



nXLi

INSTRUCTION MANUAL

Publication Number: A770-10-880

Issue: A

Original Instructions

Copyright notice

©Edwards Limited 2017. All rights reserved.

Trademark credits

Edwards and the Edwards logo are trademarks of Edwards Limited.



Declaration of Conformity

We, Edwards,
Innovation Drive,
Burgess Hill,
West Sussex,
RH15 9TW, UK

declare under our sole responsibility, as manufacturer and person within the EU authorised to assemble the technical file, that the product(s)

nXL110i 200 - 230 V 1 PH 50/60 HZ NW40/NW25	A77012320
nXL110i 200 - 230 V 1 PH 50/60 HZ NW50/NW25	A77012420
nXL200i 200 - 230 V 1 PH 50/60 HZ NW40/NW25	A77022320
nXL200i 200 - 230 V 1 PH 50/60 HZ NW50/NW25	A77022420

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

EN1012-2:1996+A1:2009	Compressors and Vacuum Pumps. Safety Requirements. Vacuum Pumps
EN61010-1:2010	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use. General Requirements
EN61326-1:2013	Electrical equipment for measurement, control and laboratory Use. EMC requirements. General requirements (Class A Emissions, Industrial Immunity)

and fulfils all the relevant provisions of

2006/42/EC	Machinery Directive
2014/35/EU	Low Voltage Directive
2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Certain Hazardous Substances (RoHS) Directive

Note: This declaration covers all product serial numbers from the date this Declaration was signed onwards.

Mr Malcolm Gray, Senior Technical Manager


07.07.2017, Burgess Hill

Date and Place

This product has been manufactured under a quality management system certified to ISO 9001:2008

Material Declaration

In accordance with the requirements of the Chinese regulatory requirement on the Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products Order No. 32 (also known as 'China RoHS2') and SJ/T 11364 Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products:

Product	Product Labels	Meaning
All nXLi models		This product contains hazardous substances in at least one of the homogeneous materials used which are above the limit requirement in GB/T 26572 as detailed in the declaration table below. These parts can safely be used for the environmental protection use period as indicated.

材料成分声明 Materials Content Declaration

部件名称 Part name	有害物质 Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr-VI)	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
机壳 Enclosure	X	0	0	0	0	0
电机 (泵和机械增压泵) Motors (pump and mechanical booster)	X	0	0	0	0	0
泵和增压泵 Pump and booster	X	0	0	0	0	0
电子元件和控件 Electronics and Controls	X	0	X	0	0	0
冷却系统 Cooling system	X	0	0	0	0	0
吹扫系统 Purge system	X	0	0	0	0	0
机台接口 Tool Interface	X	0	0	0	0	0

0: 表示该有害物质在该部件的所有均质材料中的含量低于 GB/T 26572 标准规定的限量要求。
0: Indicates that the hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.

X: 表示该有害物质在该部件的至少一种均质材料中的含量超出 GB/T 26572 标准规定的限量要求。
X: Indicates that the hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

NOTE: These products are EU RoHS compliant, the following Exemptions apply:

6(b) **Lead** as an alloying element in aluminium, containing up to 0.4% by weight

6(c) Copper alloy containing up to 4% **lead** by weight

7(a) **Lead** in high melting temperature type solder (i.e. lead based alloys containing 85% by weight or more lead)

(c) Electrical and electronic components containing **lead** in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound

7(c) II **Lead** in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher

8(b) **Cadmium** and its compounds in electrical contacts

15 **Lead** in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages

34 **Lead** in cermet-based trimmer potentiometer elements

Contents

Copyright notice.....	2
Trademark credits.....	2
List of Figures.....	7
List of Tables.....	8
Safety and compliance	9
Definition of Warnings and Cautions.....	9
Safety symbols.....	9
General description	10
Overview.....	10
Pump controller.....	11
User interface control panel.....	12
Logic interface.....	12
Autorun.....	12
Auxiliary connector socket.....	12
Pump controller configuration.....	14
Installation	15
Installation safety.....	15
Unpack and inspect.....	15
Mechanical installation.....	16
Leak test the system	18
Purge gas connection.....	18
Electrical installation.....	19
Connect the electrical supply.....	19
Connection for remote control and monitoring.....	20
Connect the logic interface to the control equipment.....	20
Additional safety equipment.....	20
Commissioning.....	20
Operation	21
Operation safety.....	21
Operational modes.....	22
Manual control mode.....	22
Parallel and serial control mode.....	22
Autorun.....	23
Digital operator control mode.....	23
Start the pump.....	24
Starting the pump with the digital operator.....	24
Transient overload protection.....	25
Status indicators.....	25
Shut down the pump.....	25
Restart the pump.....	26

Maintenance and service	27
General maintenance.....	27
Service.....	27
Returning a pump for service.....	27
Storage	28
Disposal	29
Fault finding	30
The pump has failed to start or has stopped.....	30
The pump has failed to achieve the required performance.....	30
The pump is noisy.....	30
The pumping speed is poor or if pump down time is too long.....	31
Alarm indicator.....	31
Accessories	32
Digital operator.....	32
Electrical cables.....	32
Technical Reference	33
Operating and storage conditions.....	33
General technical data.....	33
Performance.....	34
Materials exposed to gases pumped.....	36
Purge gas specification.....	36
Electrical data.....	37

List of Figures

Figure 1: nXLi.....	11
Figure 2: Interface control panel.....	12
Figure 3: Valve connector showing pin numbers.....	13
Figure 4: Logic interface connection.....	23
Figure 5: Digital operator screen view.....	25
Figure 6: Dimensions - nXL110i.....	33
Figure 7: Dimensions - nXL200i.....	34
Figure 8: nXL110i performance graph.....	35
Figure 9: nXL200i performance graph.....	36
Figure 10: HS1 Form.....	38
Figure 11: HS2 Form.....	39

List of Tables

Table 1: Auxiliary load currents.....	13
Table 2: Recommended mating plugs.....	13
Table 3: Checklist of items.....	16
Table 4: Displayed parameters.....	25
Table 5: Digital operator.....	32
Table 6: Recommended cord sets.....	32
Table 7: Operating and storage conditions.....	33
Table 8: Mechanical data.....	33
Table 9: Performance data.....	34
Table 10: Sound data.....	35
Table 11: Purge gas specification.....	36
Table 12: Electrical rating for continuous operation.....	37

Safety and compliance

Definition of Warnings and Cautions

Important safety information is highlighted as WARNING and CAUTION instructions; these instructions must be obeyed.

The use of WARNINGS and CAUTIONS is defined below.



WARNING:

Warnings are given where failure to observe the instruction could result in injury or death to people. The actual symbol shown varies according to the hazard.









CAUTION:

Cautions are given where failure to observe the instruction could result in damage to the equipment, associated equipment or process.

Safety symbols

The safety symbols on the products denote areas where care and attention is required.

The following safety symbols may be used on the nXLi and throughout the product documentation.

	<p>Warning/Caution</p> <p>An appropriate safety instruction should be followed or caution to a potential hazard exists.</p>
	<p>Warning - Dangerous Voltage</p> <p>Indicates hazards arising from dangerous voltages.</p>
	<p>Warning - Hot Surfaces</p> <p>Indicates that the marked item may be hot and should not be touched without taking precautions.</p>
	<p>Protective conductor (ground)</p> <p>To identify any terminal intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.</p>
	<p>Warning - Heavy Object</p> <p>Indicates the potential risk of physical injury and requires suitable lifting equipment to move.</p>
	<p>Warning - Use protective equipment</p> <p>Indicates that appropriate protective equipment must be used.</p>

General description

Overview



WARNING:

Improper use of the equipment could cause damage to it or injury to people. The user is responsible for the safe operation, installation and monitoring of the system.

The pump is a cord connected system rated 200 - 230 V, 50/60 Hz, 8.5 A.

