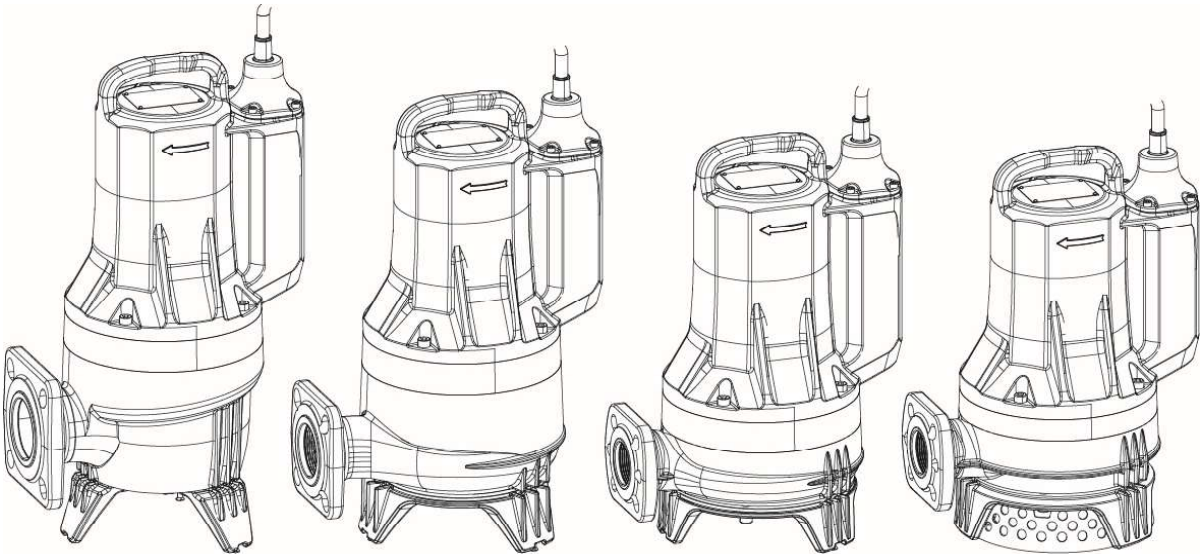
ISTRUZIONI PER L'INSTALLAZIONE E LA MANUTENZIONE (IT)
INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE (GB)
INSTRUCTIONS POUR L'INSTALLATION ET LA MAINTENANCE (FR)
INSTALLATIONS- UND WARTUNGSANLEITUNGEN (DE)
INSTRUCTIES VOOR INSTALLATIE EN ONDERHOUD (NL)
INSTRUCCIONES DE INSTALACIÓN Y MANTENIMIENTO (ES)
ΟΔΗΓΙΕΣ ΓΙΑ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ ΚΑΙ ΤΗ ΣΥΝΤΗΡΗΣΗ (GR)
INSTALLÁCIÓS ÉS KARBANTARTÁSI KÉZIKÖNYV (HU)
ИНСТРУКЦИИ ПО МОНТАЖУ И ТЕХОБСЛУЖИВАНИЮ (RU)
INSTRUÇÕES PARA A INSTALAÇÃO E A MANUTENÇÃO (PT)
INSTALLATIONS- OCH UNDERHÅLLSANVISNINGV(SE)
ASENNUS- JA HUOLTO-OHJEET (FI)
INSTRUKTIONER VEDRØRENDE INSTALLATION OG VEDLIGEHOLDELSE (DK)
KASUTUS- JA HOOLDUSJUHEND (EE)
POKYNY K INŠTALÁCII A ÚDRŽBE (SK)
NÁVOD K INSTALACI A ÚDRŽBĚ (CZ)
UPUTE ZA MONTAŽU I ODRŽAVANJE (HR)
NAVODILA ZA INŠTALACIJO IN VZDRŽEVANJE (SI)
INSTRUKCJA MONTAŻU I KONSERWACJI (PL)
INSTRUCTIUNI PENTRU INSTALARE SI INTRETINERE (RO)
ИНСТРУКЦИЯ ЗА МОНТИРАНЕ И ПОДДРЪЖКА (BG)
KURMA VE BAKIM BİLGİLERİ (TR)
UPUTSTVO ZA MONTAŽU I ODRŽAVANJE (RS)
(IR) دستورالعمل برای نصب و نگهداری
(AR) **إرشادات التركيب والصيانة**

FX RANGE



CE

DAB
WATER•TECHNOLOGY

(IT) DICHIARAZIONE DI CONFORMITÀ CE
(GB) DECLARATION OF COMFORMITY CE
(FR) DÉCLARATION DE CONFORMITÉ CE
(DE) EG-KONFORMITÄTSERKLÄRUNG
(NL) EG-VERKLARING VAN OVEREENSTEMMING
(ES) DECLARACIÓN DE CONFORMIDAD CE
(GR) ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ ΕΚ
(HU) KONFORMITÁSI (SZABVÁNY MEGFELELŐSÉGI) NYILATKOZAT
(RU) ЗАЯВЛЕНИЕ О СООТВЕТСТВИИ CE
(PT) DECLARAÇÃO DE CONFORMIDADE CE
(SE) EG-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE
(FI) EY-VAATIMUSTENMUKAISUUSVAKUUTUS

FX Range

- Noi, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY,** dichiariamo sotto la nostra esclusiva responsabilità che i prodotti ai quali questa dichiarazione si riferisce sono conformi alle seguenti direttive:
- We, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY,** declare under our responsibility that the products to which this declaration refers are in conformity with the following directives:
- Nous, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY**, déclarons sous notre responsabilité exclusive que les produits auxquels cette déclaration se réfère sont conformes aux directives suivantes:
- Wir, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY**, erklären unter unserer ausschließlichen Verantwortlichkeit, dass die Produkte auf die sich diese Erklärung bezieht, den folgenden Richtlinien:
- Wij, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY**, verklaren uitsluitend voor eigen verantwoordelijkheid dat de producten vwaarop deze verklaring betrekking heeft, conform de volgende richtlijnen zijn:
- Nostros, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY**, declaramos bajo nuestra exclusiva responsabilidad que los productos a los que se refiere esta declaración son conformes con las directivas Siguientes:
- Η εταιρεία, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY**, Δηλώνει υπεύθυνα πως τα προϊόντα στα οποία αναφέρεται η παρούσα δήλωση, συμμορφώνονται με τις προδιαγραφές των παρακάτω οδηγιών:
- Mi, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY**, kizárólagos felelősségünk mellett kijelentjük, hogy azon termékek, melyekre ezen nyilatkozat vonatkozik megfelelnek a következő Direktíváknak:
- Мы, **DAB Pumps S.p.A. - Via M.Polo, 14 Mestrino (PD) – ITALY,** заявляем под полную нашу ответственность, что изделия к которым относится данное заявление, отвечают требованиям следующих директив:
- Nós, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, declaramos sob nossa exclusiva responsabilidade que os produtos aos quais esta declaração diz respeito, estão em conformidade com as seguintes directivas:
- Vi, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, försäkrar under eget ansvar att produkterna som denna försäkran avser är i överensstämmelse med följande direktiv:
- Me, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, vakuutamme ottaen täyden vastuun, että tuotteet joita tämä vakuutus koskee, ovat seuraavien direktiivien:

– 2006/42/EC (Machinery)
– 2014/35/EU (Low Voltage)
– 2014/30/EU (Electromagnetic Compatibility Directive)
– 2011/65/EU (Restriction of the use of certain hazardous substances in electrical and electronic equipment)
– (UE) n. 305/2011 (Construction Productions Regulation)
– 2014/34/UE only for products classified as explosion-proof and marked EX II 2G

ed alle seguenti norme/and with the following standards / ainsi qu'aux normes suivantes / sowie den folgenden Normen entsprechen/en conform de volgende normen / y con las normas siguientes / και με τους παρακάτω κανονισμούς / valamint megfelel a következő szabványoknak / и следующих нормативов / e com as seguintes normas / och följande standarder / ja seuraavien standardien mukaisia:

– EN 60335-1:2012/A13:2017
– EN 60335-2-41:2003/A2:2010
– EN 60204-1:2006/A1:2009
– EN 809:1998+A1:2009
– EN 12050-1:2015

only for products classified as explosion-proof and marked EX II 2G:
- EN 60079-0:12+A11:2013 (IEC 60079-0:2011 for IEC Ex)
- EN 60079-1:14 (IEC 60079-1:2014 for IEC Ex)
- EN ISO 80079-36:2016
- EN ISO 80079-37:2016
- EN ISO/IEC 80079-34:2011 (EN 13980: 02.)

(IT) **DAB Pumps S.p.A.** nella sede di Via Marco Polo 14, Mestrino (PD) Italy è detentore del fascicolo tecnico.
(GB) DAB Pumps S.p.A. in the head office in Via Marco Polo 14, Mestrino (PD) Italy is the holder of the technical file.
(FR) **DAB Pumps S.p.A.** conserve le dossier technique au siège de Via Marco Polo 14, Mestrino (PD) Italie.
(DE) **DAB Pumps S.p.A.** Firmensitz in Via Marco Polo 14, Mestrino (PD) Italien ist im Besitz der technischen Unterlagen.
(NL) **DAB Pumps S.p.A.** bij de vestiging van Via Marco Polo 14, Mestrino (PD) Italië is houder van het technisch dossier.
(ES) **DAB Pumps S.p.A**. con sede en la calle Marco Polo 14, Mestrino (PD) Italy es propietaria del manual técnico.
(GR) **Η DAB Pumps S.p.A.** με έδρα στη Via Marco Polo 14, Mestrino (PD) Italy είναι ιδιοκτήτρια του παρόντος τεχνικού φυλλαδίου.
(HU) A termék technikai leírása a **DAB Pumps S.p.A.** cég birtokában van, a Via Marco Polo 14, Mestrino (PD) Olaszország címen.
(RU) **DAB Pumps S.p.A.** с головным офисом на Via Marco Polo 14, Mestrino (PD) Италия является правообладателем на техническую документацию
(PT) A **DAB Pumps S.p.A.** na sede de Via Marco Polo 14, Mestrino (PD) Itália detém o dossier técnico.
(SE) **DAB Pumps S.p.A.** med säte på Via Marco Polo 14, Mestrino (PD), Italien, är innehavare av den tekniska dokumentationen.
(FI) **DAB Pumps S.p.A.,** toimipaikka Via Marco Polo 14, Mestrino (PD), Italia, säilyttää teknistä eritelmää.

