ACT 600TH

Controller For
Ball bearing Turbomolecular Pumps

User's manual

adixen
by Alcatel Vacuum Technology

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Alcatel Vacuum Technology, as part of the Alcatel-Lucent Group, has been supplying vacuum pumps, helium and hydrogen leak detection systems, plasma sensors, vacuum measurement for several years.
Thanks to its complete range of products, the company has become an essential player in multiple applications : instrumentation, Research & Development, industry and semiconductors.
Alcatel Vacuum Technology has launched Adixen, its new brand name, in recognition of the company's international standing in vacuum position.
With both ISO 9001 and 14001 certifications, the French company is an acknowlegded expert in service and support, and Adixen products have the highest quality and environmental standards.

With 45 years of experience, AVT today has a worldwide presence, through its international network that includes a whole host of experienced subsidiaries, distributors and agents.
The first step was the founding of Alcatel Vacuum Products (Hingham- MA) in the United States, thirty years ago, reinforced today by 2 others US subsidiaries in Fremont (CA) and Tempe (AZ).
In Europe, AVTF-France headquarters and its subsidiaries, Alcatel Hochvakuumtechnik (Germany), Alcatel Vacuum Technology UK (Scotland), Alcatel Vacuum Technology Benelux (Netherlands), Alcatel Vacuum Systems (Italy) and more recently Adixen Sensistor AB in Sweden (in 2007) form the foundation for the European partner network.
In Asia, our presence started in 1993 with Alcatel Vacuum Technology (Japan), and has been strengthened with Alcatel Vacuum Technology Korea (in 1995), Alcatel Vacuum Technology Taiwan (in 2001), Alcatel Vacuum Technology Singapore, Alcatel Vacuum Technology Shanghai (China) (in 2004).
This organization is rounded off by more than 40 represenatives based in a variety of continents.
Thus, whatever the circumstances, the users of Adixen products can always rely on quick support of our specialists in Vacuum Technology.

Cb 02834 - Edition 04 - Feb 08

ACT 600TH controller for turbomolecular pumps

Welcome

Dear Customer,

You have just purchased an Adixen Controller type ACT 600TH.
We would like to thank you and are proud to count you as one of our customers.

This product has benefited from Alcatel Vacuum Technology's many years of experience in the field of ball bearing turbomolecular pump design.

In order to ensure the best possible performance of the equipment and your complete satisfaction in using it, we advise you to read this manual carefully before any intervention on your pump and to pay particular attention to the equipment installation and start-up section.

APPLICATIONS:

The ACT 600TH is compatible with Adixen brand, ATP150, ATP 400, ATP 900 and ATH300 model ball bearing turbomolecular or hybrid pumps.

This user's manuel includes the using instructions of the controller with an Adixen turbomolecular pump.
Refer to the pump user's manual to install the pump in the equipment (chapter B).

GB 04585 - Edition 01 - 08/2010

ACT 600TH controller for turbomolecular pumps

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

GB 04585 - Edition 01 - 08/2010

MANUAL REFERENCE: **119418**
EDITION: **01 - December 2010**

General contents

User's manual ACT 600TH

Translated from original version

GB 04586 - Edition 01 - 12/2010

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General contents

User's manual ACT 600TH

Translated from original version

CAUTION	**Indicates a potentially hazardous situation which, if not avoided, could result in property damage.**
⚠ CAUTION	**Indicates a potentially hazardous situation which, if not avoided, could result in moderate or minor injury. It may also be used to alert against unsafe practices.**
⚠ WARNING	**Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury.**
⚠ DANGER	**Indicates an imminently hazardous situation that, if not avoided, will result in death or severe injury (extreme situations).**

Before switching on the appliance, study the user's manual and make sure you follow the safety instructions it gives. You can recognise these by the 'Caution', 'Warning' and 'Danger' symbols.

Good practice tips and manufacturer's recommendations are in a blue box.

GB 04586 - Edition 01 - 12/2010

Introduction to the controller ACT 600TH

Designed for the Adixen ball bearing turbomolecular and hybrid pumps

Modern pump monitoring

- RS232/RS485 serial link
- Dry contact output data
- Analog output 0-10V
- Optocoupled control inputs
- Pump monitoring (warning/fault)
- Power supply 100-240V, 50/60Hz, single phase
- Alphanumeric display
- Membran keyboard

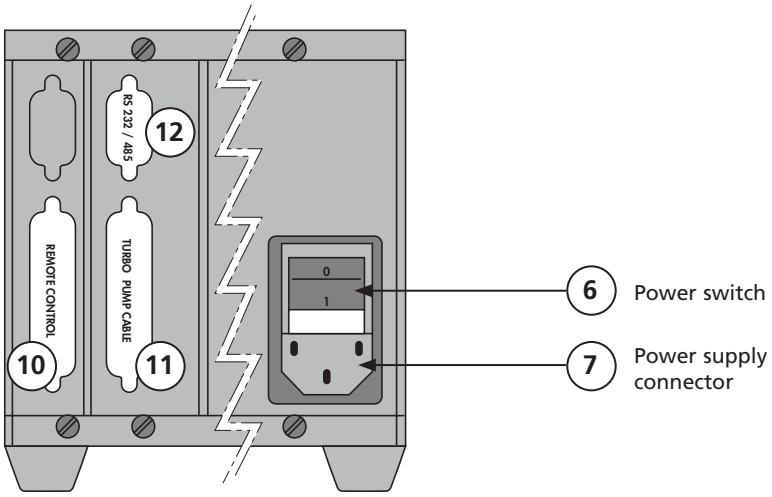
GB 04587- Edition 01 - 08/2010

Introduction to the controller ACT 600TH

ACT 600TH controller

Front panel

Rear panel



10 Remote control connector

Wiring characteristics *B 435*.

- inputs for the remote control of START, STOP, STANDBY, EXTERNAL SAFETY and Mode SELECT.

- outputs for pump monitoring parameters available in form of dry contacts.

11 Pump connector

12 RS232/RS485 connector

Wiring characteristics *B 450*.

The RS 232 serial link is used to control and monitor the pump using a computer.

The RS 485 serial link allows the installation of several pumps in a network.

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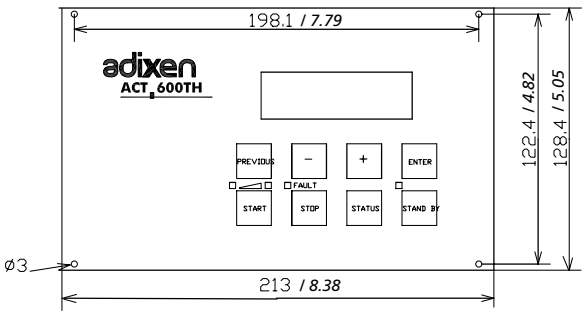
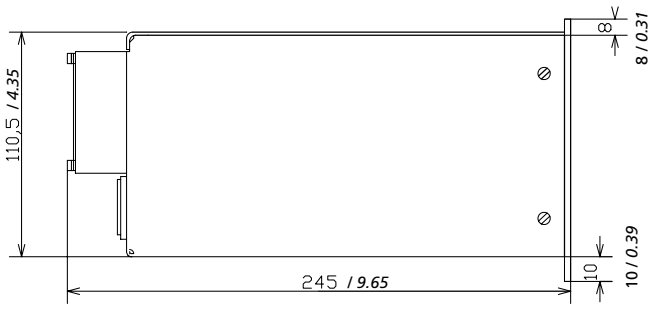
Technical characteristics of the ACT 600TH

CHARACTERISTICS	UNIT	ACT 600TH
Protection		IP20
Single-phase voltage - voltage - frequency - power max.	 V Hz VA	 100 - 240 ± 10% 50/60 300
Weight	Kg (lbs)	4 (8.8)
Maximum leakage current	mA	< 30 mA
Dimensions HxLxP)	mm (inch)	128,4 x 213 x 245 - (5.0 x 8.39 x 9.65) - 1/2 Rack 19"
Storage temperature	°C	-15 < T < +70
Sound level	dB	< 65
W.E.E.E. (2002/96/CE)		in compliance
R.O.H.S (2002/95/CE)		in compliance
Environmental conditions:		
Use of the product	-	Indoor
Ambient operating temperature	°C	0 < T < +50
Maximum altitude	m **(ft)**	< 2000 (**6561**)
Pollution degree	-	II
Maximum relative humidity	%	Maximum relative humidity 95% for temperature until 31 °C, decreasing until 50% at 40 °C

Dimensions (mm/inch)





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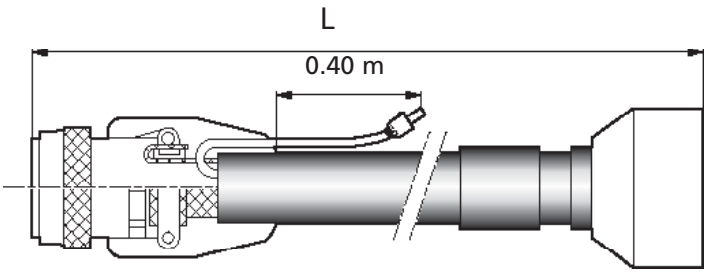
ACT 600TH controller accessories

Pump connection cable

Interconnecting cables between the pump and the controller are ordered separately.



Lenght L (m)	Part Number
1	A461237-010
1,5	A461237-015
3,5	A461237-035
5	A461237-050
10	A461237-100
15	A461237-150
20	A461237-200

GB 04603 - Edition 01 - 08/2010

Safety instructions for pump and controller installation

CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in property damage.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in moderate or minor injury. It may also be used to alert against unsafe practices.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury.
⚠ DANGER	Indicates an imminently hazardous situation that, if not avoided, will result in death or severe injury (extreme situations).

Overview

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

The performance and operational safety of this product are guaranteed provided it is used normally in the operating conditions defined in this manual.
It is the customer's task to:
- train operators to use the product if they do not speak the language the manual is written in,
- ensure operators know the safe practices to apply when using the product.

We took care to provide you with a clean appliance. To keep it in this condition, unpack it only in its final place of use.

For emergencies

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

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

GB 04013 - Edition 06 - 11/2010

Safety instructions for pump and controller installation

⚠ CAUTION

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

⚠ CAUTION

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

Installation

⚠ WARNING

Electric shock hazard.
Some components have capacitors charged to over 60VDC, or motor operating as generator. When power is switched off, they keep their charge for a time. Take precautions concerning the access to the connector pins. Wait that the turbopump rotation is stopped plus 5 minutes before commencing any work on the product.

CAUTION

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

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

⚠ WARNING

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

⚠ WARNING

When units containing control circuits are equipped with dry contact outputs, it is the responsability of the customer to use these outputs in compliance with installation and security standards.

GB 04013 - Edition 06 - 11/2010

Safety instructions for pump and controller installation

⚠ WARNING

This pump is not equipped with an emergency stop EMO device because it is designed for use on process tools and integration with the process tool EMO.
Check that the pump is correctly connected to the equipment emergency stop device.

⚠ WARNING

The user and /or OEM are ultimately responsible for operating the equipment in a safe manner. The manufacturer has no control over the types of gases exposed to this pump. This is the user and/or the OEM's responsibility to follow the necessary safety requirements.
Frequently process gases are toxic, flammable, corrosive, explosive and/or otherwise reactive.
Toxic gases can cause serious injury or death. Operators and users must take the appropriate safety recommendations to prevent injury. Consult the responsible department for instructions and safety information.
Hazardous gases through the pump can cause serious injury or death. It's mandatory by regulations to connect the turbomolecular pump's exhaust to a rough pumping line compatible with the process gases. Check that pump is correctly connected to the equipment (B310).

⚠ DANGER

Pump connection to the installation:
It is strongly recommended to secure the turbopump installation to prevent any safety hazard to the user in standard operating conditions: refer to B 20.

CAUTION

The units containing control circuits are designed to guarantee normal safety conditions taking their normal operating environment into account (use in rack).
In specific cases of use on tables, make sure that no objects enter the ventilation openings or block the openings when handling the units.