The pumping system is intended for use on clean duty applications only.

The pump is not intended for use with potentially flammable, corrosive, toxic or other hazardous gases since these gases or oxygen can mix within the pumping system.

The compact dry pumping system is optimized to run in steady state gas load conditions with an inlet pressure from 1 – 15 mbar. If the inlet pressure exceeds these pressures for an extended period, the pump controller will reduce the motor speed. The system will speed up again after the pressure is reduced or when the transient overload protection has recovered. Refer to [Table 9](#) on page 34 for information on maximum inlet pressures.

The system is offered with either an NW40 or NW50 inlet port ([Figure 1](#) on page 11, item 3) and NW25 exhaust port ([Figure 1](#) on page 11, item 2).

The pump mechanism is driven directly by a three-phase electric motor. The motor is managed by a pump controller.

The system is air cooled by a fan mounted between the pump controller and the pump cartridge. The fan will continue to run for 5 minutes after the pump is switched off. The pump incorporates a thermal protection device that will stop the motor in the event of thermal overload, for example, high ambient temperature. In this event, the pump will require restarting after cooling down. The system is provided with a connection for purge gas should it be required.

The pump is designed to pump the following residual gases normally used in high vacuum systems:

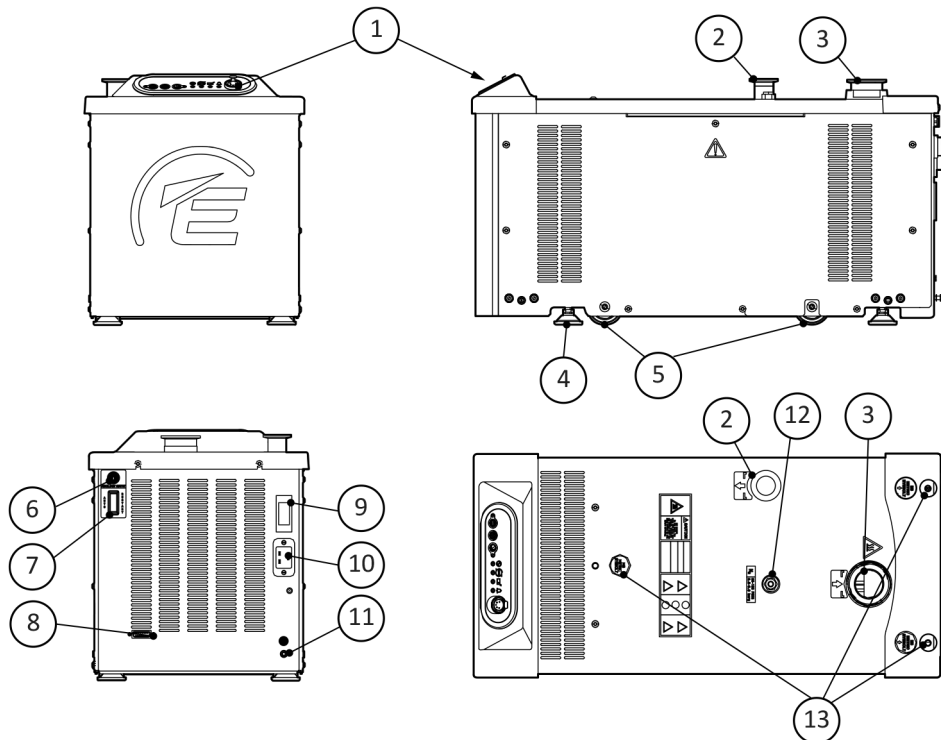
- Air
- Carbon monoxide
- Neon
- Ethane
- Nitrogen
- Krypton
- Argon
- Helium
- Butane

The pump can be used to pump oxygen and water vapour, subject to the following conditions:

- Oxygen - The oxygen concentration must be less than 20% by volume.
- Water vapour -Ensure that vapour does not condense inside the pump.

If pumping a gas not listed, contact the supplier for advice. Failure to contact the supplier may invalidate the warranty on the pump. The pump is not suitable for pumping aggressive or corrosive gases.

Figure 1 nXLi



- | | |
|------------------------|-------------------------------|
| 1. Dashboard/interface | 8. 15-way D-type connector |
| 2. Exhaust port | 9. Mains circuit breaker |
| 3. Inlet port | 10. Mains connector port |
| 4. Levelling feet x 4 | 11. Protective earth stud |
| 5. Castors x 4 | 12. N ₂ purge port |
| 6. Auxiliary connector | 13. Lifting eye positions |
| 7. Autorun switch | |

Pump controller

The pump controller contains the drive electronics that control the pump operation.



CAUTION:

Do not disconnect the pump from the electrical supply until the pump has stopped completely.

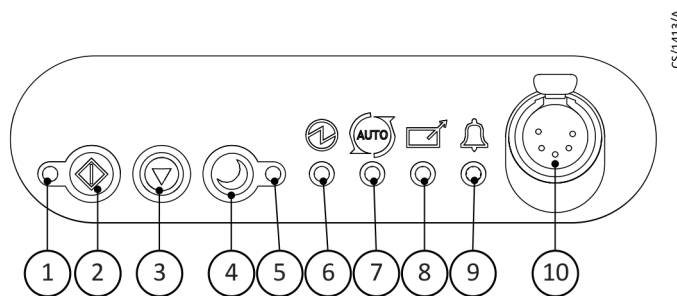
The pump controller manages the supply of current to the motor in accordance with the operating conditions and allows the pump to be connected to a single phase mains supply.

The pump controller provides the user interface control panel. The pump may be operated in these modes:

- Manually, using the buttons on the user interface panel control panel. Refer to [Figure 1](#) on page 11, item (1) and [Figure 2](#) on page 12.
- Remotely via serial communications or digital and analogue process control (parallel), via the 15-way D-type interface connector. Refer to [Figure 1](#) on page 11, item (8) and [Connection for remote control and monitoring](#) on page 20.
- In addition, the pump can also be controlled via a digital operator which is available as an accessory. It is connected to the pump via the digital operator connector socket on the user interface panel [Figure 2](#) on page 12, item (10).

User interface control panel

Figure 2 Interface control panel



- | | |
|-------------------------------|--|
| 1. Run indicator LED | 6. Power indicator LED |
| 2. Start button | 7. Autorun status LED |
| 3. Stop button | 8. Remote indicator LED |
| 4. Standby button | 9. Alarm indicator LED |
| 5. Standby mode indicator LED | 10. Digital operator connection socket |

Logic interface

The logic interface has been designed to support both serial control and parallel control and monitoring, operating through one connector.

The pump controller can be operated via the 15-way D-type logic interface connector [Figure 1](#) on page 11, item (8). The signals on the logic interface are of the following types:

- Control inputs: these are switch-type and analogue signals that are used to control the pump.
- Status outputs: these outputs identify the status of the system.

Autorun

The pump is provided with the option of an autorun facility. This is selected by the switch to the rear of the pump system [Figure 1](#) on page 11, item (7).

Refer to [Operational modes](#) on page 22 for more information.

Auxiliary connector socket

An auxiliary control connection is provided on the rear panel of the pump system, refer to [Figure 1](#) on page 11, item (6). This is to control an optional inlet valve and be operated in

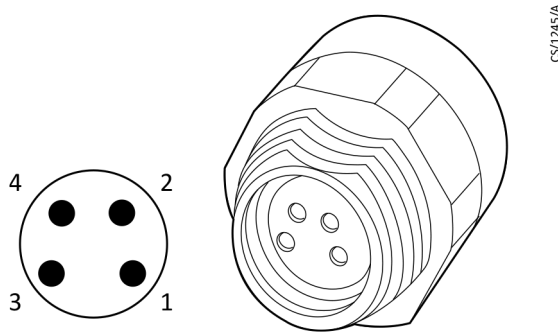
parallel with the pump NORMAL output signal, that is, the (normally closed) valve opens when the normal signal becomes active (pump at speed) and closes when stop is selected or there is a fault condition. Reaction time will be in line with valve selection. The output signal is 24 V d.c.

