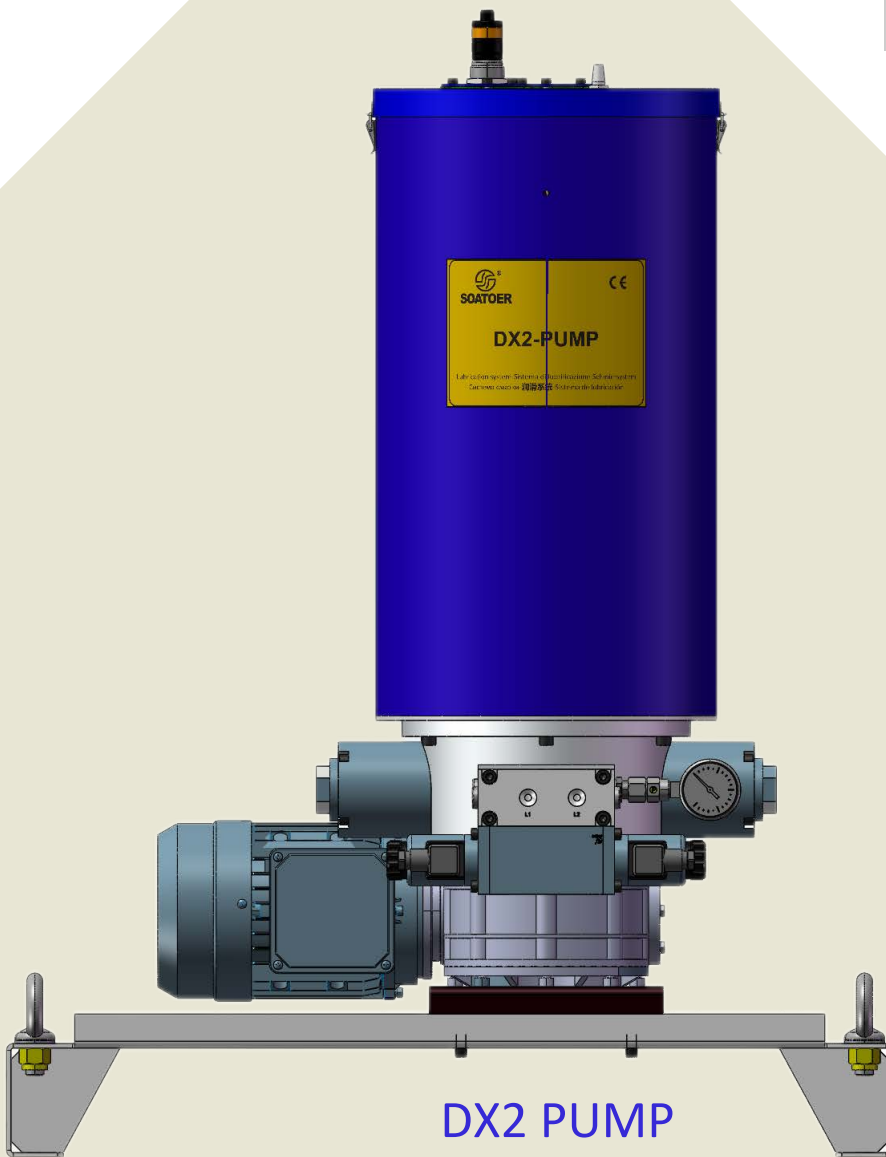
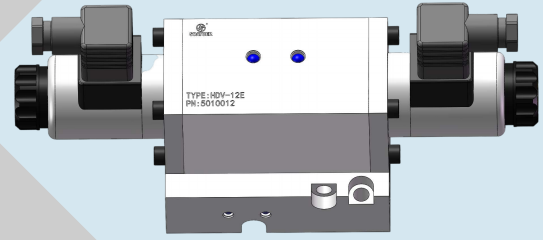




SOATOER

AN ISO 9001 APPROVED COMPANY



DUAL LINE DX LINE SYSTEM



PLATFORMS 海洋平台



LARGE CRANES 港机



MINING SECTOR 矿山



CEMENT FACTORIES 水泥



STEEL MILLS 冶金

DUAL LINE DX LINE SYSTEM

DX 双线系统

The electric DX2-PUMP has been designed for all applications that use Double Line Systems. The two pumping modules, installed in the pump body, guarantee a pressure of 400 bar in redundancy with a total flow of /200 /400 cc/minute. The pump can continue working even if one of the two modules were to stop.

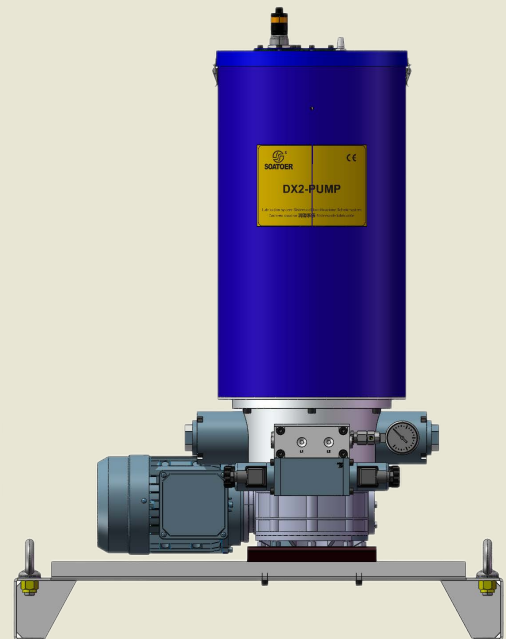
The Double Line lubrication systems, generally used on medium and large sized machinery and equipment, operate in harsh or extreme operating conditions for the various points to be lubricated. The systems can be very complex and be longer than 100 metres. Any type of system can be designed and set up in a reliable and efficient manner, with the possibility of expansion.

