xylem
Let's Solve Water

Additional Installation, Operation and Maintenance Instructions

e-NSCE, e-NSCS hydrovar X Series

Pump units with integrated variable speed drive

NSCEX, NSCEK
NSCSX, NSCSK

LOWARA
a xylem brand

Table of Contents

1 Introduction and Safety

1.1 Introduction

Purpose of this manual

This manual provides information on how to do the following in the correct manner:

- Installation
- Operation
- Maintenance.

Supplementary instructions

The instructions and warnings of this manual apply to the standard unit as described in the sale documentation. Special version pumps may be supplied with supplementary instruction manuals. For situations not considered in the manual or in the commercial documentation, contact Xylem or the Authorised Distributor.

1.2 Hazard levels and safety symbols

Before using the unit, the user must read, understand and comply with the indications of the danger warnings in order to avoid the following risks:

- Injuries and health hazards
- Damage to the product
- Unit malfunction.

Hazard levels

Hazard level	Indication
 DANGER:	It identifies a dangerous situation which, if not avoided, causes serious injury, or even death.
 WARNING:	It identifies a dangerous situation which, if not avoided, may cause serious injury, or even death.
 ATTENTION:	It identifies a dangerous situation which, if not avoided, may cause small or medium level injuries.
NOTE:	It identifies a situation which, if not avoided, may cause damage to property but not to people.

Complementary symbols

Symbol	Description
	Electrical hazard
	Hot surface hazard
	Hot liquid danger
	Danger, pressurized system
	Explosive atmosphere hazard
	Ionizing radiation hazard
	Danger, suspended loads
	Magnetic hazard
	Do not expose to direct sunlight
	Do not expose to rain or snow
	Do not use flammable liquids
	Do not use corrosive liquids

Symbol	Description
	Obligation to read the instruction manual
	Obligation to wear safety shoes
	Obligation to wear safety glasses
	Obligation to wear a safety helmet
	Obligation to wear safety gloves

1.3 User safety

Strictly comply with current health and safety regulations.

Qualified personnel

This unit must be used only by qualified users. Qualified users are people able to recognise the risks and avoid hazards during installation, use and maintenance of the unit.

Sites exposed to ionizing radiations

WARNING: Ionizing radiation hazard

If the unit has been exposed to ionizing radiations, implement the necessary safety measures for the protection of people. If the unit needs to be dispatched, inform the carrier and the recipient accordingly, so that appropriate safety measures can be put in place.

1.4 Protection of the environment

Disposal of packaging and product

Comply with the current regulations on sorted waste disposal.

Leaking of fluid

If the unit contains lubricating fluid, take appropriate measures to prevent the dispersion of leaks into the environment.

2 Handling and Storage

2.1 Unit inspection upon delivery

2.1.1 Package inspection

1. Check that quantity, descriptions and product codes match the order.
2. Check the packaging for any damage or missing components.
3. In case of immediately detectable damage or missing parts:
   - Accept the goods with reserve, indicating any findings on the transport document, or
   - Reject the goods, indicating the reason on the transport document.

   In both cases, promptly contact Xylem or the Authorised Distributor from whom the product was purchased.

2.1.2 Unpacking and inspection of the unit

ATTENTION: Cut and abrasion hazard

Always wear personal protective equipment.

1. Remove the packaging.
2. Ensure sorting of all packaging materials in accordance with the applicable regulations.
3. Release the unit by removing the screws and/or cutting the straps, if fitted.
4. Check the unit for integrity and to make sure that there are no missing components.
5. In case of damage or missing components, promptly contact Xylem or the Authorised Distributor.

2.2 Guidelines for transport

Precautions

WARNING: Crushing hazard

The unit and components are heavy: risk of crushing.

WARNING:

Always wear personal protective equipment.

WARNING:

Check the gross weight marked on the packaging.

WARNING:

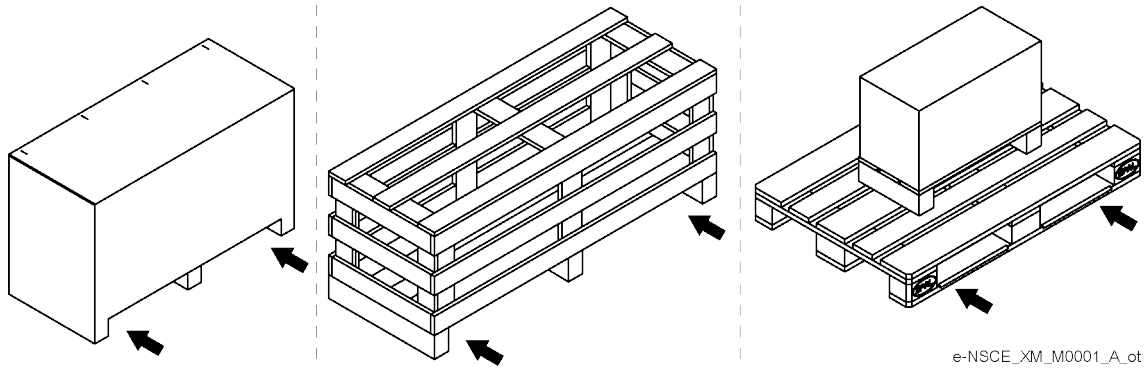
Handle the unit in compliance with the current regulations on "manual load handling", to avoid undesirable ergonomic conditions causing risks of back-spine injury.

WARNING:

Take appropriate measures during transport, installation and storage to prevent contamination from external substances.

2.2.1 Handling of the packed unit using a forklift truck

The figure shows the types of packaging and the lifting points.



2.2.2 Lifting with a crane

WARNING:

Use ropes, hooks, shackles, sling bars and eyebolts that comply with current regulations and that are suitable for the specific use.

NOTE:

Make sure that the harnessing does not hit and/or damage the unit.

WARNING:

Lift and handle the unit slowly to avoid stability issues.

WARNING:

During handling, make sure to avoid injury to people and animals, and/or damage to property.

The figure shows how to harness and lift the unit.

1. Fix the sling bar to the crane.
2. Attach 2 sling bar ropes to the two motor eyebolts.
3. Attach the other 2 ropes to the holes of the suction-side flange.
4. Lift the sling bar and tension the ropes without lifting the unit.
5. Slowly lift and move the unit.
6. Set the unit down slowly.
7. Release the ropes.

2.3 Storage

Storage of the packed unit

The unit must be stored:

- In a covered and dry place
- Away from heat sources
- Protected from dirt
- Protected from vibrations
- At an ambient temperature between -40°C and +70°C (-40°F and 158°F), and maximum relative humidity of 90% at 30°C (86°F).

NOTE:

Do not place heavy loads on top of the unit.

NOTE:

Protect the unit from collisions.

- Units with motors up to 5.5 kW: do not stack more than two units in the original packaging
- Motors > 5.5 kW: do not stack units.

Long-term storage of the unit

The operations described are necessary in cold temperature environments.

1. Empty the unit by removing the drain plug; see the figure below. Otherwise, any residual liquid in the unit could have an adverse effect on its condition and performance.

2. Tighten the cap.
   Tightening torques according to the pump body material, ± 25%:
   - Stainless steel or duplex stainless steel → 30 Nm (266 lbf-in)
   - Cast iron → 40 Nm (354 lbf·in)
3. Follow the same instructions for the storage of the packed unit.

For more information on long-term storage contact the Xylem sales company or Authorised Distributor.

3 Product description

3.1 Features

The product is a single-stage centrifugal pump unit with axial suction, radial discharge and horizontal shaft (hereinafter referred to as “unit”), with electronic integrated variable speed drive (HVX or HVX+ drive depending on version).

Denomination of the models

Model	Description
NSCEX, NSCEK	Close-coupled construction with an impeller keyed directly to the motor shaft extension
NSCSX, NSCSK	Close-coupled construction with a stub shaft keyed to the standard motor shaft extension

Intended use

- Water supply and water treatment
- Cooling and supply of hot water in factories and civil systems
- Irrigation and sprinkler systems
- Heating systems

Additional uses for optional material:

- Remote heating
- Industry in general.

Observe the operating limits in **Specifications**.

DANGER: Potentially explosive atmosphere hazard

It is prohibited to start the unit in environments with potentially explosive atmospheres or with combustible dusts.

Pumped liquids

- Clean
- Chemically and mechanically non aggressive
- Refrigerants
- Hot water
- Cold water.

DANGER:

It is prohibited to use this unit to pump flammable and/or explosive liquids.

3.1.1 Use in water distribution networks for human consumption

If the unit is intended for water supply to people and/or animals:

WARNING:

It is prohibited to pump drinking water after use with other fluids.

WARNING:

Take appropriate measures during transport, installation and storage to prevent contamination from external substances.

WARNING:

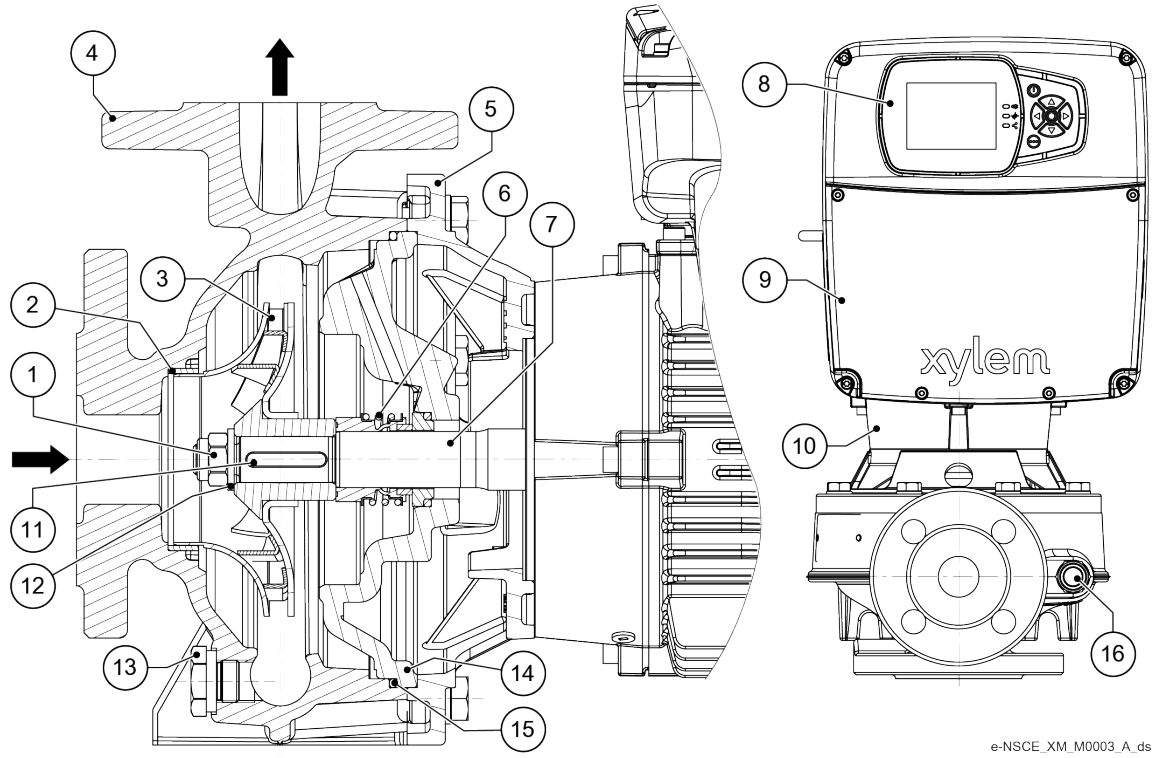
Remove the unit from its packaging just before installation to prevent contamination from external substances.

WARNING:

After installation, run the unit for a few minutes with several users open in order to wash the inside of the system.