The connector is shown in [Figure 3](#) on page 13 with the polarity of the pins marked when the valve is energized.

The auxiliary connector is regulated to 24 V d.c. to control the accessories. If the auxiliary load current exceeds the value in [Table 1](#) on page 13 the output will shut down to protect the pump controller.

Recommended mating plugs for this connection are detailed in [Table 2](#) on page 13.

Figure 3 Valve connector showing pin numbers



Pin number	Signal	Polarity
1	0 V return	Negative
2	Not connected	-
3	Not connected	-
4	Switched +24 V	Positive

Table 1 Auxiliary load currents

Description	Data
Connector plug	Phoenix part number SACC-DSI-M 8FS-4CON-M12/0.5
Voltage output	24 V d.c. -25%, +10% (18 V d.c. to 26.4 V d.c.)
Current output	500 mA

Table 2 Recommended mating plugs

Description	Data
Mating connector plug; screw connection, straight	Phoenix part number SACC-M 8MS-4CON-M-SW
Mating connector plug; solder connection, straight	Phoenix part number SACC-M 8MS-4CON-M

Description	Data
Mating connector plug; screw connection, right angle	Phoenix part number SACC-M 8MR-4CON-M-SW
Mating connector plug; solder connection, right angle	Phoenix part number SACC-M 8MR-4CON-M

Pump controller configuration

All the configuration settings stored within the pump controller are retained when power to the pump is removed so that it is possible to use a separate system to configure the pump controller before fitting the pump to the application.

This gives the benefit of tailoring the pump functionality to the application and allows the pump to be operated using a simple parallel interface system.

Installation

Installation safety



CAUTION:

Follow all safety instructions and take note of all appropriate precautions.

Potential hazards on the dry pumping system include electricity, hot surface, process chemicals, Fomblin[®] oil and nitrogen.

- Refer to Edwards Safety Manual P400-40-100 for further safety information associated with the specification, design, operation and maintenance of vacuum pumps and vacuum systems. This publication is available on request by contacting Edwards.
- Contact the local service centre or Edwards for more information regarding advice or assistance on installation.
- Do not remove the temporary covers from the system inlet and exhaust until ready to connect to the vacuum or exhaust extraction system. Do not operate the system unless the inlet and exhaust are connected to the vacuum and exhaust extraction system.
- If the system is to replace an existing pumping system, vent and purge the process system with nitrogen for 15 minutes before starting installation work. Refer to [Purge gas specification](#) on page 36 for details on gas purging requirements.
- Isolate the other components in the process system from the electrical supply to prevent accidental operation.
- Electrical and nitrogen supplies are potentially hazardous energy sources. Lockout and tagout before performing any maintenance.
- Obey all national and local rules and safety regulations when installing the system.
- Route and secure cables, hoses and pipework during installation to avoid possible risk of trips.
- Ensure that the installation area is clean and free from debris and contamination before locating the pump.
- Appropriate facilities must be provided as detailed in this manual for the system to perform to specification.
- Ensure the exhaust is piped to a suitable treatment plant where required to prevent discharge of exhaust to the surrounding atmosphere.
- Ensure the exhaust pipeline cannot become blocked. If using an exhaust isolation valve, ensure the pump cannot be operated with the valve closed.

Unpack and inspect



WARNING:

Do not use the pump if it is damaged. Failure to do so can result in injury to people and/or damage to equipment.

Refer to [Table 8](#) on page 33 for the mass of the pump.

The pump is supplied fixed by metal brackets to a wooden pallet with a cardboard surround. These metal brackets should be removed and retained.

- Take care when unpacking the pump to avoid excessive shocks which could damage the bearings and reduce the life of the pump.
- If the pump is damaged, notify the supplier and carrier immediately stating the part number and serial number of the pump together with the order number and the supplier's invoice number. Retain all packing materials for inspection.
- Do not use the pump if it is damaged.
- Open the cardboard box from the top, remove any excess packaging as required. It is advised to retain all packing materials for use should the pump be returned for service.
- Check that the package contains the items listed in [Table 3](#) on page 16. If any of these items are missing, notify the supplier in writing within three days.
- If the pump is not to be used immediately, store in suitable conditions as described in [Storage](#) on page 28.
- The pump is supplied with the inlets and outlet sealed to prevent entry of dust and vapour. Do not remove these seals until ready to install the pump on the vacuum system.

Table 3 Checklist of items

Quantity	Description	Check
1	nXLi vacuum pump	<input type="checkbox"/>
3	Lifting eye	<input type="checkbox"/>
1	Instruction manual CD (P450-00-000)	<input type="checkbox"/>

Mechanical installation



WARNING:

Heavy object. Risk of physical injury. Use suitable lifting equipment.



WARNING:

Ensure that any cabling and or pipe work attached to the pump are routed carefully to avoid causing a slip/trip hazard and to prevent any damage to the cable.



WARNING:

Risk of injury or damage to equipment. Ensure that the maximum angle between paired slings used to lift the system is 45°. Increased angle could compromise lifting eye integrity.



WARNING:

Install the pump in the vacuum system before connecting the pump to the power supply. This will ensure that the pump cannot operate and injure people during installation.



WARNING:

Topple hazard. Do not exceed the topple angle when moving the pump or the pump may fall over and injure people.



WARNING:

Push-pull hazard with strain injury. The pump system should only be wheeled over short distances over flat surfaces. The system should be lifted with suitable lifting equipment if the floor is uneven or has obstacles.



CAUTION:

Local legislation concerning the impact of the pump on the environment must be followed when installing and removing the pump.



CAUTION:

Use a catchpot to prevent the drainage of condensate back into the system. Condensate that drains back into the system could damage the pump.

The following points should be noted when installing the pump:

- When positioning the pump ensure that access to the pump electrical supply cable or any other controls are not obstructed.
- Ensure that there is a minimum of 40 mm air gap left on all sides of the pump to allow effective air circulation.
- The system must be located on a firm, level surface capable of supporting the mass of the pump.
- The system should be installed away from combustible materials.
- The shipping brackets used to secure the pump to the shipping pallet can be used for seismic restraint. They are designed to withstand a level 4 earthquake in a ground floor installation.
- The system can be secured to the floor by using M10 (class 12.9) bolts of a suitable length (not supplied) through the slotted holes in the brackets.
- If vibration transmission to the floor is a concern, suitable vibration isolators (not supplied) should be fitted between the brackets and tie bolt or stud.
- The pump must be level to a maximum of 3° in any direction, measured at the pump inlet.
- It is the user's responsibility to carry out a risk assessment of the location and take appropriate measures to ensure that the pump is manoeuvred safely and in accordance with local and national manual handling guidelines.
- Use the following procedure to locate the pump:

- Use suitable lifting equipment attached to all three lifting eyebolts (*Figure 1* on page 11, item *13*) to move the dry pumping system close to its final operating position. Refer to *Table 8* on page 33 for pump mass.
- Adjust the levelling feet (*Figure 1* on page 11, item *4*) to make sure that the dry pumping system is level and is not supported by the castors. The suggested jacking height is 5.0 mm.

Remove the plastic caps from the inlet and exhaust before connecting the pump to the vacuum system. Use appropriate NW vacuum fittings for connection to the system.