DX2系列电动泵专为使用双线系统的所有应用而设计。安装在泵体内的两个泵芯可确保冗余压力为400 bar，输出流量:200/400 cc / min。即使两个泵芯之一停止运行，泵仍可继续工作。

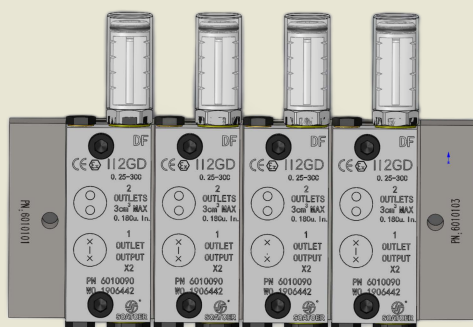
通常在大中型机械和设备上使用的双线润滑系统，在要润滑的各个点的苛刻或极端运行条件下运行。该系统可能非常复杂，并且可能超过100米。可以以可靠和有效的方式设计和设置任何类型的系统，并且可以扩展。



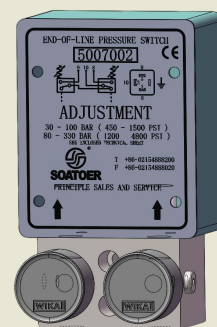
Electric pumps for oil and grease
用于油和油脂的电动泵



A flexible high-performance solution
灵活高性能的解决方案



The only electric pump with mechanical suction and delivery movement of the pumping elements
电动泵只有具有机械吸和输送运动的泵元件



DX2-PUMP FEATURES AND BENEFITS

DX2泵的特点和优点

DX PUMPING UNIT 泵单元

The pumping units can be quickly replaced since they are positioned on the front side of the pump. Downtime during maintenance is reduced to zero and the risk of contamination is eliminated. 泵芯可以快速更换，因为它们位于泵的前端。维修期间的停机时间减少到零，消除了污染的风险。

ADVANTAGES 特点

The system is always efficient with the double pumping unit. Constant lubrication can continue even if one module were to stop. 采用双抽油机，系统总是高效的。即使一个模块停止工作，也可以继续进行持续润滑。

HIGH PERFORMANCE FLOW RATE AND PRESSURE 高性能的流量和压力

High pressure values and flow performance can be reached sp as to supply any type of circuit. 高压值和流量性能可以达到任何类型的电路。

CUSTOMISABLE 可定制

The versatility and simplicity of the structure allows various customisations to be made to the assembly with additional components to provide a completely customised service. 结构的多功能性和简洁性允许通过附加组件对装配进行各种定制，以提供完全定制的服务。

CUSTOMISABLE 可定制

To guarantee safe and reliable handling, the pumps are supplied assembled to a metallic pallet that is easy grasped. 为了保证安全可靠的操作，泵被装配到一个金属托盘，很容易固定

EASY-TO-USE ELECTRIC PUMP 易于使用的电动泵

The pump body is set up to receive the two pumping elements, the pressure relief valve, the pressure gauge and the electromagnetic or electropneumatic inverter. 泵体可以安装两个泵元件，和减压阀、压力表和电磁或电动气动变频器。

ADVANTAGES 特点

All the pipes and the external components have been eliminated. 所有的管道和外部组件都被消除了。

HIGH PERFORMANCE FLOW RATE AND PRESSURE 高性能的流量和压力

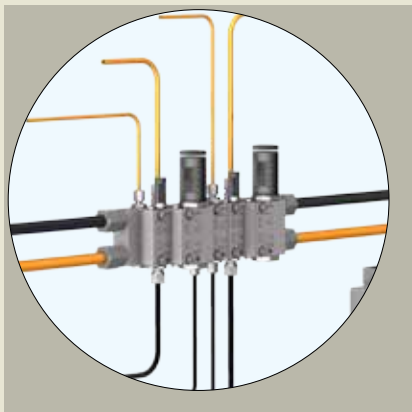
5kg, 10kg, 30 kg, 60kg, and 100 kg tanks for grease and oil with minimum and maximum level sensors on request, in AISI 316L.

5kg, 10kg, 30kg, 60kg和100kg的润滑脂和润滑油罐，最小和最大液位传感器可根据要求，采用AISI 316L。

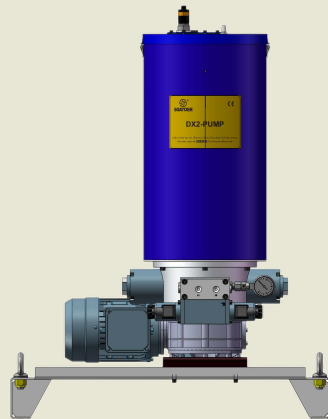
SINGLE MECHANICAL PISTON MOVEMENT 单机械活塞运动

Available with motors having different voltages and in compliance with UL-CSA / NEMA / ATEX standards.

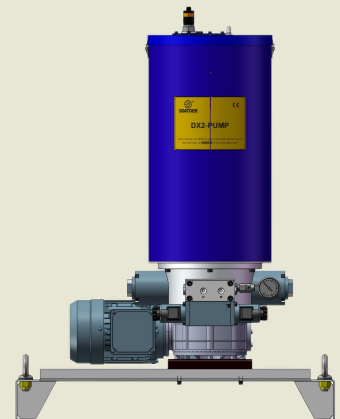
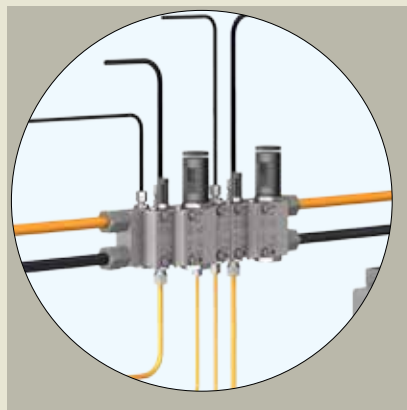
可配置不同电压的电机，符合UL-CSA / NEMA / ATEX标准



