

Additional Installation, Operation
and Maintenance Instructions



SCUBA DRY Series

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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.



CAUTION:

This manual is an integral part of the unit. Be sure to read and understand the manual before installing the unit and putting it to use. The manual must always be made available to the user, stored in the proximity of the unit, and well kept.

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 sales document, contact Xylem or the Authorised Distributor.




1.2 Safety

1.2.1 Danger 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.

Danger 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.
 CAUTION:	It identifies a dangerous situation which, if not avoided, may cause small or medium level injuries.
NOTICE:	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
	Danger, system pressurized
	Do not use flammable liquids
	Do not use corrosive liquids
	Protect against freezing
	Read the instruction manual

1.2.2 User safety

Strictly comply with current health and safety regulations.

**WARNING:**

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.

Inexperienced users

**WARNING:**

- For EU countries: this product may be used by children aged 8 years and above and persons with reduced physical, sensory or mental capabilities, or who lack experience and knowledge, provided that they are being supervised and have been instructed on how to use it safely, and understand the hazards involved. Children must not play with the product. Cleaning and maintenance must not be carried out by children without supervision.
- For countries outside the EU: this product is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or who lack experience and knowledge, unless they are being supervised and have been instructed on how to use it by a person responsible for their safety. Children should be supervised to ensure that they do not play with the product.

1.2.3 Protection of the environment

Disposal of packaging and product

Comply with the current regulations on sorted waste disposal.

Leaking of fluid

The unit contains a small quantity of lubricant oil: always put in place the necessary measures to ensure that any spilled lubricant does not disperse in the environment.



WARNING:

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

1.2.4 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.

2 Handling and Storage

2.1 Handling of the packed unit



WARNING: Crushing hazard (limbs)

The unit and its components may be 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.

The Manufacturer delivers the unit and its components in a cardboard box.

2.2 Unit inspection upon delivery

Inspect the package

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.

Unpacking and inspection of the unit



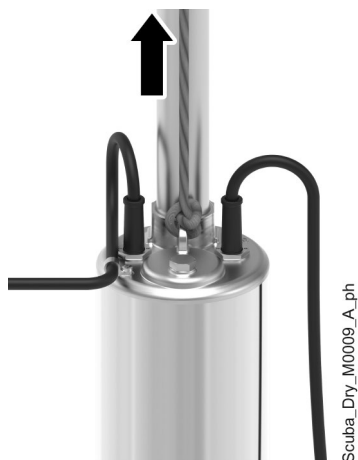
CAUTION: Cut and abrasion hazard

Always wear personal protective equipment.

1. Remove packing materials from the product.
2. Check the unit for integrity and to make sure that there are no missing components.
3. In case of damage or missing components, promptly contact Xylem or the Authorised Distributor.

2.3 Unit handling

Lift the unit by attaching a rope to the lifting ring.



DANGER: Electrical hazard

Holding the unit by the power supply cord or the float switch is strictly forbidden.



WARNING:

Use cranes, ropes, lifting straps, hooks and clasps that comply with current regulations and that are suitable for the specific use.

NOTICE:

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.

2.4 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 -5°C and +60°C (23°F and 140°F), and relative humidity between 5% and 95%.

NOTICE:

Do not place heavy loads on top of the unit.

NOTICE:

Protect the unit from collisions.

Long-term storage of the unit

1. Remove the drain plug.
2. Completely empty the unit.
3. Close the plug.



4. Follow the same instructions for the storage of the packed unit.

For further information about preparation for long-term storage, please contact Xylem or the Authorised Distributor.

3 Technical Description

3.1 Designation

Multistage close-coupled pump unit with threaded port.

3.2 Denomination of the models

Model	Description
SCD	Surface pump unit
SCDS	Surface and submersible pump unit

3.3 Data plate

1~

1 TYPE

2 Code

3 Q l/min

4 H m

5 Hmin m

6 P2 kW

7 Motor 1~

8 kg

9 t liq max °C

10 t amb max °C

11 PN kPa

12 Regulation (EU) No. 547/2012

13 MEI ≥

14 V A

15 No/Date

3~

1 TYPE

2 Code

3 Q l/min

4 H m

5 Hmin m

6 P2 kW

7 Motor 3~

8 kg

9 t liq max °C

10 t amb max °C

11 PN kPa

12 Regulation (EU) No. 547/2012

13 MEI ≥

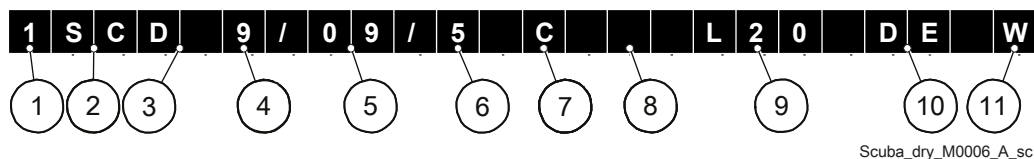
14 U Δ / Y V IP

15 No/Date

Scuba_Dry_M0005_A_sc

1. Pump unit type
2. Product code
3. Flow
4. Head
5. Minimum head
6. Rated output
7. Motor characteristics
8. Weight
9. Speed
10. Maximum liquid temperature
11. Maximum ambient temperature
12. Maximum operating pressure
13. Minimum efficiency index
14. Maximum immersion depth
15. Serial number + manufacturing date