Organismo Notificato dell'esame CE del tipo (IT) / Notified Body for the EC type-examination (GB) /Organisme notifié pour l'examen CE du type (FR) / Benannte Stelle für die EG-Baumusterprüfverfahren (DE) / Aangemelde instantie van het CE-typeonderzoek (NL) / Organismo notificado para el examen CE de tipo (ES) /

Πιστοποιημένος Φορέας για εξακρίβωση ΕΚ (GR) / CE típusvizsgálat bejegyzett vizsgáló szervezete (HU) / Организация, уведомленная об испытании CE типа (RU) / Organismo Notificado para o exame CE de tipo (PT) / Anmält organ för EG-typkontroll (SE) / EY-tyyppitarkastuksen suorittanut ilmoitettu laitos (FI):

– Eurofins Product Testing Italy S.r.l. , organismo notificato/ notified Body n. 0477

Organismo Notificato per il controllo della produzione (IT) / Notified Body for production control (GB) / Organisme notifié pour le contrôle de la production (FR) / Benannte Stelle für die Produktionskontrolle (DE) / Aangemelde instantie voor controle van de productie (NL) / Organismo notificado para el control de la producción (ES) / Πιστοποιημένος Φορέας για τον έλεγχο της ροής παραγωγής (GR) / A gyártás ellenőrzésére bejegyzett szervezet (HU) / Организация, уведомленная о проверке производства (RU) / Organismo Notificado para o controlo da produção (PT) / Anmält organ för produktionskontroll (SE) / Tuotannonvalvonnan suorittanut ilmoitettu laitos (FI):

– Eurofins Product Testing Italy S.r.l., organismo notificato / Notified Body N. 0477

Certificato Numero / Certificate Number:

- **ATEX: EPT 16 ATEX 2440 X**
- **IEC EX: IECEx EUT 16.0003X**

Mestrino (PD), 01/09/2019

Francesco Sinico
Group R&D Director

(DK) EF-OVERENSSTEMMELSESERKLÆRING
(EE) CE VASTAVUSDEKLARATSIOON
(SK) ES VYHLÁSENIE O ZHODE
(CZ) ES PROHLÁŠENÍ O SHODĚ
(HR) IZJAVA O SUKLADNOSTI CE
(SI) IZJAVA O SKLADNOSTI CE
(PL) DEKLARACJA ZGODNOŚCI CE
(RO) DECLARAŢIE DE CONFORMITATE CE
(BG) УДОСТОВЕРЕНИЕ ЗА СЪОТВЕТСТВИЕ ЕО
(TR) CE UYGUNLUK BEYANNAMESİ
(RS) IZJAVA O PODUDARANJU CE
(IR) CE اعلامیه انطباق با استاندارد
(AR) CE إعلان المطابقة والتوافق الأوروبي

FX Range

- Vi, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, erklærer på eget ansvar, at produkterne der er omfattet af denne erklæring opfylder kravene i følgende direktiver:
- Meie, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, kinnitame omal vastutusel, et tooted millega see deklaratsioon seondub, vastavad järgmistele direktiividele:
- My, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, vyhlasujeme na našu výhradnú zodpovednosť, že výrobky na ktoré sa toto vyhlásenie vzťahuje, vyhovujú nasledujúcim smerniciam:
- My, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, prohlašujema na naši výhradní zodpovědnost, že výrobky na která se toto prohlášení vztahuje, vyhovují následujícím směrnicím:
- Mi, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy,** izjavljamo na našu potpunu odgovornost, da proizvodi na koje se ova izjava odnosi, sukladni su sljedečim uputama:
- Mi, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, izjavljujemo na našo popolno odgovornost, da proizvodi na katere se ta izjava nanaša, so v skladu s sledečimi navodili:
- My, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, deklarujemy na naszą wyłączną odpowiedzialność, że produkty będące przedmiotem niniejszej deklaracji są zgodne z poniższymi dyrektywami:
- Noi, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, declarăm sub exclusiva noastră responsabilitate că produsele la care se referă această declaraţie sunt conforme cu următoarele directive:
- Ние, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, под нашата ексклузивна отговорност заявяваме, че изделията за които се отнася настоящото удостоверение, съответстват на следните директиви:
- Biz, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy**, Münhasır sorumluluğumuz altında olarak aşağıda belirtilen ve işbu beyannamenin ilişkin olduğu ürünlerin aşağıdaki direktiflere:
- Mi, **DAB Pumps S.p.A. - Via M.Polo, 14 – Mestrino (PD) – Italy,** izjavljamo na našu potpunu odgovornost, da proizvodi na koje se ova izjava poziva, podudaraju se sa sledečim pravilima:

شرکت داب ایتالیا واقع در شهر پادووا خیابان **14** مستریتو میدان پالو بدینوسیله اعلام میدارد که مسئولیت دارد کلیه محصولات
- نفيد نحن، DAB PUMPS SPA VIA M.POLO, 14 MESTRINO (PD) – ITALY، تحت مسؤوليتنا الخاصة بأن هذه المنتجات المشار إليها في هذا الإعلان مطابقة للمواصفات المطلوبة في التوجيهات الأوروبية التالية:

– 2006/42/EC (Machinery)
– 2014/35/EU (Low Voltage)
– 2014/30/EU (Electromagnetic Compatibility Directive)
– 2011/65/EU (Restriction of the use of certain hazardous substances in electrical and electronic equipment)
– (UE) n. 305/2011 (Construction Productions Regulation)
– 2014/34/UE only for products classified as explosion-proof and marked EX II 2G

og i følgende standarder / ja järgmistele standarditele / a nasledujúcim normám / a následujícím normám / kao što i sljedečim propisima / kakor tudi s sledečimi pravili / i z poniżej wymienionymi normami / şi cu următoarele norme / и на следните норми / ve aşağıdaki standartlara uygun olduklarını beyan ederiz / kao što i sa sledečim propisima /

و همچنین اجرا و رعایت استانداردهای :
والقواعد الأوروبية التالية:

– EN 60335-1:2012/A13:2017
– EN 60335-2-41:2003/A2:2010
– EN 60204-1:2006/A1:2009
– EN 809:1998+A1:2009
– EN 12050-1:2015

only for products classified as explosion-proof and marked EX II 2G:
- EN 60079-0:12+A11:2013 (IEC 60079-0:2011 for IEC Ex)
- EN 60079-1:14 (IEC 60079-1:2014 for IEC Ex)
- EN ISO 80079-36:2016
- EN ISO 80079-37:2016
- EN ISO/IEC 80079-34:2011 (EN 13980: 02.)

(DK) Det tekniske dossier opbevares hos **DAB Pumps S.p.A.** med sæde i Via Marco Polo 14, Mestrino (PD), Italien.
(EE) Tehniliste dokumentide omanik on **DAB Pumps S.p.A.**, asukoht Via Marco Polo 14, Mestrino (PD), Itaalia.
(SK) Spoločnosť **DAB Pumps S.p.A.** so sídlom na Via Marco Polo 14, Mestrino (PD) Italy je držiteľom technickej dokumentácie.
(CZ) Společnosť **DAB Pumps S.p.A.** se sídlem na Via Marco Polo 14, Mestrino (PD) Italy je držitelem technické dokumentace.
(HR) **DAB Pumps S.p.A.** sjedište Via Marco Polo 14, Mestrino (PD) Italy drži tehničku dokumentaciju.
(SI) **DAB Pumps S.p.A.** s sedežem Via Marco Polo 14, Mestrino (PD) Italy je lastnik tehnične dokumentacije.
(PL) **DAB Pumps S.p.A.** z siedzibą przy ul. Marco Polo 14, Mestrino (PD) Włochy jest posiadaczem dokumentacji technicznej.
(RO) **DAB Pumps S.p.A**. în sediul din Via Marco Polo 14, Mestrino (PD) Italia este titularul dosarului tehnic.
(BG) Фирмата **DAB Pumps S.p.A.** в седалището на Via Marco Polo 14, Mestrino (PD) Италия е притежателят на техническата документация.
(TR) Merkezi Via Marco Polo 14, Mestrino (PD) İtalya adresinde bulunan **DAB Pumps S.p.A.** teknik dokümantasyonun sahibidir.

(RS) **DAB Pumps S.p.A.** sedište Via Marco Polo 14, Mestrino (PD) Italy drži tehnički dosje.

(IR) **DAB Pumps S.p.A.** **دفترچه فنی را در اختیار دارد** Via Marco Polo 14, Mestrino (PD) Italy **در دفتر**.

هي الجهة المالكة للملف الفني. Via Marco Polo 14, Mestrino (PD) Italy **في مقرها بعنوان** **شركة DAB Pumps S.p.A.**

Organ med bemyndigelse til EF-typeafprøvning (DK) / ELi tüübihindamise teavitatud asutus (EE) / Notifikačný orgán pre typovú skúšku CE (SK) / Notifikovaný orgán, který vydal ES certifikát o schválení typu (CZ) / Prijavljeno tijelo za CE ispitivanje tipa (HR) / Priglašeni organ za ES-pregled tipa (SI) / Jednostka Notyfikowana odpowiedzialna za badania WE (PL) / Organism Notificat de examinare CE de tip (RO) / Оторизиран орган за преглед на типа за ЕС (BG) / AT tip incelemesi belgesi onaylanmış kuruluş tarafından düzenlenmiştir (TR) / Prijavljeno telo za CE ispitivanje tipa (RS) / **سازمان مطلع از ارزیابی CE از نوع** الهيئة المشهَرة قانونيًا لفحص المطابقة الأوروبية من النوعية CE (AR)

– Eurofins Product Testing Italy S.r.l. , organismo notificato/ notified Body n. 0477

Organ med bemyndigelse til kontrol af produktion (DK) / Tootmisohje teavitatud asutus (EE) / Notifikačný orgán pre kontrolu výroby (SK) Notifikovaný orgán pro kontrolu výroby (CZ) / Prijavljeno tijelo za provjeru proizvodnje (HR) / Priglašeni organ za kontrolo proizvodnje (SI) / Jednostka Notyfikowana do kontroli produkcji (PL) Organism Notificat pentru controlul producţiei (RO) / Оторизиран орган за контрол на производството и продукцията (BG) / Üretim kontrolü için Onaylanmış Kuruluş/Notifikovaný orgán pro kontrolu výroby (TR) / Prijavljeno telo za kontrolu proizvodnje (RS) / **سازمان مطلع برای کنترل تولید** الهيئة المشهَرة قانونيًا لفحص الإنتاج (AR):

– Eurofins Product Testing Italy S.r.l., organismo notificato / Notified Body N. 0477

Certificato Numero / Certificate Number:

- **ATEX: EPT 16 ATEX 2440 X**
- **IEC EX: IECEx EUT 16.0003X**

Mestrino (PD), 01/09/2019

Francesco Sinico
Group R&D Director

INDEX

1. SAFETY INSTRUCTIONS

KEY

The following symbols have been used in the discussion:

Situation of general danger.
Failure to respect the instructions that follow may cause harm to persons and property.