When connecting the pump to the vacuum system:

- Connect the pump to an exhaust line to minimize noise and exhaust emissions.
- Ensure that the pipeline connected to the pump inlet is as short as possible and has a suitable internal diameter to achieve optimum pumping speeds.
- Support the vacuum pipeline to prevent loading of the coupling joints.
- Ensure the pump exhaust line does not become blocked as a pressure of 3.0 barg may be generated in the exhaust pipework. Connect the pump using appropriate pipework and fittings.
- If necessary, incorporate flexible bellows in the system pipelines to reduce the transmission of vibration and prevent loading of the coupling joints. If using flexible bellows, ensure the use of bellows that have a maximum pressure rating which is greater than the highest pressure that can be generated in the system. The use of Edwards bellows is recommended.
- Incorporate an inlet isolation valve in the pipeline between the vacuum system and pump. This will isolate the vacuum system from the pump when it is switched off and prevent the suck-back of process gases and debris into the vacuum system.
- Ensure that the sealing surfaces are clean and scratch-free.
- Edwards recommends the use of an exhaust extraction system suitable for use with all process gases being pumped. Ensure that the exhaust extraction system cannot become blocked or obstructed when the pump is operating.

Leak test the system



CAUTION:

Leak test the system after installation and seal any leaks found to prevent leakage of dangerous substances out of and leakage of air into the system.

Edwards will accept no liability or warranty claims resulting from flammable mixtures caused by air leaks.

1. Leak test the dry pumping system to a value of $<1 \times 10^{-5}$ mbar l s⁻¹ after installation.
2. Seal any leaks found.

Purge gas connection



WARNING:

Risk of explosion. The pump is intended for clean applications only. It is not suitable for use with hazardous production materials.

Note:

Ensure that the nitrogen supply conforms to the requirements given in [Table 11](#) on page 36 section. If it does not, the gas pipelines may become blocked or the dry pumping system may be damaged.

Refer to [Figure 1](#) on page 11, item (12) for location of the nitrogen purge port.

Refer to [Table 11](#) on page 36 for purge supply requirements.

Gas purge is provided for the sole purpose of enabling the pumping of inert light gases such as helium.

Electrical installation

**WARNING:**

Risk of electric shock. The electrical installation must be carried out by a suitably qualified person. Always make the electrical connections to the pump after the pump has been installed on the vacuum system.

**WARNING:**

Risk of electric shock and/or damage to equipment. The pump must be electrically installed in accordance with regional and local codes, conforming to local and national safety requirements.

**WARNING:**

Risk of electric shock or damage to equipment. The Logic interface is 30 volts maximum rated PELV and should only be connected to PELV interfaces. Failure to use an appropriately rated supply could result in electric shock.

The pump is a cord connected device rated at 8.5 amps and must be installed in accordance with local electrical codes.

The pump is to be supplied from a single phase 200 - 230 V branch circuit protected supply rated at 15 amp maximum.

See [Table 6](#) on page 32 for recommended cord sets.

Connect the electrical supply

**WARNING:**

Risk of electric shock. Ensure that the pump and electrical cables are suitably protected against earth (ground) faults. A protective earth (ground) conductor (with a cross sectional area of 2.5 mm² /13 AWG) must be fitted to the protective earth (ground) stud.

Make the electrical connection to the pump mains connector port ([Figure 1](#) on page 11, item 10) with an appropriate cord set as recommended in [Table 6](#) on page 32.

The pump must be earthed via the earth conductor of the IEC60320 connector.

Connection for remote control and monitoring

To operate the pump using parallel or serial control, the 15-way D-type connector must be used ([Figure 1](#) on page 11, item 8).

Refer to [Figure 4](#) on page 23 for full details of the logic interface pins.

Connect the logic interface to the control equipment

The pump can be controlled using a hardware parallel control interface and / or via commands sent over a serial interface.

To control the pump using the hardware parallel interface, refer to [Parallel and serial control mode](#) on page 22 for more information. To control the pump using the serial interface, please contact Edwards for further information.

Additional safety equipment

Install suitable measurement equipment in the nitrogen supply pipeline if the process tool/control system needs to know the total flow rate of nitrogen to the pump for safety reasons.

Commissioning

1. Switch on the external electrical supply. Switch the mains circuit breaker ([Figure 1](#) on page 11, item 9) to the ON position and check that the power indicator LED ([Figure 2](#) on page 12, item 6) illuminates. If the LED does not illuminate, contact Edwards.
2. Switch on the nitrogen supply, if required.
3. Ensure that the exhaust extraction system is not blocked (for example, that valves in the exhaust extraction system are open).
4. Ensure that all openings to atmospheric pressure in the foreline vacuum system are closed.
5. Momentarily press the start button ([Figure 2](#) on page 12, item 2) until the run indicator LED ([Figure 2](#) on page 12, item 1) comes on and remains illuminated.
6. If the dry pumping system starts and continues to operate, continue at Step 7. If an alarm condition is indicated:
 - a) Shut down the dry pumping system: refer to [Shut down the pump](#) on page 25 for shut down procedure.
 - b) Contact Edwards.
7. After commissioning the dry pumping system:
 - a) To continue to operate the system, refer to [Start the pump](#) on page 24 .
 - b) To shut down the system, refer to [Shut down the pump](#) on page 25 for shut down procedure.

Operation

Operation safety

**WARNING:**

Do not operate the pump with any parts of the enclosures removed or damaged as there may be a risk of an electric shock.

**WARNING:**

Do not expose any part of the human body to the vacuum as this could result in injury to or death of people.

**WARNING:**

Risk of burns. Do not touch the pump inlet manifold or exhaust whilst the pump is running since the temperatures of these parts could be high enough to cause harm. Elevated temperatures could remain after the pump has stopped.

**WARNING:**

Risk of burns from hot surfaces and/or damage to equipment. Do not exceed the maximum continuous operating pressure.

**CAUTION:**

The system has an autorun mode which is designed to automatically start the pump system once power is applied.

**CAUTION:**

Do not use the pump to pump particulates or condensable media. Deposition may occur within the pump which will degrade pump performance and reduce the pump life.

**CAUTION:**

The controlling interface is determined by the interface that starts the pump. Once started, the pump can only be stopped or put in standby mode by the interface that it was started from, except in autorun. With autorun, the stop button on the user interface panel will override it and stop the pump.



CAUTION:

This is an industrial (Class A, Group 1) product as defined by EN55011 and EN61325. To ensure compliance with European Electromagnetic Compatibility (EMC) requirements for EMC emissions, please note that it is not intended for use in domestic buildings or in properties directly connected to an electrical supply network which also supplies domestic buildings. "Group 1" is defined as equipment which does not use RF energy as an intrinsic part of operation or process.

Operational modes

The pump implements the following control modes:

- Manual control mode – using buttons on the user interface panel
- Parallel control mode – via the 15-way D-type logic interface connector located on the rear of the pump
- Serial control mode – via the 15-way D-type logic interface connector located on the rear of the pump
- Autorun

In addition to the above control modes, the pump can also be controlled via a digital operator which is available as an accessory. It is connected to the pump via the digital operator connector socket on the user interface panel ([Figure 2](#) on page 12, item 10).

Manual control mode

The pump control functions of the user interface control panel are detailed in [Figure 2](#) on page 12.

Start/Stop

Use the buttons on the user interface control panel to start and stop the pump. The stop command does not isolate the pump from the electrical supply.

When the pump is accelerating to its full speed the run indicator LED ([Figure 2](#) on page 12, item 1) will flash. When the pump has reached its full speed the LED will stop flashing and stay lit. If an inlet valve is fitted it will open when the pump has reached full speed.

Standby

Standby mode enables the pump to be run at a reduced speed to improve the service life of the pump.

Press the standby button to select the standby mode. The standby mode indicator LED ([Figure 2](#) on page 12, item 5) will illuminate. The pump will run at factory default standby speed (89% of full speed). To return to normal run speed, press the standby button again, the standby mode indicator LED will switch off.

Vacuum performance will be reduced when operating at standby speed.

Parallel and serial control mode

It is possible to operate the pump remotely using the 15-way D-type connector fitted on the panel at the rear of the pump ([Figure 1](#) on page 11, item 8).