3.4 Identification code

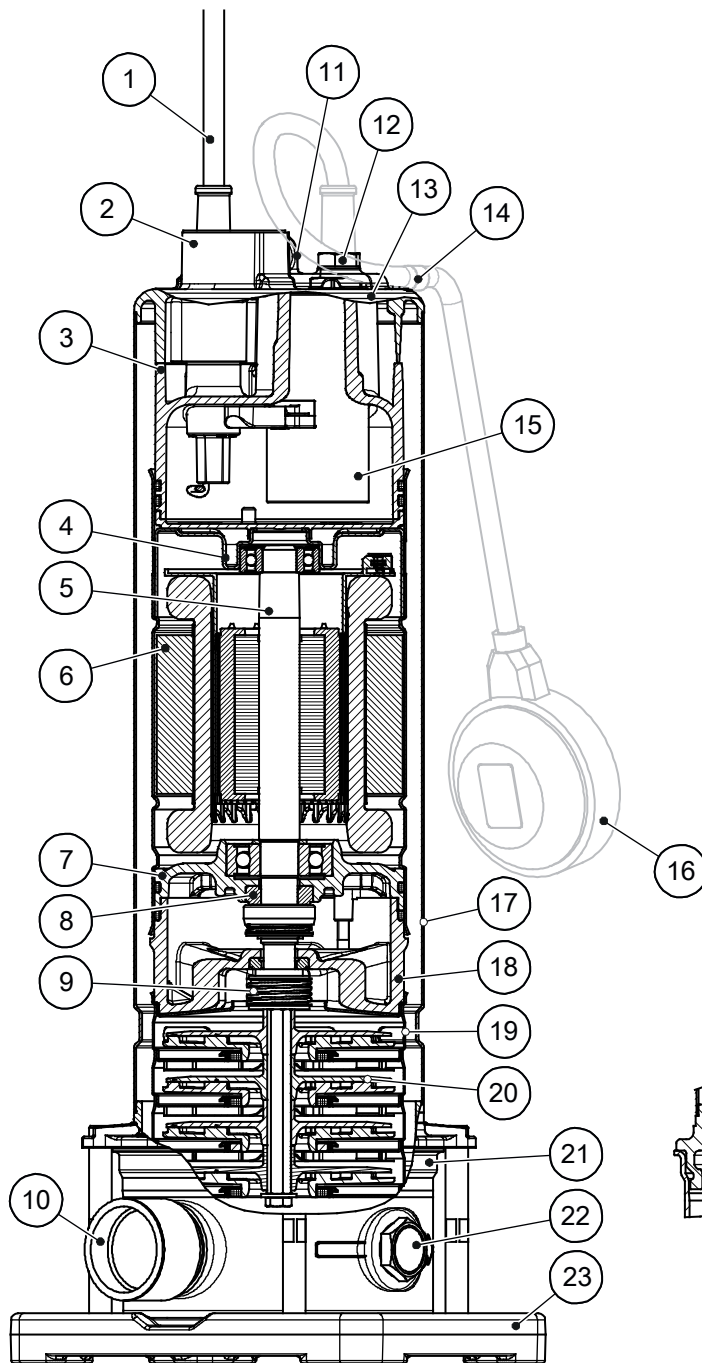


1. Flow rate in m³/h
2. Scuba series [SC]
3. Surface model [D] or surface and submersible model [DS] with stainless steel base
4. Number of impeller
5. Rated motor power in kWx10
6. Frequency 50 Hz [5] or 60 Hz [6]
7. Power supply: single-phase with internal capacitor [C], single-phase with external capacitor [Q] or three phase [T]
8. Float switch: included [G] or not included []
9. Cable length in m
10. German plug CEE 7-VII DIN49441-2-AR2 [DE], British plug BS 1363-I [UK], Australian plug AS/NZS 3112 [AU], or no plug included []
11. Certification for use with drinking water [W] or none []

Marks of safety approval

For products with a mark of electrical-related safety approval such as IMQ, TUV, IRAM, etc., the approval refers exclusively to the pump unit.

3.5 Names of the main components



1. Power supply cord
2. Discharge port
3. Upper head
4. Upper bearing support
5. Shaft and bearings
6. Stator casing
7. Lower bearing support
8. Internal mechanical seal (oil chamber)
9. External mechanical seal
10. Suction port
11. Lifting ring
12. Vent plug
13. Head
14. Floater adjustment clip
15. Capacitor
16. Float switch (optional)
17. Sleeve
18. Seal housing
19. Diffuser
20. Impeller
21. Pump body
22. Drain plug
23. Base
24. Bush (1SC, 3SC, 6 to 9 stages 5SC, and 5 to 6 stages 8SC models only)

Scuba_Dry_M0004_A_ds

3.6 Intended use

- Water supply from collection tanks for domestic use
- Irrigation
- Pressure boosting systems
- Rain water collection tanks
- Vehicle washing systems
- Systems subjected to water jet
- Craft pressure boosting systems
- Air purification and humidification
- Installation in the following environments:
 - Small and without ventilation
 - Subjected to the risk of temporary flooding
 - Requiring silent operation.

Observe the operating limits in **Technical Information** on page 33.

Pumped liquids

- Clean
- Free of solid particles or fibres
- Chemically and mechanically non aggressive
- Non-flammable.

3.7 Improper use



WARNING:

The unit was designed and built for the use described in the Intended Use section. Any other uses are prohibited, as they could compromise the safety of the user and the efficiency of the unit itself.



DANGER:

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



DANGER: Potentially explosive atmosphere hazard

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

Examples of improper use

- Pumping:
 - Liquids not compatible with the construction materials of the unit
 - Hazardous, toxic, explosive, flammable or corrosive liquids
 - Drinking liquids other than water, for example wine or milk
 - Containing abrasive, solid, or fibrous substances.
- Using the unit for flow rates exceeding the flow rate indicated in the data plate.

Examples of improper installation

- Explosive and corrosive atmospheres.

3.8 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.

4 Installation

4.1 Precautions

Before starting the works, make sure that the instructions shown in **Introduction and Safety** on page 4 have been fully read and understood.



DANGER:

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



DANGER: Potentially explosive atmosphere hazard

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



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.

NOTICE:

In case of outdoor installation, ensure protection of the system and the unit from frost.

When connecting the unit to a public or private aqueduct, or to a well for the supply of water for human and/or animal consumption, see **Use in water distribution networks for human consumption** on page 14.

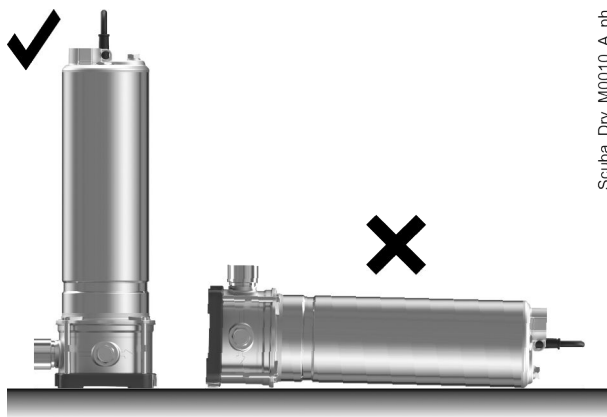
4.2 Installation area

The unit may be installed:

- On the surface, SCD and SCDS models
- Submerged, SCDS models only.

Follow the provisions in **Operating environment** on page 33.

4.2.1 Permitted positions



4.3 Hydraulic connection



DANGER:

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



DANGER: Electrical hazard

Holding the unit by the power supply cord or the float switch is strictly forbidden.



WARNING:

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



WARNING:

Install appropriate seals between the unit and the piping system.