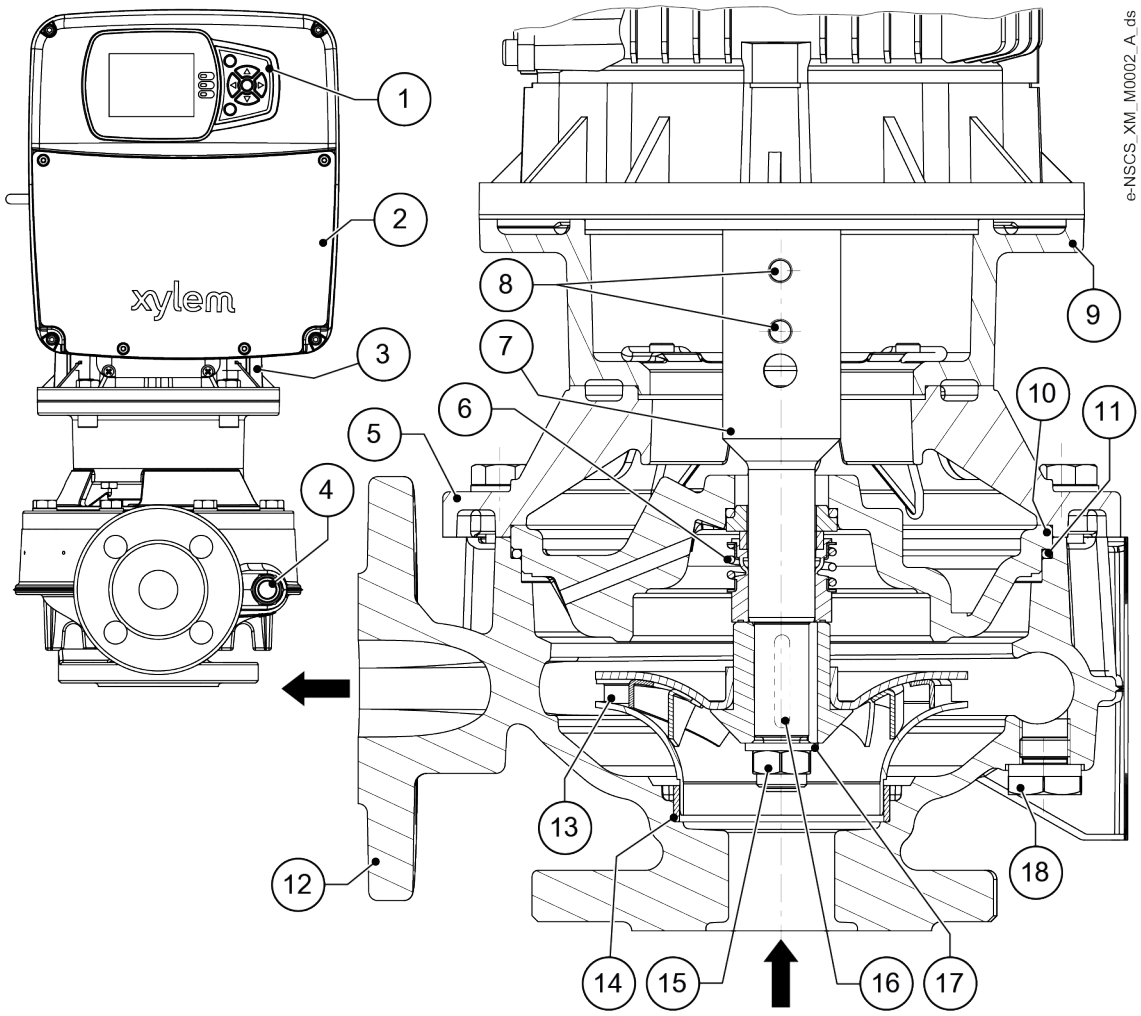
3.1.2 Part names

e-NSCE



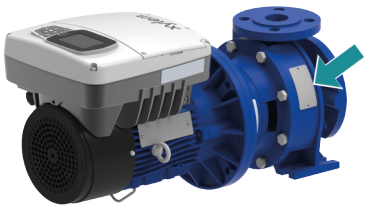
1. Impeller locking nut
2. Wear ring
3. Impeller
4. Pump body
5. Pump flange
6. Mechanical seal
7. Shaft
8. Drive display
9. Drive
10. Motor
11. Impeller key
12. Washer
13. Drain plug
14. Seal housing
15. O-Ring
16. Fill plug

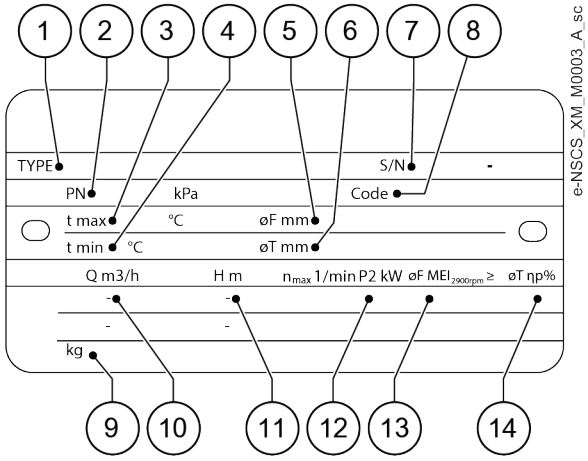
e-NSCS



1. Drive display
2. Drive
3. Motor
4. Fill plug
5. Pump flange
6. Mechanical seal
7. Coupling
8. Coupling locking grub screws
9. Motor adapter
10. Seal housing
11. O-Ring
12. Pump body
13. Impeller
14. Wear ring
15. Impeller locking nut
16. Impeller key
17. Washer
18. Drain plug

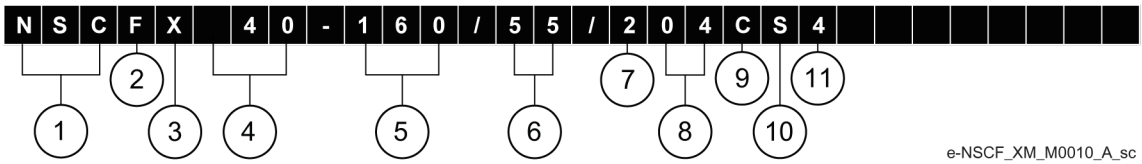
3.2 Data plate of the unit





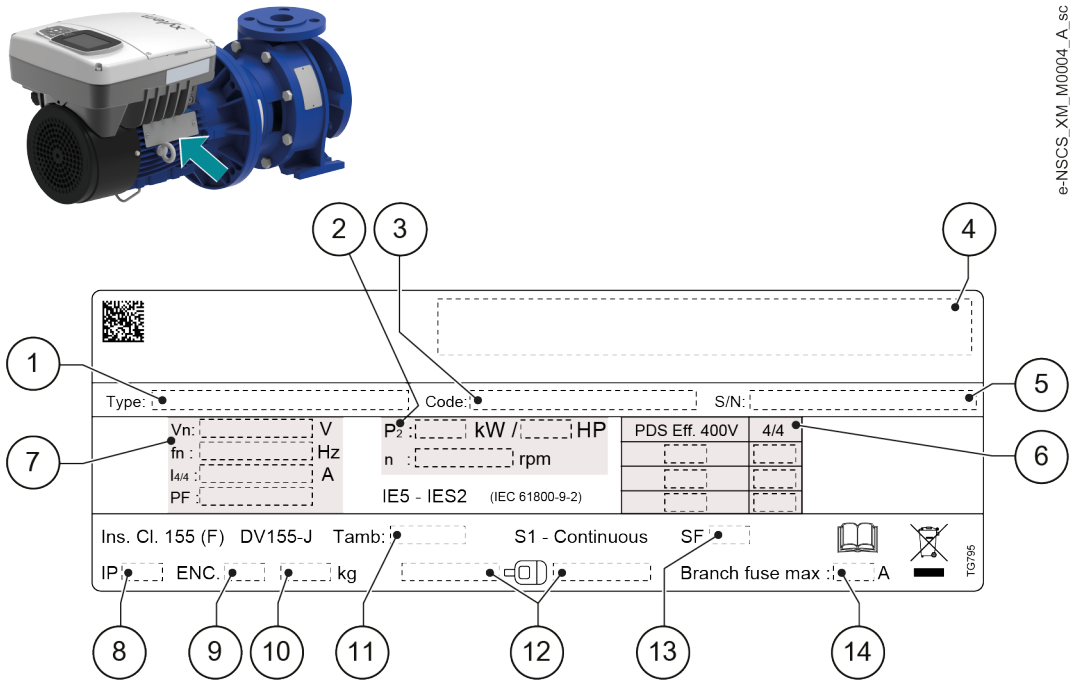
1. Identification code
2. Maximum operating pressure
3. Maximum liquid operating temperature
4. Minimum liquid operating temperature
5. Rated impeller diameter
6. Impeller diameter (trimmed impellers only)
7. Serial number + manufacturing date
8. Product code
9. Weight
10. Flow rate range
11. Head range
12. Pump rated power
13. Minimum efficiency index
14. Hydraulic efficiency in best efficiency point

Identification code



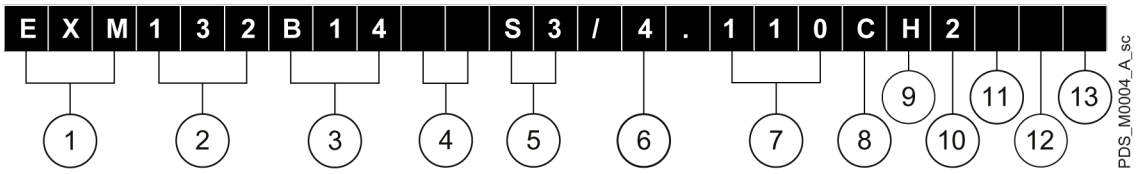
1. Series name
2. Close-coupled [E], with stub shaft [S], on base [F], or on base with spacer coupling [C]
3. Hydrovar X+ [X] or hydrovar X [K]
4. Diameter of discharge pipe in mm
5. Impeller nominal diameter in mm
6. Rated motor power in kWx10
7. High [2] or low [4] speed
8. Power supply voltage 3~ 200-240 V (50/60 Hz) [03] or 3~ 380-480 V (50/60 Hz) [04]
9. Cast iron [C], cast ductile iron [D], 1.4408 stainless steel [N] or 1.4517 duplex stainless steel [R] pump body
10. Cast iron [C], stainless steel [S], bronze [B], 1.4408 stainless steel [N] or 1.4517 duplex stainless steel [R] impeller
11. Mechanical seal and elastomers; see the technical catalogue for the available materials

3.3 Data plate of the motor assembly with drive



1. Identification code
2. Rated values at output
3. Product code
4. Brands
5. Serial number
6. Unit full load efficiency
7. Rated values at input
8. IP protection degree
9. NEMA enclosure type
10. Mass of the unit
11. Room temperature range
12. Bearing model
13. Service factor
14. Max. capacity of protective fuses

Identification code



1. Series name
2. Axis height 90, 112, 132, 160 or 180 mm
3. Flange type B3, B5, B14, HM, CEA or CA
4. Key type SV, HA, HB or normalised [ ]
5. Special shaft extension type S1, S2, S3 or S4 or normalised [ ]
6. Power supply voltage 3x208-240 V [03] or 3x380-480 V [04]
7. Rated motor power in kWx10 or HPx10
8. Drive size B, C or D
9. hydrovar X [S] or hydrovar X+ [H] drive
10. Speed range at rated power 3000 to 4000 rpm [2] or 1500 to 2000 rpm [4]
11. Standard drive [ ] or without filters [W]
12. Motor with foot [F] or without foot [ ]
13. Standard motor [ ] or oversized motor [R]

3.4 Approval marks

Any electric safety approval marks found only apply to the pump unit.

4 Installation

4.1 Precautions

General precautions

Before starting any work, make sure to read and understand all the safety instructions in **Introduction and Safety**.

DANGER:

All the hydraulic and electrical connections must be completed by a technician possessing the technical-professional requirements outlined in the current regulations.

WARNING:

Always wear personal protective equipment.

WARNING:

Always use suitable working tools.

WARNING:

When selecting the place of installation and connecting the unit to the hydraulic and electric power supplies, strictly comply with current regulations.

If the unit is intended to be connected to a public or private water supply system, see **Use in water distribution networks for human consumption**.

WARNING:

Piping must be sized to ensure safety at the maximum operating pressure.

WARNING:

Install appropriate gaskets between the unit and the piping system.

Electrical measures

DANGER: Electrical hazard

Before starting work, check that the electric power supply is disconnected and locked out, to avoid unintentional restart of the unit, the control panel and the auxiliary control circuit.

NOTE:

The mains voltage and frequency must match the values indicated on the data plate of the motor assembly with drive.

Earth

DANGER: Electrical hazard

Always connect the external protection conductor (earth) to the earth terminal before attempting to make any other electrical connections.