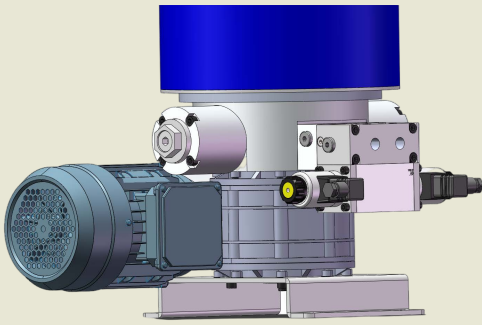
STEP 1



STEP 2



INVERSION SYSTEM 换向阀系统

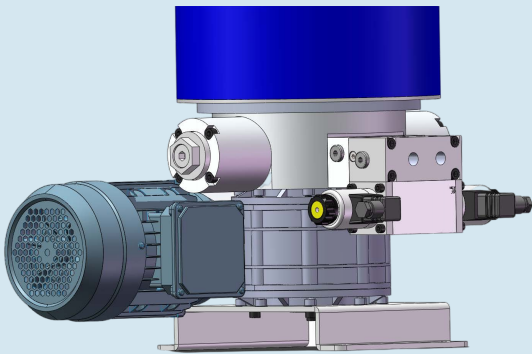


MAIN ELECTRIC DX2-PUMP UNIT DX2泵单元

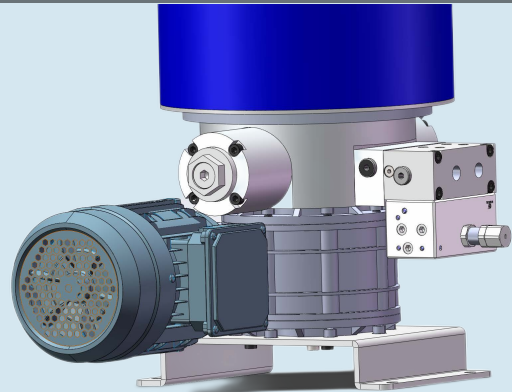
The core of the electric pump consists of the **DX2** pumping unit where the two elements that are driven alternately by the central cams are placed, which draw and supply lubricant. Inserted in the front body, they can be installed or removed without intervening on the pipes. The alternate movement of the two pistons guarantees a constant and homogeneous flow of the lubricant, the high performance pressure to be reached (400 Bar max) and the possibility of operating even if one of the two pumping elements were to stop. The pressure gauge and the adjustable safety valve are also found in the same body.

电动泵的核心由DX2泵芯组成，其中放置了由中央凸轮交替驱动的两个元件，它们抽取和供应润滑油。它们插入前本体，可以在不干涉管道的情况下进行安装或拆卸。两个活塞的交替运动保证了润滑油的恒定和均匀流动，可以达到高性能压力(400 Bar max)，即使两个泵元件中的一个停止工作，也可以继续工作。压力表和可调安全阀也在同一阀体内。

ELECTROMAGNETIC INVERTER (STANDARD) 电磁换向阀(标准)



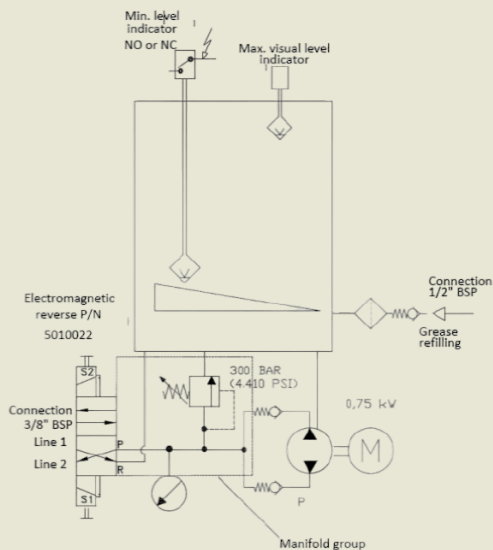
ELECTROMAGNETIC INVERTER (STANDARD) 液压换向阀(标准)



HYDRAULIC DIAGRAM 液压原理

Standard grease pump (dual line)

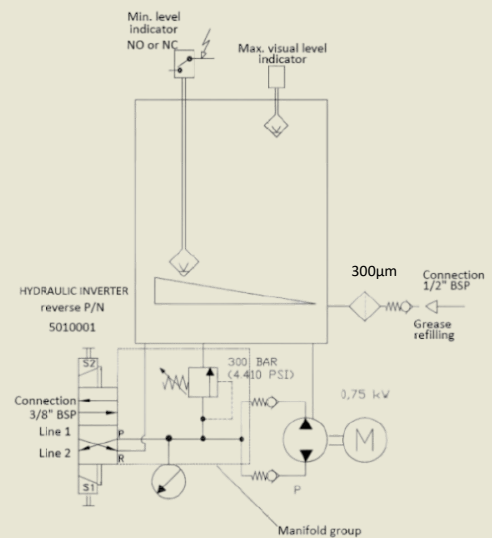
Hdraulic diagram DX grease pump (30 and 100 Kg) – dual line



HYDRAULIC DIAGRAM 液压原理

Standard grease pump (dual line)

Hdraulic diagram DX grease pump (30 and 100 Kg) – dual line



TECHNICAL FEATURES 技术参数

Operating pressure From 200 to 400 Bar max 最大压力	Da 200 a 400 Bar Max
Pressure relief valve adjustment Standard set at 300 Bar 压力设定	Di serie tarata a 300 Bar
Flow rate 200-400 cc/min 输出流量	200-400 cc/min
Outlets 2 x 3/8" seats 出口螺纹	2 sedi 3/8"
Operating temperature Min -25°C Max +70°C 工作温度	Min -25°C - Max +70°C
Degree of protection IP 55 防护等级	IP 55
Working humidity 90% max 工作湿度	90% max
Lubricants 润滑剂	Min. oil 50 cSt at operating temperature NLGI-2 Max grease at working temperature

TECHNICAL FEATURES 技术参数

Motor 电机	0.75KW IP55 CL. F Service S1
Voltage 电压	220-240 / 380-420V AC 50Hz 254-280 / 440-480V AC 60Hz
Adjustable by-pass valve 可调安全阀	From 200 tp 400 bar
Pumping 泵芯	2 pumping elements
Tank 油箱	30 kg;60kg;100 kg
Tank inlet 油箱补油口	Filter with inlet valve 带过滤的单向阀补油口
Inlet filter	300µm
Minimum Electric Level for grease 油脂低液位	PNP contact Capacitive Sensor
Maximum level for grease 油脂高液位	Visual 目视高液位
Oil Electric Minimum/Maximum Level 稀油高低液位	Visual 目视高液位
Pressure gauge 压力表	0 - 600 Bar in glycerine bath Dn 63
Inversion module 换向阀模块	Electromagnetic 24 V DC

TECHNICAL FEATURES 技术参数

Single-phase voltage motor 单相电机	115V AC 60Hz 230V AC 50Hz
Three-phase voltage motor 三相电机	330-575V AC 60Hz 500V AC 50Hz
Motor standards 电机标准	380V AC 60Hz UL-CSA - NEMA
Electromagnetic Inversion Module 电磁换向阀	230 V AC 24 V AC
Capacitance grease min/max level 油脂型电容高低液位	30 kg tank continuous reading 100 kg tank
Maximum grease level 油脂型高液位	continuous reading PNP contact Capacitive Sensor

COMPOSITION OF ORDERING CODES 订购信息

DX2/ G/ A/ S/ 1/ A/ 1/ 2

LUBRICANT 润滑剂

GREASE 油脂	G
OIL 稀油	O

TANK 油箱

30 Kg	A
60 Kg	B
100 Kg	C

MOTOR 电机

THREE-PHASE 标准三相电机	S
SINGLE-PHASE 115V	B
SINGLE-PHASE 230V	C
THREE-PHASE 330-575/60 Hz	D
THREE-PHASE 480/60 Hz	E
THREE-PHASE 380/60 Hz	F