⚠ WARNING

Do not operate the pump until it is securely fixed. If the pump seizes, the stored energy of the rotor can cause rapid movement of the pump, which may cause further damage and injury to people. It is mandatory to respect installation instructions described in the pump user's manual.
The Adixen constructor declines any responsibility if the pump installation is not made in accordance with the installation specifications.

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.

GB 04013 - Edition 06 - 11/2010

Safety instructions for pump and controller installation

⚠ WARNING

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

⚠ DANGER

Risk of cut
The access to the rotor of a turbomolecular pump with an unconnected inlet port is dangerous. In the meantime, if the pump is not switched on, it may be driven by another pump in operation.
Always connect the pump inlet port before starting the pump.

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Controller installation

Installation

The controller can be placed on a bench or mounted in a 19" rack.

CAUTION

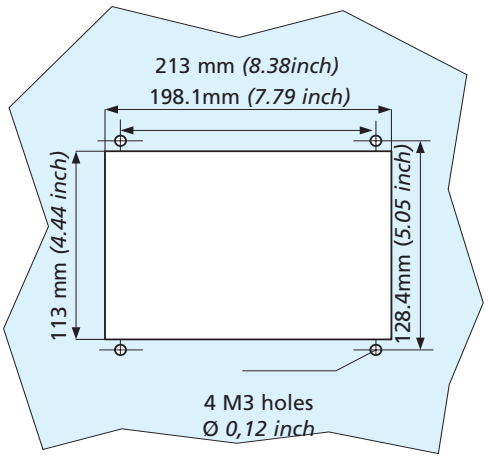
Protection against foreing bodies
Controller can be damaged when any objects are introduced or any liquids get into the unit.
Make sure no objects enter through the ventilation holes. Keep the unit away from the liquids.

Rack mounting

To optimize the space, the controller can be rack mounted or integrated into a control panel. For this, the following cut-out is required:

When doing so, we recommend:

- supplying the power through a breaker panel,
- verifying that the maximum admissible ambient temperature is not exceeded and the air circulation is not obstructed.



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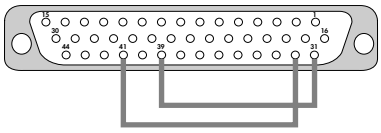
ACT 600TH safety instructions and electrical connections

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

REMOTE CONTROL
connector plug
(Factory wiring)



Wiring viewed on soldered side

If the controller is remote controlled, make the various connections on the remote control connector (📖 ***B 435***).

Display contrast setting

Option PC

Connect the **RS232/485** serial link cable to the connector (cable and computer supplied by the customer) (📖 ***B 450***).

Connect the **electrical venting valve** powered by the mains and driven by controller (📖 ***C 615***).

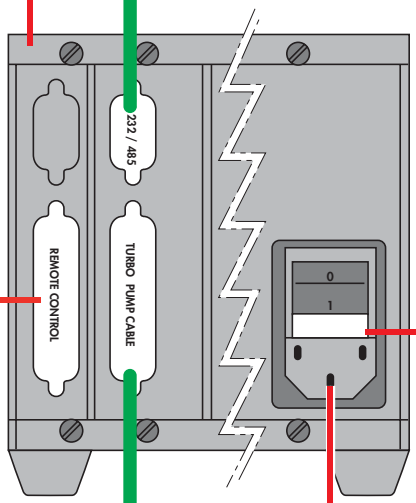
Power supply

Remote cable

or

Remote control plug

(standard wiring) for using the controller unit in local mode

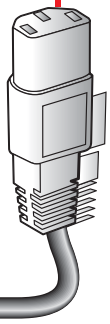


⚠ WARNING

Beware of the 72V presence on the PUMP connector. Switch the main connector on OFF before disconnecting the pump cable.

Fuse access.
(6.3A 250V delayed).

Hybrid pump



Connect the controller to the **main** using the power cable ordered separately.

Mains with earth connection.

CAUTION

If the access to the main connector is restricted, an additional isolation device should by incorporated which will be easily accessible by an operator.

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ACT 600TH safety instructions and electrical connections

⚠ DANG

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

⚠ CAUTION

Differential circuit breaker
In case of insulation defect, for personnel protection you must install on the main power supply a type B differential circuit breaker GFI (or RCD) of 30mA. This equipment protection device is compatible with type T.T electrical network. For other network type T.N or I.T, apply the right protection device. Contact Adixen product manufacturer for advice.
In all cases, comply with current local regulations.

⚠ WARNING

Make sure that main switch is off during electrical connection.
Danger, risk of electric shock: disconnect any main power sources from the product prior to servicing.

⚠ CAUTION

Ensure that all electrical wiring is safely secured so that people cannot trip on them.

CAUTION

The pump is Class 1 equipment and therefore must be earthed.
The user must check the electrical installation to which the product is connected:
- it must comply with current standards (IEC 364),
- it must have a standards compliant earth wire, properly connected to earth.

⚠ CAUTION

If access to the IEC connector is restricted an additional isolation device should be provided, which will be easily accessible by an operator.

⚠ CAUTION

IAn IEC 417#5017 symbol is located inside electrical cabinet near the ground wire connection terminal. ⏚

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ACT 600TH safety instructions and electrical connections

⚠ WARNING

Risk of electrical shock.
The turbo-pump and the controller must only be disconnected from each other when the turbo-pump is completely at rest and the controller disconnected from the power supply.
Beside, don't unplug the pump by disconnecting the main cable. Only the authorized and trained technicians can perform intervention on the product.

⚠ WARNING

Electric shock hazard on touching.
When the main switch is switched to the «0» position, items located between the mains connection and the isolator are still under mains voltage.
Disconnect the mains cable from all power sources before commencing any maintenance work on the product.

⚠ WARNING

The controller is connected:
- to the main power with a main cable separately delivered,
- to the pump with the interconnection cable.
Voltage and current are present on these cables and on the heater power line (if present).
Avoid to pinch or pull these cables and route them safely.

⚠ WARNING

Installation protection with circuit breaker
The user must supply the pump from facilities equipped with 10 A main circuit breaker, curve D or C (IEC 60947-2), in accordance with local regulations and with a minimum amp. interrupting current of 10 kAIC.
This protection device should be in close proximity to the pump (no further than 7m (25 ft) within line of sight of the pump.

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B 435

Remote control connector wiring ACT 600TH

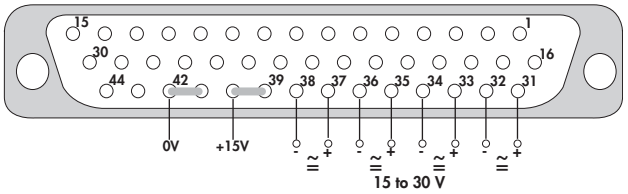
Before switching on the pump, the user should study the manual and follow the safety instructions listed in this manual.

⚠ WARNING

When units containing control circuits are equipped with dry contact outputs, it is the responsability of the customer to use these outputs in compliance with installation and security standards.

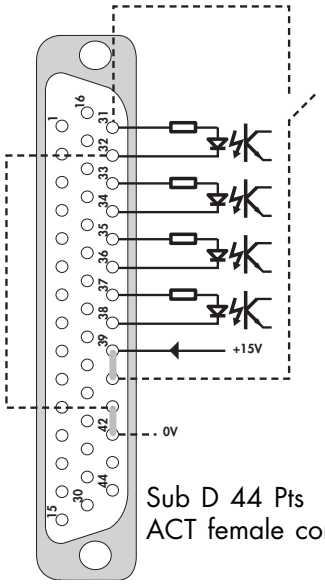
The control by voltage

The inputs are activated when an AC or DC voltage is applied. The voltage should be between 15 and 30 volts. For local operating mode, +15 V voltage is available between contacts 39 and 41 (DB 44 contacts, female connector).



Principle of the input controlled by voltage

Example: Ext. Safety engaged



Ext. Safety **31**	Inactive: the external safety device is engaged (e.g. an emergency stop) Active: pump operation authorised
REMOTE Mode **33**	Inactive: local mode (pump control using front panel keyboard) Active: remote mode validated
STAND-BY Mode **35**	Inactive: operation at nominal speed Active: operation at reduced speed
Start / Stop **37**	Inactive: Stop. Active: Start.
32 - 34 - 36 - 38	Input return 31, 33, 35 and 37.
39 - 40	+ 15 V
41 - 42	0 V

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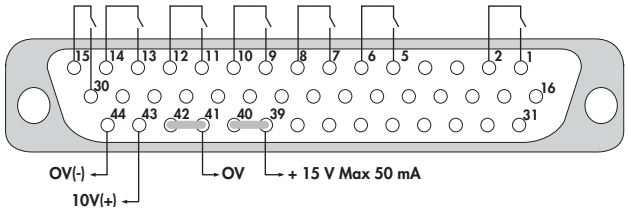
Remote control connector wiring ACT 600TH

Signaling using output contacts

These are dry contacts (**250 VAC - 1 A**), their function is to replicate the data concerning the pump operating status.



Output contact description:

1 - 2	Closed when the pump is in running-in mode.
5 - 6	Closed when the pump is accelerating.
7 - 8	Closed when START is activated and open when STOP is activated. This contact can be used to drive a roughing pump (**see C325**).
9 - 10	Closed when STANDBY is activated.
11 - 12	Open when a fault or a power failure occurs.
13 - 14	Closed when nominal speed is reached.
15 - 30	Contact to control the air inlet valve. Open when the air inlet is required.

A 0-10 V **analog output** is used to monitor variations in certain pump parameters (speed, temperature, etc.). This data can be used to plot curves.

44 - 43	Used to monitor the selected parameter in the “Set Analog output“ menu (**see C315**).

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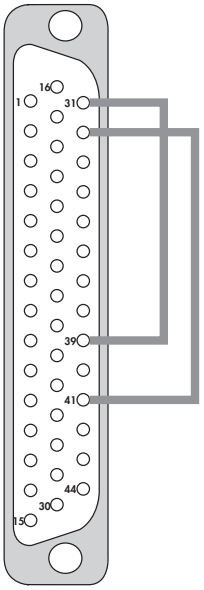
Remote control connector wiring ACT 600TH

Use in local mode

- Standard connector plug (factory wired)

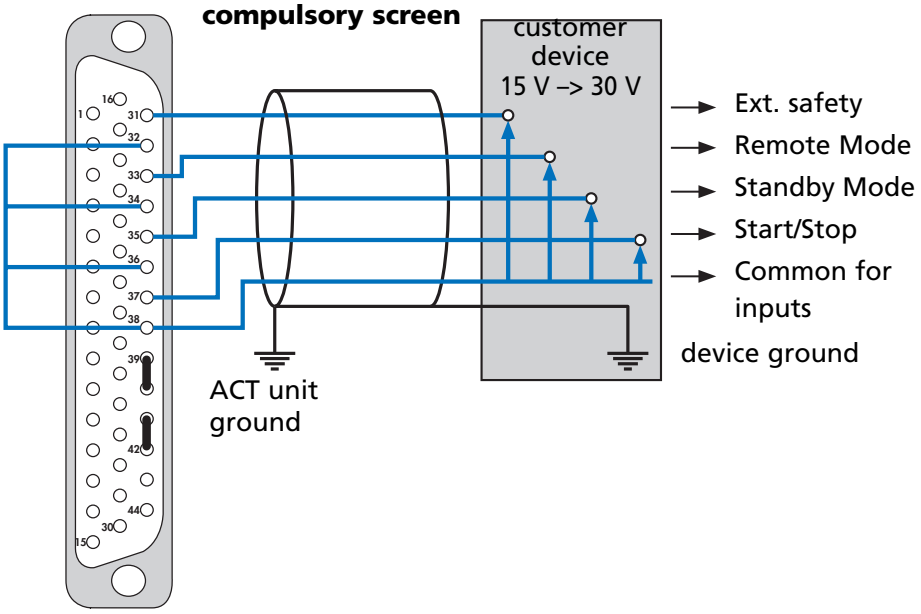


Wiring seen from solder side

Use in remote control mode

- **With galvanic isolation** (recommended)

Wiring seen from solder side.



