause the deterioration of the pump components.

For a storage period of over 1 year, it is recommended to make a pump overhaul to replace among other, the seals, the ball bearings (new pump as well as used).

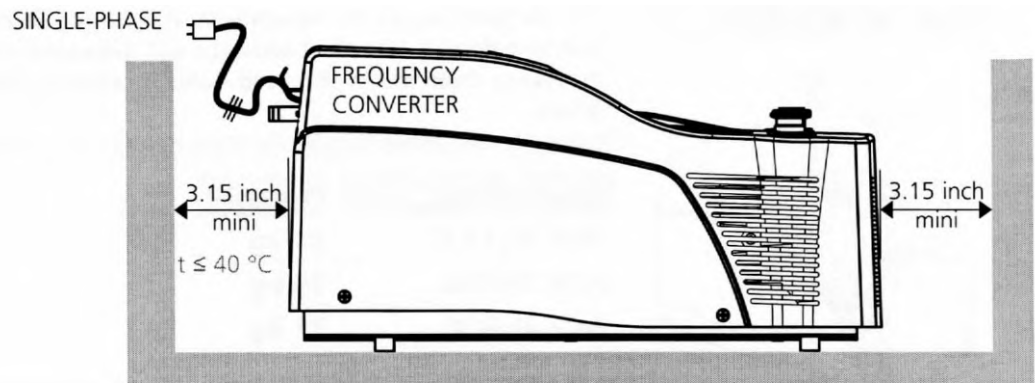
For this contact your local service center (address of the main contacts at the rear of the manual).

Installation of ACP Series pumps

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.



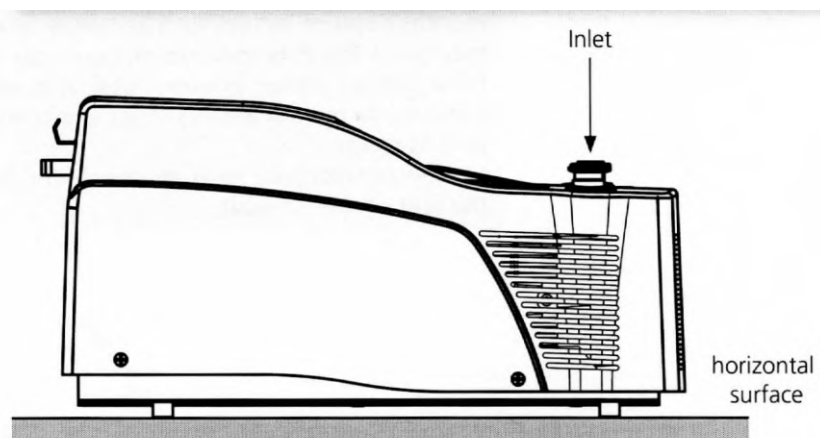
Installation safety instructions

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

- 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 pump must be operated in the horizontal position with the pumping axis vertical and the inlet operating upwards.



Mechanical connections

WARNING

Remove the blank offs blocking the inlet and exhaust ports: these components prevent foreign bodies from entering the pump during transport and storage. It is dangerous to leave them on a pump in operation.

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 maximum inlet pressure is the absolute atmospheric pressure. A pressure too high can damage the pump.

CAUTION

In case of applications involving dust or solid particules, we recommend to use appropriate inlet filters in order to protect the pump . Also, we advise to use clean fittings and pipings for connecting the pump to the 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 that the exhaust pressure does not exceed 1200 mbar (absolute pressure). A pressure too high can damage the pump.

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

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

When the pump is connected to the pumping line, it is essential to perform a leak test on the whole line to check the connection (pump, pipe,...).

Electrical connections

General

⚠ CAUTION

The performance and the operational safety of this product is guaranteed provided that it is used in normal operating parameters defined in this manual.

Any modification of the pump not improved by the manufacturer can compromise the protection ensured by the pump.

⚠ CAUTION

Our products are designed to comply with current EC regulations. Any modification of the product made by the user is liable to lead to non-compliance with these regulations, or to reduce the EMC (ElectroMagnetic Compatibility) performance and the safety of the product. The manufacturer declines any responsibility for such operations.

⚠ 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,
- stabilize the power supply line with meshing from the power supply source to a distance of 3m (10 ft) from the pump inlet.

⚠ 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

When switching off an item of equipment containing capacitors loaded at over 60 VDC or 25 VAC, take precautions concerning the access to the connector pins (single-phase motors, fitting with line filter, frequency converter, monitoring system, etc.).

⚠ 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

The pump is not equipped with a 10000 AIC main breaker. Electrical shock may result in severe injury.

Power the pump from a facilities supplied 15 A mini main circuit breaker with a 10000 AIC rating.

The user supplied certified branch fuse should be in close proximity to the pump (no further than 7m (25 ft) within line of sight of the pump).

Electrical connections

Rear panel of the pump

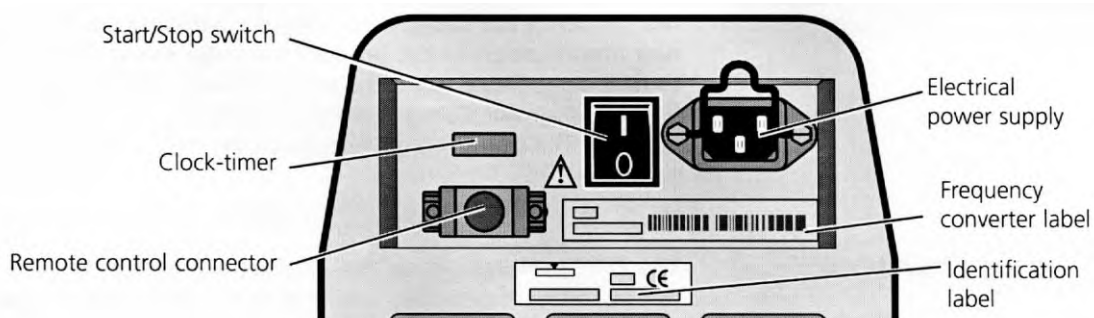
⚠ DANGER



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

Warning: risk of electrical shock.

