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IPUP A100 Instruction manual



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VIEW OUR INVENTORY

Edition: 10
Date: 09/00
Manual P/N 107782

IPUP A100

Dear Customer,

You have just purchased an Alcatel dry pump. We thank you and are proud to include you as one of our customers.

This product has benefited from Alcatel's many years of experience in semiconductor processes and dry pumping.

For optimum performance and to obtain full satisfaction from this equipment, we recommend that you study this manual before any intervention on your pump, in particular, the chapter on installation and start up.



Applications

- P/PI version: for corrosive, reactive, flammable, pyrophoric, oxidizing processes.
- L/LI version: for clean pumping.

Advantages

- Reduced volume and footprint.
- Low operating cost.
- High performance (pumping speed and ultimate pressure).
- Advanced monitoring functions.

IPUP A100

Special features

- Multi–stage Roots technology.
- Water–cooled motor.

Multi–stage pump with roots technology

- Established technology.

Low noise and vibration

Genuine dry pump

- Total tightness with the environment.

Compact footprint

- Reduced size 23.84 inches x 11.02 inches x 11.81 inches.
(605.5 mm x 280 mm x 300 mm).

Reduced cost of ownership

- Design for reliability.
- Reduced power consumption.
- Reduced water consumption.
- Reduced weight.

New control interface

- Amat SPI interface.
- Amat device net interface.
- RS 232/485 interface.

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NOTE

 WARNING	Warnings are used when failure to observe instructions could result in injury or death.
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 CAUTION	Cautions are used when failure to observe instructions could result in significant damage to equipment and/or facilities.
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Chapter A

IPUP A100 instruction manual

Introduction

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IPUP A100 operating principle

DESIGN TO MINIMIZE POTENTIEL RESIDUES

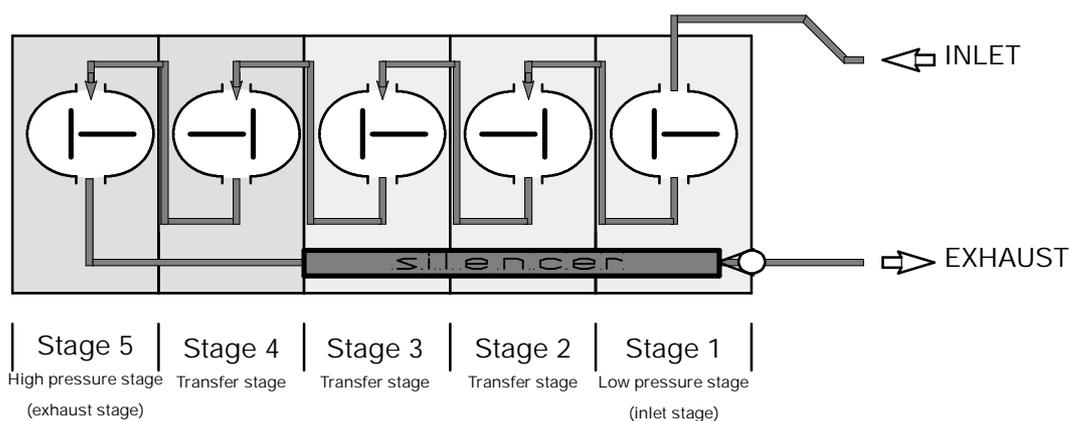
The equipment was designed to minimize potentiel residue deposits:

- by limiting the internal volumes that contain gas,
- by injecting N₂ purge on each pump stage to dilute the process gas (P version only),
- by regulating the pump temperature and adjusting it to each process in order to limit gas condensation (P version only),
- by integrating the silencer inside the pump to reduce by-product deposition.

MULTI-STAGE PUMP WITH ROOTS TECHNOLOGY

IPUP A100 pump consists of 5 Roots type stages.

The two rotors rotate without touching each other.



IPUP A100 operating principle

TIGHTNESS WITH ENVIRONMENT

Tightness at low pressure side

The pump is fitted with ball bearings lubricated with fluorinated grease.

An overpressure zone is created around the bearing by injecting a neutral gas.

The pressurization and the seals prevent pumped gases and powders from migrating towards the bearings.

Neutral gas purging for the bearings is imperative for corrosive processes.

Tightness at high pressure side

The bearings are lubricated by splashing oil.

The oil trap is sealed from stage 5 by a trap and a deflector.

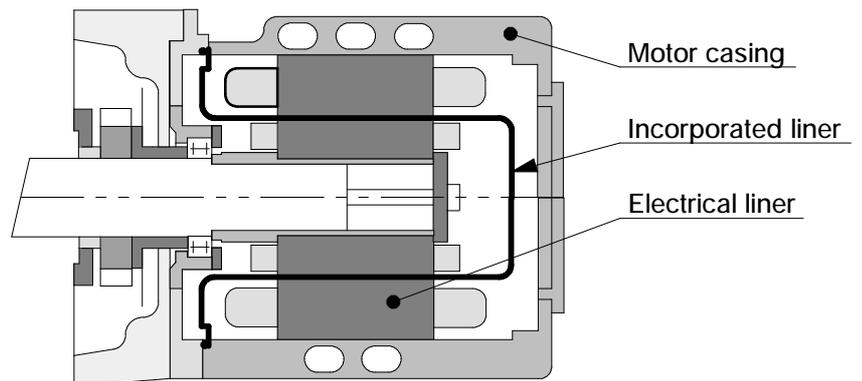
IPUP A100 operating principle

TIGHTNESS WITH ENVIRONMENT (CONT'D)

Tightness at motor side (shaft passage)

The vacuum tightness is ensured by the motor design with built-in jacket (hermetically sealed).

This system provides total safety regarding leaks outside the pump and requires no maintenance.



Tightness at shutdown

The pump is fitted with an antisuckback valve in the exhaust tube which prevents the exhaust from being sucked back.

IPUP A100 description

IPUP A100 DESCRIPTION

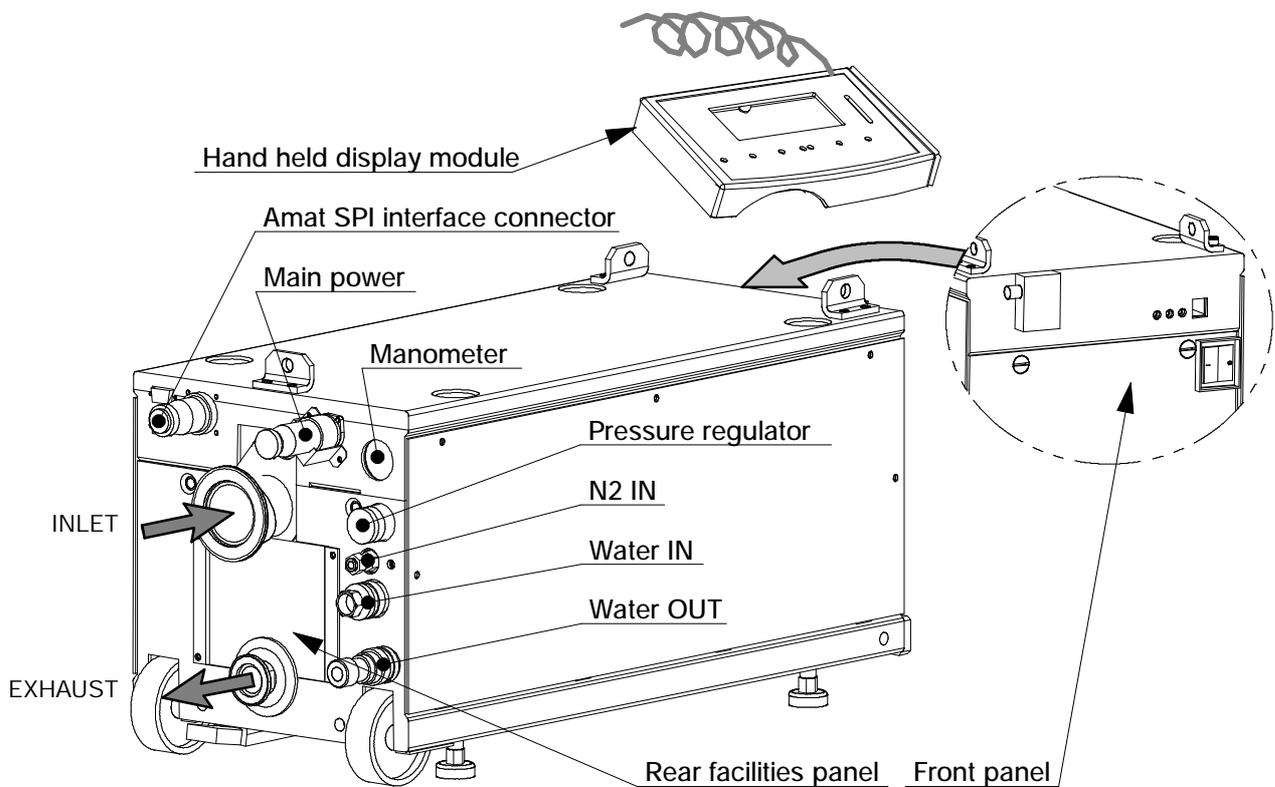
The IPUP A100 pump includes an intelligent monitoring system.

This pump is fully integrated in a compact and enclosed frame which includes:

- the control panel located on the front panel,
- the facilities panel located on the rear panel,

An Amat SPI connector located on the rear facilities panel allows pump control and communication with the process tool.

A hand held display module can be connected to the front panel to display and program the pump parameters.



IPUP A100 description

INTERNAL EQUIPMENT OF THE IPUP A100 PUMPS

IPUP A100P/PI equipment

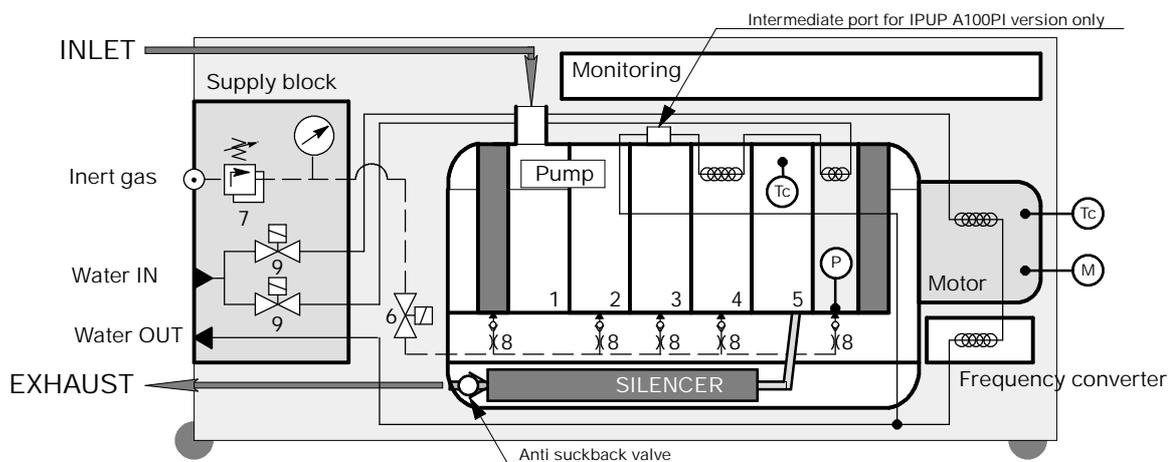
The IPUP A100P/PI is designed for corrosive processes, so it is equipped with:

- nitrogen injection and water cooling circuit optimized to avoid deposition and condensation,
- temperature regulation device.

The IPUP A100PI pump is equipped with an additional intermediate port for specific applications where a permanent pumping flow of about 35 m³/h is required (example: dynamic seal pumping).

IPUP A100P/PI EQUIPMENT

Pump	Gas circuit	Cooling circuit	Sensors
i Low pressure stage	¥ Gas solenoid valve	.. Water solenoid valve	Tc Temperature sensor
©☎ Transfer stages	Pressure regulator		P Pressure sensor
⊠ High pressure stage	§ Inert gas purge nozzles		M Motor sensor



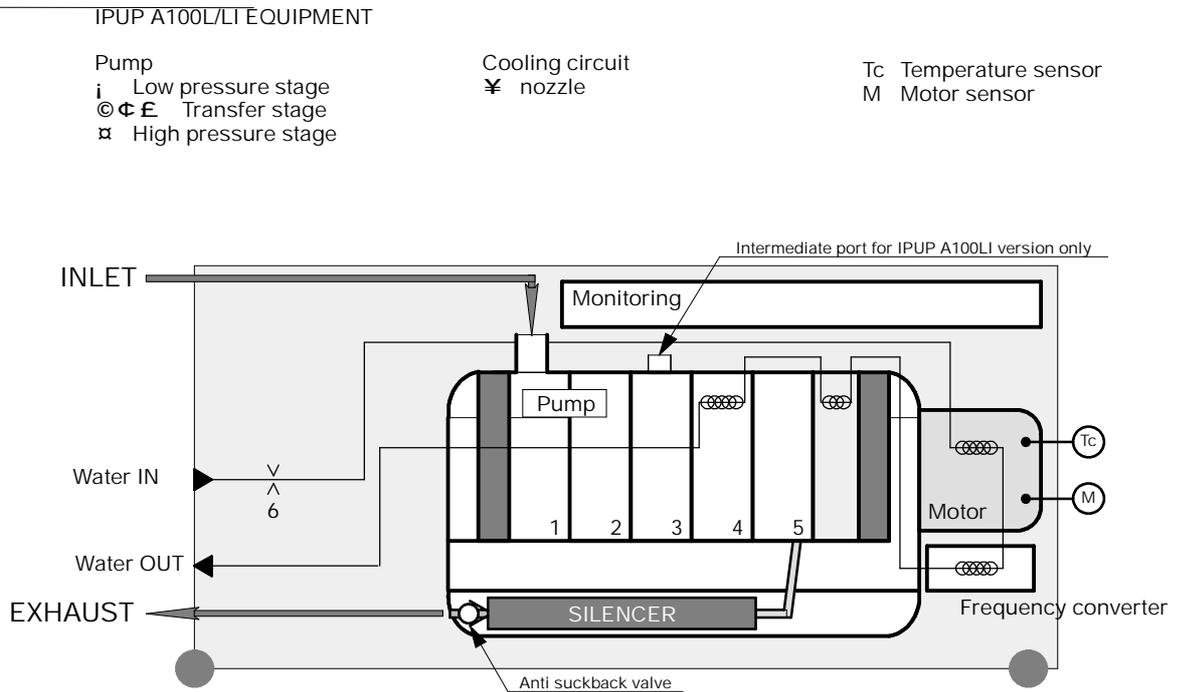
IPUP A100 description

IPUP A100L/LI equipment

The IPUP A100L/LI is designed for clean applications such as load lock pumping, cryopump regeneration and backing of turbopumps on non-corrosive processes.

- only a water cooling circuit is installed,
- no nitrogen purge is needed.

The IPUP A100LI pump is equipped with an additional intermediate port for specific applications where a permanent pumping flow of about 35 m³/h mbar is required (example: dynamic seal pumping).



IPUP A100 monitoring system

GENERAL

Each IPUP A100 pump includes an intelligent monitoring system.

DESCRIPTION

Electrical cabinet

This is located at the top of the machine. It is linked with the main power supply, pump motor and electronic cabinet.

Electronic cabinet

This handles pump configuration and displays the sensor parameters.

It is linked to the indicator lights located on the front panel.

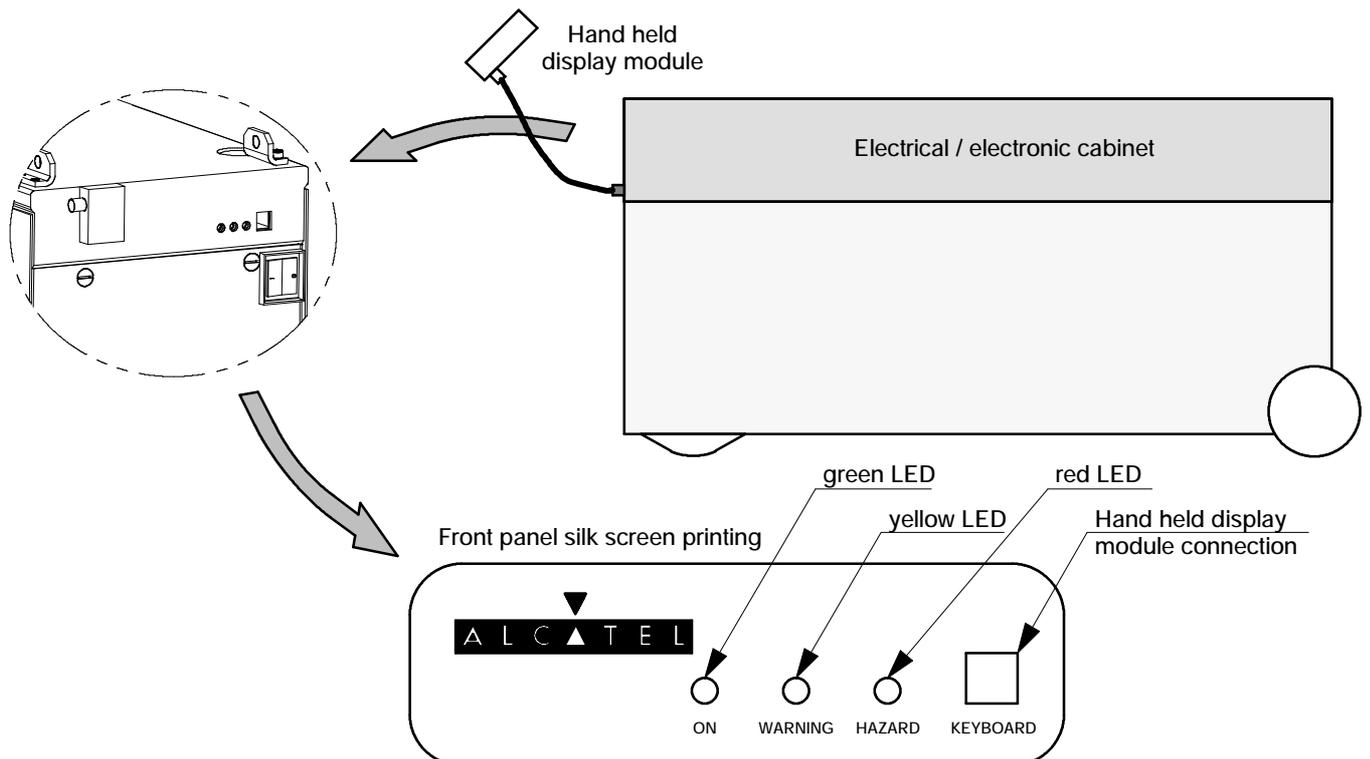
It allows data to be exchanged with the hand held display module.

Hand held display module

This allows users to review operating parameters.

It allows users to access and modify configured parameters.

It allows users to start and stop the pump (see C 10) (if configured).

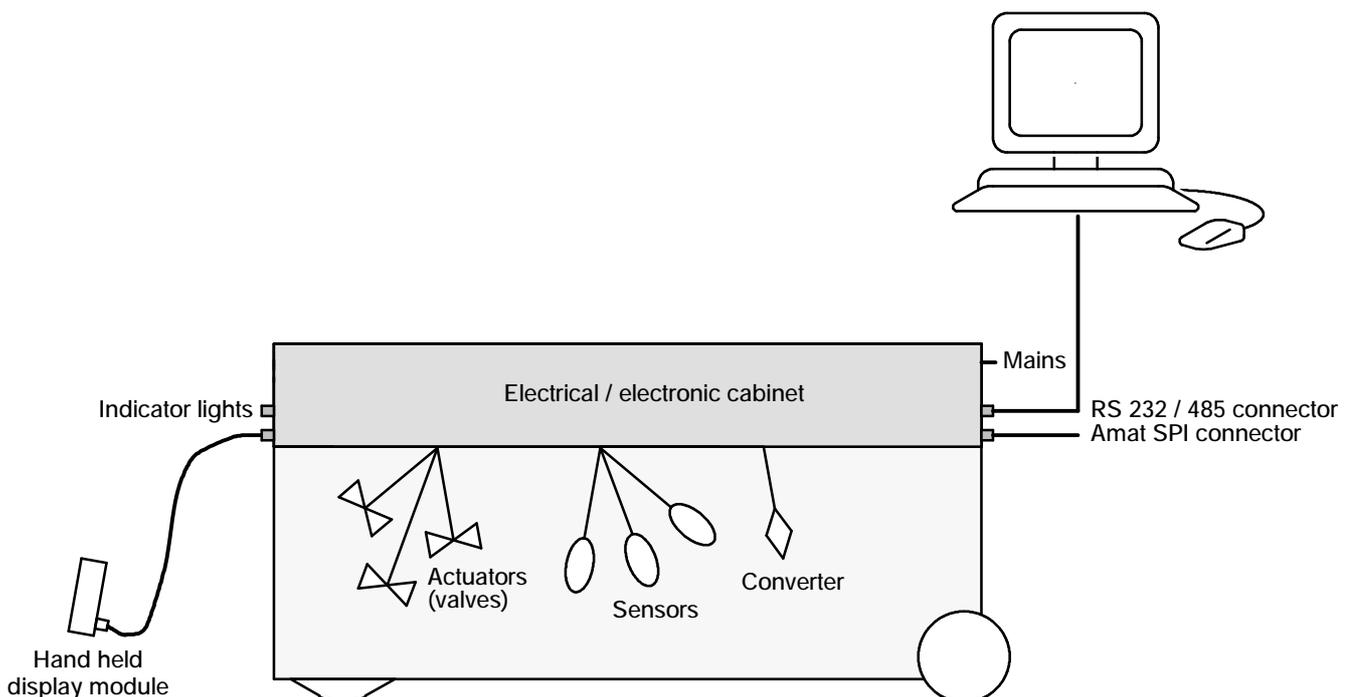


IPUP A100 monitoring system

MONITORING SYSTEM CHARACTERISTICS

- Microprocessor controlled.
- Parameters and messages are displayed on the hand-held remote control.
- Memorization of the last ten warnings and hazards.
- RS 232 – RS 485 – Network links.

Note : the monitoring system can be interfaced with the process tool via the Amat SPI connector or the RS 232 / 485 connector.



MAIN FUNCTIONS

- Motor protection.
- Pump temperature monitoring and control.
- Exhaust pressure monitoring (P version only).
- Maintenance time control.

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IPUP A100 technical characteristics

Characteristics	UNITS	A100L ⁽¹⁾	A100LI ⁽¹⁾	A100P ⁽¹⁾	A100PI ⁽¹⁾
❖ Rotation speed	<i>Hz</i> <i>rpm</i>	100 6000	100 6000	100 6000	100 6000
❖ Peak Pumping speed	<i>m³/h</i> <i>l/min</i> <i>cfm</i>	95 1583 63	95 1583 63	95 1593 63	95 1593 63
❖ Ultimate pressure (without N ₂ purge)	<i>mbar</i> <i>mTorr</i>	$1.2 \cdot 10^{-2}$ 9	$1.2 \cdot 10^{-2}$ 9	$1.2 \cdot 10^{-2}$ 9	$1.2 \cdot 10^{-2}$ 9
❖ Ultimate pressure (with 30 slm N ₂ purge)	<i>mbar</i> <i>mTorr</i>			$6 \cdot 10^{-2}$ 50	$6 \cdot 10^{-2}$ 50
❖ Max. continuous inlet pressure	<i>Torr</i>	50	50	50	50
❖ Supply voltage 3PH	<i>V</i>	200 -- 208 V -- 3 phase -- 50/60Hz ⁽³⁾			
❖ Maximum continuous power (at max. pressure)	<i>kW</i>	2.5			
❖ Power consumption at ultimate pressure	<i>kW</i>	1.8	1.8	2.05	2.05
❖ Average sound level at full speed	<i>dba</i>	55	50	55	50
❖ Guaranteed sound level at full speed		58	–	58	–
❖ N ₂ Flowrate range	<i>slm</i>	--		min. 20/ max. 50	
❖ Ambient temperature	<i>°C</i>	15 to 50		15 to 50	
❖ Water flow	<i>l/h</i>	min. 100			
❖ Water temperature	<i>°C</i>	min. 10 / max. 25			
❖ Gear box fluid capacity ⁽²⁾	<i>cm³</i> <i>cc</i>	150			
❖ Weight (without hand held display module)	<i>lbs/Kg</i>	220.4 / 100			
❖ Inlet flange		DN 50 iso KF			
❖ Exhaust flange		DN 25 iso KF			
❖ Secondary exhaust port		DN 25 iso KF			
❖ Interstage flange		DN 25 iso KF			
❖ Max exhaust flow	<i>cfm</i>	13	–	13	–
Vibration level at the enclosure baseplate sidehole (4 to 400 Hz Spectrum)					
❖ Acceleration	<i>G</i>	< 0.1			
❖ Displacement	<i>µm</i>	< 1.5			
❖ Speed	<i>mm/s</i>	< 1			

(1) Variable speed control, min. 20 Hz / max. 100 Hz.