ELECTROMAGNETIC/HYDRAULIC INVERSION MODULE 电磁/液压换向阀

24 V DC	1
115 V AC	2
230 V AC	3
液压换向阀	4

MINIMUM GREASE LEVEL 低液位

CAPACITIVE 电容	A
LASER (min - max) 激光	B

MAXIMUM GREASE LEVEL 高液位

VISUAL 目视	1
CAPACITIVE 电容	2

FLOW 流量

200cc	1
400cc	2

Persons authorized to operate the pump 有权操作泵的人员

Operator 操作员

A person who is qualified by training and experience to carry out the functions and activities related to normal operation, including the avoidance of possible hazards that may arise during machine operation. 经过培训并具有执行正常操作相关功能和活动经验的人员，包括避免机器操作中可能出现的危险。

Person qualified for maintenance and repair works 具有维修及维修资格者

A professionally trained and experienced person that is capable of recognizing risks and possible hazards when carrying out installation, maintenance, or repair works on the pump, and eliminating these by initiating adequate measures. 经过专业培训和经验丰富的人员，在进行泵的安装、维护或维修工作时，能够识别风险和可能的危害，并通过采取适当的措施消除这些风险。

Protection of special groups of persons

The respective legal employment restrictions do apply. 相关的法律就业限制确实适用。

6.12. Safety recommendations to be complied with 应遵守的安全建议**6.13. General behaviour when handling the machine** 操作机器时的一般行为

- Only operate the machine if it is in perfect technical condition, according to its intended use, in awareness of safety and risks and in adherence to these Instructions. 只有在机器处于完美的技术条件下，根据其预期用途，在安全风险意识和遵守本说明书的情况下，才能操作机器。
- Familiarize yourself with the functions and working methods required. Always keep to the order of the indicated assembly and operating steps.
- If there are uncertainties regarding the proper condition or the correct assembly / operation, ensure clarification. The machine / pump must not be put into service until all uncertainties will have been clarified.
- Keep unauthorized people away from the machine.
- All relevant safety provisions and in-house operational instructions applicable to the respective activity must be adhered to.
- Responsibilities for different activities must be clearly defined and adhered to. Ambiguities greatly endanger safety.
- During operation, safety-related protective and emergency devices must not be removed, modified or affected otherwise in their function and are to be checked at regular intervals for completeness and function.
- Occurring faults are to be remedied in the frame of the responsibilities. Inform your superior in the case of faults beyond your competence.
- Do not open the reservoir lid during operation. Do not reach into the reservoir.
- Wear personal protective equipment always.
- When handling lubricants etc., adhere to the respective safety data sheets.
- Never use parts of the centralized lubrication system or of the machine as standing or climbing aids.

熟悉所需的功能和工作方法。始终保持指定的组装和操作步骤的顺序。

如果对正确的条件或正确的装配/操作有不确定的地方，确保澄清。

在澄清所有不确定因素之前，机器/泵不能投入使用。

让未经授权的人远离机器。必须遵守所有适用于活动的相关安全规定和内部操作说明。

不同活动的责任必须明确定义和遵守。歧义极大地危害安全。在运行过程中，与安全有关的保护和应急装置的功能不得拆卸、修改或受到其他影响，并应定期检查其完整性和功能。

发生的故障将在责任框架内进行补救。如果你的错误超出你的能力范围，要通知你的上司。操作时不要打开储液罐盖。

不要把手伸到水库里。始终穿戴个人防护装备。

在处理润滑剂等时，请遵守相应的安全数据表。

切勿使用集中润滑系统或机器的部分作为站立或攀爬辅助设备。

Safety information is to be read and observed by any persons entrusted with works on the machine or by those persons who supervise or instruct the beforementioned group of persons. It is prohibited to commission or operate the machine prior to reading the Instructions. These Instructions must be kept at an accessible location for further use.

安全信息应由任何受委托工作的人员阅读和遵守在机器上或由那些监督或指导上述的人群人。禁止调试或操作机器阅读说明之前。这些说明书必须放在方便取用的地方供进一步使用的地点。

Emergency stopping of pump 紧急停止泵

In case of an emergency, the pump can be shut down by: Switching off the machine or vehicle in which the pump is integrated.

在紧急情况下，可以通过以下方式关闭泵:关闭与泵集成在一起的机器或车辆。

Intended use 预期用途

Supply of lubricants within a centralized lubrication system following the specifications made in these instructions. 在一个集中润滑系统内的润滑油供应遵循这些说明的规格。

Pump operation 润滑泵工况

Operation is permitted only, if in compliance with: 只有在符合以下规定的情况下，才允许进行操作:

- All indications given in these instructions or stated in the applicable documents.

所有指示中给出的或在适用文件中陈述的指示。

- Laws and regulations to be complied with by the user. 用户应遵守的法律法规。

Foreseeable misuse 可预见性

Any other use and purpose of the machine than the ones described before are strictly prohibited. The use is expressly forbidden:

任何其他用途和目的机器，而不是前面所描述的严格禁止的。使用是明确禁止的:

- In any explosion protection zone. 在任何防爆区域。
- Outside the indicated operating temperature range. 超出指定的工作温度范围。
- For the supply / transport / stockpiling of hazard group I fluids following Directive 67/548/EC. 第67/548/EC号指令规定的第一类危险液体的供应/运输/储存。
- For the supply / transport / stockpiling of gases, liquefied gases, dissolved gases, vapours and

fluids that reach a steam pressure of more than 0.5bar above the normal atmospheric pressure (1013 mbar) at the maximum admissible operating temperature.

供供应/运输/储存气体、液化气体、溶解气体、蒸气及液体，在最高容许工作温度下，蒸气压力高于正常大气压(1013毫巴)0.5巴以上。

Prohibition of certain activities 禁止若干活动

The following activities may be carried out by manufacturer specialists or authorized persons only due to potential sources of faults that may not be visible for the user:

只有在用户无法看到的潜在故障来源的情况下，制造商专家或授权人员才可以进行以下活动:

- Replacement or changes to the pistons of the pump elements. 更换或更换泵的活塞元件。

Conversions / modifications 转换/修改

Unauthorized conversions or modifications may result in unforeseeable impacts on safety. Therefore, any unauthorized reconstructions or changes are expressly prohibited.

