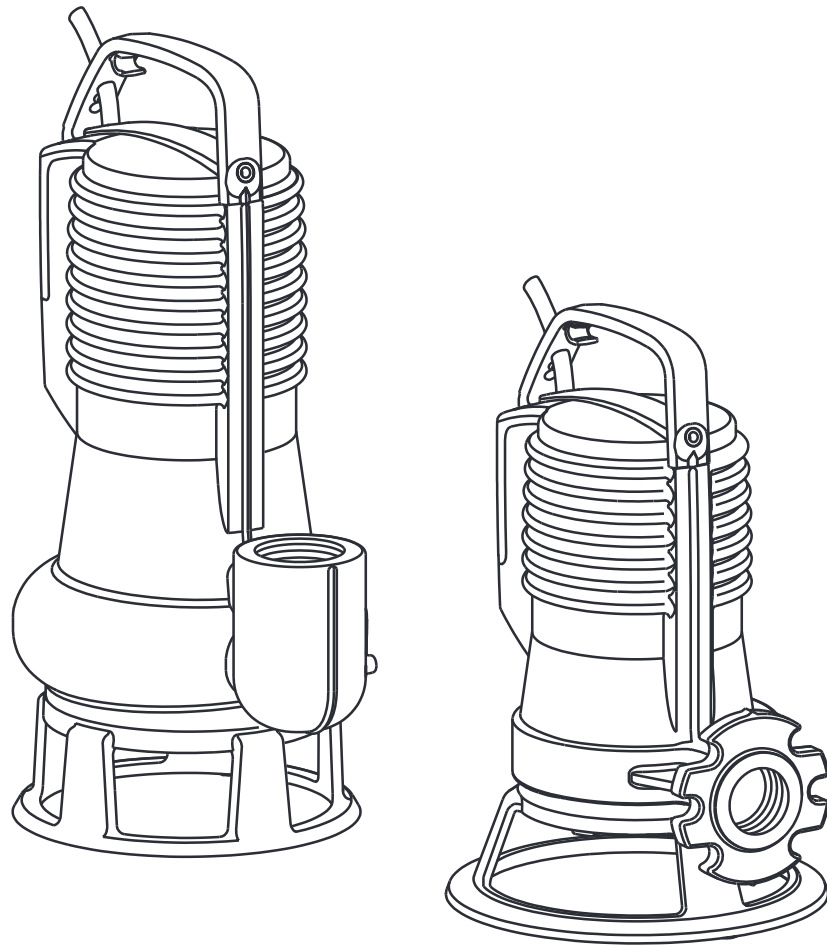




water solutions



**use and maintenance booklet
safety instructions**



EU DECLARATION OF CONFORMITY



The manufacturer:

ZENIT ITALIA S.r.l.
Via dell'Industria, 11 - 41018 S.Cesario S.P. MODENA - (ITALY)

Declares that the submersible electric pump, series BLUE and BLUEPRO, -Ex versions with marking

 **II 3G k Ex nA IIC T3 Gc**
 **II 3G k Ex nA nC IIC T3 Gc**

II: Equipment Group: for surface (not mines)

3G: Level of protection: Normal Required level of protection Type of explosive atmospheres (group **II**): Gas vapours –Zone 2

nA: non sparking apparatus

nA nC: non sparking apparatus with encapsulated thermal protection device

k: the mechanical protection mode used for the device corresponds to that of protection for immersion in liquids

IIC: enclosure appropriate for substances in group IIC (also suitable for environments with substances classified as IIA and IIB)

T3: temperature class

Gc: Equipment Protection Level (EPL); suitable for Zone 2 use (not suitable for Zone 1 or 0). Equipment category 3G.

Meet the Essential Health and Safety Requirements applicable to them in terms of the directive ATEX 2014/34/UE and IEC Ex scheme.

The following main standards are applied: EN 60079-0:2012+A11:2013, EN 60079-15:2010, EN 13463-1:2009, EN 13463-8:2003, IEC 60079-0:2011, IEC 60079-15:2010 - EN 60034-1:2010-10+EC:2010-10; EN 60335-1:2012-01; IEC 60335-2-41:2012.

The aforesaid equipment has been approved by the following certification procedures:

- Type examination certificate (Voluntary request of Directive 2014/34/UE) number EPT 16 ATEX 0228 X and - IEC Ex Certificate of Conformity (CoC) N° IECEX EUT 16.0006X issued by Eurofins Product Testing Italy s.r.l. via Cuorgnè 21 - 10156 Turin (Italy).

IEC Ex Quality Assessment Report (QAR):

Zenit Italia S.r.l. N° DNV/QAR10.0002/02 performed by DNV - DNV (DNV Nemko Presafe AS)

Zenit pumps (Suzhou) Co., Ltd N° CN/CQM/QAR10.0003/04 performed by CQM - China Quality Mark Certification Group Co., Ltd.