(2) Oil charge is filled at factory. Do not modify the oil level.

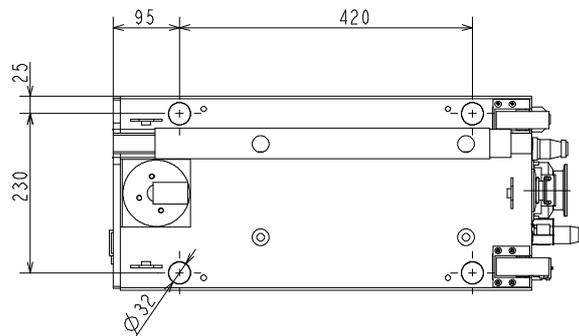
(3) According to CE regulations, IPUP A100 can withstand a supply voltage variation of ± 10%.

A 40

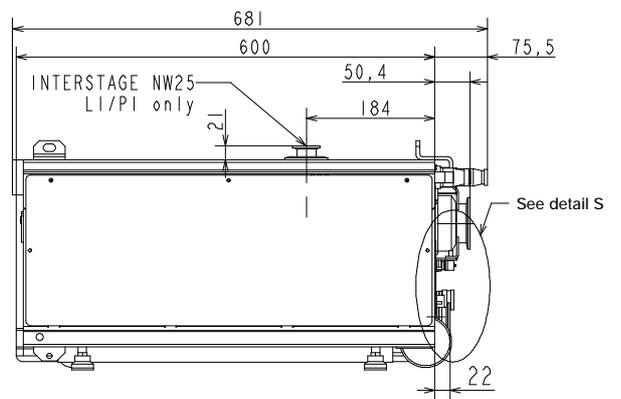
IPUP A100 technical characteristics

IPUP A100 DIMENSIONS AND INTERFACING (1/2)

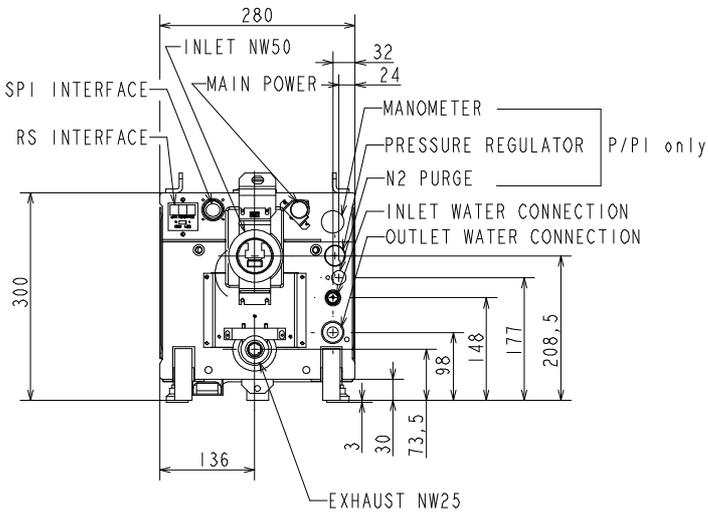
Bottom view



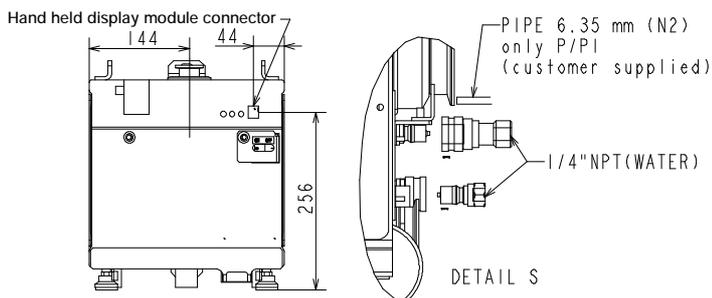
Front view



Right view



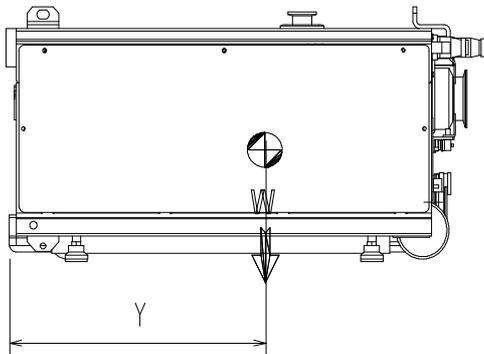
Left view



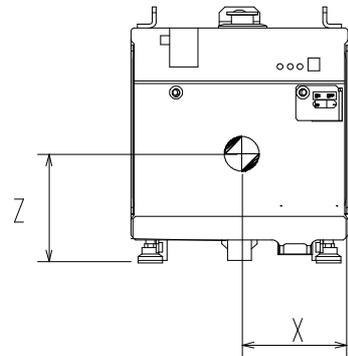
IPUP A100 technical characteristics

IPUP A100 DIMENSIONS AND INTERFACING (2/2)

Right view

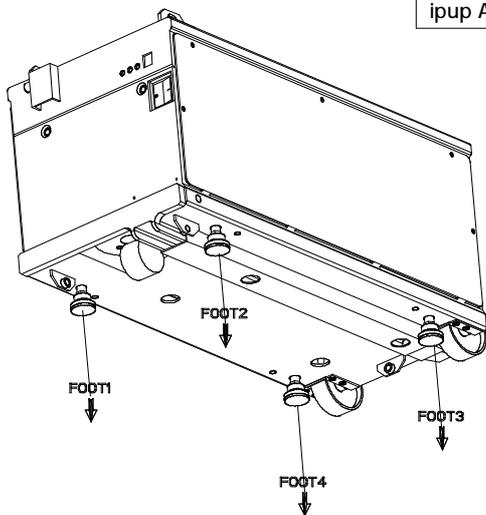


Front view



A100 CG & WEIGHT DISTRIBUTION

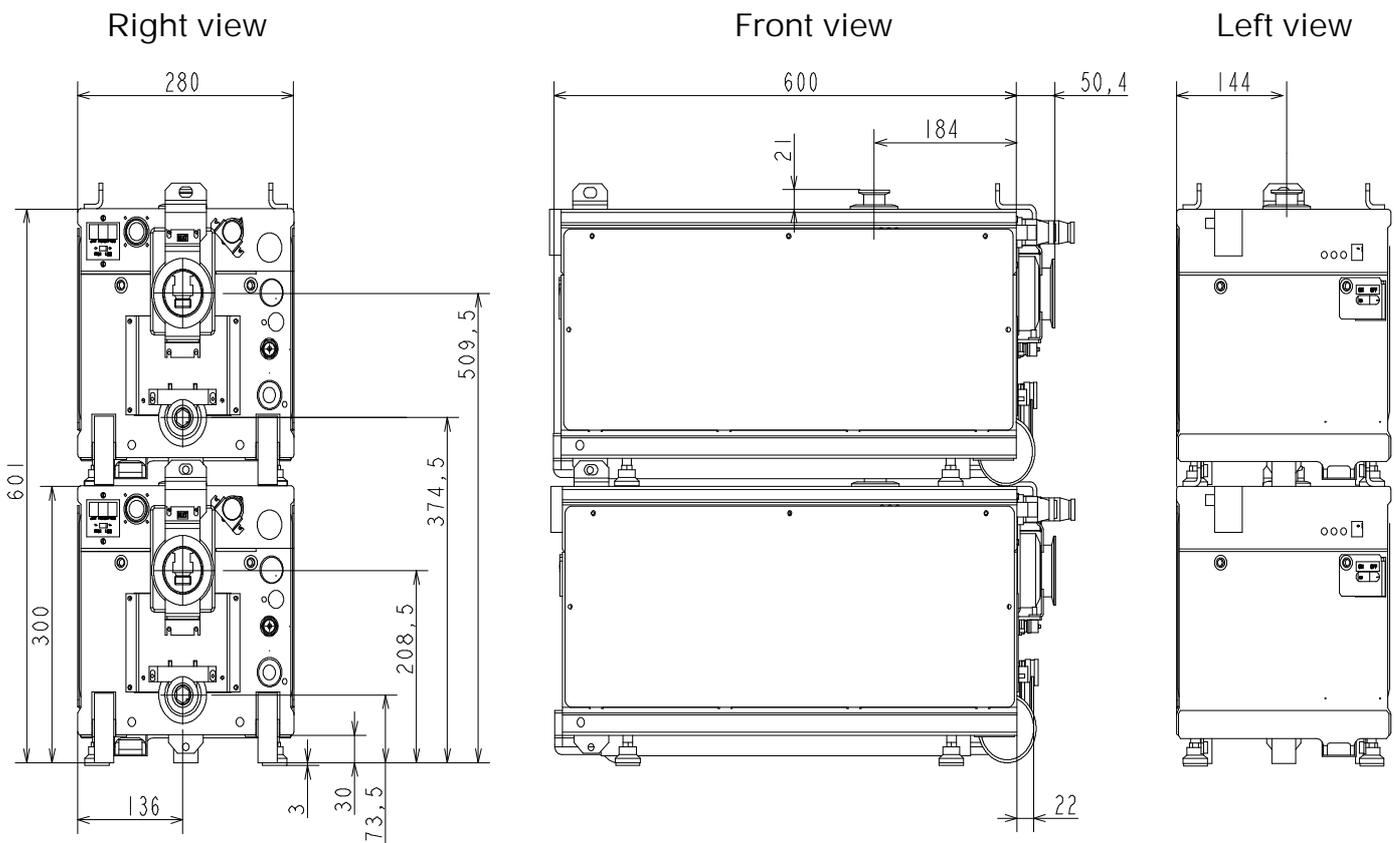
	WEIGHT Kg	CG X mm	CGY mm	CGZ mm	FOOT DISTRIBUTION WEIGHT(Kg)			
					1	2	3	4
ipup A100	103	135	325	152	22	24	29	28



A 40

IPUP A100 technical characteristics

IPUP A100 STACKING DIMENSIONS AND INTERFACING (1/2)

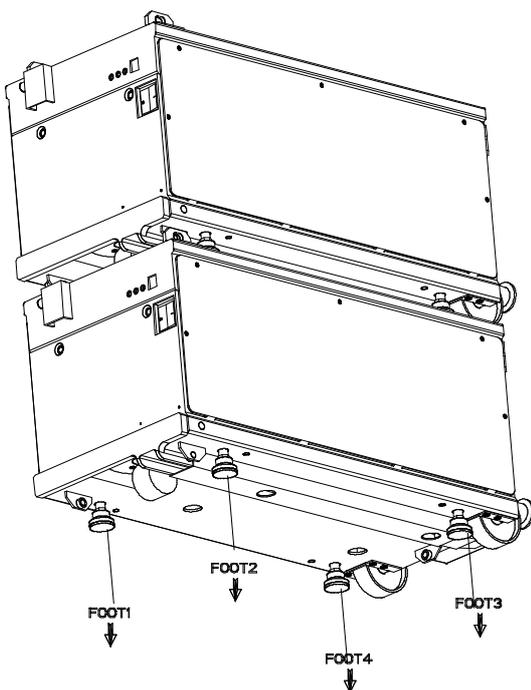
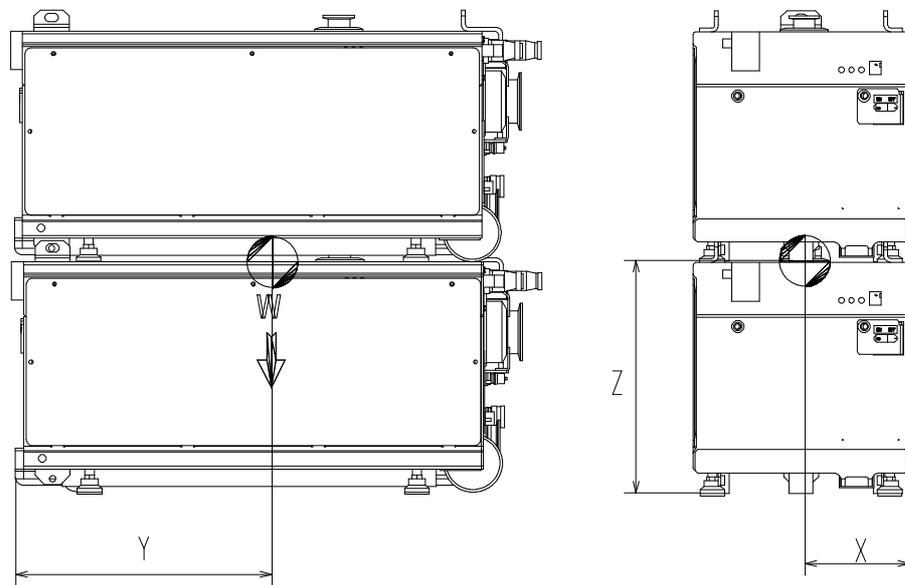


IPUP A100 technical characteristics

IPUP A100 STACKING DIMENSIONS AND INTERFACING (2/2)

Right view

Front view



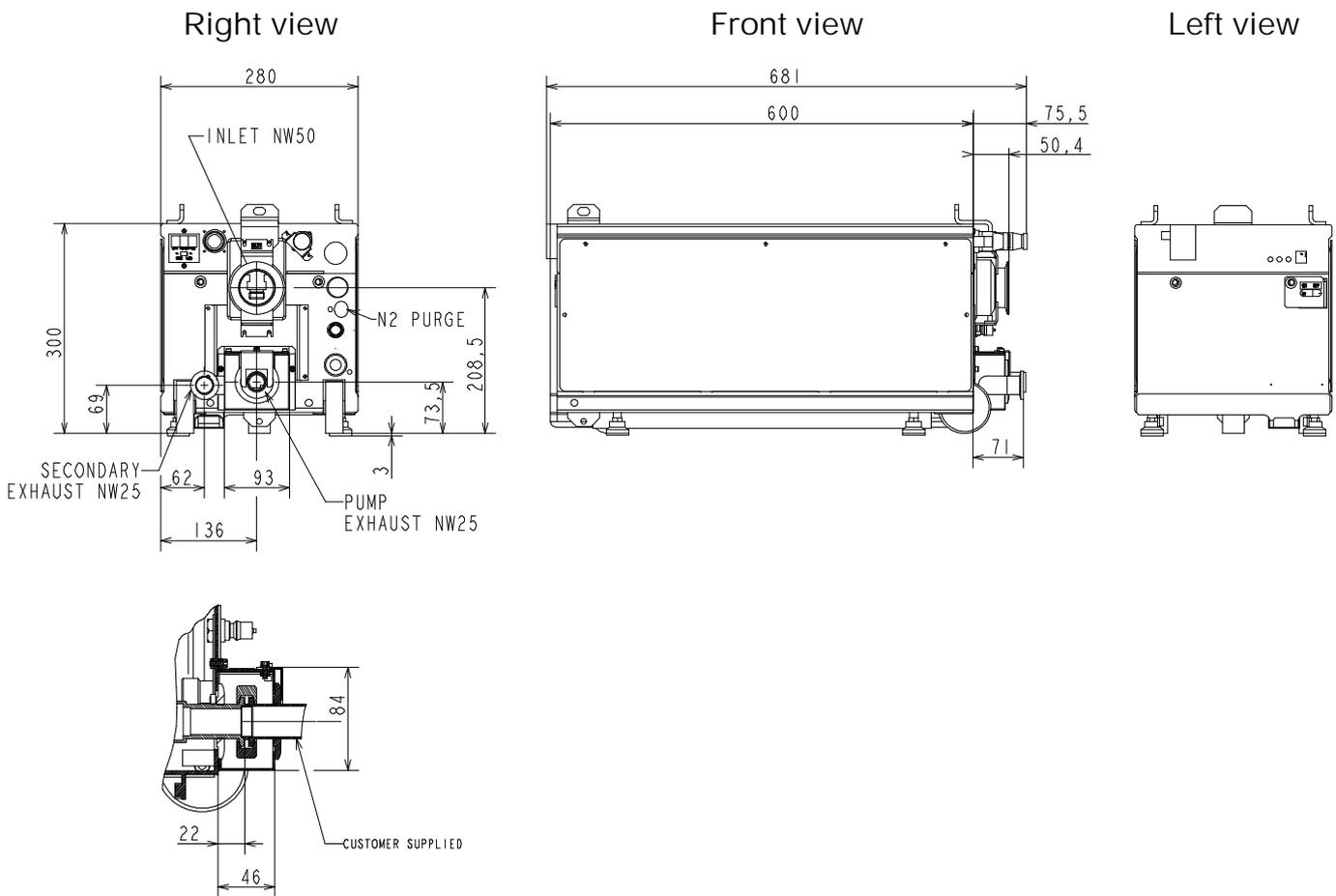
A100 STACKING CG & WEIGHT DISTRIBUTION

	WEIGHT Kg	CG X mm	CGY mm	CGZ mm	FOOT DISTRIBUTION WEIGHT(Kg)			
					1	2	3	4
ipup A100	206	135	325	302	44	48	58	56

A 40

IPUP A100 technical characteristics

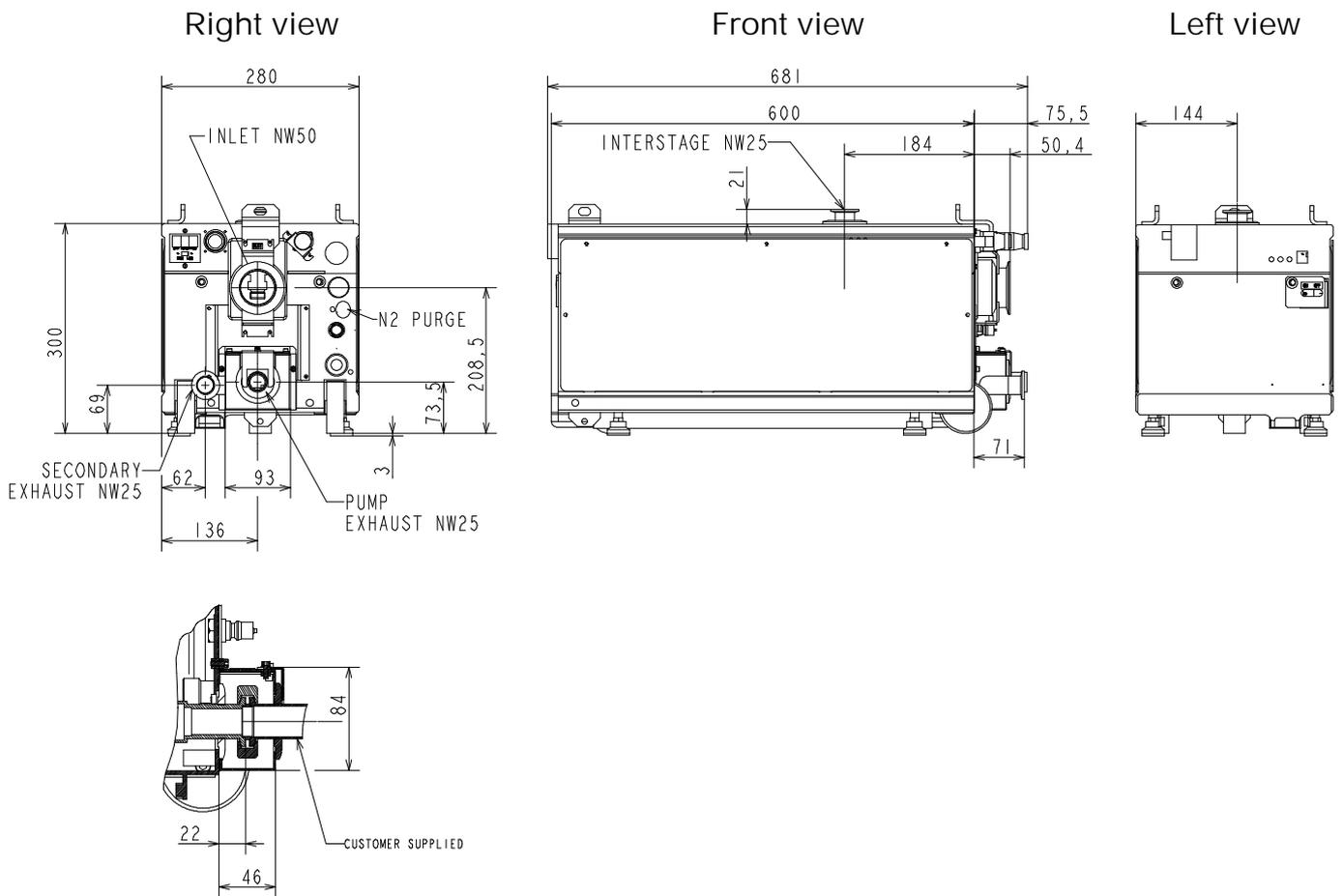
IPUP A100P DIMENSIONS



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IPUP A100 technical characteristics

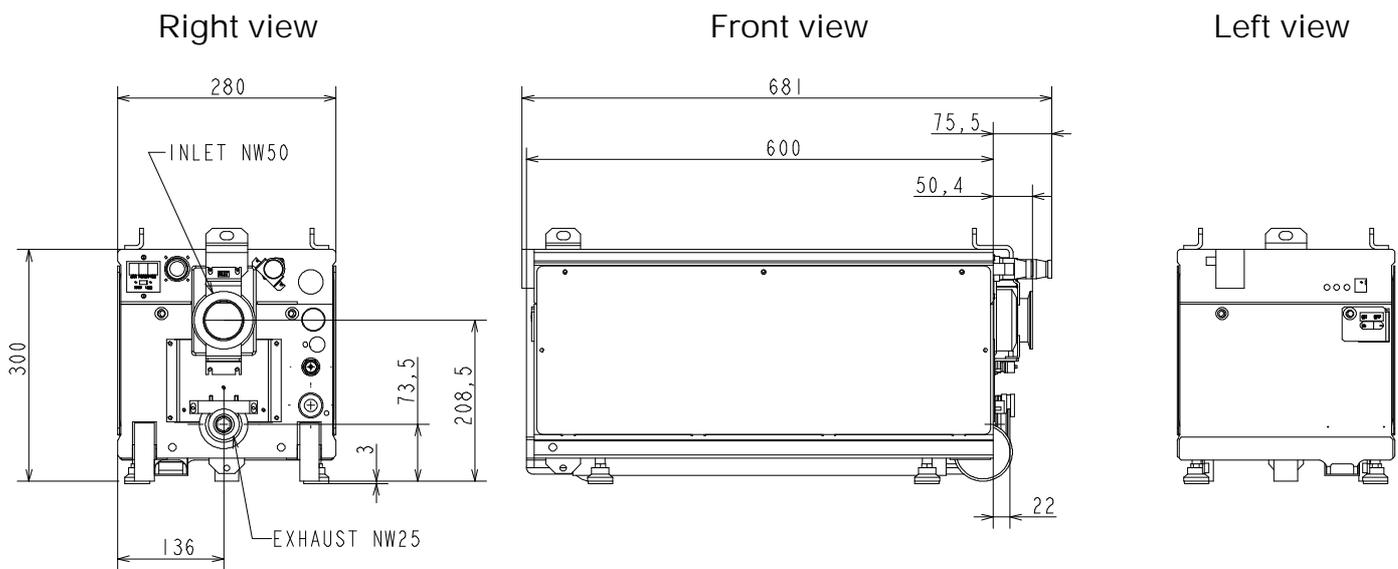
IPUP A100PI DIMENSIONS



A 40

IPUP A100 technical characteristics

IPUP A100L DIMENSIONS



A 40

IPUP A100 technical characteristics

IPUP A100LI DIMENSIONS

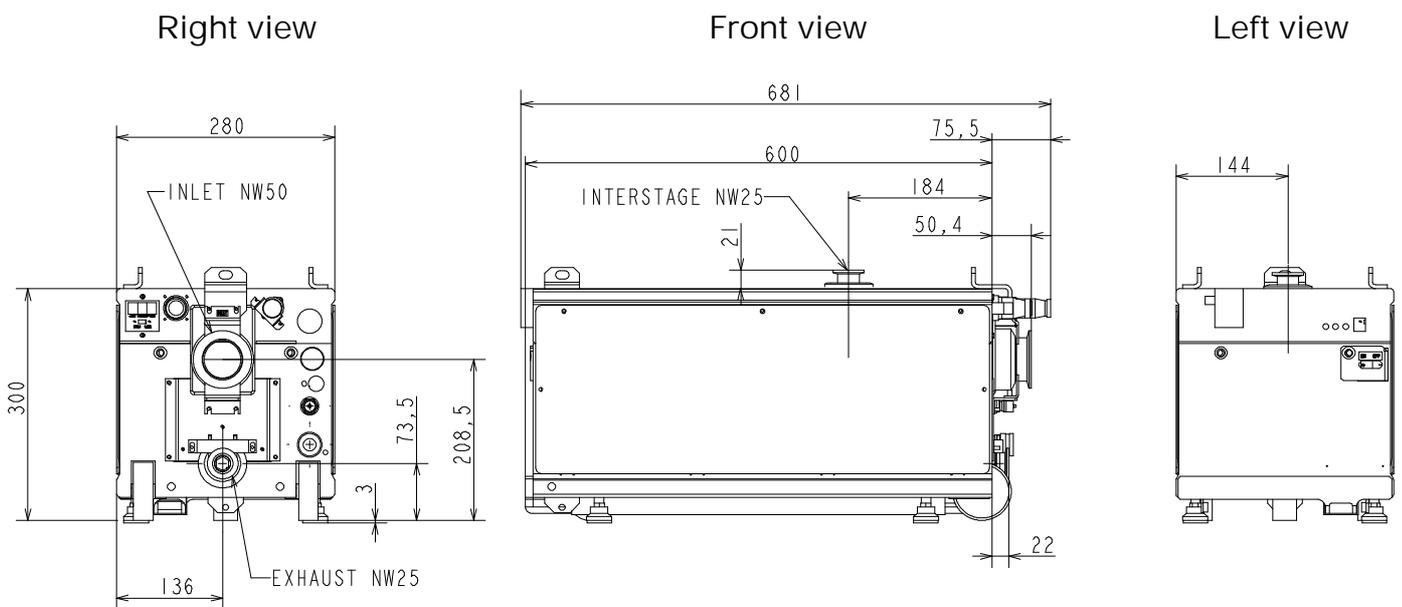


Table of IPUP A100 part numbers

Table of IPUP A100 Part Numbers			
Item	Description	Alcatel Part Number	AMAT Part Number
1	IPUP A100L – Point of Use Pump – Clean Duty	800587	0190 – 01042
2	IPUP A100L – Point of Use Pump – Clean Duty – Hardwire Option	800764	0190 – 00697
3	IPUP A 00LI – Point of Use Pump – Clean Duty – Secondary Inlet Port at 3rd Stage	800588	3620 – 00095
4	IPUP A100P – Point of Use Pump – Harsh Duty	800589	3620 – 01617
5	IPUP A100PI – Point of Use Pump – Harsh Duty – Secondary Inlet Port at 3rd Stage	800584	3620 – 98017
6	CDN118 DeviceNet Module	107902	3620 – 01618
7	IPUP A100 Hand Held Display Module	108343	
8	IPUP A100P – Point of use Pump Harsh Duty – High Voltage Option	800677	
9	IPUP A100 – Point of use Pump Instruction Manual	107782	
10	IPUP A100P – Point of Use Pump – Harsh Duty – EPI Configuration	800998	
11	IPUP A100L – Point of Use Pump – Clean Duty – Power Start Option	800675	

CE marking certificate

DECLARATION OF CONFORMITY
CE (EC conformity marking)
 in accordance with 89/336/EEC and 73/23/EEC directives.

