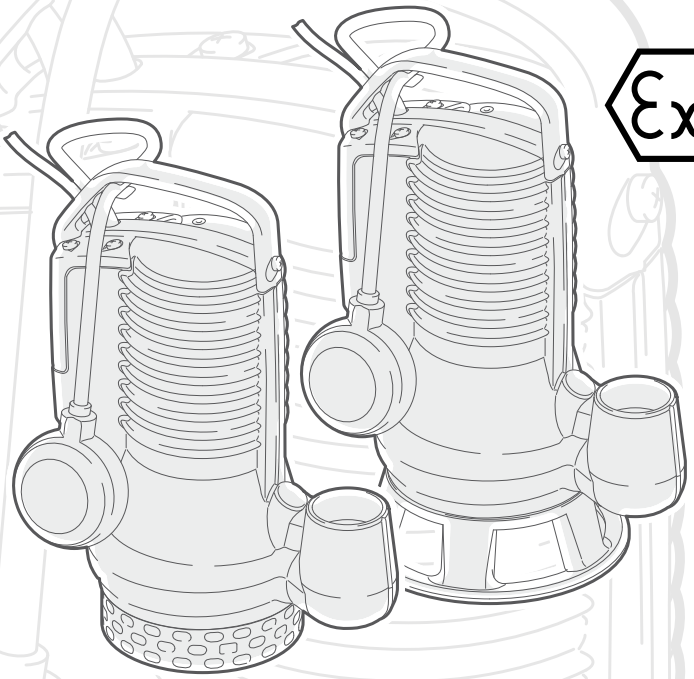
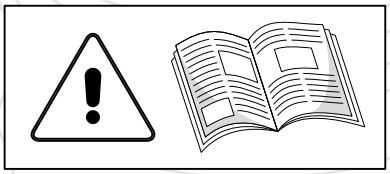
ZENIT

A TSURUMI PUMP COMPANY

blue bluePRO

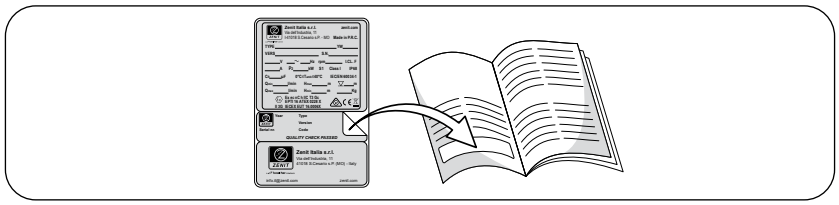




Submersible electric pumps

Safety, Installation and Operations Manual

EU DECLARATION OF CONFORMITY



Manufacturer: **ZENIT Italia S.r.l.**
Via dell'Industria,11 41018 S.Cesario s.P., Modena - (ITALIA)

Plant: **ZENIT Italia S.r.l.**
Via dell'Industria,11 41018 S.Cesario s.P., Modena - (ITALIA)
Zenit Pumps (China) Co., Ltd.
49 Pingsheng Road, Suzhou, Jiangsu Province 215000, P.R.C.

Declare that the submersible electric pump, series blue and bluePRO, -Ex versions with marking

NAE version: models without thermal protection		**All version with thermal protection**	
Ⓔx **II 3G**	*(ATEX)*	Ⓔx **II 3G**	*(ATEX)*
Ex ec h IIC T3 Gc	*(ATEX and IECEx)*	**Ex ec nC h IIC T3 Gc**	*(ATEX and IECEx)*

meet the Essential Health and Safety Requirements applicable to them in terms of the following directives and subsequent amendments and additions:

- MACHINERY DIRECTIVE 2006/42/EC
- LOW VOLTAGE DIRECTIVE 2014/35/EU
- ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2014/30/EU
- RoHS DIRECTIVE 2011/65/EU and 2015/863/EU
- ATEX DIRECTIVE 2014/34/EU

The following main standards are applied: EN ISO 12100:2010, EN 809:1998 + A1:2009 + AC:2010, EN 60034-1:2010 + AC:2010, EN 60034-5:2001 + A1:2007, EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019 + A15:2021, EN IEC 60335-2-41:2021 + A11:2021, EN IEC 63000:2018, EN 60079-0:2018 and IEC 60079-0:2017, EN 60079-7:2015 + A1:2018 and IEC 60079-7:2015, EN 60079-15:2019 and IEC 60079-15:2017, EN ISO 80079-36:2016 and ISO IEC 80079-36:2016, EN ISO 80079-37:2016 and ISO IEC 80079-37:2016.

The aforesaid equipment has been approved by the following certification procedures:
- **ATEX type**: examination certificate (Volountary request of Directive 2014/34/EU) No. **EPTI 16 ATEX 0228 X**;
- **IECEx type**: Certificate of Conformity (CoC) No. **IECEX EUT 16.0006X** issued by Eurofins Product Testing Italy s.r.l. via Cuorgnè 21 10156 Turin (Italy).

IECEx Quality Assessment Report (QAR):
Zenit Italia S.r.l. N° **DNV/QAR10.0002** performed by DNV - DNV (DNV Product Assurance AS)
Zenit pumps (China) Co., Ltd N° **CN/PCET/QAR22.0002** performed by PCET - PCEC (Tianjin) Certification Services 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.**

The plant Zenit Pumps (China) Co., Ltd operates in accordance with Quality Control System procedures which comply with the ISO 9001 standard, accredited by CQC with Certificate No. **CN00122Q39485R4M/3200.**

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)

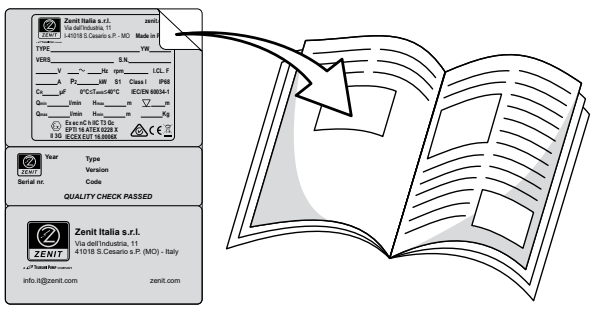
Modena, _____

Signed: Massimiliano Volta
Managing Director Zenit Italia s.r.l.
Person empowered to sign the UE declaration of conformity

TABLE OF CONTENT

The images are indicative only and may not match the actual product. Details given here may differ from the actual product. Zenit reserves the right to modify the product without prior warning. For more information, consult the website **www.zenit.com.**

AFFIX HERE



For correct installation and safe use of the product, read this manual carefully and keep it safe in a clean, easily accessible place for future reference.
Misuse of the product may cause even serious injury and damage, cause malfunctions and lead to loss of warranty cover.