The manufacturer ZENIT ITALIA S.r.l. operates in accordance with Quality Control System procedures which comply with the UNI EN ISO 9001 standard, accredited by DNV with certificate no. CERT-00660-95-AQ-IND-SINCERT

We also declare that the technical file for the electric pump is available at:

Zenit Italia S.r.l.

Via dell'Industria, 11 - 41018 S.Cesario s.P. Modena - (ITALIA)

Modena, _____

Signed
Massimiliano Volta
(Director)



1. USE AND MAINTENANCE INSTRUCTIONS

1.1 Introduction

Before installing and using the pump, read the instructions given below carefully.

There is a self-adhesive label supplied with this manual bearing all the pump data, which must be applied to the manual in the relative space. This manual must be kept for the entire life of the product, as the manufacturer cannot be held responsible for damage, to people or things, caused by the submersible electric pump if used in any other ways than those provided for herein, or in the event that the maintenance and safety regulations are not complied with. In any case, the pump's installation and use must be effected by qualified adults.

1.2 Safety

Do not allow the electric pump to be used by children or non-qualified persons.

Do not modify the pump for any reason (such as fitting couplings or carrying out drilling or finishing work, etc...).

Do not put your fingers or other objects in the intake and delivery holes.

Be particularly careful when using the GRBLUE model, which is fitted with a shredder blade in the intake area.

Ensure the end of the electric power cable does not come into contact with the fluid.

When carrying out installation, checking or maintenance operations on the electric pump, always use Personal Protective Equipment (PPE), i.e. regulation garments and equipment.

Accident-prevention shoes and gloves, safety goggles and leather aprons must be always be worn.

Before handling the fitted product, wash it thoroughly with running water.

Only connect the electricity supply once the electric pump has been correctly installed.

Unplug the unit at the mains before carrying out any maintenance and/ or cleaning operations or when simply removing the pump from the fluid.

Use jets of water and/ or detergent to clean the machine before carrying out any maintenance and/ or cleaning operation.

Do not obstruct the fluid intake and delivery pipes.

In the event of damage, stop the pump immediately.

Contact an authorised Zenit technical service centre for repairs and always request the use of original spare parts.

Failure to comply with the above could result in impaired pump safety, in addition to forfeiture of the warranty.

1.3 Conditions of use

Heavy-duty electric pumps suitable for use with a limited number of start-ups per hour, not suitable for fluids for alimentary use.

The DR*blue*, DR*blue*PRO, DG*blue*PRO, DG*blue*, GR*blue*PRO, AP*blue*PRO model electric pumps are designed to treat fluids such as clear water, dirty water or sewage.

The electric pump normally works completely immersed in the fluid in order to prime itself and to pump out. The pump must be immersed completely in the fluid so that the latter can cool the motor sufficiently.

This way the inlet will not take in air and the pump will operate correctly.

In the DR*blue* - DR*blue*PRO versions the grating can be removed to enable fluid intake from up to the last few millimetres from the bottom.

The DR*blue*PRO and AP*blue*PRO models are designed for the evacuation of clear water or dirty water containing small solid bodies.

The DG*blue* - DG*blue*PRO model guarantees a clear passage for solids of up to 50 mm and is suitable for the treatment of dirty water.

The GR*blue*PRO model can be used for sewage containing fibres which can be shredded using an intake shredding system.

Number of start-ups per hour: some start-ups per hour are allowed;

Immersion depth: maximum of 7m beneath the fluid level;

Temperature of fluid treated: maximum of 40°C;

Density of fluid treated: maximum of 1.1 Kg/ dm³;

PH of fluid to be pumped: between 6 and 14;

If the electric pump is used in swimming pools and suchlike, people must not bath in or come into contact with the treated fluid until the pump has been removed from the pool.

Users must follow the safety rules in force in the country of use, as well as applying their common sense, and make sure the routine cleaning and maintenance operations are carried out correctly.

It is the installer's duty to check the correct environmental conditions for use of the pump, ensuring they guarantee safety and hygiene. The responsibilities of the staff authorised to use the electric pump are delegated to the customer.

1.4 Noise level

The submersible electric pumps feature an acoustic pressure level of below 70dB(A) when immersed and below 80dB(A) in the air.

1.5 Handling

The electric pumps of 30 kg or less can be handled and lifted manually using the special handle located in the upper section of the pump.

Do not use the electric power cable to lift or move the pump.

Check that the box and its contents are in perfect condition and stop the installation in the event that any defects or anomalies are found, then inform the supplier.