Voltage or current hazard sufficient to cause shock. Disconnect and lockout power before servicing. Any intervention must be done by trained personnel only.



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

Model	Voltage range		
ACP 15	110 V - 230 V 50/60 Hz	10 A / 5 A	1150 VA
ACP 28 / 40			

- The motor is equipped with an electrical frequency converter which allows automatically low or high voltage pump running, according to range voltage 110 V to 230 V, 50/60 Hz.
- 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.

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 %.

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

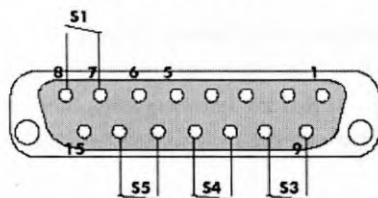
Used by means of dry contacts:

- 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	50	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

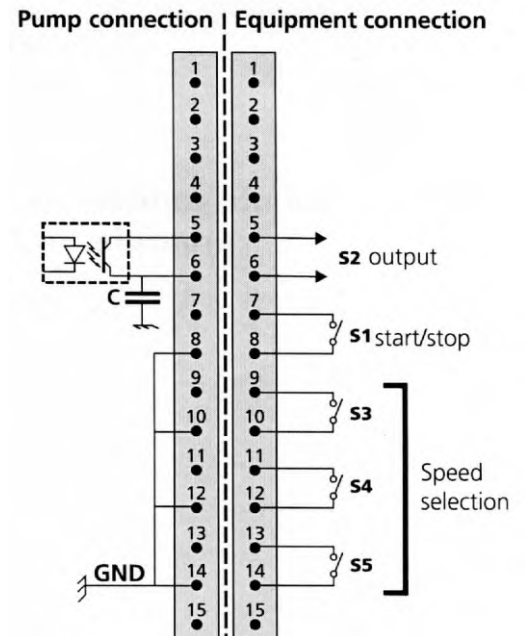
S1, 53, 54 and 55 are inputs.
S2 is an output (open collector)

51: start/stop

52 closed:
pump at speed

53, 54, 55:
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 Si, 53, 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.

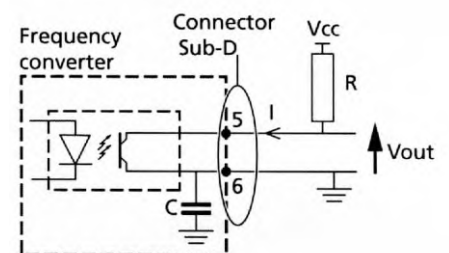
Wiring of output S2:

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

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

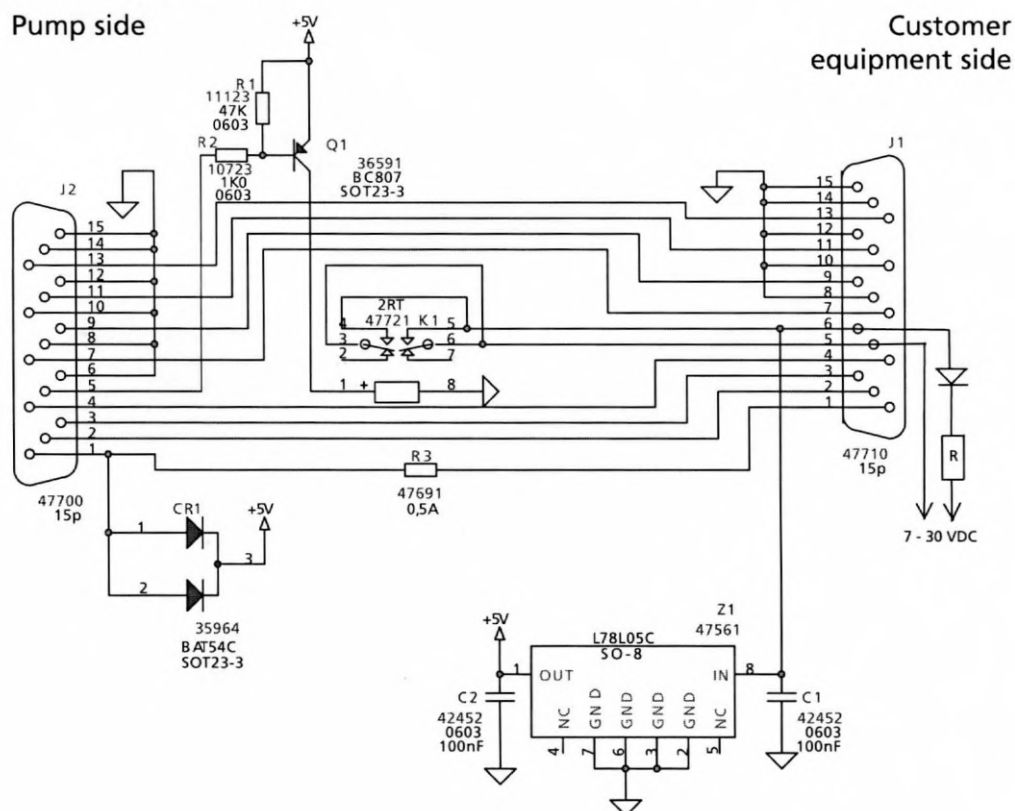
When the nominal speed is reached, the transistor becomes conductive («on-state») and $V_{out} = 0\text{ V}$.

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.