1. SAFETY INSTRUCTIONS

1.1 Introduction

These safety instructions refer to the installation, operation and maintenance of the pump IECEx and ATEX Blue Standard and Professio- nal Series for use in places with an explosive gas atmosphere other than mines (-Ex).
Before installing and using the pump, read the instructions given below carefully.
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.

1.2 Key to the symbols used in the manual

 Warning - Hazard for operators and pump

 Warning - Electrical risk

 Warning - Very hot surfaces with burn hazard

 Warning - These instruction must be observed for Explosion-proof pumps (-Ex models).Failure to comply with this instruction may cause danger of an explosion occurring. It is recommended to follow these instruction also for standard pump.

CAUTION Important information to be read with special care

1.3 General safety regulations

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

1.3.1 Training of installation and maintenance staff

The staff assigned to install and maintain the product must be trained in the inevitable residual risks related to electrical equipment opera- ting in contact with biological liquids.
They must also be capable of reading and understanding the contents of the technical documentation supplied with the product, especially the electrical wiring diagrams.

1.3.2 Personal protective equipment (PPE) to use

Handle the pump while wearing personal protective equipment in conformity with the law.
Use is compulsory of protective gloves, safety footwear, protective goggles with the sides closed and leather aprons. Before handling the already installed product, wash it with plenty of running water and/or detergents.

1.3.3 Residual risks

The product is designed and built to ensure safe, reliable use.
However, since it is intended for use with liquids that constitute a health hazard, the installation and maintenance staff must take great care and always wear regulation personal protection equipment.
During all work on the product, users must take care not to drop the pump and must not underestimate the risks of burns, electrocution, drowning and suffocation or poisoning due to the inhalation of toxic gases.
The pumps MUST be used ONLY in areas compatible with the characteristics recorded on the label.
During handling, installation or removal operations the pump must be disconnected from the power supply panel.

 **To reduce the risks associated with lightning, the user is required to install any necessary and adequate lightning protection measures.**

1.4 Storage

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

CAUTION **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 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 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.

1.5 Disposal

 The crossed bin symbol on the equipment, or its packaging, indicates that the product must be collected separately from other waste at the end of its useful life and not with mixed urban waste.
Appropriate waste sorting for the subsequent recycling, treatment and disposal in an environmentally sound way of the disused equip- ment avoids negative effects on the environment or human health and favours the re-use or recycling of the equipment's materials.
Please contact your municipality, or local authority, for all information regarding the waste sorting systems available in the area.

2. PRODUCT DESCRIPTION

2.1 Product description - Intended use
Blue series pumps are suitable for professional use, heavy duty with clean and dirty water.
They are classified depending on the hydraulic type as follow:

- **DR*blue***, **DG*blue***, **DR*blue*PRO**, **DG*blue*PRO Series**: drainage and evacuation of sewage water and/or with oil also with solid parts.
- **GR*blue*PRO Series**: drainage and evacuation of sewage water and/or with oil with solid parts to be cutted.
- **AP*blue*PRO Series**: drainage and evacuation of sewage clean, sandy, muddy water, with small solid parts.

The equipment is manufactured with cables permanently connected to it.

This pump is a fixed appliance intended to be used while fastened to a support or while secured in a specific location. This appliance is not intended to be held in the hand during normal use.

This pump may not be used with liquids for human consumption.

***Blue* pumps must under no circumstances be used to pump explosive, flammabile or comustible liquids.**

-Ex models are certified for use in potentially explosive atmosphere according to the marking string recorded on the nameplate.

2.2 Operating conditions
The pump normally works completely immersed in the fluid in order to prime itself and to pump out and so that the latter can cool the motor sufficiently.
These pumps shall be installed only in vertical position (with vertical rotational axis). This way the inlet will not take in air and the pump will operate correctly.
For correct use, comply with the following operating conditions:
- Duty type: S1
- Degree of protection: IP 68 (10m – 168 h)
- Maximum immersion depth: 7 m
- Ambient temperature. 0 ÷ +40 °C
- Temperature of the liquid 0 ÷ +40 °C
- Density of fluid treated: maximum of 1.1 Kg/ dm³;
- PH of fluid to be pumped: between 6 and 14;
- The equipment is not intended to be supplied through inverter.
- The pump has been designed to operate at the speeds indicated on the nameplate.
- The pumps feature an acoustic pressure level of below 70dB(A) when immersed and below 80dB(A) in the air.

2.3 Equipment explanation to -Ex approval
Blue series pumps are suitable for professional use, heavy duty with clean and dirty water.
They have the types of protection “Ex ec” and “Ex h” and are suitable for gas group IIC.
Models with thermal protectors have also the type of protection “nC”. The equipment is manufactured with cables permanently connected to it.
The IECEx and ATEX Blue pumps have the following explosion protection classification

2.3.1 Suitability of the pump to the location of installation

Models without thermal protection (Electrical variant: NAE)	**Models with thermal protection** (Electrical variant: T, TC, TCD, TCG, TCDT, TCDGT)
II 3G *(ATEX)* **Ex ec h IIC T3 Gc** *(ATEX and IECEx)*	**II 3G** *(ATEX)* **Ex ec nC h IIC T3 Gc** *(ATEX and IECEx)*

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.

2.3.2 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)

2.4 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.

	The specific marking of explosion protection given in the Annex II of the Directive 2014/34/EU
II	Group of the equipment. Group II: electrical equipment for use in places with an explosive gas atmosphere other than mines
3G	Category of the equipment subject of certification, in presence of potentially explosive atmospheres of Gas, Vapors, Mist (G). The equipment can be installed in ZONE 2
Ex ec h IIC	The types of protection for the Ex equipment correspond to increased safety “ec” and through liquid immersion “h”, suitable for Gas Group IIC, IIB and IIA.
Ex ec nC h IIC	The types of protection for the Ex equipment correspond to increased safety “ec” with encapsulated thermal protection device “nC” and through liquid immersion “h”, suitable for Gas Group IIC, IIB and IIA.
T3	Temperature Class of the equipment (maximum surface temperature 200°C)
Gc	Equipment for explosive gas atmospheres, having a “enhanced” level of protection (EPL Gc), which is not a source of ignition in normal operation and which may have some additional protection to ensure that it remains inactive as an ignition source in the case of regular expected occurrences. Suitable for use in ZONE 2. Equipment category 3G.