Situation of electric shock hazard.
Failure to respect the instructions that follow may cause a situation of grave risk for personal safety.

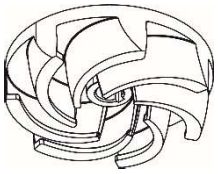
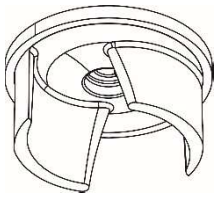
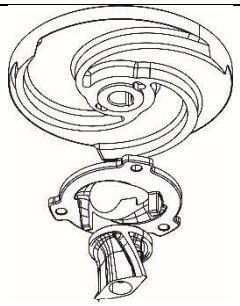
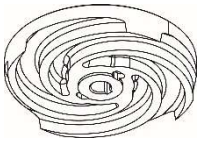
Notes

These instructions must be observed for explosion-proof pumps.

2. GENERAL DESCRIPTION

This manual contains the instructions for the installation, operation and maintenance of submersible pumps of the FX RANGE series. The pumps are equipped with electric motors with power between 0.75 and 11 kW.
The pumps in the FX RANGE series are designed and suitable for pumping domestic and industrial sewage and waste waters compatible with the materials of which the pumps are made. The pumps can be installed on an auto-coupling system or stand freely on the bottom of a tank.

The booklet also includes specific instructions for the explosionproof pumps.

	FEKA FXV	FEKA FXC	GRINDER FX	DRENAG FX
Description	Submersible pumps with back-flowing impeller with complete free passage.	Submersible pump with ring impeller and with anti-locking disc	Submersible pump with ring impeller and grinder device at the front	Submersible pump with ring impeller and with wear disc in abrasion-resistant rubber
	 **Fig1a**	 **Fig1b**	 **Fig1c**	 **Fig1d**
Free impeller passage	50mm (FEKA FXV 20) 65mm (FEKA FXV 25)	50mm	-	10 mm
Standards				
EN 12050-1	X	X	X	
EN 12050-2				X
Type of liquid				
Clear water	X	X		X
Groundwater	X	X		X
Rainwater	X	X		
Clear water containing sand	X	X		X
Waste water: Without large solids or long fibres	X	X	X	
Waste water with small solids and without long fibres.	X	X	X	
Untreated sewage (with solids and long fibres)	X		X	

TECHNICAL CHARACTERISTICS

Consult the Instructions Booklet and the data plate to check the following technical data:

- Electric Power Supply.
- Construction Characteristics.
- Hydraulic Performance.
- Working Conditions.
- Pumped liquids.

Pos.	Description
1	Pump Designation
2	Serial number
3	Model Code
4	Weight (with 10m cable)
5	Maximum liquid temperature
6	Range of flow
7	Range of head
8	Maximum head
9	Min. head
10	Rated power at the shaft
11	Rated input power
12	Enclosure class to IEC
13	Insulation class
14	Rated voltage
15	Rated current
16	Frequency
17	Capacitor capacity (not applicable)
18	Number of phases
19	Rated speed
20	Level of duty
21	Country of production
22	Maximum installation depth
23	Marking Ex/Quality marks
24	CE mark

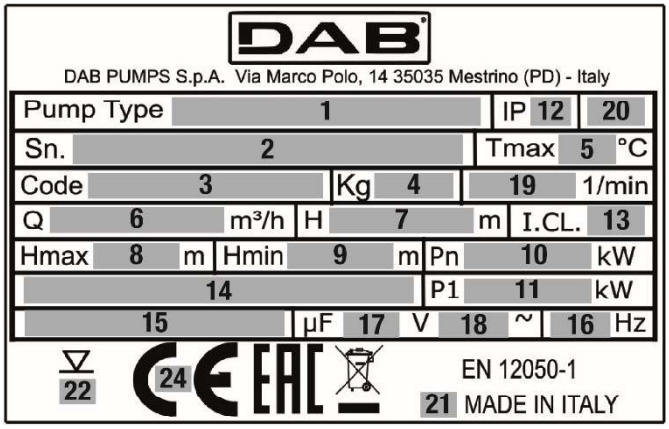


Fig. 1 Nameplate

2.1 Product drawing

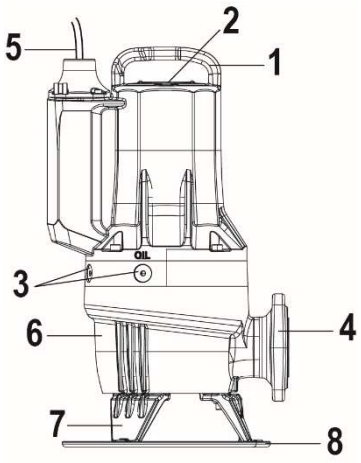


Fig. 2 FX RANGE pump

Pos.	Description	Material
1	Lifting bracket	GJL200
2	Nameplate	Steel AISI 304
3	Oil screws	OT58 NICKEL
4	Discharge flange	GJL200
5	Cable plug	H07RN8-F
6	Pump housing	GJL200
7	Support feet	GJL200
8	Support disc	PP

2.2 Operating conditions

FX RANGE pumps are suitable for continuous operation always immersed in the pumped liquid. The FX RANGE pumps allow operation with the motor NOT IMMERSED for short periods (10min).

pH value: 6.5-12 (Warning: indicative range, the pH value alone is not exhaustive in defining the aggressiveness of the pumped liquid)

Temperature of the operating liquid: 0 °C to +40 °C.
For short periods a temperature of up to +60 °C is permissible (non-Ex versions only).

Explosion-proof pumps must never pump liquids of a temperature higher than +40 °C.

Ambient temperature
For non-explosion proof pumps, the ambient temperature may exceed +40 °C for a short period.

For explosion-proof pumps, the ambient temperature on the installation site must be in the range from 0°C + 40 °C.

Density and viscosity of the pumped liquid: viscosity and density comparable to those of water.

Flow velocity
It is advisable to keep a minimum flow velocity to avoid sedimentations in the piping system. Recommended flow velocities:
• in vertical pipes: 1.0 m/s
• in horizontal pipes: 0.7 m/s

Operating mode
Maximum 20 starts per hour.

FOR FURTHER LIMITATIONS OF THE OPERATING RANGE, REFER TO THE IDENTIFICATION PLATE.

3. DELIVERY AND HANDLING

3.1 Transportation

Before lifting the pump, check that the tools and equipment used for handling, lifting and lowering it into the sinkhole are suitable for the weight to be lifted, efficient and complying with the applicable safety laws.

The weight of the pump is declared on the pump identification plate and on the label on the packaging.

Always lift the pump by its lifting bracket or by means of a fork-lift truck if the pump is fixed on a pallet. Never lift the pump by means of the motor cable or the hose/pipe.

3.2 Storage

During long periods of storage, the pump must be protected against moisture and heat.
Storage temperature: -30 °C to +60 °C. If the pump has been in use, the oil should be changed before storage. After a long period of storage, the pump should be inspected before it is put into operation. Make sure that the impeller can rotate freely.

The impeller may have sharp edges – wear protective gloves.

If stored outside the limits indicated, pay particular attention to the conditions of the mechanical seal, the O-rings, the oil and the cable gland.

4. INFORMATION ON PRODUCTS WITH THE EX MARKING

Marking:	CE 0477 II2G Ex db IIB T4 Gb Ex h IIB T4 Gb EPT 16 ATEX 2440 X
0477:	code identifying the body that checks the production site;
	explosion-proof appliance designed for use in a potentially explosive atmosphere;
II: group.	identifies an electrical appliance for use in an environment other than mines with possible presence of firedamp;
2: category.	pump designed for use in places where it is probable that there will be explosive atmospheres caused by mixtures of air and gas, vapours or mists, or mixtures of air and dust;
G: gas.	the pump is protected in environments with gas, vapours or inflammable mists;
EX:	explosion-proof appliance designed for use in a potentially explosive atmosphere;
db:	electrical constructions for potentially explosive atmospheres – Explosion-proof housings “d”;
h:	non electrical constructions for potentially explosive atmospheres – Protection with immersion in liquid “h”;
IIB:	characteristic of the gas for which the appliance is intended;
T4:	corresponds to 135°C, and is the maximum surface temperature that can be safely reached by the pump;
X	The letter “X” on the certificate indicates that the appliance is subject to special conditions for safe use. The conditions are mentioned in the certificate and in the installation and operating instructions.
Gb:	Level of protection of the appliances, appliances for explosive gas atmospheres having a “HIGH” protection level.

Marking for explosion-proof versions according to the IECEx scheme

Marking:	CE xxxx Ex db IIB T4 Gb IECEx EUT 16.0003X
Ex	Area classification according to AS 2430.1.
db	Flame protection in compliance with IEC 60079-1:2014.
IIB	Suitable for use in explosive atmospheres (not in mines). Gas classification, see IEC 60079-0:2004, Attachment A. Gas group B includes gas group A.
T4	The max. surface temperature is 135°C according to IEC 60079-0.
X	The letter “X” on the certificate indicates that the appliance is subject to special conditions for safe use. The conditions are mentioned in the certificate and in the installation and operating instructions.
Gb	Appliance protection level.