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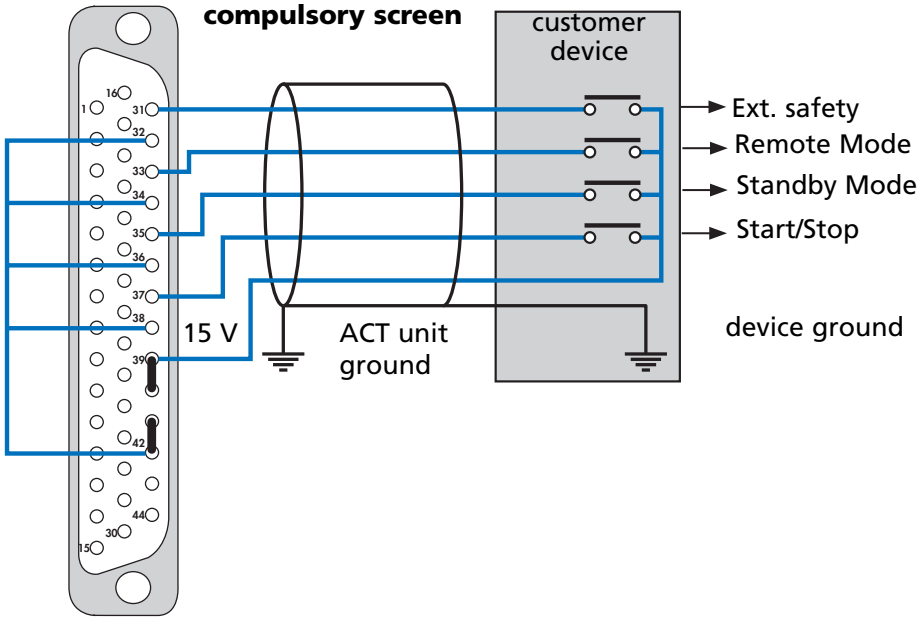
Remote control connector wiring ACT 600TH

Use in remote control mode

■ **Without galvanic isolation** (no recommended)

Wiring seen from solder side.



The voltage used to power the contacts is supplied by the ACT 600 TH (terminals 39-40). The disadvantage of this method is the risk of exposing this voltage to external interference (see also diagrams on page 1/5).

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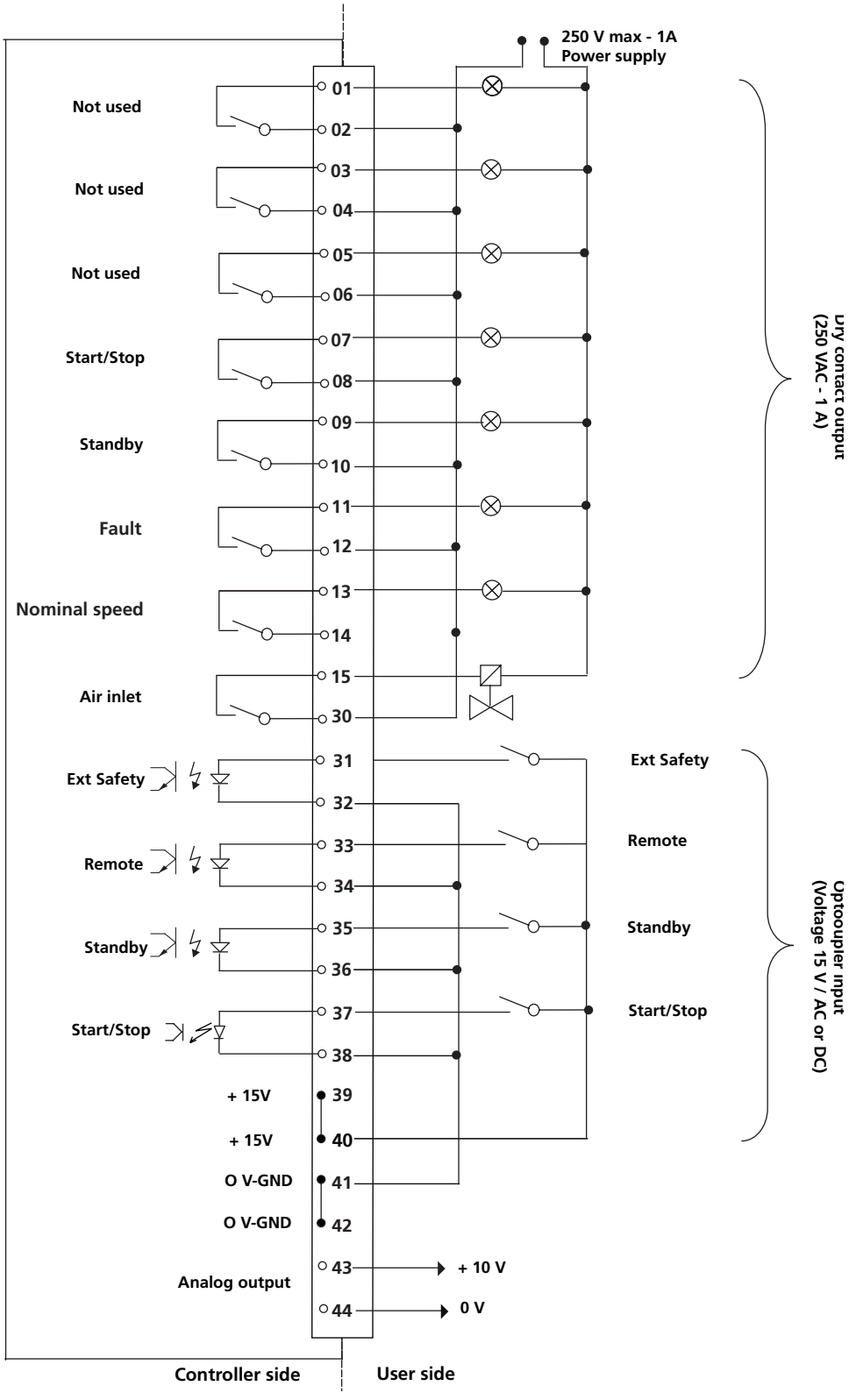
Remote control connector wiring ACT 600TH

Remote control wiring

Remote control connector



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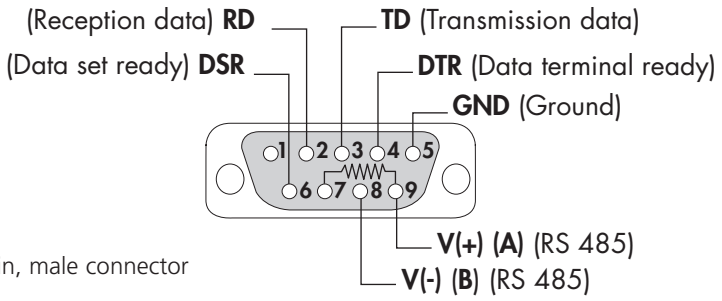
RS 232/485 serial link wiring (ACT 600TH)

The box version controller is shipped with factory configuration. The serial link parameters can be modified by accessing the corresponding unit menu.

Factory configuration

- Type : **RS 232**
- Transmission speed : **9600 bauds**
- Data length : **8 bits**
- Parity : None
- Stop bit : **1**

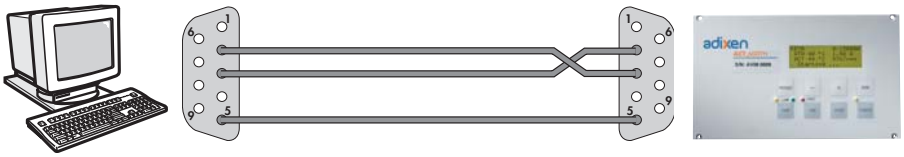
RS232/RS485 connector wiring



Sub D9 pin, male connector

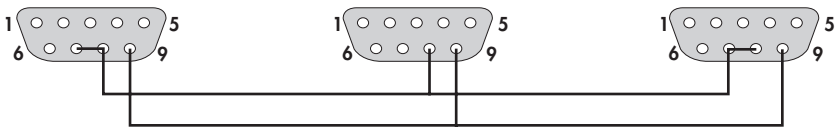
Connection examples

RS 232 type serial link with a single controller



RS 485 multiple connection

Several units can be controlled on a single link. It's a parallel type connection which allows communication in the network even if a unit is disconnected.



Wiring of the unit at the end of the line : connect terminals 7 and 8.

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Safety instructions for product use

CAUTION

Before to use the controller, make sure that the mechanical and electrical connections have been made (📖 chapter *B).*

⚠ DANGER

Risk of injury by cutting

- The inlet of the pump musn't be disconnected as long as the rotor is moving and without having disconnecting the power line cable.
- Contact with the pump rotor cell may cause cuts. Alternatively, protective gloves may be worn when servicing the product.

CAUTION

Risk of seizing
Avoid moving or applying shock to a running detector.
Avoid rotating the product about an axis perpendicular to the axis of rotation of the high vacuum pump.

CAUTION

Do no install water fittings above electrical components: there is a risk of electrical discharge in case of a leak at the water fitting connection.

CAUTION

Controller ventilation
Internal components can be damaged through overheating oif there is inadequate ventilation.:
- do not block the ventilation holes,
- leave 50 mm (2inch) free space above and below the controller and 15 mm(0,6 inch) along the sides.

⚠ WARNING

Risk of electrical shock
The turbopump and the controller must only be disconnected from each other when the turbopump is completely at rest and the controller disconnected from the power supply.
Beside, don't unplug the pump by disconnecting the main cable. Only the authorized and trained technicians can perform intervention on the product.

En 04017 - Edition 02 - 11/2010

Safety instructions for product use

DANGER

Auto-restart
When the pump is stopped with an over temperature issue, it will restart automatically when the temperature has decreased until the restart value.
It is the responsibility of the user to take all the measures required to prevent risks resulting from this type of operation. The user must provide a device (integrated in the equipment/host tool) to warn or to avoid this restart.

Refer to the controller User's manual to monitor the pump (📖 chapter C). Check pump operating on the controller front panel, refer to the controller user's manual if a fault appears (📖 *D 215*).

En 04017 - Edition 02 - 11/2010

ACT 600TH controller start-up

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

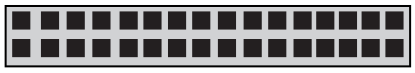
Verify electrical connections before positioning the main switch to position ‘1’ (*B 415*).

Once the various electrical connections have been made, set the main switch on the rear panel to “I”

The controller performs a self-test and identifies the pump to which it is connected.

The initialization time is approximately 15 seconds.

Display initialization



Indicator light test: they are lit in succession.

The equipment is identified, the program version is displayed.

The operation time and the name of the pump are displayed.

Local mode operation

- Start the pump by pressing on START button: the rotational speed is displayed.
- Pump operation status is shown in the indication of rotation table.
- Stop the pump by pressing on STOP button.

Remote mode operation

- The pump can be remotely controlled when the remote control connector has been wired (*B 435*).
- Pump start and stop are controlled by the START/STOP command inputs from the remote control connector.

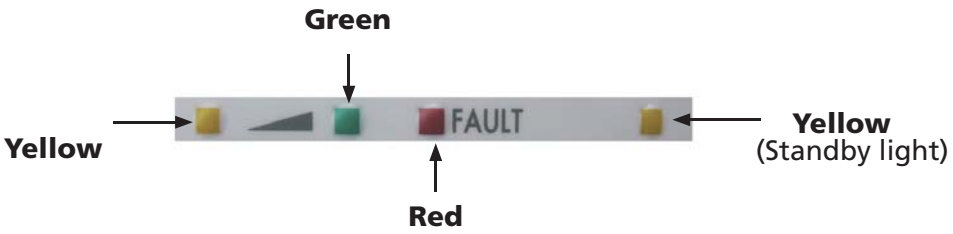
GB 04593 - Edition 01 - 08/2010

ACT 600TH controller start-up

RS232/RS485 mode operation

- The RS232/RS485 serial link mode operation is possible if the RS connector has been wired (*B 450*).
- Pump start and stop are controlled by the corresponding RS commands (*C 815*).

