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A3P SERIES

Dry pumps for medium duty applications

Operating instructions

A3-P Series dry pumps

Welcome

Dear Customer,

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

This product has benefited from adixen Vacuum Products'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 operating manual before any intervention on your pump, in particular, the chapter on installation and start up.



Applications

- P version : for light and medium process.

Feature

- Compact design.
- Low noise level.
- Low vibration level.
- Robust and established technology.
- High pumping speed (equivalent to pump and blower), in a compact design.
- Advanced monitoring functions.

Benefits

- Easy to integrate.
- Clean room compatibility.
- Highest reliability.
- Low operating cost.
- Failure of circuit protection.

Special feature

- Standby purge (option).
- Standby power / high speed option.
- Semi S2-0706 standard compatible (option).

A3-P Series dry pumps

This product complies with the requirements of European Directives, listed in the Declaration of Conformity contained in G 100 of this operating instructions

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English original version

Operating instructions - A3P Series

Chapter A

INTRODUCTION

- A 10 Operating principle
- A 20 Description
- A 30 Monitoring system
- A 40 Technical characteristics
- A 50 Accessories
- A 60 Options

Chapter B

START UP

- B 00 Safety instructions
- B 01 A3P Series - Hook-up requirements
- B 10 Unpacking / Handling / Storage
- B 20 Positioning the pump in the pumping installation
- B 30 Connection to the cooling circuit
- B 40 Inert gas purge connection (N₂ connection)
- B 50 Electrical connection
- B 51 Checking the direction of rotation at initial pump start-up (for A603P pump only)
- B 60 Connection to the pumping circuit
- B 70 Remote control plug connection
- B 80 Safety plug connection
- B 90 User plug connection
- B 100 EMO plug connection (on A603P / A1003P pump models)
- B 110 RS 232 or RS 485 link wiring
- B 120 Removable handle (accessory) installation

Chapter C

OPERATION

- C 00 Safety recommendations for harsh processes
- C 10 Operating modes
- C 20 Monitoring system parameters
- C 25 Safety management
- C 40 Operating mode with hand held display module (accessory)
- C 41 Start up of the monitoring system
- C 42 Monitoring system function table
- C 43 Starting mode definition «Hand held display module»
- C 44 Saving and loading of pump configuration
- C 45 Monitoring system setting for transport
- C 70 Use of the inlet isolation valve (accessory)
- C 90 Use of the serial link

Chapter D

TROUBLESHOOTING

- D 00 Safety instruction related to maintenance
- D 10 First level of maintenance
- D 20 Fault message number table
- D 30 Diagnosis and troubleshooting

Chapter E

MAINTENANCE INSTRUCTIONS

- E 10 Standard repair exchange
- E 11 Preliminary precautions
- E 12 Draining of the water cooling circuit
- E 14 Disconnecting the pump from the installation
- E 15 Shipping procedure
- E 20 Increase the maintenance parameters

English original version

Operating instructions - A3P Series

Chapter F

MAINTENANCE COMPONENTS

- F 00 Spare parts - Instruction of use
- F 10 Spare part list

Chapter G

ANNEXES

- G 100 Declaration of coformity
- G 101 Semi certificate
- G 110 A103 - Electrical schematic
- G 120 A603 - Electrical schematic
- G 130 A1003 - Electrical schematic
- G 170 Electronic cabinet
- G 200 Service

CAUTION

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

CAUTION

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

WARNING

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

DANGER

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



Introduction

Operating Manual - A3P Series Detailed contents

A 10	<i>Operating principle</i>
A 20	<i>Description</i>
A 30	<i>Monitoring system</i>
A 40	<i>Technical characteristics</i>
A 50	<i>Accessories</i>
A 60	<i>Options</i>

Operating principle

Designed to minimize by-product deposition

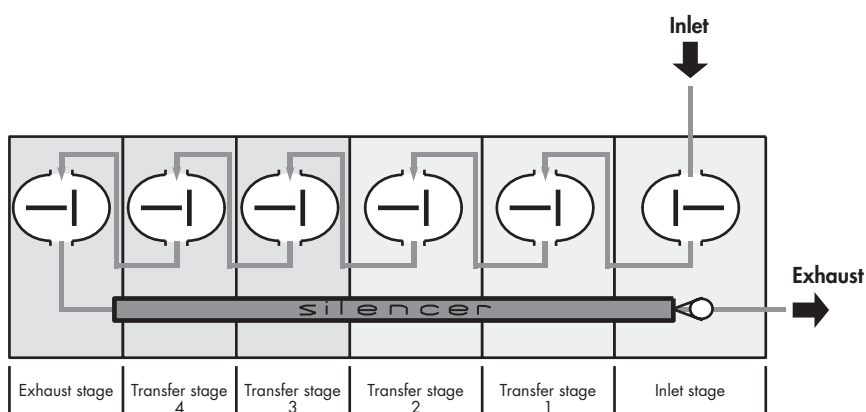
The equipment is designed to minimize potential by-product deposition:

- By limiting the internal volumes containing gas.
- By injecting N₂ purge on each pump stage to dilute the process gas.
- By regulating the pump temperature to limit gas condensation.
- By integrating the silencer inside the pump body to reduce by-product deposition.

Multi-stage roots principle

A3-P Range pump functional block consists of 6 Roots type pumping stages.

The two rotors rotate without touching each other.



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 of the bearings is imperative.

Tightness at high pressure side

The bearings are lubricated by oil splashing.

The tightness is achieved with a deflector and a seal.

Operating principle

Tightness at motor side (center hump)

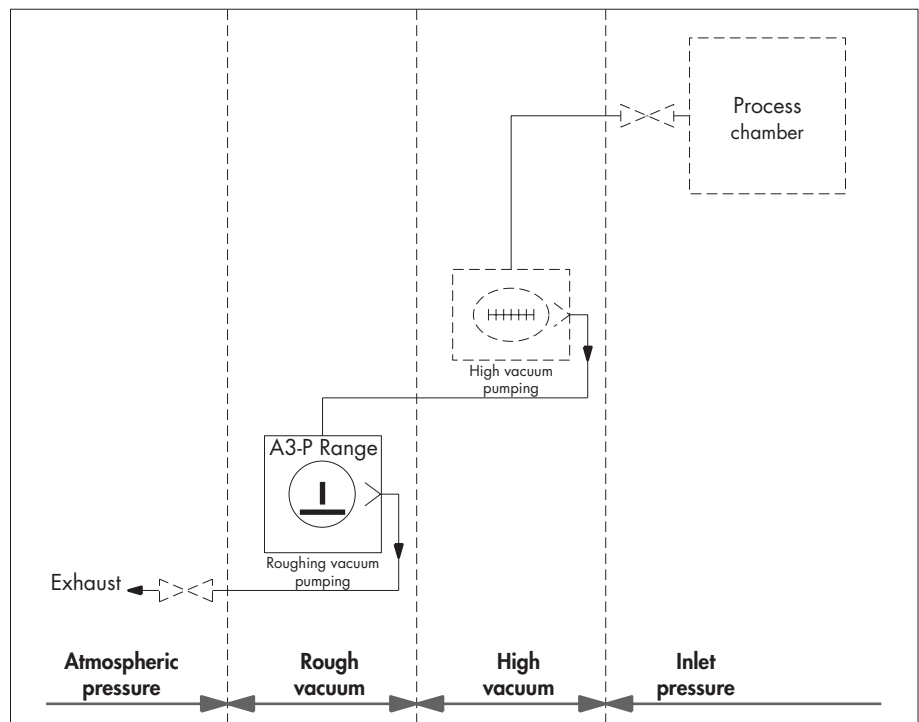
The vacuum tightness is ensured by the motor design (hermetically sealed).

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 pump exhaust pipe, preventing the exhaust being sucked back.

The pump in a pumping installation



Description

Description The A3-P Range is composed of the following pumping systems:

- A103P pump,
- A603P, A1003P pumping group, composed of an A103P functional block combined with a Roots.

These pumping systems are 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 (except inlet port located on the top for A603P, A1003P pumps).
- The electrical interface panel located on the rear panel.

The pumping systems include an intelligent monitoring system.

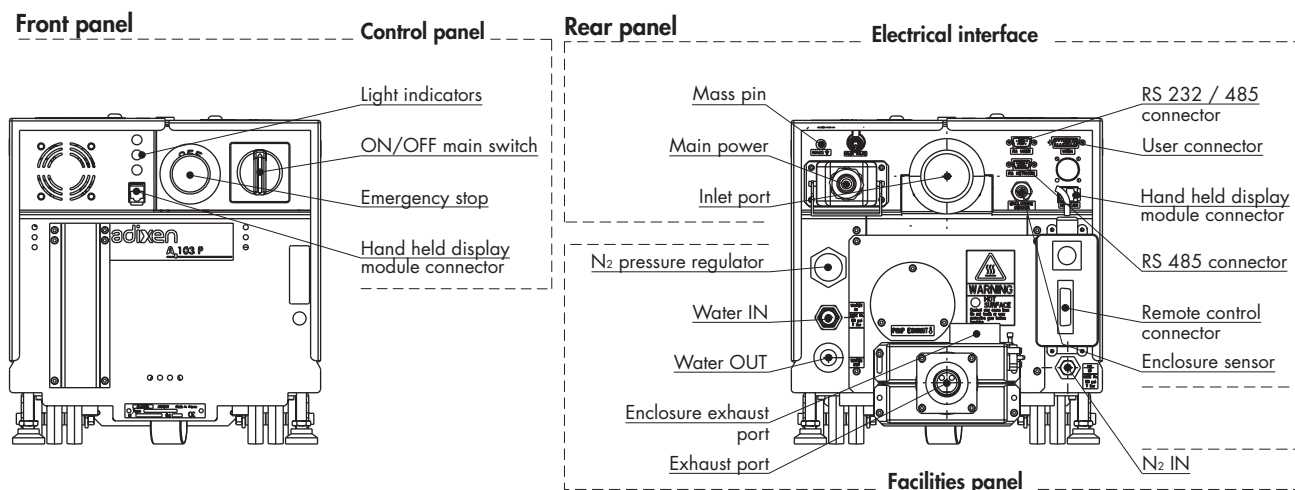
A hand held display module can be connected to the front or rear panel to display and program the pump parameters.

A remote control connector (dry contacts / 50 pins plug) located on the electrical interface panel allows pump control and communication with the process tool.

A RS 232/485 connector located on the electrical interface panel allows pump control and communication with the process tool by means of the serial link protocol.

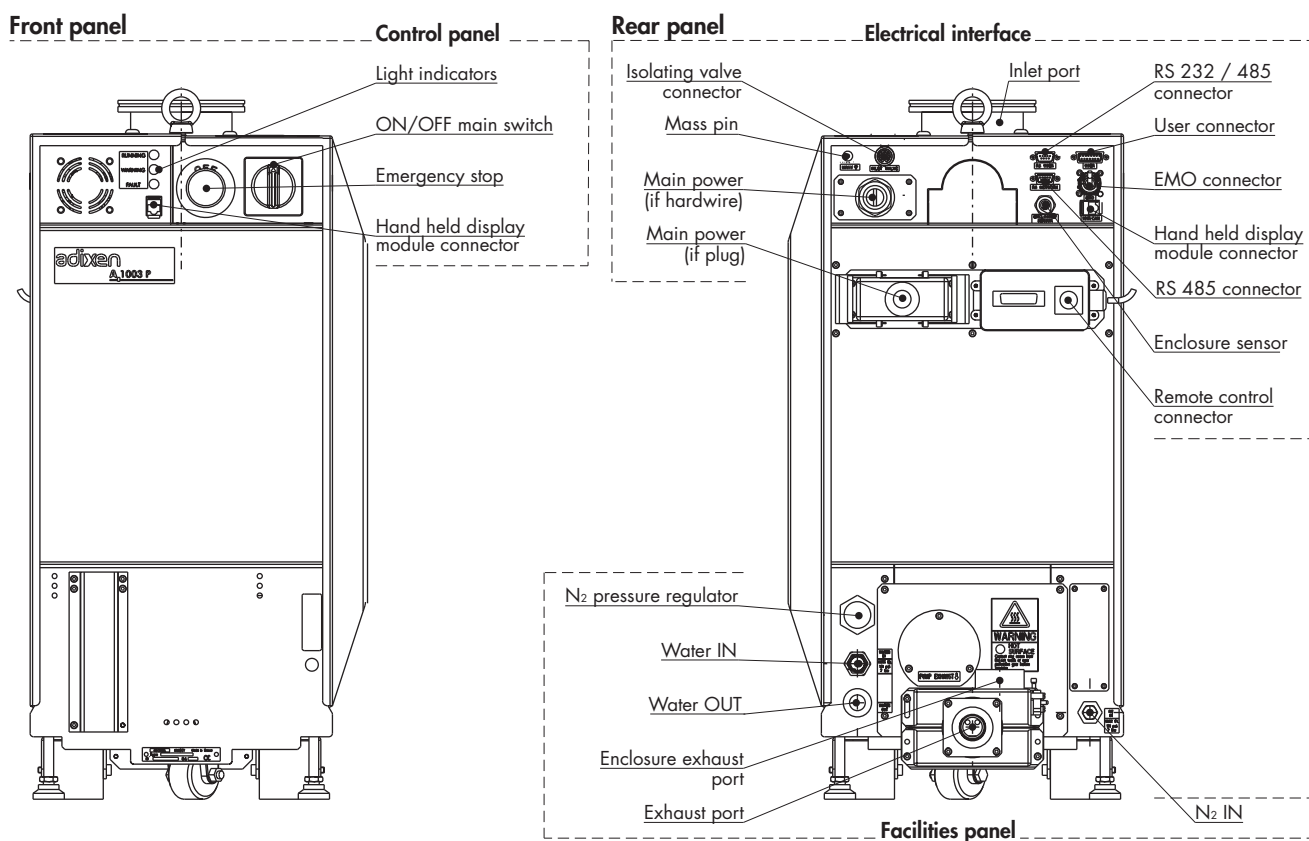
Interfaces

A103P pump



Description

A603P / A1003P pump



Description

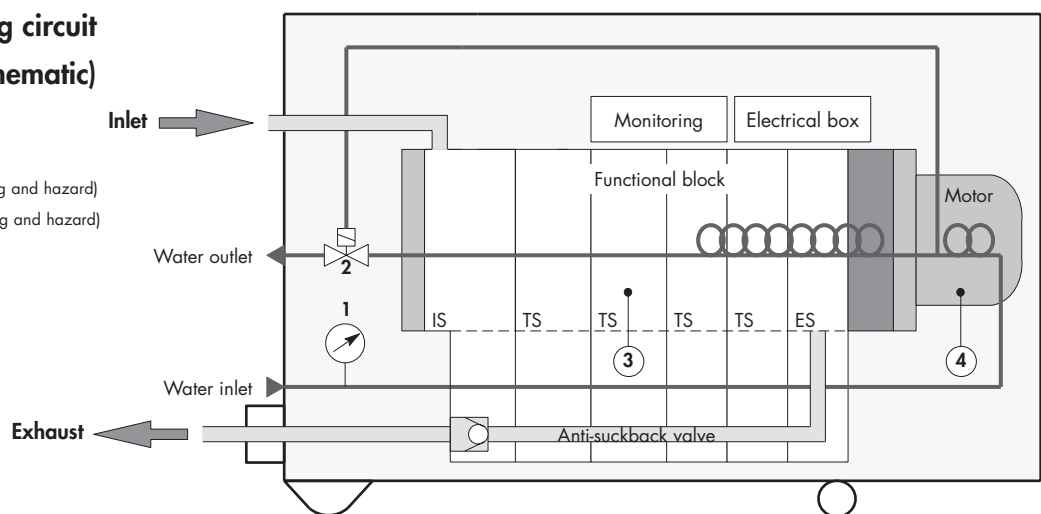
Internal equipment of the pumps

The A3-P Range pumping systems are designed for medium processes, so they are equipped with:

- Nitrogen injection and water cooling circuit optimized to avoid deposition and condensation,
- Temperature regulation device.

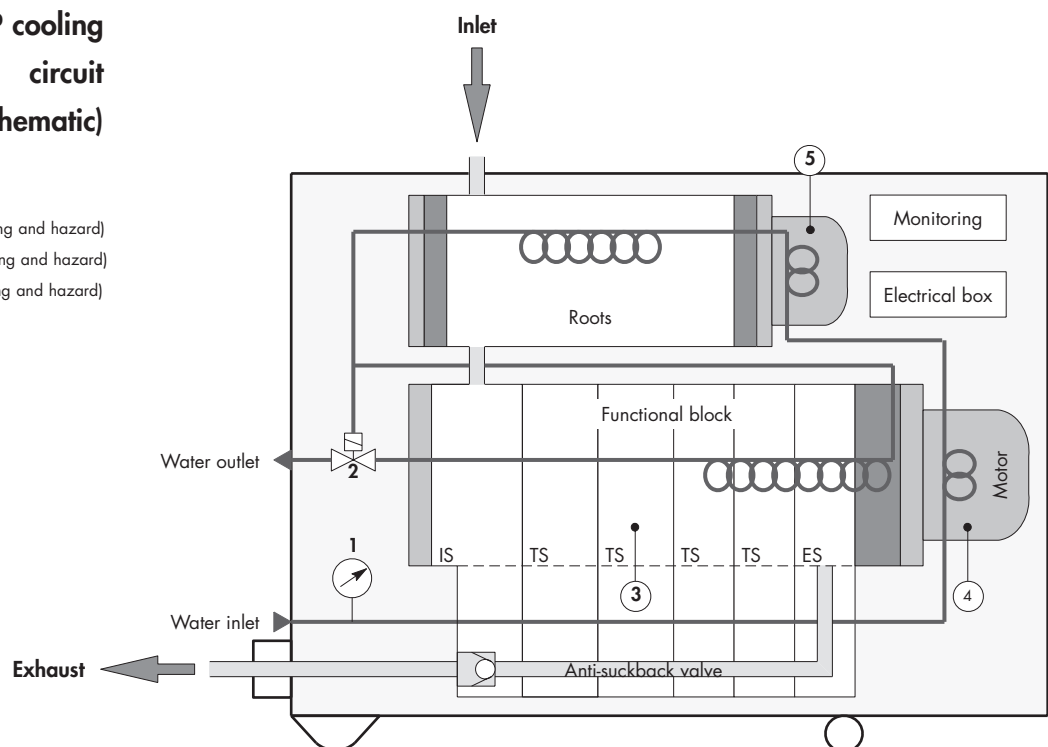
A103P cooling circuit (principle schematic)

- 1 : Water flow switch (warning)
- 2 : Water solenoid valve
- 3 : Pump temperature sensor (warning and hazard)
- 4 : Motor temperature switch (warning and hazard)
- IS : Inlet stage
- TS : Transfer stage
- ES : Exhaust stage



A603P/A1003P cooling circuit (principle schematic)

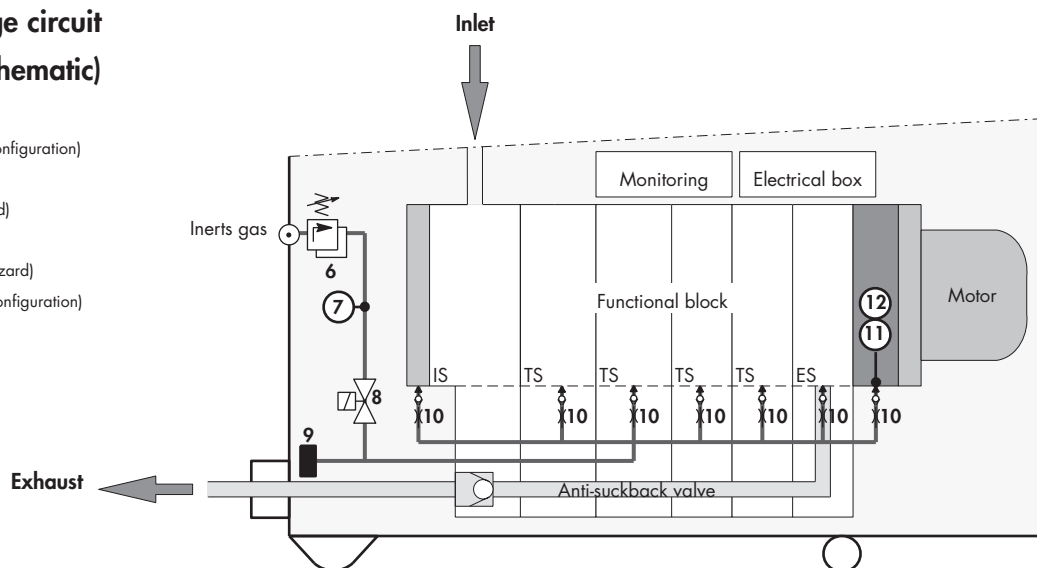
- 1 : Water flow switch (warning)
- 2 : Water solenoid valve
- 3 : Pump temperature sensor (warning and hazard)
- 4 : Motor temperature switch (warning and hazard)
- 5 : Roots temperature switch (warning and hazard)
- IS : Inlet stage
- TS : Transfer stage
- ES : Exhaust stage



Description

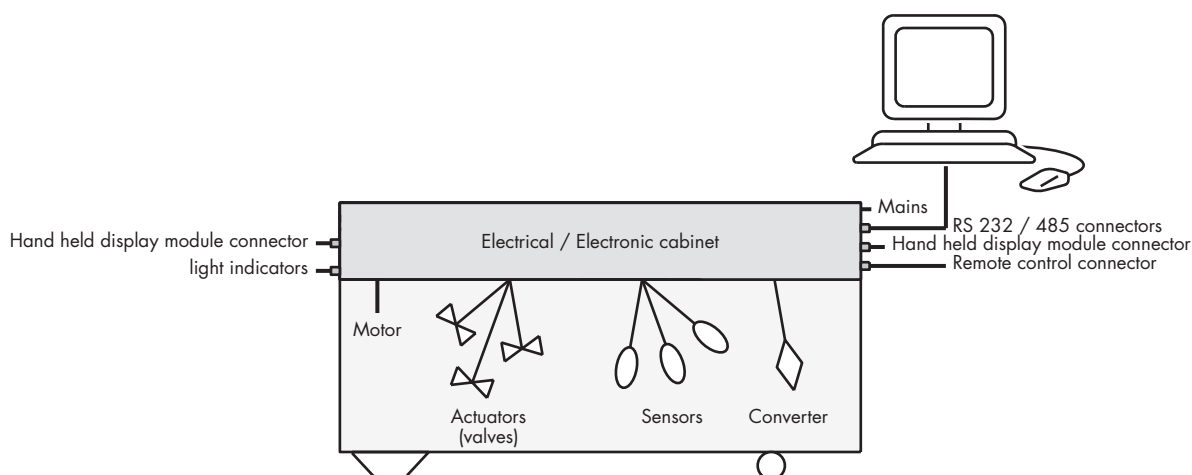
N₂ purge circuit (principle schematic)

- 6 : Pressure regulator
- 7 : N₂ flow switch (hazard) (Semi configuration)
- 8 : N₂ valve
- 9 : Flow sensor (warning and hazard)
- 10 : Inert gas purge nozzles
- 11 : Pressure sensor (warning and hazard)
- 12 : Pressure switch (hazard) (Semi configuration)
- IS : Inlet stage
- TS : Transfer stage
- ES : Exhaust stage



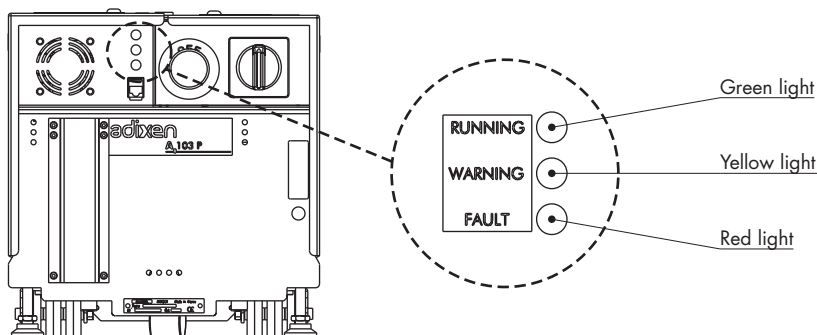
Monitoring system

Description Each A3-P Range pump includes an intelligent monitoring system.



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

Electronic cabinet The electronic cabinet is located at the top of the machine. It ensures the pump automatic operation and controls all sensors. It is linked to the light indicators. It allows to exchange data with the hand held display module (accessory) and ensures interface with the Adixen supervisor network. Monitoring can be interfaced with the main production equipments.



Hand held display module accessory The hand held display module accessory can be connected either at the front or at the rear side of the pump. It ensures a friendly access to the pump operating settings as well as the display of pump status during operation.

Monitoring system

Monitoring system characteristics

- Microprocessor controlled.
- Parameters and messages are displayed on the hand-held display module accessory.
- Saving of the last ten warnings and hazards.
- RS 232 / 485 - (Network links).

Note : the monitoring system can be interfaced with the process tool via the remote control connector or RS 232 / 485 connectors.

Main functions

- Pump temperature monitoring and control.
- Exhaust pressure monitoring.
- N₂ flow monitoring.
- Maintenance time control.
- Hardwire safety sensor control.
- Power consumption.

