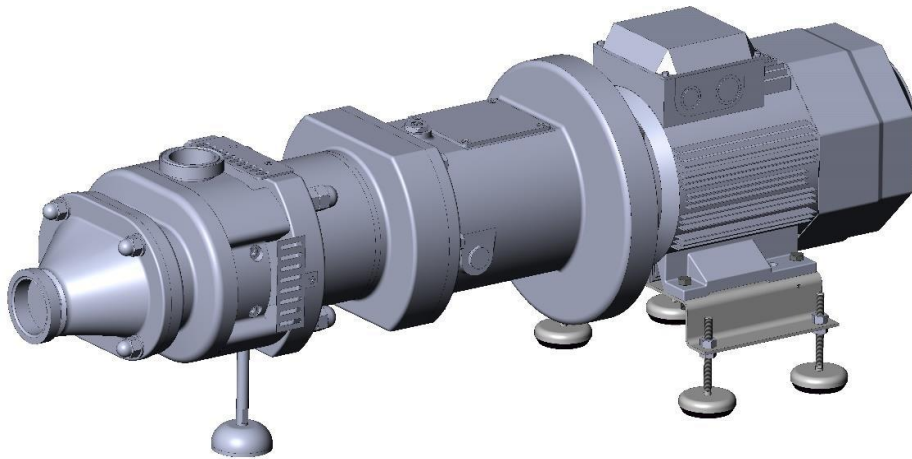


# INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

ANNEX FOR CE ATEX REGISTERED EQUIPMENT UNDER DIRECTIVE 2014/34/UE:

## TWIN SCREW PUMP

# DCH Ex



Original Manual

01.530.30.05EN

(A) 2023/03



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(B) 2023/03

# EU Declaration of Conformity

We,

**INOXPA, S.A.U.**

Telers, 60

17820 – Banyoles (Girona)

Hereby declare under our sole responsibility that the machine

## **TWIN SCREW PUMP**

Designation

**DCH**

Type

**DCH 1A1 / DCH 1A2 / DCH 2A1 / DCH 2A2 / DCH 3A1 / DCH 3A2 / DCH 4A1 /  
DCH 4A2**

From serial number **IXXXXXXXXXX** to **IXXXXXXXXXX** <sup>(1)</sup>

Is in compliance with applicable provisions of the following directive:

**Directive ATEX 2014/34/EU**

Applicable harmonized standards:

**EN ISO 80079-36:2016**

**EN ISO 80079-37:2016**

This Declaration of Conformity covers equipment with the following ATEX marking:



II 2G Ex h IIB T4...T1 Gb



II 2D Ex h IIIB T135 °C...T450 °C Db



II 2G Ex h IIB T4...T1 Gb

II 2D Ex h IIIB T135 °C...T450 °C Db

The technical documentation referenced 13215589-774802 is on file with the notified body  
LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES (LCIE), 33, Av. du Général  
Leclerc BP 8, 92266 Fontenay-aux-Roses, France. Reference num. 0081.

The person authorized to compile the technical documentation is the signer of this document.