We declare : ALCATEL AVTF
 That the product : VACUUM PUMP ADP 100
 Is in conformity with :

- **89/336/EEC directive.** The reference to the specification for this conformity are :

<input checked="" type="checkbox"/> NF EN 55011	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) high frequency equipment.	<input type="checkbox"/> NF EN 50081-1	Generic emission standard part 1 : Residual, commercial and light industry.
<input type="checkbox"/> NF EN 55013	Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment.	<input checked="" type="checkbox"/> NF EN 50081-2	Generic emission standard part 2 : Industrial environment.
<input type="checkbox"/> NF EN 55014	Limits and methods of measurement of radio disturbance characteristics of household electrical appliances, portable tools and similar electrical apparatus.	<input type="checkbox"/> NF EN 50082-1	Generic immunity standard Part 1 : Residual, commercial and light industry.
<input type="checkbox"/> NF EN 55022	Limits and methods of measurement of radio disturbance characteristics of information technology equipment.	<input checked="" type="checkbox"/> NF EN 50082-2	Generic immunity standard Part 2 : Industrial environment.
		<input type="checkbox"/> NF EN 55104	Immunity requirements for household appliances tools and similar apparatus.
		<input type="checkbox"/> NF EN 60 601-1-2	General requirements for electromagnetic compatibility.

- **73/23/EEC directive.** The reference to the specification for this conformity are :

<input type="checkbox"/> NF EN 60950	Safety of information technology equipment, including electrical business equipment.	<input type="checkbox"/> NF EN 60065	Safety requirements for mains operated electronic and related apparatus for household and similar general use.
<input type="checkbox"/> NF EN 61131-1 NF EN 61131-2	Programmable controllers.	<input type="checkbox"/> EN 60204	Electrical equipment of industrial machines.
<input type="checkbox"/> NF EN 60601	Programmable controllers.	<input checked="" type="checkbox"/> EN 61010	Safety requirements for measurements, control and laboratory use.
<input type="checkbox"/> NF EN 60335-1	Safety of household and similar electrical appliances.	<input type="checkbox"/> EN 60598-2-6	Safety requirements for luminaries with built-in transformers for filament lamps.

Tested by : **N.C.E (Laboratory)**
 19, rue François Blumet
 38360 SASSENAGE
 FRANCE
 Tél : 04.76.27.83.83 Fax : 04.76.27.77.00.

N.C.E.
 Z.A. de l'Argentière
 19, rue François Blumet
 38360 SASSENAGE
 Tél. 04 76 27 83 83

Reports n° : R9907134C-E, R9907135S-E
 Date : July 09th, 1999

Manufacturer, title and full address : **ALCATEL AVTF**
 98, Avenue de Brogny BP 2069
 74009 ANNECY Cedex

Name and signature :

Jean-Yves COEBOAN


ERIC BASSET


SEMI S2 certificate



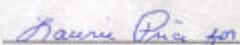
Global Semiconductor Safety Services

CERTIFICATE OF COMPLIANCE

To SEMI S2-93A Guidelines

March 14, 2000

Company Name & Location:	Alcatel Vacuum Products 98, Avenue de Brogny – BP 2069 74009 Annecy Cedex (France)
Place of Manufacturing:	Cedex, France
Document Number:	990799F2
Date of Report:	March 14, 2000
Product Description:	Loadlock Pump
Investigated in accordance with:	SEMI S2-93A / S8-95
Model:	A-100L

 <u>Pavol Breder, Technical Manager</u>	 <u>John Hatfield, Technical Manager</u>
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Chapter B

IPUP A 100 instruction manual

Start up

■ Safety instructions	■ B 00
■ Unpacking / Handling / Storage	■ B 10
■ Positioning the pump in the pumping installation	■ B 20
■ Connection to the cooling circuit	■ B 30
■ Inert gas purge connection (N ₂ connection)	■ B 40
■ Electrical connection	■ B 50
■ Amat smart pump interface connection	■ B 60
■ RS 232 or RS 485 link wiring	■ B 70
■ Connection to the pumping circuit	■ B 80

Safety instructions

GENERAL

- 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 the regulations, or even to put into doubt the EMC (Electro Magnetic Compatibility) performance and the safety of the product. ALCATEL declines any responsibility for such operations.
- The EMC performance of the product is obtained on the condition that the installation complies with the EMC rules. In particular, 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 3 m from the product inlet.
- This pump is not equipped with an emergency stop EMO device because it is designed for use on process tools and integration with the process tool EMO.
- This pump is not equipped with a lock out / tag out (LO/TA) device because it is designed for use on process tools. In order to properly secure the pump for installation and/or maintenance, the entire tool needs to be properly locked-out / tagged-out in accordance with OSHA requirement 29 CFR.1910.147.



When the electrical switch (RT1) is set to "0", the part supply power/filter and filter/electrical switch RT1, is energized. Risk of electrical shock in case of contact. Disconnect main electrical cable before any intervention.



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.

Safety instructions



WARNING

For P 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 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.



WARNING

If loss of cooling water creates a significant risk, then the water flow must be monitored externally by the process equipment.



WARNING

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. In addition an interlock should be provided to ensure that gas flow to the pump is stopped when nitrogen 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 (capable of detecting 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

When the pump is switched off, internal parts (monitoring, frequency converter) contain capacitors charged with over 60 VDC and remain energized.

Electrical shock may result in severe injury.

Wait 1 minute after switching off before opening the pump.



WARNING

HOT SURFACE

Contact may cause burn.
Do not touch or wear protective gear
before servicing.

Operating conditions may generate temperatures justifying particular attention on the part of the user (external surfaces > 70°C on exhaust connections).

Contact may cause burns.

Always use gloves before servicing.

Safety instructions

- Alcatel 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 (see B 50).



Safety interlock

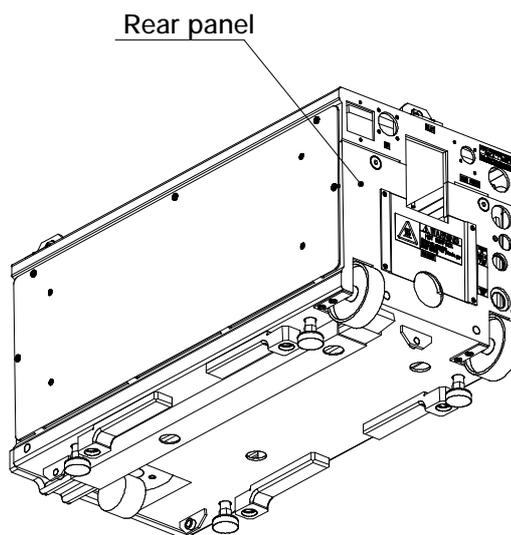
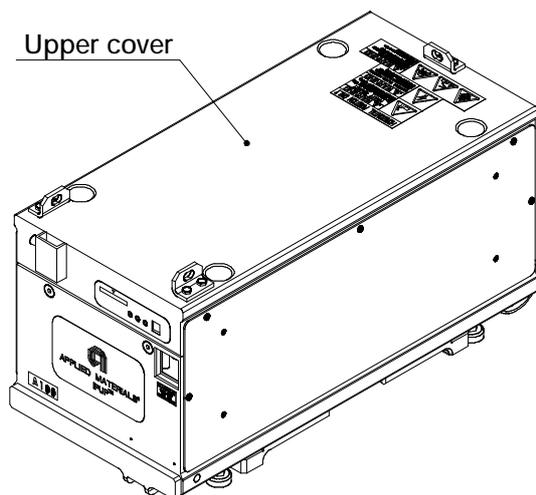
The pump motor is protected against overload through the drive "start/stop" and enable control circuitry of the variable speed controller. The drive start/stop includes solid state components. If hazards due to accidental contact with moving machinery or unintentional flow of liquid, gas or solids exist, an additional hardwired stop circuit is required to remove AC input power to the drive.

This interlock must never be overridden during installation, use or maintenance.

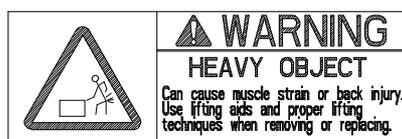
Once activated power will be switch off and the pump will be put in a safe condition. When a fault occurs, the cause must be corrected before the fault can be cleared. It is required to switch power off and on to clear the fault.

Safety instructions

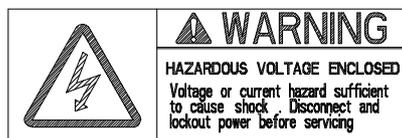
PUMP LABELS



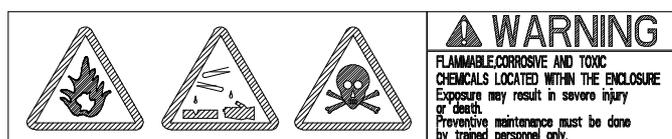
Located on the rear of the pump, this label warns the user against possible risk of injury due to any hand contact with hot surfaces. It states that protective gloves should be used before performing any intervention.



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.



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.



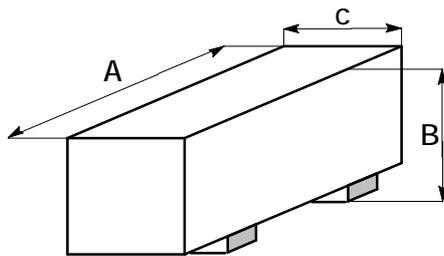
Located on the upper cover, this label warns the user against pumped process gas that could be dangerous and toxic and could cause severe injuries or death. It specifies that any preventive maintenance operation can only be performed by trained personnel.

Unpacking / Handling / Storage

PRECAUTIONS

- If the equipment has been damaged, take necessary steps with the carrier and inform Alcatel, if necessary. In all cases, Alcatel recommends that the packaging be kept, in the event that the equipment needs to be transported or put into prolonged storage.
- Risk of tilting: compliance with the EEC safety rules is guaranteed (normal range $\pm 10^\circ$). However, precautions should be taken against the risk of tilting during product handling, installation and operation.

PACKAGING DIMENSIONS



inch ± 2 (mm ± 50)	A	B	C
IPUP A100	33.66 (855)	22.05 (560)	17.91 (455)

UNPACKING

Open the crate.

Remove additional packages from the crate and set aside.

These packages contain:

- 3 C HC M8–16 screws,
- 3 M8 washers,
- 3 shackles 8430 WMA 107,
- 1 label "this product complies with our final quality tests",
- 1 female nipple 1/4 SH2 63 Y PARKER,
- 1 male nipple 1/4 SH2 63 Y PARKER,
- 1 desiccant for packing "dydragyl",
- 1 bracket,
- 2 CS M3–8 screws,
- 1 power electrical cable,
- 1 instruction manual.

Unpacking / Handling / Storage

SHIPPING SCREWS PROCEDURE



The IPUP A100 pumps are sent from the factory with two screws to hold the functional block in place during shipping.

These screws must be loosened before pump is operated.

Also, located on the top of the pump there is a warning sign posted.

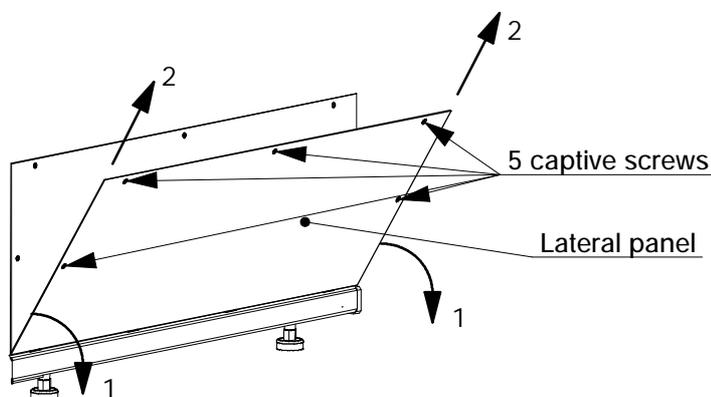
Dismantling of the lateral panel

Yellow warning sticker

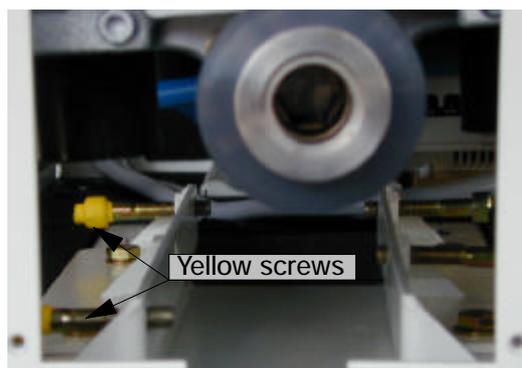
Panel to be removed



- Loosen the five captive screws from the lateral panel located at the right of the front panel.
- Rotate the lateral panel (1).
- Remove the lateral panel by lifting it (2).



Loosen the functional block



Locate two C CH M8x45 screws highlighted in yellow.



loosen these two screws two to three turns.

Replace the cover.

When unit is to be shipped again the screws need to be tightened up.

Note: Apply a spot of 222 low-strength threadlocker on each screw.

Unpacking / Handling / Storage

HANDLING

	<p>WARNING HEAVY OBJECT Can cause muscle strain or back injury. Use lifting aids and proper lifting techniques when removing or replacing.</p>	<p>Regarding its weight (220.4 lbs / 100 kg), handling the pump can cause muscle strain or back injury. For all equipment handling, use the appropriate handling devices.</p>
---	---	---

Handling the pump to remove it from the crate

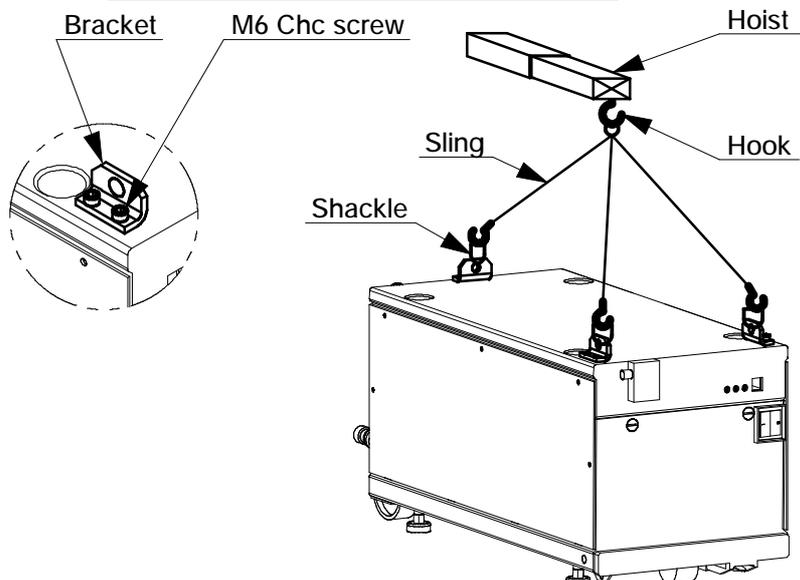
The pump is equipped with three brackets screwed on the pump top cover.

These brackets are used for handling the pump as well as fixing two pumps (stacking) (see B 20).

It is highly recommended that a hoist is used for lifting.

- Fit a shackle (delivered in the crate in separate packaging) on each lifting bracket.
- With a hoist and a sling with three arms, lift the pump using shackles.

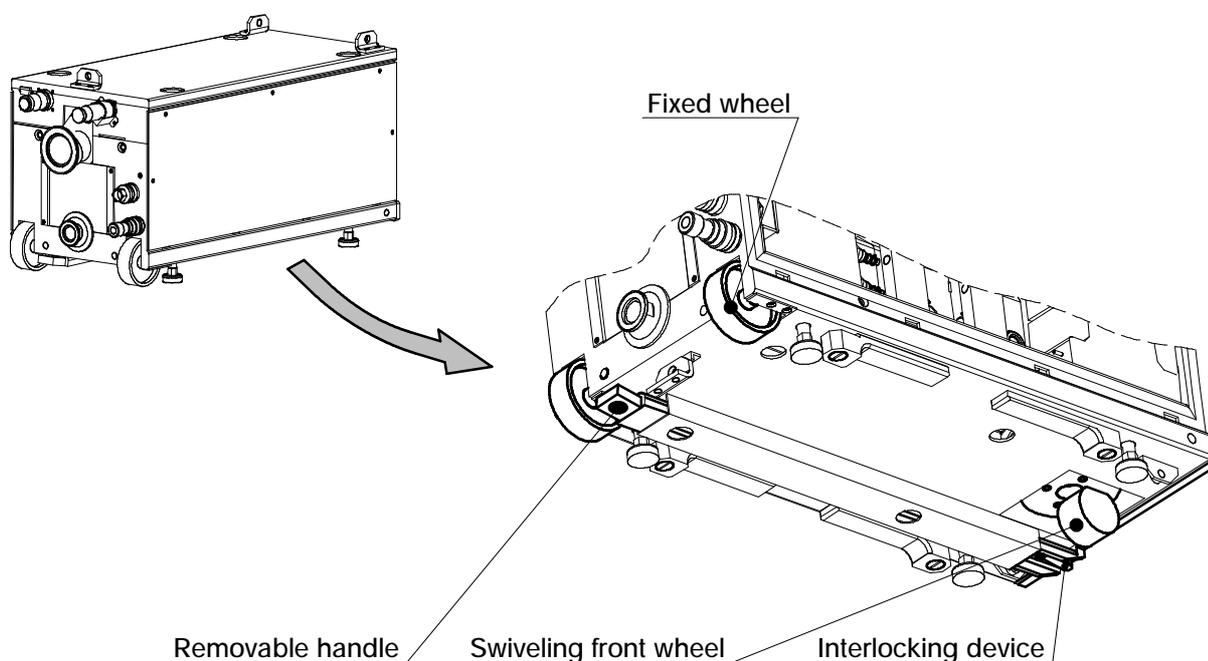
Pump	Weight in lbs (kg)
IPUP A100	220.4 (100)



Unpacking / Handling / Storage

Move the pump by pushing it

The pump is equipped with 2 fixed wheels, 1 swivelling front wheel, a removable handle provided to move the pump easily.

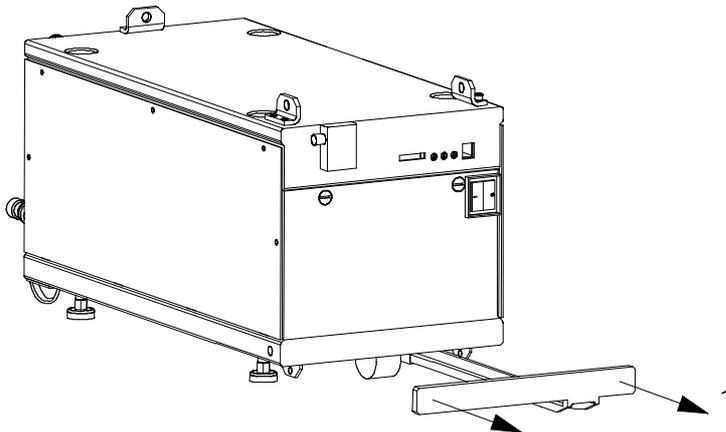


Unpacking / Handling / Storage

Move the pump by pushing it
(cont'd)

Remove the handle from its support under the frame as follows:

- Pull the handle along the frame rail up (1) to remove it.



Install the handle on the upper part of the front panel as follows (see figure next page):

- pull manually the spring connecting pin,
- install the handle and release the spring connecting pin, (*check that the spring connecting pin is correctly positioned in the handle hole*).

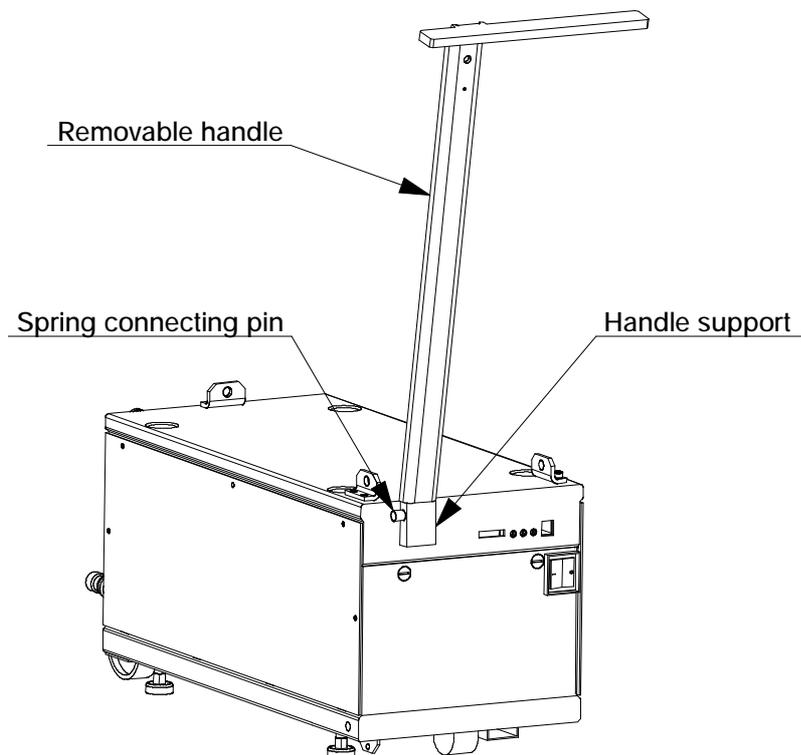
Push the handle to move the pump.

When the pump is in the desired location, position it (*see B 20*).

Then store the handle under the frame by proceeding in reverse manner.