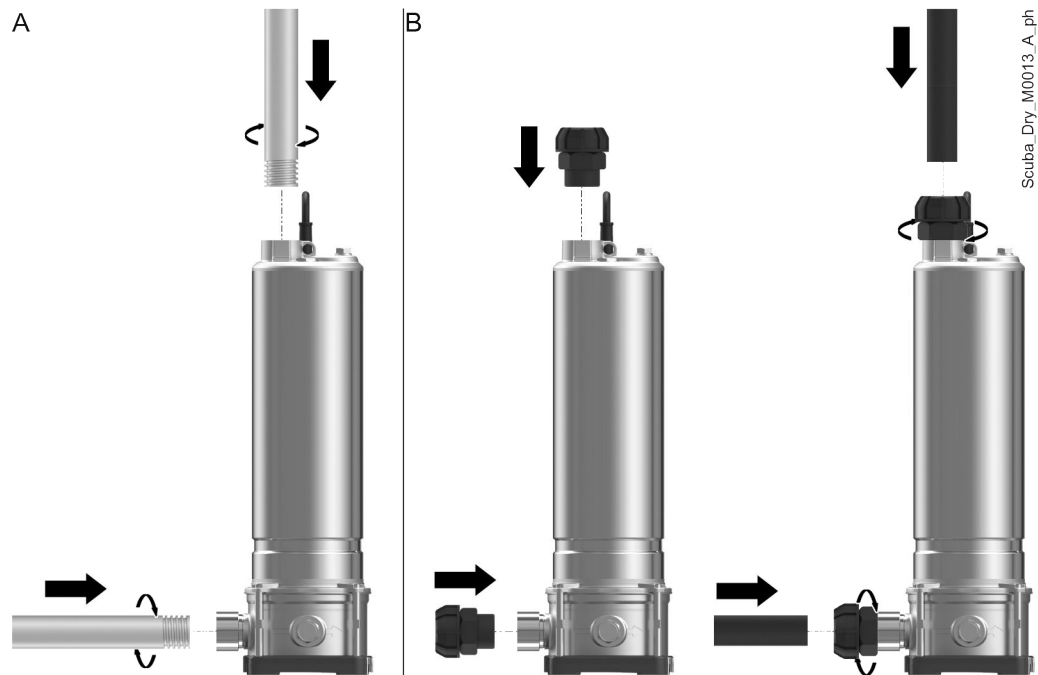
4.3.1 Connecting surface units

Preliminary operations

1. Position the unit as close as possible to the liquid being pumped.
2. Secure the unit to a concrete or metal foundation base sufficiently strong to ensure permanent and sturdy support.

General guidelines

1. Remove any welding residues, deposits and impurities in the piping system to avoid damage to the unit. If necessary, install a filter on the suction side.
2. Connect the piping system to the suction and discharge ports:
 - a) Metal piping systems should be screwed directly to the port;
 - b) In case of plastic piping, use an adapter.



3. Support the pipes independently to prevent them from weighing on the unit.
4. Install appropriate seals between the unit and the piping system connections.
5. Check the piping system for perfect tightness.

Suction pipe

1. Suction pipes exceeding 10 m in length (33 ft) must have a larger diameter than the suction port.
2. Flexible piping systems must have a reinforced spiral to prevent contraction in case of depression.
3. In case of suction lift installation:
 - The piping system must have an increasing slope towards the unit exceeding 2%; to avoid air pockets
 - Install a foot check valve with suction strainer, making sure that it is always submerged.
4. In case of positive suction head installation, install:
 - An on-off valve
 - An Inspectionable filter.

Discharge pipe

1. Install a check valve on the piping system, at least 2 m (7 ft) from the unit, followed by one every 10 m (33 ft) of geodetic level difference.
2. Install a pressure gauge for checking the actual operating pressure of the unit.
3. Install an on-off valve, downstream from the check valve and pressure gauge, to regulate the flow rate.
4. Install a diaphragm tank to limit the number of starts, stabilise the operating pressure and reduce the pressure peak caused by water hammer effects.

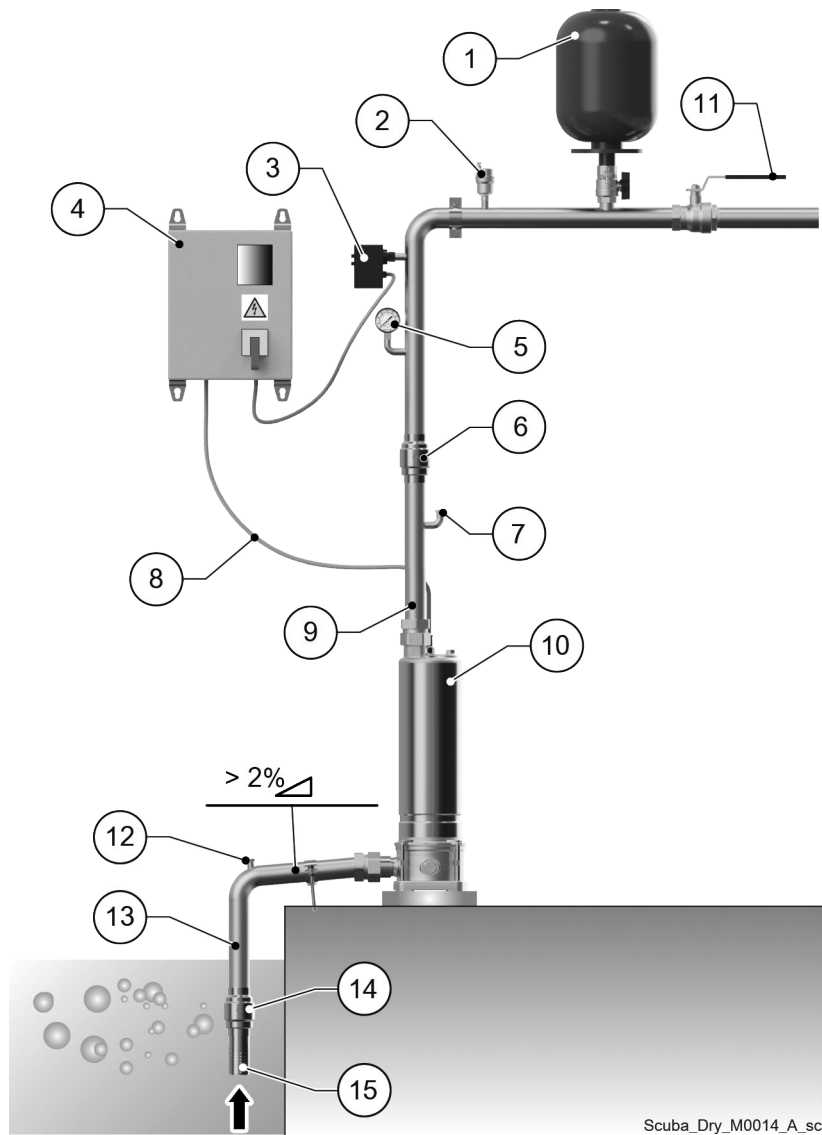


Figure 1: Surface unit, example of suction lift installation

1. Diaphragm tank
2. Bleed valve
3. Start and stop device
4. Control panel
5. Pressure gauge
6. Check valve
7. Fill plug
8. Electric power supply cord
9. Discharge pipe
10. Unit
11. On-off valve
12. Fill plug
13. Suction pipe
14. Bottom valve
15. Suction strainer