1.6 Storage

During storage, the electric pump must be kept in a suitable place, out of the reach of children or those with diminished responsibility, suitably secured against falling and protected from damp, dust, vibrations and extreme temperatures (below -5°C and above +40°C).

WARNING: Turn the impeller by hand occasionally (at least every month) through the outlet or intake, to prevent the mechanical seals from sticking together.

Following storage, inspect the electric pump to make sure there is no damage, check the oil level in the mechanical seals chamber and make sure the impeller spins freely.

If the electric pump needs to be stored for more than six months, prior to commissioning it, change the oil in the mechanical seals chamber and take it to an authorised disposal centre.

Do not dispose of the oil as household waste.

1.7 Installation

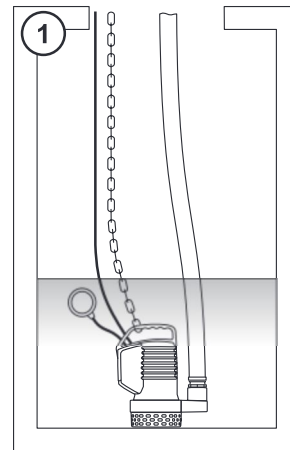
If the pump is installed in a shaft, this must have the following minimum dimensions: 350mm x 350mm x 350mm.

However, the manufacturer recommends the use of shafts which are no smaller than 500mm x 500mm x 500mm.

WARNING: Check that the submersible pump has been primed. In some cases, an air bubble may form in the upper part of the pump body, which prevents liquid pumping.

1.7.1 Mobile post (Fig. 1)

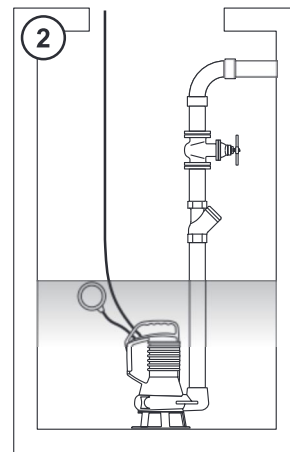
Using a hose union, connect the delivery pipe to a hose with an internal reinforcement coil and a diameter which is the same size as or larger than the electric pump outlet.



1.7.2 Fixed post (Fig. 2)

Connect the electric pump to a metal piping, fitting a non-return valve and an interception gate valve on the said metal piping. This ensures the pump stability is guaranteed by the piping.

The pump can also be connected to polyethylene piping, using the relative union. Connect the electric pump to the earth using the PVC insulated fork.

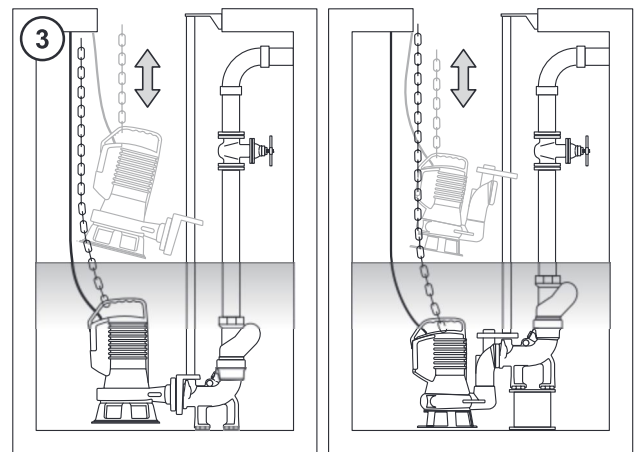


1.7.3 With the joining foot (fig. 3)

Designed for the horizontal outlet models. Fix the joining foot to the bottom of the tank first, using expansion plugs. Install the delivery pipe with the relative non-return valve and gate valve.

Engage two guide pipes on the joining foot, fixing them in the upper part using the spacer bracket provided by the manufacturer.

This way, the pump can be lowered supported with a galvanised chain or cable hooked around the handle and, thanks to the two guide pipes it will fit perfectly in place on the foot.



1.8 Electrical connections

All the operations involved in the connection to the electrical network must be carried out by skilled labour and in compliance with the legislation in force.

WARNING: In the wiring-up stage, connect the yellow-green earth conductor first, then the others.

For the protection of the electric motor and the safety of the people in the vicinity, connect the pump to a suitably-scaled differential overload switch.

WARNING: for the single-phase versions it is compulsory to avoid a high number of start-ups per hour in order to maintain the capacitor in the best condition.

Before installation make sure that:

- the power line has an earth and complies with the regulations in force
- the pump's and float switch cables are not damaged

If the electric connection is a three-phase connection, make sure the rotation direction is correct. Hold the pump by the handle, lifting it a few millimetres off the floor, then run the motor for one second. You should notice an anticlockwise reaction. If the pump is rotating in the wrong direction, simply invert two of the phases.