5. INSTALLATION

The construction of tanks, reservoirs or sinkholes where the electropump is to be housed, as well as its positioning with respect to the level of the sewage network, are subject to standards and legal regulations that must be respected.

Installation types
The FX RANGE pumps are designed for two installation types:
• free-standing submerged installation on ring stand. (Fig.3)
• submerged installation on automatic coupling. The automatic coupling system facilitates maintenance and service as the pump can be easily removed from the tank. (Fig.4)

Before installation, check that the bottom of the tank is flat and uniform.

Check that pit, pool or tank are well dimensioned and that water level assures a correct running of electric pump with limited number of starts per hour.

For mobile installations we recommend the use of a support disc kit (Fig 1) to prevent the pump from sinking into the ground during operation due to suction. In any case, create a support surface that is as solid as possible.

5.1 Level switches

FX RANGE Automatic Pumps, version MA (Fig.5)
The pumps in the FX RANGE range in the MA single-phase automatic version are supplied complete with adjustable float switch. This allows the pump to be switched on and off autonomously according to the level of the liquid inside the tank.

Make sure that the float switch can move freely in the tank without obstacles. Adjust the float switch so that it switches off before the minimum pumping level.
The pump can work with the motor uncovered only for short periods (10min).

FX RANGE Non Automatic Pumps. version MNA and TNA (Fig.6)
The non-automatic version of the FX RANGE range of pumps (MNA and TNA) requires a control panel connected to float switches or to another level monitoring system.
Stop Level: The stop level or float switch must be positioned so that the pump or pumps, for multiple installations, stop before the minimum pumping level is reached.
Start level: In tanks with one pump, set the start level so that the pump is started once the requested level is reached, the pump must always be started before the liquid level reaches the bottom inlet pipe to the tank.
2-pump start level: In tanks with two pumps, the **start level switch** for pump 2 must start the pump before the liquid level reaches the bottom inlet pipe to the tank, and the start level switch for pump 1 must start this pump correspondingly earlier.
If installed, always install the **high-level alarm switch** about 10 cm above the start level switch; however, the alarm must always be given before the liquid level reaches the bottom inlet pipe to the tank.

For further information on electric panels and the respective use of level switches, contact DAB Pumps.

Switches or sensors in potentially explosive environments must be certified for this application.

5.2 Installation with accessories

See figure 3a, 4, 4a

6. ELECTRICAL CONNECTION

The control panel and respective electrical equipment, when contemplated, must be of a type approved by the safety regulations in force. Instruments and components of the panel must be of an adequate capacity and quality to maintain reliable operation over time.

In potentially explosive environments, the electrical connection and the control panel must be provided with explosion-proof protection.

Before making the electrical connection, turn off the power and ensure that it cannot be reconnected accidently. Connect the earth lead before connecting the line leads; if the electropump has to be removed or dismantled, the earth lead must be removed last.

The installer is responsible for ensuring that the earthing system is efficient and made in compliance with the regulations in force.

For explosion-proof pumps the electrical and equipotential connection must be made according to standard EN 60079-14.

Before installation and the first start-up of the pump, check the condition of the cable visually to avoid short circuits.

If the power cable is damaged, it must be replaced by the manufacturer's service centre or by another qualified person.

On explosion-proof pumps, make sure that an external earth conductor is connected to the external earth terminal on the pump.
The section of the earth lead must be at least 4mm², yellow/green.
Make sure that the earth connection is protected from corrosion.
Make sure that all protective equipment has been connected correctly.
Float switches used in potentially explosive environments must be approved for this application.

Set the motor-protective circuit breaker to the rated current of the pump. The rated current is stated on the pump nameplate.

The supply voltage and frequency are marked on the pump nameplate. The voltage tolerance must be within - 10 %/+ 10 % of the rated voltage. Make sure that the motor is suitable for the power supply available at the installation site.
All the pumps are supplied with a 10 m cable and a free cable end.
For greater lengths contact the DAB Pumps technical assistance service.

The connections of the pump protection system, such as thermal protections and oil-in-water sensor, are to be provided by the user, who must use a control panel with suitable characteristics.

6.1 Wiring diagrams

See Fig.15a and 15b

6.2 Thermal switch

All FX RANGE pumps have thermal protection incorporated in the stator windings (see wiring diagrams, contacts k1, k2) See parag. 6.1. The thermal switches are inserted in the motor windings and intervene by opening and interrupting the circuit when an excessive temperature is reached in the windings (about 150°C).

Non explosion-proof pumps
For correct operation the thermal switch must be connected to a device for interrupting the power supply circuit of the electropump. When the electropump has cooled, once the circuit of the thermal switch has been reset, the device can automatically restart the pump.

Explosion-proof pumps

The device for interrupting the power supply circuit of explosion-proof pumps must not restart the pump automatically. This ensures protection against over temperature in potentially explosive environments.

7. START-UP

Before starting work on the pump, check that the main switch is off.
It must be ensured that the power supply cannot be accidentally switched on.
Make sure that all protective equipment has been connected correctly.
The pump must not run dry.

The pump must not be started if the atmosphere in the tank is potentially explosive.

Before starting the pump, check that it is suitably connected to the pumping system to avoid uncontrolled leakage of liquid.

Do not put your hands or any tool into the pump suction or discharge port after the pump has been connected to the power supply.

7.1 General start-up procedure

This procedure applies to new installations as well as after service inspections if start-up takes place some time after the pump was placed in the tank.

- After long periods of storage, check the conditions of the oil in the oil chamber. See also section 8.1 Routine maintenance.
- Check that the system, bolts, gaskets, pipework and valves etc. are in correct condition.
- Mount the pump in the system.
- Switch on the power supply.
- Check whether the monitoring units, if used, are operating satisfactorily.
- Check the setting of the float switches or of the level sensors.
- Check that the impeller can turn freely by briefly starting the motor.
- Check the direction of rotation. See section 7.2 Direction of rotation.
- Open the isolating valves, if fitted.
- Check that the liquid level is above the pump motor.
- Start the pump and let the pump run briefly, and check if the liquid level is falling.
- Observe if the discharge pressure and input current are normal. If not there might be air trapped inside the pump (See section 5 Installation).

In case of abnormal noise or vibrations from the pump, other pump failure or power supply failure or water supply failure, stop the pump immediately. Do not attempt to restart the pump until the cause of the fault has been found and the fault corrected.

After one week of operation or after replacement of the shaft seal, check the condition of the oil in the chamber. For pumps without sensor, this is done by taking a sample of the oil. See section 8. Maintenance and service for procedure. Every time the pump has been removed from the tank, go through the above procedure when starting up again.

7.2 Direction of rotation (for three-phase pumps)

The pump may be started for a very short period without being submerged to check the direction of rotation.

Check the direction of rotation before starting up the pump. An arrow on the motor housing indicates the correct direction of rotation. Correct direction of rotation is clockwise when viewed from above.

Checking the direction of rotation
The direction of rotation should be checked in the following way every time the pump is connected to a new installation.
Procedure

1. Let the pump hang from a lifting device, e.g. the hoist used for lowering the pump into the tank.
2. Start and stop the pump while observing the movement (jerk) of the pump. If connected correctly, the pump will rotate clockwise, i.e. it will jerk counter-clockwise. See fig.7 If the direction of rotation is wrong, interchange any two of the phases in the power supply cable.

8. MAINTENANCE AND SERVICE

Routine maintenance work, limited to checking, cleaning or replacing limited parts, may be carried out only by expert and qualified personnel, provided with suitable equipment, who know the safety regulations for the working environment and have read and carefully checked the content of this manual and of any other documentation attached to the product.

Special maintenance or repairs must be entrusted to authorised Dab Pumps service centres.

Before starting any work on the system or troubleshooting, ensure that the main switch is off and that the power supply cannot be switched on again accidentally. Check that all the protection systems are correctly connected and that all the rotating parts are stopped.

Maintenance work on explosion-proof pumps must be carried out by DAB Pumps or a service workshop authorized by DAB Pumps.
However, this does not refer to hydraulic components such as the pump body, the impeller and the mechanical seal.

The replacement of the cable must be carried out exclusively by the manufacturer's service centre or by another qualified person.

The pump may have been used for pumping liquid that is harmful to health, contaminated or toxic. Take all the precautions concerning health and safety before carrying out maintenance or repairs.

Use genuine spare parts only for repairs.
Select the spare parts to be ordered, consulting the exploded drawings available on the DAB Pumps site or the DNA selection software.

The manufacturer declines any responsibility for eventual damages to persons, animals or things for maintenance and repair interventions carried out by unauthorized personnel or with no genuine spare parts.

Specify the following information when ordering spare parts:
1. The type of electric pump.
2. Serial number and manufacturing year.
3. Denomination and reference number of the spare parts.
4. Required number of parts.

8.1 Routine maintenance

Pumps running normal operation should be inspected every 3000 operating hours or at least once a year. If the pumped liquid is very muddy or sandy, inspect the pump at shorter intervals.
Check the following points:

- **Power consumption**

See pump nameplate.

- **Oil level and oil condition**

When the pump is new or after replacement of the shaft seal, check the oil level and water content after one week of operation. If there is more than 20 % extra liquid (water) in the oil chamber, the shaft seal is defective. The oil should be changed after 3000 operating hours or once a year.

- **Cable entry**

Make sure that the cable entry is watertight (visual inspection) and that the cable is not sharply bent and/or pinched.

- **Pump parts**

Check impeller, pump housing, etc. for possible wear. Replace defective parts.

- **Ball bearings**

Check the shaft for noisy or heavy operation (turn the shaft by hand). Replace defective ball bearings.
A general overhaul of the pump is usually required in case of defective ball bearings or poor motor function. This work must be done by an assistance workshop authorised by **DAB Pumps.**
The ball bearings used are sealed and lubricated, using a special lubricant for high temperatures (-40°C + 150°C).

Defective bearings may reduce the Ex safety.