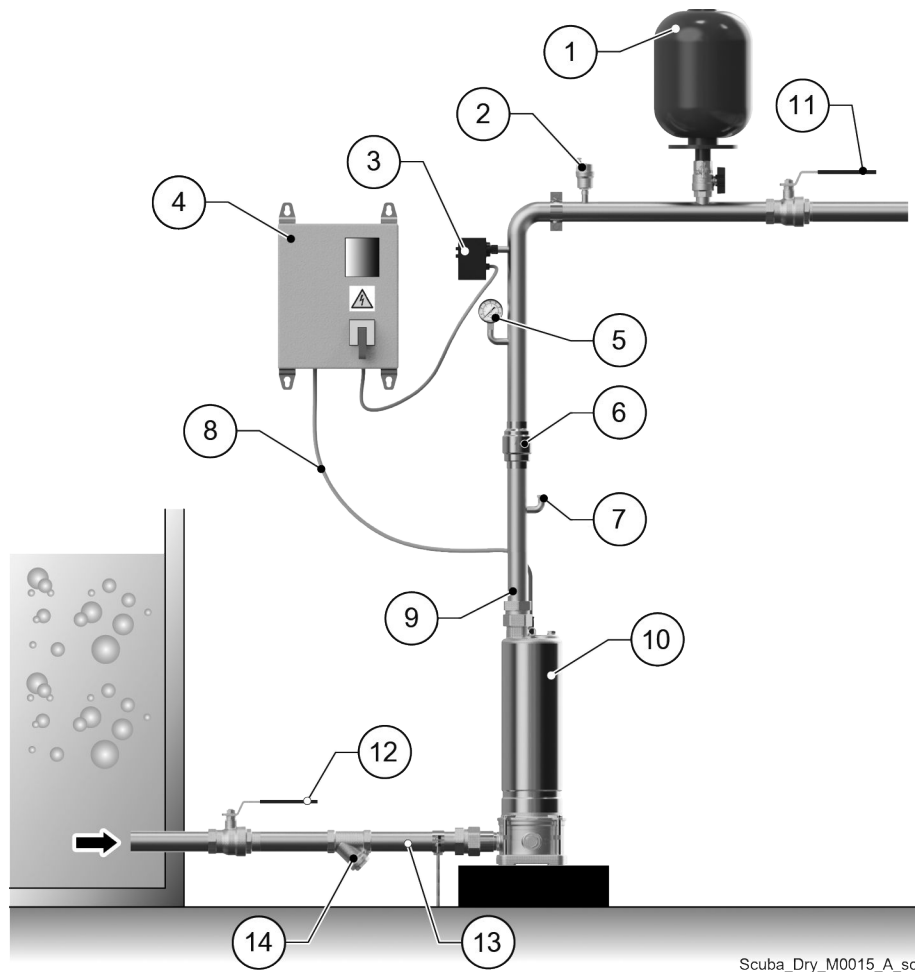


Figure 2: Surface unit, example of positive suction head installation

1. Diaphragm tank
2. Bleed valve
3. Start and stop device
4. Control panel
5. Pressure gauge
6. Check valve
7. Fill plug
8. Electric power supply cord
9. Discharge pipe
10. Unit
11. On-off valve
12. On-off valve
13. Suction pipe
14. Filter

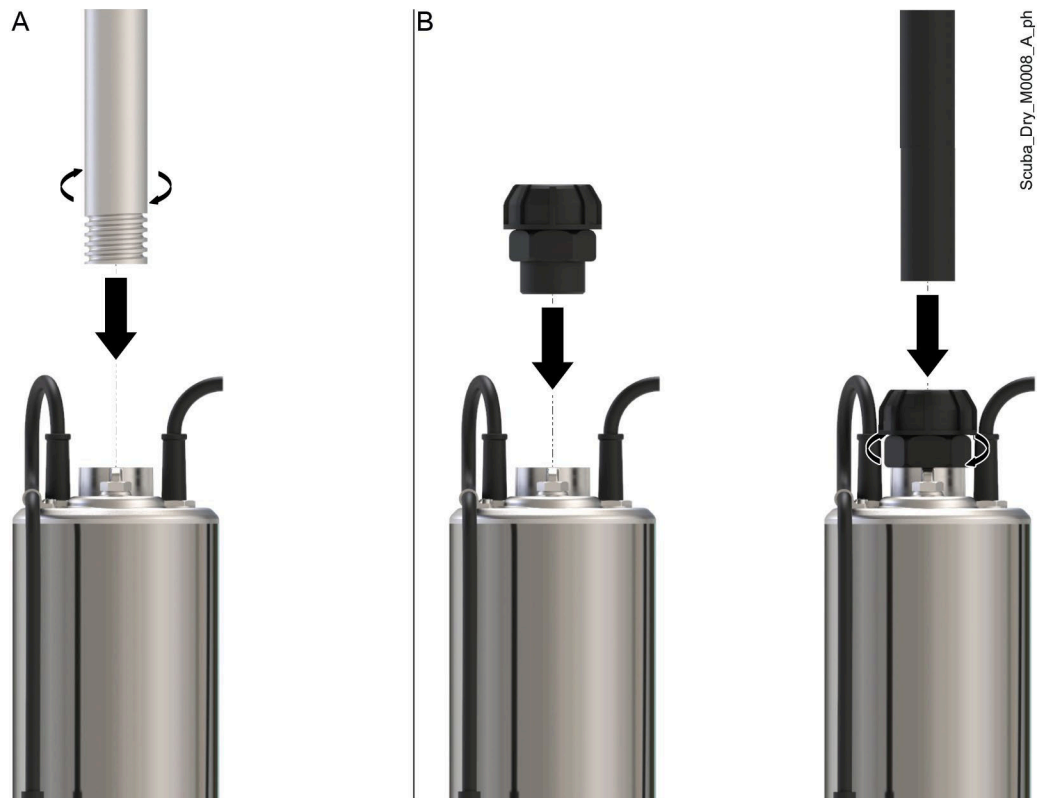
4.3.2 Connecting submerged units

Preliminary operations

1. Check that the tank or the basin are of appropriate size for housing the unit, with an even perimeter without obstacles.
2. Check that the sizes of the tank/basin do not hinder the free movement of the float switch and the float suction filter, if present.

Guidelines

1. Connect the piping to the unit discharge port:
 - a) In case of metal piping, this should be screwed directly to the port;
 - b) In case of plastic piping, use an adapter.



2. Install a check valve on the piping, at least 2 m (7 ft) from the unit, and then one every 10 m (33 ft).
3. Make a 3 mm (1/8") relief hole 10 cm (3.9 in) from the discharge port.
4. Secure the power supply cord to the piping with nylon ties at distances of 3 m (10 ft) from each other, keeping it loose from one tie and the next, to avoid it being pulled in case of piping expansion.
5. Secure a rope made of non-perishable material to the lifting ring.
6. Lower the unit in the tank/basin holding it with the rope.
7. Position the unit:
 - At the centre of the tank/basin
 - Submerged in the liquid at a depth of at least 15 cm (6 in)
 - At a maximum depth of 17 m (56 ft) from the maximum level of the liquid
 - With at least 3 m (10 ft) of power supply cord out of the liquid
 - With the float switch, if installed, at least 5 cm (2 in) from the wall of the tank/basin
 - With the float suction filter, if installed, below the water level.