Certificates number:
IECEx EUT 16.0006X
IECEx EUT: laboratory that issued the IECEx certificate of conformity
16: year in which the certificate was issued
0006: IECEx certificate number

EPTI 16 ATEX 0228 X
EPTI: laboratory that issued the ATEX certificate of conformity
16: year in which the certificate was issued
ATEX 0228: ATEX certificate number

X: specific conditions of use
The certificate number indicated on the nameplate is followed by an “X”.
It means that the user must follow specific conditions of use described in this manual.

1. The pump shall operate only completely submersed. For models provided without float switch a suitable separate protection device shall be installed to prevent the pump from operating when not fully submersed.
2. The cable shall be protected against the risk of damage due to mechanical stresses. Do not use the feeding of the floating switch cable to move the pump.
3. Do not expose permanently the plastic enclosure of floating switch to light of the sun or luminaires.
4. Do not expose permanently the plastic enclosure of the pump to light of the sun or luminaires
5. The end connection of the feeding cables shall be made in safe area or in according to a type of protection listed in IEC 60079-0 standard suitable for the installation hazardous area.

2.5 Code designation

The pump can be identified by the “type” and the “version” designations stated on the pump nameplate. Below an example with the legend:

TYPE

DG bluePRO 50/2/G40V A 1 B M 5

(A) (B) (C)

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Hydraulic Family
DG = Vortex
DR = Channels
GR = Grinder
AP = High head

② Series
BLUE = Blue STANDARD
BLUEPRO = Blue PROFESSIONAL

③ Power (HPx100) / motor poles

④ Pump outlet
(A) TYPE (GAS thread)
(B) DIAMETER (mm)
(C) V = vertical H = horizontal

⑤ Hydraulic model

⑥ Sequential number (0...n)
(Refers to the pump evolution)

⑦ Motor size

⑧ Motor phases
M = Single-phase T = Three-phase

⑨ Frequency
5 = 50Hz 6 = 60Hz

VERSION

TC 10 NN 230 D EX NN

⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯

⑩ Electrical variant
NAE = No electrical accessory
T = Thermal protection
TC = Thermal protection and capacitor
TCD = Thermal protection, starting and run capacitors
TCG = Thermal protection, capacitor and float switch
TCDT = Thermal protection, starting and run capacitors, overolad protection
TCDGT = Thermal protection, starting and run capacitors, float switch, overload protection

⑪ Cable length

⑫ Plug type
NN = No plug
AU = Australian plug
...= Other

⑬ Rated Voltage

⑭ Starting
D = DOL
Y = star/delta

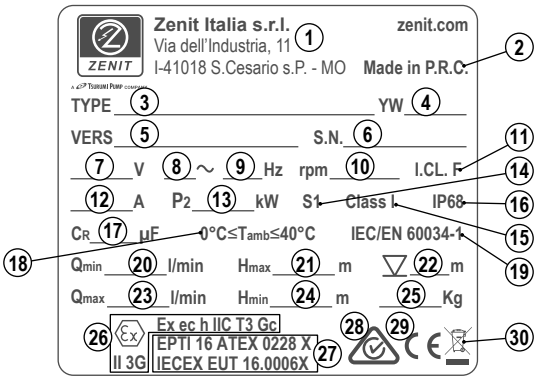
⑮ Certification
NN = standard
EX = ATEX, ATEX + IECEx
CX = IECEX only

⑯ Customization

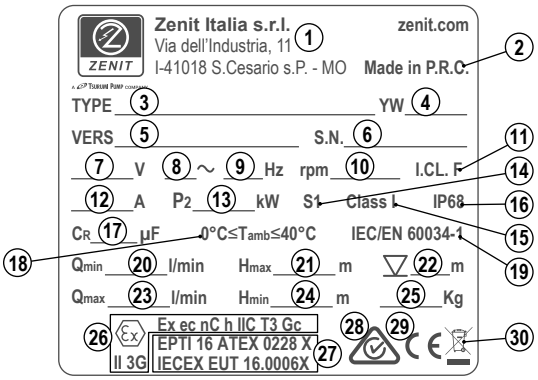
2.6 Nameplate

On the top of the pump you find the nameplate which states the operating data and approvals applying to the pumps.
Below is an example with the legend.

Electrical variant:
NAE



Electrical variant:
T, TC, TCD, TCG, TCDT, TCDGT



1. Manufacturer name and address
2. Country of manufacture
3. Pump type
4. Year and week of production
5. Pump version
6. Serial number
7. Rated voltage
8. Motor phases
9. Frequency
10. Speed (revolutions per minute)
11. Insulation class
12. Rated current
13. Motor output power P2
14. Duty type
15. IEC protection class against electric shock
16. IP code (degree of protection provided by enclosure)
17. Run capacitor
18. Ambient temperature (liquid)
19. Motor reference standards
20. Minimum flow-rate
21. Maximum head
22. Maximum immersion depth
23. Maximum flow-rate
24. Minimum head
25. Weight
26. ATEX and/or IECEx marking string
27. ATEX and/or IECEx certification number
28. RCM mark
29. CE mark
30. WEE mark

2.7 Electrical features

Models 50Hz *(60Hz)*

	DR/DG *blue* 40/2	**DR/DG *blue 50/2* DR/DG *blue*PRO 50/2**		**DR/DG *blue* 75/2 DR/DG *blue*PRO 75/2**		**DR/DG *blue 100/2* DR/DG *blue*PRO 100/2**	
Rated power [kW]	0.3 *(0.28)*	0.37 *(0.37)*		0.55 *(0.55)*		0.74 *(0.74)*	
N° of phases	1	1	3	1	3	1	3
Connection	-	-	Y	-	Y	-	Y
Rated voltage [V]	230 *(230)*	230 *(230)*	400 *(400)*	230 *(230)*	400 *(400)*	230 *(230)*	400 *(400)*
Rated current [A]	2.3	2.8	1.15	4.1	1.45	5.6	2.15
Starting-Rated current Ratio	1.9 *(2.3)*	1.9 *(2.7)*	3.2 *(4.2)*	2.0 *(2.3)*	3.5 *(4.5)*	2.0 *(2.1)*	3.4 *(3.9)*
Running capacitor [µF]	10 *(10)*	10 *(10)*	-	14 *(14)*	-	20 *(20)*	-
Rated frequency [Hz]	50 / 60						
rpm	2900 *(3400)*						
Insulation class	F						