Indicator lights



Indication of rotation

Light	Description	Light indicator status
Yellow	The pump is accelerating	Speed lower than nominal speed
Green	The pump has reached the nominal speed	Nominal speed or standby speed reached Speed higher than the one selected
Yellow	Standby speed	Standby speed selected Running-in is in progress
Red	A fault has occured	Warning is signaled Fault is signaled

Lit

Flashing

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ACT 600TH controller start-up

	Inputs				Outputs					
Remote control connector	37-38	35-36	31-32	33-34	7-8	9-10	11-12	13-14		
Actions / Events	Start =on Stop = off	Stand by	Def ext	Remote	Start =on Stop = off	Standby	Fault	At speed	Operating status	Light status
Ext Safety remote mode	on	on	off	on	off	on	off	off	Fault D01 Ext Safety inhibited front panel command	
Remote control	on	on	on	on	on	on	on	on	Pump in standby	
Pump disconnected	off	off	on	on	off	off	off	off	Fault D08 no connect	-
Pump connected	off	off	on	on	off	off	on	off	Ready to start	-
Pumping start up	on	off	on	on	on	off	on	off	Pump accelerates	
Nominal speed	on	off	on	on	on	off	on	on	Pump at speed	
Standby selected	on	on	on	on	on	on	on	on	Pump decelerates until standby speed	
Standby speed	on	on	on	on	on	on	on	on	Pump at standby speed	
Standby OFF	on	off	on	on	on	off	on	on	Pump at nominal speed	
Stop selected	off	off	on	on	off	off	on	off	Pump stopped and air cooled	
Running-in mode start up	on	off	on	off	on	on	on	off	Running-in in progress	
Warning • ATP temperature > 60 °C • ATH temperature > 75 °C	on	off	on	on	on	off	on	on	Fault W04: Pump temp warning	
Fault • ATP temperature > 70 °C • ATH temperature > 85 °C	on	off	on	on	off	off	off	off	Fault D04: Pump temp	
Temperature pump OK	on	off	on	on	on	off	on	on	Pump at speed	
Warning • ACT temperature > 65 °C	on	off	on	on	on	off	on	on	Fault W03: ACT temp warning	
Fault • ACT temperature > 75°C	on	off	on	on	off	off	off	off	Fault D03: ACT temp	
Temperature ACT OK	on	off	on	on	on	off	on	on	Pump at speed	

Lit

Flashing

* The running-in is signaled by the yellow light flashing and the speed variation according to the running-in cycle.

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ACT 600TH available functions

Interface description display / buttons

Display time counter, messages

Setting parameter access A 100

Indicator lights to display the pump running status

Pump control buttons

1 Front panel buttons

By pressing

This button allows “START ” of the pump.
The pump is started to reach the selected speed.
The yellow increasing speed indicator light comes on. When the pump reaches its selected speed, the yellow indicator light goes off and the green indicator light comes on.

This button allows “STOP ” of the pump.
The rotation speed monitoring indicator light goes off. The pump motor is no longer powered, the pump decelerates.

Select the reduced speed rotational mode

The speed selection yellow indicator light comes on. The pump regulates its speed to reach the value of the programmed reduced rotational speed.

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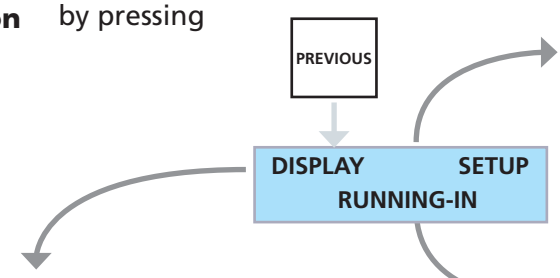
ACT 600TH available functions

2 The parameter setting keys

Setting access	PREVIOUS	Used to access the parameter setting mode. Used to exit the various menus without validation the functions.
Selection	+	Used to move in the menus, or from one parameter to another.
	-	Used to select or adjust the value of the selected parameter.
Validation	ENTER	Used to validate the selection of a menu, parameter or value.
	STATUS	Used to exit the menus and return to the pump parameter display.

3 Controller setting configuration

Enter the sub-menus by pressing PREVIOUS



- Access to parameter programming.
- Display the monitored parameters (📖 *C 215*).
- List the faults and warnings (📖 *D 215).*
- Select running-in cycle.
- Start the running-in cycle (📖 *E 315*).

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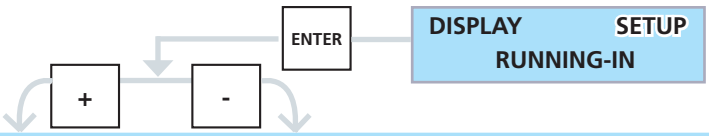
ACT 600TH available functions

4 SETUP menu



Menu	Submenu	Description	Setting Limits	Initial configuration
ACCESS CODE		Enter the access code	0 to 65535	0
SET ANALOG OUT		Configure 0 - 10 V output		Speed
	Speed (rpm) I motor (mA) T° pump (°C) T° cont (°C)		10 V = selected nominal speed 10 V = 4A 10 V = 100 °C = 212 °F 10 V = 100 °C = 212 °F	
STANDBY SPEED		Modify the STANDBY speed	6000 to 27000 rpm (for ATP) 30000 to 42000 rpm (for ATH)	12000 rpm or 30000 rpm
AUTO STARTING		Give the authorization to restart the pump after a power failure	YES or NO	NO
BUZZER		Activate or desactivate the buzzer	ON or OFF	ON
TEMPERATURE UNIT		Select the temperature measurement units	°C or °F	°C
SET SERIAL LINK		Set RS serial link	RS282/RS485/NETWORK	RS232
RS232/RS485	**Speed (bauds)**	- Transmission speed	4800 to 38400	9600
	Parity	- Parity	None/Odd/Even	None
	Data bits	- Data length	7 or 8	8
	Stop bits	- Number of STOP bits	1 or 2	1
	Echo**	- Authorize or not the echo of characters received on the link	On or OFF	ON
	Separator	- Data separating character	0 to 255	44 (comma)
	Address	- Controller address in multiple link	0 to 255	0
	Set data logger**	- Authorize transmission at pre-set intervals on the serial link	ON or OFF	OFF
		- Set the transmission interval	1 s to 4mn 15 s	00 mn 01 s
NETWORK	**Address**	- Number controller in the chain in case of multiple link.	0 to 255	0
SET START DELAY		Modify the time before starting the pump	(00 mn 00 s) to (240 mn 59 s)	00 mn 00 s
TIME TO VENTING		Set a delay before opening the inlet valve opens	from 00 mn 00 s to 59 mn 59 s	00 mn 01 s
VENTING TIME		Set the air inlet valve opening time	from 00 mn 00 s to 59 mn 59 s	00 mn 01 s
MAINTENANCE*		Program the maximum operating time before maintaining the bearings	M0 = 1000 to 20000 hours M1 = 1000 to 40000 hours M2 = 1000 to 60000 hours	M0 = 10000h
TIME BEARING		Display the life time bearing counter	0 to 50000 hours	0
NEW CODING		Modify the access code	0 to 65535	0

* not avaibable on ATH300 ** not avaibable with RS 485 option

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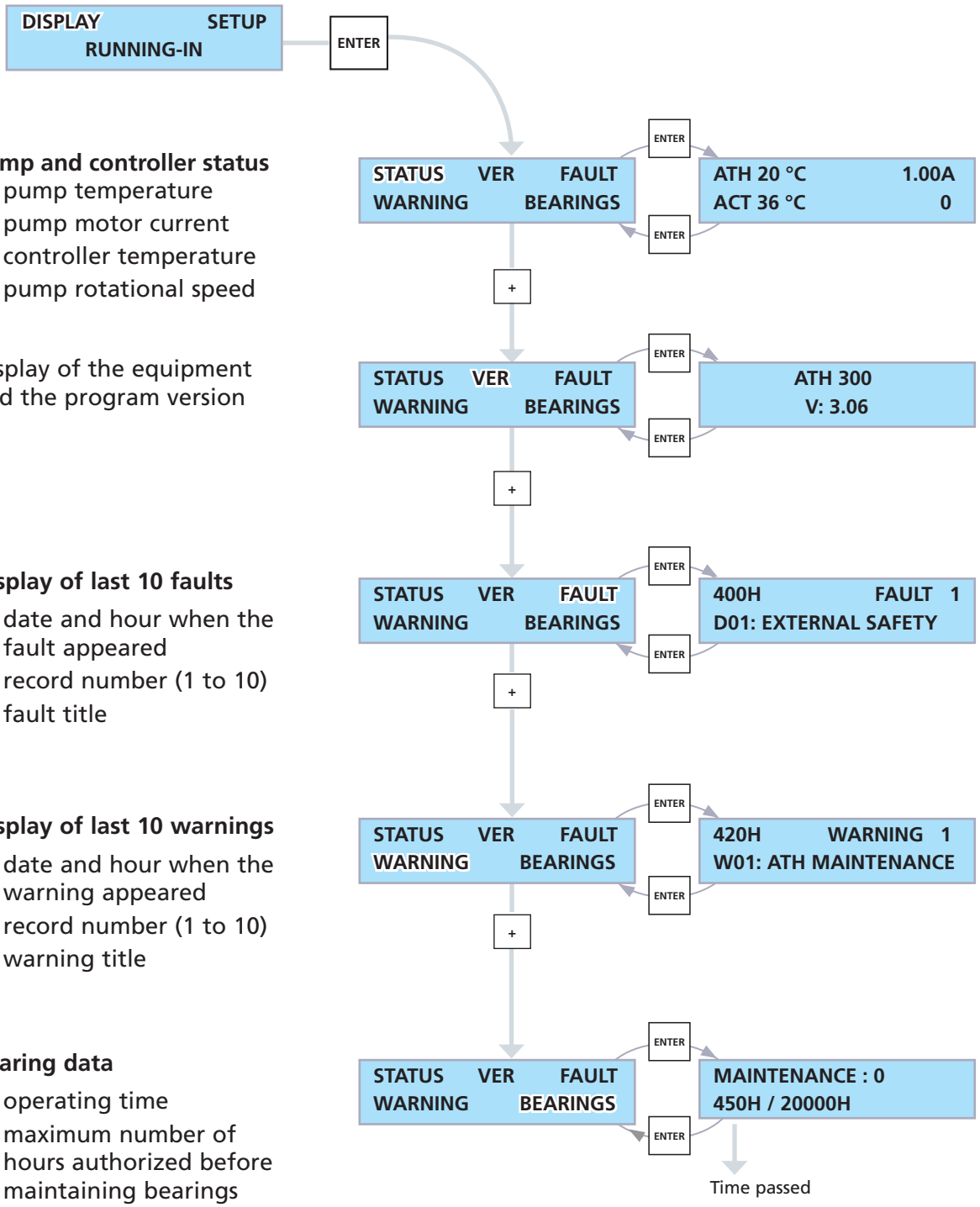
ACT 600TH available functions

5 Display the pump and controller data



Pump and controller status
- pump temperature
- pump motor current
- controller temperature
- pump rotational speed

Display of the equipment and the program version

Display of last 10 faults
- date and hour when the fault appeared
- record number (1 to 10)
- fault title

Display of last 10 warnings
- date and hour when the warning appeared
- record number (1 to 10)
- warning title

Bearing data
- operating time
- maximum number of hours authorized before maintaining bearings

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C 325

Pump delayed start-up - ACT 600 TH

Start delay setting

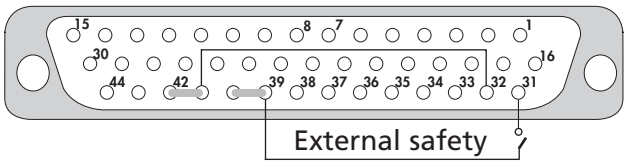
Set a start time different from zero in the controller menu.
When START is pressed, the pump will start at the end of the programmed time.