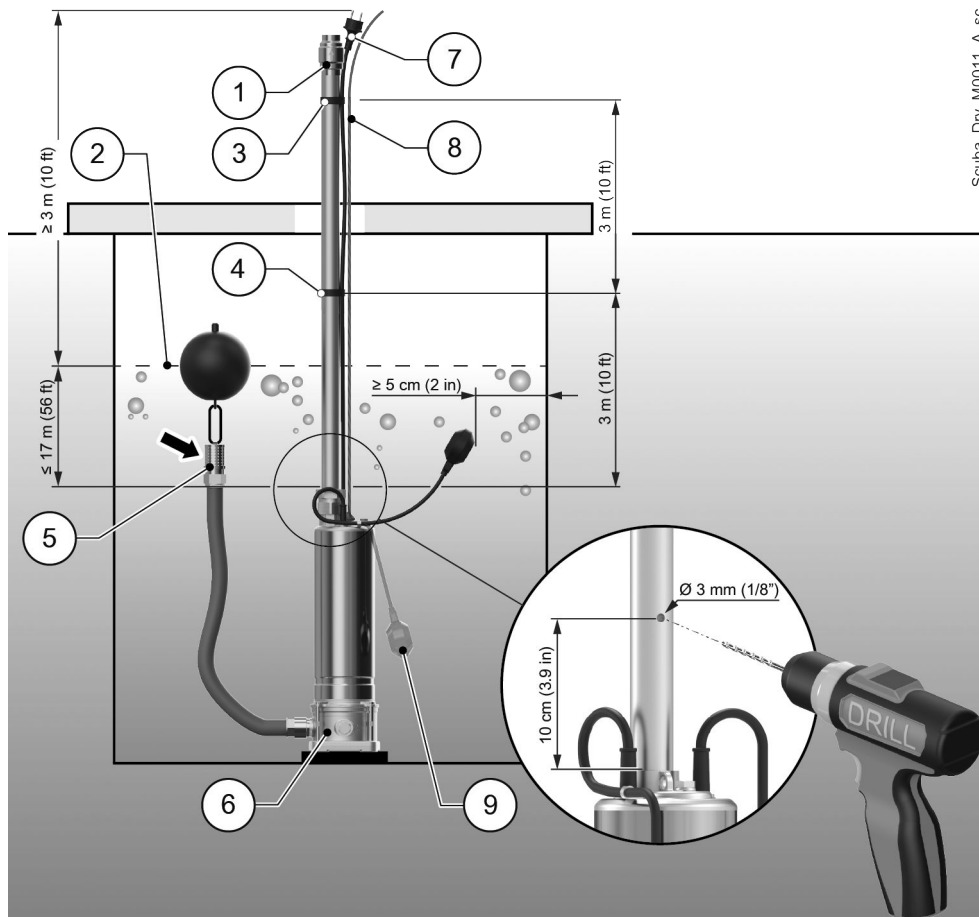


Figure 3: Submerged unit, installation example

1. Check valve
2. Maximum level
3. Nylon tie
4. Nylon tie
5. Float suction filter (optional)
6. Unit
7. Electric power supply cord
8. Lifting rope
9. Float switch (optional)

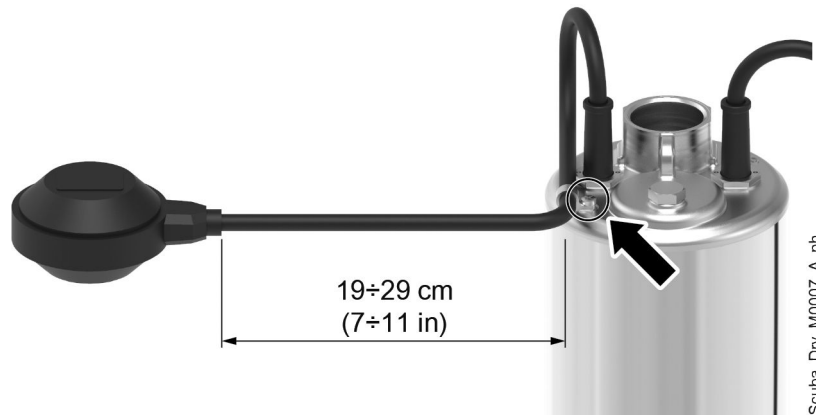
NOTICE:

In the operating position, the unit, the piping system, the electric power supply cord and the lifting rope must never be in contact with the walls of the tank/basin.

Float switch adjustment

If present, the float switch controls the automatic start and stop of the unit. To change its action:

1. Loosen the floater adjustment clip screw.



2. Adjust the length of the float switch cable based on the desired minimum and maximum levels:
 - Short: decrease the distance between minimum and maximum level, more frequent starts and stops.
 - Long: increase the distance between minimum and maximum level, less frequent starts and stops.
3. Tighten the screw.
Tightening torque: 1.5 Nm (13 lbf-in).

NOTICE:

The float switch cable length must not be less than 19 cm (7 in).

4.4 Electrical connection



DANGER:

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



DANGER: Electrical hazard

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

4.4.1 Ground



DANGER: Electrical hazard

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



DANGER: Electrical hazard

Connect the pump unit and any electric accessories to a socket with protection conductor (ground).

**DANGER: Electrical hazard**

Check that the external protection conductor (ground) 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.

4.4.2 Guidelines for electrical connection

1. Check that:
 - The mains voltage and frequency match the specifications on the data plate
 - The power supply cord is protected from high temperatures, vibrations, collisions and abrasions.
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
 - For use in swimming pools, garden ponds or similar, and only when inside there are no people or animals, a residual current earth leakage switch ($I_{\Delta N} \leq 30 \text{ mA}$)
 - If it is not possible to visually check the level of the liquid, install a system for protection against dry run connected to a pressure switch (or float switch, probes, or other suitable devices)
 - In case of permanent installation, install an RCCB earth leakage switch with tripping current $\leq 30 \text{ mA}$.

Overload or overtemperature protection - single-phase motor unit

**DANGER: Electrical hazard**

Connect the plug to a socket with protection conductor (ground).

The unit is equipped with built-in capacitor and motor protector, and stops automatically in case of overload or overtemperature.

After a few minutes the motor protector gives the restart consent.

Overload protection - three-phase motor unit

Install an appropriate motor protector in the control panel, with D curve in accordance with the current shown in the data plate.

Calibrate the motor protector depending on the use of the motor:

- With full load, comply with the nominal current value on the data plate
- With partial load, comply with the value of the operating current measured with a current pincer.

4.4.3 Guidelines for the electrical control panel

NOTICE:

The electric panel must match the ratings on the data plate. Improper combinations could damage the motor.