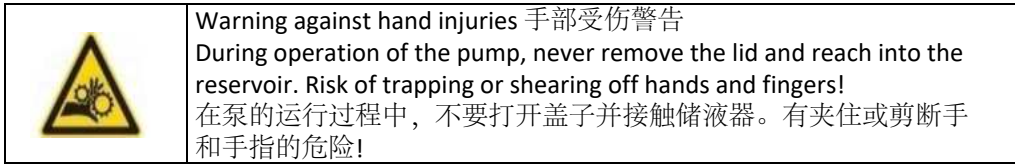
未经授权的转换或修改可能会对安全造成不可预见的影响。因此，任何未经授权的重构或更改都是明确禁止的。

Inspections 检查

The following inspections were carried out prior to delivery: 发货前进行了以下检查:

- Electrical inspections following EN 60204-1. 遵循EN 60204-1的电气检查。
- Safety and functional tests. 安全性和功能测试。

Warning label on the pump 泵上的警告标签



Other applicable documents 其他适用的文件

In addition to these instructions, the following documents must be observed by the respective target group: 除这些指示外，各目标群体还必须遵守下列文件:

- Operating instructions / release provisions by the operator. 操作者的操作说明/放行规定。
- Instructions of the components for set-up of the centralized lubrication system 集中润滑系统安装的部件说明
- Safety data sheet of the lubricant used. 所使用润滑油的安全数据表。

Where appropriate: 在合适的地方

- System documentation. 系统文件编制
- Other relevant documents for the integration of the pump into the machine. 泵与机器集成的其他相关文件。

The owner must supplement these documents by the respective valid national or regional regulations laid down by the country in which the product is to be used. If the machine is sold or transferred, any associated documents must be passed on to the subsequent operator as well. 所有者必须根据产品使用国制定的相关有效的国家或地。

Sources of hazard 危害来源

The pump has been designed, built and tested using state-of-the-art technology. It will have left our company only after having passed stringent safety and reliability tests. Like for pump there may still be involved potential sources of hazard, for example: 该泵的设计、制造和测试采用了最先进的技术。只有通过严格的安全性和可靠性测试，它才会离开我们公司。就像所有复杂的机器一样，这台泵也可能有潜

Moving, rotating parts 移动, 旋转部分

- Drive, stirring paddles 启动刮油板

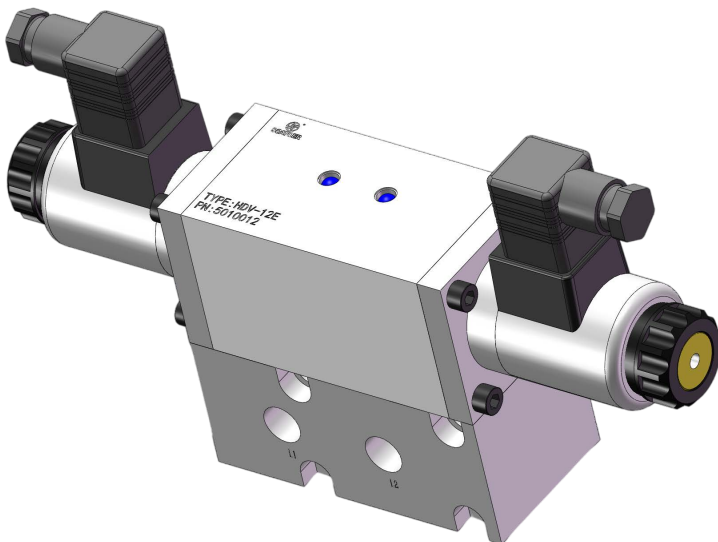
FIXED DELIVERY PUMPING ELEMENTS 固定排量泵芯

The pump has two fixed delivery standard pumping elements (200 cm³/ min for each pumping element). A piston slides inside the body of the pumping element coupled to the latter by a lapping process. The seal between the piston and the pumping body is of a dry type, with no gasket provided between the two. The pumping element retention valve is of the tapered seal type. This solution is able to guarantee an optimum seal for the system at high operating pressures (max. pressure of 400 bar). The pumping elements are assembled on the manifold unit with a threaded attachment, which facilitates its assembly/ dismantling.

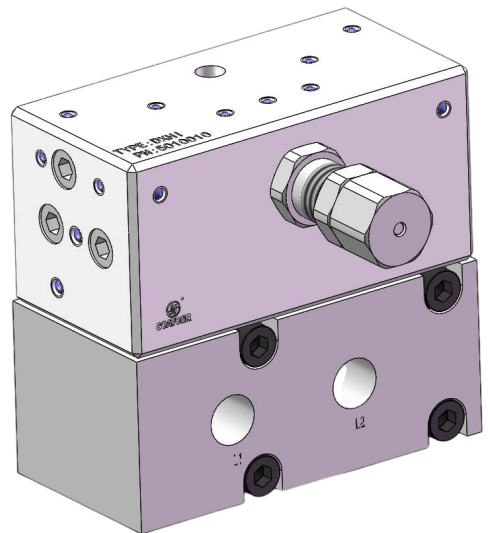
该泵有两个固定的输送标准泵元件(每个泵元件200厘米³/分钟)。活塞在泵送元件内部滑动, 泵送元件通过研磨过程与泵送元件耦合在一起。活塞和泵体之间的密封是干式的, 两者之间没有垫片。抽油元件保持阀为锥形密封型。该解决方案能够保证系统在高工作压力(最大工作压力)下具有最佳的密封性能。压力为400bar)。抽油元件通过螺纹连接组装在管汇单元上, 便于其组装/拆卸。

INVERTORS 换向阀

Code	Description 描述
Series 5010022	Interchangeable electromagnetic inverter (mounted as standard on DX2 pump)
Series 5010014	Electromagnetic inverter 电磁换向阀
Series 5010001	Hydraulic inverter 液压换向阀