1.9 Residual risks

The risks that cannot be eliminated by the safety measure adopted by the manufacturer are caused by incorrect use of the pump or by the user's failure to comply with the safety regulations described in this manual. In particular, the user must ensure no people and/or animals come into contact with the fluid when the pump is working.

1.10 Maintenance

The pump maintenance and repair operations must be carried out by workers authorised by the manufacturer; Failure to comply with these instructions will result in forfeiture of the warranty and jeopardise the unit's safety. Before any cleaning and/ or maintenance operations are carried out on the electric pump, the power supply must be switched.

To disconnect the submersible electric pump from the electricity mains, first disconnect the phase conductors, then the yellow –green earth one.

Use the special handle to remove the submersible electric pump from the tank.

WARNING: Before carrying out any operations, check the pump temperature. Only work on the pump when it is at room temperature.

Clean the electric pump thoroughly, using a jet of water or specific products to clean all its parts.

When disposing of the waste material, follow the antipollution rules in force.

Replace any broken or worn parts with original spare parts only.

Given the likelihood that work on the electric pump will be carried out in confined spaces such as vats, wells, cesspools, tanks or cisterns, do not underestimate the risks caused by potentially poisonous exhalations.

Store the electric pump in a suitable place, out of reach of children and unauthorised persons.

Dispatch the electric pump to an authorised scrapping centre for its disposal.

Do not dump any parts of the electric pump.

2. SAFETY INSTRUCTIONS - Blue Standard and PROfessional series - Non sparking apparatus



2.1 Introduction

These safety instructions refer to the installation, operation and maintenance of the pump IECEx and ATEX Blue Standard and Professional Series for use in areas where there is a presence of potentially explosive atmospheres.

This document treats various safety aspects that involve pumps different constructive variants.

2.1.1 Group II apparatus for gas

The non sparking apparatus IECEx and ATEX Blue pumps have the following protection types against the risk of explosion, the first one concern pumps without thermal protection and the second one concern pump with thermal protection inside:

 II 3G k Ex nA IIC T3 Gc
 II 3G k Ex nA nC IIC T3 Gc

according to

IECEx scheme compliance with the standards IEC 60079-0:2011, IEC 60079-15:2010,

and ATEX scheme compliance with the standards EN 60079-0:2012+A11:2013, EN 60079-15:2010, EN 13463-1:2009, EN 13463-8:2003

2.2 Identification of non sparking apparatus

2.2.1 Suitability of the pump to the location of installation

The user shall check that pump is suitable to the area classification and to the characteristics of the flammable substances present. National Law, local Rules and Standards establish the essential safety requirements against the risk of explosion in classified areas.

2.2.2 Places subject to the presence of inflammable gas, mist or steam

The classification criteria for areas subject to the risk of explosion are laid down in the IEC 60079-10 standard.

The technical requirements for electrical plants located in classified areas are established by the IEC 60079-14 standard.

The choice of type of pump, according to these technical and legislative provisions, must take into account the following factors:

- Type of plant: above ground plants
- Zone classification: 0, 1, 2
- Characteristics of the flammable substances present in the form of gases, vapours or mists:
 - Sub-group: IIA, IIB, IIC
 - Temperature class: T3 (defines the ignition temperature of the gases)

2.3 Nameplate safety data

In addition to operating data, the information provided on the nameplate, includes:

- Information necessary to identify the appropriate type of pump and for the correct installation of the pump itself.
- References to the notified bodies responsible for certification.
 - II: Equipment Group: for surface (not mines)
 - 3G: Level of protection: Normal Required level of protection Type of explosive atmospheres (group II): Gas vapours –Zone 2
 - k: the mechanical protection mode used for the device corresponds to that of protection for immersion in liquids
 - nA: non sparking apparatus
 - nA nC: non sparking apparatus with encapsulated thermal protection device
 - IIC: enclosure appropriate for substances in group IIC (also suitable for environments with substances classified as IIA and IIB)
 - T3: temperature class
 - Gc: Equipment Protection Level (EPL); suitable for Zone 2 use (not suitable for Zone 1 or 0). Equipment category 3G.