ACT 600TH
«SETUP» Menu
«SET START DELAY» / Submenu
=> Set a time before the start-up

«Ext. safety» input operation

This input, which can be used to control an external contact safety device for the ACT controllers, is controlled in 2 different ways depending on the value given to the **SET START DELAY** parameter accessible in the configuration menus.

«Remote control» connector



If SET START DELAY = 0

The external safety input is controlled continuously. If the «external safety» contact is open, it displays the fault «**EXTERNAL SAFETY**», lights up the red fault indicator light and inhibits the pump start-up. The output contact 7-8 is kept open.

If SET START DELAY ≠ 0

- Before pressing on "**START**", the external safety input is not controlled.
- After pressing on "**START**" and during a delay
  - of 4 seconds if **SET START DELAY > 4 s**
  - or between 1 and 4 s if **SET START DELAY ≤ 4 s**

  the external safety input is not controlled.
- After this delay, this input is handled by the ACT. If the «external safety» contact is opened, it displays the fault «**EXTERNAL SAFETY**», lights up the red fault indicator light, opens the output contact **7-8** and inhibits the pump start-up. This contact can be used to control the roughing pump (see wiring example, following page).

Note: In «REMOTE» mode, after an external fault, the pump must be set to the «STOP» status before starting up again.

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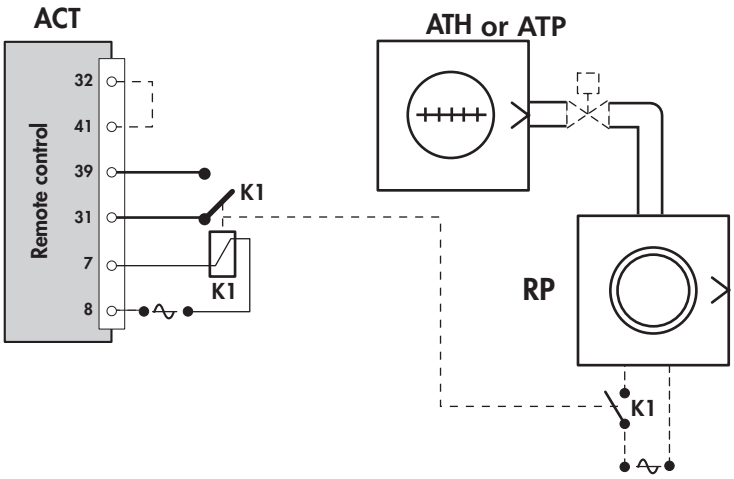
C 325

Pump delayed start-up - ACT 600TH

Wiring example to control a roughing pump.



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C 615

Venting valve operation - ACT 600TH

Instructions before wiring

The venting valve (NO) allows the pump to safety achieve at the atmospheric pressure, when you stop the pumping or in case of power failure.

Check the solenoid valve voltage: it must be compatible with the main power supply and the controller.

Connect the venting valve to the pump. See User's Manual of the pump (**B330**).
Wire the venting valve according to the diagram on section (**B435**).

Controller setting

The valve operation is controlled by the controller.
Set the following menus:

Delay/Time opening

ACT 600TH
«SETUP» Menu
«TIME TO VENTING» / Submenu
=> Set a delay before valve opening
«VENTING TIME» / Submenu
=> Set the time of venting

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

Conventions applicable to the syntax of all commands:

adr = address, from 000 to 255
<CR> Carriage Return (ascii 13)
<LF> Line Feed (ascii 10); between square brackets: this character is not compulsory.

Status values

ok : command executed correctly

Error messages

Err0 : adjustment error (out of bounds)
Err1 : command error (syntax)
Err2 : parameter error (e.g. non-hexadecimal character)
Err3 : context error
Err4 : checksum error

ADR

Specifies the address of the device for networking

Syntax

#adr**ADR**aaa<CR>[<LF>]

adr = address of the device before the command
aaa = new address of the device
condition: 000 ≤ aaa ≤ 255

Result

#aaa,ok or Err2

This command is used to allocate a specific number to each of the products making up a network (loop for RS 232 or parallel for RS 485).

⚠ CAUTION

it is important to note down the number allocated to each device.

BRK

Stop the pump by braking (ATP 80/100 and ATH 200 series only)

Syntax

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

Result

#adr,ok

This command is used to brake the motor electrically, which is particulary effective at high speed. It is currently only available for the variable drive units of the ACT 20x TH.

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

CKS — Enables or disables reply strings checksum

Syntax

#adr**CKS**ON<CR>[<LF>]
Enables ascii character checksum at the end of a reply string

or

#adr**CK**SOFF<CR>[<LF>]
Disables ascii character checksum at the end of a reply string

Result

#adr,ok,**S** for CKSON
#adr,ok for CKSOFF

This feature allows the user to test if there is any transmit error with a reply string.
S is a character whose ascii value is the checksum, on 7 bits, of all the character ascii values from the beginning of the reply string to the character before **S**. The 8th bit of **S** (MSB, Most Significant Bit) is always 1.

CYC — Starts the specified running-in cycle

Syntax

#adr**CYC**1<CR>[<LF>] to start running-in program 1

or

#adr**CYC**2<CR>[<LF>] to start running-in program 2

Result

#adr,ok

Running-in program 1 should be executed after a pump maintenance operation (change of bearings).
At the end of the program, the pump maintenance parameters are updated and the «maintenance requested» alert can be cleared. Program 2 is used after regreasing (ATP series only), or after prolonged storage.

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

DLI — Defines the DataLogger transmission interval

Syntax

#adr**DLI**xxx<CR>[<LF>]
xxx: DataLogger send interval in seconds
condition: 001 ≤ xxx ≤ 255

Result

#adr,ok or Err2

See also: DLR

Note: if ok, the interval sent is stored in user memory.

DLR — Enables DataLogger operation (only with RS 232)

Syntax

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

Result

#adr,sssss,nnnnn,iiii,ttttt,uuuu.o,www,ppp,vvv

Returns current values:
sssss: current speed (in rpm)
nnnnn: speed set point (in rpm)
iiii: current (in mA)
ttttt: pump working speed (in hours)
uuuu.o: (reserved)
www: pwm (reserved)
ppp: pump temperature (°C)
vvv: variator temperature (°C)

The main characteristics of the pump and its controller are sent over the RS link, at the rate defined by the **DLI** command.

See also: DLI, LNG, SEP, SHT

Note: any new characters arriving on the serial port (RS 232) will cancel the automatic DataLogger transmission.

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

ECH — Enables or disables command echoing

Syntax

#adr**ECH**ON<CR>[<LF>]
enables all characters received to be echoed over the serial port (RS 232 only).
or
#adr**ECH**OFF<CR>[<LF>]
disables all characters received from being echoed over the serial port.

Result

#adr,ok
Comments:
- This command is disabled in RS 485 operation, the value OFF is required.
- Using a loop-type RS 232 network requires «**ECH**ON» operation.

HDR — Defines the start character for a command reply string

Syntax

#adr**HDR**nnn<CR>[<LF>]
nnn: 3-digit decimal value of the ascii code of the corresponding character (with leading zeros).
condition : 032 ≤ nnn ≤ 255

Result

?adr,ok ? is the desired character.
#adr,ErrX if error
Allows the user to distinguish between the first character in a «command» string (for which # cannot be changed) and the first character of a «reply» string.
Affects the first character of ALL replies.
Default value: the hash sign, # (ascii code = 035)
If ok, the selected value is automatically stored in user memory.

IDN — Identifies the device which is communicating, and its software version

Syntax

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

Result

#adr, VS.... - Vx.zz
or
#adr, VS.... - Vx.zz for «pump type»

Returns the type of Variable drive Supervisor, the software version (x), the software edition (zz), and the type of pump for which this variable drive is set up.

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

LEV — Returns the state of the parameters defined by SET

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

Result #adr,nnnnn,sssss,aaaa,hhhhh or
#adr,nnnnn rpm,sssss rpm,aaaa mA,hhhhh hours

Returns the current values:
- **nnnnn** : speed set point
- **sssss** : stand-by speed set point
- **aaaa** : current set point
- **hhhhh** : alert level for pump bearing maintenance

Complete cabinet only:

Syntax #adrLEV10<CR>[<LF>]

Result #adr,nnnnn,sssss,hhhhh,g,ccccc,eeeee,ddddd,pppp,qqqq

Returns current values:

nnnnn	: nominal speed set point (in rpm)
sssss	: stand-by speed set point (in rpm)
hhhhh	: alert level for pump bearing maintenance (in hours)
g	: regreasing counter
ccccc	: pump working time (in hours)
eeeee	: electronic working time (in hours)
ddddd	: start delay (max 14459 s, that is 240 mn 59 s)
pppp	: time to venting (max 3599 s, that is 59 mn 59 s)
qqqq	: venting time (max 3599 s, that is 59 mn 59 s)

See also: LNG, SEP, SHT

LNG — Returns the strings sent with the identification sub-strings

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

Result #adr,ok
AVT>

Allows the parameters returned by the **DLR**, **LEV** and **SPD** commands
to be identified with sub-strings.
Also generates the «AVT>» prompt each time a <CR> character is received.

See also: SHT

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

NSP

Switches the speed set point to the nominal speed value

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

Result #adr,ok

The speed set point for the pump is set to its nominal value.
This configuration is automatically saved in user memory.
This mode of operation prevents the use of the «**RPM**» command.

OTP

Used to select possible user choices

Syntax

#adr**OPT**1 n<CR>[<LF>]
choice of parameters on the analog output:
n = 0 : real pump speed
n = 1 : pump current
n = 2 : temperature of pump body
n = 3 : temperature of internal electronics

#adr**OPT2** n<CR>[<LF>]
choice of temperature unit:
n = 0 : degrees Centigrade
n = 1 : degrees Fahrenheit

ACT miniboard only:

#adr**OPT4** n<CR>[<LF>]
Priority choice between Remote mode and RS 232 :
n = 0: Remote mode (I/O) has priority
RS 232 is not allowed to control the pump but the data reading is available.
n = 1: RS 232/485 commands have priority.
«Remote» and reduced «speed switch» are not taken into account. The miniboard is essentially controlled by the RS commands.
Note : in Remote mode, when the running-in is selected and launched (J1 input connector), the running speed is independent of the switch and no actions are authorized on the input «remote».
Only the TMP OFF command allows the running -in stop.

Complete cabinet only:

#adr**OPT10** n<CR>[<LF>]
auto-starting:
n = 0 : no
n = 1 : yes

#adr**OPT11** n<CR>[<LF>]
buzzer: **n = 0** : without
n = 1 : with

Result #adr,ok

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

See also: SEL

Comment: The choice of the temperature unit affects the results of the **DLR** and **STA** strings and the display (if cabinet fitted).

RMT — Reset of the pump counter

Syntax

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

Result

#adr,ok

Used by Service Center to reset the pump operating time.

RPM — Defines the speed set point in stand-by mode

Syntax

#adr**RPM** nnnnn<CR>[<LF>] or #adr**RPM**nnnnn<CR>[<LF>]

Result

#adr,ok or #adr,ErrX
1, out of range; 2, parameters ; 3, context (not in Stand-by mode)

See also: NSP, SBY

Comment: if ok, the new speed is automatically stored in user memory.

SAV — Saves the internal parameters in user's memory

Syntax

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

Result

#adr,ok

Saves the current context (except for running-in cycles). If this command is sent when the pump is being supplied, it can for example allow automatic re-start in the event of a power cut.

SBY — Switches the speed set point to the stand-by value

Syntax

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

Result

#adr,ok

Resets the stand-by speed to its last stored value, and allows it to be modified if an «**RPM**» command is sent.