The 15-way D-type connector is PELV-double insulated. It is recommended that galvanic isolated relay contacts are used to avoid ground loops or spurious EMC issues.

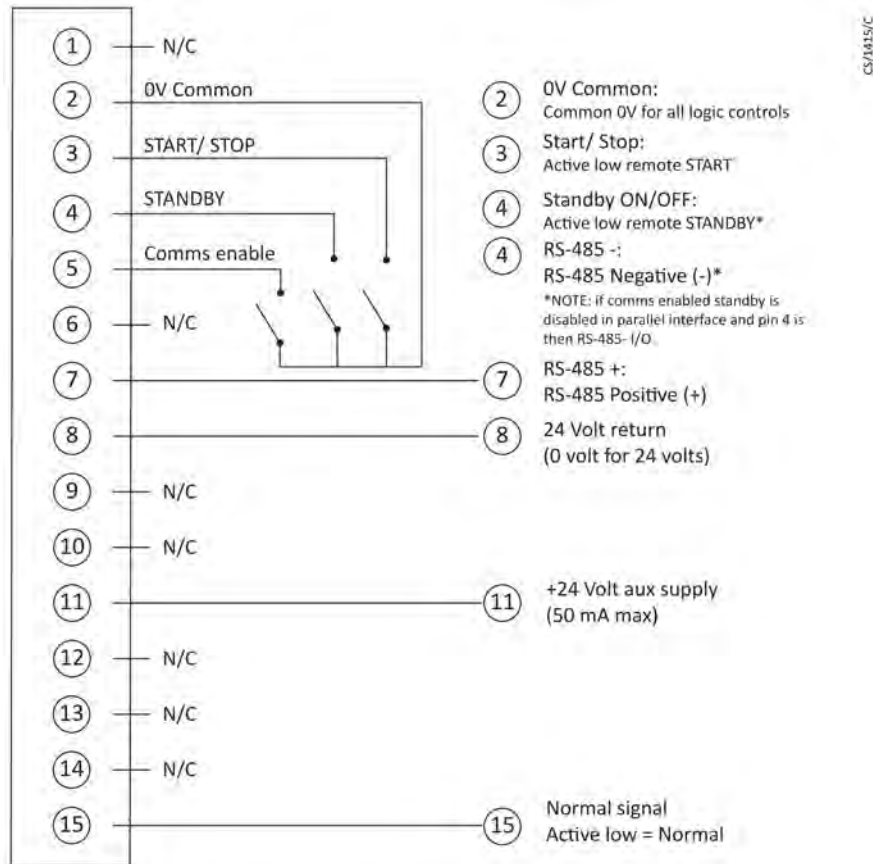
The available controls are:

- Run/Stop
- Normal/OK signal
- Standby

Figure 4 on page 23 shows which connections to make to enable the functions.

The "AUTORUN" switch (Figure 1 on page 11, item 7) should be in the 'OFF' position for remote operation. Also, another interface must not be in control as this will lock out the remote interface.

Figure 4 Logic interface connection



Autorun

With "AUTORUN" selected to the 'ON' position Figure 2 on page 12, item 7, the pump system will automatically start when power is applied and stop when power is removed. With the "AUTORUN" switch set to the 'OFF' position, the pump system will be started or stopped using one of the control modes detailed above.

Digital operator control mode

It is possible to control the pump using a digital operator which is available as an accessory.

It is connected to the pump via the digital operator connector socket on the user interface panel (Figure 2 on page 12, item 10). Refer to *Starting the pump with the digital operator* on page 24 for further instructions.

Start the pump



WARNING:

Ensure that it is safe to start the pump. If not, for example, maintenance is being performed on components downstream of the dry pumping system, injury could be caused to people.



WARNING:

Do not operate the pump if the exhaust pipeline is restricted or blocked as the pump will not operate correctly and may be damaged.

To start the pump:

1. Ensure that any vacuum isolation valve is closed, if fitted.
2. With the mains supply isolated, make the electrical connection to the pump mains connector port (*Figure 1* on page 11, item *10*) with an IEC60320 connector (C19).
3. Check that the exhaust extraction system is not restricted and that any valves in the exhaust extraction system are open.
4. Apply power.
5. Start the pump system using the appropriate control source, that is, momentarily press the **START** button in manual control mode (*Figure 2* on page 12, item *2*), the start/stop control input in parallel control mode or Start command in serial mode.
6. Open the vacuum system isolation valve, if fitted.

Starting the pump with the digital operator

1. Connect the digital operator to the digital operator connection socket (*Figure 2* on page 12, item *10*) using the cable provided with the digital operator.
2. When the digital operator is connected, the screen shown in *Figure 5* on page 25 will be displayed.
3. Control must be taken with the digital operator by pressing the **LO/RE** button. The LO/RE LED light will illuminate whilst the digital operator has control.
4. To start the pump, press the **RUN** button. The pump will start and accelerate up to the reference frequency of 450 Hz. The RUN LED light will illuminate whilst the pump is running.
5. To stop the pump, press the **STOP** button. The RUN LED will flash until the motor decelerates and comes to a complete stop.

The parameters shown in *Table 4* on page 25 are visible on the display screen whilst the pump is running: To view other parameters please refer to the digital operator user manual or by contacting Edwards.

Figure 5 Digital operator screen view

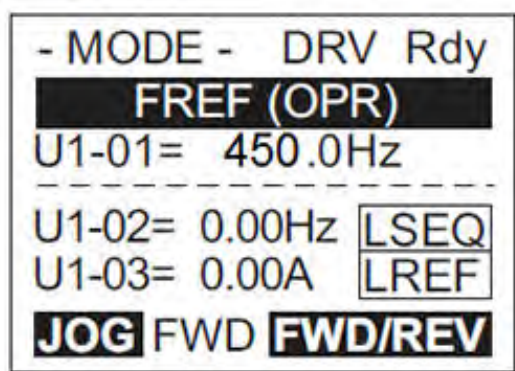


Table 4 Displayed parameters

Parameter code	Parameter description
U1-01	Reference frequency (set to 450 Hz)
U1-02	Actual frequency (Hz)
U1-03	Output current (A)

Transient overload protection

The pump operates an overload protection condition such that if the load exceeds the pumps capacity, the pump will momentarily stop before restarting automatically to attempt pump down again. This cycle will repeat to a maximum 10 times after which, if the pump is still subjected to the overload, the pump will trip, the alarm indicator LED will show a constant RED and the pump will stop.

Status indicators

Refer to [Figure 2](#) on page 12.

Shut down the pump



WARNING:

Risk of injury. Do not remove the inlet connections until the pump has been allowed to stop rotating and the power and N₂ supply has been isolated. The pump can take up to three minutes to completely stop.



CAUTION:

Do not disconnect the pump from the electrical supply until the pump has stopped completely.

The pump can be shut down using either the front panel controls, the digital operator (if fitted) or the 15-way D-type connector in either parallel or serial control mode.



Note:

*Only the item in control can stop the pump. Unless it is in Autorun mode where the **STOP** button on the user interface control panel can stop the pump.*

Shut down the pump:

1. Close any vacuum system isolation valve to prevent suck-back into the vacuum system (where fitted). Stop the pump system using the appropriate control source, that is, press and hold the **STOP** button in manual control mode on the user interface ([Figure 2](#) on page 12 item 3); disable the Start/Stop control input from the parallel control interface if this was in control; send a Stop command if in serial control mode or press the **STOP** button on the Digital Operator.
2. When the pump is switched off, the fan will continue to run for a short time while the pump cools down.
3. Vent the pump through the inlet.
4. Isolate the mains supply.

Restart the pump



Note:

If the pump has automatically shut down because of high pump power, check that the pump is free to rotate before restarting: contact Edwards.