- IECEX EUT: laboratory that issued the IECEX certificate of conformity / EPT: laboratory that issued the ATEX certificate of conformity
- 16: year in which the certificate was issued
- 0006: IECEX certificate number / ATEX 0228: ATEX certificate number
- **X: special conditions:**
 1. **The submersible pump shall operate only completely submersed.**
A suitable separated protection device shall prevent the pump from operate when not fully submersed.
 2. **Do not use the feeding cable to move the pump.**
The cable shall be protected against the risk of damage due to mechanical stresses.
 3. **The end connection of the feeding cable shall be made in safe area or in according to a type of protection listed in IEC 60079-0 standard suitable for the installation in hazardous area.**

Notes:

- IIC apparatus are also suitable for environments with substances classified as IIA and IIB.
- Apparatus with a given temperature class are also suitable for all substances with a higher temperature class (e.g.: T3 pumps are suitable for substances with a T3, T2, T1 temperature class).
- The certificate number indicate on the nameplate is followed by an "X".
It means that the user must follow specific conditions of use described in this manual.
- non sparking apparatus are normally made to be used at an ambient temperature in the range of 0 ÷ +40°C in submersible conditions.
- The pump has been designed to operate at the speeds indicated on the identification plate.
- The information provided in our catalogues must be observed to prevent the pump from overheating.

2.4 Installations

2.4.1 Mains

Connections to the mains must be performed as shown in the wiring diagrams supplied with the pump in the "Instructions for use and maintenance" manual.

If the terminal side of the cable is in a hazardous area, the connection has to be protected by a protection mode allowed by the IEC 60079-0 standard suitable for that hazardous area.

The plug has to be positioned out of the hazardous area.

Don't keep the pump with the hand.

2.5 Auxiliary components

2.5.1 Thermal protection

nA nC pumps have a thermal protection inside the motor suitable for interrupt the power supply in case of pump malfunctioning.

2.5.2 Starting capacitor

GRb/uePRO single phase pump version has a starting capacitor, which works in parallel to the standard capacitor, and it has to be connected outside the pump in an electrical cabinet situated outside the explosive atmosphere.

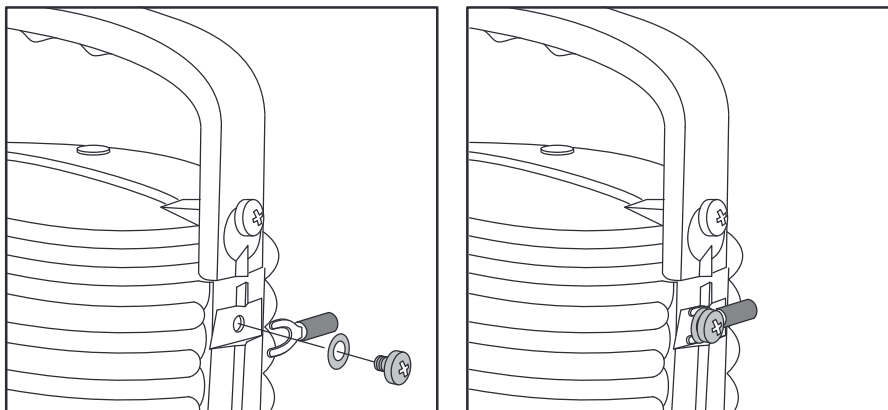
If it could not possible to get the starting capacitor, the pump fully works without it but it is important to avoid the pump to process big solid parts.

2.6 Earthing connection

Non sparking apparatus pumps are provided with two earthing terminals: one inside the pump envelope and the other on the pump frame. Depending on the cross-section of the line conductor, the earthing conductor cross-section must be:

<i>S - Line conductor section</i>	<i>H - Earth conductor section</i>
$S \leq 16 \text{ mm}^2$	$H = S$

The earth connection is made in the sequence indicated in the figures below:



2.7 Inspections and maintenance of pumps

The inspections and maintenance of the pump shall be executed in compliance with the criteria of the IEC 60079-17 standard.

The electrical connection terminals must be tightened fully to avoid high contact resistances and consequential overheating.

Care must be taken to ensure that the insulation distances on air and on the surfaces between the conductors are maintained, as established by the standards.

Replacement of gaskets and cable entry parts shall be executed using components that are identical to the components supplied by the manufacturer to ensure the protection degree is maintained.



2.8 Repair of classified areas pumps

Repairs made to spark protected pumps shall be executed in compliance with the criteria specified by IEC 60079-19 standard, by certifications and by this manual.

If repairs are not executed by the manufacturer, they must be carried out at workshop which have the necessary equipment and with adequate technical expertise concerning the pump protection methods and must be supervised by qualified and authorized personnel.

If repair work involves parts that influence the protection against explosions, the pump construction data must be not changed (e.g.: cable entries, winding characteristics, etc.) and if parts have to be replaced, this must be done with original components.