Technical characteristics

Characteristics	Units	A103P	A603P	A1003P
■ Peak Pumping speed (50/60Hz)	m ³ /h cfm l/mn	120/120 70/70 2000/2000	480/600 282/350 8000/10000	900/900 530/530 15000/15000
■ Typical ultimate pressure (without N ₂ purge) (50/60 Hz)	hPa mtorr	6.5 10 ⁻³ /6.5 10 ⁻³ 5/5	5 10 ⁻⁴ /3 10 ⁻⁴ 4.10 ⁻¹ /2 10 ⁻¹	3 10 ⁻⁴ /3 10 ⁻⁴ 2 10 ⁻¹ /2 10 ⁻¹
■ Typical ultimate pressure (with 20 slm N ₂ purge) (50/60 Hz)	hPa mtorr	2.6 10 ⁻² /2.6 10 ⁻² 20/20	2 10 ⁻³ /1 10 ⁻³ 1.5 /7.5 10 ⁻¹	1 10 ⁻³ /1 10 ⁻³ 7.5 10 ⁻¹ /7.5 10 ⁻¹
■ Max. continuous inlet flow	slm	50	25	
■ Supply voltage ⁽¹⁾⁽⁴⁾ Low voltage High voltage	V	200/230V - 3 phases - 50/60Hz 380/440V - 3 phases - 50/60Hz		
■ Power consumption at ultimate pressure (without purge)	kW	1	1.3 to 1.6	
■ Noise level ⁽²⁾	dba	< 58	< 65	
■ N ₂ Flowrate range	slm	15 to 60		
■ Ambient temperature	°C	5 to 40		
■ Water flow	l/h	100 mini		
■ Water temperature	°C	10 to 25		
■ Gear box fluid capacity ⁽³⁾ oil type : A 113	cm ³ cc	100	100 (A103P) + 700 (Roots)	
■ Weight	lbs Kg	275.6 125	595.2 270	
■ Inlet flange	ISO-K	DN50	DN100	
■ Exhaust flange	ISO - KF	DN25		
■ Secondary exhaust port	mm	Ø50		

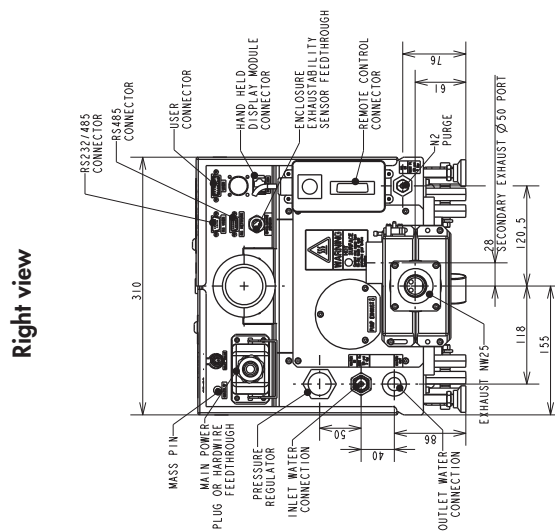
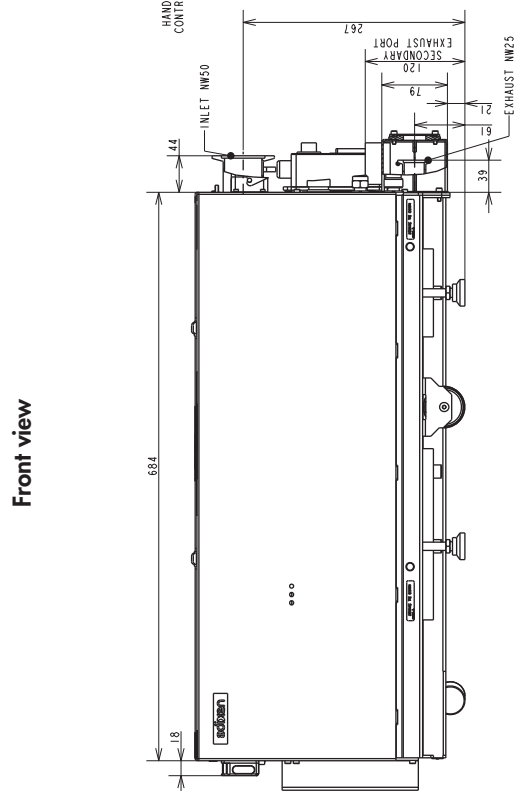
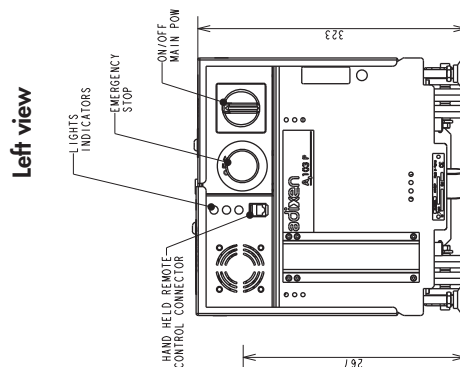
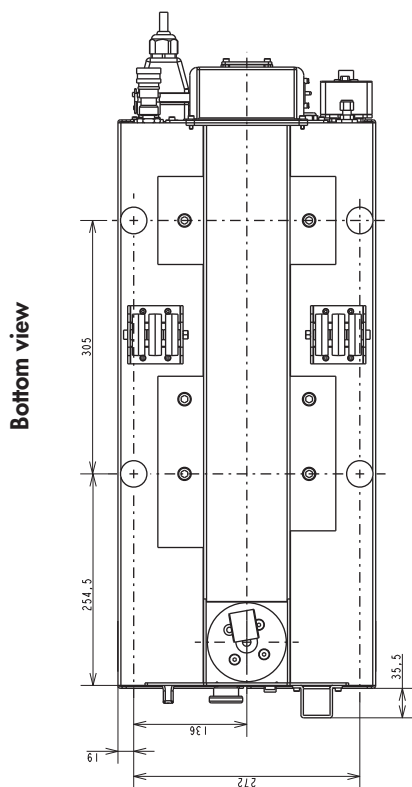
Technical characteristics

Characteristics	Units	A103P	A603P	A1003P
Environmental conditions: ■ Use of the product ■ Altitude ■ Ambient operating temperature ■ Maximum relative humidity ■ Transient overvoltage ■ Pollution degree			indoor use up to 2000m 5 to 40 °C (41 to 104 °F)	
			80 % for temp. up to 31 °C (87 °F) decreasing linearly to 50 % at 40 °C (104 °F)	
			category II rate 2	

- (1) According to CE regulations, A3-P Range pumps can withstand a transient supply voltage variation of $\pm 10\%$.
- (2) The acoustic pressure is measured on a pump whose temperature has been stabilized. The pump is on a table one meter from the ground. There are 5 microphones (4 around the pump, 1 above) which are placed one meter from the ground and one meter from the pump.
- (3) Oil charge is filled at factory. Do not modify the oil level. A 113 Material safety data sheet is available on request.
- (4) For Semi hardwire option, the Short Circuit Current Rate (SCCR) of the pump is rated of 5kA.

Technical characteristics

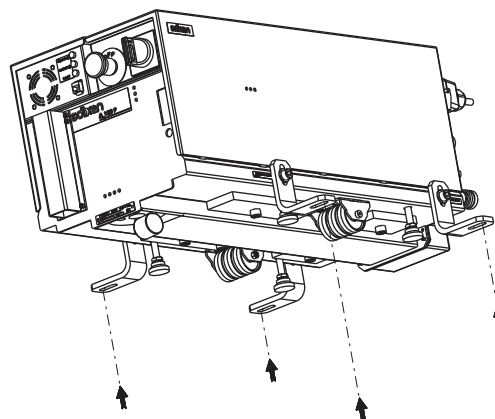
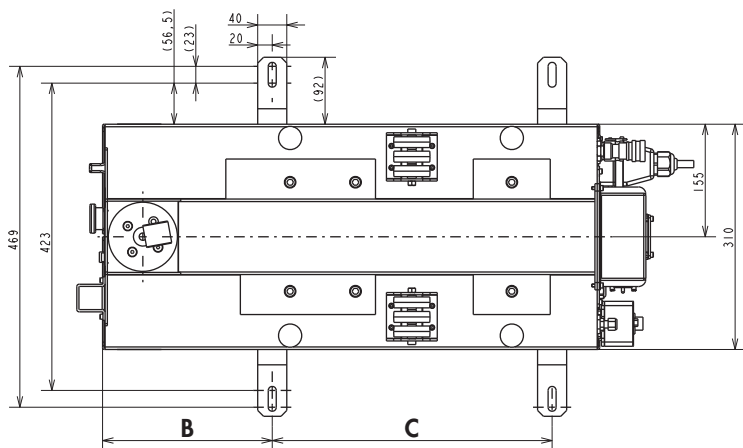
Dimensions and interfacing A103P pump



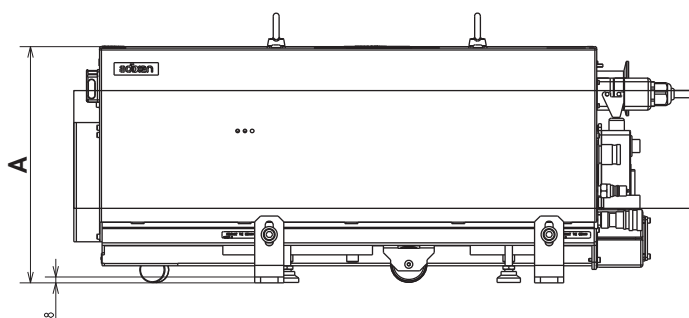
Technical characteristics

Seismic tie down dimensions

Bottom view



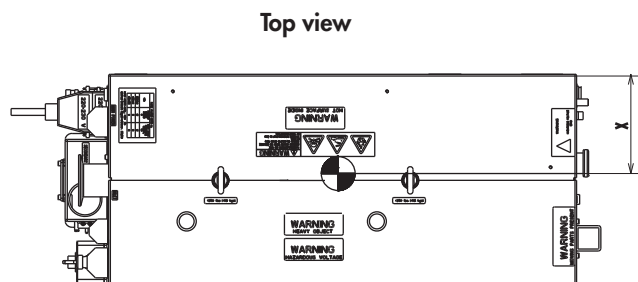
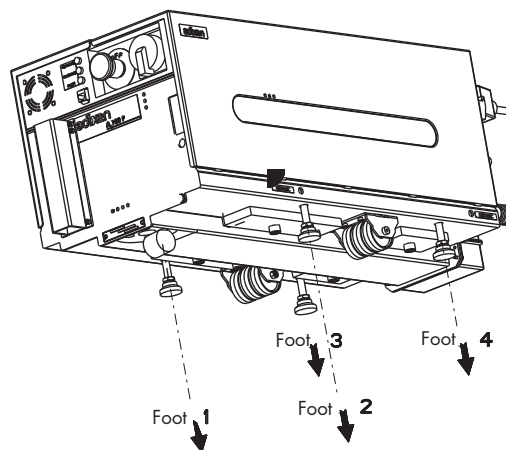
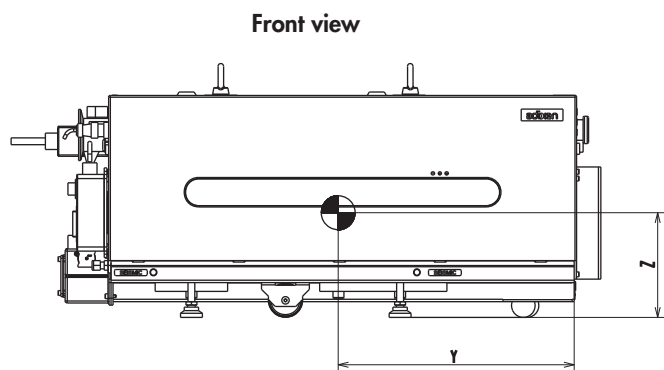
Front view



		A103P	A603P / A1003P
A	mm	325	683
	inch	12.79	26.89
B	mm	233.5	233.5
	inch	9.19	9.19
C	mm	385	385
	inch	15.16	15.16

Technical characteristics

Gravity center and weight distribution



		A103P		A603P / A1003P	
		mm	inch	mm	inch
Gravity center	X	145	5.71	153	6.02
	Y	345	13.58	361	14.21
	Z	153	6.02	312	12.28

		Kg	lbs	Kg	lbs
		Weight	125	275.6	270
Gravity center	1	47	103.6	89	196.2
	2	41	90.4	87	191.8
	3	17	37.5	418	105.8
	3	20	44.1	46	101.4

Accessories

Isolation valve at pump inlet

This valve avoids a reverse flow of gas to the chamber and increases tightness when the pump is switched off.

It also isolates the running pump from process.

Pump	Description	P/N
A103P	Manual valve - DN50 ISO-KF inox	30501M
	Electro-pneumatic valve 24 VCC DN50 ISO-KF inox	30501B
A603P A1003P	Manual valve - DN100 ISO-F inox	30503M
	Electro-pneumatic valve 24 VCC DN100 ISO-F inox	30503B
-	Cable for electro-pneumatic valve (2,5m)	A330071

Hand held display module

Allows user to review operating parameters, to access and modify configured parameters and to start and stop the pump.

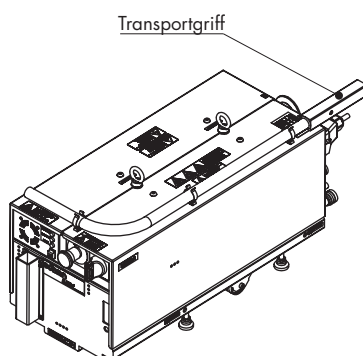


Description	P/N	Qty
Hand held display module kit including:	112631S	1
Hand held display module		1
Cable 1.5 m		1

Operating mode with HHDM (accessory) C 40

Removable handle

This removable handle allows to move the pump easily.



Description	P/N	Qty
Removable handle kit including:	110918	1
Arm		1
Plug		2
Clip		3
Screw Chc M4x10		3
Washer M4		3

Removable handle (accessory) installation B 120

Secondary exhaust enclosure (Semi configuration)

The purpose of the secondary exhaust enclosure is to exhaust gas and vapors that might leak from the pump. **P/N:** 110872S

Secondary exhaust enclosure installation (accessory) B 60

Accessories

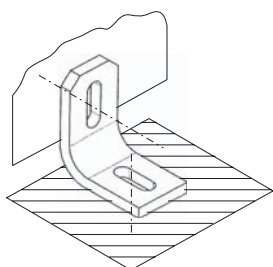
Interface boards OEM / Remote control



This device ensures direct interface between monitoring and the main production equipment.

Contact nearest manufacturer representative.

Anti earthquake square



These anti earthquake squares allow to bolt down the pump to the floor.

Description	P/N	Qty
Anti earthquake square kit including:	110914	1
Anti earthquake square		4
Washer M10		4
Screw Chc M10x25		4

Technical characteristics

A 40

Water connectors

These connectors allow to connect the pump to the customer water circuit.

Description	P/N	Qty
IN : 1/4 quick female connector	076721	1
OUT : 1/4 quick male connector	076720	1

Connection to the cooling circuit

B 30

ESD connector kit

This kit includes all the necessary connectors to put the pump in accordance with the IEC 61000-2-4 standard - EMC / environment - compatibility levels in industrial plants for low-frequency conducted disturbances.

Description	P/N	Qty
ESD connector kit	114572S	1






Fitting accessories

A wide range of accessories are available in Adixen product catalog (fitting rings, valves, bellows...).

Options

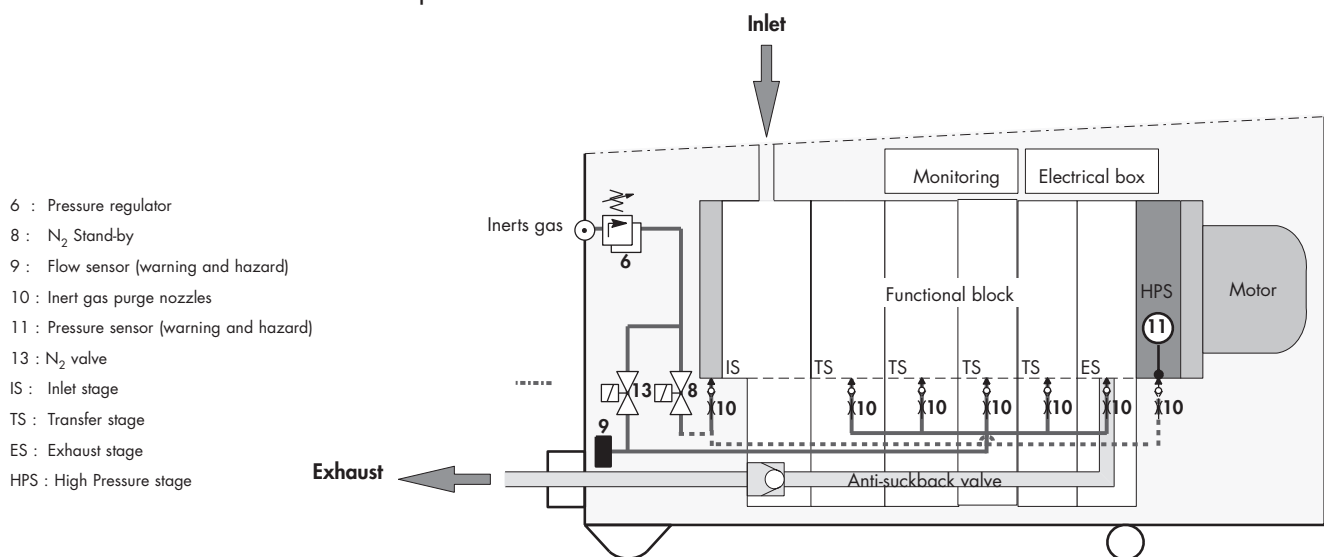
SEMI S2-0706 This option is needed to be in accordance with the Semi S2-0706 standard.

In this case, the pump is equipped with:

- Pressure switch  **A 20**.
- N₂ flow switch  **A 20**.
- Exhaust box  **B 60**.
- Hardwire electrical connection  **B 50**.
- Ground fault interruptor  **B 50**.

Stand-by purge

In order to reduce the overall nitrogen consumption, this option stops the nitrogen injection for dilution in the functional block stages when the process is off.



Electrical connection with plug

If this option is selected, the pump does not conform to Semi S2-0706.

Electrical connection

 **B 50**

Electro-Static Discharge

This option allows the pump to accept Electro-Static Discharge until 30KV in accordance with the IEC 61000-2-4 standard - EMC / environment - compatibility levels in industrial plants for low-frequency conducted disturbances.

Lonworks

Lonworks interface is used to interface the dry pump with Lam tool. It means that this interface should be ordered for each installation on Lam tool. It completely replaces the electrical interface you were used to connect to our pumps.



Operating Manual - A3P Series Detailed contents

B 00	<i>Safety instructions</i>
B 01	<i>A3P Series - Hook-up requirements</i>
B 10	<i>Unpacking / Handling / Storage</i>
B 20	<i>Positioning the pump in the pumping installation</i>
B 30	<i>Connection to the cooling circuit</i>
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B 50	<i>Electrical connection</i>
B 51	<i>Checking the direction of rotation at initial pump start-up (for A603P pump only)</i>
B 60	<i>Connection to the pumping circuit</i>
B 70	<i>Remote control plug connection</i>
B 80	<i>Safety plug connection</i>
B 90	<i>User plug connection</i>
B 100	<i>EMO plug connection (on A603P / A1003P pump models)</i>
B 110	<i>RS 232 or RS 485 link wiring</i>
B 120	<i>Removable handle (accessory) installation</i>

Safety instructions

CAUTION

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

CAUTION

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

WARNING

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

DANGER

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

Pump installation

The installation of the pump can only be performed by trained personnel.

General

CAUTION

Our products are designed to comply with current EEC regulations. Any modification of the product made by the user is liable to lead to non-compliance with the regulations, or even to put into doubt the EMC (ElectroMagnetic Compatibility) performance and the safety of the product. Manufacturer declines any responsibility for such operations.

CAUTION

The EMC performance of the product is obtained on the condition that the installation complies with the EMC rules. In particular, in disturbed environments, it is essential to:

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

WARNING

When the main switch is set to «0», the part supply between the power and the main electrical switch, is energized.
Risk of electrical shock in case of contact.
Disconnect main electrical cable before any intervention.

Safety instructions

General (continued)

⚠ WARNING

When the EMO is activated, some internal electrical parts are energized and water cooling line and N₂ purge line are always supplied.
Risk of electrical shock in case of contact.
Before any intervention, disconnect main electrical cable, water inlet and outlet quick connectors and N₂ purge connector.

⚠ WARNING

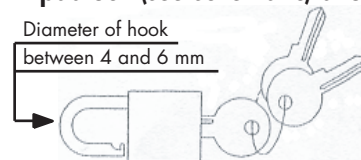
Hazardous voltage enclosed.
Voltage or current hazard sufficient to cause shock.
Disconnect and lockout power before servicing.
Any intervention must be done by trained personnel only.

⚠ WARNING

Trip Hazard.
Route all facilities connections in a manner that will not present a trip hazard for personnel when accessing the EMO or disconnect device.

⚠ CAUTION

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



Installation procedure:

- Set the main switch to «0».
 - Push the grey part of the main switch.
 - Insert the padlock through hole of the main switch.
- Close and lock the padlock.

⚠ DANGER

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 Lower Explosive Limit are sent to the pump then nitrogen should be supplied at a rate to ensure that concentration is diluted to be below the Lower Explosive Limit, 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.

Safety instructions


General (continued)

⚠ DANGER

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

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 Lower Explosive Limit detection in the secondary exhaust (capable of detecting at 25% of the Lower Explosive Limit) that will stop chemical supply to the pump when gas is detected at 25% of Lower Explosive Limit for that flammable material.

To connect this detection, the customer can use the EMO connector, pins 2 and 3  B 100.

⚠ 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

Lock out / tag out water and N₂ supplies.

The end user needs to provide a dedicated source of water and nitrogen equipped with manual valves that can be locked out within 10 feet of the tool.

⚠ WARNING

Other located hazardous energies.

Nitrogen purge and water cooling circuit are pressurized hazardous energies. Release pressure before servicing:

- for the N₂ purge, disconnect the gas line quick connector and turn off the pressure regulator by turning the knob counter-clockwise;
- for the water cooling circuit, disconnect the input connector and leave the output connected. Wait 1 minute before disconnecting the output.



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.

Wait 30 min before servicing and always use gloves. The protective gloves should be used in accordance to the protective gloves supplier's instructions.

Safety instructions

General (continued)

WARNING

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.

The response for loss of purge flow and loss of secondary exhaust should place the point of hazard area in a safe-state.

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

Once activated power will be switched 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.

WARNING

Manufacturer has no control over the types of gases passing through this pump. Frequently, process gases are toxic, flammable, corrosive, explosive or otherwise reactive. Since these gases can cause serious injury or death, it is very important to plumb the exhaust of the pump to the facility's hazardous gas exhaust system which incorporates appropriate filters, scrubbers, etc., to insure that the exhaust meets all air regulation.

CAUTION



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

CAUTION

The pump is equipped with an emergency off (EMO) circuit.

When activated, it places the equipment into a safe shutdown condition.

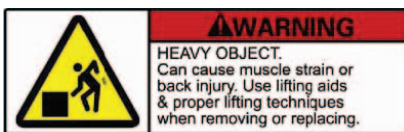
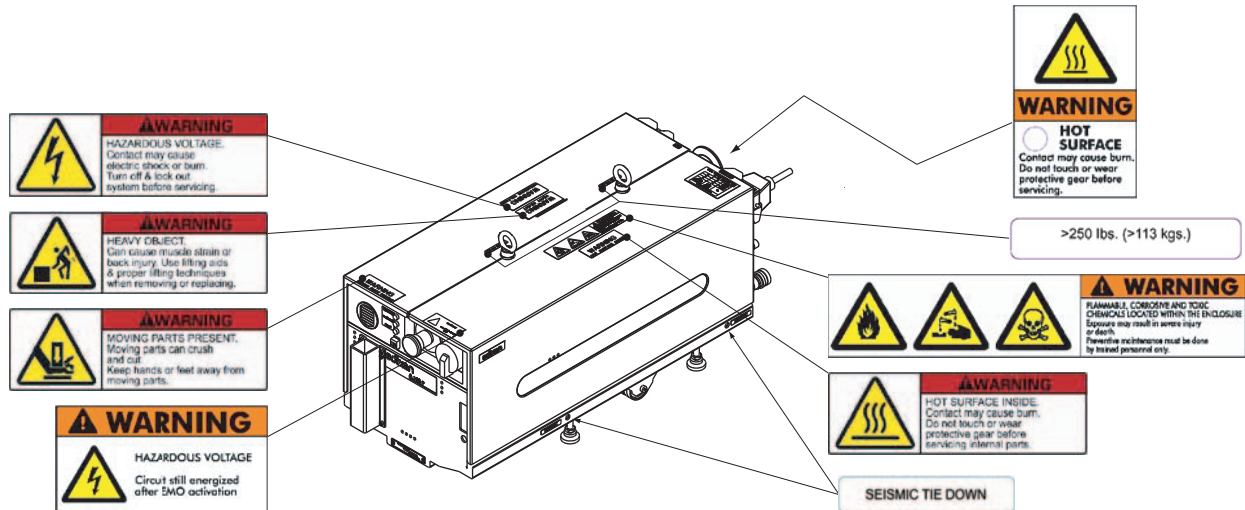
For external use, one EMO dry contact is provided on J1 «emergency stop» connector pins 1 and 4  B 100.

The pump EMO can also be externally monitored  A 50 through J1 «emergency stop» connector pins 2 and 3  B 100.

The EMO circuit consists of electromechanical components, and resetting it will not re-energize the pump.

Safety instructions

Pump labels



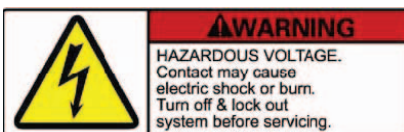
A 329 982 - 1

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.



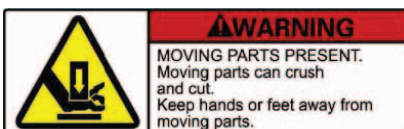
A 329 982 - 2 and A 215 138 - 2

Located on the upper cover and at 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. The protective gloves should be used in accordance to the protective gloves supplier's instruction.



A 329 982 - 3

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.



A 329 982 - 4

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



Located on the upper cover, this label indicates that the internal electrical circuit is energized when EMO is activated.

Safety instructions



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.

SEISMIC TIE DOWN

A 329 982 - 5

Located on the lower part of lateral panels, these labels indicate the location of the fixing holes of the anti earthquake square accessories.

>250 lbs. (>113 kgs.)

A 215 138 - 1

Located on the upper cover, this label indicates the weight class of the pump.

Decontamination / product dismantling

Decontamination - product dismantling

According to the regulations 2002/96/CE about Waste of electrical and electronical equipments, and 2011/65/CE about Restriction of Hazardous substances, the manufacturer provides a recycling paid service for the end-of-life of waste electrical and electronic equipment.

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

This obligation will not cover the shipping cost to an adixen Vacuum Products service center.