If the pump has been automatically shut down because of an alarm condition, the alarm condition must be rectified before restarting the pump. Restart the pump as described in [Operation](#) on page 21.

Maintenance and service

General maintenance

The system requires no user maintenance. Maintenance must be carried out by Edwards service centres (refer to [Service](#) on page 27). The frequency of maintenance operations depends on the process. Adjust the frequency of maintenance operations according to user experience.

Edwards recommend carrying out a monthly visual inspection of the dry pumping system where it is installed. Check that the electrical supply cord, hoses and pipelines bringing services to the pump are in good condition and ensure that all connections are secure.

Service

It is recommended that the pump be serviced every 5 years. The pump should then be returned to an Edwards service centre.

Edwards products are supported by a world-wide network of Edwards Service Centres. Each Service Centre offers a wide range of options including: equipment decontamination; service exchange; repair; rebuild and testing to factory specifications. Equipment which has been serviced, repaired or rebuilt is returned with a full warranty.

Local Service Centres can also provide Edwards engineers to support on-site maintenance, service or repair of equipment. For more information about service options, contact the nearest Service Centre or other Edwards company.

Returning a pump for service

When returning a pump to a Service Centre, use the returns procedures in the HS1 form.

Follow the procedure in [Figure 10](#) on page 38 and ensure that a completed [Figure 11](#) on page 39 form is returned with the pump.

The instruction in the returns procedure to drain all fluids does not apply to the lubricant in the pump oil reservoirs. Do not return the pump with the accessories fitted. Remove all accessories and retain them for future use.

If the pump is configured to suit the application, make a record of the configuration before returning the pump. All replacement pumps will be supplied with default factory settings.

Edwards products, spares and accessories are available from Edwards companies in Belgium, Brazil, China, France, Germany, Israel, Italy, Japan, Korea, Singapore, United Kingdom, U.S.A. and a world-wide network of distributors. The majority of these centres employ Service Engineers who have undergone comprehensive Edwards training courses.

Order spare parts and accessories from the nearest Edwards company or distributor. When ordering, state for each part required:

- Model and Item Number of the equipment
- Serial number
- Item Number and description of part.

Storage



WARNING:

Do not drain oil from the pump whether dangerous substances have been pumped or not. Blanking plates must be fitted to seal vacuum inlet and outlet ports to prevent possible oil leakage. Ensure the pump is correctly labelled. If in doubt, contact Edwards.

To store the pump:

1. Shut down the pump as described in [Shut down the pump](#) on page 25.
2. Disconnect the pump from the electrical supply.
3. Place and secure protective covers over the inlet and outlet ports.
4. Store the pump in clean, dry conditions until required for use.
5. When required, prepare and install the pump as described in [Installation](#) on page 15.

Disposal

Dispose of the pump and any components and accessories safely and in accordance with all local and national safety and environmental requirements.

Edwards products are supported by a world-wide network of Edwards Service Centres. Each Service Centre offers a wide range of options including disposal. Refer to [Service](#) on page 27 for more information.

Dry pumping system materials suitable for recycling include cast iron, steel, PTFE, stainless steel, brass, aluminium, zinc alloy, nickel, mild steel, ABS, polyamide.

Take particular care with:

- Fluoroelastomers which may have decomposed as the result of being subjected to high temperatures.
- Components which have been contaminated with dangerous process substances.

Fault finding

A list of fault conditions and their possible causes is provided here to assist in basic troubleshooting. If unable to rectify a fault when using this guide, call your supplier or your nearest Edwards Service Centre for advice.

Symptom
<i>The pump has failed to start or has stopped</i> on page 30
<i>The pump has failed to achieve the required performance</i> on page 30
<i>The pump is noisy</i> on page 30
<i>The pumping speed is poor or if pump down time is too long</i> on page 31

The pump has failed to start or has stopped

Cause	The electrical supply fuses have blown.
Remedy	Ensure the external electrical supply is switched on and that the power indicator LED (<i>Figure 2</i> on page 12, item <i>6</i>) is illuminated. If the LED does not illuminate, contact Edwards.

Cause	The motor controller has not reset after an over temperature event.
Remedy	Disconnect the mains supply and wait for at least one minute and attempt to restart the pump. If the pump still does not start, contact Edwards. If the alarm indicator LED (<i>Figure 2</i> on page 12, item <i>9</i>) on the user interface control panel is flashing it is indicating that the pump is experiencing a high current load from possibly a high inlet pressure/flow. Adjust the inlet pressure/flow until the pump performance recovers.

The pump has failed to achieve the required performance

Cause	The pressure measurement technique or gauge head is unsuitable or gives an incorrect indication of pressure.
Remedy	Ensure that the vacuum measurement equipment is calibrated and is in date and that the correct gauge range has been selected for the application. Contact Edwards for further assistance on gauge selection, if required.
Cause	The vacuum fittings are dirty or damaged.
Remedy	Ensure that any vacuum fittings that are used are clean and scratch free.
Cause	There is a blockage or high pressure in the exhaust line.
Remedy	Ensure that any exhaust valves fitted are not closed when the pump is running.
Cause	The motor controller is current limiting the supply.
Remedy	If the alarm indicator LED (<i>Figure 2</i> on page 12, item <i>9</i>) on the user interface control panel is flashing it is indicating that the pump is experiencing a high current load from possibly a high inlet pressure/flow. Adjust the inlet pressure/flow until the pump performance recovers.

The pump is noisy

Cause **The pump is contaminated with solid particles.**

Remedy Contact Edwards or the supplier for further information.

The pumping speed is poor or if pump down time is too long

Cause **The connecting pipelines are too small in diameter.**

Remedy It is the users responsibility to provide pipework with sufficient conductance to ensure that pump performance is not compromised.

Cause **There is a leak in the system.**

Remedy Leak check the pump system in accordance with the requirements specified in [Table 9](#) on page 34.

Cause **The motor controller is current limiting the supply.**

Remedy Adjust the inlet pressure/flow until the pump performance recovers.

Cause **Pumping chamber is too big.**

Remedy Ensure the chamber size does not exceed the limits specified in [Table 8](#) on page 33.

Alarm indicator

If the red alarm indicator LED ([Figure 2](#) on page 12, item [9](#)) is illuminated, contact Edwards for further information.

Before performing any fault finding, lockout/tagout the electrical and nitrogen supplies.

Accessories

The following accessories are available to support the pump. Please contact an Edwards representative for more information.

<i>Digital operator</i>	Allows connection to the pump controller via the XLR connection socket on the interface control panel.
<i>Electrical cables</i>	Recommended cord sets for regional requirements.

Digital operator

Allows connection to the pump controller via the XLR connection socket on the interface control panel.

Table 5 Digital operator

Description	Item number
Digital operator	D37520056

Electrical cables

Recommended cord sets for regional requirements.