DANGER: Electrical hazard

Connect all the electrical accessories of the unit to earth.

DANGER: Electrical hazard

Check that the external protection conductor (earth) is longer than the phase conductors. In case of accidental disconnection of the unit from the phase conductors, the protection conductor must be the last one to detach itself from the terminal.

DANGER: Electrical hazard

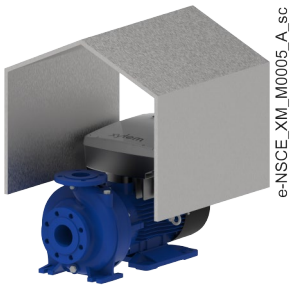
Install suitable systems for protection against indirect contact, in order to prevent lethal electric shocks.

4.2 Mechanical installation

Install the unit on a concrete or metal foundation base sufficiently strong to ensure permanent and rigid support.

4.2.1 Installation area

1. Follow the provisions in **Operating environment**.
2. Place the unit in a raised position in relation to the floor.
3. Make sure that any leaks will not cause flooding to the installation area or submerge the unit.
4. In case of outdoor installation, ensure appropriate protection of the unit against direct sunlight, rain and snow using appropriate covers.
   The figure shows an example of coverage.



Air clearance between a wall and the external surfaces of the unit

- To ensure suitable ventilation: ≥ 100 mm (4 in)
- To permit inspection and removal of the motor: ≥ 300 mm (12 in)
- If the space available is any less, refer to the technical catalogue.

4.2.2 Permitted positions

Install the unit in the horizontal position. Contact Xylem or the Authorised Distributor for other positions.

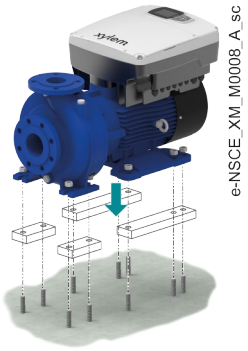
4.2.3 Requirements on the concrete foundation

- The concrete must have a compression resistance of C12/15 and meet the requirements of exposure class XC1 according to EN 206-1
- The foundation weight must be ≥ 1.5 times the unit weight (≥ 5 times the weight of the unit if a quieter operation is required)
- The surface should be as flat and level as possible.

4.2.4 Anchoring to the foundation

1. Depending on the model, where necessary install the spacers of the feet of the unit: see the technical catalogue.
2. Place the unit on the foundation.
3. Level the unit with a spirit level on the discharge port.
   Maximum permissible tolerance: 0.2 mm/m (0.0024 in/ft).
4. Align the suction and discharge ports to their piping.
5. Secure the unit with bolts:
   - Appropriate
   - Suitable for the support material and the application conditions.

The figure shows an example of a unit anchored to the foundation with spacers (accessory).



4.2.5 Reducing vibrations

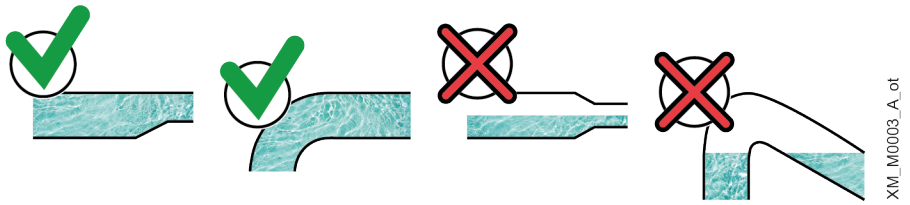
The unit and the flow of liquids in the system can generate amplified vibrations from the possible incorrect installation of the unit and the piping. See **Hydraulic connection**.

4.3 Hydraulic connection

Guidelines

1. Do not install the unit at the lowest point of the system, to avoid the accumulation of sediments.
2. Install an automatic relief valve at the highest point of the system to eliminate air bubbles.
3. Remove any welding residues, deposits and impurities in the pipes that could damage the unit; install a filter if necessary.
4. Support the piping system independently to prevent them from weighing on the unit.
5. To reduce the transmission of vibrations between the unit and the system and vice versa, install:
   - Anti-vibration joints on the suction and discharge sides of the unit
   - Dampers between the unit and the surface on which it is installed.

6. In order to reduce flow resistance, the pipe on the suction side must be:
   - As short and as straight as possible
   - For the section connected to the unit, straight and without bottlenecks, covering a length equal to at least six times the diameter of the suction port
   - Wider than the suction port; if necessary, install an eccentric reducer that is horizontal on top
   - Without bends; if this cannot be avoided, bends of a radius as wide as possible
   - Without traps and 'goosenecks'
   - With valves with a low specific flow resistance.



7. Install a check valve on the discharge side to prevent the liquid from flowing back into the pump unit when this is at standstill.
8. Install a pressure gauge (or a vacuum pressure gauge, in case of suction lift installation) on the suction side, and a pressure gauge on the discharge side, for checking the actual operating pressure of the pump unit.
9. To exclude the unit from the system for the purpose of maintenance, install:
   - An on-off valve on the suction side
   - An on-off valve on the discharge side, downstream the check valve and pressure gauge, also useful for regulating the flow rate.
10. If the unit is used in a pressure boosting system, an expansion vessel must be installed on the discharge.
11. On the suction side, install a device to prevent the absence of liquid (float or probes), or a minimum pressure device.
12. Sufficiently submerge the end of the suction pipe in the liquid, in order to prevent any air from penetrating through the suction vortex when the level is at the minimum
13. In case of suction lift installation, the suction pipe must have an increasing slope towards the unit exceeding 2%; to avoid air pockets; also install:
    - A foot check valve that guarantees full opening (full section)
    - A filling on-off valve to facilitate the removal of the air and priming.

Representative installation diagrams

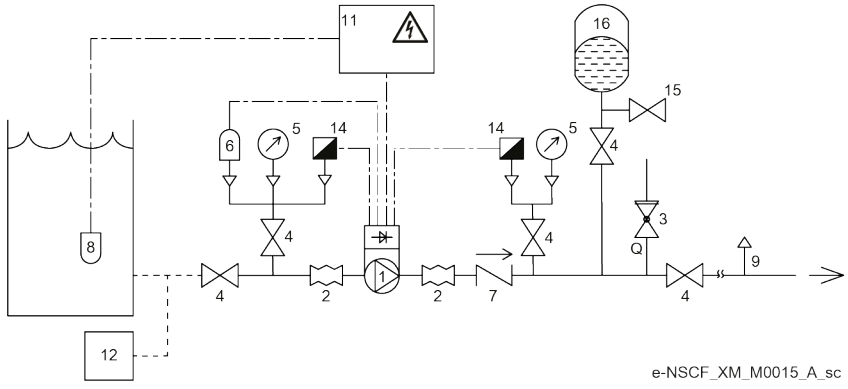


Figure 1: Positive suction head installation

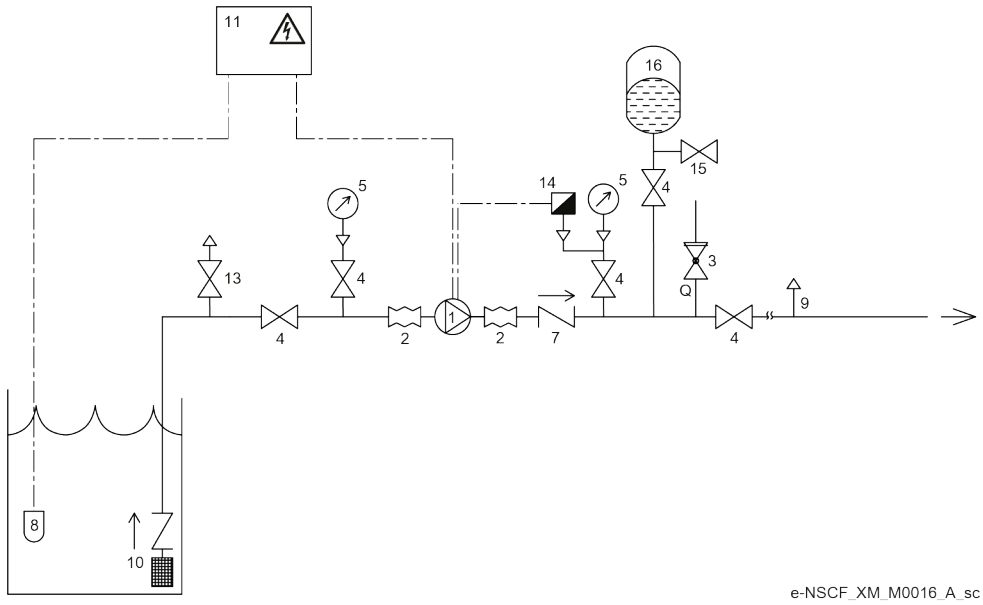


Figure 2: Suction lift installation

1. Pump unit with drive
2. Anti-vibration joint
3. Overpressure safety on-off valve
4. On-off valve
5. Pressure gauge or vacuum pressure gauge
6. Minimum pressure switch
7. Check valve
8. Electrode probes or float
9. Automatic relief valve
10. Foot check valve with filter
11. Electric panel
12. Pressurised circuit
13. Filling on-off valve
14. Pressure sensor
15. Drain tap
16. Expansion vessel

4.3.1 Forces and torques applicable to the flanges

The tables show the maximum forces and torques that can be exerted by the piping system on the flanges of the unit, depending on the pump body material.

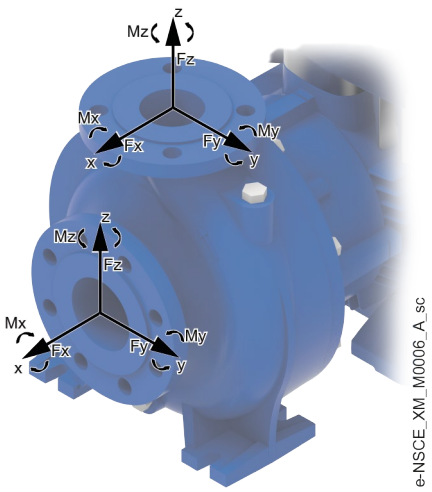


Table 1: EN-GJL-250 / EN-GJS-400 cast iron pump body

Construction size	Suction							Discharge						
	DN, mm	Max Forces, N			Max Torques, Nm			DN, mm	Max Forces, N			Max Torques, Nm		
		Fx	Fy	Fz	Mx	My	Mz		Fx	Fy	Fz	Mx	My	Mz
32-…	50	580	530	480	490	350	405	32	320	300	370	385	265	300
40-…	65	740	650	600	525	385	420	40	390	350	440	455	315	370
50-…	65	740	650	600	525	385	420	50	530	480	580	490	350	405
65-…	80	880	790	720	560	405	455	65	650	600	740	525	385	420
80-…	100	1180	1050	950	615	440	510	80	790	720	880	560	405	455
100-…	125	1390	1250	1120	735	525	665	100	1050	950	1180	615	440	510
125-…	150	1750	1580	1420	875	615	720	125	1250	1120	1390	735	525	665
150-…	200	2350	2100	1890	1140	805	930	150	1580	1420	1750	875	615	720

Table 2: Stainless steel (1.4408) or duplex stainless steel (1.4517) pump body

Construction size	Suction							Discharge						
	DN, mm	Max Forces, N			Max Torques, Nm			DN, mm	Max Forces, N			Max Torques, Nm		
		Fx	Fy	Fz	Mx	My	Mz		Fx	Fy	Fz	Mx	My	Mz
50-…	65	1470	1300	1190	770	840	1550	50	1050	950	1160	980	700	805
65-…	80	1750	1580	1440	805	910	1655	65	1300	1190	1470	1050	770	840
80-…	100	2350	2100	1890	875	1015	1820	80	1580	1440	1750	1120	805	910
100-…	125	2770	2490	2240	1050	1330	2245	100	2100	1890	2350	1230	880	1020
125-…	150	3500	3150	2840	1225	1435	2575	125	2490	2240	2770	1470	1050	1330
150-…	200	4690	4200	3780	1610	1855	3350	150	3150	2840	3500	1750	1225	1435

4.4 Guidelines for electrical connection

1. Check that the electrical leads are protected against:
   - High temperature
   - Vibrations
   - Collisions
   - Liquids.
2. Check that the power supply line is provided with:
   - A short circuit protection device of appropriate size
   - A mains disconnection device with contact opening distance ensuring complete disconnection for overvoltage III category conditions.