Unpacking / Handling / Storage

Move the pump by pushing it
(cont'd)



EQUIPMENT STORAGE

- If the pump is going to be put into storage, the inlet and exhaust connections should be blanked off.
This equipment can be stored at an ambient temperature between -10°C and $+60^{\circ}\text{C}$.

Positioning the pump in the pumping installation

- Pump performance will depend on the kind of accessories used and the quality of the mechanical connections such as the pump fittings.
- IPUP A100P pump models are typically used in corrosive environments. Their reliability will depend on proper installation and maintenance. When assembling the vacuum circuit, we recommend installing maintenance accessories such as isolation valves on the inlet, exhaust and purge lines.
- For safety reasons, the materials and sealing properties of the accessories used on the inlet and exhaust lines must be compatible with the gases being used.

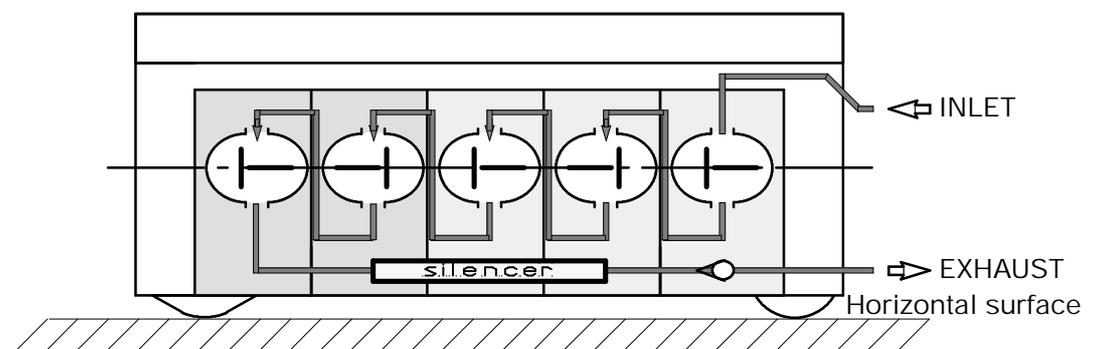
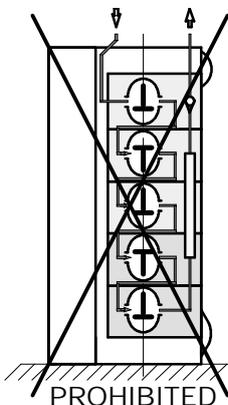
HANDLING THE PUMP

Determine where the pump will be placed. Refer to the technical specification section for dimensions, if needed (see A 40).

Use the handling devices to position the pump in the desired location (see B 10).

POSITIONING THE PUMP

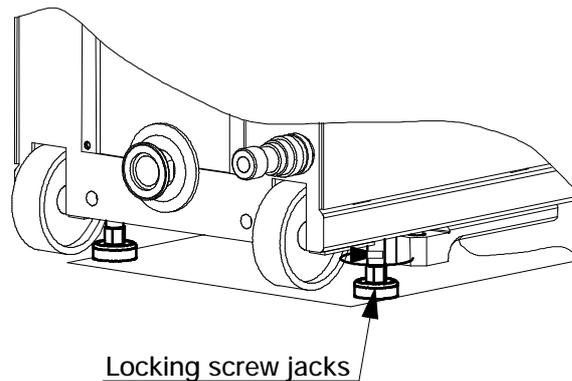
- The pump must operate in the horizontal position. It may not be used standing on its end.



Positioning the pump in the pumping installation

POSITIONING THE PUMP (CONT'D)

Each pump is equipped with four locking screw jacks. Lock the pump by adjusting these jacks so that all four feet are resting solidly on the floor.

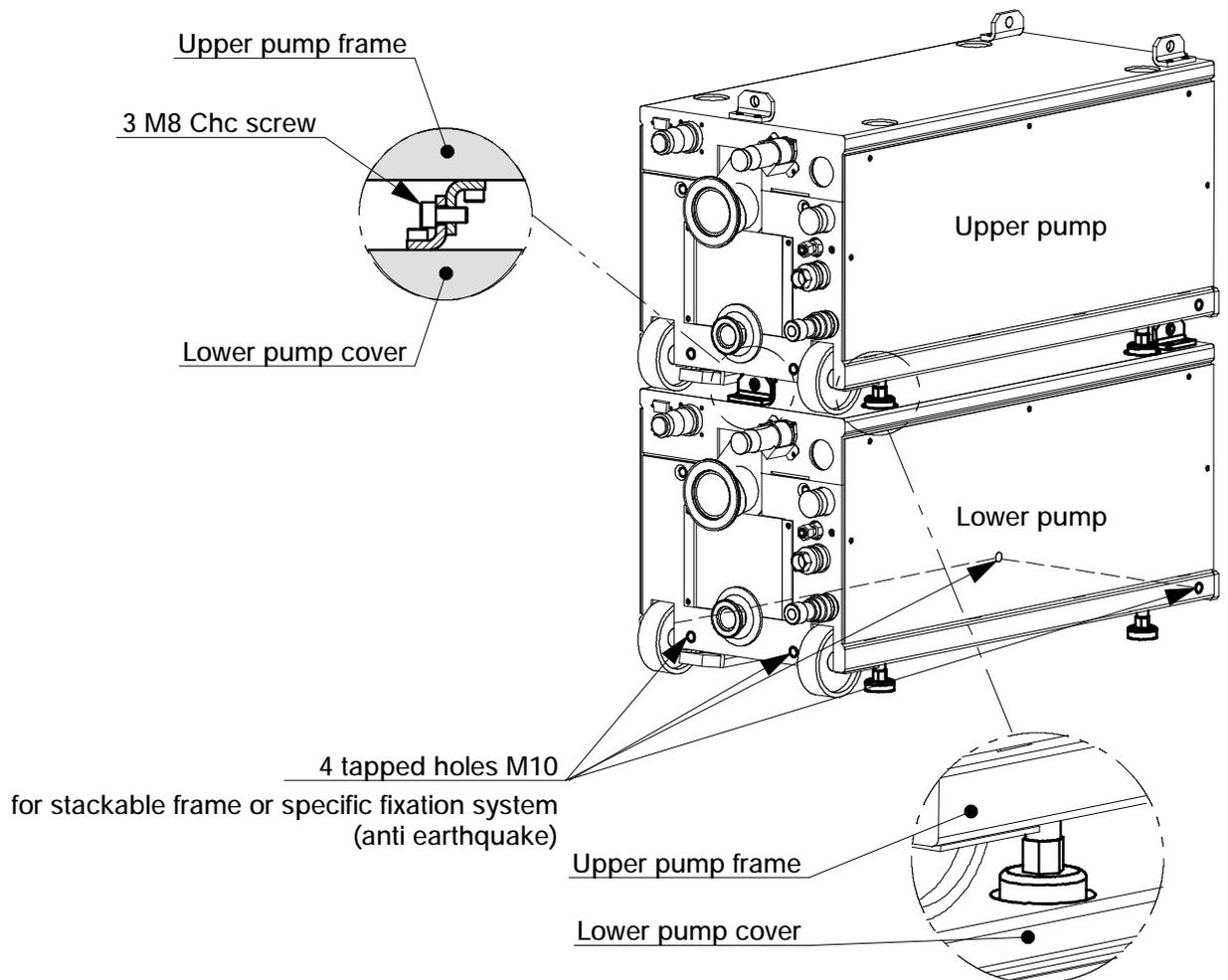


Pump stacking

The pump design enables up to 2 pumps to be stacked without specific frame accessories.

- Check that the six brackets are correctly secured (3 on the top of the pump cover and 3 under the pump frame).
 - Lock the lower pump by adjusting its jacks solidly on the floor.
 - Raise the upper pump using the four screw jacks. The wheels should not be in contact with the floor.
 - Lift the upper pump (*as described in B 10*) and position it on the lower pump cover.
 - Check that the upper pump screw jacks are positioned in the four provided bases located on the lower pump cover.
- H Lock the upper pump by adjusting its jacks solidly on the lower pump cover.
- H Secure the stacked pump by screwing a CHc M8 screw in each assembly bracket

Positioning the pump in the pumping installation



Note : All handling devices are designed for handling one pump only.

Connection to the cooling circuit

WATER CHARACTERISTICS

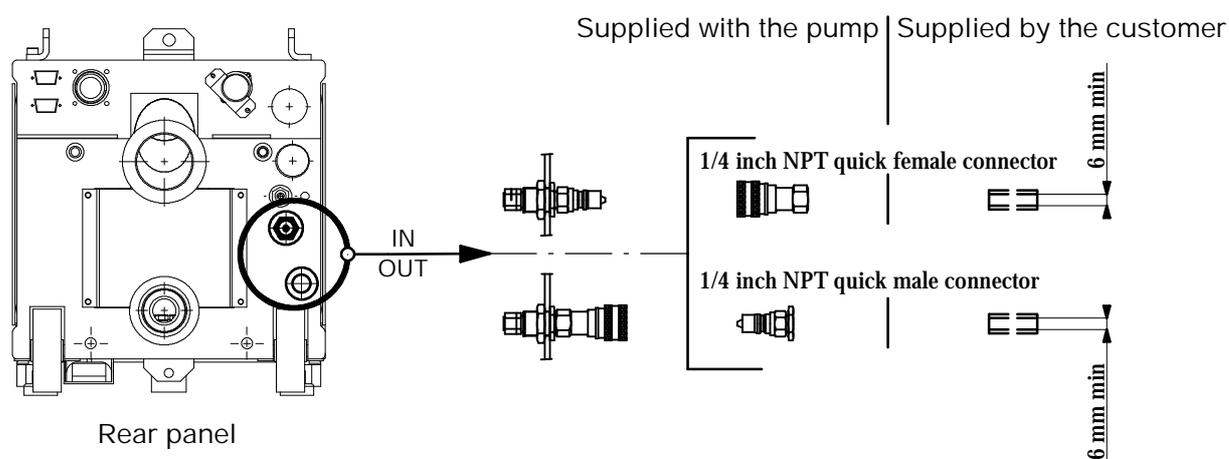
In order to limit corrosion and clogging of the motor cooling circuit, it is recommended to use cooling water with the following characteristics:

- Treated soft water or non-corrosive industrial water
- pH level between 7.5 and 11
- Hardness < 7 milli-equivalent/dm³
- Resistivity > 1500 /cm
- Solid particle size (max.): 0.03 mm²
- Solid pollution < 100 mg/dm³
- Temperature 25° C max. / 10° C min
- Pressure range between 29 and 85 PSIG (3 and 7 bar absolute)
- Pressure inlet/outlet: 2 bar minimum
- Water flow: min. 100 l/h
- Deionized water compatible

If the "solid particle size" and "solid pollution" water characteristics values can not be reached, install a filter on the cooling connection.

Connection to the cooling circuit

WATER COOLING QUICK CONNECTION



Install the two quick-connect connectors, packaged separately, on the self-sealing quick-connect connectors.

Connect the water pipes to the quick-connect connectors.

- Water inlet marked "IN" (1/4 inch NPT quick female connector)
- Water outlet marked "OUT" (1/4 inch NPT quick male connector)

Inert gas purge connection (N₂ connection)

NITROGEN CHARACTERISTICS (IPUP A100P VERSION ONLY)

For maximum performances, a filtered dry nitrogen supply with the following characteristics is required:

- Condensation point < 22° C
- Dust < 1 µm
- Oil < 0.1 ppm
- Pressure between 30 and 105 absolute PSIG (2 and 7 absolute bar)
- Flowrate (see A 40)

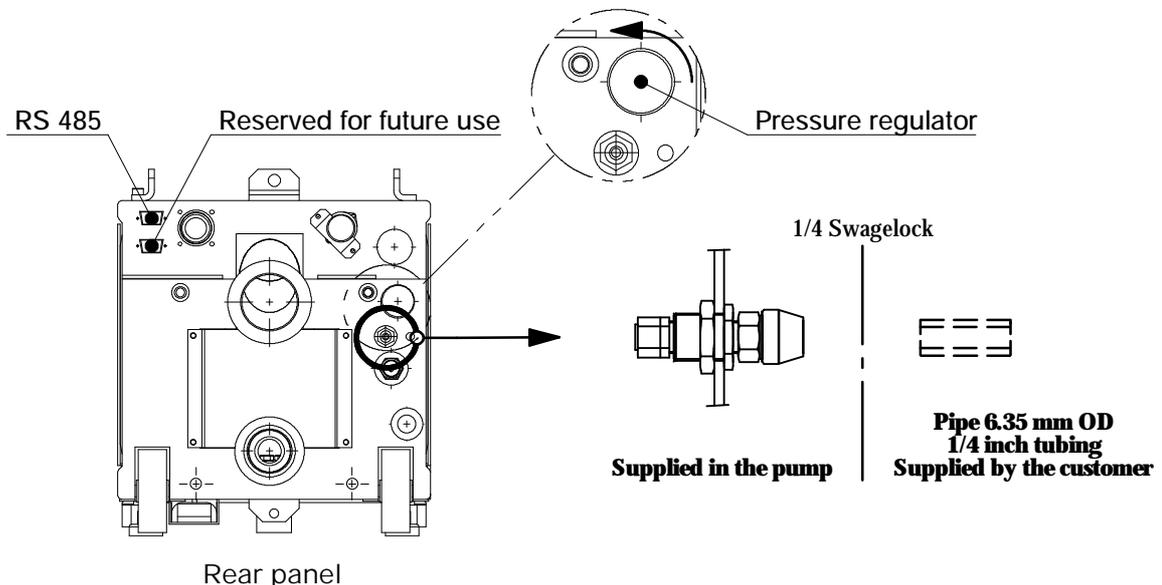


CAUTION

A sudden inrush of N₂ into the pressurization circuit may result in damage to internal parts.

Close the pressure regulator by turning the knob counter-clockwise before pressurizing the circuit.

CONNECTION



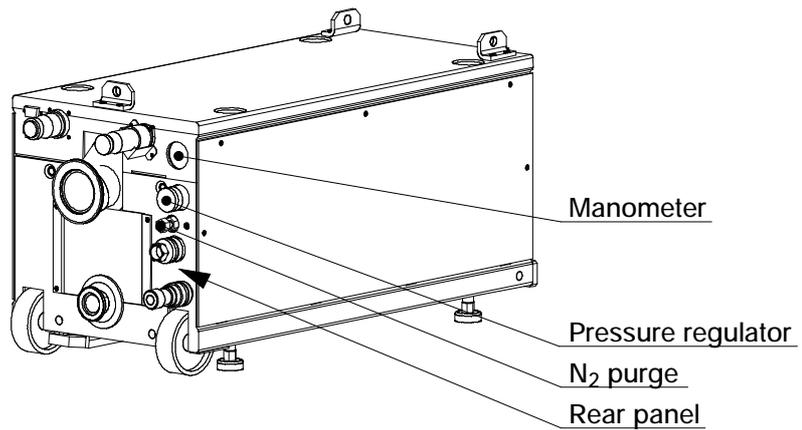
Inert gas purge connection (N₂ connection)

N₂ FLOWRATE ADJUSTMENT

IPUP A100P only

Nitrogen needs to be used to reduce the concentration of pyrophoric material to below the LEL.

The N₂ flow rate can be adjusted with the pressure regulator depending on processes (see C 60).



Electrical connection

- Make sure that breaker RT1 is off during electrical connection.
- Study the preliminary precautions (*See B 00*).

All the internal electrical connections required for use the pump are made prior to shipment.

However, the electrical connection of the main power supply is provided by the process tool.

An out of phase condition is corrected automatically by the pump electronics.

IPUP A100 does not include any operator replaceable fuses.

PROTECTIVE EARTH CONNECTION



An IEC 417q5019 symbol is located inside the enclosure, under the monitoring cooling plate near the main protective conductor terminal.

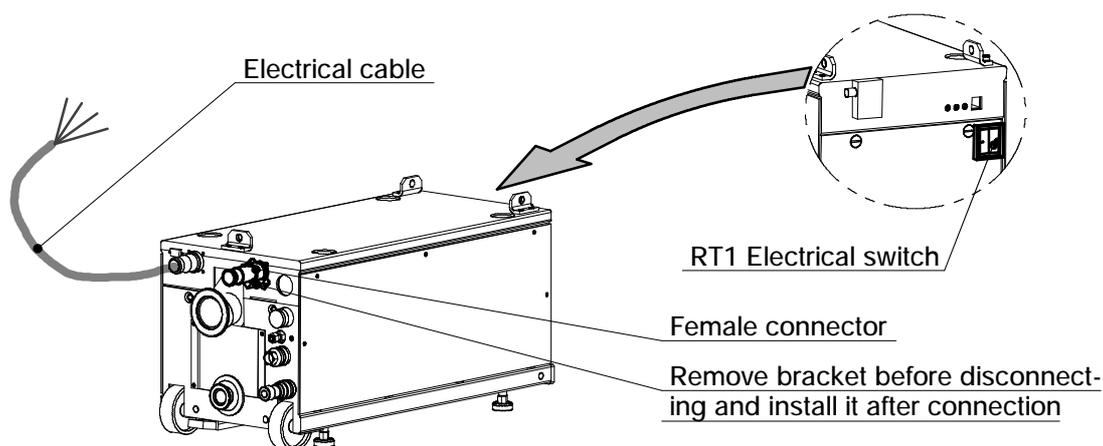
PROCESS TOOL ELECTRICAL PROTECTION



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 min main circuit breaker with a 10000 AIC rating. The user-supplied circuit breaker should be in close proximity to the pump (no further than 25 ft within line of sight of the pump).

Electrical connection

ELECTRICAL CONNECTION



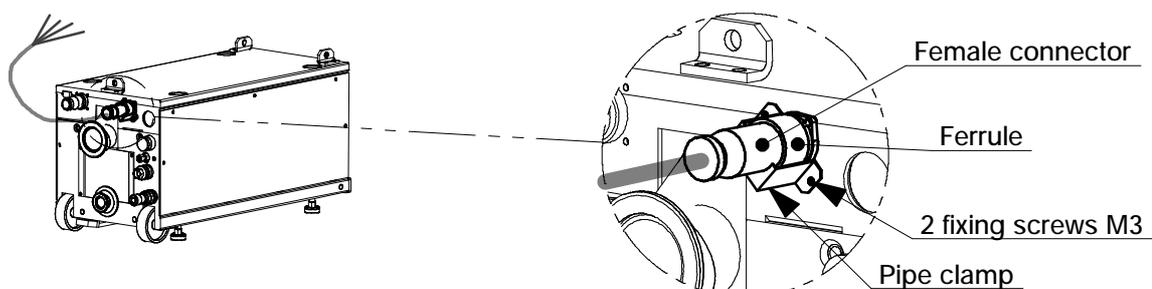
The pump is supplied with an electrical cable [4 × 14 AWG leads (2.08mm²)] (2.5m length) equipped with a female connector.

Connect the green lead to the ground on the connector, the other 3 leads may be connected with the 3 phases.

The pump will automatically correct with autophase correction fixture.

Connect the female connector to the pump male connector and lock it as follows:

- Screw the ferrule.
- Fit the pipe clamp on the female connector collar (position the fixing holes correctly).
- Secure the two M3 fixing screws.



Amat smart pump interface connection



CAUTION

Dry contact outputs are rated 50 V -- 1 A max.
Over voltage and over current can cause internal electrical damages.
Monitor SPI contact voltage below 50 V and current below 1 A.

The remote control function allows:

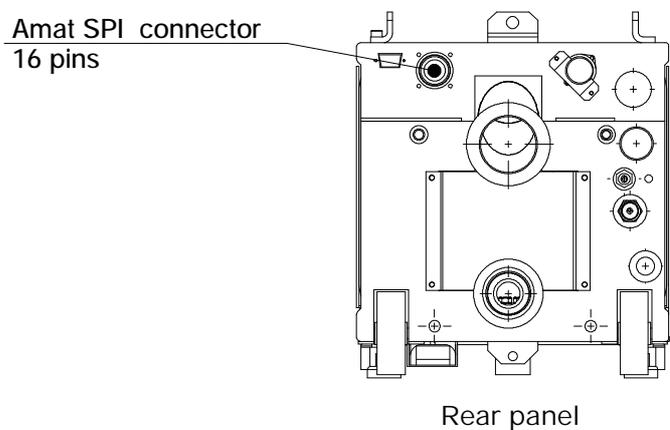
- control of pumping functions START/STOP and variable rotation speed,
- monitoring the status of dry contact outputs (50 V– 1 A).

These contacts can be monitored or used by a system external to the pump.

AMAT SPI CONNECTOR LOCATION

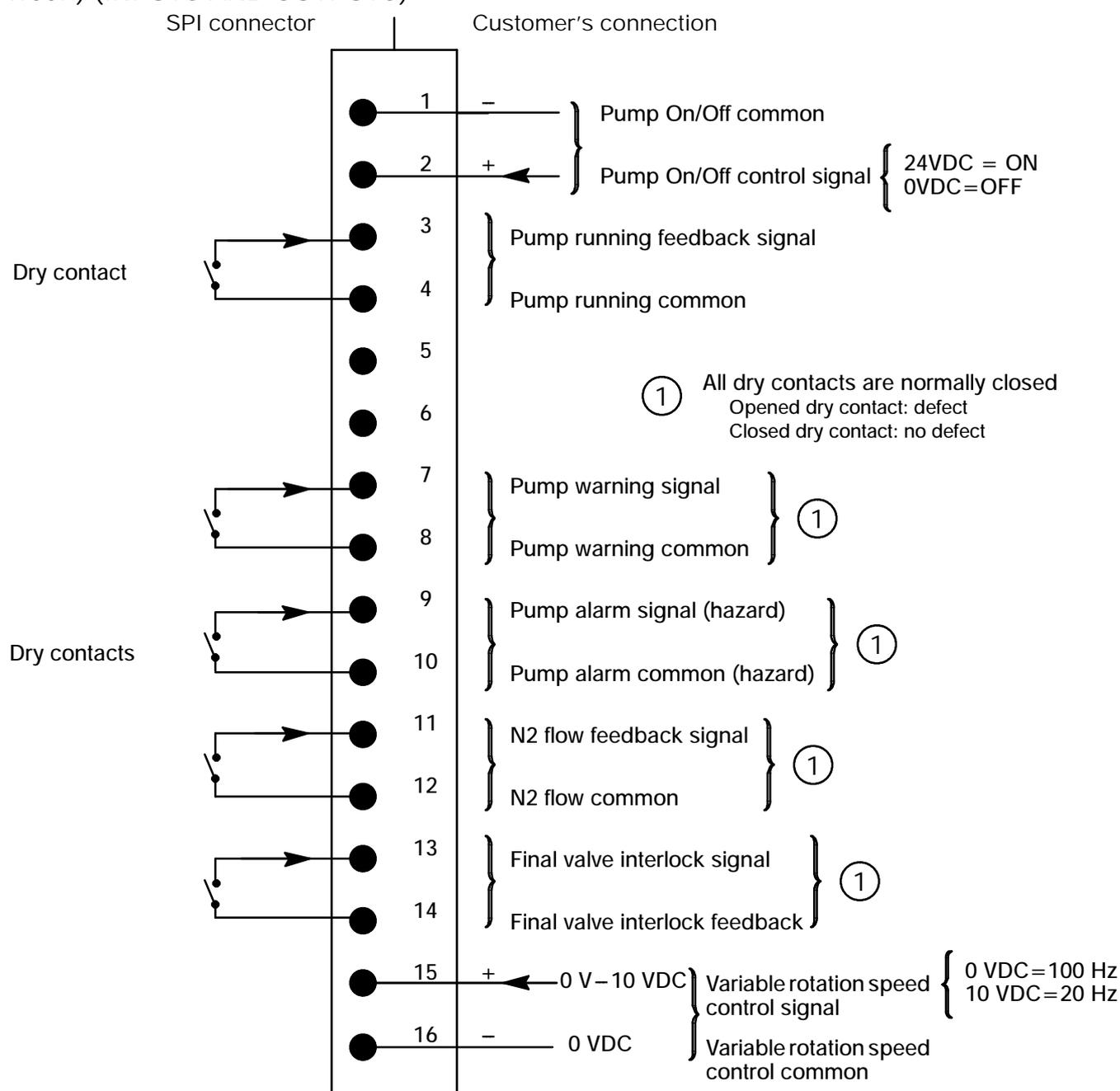
IPUP A100 pump warnings and hazards are monitored on the SPI connector with exception of maintenance warnings.

Remote control connection is realized with the Amat SPI connector located at the rear of the pump.