- **O-rings and similar parts**

During service/replacement, it must be ensured that the grooves for the O-rings as well as the seal faces have been cleaned before the new parts are fitted.

Used rubber parts must not be reused.

Explosion-proof pumps must be checked by an authorized Ex workshop once a year.

- **Oil change (Fig.8)**

After 3000 operating hours or once a year, change the oil in the oil chamber as described below.
If the shaft seal has been replaced, the oil must be changed.

When loosening the screws of the oil chamber, note that pressure may have built up in the chamber. Do not remove the screws until the pressure has been fully relieved.

- **Draining of oil**
  1. Place the pump on a plane surface with one oil screw pointing downwards.
  2. Place a suitable container (approx. 1 litre), for instance made of transparent plastic material, under the oil screw.

Used oil must be disposed of in accordance with local regulations.

  3. Remove the lower oil screw.
  4. Remove the upper oil screw. If the pump has been in operation for a long period of time, if the oil is drained off shortly after the pump has been stopped, and if the oil is greyish white like milk, it contains water. If the oil contains more than 20 % water, it is an indication that the shaft seal is defective and must be replaced. If the shaft seal is not replaced, the motor will be damaged. If the quantity of oil is smaller than the quantity stated, the shaft seal is defective.
  5. Clean the faces for the gaskets for oil screws.

- **Filling with oil**
  1. Rotate the pump so that one of the two oil holes in a vertical position facing upwards.

2. Pour the oil into the chamber. The suitable amount of oil is indicated by the second oil venting hole (positioned beside the vertical filling hole). Once the oil has reached and escapes from the hole at the side, the oil quantity is correct.
3. Fit the oil screws with new gaskets.

The table shows the quantity of oil in the oil chamber of FX RANGE pumps. Oil type: ESSO MARCOL 152.

	Motor type		
	2poles >= 1.5kw	**2poles <= 1.1kw**	**4poles**
NoAtex	0.68 [l]	0.58 [l]	0.65 [l]
Atex	0.75 [l]	0.65 [l]	0.72 [l]

- **Capacitor change (Fig. 9)**
- **Impeller cleaning (Fig. 10)**
- **Mechanical Seal replacement (Fig.11)**
- **Float replacement (Fig.13)**
- **Cutter change (for GRINDER FX Fig.14)**

8.2 Special maintenance

Special maintenance operations must be carried out exclusively by an assistance workshop authorised by **DAB Pumps.**

8.3 Contaminated pumps

If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.

If you are asking to have a pump repaired, you must contact the service centre to give them the details about the pumped liquid, etc., before sending the pump for repair. Otherwise, the service centre may refuse to accept the pump.
However, any application for service (no matter to whom it may be made) must include details about the pumped liquid if the pump has been used for liquids which are injurious to health or toxic.
Before a pump is returned, it must be cleaned in the best possible way before it is returned.

9. TROUBLESHOOTING

Before attempting to diagnose any fault, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on. All rotating parts must have stopped moving.

All regulations applying to pumps installed in potentially explosive environments must be observed. It must be ensured that no work is carried out in potentially explosive atmosphere.

When performing checks or inspections refer to the safety regulations stated in this manual or the attachment.

PROBLEMS	PROBABLE CAUSES	REMEDIES
Failure in electric pump.	1. Insufficient voltage	1. Check the motor input voltage value (see “Technical characteristics”).
	2. No motor power	2. Check the power line, the power wiring, the connections and the fuses.
	3. Thermal overload switch has tripped. a) single-phase motor b) three-phase motor	a) Wait until cooling has occurred b) Reset the thermal overload switch and check it is calibrated properly.
	4. The thermal switch on the panel or automatic residual current device on the main electrical panel have tripped.	4. Check the insulation on the electric pump wires, the electric pump itself or the floats. Reset the thermal switch inside the panel or the residual current device on the main electrical control panel.
	5. Automatic float switch jammed.	5. Clean, inspect and make sure it is working properly
	6. Level sensors or floats fail to enable start.	6. Wait for level to be restored, inspect the sensors, floats and relative equipment and make sure they are all working properly.
	7. Faulty control panel.	7. Where possible try to bypass the control panel by connecting the pumps directly to the power supply. If necessary contact the DAB Assistance Service.
	8. Impeller jammed.	8. Remove obstruction, wash and clean: if necessary contact the DAB Assistance Service.
	9. Electric pump not working.	9. Contact the DAB Assistance Service.
Electric pump starting with thermal protection intervention	1. Power voltage differs from that stated on ID plate.	1. Check motor input voltage. If necessary contact electricity provider.
	2. Three-phase motor. Phase interruption.	2. Restore motor power connections, then check for proper current absorption.
	3. Three-phase motor. Relay calibrated at too low a value.	3. Adjust relay calibration, set it to a value slightly higher than that shown on the motor ID plate.
	4. Thermal overload relay faulty	4. Replace the faulty relay, check the system is working properly.
	5. Impeller jammed.	5. Remove obstruction, wash and clean: if necessary contact the DAB Assistance Service.
	6. Incorrect direction of rotation	6. Reverse direction of rotation (see 7.2: “Direction of Rotation”)
	7. Pumped liquid too dense.	7. Dilute the liquid. Check the pumped liquid is suitable (see “Technical Characteristics”).
	8. Electrical pump dry-running.	8. Check the level of liquid in the tank and the level control instruments.
	9. Operation point outside working range.	9. Check electric pump operation point, check delivery pipe characteristics and components. If necessary contact the DAB Assistance Service.
	10. Electric pump not working.	10. Contact the DAB Assistance Service.
Electric pump drawing more power than value shown on ID plate.	1. Power voltage differs from that stated on ID plate.	1. Check motor input voltage. If necessary contact electricity provider.
	2. Three-phase motor. Phase interruption.	2. Restore motor power connections, then check for proper current absorption.
	3. Incorrect sense of rotation.	3. Reverse direction of rotation (see 7.2: “Direction of Rotation”)
	4. Impeller jammed.	4. Remove obstruction, wash and clean: if necessary contact the DAB Assistance Service.
	5. Pumped liquid too dense.	5. Dilute the liquid. Check the pumped liquid is suitable (see “Technical Characteristics”).

	6. Operation point outside working range.	6. Check electric pump operation point, check delivery pipe characteristics and components. If necessary contact the DAB Assistance Service.
	7. Electric pump not working.	7. Contact the DAB Assistance Service.
Performance too low, the pump does not perform as required.	1. Incorrect direction of rotation	1. Reverse direction of rotation (see 7.2: “Direction of Rotation””)
	2. Operation point outside working range.	2. Check electric pump operation point, check delivery pipe characteristics and components. If necessary contact the DAB Assistance Service.
	3. Liquid pumped with air or gas present.	3. Increase collection tank size. Install de-gassing devices.
	4. Pumped liquid too dense.	4. Dilute the liquid. Check the pumped liquid is suitable (see “Technical Characteristics”).
	5. Pump not primed, air inside pumping body	5. Check pump priming (see “priming plug”)
	6. Electric pump not working.	6. Contact the DAB Assistance Service.