Isolated type networks (IT)

The installation of hydrovar X and hydrovar X+ units in distribution networks where the neutral is isolated from earth, must be evaluated according to the declared leakage current and the number of units to be connected. Contact Xylem or the Authorised Distributor for further information.

4.5 Guidelines for the control panel

NOTE:

The control panel must match the ratings on the unit data plate.

1. Fit a system for protection against dry running to which to connect a pressure switch, or a float, probes or other suitable devices.
2. Electrically connect to the control panel any low-pressure or liquid-failure protection devices (pressure switch, float or probes) already installed in the system.

4.5.1 Fuses and/or automatic switches

- An electronically activated drive function ensures motor overload protection. The overload protection function calculates the increment level in order to activate the timing of the trigger function (motor stop).
  The higher the input current, the faster the response. The function provides Class 20 protection for the motor.
- The drive must be equipped with overcurrent and short-circuit protection to prevent the overheating of the power supply cables. Line fuses or automatic switches must be installed to ensure this protection. Fuses and automatic switches must be provided by the installer as part of the installation.
- Use the recommended fuses and/or automatic switches on the power supply side as protection in the event of drive component failure (first failure). The use of the recommended fuses and automatic switches ensures that possible damage to the drive is limited to the inside of the same. For other types of protection, ensure that the passing energy is equal to or less than that of the recommended models.
- Compliance with UL requirements is only ensured by using approved fuses of category JDDZ.2/8 type T and with the characteristics indicated below and in the table.
- The fuses shown in the table are suitable for use on a circuit capable of releasing 5000 Arms (symmetrical), maximum 480 V. With the indicated fuses, the short-circuit current rating (SCCR) for the drive is 5000 Arms.

The figure shows the recommended fuses and switches.

HVX, HVX+ model	Xylem motor model	Three-phase power supply voltage, Vac	Non-UL fuses, type gG, A	UL fuses, type T, manufacturer and model				MCB S203 model ABB Switches
				Bussmann	Edison	Littelfuse	Ferraz-Shawmut	
B	EXM…/3….B..	200 - 240	16	JJN-15	TJN (15)	JLLN 15	A3T15	C16
C	EXM…/3….C..		30	JJN-30	TJN (30)	JLLN 30	A3T30	C32
D	EXM…/3….D..		63	JJN-60	TJN (60)	JLLN 60	A3T60	C63
B	EXM…/4….B..	380 - 480	16	JJS-15	TJS (15)	JLLS 15	A6T15	C16
C	EXM…/4….C..		30	JJS-30	TJS (30)	JLLS 30	A6T30	C32
D	EXM…/4….D..		63	JJS-60	TJS (60)	JLLS 60	A6T60	C63

NOTE:

Refer to the current shown on the data plate for the selection of the protective device and comply with local and national regulations for its sizing.

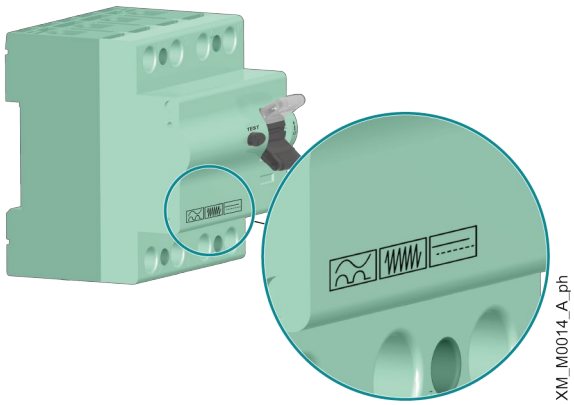
4.5.2 High sensitivity differential switch (RCD)

If a switch is installed to protect people against earth leakage, check that:

- It is suitably sized for the system configuration and environment of use
- It has a starting delay to prevent faults caused by transient earth currents
- It can detect alternate or direct current; it is marked with the symbols shown in the figure below.

NOTE:

When using an automatic earth leakage switch or an earth fault switch, make sure to consider the total earth leakage current of all the electric devices of the system.

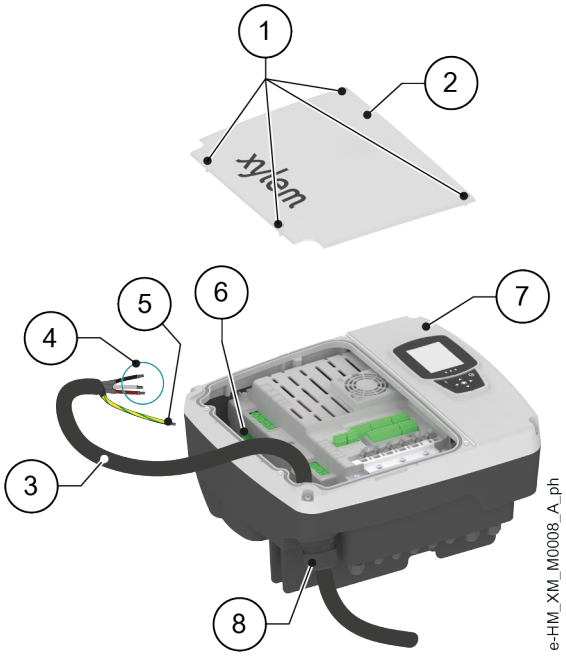


4.6 Guidelines for the drive

4.6.1 Power supply connection

NOTE:

The cable cross section must be sized according to the rated current of the unit. Observe local and national regulations for cable sizing.



1. Screws of the cover
2. Cover
3. Power supply cord
4. Phase conductors
5. Protection conductor (earth)
6. Terminals
7. Drive
8. Cable Gland

1. Remove the cover and observe the wiring diagrams inside.
2. Ascertain the size of the drive; see **Data plate of the motor assembly with drive**.
3. Insert the power cable in the power supply cable gland:

Drive size	Type of cable gland
B	M20
C	M25
D	M40

4. Tightly connect the conductors, making sure that the protection one is longer than the phase ones. In models size:
   - B and C, open the springs with a slotted screwdriver with a maximum width of 2.5 mm (0.98 in)
   - D, tighten the terminal screws with a Pozidriv screwdriver and tightening torque of 4 Nm (35 lbf-in).

   Note: For size D models, it is advisable to use cable terminals with a plastic sheath.
5. Tighten the cable gland.
   Tightening torque:
   - M20 → 6 Nm (53 lbf·in)
   - M25 → 7 Nm (71 lbf·in)
   - M40 → 12 Nm (106 lbf·in).
6. Fit the cover and tighten the screws.
   Tightening torque: 3 Nm (27 lbf·in) ± 15%.

Cable input characteristics

See **Data plate of the motor assembly** to ascertain the size of the drive.

Type of cable gland	Cable diameter, mm (in)	Tightening torque on the support plate, Nm (lbf·in)	Cable gland torque, Nm (lbf·in)	Number of inputs according to drive size		
				B	C	D
M12	3-6.5 (0.1-0.26)	2.7 (24)	1.5 (13)	3	3	5
M16	5-10 (0.2-0.4)	5 (44)	3 (27)	3	3	3
M25	11-17 (0.4-0.7)	7.5 (66)	7 (62)	1	1	-
M40	19-28 (0.7-1.1)	14 (124)	12 (106)	-	-	1

NOTE:

During installation, check that the cable glands on the support plate are tightened correctly, according to the values in the table.

NOTE:

When replacing cable glands and/or installing adapters, use suitable approved components to maintain degrees of protection IP55 and NEMA 4.

Characteristics of power terminals and conductors

See **Data plate of the motor assembly** to ascertain the size of the drive.

Drive size	Connection type	Type and cross-section of installable conductors	Stripping length, mm (in)
B and C	Spring	• Rigid: 1.5-10 mm^2 • Flexible: 1.5-6 mm^2 • Cable terminals without plastic sheath: 1.5-6 mm^2 • Cable terminals with plastic sheath: 1.5-4 mm^2 • UL/CSA compliant: AWG 16-8	15 (0.6)
D	With screw	• Rigid: 2.5-35 mm^2 • Flexible: 2.5-25 mm^2 • Cable terminals without plastic sheath: 2.5-25 mm^2 • Cable terminals with plastic sheath: 2.5-25 mm^2 • UL/CSA compliant: AWG 14-2	

5 Use and Operation

5.1 Precautions

WARNING:
Make sure that the drained liquid cannot cause damage or injuries.

WARNING:
In the case of liquids that are excessively hot or cold, pay attention to the risk of injury.

WARNING: Electrical hazard
Check that the unit is properly connected to the mains power supply.

WARNING: Hot surface hazard
Be aware of the extreme heat generated by the unit.

WARNING:
It is prohibited to place flammable materials near the unit.

NOTE:
It is prohibited to operate the unit when dry, not primed and below the rated flow rate.

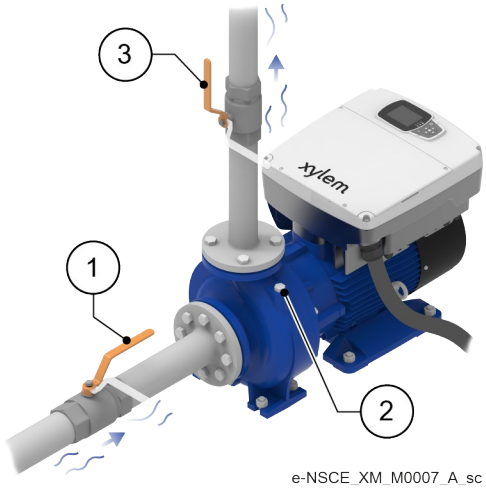
NOTE:
It is prohibited to operate the unit with the on-off valves closed.

NOTE:
It is prohibited to use the unit in the case of cavitation.

NOTE:
The unit must be filled and vented properly before it can be started.

NOTE:
The maximum pressure delivered by the unit at the discharge side, determined by the pressure available on the suction side, must not exceed the maximum pressure (PN).

5.2 Filling and priming



1. On-off valve on suction line
2. Filling plug
3. On-off valve on discharge line

Positive suction head installation

1. Close both on-off valves.
2. Loosen the filler cap.
3. Slowly open the valve on the suction side until the liquid regularly comes out from the hole; if necessary, loosen the cap further.
4. Tighten the cap.
5. Open the on-off valves slowly and fully.

Suction lift installation

1. Open the suction on-off valve and close the discharge valve.
2. If installed, partially open the filling valve; see **Hydraulic connection**.
3. Remove the filler cap.
4. Fill the unit and the suction pipe through the filling hole.
5. Remove any air that may be present by further opening the filling valve.
6. Close the plug.
7. Close the filling valve.
8. Slowly fully open the valve on the discharge side.

5.3 Startup

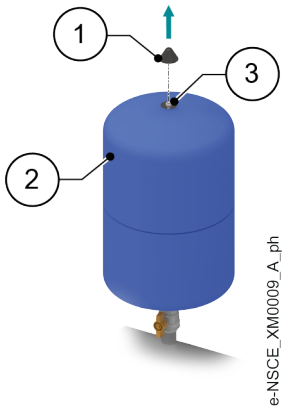
NOTE:

It is prohibited to operate the unit with the discharge side on-off valve closed or at zero flow rate: this can cause the liquid to overheat and damage the unit.

NOTE:

If there is a risk of the unit running at a flow rate below the minimum expected, install a bypass circuit.

Check the pre-charge of the expansion vessel



1. Valve cap
2. Expansion vessel
3. Valve

1. Check that the pressure of the system is zero, to avoid affecting the reading of the pressure gauge.
2. Unscrew the cap.
3. Apply the pressure gauge to the valve and check the pressure.
   Pre-charge pressure = P START – 0.3 bar.
4. Remove the pressure gauge and screw the cap.

Preparing the unit

1. Check the connection between the START/STOP and GND inputs on the terminal board.
2. Check that all the operations indicated in **Filling and priming** have been completed correctly.
3. Shut off the discharge on-off valve almost completely.
4. Fully open the suction on-off valve.

Startup

1. Start the unit by pressing the ON/OFF button on the drive display.
   Note: If parameter 1.0.45 - Autostart is configured
   - "Yes" (NSC..X panel) or
   - "Yes' (NSC..K panel),

   at the next start-up it will not be necessary to press ON/OFF again.
2. Gradually open the discharge on-off valve until half open.
3. Wait a few minutes and then fully open the discharge on-off valve.
4. With the unit in operation, it is possible to change:
   - the duty setpoint, going to the second screen (NSC..X panel)
   - the control setpoint, using the UP and DOWN buttons (NSC..K panel).