Amat smart pump interface connection

AMAT SPI CONTACTS (IPUP A100P) (INPUTS AND OUTPUTS)



Note: Dry output contacts are software monitored

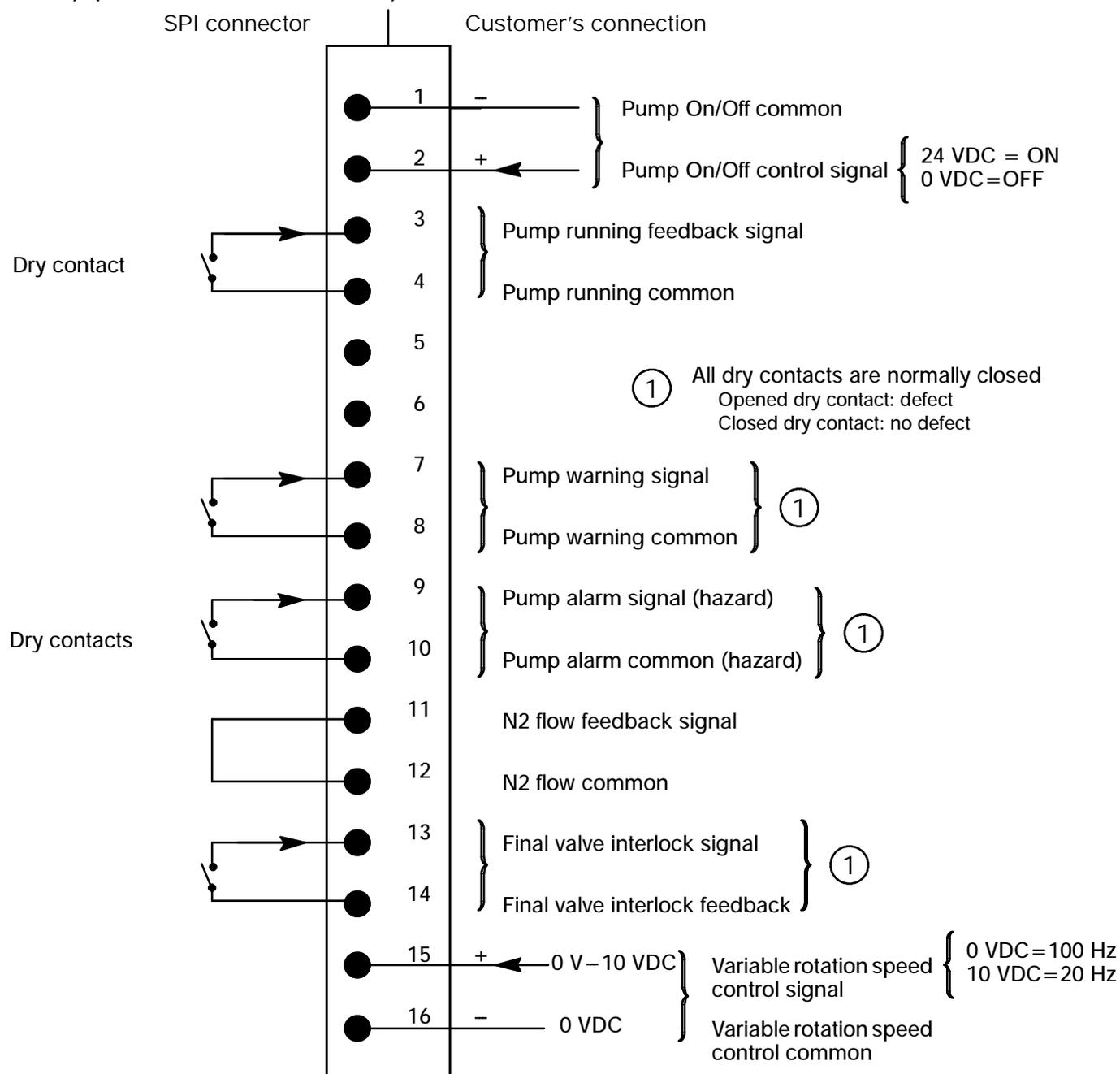
Amat smart pump interface connection

Pump working conditions

Pump status	SPI Contacts				
	3/4	7/8	9/10	11/12	13/14
Pump running	Close	Close	Close	Close	Close
Pump stopped	Open	Close	Close	Close	Open
Pump running + warning	Close	Open	Close	Close	Close
Pump stopped + hazard	Open	Close	Open	Close	Open
N ₂ Flow defect	Close	Open	Close	Open	Open

Amat smart pump interface connection

AMAT SPI CONTACTS (IPUP A100L) (INPUTS AND OUTPUTS)



Note: Dry output contacts are software monitored

Amat smart pump interface connection

Pump working conditions

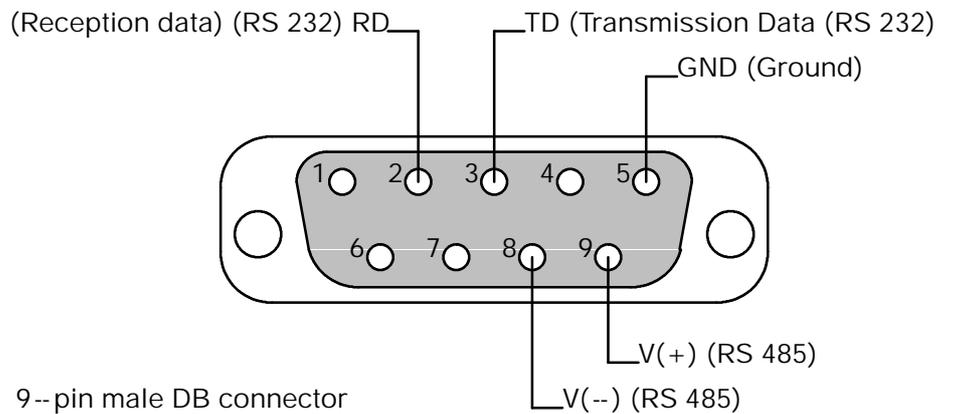
Pump status	SPI Contacts				
	3/4	7/8	9/10	11/12	13/14
Pump running	Close	Close	Close	Close	Close
Pump stopped	Open	Close	Close	Close	Open
Pump running + warning	Close	Open	Close	Close	Close
Pump stopped + hazard	Open	Close	Open	Close	Open

RS 232 or RS 485 link wiring

At first power-on, the user will find the initial factory-set configuration (see C 50).

The setting can be modified through the corresponding monitoring menu (see C 90).

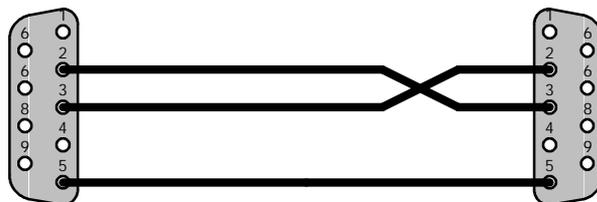
CONNECTOR WIRING RS 232 / 485



The syntax of commands and messages is dealt with in a separate chapter (see C 90).

EXAMPLES OF POSSIBLE CONNECTION

Link RS 232 with a single monitoring system



Connection to the pumping circuit

- Remove the plastic caps blocking the inlet and exhaust holes; these components prevent foreign bodies from entering the pump during transport and storage.

For safety reasons, any accessories connected to the inlet and exhaust must be made of materials compatible with pumped gases.

AT THE PUMP EXHAUST

 WARNING	<p>Exhaust of corrosive, reactive, flammable, pyrophoric or oxidizing process gases may result in severe injury or death. Always connect the pump exhaust to an exhaust stack.</p>
---	--

A leak test should be performed after any pump connection.

Exhaust connection

DN25 ISO KF.

Several fitting accessories are available in the Alcatel catalog.

AT THE PUMP INLET

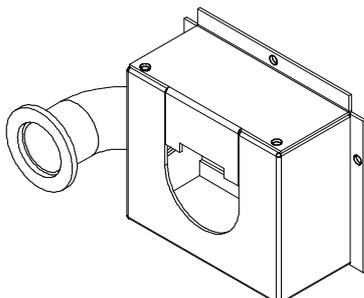
- Make sure that any vacuum accessories connected to the inlet of the pump can withstand a negative pressure of 1 bar relative to atmospheric pressure.

Inlet connection

DN50 ISO KF.

Several fitting accessories are available in the Alcatel catalog.

SECONDARY EXHAUST ENCLOSURE



This external exhaust is required to be Semi compliant. Its purpose is to exhaust gas and vapors that might leak from the pump.

It is delivered with each IPUP A100P/PI version pump.

- flow: 5 cfm
- static pressure: –0.14 inch of water measured at the secondary exhaust port
- exhaust: DN25 ISO KF

Chapter C

IPUP A100 instruction manual

Operation

■ Operating mode	■ C 10
■ Start up of the monitoring system	■ C 20
■ Use of the monitoring system for pumping operation	■ C 30
■ Monitoring system parameters	■ C 40
■ Monitoring system function table IPUP A100P version	■ C 50
■ Monitoring system function table IPUP A100L version	■ C 51
■ Gas purge and temperature according to the semiconductor processes	■ C 60
■ Saving and loading of pump configuration (with monitoring system)	■ C 70
■ Monitoring system setting for transport	■ C 80
■ Use of the serial link	■ C 90

Operating mode

DIFFERENT CONTROL MODES

According to the monitoring configuration and wiring, the pump can be:

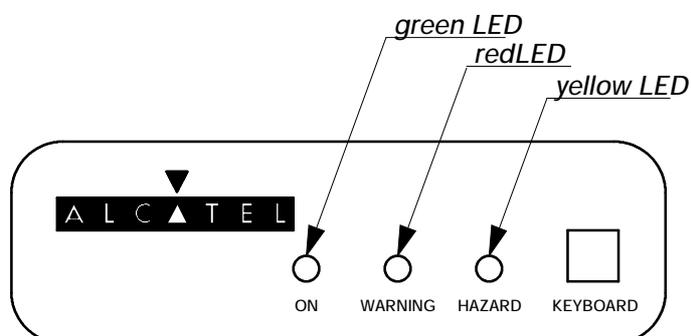
- controlled remotely using the Amat SPI connector,
- controlled remotely by serial link (RS 232 / RS 485),
- controlled locally with a hand held display module by pressing the control key (the star appears).

The pump can be equipped with a hand held display module, connected in front of the frame.

This hand held display module allows the user to:

- set / modify pump parameters,
- review operation parameters,
- start/stop the pump (POWER START and CONTROL REMOTE DISABLED)
- start/stop the N₂ purge if parameters are configured.

The indicator lights located on the cover indicates the status of the pump.



- Green on = pump is running and no problems,
- Yellow on and green on = warning,
- Red on = hazard.

Pump will automatically shutdown and will not restart until corrected.

Operating mode

PUMP CONTROL MODES

Power start enabled	Control Remote disabled	=	Autostart	Start / Stop the pump through RT1 switch.
	Control Remote enabled	=	Remote controlled (SPI 24V)	Start / Stop the pump through SPI connector.
Power start disabled	Control Remote enabled	=	Remote controlled (SPI 24V)	Start / Stop the pump through SPI connector.
	Control Remote disabled	=	Hand Held Display Module controlled	Start / Stop the pump through hand held display module.

PRIORITY CONTROL MODES

Control Remote selection	Priority over
Enabled	SPI > RS232
Disabled	RS232 > Hand Held Display Module RS232 > Autostart

REMOTE CONTROLLED OPERATING MODE

Remote control of a single pump through Amat SPI connector

The pump is monitored by the process tool in which it is installed and is controlled remotely through the Amat SPI connector (see B 60).

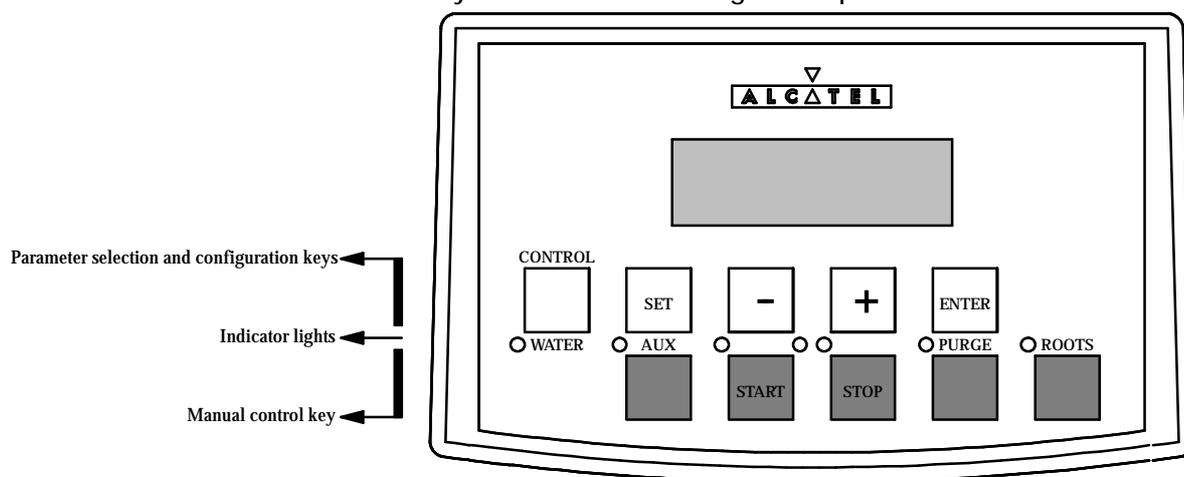
Remote control of a single pump or group of pumps through RS 232/485 serial link

The pump can be controlled through the RS 232/485 serial link (see B 70 and C 90).

Start up of the monitoring system

HAND HELD DISPLAY MODULE

The keyboard is used to configure the parameters.



PARAMETER SELECTION AND CONFIGURATION KEY FUNCTIONS

Symbol	Description	Functions
	Local mode selection key	<ul style="list-style-type: none"> ● Press control to access to the pump command through the hand held display module
	Parameter setting mode access key	<ul style="list-style-type: none"> ● Press to access the parameter setting mode ● Press to exit the various menus without validating the functions
 	Selection keys	<ul style="list-style-type: none"> ● Press to move to: <ul style="list-style-type: none"> - the next or the previous menu - the next or the previous parameter in the displayed menu ● Press to select or adjust the value of the previously selected parameter
	Configuration validation key	<ul style="list-style-type: none"> ● Press to validate the selection of a menu, a parameter or a value ● Press to validate an answer to a requested information

Start up of the monitoring system

- A membrane protects the keys. Make selection by hand only and do not use hard objects such as pens, screwdrivers, etc..., which could damage the keys.

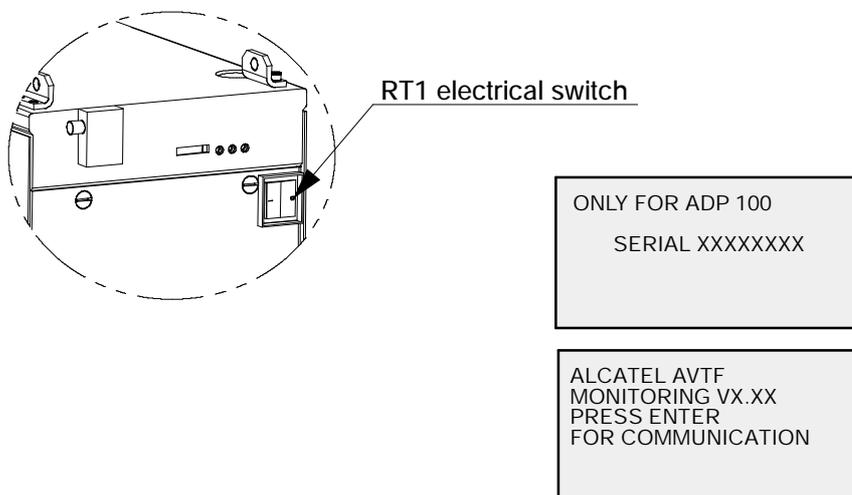
Fast scroll can be obtained for the + and – keys by continuously holding down the button.

For all the other keys, press several times.

Power ON

- Study the preliminary precautions (See B 00).

Position the electrical switch RT1 to position 1, the display lights up and the following screens appear:



Press the ENTER key to continue:

WAITING FOR ADP 100 ???	WAITING FOR ADP 100 OLWRTA	120 H REM N2 PUMPING STOPPED 09/30/99 10H40
----------------------------	-------------------------------	---

The monitoring system has been configured in the factory.

This configuration allows the pump to run (see C 30).

If necessary, parameters may be customized (see C 50 and C 51).

Start up of the monitoring system

Access to the parameter settings

The programming is set at the factory and is protected by an access code which disables parameter modification.

Press the SET key.

When the code is displayed, (0 set at factory), press the ENTER key.

Access code can be changed.



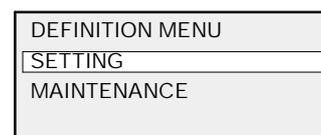
Initialize the equipment by updating the clock

To ensure correct maintenance schedules, fault monitoring and customized parameters, it is necessary to initialize the date and time of the machine.

Press the SET key to enter the menu.

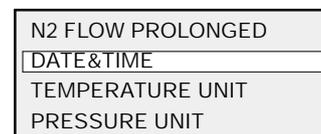
Press the + key, repeatedly to have access to the SETTING menu.

Validate with the ENTER key.



With the + key, move through to DATE&TIME menu.

Validate with the ENTER key.

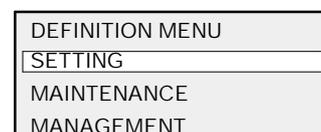


Access to the selected parameters with key + or -.

Validate with the ENTER key.



Update the needed parameters and validate. Return to the main menu by pressing SET successively.



Use of the monitoring system for pumping operation

- Study the preliminary precautions (*See B 00*).
- The performance and the operational safety of this product is guaranteed provided that it is used within normal operating parameters defined in this manual.
- The pump is tested and filled with a synthetic oil charge at factory. Do not modify the oil level.

OPERATION SETTING

Preliminary adjustments

Adjust the voltage on the Amat SPI connector (pins 15–16) (*see B 60*) between 0 and 10 V, to adapt the rotation speed.

The speed decreases from 0 V (100 Hz) to 8 V (20 Hz) and is constant between 8 V (20 Hz) and 10 V (20 Hz).

- If no voltage is set on the Amat SPI connector (pins 15–16), then the pump will run at nominal speed (100 Hz).

Check that the RT1 electrical switch is on the "1" position.

Neutral gas purge control (IPUP A100P version only)

To ensure that the gas purge comes on as soon as the pump starts, set the CMD PURGE menu to DISABLED.

This selection does not allow the user to stop the gas purge while pump is running.

To start or stop the gas purge during pumping, set the CMD PURGE menu to ENABLED.

The purge will start or stop by pressing the PURGE control key located on the hand held display module.

When the purge gas is selected, the message N2 is displayed on the hand held display module.

Use of the monitoring system for pumping operation

PUMP START UP

Start up the pump by setting 24 VDC on the Amat SPI connector (pins 1–2) (see B 60) with 24 VDC.

The following operations will occur automatically:

- water valves open (IPUP A100P version only),
- IPUP A100 pump starts,
- data capture and sensor processing,
- purge gas valve opens (IPUP A100P version only), if option CMD PURGE was selected (see Neutral gas purge control).

Then adjust the gas flow rate using the pressure regulator (as required by customer application) (see C 60).

At the same time the operating parameters are displayed.

* 19H REM N2	
PRESSURE	500 MBAR
ADP TEMP	110° C

To configure the pump parameters, use the SET key (see C 50 and C 51).

Only installed and configured parameters are displayed.

- Do not move a pump when in operation.

Note : During pump start up, the temperature is not monitored (no warning, no hazard) until the pump has reached the programmed temperature value (P version only).

Use of the monitoring system for pumping operation

OPERATION MONITORING

During operation, the user is warned of an operating incident by:

- One or several faults are displayed on the screen, in alternance with monitoring parameters. When these faults are activated, the monitoring triggers the warning phase which is followed by the hazard phase. The period of time for these phases can be set.
- Indicator lights on the front panel are illuminated.
- Indicator lights on the hand held display module unit are illuminated.
- The fault contacts on the Amat SPI connector at the rear of the pump are open.
- Pumping is stopped when an hazard threshold is reached.

A list of incidents is given in *chapter D*.

PUMPING SHUT DOWN

If the 24 VDC power supply between (pins 1–2 of the Amat SPI connector) is removed, the following operations occur:

- pump stops,
- injection of purge gas continues during the shutdown phase (IPUP A100P version only) if timing has been programmed (0 to 120 min).

The message STOP IN PROGRESS appears on the screen:

1 MN REM N2	
STOP IN PROGRESS	
PRESSURE	780 MBAR
ADP T°	75° C

- cooling of the IPUP A100L continues.
- cooling of the IPUP A100P continues until the high pressure stage temperature goes below 70° C.
- when the purge timer expires (if programmed) or pressure > 1700 mbar and high pressure stage \pm 70° C, then the message pumping stopped is displayed.

The message PUMPING STOPPED appears on the screen:

120H REM N2	
PUMPING STOPPED	
09/30/99	10H50

Monitoring system parameters

PURPOSE OF THE SENSORS

PUMP	SENSOR	FUNCTION
P	Pump Temperature sensor	<ul style="list-style-type: none"> ● Allows regulation of pump temperature. ● Indicates a pump temperature variation (a warning when temperature is greater than the warning threshold and an alarm when temperature is greater than alarm threshold).
L and P	Motor power sensor (included in the frequency converter)	<ul style="list-style-type: none"> ● Monitors the power consumed by the machine by generating an hazard as soon as the power exceeds a preset program threshold for a preset duration time. The pump is stopped immediately when the hazard occurs.
L and P	Warning motor temperature *	<ul style="list-style-type: none"> ● Indicates to the user that a temperature warning is present.
L and P	Hazard motor temperature *	<ul style="list-style-type: none"> ● The pump is stopped immediately when the hazard threshold is exceeded.
P	Pressure sensor *	<ul style="list-style-type: none"> ● Indicates exhaust overpressure when the pressure reaches 1700 mbar (silencer clogged) and stops the pump at 2500 mbar.
P	N2 Pressure sensor	<ul style="list-style-type: none"> ● Monitors the N2 injection into the pump. When pressure is under the preset threshold, a N2 warning is generated.

* These thresholds are factory set and can not be customized.

TABLE OF MONITORING PARAMETERS MAX. AND MIN. THRESHOLDS

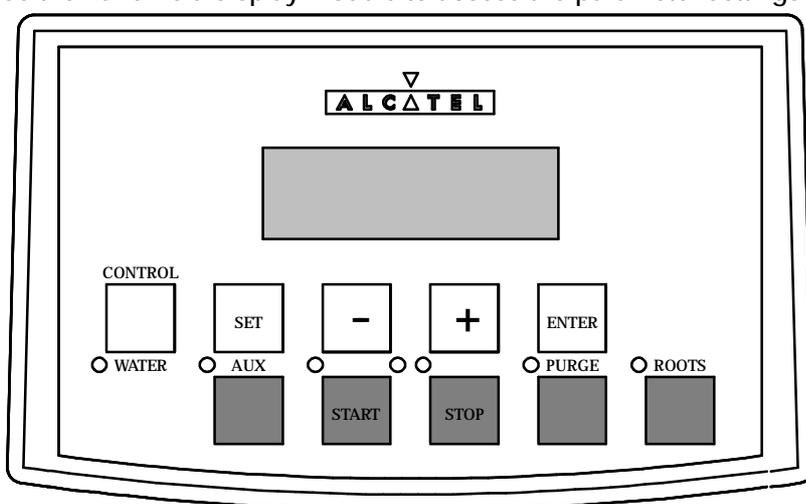
PARAMETER	UNIT	THRESHOLD		Factory configuration	
		MIN.	MAX.	Warning	Hazard
Pump temperature sensor	°C	T =90	T=130	T 10° C	140
Pressure sensor	mbar	–	–	1700	2500
N ₂ pressure	mbar	550	1100	950	
Warning temperature motor	°C	–	–	50	–
Hazard temperature motor	°C	–	–	–	75

The monitoring system can be customized according to the customer application, by programing the parameters of the various menus listed in C 50 and C 51 with pump stopped.

Monitoring system function table IPUP A100P version

PUMP CONFIGURATION

Use the hand held display module to access the parameter settings.



The settings are defined in the factory and protected by an access code which disables parameter modifications.

Press the SET key .

When the code is displayed, (0 set at factory), press the ENTER key.

The access code can be changed.

ENTER PASSWORD

CODE : * 0 *

Parameters can be transferred from one pump to another.

This can be done if the pump is to be replaced or when installing a new pump (see C 70).

Monitoring system function table IPUP A100P version

ACCESS TO PARAMETER SETTINGS

Access the parameters by validating the access code (see C 30).