Electromagnetic inverter for DX2



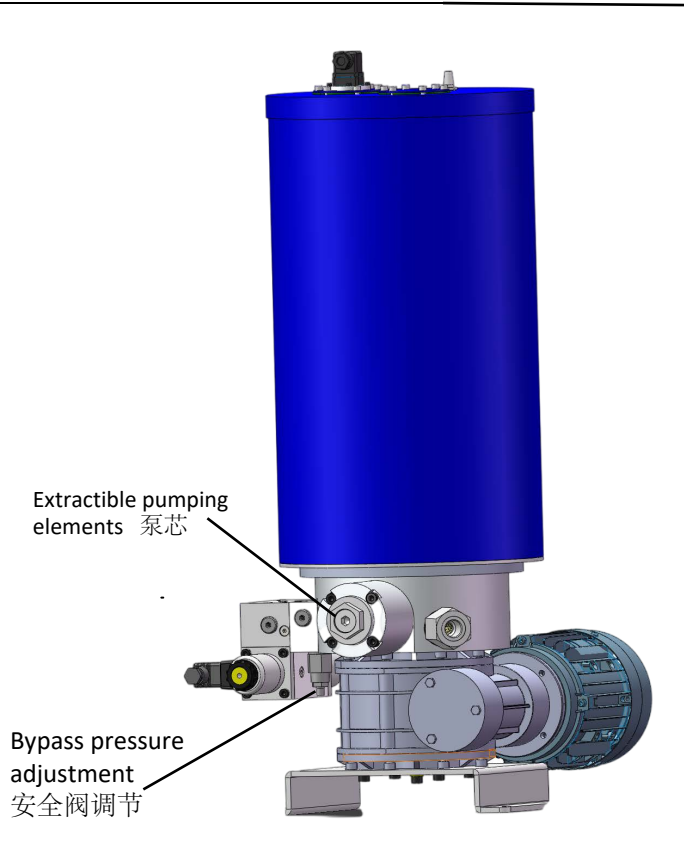
Hydraulic inverter for DX2

Spare parts 描述			
Code	Description	Current (A)	Power (W)
5004011	Electromagnet 24V DC	4.4	105
5004012	Electromagnet 110V AC 50/60 Hz	1	120
5004013	Electromagnet 230V AC 50/60 Hz	0.5	110
5082034	Seal kit		



GENERAL NOTE FOR ALL INVERTERS: It is advisable to plan a delay in the de-energizing of the electromagnets from 2 ÷ 5 sec. to allow complete inversion in relation to the closing time of the pressure gauge at the end of the line. 对于所有的换向阀, 一般注意事项: 建议电磁铁断开电源的延迟时间为2-5秒, 以允许完全反转, 相对于管道末端压力表的关闭时间。

PRESSURE CONTROL VALVE MOUNTED ON THE PUMP 压力控制阀安装在泵上

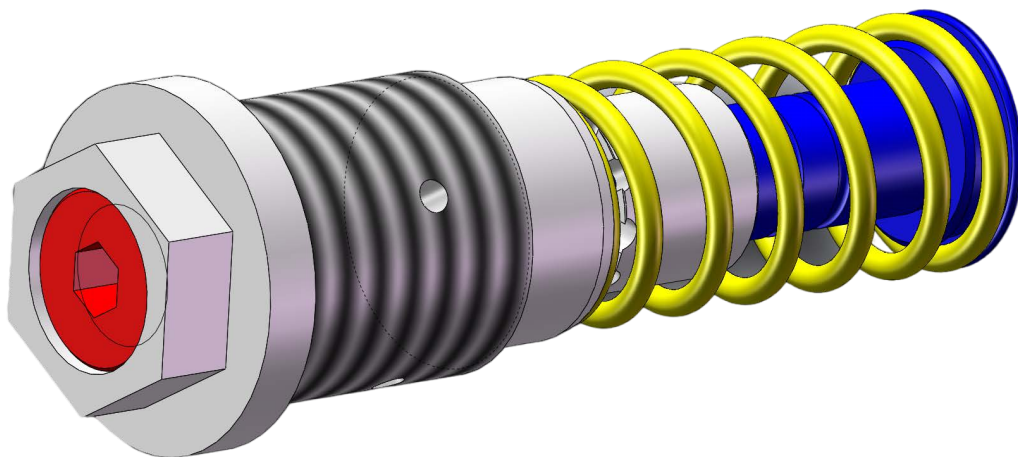
<p>Pump group unit 泵单元</p> <p>The pump has a pressure control valve, mounted on the manifold unit on the right side of the pumping elements. The valve can be easily dismantled for inspection if required. It is calibrated by turning the bypass pressure adjustment nut:</p> <p>该泵有一个压力控制阀，安装在泵元件前侧的阀块上。如果需要，阀门可以很容易地拆卸进行检查。通过转动旁路压力调节螺母进行校准：</p> <ul style="list-style-type: none"> • clockwise (increase of pressure) 顺时针方向(压力增加) • anticlockwise (decrease of pressure) 逆时针(降压) <p>Once the bypass has been calibrated, the position of the pressure adjustment nut is locked using a lock nut. It is important to bear in mind that line inversion is controlled by closing the contacts of the pressure switch. Adjusting the pressure switch provides an operating pressure which is lower than the maximum pressure controlled by this valve.</p> <p>一旦旁路已校准，压力调节螺母的位置被锁定使用锁定螺母。重要的是要记住，线路反转是通过关闭压力开关的触点来控制的。调节压力开关提供的工作压力低于此阀控制的最大压力。</p>	
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Code	Description 描述
3191311	Pressure 100 - 450 bar (1470 - 6615psi)
3191314	Pressure 50 - 200 bar (735- 2940 psi) on request

PUMPING ELEMENTS FIXED . 固定量泵芯

The standard pump has two pumping elements with fixed delivery. 标准泵有两个固定输送的泵送元件。

Code	Description 描述
1002042	Pumping element with fixed delivery 200 cm ³ /min, 排量 200cc/每分钟



Standard grease pumps have two types of level:标准润滑脂泵有两种水平:

- Minimum capacitive level;电容式最低液位开关;
- Maximum visual level (float). 最高目视液位

Code	Description 描述
0295100	Maximum visual level kit (float).
0295120	Minimum capacitive level kit per tank kg 30 (68.1 lb)
0295110	Minimum capacitive level kit per tank kg 100 (220.5 lb)
3289166	Capacitive probe

Minimum capacitive level 电容式最低液位

The minimum level is produced by a capacitive probe, positioned on the end of a pipe mounted on the tank cover. The capacitive probe is normally closed. When it reaches the minimum level the probe indicates a lack of lubricant. To make the solution valid for NLGI2 grease as well, the capacitive probe interfaces with the scraper whose function is to clean the lower face of the grease probe. If the capacitive probe is replaced then it must be recalibrated (see calibration procedure).

The minimum level contact is indicated by a light signal on the control panel. In addition it controls any command for the pump to automatically refill the tank.

最小液位由电容探头产生，探头位于安装在罐盖上的管道末端。电容探头通常是闭合的。当它达到最低水平时，探针表明缺少润滑剂。为了使解决方案对NLGI2润滑脂也有效，电容探针与刮刀接口，刮刀的功能是清洁润滑脂探针的下表面。如果电容探头被更换，则必须重新校准(参见校准程序)。最小液位触点由控制面板上的灯光信号指示。此外，它控制任何命令泵自动补充油箱。

Maximum visual level (floating) 最高目视液位(浮动)

The phase for loading the lubricant into the tank is carried out by the operator, with an appropriate pump. Once the maximum level of lubricant has been reached, the small rod which indicates that the tank is full intervenes.