Wiring example

This is an example that correspond to the remote interface plug available as an accessory (📄 **A 50**). It allow to use output S2 as a relay (dry contact).



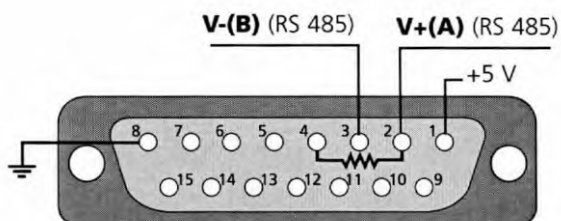
RS 485 serial link wiring

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**

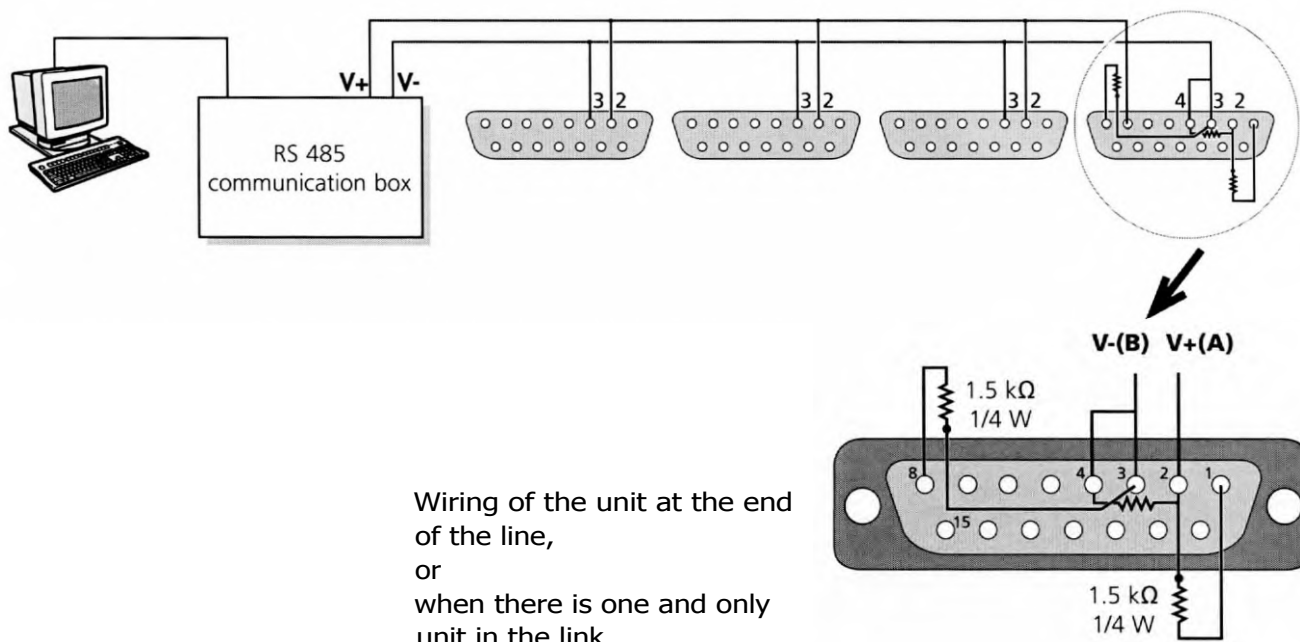
RS 485 connector wiring



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:
 - Maximum moisture rate: 5 ppm of water
 - Dust < 1pm
 - Oil <0.1 ppm
 - Pressure: 1.5 bar 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).

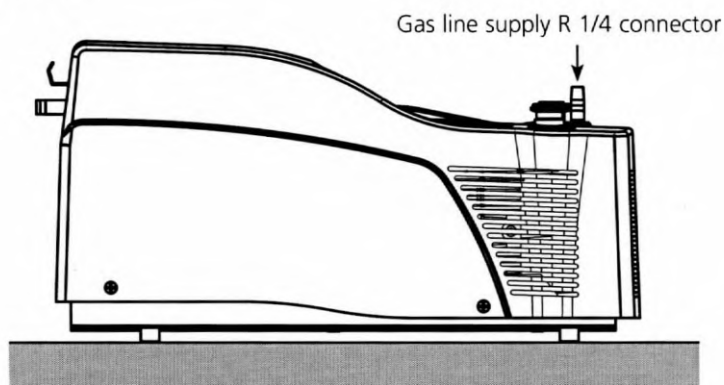
Note : we recommend to install an isolation valve on the gas supply line, nearest the inlet gas port to allow pump performance recovering when the gas line is not used (📖 **A 40, A 41**).

- For optimum ball bearing protection, the neutral gas pressure must be set to 0.3 bar (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 (mbar)	3×10^{-1}	2×10^{-1}

e.g: ACP 28 G



Pump operation

CAUTION

The ACP Series uses a synthetic oil fluid. The amount 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

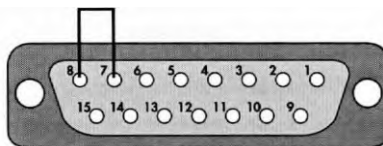
When the pump is stopped with an overtemperature issue, it will restart automatically when ambient temperature has decreased until the restart value.

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.

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 operation

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.

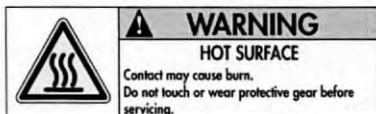
A time counter displays the pump running time in hour.

CAUTION

Avoid sudden changes in ambient temperature when the pump is running.

CAUTION

Neutral gas purging is imperative for the pumping of corrosive gas traces.