	GR *blue*PRO 100/2 (*) AP *blue*PRO 100/2		**DR/DG *blue*PRO 150/2 GR *blue*PRO 150/2 (*) AP *blue*PRO 150/2**		**DR/DG *blue*PRO 200/2 GR *blue*PRO 200/2 (*) AP *blue*PRO 200/2**	
Rated power [kW]	0.74 *(0.74)*		1.1 *(1.1)*		1.5 *(1.5)*	
N° of phases	1	3	1	3	1	3
Connection	-	Y	-	Y	-	Y
Rated voltage [V]	230	400	230	400	230	400
Rated current [A]	5.5	2.7	7.5	3.2	10	4.3
Starting-Rated current Ratio	2.3 *(2.7)*	3.6 *(4.8)*	2.4 *(3.1)*	4.5 *(5.7)*	1.9 *(2.5)*	4.3 *(5.7)*
Running capacitor [µF]	25 *(25)*	-	30 *(40)*	-	30 *(40)*	-
Rated frequency [Hz]	50 / 60					
rpm	2900 *(3400)*					
Insulation class	F					

***(*):** GR bluePRO pumps require starting capacitor. See Point 2.12.*

2.8 Installation

If the pump is installed in a well, this must have the following minimum dimensions: 350mm x 350mm x 350mm. However, the manufacturer recommends the use of wells which are no smaller than 500mm x 500mm x 500mm.

CAUTION **All of the following operations must be carried out in safety area, in absence of potentially explosive atmospheres.**

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

2.8.1 Mobile post (Fig. 1)

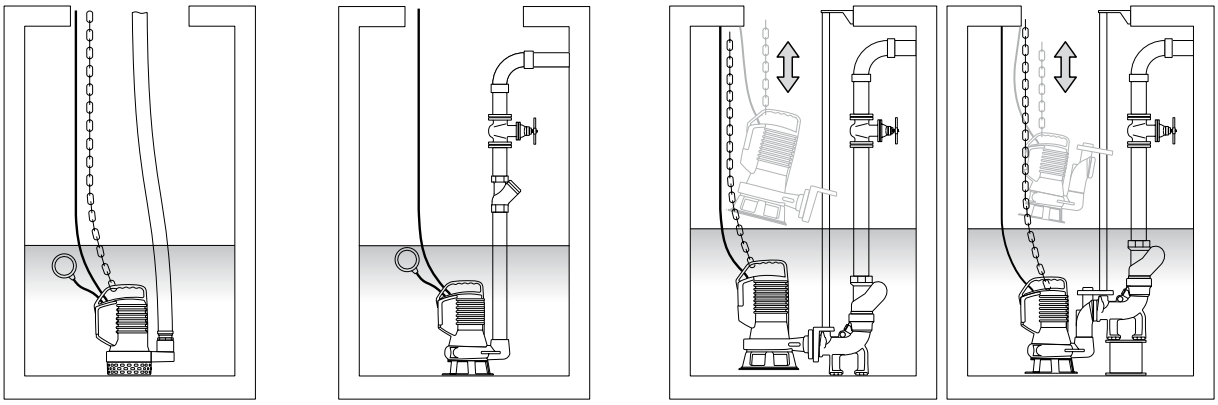
Using a hose union, connect the delivery pipe to a hose with an internal reinforcement coil and a diameter which is the same size as or larger than the electric pump outlet.

2.8.2 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.

2.8.3 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 2 3

2.9 Checking the impeller rotation direction (three-phase models only)

Before making the three-phase electrical connection, make sure the rotation direction is correct.
To check the rotation direction, proceed as follows:

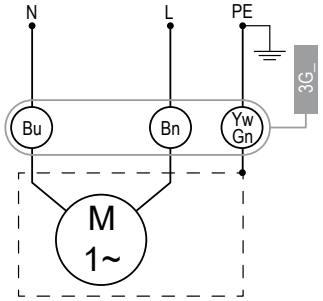
1. Lay the pump horizontal on one side and leave it free. Remove the grid, if present (DR *blue* and AP *blue* models).
2. Temporarily connect the yellow-green wire to ground and then connect the power supply wires to the contactor.
3. Make sure there are no people or objects within a radius of at least 1 meter of the pump.
4. Turn on the start switch for a few moments.
5. Watch the impeller as it stops through the intake port and check that it turns anticlockwise. If the pump is rotating in the wrong direction, invert two of the power supply wires in the contactor and try again. Once the correct rotation direction has been obtained, MARK the power supply wire connection positions, REMOVE the temporary electrical connections and install the pump in the planned position.

2.10 Electrical connections

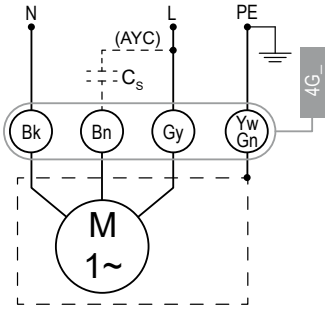
- All operations connected to the mains must be performed by qualified personnel, in compliance with the local regulations.
- To ensure safety the pump is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.
- The electrical connection of the models without plug must be performed by connecting first the yellow-green to the ground, then the other wires.
- Appliances without plug are intended to be permanently connected to fixed wiring; a switch that ensure the all-pole disconnection incorpo-rated in the fixed wiring is to be provided. The switch shall be directly connected to the supply terminals and shall have a contact separation in all poles, providing full disconnection under overvoltage category III (4000V).
- The pump motor must be protected from overload by installing in the main control circuit or power line of pump an overload protection(motor protection breaker). The protection must be adequately dimensioned according to the rated pump data.
- The starting current in direct-on-line start can be up to six times higher than the rated current.
- Refer to the technical data sheet for the correct value of staring current of pumps with rated voltage different from the standard versions.