DEFINITION MENU

	SET	ENTER	ENTER	ENTER	
DEFINITION	LANGUAGE	FRENCH/ENGLISH	All the menus are in the selected language.		Initial configuration English
	SYSTEM SELECT	A 100L A 100P	Select the pump type.		A 100P
	POWER START	ENABLED DISABLED	Allows automatic pump start when powered ON (control remote DISABLED only) (see C 10).		DISABLED
	CONTROL REMOTE	ENABLED DISABLED	Allows pump command through SPI connector (see C 10).		ENABLED
	PURGE COMMAND	ENABLED DISABLED	Allows independant purge control at pump start-up. The purge flow is controlled by the PURGE control key or pump start-up controlled.		DISABLED
	INTERN. T° OPTION	ENABLE DISABLED	Temperature regulation validation.		ENABLED
	BUZZER	ENABLED DISABLED	Controls buzzer ON/OFF in case of a fault. Buzzer stop by pressing ENTER.		ENABLED



Do not set a P pump to an L pump configuration. Line N2 will not be supplied and the internal temperature regulation will be false. This will quickly wear down the pump's parts. Select the pump for the process it is being used in.

Monitoring system function table IPUP A100P version

SETTING MENU

				Initial configura tion
SETTING	SERIAL LINK	TYPE	RS232/RS485/Network	RS 485
		ECHO	ENABLED/DISABLED	ENABLED
		SPEED	9600	9600 baud
		PARITY	no/even/odd	no
		2 STOP BITS	ENABLED/DISABLED	DISABLED
		ADDRESS	min: 0 max: 999	0
	N2 FLOW SENSOR	WARNING TIME	0 to 60 min or DISABLED	2 min
		HAZARD TIME	0 to 60 min or DISABLED	DISABLED
	PRESSURE		min: 550 max: 1100	950 mbar
	INTERN T°	INPUT VALUE	min: 90° C max: 130° C	90° C
		HAZARD THRESHOLD	Input value + 10° C min: 125° C max: 140° C	130° C
	F.C DISPLAY CHOICE		min: 1 max: 29	1
	F.C PARAMETER		min: 1 max: 100	30
	N2 FLOW PROLONGED		0 to 120 min	0 min
	DATE AND TIME	day/month/year/hour/ minute		
TEMPERATURE UNIT	°C / °F	Celsius/Fahrenheit	Celsius	
PRESSURE UNIT		mbar/Torr/PSI/hPa	mbar	
Contrast	Press + or --	Contrast display setting		

Monitoring system function table IPUP A100P version

MAINTENANCE MENU

 		 		Initial configuration
MAINTENANCE	RUN TIME	0 to 65500 h		x
	OVERHAUL MAINT.	0 to 65500 h		x
	EXHAUST MAINT.	0 to 65500 h		x
	PARTIAL MAINT.	0 to 65500 h		x
	OVERHAUL. WARNING	1000 to 34000 h		17000 h
	EXHAUST WARNING	1000 to 34000 h		8500 h
	PART. MAINT. WARNING	1000 to 34000 h		8500 h

- Maintenance warning parameters have to be set according to table (see E 10).

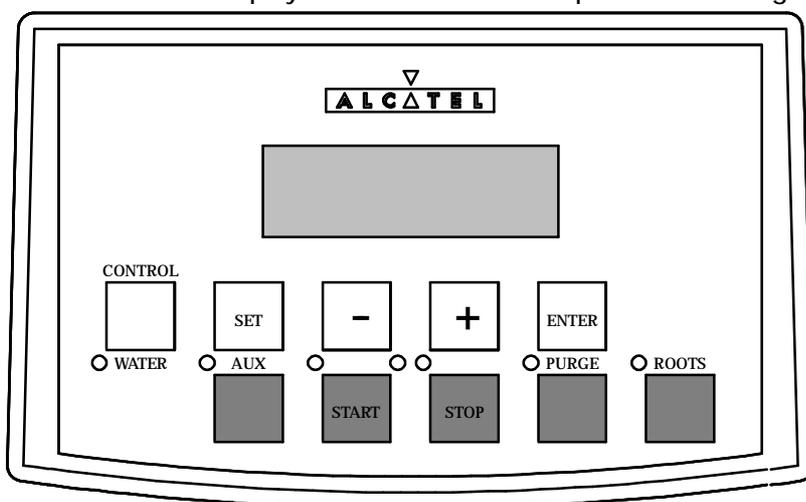
MANAGEMENT MENU, OPERATING TIME, LAST TEN WARNINGS, LAST TEN HAZARDS

										Initial configuration
MANAGEMENT	PASSWORD			0 to 65535						
	VERSION	FRAME SERIAL N° M40 SERIAL N° M40 OTP VERSION M40 FLASH VERSION ADP 100 SERIAL N° OTP DISP. VERSION FLASH DISP. VERSION								
	STORAGE			ENABLED/DIS- ABLED		DIS- ABLED				
	CONFIG SAVE	Save the pump configuration into the remote display memory. Valid by pressing Enter Key.								
	CONFIG LOAD	Allow to transfer the remote display memory into the pump memory. Valid by pressing Enter Key.								
OPERATING TIME	Displays the operating times of the various components.									
LAST WARNING(S)	Displays the 10 last recorded warnings.									
LAST ALARM(S)	Displays the 10 last recorded hazards.									

Monitoring system function table IPUP A100L version

PUMP CONFIGURATION

Use the hand held display module to access the parameter settings



The settings are defined in the factory and protected by an access code which disables parameter modifications.

Press the SET key.

When the code is displayed, (0 set at factory), press the ENTER key.

Access code can be changed.

ENTER PASSWORD

CODE : * 0 *

Parameters can be transferred from one pump to another.

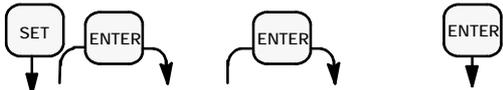
This can be done if the pump is to be replaced or when installing a new pump (see C 70).

Monitoring system function table IPUP A100L version

ACCESS TO THE "PARAMETER PROGRAMING"

Access to the parameters by validating the access code (see C 30).

DEFINITION MENU

				Initial configuration
DEFINITION	LANGUAGE	FRENCH/ENGLISH	All the menus are in the selected language.	English
	SYSTEM SELECT	A 100L A 100P	Select the pump type.	A 100L
	POWER START	ENABLED DISABLED	Allows automatic pump start when powered ON (control remote DISABLED only) (see C 10).	DISABLED
	CONTROL REMOTE	ENABLED DISABLED	Allows pump command through SPI connector (see C 10).	ENABLED
	BUZZER	ENABLED DISABLED	Controls buzzer ON/OFF in case of fault. Buzzer stop by pressing ENTER.	ENABLED



CAUTION

Do not set an L pump to a P pump configuration.
The N2 flow and internal temperature alarms will quickly shut off the pump.
Select the pump for the process it is being used in.

Monitoring system function table IPUP A100L version

SETTING MENU

							Initial configuration
SETTING	SERIAL LINK	TYPE	RS232/RS485/Network		RS 485		
		ECHO	ENABLED/DISABLED		ENABLED		
		SPEED	9600		9600 baud		
		PARITY	no/even/odd		no		
		2 STOP BITS	ENABLED/DISABLED		DISABLED		
		ADDRESS	min: 0 max: 999		0		
	DATE AND TIME	day/month/year/hour/ minute					
Contrast	Press + or --	Contrast display setting					

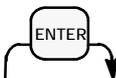
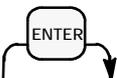
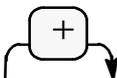
MAINTENANCE MENU

						Initial configuration
MAINTENANCE	RUN TIME	0 to 65500 h		x		
	OVERHAUL MAINT.	0 to 65500 h		x		
	PARTIAL MAINT.	0 to 65500 h		x		
	OVERHAUL. WARNING	1000 to 42000 h		26000 h		
	PART. MAINT. WARNING	1000 to 42000 h		13000 h		

- Maintenance warning parameters have to be set according to table (see E 10).

Monitoring system function table IPUP A100L version

MANAGEMENT MENU, OPERATING TIME, LAST TEN WARNINGS, LAST TEN HAZARDS

    	Initial configuration			
MANAGEMENT	PASSWORD		0 to 65535	
	VERSION	FRAME SERIAL N° M40 SERIAL N° M40 OTP VERSION M40 FLASH VERSION ADP 100 SERIAL N° OTP DISP. VERSION FLASH DISP. VERSION		
	STORAGE		ENABLED/DIS- ABLED	DIS- ABLED
	CONFIG SAVE	Save the pump configuration into the remote display memory. Valid by pressing Enter Key.		
	CONFIG LOAD	Allow to transfer the remote display memory into the pump memory. Valid by pressing Enter Key.		
OPERATING TIME	Displays the operating times of the various components.			
LAST WARNING(S)	Displays the 10 last recorded warnings.			
LAST ALARM(S)	Displays the 10 last recorded hazards.			

Gas purge and temperature according to the semiconductor processes

Processes		Pump	pressure regulator adjustment	N2 (1)	IPUP A100 Temp.	
CLEAN	Load--lock and transfer chamber pumping	IPUP A100L	0	0	--	
	Sputtering		0	0	--	
MEDIUM	Dielectric etch	IPUP A100P	0.5 bar	20 slm	not regul.	not regul.
	Stripping		0.5 bar	20 slm	not regul.	not regul.
	Resist and polyamid etch		0.5 bar	20 slm	not regul.	not regul.
	Metal etch (Al, W, Ta, Ti, TiN)		0.5 bar	20 slm	105 °C	221 °F
	Polysilicon etch		0.5 bar	20 slm	95 °C	203 °F
	Ion implant (source)		1 bar	35 slm	not regul.	not regul.
	Tungsten CVD (W CVD)		1 bar	35 slm	not regul.	not regul.
	Titanium and Titanium nitride CVD (Ti, TiN CVD)		1 bar	35 slm	not regul.	not regul.
	Silicon epitaxy		1.5 bar	50 slm	95 °C	203 °F
	SiO ₂ CVD using silane as silicon source		1 bar	35 slm	95 °C	203 °F
	Polysilicon CVD		1 bar	35 slm	95 °C	203 °F
Undoped SiO ₂ HDPCVD	1 bar	35 slm	95 °C	203 °F		
HARSH	Non doped SiO ₂ CVD using TEOS	IPUP A100P	1 bar	35 slm	95 °C	203 °F
	Doped SiO ₂ CVD using TEOS (PSG, BSG, BPSG)		1.5 bar	50 slm	105 °C	221 °F
	SACVD oxide using TEOS		1.5 bar	50 slm	105 °C	221 °F
	Silicon nitride and nitroxide PECVD		1.5 bar	50 slm	115 °C	239 °F
	Silicon nitride LPCVD		1.5 bar	50 slm	115 °C	239 °F
	MOCVD doped using phosphorus		1.5 bar	50 slm	95 °C	203 °F
	Doped SiO ₂ CVD using phosphorus, boron or fluorine HDPCVD		1.5 bar	50 slm	105 °C	221 °F

(1) N2 values are given in standard liter per minute.
 These are the minimum nitrogen flow rates that should be used according to these baseline processes.
 More N2 should be used as necessary.

In any case, water flow rate is 100 l/h min.

Note : This table is only for information. It can be adapted to specific customer process.

- For any other processes or chemicals not referenced above, contact ALCATEL for compatibility.

Saving and loading of pump configuration (with monitoring system)

For pump installation or replacement, the user may have to copy the configuration (set of all parameters and operation setting programmed by the user) from one pump to another.

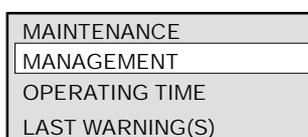


Loading and saving the parameters with the pump in operation may result in a software conflict. Perform these operations when the pump is switched on but with pumping stopped.

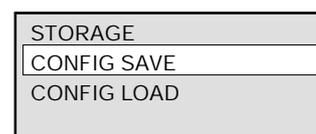
Saving the configuration

The pump configuration is stored in the monitoring system.

Enter in the menu by pressing SET.
Press the + key repeatedly to have access to the MANAGEMENT menu.
Validate with the ENTER key.



With the + key, move through to CONFIG. SAVE menu.
Validate with the ENTER key.



The pump configuration is then transferred into the hand held display module memory.

Return to main menu and exit the setting mode by pressing SET.

Disconnect the hand held display module.

Remote loading

Connect the hand held display module onto the pump to be configured.

Load the configuration previously saved in the hand held display module into the pump by selecting the CONFIG LOAD menu from MANAGEMENT menu.

The former configuration is automatically reset.



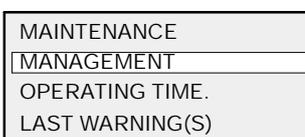
Loading parameters may result in creating software conflicts. After loading, configure manually the following parameters (temperature unit, pressure unit, serial link, time and date).

Monitoring system setting for transport

Setting "storage" mode for transport and prolonged storage

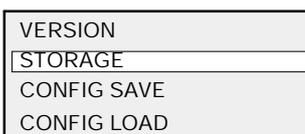
Enter the menu by pressing SET.

Press the + key repeatedly to access the MANAGEMENT menu.



Validate with the ENTER key.

With the + key, move through to STORAGE menu.



Validate with the ENTER key.

Choose ENABLED.

Validate with the ENTER key proceed twice on the SET key.



STOCK appears on display.

The pump start up is no longer possible and the hour counter is stopped.

NOTE : when power comes on, STORAGE mode is automatically deleted.

Date and time reset is only necessary (see C 20).

Use of the serial link

MONITORING SYSTEM PARAMETER CONFIGURATION

Setting

Action

Display

Access to "SETTING" menu

Enter the menu by pressing SET.

Press the + key repeatedly to access the SETTING menu.

Validate with the ENTER key.

DEFINITION MENU
SETTING
MAINTENANCE
MANAGEMENT

Access to the parameter settings by the "SERIAL LINK" menu

Press the + key repeatedly to access the SERIAL LINK menu.

Validate with the ENTER key.

SETTING
SERIAL LINK
N2 FLOW SENSOR
PRESSURE

Access to the parameter to be modified

Modify the chosen parameter with + or - key.

Validate the setting with the ENTER key.

Return to main menu with SET key.

SERIAL LINK	
TYPE :	RS 485
ECHO :	ENABLED
SPEED :	9600
PARITY :	NO
2 STOP BITS :	DISABLED
ADDRESS :	0

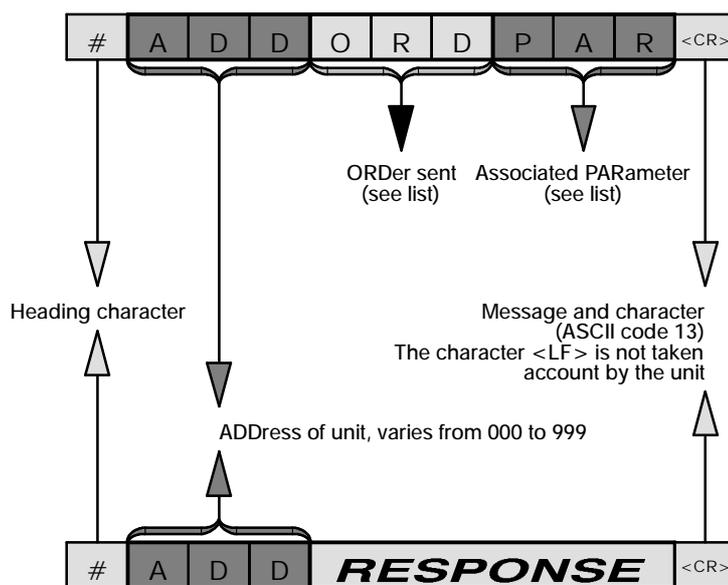
Use of the serial link

CONTROLLING THE UNIT PUMPING USING THE SERIAL LINK

The controls are used to manage information relative to the working pump. The pumping remote controls are however managed as a priority.

INSTRUCTION SYNTAX

The control



The response

Example of dialog :

E : q000SYSON<CR>

R : q000K..<CR>

Use of the serial link

LIST OF CONTROLS

ORDER	PARAMETER	RESPONSE	ACTION
DLI	XXX	OK or ERR2	● Program the automatic transmission interval in minutes: 1 to 255 sec.
DLR	None	OK	● Start up the Data Logger (ATPI) for RS 232 only.
ECH	ON or OFF	OK or ERR2	● Return all characters received on the serial link in the ECHON case.
HDR	<val> see folio 6/6	OK or ERR3	● Change the response heading character.
IDN	None	V X.X	● Send back the software version number
SET	XXYZZZZ	OK or ERR2	<ul style="list-style-type: none"> ● Parameter setting ● Example : # 0 0 0 S E T X X Y Z Z Z Z <p>XX = 00 : reserved 01 : reserved 02 : reserved 03 : nitrogen flow 04 : reserved 05 : reserved 06 : purge flow prolonged 07 : full overhaul 08 : P out maintenance 09 : reserved 10 : exhaust Maintenance 11 : reserved 12 : reserved 13 : pressure alert threshold 14 : date setting : Day 15 : date setting : Month 16 : date setting : Year 17 : time setting : Hour 18 : time setting : Minute 19 : free 20 : setpoint (0) / ADP T° alarm (1) 21 : reserved 22 : reserved</p> <p>Y = 0 : alert 1 : alarm</p> <p>ZZZZ = threshold value (see page 5/6)</p>
SEP	<val> see page 5/6	OK or ERR3	● Used to change the separator character between the two consecutive data items in a response.
SYS	ON or OFF	OK or ERR2	● Start up the pumping unit with SYSON and stop with SYSOFF.
TPS	XX		<ul style="list-style-type: none"> ● Maintenance time <p>XX = 00 : running time 01 : full overhaul 02 : P out maintenance 03 : reserved 04 : exhaust Maintenance 05 : reserved 06 : reserved</p>

Use of the serial link

LIST OF CONTROLS (CONT'D)

ORDER	PARAMETER	RESPONSE	ACTION		
PUR	ON or OFF	OK or ERR2	<ul style="list-style-type: none"> ● Start up the purge with PURON, and stop with PUROFF. 		
DEF	XXY	FAULT	<ul style="list-style-type: none"> ● Display the 10 last Alerts or Alarms ● Example : # 0 0 0 D E F X X Y XX = 0 to 09 Y = 0 alarm 1 alert 		
STA	None	<ul style="list-style-type: none"> ● Transmission of a Data Logger frame ● Example : <pre>#000 0010001000 0990 0 000 017 000 000 00 0000000000000000000000 000 0/3 5/15 17/20 22/25 27/29 31/33 35/37 39/42 44/45 47/67 69/71</pre> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> 0 : header character 1-2-3 : address 4 : separator character 5 : ADP status 6 : reserved 7 : purge status 8 : reserved 9 : water valve 10 : reserved 11 : reserved 12 : ADP water valve 13 : reserved 14 : reserved 15 : control in bit 3 and monitoring 0-1-2 16 : separator character 17-20 : pressure (mbar) 21 : separator character 22-25 : power (W) 26 : separator character 27-29 : ADP temperature (° C) 30 : separator character 31-33 : reserved 34 : separator character 35-37 : reserved 38 : separator character 39-42 : analog input (mV) </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> 43 : separator character 44-45 : value hazard FC 46 : separator character 47 : pressure fault 48 : reserved 49 : reserved 50 : reserved 51 : reserved 52 : reserved 53 : frequency control 54 : reserved 55 : reserved 56 : motor temperature fault 57 : reserved 58 : reserved 59 : N2 purge fault 60 : maintenance fault 61 : ADP temperature fault 62 : N2 pressure fault 63 : reserved 64 : reserved 65 : reserved 66 : reserved 67 : reserved 68 : separator character 69-72 : N2 purging on second 73 : CR </td> </tr> </table>		<ul style="list-style-type: none"> 0 : header character 1-2-3 : address 4 : separator character 5 : ADP status 6 : reserved 7 : purge status 8 : reserved 9 : water valve 10 : reserved 11 : reserved 12 : ADP water valve 13 : reserved 14 : reserved 15 : control in bit 3 and monitoring 0-1-2 16 : separator character 17-20 : pressure (mbar) 21 : separator character 22-25 : power (W) 26 : separator character 27-29 : ADP temperature (° C) 30 : separator character 31-33 : reserved 34 : separator character 35-37 : reserved 38 : separator character 39-42 : analog input (mV) 	<ul style="list-style-type: none"> 43 : separator character 44-45 : value hazard FC 46 : separator character 47 : pressure fault 48 : reserved 49 : reserved 50 : reserved 51 : reserved 52 : reserved 53 : frequency control 54 : reserved 55 : reserved 56 : motor temperature fault 57 : reserved 58 : reserved 59 : N2 purge fault 60 : maintenance fault 61 : ADP temperature fault 62 : N2 pressure fault 63 : reserved 64 : reserved 65 : reserved 66 : reserved 67 : reserved 68 : separator character 69-72 : N2 purging on second 73 : CR
<ul style="list-style-type: none"> 0 : header character 1-2-3 : address 4 : separator character 5 : ADP status 6 : reserved 7 : purge status 8 : reserved 9 : water valve 10 : reserved 11 : reserved 12 : ADP water valve 13 : reserved 14 : reserved 15 : control in bit 3 and monitoring 0-1-2 16 : separator character 17-20 : pressure (mbar) 21 : separator character 22-25 : power (W) 26 : separator character 27-29 : ADP temperature (° C) 30 : separator character 31-33 : reserved 34 : separator character 35-37 : reserved 38 : separator character 39-42 : analog input (mV) 	<ul style="list-style-type: none"> 43 : separator character 44-45 : value hazard FC 46 : separator character 47 : pressure fault 48 : reserved 49 : reserved 50 : reserved 51 : reserved 52 : reserved 53 : frequency control 54 : reserved 55 : reserved 56 : motor temperature fault 57 : reserved 58 : reserved 59 : N2 purge fault 60 : maintenance fault 61 : ADP temperature fault 62 : N2 pressure fault 63 : reserved 64 : reserved 65 : reserved 66 : reserved 67 : reserved 68 : separator character 69-72 : N2 purging on second 73 : CR 				

GB 00542

Use of the serial link

TABLE OF MAX. / MIN. PARAMETERS THRESHOLDS

PARAMETER	UNIT	THRESHOLDS		
		MIN.	MAX.	LIMIT
Purge flow sensor	min	0	60	61 invalid
Purge prolonged time	min	0	120	
Pump temperature regul.	°C	90	130	

MODIFYING THE SEPARATOR CHARACTER

ORDER	PARAMETER	RESPONSE	ACTION
SEP	<val> val = decimal value of the ASCII code of the separator character between 1 and 255	OK or ERR3	<ul style="list-style-type: none"> ● Change the separator character between two consecutive data items in a response. ● The factory configuration is the decimal code "032" of the "space" character. ● Memorization of the customer configuration by the software.

Example :

A command such as: #000SEP044<CR> where "044" is the decimal ASCII code of the character "," (comma).

Command #000STA<CR>

Response #000,00000,2,0080,2530,0127,1230,0000000000<CR>

Only commands requiring the separator character are affected by the SEP command.

Use of the serial link

MODIFYING THE HEADER CHARACTER

ORDER	PARAMETER	RESPONSE	ACTION
HDR	<p><val> val = decimal value of the ASCII code of the header character between 0 and 127.</p>	<p>OK or ERR3</p>	<ul style="list-style-type: none"> ● Change the header character in front of a response address. ● The factory configuration is the decimal code "035" of the character "#". ● Memorization of the customer configuration by the monitoring. ● The code "000" corresponds to "no header character".

Example :

The value "047", the decimal ASCII code of the character "/".

command #002HDR047<CR>

response /002OK

command 002IDN<CR>

response /002M4ADP100X V1.XX

INTERPRETING RESPONSES SUPPLIED BY THE SERIAL LINK

OK or a specific response to the order if everything is correct.

ERR0 : setting fault

ERR1 : order fault

ERR2 : parameter fault

ERR3 : context fault

ERR4 : checksum fault

NOTE: "The remote control mode" has priority on RS 232 or RS 485 commands.

Chapter D

IPUP A100 instruction manual

Troubleshooting

■	First level of troubleshooting	■	D 10
■	Diagnosis and troubleshooting	■	D 20
■	Message numbers	■	D 30
■	Pump does not start. Hand held display module is not illuminated	■	D 40
■	Pump does not start. IPUP A100 without hand held display module ...	■	D 50
■	Pump does not start. Hand held display module is illuminated	■	D 60
■	Pump does not start. Display is showing a message or an alarm	■	D 70
■	Fault message display. Facilities problem	■	D 80
■	Fault message display. Temperature problem	■	D 90
■	Fault message display. Pressure problem	■	D 100
■	Fault message display. Maintenance problem	■	D 110
■	Pump is running. No message	■	D 120

First level of troubleshooting

When a problem occurs, the user is informed by:

- the relevant fault indicator light which is located on the front panel: yellow and green lit in case of warning, red lit in case of hazard (followed by a pump stop),
- the display of fault message if the hand held display module is connected,
- a message via the RS 232 / 485 link.