Whenever you return the product to an repair service center, please make sure you follow the Service procedure and fill in the declaration of contamination found on our website.

Manufacturer contact in case of emergency

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

A3P Series – Hook-up requirements

Packaging dimensions (B 10)	A103P	A603P	A1003P
l x w x h	1065 x 625 x 680 mm 41.93 x 24.61 x 26.77 inches	1065 x 625 x 1030 mm 41.93 x 24.61 x 40.55 inches	

Weight (B 10)	A103P	A603P	A1003P
Packaging weight	150 kg 330.7 lbs	295 kg 650.4 lbs	
System weight	125 kg 275.6 lbs	270 kg 595.2 lbs	

Oil quantities	A103P	A603P	A1003P
Gear boxe fluid capacity	A103P Roots	100 cc	100 cc 700 cc

Water cooling circuit (B 30)	A103P	A603P	A1003P
Water flow	100 l/h		
Water temperature	10 to 25 °C		
Pressure	300 - 700 kPa absolute (30 - 87 PSIG)		
Connection - inlet type outlet type material remarks	1/4 inch NPT quick female connector 1/4 inch NPT quick male connector Stainless steel Quick connect (supplied)		

Inert gas purge circuit (B 40)	A103P	A603P	A1003P
Nitrogen flow	15 to 60 slm		
Pressure	200 - 700 kPa absolute (15 - 87 PSIG)		
Connection - inlet type material	Swagelock for tube 6.35 mm (0.25 inch) Stainless steel		

A3P Series – Hook-up requirements

Electricity (B50)	A103P	A603P	A1003P
Power consumption at maximum inlet flow	2 kW	3 kW	
Short Circuit Current Rating of main electrical cabinet	5 kAIC		
Power supply voltage - Low voltage	200-230 V		
Full load current 50 H _z	11.4 A	17.1 A	22.8 A
Full load current 60 H _z	11.4 A	17.6 A	22.8 A
Breaker size	15 A	30 A	30 A
Cable section	AWG-14 (2.5 mm ²)	AWG-10 (4 mm ²)	AWG-10 (4 mm ²)
Power supply voltage - High voltage	380-440 V		
Full load current 50 H _z	6 A	9.2 A	12 A
Full load current 60 H _z	6 A	9.4 A	12 A
Breaker size	10 A	20 A	20 A
Cable section	AWG-14 (2.5 mm ²)	AWG-10 (4 mm ²)	AWG-10 (4 mm ²)

WARNING

For SEMI configuration, the main circuit breaker must be provided by the end user and should have a minimum of 10kAIC rating. Electrical shock may result in severe injury. Always disconnect main power before servicing the pump.

Pumping circuit (B60)	A103P	A603P	A1003P
Gas inlet - flange	DN 50 - ISO K	DN 100 - ISO K	
material		Stainless Steel	
remarks		a bellow is necessary	
Gas exhaust - flange		DN 25 - ISO KF	
material		Stainless Steel	
remarks		a bellow is necessary	

Exhaustable enclosure (B60)	A103P	A603P	A1003P
Flow		22 cfm	
Static pressure*		0.125 wg	
Exhaust		Ø 50 mm	

* Measured at the secondary exhaust port.

Unpacking/ Handling / Storage

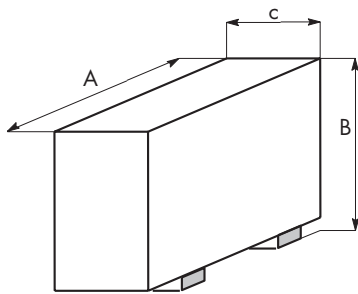
Precautions

If the equipment has been damaged, take necessary steps with the carrier and inform Manufacturer, if necessary. In all cases, Manufacturer recommends that the packaging be kept, in the event that the equipment needs to be transported or put into prolonged storage.

WARNING

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 and weight



	Dimensions				Weights	
	Unit	A	B	C	Unit	
A103P	mm	1065	680	625	Kg	150
	inch	41.93	26.77	24.61	lbs	330.7
A603P A1003P	mm	1065	1030	625	Kg	295
	inch	41.93	40.55	24.61	lbs	650.4

Tolerance : ± 20 mm.
 $\pm 0,79$ inch.

Unpacking

Open the crate.

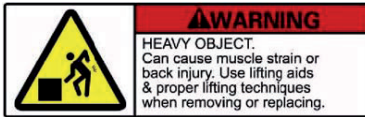
Remove additional packages from the crate and set aside.

These packages contain:

- 1 instruction manual,
- 1 label «this product complies with our final quality tests»,
- 1 safety label set in Italian, Chinese, French, German, Taiwanese, Japanese and Korean language,
- 1 EMO cover plug,
- 1 remote control cover plug,
- 1 maintenance cover plug,
- 1 safety cover plug,
- 1 power plug (only for A3-P Range pump configured with plug electrical connection).

Unpacking/ Handling / Storage

Handling



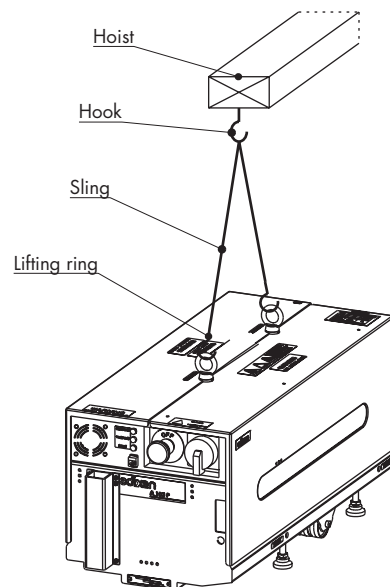
Regarding its weight (275,6 to 595,2 lbs / 125 to 270 kg), handling the pump can cause muscle strain or back injury. For all equipment handling, use the appropriate handling devices.

Handling the pump to remove it from the crate

The pump is equipped with two lifting rings screwed on the pump top cover. These lifting rings are used for handling the pump.

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

- With a hoist and a sling with two arms and hooks, lift the pump using lifting rings.



Prepare the pump

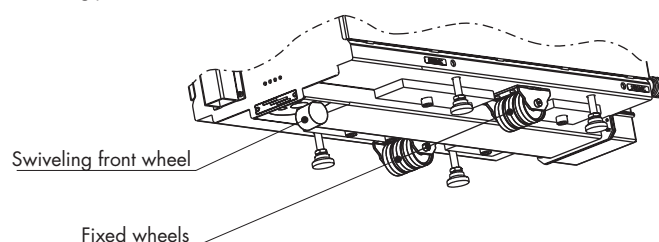
The pump is sealed with anti-corrosion bag which should not be removed until the pump is ready to be used.

The inlet and exhaust are sealed with blank-off flanges which should not be removed until the pump is ready to be used.

Move the pump

The pump is equipped with 2 fixed wheels and 1 swivelling front wheel.

A removable handle is available as an accessory to move easily the pump B 120.



Unpacking/ Handling / Storage

Equipment storage

CAUTION

If the pump is going to be put into storage, the anti-corrosion bag should not be removed.

This equipment can be stored at an ambient temperature between -10°C and +60°C.

Positioning the pump in the pumping installation

CAUTION

Pump performance will depend on the kind of accessories used and the quality of the mechanical connections such as the pump fittings.

A3-P Range pumps are 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 valve 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.

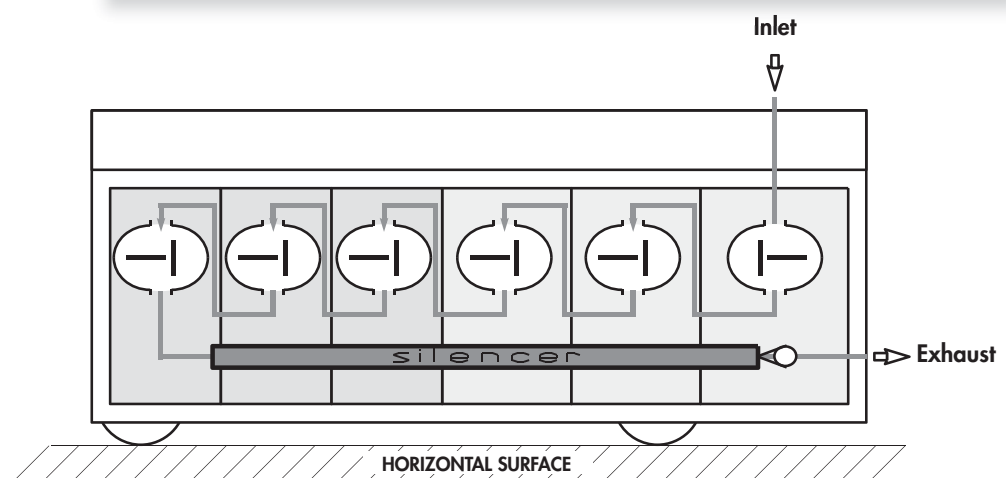
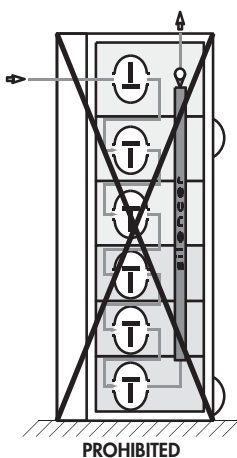
Positioning the pump

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

Use the handling devices (accessory) to position the pump in the desired location [B 120](#).

CAUTION

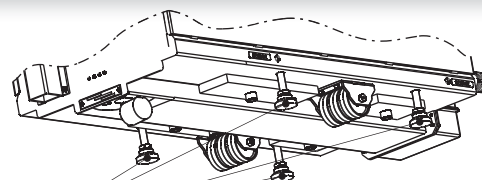
The pump must operate in the horizontal position. It may not be used standing on its end.



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.

WARNING

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. See [A 40](#) for location of the center of gravity.



Locking screw jacks

Connection to the cooling circuit

CAUTION

A leak of water wouldn't be contained and that's why the pump should be installed in a location where a water leak will not cause secondary damage and can be easily cleaned up.

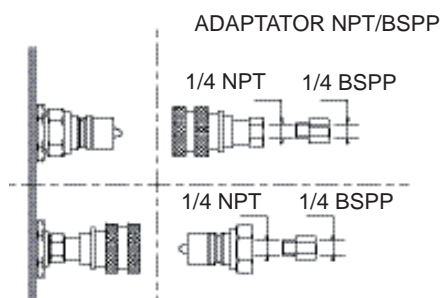
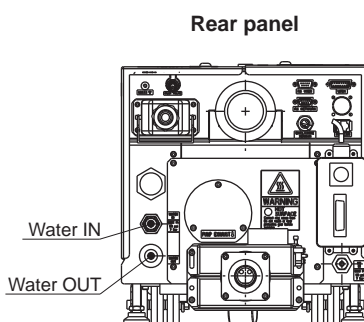
Water characteristics

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

pH level	5.5 to 9
Hardness	< 10 °fH (French degree) < 2 milli-equivalent/l < 100 mg/l of CaCO ³ (calcium carbonate)
Total dissolved solids	< 300 mg/l
Index of Langelier LSI = pH - pHs	< 0 to 20 °C
Particle size	0.2 mm
Resistivity	2 000 Ω·cm < R < 1 000 000 Ω·cm
Input temperature	+10 °C to +35 °C
Relative input pressure	29 PSI (200 kPa) to 87 PSI (600 kPa)
Differential pressure (inlet/ outlet)	29 PSI (200 kPa)

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

Water cooling quick connection



Connect the water pipes to the quick-connect connectors.


- Water inlet marked «IN» [1/4 inch NPT quick female connector (customer supply)].
- Water outlet marked «OUT» [1/4 inch NPT quick male connector (customer supply)].

Minimum pressure rating for connections and pipework: 174 PSIG (1400 kPa absolute).

Inert gas purge connection (N₂ connection)

Nitrogen characteristics

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
- Min. supply pressure: 15 PSIG (200 kPa absolute)
- Max. supply pressure: 87 PSIG (700 kPa absolute)
- Flowrate  **A 40**

Concentration	Fab 200	Fab 300
H ₂ O	10 ppb	0,08 ppb
O ₂	5 ppb	0,01 ppb

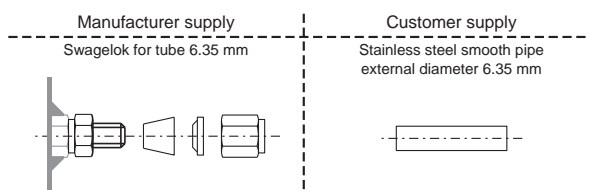
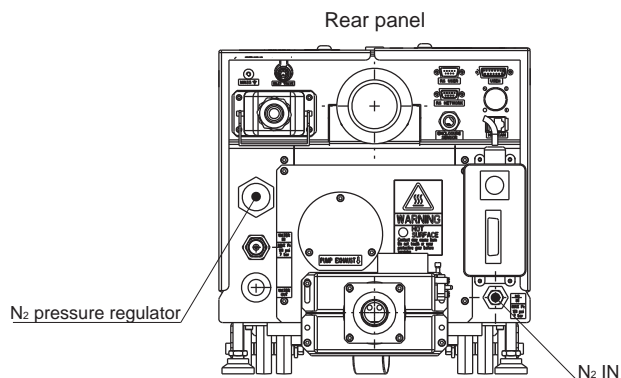
CAUTION

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

Connect the N₂ pipe on the N₂ connector.



N₂ flowrate adjustment


Nitrogen needs to be used to reduce the concentration of pyrophoric material below the Lower Explosive Limit.

The N₂ flow rate can be adjusted with the **pressure regulator** according to the process.

The N₂ flow level is read on the hand held display module.

Electrical connection

Make sure that the main switch is off during electrical connection.

Study the preliminary precautions  B 00.

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

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

Customer electrical installation protection

WARNING

The pumps are equipped with a 10 000 AIC breaker. Electrical shock may result in severe injury. Always disconnect main power before servicing the pump.

Main circuit breaker rating (recommended values).

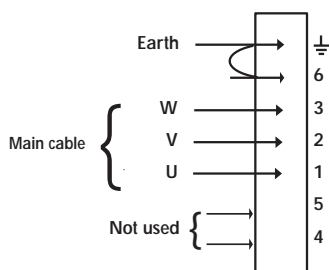
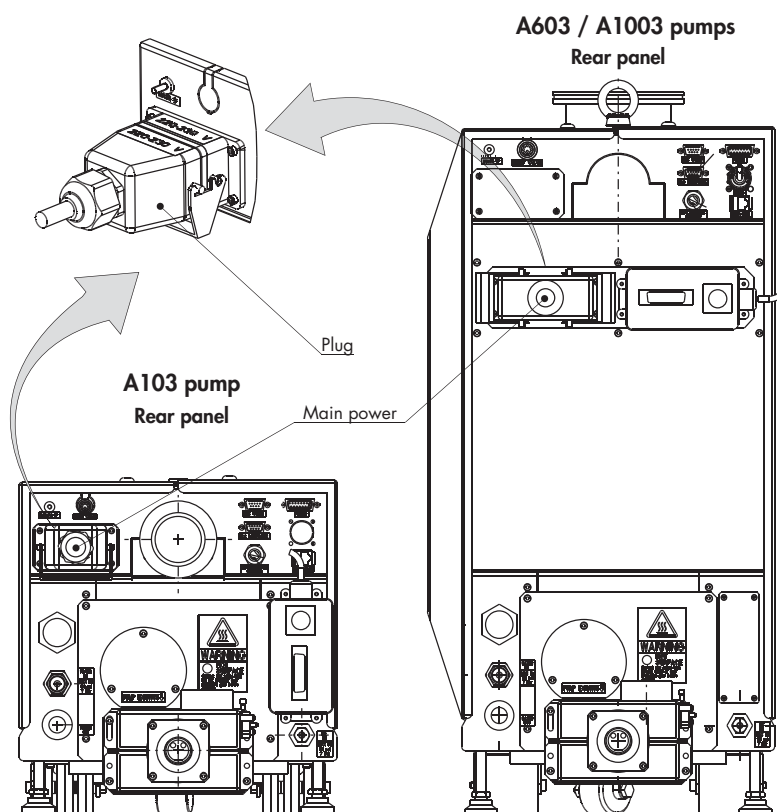
	200 - 230 V Low Voltage	380 - 440 V High Voltage
A103P	15 A	10 A
A603P / A1003P	30 A	20 A

Line voltage

Check that the line voltage corresponds to the pump label, voltage located on the upper cover. See  B 01

Electrical connection

Electrical connection Electrical connection using a plug (option)



The pump is supplied with a plug separately packaged.

Plug type : female plug (6 contacts + earth)

Connect the mains cable to the power supply plug using wire with the following specification:

	Cable (customer supply)
A103P	AWG-14 (or 2.08 mm ²)
A603P / A1003P	AWG-10 (or 5.26 mm ²)

Then, connect the power supply plug on the pump frame power supply connector **and lock it**.

A603P pump model is not equipped with a frequency converter on the roots Blower.

the motor rotation depends directly on the main power connection.

Uncorrect wiring may cause backwards pump rotating.

It is necessary to check the direction of rotation at first start up.

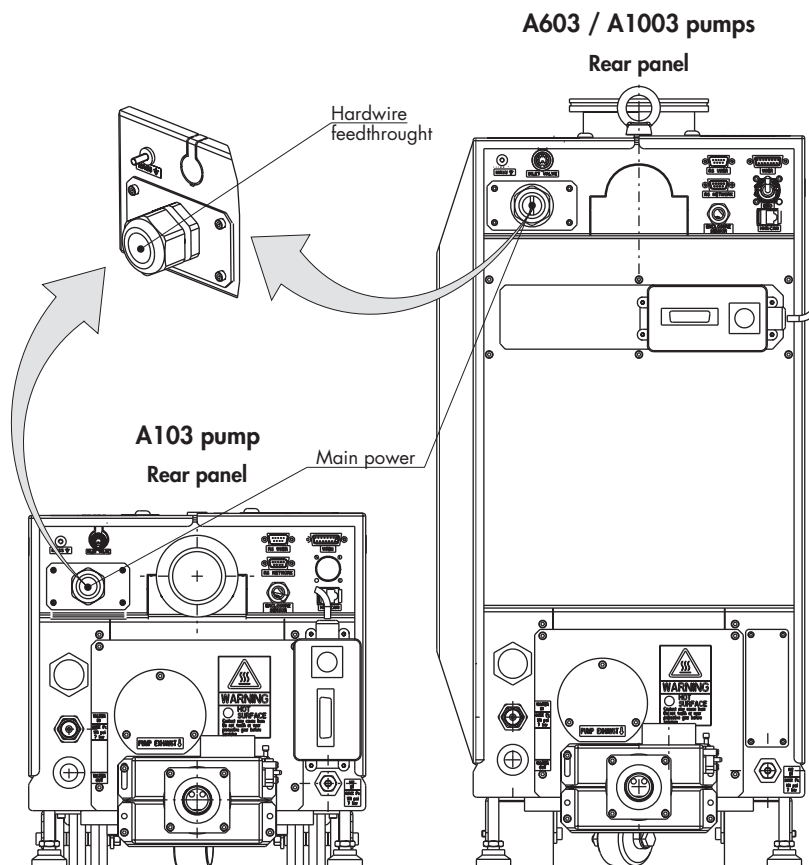
See B 51.

CAUTION

Check that the cable is correctly protected against ground defects and that earth wire is longer than the three conducting wires.

Electrical connection

Electrical hard wire connection



Without Semi option

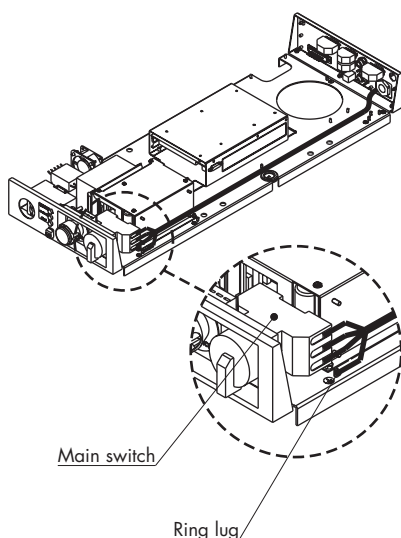
Unlock the black handles.

Loosen (1/4 turn) the two blocking screws of the left upper panel (exhaust side view).

Open the panel.

Pass the cable through the feed through provided for this purpose.

Connect the mains cable to the main switch using a cable with following specification:



	Cable (customer supply)
A103P	AWG-14 (or 2.08 mm ²)
A603P / A1003P	AWG-10 (or 5.26 mm ²)

To ground the unit use a ring lug on the ground conductor (green / yellow) and attach to the electrical frame pin with M4 nut.

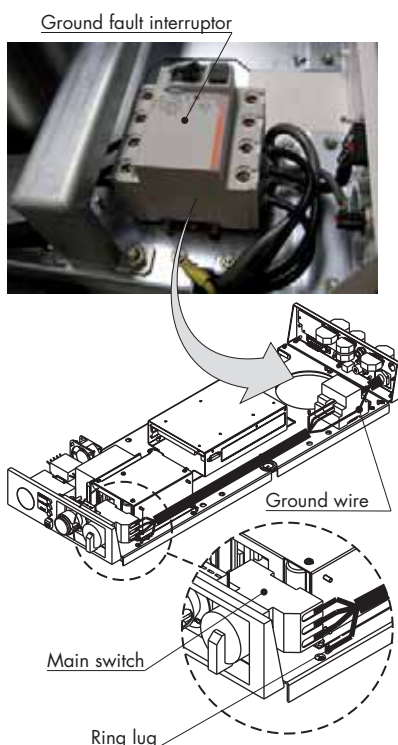
Replace the left upper panel.

CAUTION

Check that the cable is correctly protected against ground defects and that earth wire is longer than the three conducting wires.

Electrical connection

Electrical hard wire connection (continued)



With Semi option

Unlock the black handles.

Loosen (1/4 turn) the two blocking screws of the left upper panel (exhaust side view).

Open the panel.

Strip the cable until the end of the ground fault strip (600 mm for A103P and A1003P pumps).

Pass the cable through the feed through provided for this purpose.

Cut the 3-phase wires of the cable and install the terminal block at the end.

Connect the mains cable to the main switch using a cable with following specification:

	Cable (customer supply)
A103P	AWG-14 (or 2.08 mm ²)
A603P / A1003P	AWG-10 (or 5.26 mm ²)

To ground the unit use a ring lug on the ground conductor (green / yellow) and attach to the electrical frame pin with M4 nut.

Replace the left upper panel.

Overcurrent protection required for UL application

The ground fault interruptor (GFI) must be protected upstream by a specific type of circuit breaker, according to UL standards and in the GFI manufacturer instructions.

	GFI model	Interrupt rating voltage (VAC)	Max. short circuit current withstand
25A to 100A	Q03100	240 VAC	10 kA
25A to 100A	QOU	240 VAC	10 kA
25A	C60	240 VAC	10 kA
20A	C60	480 VAC	10 kA

CAUTION

Check that the cable is correctly protected against ground defects and that earth wire is longer than the three conducting wires.

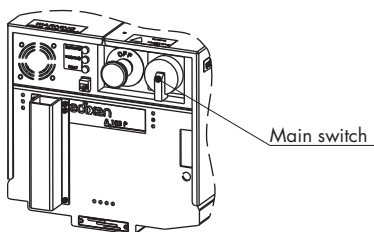
Checking the direction of rotation at initial pump start-up (for A603P pump only)

A603P pump model is not equipped with a frequency converter: the motor rotation depends directly on the main power connection. Incorrect wiring may cause backwards pump rotating. Its is necessary to check the direction of rotation at first start up.

Preliminary operations

Switch on the pump

Position the main switch on position «1».



Controlling the pump using the hand held display module

The hand held display module allows to control the pump and to configure the parameters. Connect the hand held display module.



At the first hand held display module connection, the monitoring identifies the pump.

FOR ALL PUMP
SERIAL XXXXXXX

The display lights up and the following screens appear:

Adixen Vacuum Products
MONITORING VX.XX
PRESS ENTER
OR AUTO CONNECTION

Initialize the system by pressing on **ENTER**.

MAITING
OLWRTA

The monitoring displays the status of the pump.

Because it is the first connection, it is necessary to take the pump control via the **CONTROL** key: **a star appears on the left side of the display.**

23 H LOC N2 LS RT
PUMPING STOPPED
15/10/05 10H10

Checking the direction of rotation at initial pump start-up (for A603P pump only)

Check the direction of rotation at initial pump start-up

DANGER

When inspecting the direction of rotation of the Roots at the initial start-up, provide protection against the risk of compression related to the rotating parts in the inlet.
Caution ! A non-powered Roots can be driven by another pump in rotation (risk of compression).

Remove the blank-off flange on the inlet and exhaust port.

Fit a pressure gauge at the pump inlet.

Set the main switch to position «1».

Press on the **ROOTS** key until the word **ROOTS** disappears from the display.

Start-up the pump by pressing «**START**» and stop it after few seconds:

- if the pressure indicated is less than $5 \cdot 10^{-1}$ hPa, the direction of rotation is correct.
- if the pressure increases, **invert two phases at the power supply plug, or from main switch terminal** (for electrical hard wire connection)

 B 50.

WARNING

When the main switch is set to «0», the part supply between the power and the main electrical switch, is energized.
 Risk of electrical shock in case of contact.
 Disconnect main electrical cable before any intervention.

WARNING

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

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.


CAUTION

In order to prevent foreign bodies from entering the pump, while waiting to be installed, replace blank-off flanges on inlet and exhaust ports again.

Checking the direction of rotation at initial pump start-up (for A603P pump only)

Check the direction of rotation at initial pump start-up (continued)

As soon as the installation and start-up procedure is complete, and the direction of rotation is checked, the pump is now ready for use  **B 60**.

However, if the pump has to be remote controlled, proceed to specific wiring instructions  **B 70**.

Connection to the pumping circuit

Preliminary precautions for inlet and exhaust connections

⚠ WARNING

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

⚠ CAUTION

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

Material in contact with process gases	
Components	Material
Pump, inlet, exhaust	Stainless steel, cast iron
O-rings and shaft-seals	Fluorinated elastomer, PTFE, FPE, Stainless steel

It is recommended to be able to isolate the pump from the vacuum and exhaust system particularly if you have pumped corrosive gases. (inlet and exhaust isolation valves, purges...) Several fitting accessories are available in the Manufacturer catalog.