~1 50/60Hz

Electrical version: TC, TCG, TCDT, TCDGT

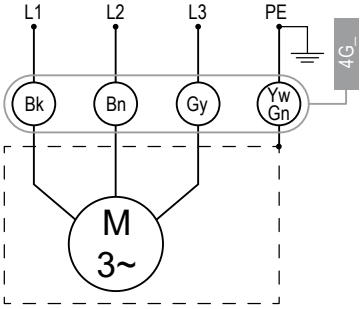


Electrical version: TCD

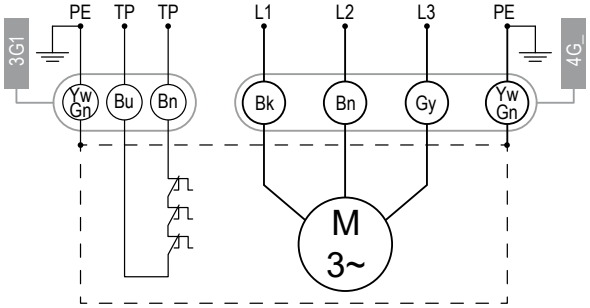


~3 50/60Hz

Electrical version: NAE



Electrical version: T



L - N	L1 - L2 - L3	PE	C_s	AYC	Bk	Bn	Gy	Bu	Yw Gn
Single-phase power supply	Three-phase power supply	Ground	Start capacitor	At your care	Black	Brown	Grey	Blue	Yellow/ Green

CAUTION **In case of discrepancies of the wires color, contact the dealer where this equipment was purchased, or the Zenit sales office in your area.**

2.11 Thermal protection

"Ex ec nC" pumps are protected against overheating by bimetal thermal protector/s (PTO) built into the windings head of the motor which open its contact when the winding temperature exceeds the NST (nominal switching temperature).
Once the temperature of the electric motor drops below the safety limit, the thermal protector returns to its original position and the motor may suddenly restart.

Single-phase motors have the thermal protector connected in series to the main circuit to directly cutting off the motor supply in case of overheating.

Three-phase motors have thermal protections connected to their own cable which must be connected to an external control panel set to shut down the pump supply when the thermal protection intervenes.

2.12 Starting capacitor

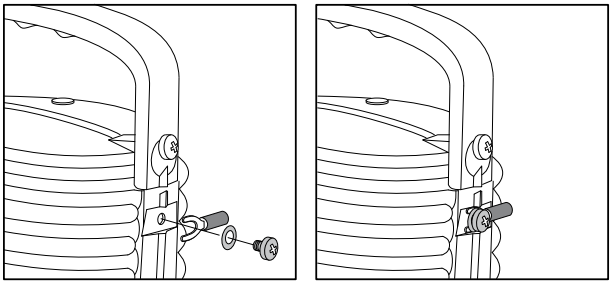
GR BluePRO single phase pumps are equipped with a special connection box. This plastic box can receive all the electrical components and in particular an 80 µF starting capacitor, which works in parallel to the running capacitor. The connection box is equipped with a power cable with or without plug at the end. Positioning and connection of connection box is at user care and must be performed in safe area according manufacturer's instructions.

2.13 Earthing connection

The pump is 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:

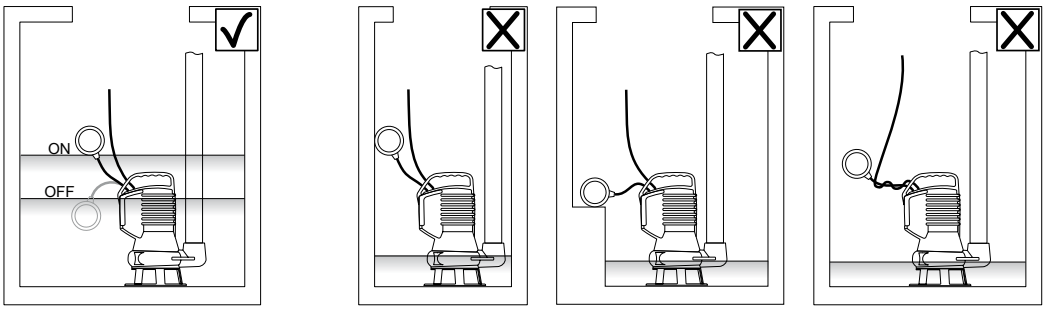
S - Line conductor section	*H - Earth conductor section*
S ≤ 16 mm²	H = S

The earth connection is made in the sequence indicated in the figures.

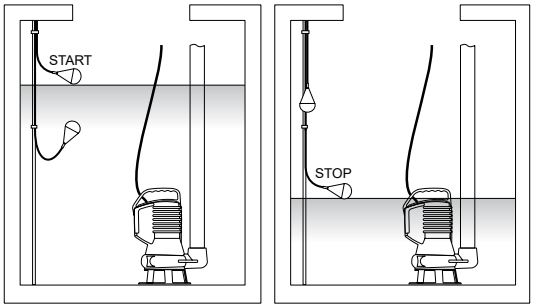


2.14 Floating switch

The electric pump can be supplied with a floating switch and its functioning is completely automatic. The floating switch has an adjustable stroke to allow regulation of the on and off levels. Make sure that there is nothing around that could obstruct the movement.
It is important that the cables do not get in each other's way, twisted up or stuck in any jutting parts or grips inside the tank.



If the pump does not have a start/stop floating switch, one or more start/stop floating switches should be installed inside the tank to control starting and stopping and for any alarms.
In the event of strong turbulence, floating switches should be installed on a rigid rod mounted inside the tank Make sure that the minimum level does not fall below the pump's top.



3. MAINTENANCE

Any interventions of the pump in -Ex versions must be carried out by an Ex-Certified Service Centre (according with international and/or local standards and rules) or by a Zenit Service Centre by trained technicians using only original spare parts. Failure to comply with this rule causes loss of -Ex approval.

3.1 General safety precautions

All of the following operations must be carried out in safety area, in absence of potentially explosive atmospheres.

- Before cleaning and/or maintenance procedures, a skilled technician must disconnect the pump from the power supply and ensure that it cannot start up accidentally.
- Always disconnect the phase wires first and then the yellow-green ground wire.
- Ensure that the pump cannot fall or roll, causing injury or damage.
- Wash the surface of the pump thoroughly with clean water and/or specific detergent before doing any work on it.
- After prolonged use, the surface of the pump may become very hot: allow it to cool sufficiently to avoid burns.
- Always comply with the safety regulations in force in the place of installation, any local regulations and the dictates of common sense.

3.2 Daily and periodic inspection

Regular maintenance and inspection are indispensable to maintaining the pump's performance.
If the pump behaves differently form its normal operating condition, refer to section "4.TROUBLESHOOTING" and take appropriate measures at an early stage.