- Install appropriate devices for protecting the motor from overloads and short circuits:

Motor	Safety features
Single-phase	<ul style="list-style-type: none"> • Automatic reset thermal-ampere protection, in-built (motor protector) • From short circuit, by the installer: aM fuses (motor start-up), or thermal magnetic switch with C curve and $I_{cn} \geq 4.5 \text{ kA}$, or other similar device.
Three-phase	<ul style="list-style-type: none"> • Thermal, by the installer: trip class 10 A overload thermal relay + aM fuses (motor start-up), or start class 10 A motor protection thermal magnetic switch • From short circuit, by the installer: aM fuses (motor start-up), or thermal magnetic switch with C curve and $I_{cn} \geq 4.5 \text{ kA}$, or other similar device.

- If required, install phase failure sensitive thermal relays.

4.4.4 Operation with frequency converter

Single-phase and three-phase motors can be connected to a frequency converter for speed control.

- The converter exposes the insulation of the motor to a greater load, determined by the length of the connecting cable: observe the requirements of the Manufacturer of the frequency converter
- The minimum frequency must not fall below 25 Hz
- The head of the unit must never be below 2 m (6.5 ft)
- For applications requiring silent operation, install an outlet filter between the motor and the converter; a sinusoidal filter can reduce the noise even further
- The conditions of installation must guarantee protection against voltage peaks between the terminals and/or dV/dt in the table:

Motor size	Voltage peak, V	dV/dt , V/ μs
up to 90R (500 V)	< 650	< 2200
from 90R to 180R	< 1400	< 4600
over 180R	< 1600	< 5200

5 Use and operation

5.1 Precautions



DANGER: Electrical hazard

Do not use the unit in swimming pools or similar places when people are inside.



WARNING:

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



WARNING: Electrical hazard

Check that the unit is properly connected to the mains power supply.



WARNING: Injuries hazard

The unit, equipped with a single-phase motor with automatic reset thermal overload protection, could restart inadvertently after it has cooled down: risk of physical injury.



WARNING:

It is prohibited to put combustible materials near the unit.



WARNING:

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

NOTICE:

Dry run of the unit is forbidden.

NOTICE:

It is prohibited to operate the unit with the on-off valve closed.

NOTICE:

- SCD model: the unit must be primed before startup
- SCDS model: the unit must be submerged in the liquid at a depth of at least 15 cm (6 in) before startup.

NOTICE:

Make sure that there is no residual air inside the unit.

5.2 Initial start-up

5.2.1 Surface unit

1. Shut the on-off valve located on the discharge line.
2. Open the on-off valve on the suction line, if present.
3. Using the filling plug, fill the suction lift unit, or vent the positive suction head unit.
4. Start the unit by connecting the plug to the power supply and/or turning on the switch.
5. Slowly fully open the on-off valve on the discharge side.
6. With the unit in operation, check that:
 - No liquid is leaking from the unit or piping system
 - There is no unwanted noise or vibrations
 - The electric consumption is within the rating plate limits
 - The unit offers the expected hydraulic performance levels.
7. Note down the pressure value at zero flow rate.

5.2.2 Submerged unit

1. Shut the on-off valve located on the discharge line.
2. Vent the unit using the fill plug.
3. Start the unit by connecting the plug to the power supply and/or turning on the switch. If the unit has a float switch, it may start or not depending on its position.
4. With the unit in operation, slowly fully open the discharge on-off valve.
5. With the unit in operation, check that:
 - No liquid is leaking from the unit or piping system
 - There is no unwanted noise or vibrations
 - The absence of vortexes nearby the suction port
 - The float switch, if installed, moves without obstacles
 - The electric consumption is within the rating plate limits
 - The unit offers the expected hydraulic performance levels.
6. Note down the pressure value at zero flow rate.

5.3 Rotation sense check (three-phase motors)

1. Shut the on-off valve located on the discharge line.
2. Start the unit.
3. Check the pressure gauge: if no pressure or low pressure is detected, the rotation direction is wrong.
4. Stop the unit.

5.3.1 Wrong rotation direction

1. Disconnect the power supply.
2. Invert two of the three wires of the power supply cord, on the electric panel side.

5.4 Stopping

1. Shut the on-off valve located on the discharge line.
2. Stop the unit by disconnecting the plug from the power supply and/or turning off the switch. If a float switch is installed, the unit stops automatically when the same reaches the low position (minimum liquid level).
3. Slowly open the on-off valve again and check that no liquid is returning to the tank/basin through the unit.

6 Maintenance

6.1 Precautions

Before starting the works, make sure that the instructions shown in **Introduction and Safety** on page 4 have been fully read and understood.



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.



DANGER: Electrical hazard

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



DANGER: Electrical hazard

If the unit is connected to the frequency converter, disconnect the mains power supply and wait at least 10 minutes for the residual current to dissipate.

6.2 Surface unit maintenance

Every 6 months:

1. Check the integrity of the power supply cord; if the cord is damaged, put the unit out of service and contact Xylem or the Authorised Distributor for its replacement.
2. Check the pressure at zero flow rate and compare it with the pressure recorded during first start up; if the difference between the two values exceeds 10-15%, contact Xylem or the Authorised distributor.
3. Carefully clean the unit and the filters.

6.3 Submerged unit maintenance

Every 6 months of operation or at the end of the season, when the first of the two limits is reached:

1. Check the integrity:

- Of the power supply cord
- Of the float switch cable, if present
- Of the float suction filter, if present.

If either of them is damaged, contact Xylem or the Authorised Distributor for the replacement.

2. Check the pressure at zero flow rate and compare it with the pressure recorded during first start up; if the difference between the two values exceeds 10-15%, contact Xylem or the Authorised distributor.
3. Carefully clean the unit and the filters.

6.4 Long periods of inactivity

1. Units used for pumping salt water, meeting the specifications in **Technical Information** on page 33, must be rinsed with fresh water afterwards.
2. Empty the unit and the piping.
3. Put the unit out of service.
4. Protect the unit against freezing.

Before restarting the unit, see **Initial start-up** on page 26.

6.5 Spare parts ordering

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

7 Troubleshooting

7.1 Precautions



WARNING:

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



WARNING:

Observe the safety requirements in the chapters on **Use and Operation** and **Maintenance**.