Table 6 Recommended cord sets

Description	Rating	Coupler type	Item number
Cord set assembly, UK	H05VV-F, 3 x 1.5 mm ² , 300 V, 70 °C fitted with a BS1363 UK plug with BS1362 13 A fuse to an IEC60320 style C19 with a maximum length of 2.5 metres.	Straight entry	A50505003
		Right-angled entry	A50505006
Cord set assembly, Europe	H05VV-F, 3 x 1.5 mm ² , 300 V, 70 °C fitted with a European Schuko VDE approved 16 A 250 V rated plug with dual earthing contact to an IEC60320 style C19 with a maximum length of 2.5 metres.	Straight entry	A50506003
		Right-angled entry	A50506006
Cord set assembly, USA/Canada (200-230 V)	SJT, 3 x 14 AWG, 300 V, 90 °C, VW-1 fitted with a NEMA 6-15P plug and IEC 60320 C19 coupler with a maximum length of 3 metres.	N/A	N/A

Technical Reference

Operating and storage conditions

Table 7 Operating and storage conditions

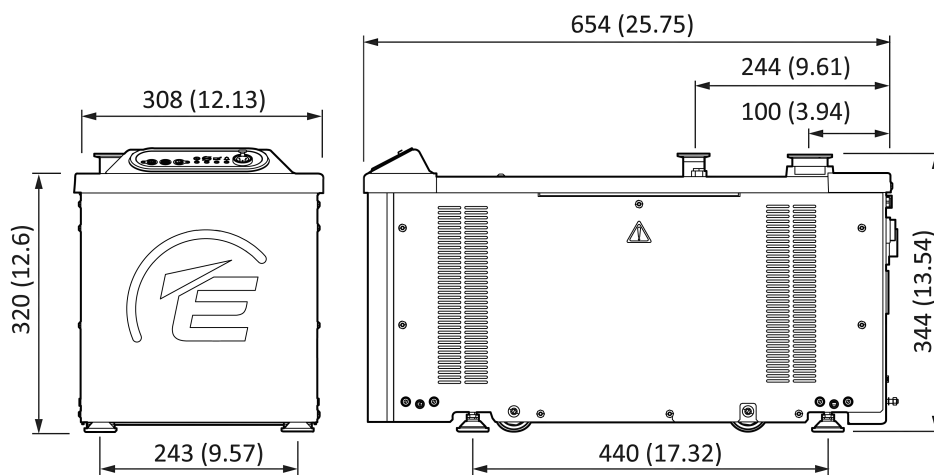
Range	Data
Ambient operating temperature range	5 °C to 40 °C
Ambient operating humidity range	10 to 90% RH (non-condensing)
Maximum operating altitude	2000 m
Ambient storage temperature range	-30 °C to 70 °C
Pollution degree	2
Equipment type	Indoor use
Enclosure protection	IP20

General technical data

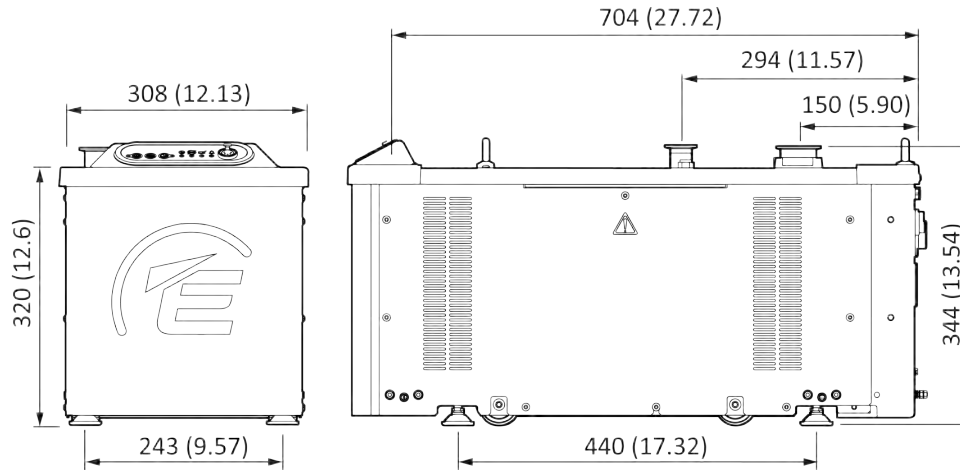
Table 8 Mechanical data

	nXL110i	nXL200i
Overall dimensions (L x W x H)	654 x 308 x 344 mm	704 x 308 x 343 mm
Maximum tilt angle	25 °	
Nominal rotational speed	9000 rpm	
Mass	75 kg	81 kg
Inlet connection	NW40/NW50	
Outlet connection	NW25	

Figure 6 Dimensions - nXL110i



All measurements indicated are shown in mm (inches)

Figure 7 Dimensions - nXL200i

All measurements indicated are shown in mm (inches)

Performance

Table 9 Performance data

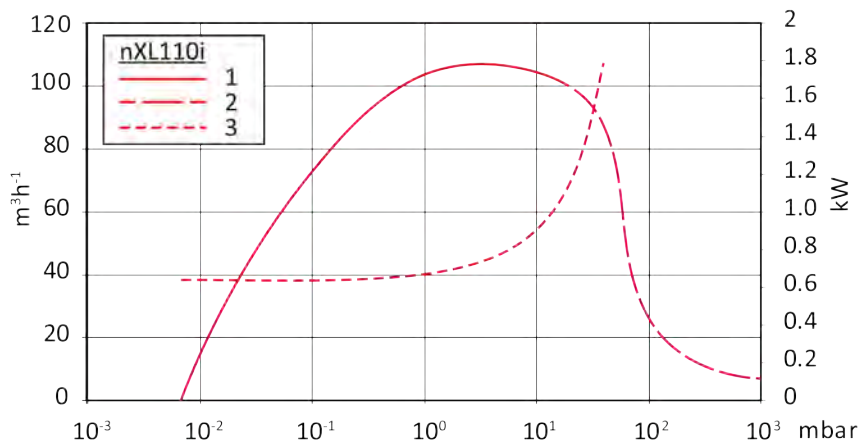
	nXL110i	nXL200i
Maximum pumping speed (m ³ /hr)*	110	200
Maximum continuous inlet pressure at 40° ambient (mbar)	8	
Maximum continuous inlet pressure at 30° ambient (mbar)	15	
Maximum continuous exhaust pressure (bar gauge)	0.4	
Maximum inlet flow to pump down a 100 litre chamber from atmospheric pressure (slm)	0	N/A
Maximum inlet flow to pump down a 75 litre chamber from atmospheric pressure (slm)	5	0
Maximum inlet flow to pump down a 50 litre chamber from atmospheric pressure (slm)	25	20
Suck-back protection	By exhaust valve	By exhaust valve
Leak tightness (static) (mbar l s ⁻¹)	<1 x 10 ⁻⁵	<1 x 10 ⁻⁵

* Values for maximum pumping speed are obtained at sea level. Above this level pump performance may be compromised and the rotational speed may drop below nominal.

Table 10 Sound data

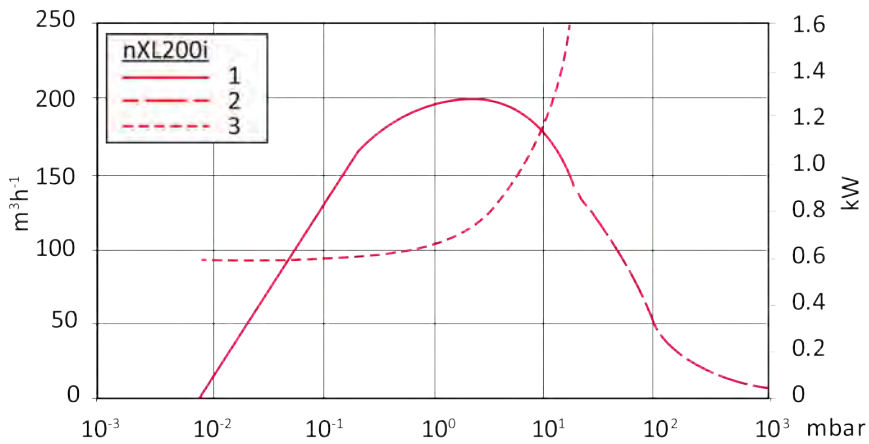
Declared dual-number noise emission values in accordance with ISO 4871		
	nXL100i	nXL200i
Measured A-weighted emission sound pressure level, L_{pA} at ultimate vacuum 1 m from the pump in free space dB(A)	56.7	55.4
Uncertainty, K_{pA} dB(A)	2.5	2.5
Values determined in accordance with ISO 3744: 2010		

Figure 8 nXL110i performance graph



- 1. nXL110i
- 2. nXL110i in transient overload protection
- 3. Supply power (kW)