Banyoles, 2023

David Reyero Brunet  
Technical Office Manager

<sup>(1)</sup> Where X is a numeric character

# 1. Table of contents

<b>1. Table of contents .....</b>	<b>2</b>
<b>2. General Information .....</b>	<b>4</b>
2.1. INSTRUCTIONS MANUAL .....	4
2.2. COMPLIANCE WITH THE INSTRUCTIONS .....	4
2.3. SYMBOLS .....	4
2.4. WARRANTY .....	4
2.5. PUMP NAMEPLATE .....	4
2.6. PUMP VERSION .....	4
<b>3. Design .....</b>	<b>5</b>
3.1. PUMP DESIGN .....	5
3.2. PUMP ON BASE PLATE .....	5
3.3. PUMP OPERATIONS .....	5
<b>4. Safety .....</b>	<b>6</b>
4.1. GENERAL INFORMATION .....	7
4.2. MECHANICAL RISKS .....	7
4.3. MANUAL OPERATION RISKS .....	7
4.4. ELECTRICAL RISKS .....	7
4.5. THERMAL RISKS .....	8
4.6. CHEMICAL RISKS .....	8
4.7. DANGEROUS AREAS .....	8
<b>5. Carriage, lifting and Storage .....</b>	<b>9</b>
5.1. CARRIAGE AND PACKAGING .....	9
5.2. LIFTING .....	9
5.3. STORAGE .....	9
<b>6. Installation and connection .....</b>	<b>10</b>
6.1. GENERAL RULES FOR INSTALLATION .....	10
6.2. PUMP GROUP INSTALLATION .....	10
6.3. COUPLING .....	11
6.4. PIPING CONNECTION .....	11
<b>7. Pump Operation .....</b>	<b>13</b>
7.1. PRELIMINARY OPERATION .....	13
7.2. STARTING AFTER A LONG STORAGE .....	13
7.3. CHECK BEFORE STARTING .....	14
7.4. PUMP FILLING .....	14
7.5. PUMP STARTING .....	14
7.6. SWITCH OFF .....	14
7.7. WORKING CHECK .....	14
7.8. CIP/SIP PROCEDURES .....	14
7.9. COP (cleaning of place) PROCEDURE .....	14
<b>8. Maintenance .....</b>	<b>15</b>

8.1. INSTRUCTION FOR SPARE PART ORDERING .....	15
8.2. WEARING PARTS .....	15
8.3. GENERAL INFORMATION ON MAINTENANCE ACTIVITIES .....	15
8.4. MAINTENANCE TABLE .....	16
8.5. MECHANICAL SEAL CHECK.....	16
8.6. LUBRICATION .....	16
8.7. MALFUNCTIONS AND POSSIBLE CAUSES .....	16
<b>9. Assembly and disassembly .....</b>	<b>17</b>
9.1. GENERAL INFORMATION.....	17
9.2. REMOVE THE PUMP FROM THE GROUP .....	17
9.3. DISASSEMBLY WET SIDE COMPONENTS AND MECHANICALS SEALS.....	17
9.4. ASSEMBLY SCREW CW, SCREW CCW AND MECHANICAL SEALS .....	17
9.5. ASSEMBLING THE SCRWS.....	17
9.6. TIGHTENING TORQUE TABLE .....	17
9.7. EXPLODED DRAWING (close-coupled DCH 2A1 / DCH 2A2).....	17
9.8. PARTS LIST (close-coupled DCH 2A1 / DCH 2A2) .....	17

## 2. General Information

### 2.1. INSTRUCTIONS MANUAL

This manual contains information regarding the reception, installation, operation, assembly, disassembly and maintenance of the DCH pump. Carefully read the instruction prior to starting the pump, familiarize yourself with the installation, operation and correct use of the filter and strictly follow the instructions. These instructions should be kept in a safe location near the installation area. The information published in the instruction manual is based on updated data. INOXPA reserves the right to modify this instruction manual without prior notice

### 2.2. COMPLIANCE WITH THE INSTRUCTIONS

### 2.3. SYMBOLS



**This sign shows info related to equipment complying with Directive ref. N° 2014/34 UE. The not-observance of above indications may lead to serious risks for health and safety.**



**The pump must be used only for the intended conditions of use in the specific purchase for which INOXPA ordered the execution, selected construction materials and performed the operation tests that make the pump snugly against the claims. For this reason, the pump cannot be used in situations other than those indicated in the listing.**

In the case where the operating conditions specified on the order could be changed (for example, operating fluid pumped, temperature or use), it is absolutely necessary to contact INOXPA to receive an eventual written consent. INOXPA declines all responsibility for uses other than those specified in the contract.

### 2.4. WARRANTY

Any warranty will be void immediately and lawfully and, additionally, INOXPA will be compensated for any civil liability claims submitted by third parties, in the following cases:

- The equipment has been used improperly or has not been used in accordance with the working conditions in the classified area, work has been carried out in a different classified area, or different conditions of temperature or pressure and/or different substances have been used.