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

At the pump exhaust

⚠ WARNING

Exhaust of corrosive, reactive, flammable, pyrophoric or oxidizing process gases may result in severe injury or death.
Always connect the pump exhaust to an appropriate exhaust extraction system.

⚠ WARNING

Ensure that all components in the exhaust pipeline have a maximum pressure rating which is greater than the highest pressure that can be generated in your system.

Incorporate flexible stainless steel flanged bellows in the vacuum pipeline to reduce the transmission of vibration.

Connection to the pumping circuit

Connection	A103P	A603P / A1003P
Exhaust connection	DN25 ISO-KF	

Several fitting accessories are available in the adixen catalog.

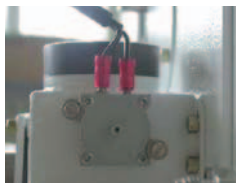
Secondary exhaust enclosure (Semi configuration)

The purpose of the secondary exhaust enclosure is to exhaust gas and vapors that might leak from the pump.

	A103P / A603P / A1003P
Flow	22 cfm
Differential pressure *	0.3 hPa / 0.125» wg
Exhaust	Ø 50 mm

* Measured at the secondary exhaust port

Connection procedure for pump equipped in Semi configuration



Remove the grey junk ring and the plate from the exhaust box by unscrewing the 4 screws Chc M4x12.

Disconnect the 2 terminals of differential pressure sensor cable from the differential pressure sensor.

Remove the differential pressure sensor from the upper box by unscrewing the 2 screws M3.

Check the presence of the O-ring of the differential pressure sensor.

Remove the upper box from the pump by unscrewing the 4 screws Chc M4x12.

Place the plate then the grey junk ring on the customer pipe.

Place the centering ring DN25 equipped with O-ring on the exhaust port and connect the customer pipe.

Secure it with the connect clamp.

Place the upper box.

Secure it with 4 screws Chc M4x12.

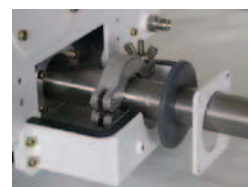
Replace the differential pressure sensor on the upper box and secure it with the 2 screws M3.

Connect the 2 terminals of differential pressure sensor cables to the differential pressure sensor.

Push the grey junk ring and the plate against the exhaust box.

Hold them in position with the 4 screws Chc M4x12. The plate must be in contact with the exhaust box soldered nuts.

Connect the secondary exhaust port to the customer application.



Connection to the pumping circuit

At the pump inlet

CAUTION

Make sure that any vacuum accessories connected to the inlet of the pump can withstand a negative pressure of 100 kPa relative to atmospheric pressure.

Incorporate flexible stainless steel flanged bellows in the vacuum pipeline to reduce the transmission of vibration.


To get the best pumping speed, ensure that the vacuum line is the minimum length possible and has an internal diameter not less than the inlet connection of the pump.

Connection

	A103P	A603P / A1003P
Inlet connection	DN50 ISO-KF	DN100 ISO-K

Several fitting accessories are available in the adixen catalog.

Remote control plug connection

Study the preliminary precautions  B 00.

CAUTION

Dry contact outputs are rated 50 V DC - 1 A max.
Overvoltage and overcurrent can cause internal damages.
Monitor external contacts voltage below 50 V and current below 1 A.

WARNING

When units containing control circuits are equipped with dry contacts outputs, it is the customer' responsibility to wire these outputs in compliance with safety extra low voltage installation and security standards. It concerns «Remote control», «emergency stop» and «RS232/485» connectors.

CAUTION

Make sure that main switch is off to avoid any short circuit during remote control plug disconnection/connection.

Presentation

The remote control function allows:

- Remote control of pumping functions «START/STOP/PURGE» and «Inlet valve».
- Remote monitoring of pump status through auxiliary dry contacts (50 V DC - 1A).

These contacts can be used to control automatic functions.

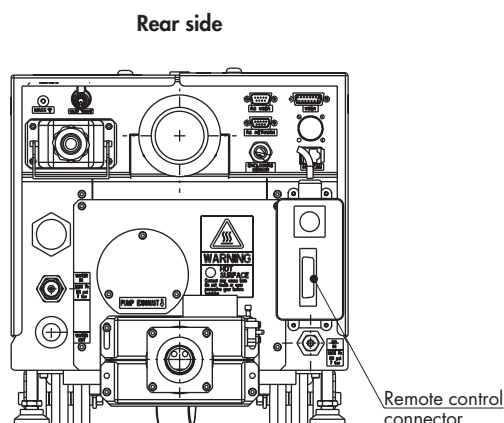
- Monitor pump warnings and hazards on the remote control connector with exception of maintenance warnings.

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

Connector location

The remote control connection is done via the «remote control connector», located on the rear side of the pump.

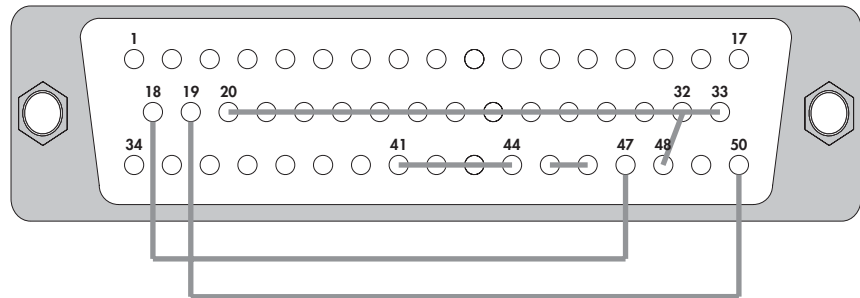
Connector type : 50 pins - male Sub D



Remote control plug connection

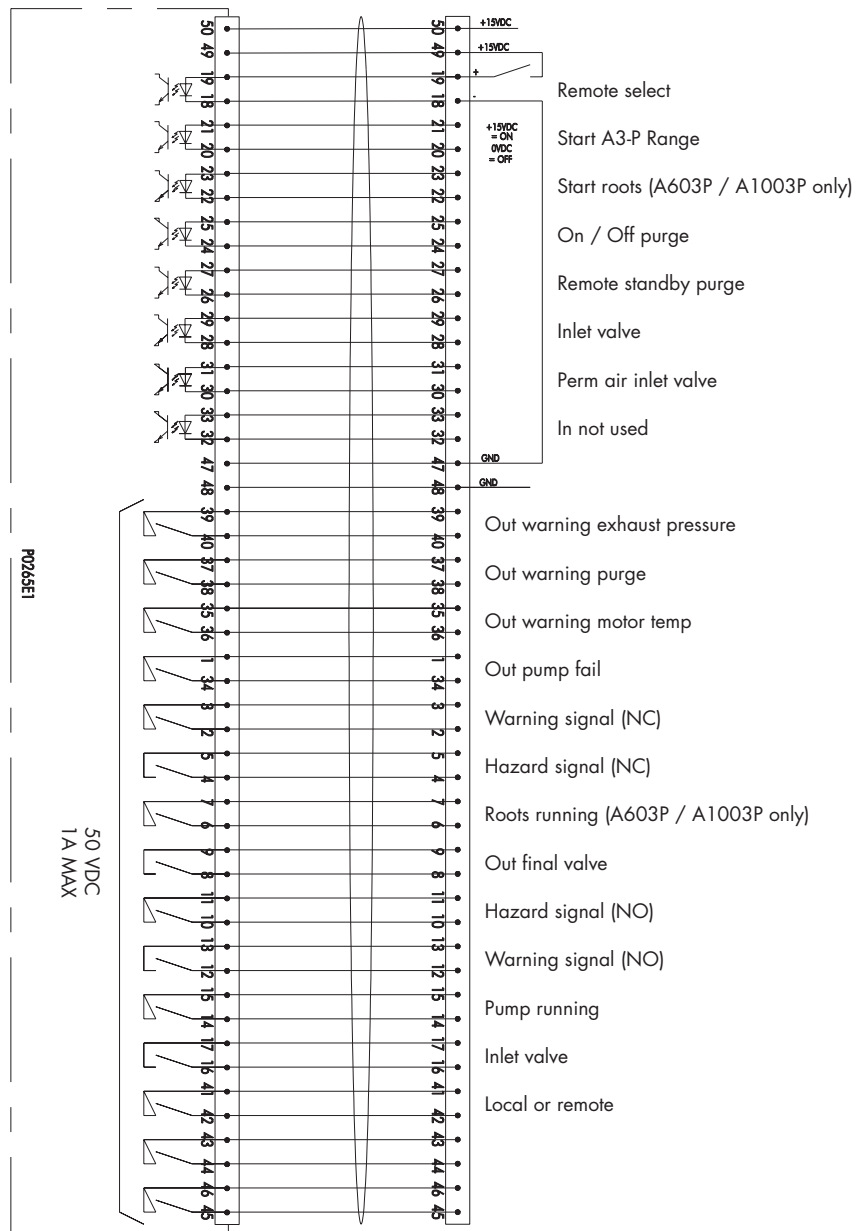
Cover plug wiring

The remote control cover plug is fitted on the «remote control connector» when the pump is configured in local mode.



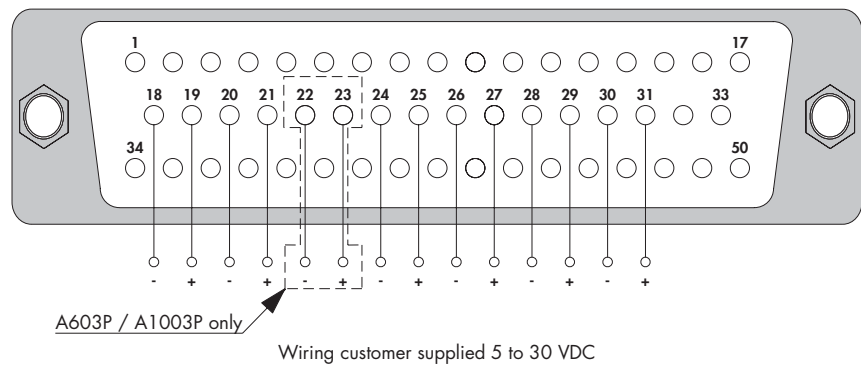
Factory wired (soldered side view)

Plug wiring

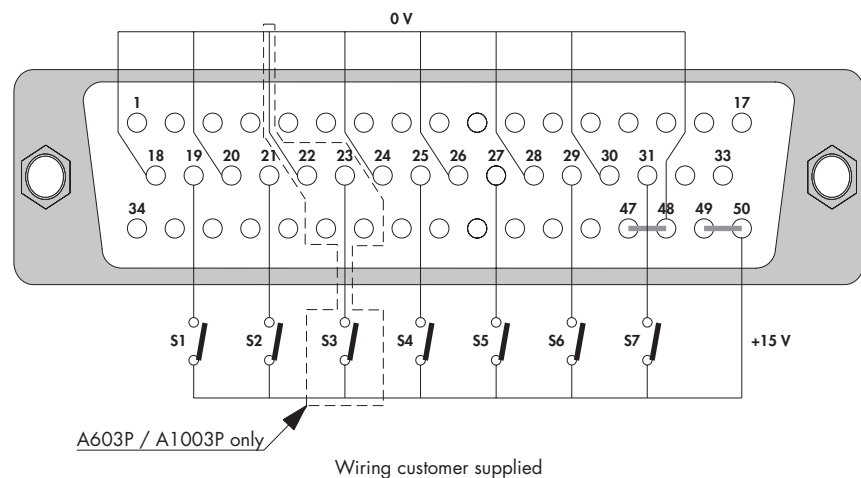


Remote control plug connection

Contacts (inputs) These inputs are considered to be activated when a DC voltage between 5 and 30 V is applied.



Inputs can be used by pins 47, 48 (0V) and pins 49, 50 (15V), in order to be controlled by external contacts of the customer equipment.



Contact	Function	
<i>All dry contacts are normally open</i>		
S1 (18-19)	local mode or remote control mode	Contact closed: local mode. Contact open: remote control mode.
S2 (20-21)	A3-P Range Start/Stop	Contact closed: A3-P Range starts. Contact open: A3-P Range stops. This function is only valid when remote control is validated, with contact S1 open.

Remote control plug connection

Contacts (inputs) (continued)

Contact	Function	
<i>All dry contacts are normally open</i>		
S3 (22-23)	A603P / A1003P only Roots Start/Stop	Contact closed: Roots starts. Contact open: Roots stops. This function is only valid when remote control mode is validated, with contact S1 open, and when " ROOT.CMD " selection is validated in DEFINITION menu of hand held display module.
S4 (24-25)	N ₂ purge Start/Stop	Contact closed: N ₂ purge starts. Contact open: N ₂ purge stops. This function is only valid when remote control mode is validated, with contact S1 open, and when " PURGE.CMD " selection is validated in DEFINITION menu of hand held display module.
S5 (26-27)	N ₂ stand-by purge valve Start/Stop	Contact closed: N ₂ stand purge starts when the " PURGE FLOW PROLONGED " time is passed. Contact open: N ₂ stand-by purge stops This function is only valid when remote control mode is validated, with contact S1 open, and when " N2 STANDBY " selection is validated in DEFINITION menu of hand held display module.
S6 (28-29)	Opening/Closing of inlet valve (remote mode only)	Contact closed: closing of inlet valve. Contact open: opening of inlet valve. This function is only valid when: <ul style="list-style-type: none"> ▪ The remote control mode is validated, ▪ "INLET VALVE OPTION" selected and validated in the DEFINITION menu of hand held display module.
S7 (30-31)	Authorization to close or not the inlet valve with the key " AUX " of hand held display module (local mode only)	Contact closed: authorization to close the inlet valve with the key " AUX " of hand held display module. Contact open: no authorization to close the inlet valve with the key " AUX " of hand held display module. This function is only valid when " INLET VALVE OPTION " is "valid" in the DEFINITION menu of hand held display module.

Remote control plug connection

Contacts (available outputs)

Contact	Function
<i>Contact opened, in the presence of a fault (normally closed)</i>	
1-34	Out. pump fail
2-3	Warning signal
4-5	Hazard signal
6-7	Roots running (A603P / A1003P only)
8-9	Out. final valve **
14-15	Pump running
16-17	Inlet valve **
35-36	Out. warning motor temp
37-38	Out. warning purge
39-40	Out. warning exhaust pressure
41-42	Local or remote *
<i>Contact closed, in the presence of a fault (normally open)</i>	
12-13	Warning signal
10-11	Hazard signal

* Contact opened = Local

Contact closed = Remote

** Contact opened = valve closed

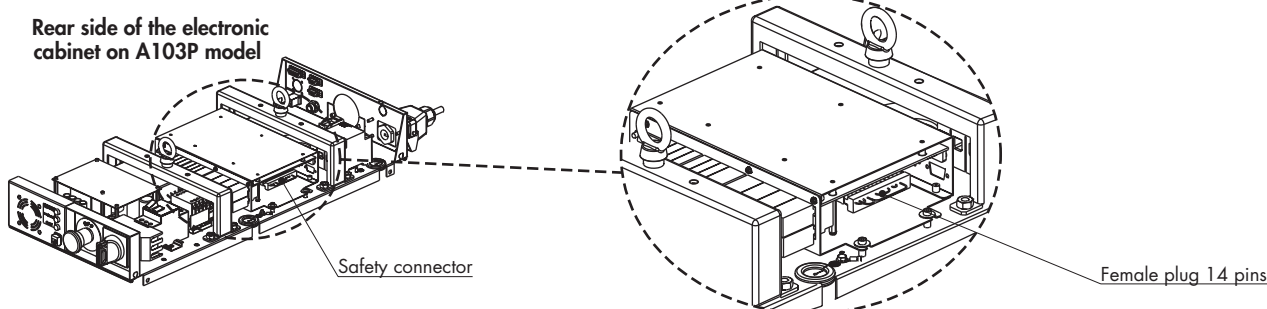
Contact closed = valve opened

Safety plug connection

Study the preliminary precautions  B 00.

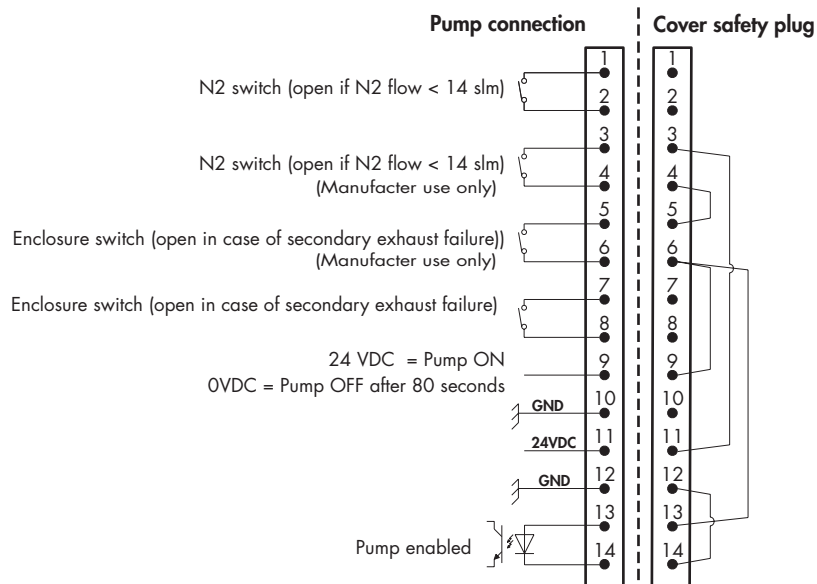
Presentation The safety plug will stop the pump in the event of an N₂ flow fault or loss of secondary enclosure ventilation (Semi configuration).

Connector location The safety connections are done via the «safety» connector, located on the rear side of the electronic cabinet.



Cover plug wiring The pump can run only if the cover plug is fitted on the «Safety connector».


Note : An overtemperature of the motor and an overpressure of the exhaust will stop the pump.



Contact	Function
1-2	N ₂ switch (open if N ₂ flow < 14 slm) (customer use) .
7-8	Enclosure switch (open in case of secondary exhaust failure) (customer use) (Semi configuration).
13-14	Safety start / stop of the pump.

Note : A maintenance cover plug can be connected on the safety connector  D 10.

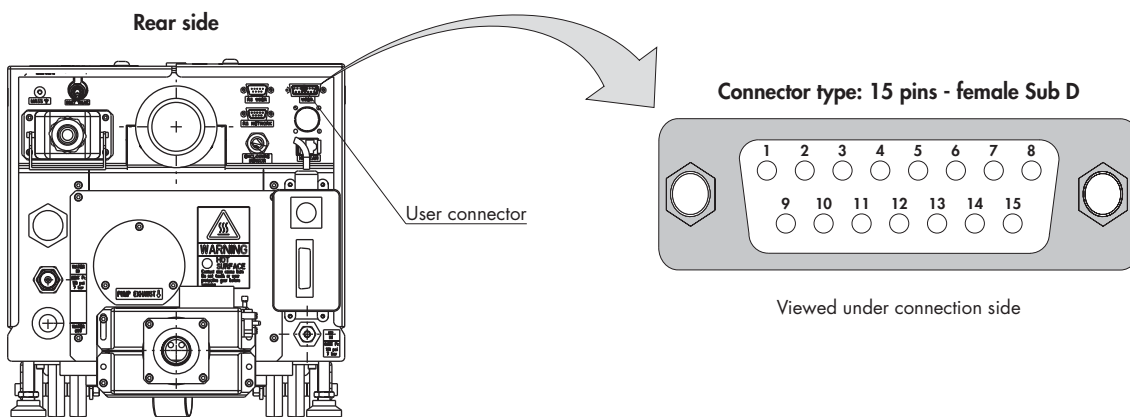
User plug connection

Study the preliminary precautions  B 00.

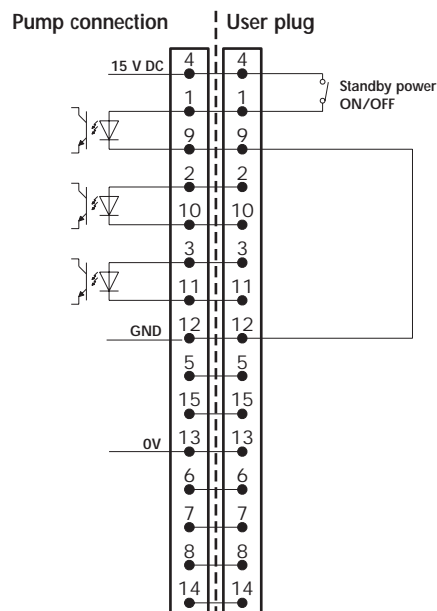
Presentation The user connection is intended for specific customer applications.

Connector location The user connection is done via the «user» connector, located on the rear side of the pump.

A103P / A603P / A1003P pumps



Plug wiring for standby power option



This plug wiring allows the standby power option operation when the monitoring setting is ENABLED  C 10 .

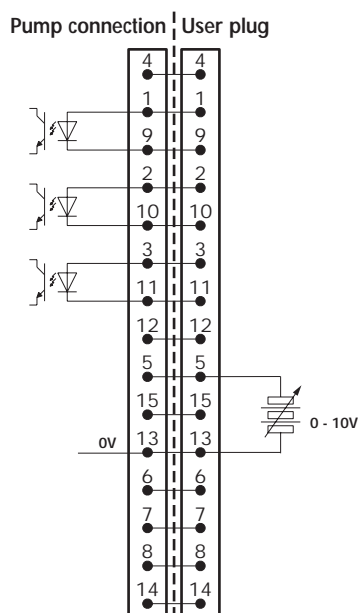
User plug connection

Plug wiring for high speed option

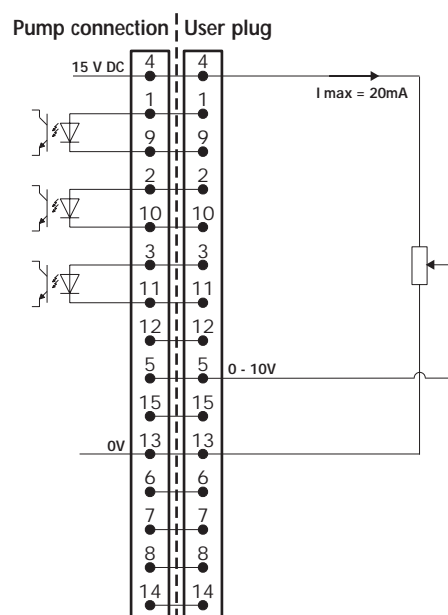
This «High speed» option allows to modify the rotation speed of the motor (from 0 VDC = 100 Hz to 8 VDC = 20 Hz).

These plug wirings allow the «High speed» option operation when the monitoring setting is ENABLED  **C 10**.


Wiring: 1st case



Wiring: 2nd case



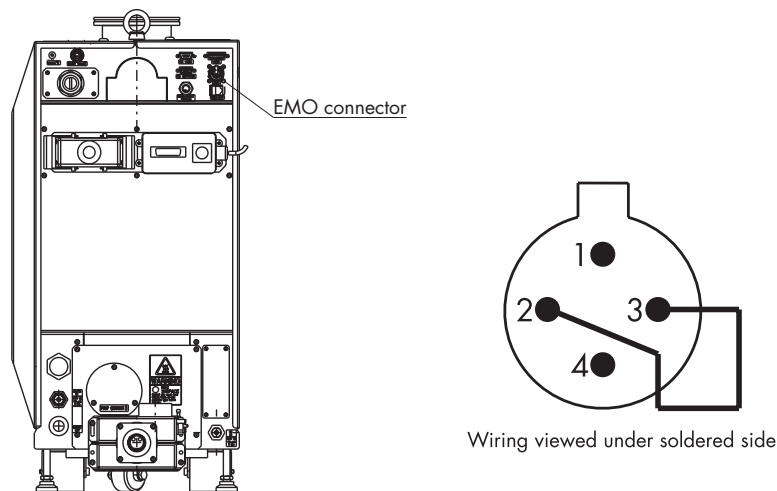
EMO plug connection (on A603P / A1003P pump models)

Study the preliminary precautions  B 00.

Presentation The «EMO» plug allows the control or remoting of the emergency stop function from the front panel of the unit.

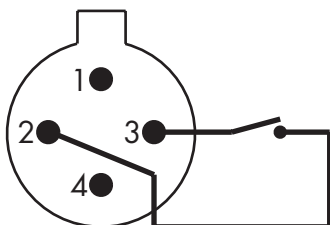
Connector location The emergency stop connection is done via the «EMO connector», located on the rear side of the pump.

A603P / A1003P Pumps
Rear side



Cover plug wiring In local mode, the pump can run only if the cover plug (delivered with the pump) is fitted on the «EMO connector». When the emergency stop is interfaced, if the remote mode is not used, it is necessary to connect the «remote cover plug».

Plug wiring All dry contacts are rated 50V - 1A.



Wiring viewed under soldered side

Contact	Function
<i>Input</i>	
2-3	Contact opened, emergency stop command is activated.
<i>Available output</i>	
1-4	This contact opens when emergency stop is activated.

WARNING


When units containing control circuits are equipped with dry contacts outputs, it is the customer' responsibility to wire these outputs in compliance with safety extra low voltage installation and security standards. It concerns «Remote control», «emergency stop» and «RS232/485» connectors.


RS 232 or RS 485 link wiring

At first power-on, the user will find the initial factory-set configuration:

- Type: **RS 232**
- Transmission SPEED: **9600 bauds**
- Data length: **8 bits**
- Parity: **NO**
- Stop bit: **1**
- Echo: **ON**

The settings can be modified:

- Through the corresponding monitoring menu  **C 42** with hand held display module (accessory).
- Through the RS 232 / 485 serial link connected with manufacturer network.

The commands and message reception syntax is available on section  **C 90**.