将润滑油装入油箱的这一阶段是由操作员用适当的泵进行的。一旦达到润滑油的最高水平，指示油箱已满的小杆介入。

Procedure for calibrating the capacitive probe 电容式探头的校准程序

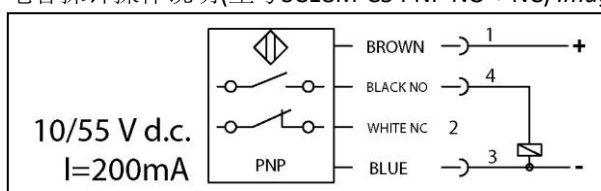
Before being assembled the capacitive probe must be calibrated in accordance with the following sequence:

电容探头装配前，必须按照以下顺序进行校准:

1. connect the sensor electrically;电连接传感器;
2. immerse the sensor in the lubricant, down to half of its length;将传感器浸入润滑剂中，长度减半;
3. remove the sensor from the lubricant until it skims the surface of the lubricant;将传感器从润滑剂上取下，直至其擦过润滑剂表面;
4. at this point there can be two possible types of operation:此时可以有两种可能的操作类型:
 - the sensor status does not change: its sensitivity must be reduced (by acting on the screws for adjusting sensor sensitivity) until its state of excitation is reached 传感器状态不会改变:其灵敏度必须降低(通过操作螺钉调节传感器灵敏度), 直到达到激发状态
 - if its status changes, the sensor already possesses the correct sensitivity. 如果状态发生变化，表示传感器已经具有正确的灵敏度。
5. after checking that the sensor has been correctly read, the sensor reading must be repeated at least three times. 在检查传感器读数正确后，传感器读数必须重复至少三次
6. Tighten the capacitive probe on the probe carrier rod, complying with the following assembly height: 按照以下安装高度将电容探头紧固在探头托杆上:
 - 450 mm (from below the cover up to the lower surface of the sensor) for a 30 kg tank
 - 900 mm (from below the cover up to the lower surface of the sensor) for a 100 kg tank

Operating instructions for the capacitive probe (model SC18M-C5 PNP NO + NC)

电容探针操作说明(型号SC18M-C5 PNP NO + NC) Image 4

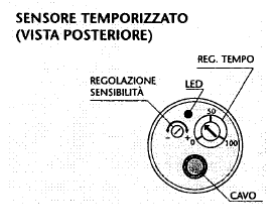


Sensors operating under C for continuous current (4 wires) 在C下工作的连续电流传感器(4线)

They are sensors which are amplified in continuous current and which incorporate, in addition to the oscillator, the outlet amplifier. They are supplied with 4 wires with an antivalent function in the NPN or PNP versions. In this operation the sensors offer as standard characteristics protection against permanent short circuit of the load, absolute safety against inversion of polarity and protection from the peaks produced by disconnecting inductive loads. They can be supplied together with model ALNC – ALTP feeders. They are compatible with programmable controller inputs.

它们是在连续电流中被放大的传感器，除了振荡器外，还包括出口放大器。在NPN或PNP版本中，它们提供了4根具有反价功能的导线。在这种操作中，传感器提供标准特性保护，防止负载的永久短路，绝对安全的极性反转，以及断开感应负载产生的峰值保护。可与ALNC型ALTP馈线配套使用。它们与可编程控制器输入兼容。

Image 5



PROBLEMS AND SOLUTIONS 问题与对策

Below is a diagnostic table showing the main faults, the probable causes and the possible solutions.

In the event of doubts and/or problems which cannot be solved, do not proceed to look for the fault by dismantling parts of the machine, but contact the SOATOER Technical Office.

下面是诊断表，列出了主要故障、可能的原因和可能的解决方案。

如果出现疑问和/或无法解决的问题，请不要继续拆卸机器部件寻找故障，而是与SOATOER技术办公室联系。

Fault 故障	Cause 原因	Solution 解决方法
<p>The electric pump is not delivering any lubricant. 电动泵不提供任何润滑剂。</p>	<p>The electric motor is not functioning. 电机不工作了。</p> <p>The tank is empty. 油箱空了</p> <p>The pump is not triggered. Causes of the pump's failure to trigger: 泵未启动。泵无法启动的原因:</p> <ul style="list-style-type: none"> • The motor is turning in an inverted direction (clockwise); 电机反向(顺时针)转动; • The motor is turning in the right direction but the stirring paddle is not turning; 电机，但是刮油板没有转动; • Presence of air bubbles in the lubricant. 润滑油中存在气泡。 <p>The pressure adjustment valve (bypass) has been calibrated at too low a value Presence of dirt in the non-return valve. 压力调节阀(旁路)压力调节过低 止回阀内存在污垢。</p>	<p>Check the connection between motor and electric supply line. 检查电机与供电线路的连接。</p> <p>Check the motor winding. 检查电机绕组。</p> <p>Check that the connection plates for the motor terminal box are positioned in accordance with the supply voltage. 检查电机接线盒接线板的位置是否与供电电压一致。</p> <p>Fill the tank. 加油 N.B.: If the tank was emptied without the electric signal for reaching the minimum level being given, the minimum level contact must be checked. 注意:如果在没有给出达到最低液位的电信号的情况下清空水箱，则必须检查最低液位触点。</p> <p>Remove the cover from the tank and check that the stirring paddle is turning anticlockwise and that the lubricant is moving; if not invert two of the three motor phases. See above. 拆下油箱盖，检查搅拌桨是否逆时针转动，润滑油是否在运动;如果不反转电机的三个相位中的两个。 见上图。</p> <p>Remove the pump delivery pipe and drain off the lubricant until the air bubbles have been eliminated. 拆下泵的输送管道，排掉润滑油，直到气泡消除。</p>
<p>The pump will not go under pressure. 泵正常运转但是没有压力。</p>	<p>Possible dirt on the cone of the pump stop valve 泵截止阀的锥体上可能有污垢</p> <p>Internal gasket between pumping element and manifold unit broken. 泵芯和管汇单元之间的内部垫圈损坏。</p>	<p>Clean the cone and the pumping element stop valve housing, draining off the lubricant. 清洗锥体和泵芯截止阀外壳，排出润滑油。</p> <p>Replace the gasket (code 3190489). 更换垫圈(代码3190489)。</p>