Standard IEC 60079-19 foresees various typologies of intervention that have different impacts on the integrity of the equipment submitted to maintenance; the possible activities are synthesized below:

1. Repair: action to restore to a faulty apparatus to its fully serviceable condition and in compliance with the relevant standard (relevant standard means the standard to which the apparatus was originally designed);
2. Overhaul: action to restore to a fully serviceable condition an apparatus which has been in use or in storage for a period of time but which is not faulty;
3. Maintenance: Routine actions taken to preserve the fully serviceable condition of the installed apparatus;
4. Reclamation: means of repair involving, e.g., the removal or addition of material to reclaim component parts which have sustained damage, in order to restore such parts to a serviceable condition in accordance with the relevant standard;
5. Modification: change to the design of the apparatus which affects material, fit, form or function.

Producer supports the activities of:

1. Reparation
2. Overhaul
3. Maintenance

but doesn't authorize interventions of:

1. Reclamation
2. Modification

Possible constructive modifications can be performed, in the respect of the ties of the certificate, only by the manufacturer.

A written report must be prepared by repairer with a detailed indication of the work carried out.

After a repair work has been properly completed, an additional nameplate shall be affixed to the pump (without removing the original one) showing the following marks:

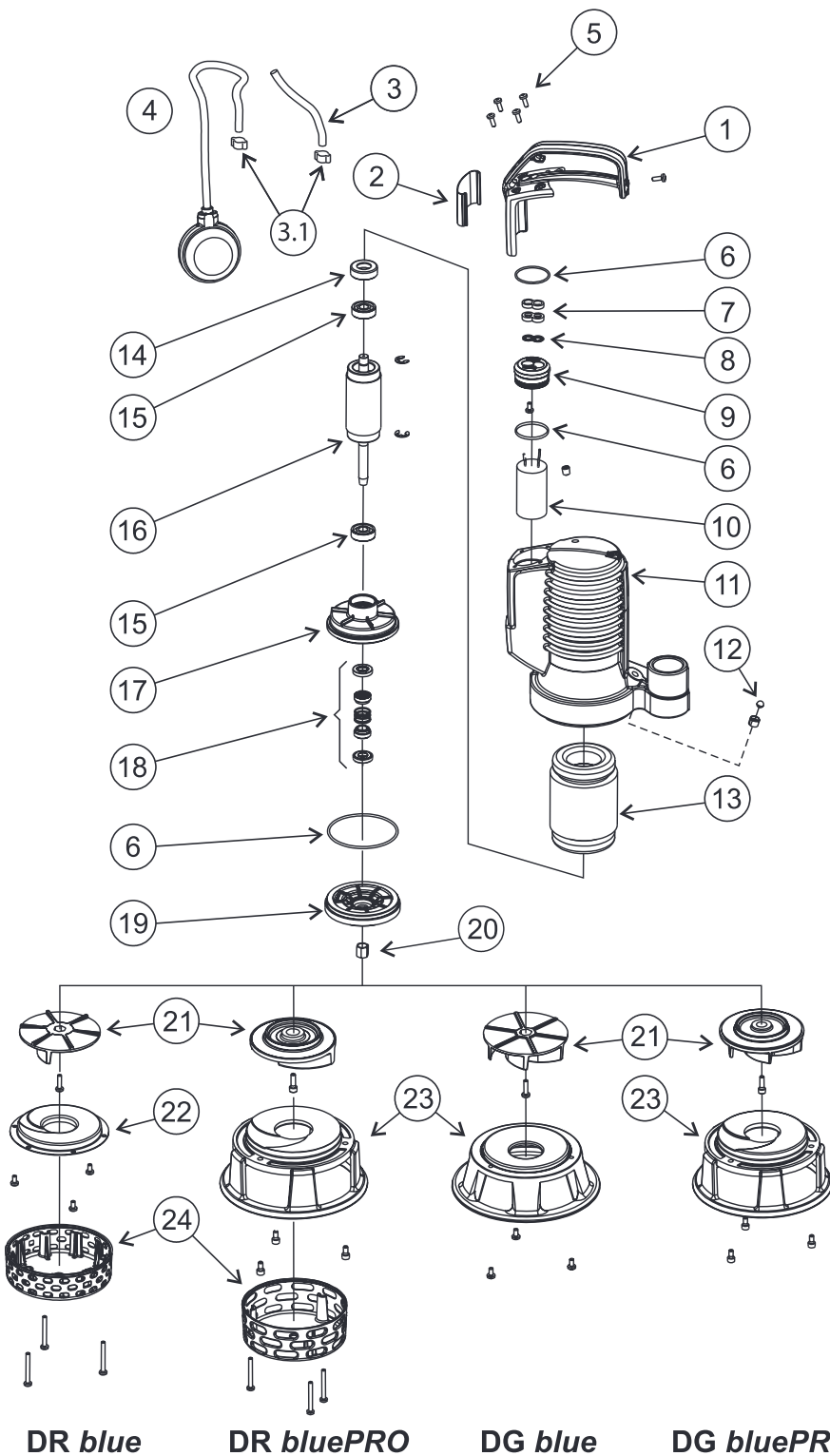
- Symbol R
- Name or trademark of the repairer
- Reparation number by the repairer
- Date of repair

In case of reparation modify relevant aspects concerning protections against explosions and pumps does not comply with the certificate, the original nameplate must be removed and the pump can no longer be used in areas where there is a danger of explosion.