### 2.5. PUMP NAMEPLATE

### 2.6. PUMP VERSION

# 3. Design

## 3.1. PUMP DESIGN

## 3.2. PUMP ON BASE PLATE

## 3.3. PUMP OPERATIONS

## 4. Safety



**Do not use the DCH pumps outside the prescribed limits contractually without the express consent of INOXPA.**

**The unauthorized use outside of the pressure and temperature limits may cause the deterioration of the seals, the binding and the explosion of the pump. Products with a viscosity higher than those prescribed by contract can cause overheating of the pump. Untested liquids can cause overheating or premature wear of the interior of the pump organ and void the ATEX certification of the pump. If in doubt, and for pumping liquids other than those prescribed by contract, contact INOXPA to have appropriate guidelines.**



**The pump designed to be inserted in locations classified as reported in its CE certificate of conformity issued by the manufacturer.**

**It is absolutely forbidden the installation of the equipment in hazardous areas with a greater degree of danger posed by the requirements of certification.**

The shipment should be checked in accordance with the instructions included in the manual. Also, the CE ATEX mark inscribed on the manufacturer's plate should be checked in order to verify that it matches the requirements of the order.



II 2G Ex h IIB T4...T1 Gb  
II 2D Ex h IIB T135°C...T450 °C Db



II 2G Ex h IIB T4...T1 Gb



II 2D Ex h IIB T135°C...T450 °C Db

**CE ATEX mark inscribed on the manufacturer's plate.**

If the equipment mark does not correspond to the order, INOXPA should be immediately informed of the situation.

The temperature class and the maximum surface temperature depend on the temperature of the product to be pumped and the ambient temperature.

Temperature class for explosive gas atmospheres

Temperature class	Product temperature (in process or cleaning)	Room temperature
T4	≤ 110 °C	-20 °C to +40 °C
T3	≤ 140 °C	-20 °C to +40 °C
T2	≤ 210 °C	-20 °C to +40 °C
T1	≤ 315 °C	-20 °C to +40 °C

Maximum surface temperature for explosive dust atmospheres

Maximum surface temperature	Product temperature (in process or cleaning)	Room temperature
T135 °C	$\leq 135$ °C	-20 °C to +40 °C
T200 °C	$\leq 200$ °C	-20 °C to +40 °C
T300 °C	$\leq 300$ °C	-20 °C to +40 °C
T450 °C	$\leq 450$ °C	-20 °C to +40 °C

#### 4.1. GENERAL INFORMATION

The motors of the DCH Ex pumps must be suitable for operating in explosive atmospheres.



**This pump was selected for a given set of pumping conditions and operating conditions in explosive atmospheres when the order was placed. will not be responsible for any damage caused if the information provided by the buyer is incomplete or incorrect (type of liquid, viscosity, RPM, classification of the potentially explosive zone, gas generated by the potentially explosive atmosphere, etc.)**

#### 4.2. MECHANICAL RISKS

During the assembled machine movement operations (installation and put out duty) or some parts of it (maintenance phase and put out duty) there are remaining risks typical of the lifting and transport machine: crush for the use of a lifting and transport means, crush for the load fall or the transport means, impact, entrapping, lag, entangling.

To restrict the risk, the Buyer can ask the handling be done by a skilled staff, suitably informed about the risks concerning the load movement according to the current regulations.

The operators must respect these handbook dispositions.

Do not do handlings different from the expected ones.

#### 4.3. MANUAL OPERATION RISKS



**The limits of the operating conditions in explosive atmospheres must not be exceeded.**



**This pump was selected according to the operating conditions specified by the user. Therefore, INOXPA disclaims liability for any damage caused by use of the pump in conditions other than those stated in the order.**

#### 4.4. ELECTRICAL RISKS

Before connecting and electric motor to the system, check local regulations regarding electric safety and standards EN 60204-1 and EN 60079-14. Also the motor manual. This motor should be Atex with adequate protection for the working environment in which it must run.



**Follow the motor manufacturer's indications at all times.**





**Protection against motor overload, suitable for the motor's nominal power must also be installed.**

If necessary, install a separate fan, bearing in mind the environment where it will operate (potentially explosive atmosphere).

#### **4.5. THERMAL RISKS**

Some parts of the circuit and the engine, during the working, can have temperatures higher than 80°C. These parts marked with the suitable signaling. Do not touch these parts during the working.