See also: NSP, RPM

This configuration is automatically stored in user memory.

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

SEL — Returns the state of the parameters defined by OPT

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

Result
#adr,a,u
a : Returns choice of parameters on the analog output:
a = 0 : real pump speed
a = 1 : pump current
a = 2 : temperature of pump body
a = 3 : temperature of internal electronics
u : Returns the choice of temperature unit:
u = 0 : degrees Centigrade u = 1 : degrees Fahrenheit

Complete cabinet only:

Syntax #adr**SEL**10<CR>[<LF>]

Result
#adr,a,u,s,b
a : Returns choice of parameters on the analog output:
a = 0 : real pump speed
a = 1 : pump current
a = 2 : temperature of pump body
a = 3 : temperature of internal electronics
u : Returns the choice of temperature unit:
u = 0 : degrees Centigrade u = 1 : degrees Fahrenheit
s : Returns auto-starting choice:
s = 0 : no s = 1 : yes
b : Returns buzzer choice:
b = 0 : without b = 1 : with

SEP — Defines the character which separates the parameters in a reply

Syntax #adr**SEP**nnn<CR>[<LF>]
nnn: 3-digit decimal value of the ascii code of the desired character (with leading zeros).
condition : 000 ≤ nnn ≤ 255

Result #adr,ok or #adr,ErrX if error

Allows the user to select the character which separates the parameters returned by the **DLR**, **STA** and **LEV** commands. Default value: comma «,» ascii code = 044
If ok, the selected value is automatically stored in user memory.

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

SET — Defines the internal operating parameters

Syntax

#adr**SET**1 hhhhh<CR>[<LF>]	limit maintenance time 000<hhhhh<65535
#adr**SET**2 sssss<CR>[<LF>]	maximum time for start-up (future)

Complete cabinet only:

#adr**SET**10 ccccc<CR>[<LF>] :	pump working time (in hours)
#adr**SET**11 eeeee<CR>[<LF>] :	electronic working time (in hours)
#adr**SET**12 g<CR>[<LF>] :	regreasing counter (0 to 2 max)
#adr**SET**13 ddddd<CR>[<LF>] :	start delay (max 14459s, that is 240mn 59s)
#adr**SET**14 pppp<CR>[<LF>] :	time to venting (max 3599s, that is 59mn 59s)
#adr**SET**15 qqqq<CR>[<LF>] :	venting time (max 3599s, that is 59mn 59s)

Result #adr,ok or #adr,ErrX

See also: LEV

SHT — Returns the transmitted string without the identification sub-string

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

Result #adr,ok

The strings sent following **DLR**, **LEV** and **SPD** commands will now be sent without the parameter identification sub-strings (e.g: without the units).

See also: LNG

SPD — Returns the current speed

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

Result #adr,nnnnn

See also: LNG, SHT #adr,nnnnn rpm

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Detailed description of RS commands for ACT 600TH

(valid from V1.10 version variator board)

STA — Returns the status of the internal dynamic parameters

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

Result #adr,xxxxxx,yyyyyy,zzzzzz,sssss,iiii, www,ppp,vvv,ttttt<CR><LF>

adr: address
543210
xxxxxx status bits:
5 - RS echo (1->off)
4 - String long (0) / short (1)
3 - On (1) / Off (0)
2 - reduced or nominal speed reached (1)
1 - standby (1)
0 - running-in (1)

yyyyyy fault bits:
5 - controller temperature
4 - motor temperature
3 - excess current
2 - sensors or start-up
1 - external
0 - pump not connected

zzzzzz alert bits:
5 - reserved (future use)
4 - reserved (future use)
3 - controller temperature
2 - motor temperature
1 - start-up time exceeded (future)
0 - operating time exceeded

sssss current speed value in rpm
iiii current value in mA
www reserved (pwm value)
ppp pump temperature value
vvv controller temperature value
ttttt pump operating time value

⚠ CAUTION

Reminder: The "#" character at the start of the reply string can be set with the "HDR" command. The "," character which separates the parameters in the reply string can be modified with the "SEP" command.

TMP — Defines the operating state of the turbomolecular pump

Syntax
#adr**TMP**ON<CR>[<LF>] : start pump rotation
#adr**TMP**OFF<CR>[<LF>] : stop pump rotation

Result #adr,ok or #adr,Err3 if the pump is already in the state requested (context error)

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Safety instructions for maintenance and cleaning at the customer's site

⚠ WARNING

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

⚠ WARNING

Standard precautions before any maintenance operation:
Before performing a maintenance operation, stop the pump. When the pump is at rest, switch off the pump by setting the controller main switch to «0», wait 5 minutes before disconnecting the main cable. If this last one remains connected, some components will still be energized.
Be sure that the controller status is visible from the operator otherwise disconnect the cable from the pump.

⚠ WARNING

Risk of injury by cutting
The inlet of the pump must not be disconnected as long as the rotor is moving and without having disconnecting the power line cable.

⚠ WARNING

«After pumping on corrosive or toxic gases, it is strongly recommended to seal the pump with blanking plates in case of return to the repair service centers ((refer to pump user's manual).»

⚠ DANGER

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

Wear gloves, protective glasses and, if required for the used gases, a breathing mask.
Ventilate the premises well.
Do not eliminate maintenance waste via standard disposal channels. Have it destroyed by a qualified company if necessary.
Install the inlet and exhaust blanking plates, thus delivered with the pump or available as accessories.

En 04020 – Edition 02 – 11/2010

D100

Safety instructions for maintenance and cleaning at the customer's site

The outside of the product and control box can be cleaned with a lint free wiper. Avoid using cleaning products that deteriorate printed surfaces and self adhesive labels. All other cleaning operations must be done by our service centers.

Decontamination – product dismantling
According to the regulations 2002/96/CE about Waste of electrical and electronical equipments, and 2002/95/CE about Restriction of Hazardous substances, the manufacturer provides a recycling paid service for the end of-life of waste electrical and electronic equipment.
Any obligation of the manufacturer to take back such equipment shall apply only to complete not amended or modified equipment, using Alcatel Vacuum Technology original spare parts, delivered by Alcatel Vacuum Technology, containing i.e. all its components and sub-assemblies.
This obligation will not cover the shipping cost to an Alcatel take back facility.
Before returning the product, fill in the safety form available in appendix of the user's manual. Attach it to the product
before shipping to the service-repair office closest to you.

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

En 04020 – Edition 02 – 11/2010

Diagnosis and troubleshooting ACT 600TH

Default type:

«Warning»

The warnings don't stop the pump, They are signaled by:

- the flashing of the «**FAULT**» red light indicator
- the display of a warning message Wxx).

«Fault»

The faults stop the pump, they are signaled by:

- the lighting of the «**FAULT**» red light indicator
- fault output is activated (pin11-12) on the Remote Control connector
- the display of a fault message Dxx.

Warning and faults are also available via the RS232/RS485 serial link on warning (z) and fault (y) bits (STA command).

INCIDENT	CAUSE	CONSEQUENCE	TROUBLESHOOTING
No event occurs after power ON: **• No display** **• Indicators does not light.**	▶ No mains current in the controller. ▶ Defective power cable. ▶ Fuses.	The controller is not powered.	• Change the power cable. • Check the fuses. • ***Contact customer service.***
Incoherent display **Inoperative Keyboard (at starting or during the pumping).**		The display is different from «Ready to start !».	• ***Contact customer service.***
No light switches on.	▶ Defective lights.	The pump can be used without indicators.	• ***Contact customer service.***
The pump isn't running (pump seizing). **No messages.**	▶ Cell seizing.	No message. Check the pump status. Imax = 0.8 A Rotation speed: 0 rpm The controller temperature is increasing and the warning «ACT TEMP» can appear (65 °C).	• Check the pump rotation (manually) • Make the pump maintenance • ***Contact customer service.***
W01: GREASING	▶ The authorized limit for ball bearing maintenance time has been reached. (M=0 or M=1)		• Regrease the pump and initialize the maintenance counter.
W02: PUMP MAINTEN.	▶ Pump maintenance time has been reached.	Bearing must be changed.	• ***Contact customer service.***

GB 04597 - Edition 01 - 08/2010

Diagnosis and troubleshooting ACT 600TH

INCIDENT	CAUSE	CONSEQUENCE	TROUBLESHOOTING
W03: ACT TEMP.	▶ The controller temperature is between 65 and 75 °C but does not exceed the authorized limit.		• Check the controller cooling circuit: ventilation grid. • Reduce the working pressure or the flowrate.
W04: PUMP TEMP.	▶ Pump temperature is between 60 and 70 °C (ATP) or 75 and 85 °C (ATH).		• Check the pump ventilation. • Reduce the working pressure or the flowrate.
D01: EXT SAFETY	▶ The external security contact on the REMOTE CONTROL connector is activated.	The controller stops the motor. The pump can't restart.	• Test the external safety devices (contact 31 - 32). • Repair the fault and press START to restart.
D02: DLY SOFTWARE	▶ Soft counter default.		• Reinitialize the controller with the main switch (0/1). • If the fault happens again, ***Contact customer service.***
D03: ACT TEMP.	▶ Controller temperature exeeds the authorized limit (> 75°C).		• Check that the cooling circuit is operating correctly: ventilation grid.
D04: PUMP TEMP.	▶ The pump motor temperature exceeds the authorized limit.		• Check that the cooling circuit is operating correctly. • Reduce the working pressure or the flowrate. • If the fault happens again, ***Contact customer service.***
D05: HALL SENSORS	▶ Not used.		
D06: START FAULT	▶ Not used.		
D07: PUMP CURRENT	▶ Motor overcurrent or Hall sensor defaults.	Starting current too high.	• Reinitialize the controller with the main switch (0/1). • If the fault happens again, ***Contact customer service.***
D08: NO CONNECT	▶ Pump not connected.	The pump can't start up.	• Check the cable connection.
D09: HIGH PRESS.	▶ Not used.		

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ACT 600TH preventive maintenance intervals

Maintenance display

Pump maintenance intervals are signalled by the red fault indicator flashing, and the display “W02 = Pump maintenance” message.

A pump operating time counter is available in the controller’s internal memory and can be consulted over the serial link (**C 815**, **STA** command).

Maintenance intervals

For continuous operation, the maintenance frequency is two years. However, specific operating conditions may reduce this interval (high pressure, cycle pumping, temperature...). It could be necessary to set the maintenance counter using the serial link (**C 815**, **SET1** command).
For further information, we advise contacting the nearest Service Center. Maintenance operations are performed by our Service Centers.

Resetting of «Time bearing» counter

After a ball bearing replacement at one of our Service centers, it is necessary to reset the TIME BEARING counter. Refer to (**E 365**) page 5/5).

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E 315

Pump running-in using ACT 600TH

The pump must undergo a running-in operation

It consists of pump operation cycles at different speeds to distribute gradually and regularly thee grease through the ball bearings.

Running-in after ball bearings replacement

Running-in program N°1 **Duration ≈ 23 hours**

This operation is used to obtain the pump's initial performance in terms of reliability, noise level, vibration and power consumption.

Running-in after ball bearing replacement is performed by Adixen repair Service Center.

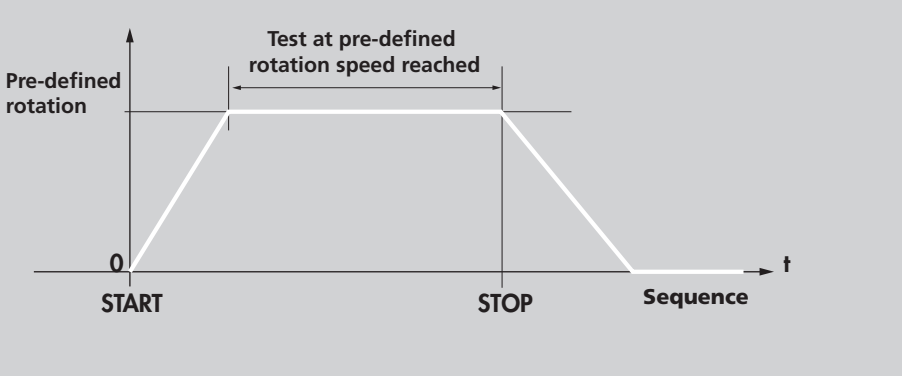
Running-in after pump lubrication

Running-in program N°2 **Duration ≈ 6h40 hours**

This operation is used to properly distribute the grease after ball bearing regreassing.