The pumps are designed so as not to present a thermal risk for the user's safety. However, specific operating conditions can generate temperatures which require particular care to be taken by the user

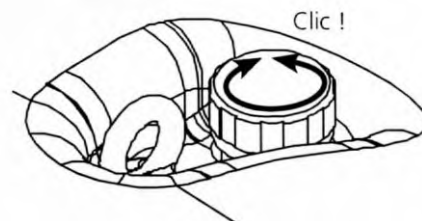
Pumping of condensable vapours

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.

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 ; this character is not compulsory
 # hash sign (ascii 35)
 , comma (ascii44)

Status values

Ok : command executed correctly

Error messages

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

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 ≤aaa ≤255

Result

#aaa,ok or Err2
 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.

Syntax

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

Result

#adr,ok
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 – Vx.zz
 Return the type of pump, ACP15, ACP28 or ACP 40 depending on the variator, the software version (x) and software release (zz).
 Ex : #004,ACP28– V1.03: product address 004 controls ACP 28 with a software release V1.03.

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
RPM	Defines the speed set point in stand-by mode
Syntax	#adr RPM nnnn<CR>[LF] nnnn speed value in rpm Set point speed from 2100 rpm (35 Hz) (to maximum speed by step of 10 rpm. Max. speed : ACP15: 6000rpm (100 Hz) ; ACP 28/40 or RVP : 4800 rpm (80 Hz).
	Note: you must send the SBY command, before changing the pump rotational speed using RPM command.
Result	#adr, ok or #adr, Errx x = 1 out of range, 2: parameter error , 3: context error.
SBY	Switches the speed set point to the stand-by value
Syntax	#adrSBY<CR>[LF] Resets the stand-by speed to the default value (35Hz for all pump models).
Result	#adr, ok
	Note : you must send the SBY command before changing the pump rotational speed using the RPM command.
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, Err3 if the pump is already in the requested state (context error).

Detailed description of RS 485 commands

STA Returns the state of the internal dynamic parameters

Syntax #adrSTA<CR>[LF]

Result #adr,xxxxxx,yyyyyy,zzzzz,sssss,iii,www,opp,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

xxxxxx state bits

5 - reserved (0)

4 - reserved (0)

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

2 - standby speed (1), nominal speed reached (0)

1 - standby mode (1), other (0)

yyyyyy fault bits

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

4 - motor temperature too high (1)

3 - motor current too high (1)

2 - reserved (0)

1 - reserved (0)

0 - reserved (0)

zzzzzalert bits

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

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

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

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

www: reserved

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

vvv: reserved

tttt: pump operating time value (since first start up), codified on 4
decimal figures (eg: operating time 4568 hours: tttt = 4568).

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	<ul style="list-style-type: none"> • oil draining • LP and HP bearing replacement • seal replacement

M Call customer Service*

* The manufacturer Center Service adress list at the back of the cover Manual.

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

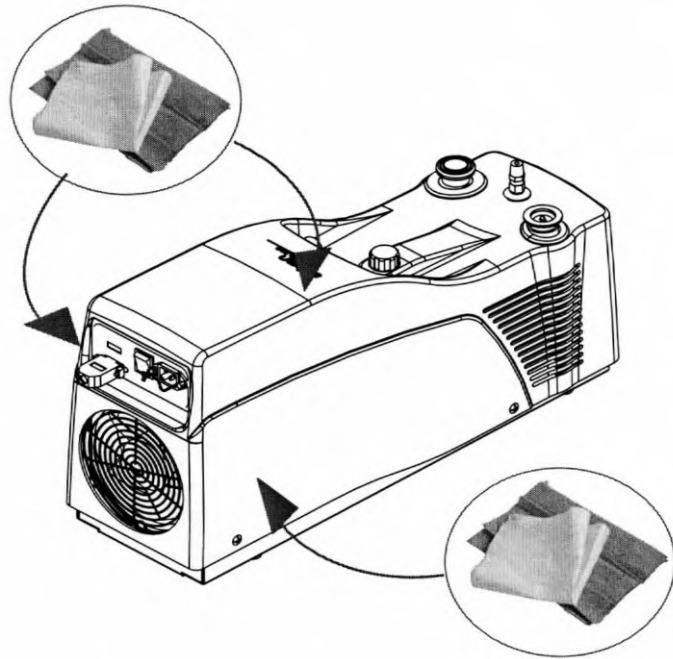
The full overhaul must be performed by manufacturer's trained personnel. Contact nearest service center or the service support at the following e-mail address:

support.service@adixen.fr

M Performed by the manufacturer

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.



Safety instructions related to maintenance

⚠ WARNING

Hazardous voltage enclosed. Voltage or current hazard sufficient to cause shock. Disconnect and lockout power before servicing. Any intervention must be done by trained personnel only.

⚠ DANGER

"G" version

Remaining process gases in the pump may cause severe injury or death.

Before removing the pump, 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.

Recommandations

Purge the installation with dry nitrogen.

Wear gloves, protective glasses and, if necessary, a breathing mask.

Ventilate the premises well.

Do not dispose of residue, if necessary, have it destroyed by a qualified organization.

CAUTION

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

Fill in the safety questionnaire (📖 **G 200**) and return it with the product to the service center (see addresses at the back of the manual).