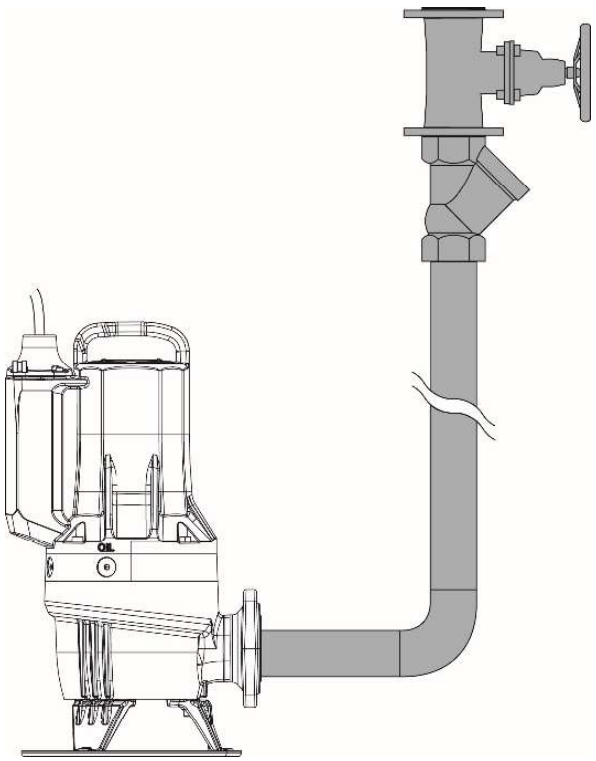


Fig. 3

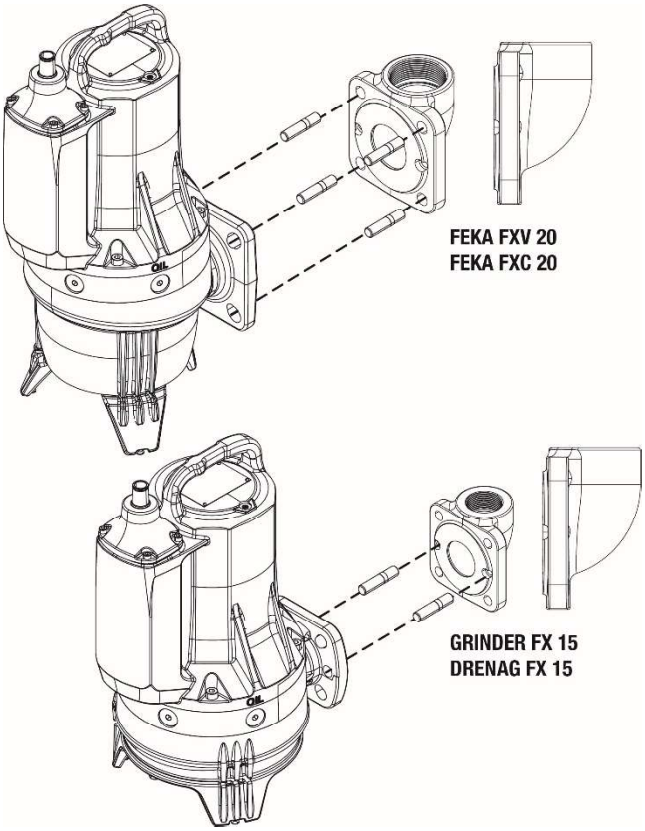


Fig. 3a

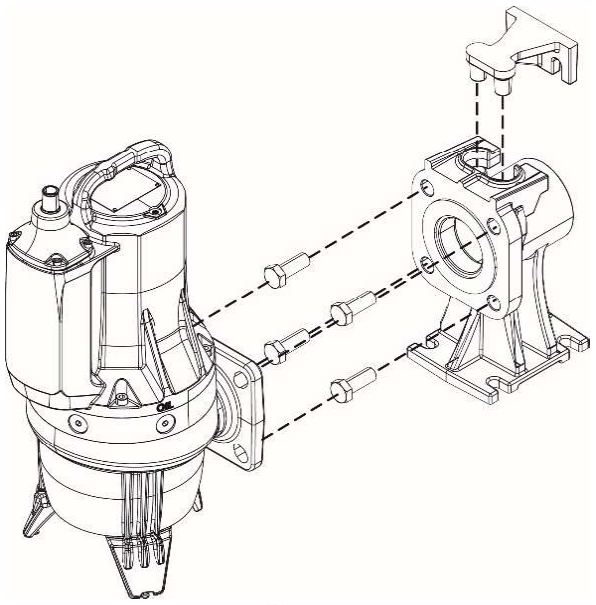


Fig. 4

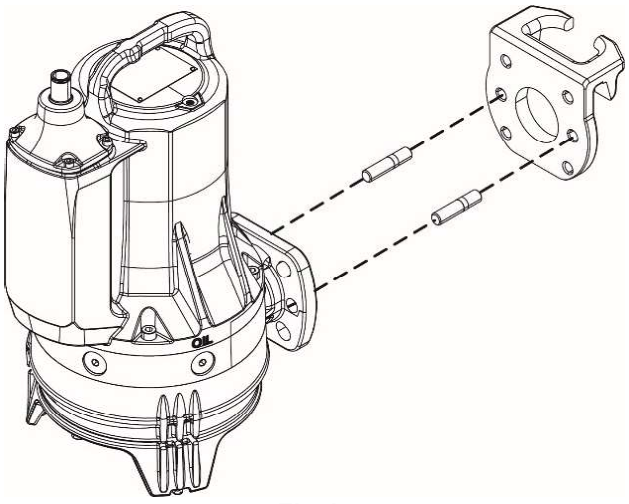


Fig.4a

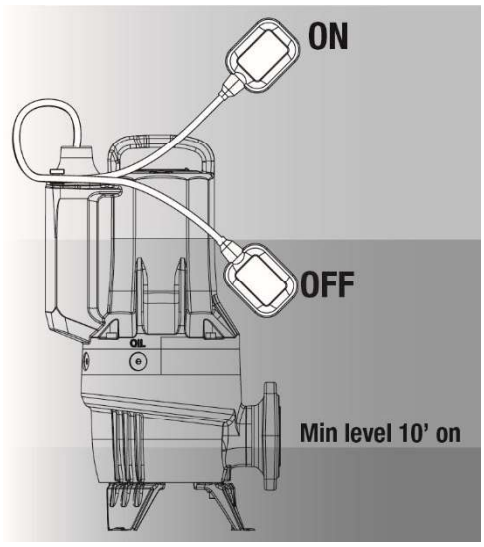


Fig.5

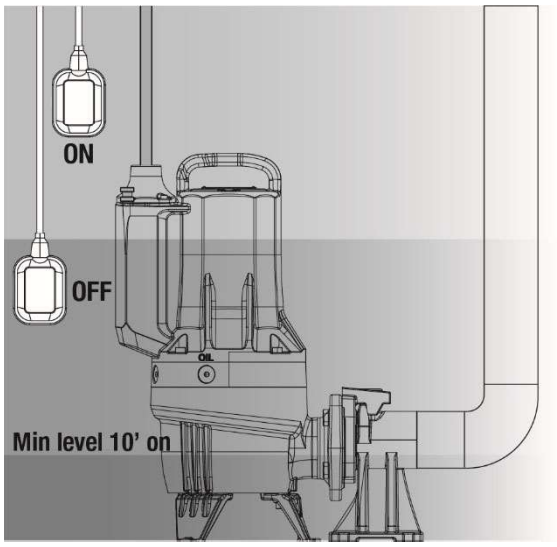


Fig.6

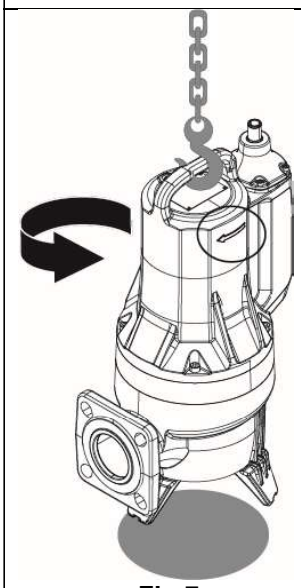


Fig.7