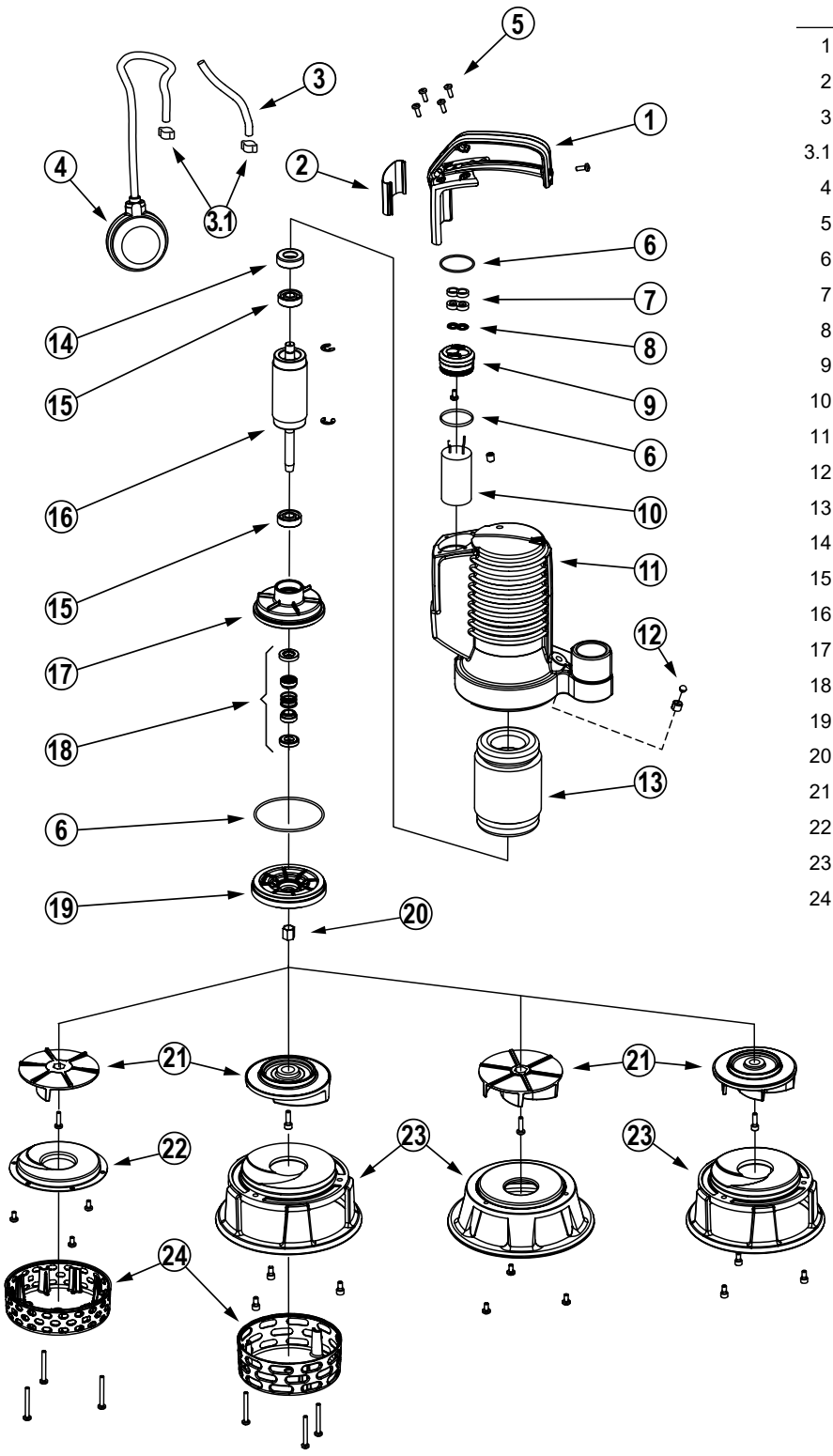
Interval	Inspection Item	
Daily	Measuring the operating current	To be within the rated current
	Measuring the power voltage	Power supply voltage variation within ± 5% of the rated voltage
Monthly	Measuring the insulation resistance	Insulation resistance reference value = 20 MΩ minimum
	NOTE: The motor must be inspected if the insulation resistance is considerably lower than the last inspection	
Half-yearly	Inspection of lifting chain or rope	Replace if damage, corrosion, or wear has occurred to the chain or rope Remove if foreign object is attaching to it
Yearly	Inspecting cables, oil, mechanical seals, bearings, wearing parts (impeller, suction flange….)	
	NOTE: rubber parts need to be replaced if disassembled during inspection	
Once every 2 years or 9000 hours for heavy duty	Changing oil	9,000 hours (for heavy duty) or 24 months, whichever comes first
	Changing the mechanical seals	
	NOTE: The inspection and replacement of these parts require specialized equipment. To have this operation performed, contact the dealer where this equipment was purchased, or the ZENIT sales office in your area.	
Once every 2 to 5 years	Overhaul	The pump must be overhauled even if the pump appears normal during operation. Especially, the pump may need to be overhauled earlier if it is used continuously
	NOTE: To overhaul the pump, contact the dealer where it was purchased, or the ZENIT sales office in your area	

4. TROUBLESHOOTING GUIDE

	Problem	Possible cause	Solution
1	The pump doesn't start	No power supply	Check power supply line
		Damaged or disconnected cable	Check the cable connections and make sure that it's not damaged
		Fuses blown	Check fuses type and rating and replace them with correct ones
		Tripped circuit breaker	Refer to Point 3
		Tripped thermal protector	Refer to Point 2
		Damaged or wrongly connected capacitor (single phase motor)	Replace the capacitor and check that it's correctly connected
		Tripped level control	Check that the level sensor is correctly connected and functioning
		Broken, burned or disconnected wiring	Check the status of wiring and connections
2	The thermal protection trips after a short operating time	The pump is immersed in a liquid which is too hot	Cool down the liquid
		Clogged hydraulic	Clean the hydraulic parts and remove the blocking material
		Blocked rotor	Contact an authorised service center
		Incorrect voltage	Check that the supplied voltage matches with the one on the pump's nameplate
		Fault in bearings	Contact an authorised service center
		Starts per hour exceed the permitted number	Refer to Point 6
3	Tripped circuit breaker	High drop voltage	Reestablish the correct voltage supply
		Low voltage supply	Measure the voltage supply. Reestablish the correct voltage supply
		Clogged hydraulic	Clean the hydraulic parts and remove the blocking material
		Blocked rotor	Contact an authorised service center
		Short circuit in the motor winding	Contact an authorised service center
		Wrong electrical connection	Check and correct the electrical installation
		Low setting of the thermal relay	Set the relay in accordance with the rated current on the nameplate
4	Tripped residual current device (RCD)	Low motor winding insulation	Contact an authorised service center
		Fault in cable	Have the cable checked and repaired by a qualified electrician
5	The pump operates but the flow is low or null	Clogged hydraulic	Clean the hydraulic parts and remove the blocking material
		Clogged outlet pipe	Clean the outlet pipe
		Blocked non-return valve	Clean the non-return valve
		Outlet valve blocked or closed	Open and/or clean the outlet valve
		Wrong direction of rotation	Check the direction of rotation, interchange any two of the phases
		Leakage in the pipeline	Check the pipeline and fix the leakage causes
		Wrong pump selection	Replace the pump with a suitable one
6	Starts per hour exceed the permitted number *(see technical data sheet)*	Wrong setting of the level control	Correct the level control setting
		Level control malfunction	check the level sensors functionality
		Turbolence near the level sensors	Remove the causes of turbulence or change the positioning of the level sensors
		Undersized tank	Adjust the tank dimension
7	Noisy operation and excessive vibrations	Fault in bearings	Contact an authorised service center
		Damaged impeller	Contact an authorised service center
		Blocked impeller	Clean the hydraulic parts and remove the blocking material
		Wrong direction of rotation of the impeller	Check the direction of rotation, interchange any two of the phases
8	The pump works correctly but absorbed current is too high	Wrong duty point	Make sure the pump operates within its operative range
		Wrong voltage supply	Reestablish the correct voltage supply
		Clogged hydraulic	Clean the hydraulic parts and remove the blocking material
		Fault in bearings	Contact an authorised service center
		Wrong direction of rotation of the impeller	Check the direction of rotation, interchange any two of the phases