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):

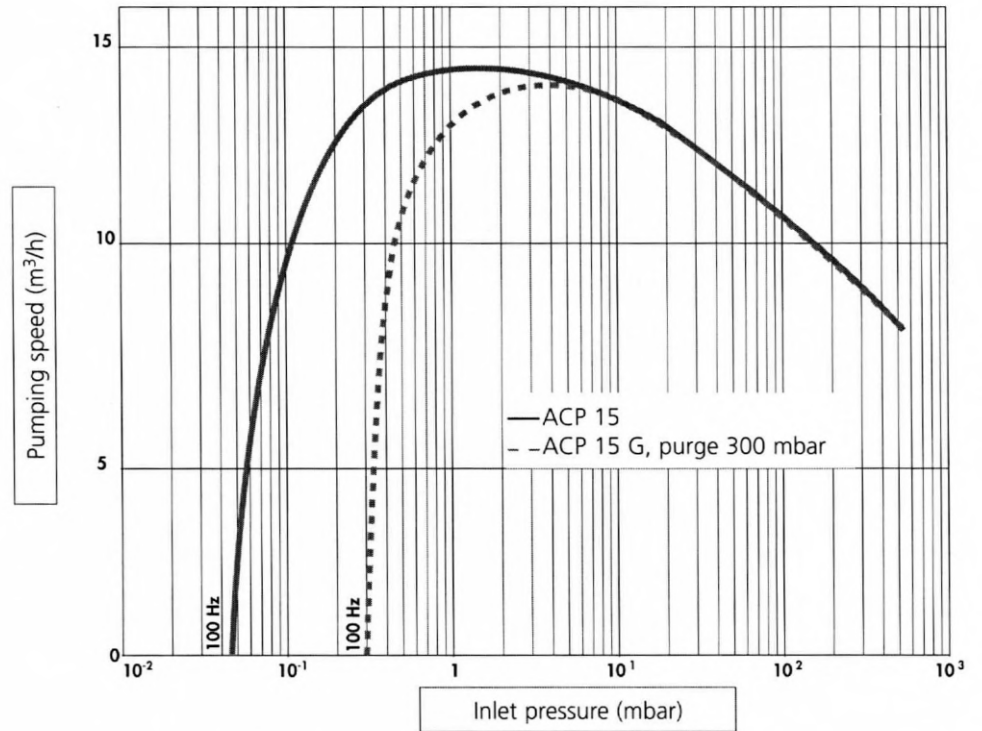
Accessories	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Centering ring with O-ring	068 193	068 189	068 194
Stainless steel blank flange	068 195	068 196	068 197
Clamp	083 333	083 264	087 163

How us to contact

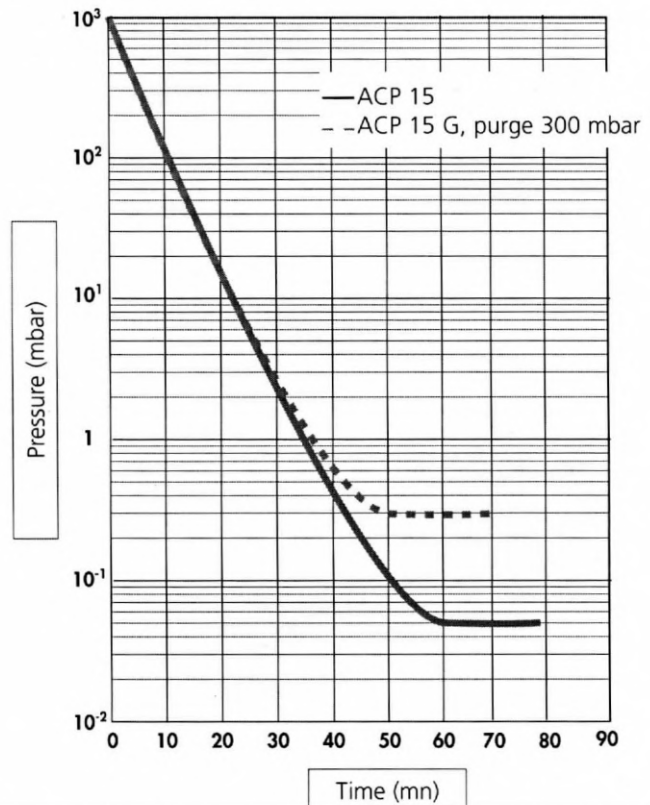
The full overhaul must be performed by manufacturer trained personnel. Contact manufacturer nearest service center or the service support at the following e-mail address:

support.service@adixen.fr

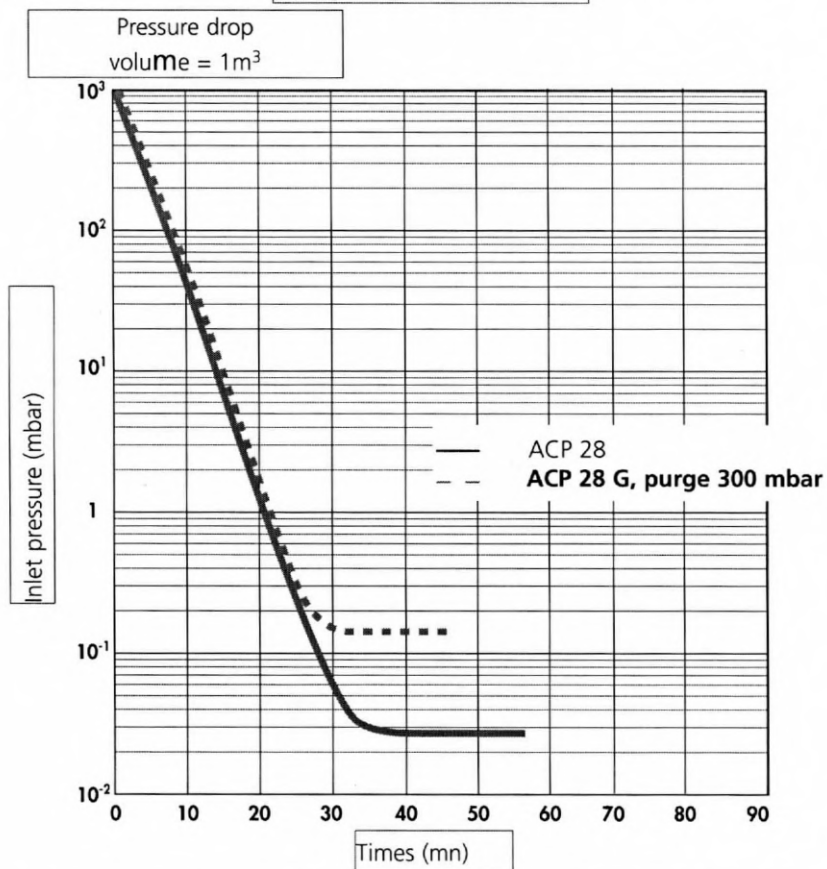
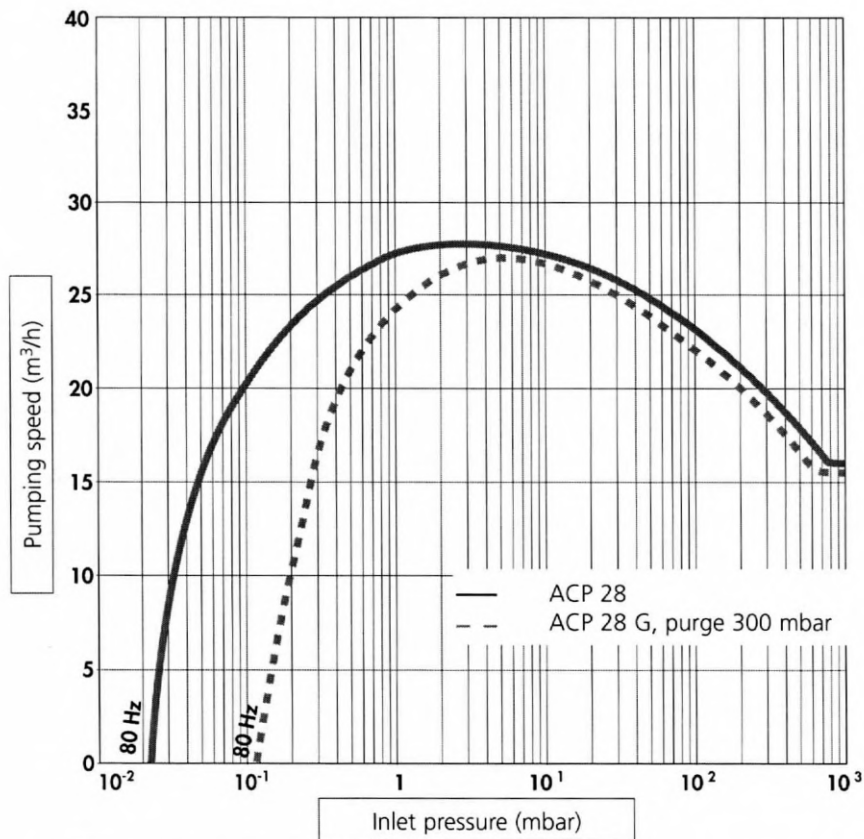
ACP 15 / 15 G pumping curves



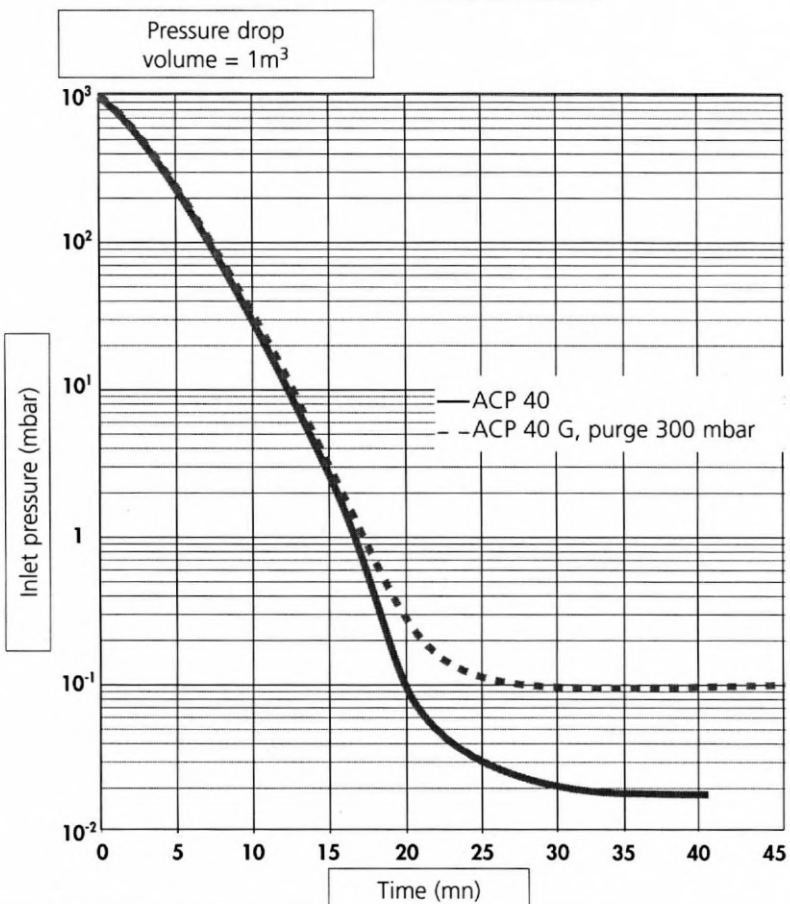
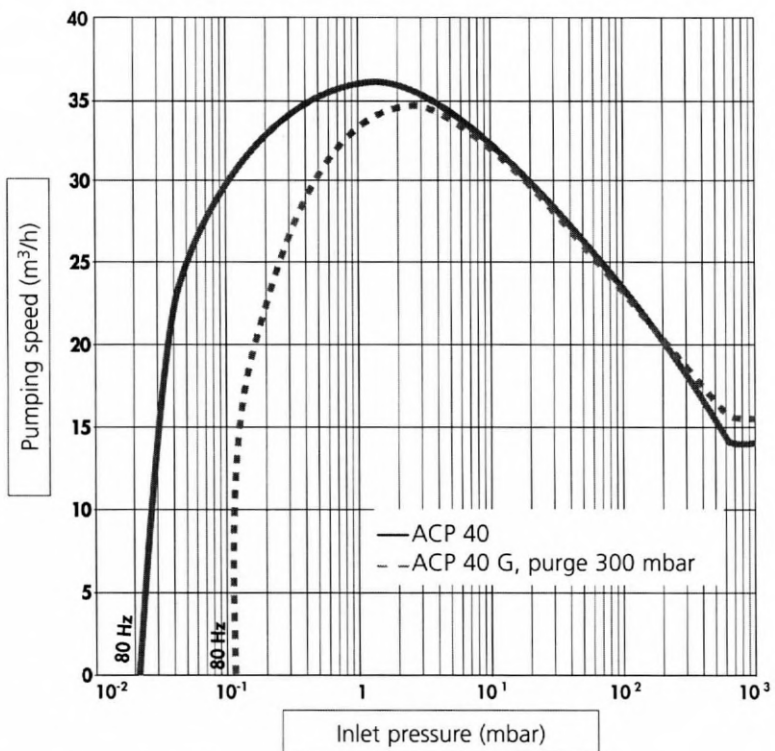
Pressure drop
volume = 1m³