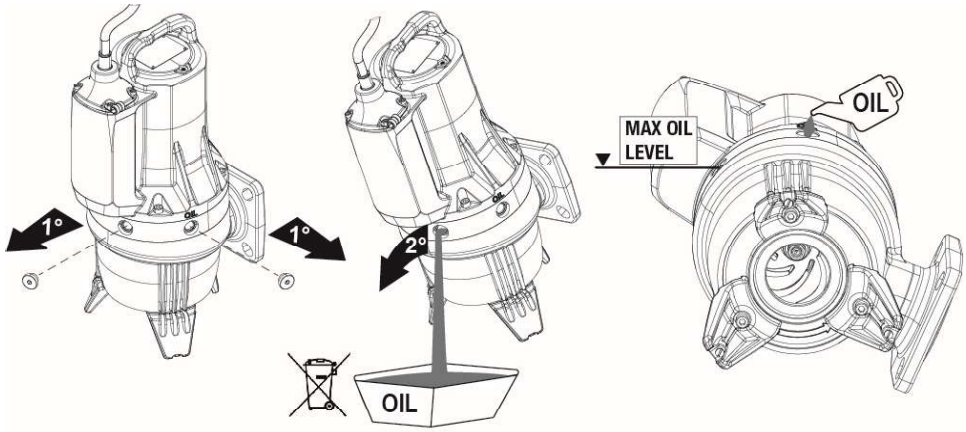


Fig.8

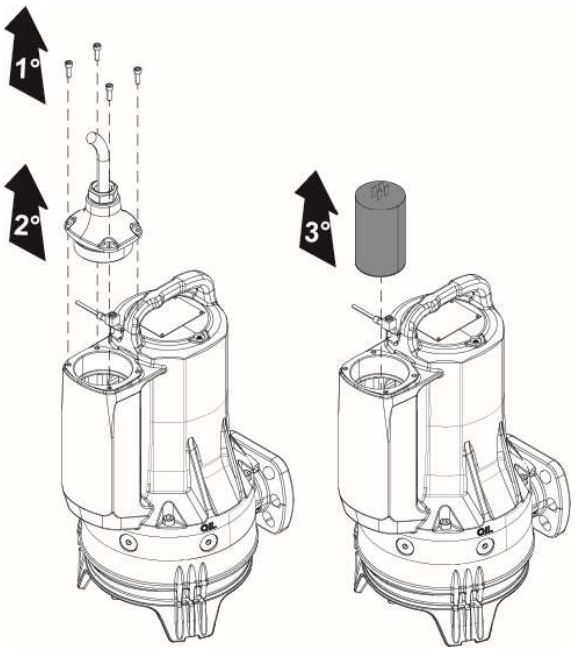


Fig.9

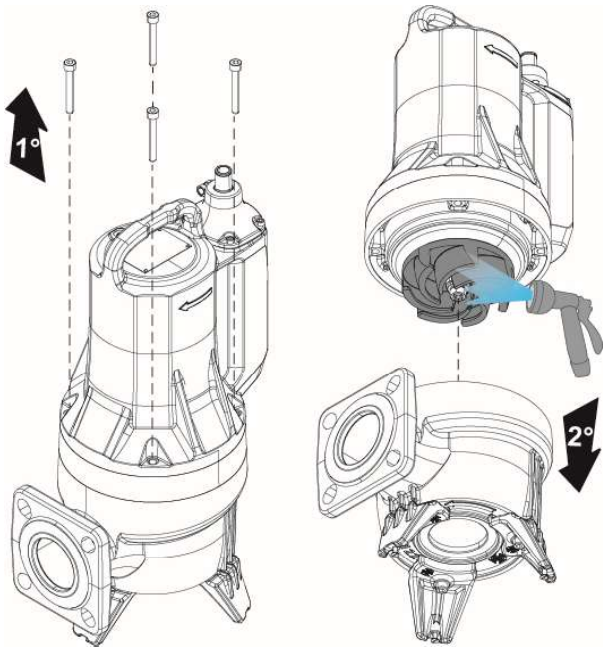


Fig.10

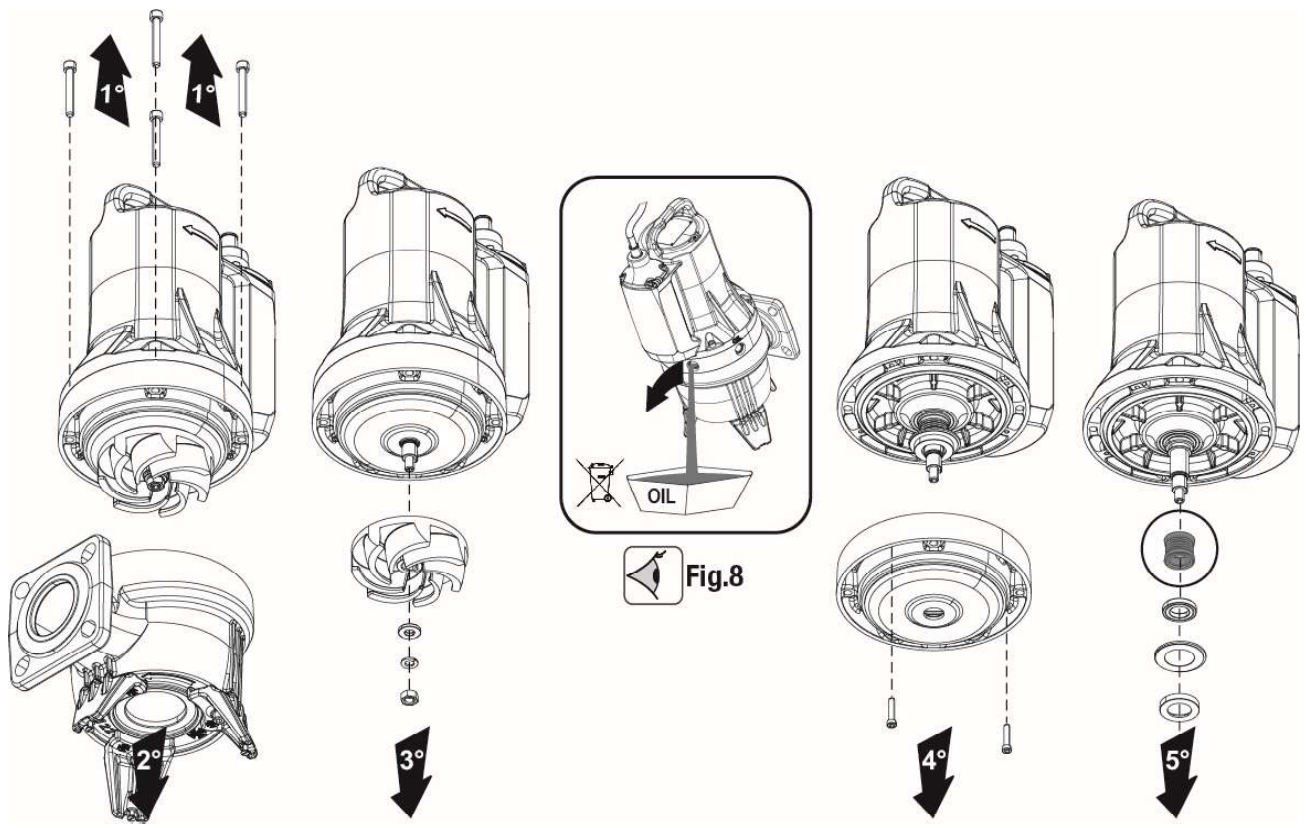


Fig.8

Fig.11

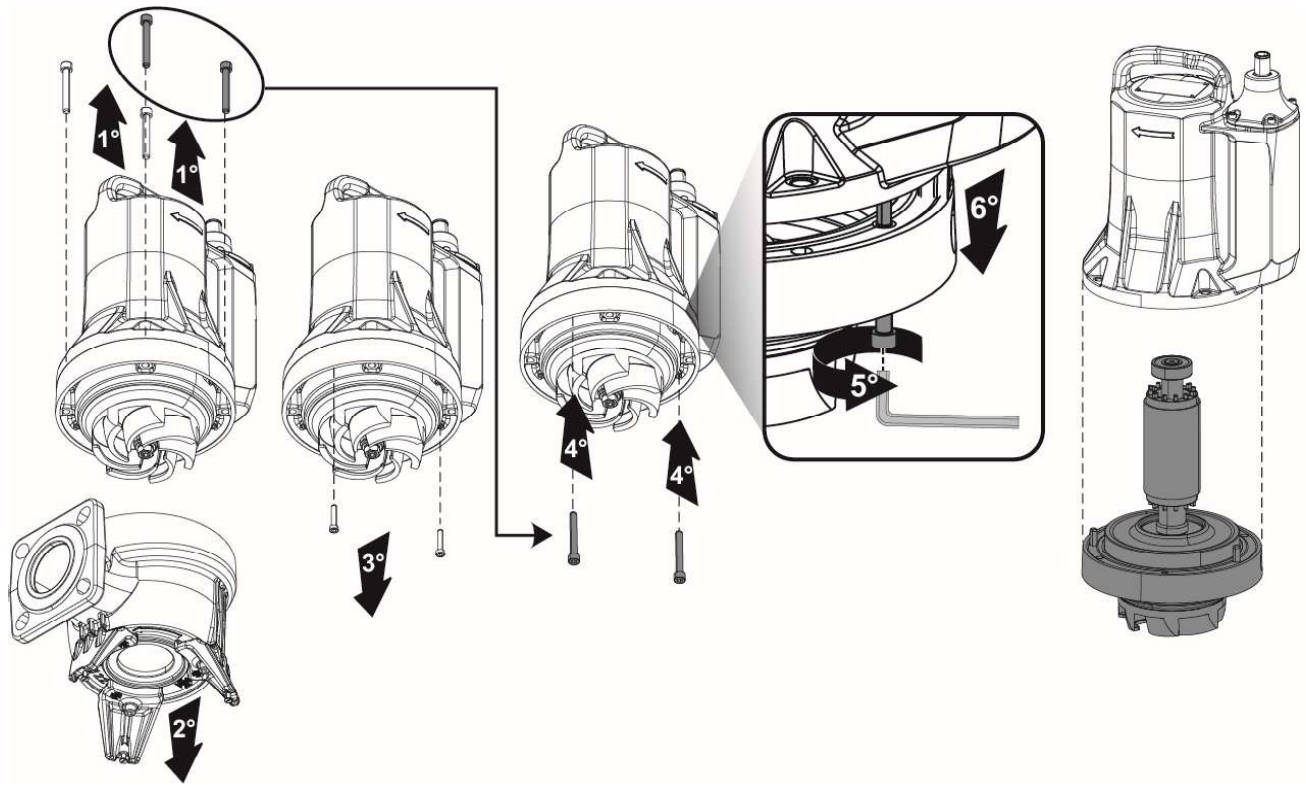


Fig.12

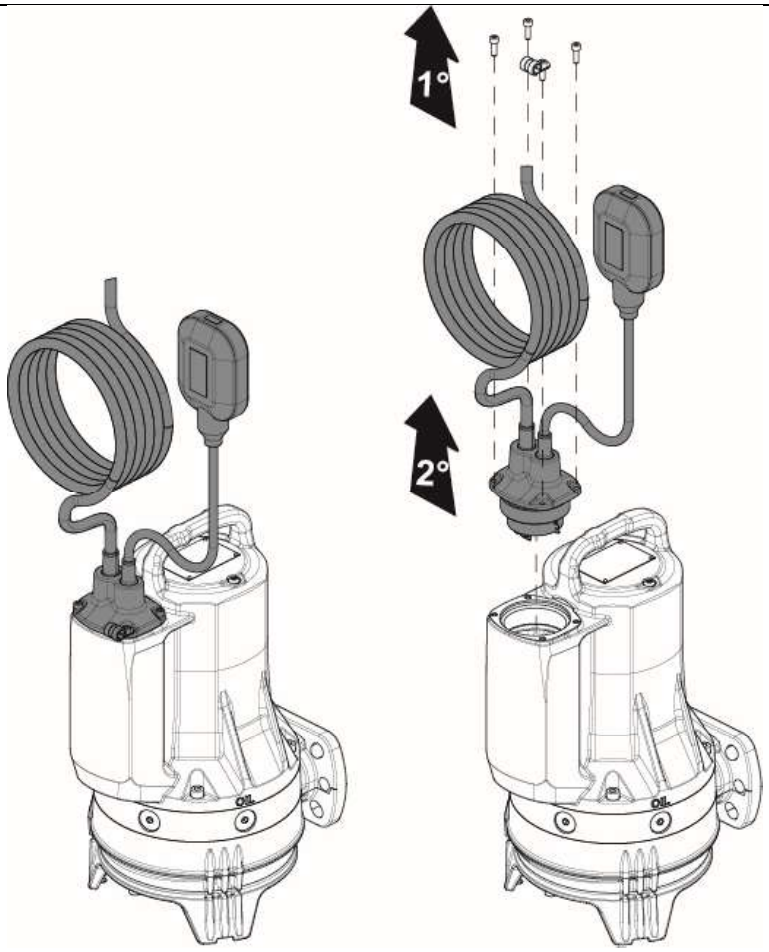


Fig.13

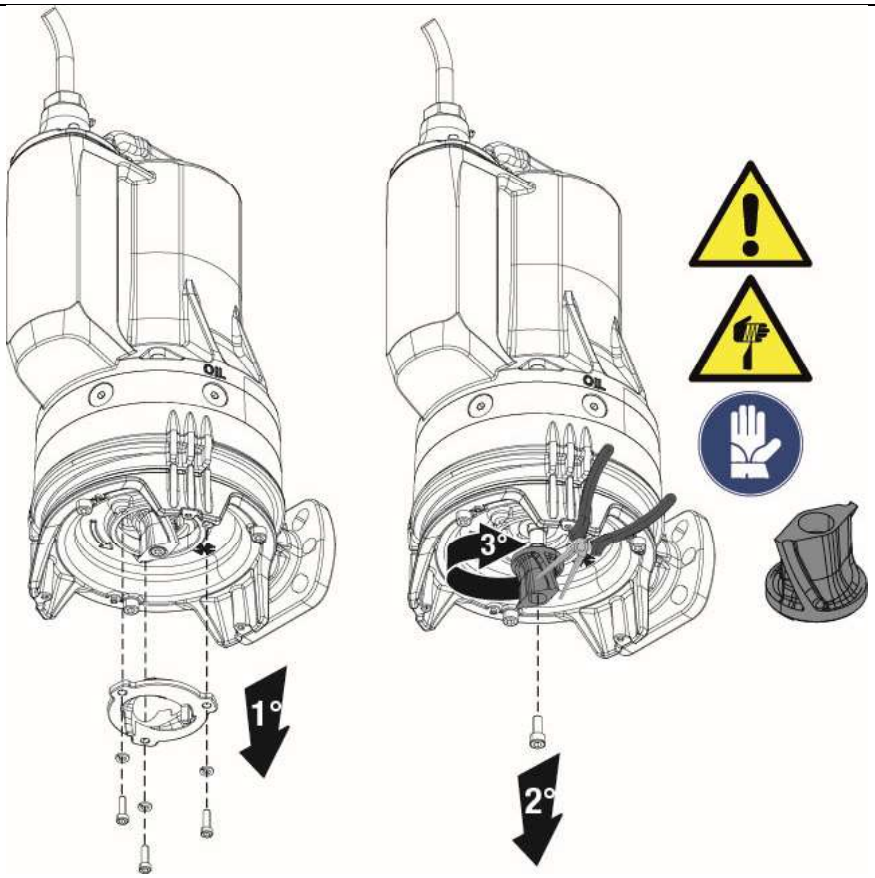
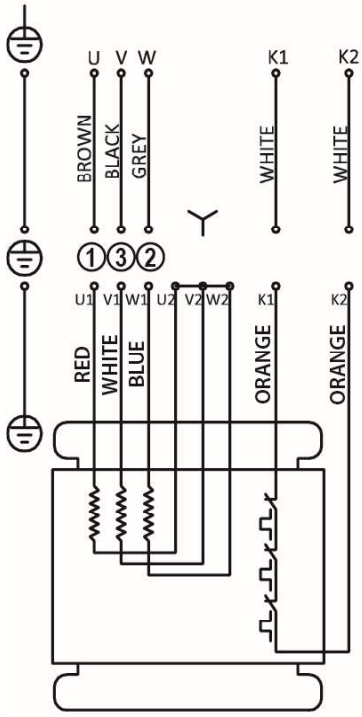