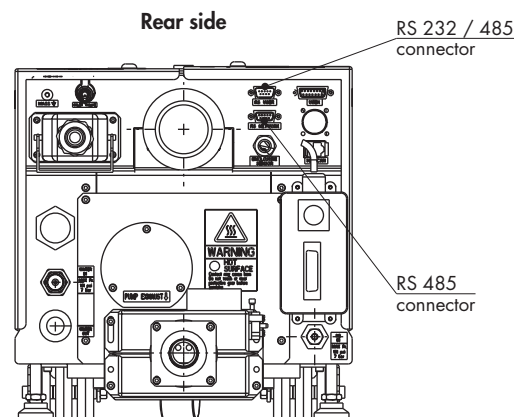
RS 232 / 485 connector location

The serial link connection is done via the RS 232 / 485 connector or RS 485 connector located on the rear side of the pump.

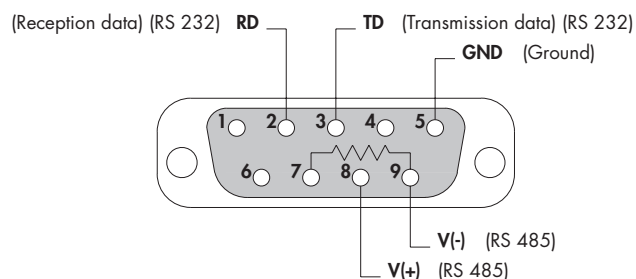
Connector type (RS 232 / 485): 9-pin male DB connector.

Connector type (RS 485): 9-pin female DB connector.

A103P / A603P / A1003P pump

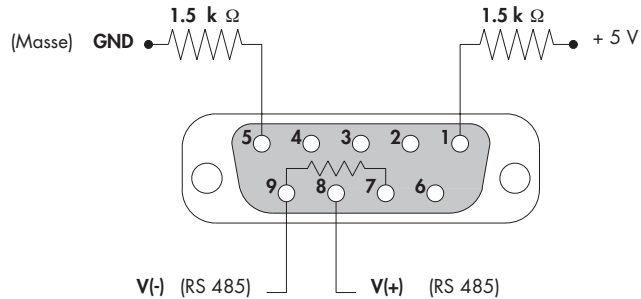


RS 232 / 485 plug wiring



RS 232 or RS 485 link wiring

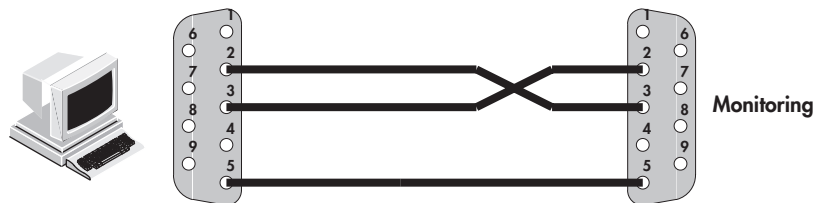
RS 485 plug wiring



Pin 7, 8 and 9 of RS 485 are internally and respectively connected to pin 7, 8 and 9 of RS 232/485.

Examples of possible connection

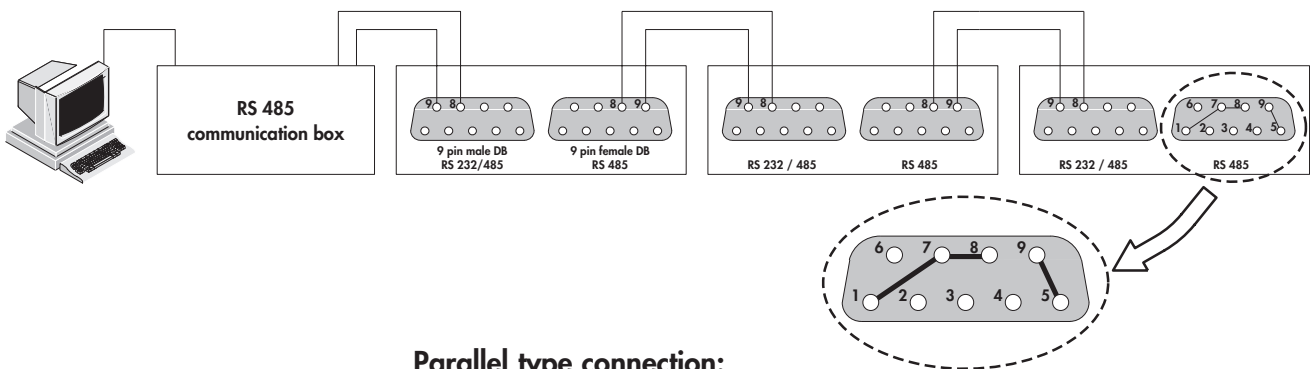
Serial link RS 232 with a single monitoring system



Serial link RS 485

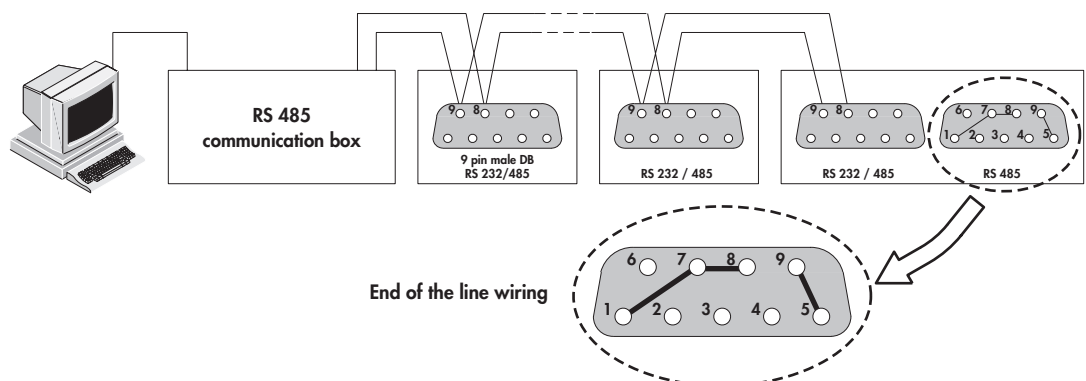
Series type connection:

All communications will be lost if any one pump is disconnected.



Parallel type connection:

Communication will be lost only on the disconnected pump.



Removable handle installation (accessory)

Description

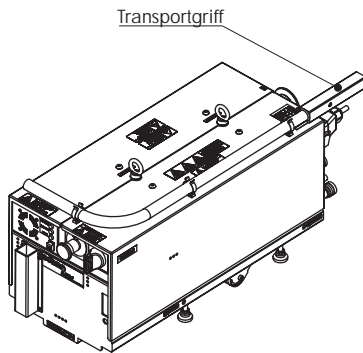
A removable handle is available as an accessory for A103P to make the pump moving easier.

Accessories

 A 50

Installation

Storage of the removable handle

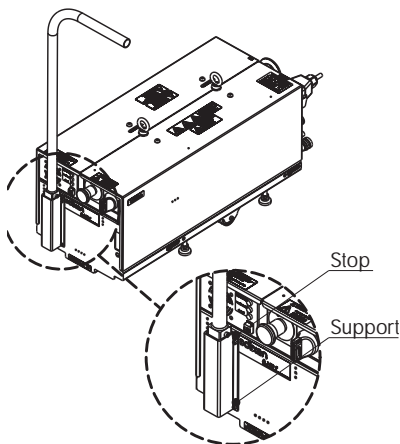


Install the removable handle clips.

- Place the three clips into the hole of the right upper panel.
- Secure them with the three Chc M4 screws equipped with their washer.

Put in place the handle.

Move the pump with the removable handle



Install the removable handle on its support.

- Remove the removable handle from the right upper panel.
- Place the removable handle in its support on the front side of the pump.

Push or pull the removable handle to move the pump.

When the pump is in the desired location, position it  B 20.

Then store the removable handle on the right upper panel by proceeding in reverse manner.



Operating Manual - A3P Series Detailed contents

C 00	<i>Safety recommendations for harsh processes</i>
C 10	<i>Operating modes</i>
C 20	<i>Monitoring system parameters</i>
C 25	<i>Safety management</i>
C 40	<i>Operating mode with hand held display module (accessory)</i>
C 41	<i>Start up of the monitoring system</i>
C 42	<i>Monitoring system function table</i>
C 43	<i>Starting mode definition «Hand held display module»</i>
C 44	<i>Saving and loading of pump configuration</i>
C 45	<i>Monitoring system setting for transport</i>
C 70	<i>Use of the inlet isolation valve (accessory)</i>
C 90	<i>Use of the serial link</i>

Safety recommendations for harsh processes

SHUT DOWN PROCEDURE FOR DISCONTINUOUS OPERATION

All process pumps are designed for continuous operation in pumping process gas and should not be stopped.

adixen Vacuum Products will be released from any warranty and liability claims if a process pump is stopped for a prolonged time leading to condensation of by-products, powder build-up or corrosion inside the pump.

The only guaranteed solution by adixen Vacuum Products to restart a process pump after a prolonged stop is to perform a complete overhaul of the pump.

Despite this recommendation, if the pump is shut down for a prolonged time, it is advisable to follow the precautions below-mentioned in order to reduce the risks of condensation, powder build-up and corrosion inside the pump.

- From the process chamber, flush the pump using a dry inert gas, such as Nitrogen, through the inlet port during 30 minutes.
- Stop inert gas supply and let the pump running at ultimate pressure for 5 minutes.
- Stop the pump and close inlet port with the appropriate blank-off flange.
- If the pump is equipped with a monitoring system, configure N2 prolonged option in the menu and set it on 30 minutes, then perform a cycle start/stop of the pump. Wait till end of purge prolonged cycle (30 minutes).
- Put appropriate blank-off flange at exhaust of the pump.
- Turn off the cooling water supply.

When the pump will need to be back in operation, the following points need to be observed :

- Remove the exhaust and inlet blank-off flanges and connect the pump to the equipment.
- Turn on the cooling water.
- Power on the pump and press start button.

In case of trouble to restart the pump, contact adixen Customer Service.

Safety recommendations for harsh processes

CAUTION

SAFETY INFORMATION related to SiH₄/H₂ PROCESSES

Processes using high H₂ or SiH₄ flows require extended safety to prevent any problem. In order to avoid any safety issue or risks relative to process and pumping conditions, it is necessary to set up the pump with correct settings, following adixen recommendations.

Concerned processes : PECVD Si : (a/ μ c-Si using both SiH₄ and H₂) ; PECVD SiN (using SiH₄)

On these applications, and depending on working conditions (flows ratio and working pressure), two risks can easily be identified.

- Explosion of Si dust,
- Ignition of SiH₄/H₂ trapped into powders.

Explosion of Si dust : (PECVD Si)

Some PECVD Si produces a lot of an orange/brown powder which is composed of very thin particles of Si. Depending on exact process conditions, size of these particles may vary from 0,1 to 100 μ m. In this range, a mix of Si dust and air in a cloud is considered as highly explosive as its ignition energy is very low. Friction between particles or air flow inrush is sufficient. Overpressure generated by this kind of mix is 10-11 times initial pressure.

Explosion due to ignition of SiH₄ trapped in by-products : (PECVD Si & SiN)

Another well known phenomena is explosion due to trapped silane. As PECVD Si and SiN produce a lot of powder which deposits into vacuum line, pump, exhaust line... The different layers of powder have the ability to retain/trap process gases. These gases can be released suddenly and ignite in case of violent air inrush.

Explosion consequences:

An explosion, either in vacuum line or pump or exhaust line, is a complex chemical reaction.. An explosion can also generate a leak which will generate a second explosion...

Another important point is that vacuum pumps are also compressors. Depending on pressure in volume to evacuate, pressure in different pump's stages can be much greater than Atmosphere. Consequently, explosion can generate very high local overpressure.

GENERAL RECOMMENDATION

It is necessary to pay particular attention to:

Leak tightness of the whole system:

- Be sure there is no air leak on pumping system itself and on vacuum line. Leak rate has to be lower than 10^{-6} hPa.l/sec of Helium. A leak from outside to inside may lead to uncontrolled reaction between SiH₄ and O₂. If the leak is big enough, H₂/O₂ mix could be ignited by decomposition of SiH₄. In the worst case, explosion can occur.
- End user must guarantee vacuum line and exhaust line leak-tightness
- Be sure there is no leak at pump exhaust. An overpressure Helium leak test has to be performed. Maximum leak rate is $5 \cdot 10^{-5}$ hPa.l/sec.

N₂ purge:

- Be sure pump is purged with N₂. Air is prohibited.
- This purge could be stopped when process gases are off, but it has to be in a safe and robust procedure.
- Be sure N₂ purge warning and alarm are enabled
- Be sure N₂ purge is prolonged at least 10 min after pump stop to evacuate residual process gases after pump stop

Communication with tool:

- global warning and alarm and specific N₂ warning and alarm has to be sent to the tool which must shut off active gases.
- Immediate corrective actions must be scheduled in case of N₂ signals (warning or alarm).

Safety recommendations for harsh processes

CAUTION

SPECIFIC ADIXEN RECOMMENDATIONS for processes using SiH₄ and H₂

For these applications, using SiH₄ or H₂, adixen recommends:

- 1) To avoid O₂ in process vacuum line after process chamber maintenance : O₂ may likely react with trapped gases and deposited dusts & polymers.

Preferred solution:

AVTF strongly advise to use separated 'load lock & transfer' (clean) pump in order to evacuate process chamber from atmospheric pressure down to 60 hPa (or less), using a soft pumping step to limit particle transportation.

Alternative solution:

End User may flush process chamber and piping installation with nitrogen in order to decrease oxygen concentration below MOC/LOC level with safety margin (ie [O₂] < 2% for hydrogen or 0.84% for Silane).

- 2) To avoid air inrush in vacuum line: a sudden air inrush could shake the fore line strong enough to make powders fall and release pyrophoric gases. It could also lead to cloud creation which can be ignited easily with very low energy.
 - Avoid ports on the fore line between process chamber and process pump, or secure them (i.e. a valve must be equipped with a blank-off flange and a clamp which cannot be opened without a tool)
 - Use a main isolation valve which cannot be opened if the differential pressure is too high, meaning that only a soft pumping valve can be used to evacuate the chamber from atmosphere
 - To use an efficient flow restriction (i.e. soft pumping) for chamber evacuating from Atmosphere down to 60hPa : In order to avoid cloud formation within flammable range of common species
- 3) To stop Roots blowers interlocked when chamber pressure is higher than safety level of 60hPa, to avoid:
 - Si particles removal from pipe inner surfaces (generating Si dust cloud)
 - Generating Si dusts cloud due to high turbulences created at rotating parts contact.
 - Possible Roots exhaust overpressure which could increase effects of a possible explosion by increasing the initial pressure.
- 4) To interface pumps with the tool: N₂ warning has to be considered as a safety issue (see interface recommendations) with immediate interlock action on process gases inlet.
- 5) To flush the pump with N₂ (pump running) during at least 20mn before to exchange it
- 6) To install additional protections to avoid projections if any component of the entire system cannot withstand the pressure of an eventual explosion.
- 7) To minimize or secure quantity of inlets ports in the exhaust line which can become undesired leak sources or sudden, air inrush.
- 8) To respect a safety area around the pump of 4m minimum. This will prevent any damage on operators ears due to overpressure shock wave propagation, as well as little fragments ejection - if any.

Operating modes

Different control modes

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

- Locally controlled by the hand held display module (accessory).
- Remote controlled by the equipment (remote control connector).
- Remote controlled by the serial link (RS 232 connector).

If the EMO connector is not connected to the tool, it is necessary to connect the EMO cover to the EMO connector  B 100 .

Local control mode

In local mode, the remote control cover plug must be connected to the remote control connector at the rear panel of the pump. The remote cover plug is necessary to disable the remote control mode and to enable the local control mode.

Local control with hand held display module (accessory)

The pump is running as a stand-alone part of the equipment on which it has been installed.

The pump is controlled by the hand held display module (HHDM accessory), connected in front or rear panel of the pump, or by both simultaneously connected, one in front and the other at the rear panel of the pump.

A second HHDM can also be connected in series with the first one.

CAUTION


For safety reasons, the pump can be controlled only by one hand held display module at the same time.

Remote control modes

Remote control by «J14 remote control connector»

Pump alone

The pump is monitored by the equipment in which it is installed (such as an automated pumping system or industrial equipment).

The pump is remote controlled by the opening or closing of different dry contacts wired on remote control connector  B 70.



This mode is enabled when **S1** contact is open that also inhibit the control of the pump by the HHDM. However, the data and operating parameters can be read on the HHDM.

In remote mode, «REM» is displayed on the HHDM.

Remote control via the «RS 232 connector»





Pump alone or in a group of pumps

The pump is monitored by the equipment in which it is installed, either alone or in a group of pumps.

The pump is remote controlled by the commands transmitted on the serial link (refer to  B 110 for wiring and  C 90 for commands).

Operating modes

Pump control mode Priority

Pump control mode	How enable the mode?	Display on HHDM	How to disable ?
1- Local mode using the HHDM	<ul style="list-style-type: none"> connect the HHDM on the RJ45 connector connect the remote control cover plug on J14 Press «CONT» key 	«LOC» and a star'*) appears on the left of the screen	press "CONT"key.
2- Remote control mode via J14 remote connector	<ul style="list-style-type: none"> connect the pump to the tool via J14  B 100 Open S1 contact to remote control the pump 	«REM»	close S1 contact
3- Serial link mode via RS 232 connector	<ul style="list-style-type: none"> connect RS 232 connector  B 70 Send CTRLON command  C 90 	«RS»	Send CTRLOFF command  C 90

RS mode has priority on LOC and REM mode.


REM mode has priority on LOC mode.

LOC mode has no priority regarding the other modes.

N₂ control operation


Software monitoring


The absence or a too low flow of N₂ is software monitored.

This is defined by two parameters that can be adjusted through the HHDM  **C 42**:

- N₂ flow sensor warning time (W13).
- N₂ flow sensor hazard time (D13).

Hardware monitoring (Semi configuration only)

If an N₂ flow below 14 slm is detected by the flow switch, the pump will be stopped after 80 seconds if the safety cover plug is connected to the safety connector  **B 80**.

Example Let's consider that the setting of the **N₂ flow sensor** parameters in the **SETTING** menu  **C 42** is the following:

N ₂ flow sensor	
Warning time	Hazard time
2 min	5 min

Operating modes


N₂ control operation

Example (continued)

The sequences in case of N₂ loss will be the following ones :

- As soon as pressure drops below the threshold (t=0 mn):
The yellow leds on the HHDM and in front of the pump will turn «on».
The N₂ flow warning message (W13) is displayed HHDM.
The pump warning signal (remote control plug pins 2 and 3), the N₂ flow feedback signal (remote control plug pins 37 and 38) and the final valve interlock signal (remote control plug pins 8 and 9) will open.
Pump will still be running.
- At the end of the warning time (t=2mn):
The red leds on the HHDM and in front of the pump will turn «on».
The N₂ flow hazard message (D13) is displayed on the HHDM.
The pump buzzer will turn on.
The pump alarm signal (remote control plug pins 4 and 5), the N₂ flow feedback signal (remote control plug pins 37 and 38) and the final valve interlock signal (remote control plug pins 8 and 9) will open.
Pump will still be running.
- At the end of the hazard time (t=5mn): Pump stops.

«N2 flow sensor» setting

The **N₂ flow sensor** parameters in the **SETTING** menu  **C 42** is set at factory as follows:


N ₂ flow sensor	
Warning time	Hazard time
2 min	Disabled

This means that the pump monitoring will not take decision to stop the pump in case of N₂ loss or too low flow.

However all the information to handle safety operations linked to the process gas panel are provided through the «remote control connector» and the «safety connector».

Operating modes


Stand-by purge operation (option)

The **stand-by purge function** can be used to reduce the pump nitrogen consumption during process idle. The «remote control» plug  **B 70** must be used for this feature.

«Standby N₂ option» setting

The selection of the **Standby N₂ option** can be performed by the RS 232 / 485 or the HHDM (accessory).

To change the parameter of the **Standby N₂ option** from **Disabled** to **Enabled** with the HHDM, perform the following operations:

- Connect the HHDM plug to the HHDM connector on the front or rear panel.
- Set the **Standby N₂ option** parameter in the **DEFINITION** menu  **C 42** as follows:

Standby N ₂ option
Enabled

Hand held display module message

A message specific to each stand-by purge configuration will be displayed on the HHDM.

HHDM message	Setting of the monitoring	Equipment command
	Standby N ₂ option	Via remote control connector (S5)
N ₂	Disabled	/
* *	Enabled	Activated
N *	Enabled	Not activated


Autostart control operation

The **autostart function** allows the automatic restarting of the pump when the stop is caused by a power failure.

«Auto-start» setting

The selection of the **Auto-start** can be performed by the RS 232 / 485 or the HHDM (accessory).

To change the parameter of the **Auto-start** from **Disabled** to **Enabled** with the HHDM, perform the following operations:

- Connect the HHDM plug to the HHDM connector
- Set the **Auto-start** parameter in the **DEFINITION** menu  **C 42** as follows:

Auto-start
Enabled

 **DANGER**

When the pump has been configured for automatic restart after a power failure, it is the responsibility of the user to take all the measures required to prevent risks resulting from this type of operation.

Operating modes


Stand-by power and high speed control operation


The «user» plug  **B 90** must be wired for these features:

- The **stand-by power function** can be used to reduce the pump power consumption (stand-by of the pump) during process idle.
- The **high speed function** can be used to reduce the pump consumption or to increase the pump performance.

«Standby power option» setting

To change the parameter of the **Standby power opt** from **Disabled** to **Enabled** with the HHDM (accessory), perform the following operations:

- Connect the HHDM plug to the HHDM connector on the front or rear panel.
- Set the **Standby power opt** parameter in the **DEFINITION** menu  **C 42** as follows:

HHDM message	Setting of the monitoring		Equipment command
	High speed option	Standby power option	Via User connector  B 90
SP	Enabled or Disabled	Enabled	Standby power switch ON


A message «SP» will be displayed on the HHDM.


«High speed option» setting

The **High speed option** parameter in the **DEFINITION** menu  **C 42** is set at factory as follows:

	A103P	A603P / A1003P
High speed option	Enabled	Disabled

To change the parameter of the **High speed option** perform the following operations:

- Connect the HHDM (accessory) plug to the HHDM connector on the front or rear panel.
- Set the **High speed option** parameter in the **DEFINITION** menu  **C 42** as follows:

HHDM message	Setting of the monitoring	Equipment command
	High speed option for A103P	Via User connector  B 90
HS	Enabled	Possible to adjust the speed
LS	Disabled	Impossible to modify the speed

Monitoring system parameters

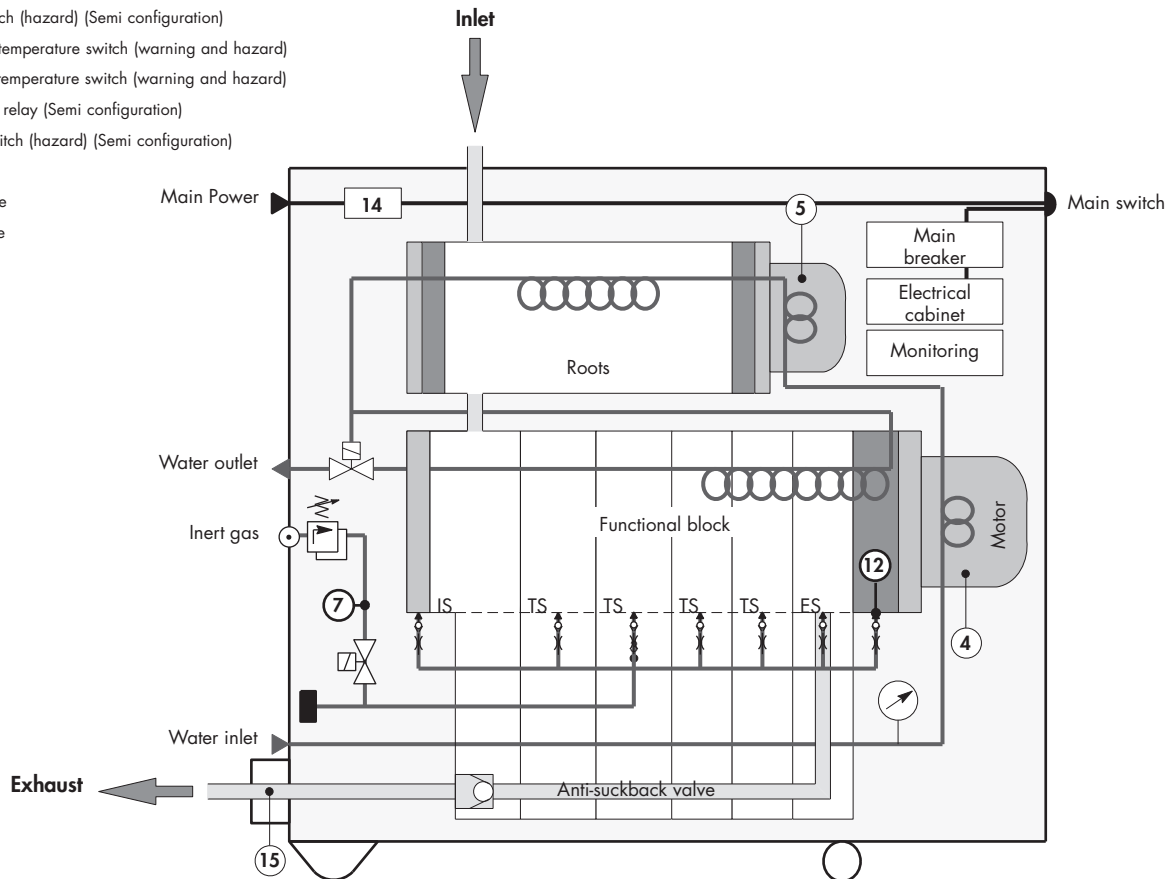
Sensor	Function
Pump Temperature sensor	Allows regulation of pump temperature. Indicates a pump temperature variation (a warning when temperature is greater than the warning threshold and an hazard when temperature is greater than alarm threshold).
Motor power sensor (included in the frequency converter)	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.
Warning water flow switch *	Indicates a water flow below 60 l/h.
Warning motor temperature switch *	A motor temperature warning is generated when the warning threshold is exceeded.
Hazard motor temperature switch *	The pump is stopped immediately when the hazard threshold is exceeded.
Pressure sensor *	Indicates exhaust overpressure when the pressure reaches 1600 hPa (silencer clogged) and stops the pump at 2000 hPa.
Flow sensor	Monitors the N ₂ injection into the pump. When flow is under the preset threshold, a N ₂ warning is generated.