The running-in consists of conducting Start/Stop sequences at various speeds.

A phase of identical sequences is performed.



During the running-in, the cycle and phase counters are decremented to display.

PROG: 1	STOP
PH:0	CYCLE: 0

The running-in is complete

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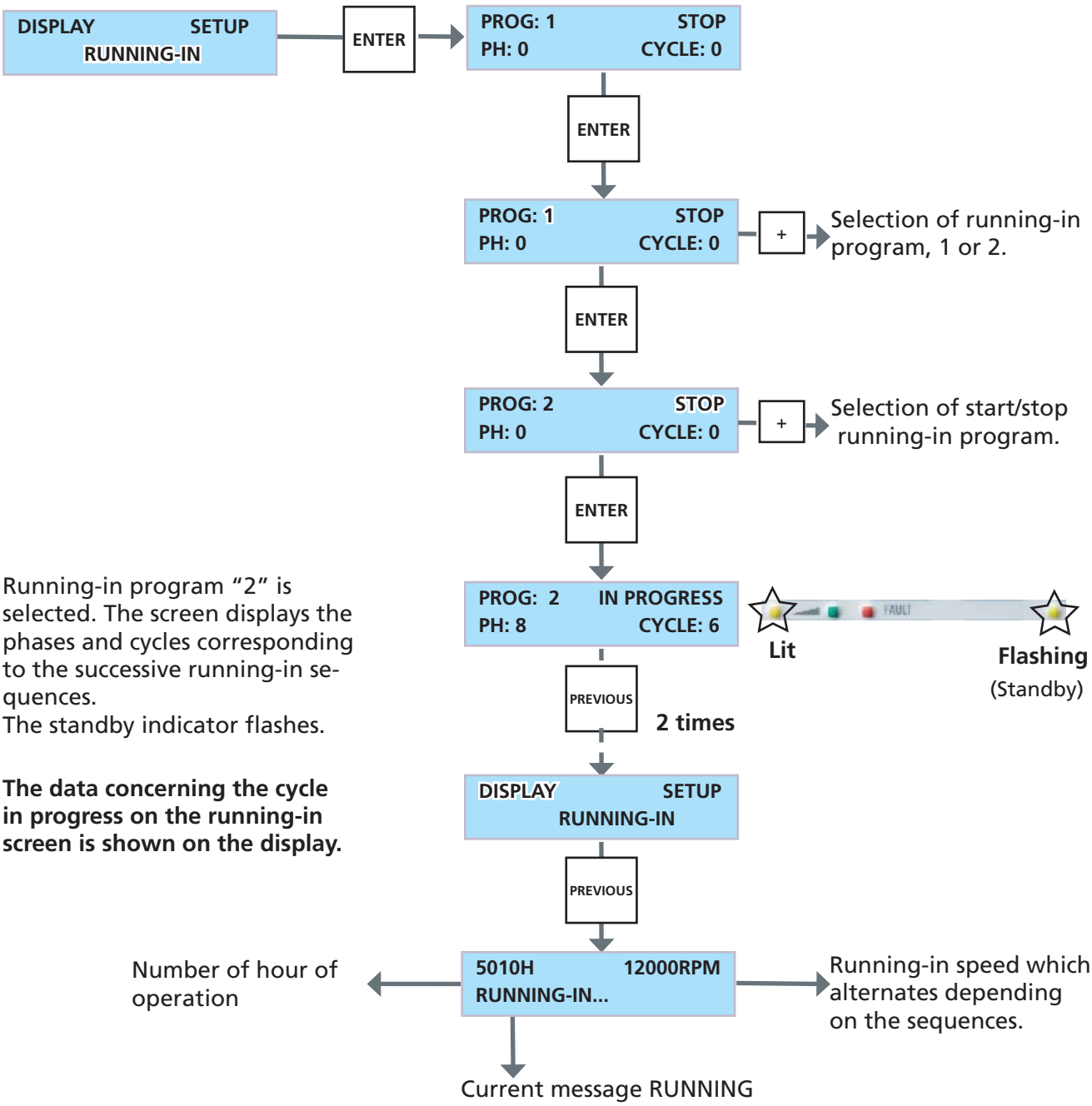
Pump running-in using ACT 600TH

Running-in procedure

- Blank off turbo inlet for protection.
- Let the pump operate 10 minutes at atmospheric pressure.
- Then, connect the primary pump and operate at ultimate pressure (the cooling has been started up).
- Start the running-in operation as follows:



Running-in program "2" is selected. The screen displays the phases and cycles corresponding to the successive running-in sequences.
The standby indicator flashes.

The data concerning the cycle in progress on the running-in screen is shown on the display.

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Pump running-in using ACT 600TH

If a problem occurs during running-in

The controller displays:

PROG 2	FAULT
PH 1	CYCLE 2

and the program is stopped. Remedy to the problem and start again the running-in operation.

During the running-in cycles:
- the START / STOP / STANDBY keys are desactivated,
- access to the SETUP menu is impossible,
- access to the DISPLAY menu is possible.

We advise you against stopping the running-in procedure.

If a power failure occurs during running-in

The controller displays:

5600H	0RPM
READY TO START !	

and the Standby indicator light is lit on. The running-in operation has been stopped and **it must be started again**.

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Maintenance counters for the ACT 600TH controller

Principle

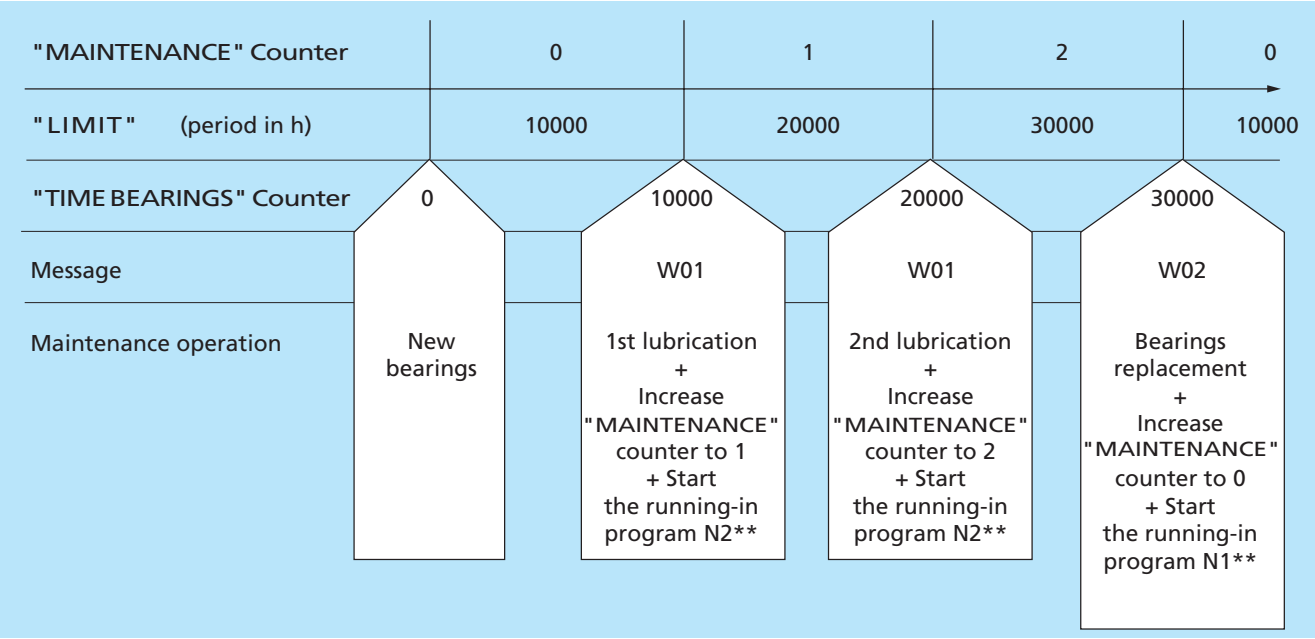
The ball bearings can be regreased 2 times before the bearings to be changed.

The maintenance counter allows to account for these different operations (0-1-2) and to set their frequency limits (in hours).

When leaving the factory, the “MAINTENANCE” counter set to “0” and the frequency fixed at 10000 hours (*): this can be modified depending on the defined values in the greasing schedule (📖 ***D30*** of pump User’s manual) or on acquired process knowledge Maintenance operations are automatically displayed by the controller since this reset.

The user will have to perform the regreasings or ball bearing replacement and to increase the maintenance counter.

Example of operation with a maintenance frequency fixed to 10000 hours (*).



***** The maintenance frequency for regreasing or ball bearing replacement could be modified along the life time of the bearings: it could be justified by a process evolution, or the user’s application knowledge

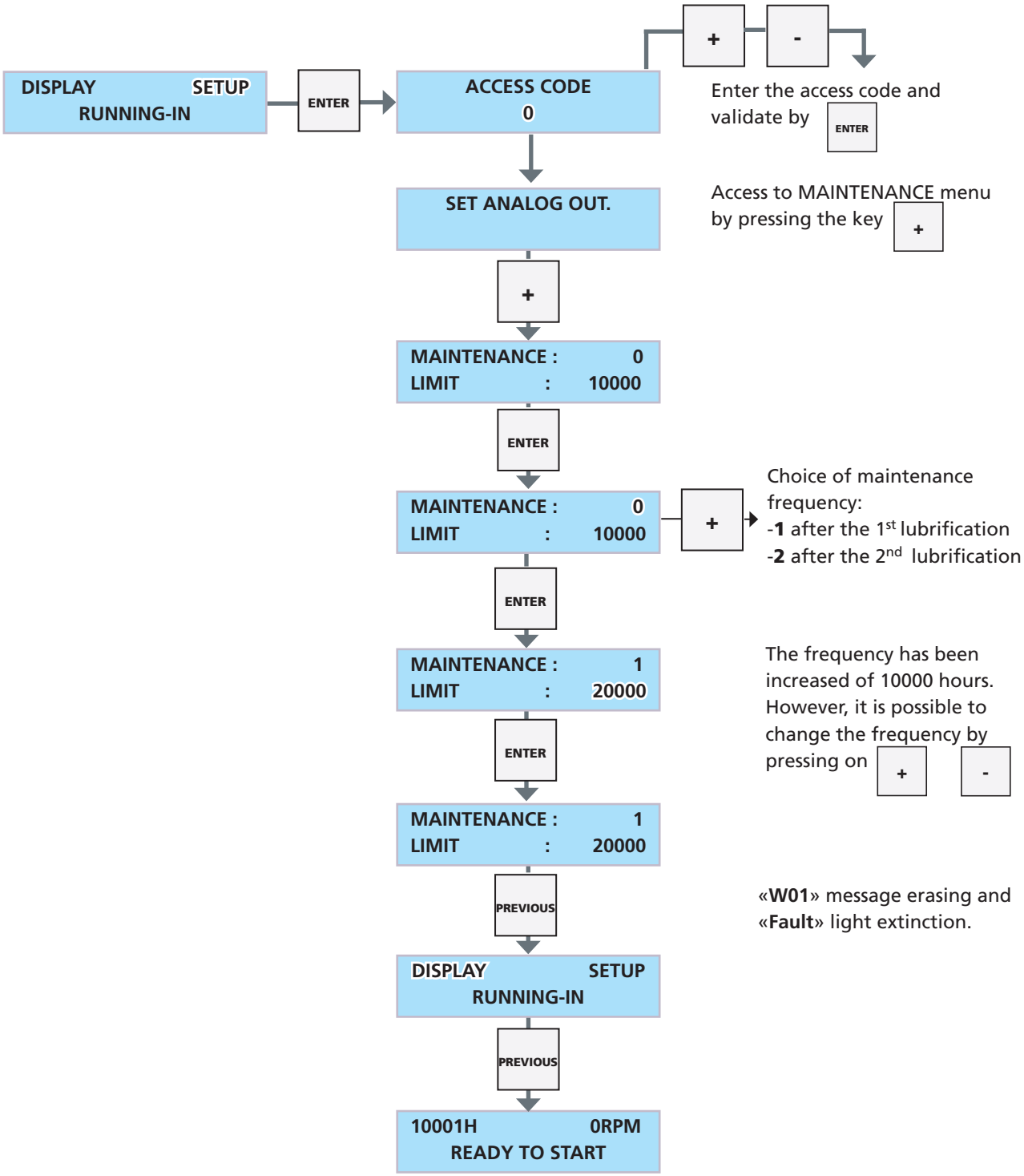
** In all cases, wait for the display of running-in «Stop».