Final checks

After the start-up procedure, with the pump unit in operation, check that:

- No liquid is leaking from the unit or pipes
- The maximum pressure of the unit at the discharge, determined by the available suction pressure, must not exceed the maximum pressure (PN)
- The pressure indicated in the drive display is the same as that of the discharge pressure gauge
- There is no unwanted noise or vibrations
- With zero flow rate the unit stops automatically
- No vortexes can occur at the end of the suction pipe, at the point of the foot check valve (suction lift installation)
- The devices to prevent the absence of liquid (float or probes), or the minimum pressure devices work correctly.

NOTE:

If the units does not deliver the required pressure, repeat the operations in **Filling and priming**.

WARNING:

After startup, run the unit for a few minutes with several users open in order to wash the inside of the system.

Settling of the mechanical seal

The pumped liquid lubricates the seal faces of the mechanical seal; under normal conditions, a small amount of liquid may leak out. When the unit is run for the first time, or immediately after the seal is replaced, more liquid may temporarily leak out. To help the seal settle and to reduce leaking:

1. Close and open the on-off valve on the discharge side two or three times with the unit running.
2. Stop and start the unit two or three times.

5.4 Manual stop

Stop the unit:

- By pressing ON/OFF on the drive display, or
- Opening the intended enabling contact, if used.

6 Control

Introduction

DANGER: Electrical hazard

If the drive display is damaged, contact Xylem or the Authorised Distributor.

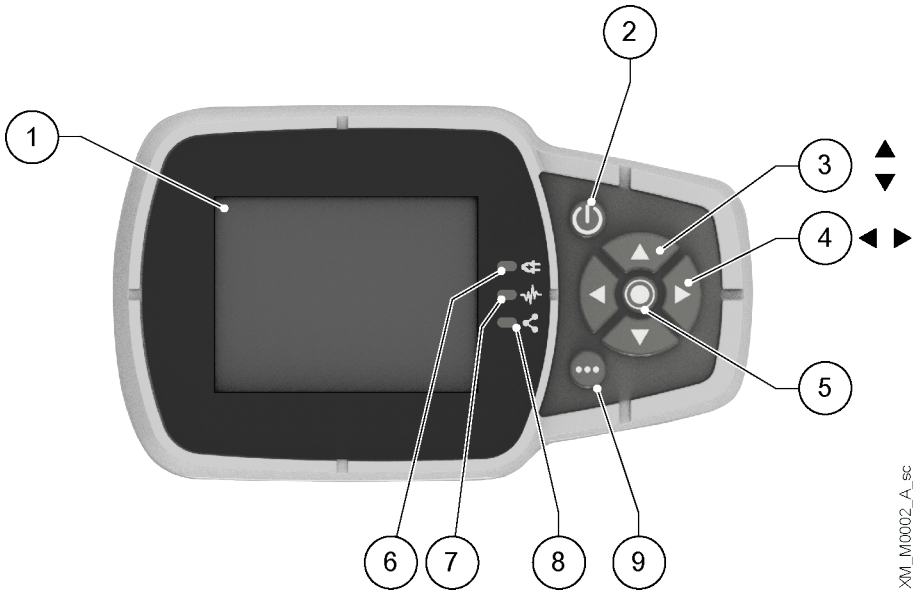
WARNING: Hot surface hazard

Only touch the drive display buttons. Pay attention to the high temperature released by the unit.

Depending on model, please observe the instructions in the following paragraphs:
- e-NSCE and e-NSCS hydrovar X+, **NSC..X drive display**.
- e-NSCE and e-NSCS hydrovar X, **NSC..K drive display**.

Programming instructions can be found in the Programming Manual.

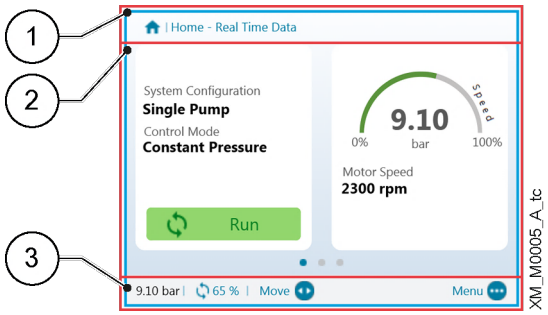
6.1 NSC..X drive display



Position number	Name	Function
1	Display	
2	ON/OFF button	• Start and stop the unit • Reset the errors by pressing for 5 seconds.
3	UP and DOWN arrow keys	• Move vertically between menu options • Perform a manual switch-over on a multi-pump system by pressing the DOWN arrow (extended pressure) • Rotate the display 180° by simultaneously pressing ENTER and the UP arrow (extended pressure).
4	RIGHT and LEFT arrow keys	• Move horizontally to navigate home screens and menus • Lock and unlock the display by simultaneously pressing the RIGHT and LEFT arrows (extended pressure).

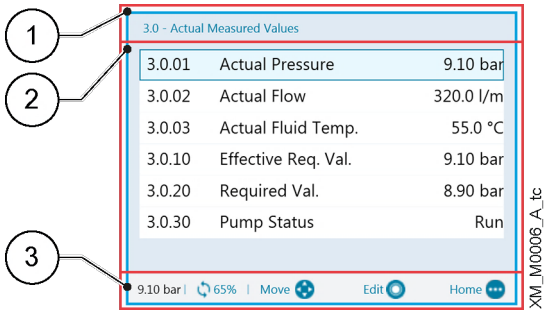
Position number	Name	Function
5	SEND button	• Advancing through the menu levels • Confirm the selection of a parameter • Confirm the value of a parameter.
6	Unit LED on	Indicate that the unit is powered.
7	Unit status LED	Indicate: • Motor not powered (off) • Alarm active and motor stopped (yellow) • Unit error and motor stopped (red) • Motor started (green) • Alarm active and motor started (yellow alternating green).
8	Connection status LED	Indicate: • BMS communication disabled (off) • BMS communication active (green) • Wireless communication with mobile device established (fixed blue) • Wireless communication with mobile device being established (flashing blue) • Wireless communication and BMS communication active (blue alternating green).
9	Multifunction button	• Access the parameter menu or additional functions according to the screen on the display. • Enable wireless connection (extended pressure).

6.1.1 Graphic display



Position number	Name	Description
1	Header bar	It shows static information and messages relating to the operating conditions, such as: • Alarms • Errors • Multi-pump operation.
2	Main screen	It shows the main information and allows the operating parameters to be changed. There are up to 5 screens, which can be navigated by pressing the RIGHT and LEFT arrow keys. The symbol ⧉ next to an entry indicates an editable parameter.
3	Lower bar	Show: • On the left, the essential operating information, such as the actual adjustment value and the speed percentage at which the unit is operating • On the right, the buttons available for interaction in the main screen.

6.1.2 Parameter menu, NSC..X



Position number	Name	Description
1	Header bar	It shows the parameter path at menu and submenu level.
2	Parameter list	Show: • The index, • The name, • The preview of the value of the parameters for the current menu level. To advance a level or change the value, press SEND or the RIGHT arrow key.
3	Lower bar	Show: • On the left, the essential operating information, such as the actual adjustment value and the speed percentage at which the unit is operating • On the right, the buttons available for interaction in the main screen.

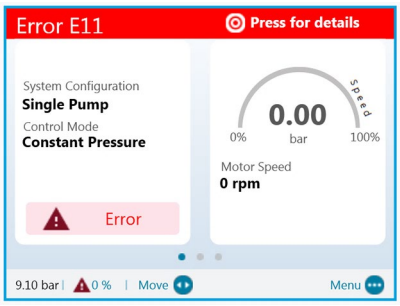
The menu is split into 3 levels:
- Main
- Submenu
- Parameters.

To display or change a parameter:
1. Press the function button in the main screen.
2. Enter the password using the arrow keys.
3. Press SEND.
   Note: after 10 minutes of inactivity, the password must be re-entered.
4. Press the RIGHT arrow key or SEND to advance between levels, or the LEFT arrow key to return.

6.1.3 Operating mode change, NSC..X

The unit parameters are set at the factory and the unit is ready for use.
To change parameters and advanced features, access the configuration menu.
1. Press the multi-function button.
2. Enter the password using the arrow keys.
3. Press SEND.
4. Navigate through the menus to locate the parameter or function to be changed: see the Drive and Programming Manual for the association between parameter codes and their functions.

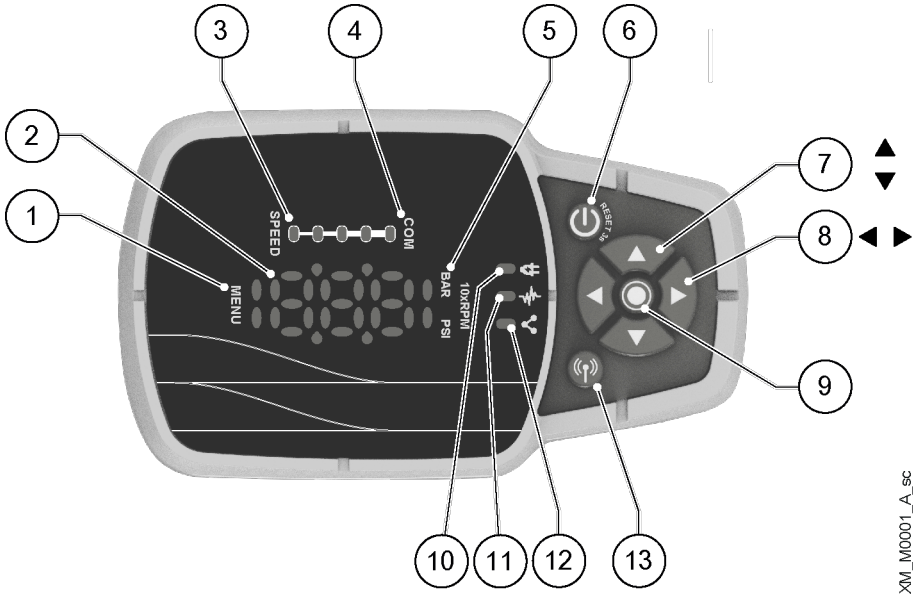
6.1.4 Error reset, NSC..X



In the event of an error, the unit automatically makes several attempts to reset itself, where permitted: if the attempts are unsuccessful, the unit stops and the display shows the error code.
To eliminate the error:

1. Open the first main screen by pressing SEND.
2. Read the description of the error in the screen.
3. Identify the cause and follow the instructions in **Troubleshooting**.
4. Reset the error by pressing and holding down ON/OFF for 3 seconds: the unit returns to the status before the error.

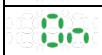
6.2 NSC..K drive display



Position number	Name	Function
1	Menu indicator	Indicate: • Navigation through the menu items (steady light) • The display of a parameter value (flashing light).
2	Seven-segment display	
3	Speed bar	
4	Multi-pump communication indicator	

Position number	Name	Function
5	Unit of measure indicator	
6	ON/OFF button	• Start and stop the unit • Reset the errors by pressing for 5 seconds.
7	UP and DOWN arrow keys	• Quickly change the setpoint in the main display • Navigate through the submenus and change the parameter displayed in the parameter menu • Perform a manual switch-over on a multi-pump system by pressing the DOWN arrow (extended pressure) • Rotate the display 180° by simultaneously pressing ENTER and the UP arrow (extended pressure).
8	RIGHT and LEFT arrow keys	• Show speed and pressure in alternation in the main display • Navigate the parameter menu levels • LEFT arrow only, confirm the changed value • Lock and unlock the display by simultaneously pressing the RIGHT and LEFT arrows (extended pressure). • RIGHT arrow only, navigate through the active error codes, if more than one are present.
9	SEND button	• Advancing through the menu levels • Confirm the value of a parameter • Enter the parameter configuration menu (extended pressure).
10	Unit LED on	Indicate that the unit is powered.
11	Unit status LED	Indicate: • Motor not powered (off) • Alarm active and motor stopped (yellow) • Unit error and motor stopped (red) • Motor started (green) • Alarm active and motor started (yellow alternating green).
12	Connection status LED	Indicate: • BMS communication disabled (off) • BMS communication active (green) • Wireless communication with mobile device established (fixed blue) • Wireless communication with mobile device being established (flashing blue) • Wireless communication and BMS communication active (blue alternating green).
13	Wireless technology communication button	Connect the unit to a mobile device.