WARNING:

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

7.2 The unit does not start

Cause	Solution
Power supply cut off	Restore the power supply
Float switch in the low position	<ul style="list-style-type: none"> • Check the liquid level in the tank/basin and/or • Adjust the float switch and/or • Check that the float switch can move without impediments
The motor protector in the panel has tripped (three-phase version)	See paragraph 7.8
The thermal protection has tripped (single-phase version)	Contact Xylem or the Authorised Distributor for the replacement
Power supply cord is damaged	Contact Xylem or the Authorised Distributor for the replacement
Float switch cable damaged	Contact Xylem or the Authorised Distributor for the replacement
Panel capacitor faulty (three-phase version)	Replace the capacitor
Unit capacitor faulty	Contact Xylem or the Authorised Distributor for the replacement
Control panel faulty	Check and repair or replace the control panel
Starter set incorrectly, or faulty	Adjust or replace the starter

7.3 There is little or no flow rate and pressure

Cause	Solution
Three-phase motor turning in the wrong direction	Check the direction of rotation and change if necessary; see paragraph 5.3
Presence of air in the unit	<ul style="list-style-type: none"> • Bleed the unit and/or • Make a relief hole, see paragraph 4.3.2, and/or • Raise the liquid level, and/or • Increase the installation depth, and/or • Reduce the flow rate and/or • Replace the unit with another with lower performance levels and/or • Increase the diameter of the suction pipe to reduce flow resistance
Check valve locked in closed or partially closed position	Replace the check valve
Foot check valve locked in closed or partially closed position	Replace the foot check valve
Suction filter clogged	Clean the filter
Throttled suction and/or discharge pipes	Remove the throttling
Piping and/or unit clogged	Remove the clogging
Energised	Check the electric power supply
Liquid leaks from the gaskets of the piping system or the unit	<ul style="list-style-type: none"> • Replace the gaskets • Check that the installation complies with the intended use limits and/or • Contact Xylem or the Authorised Distributor
Low rotation speed	Check the calibration of the frequency converter, if installed
Undersized unit	Contact Xylem or the Authorised Distributor

7.4 The unit starts too frequently (automatic start/stop)

Cause	Solution
The float switch does not work correctly	<ul style="list-style-type: none"> • Check the liquid level in the tank/basin and/or • Adjust the float switch and/or • Check that the float switch can move without impediments
Check valve blocked or clogged	Replace the check valve
Starter set incorrectly, or faulty	Adjust or replace the starter
Expansion vessel <ul style="list-style-type: none"> • No pre-charge, or • Undersized, or • Not installed 	<ul style="list-style-type: none"> • Pre-charge the expansion vessel, or • Replace the expansion vessel with another suitable one, or • Install an expansion vessel
Oversized unit	Contact Xylem or the Authorised Distributor

7.5 The unit never stops (automatic start/stop)

Cause	Solution
The float switch does not work correctly	<ul style="list-style-type: none"> • Check the liquid level in the tank/basin and/or • Adjust the float switch and/or • Check that the float switch can move without impediments
The required flow rate is greater than the one expected	Reduce the required flow rate
Leaking of fluid from the piping	Eliminate the leaks
Three-phase motor turning in the wrong direction	Check the direction of rotation and change if necessary
Pipes, on-off valves or filter clogged with impurities	Remove the impurities
Starter set incorrectly, or faulty	Adjust or replace the starter
The unit runs but there is little or no flow rate	See paragraph 7.3

7.6 The differential protection device (RCD) is activated

Cause	Solution
Unsuitable type of differential	Check the type of differential
Low insulation unit	Contact Xylem or the Authorised Distributor for the replacement

7.7 The unit stops and starts cyclically, single-phase version

The unit with single-phase motor stops and starts cyclically, without the intervention of the float switch or the starter.

Cause	Solution
Liquid temperature too high	Bring the liquid temperature back within the permitted limit
Unit mechanically seized	Check and repair the unit
Wrong power supply voltage	Check the power supply voltage
Pumped liquid too thick	Check the pumped liquid
Too many starts	See paragraph 7.4
Wrong duty point, flow rate below or above the permitted limits	Bring the flow rate back within the permitted limits
Unit faulty	Contact Xylem or the Authorised Distributor for the replacement

7.8 The motor protector in the panel has tripped, three-phase version

Cause	Solution
It is calibrated at a value too low in relation to the rated current of the motor	<ul style="list-style-type: none"> Repeat the motor protector calibration, and/or Install a correctly sized motor protector
Missing power supply phase	Check the power supply and restore the phase
Loose and/or faulty motor protector connections	Tighten or replace the clamps and terminals
The unit does not turn freely due to a mechanical fault	Check and repair the unit
Power supply cord is damaged	Contact Xylem or the Authorised Distributor for the replacement
Wrong power supply voltage	Check the power supply voltage
Pumped liquid too thick	Check the pumped liquid
Panel installation room temperature too high	Lower the room temperature
Too many starts	See paragraph 7.4
Wrong duty point, flow rate below or above the permitted limits	Bring the flow rate back within the permitted limits
Unit faulty	Contact Xylem or the Authorised Distributor for the replacement

7.9 The unit produces excessive noise and/or vibrations

Cause	Solution
Resonance	Check the installation
Frequency converter wrongly calibrated (if present)	See the frequency converter manual
Foreign bodies in the unit	Remove the foreign bodies
The unit does not turn freely due to a mechanical fault	Send the unit to an authorised workshop for testing
Wrong duty point, flow rate below or above the permitted limits	Bring the flow rate back within the permitted limits
Presence of air in the unit	<ul style="list-style-type: none"> Bleed the unit and/or Make a relief hole, see paragraph 4.3.2, and/or Raise the liquid level, and/or Increase the installation depth, and/or Reduce the flow rate and/or Replace the unit with another with lower performance levels and/or Increase the diameter of the suction pipe to reduce flow resistance
Unit not secured or incorrectly secured to the foundation	Secure the unit to a concrete or metal foundation base sufficiently strong to ensure permanent and sturdy support

7.10 The frequency converter is in error mode or turned off

The frequency converter (if present) is in error mode or turned off.

Cause	Solution
See the frequency converter manual	See the frequency converter manual

8 Technical Information

8.1 Operating environment

Non-aggressive, non-explosive atmosphere, and not subjected to frost.

Temperature of pumped liquid

0 to 40°C (32 to 104°F).

NOTICE:

If the temperature exceeds the stated limits, contact Xylem or the Authorised Distributor.

Suspended impurities

Model	Maximum diameter, mm (in)
1SCD(S)	≤ 1.0 (0.04)
3SCD(S), 5SCD(S), 8SCD(S)	≤ 2.0 (0.08)

Chloride concentration

≤ 200 ppm at 20°C (68°F).

Sand quantity

≤ 25 g/m³.