Make any intervention on these components only after the machine has been cooled, at least, 30 minutes. Foresee always the suitable protective means, such as delimiter barriers or other.

#### **4.6. CHEMICAL RISKS**

#### **4.7. DANGEROUS AREAS**



**The pump is not self-operating equipment. When connected to a driving motor a full risk assessment of the motor pump unit should be carried out by the unit manufacturer and/or by the user.**

# 5. Carriage, lifting and Storage

## 5.1. CARRIAGE AND PACKAGING

## 5.2. LIFTING

## 5.3. STORAGE

If the pump is not for immediate use, then it must be moved twice a week in order to prevent the impeller, mechanical seal, and bearings from seizing up.

## 6. Installation and connection



The received pump must be checked to ensure that it is adapted to the working conditions of the classified area and the conditions of the order.



The installation and maintenance of the equipment should be performed by qualified and authorized personnel. The place of installation must be designed according to the laws and the directives for systems installed in potentially explosive atmospheres.



Do not install the pump directly direct exposure of sunlight or inclement weather. Do not install the pump in places without ventilation. Ensure the equipotentiality of the pump crossed a link to a suitable ground reference using electrical conductors with an appropriate section. Do not exceed the number of revolutions and the pressure values for which the pump has been sold. Install a suitable suction filter to prevent ingress of dirt or harmful materials for the pump. The filter should have a filtering area at least 4 times the area of the front flange of the pump.

Predict the damper on the piping and / or upstream flexible joints and downstream of the pump so as to reduce the system noise and the effects of water hammer.

### 6.1. GENERAL RULES FOR INSTALLATION

Do not remove the protection caps mounted on the suction and discharge casings, and the closing caps installed on all auxiliary connections, before they are connected to the piping, all this in order to protect the pump from the access of foreign bodies. Before performing the connection of discharge and suction casings, it is always necessary to verify that these are perfectly clean and therefore without any kind of dirt, such as welding residues, sand, foreign bodies, etc. Always protect the pump using a suction filter, which shall be selected on the basis of the viscosity of the fluid to be pumped, placed on the suction circuit. The pressure loss across the filter should not be reach the unallowable limit of the suction pressure, which shall remain within the limits provided by the supplier or the pump datasheet. If the pump is intended for pumping liquids with a temperature above 80 °C, some of it surfaces could reach a higher temperature value during operation. In this case it is always advisable to provide suitable security tools, such as barriers or other. The positioning must be performed carefully on foundations, trying to prevent crushing and using adequate tools for the lifting. Install the pump group in a place accessible from all sides, clean and able to ensure a horizontal installation of the pump by providing a free area of 1500 mm around the pump. Provide adequate ventilation of the group, avoiding placement in narrow, dusty and poorly ventilated areas.

### 6.2. PUMP GROUP INSTALLATION

#### 6.2.1. Preparing the location

Place the pump near a drain on the floor. Note that the handling of inflammable fluids can create an area classified as Zone 0 in the drain area and therefore all the appropriate safety indications must be observed.

The motors used must be EC marked in accordance with Directive ATEX 2014/34/EU and with the instructions of the manufacturer and the applicable national and local regulations.



**When pumping inflammable or explosive liquids, a proper connection must be used. Connect the parts of the assembly with the earth connections in order to reduce the risk of static electricity.**

Depending on the fluid to be pumped, high temperatures may be reached inside and around the pump:



**Note that the surface temperature of the pump in normal operating conditions is determined by the fluid it pumps. To see 4. point.**



**Air must be properly recirculated in order to cool the pump motor. Make sure there is no other equipment or surfaces near the motor that may radiate additional heat or affect the cooling of the motor. See the motor instructions manual.**