5. PARTS NOMENCLATURE

DR *blue* - DR *blue*PRO
DG *blue* - DG *blue*PRO

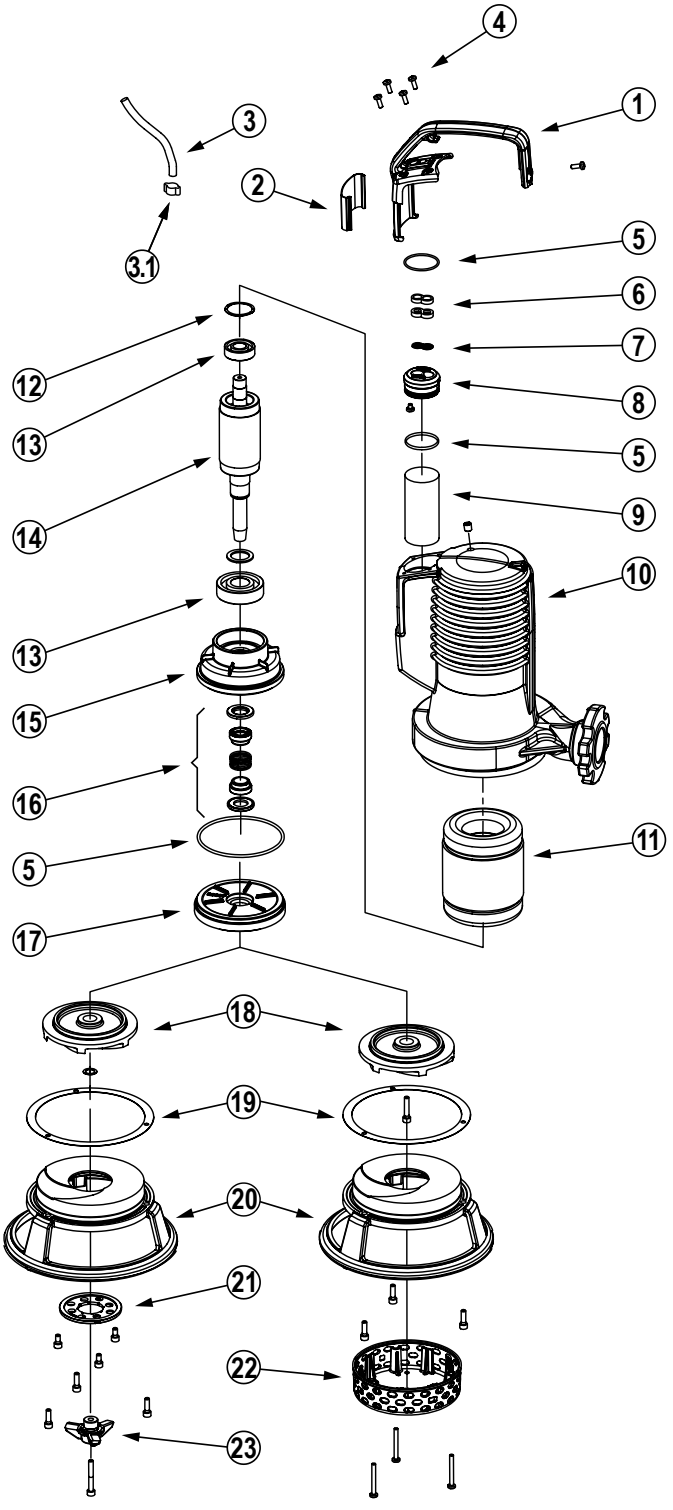


	Component	Material
1	Handle	Plastic
2	Plate	Stainless steel
3	Cable	Cupper, rubber
3.1	Cable clamp	Stainless steel
4	Float switch	Plastic, rubber
5	Screws	Stainless steel
6	O-Ring	Rubber
7	Cable gland	Plastic, rubber
8	Cable fastener	Plastic
9	Cable gland support	Plastic
10	Capacitor	Plastic, metal, rubber
11	Motor case	Cast iron
12	Bleeder valve (*)	Plastic, rubber
13	Stator	Cupper, iron
14	Support washer	Rubber
15	Bearing	Stainless steel
16	Shaft with rotor	Stainless steel/Aluminium
17	Lower bearing holder	Aluminium
18	Mechanical seal	Rubber, iron, SiC
19	Sealing flange	Cast iron
20	Impeller bushing	Brass
21	Impeller	Plastic/Cast iron (*)
22	Suction flange	Stainless steel
23	Foot base support	Cast iron
24	Grid	Plastic/Stainless steel