8.2 Maximum head

50 Hz

Model	Head, m (ft)	Model	Head, m (ft)	Model	Head, m (ft)
1SCD..9/09/5C	75 (245)	3SCD..8/15/5T	90 (294)	5SCD..5/09/5T	59 (193)
1SCD..7/07/5C	60 (197)	3SCD..7/09/5T	79 (258)	5SCD..4/07/5T	48 (156)
1SCD..6/05/5C	101 (331)	3SCD..5/07/5T	58 (190)	5SCD..3/05/5T	36 (117)
1SCD..9/09/5T	78 (257)	3SCD..4/05/5T	47 (153)	8SCD..6/15/5C	65 (214)
1SCD..7/07/5T	61 (201)	5SCD..8/15/5C	93 (304)	8SCD..3/09/5C	32 (104)
1SCD..6/05/5T	102 (335)	5SCD..6/11/5C	70 (228)	8SCD..2/05/5C	21 (69)
3SCD..9/15/5C	91 (298)	5SCD..5/09/5C	59 (195)	8SCD..6/22/5T	66 (215)
3SCD..8/11/5C	78 (255)	5SCD..4/07/5C	47 (156)	8SCD..5/15/5T	55 (179)
3SCD..7/09/5C	57 (186)	5SCD..3/05/5C	35 (116)	8SCD..4/11/5T	44 (144)
3SCD..5/07/5C	45 (149)	5SCD..8/22/5T	94 (309)	8SCD..3/09/5T	33 (108)
3SCD..4/05/5C	101 (331)	5SCD..7/15/5T	83 (271)	8SCD..2/05/5T	22 (72)
3SCD..9/22/5T	75 (245)	5SCD..6/11/5T	71 (232)	-	-

60 Hz

Model	Head, m (ft)	Model	Head, m (ft)	Model	Head, m (ft)
1SCD3/05/6C	46 (151)	5SCD3/11/6C	51 (167)	3SCD4/09/6T	67 (219)
1SCD4/07/6C	61 (200)	5SCD4/15/6C	69 (226)	3SCD6/15/6T	100 (328)
1SCD5/09/6C	73 (238)	8SCD2/11/6C	32 (103)	5SCD2/07/6T	35 (115)
1SCD6/11/6C	86 (283)	8SCD3/15/6C	47 (155)	5SCD3/11/6T	52 (172)
3SCD2/05/6C	33 (107)	1SCD3/05/6T	45 (147)	5SCD4/15/6T	68 (223)
3SCD3/07/6C	49 (161)	1SCD4/07/6T	60 (196)	5SCD6/22/6T	102 (335)
3SCD4/09/6C	65 (214)	1SCD5/09/6T	75 (244)	8SCD2/11/6T	32 (104)
3SCD5/11/6C	82 (268)	1SCD6/11/6T	89 (293)	8SCD3/15/6T	48 (156)
3SCD6/15/6C	98 (321)	3SCD2/05/6T	34 (110)	8SCD4/22/6T	63 (208)
5SCD2/07/6C	34 (112)	3SCD3/07/6T	50 (165)	-	-

8.3 Maximum operating pressure PN

1MPa (145 psi).

Note:

$$P_{1max} + P_{max} \leq PN$$

Data	Description
P1max	Maximum input pressure
Pmax	Maximum pressure generated by the unit
PN	Maximum operating pressure

8.4 Maximum number of starts per hour

Motor power, kW	Starts / h
0.5 - 0.9	25
1.1 - 2.2	20

8.5 Mechanical characteristics

Electric power supply cord length

Unit	Length, m (ft)
Surface	5 (16)
Submerged	20 (66)

Maximum immersion depth

17 m (56 ft)

Protection class

IPX8.

8.6 Electrical specifications

Speed

Frequency Hz	Speed, min ⁻¹
50	2900
60	3500

Permitted tolerances for the supply voltage

Frequency Hz	Phase ~	No. of conductors + earth	UN, V ± %
50	1	2 + 1	220-240 ± 6
	3	3 + 1	230/400 ± 10
60	1	2 + 1	220-230 ± 6
	3	3 + 1	220/380 ± 5

8.7 Sound pressure

Unit position	LpA sound pressure level measured in free field at a distance of one metre, dB ± 2
On the surface	< 70
Submerged	Non-applicable

8.8 Materials in contact with the liquid

Component	Material
Pump body, base (SCDS), sleeve, diffuser, stator casing	AISI 304 stainless steel
Shaft	AISI 431 stainless steel
Impeller, lower bracket, upper head	Technopolymer

9 Disposal

9.1 Precautions



WARNING:

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



WARNING:

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

9.2 WEEE 2012/19/EU (50 Hz)

(IE) (MT) (GB) 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 favors the re-use and / or recycling of the materials it is composed of the equipment.

WEEE from private household¹: please contact your municipality, or local authority, for all information regarding the separate collection systems available in the area. The retailer is obliged to collect the old equipment free of charge when buying new equipment of an equivalent type, for the purpose of starting the correct recycling / disposal.

WEEE other than WEEE from private households²: the separate collection of this equipment at the end of its life is organized and managed by the producer. 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 a supply chain independently authorized to manage.

Producer of EEE as per Directive 2012/19/EU:

(IE)

Xylem Water Solutions Ireland Ltd - 50 Broomhill Close - Airton Road - D24 Tallaght - Dublin 24

(MT)

-

(GB)

Xylem Water Solutions UK Ltd - Millwey Rise Industrial Estate - Axminster - Devon EX13 5HU

¹ Classification according to the type of product, use and local legislation in force

² Classification according to the type of product, use and local legislation in force

10Declarations

10.1 EC Declaration of Conformity (Original)

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

Close-coupled pump unit (see rating plate)

fulfils the relevant provisions of the following European Directives:

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

and the following technical standards:

- EN 809:1998+A1:2009, EN 60335-1:2012 + A11:2014 + A13:2017, EN 60335-2-41:2003 + A1:2004, + A2:2010³, EN 62233:2008.

Montecchio Maggiore, 27/01/2020

Amedeo Valente
(Director of Engineering and R&D)



rev.00

³ Except section 25.8 for SCDS version models with power supply cords less than 20 m (33 ft) long

10.2 EU Declaration of Conformity (n. 36)

1. (EMCD) Apparatus/product model: SC.. (see rating plate)
(RoHS) Unique identification of the EEE: N. SC..
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:
Close-coupled pump unit.
5. The object of the declaration described above is in conformity with the relevant Union harmonization legislation:
 - 2014/30/EU Directive of 26 February 2014 (electromagnetic compatibility) and subsequent amendments
 - 2011/65/EU Directive of 8 June 2011 (restriction of the use of certain hazardous substances in electrical and electronic equipment) and subsequent amendments.
6. References to the relevant harmonized standards used or references to the other technical specifications, in relation to which conformity is declared:
 - EN 55014-1:2006 + A1:2009 + A2: 2011, EN 55014-2:1997 + A1:2001 + A2:2008, EN 61000-3-2:2014, EN 61000-3-3:2013.
 - EN 50581:2012.
7. Notified body: -
8. Additional information:
RoHS - Annex III - Applications exempt from the restrictions: lead as a binding element in steel, aluminium, copper alloys [6a), 6b), 6c)].

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

Montecchio Maggiore, 07/01/2020

Amedeo Valente
(Director of Engineering and R&D)



rev.00

Lowara is a trademark of Xylem Inc. or one of its subsidiaries.

11 Warranty

11.1 Information

For information on the warranty refer to the documentation of the sale contract.

Xylem |'zīləm|

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

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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



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www.xylem.com/brands/lowara

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