#### 6.2.2. Fixing baseplate on foundation

#### 6.2.3. Assembly pump without foundation

### 6.3. COUPLING



**During the alignment operations, wear suitable protections (in particular for the hands). Pay more attention in case of high temperature. Perform any work in the presence of at least 2 people. For any operation, use appropriate size engines ONLY. In case of doubt, contact INOXPA before performing any operation. Improper coupling alignment could cause unexpected increases in temperature resulting in the loss of the "Ex" requirement. Always check the pump when it stops, making sure that the safety procedures to avoid accidental starting have been activated. During the alignment operation is always necessary to use hand protections such as gloves, etc. If the surface temperature is high, use protective equipment suitable for each operation, always use appropriate handling systems, such as tackles or other. The pump must be aligned with the aid of a spirit level positioned on the motor shaft and on the flanges. Perform the alignment procedure after assembling the two semi-couplings on the motor and the pump.**

#### 6.3.1. Motor alignment

#### 6.3.2. Coupling guard mounting

### 6.4. PIPING CONNECTION

#### 6.4.1. General information



**Before starting up the pump, make sure that the suction and discharge valves of the pump are open.**



**Before closing the suction and discharge valves, make sure that the pump is switched-off and has stopped.**

When hot fluids are being pumped, pay attention to thermal dilation. In this case, use expansion washers and pay special attention to avoid leaving the equipment electrically insulated (electrical equipotentiality) from the rest of the assembly.

#### 6.4.2. Suction piping

#### 6.4.3. Discharge piping

#### 6.4.4. Auxiliary piping

#### 6.4.5. Electrical connection

Before connecting the motor to the mains, read the manufacturer's instructions manual. This motor must be an ATEX motor with a protection level corresponding to the working environment where it will operate.



**Protection against motor overload, suitable for the motor's nominal power, must also be installed.**



**The electrical equipment, terminals and components of the control systems may still contain electric current when switched off. Contact may place the operator or installation in danger or cause irreparable damage to the equipment. The supplier's instructions for the safe opening of the motor should be followed at all times.**



**Permits to work will be required to handle the equipment in potentially explosive atmospheres. It is strongly recommended that this type of work be carried out in non-classified atmospheres (i.e. there must not be an explosive atmosphere in the location of the pump when it is being handled).**

# 7. Pump Operation

## 7.1. PRELIMINARY OPERATION



The pump must not run in the absence of liquid for over a minute. Times longer than one minute may result in internal heat buildup of equipment that, in the presence of flammable liquids, can be extremely dangerous. In case of accidental start of the pump in absence of liquid for longer than 1 minute time the "Ex" device certification will only be guaranteed when combined with appropriate detection devices complying with the applicable standards (EN 13463-6).



Before starting up, those responsible must be duly informed about the pump and the safety instructions. This Annex, along with the instructions manual, will be available to staff at all times.



In order to carry out any type of work in potentially explosive atmospheres, it is necessary to adopt special safety measures such as permits to work.

## 7.2. STARTING AFTER A LONG STORAGE

### 7.3. CHECK BEFORE STARTING



**Before starting up the pump, make sure that the suction and discharge valves of the pump are open.**

If there is a risk of operation in dry conditions, it is recommended that a flow-detection probe be installed in the pump intake, or any other device preventing the pump from operating in dry conditions.



**If the fluids that have to be drained are inflammable, the possible formation of potentially explosive atmospheres must be considered; permits to work should therefore be issued.**

### 7.4. PUMP FILLING

### 7.5. PUMP STARTING



**Before starting the electric motor and pump make sure you have read all the manual operating engine electrical motor and the manual operating frequency converter.**

**Never start the pump if the suction valve is closed, because the installed pump is the volumetric type and the pump delivery pressure is only the installation counter-pressure function, and if the delivery valve is closed the pressure in the piping can reach intolerable values for the whole discharge system. The installation of a safety valve on the discharge pipe is preferred. In the case in which is installed a safety valve on the discharge pipe, do not operate the pump with the discharge line closed for over 1 minute.**



**An explosive atmosphere may be formed during the start-up of the pump. Therefore, permits to work will be required and these tasks must only be carried out by qualified or trained personnel.**

### 7.6. SWITCH OFF

### 7.7. WORKING CHECK

### 7.8. CIP/SIP PROCEDURES

### 7.9. COP (cleaning of place) PROCEDURE

## 8. Maintenance



**For the replacement of any part of the pumps always use original spare parts INOXPA. The use of non-original spare parts will void the "Ex" certification of the pump and immediately voids the warranty.**

### 8.1. INSTRUCTION FOR SPARE PART ORDERING

When ordering spare parts for a pump operating within a classified area, it must be expressly stated that the pump is an ATEX pump and quote the manufacture number.