Unless of re-examination and approval by a competent certification body.

3. Parts nomenclature

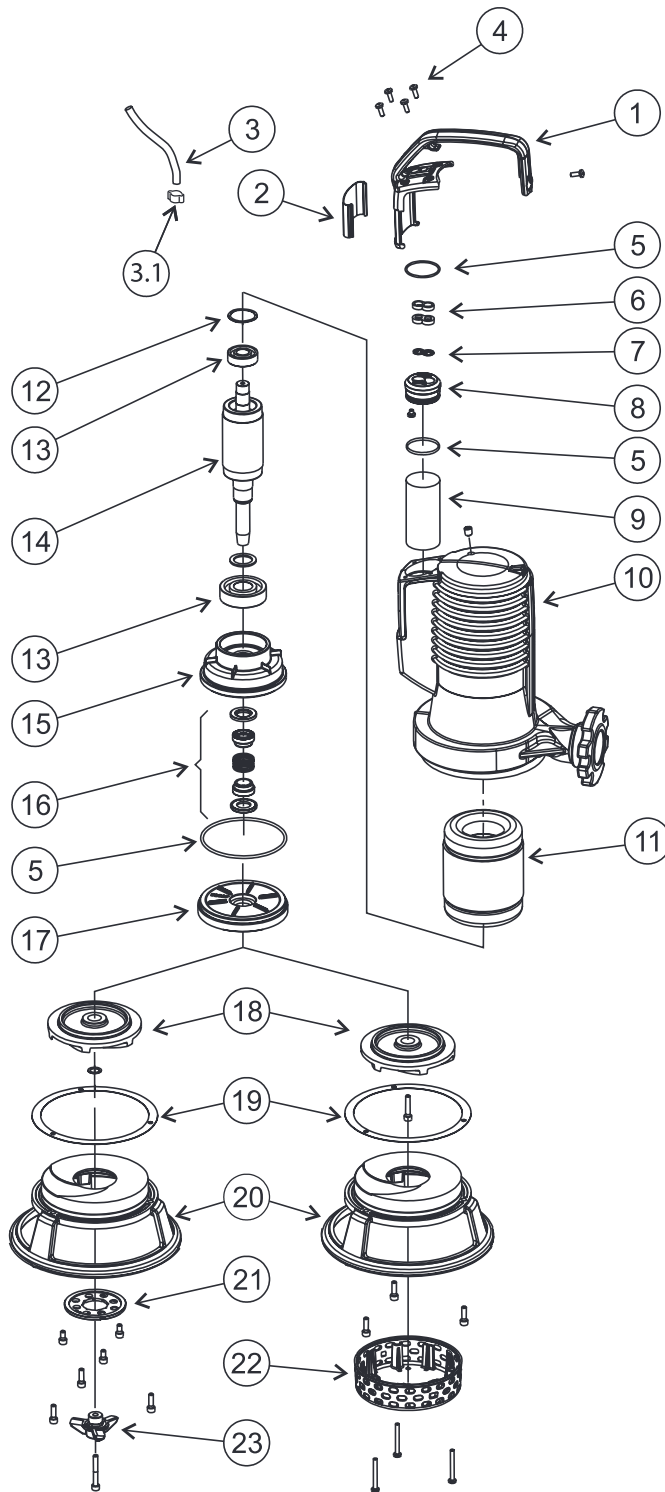
DRblue - DRbluePRO DGblue - DGbluePRO



- 1 Handle
- 2 Plate (*)
- 3 Cable
- 3.1 Cable camp
- 4 Float switch
- 5 Screws
- 6 O-Ring
- 7 Cable gland system
- 8 Cable fastener
- 9 Cable gland support
- 10 Capacitor
- 11 Motor case
- 12 Bleeder valve (*)
- 13 Stator
- 14 Support washer
- 15 Bearing
- 16 Shaft with rotor
- 17 Lower bearing holder
- 18 Mechanical seal
- 19 Sealing flange
- 20 Impeller bushing
- 21 Impeller
- 22 Suction flange
- 23 Foot base support
- 24 Grid