6.2.1 Main visualization

Glyph	Name	Description
	OFF	Unit stopped with ON/OFF button or BMS. Note: lower priority in relation to STOP.
	STOP	START/STOP and GND digital inputs open.
	Start request	Request to start the unit with the ON/OFF button. It remains active for a few seconds, then the following appears: • Unit in operation, or • Alarm, or • Error.
	Alarm	Alarm code of the unit in alarm status, in alternation with the main display. The unit status LED can be: • Yellow= motor stopped • Yellow in alternation with green = motor started.
	Error	Error code of the unit in error status.
	Unit in operation	Unit in operation and selected unit of measure display: • Speed, 10xRPM • Pressure in bar or psi.
	Display blocked	Display locked by the operator and button operation inhibited.

6.2.2 Parameter menu, NSC..K

The menu is split into 3 levels:
- Main
- Submenu
- Parameters.

To display or change a parameter:
1. Press the SEND button (extended pressure).
2. Enter the password using the arrow keys.
3. Press SEND.
   Note: after 10 minutes of inactivity, the password must be re-entered.
4. Press the UP and DOWN arrow keys to navigate through the menus.
5. Press SEND or the RIGHT arrow to go to the menu sub-levels until the parameter value is found.
6. Press the UP and DOWN arrow keys to increase or decrease the parameter value.
7. Press SEND or the LEFT arrow key to confirm.
   Note: after 5 seconds of inactivity, the parameter returns to the previously set value.

Glyph	Name	Notes
	Main menu	• Menus numbered from 1 to 9. • Menu indicator: fixed light.
	Submenu	• Submenus numbered from 1 to 9. • Menu indicator: fixed light.
	Parameter	Navigation in the parameter level. • Parameters numbered from 0 to 99. • Submenus numbered from 1 to 9. • Menu indicator: fixed light.
	Parameter value	Parameter value modification. • Menu indicator: light flashing. • Parameter value while editing: flashing.

6.2.3 Operating mode change, NSC..K

The unit parameters are set at the factory and the unit is ready for use.
To change parameters and advanced features, access the configuration parameters.
1. Press the SEND button (extended pressure).
2. Enter the password using the arrow keys.
3. Press SEND.
4. Select the parameter to be changed in the M01 menu: see the Drive and Programming Manual for the association between parameter codes and their function.

6.2.4 Error reset, NSC..K

In the event of an error, the unit automatically makes several attempts to reset itself, where permitted: if the attempts are unsuccessful, the unit stops and the display shows the error code. To eliminate the error:
1. Identify the cause and follow the instructions in **Troubleshooting**.
2. Reset the error by pressing and holding down ON/OFF for 3 seconds: the unit returns to the status before the error.

6.3 Xylem X App

Introduction

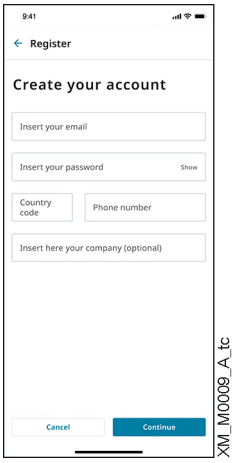
Available for mobile devices with wireless technology operating system.
Use the App to:
- Check the status of the unit
- Configure parameters
- Interact with the unit and obtain data during installation and maintenance
- Generate a work report
- Contact the assistance service.

Download the App and connect the mobile device with the unit

1. Download the Xylem X App to the mobile device from App Store[1] or Google Play[2] by scanning the QR code:

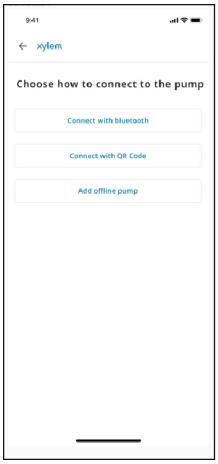
[1] Compatible with iOS® operating systems with version 11.0 and above
[2] Compatible with Android operating systems with version 8.0 and above

2. Complete the registration.



XM_M0009_A_tc

3. On the drive display, press the wireless communication button.
4. Add the unit to the user profile.



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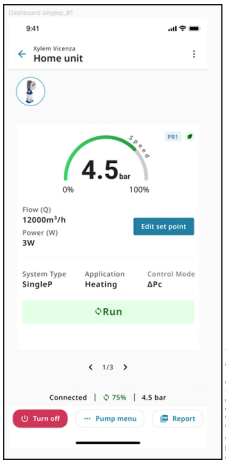
5. When the connection has been established, the connection light turns blue steady: it is now possible to control the unit using the mobile device.



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7 Maintenance

7.1 Precautions

Before starting any work, make sure to read and understand all the safety instructions in **Introduction and Safety**.

DANGER: Electrical hazard

Before starting work, check that the electric power supply is disconnected and locked out, to avoid unintentional restart of the unit, the control panel and the auxiliary control circuit.

DANGER: Electrical hazard

After disconnecting the system from the power supply, wait 2 min for the discharge of the residual current.

WARNING:

Maintenance must be done by a technician possessing the technical-professional requirements outlined in the current regulations.

WARNING:

Always wear personal protective equipment.

WARNING:

Always use suitable working tools.

WARNING:

In the case of liquids that are excessively hot or cold, pay attention to the risk of injury.

The disassembly or installation of the rotor in the motor casing generates a strong magnetic field:

DANGER: Magnetic hazard

The magnetic field may be dangerous for anyone wearing pacemakers, or any other medical devices sensitive to magnetic fields.

NOTE:

The magnetic field may attract metal debris on the rotor surface, causing damage to the same.

7.2 Maintenance every 4000 hours of operation, or every year

Perform maintenance when one of the two limits is reached.

Maintenance with unit started

Check:
1. That the unit does not produce abnormal noises or vibrations.
2. That no liquid is leaking from the unit and the piping system.

Maintenance with the unit switched off and disconnected from the power supply

1. Check:
   - The integrity of the power cable
   - For size D drives only, the tightening of the conductor terminals with a torque of 4 Nm (35 lbf·in)
   - That there are no signs of overheating and electric arcs on the terminal boxes and traces of humidity in the drive.
   - The tightening of all bolts
   - The precharge of the expansion vessel; see the instructions in **Startup**.
2. Clean:
   - The fan cover
   - The drive dissipator
   - The stator casing

   and check the status of the cooling fan.

7.3 Maintenance every 10000 hours of operation or every 2 years

When the first of the two limits is reached, replace the mechanical seal and the O-Rings of the pump body.

7.4 Maintenance every 17500 hours of operation or every 5 years

When the first of the two limits has been reached, replace the permanently lubricated bearings of the motor, if present.

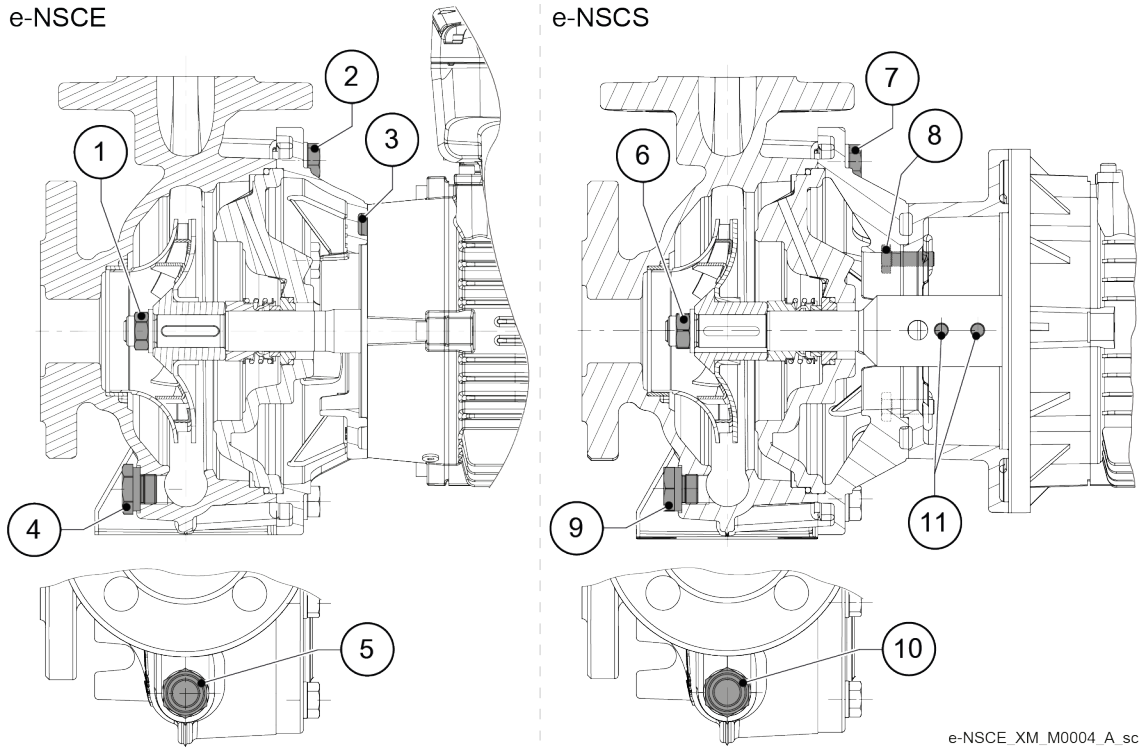
7.5 Long periods of inactivity

1. Shut the suction and discharge on-off valves.
2. Follow the instructions in **Storage**.
3. Before starting the unit, check the status of the connections of the electric conductors on the unit and the control panel.
4. Start the unit following the instructions in **Startup**.

7.6 Identification of spare parts

Identify the spare parts with the product codes directly on the site spark.xylem.com.
Contact Xylem or the Authorised Distributor for further technical information.

7.7 Tightening torques



Position number	Screw	Torque, Nm (lbf·in)
1	M12	45 (398) ± 15%
2	M10X25	32 (283) ± 15%
	M10X30	40 (354) ± 15%
	M12	60 (531) ± 15%
3	M8	15 (133) ± 15%
	M10	32 (283) ± 15%
	M12	45 (398) ± 15%
4 and 5	M16	40 (354) ± 25%
6	M12	45 (398) ± 15%
	M16	110 (974) ± 15%
	M24	200 (1770) ± 15%
7	M10	40 (354) ± 15%
	M12, on steel	50 (443) ± 15%
	M12, on cast iron	60 (531) ± 15%
8	M8	15 (133) ± 15%
	M10	32 (283) ± 15%
	M12	45 (398) ± 15%
9 and 10	M16, on cast iron	40 (354) ± 25%
	M16, on stainless steel or duplex stainless steel	30 (266) ± 25%
11	M8	13 (115) ± 15%
	M10	28 (248) ± 15%

8 Troubleshooting

WARNING:

Maintenance must be done by a technician possessing the technical-professional requirements outlined in the current regulations.

WARNING:

If a fault cannot be corrected or is not mentioned, contact Xylem or the Authorised Distributor.