ACP 28 / 28 G pumping curves



ACP 40 / 40 G pumping curves



DECLARATION OF CONFORMITY

We, Alcatel Vacuum Technology France
 98, Avenue de Brogny, BP 2069
 74009 ANNECY France

ISO 9001 CERTIFIED

declare under our sole responsibility that the following products :

ACP 15 - ACP 15G
ACP 28 - ACP 28G
ACP 40 - ACP 40G

to which this declaration relates are in conformity with the following European Directives

73 / 023 / EEC	Low Voltage Directive
89 / 336 / EEC	Electromagnetic Compatibility Directive
93 / 68 / EEC	Council Directive (EC Marking)
98 / 37 / EEC	Machinery Directive

The standards, normative documents, and/or specifications to which the products comply are

ENV 50204	Immunity to radiated electromagnetic field from digital radio telephones
NF EN 55011 class A	EMC / Radio disturbance characteristics
NF EN 61000-3-2	EMC / Harmonic current emissions
NF EN 61000-3-3	EMC / Limitation of voltage changes in public low-voltage supply
NF EN 61000-4-2	EMC / Immunity to electrostatic discharge
NF EN 61000-4-3	EMC / Immunity to radiated, radio-frequency, electromagnetic field
NF EN 61000-4-4	EMC / Immunity to electrical fast transient / burst
NF EN 61000-4-5	EMC / Immunity to surge
NF EN 61000-4-6	EMC / Immunity to conducted disturbances, inducted by radio-frequency fields
NF EN 61000-4-11	EMC / Immunity to short interruptions and voltage variations
NF EN 61000-6-2	EMC / Generic immunity standard - Industrial environments
NF EN 61000-6-4	EMC / Generic emission standard / Industrial environment
NF EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
NF EN 1012-2	Safety requirements for vacuum pumps
NF EN 563	Safety of machinery — Temperatures of touchable surfaces
UL 61010A-1-	General requirements — Electrical equipment for laboratory use
CSA-C22.2 No 1010.1-92	Safety requirements for electrical equipment for measurement, control and Laboratory use

Mr J.Y. GUEGAN, Président Directeur Général

Annecy, 10/05/06

52 SEMI Certificate**Intertek Industrial*****TYPE-EVALUATION CERTIFICATE*****Certificate Number: 07 SEMI 22962**Dated: 15th June 2007

Issued by Intertek Testing and Certification Limited. This evaluation has addressed all aspects of the SEMI S2-0703 Guidelines. Personnel involved in performing SEMI S2-0703 evaluations for Intertek Testing and Certification meet the qualifications identified in SEMI S7.

Product Description: TYPES: ACP15, ACP28 AND ACP40 ADIXEN VACUUM PUMPS**Manufactured and Submitted for evaluation by:**

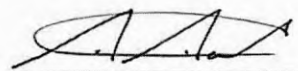
Alcatel Vacuum Technology
98 Avenue de Brogny
BP 2069
Annecy
France

This is to certify that samples of the equipment defined above together with supporting documentation has been evaluated and where necessary tested and found to Conform to or Conform to the intent of the applicable clauses of SEMI S2-0703 Environmental Health and Safety Guideline for Semiconductor Manufacturing Equipment.

Where reliance has been placed on information provided by others during this evaluation Intertek does not take responsibility for the accuracy of this information and has made use of this information in good faith.

Full details are given in Confidential Intertek Report 06022962 Dated June 2007

Certificate Approved by:



A T Austin
Deputy Certification Manager

Intertek Testing & Certification Ltd
Intertek House, Cleeve Road, Leatherhead, Surrey, KT22 7SB
Tel: +44 (0)1372 370900 Fax: +44 (0)1372 370977
<http://www.uk.intertek-etsemko.com>
Registered No 3272281 Registered Office 25 Savile Row London W1X 1AA

Sheet 1 of 1

This Certificate is the property of Intertek Testing and Certification Ltd.

Safety questionnaire

Procedure for returning ADIXEN products

You wish to return an Adixen product for maintenance. The equipment will be dismantled and possibly cleaned by a technician from our Service Centre.

In compliance with European Community's L360 directives, French labor code L231 - R231 and Federal OSHA Safety Standard 1910-1200, Alcatel Vacuum Technology requires this form to be completed to preclude the potential health risk to its service personnel that can occur when receiving, disassembling, or repairing potentially contaminated products.