Otherwise, Inoxpa cannot ensure that the pump operates with parts that are suitable for the classified.

### 8.2. WEARING PARTS

### 8.3. GENERAL INFORMATION ON MAINTENANCE ACTIVITIES



**The maintenance work of any equipment intended for use in potentially explosive atmospheres can only be carried out with the appropriate permit to work, as specified by ATEX 2014/34/UE.**



**Maintenance jobs can only be done by qualified personnel. Use the proper clothing. Ensure that staff read the entire instructions manual and this Annex and, in particular, indicate those chapters that refer to the job to be done.**



**Pay special attention during the drainage process to prevent damage to personnel and adjacent equipment. Purge completely the system and make sure that the product is de-aerated or collect the product in accordance with local regulations. The pumping system shall be purged by authorized and trained personnel.**



**Plan to replace bearings every 5000 operating hours. Be sure to use only original parts supplied by INOXPA, in order to avoid the invalidation of product warranty and "Ex" requirement.**



**The pump must be kept clean by avoiding accumulation of dust exceeding 5mm above it. Excessive accumulations of dust could hinder proper heat dispersal. Consider cleaning activities in the plane of the equipment maintenance.**

Try to ensure that the working environment is clean, for some parts are very fragile and others have a low tolerance level.



**The possibility of the presence of an explosive atmosphere must also be considered. Therefore, these jobs can only be carried out after the appropriate work permit has been issued.**

Use tools that are technically suitable for maintenance and repair jobs. If the area is not unclassified, all the tools must be flameproof and safe-work permits must be issued the job is started.



Apart from the safety measures indicated in the manual given by the motor manufacturer for safely opening it must also be followed.



**The possible existence of formation of explosive atmospheres must be taken into account when emptying the pump, so safe work permits must be issued and any possible source of ignition in the area surrounding the equipment or the work place must be eliminated**

The user is responsible for establishing a cleaning or disinfection plan that suits their needs. This plan should take into account all applicable laws, regulations and standards related to protection of public health and safety in the use and disposal of chemical products.

#### **Outside cleaning.**



**Do not spray the hot parts of the pump with water, since some parts might crack and pump fluid could spill into the environment, thereby generating a potentially explosive atmosphere.**



**The outside of the equipment must be cleaned in order to avoid the excessive build-up of combustible or explosive dust on the outer Surface of the equipment. The accumulated dust must never exceed 2 mm.**

### **8.4. MAINTENANCE TABLE**

### **8.5. MECHANICAL SEAL CHECK**

It is important to perform a daily check of the mechanical seals to detect any leakage.

### **8.6. LUBRICATION**

#### **8.6.1. General information**

To ensure a good pump working, it is necessary to take care of the mounting and bearing lubrication.

The INOXPA twin screw pumps DCH series are always constructed with the gear housing, and are lubricated with oil.

Consult the data sheets of the pump, enclosed to this handbook, to verify both the type and the quantity of the required lubricant.

If the work environment is clean and there are no particular oil pollution hazards due to water and dust, and the operating temperature is about 60 ° C, the lubricant must be replaced (or only controlled in case of use of grease) each 4000/6000 hours.

For mounting temperatures above 60 ° or particularly dirty or wet environments, reduce the time between controls and changes.

A possible overheating can be caused by an excess of oil charge, a bad alignment or heavy vibrations.

#### **8.6.2. Lubrication points**

#### **8.6.3. Changing of lubricating oil**

#### **8.6.4. Lubricant table**

### **8.7. MALFUNCTIONS AND POSSIBLE CAUSES**

# 9. Assembly and disassembly

## 9.1. GENERAL INFORMATION



**Improper assembly or disassembly of the equipment can impair operation of the pump, cause high repair costs, long downtime and even render the protective system of the equipment ineffectual.**

INOXPA disclaims any liability for accidents or damage caused by failure to observe the instructions of the manual and of this Annex.