8.1 The unit does not switch on

Cause	Solution
Electric power supply absent	Restore the electric power supply
Power supply cord is damaged	Replace the cable
Unit faulty	Contact Xylem or the Authorised Distributor, or send the unit to an authorised workshop

8.2 Little or no hydraulic performance

Cause	Solution
Air inside the unit	• Bleed the unit and/or • Increase the liquid level inside the tank, and/or • Remove any turbulences of the liquid in the suction area, and/or • Check the suction conditions
Check valve at the discharge blocked or partially blocked	Replace the valve: • Check valve and/or • bottom valve
Discharge piping system chocked and/or obstructed	Remove all chocking and/or obstructions
Suction filter clogged, if present	Clean the filter
Foreign bodies in the unit	Remove the foreign bodies
Wrong unit settings	Check the settings
Undersized unit	Contact Xylem or the Authorised Distributor, or send the unit to an authorised workshop
Damaged or worn internal unit components	Contact Xylem or the Authorised Distributor, or send the unit to an authorised workshop
Unit faulty	Contact Xylem or the Authorised Distributor, or send the unit to an authorised workshop

8.3 The differential protection device (RCD) has tripped

Cause	Solution
Differential unsuitable or faulty	Check or repair the differential
Unit faulty	Contact Xylem or the Authorised Distributor, or send the unit to an authorised workshop

8.4 The unit does not stop when the setpoint is reached

Cause	Solution
Check valve at the discharge blocked or partially blocked	Replace the check valve
Expansion vessel not installed, faulty, undersized or incorrectly pre-charged	• Install, or • Replace, or • Pre-charge the expansion vessel
Wrong unit settings	Check the settings

8.5 The unit produces excessive noise and/or vibrations

Cause	Solution
Plant resonance	Check the installation
Foreign bodies in the unit	Contact Xylem or the Authorised Distributor, or send the unit to an authorised workshop
Cavitation	Check the suction conditions
Air inside the unit	• Bleed the unit and/or • Increase the liquid level inside the tank, and/or • Remove any turbulences of the liquid in the suction area, and/or • Check the suction conditions
Unit wrongly anchored to the foundations	Check the unit anchoring
Anti-vibration joint on the piping system not suitable or absent	Install or check the anti-vibration
Motor-pump flexible coupling incorrectly adjusted	Adjust the coupling
Unit faulty	Contact Xylem or the Authorised Distributor, or send the unit to an authorised workshop

8.6 The unit is leaking at the mechanical seal

Cause	Solution
Seal damaged or worn	Replace the seal or contact Xylem or the Authorised Distributor, or send the unit to an authorised workshop

8.7 Unit error or alarm

Cause	Solution
Miscellaneous	See the Drive and Programming Manual

9 Specifications

9.1 Operating environment

Non-aggressive and non-explosive atmosphere.

Temperature

From 0 to 40°C (32÷104°F), unless otherwise indicated on the data plate of the electric motor.

Relative air humidity

< 50% at 40°C (104°F).

NOTE:
If the humidity exceeds the stated limits, contact Xylem or the Authorised Distributor.

Elevation

< 1000 m (3280 ft) above sea level.

NOTE: Danger of motor overheating
If the unit is exposed to temperatures or installed at an altitude greater than those stated, reduce the power output of the motor according to the coefficients reported in the table. Otherwise, replace the motor with a more powerful one.
If the unit is installed at an altitude exceeding 2000 m (6600 ft), contact Xylem or the Authorised Distributor.

Altitude m (ft)	Power reduction coefficient
1000÷1500 (3300÷4900)	0.97
1500÷2000 (4900÷6600)	0.95

9.2 Materials in contact with the liquid

Pump body material	Impeller material	Identification code
Cast iron	Bronze	CB
	Cast iron	CC
	1.4408 stainless steel	CN
	1.4301 stainless steel	CS
Cast ductile iron	Bronze	DB
	Cast iron	DC
	1.4408 stainless steel	DN
1.4408 stainless steel	1.4408 stainless steel	NN
1.4517 duplex stainless steel	1.4408 stainless steel	RN
	1.4517 duplex stainless steel	RR

9.3 Mechanical seal

Unbalanced single acc. EN 12756, version K.

9.4 Pressure/temperature operating limits

The chart shows the pumped liquid pressure and temperature limits permitted for the mechanical seal, based on the material of the hydraulic components.
For more information, see the technical catalogue.

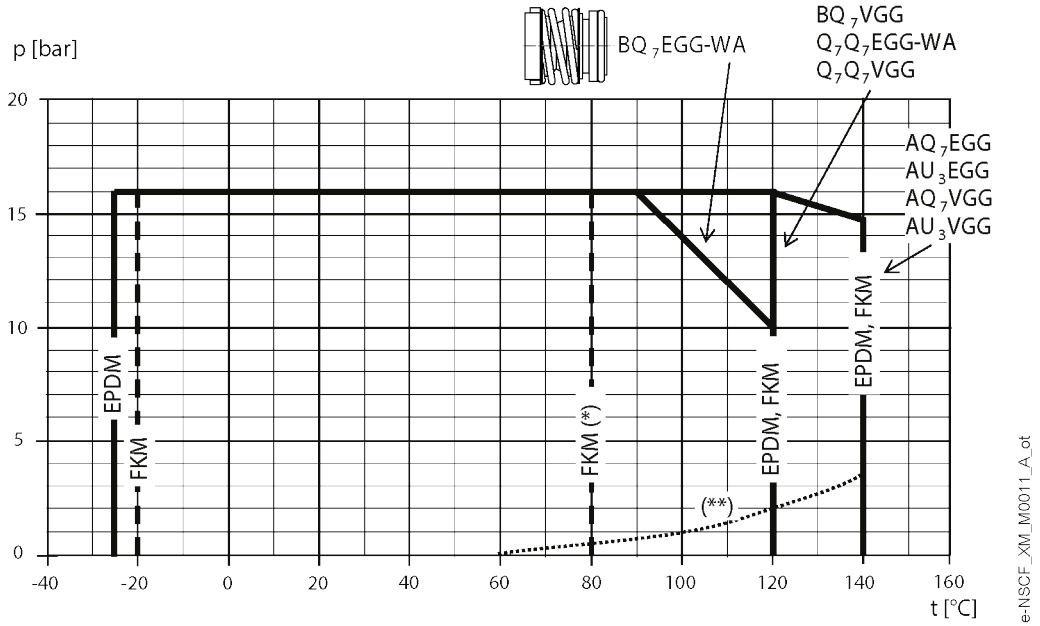


Figure 3: Cast iron pump body and bronze, cast iron, 1.4408 stainless steel or stainless steel impeller

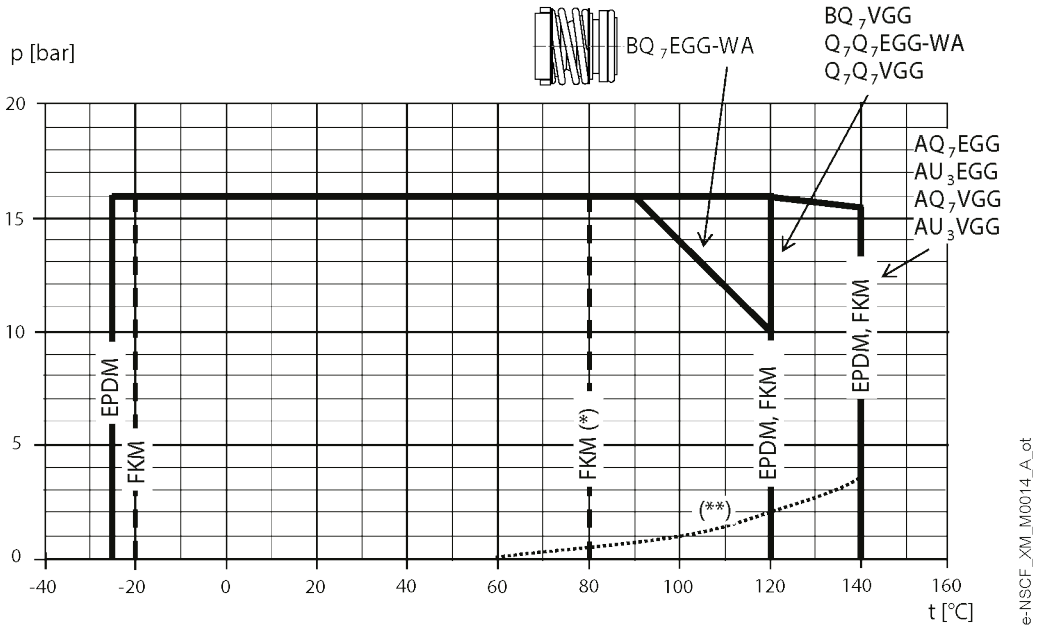


Figure 4: Ductile cast iron pump body and bronze, cast iron or 1.4408 stainless steel impeller

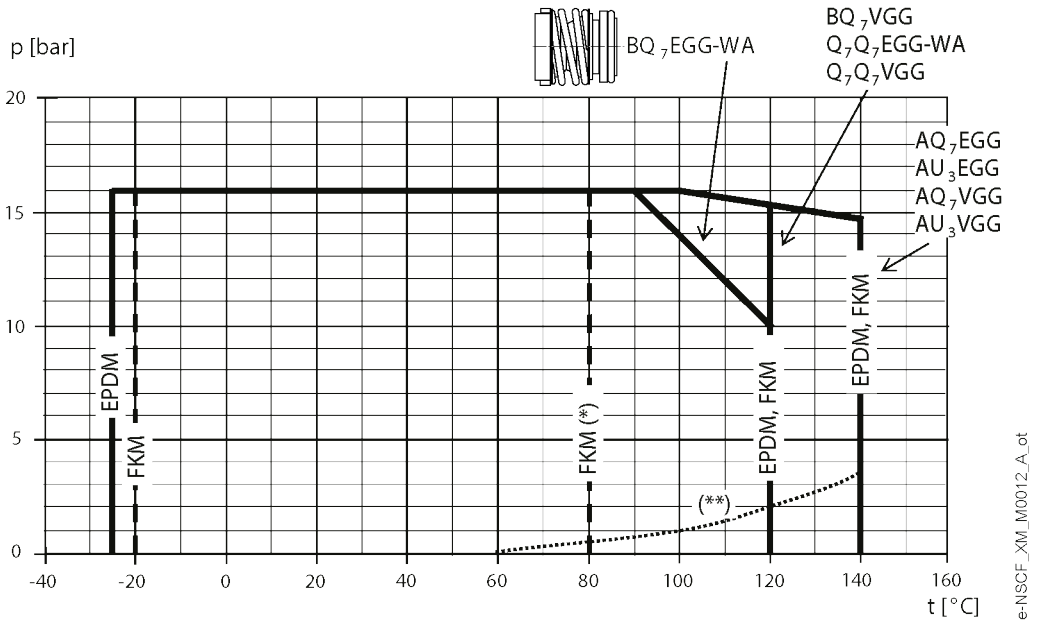


Figure 5: 1.4408 stainless steel or 1.4517 duplex stainless steel pump body and 1.4408 stainless steel impeller

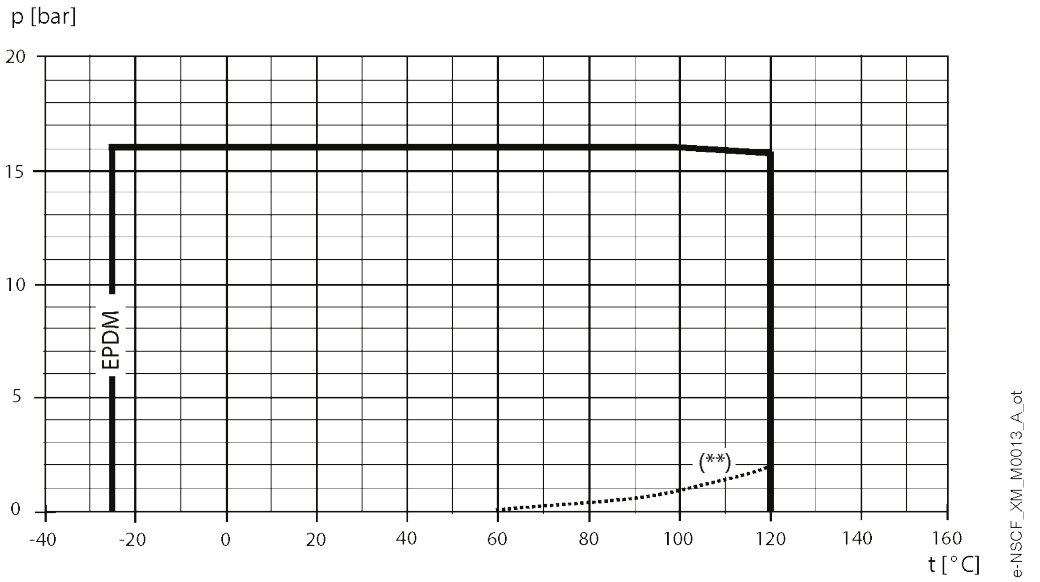


Figure 6: 1.4517 duplex stainless steel pump body and impeller

(*) = hot water
(**) = minimum pressure required at mechanical seal

9.5 Maximum number of starts and stops

≤ 4/h.

NOTE:

If more starts and stops are required, use the dedicated external input.

9.6 Electrical specifications

See the motor data plate.

Permitted tolerances for the supply voltage

- 200 - 240 V ±10% 50/60 Hz
- 380 - 480 V ±10% 50/60 Hz.