Fig.14

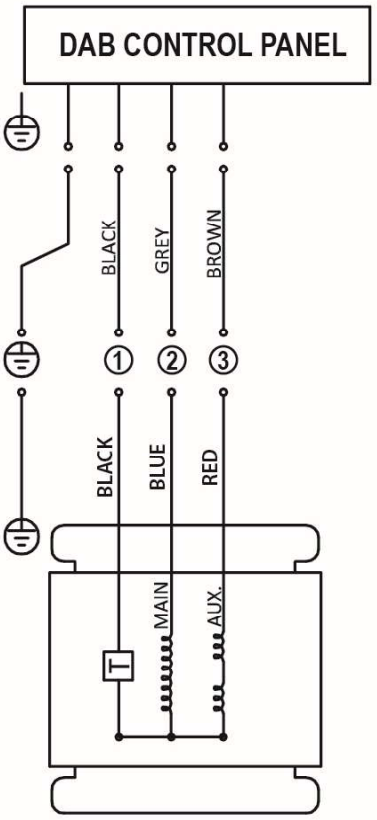
THREE PHASE

3-400V 50Hz
3-230V 50Hz
3-200-230V 60Hz
3-380-480V 60Hz
0.75kw to 2.2kw
ATEX



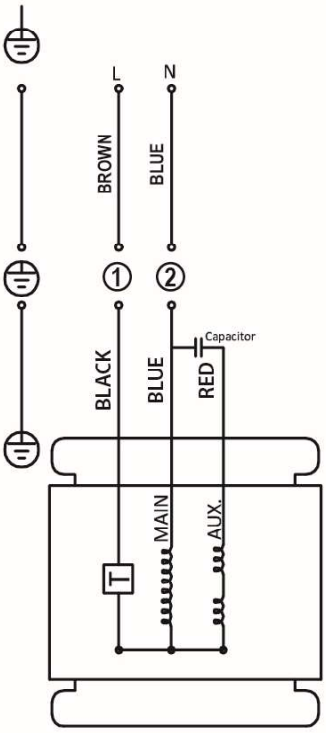
GRINDER FX

1-230V 50Hz 0.75 kw to 1.5kw
1-230V 60Hz 0.75 kw to 2.2kw
1-115-127V 60Hz



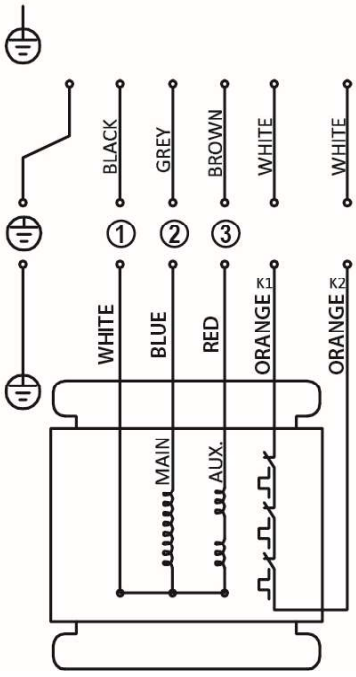
FEKA FXV - FEKA FXC DRENAG FX

1-230V 50Hz 0.75 kw to 1.5kw
1-230V 60Hz 0.75 kw to 2.2kw
1-115-127V 60Hz



GRINDER FX ATEX

1-230V 50Hz 0.75 kw to 1.5kw
1-230V 60Hz 0.75 kw to 2.2kw



FEKA FXV - FEKA FXC DRENAG FX ATEX

1-230V 50Hz 0.75 kw to 1.5kw
1-230V 60Hz 0.75 kw to 2.2kw

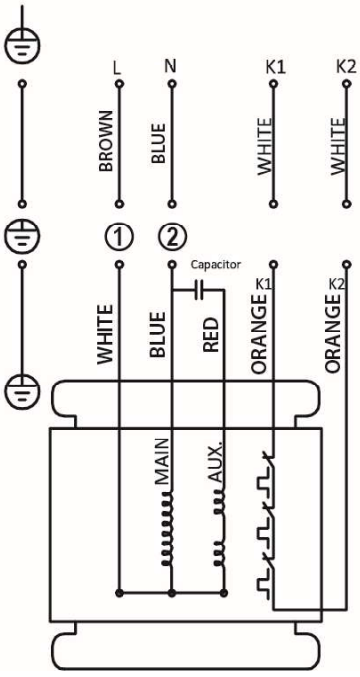
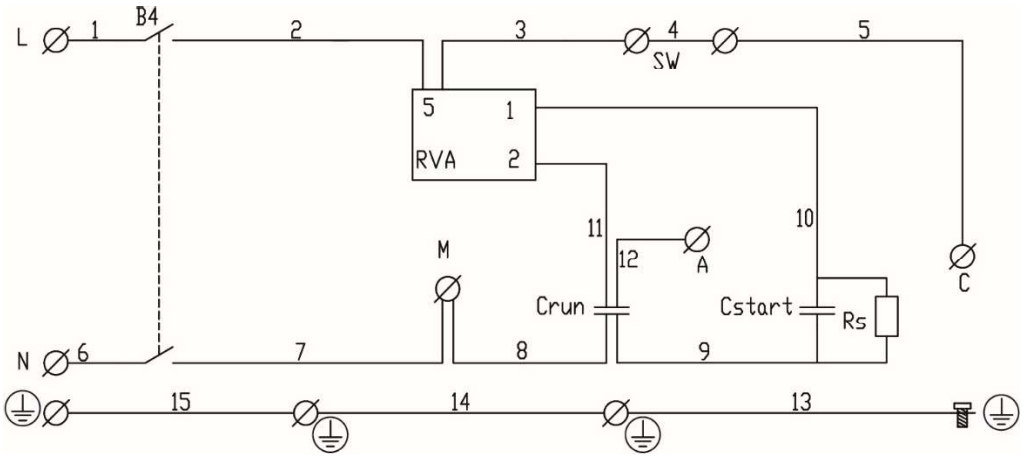


Fig.15a Wiring Diagram



CB Booster for Grinder FX

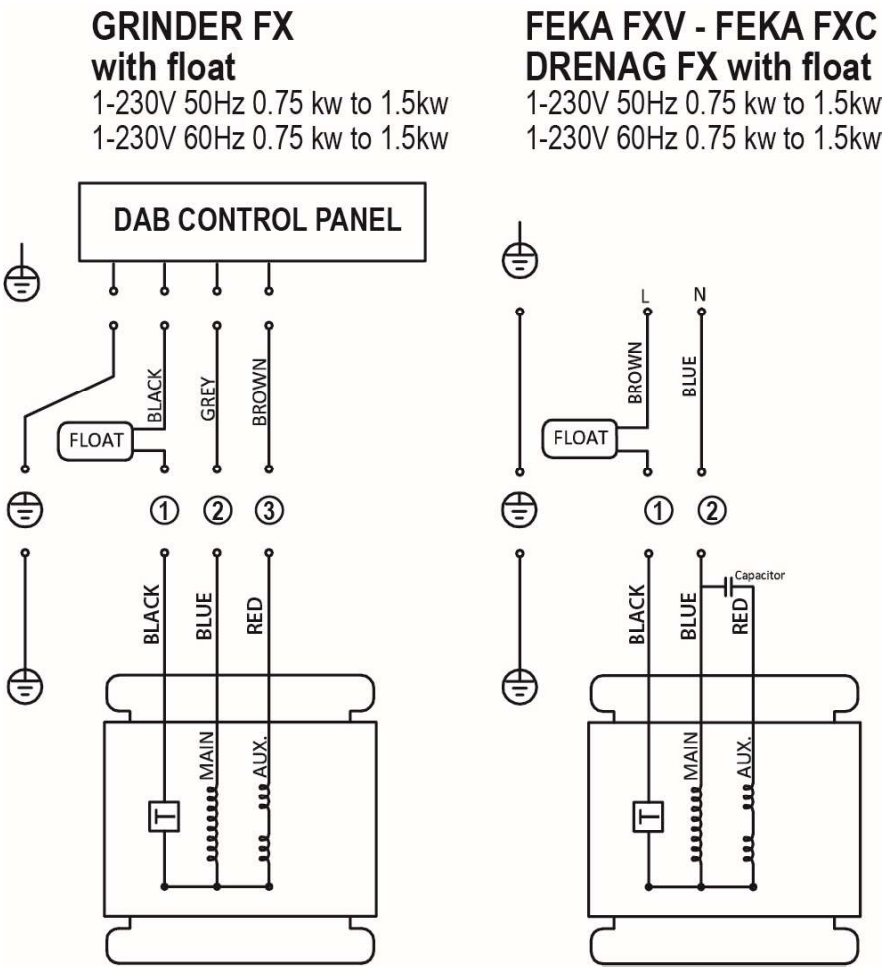


Fig.15b Wiring Diagram