Equipment returned without this form completed and secured to outside of package will be returned to customer unprocessed.

Equipment must be drained of fluids and residue, securely packaged and shipped prepaid.

Concerning the closing of the ports (inlet & outlets of the product), metallic airtight blank flanges should be used if toxic or copper gases have been pumped.

We wish to draw your attention to the following points:

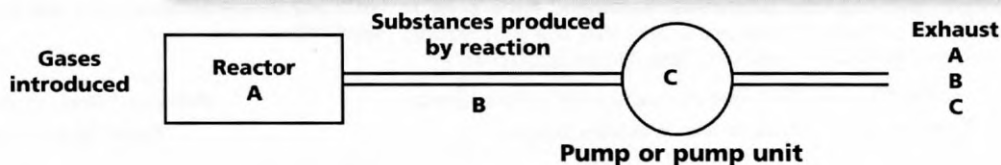
- The risk may be of the following nature:
 - **Chemical:** Danger to health, risks of explosion, fire, risks for the environment. Please indicate the chemical formula and name of the gases or substances that have been in contact with the equipment (pump or detector).
 - **Biological:** In case of contamination (such as pathogenic germs, micro-organisms (bacteria, viruses, etc.) classes 1 to 4 and group E), our Service Center is currently unable to decontaminate and recycle such material without risk to the safety of our staff. Please contact us **before sending** the product to the Service center.
 - **Radioactive:** In case of contamination, our Service Center is currently unable to decontaminate and recycle such material without risk to the safety of our staff. Please contact us **before sending** the product to the Service center.
 - **Copper contamination:** Copper based by products formed in sputtering or etching processes are considered as a poison in some semi-conductor processes.

If following inspection and quotation, customer elects to not proceed with repair, he will be subject to service fee to cover product decontamination, disassembly, cleaning and evaluation costs.

Please to fill in the following form, print it and attach it to the product before shipping to the service-repair office closest to you.

⚠ WARNING

In the event of chemical contamination, please indicate the following gases or substances:



- Gases (or substances) introduced into the reactor and which may be found at the exhaust (A).
 - Gases (or substances) resulting from the reaction or process (B).
 - Gases (or substances) that may possibly be formed inside the pump (due to a thermodynamic or chemical reaction, condensation, deposition, precipitation, etc.) (C).
- **Precautions need to be taken before transferring contaminated products.**
Please contact Service Center for recommendations.

QUESTIONNAIRE DE SECURITE - SAFETY QUESTIONNAIRE

Ce questionnaire est telechargeable sur le site : www.adixen.com

This questionnaire can be downloaded from: www.adixen.com

Procédure de retour des produits ADIXEN

(Ce formulaire ne peut être rempli et signé que par une personne habilitée)

Procedure for returning ADIXEN products

(This questionnaire is only to be filled in and signed by an authorized person)

SOCIETE - COMPANY Nom Société - Name of company : Nom personne - Name of person : <small>(Qui remplit ce formulaire) - (Who has filled in questionnaire)</small> Fonction - Position : N° Tél. - Tel. no : N° Fax - Fax no : <small>(Pour renseignements éventuels sur les produits utilisés) - (for any information on products used)</small>			EQUIPEMENT - EQUIPMENT Description : N° de Série - Serial no : Type de procédé - Type of process : <small>(Pour lequel l'équipement est utilisé) - (for which equipment is used)</small> Date de l'expédition - Date of consignment :		
INTERVENTION - SERVICE Intervention souhaitée (Révision, réparation,...) - Service required (overhaul, repair, etc.) : Type d'anomalie constatée - Type of anomaly observed :					
PROCEDE CUIVRE - COPPER PROCESS Produit utilisé sur un procédé Cuivre - Product used on a Copper process Oui - Yes Non - No					
ASPECT SECURITE - SAFETY ASPECT L'équipement mentionné ci-dessus a été en contact avec les produits suivants - The above equipment has been in contact with the following substances : (nom et formule chimique) - (name and chemical formula)					
Ces produits présentent un risque de nature - These substances present the following risks					
Chimique - Chemical Toxique - Toxic Oui - Yes Non - No Cancérogène - Carcinogenic Oui - Yes Non - No Combustible - Combustible Oui - Yes Non - No Corrosive - Corrosive Oui - Yes Non - No Explosive - Explosive Oui - Yes Non - No Biologique - Biological Oui - Yes Non - No Radioactive - Radioactive Oui - Yes Non - No Autre - Other <small>(Vous reporter éventuellement à la page précédente) - (See preceding page if necessary)</small>			Explication détaillée - Detailed explanation Si «Oui» risque de nature - If «Yes», what type of risk		
SIGNATURE Vous avez répondu "Oui" à une des questions précédentes : Je confirme que seules les substances précisées ont été en contact avec l'équipement sus-mentionné, et que les procédures de préparation, d'emballage, et de transport ont été respectées. You have replied "yes" to one of the above questions: I confirm that only the substances mentioned have been in contact with the above equipment and that the preparation, packing and transport procedures have been complied with.			Je confirme que le matériel sus-mentionné n'a été en contact avec aucune substance dangereuse, et a été vidé de son huile. (Si applicable) (Si applicable) I confirm that the above equipment has not been in contact with any dangerous substance and has been emptied of oil. (If applicable)		
Réponse "Oui" (fermeture étanche de l'aspiration et du refoulement) Reply "Yes" (seal inlet and outlet ports with blank flanges)			Réponse "Non" (sans risque) Reply "No" (no risk)		
Nom - Name : Fonction - Position : Date : Signature autorisée - Authorised signature :			Nom - Name : Fonction - Position : Date : Signature autorisée - Authorised signature :		
Tampon / Cachet Stamp / Seal		Tampon / Cachet Stamp / Seal			