(*) PRO version only

DR *blue* **DR *bluePRO*** **DG *blue*** **DG *bluePRO***

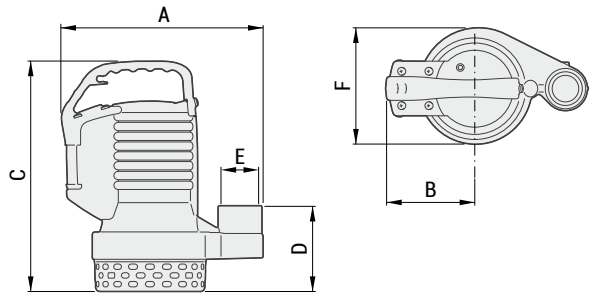
GR *blue*PRO - AP *blue*PRO



GR *bluePRO* **AP *bluePRO***

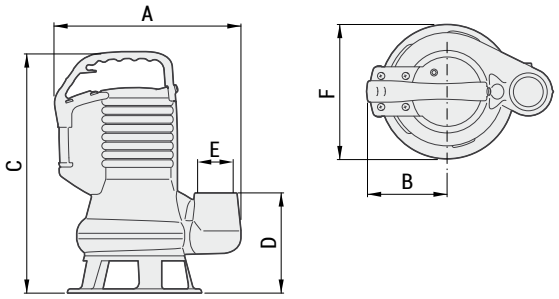
	Component	Material
1	Handle	Plastic
2	Plate	Stainless steel
3	Cable	Cupper, rubber
3.1	Cable clamp	Steel
4	Screws	Stainless steel
5	O-Ring	Rubber
6	Cable gland	Plastic, rubber
7	Cable fastener	Plastic
8	Cable gland support	Plastic
9	Capacitor	Plastic, metal, rubber
10	Motor case	Cast iron
11	Stator	Cupper, iron
12	Support washer	Stainless steel
13	Bearing	Stainless steel
14	Shaft with rotor	Stainless steel/Aluminium
15	Lower bearing holder	Aluminium
16	Mechanical seal	Rubber, iron, SiC
17	Sealing flange	Paper
18	Impeller	Cast iron
19	Gasket	Paper
20	Foot base support	Cast iron
21	Cutting disk	NiCr steel
22	Grid	Plastic
23	Cutter	Stainless steel

6. OVERALL DIMENSIONS



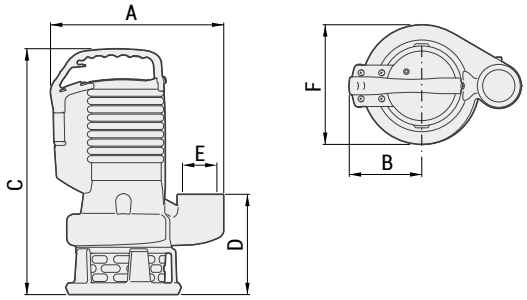
DR *blue*

	A mm	B mm	C mm	D mm	E	F mm
DR blue 40/2/G40V	255	115	295	110	G 1¼"	150
DR blue 50/2/G40V	255	115	295	110	G 1¼"	150
DR blue 75/2/G40V	255	115	325	110	G 1¼"	150
DR blue 100/2/G40V	255	115	325	110	G 1¼"	150



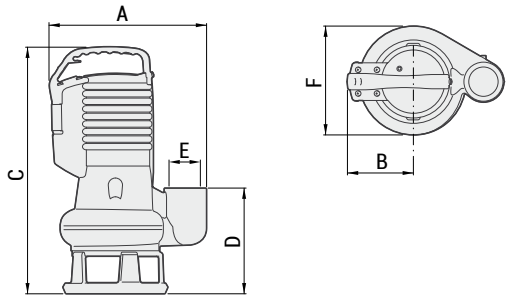
DG *blue*

	A mm	B mm	C mm	D mm	E	F mm
DG blue 40/2/G40V	263	113	341	141	G 1½"	189
DG blue 50/2/G40V	263	113	341	141	G 1½"	189
DG blue 75/2/G40V	263	113	368	141	G 1½"	189
DG blue 100/2/G40V	263	113	368	141	G 1½"	189



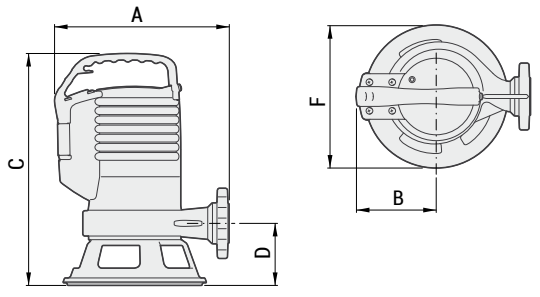
DR *bluePRO*

	A mm	B mm	C mm	D mm	E	F mm
DR bluePRO 50/2/G32V	257	113	296	112	G 1¼"	150
DR bluePRO 75/2/G32V	257	119	324	112	G 1¼"	150
DR bluePRO 100/2/G32V	257	119	324	112	G 1¼"	150
DR bluePRO 150/2/G50V	293	122	413	168	G 2"	204
DR bluePRO 200/2/G50V	293	122	413	168	G 2"	204



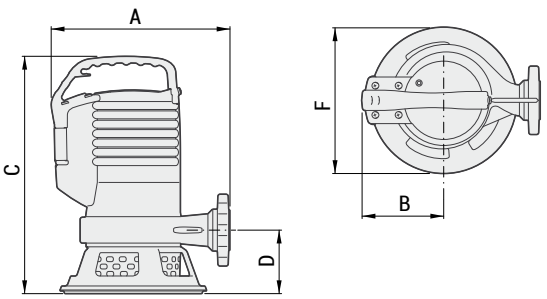
DG *bluePRO*

	A mm	B mm	C mm	D mm	E	F mm
DG bluePRO 50/2/G40V	263	113	341	141	G 1½"	189
DG bluePRO 75/2/G40V	263	113	368	141	G 1½"	189
DG bluePRO 100/2/G40V	263	113	368	141	G 1½"	189
DG bluePRO 150/2/G50V	293	123	458	195	G 2"	203
DG bluePRO 200/2/G50V	293	123	458	195	G 2"	203



GR *bluePRO*

	A mm	B mm	C mm	D mm	E	F mm
GR *blue*PRO 100/2/G40H	270	130	365	95	G 1½"	220
GR *blue*PRO 150/2/G40H	285	125	410	100	G 1½"	230
GR *blue*PRO 200/2/G40H	285	125	410	100	G 1½"	230



AP *bluePRO*

	A mm	B mm	C mm	D mm	E	F mm
AP bluePRO 100/2/G40H	268	123	345	84	G 1½"	198
AP bluePRO 150/2/G40H	285	123	392	87	G 1½"	207
AP bluePRO 200/2/G40H	285	123	392	87	G 1½"	207