MAINTENANCE TIME MONITORING

Depending on the programmed values, when operating time for maintenance is reached, the corresponding warning message will be displayed in alternance with the operating parameters.

The yellow and green indicators are illuminated on the front panel.

Press the SET button during the pumping and the programmed operating times for the components will be displayed.

This information can be read at any time using the MAINTENANCE menu.

GENERAL ELECTRICAL DIAGRAM

When troubleshooting the pump (*using D 20*) you may need to check the electrical components of the IPUP A100 (*see G 10*).

Diagnosis and troubleshooting

MESSAGE NUMBERS

- Message numbers D 30

PUMP DOES NOT START

- Hand held display module is not illuminated D 40
- IPUP A100 without hand held display module ... D 50
- Hand held display module is illuminated D 60
- Display is showing a message or an alarm D 70

FAULT MESSAGE DISPLAY

- Facilities problem D 80
- Temperature problem D 90
- Pressure problem D 100
- Maintenance problem D 110

PUMP IS RUNNING

- No message D 120

Message numbers

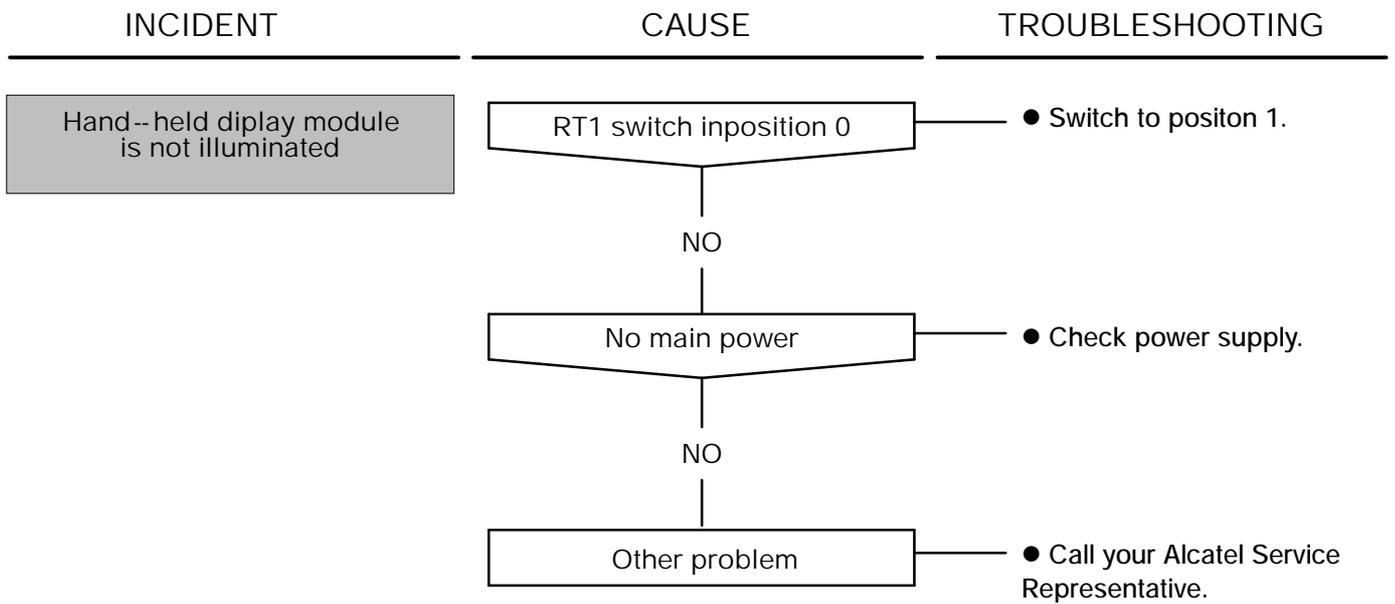
LIST OF PROBLEMS WHICH GENERATE A FAULT MESSAGE ON THE HAND HELD DISPLAY MODULE

Each fault number will be preceded by the letter W or D:

- the letter W indicates a Warning message.
- the letter D indicates a Hazard message.

FAULT NUMBER	MESSAGE	REFERENCE
01	EXHAUST. PRESSURE	D 70
		D 100
07	FREQUENCY CON- VERTER	
10	MOTOR TEMP	D 80
13	N2 FLOW	D 80
15	INTERNAL T° HIGH	D 90
16	INTERNAL T° LOW	D 90
30	EXHAUST MAINT.	D 110
31	IPUP A100 LP MAINT.	D 110
32	IPUP A100 MAINT.	D 110

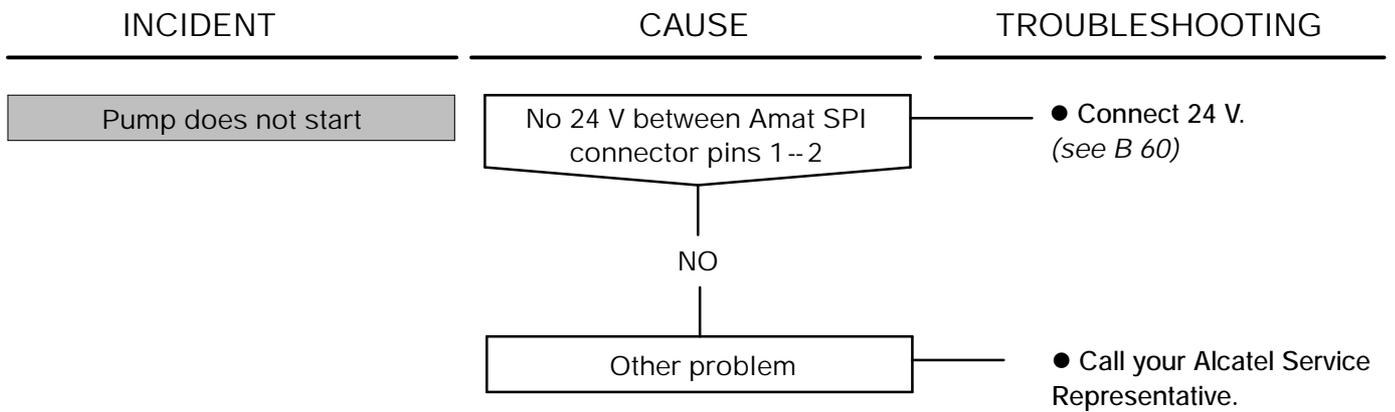
Pump does not start.
Hand held display module is not illuminated



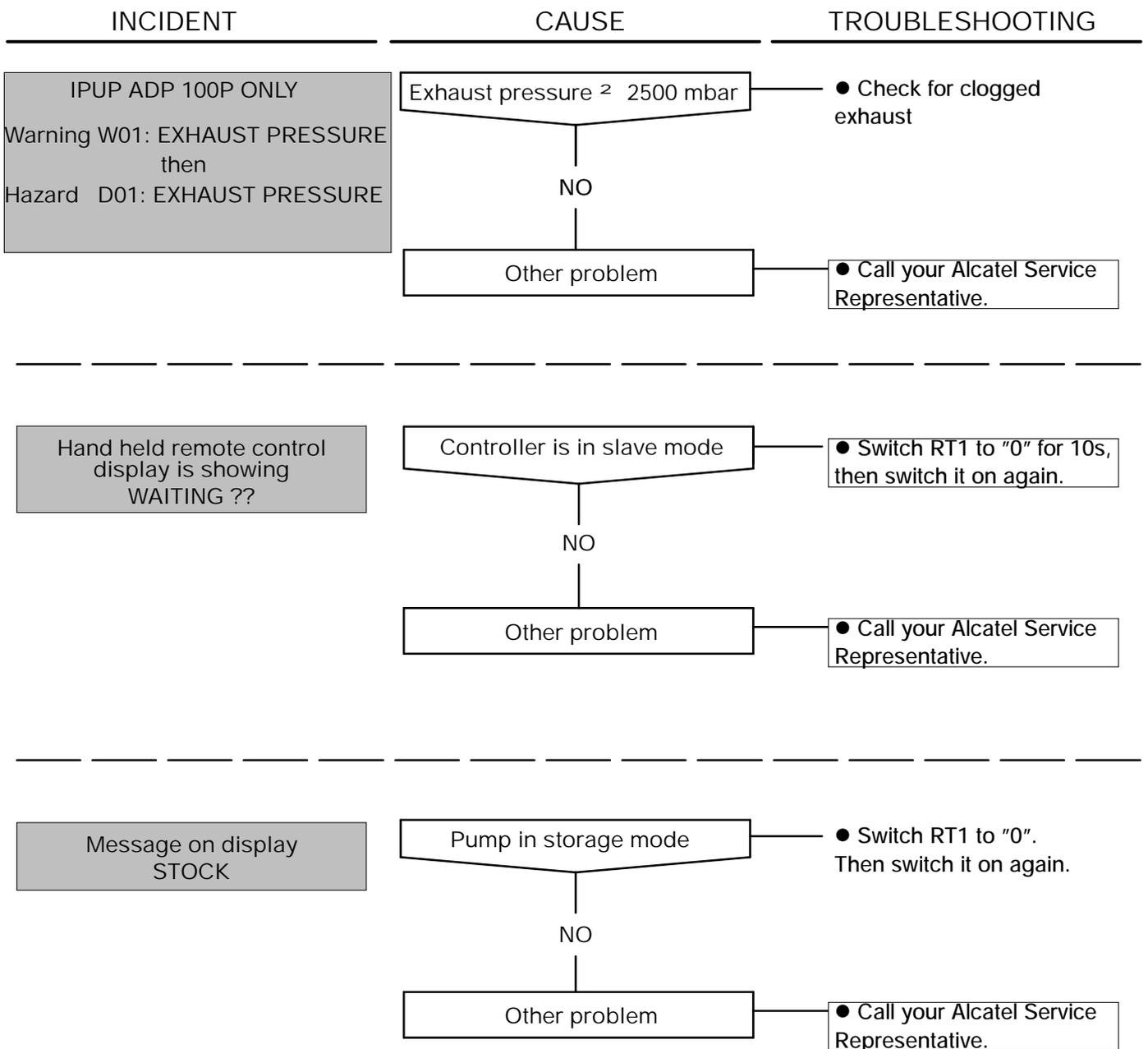
Pump does not start.
 IPUP A100 without hand held
 display module

INCIDENT	CAUSE	TROUBLESHOOTING
<p>Pump does not start</p>	<p>No 24 V between Amat SPI connector pins 1--2</p>	<ul style="list-style-type: none"> ● Connect 24 V. (see B 60)
	<p>NO</p>	
	<p>RT1 switch in position 0</p>	<ul style="list-style-type: none"> ● Switch to positon 1.
	<p>NO</p>	
	<p>No main power</p>	<ul style="list-style-type: none"> ● Check power supply.
	<p>NO</p>	
	<p>Other problem</p>	<ul style="list-style-type: none"> ● Call your Alcatel Service Representative.

Pump does not start.
Hand held display module is illuminated



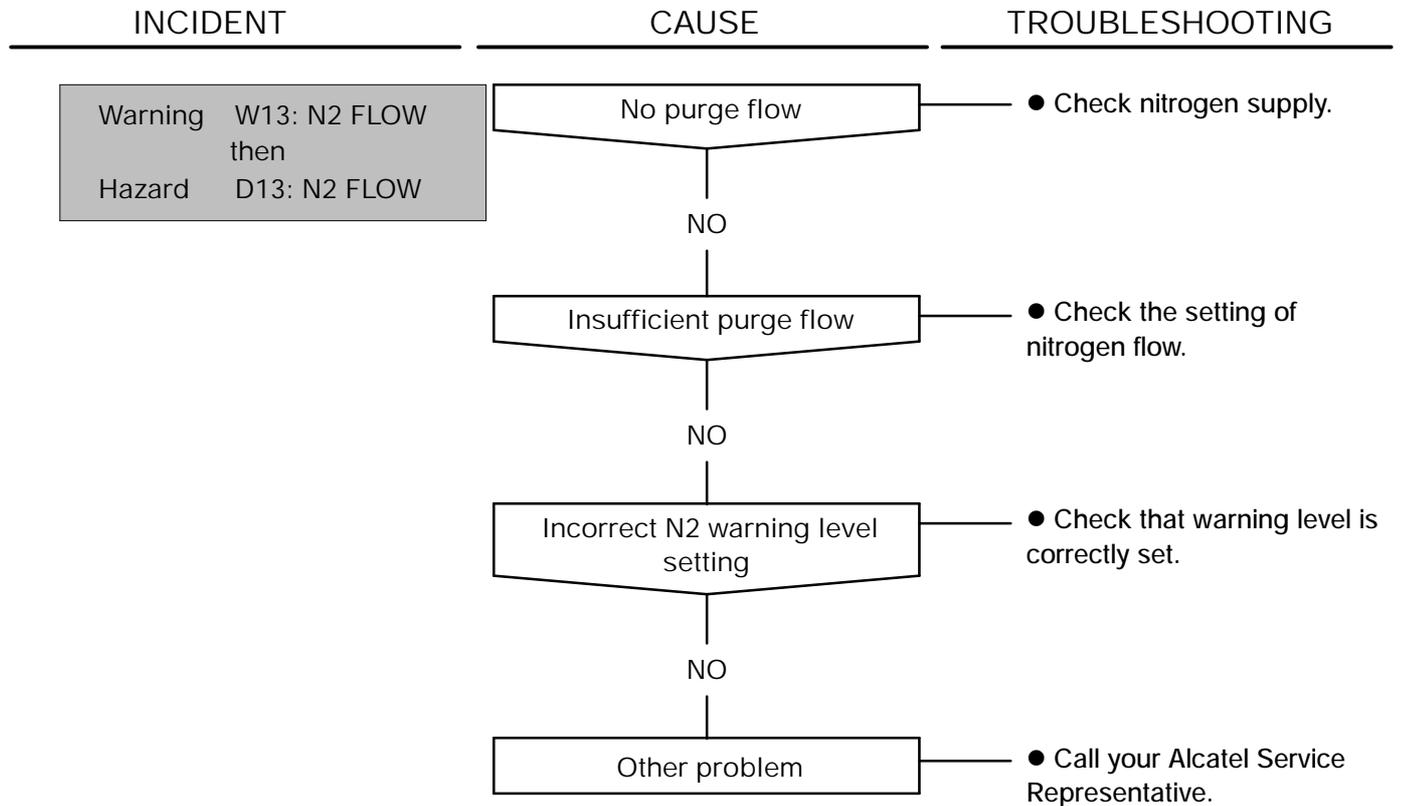
Pump does not start.
Display is showing a message or an alarm



Fault message display – Facilities problem

IPUP A100P WITH HAND HELD DISPLAY MODULE

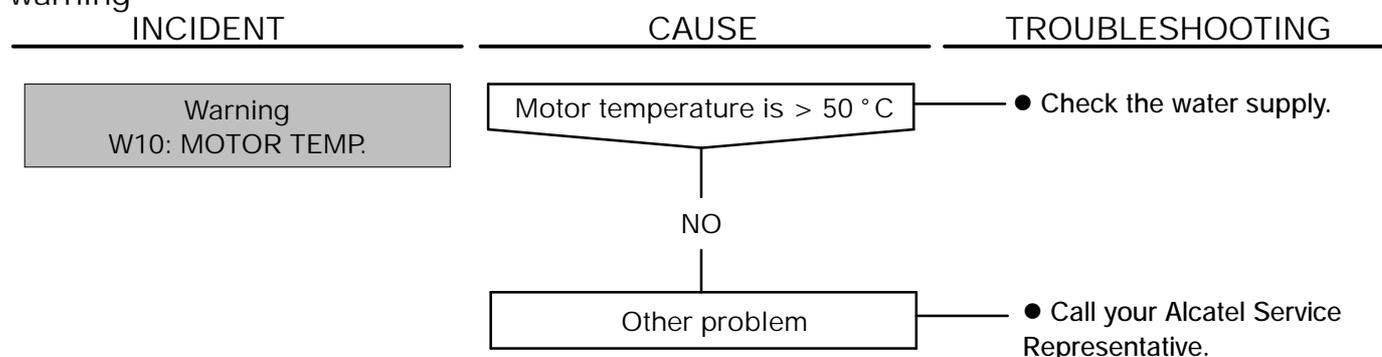
Pump is running and displays a warning



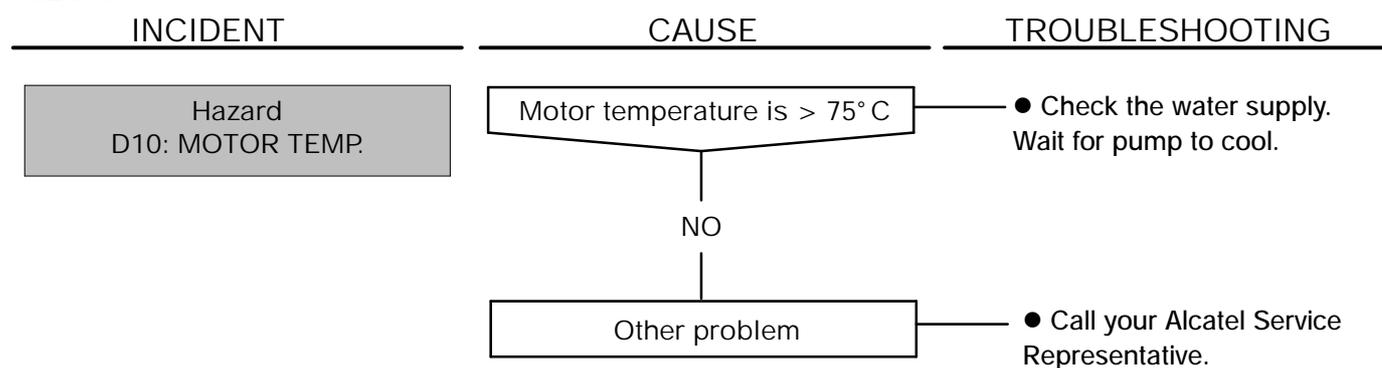
Fault message display – Facilities problem

IPUP A100 WITH HAND HELD DISPLAY MODULE

Pump is running and displays a warning



Pump is stopped and displays a hazard



Fault message display – Temperature problem

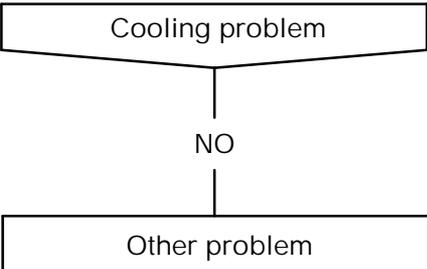
IPUP A100P WITH HAND HELD
DISLAY MODULE

Pump is running and displays a
warning

INCIDENT	CAUSE	TROUBLESHOOTING
<p>Warning INTERNAL T° HIGH or LOW</p>	<pre> graph TD A[Cooling problem] --> B[NO] B --> C[Other problem] </pre>	<ul style="list-style-type: none"> ● Check the water supply. ● Call your Alcatel Service Representative.
<p>W15: INTERNAL T° HIGH Pump temperature > 10°C compared to temperature control setting value</p>		
<p>W16: INTERNAL T° LOW Pump temperature < 10°C compared to temperature control setting value</p>		<ul style="list-style-type: none"> ● Call your Alcatel Service Representative.

Fault message display – Temperature problem

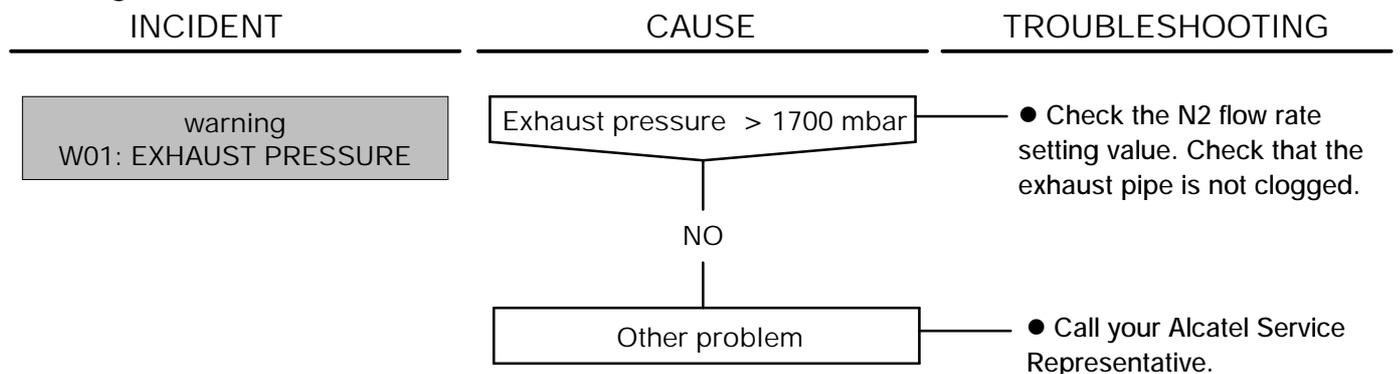
Pump is stopped and displays a hazard

INCIDENT	CAUSE	TROUBLESHOOTING
<p data-bbox="82 900 510 981">Hazard D15: INTERNAL T° HIGH</p> <p data-bbox="82 1003 510 1120">Pump temperature reaches temperature control setting value +/- 10° C but the display is 0 or 170° C</p>		<ul data-bbox="1082 1003 1404 1070" style="list-style-type: none"> ● Call your Alcatel Service Representative.
<p data-bbox="82 1361 510 1420">Pump temperature is higher than hazard threshold</p>	 <pre> graph TD A[Cooling problem] --> B[NO] B --> C[Other problem] </pre>	<ul data-bbox="1082 1361 1404 1630" style="list-style-type: none"> ● Check the water supply. ● Call your Alcatel Service Representative.

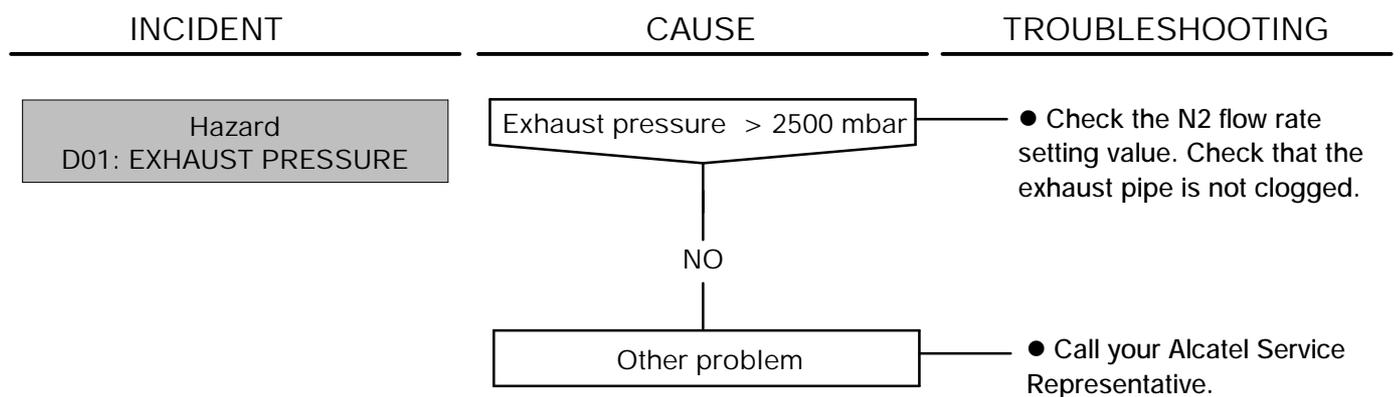
Fault message display – Pressure problem

IPUP A100P WITH HAND HELD
DISPLAY MODULE

Pump is running and displays a
warning



Pump is stopped and displays a
hazard

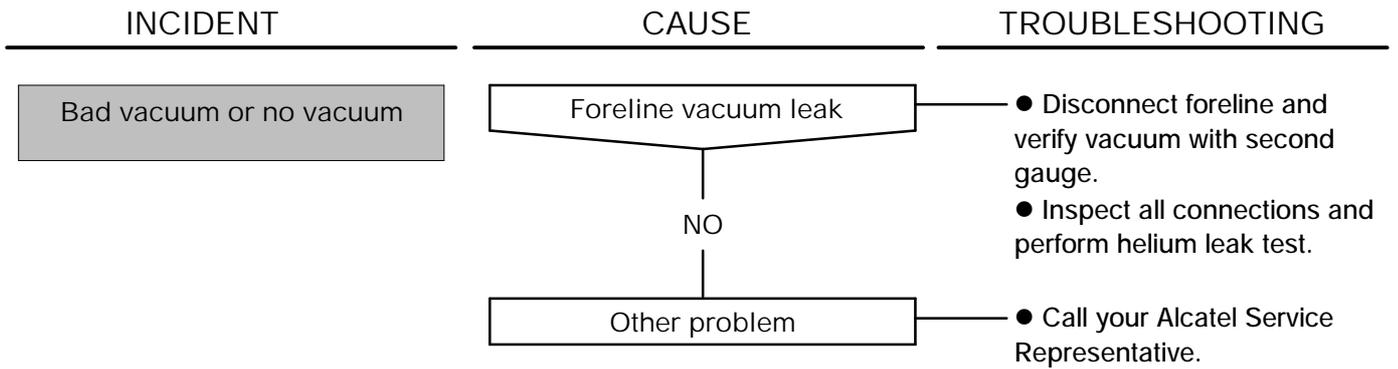


Fault message display – Maintenance problem

IPUP A100 VERSION WITH HAND
HELD DISPLAY MODULE

INCIDENT	CAUSE	TROUBLESHOOTING
W32: ADP MAINT. W31: ADP LP MAINT. W30: EXHAUST MAINT. (P only)	The maintenance threshold of a parameter is reached	● Check maintenance threshold. Perform maintenance (Call your Alcatel Service Representative).