(*) PRO version only

**GRbluePRO
APbluePRO**

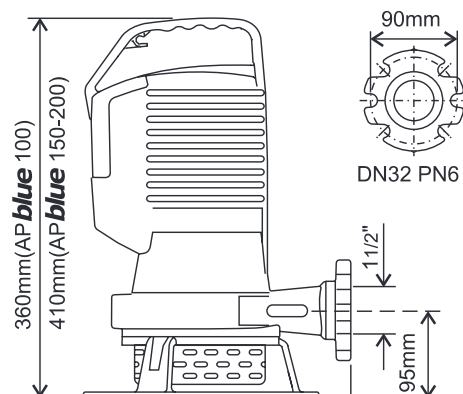
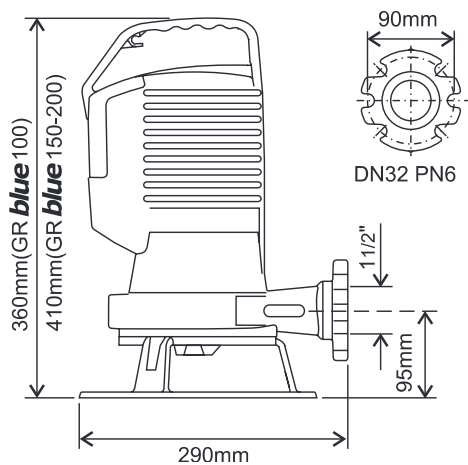
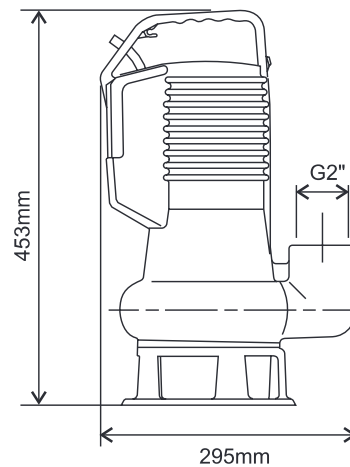
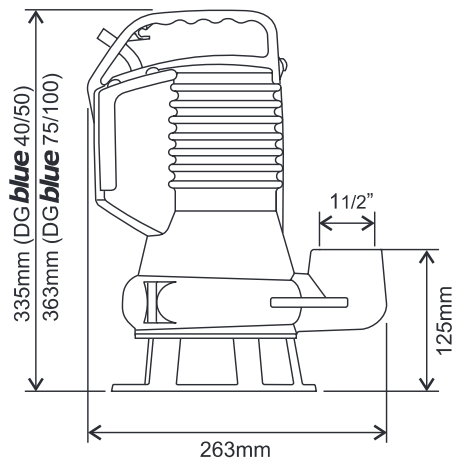
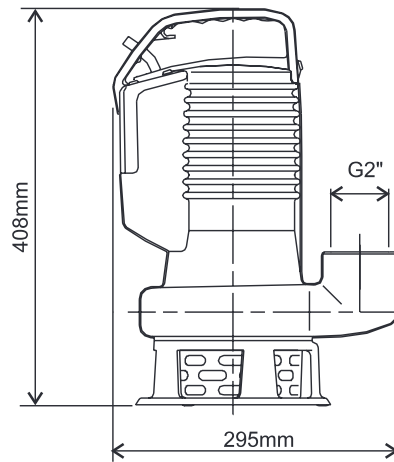
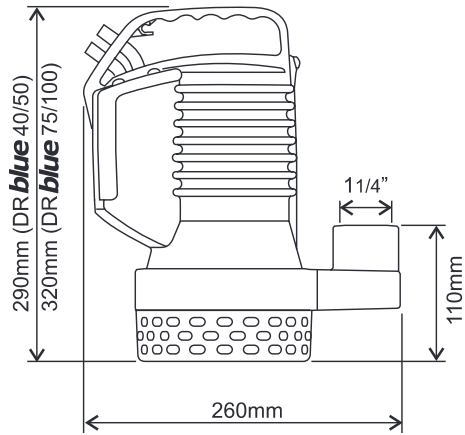


- 1 Handle
- 2 Plate
- 3 Cable
- 3.1 Cable camp
- 4 Screws
- 5 O-Ring
- 6 Cable gland system
- 7 Cable fastener
- 8 Cable gland support
- 9 Capacitor
- 10 Motor case
- 11 Stator
- 12 Support washer
- 13 Bearing
- 14 Shaft with rotor
- 15 Lower bearing holder
- 16 Mechanical seal
- 17 Sealing flange
- 18 Impeller
- 19 Gasket
- 20 Foot base support
- 21 Cutting disk
- 22 Grid
- 23 Cutter

GR bluePRO

AP bluePRO

4. Overall dimensions



**COMPANY WITH QUALITY MANAGEMENT
SYSTEM CERTIFIED BY DNV
= ISO 9001:2008 =**



water solutions

zenit.com

Cod. 27270100700400000
Rev. 3 - 15/09/16