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

Safety management

Safety switch location

- 7 : N₂ flow switch (hazard) (Semi configuration)
- 12 : Pressure switch (hazard) (Semi configuration)
- 4 : Pump motor temperature switch (warning and hazard)
- 5 : Roots motor temperature switch (warning and hazard)
- 14 : Ground fault relay (Semi configuration)
- 15 : Enclosure switch (hazard) (Semi configuration)
- IS : Inlet stage
- TS : Transfer stage
- ES : Exhaust stage



Safety parameters

	N ₂ flow switch (Semi configuration)	Pressure switch (Semi configuration)	Pump motor and Roots temperature switches	Enclosure exhaust switch (Semi configuration)	Ground fault relay (Semi configuration)
Function	Detect a defect of N ₂ flow purge	Detect an overpressure in the exhaust line	Detect a motor overheating	Detect a defect of enclosure ventilation	Detect an electrical leak
Threshold	Hazard < 14 slm	Hazard ≥ 2000 hPa	Hazard ≥ 150 °C	Hazard ≥ 1.6 hPa	Hazard > 30 mA
Equipment condition after interlocks activation	When the N ₂ flow is lower than 14 slm, a hazard stops the pump after 80 s	When the pressure reaches 2000 hPa, a hazard stops the pump immediately	When the motor temperature reaches 150 °C, a hazard stops the pump immediately	When the differential pressure in the exhaust box reaches 1.6 hPa, a hazard stops the pump after 80s	When the electrical ground leak is lower than 30 mA, the main breaker is activated and the pump stops
Soft message	Safety hazard: D43	Safety hazard: D42	Safety hazard: D41 D40	Safety hazard: D44	/

Operating mode with hand held display module (accessory)

C 41 *Start up of the monitoring system*

C 42 *Monitoring system function table*

C 43 *Starting mode definition «Hand held display module»*

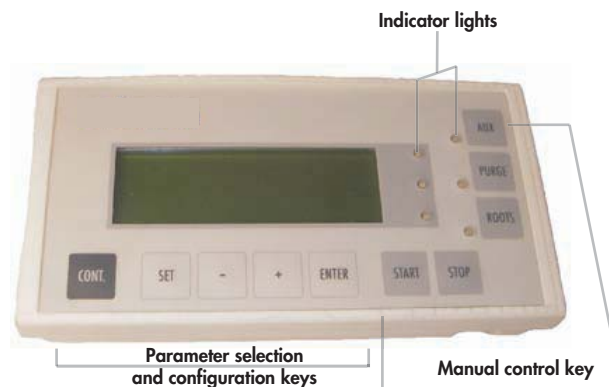
C 44 *Saving and loading of pump configuration*

C 45 *Monitoring system setting for transport*






Start up of the monitoring system

Hand held display module

The keyboard is used to control the pump and configure the parameters.



The function of the parameter selection and configuration keys

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

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 by holding down the **+** / **-** keys.

For all the other keys, press several times.

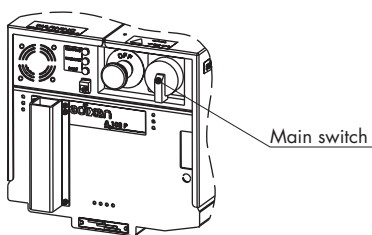
Start up of the monitoring system

Monitoring start up

Before using the monitoring, check that the mechanical and electrical connections defined in the chapter B have been made.

CAUTION

For A603P pump model, don't forget to check the direction of rotation before starting up the pump  B 51.



Connect the hand held display module.

Position the main switch on position **1**.

At the first hand held display module connection, the monitoring identifies the pump.

FOR ALL PUMP

SERIAL XXXXXXX

The display lights up and the following screens appear:

**adixen Vacuum Products
MONITORING VX.XX
PRESS ENTER
OR AUTO CONNECTION**

Initialize the system by pressing on **ENTER**.

**MAITING.....
OLWRTA**

The monitoring displays the status of the pump

**23 H LOC N2 LS RT
PUMPING STOPPED
15/10/05 10H10**

Because it is the first connection, it is necessary to take the pump control via the **CONTROL** key: **a star appears on the left side of the display.**

Access to the parameter settings


The programing made at the factory is protected by an access code which disables parameter modification.

Press the **SET** key.

ENTER PASSWORD

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

*** 0 ***

Access code and parameters can be customized  C 42.

Start up of the monitoring system

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.

DEFINITION MENU
SETTING
MAINTENANCE
MANAGEMENT

N2 FLOW PROLONGED
DATE AND TIME
TEMPERATURE UNIT
PRESSURE UNIT

DATE AND TIME
DAY
MONTH
YEAR

DEFINITION MENU
SETTING
MAINTENANCE
MANAGEMENT

Monitoring system function table

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 customized (see **Password** parameter of the **Management** menu folio 5/6).

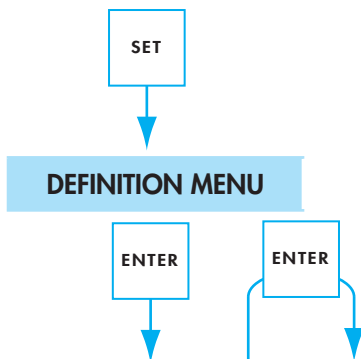
ENTER PASSWORD

* 0 *

Parameters can be load from one pump to another.

This can be done if the pump is to be replaced or when installing a new pump  C 44.

Monitoring system function table



Selection	Choice	Definition	Initial configuration
LANGUAGE	FRANCAIS ENGLISH	All the menus are in the selected language.	English
SYSTEM SELECT	A3R0/R1/R2	Allows to read the pump type: A3R0 for A103P A3R1 for A603P A3R2 for A1003P	According to the pump
AUTO-START	ENABLED DISABLED	Allows automatic pump start after a power failure.	Disabled
ROOTS COMMAND	ENABLED DISABLED	Allows separate control of the Roots START/STOP control from the ADP START/STOP, instead of simultaneous start-up, the Roots is started using ROOTS key or remote controlled.	Disabled
STANDBY N2 OPTION	ENABLED DISABLED	Authorizes the stoppage of the nitrogen injection in the functional block stages when processing is stopped (if standby purge option installed).	Disabled
STANDBY POWER OPT	ENABLED DISABLED	Authorizes the stand-by of the pump when processing is stopped.	Disabled
HIGH SPEED OPTION	ENABLED DISABLED	Authorizes the modification of the pump speed.	Disabled (A603/A1003) Enabled (A103)
INLET VALVE OPTION	ENABLED DISABLED	Inlet valve validation.	Disabled
ROOTS T° OPTION	ENABLED DISABLED	NA	Disabled
INTERN. T° OPTION	ENABLED DISABLED	Temperature regulation validation.	Disabled
KEY MODE OPTION	ENABLED DISABLED	Authorizes the key mode (for maintenance only) .	Disabled

Monitoring system function table

SET

↓

DEFINITION MENU

ENTER

ENTER

+

Selection	Choice	Definition	Initial configuration
AUX TEMP.	ENABLED DISABLED	NA	Disabled
BUZZER OPTION	ENABLED DISABLED	Controls buzzer ON/OFF in case of a fault. Buzzer stop by pressing ENTER .	Enabled

SET

↓

SETTING

ENTER

ENTER

+

Selection	Selection	Setting limits	Initial configuration
SERIAL LINK 1	TYPE	RS 232 / RS 485 / Network	RS 232
	ECHO	ENABLED / DISABLED	Enabled
	SPEED	9600 bauds	9600 bauds
	PARITY	no / even / odd	No
	2 STOP BITS	ENABLED / DISABLED	Disabled
	ADDRESS	0 to 999	0
N ₂ FLOW SENSOR	WARNING TIME	0 to 60 min	0
	ALARM TIME	0 to 60 min / DISABLED	Disabled
PURGE WARNING	-	15 to 60 slm (standard liter per minute)	15
INTERNAL T°	INPUT VALUE	70 to 110°C	100
	ALARM THRESHOLD	+10°C above the set value	130

Monitoring system function table

Selection	Selection	Setting limits	Initial configuration
POWER SENSOR	WARNING THRESHOLD	500 to Alarm threshold *	2800
	ALARM THRESHOLD	2500 to 6000	3000*
N ₂ FLOW PROLONGED	-	0 to 120 min	10
DATE & TIME	DAY	1 to 31	-
	MONTH	1 to 12	-
	YEAR	0 to 99	-
	HOUR	0 to 23	-
	MINUTE	0 to 59	-
PRESSURE UNIT	-	hPa / Torr / PSI / hPa	hPa
ANALOG.1 INPUT	WARNING THRESHOLD	NA	-
	ALARM THRESHOLD		-
TEMPERATURE UNIT	-	Celsius / Fahrenheit	Celsius
CONTRAST	PRESS + OR -	Contrast display setting	-

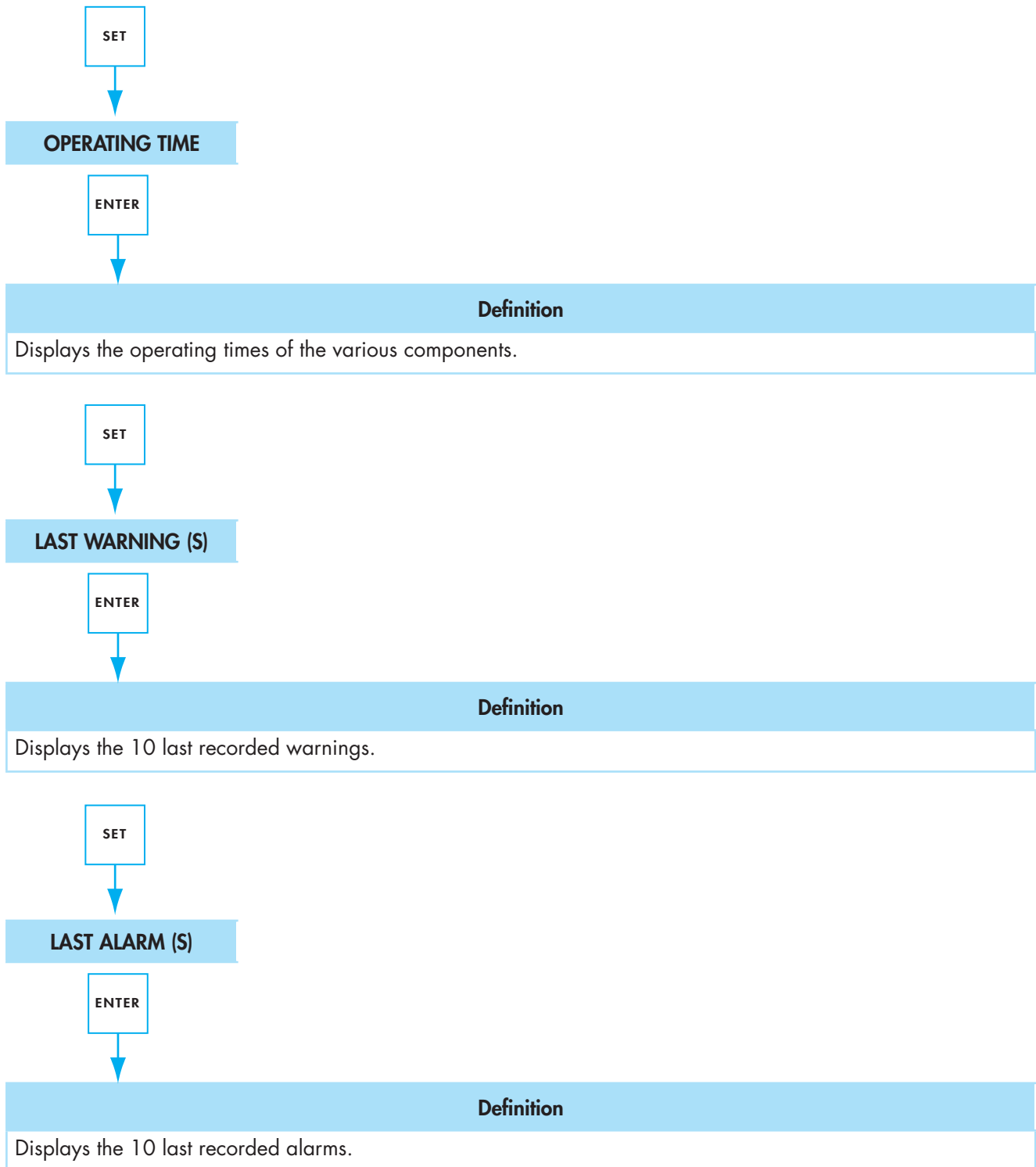
Selection	Setting limits	Initial configuration
RUN TIME	0 to 65500 h	0
OVERHAUL MAINT.	0 to 65500 h	0
PARTIAL MAINT.	0 to 65500 h	0
ROOTS MAINT.	0 to 65500 h	0
EXHAUST MAINT.	0 to 65500 h	0
OVERHAUL. WARNING	1000 to 42000 h	17000
PART. MAINT. WARNING	1000 to 42000 h	8500
ROOTS MAINT. WARNING	1000 to 42000 h	17000
EXHAUST WARNING	1000 to 42000 h	8500

Monitoring system function table

Selection	Selection	Setting limits	Initial configuration
PASSWORD	-	0 to 65535	0
PUMP SN AND VERS.	FRAME SERIAL N°		-
	ELEC SERIAL N°		-
	ELEC OTP VERSION		-
	ELEC FLASH VERSION		-
	ADP PUMP SERIAL N°		-
	ROOTS P. SERIAL N°		-
	OTP DISP. VERSION		-
FLASH DISP. VERSION	-	-	
STORAGE*	-	ENABLED / DISABLED	Disabled
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.		

* Storage Parameter : Just before transport, set the storage mode on «Enabled». At switching on storage mode is automatically deleted **C 45**.

Monitoring system function table



Starting mode definition «Hand held display module»

Study the preliminary precautions  B 00.

CAUTION

The performance and the operating safety of the product can only be guaranteed if it is used according to normal conditions of use.

CAUTION

The pump is tested and filled with a synthetic oil charge at factory. Do not modify the oil level.

CAUTION

Do not move a pump when it is in operation.


CAUTION

For A603P pump model, don't forget to check the direction of rotation before starting up the pump  B 51.

Pump start up

Check that the safety plug is connected  B 80.

Check that the remote control cover plug is connected  B 70.

Check that the EMO cover plug is connected  B 100.

Put the main switch on position **1**.


Connect the hand held display module plug to the hand held display module connector located on the front or rear panel.

Take the pump control via the **CONTROL** key on the hand held display module (a star appears on the left side of the screen).

Start the pump by pressing the **START** key on the hand held display module.

The following operations will perform automatically:

- Inlet valves open (if preselected).
- Pump starts.
- Data capture and sensor are in progress.
- Purge valve opens.

Then adjust the gas flow rate using the pressure regulator (as required by customer application  B 40).

These operating parameters are displayed on the screen.

23 H LOC N2 LS RT
ADP POWER : 1000 W
PRESSURE : 1322 HPA
ADP TEMP : 82°C

Note : Only installed and configured parameters are displayed.

During pump start-up, the temperature is not monitored (no warning, no hazard) until the pump has reached the programmed temperature value.

WARNING

The pumps are equipped with an exhaust pressure monitoring sensor. It is the responsibility of the user to prevent the risks related to excess overpressure.

Starting mode definition «Hand held display module»

Operation monitoring

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


- One or several faults are displayed on the screen, alternating with monitoring parameters. When these faults are activated, the monitoring system triggers the warning phase followed by the hazard phase. The period of time of these phases can be set.
- Indicator lights on the front panel and buzzer sounded, if option selected.
- Indicator lights on display panel.
- The fault contacts on the «remote control connector» at the rear of the monitoring unit are closed.
- Pumping is stopped when an hazard threshold is reached.

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

Pumping shutdown


Stop the pump by pressing the **STOP** then **ENTER** keys on the hand held display module.

The following operation will perform automatically:

- Inlet valve closes (if any and if selected).
- Pump stops.
- Injection of purge gas continues during the shutdown phase if timing of **N₂ flow prolonged** of the **SETTING** menu has been programmed (0 to 120 min)  **C 42**.


This additional N₂ injection is activated after each pump stop, whatever may be the origin, either a stop command coming from the tool, from the hand held display module (accessory) or a pump stop generated by an hazard.

The message **STOP IN PROGRESS** appears on the screen (see caution).

- Cooling of the pump continues until the temperature goes below the programmed **Intern T° / input value** parameter of the **Setting** menu  **C 42**.
- When timing of **N₂ flow prolonged** expires (if selected) or if pressure > 1450 hPa, then the message **PUMPING STOPPED** appears on the screen.

* 23 H LOC N2 LS RT
STOP IN PROGRESS
PRESSURE : 1322 HPA
ADP TEMP : 82°C

120H LOC N2
PUMPING STOPPED
05/05/02 10H10

To stop the pumping system for a long period, refer to «Shut down procedure for discontinuous operation» safety instructions, see  **C 00** .

 **WARNING**

When the **STOP IN PROGRESS** message appears on the display, don't intervene on the pump: risk of injury by contact with hot surfaces. Wait for the **PUMPING STOPPED** message before intervening on the pump.

Starting mode definition «Hand held display module»

Use with two hand held display modules

To take the control with a hand held display module, press on the **CONTROL** key of the choosen hand held display module: a star appears on the left corner of the display.

The control of the pump is now not possible from the other hand held display modules, as long as the first one has not given the control back.

To give the control again, press on the **CONTROL** key of the hand held display module, until the star has disappeared.

Reading of data and parameters can be done on both hand held display modules, **even if they do not control the pump.**

If the message «NOT ALLOWED» appears after an action of any key, check the presence of the star on the display, showing that the control has been taken.

Saving and loading of pump configuration

At pump installation or replacement, it may be necessary to copy the configuration (set of all the parameters and operation setting programmed by the user) from a pump to another.

CAUTION

**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 the menu by pressing **SET**.

Press the **+** key repeatedly to access to the **MANAGEMENT** menu.

Validate with the **ENTER** key.

MAINTENANCE
MANAGEMENT
OPERATING TIME
LAST WARNING (S)

Press the **+** key repeatedly to access the **CONFIG SAVE** menu.

Validate with the **ENTER** key.

STORAGE
CONFIG SAVE
CONFIG LOAD

The following screen appears.

Validate with the **ENTER** key.

CONFIG SAVE
CONFIRM ?

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

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

Disconnect the hand held display module.

Saving and loading of pump configuration

Remote loading

Connect the hand held display module onto the pump to be configured. Take the control of the pump from the hand-held module display (* at cover left of the display).

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.

All pump parameters are loaded remotely, except the following parameters:

- buzzer,
- unit of temperature,
- unit of pressure,
- RS link,
- time and date,
- language.

CAUTION

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**.

MAINTENANCE
MANAGEMENT
OPERATING TIME
LAST WARNING (S)

Press the **+** key repeatedly to access to the **MANAGEMENT** menu.

Validate with the **ENTER** key.

PUMP SN AND VERS.
STORAGE
CONFIG SAVE
CONFIG LOAD

Press the **+** key repeatedly to access the **STORAGE** menu.

Validate with the **ENTER** key.

STORAGE
ENABLED

Choose the parameter **ENABLED** with the **+** or **-** keys.

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

STOCK 150H
PUMPING STOPPED
13/05/02 13H56

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  C 41.


Use of the inlet isolation valve (accessory)

The operation describes the various factors involved in operating of the inlet valve.

Inlet valve option setting

The selection of the **Inlet valve option** can be performed by the RS 232 / 485 or the hand held display module (accessory).

To change the parameter of the **Inlet valve option** with the hand held display module, perform the following operations:

- Connect the hand held display module (accessory) plug to the hand held display module connector on the front or rear panel.
- Set the **Inlet valve option** parameter in the **DEFINITION** menu  **C 42** as follows:

Inlet valve option
Enabled or Disabled

Inlet valve option on Disabled


The valve is always open.

Inlet valve option on Enabled

The valve can operate in four different ways:


- Controlled by the pump (local mode).
- Controlled by the hand held display module.
- Controlled by the customer's equipment (remote control mode).
- Controlled by the RS 232 serial link.

Controlled by the pump (local mode)

For the valve operating mode as described below, contact **S1** must be closed  **B 70**.

- If the **STOP** button on the hand held display module is pressed or if the pump is stopped due to an alarm, the valve is closed and the pump stops as soon as the valve end stop sensor is triggered or after 3 seconds.
- If the **START** button on the hand held display module is pressed, the valve opens 3 seconds after the pump start up.

Controlled by the hand held display module (local mode)

For the valve operating mode as described below, contact **S1** and **S7** must be closed  **B 70**.

Use of the inlet isolation valve (accessory)


Inlet valve option on Enabled (continued)



Pressing the **AUX** button on the hand held display module opens or closes the valve, whatever the pump is stopped or running (press the **ENTER** button on the hand held display module to confirm the operation).

Note : Even in local or remote control mode:

*When the pump stops normally or due to an alarm, the valve is closed and the pump stops as soon as the valve end stop sensor is triggered or after 3 seconds.
When the pump is started, the valve opens 3 seconds after the pump starts.*

Controlled by the customer's equipment (remote control mode)

For the valve operating mode as described below, contact **S1** must be open  **B 70**.

- The valve closes if contact **S6** controlled by the customer's equipment is closed  **B 70**.
- The valve opens if contact **S6** controlled by the customer's equipment is opened  **B 70**.

Note : stopping or starting the pump has no effect on the valve.

Controlled by the RS 232 serial link (RS control mode)

The valve open control message on the serial link is only taken into account if contact **S7** is closed.

Use of the serial link

Monitoring system parameter configuring

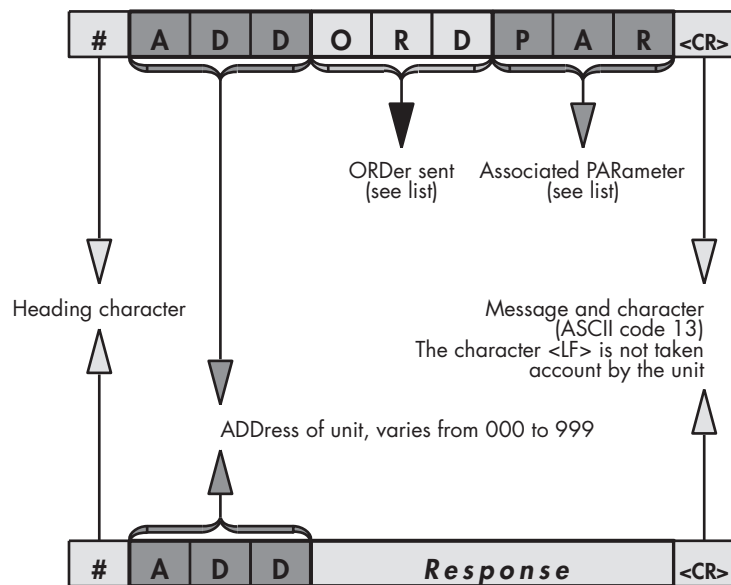
The initial configuration of the serial link is as follows:

- Type: **RS 232**
- ECHO: **ENABLED**
- Transmission SPEED: **9600 bauds**
- Parity: **NO**
- 2 Stop Bits: **DISABLED**
- Address: **0**

Setting / Observations	Action / Observations	Display / Observations
Access in the «SETTING» menu	Enter the menu by pressing SET . Press the + key repeatedly to access to the SETTING menu. Validate with the ENTER key.	DEFINITION SETTING MAINTENANCE MANAGEMENT
Access to the parameter programming by the «SERIAL LINK» menu	Press the + key repeatedly to access the SERIAL LINK menu. Validate with the ENTER key.	SETTING SERIAL LINK 1 N2 FLOW SENSOR PURGE WARNING
Access to the parameter to be modified	Press the + key repeatedly to access the menu to be modified. Validate with the ENTER key. Modify the chosen parameter with + or - keys. Validate with the ENTER key. Return to main menu with SET key.	SERIAL LINK 1 TYPE (RS 232) ECHO (ENABLED) SPEED (9600)
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.	

Use of the serial link

Instruction syntax The control



The response

Example of dialog :

```
E : #000 SYS ON
R : #000 OK
E : #000 ROO ON
R : #000 ERR2
```

Use of the serial link

List of controls

Order	Paramater	Response	Action
DLI	XXX	OK or ERR2	• Program the automatic transmission interval: 1 to 255 sec.
DLR	None	OK	• Start up the Data Logger for RS 232 only.
ECH	ON or OFF	OK or ERR2	• Return all characters received on the serial link in the ECHON case for RS 232 only.
HDR	<val> (see folio 5/6)	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 XX = 00 : adp power 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 Y = 0 : alert 1 : alarm ZZZZ = threshold value
SEP	<val> (see folio 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 (see CTRL order).
CTRL	ON or OFF	OK or ERR2	• Take the pump control with CTRLON and let the pump control with CTRLOFF.