Figure 9 nXL200i performance graph



- 1. nXL200i
- 2. nXL200i in transient overload protection
- 3. Supply power (kW)

Materials exposed to gases pumped

The following materials and component types are exposed to the gases pumped:

- SG iron
- aluminium alloy
- steel
- PTFE (seals)
- Fluoroelastomer (seals)

Purge gas specification

Table 11 Purge gas specification

Specification	Reference data
Purge gas	Dry air, nitrogen, argon or other inert gases
Purge gas interface	8.0 mm tube compression fitting
Maximum allowable purge gas supply pressure	7 bar (gauge); 100 psig, 7 x 10 ⁵ Pa
Minimum allowable purge gas supply pressure	3.0 bar (gauge), 45 psig, 3 x 10 ⁵ Pa
Minimum purity	ISO 8573 solids class 1
Typical flow at 3.0 bar	4 slm

Electrical data

Table 12 Electrical rating for continuous operation

Supply (V a.c. rms)	Phase	Frequency (Hz)	Input current (A rms)
200 - 230	Single	50/60	8.5



Note:

In a transient overload condition the maximum overload current drawn by the pump is 10 amps. Refer to [Transient overload protection](#) on page 25 for further information.

Figure 10 HS1 Form



Form HS1

Return of Edwards Equipment - Procedure

INTRODUCTION

Before returning your equipment, you must warn Edwards if substances you used (and produced) in the equipment can be hazardous. This information is fundamental to the safety of our Service Centre employees and will determine the procedures employed to service your equipment.

Complete the Declaration (HS2) and send it to Edwards before you dispatch the equipment. It is important to note that this declaration is for Edwards internal use only, and has no relationship to local, national or international transportation safety or environmental requirements. As the person offering the equipment for shipment, it is your responsibility to ensure compliance with applicable laws.

GUIDELINES

- Equipment is 'uncontaminated' if it has not been used, or if it has only been used with substances that are not hazardous. Your equipment is 'contaminated' if it has been used with any substances classified as hazardous under the UN Globally Harmonised System on the classification and labelling of chemicals (GHS), EU Regulation No 1272/2008 on classification, labelling and packaging (CLP) or US Occupational Safety and Health regulations (29CFR1910.1200, Hazard Communication).
- If your equipment has been used with radioactive substances, biological or infectious agents, mercury, polychlorinated biphenyls (PCB's), dioxins or sodium azide, you must decontaminate it before you return it to Edwards. You must send independent proof of decontamination (for example a certificate of analysis) to Edwards with the Declaration (HS2). Phone Edwards for advice.
- If your equipment is contaminated, you must either:
 - Remove all traces of contamination (to the satisfaction of laws governing the transportation of dangerous/hazardous substances).
 - Or, properly classify the hazard, mark, manifest and ship the equipment in accordance with applicable laws governing the shipment of hazardous materials.

Note: Some contaminated equipment may not be suitable for airfreight.

PROCEDURE

1. Contact Edwards and obtain a Return Authorisation Number* for your equipment.
2. Complete the Return of Edwards Equipment - Declaration (HS2).
3. If the equipment is contaminated, you must contact your transporter to ensure that you properly classify the hazard, mark, manifest and ship the equipment, in accordance with applicable laws governing the shipment of contaminated/hazardous materials. As the person offering the equipment for shipment, it is your responsibility to ensure compliance with applicable law. **Note: Equipment contaminated with some hazardous materials, such as semiconductor by-products, may not be suitable for airfreight - contact your transporter for advice.**
4. Remove all traces of hazardous gases: pass an inert gas through the equipment and any accessories that will be returned to Edwards. Where possible, drain all fluids and lubricants from the equipment and its accessories.
5. Seal up all of the equipment's inlets and outlets (including those where accessories were attached) with blanking flanges or, for uncontaminated product, with heavy gauge tape.
6. Seal equipment in a thick polythene/polyethylene bag or sheet.
7. If the equipment is large, strap the equipment and its accessories to a wooden pallet. If the equipment is too small to be strapped to a pallet, pack it in a suitable strong box.
8. E-mail via scan, fax or post a copy of the original with signature of the Declaration (HS2) to Edwards. The Declaration must arrive before the equipment.
9. Give a copy of the Declaration (HS2) to the transporter. You must tell your transporter if the equipment is contaminated.
10. Seal the original Declaration in a suitable envelope: attach the envelope securely to the outside of the equipment package, in a clear weatherproof bag.
WRITE YOUR RETURN AUTHORISATION NUMBER* CLEARLY ON THE OUTSIDE OF THE ENVELOPE OR ON THE OUTSIDE OF THE EQUIPMENT PACKAGE.

* not applicable in Japan

Figure 11 HS2 Form



Form HS2

Return of Edwards Equipment - Declaration

Return Authorisation Number: _____

- You must:
- Know about **all** of the substances which have been used and produced in the equipment before you complete this Declaration
 - Read the Return of Edwards Equipment - Procedure (HS1) before you complete this Declaration
 - Contact Edwards to obtain a Return Authorisation Number and to obtain advice if you have any questions
 - Send this form to Edwards before you return your equipment as per the procedure in HS1

SECTION 1: EQUIPMENT

Manufacturer's Product Name _____ Manufacturer's Part Number _____ Manufacturer's Serial Number _____ Has the equipment been used, tested or operated? YES, Used or operated <input type="checkbox"/> Go to Section 2 YES, Tested, but not connected to any process or production equipment, and only exposed to Nitrogen, Helium or Air <input type="checkbox"/> Go to Section 4 NO <input type="checkbox"/> Go to Section 4	IF APPLICABLE: Tool Identification Number _____ Tool Manufacturer/OEM _____ Tool Model _____ Process _____ Installed Date _____ De-installed Date _____ Part Number of Replacement Equipment _____ Serial Number of Replacement Equipment _____ Pump datalog attached? YES <input type="checkbox"/> NO <input type="checkbox"/> (Edwards Internal Use Only)
---	---

SECTION 2: SUBSTANCES IN CONTACT WITH THE EQUIPMENT

Are any substances used or produced in the equipment: <ul style="list-style-type: none"> • Radioactive, biological or infectious agents, mercury, poly chlorinated biphenyls (PCBs), dioxins or sodium azide? (if YES, see Note 1) YES <input type="checkbox"/> NO <input type="checkbox"/> • Hazardous to human health and safety? YES <input type="checkbox"/> NO <input type="checkbox"/> 	Note 1: Edwards will not accept delivery of any equipment that is contaminated with radioactive substances, biological/infectious agents, mercury, PCB's, dioxins or sodium azide, unless you: <ul style="list-style-type: none"> • Decontaminate the equipment • Provide proof of decontamination YOU MUST CONTACT EDWARDS FOR ADVICE BEFORE YOU RETURN SUCH EQUIPMENT
---	---

SECTION 3: LIST OF SUBSTANCES IN CONTACT WITH THE EQUIPMENT

Substance name	Chemical Symbol	Precautions required (for example, use protective gloves, etc.)	Action required after a spill, leak or exposure

SECTION 4: RETURN INFORMATION

Reason for return and symptoms of malfunction: _____

For how many hours has the product run? _____ Do you wish to purchase a full Failure Analysis report? YES NO

If you have a warranty claim:

- who did you buy the equipment from? _____
- give the supplier's invoice number _____

SECTION 5: DECLARATION

Print your name: _____ Print your job title: _____

Print your organisation: _____

Print your address: _____

Telephone number: _____ Date of equipment delivery: _____

I have made reasonable enquiry and I have supplied accurate information in this Declaration. I have not withheld any information, and I have followed the Return of Edwards Equipment - Procedure (HS1).

Signed: _____ Date: _____

Note: Please print out this form, sign it and return the signed form as hard copy.

P900-71-000 Issue N