### **Preparations.**

As well as the instructions given in the manual, the possibility of the presence of an explosive atmosphere must also be considered. Therefore, these Jobs can only be carried out after the safe work permits have been issued.

### **Tools.**

Use tools that are technically suitable for maintenance and repair jobs. If the area is not unclassified, all the tools must be flameproof and safe-work permits must be issued.

### **Cleaning.**

Before proceeding to dismantle the pump, both the outside and the inside of the pump must be cleaned. The possibility of the presence or development of an explosive atmosphere must also be considered. Therefore, these jobs can only be carried out after the appropriate work permits have been issued.

### **Disconnection.**



**The possibility of the presence or development of an explosive atmosphere must be considered. Therefore, the appropriate work permits must be issued and any possible ignition source in the areas surrounding the equipment must be eliminated.**

### **Electrical safety.**

In addition to the safety instructions given in the manual, the indications given by the motor manufacturer must be followed at all times in order to open the motor safely or lock it in.

## 9.2. REMOVE THE PUMP FROM THE GROUP

## 9.3. DISASSEMBLY WET SIDE COMPONENTS AND MECHANICAL SEALS

## 9.4. ASSEMBLY SCREW CW, SCREW CCW AND MECHANICAL SEALS

## 9.5. ASSEMBLING THE SCRWES

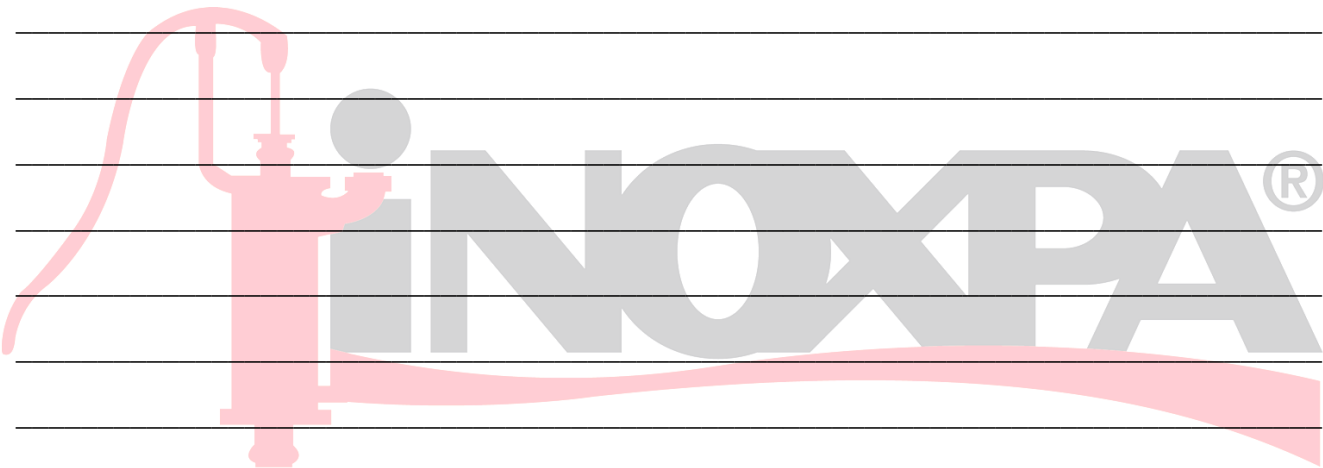
## 9.6. TIGHTENING TORQUE TABLE

## 9.7. EXPLODED DRAWING (close-coupled DCH 2A1 / DCH 2A2)

## 9.8. PARTS LIST (close-coupled DCH 2A1 / DCH 2A2)



NOTAS



**How to contact INOXPA S.A.U.:**

contact details for all countries are  
continually updated on our website.

Please visit [www.inoxpa.com](http://www.inoxpa.com) to access the information.



**INOXPA S.A.U.**

Telers, 60 – 17820 – Banyoles – Spain

[www.sks-online.com](http://www.sks-online.com)

Tel.: +34 972 575 200 – Fax.: +34 972 575 502