Use of the serial link

List of controls (continued)

Order	Paramater	Response	Action																																																																																																																				
TPS	XX		<ul style="list-style-type: none"> Maintenance time XX = <ul style="list-style-type: none"> 00 : running time 01 : full overhaul 02 : P out maintenance 03 : reserved 04 : exhaust Maintenance 05 : Reserved 06 : Reserved 																																																																																																																				
ROO	ON or OFF	OK or ERR2	<ul style="list-style-type: none"> Start up the ROOTS with the command ROOON and stop with ROOOF. 																																																																																																																				
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 <ul style="list-style-type: none"> XX = 0 to 09 Y = 0 alarm 1 alert 																																																																																																																				
STA	None	Transmission of a Data Logger frame Example : #000 00100010000 0990 0000 017 000 000 000 00 00000000000000000000 0000 <small>0/3 5/15 17/20 22/25 27/29 31/33 35/37 39/42 44/45 47/67 69/72</small>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">0</td> <td style="width: 60%;">: header character</td> <td style="width: 10%;">38</td> <td style="width: 25%;">: separator character</td> </tr> <tr> <td>1-2-3</td> <td>: address</td> <td>39-42</td> <td>: analog input (mV)</td> </tr> <tr> <td>4</td> <td>: separator character</td> <td>43</td> <td>: separator character</td> </tr> <tr> <td>5</td> <td>: pump status</td> <td>44-45</td> <td>: value hazard FC</td> </tr> <tr> <td>6</td> <td>: roots status</td> <td>46</td> <td>: separator character</td> </tr> <tr> <td>7</td> <td>: purge status</td> <td>47</td> <td>: pressure fault</td> </tr> <tr> <td>8</td> <td>: Stanby control mode</td> <td>48</td> <td>: reserved</td> </tr> <tr> <td></td> <td>bit 0 = 0 : stand-by purge Off</td> <td>49</td> <td>: reserved</td> </tr> <tr> <td></td> <td>bit 0 = 1 : stand-by purge On</td> <td>50</td> <td>: reserved</td> </tr> <tr> <td></td> <td>bit 1 = 0 : stand-by power Off</td> <td>51</td> <td>: reserved</td> </tr> <tr> <td></td> <td>bit 1 = 1 : stand-by power On</td> <td>52</td> <td>: reserved</td> </tr> <tr> <td>9</td> <td>: water valve</td> <td>53</td> <td>: frequency control</td> </tr> <tr> <td>10</td> <td>: inlet valve</td> <td>54</td> <td>: reserved</td> </tr> <tr> <td>11</td> <td>: reserved</td> <td>55</td> <td>: reserved</td> </tr> <tr> <td>12</td> <td>: pump water valve</td> <td>56</td> <td>: motor temperature fault</td> </tr> <tr> <td>13</td> <td>: reserved</td> <td>57</td> <td>: reserved</td> </tr> <tr> <td>14</td> <td>: reserved</td> <td>58</td> <td>: reserved</td> </tr> <tr> <td>15</td> <td>: control in bit 3 and monitoring 0-1-2</td> <td>59</td> <td>: N₂ purge fault</td> </tr> <tr> <td>16</td> <td>: separator character</td> <td>60</td> <td>: maintenance fault</td> </tr> <tr> <td>17-20</td> <td>: pressure (hPa)</td> <td>61</td> <td>: pump temp. fault</td> </tr> <tr> <td>21</td> <td>: separator character</td> <td>62</td> <td>: N₂ pressure fault</td> </tr> <tr> <td>22-25</td> <td>: power (W)</td> <td>63</td> <td>: reserved</td> </tr> <tr> <td>26</td> <td>: separator character</td> <td>64</td> <td>: reserved</td> </tr> <tr> <td>27-29</td> <td>: pump temp. (°C)</td> <td>65</td> <td>: reserved</td> </tr> <tr> <td>30</td> <td>: separator character</td> <td>66</td> <td>: reserved</td> </tr> <tr> <td>31-33</td> <td>: mfs</td> <td>67</td> <td>: reserved</td> </tr> <tr> <td>34</td> <td>: separator character</td> <td>68</td> <td>: separator character</td> </tr> <tr> <td>35-37</td> <td>: reserved</td> <td>69-72</td> <td>: N₂ purging on second CR</td> </tr> <tr> <td></td> <td></td> <td>73</td> <td>: CR</td> </tr> </table>	0	: header character	38	: separator character	1-2-3	: address	39-42	: analog input (mV)	4	: separator character	43	: separator character	5	: pump status	44-45	: value hazard FC	6	: roots status	46	: separator character	7	: purge status	47	: pressure fault	8	: Stanby control mode	48	: reserved		bit 0 = 0 : stand-by purge Off	49	: reserved		bit 0 = 1 : stand-by purge On	50	: reserved		bit 1 = 0 : stand-by power Off	51	: reserved		bit 1 = 1 : stand-by power On	52	: reserved	9	: water valve	53	: frequency control	10	: inlet valve	54	: reserved	11	: reserved	55	: reserved	12	: pump water valve	56	: motor temperature fault	13	: reserved	57	: reserved	14	: reserved	58	: reserved	15	: control in bit 3 and monitoring 0-1-2	59	: N ₂ purge fault	16	: separator character	60	: maintenance fault	17-20	: pressure (hPa)	61	: pump temp. fault	21	: separator character	62	: N ₂ pressure fault	22-25	: power (W)	63	: reserved	26	: separator character	64	: reserved	27-29	: pump temp. (°C)	65	: reserved	30	: separator character	66	: reserved	31-33	: mfs	67	: reserved	34	: separator character	68	: separator character	35-37	: reserved	69-72	: N ₂ purging on second CR			73	: CR
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Use of the serial link

Modifying the separator character

Order	Paramater	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.

Modifying the header character

Order	Paramater	Response	Action
HDR	<val> val = decimal value of the ASCII code of the header character between 0 and 127.	OK or ERR3	<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**

Use of the serial link

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 RS 232 or RS 485 commands have priority on the remote control (dry contacts / 50 pins plug).



Troubleshooting

Operating Manual - A3P Series Detailed contents

D 00	<i>Safety instruction related to maintenance</i>
D 10	<i>First level of maintenance</i>
D 20	<i>Fault message number table</i>
D 30	<i>Diagnosis and trouble shooting</i>

Safety instruction related to maintenance

This chapter describes the main preventive maintenance operations and provides a guide for operating the equipment safely.

⚠ WARNING

When the main switch is set to «0», the part supply power and the main switch is energized.
Risk of electrical shock in case of contact.
Disconnect main electrical cable before any intervention.

⚠ WARNING

When the EMO is activated, some internal electrical parts are energized and water cooling line and N₂ purge line are always supplied.
Risk of electrical shock in case of contact.
Before any intervention, disconnect main electrical cable, water inlet and outlet quick connectors and N₂ purge connector.

⚠ WARNING

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

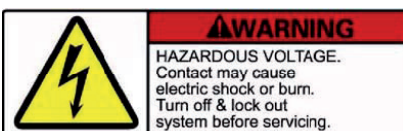
⚠ WARNING

When the pump is switched off, internal parts (monitoring, frequency converter) contain capacitors charged with over 60 V DC and remain energized.
Electrical shock may result in severe injury.
Wait 1 minute after switching off before opening the pump.



A 329 982 - 2 and A 215 138 - 2

Located on the upper cover, 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. The protective gloves should be used in accordance to the protective gloves supplier's instruction.



A 329 982 - 3

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.

Manufacturer contact

The partial and full overhaul must be performed by Manufacturer trained personnel.

Contact Manufacturer nearest service center or the service support at the following e-mail address:


support.service@adixen.fr

First level of maintenance

Study the safety instructions related to maintenance  D 00.

Operation monitoring

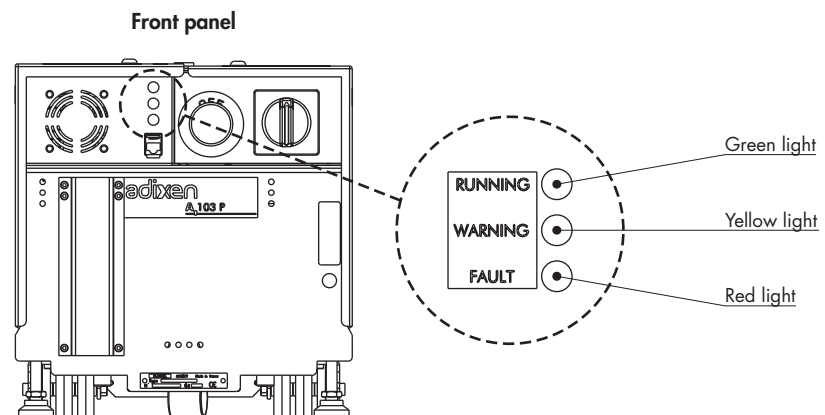
During operation, the user is warned of an operating incident by:


- The audible buzzer warning (if preselected  C 42).
- Indicator lights on the front panel are illuminated.

Green on: pump is running and no problems

Yellow and green on: warning

Red on: hazard



- Pumping is stopped when an hazard threshold is reached (if option selected).
- The fault contacts on the remote control connector at the rear side of the pump are open.
- A message via the RS 232 serial link.
- If the pump is equipped with hand held display module (accessory): One or several faults are displayed on the screen, alternately 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  C 42. Only installed and configured parameters are displayed. Indicator lights on the hand held display module are illuminated.

First level of maintenance

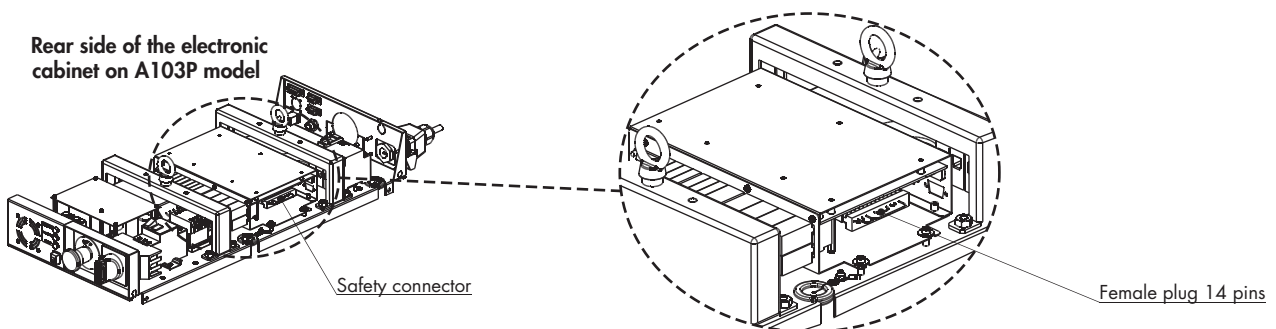
Maintenance plug connection

⚠ WARNING

The maintenance plug must be only used for maintenance and tests. The maintenance plug should never be used for any other purpose.

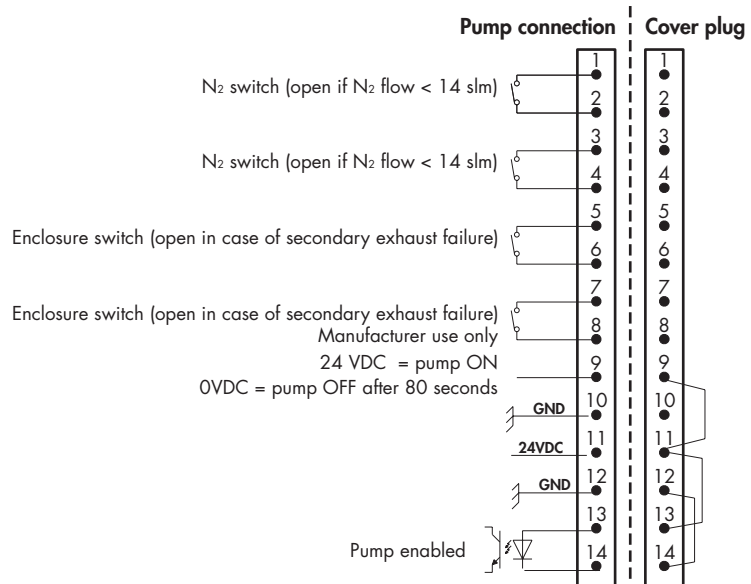
Presentation The maintenance cover plug allows start up of the pump without N₂ flow and without the secondary exhaust.

Connector location The «maintenance connection» is done via the «safety» connector, located on the rear side of the electronic cabinet.



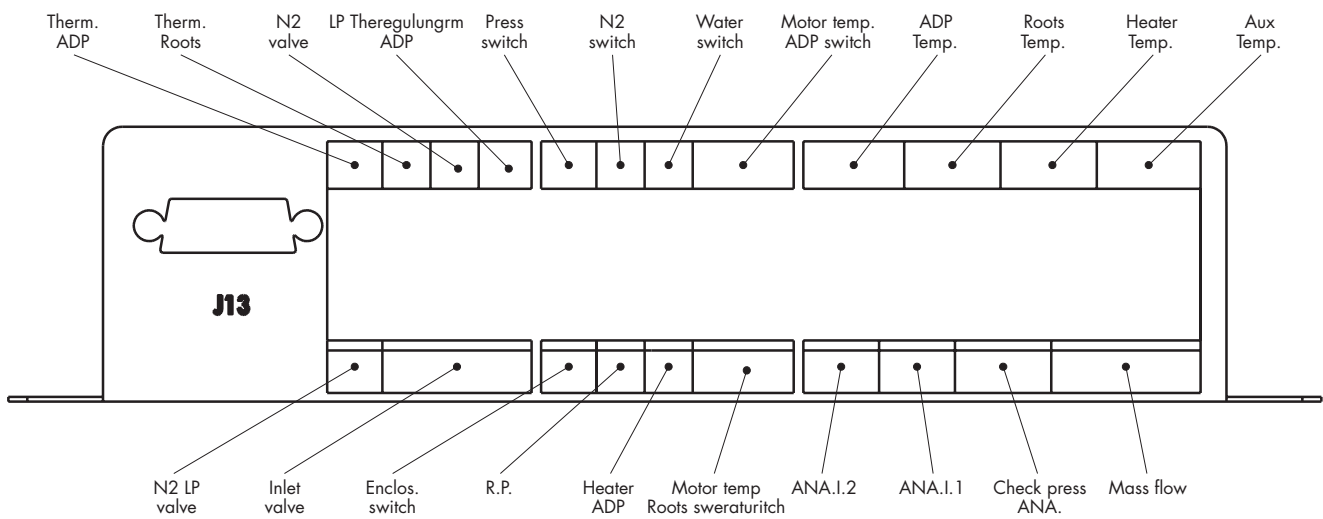
Connect the «maintenance cover plug» instead of the cover plug on the safety connector.

Cover plug wiring *Note : An overtemperature of the motor and an overpressure of the exhaust still stops the pump.*



First level of maintenance

Sensor connector layout at the rear of the monitoring system




Maintenance operations

See section




Fault message number table

Warning message «WXX»

- the yellow light is lighting up,
- the buzzer is activated (if parameter configured  C 42),
- the pump doesn't stop.

Hazard or safety hard message «DXX»



the red light is lighting up,
the buzzer is activated (if parameter configured  C 42),
the pump stops.

Fault list for pumping unit

Warning	Hazard	Fault	Safety hazard	Fault
W01	D01	EXHAUST. PRESSURE	D42	SAFETY EXH PRESS
W03	D03	MOTOR POWER		
	D07	FREQ. CONVERT.		
W08		WATER FLOW		
W10	D10	MOTOR TEMP.	D41	SAFETY MOTOR TEMP.
W11		INLET VALVE		
W13	D13	N2 FLOW	D43	SAFETY N2 FLOW
W15	D15	INTERNAL T° HIGH		
W16		INTERNAL T° LOW		
W17	D17	ROOTS TEMP.	D40	SAFETY ROO. TEMP.
W29		MAINT. ROOTS		
W30		EXHAUST. MAINT.		
W31		ADP LP MAINT.		
W32		ADP MAINT.		
	D34	EM. STOP; ADP. CONT		
	D35	EMERGENCY STOP		
	D36	ADP CONTACTOR		
	D37	ROOTS CONTACTOR		
	D39	ROOTS BREAKER		
			D44	SAF. CABINET PRES
W45		START UNABLED		
	D62	ROOTS FREQUENCY CONVERTER		

Diagnosis and trouble shooting

Display doesn't work or is showing a message






INCIDENT	CAUSE	TROUBLESHOOTING
Hand held display module is not lighting up	→ Main breaker (RT1) in position «0»	<ul style="list-style-type: none"> ☞ Set the main break (RT1) to position «1». ☞ Check the ground fault relay  B 50.
	→ No main power	<ul style="list-style-type: none"> ☞ Check power supply.
	→ Hand held module display cable incorrectly connected	<ul style="list-style-type: none"> ☞ Check the connection.
	→ Other problem	<ul style="list-style-type: none"> ☞ Call the customer service center.
Display is showing <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> XXX LOC.N.2 PUMPING STOPPED MM/JJ/AA HH:MM </div> ... by pressing on any key ... <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> XXX LOC.N.2 COMMAND NOT ALLOWED MM/JJ/AA HH:MM </div>	→ Pump is used with several hand held module display	<ul style="list-style-type: none"> ☞ Only one hand held module display can monitor the pump. ☞ Press on CONTROL to disable the monitoring on other module displays. ☞ Press on CONTROL on the requested module display to monitor the group. ☞ Wait for the display: <div style="border: 1px solid black; padding: 5px; margin: 5px 0; width: fit-content;"> * XXX LOC.N.2 PUMPING STOPPED MM/JJ/AA HH:MM </div>
	→ Other problem	<ul style="list-style-type: none"> ☞ Call the customer service center.
Message on display <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> STOCK </div>	→ Pump in storage mode	<ul style="list-style-type: none"> ☞ Set the main switch to position «OFF» to switch off the pump. ☞ Switch it on again.
Message on display <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> REM </div>	→ In remote mode <i>no cover plug or bad connection</i>	<ul style="list-style-type: none"> ☞ Check the wiring of the remonte control connector  B 70.
	→ Monitoring problem	<ul style="list-style-type: none"> ☞ Call the customer service center.

Diagnosis and trouble shooting

Display is showing a defect number

INCIDENT	CAUSE	TROUBLESHOOTING
Warning W01 EXHAUST PRESSURE		
<i>Pump does not start</i>	→ Exhaust pressure > 1400 hPa	☞ Check the exhaust pipe.
	→ Other problem	☞ Call the customer service center.
<i>Pump is running</i>	→ Exhaust pressure > 1250 hPa	☞ Check the N ₂ flowrate setting value  B 40 . ☞ Check the exhaust pipe.
	→ Other problem	☞ Call the customer service center.
Hazard D01 EXHAUST PRESSURE		
<i>Pump does not start</i>	→ Exhaust pressure > 1400 hPa	☞ Check the exhaust pipe.
	→ Other problem	☞ Call the customer service center.
<i>Pump is running</i>	→ Exhaust pressure > 1990 hPa	☞ Check the N ₂ flowrate setting value  B 40 . ☞ Check the exhaust pipe.
	→ Other problem	☞ Call the customer service center.
Hazard D42 SAFETY EXH PRESS		
	→ Exhaust pressure > 2000 hPa	☞ Check the sensor connection on the «Press switch» connector  D 10 . ☞ Check the exhaust pipe.
	→ Other problem	☞ Call the customer service center.
Hazard D07 FREQ. CONVERT. 50		
		☞ Call the customer service center.





Diagnosis and trouble shooting

INCIDENT	CAUSE	TROUBLESHOOTING
Warning W08 WATER FLOW	→ No water flow	☞ Check the water supply.
	→ Insufficient water flow (< 60 l/h)	☞ Check that the pipes are not clogged. ☞ Check that there are no leaks.
	→ Sensor problem	☞ Check the sensor connection on the «Water switch» connector  D 10 .
	→ Other problem	☞ Call the customer service center.
Warning W10 MOTOR TEMP.	→ Motor temperature is > 120 °C	☞ Refer to water flow defect (see W08).
	→ Sensor problem	☞ Check the sensor connection on the «Motor temp. ADP switch» connector  D 10 .
	→ Other problem	☞ Call the customer service center.
Safety hazard D10 MOTOR TEMP. or Safety hazard D41 SAFETY MOTOR TEMP.	→ Motor temperature is > 150 °C	☞ Refer to water flow defect (see W08)
	→ Sensor problem	☞ Check the sensor connection on the «Motor temp. ADP switch» connector  D 10 .
	→ Other problem	☞ Call the customer service center
<i>D41 defect appears only if the Safety plug is connected to the safety connector  B 80</i>		
Warning W11 INLET VALVE <i>There is no isolating valve at inlet</i>	→ Incorrect monitoring configuration	☞ Check that «INLET VALVE OPTION» is disabled  C 42 .
	→ Other problem	☞ Call the customer service center.
	→ The valve does not close at pump stop or does not open at start-up	☞ Check compressed air supply. ☞ Check valve condition.
<i>There is an isolating valve at inlet</i>	→ Other problem	☞ Call the customer service center.


Diagnosis and trouble shooting

INCIDENT	CAUSE	TROUBLESHOOTING
Warning / Hazard W13 / D13 N2 FLOW	→ No purge flow	<ul style="list-style-type: none"> ☞ Check the nitrogen supply. ☞ Check the main valve connection on the «N₂ valve» connector  D 10.
	→ Insufficient purge flow	<ul style="list-style-type: none"> ☞ Check the N₂ flowrate setting value  B 40. ☞ Check that there are no leaks.
	→ Incorrect threshold setting	☞ Check the warning threshold  C 42 .
	→ Sensor problem	☞ Check the sensor connection on the «Massflow» connector  D 10 .
	→ Other problem	☞ Call the customer service center.
Safety hazard D43 SAFETY N2 FLOW	→ No purge flow	<ul style="list-style-type: none"> ☞ Check the nitrogen supply. ☞ Check the main valve connection on «N₂ valve» connector  D 10.
	→ Insufficient purge flow (< 14 slm)	<ul style="list-style-type: none"> ☞ Check the N₂ flowrate setting value  B 40. ☞ Check that there are no leaks.
	→ Sensor problem	☞ Check the sensor connection on the «N ₂ switch» connector  D 10 .
	→ Other problem	☞ Call the customer service center.
Warning W15 INTERNAL T° HIGH <i>Pump temperature is > of 10 °C to the temperature control setting value</i>	→ Temperature control valve supply problem	☞ Check the temperature control valve connection on the «Therm. ADP» connector  D 10 .
	→ Cooling problem	☞ Refer to water flow defect (see W08).
	→ Defective control valve	☞ Call the customer service center.
	→ Other problem	☞ Call the customer service center.





Diagnosis and trouble shooting

INCIDENT	CAUSE	TROUBLESHOOTING
<p>Hazard</p> <p>D15 INTERNAL T° HIGH</p> <p><i>Pump temperature is higher than threshold</i></p>	→ Defective temperature sensor	☞ Check the sensor connection on the «ADP Temp.» connector  D 10 .
	→ Temperature control valve not connected	☞ Check the temperature control valve connection on the «Therm. ADP» connector  D 10 .
	→ Cooling problem	☞ Refer to water flow defect (see W08).
	→ Defective control valve	☞ Call the customer service center.
	→ Other problem	☞ Call the customer service center.
<p>Warning</p> <p>W16 INTERNAL T° LOW</p> <p><i>Pump temperature is < of 10 °C to the temperature control setting value</i></p>	→ Temperature control valve supply problem	☞ Check the temperature control valve connection on the «Therm. ADP» connector  D 10 .
	→ Cooling problem	☞ Refer to water flow defect (see W08).
	→ Defective control valve	☞ Call the customer service center.
	→ Other problem	☞ Call the customer service center.
<p>Warning</p> <p>W17 ROOTS TEMP.</p> <p><i>A603P and A1003P only</i></p>	→ Roots motor temperature is > 120 °C	☞ Refer to water flow defect (see W08).
	→ Sensor problem	☞ Check the sensor connection on the «Motor temp. Roots switch» connector  D 10 .
	→ Other problem	☞ Call the customer service center.



Diagnosis and trouble shooting

INCIDENT	CAUSE	TROUBLESHOOTING
<p>Hazard</p> <p>D17 ROOTS TEMP.</p> <p>Safety hazard</p> <p>D40 SAFETY ROO. TEMP.</p>		
A103P only	→ Strap disconnected	☞ Connect the «Motor temp Roots switch» strap on the connector  D 10 .
A603P and A1003P only	→ Roots motor temperature is > 150 °C	☞ Refer to water flow defect (see W08).
	→ Sensor problem	☞ Check the sensor connection on the «Motor temp. Roots switch» connector  D 10 .
	→ Other problem	☞ Call the customer service center.
<p>Warning</p> <p>W29 MAINT. ROOTS</p> <p>Warning</p> <p>W30 EXHAUST MAINT.</p> <p>Warning</p> <p>W31 ADP LP MAINT.</p> <p>Warning</p> <p>W32 ADP MAINT.</p>	→ The maintenance threshold of a parameter is reached	<p>☞ Check the maintenance thresholds  C 42.</p> <p>☞ Call Manufacturer Support Service.</p>
<p>Hazard</p> <p>D34 EM. STOP; ADP. CONT</p> <p>A603P and A1003P only</p>	→ EMO cover plug disconnected	<p>☞ Connect the EMO cover plug  B 100.</p> <p>☞ Check that there is a strap between pins 2 and 3 of the EMO  B 100.</p>
	→ Other problem	☞ Call the customer service center.

Diagnosis and trouble shooting

INCIDENT	CAUSE	TROUBLESHOOTING
Hazard D35 EMERGENCY STOP	→ Pump emergency stop is engaged	☞ Rotate to unlock the emergency stop on the control panel of the front panel.
	→ Other problem	☞ Call the customer service center.
Hazard D36 ADP CONTACTOR	→ EMO plug disconnected	☞ Connect the EMO plug  B 100 . ☞ Check that there is a strap between pins 2 and 3 of EMO  B 100 .
	→ Other problem	☞ Call the customer service center.
Hazard D37 ROOTS BREAKER	→ Incorrect monitoring configuration (for A103P)	☞ Check that «SYSTEM SELECT» on «DEFINITION MENU» is set to «A3R0»  C 42 .
	→ Roots breaker (RT2) in position «0»	☞ Set the Roots breaker in position «1».
	→ Other problem	☞ Call the customer service center.
Hazard D39 ROOTS CONTACTOR	→ Incorrect monitoring configuration (for A103P)	☞ Check that «SYSTEM SELECT» on «DEFINITION MENU» is set to «A3R0»  C 42 .
	→ Other problem	☞ Call the customer service center.

Diagnosis and trouble shooting

INCIDENT	CAUSE	TROUBLESHOOTING
Safety hazard D44 SAF. CABINET PRES		
<i>Pump not equipped with Semi option</i>	→ Strap disconnected	☞ Check the exhaustability connection on the «Enclos. switch» connector  D 10.
	→ Other problem	☞ Call the customer service center.
<i>Pump equipped with Semi option</i>	→ No exhaustability in the Exhaust box	☞ Check the customer exhaustability line.
	→ Exhaustability threshold < 1.6 hPa	☞ Check the customer exhaustability line.
	→ Sensor problem	☞ Check the exhaustability connection on the «Enclos. switch» connector  D 10.
	→ Other problem	☞ Call the customer service center.
Safety hazard W45 START UNABLED	→ Safety or Maintenance plugs disconnected	☞ Connect the safety or maintenance plugs.
	→ Other problem	☞ Call the customer service center.
Hazard D62 ROOTS FREQ. CONV.		☞ Call the customer service center.