Pump is running – no message



Chapter E

IPUP A100 instruction manual

Maintenance instructions

■	Maintenance frequency	■	E 10
■	Shipping procedure for contaminated pumps ..	■	E 20

Maintenance frequency

	Processes	Pump	Silencer cartridge	Lp bearing	Complete overhaul
CLEAN	Load--lock and transfer chamber pumping Sputtering	IPUP A100L	/	/	17000 h (2 years)
MEDIUM	Dielectric etch Stripping Resist and polyamid etch Metal etch (Al, W, Ta, Ti, TiN) Polysilicon etch Ion implant (source) Tungsten CVD (W CVD) Titanium and Titanium nitride CVD (Ti, TiN CVD) Silicon epitaxy SiO ₂ CVD using silane as silicon source Polysilicon CVD Undoped SiO ₂ HDPCVD	IPUP A100P	13000h (1.5 years)	13000h (1.5 years)	26000 h (3 years)
HARSH	Non doped SiO ₂ CVD using TEOS Doped SiO ₂ CVD using TEOS (PSG, BSG, BPSG) SACVD oxide using TEOS Silicon nitride and nitroxide PECVD Silicon nitride LPCVD MOCVD doped using phosphorus Doped SiO ₂ CVD using phosphorus, boron or fluorine HDPCVD	IPUP A100P	/	/	8500 h (1 year)

Maintenance times can change according to processes and equipment used.

Shipping procedure for contaminated pumps

Before shipping any pumps, remember to blow out the water line, purge the functional block with N₂ and pressurize with dry nitrogen.



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. (see C 50) page 3/4 for programming instructions.

Nitrogen pressure and flow rate should be identical to the programmed values during process.



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.

Procedure for emptying the water circuit

As the water circuit is equipped with water valve (normally closed), emptying operation must be done when the pump is running (so valves are opened).

Prepare a flexible pipe (A) with a 1/4 inch quick male connector (to be connected to compressed air circuit) and another flexible pipe (B) with a 1/4 inch female connector.

Disconnect inlet and outlet water fittings on the pump.

Connect pipe (A) on the pump, at location "Water Out" and place the other end of the pipe in a vessel (total water volume will be less than one litre).

Connect pipe (B) at location of "Water In" and connect the other end to a compressed air circuit (2 to 5 bars).

When the water is filled out, quickly stop the pump and disconnect pipes (A) and (B).

D This operation must be performed quickly, because without any water cooling the pump will overheat after a few minutes and will be in warning/hazard mode.

Shipping procedure for contaminated pumps

N2 PRESSURIZATION KIT

Refer to  F 30 N2 pressurization kit

Refer to  A 50 Accessories

Description	P/N	Qty
N2 pressurization kit	107956	1
Injector	106859	1

Inlet port

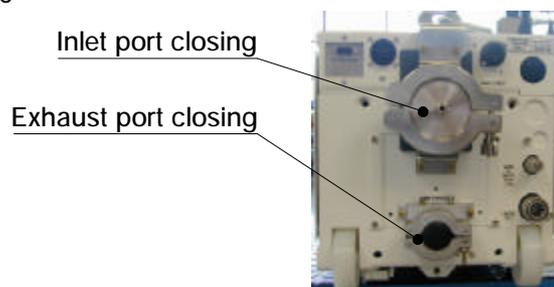
DN50 ISO KF

- Blank off flange DN50 equipped with male 1/8" Gconnector
- Centering ring DN50.
- O-ring DN50KF
- Quick connect clamp DN50

Exhaust port

DN25 ISO KF

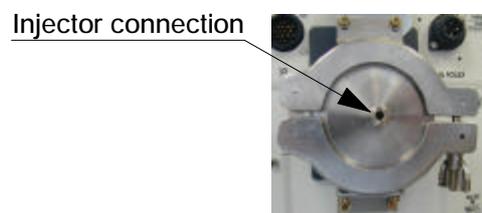
- Blank off flange DN25
- Centering ring DN25
- O-ring DN25KF
- Quick connect clamp DN20/25



Pressurization

Required accessories on purge port to maintain the pressure (DN50 ISO KF).

- Blank off flange DN50 equipped with male 1/8" G connector
- Injector



Shipping procedure for contaminated pumps

ROUGH DECONTAMINATION PROCEDURE

The pump must be disconnected from its installation and isolated electrically.



Install the pump under a suction hood.
It must remain there throughout the operation.

General sweeping

Fit the DN 50 blank off flange with anti-suckback valve on the inlet connector.

Sweep with dry nitrogen using the injector at an absolute pressure of 1.1 to 1.5 bar for 30 minutes.

Stop the nitrogen flow.

Pressurize the pump

Blank off the outlet port.

Pressurize the pump with dry nitrogen to an absolute pressure of 1.1 bar using the injector.

Shipping procedure for contaminated pumps

SAFETY QUESTIONNAIRE

This safety questionnaire should be completed by the customer before returning the pump to a service center for maintenance.



SAFETY QUESTIONNAIRE

Procedure for returning ALCATEL vacuum pumps and helium leak detectors

You wish to return an Alcatel vacuum pump or helium leak detector for maintenance. The equipment will be dismantled and possibly cleaned by a technician from our Service Centre. In order to ensure the effective safety of our staff and protection of the environment, we need to know the types of gas or substances with which the pump or leak detector has been used. This will enable us to take the appropriate safety measures.

The following page contains a questionnaire that you can use for this purpose. This procedure complies with the European Community's L360 directives and articles L231 and R231 of the French Labour Code.

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 helium detector].
 - **Biological** : pathogenic germs, micro-organisms (bacteria, viruses, etc.) classes 1 to 4 and group E. We are currently unable to deal with contamination of this sort without risk to the safety of our staff. If your equipment has been contaminated in this way, contact us so that we can try to find a solution together.
 - **Radioactive** : contact us in this case.
- **Attention**

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

Gases introduced

A

Reactor

Substances produced by reaction

B

Pump or pump unit

Exhaust

A

B

C

- 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.).

- Precautions need to be taken before transferring contaminated pumps. Please contact customer service for recommendations.

Shipping procedure for contaminated pumps

SAFETY QUESTIONNAIRE (CONT'D)



QUESTIONNAIRE DE SÉCURITÉ SAFETY QUESTIONNAIRE

Procédure de retour des Pompes à Vides et Détecteur de Fuite à Hélium ALCATEL
Procedure for returning ALCATEL Vacuum Pumps and Helium Leak Detectors
 (Ce formulaire ne peut être rempli et signé que par une personne habilitée.)
 (This questionnaire is only to be filled in and signed by an authorized person)

SOCIÉTÉ - COMPANY Nom Société - Name of company : <small>(Qui remplit ce formulaire) - (who has filled in questionnaire)</small> Nom personne - Name of person : 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>		ÉQUIPEMENT - 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 :			
ASPECT SÉCURITÉ - 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: <small>(nom et formule chimique) - (name and chemical formula)</small>			
Ces produits présentent un risque de nature These substances present the following risks			
Chimique - Chemical Toxique - Toxic Oui - Yes Non - No Carcinogénique - 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 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) 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" (nécessite une protection) Reply "YES" (requires protection)		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

Chapter F

IPUP A100 instruction manual

Maintenance components

■ N2 pressurization kit	■ F 10
-------------------------------	--------

N2 pressurization kit

DESCRIPTION

Description	P/N	Qty
N2 pressurization kit	107956	1
Blank off flange DN50		1
Male connector 1/8G		1
Centering ring DN50 with inlet screen		1
O-ring DN50KF		1
Quick connect clamp DN50		1
Blank off flange DN25		1
Centering ring DN25		1
Quick connect clamp DN20/25		1
O-ring DN25KF		1
Loctite		0.05
Injector	106859	1

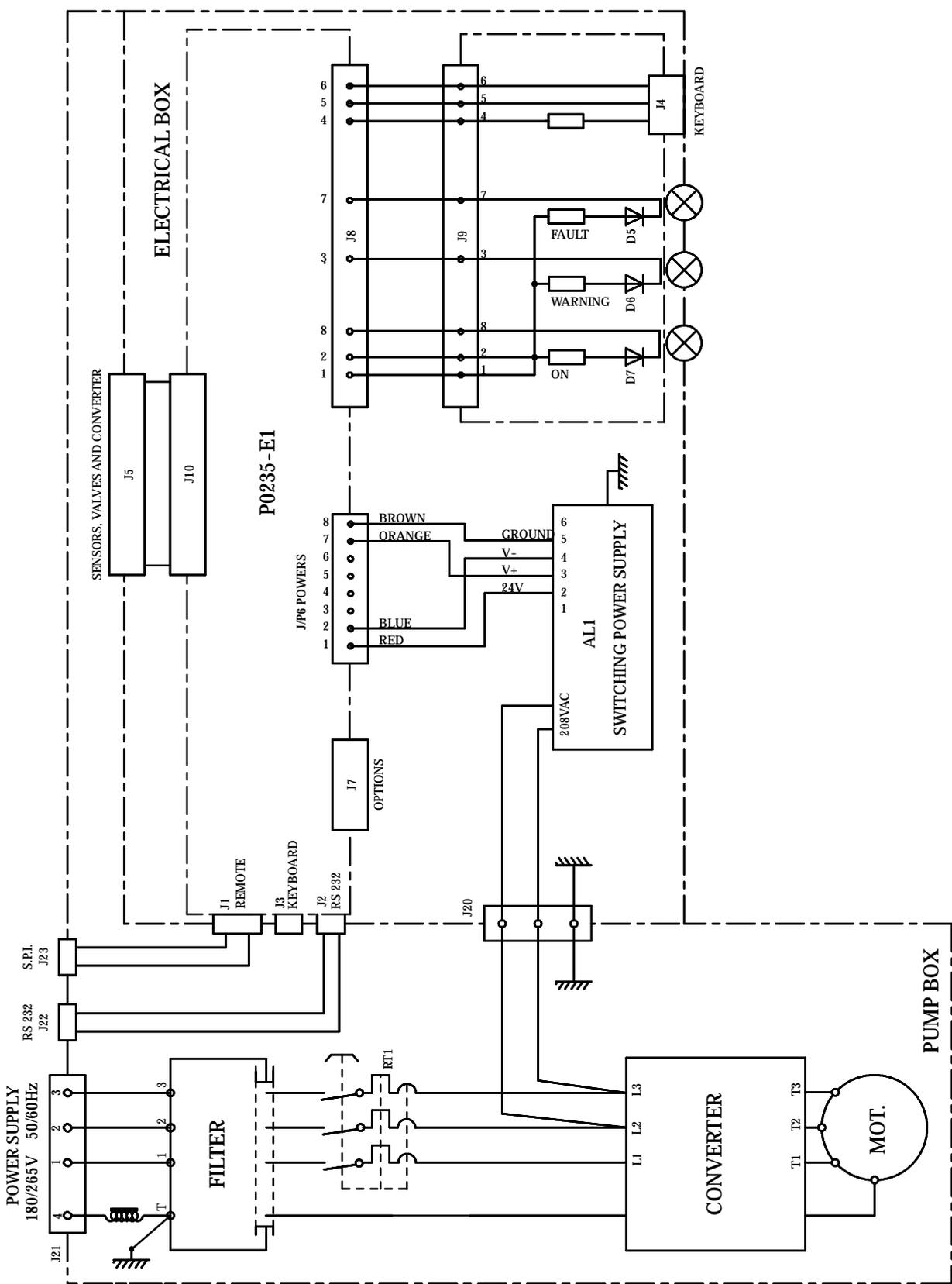
Chapter G

IPUP A100 instruction manual

Appendix

■ IPUP A100 electrical block diagram	■ G 10
■ Safety data sheet	■ G 20
■ Accessory part numbers	■ G 30

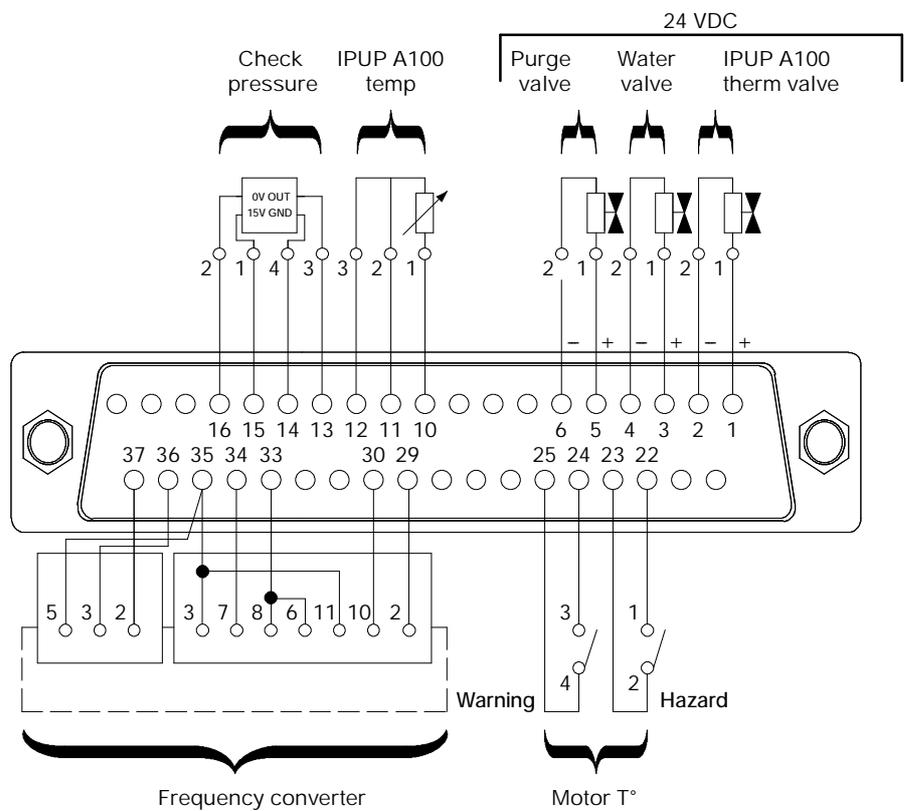
IPUP A100 electrical block diagram



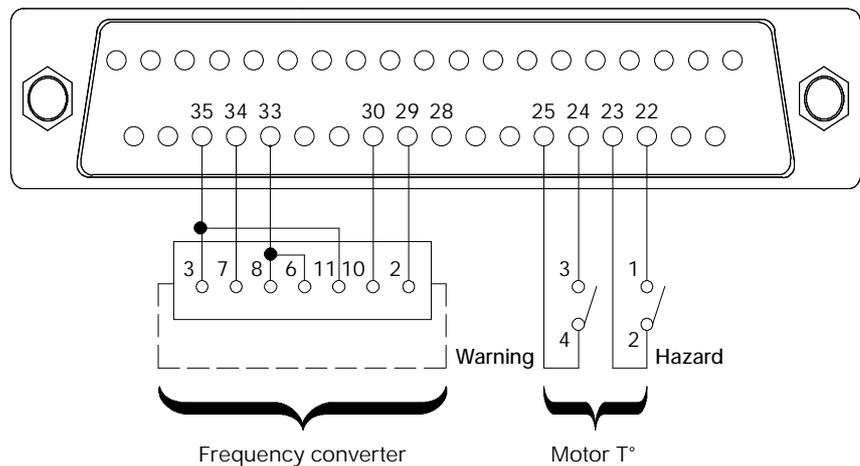
GB 00562

IPUP A100 electrical block diagram

J5 CONTROL CONTACTS IPUP A100P VERSION



J5 CONTROL CONTACTS IPUP A100L VERSION



Safety data sheet



SAFETY DATA SHEET

ref: sym/ss 58

updating: march, 1994

COMPOUND NAME:	FOMBLIN Y
COMPANY IDENTIFICATION	
Company:	AUSIMONT S.p.a
Address:	Via s. Pietro 50/A
City:	Bollate (MI)
Teleph. number:	39-2-3835.1
Fax number:	39-2-3835-6355
Emergency Calls	
Teleph. number:	39-2-3835-6300
1) COMPOUND IDENTIFICATION	
Compound name:	Fomblin Y
Chemical name:	Perfluorinated polyethers
Molecular weight:	1500-7000
Structural formula:	$CF_3-(O-CF_2-CF_2)_n-(O-CF_2)_m-O-CF_3$
Empirical formula:	CF_3
CAS name:	1 propene, 1,1,2,3,3,3.-hexafluoro-, oxidized, polymd.
CAS number:	69991-67-9
EEC number :	
2) COMPOSITION/INFORMATION ON INGREDIENTS	
3) HAZARDS IDENTIFICATION	
Adverse effects and main risks	
No risk is expected on the basis of toxicological evaluation.	
4) FIRST AID MEASURES	
Eye contact	
Wash with plenty of water.	
Skin contact	
Wash with water and soap.	
Ingestion	
Induce vomiting if the subject is conscious.	

Safety data sheet

5) FIRE FIGHTING MEASURES	
Precautions in case of fire Keep containers cool by spraying with water when exposed to fire.	
Appropriate fire extinguishing media Sprayed water.	
Risks from exposure to combustion products Possible risks are due to irritating and toxic effects of thermal decomposition products (HF and COF ₂).	
Specific protective equipment Breathing apparatus.	
6) ACCIDENTAL RELEASE MEASURES	
Precautions in case of leakage/spillage Wear suitable protective clothes (see section 8). Stop the leakage or spillage.	
Cleaning methods Absorb the liquid with earth, sand or sawdust.	
7) HANDLING AND STORAGE MEASURES	
Handling precautions Wear protective clothes when required. Do not drink and eat during handling. No smoking is compulsory in working areas. Avoid heating above the decomposition temperature (290° C). During handling electrostatic charges may be generated and therefore take the appropriate measures to avoid it.	
Storage precautions Keep away from heat sources, from flammable, combustible or explosive materials and from incompatible compounds (see section 10).	
Compatible packaging materials Store in glass or plastic (polyethylene) containers	
8) EXPOSURE CONTROL/PERSONAL PROTECTION	
Exposure limit values Only threshold limits of by-products from thermal decomposition are applicable:	
TLV/TWA (HF):	2.5 mg/m ³
TLV/TWA (COF ₂):	5 mg/m ³
Personal protective clothing	
Eyes protection:	safety goggles
Hand protection:	rubber gloves
Body Protection:	worksuit or rubber apron

 Safety data sheet

9) PHYSICAL AND CHEMICAL PROPERTIES	
Physical state:	clear, viscous liquid
Colour:	colourless
Odour:	odourless
Flammability:	not flammable
Explosivity:	not explosive
Vapour pressure (20° C):	< 0.01 mbar
Specific gravity (20° C):	1.84 – 1.93 g/ml
Solubility in water:	not soluble
Solubility in org. solvents:	soluble in fluorinated solvents
10) STABILITY AND REACTIVITY	
Stability	The product is stable in normal conditions of use.
Conditions to avoid	Avoid to expose the product to free flames or to temperatures above 290° C.
Materials to avoid	Avoid the contact with alkaline metals and ammonia, strong or non aqueous alkali, Lewis acids (like AlCl ₃ , SbF ₅ , CoF ₃) above 100° C.
11) TOXICOLOGICAL INFORMATION	
Penetration routes	Ingestion, inhalation.
Adverse effects	Only the thermal decomposition products can be toxic in case of inhalation.
Local effects/Irritating properties	Not irritant.
Delayed effects/sensitization	Not sensitizer.
Chronic effects	No chronic effects are known.
Carcinogenic effects	No carcinogenic effects are known.
Mutagenic effects	No mutagenic effects are known.
Reproduction effects	No reproductive effects are known.

Safety data sheet

Experimental Toxicological Data Very low acute toxicity by oral and inhalation route:	
LD50 ingestion: > 15–25 g/Kg (rat)	note: no effects at that dosage.
LC50 inhalation: > 2000 ppm for 4 hours (rat)	note: no change of behaviour at the tested dosage
LD50 intraperitoneal: > 25 g/Kg (rat)	Note: no effects at that dosage.
No effects by repeated administration (up 1 month at 1 g/Kg/day)	
12) ECOLOGICAL INFORMATION	
Use the product according to the good working practice. Avoid to discharge in the environment	
13) DISPOSAL CONSIDERATIONS	
Send spent product to authorized disposal plants or to incinerators equipped with specific emission treatment plant.	
14) TRANSPORT INFORMATION	
General information	
U.N. number:	not classified
Packaging group:	not classified
International regulation for road/railway transportation (ADR/RID)	
Classification: not Classified	
National regulation for railway transportation	
Classification : not classified	
International regulation for maritime transportation (IMDG/IMO)	
Classification: not classified	
National Regulations for maritime transportation (MMM)	
Classification: not classified	
International Regulations for Air Transportation (ICAO/IATA)	
Classification: not classified	
15) REGULATORY INFORMATION	
Labelling information	
Trade Name: Fomblin Y	
Classification	
Not required	
European regulation for protection of man and environment	
DPR 303/56 (General regulation for safety and hygiene in work places):	
Not cited.	

Safety data sheet

16) OTHER INFORMATION
BIBLIOGRAPHY
I.N. Sax – Dangerous Properties of Industrial Materials – 1987
Safety Data Sheet according to EEC Directive 91/155 The information given in this safety data sheet is for safety purposes only. It is given in good faith and based on the best knowledge and experience of the company at the date of issue. The company is not responsible for damages caused by the use of the product in applications for which it was not intended or for conditions of use outside its control.

Accessory part numbers

PUMP ACCESSORIES

Device net module



Allows the communication with the equipment by using the Device net protocol.

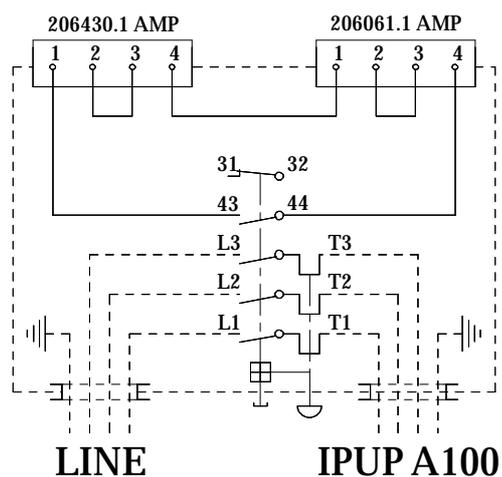
Part number	107902
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Emergency stop



This device is intended to switch off the pump power. It also has one relay contact (1 normally open) for external use.

Part number	107849
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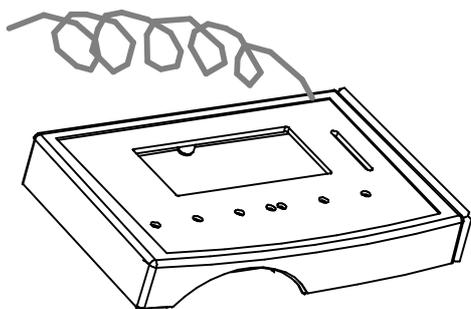


Accessories part numbers

Power supply cord

Lenght	Part number
15 m	107999
30 m	108000

Hand held display module



Allows user to review operating parameters and to access and modify configured parameters.

Part number	108343
-------------	--------

N2 pressurization kit

Allows user to close and pressurize the pump for return to a service center.

Part number	107956
-------------	--------

Frequency converter display

Allows user to list and modify frequency converter parameters.

Part number	107909
-------------	--------

Silencer kit

Allows user to reduce noise level in case of free exhaust.



Part number	108599
-------------	--------