GB 04600 - Edition 01 - 08/2010

Maintenance counters for the ACT 600TH controller

Increasing the «MAINTENANCE» counter after regreasing

Display of the «**W01:GREASING**» message and flashing of «**Fault**» light.



GB 04600 - Edition 01 - 08/2010

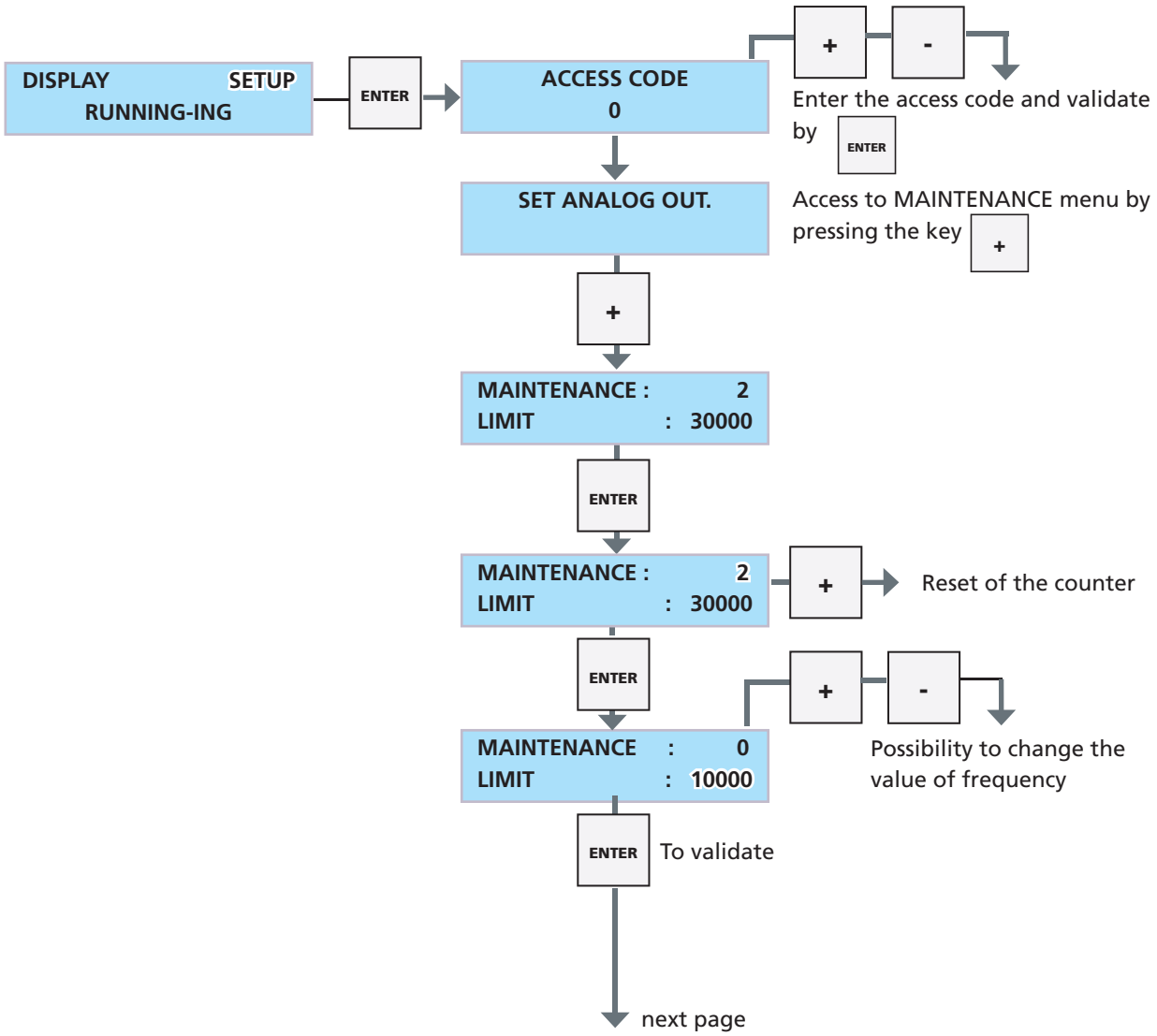
Maintenance counters for the ACT 600TH controller

«MAINTENANCE» counter resetting after ball bearing replacement

CAUTION

This operation is only performed by our Service Center, after ball bearing replacement.

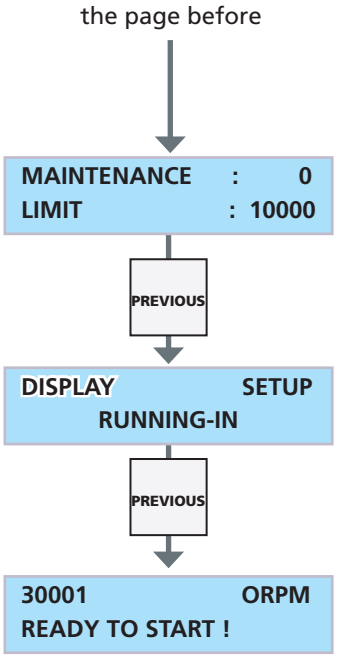
Display of the «**W02 : PUMP MAINTEN.**» message and flashing of «**Fault**» light.



GB 04600 - Edition 01 - 08/2010

Maintenance counters for the ACT 600TH controller

«MAINTENANCE» counter resetting after ball bearing replacement (Cdt).



«**W02**» message is erased and «**Fault**» light extinction.

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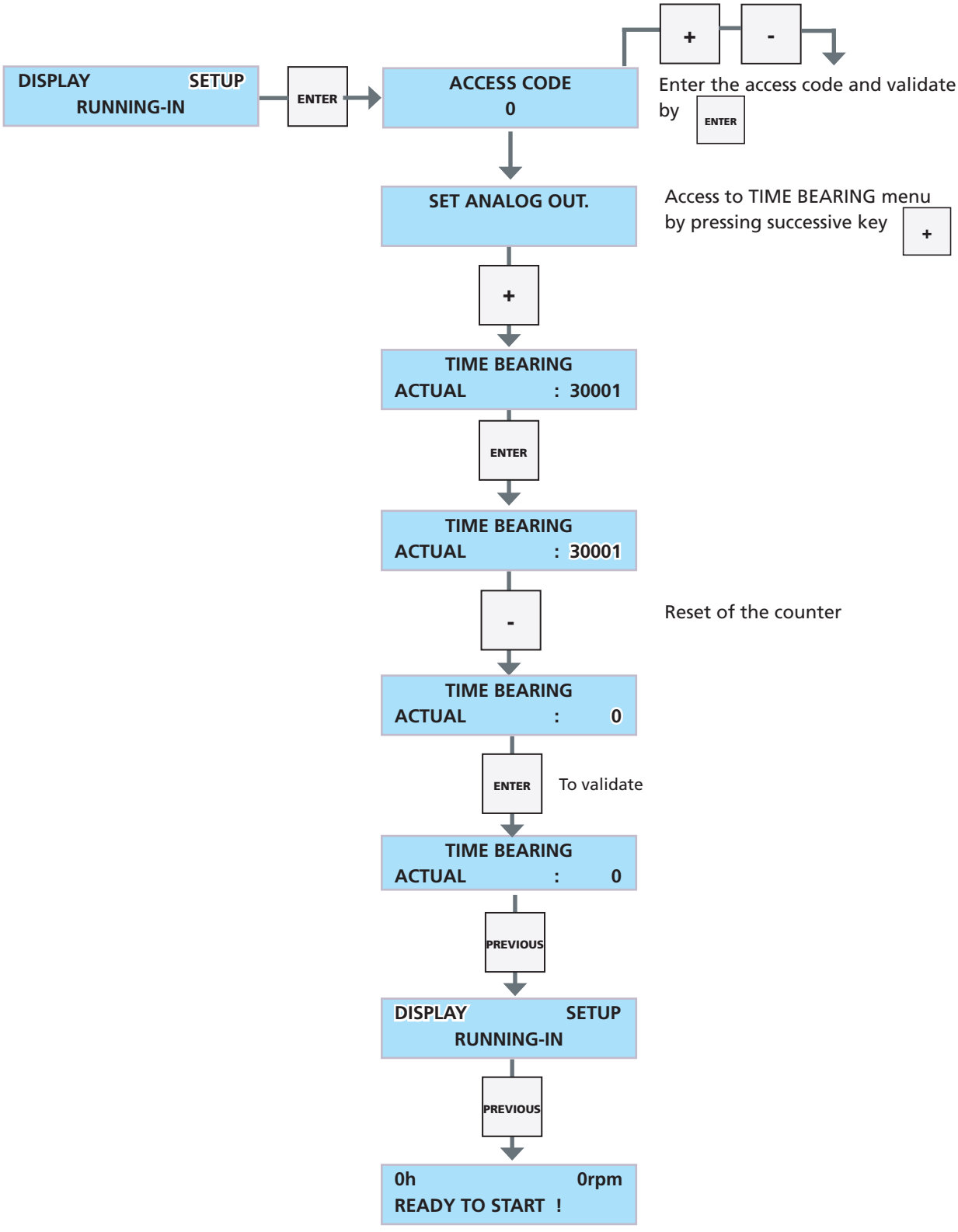
Maintenance counters for the ACT 600TH controller

After a ball bearing replacement at our Service Center, it is necessary to reset the **TIME BEARING** counter as follows:



GB 04600 - Edition 01 - 08/2010

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**).

GB 01390 - Edition 03- Fev 08

F 101

ACT 600TH spare parts for first level of maintenance

Spare parts

Description	Quantity
Fuse 6.3A 250 V HBC	2

GB 04601 - Edition 01 - 08/2010

CHINA
Alcatel Vacuum Technology, Shanghai
N°82 Lane 887 Zuchongzhi Road
Zhangjiang High-Tech Park,
Shanghai 201203
China
Tel. (86) 21 5027 0628
Fax. (86) 21 3895 3815

GERMANY
Alcatel Hochvakuumtechnik GmbH
Am Kreuzeck 10 - Postfach 1151
97877 Wertheim
Germany
Tel. (49) 9342 9610 0
Fax. (49) 9342 9610 30

INDIA
Alcatel Vacuum Technology India
Deepak
812, 8th Floor, Park Centra, Sector-30,
Gurgaon - Haryana - 122 001
INDIA
Tel. (91) 124-4737777
Fax. (91) 124-4737799

ITALY
Alcatel Vacuum Systems
Via Trento, 30
20059 Vimercate (Mi)
Italy
Tel. (39) 0396 86 38 55
Fax. (39) 039 66 71 25

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Alcatel-Lucent Japan Ltd.
1-9-4 Kita Shin-Yokohama
Kohoku-ku
Yokohama, Kanagawa 223-0059
Japan
Tel. (81) 3 6431 7130
Fax. (81) 45 544 0049

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315-2 Banwol-dong, Hawsung-si,
445-330 Kyungki-do,
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NL 4105 DP Culemborg
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