Leakage Current

≤ 3.5 mA (AC).

Protection class

IP 55.

9.7 Radio frequency characteristics

Features	Description
Technology	Wireless Low Energy 5.2
Band	2.4 GHz ISM
RF	≤ 4.5 mW (6.5 dBm)

9.8 Characteristics of inputs and outputs

Features	Description
Communication ports	2, RS-485
Digital inputs	3 for NSC..K, 5 for NSC..X: • Floating/NPN contact, open manifold/drain open, to GND • Internal polarisation +24 VDC, current limited to 6 mA max. • Protection from -0.5 VDC to +30 VDC, ±15 mA max.
Analogue inputs	2 for NSC..K, 4 for NSC..X: • Configurable or 0-20 mA current, or 0-10 V voltage • 24V signal for sensor power supply with current limitation 60 mA
Analogue output	Configurable as either 0-20 mA current signal or 0-10 V voltage signal
Relay	2, with NC and NO changeover contact: • Relay 1 up to 240 VAC 0.25 A or 30 VDC 2 A • Relay 2 up to 30 VAC 0.25 A or 30 VDC 2 A

WARNING:

If relay 1 is connected to a voltage higher than 30 VAC, disconnect and do not use the terminals of relay 2.

9.9 Sound pressure

Measured in free field at a distance of one metre from the unit, operating without load.

Construction size	LpA, dB ± 2	Construction size	LpA, dB ± 2
32-125/30	<70	65-125/110	78
32-125/40	70	65-160/150	<70
32-160/55	71	65-160/185	<70
32-200/75	71	65-160/220	<70
32-200/110	71	80-160/15	<70
40-125/30	<70	80-160/40	<70
40-125/40	70	80-160/55	<70
40-160/55	78	80-160/110	71.5
40-160/75	71	80-160/150	72
40-200/110	71	80-160/185	72
40-200/150	70	80-160/220	72
40-200/185	75	100-160/30	<70
40-250/220	72	100-160/40	<70
50-125/15	<70	100-160/220	72
50-125/30	<70	100-200/55	<70
50-125/40	<70	100-200/75	<70
50-125/55	71	100-250/110	<70
50-125/75	71	125-200/55	<70
50-160/110	71	125-250/75	<70
50-160/150	70	125-250/110	<70
50-200/185	71.5	150-200/110	<70
50-200/220	71.5	50-200/220	71.5
65-125/15	<70	65-160/220	75
65-125/22	<70	80-160/185	72
65-125/55	71	80-160/220	72
65-125/75	71	-	-

10 Disposal

10.1 Precautions

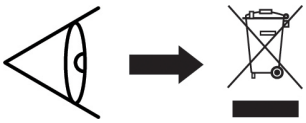
WARNING:

The unit must be disposed of through approved companies specialised in the identification of different types of materials: steel, copper, plastic, lithium, ferrite etc...

WARNING:

It is prohibited to dispose of lubricating fluids and other hazardous substances in the environment.

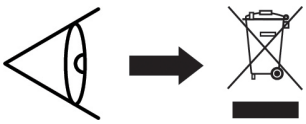
10.2 WEEE (EU/EEA)



INFORMATION TO USERS pursuant to art. 14 of the Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE). The crossed bin symbol on the appliance or on its packaging indicates that the product at the end of its useful life must be collected separately and not disposed of together with other mixed urban waste. Appropriate separate collection for the subsequent start-up of the disused equipment for recycling, treatment and environmentally compatible disposal helps to avoid possible negative effects on the environment and on health and favours the re-use and / or recycling of the materials of which the equipment is composed.

WEEE from users other than private households[3]: the separate collection of this equipment at the end of its life is organized and managed by the producer[4]. The user who wants to get rid of this equipment can then contact the producer and follow the system that it has adopted to allow the separate collection of equipment at the end of life or select an organization independently authorized to manage waste.

10.3 WEEE (UK)



INFORMATION TO USERS pursuant to art. 44 of the The Waste Electrical and Electronic Equipment Regulations 2013 (S. I. 2013 No. 3113). The crossed bin symbol on the appliance or on its packaging indicates that the product at the end of its useful life must be collected separately and not disposed of together with other mixed urban waste. Appropriate separate collection for the subsequent start-up of the disused equipment for recycling, treatment and environmentally compatible disposal helps to avoid possible negative effects on the environment and on health and favours the re-use and / or recycling of the materials of which the equipment is composed.

[3] *Classification according to product type, use and current local laws*

[4] *Producer of EEE as per Directive 2012/19/EU*

WEEE from users other than private households[5]: the separate collection of this equipment at the end of its life is organized and managed by the producer[6]. The user who wants to get rid of this equipment can then contact the producer and follow the system that it has adopted to allow the separate collection of equipment at the end of life or select an organization independently authorized to manage waste.

[5] *Classification according to product type, use and current local laws*

[6] *Producer of EEE as per WEEE Regulations 2013*

11 Declarations

Refer to the specific declaration relating to the marking on the product.

11.1 Electric pump (CE)

CE

EC Declaration of Conformity (Original)

Xylem Service Italia S.r.l., with headquarters in Via Vittorio Lombardi 14 - 36075 Montecchio Maggiore VI - Italy, hereby declares that the product:

NSCEX…or NSCEK…or NSCSX…or NSCSK… electric pump with integrated variable speed drive (EXM-type electric motor), with or without pressure transmitter and relative cable (see label on the last page of "Safety and Other Information" manual)

fulfils the relevant provisions of the following European Directives

- Machinery 2006/42/EC and subsequent amendments (ANNEX II - natural or legal person authorised to compile the technical file: Xylem Service Italia S.r.l.)
- Eco-design 2009/125/EC and subsequent amendments, Regulation (EU) no. 547/2012 and subsequent amendments (water pump) if MEI marked.

and technical standards

- EN 809:1998+A1:2009, EN 60204-1:2018, EN 61800-5-1:2007+ A1:2017+A11:2021
- EN 16480:2021.

Additional information: the EXM series motor includes an integrated variable speed drive, and the energy performance of the two components cannot be tested independently of each other (Regulation (EU) 2019/1781, Article 2(2)(b), (3)(a)). The marking shown (IE...-IES...) is that required by the technical standard IEC 61800-9-2.

Montecchio Maggiore, 05.04.2024

Peter Björnsson
Managing Director

rev.00

EU Declaration of Conformity (No 81)

1. RED - Radio equipment: NSCEX, NSCEK, NSCSX, NSCSK (see product data plate)
   RoHS - Unique identification of the EEE: NSC..X, NSC..K
2. Name and address of the manufacturer:
   Xylem Service Italia S.r.l.
   Via Vittorio Lombardi 14
   36075 Montecchio Maggiore VI
   Italy
3. This declaration of conformity is issued under the sole responsibility of the manufacturer.
4. Object of the declaration:
   NSCEX…or NSCEK…or NSCSX…or NSCSK… electric pump with integrated variable speed drive (EXM-type electric motor), with or without pressure transmitter and relative cable.

5. The object of the declaration described above is in conformity with the relevant Union harmonization legislation:
   - Directive 2014/53/EU of 16 April 2014 and subsequent amendments (radio equipment).
   - Directive 2011/65/EU of 8 June 2011 and subsequent amendments including directive (EU) 2015/863 (restriction of the use of certain hazardous substances in electrical and electronic equipment).
6. References to the relevant harmonised standards used or references to the other technical specifications, in relation to which conformity is declared:
   - EN 61800-3:2004+A1:2012 (Category C2), EN IEC 61800-3:2018 (Category C2), EN 61000-6-2:2005, EN IEC 61000-6-2:2019, EN 61000-6-4:2007+A1:2011, EN IEC 61000-6-4:2019, EN 61000-3-2:2014, EN IEC 61000-3-2:2019+ A1:2021, EN 61000-3-3:2013+A1:2019+A2:2021, ETSI EN 300 328 V2.2.2 (2019-07), EN 62311:2008, EN IEC 62311:2020
   - EN IEC 63000:2018.
7. Notified body: - - -
8. RED - Any accessories/components/software: - - -
9. Additional information:
   RoHS – Annex III – Applications exempted from the restrictions: lead as a binding element in steel, aluminium and copper alloys [6(a), 6(b), 6(c)], in solders and in electrical/ electronic components [7(a), 7(c)-I].

Signed for and on behalf of:
Xylem Service Italia S.r.l.

Montecchio Maggiore, 05.04.2024

Peter Björnsson
Managing Director

rev.00

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11.2 Electric pump (UKCA)

UK CA

UK Declaration of Conformity (Original)

Xylem Service Italia S.r.l., with headquarters in Via Vittorio Lombardi 14 - 36075 Montecchio Maggiore VI - Italy, hereby declares that the product:

NSCEX…or NSCEK…or NSCSX…or NSCSK… electric pump with integrated variable speed drive (EXM-type electric motor), with or without pressure transmitter and relative cable (see label on the last page of "Safety and Other Information" manual)

fulfils the relevant provisions of the following UK legal acts
- S.I. 2008/1597 - Supply of Machinery (Safety) Regulations 2008 and subsequent amendments (Schedule 2 - Part 2 - Annex II - natural or legal person authorised to compile the technical file: Xylem Service Italia S.r.l.)
- S.I. 2019/539 - The Ecodesign for Energy-Related Products and Energy Information (Amendment) (EU Exit) Regulations 2019 (water pump) if MEI marked,

and technical standards
- EN 809:1998+A1:2009, EN 60204-1:2018, EN 61800-5-1:2007+ A1:2017+A11:2021.

- EN 16480:2021.

Additional information: the EXM series motor includes an integrated variable speed drive, and the energy performances of the two cannot be tested independently of each other (S.I. 2021/745, Regulation 34, Schedule 16, paragraphs 10(1)(b), 10(2)(a)). The marking shown (IE...-IES...) is that required by the technical standard IEC 61800-9-2.

Montecchio Maggiore, 05.04.2024

Peter Björnsson
Managing Director

rev.00

UK Declaration of Conformity (No 81)

1. RE-D - Radio equipment: NSCEK, NSCSX, NSCSK (see product data plate)
   RoHS - Unique identification of the EEE: NSC..K, NSC..X
2. Name and address of the manufacturer:
   Xylem Service Italia S.r.l.
   Via Vittorio Lombardi 14
   36075 Montecchio Maggiore VI
   Italy
3. This declaration of conformity is issued under the sole responsibility of the manufacturer.
4. Object of the declaration: NSCEX…or NSCEK…or NSCSX…or NSCSK…electric pump with integrated variable speed drive (EXM-type electric motor), with or without pressure transmitter and relative cable.
5. The object of the declaration described above is in conformity with the relevant UK legislative acts:
   - S.I. 2017/1206 - The Radio Equipment Regulations 2017 and subsequent amendments
   - S.I. 2012/3032 - The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 and subsequent amendments
6. References to the relevant designated standards used or references to the other technical specifications, in relation to which conformity is declared:
   - EN 61800-3:2004+A1:2012 (Category C2), EN IEC 61800-3:2018 (Category C2), EN 61000-6-2:2005, EN IEC 61000-6-2:2019, EN 61000-6-4:2007+A1:2011, EN IEC 61000-6-4:2019, EN 61000-3-2:2014, EN IEC 61000-3-2:2019+ A1:2021, EN 61000-3-3:2013+ A1:2019+A2:2021, ETSI EN 300 328 V2.2.2 (2019-07), EN 62311:2008, EN IEC 62311:2020
   - EN IEC 63000:2018.
7. Approved body: - - -
8. RE-D - Any accessories/components/software: - - -
9. Additional information:
   RoHS – S.I. 2020/1647 - The Hazardous Substances and Packaging (Legislative Functions and Amendment) (EU Exit) Regulations 2020 – regulation 3(1), Schedule A2, Table 1 – Exempted applications from the restrictions: lead as a binding element in steel, aluminium and copper alloys [12, 15, 18], in solders and in electrical/electronic components [19, 21].

Signed for and on behalf of: Xylem Service Italia S.r.l.

Montecchio Maggiore, 05.04.2024

Peter Björnsson
Managing Director

rev.00

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12 Warranty

For information on the warranty refer to the commercial documentation.

Xylem |’zīləm|

1) The tissue in plants that brings water upward from the roots;
2) A leading global water technology company.

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For more information on how Xylem can help you, go to www.xylem.com

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