Maintenance instructions

Operating Manual - A3P Series Detailed contents

E 10

Standard repair exchange

E 11

Preliminary precautions

E 12

Draining of the water cooling circuit

E 14

Disconnecting the pump from the installation

E 15

Shipping procedure

E 20

Increase the maintenance parameters

Standard repair exchange

Standard repair exchange procedures

A3-P Range standard repair exchange has been detailed into several key steps. These are detailed in specific sections as listed below.

The key steps must be followed in chronological order:

E 11

Preliminary precautions

E 12

Draining of the water cooling circuit

E 14

Disconnecting the pump from the pumping installation

E 15

Shipping procedure

G 200

Safety questionnaire

B 10 to B 60

Installing a new pump

Preliminary precautions

Users are advised to observe the precautions presented below during any maintenance operation on the pump.

DANGER

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

DANGER


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

DANGER

Chemical supplies coming from the tool, as well as the water and the nitrogen need also to be locked out/tagged out.

Users are advised:



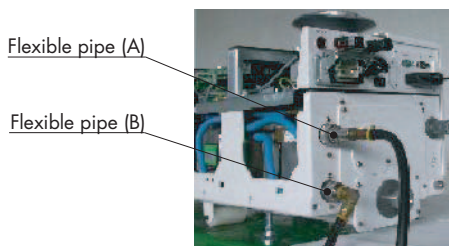
Stop the pumping system according to «Shut down procedure for discontinuous operation» safety instructions, see  C 00.

- Wear gloves, protective glasses and, if required for the used gases, a breathing mask.
- Ventilate the premises well.
- Do not dispose of residue in the usual waste disposal network but, have it destroyed by a qualified organization.
- Install the inlet and exhaust blanking plates, thus delivered with the pump.

Draining of the water cooling 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 and regulation disabled).

Preliminary operations



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

Connect pipe (A) on the pump, at location of «IN» and connect the other end to a compressed air circuit (200 to 500 kPa).

Connect pipe (B) on the pump, at location «OUT» and place the other end of the pipe in a vessel (total water volume will be less than one litre).

Draining the water volume

Inject compressed air into the «IN» inlet until the first water volume has been completely evacuated.

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

⚠ WARNING

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.

Disconnecting the pump from the installation

Study the preliminary precautions  E 11.

Turning off the pump

Turn off the pump, turn the main switch to «0».

Turn off the customer main circuit breaker and lock out tag out per facilities procedures.

Disconnect the main wires from the electrical connector.

Description

 A 20

Disconnecting the facilities

Disconnect all electrical connectors.

Disconnect the water inlet and outlet quick connectors.

Disconnect the N₂ purge connector.

Disconnect the pump from the inlet piping.

Cap the equipment inlet piping.

Disconnect the secondary exhaust port from customer application.

Disconnect the pump from the exhaust piping.

Cap the equipment exhaust piping.

Description

 A 20

Disconnect the pump from the installation

Remove the anti-earthquake squares (if equipped).

Raise the four locking screw jacks.

Remove the pump from the installation.

Shipping procedure

Study the preliminary precautions  E 11.



A 329 982 - 2 and A 215 138 - 2


Located on the upper cover, this label warns the user against possible risks of injury due to any hand contact with hot surfaces. It states that protective gloves should be used before performing any intervention. The protective gloves should be used in accordance to the protective gloves supplier's instruction.

Preparing the pump for shipping

Drain the pump Water must be drained to avoid hoses freezing up during shipment.

Draining of the water cooling circuit  E 12

Seal the inlet and exhaust Pump must be sealed hermetically to avoid leak of by products and residual gases.

Blank-off flange kit  F 10

Blank the inlet

Place the centering ring equipped with O-ring on the inlet port.
Place the equipped inlet blank-off flange.
Secure it with the quick connect clamp.

	A103P	A603P / A1003P
Inlet connection	DN50 ISO-K	DN100 ISO-K

Blank the exhaust

Place the centering ring equipped with O-ring on the exhaust port.
Place the outlet blank-off flange.
Secure it with the quick connect clamp.

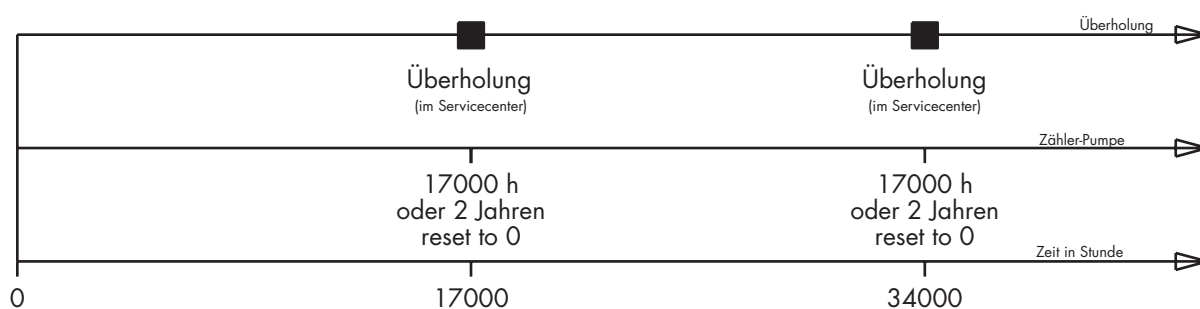
	A103P / A603P / A1003P
Exhaust connection	DN25 ISO-KF

Increase of the maintenance parameters

When the maintenance of an element has been done, **it is necessary to increase to the next maintenance time to stop the warning** of this element.

The zero-set-up of the maintenance parameters will be done in a service center during a total maintenance.

Table of maintenance



Increase of the maintenance parameters

Access to the parameter programming

Press the **SET** key.

Press the key **+** and **-** until the code is obtained (factory setting = 0)

Validate with the **ENTER** key.

ENTER PASSWORD

« 0 »

Access to chosen parameter menu

Press the **+** key repeatedly to access to **MAINTENANCE** menu.

Validate with the **ENTER** key.

**DEFINITION MENU
SETTING
MAINTENANCE
MANAGEMENT**

Press the **+** key repeatedly to access to the chosen menu.

Validate with the **ENTER** key.

**OVERHAUL. WARNING
EXHAUST WARNING
PART. MAINT. WARNING**

The fresh screen appears.

Use the **+** keys to increase the maintenance duration time.

Validate with the **ENTER** key.

Return to the main menu and exit the setting mode using the **SET** key.

**PART. MAINT. WARNING
17000
MIN: 1000 H
MAX: 34000 H**



Maintenance components

Operating Manual - A3P Series

Detailed contents

F 00

Spare parts - Instruction of use

F 10

Spare part list

Spare parts - Instructions of use

Replacement of parts and use of non genuine parts

Our products are designed to comply with current EC regulations and guarantee optimal operating conditions with maximum safety conditions for the user.


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 performance of the product and the user's safety.

Replacement of defective components with parts that are not genuine, jeopardizes the initial safety conditions of the equipment.

In such cases, the EC declaration of conformity becomes null: The manufacturer withdraws responsibility for such operations.

Besides, counterfeiting and unfair trading of parts are condemned under civil and criminal laws.

The manufacturer urges the user not to use «imitation parts», or the misappropriation and pirating of intellectual property performed by some dishonest operators.

The manufacturer supplies maintenance components, spare parts or kits to perform the maintenance of its products ( F).

Spare part list

	A103P P/N	A603P / A1003P P/N
Blank-off flange kit	112311	112313
Emergency plug connector	106587	106587
Remote control plug connector	107222	107222



Annexes

Operating Manual - A3P Series Detailed contents

G 100	<i>Declaration of conformity</i>
G 101	<i>Semi certificate</i>
G 110	<i>A103 - Electrical schematic</i>
G 120	<i>A603 - Electrical schematic</i>
G 130	<i>A1003 - Electrical schematic</i>
G 170	<i>Electronic cabinet</i>
G 200	<i>Service</i>

DECLARATION OF CE CONFORMITY

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

ISO 9001 CERTIFIED

declare under our sole responsibility that the following products

**A103P
A603P
A1003P**

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

2006/42/EEC : MACHINERY DIRECTIVE

2006/95/EEC : LOW VOLTAGE DIRECTIVE

2004/108/EEC : ELECTROMAGNETIC COMPATIBILITY DIRECTIVE

2002/95/EEC : RESTRICTION OF HAZARDOUS SUBSTANCES

1997/23/EEC : PRESSURE DIRECTIVE

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

Implemented standards

**NF EN 55014-2
Semi SAFETY S2-076**

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

Signatures:

AnneCY August 11, 2011

Authorized person to compile the relevant technical documentation:



Mr Eric TABERLET
President



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

Semi certificate

Type Examination Certificate

Certificate Number 013008-E302633R2

Issue Date 2008 January 30

Page 1 of 1



Test results apply only to the sample(s) actually tested by Underwriters Laboratories Inc. ("UL")

Product: ADIXEN A3P Series Pumps

Tests Requested By: Alcatel Vacuum Products Inc
48389 Fremont Blvd, suite 112
Fremont, CA 94538
United States

Manufacturer: Alcatel Vacuum Products Inc.

Model/Type/Serial Ref: A1003P, A603P and A103P (See Final report, 06CA58566-20080128, for serial number of equipment tested)

UL has determined that the sample(s) tested conform with the requirements of the Guideline indicated on this Certificate.

Guideline: SEMI S2-0706

Note: All items either comply 100% with the requirements of the SEMI S2-0706 Guidelines or, Conform to the Intent of the Guidelines based on the overall risk assessment. Refer to the SEMI S2-0706 report (Report No. 06CA58566-20080128F) for details.

The client provided all of the test samples for testing by UL. UL did not select the samples or determine whether the samples provided were representative of other manufactured products. UL has not established Follow-Up Service or other surveillance of the product. UL's name and marks shall not be used on or in connection with the product. The client and or manufacturer are solely and fully responsible for conformity of all products to all applicable standards, specifications or requirements. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Issued By: *Alan Rehder*

Alan Rehder, Staff Engineer

Underwriters Laboratories Inc.

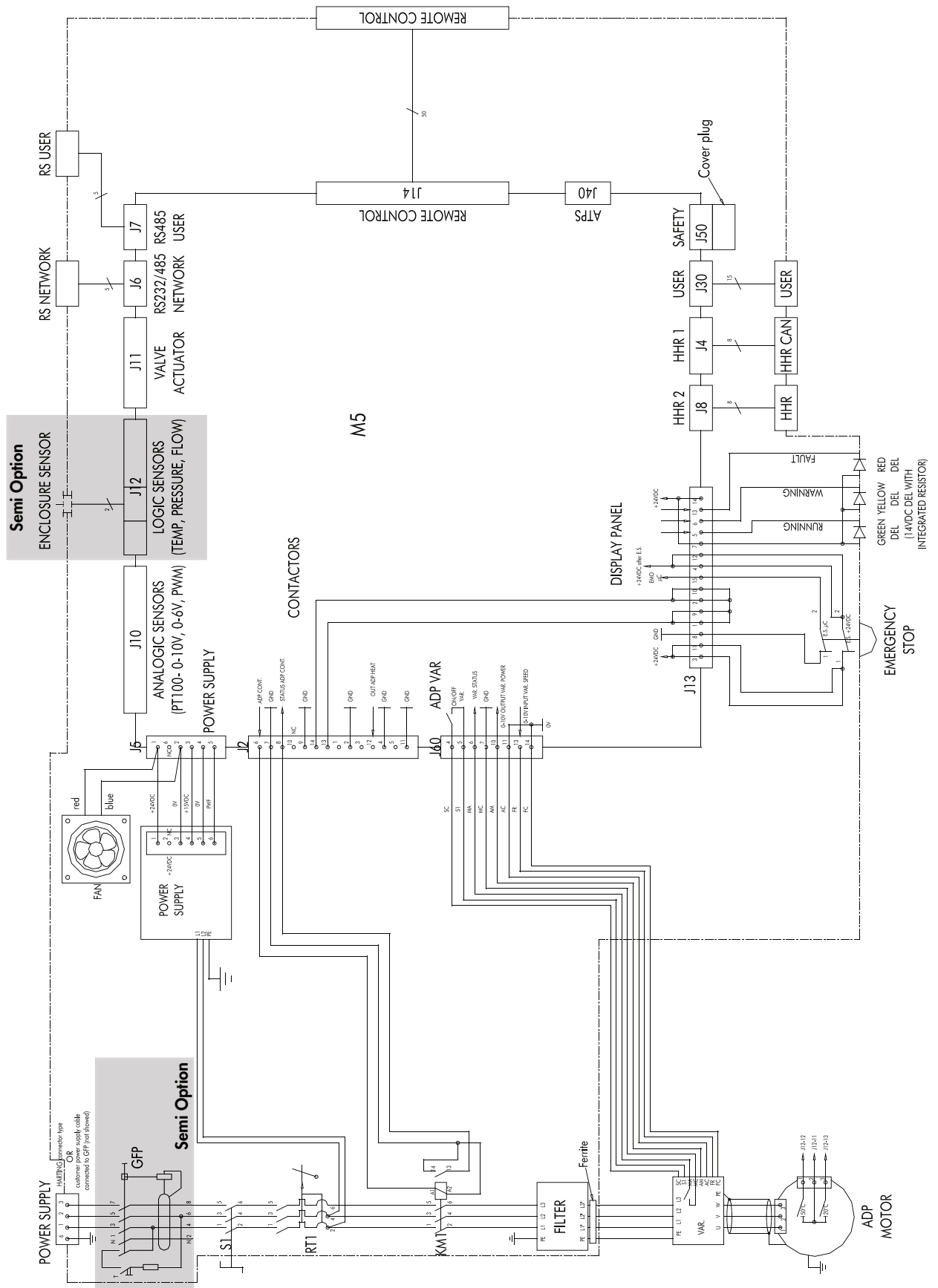
Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL. For questions in The United States of America you may call 1-877-UL-HELPS.

Reviewed by: *Jeffrey Hom*

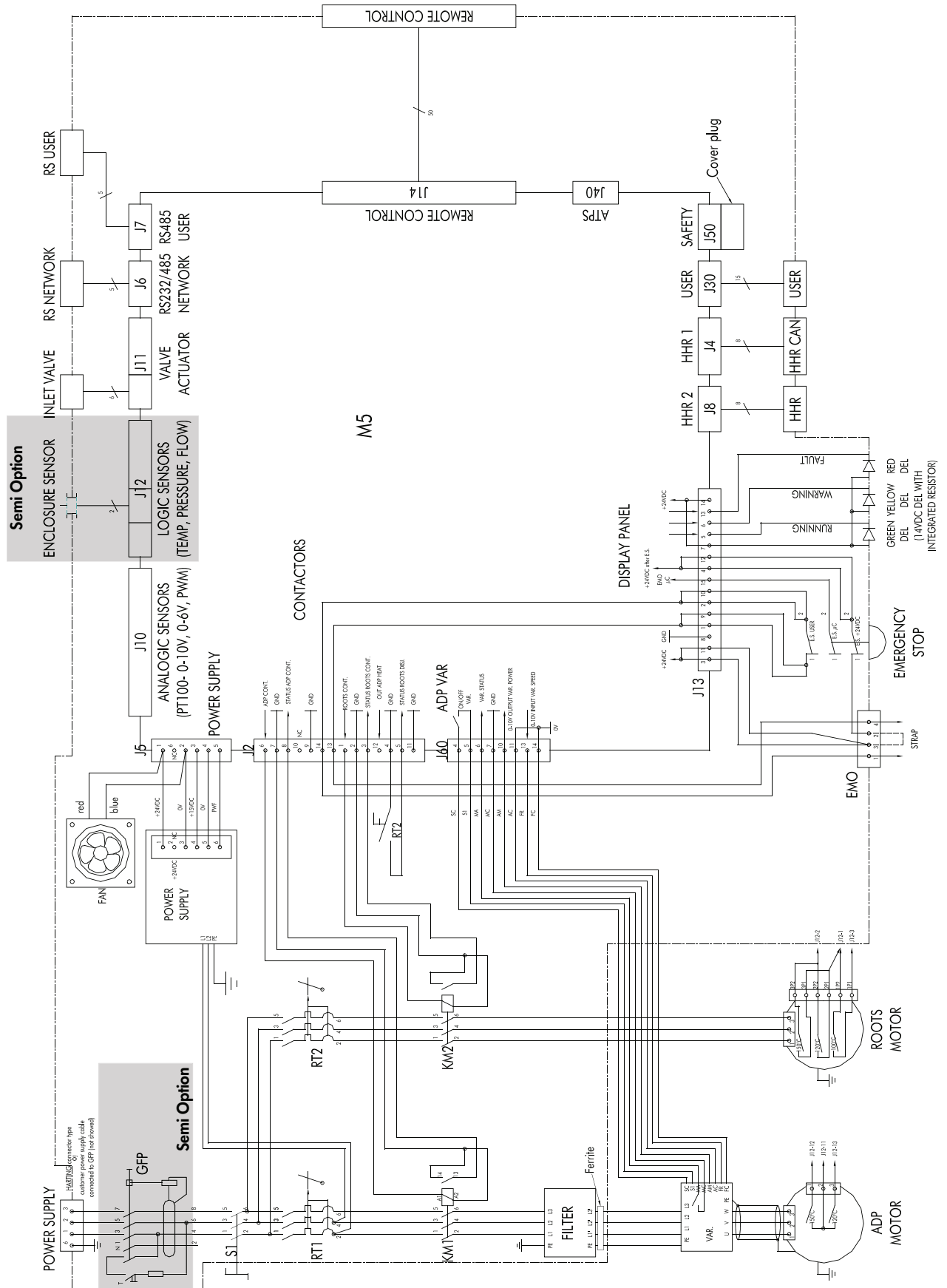
Jeffrey Hom, Staff Engineer

Underwriters Laboratories Inc.

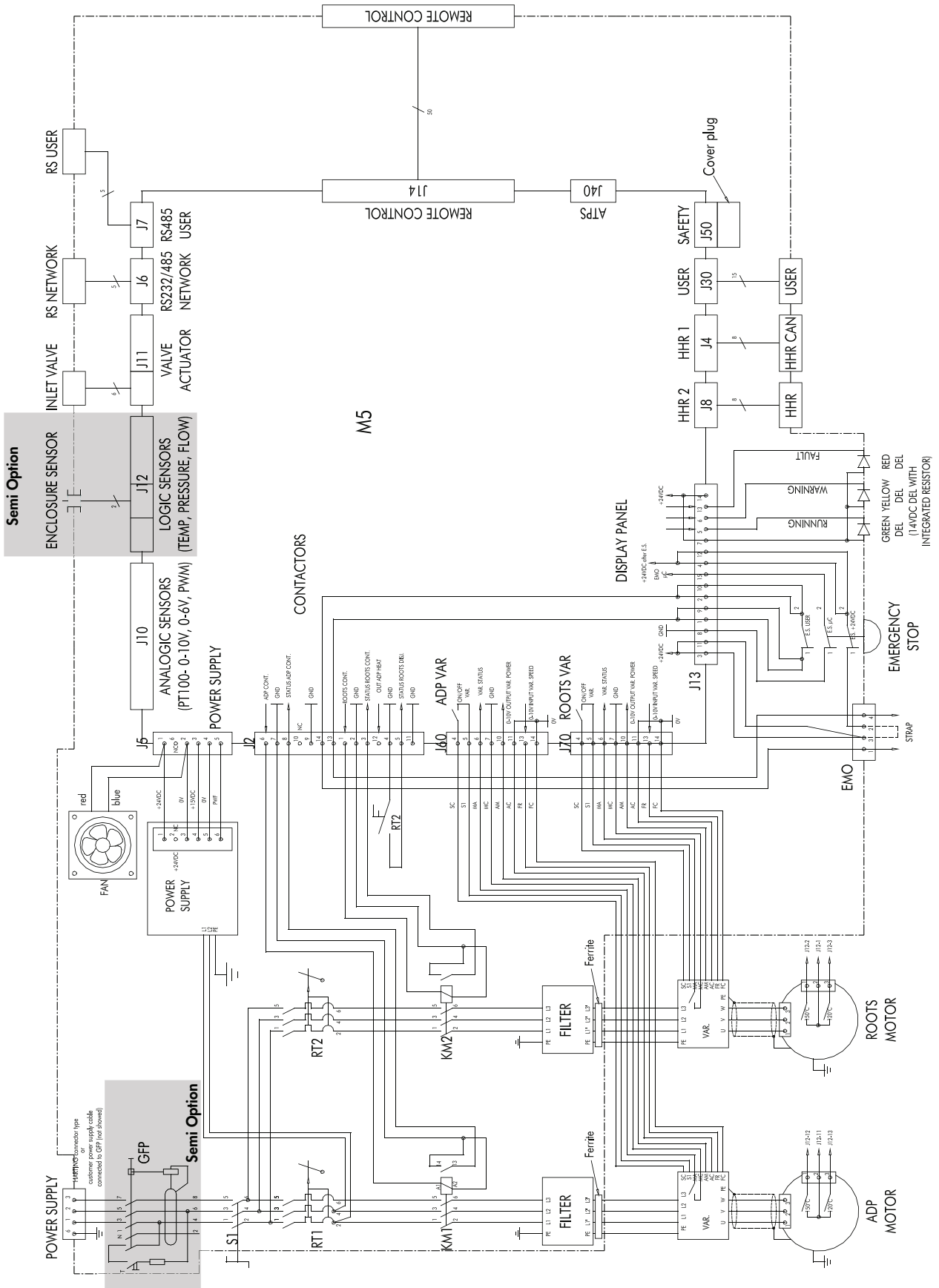
A103 - Electrical schematic



A603 - Electrical schematic

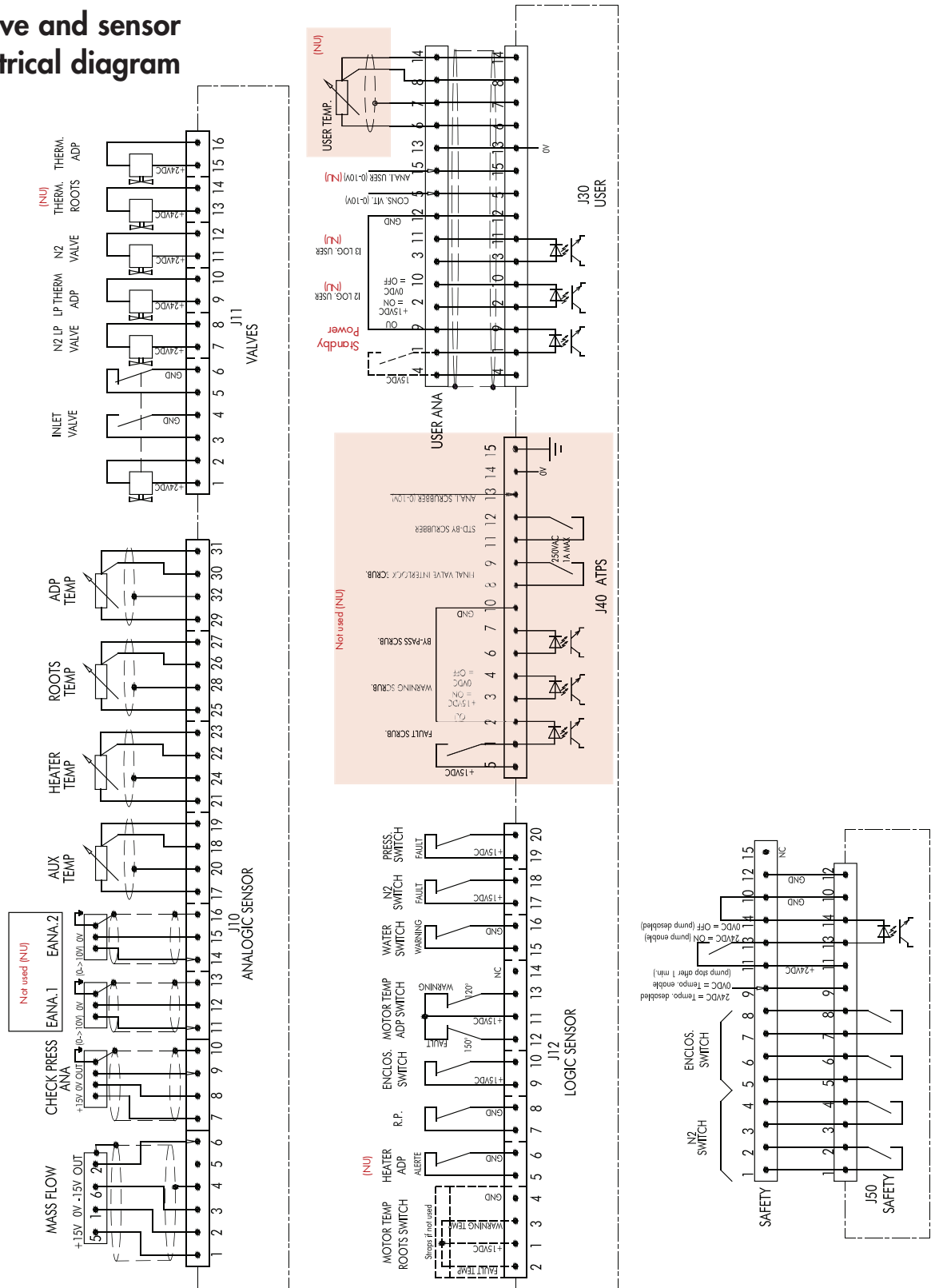


A1003 - Electrical schematic



Electronic cabinet

Valve and sensor electrical diagram



Service

Pfeiffer Vacuum offers first-class customer service!

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

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

Overhaul and repair in the Pfeiffer Vacuum Service Center

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

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

Sending of contaminated pumps or devices

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

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

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

Exchange or repaired devices

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

Service orders

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

**Vacuum Solutions
from a single Source**

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

**Complete range
of products**

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

**Competence in
theory and practice**

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

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

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