Fault 故障	Cause 原因	Solution 解决方法
No signal indicating minimum level when there is no lubricant in the tank. 当油箱内没有润滑剂时，没有指示最低液位的信号。	Incorrect adjustment of minimum level. 最低液位调整不正确。	Check the correct functioning of the level probe in the following way: 用以下方法检查液位探头是否正常工作: Dismantle the minimum level unit and recalibrate the capacitive probe. 拆下最低液位单元，重新校准电容探头。
Selection of minimum level, with lubricant below the minimum and pump working. 没有润滑油泵工作	Incorrect adjustment of minimum level. 最低液位调整不正确。	The light on the control panel is still on: check the electric connection and, if necessary, replace the capacitive probe. 控制面板上的灯仍亮着:检查电气连接，必要时更换电容探头。
Lubrication installation accessories 润滑装置配件		
METERING UNIT DF3 计量阀DF3 Alarm signal indicating non-delivery of lubricant. The small rods visible inside the metering unit turrets must move sequentially up and down and activate the control microswitch when the pump is working. If this is not the case the two outlets or the single outlet of that metering unit will not deliver lubricant. 润滑油未输送报警信号。计量阀指示杆可见的小杆必须依次上下移动，并在泵工作时激活控制微开关。如果不是这种情况，两个出口或计量阀的单一出口将不会提供润滑剂。	Metering unit small piston jammed. 计量单元小活塞卡住。 Piping between metering unit outlet and point requiring lubrication obstructed. 计量单元出口和需要润滑点之间的管道堵塞。 Pressure on the line too low (the lubricant is not delivered by any outlet or only by a few outlets). 管路压力过低(润滑油不是由任何出口输送的，或只有几个出口)。 Metering unit arranged for two outlets by used for only one outlet. 设有两个出线口的计量单元，用于只设一个出线口。	Replace the metering unit with another one having the same characteristics. However it is advisable to make sure that the metering units have been correctly assembled, particularly with regard to fixing. Over-locking of the fixing screws may damage the metering unit and cause the small piston to jam. 用另一个具有相同特性的计量单元替换计量单元。然而，建议确保计量单元已正确组装，特别是在固定方面。固定螺丝过锁可能会损坏计量装置，导致小活塞卡死。 Remove the outlet pipe and check to see if the metering unit is delivering lubricant. Change the pressure control valve adjustment (bypass) or the adjustment of the control pressure gauge (and of line). 改变压力控制阀的调节(旁路)或控制压力表的调节(和管路的调节)。 Check that, when one single outlet is used, the right pad is assembled and that the other outlet is sealed. See instruction sheet for DF3 metering units. 检查，当一个出口使用时，右垫组装好，另一个出口是密封的。 DF3计量单元见说明书。
END OF LINE PRESSURE GAUGE 管路压力表结束 The pressure gauge is not sending the signal to the electric command and control panel. 压力表没有向电气指令和控制面板发送信号。 The pressure gauge sends the signal before the end of the lubrication cycle. 压力表在润滑循环结束前发出信号。	Electrical connection incorrect. 错误的电连接 Incorrect adjustment of the control pressure gauge. The pressure value set is too high and the pressure adjustment valve (bypass) intervenes before the pressure gauge can be activated. 控制压力表调整不正确。压力值设定过高，压力调节阀(旁通)介入，压力表才可激活。 Incorrect adjustment of the control pressure gauge. The pressure value set is too low. 控制压力表调整不正确。压力值设置过低。	Check the electrical connection. 检查电气连接。 Reduce the pressure gauge calibration pressure until an electrical contact is obtained. 降低压力表校准压力，直到得到电接点。 Increase the pressure gauge calibration valve. The optimum calibration value is the one which allows a pressure of 50-70 bar (735 – 1029 psi) at the end of the lubrication line. 增加压力表校准阀。最佳校准值是在润滑管道末端允许压力为50-70巴(735 - 1029 psi)的校准值。

MAINTENANCE PROCEDURES 标准维护程序

Use the individual protective devices needed to avoid contact with mineral oil or grease. Regular inspection

The following regular checks must be carried out:

使用需要的个人保护装置，以避免与矿物油或润滑脂接触。定期检查
必须进行以下定期检查:

Check 检查	
the lubrication status 润滑油状态	1000 hours
Cleanliness of the loading and suction filter 装载和吸入过滤器的清洁度	4000 hours

The machine does not require any special equipment for any checking and/or maintenance activity, however the recommendation is to use suitable equipment which is in a good condition in order to avoid causing damage to persons or machine parts (according to current regulation).

机器不需要任何特殊设备进行检查和/或维修活动，但建议使用状态良好的合适设备，以避免对人员或机器部件造... (根据现行规定)。

If necessary clean the tank paying due attention (when the machine is off and without it being possible to restart it).

Remember to reseal the tank once the operation has been completed.

如有必要，应注意清洗水箱(当机器关闭且无法重新启动时)。一旦操作完成，请记住重新密封储罐。

Make sure that the electric and hydraulic supply has been disconnected before carrying out any maintenance intervention.
在进行任何维修干预之前，确保电力和液压供应已经断开。

DISPOSAL 废弃处置

In the course of machine maintenance, or if the machine is scrapped, do not dispose of polluting parts into the environment. Refer to local regulations with regard to their correct disposal. When scrapping the machine the identification plate and any other documents must be destroyed.

在机器维修过程中，或如果机器被报废，不要将有污染的零件处理到环境中。参考当地法规，正确处理。在刮刀时，必须销毁机器的标识牌和其他任何文件。

HANDLING AND TRANSPORT 伤员搬运与转移

A metal pallet is used for transport and storage with packing at the side and a wooden cover.

The pump is fixed on a metal pallet, which allows safe handling using a transpallet or forklift truck. The metal pallet has been designed so that it can be installed in the installation, being equipped with 4 (four) holes of \varnothing 14 mm suitable for fixing to the floor.

一个金属托盘用于运输和储存，包装在旁边和一个木制的盖子。泵是固定在一个金属托盘，这允许安全处理使用 transpallet 或叉车。金属托盘设计为4个 \varnothing 14mm的孔位，适合在安装过程中安装。

The machine components can withstand temperatures, during storage, from -20 to + 50 °C (-4°F - 122°F); it is therefore necessary, in order to avoid damages, for the machine to be started up when the machine has reached a minimum temperature of +5 °C (+41°F).

机器部件在储存期间能承受-20到+ 50°C(-4°F - 122°F)的温度;因此，为了避免损坏，机器必须在最低温度达到+5°C(+41°F)时启动。

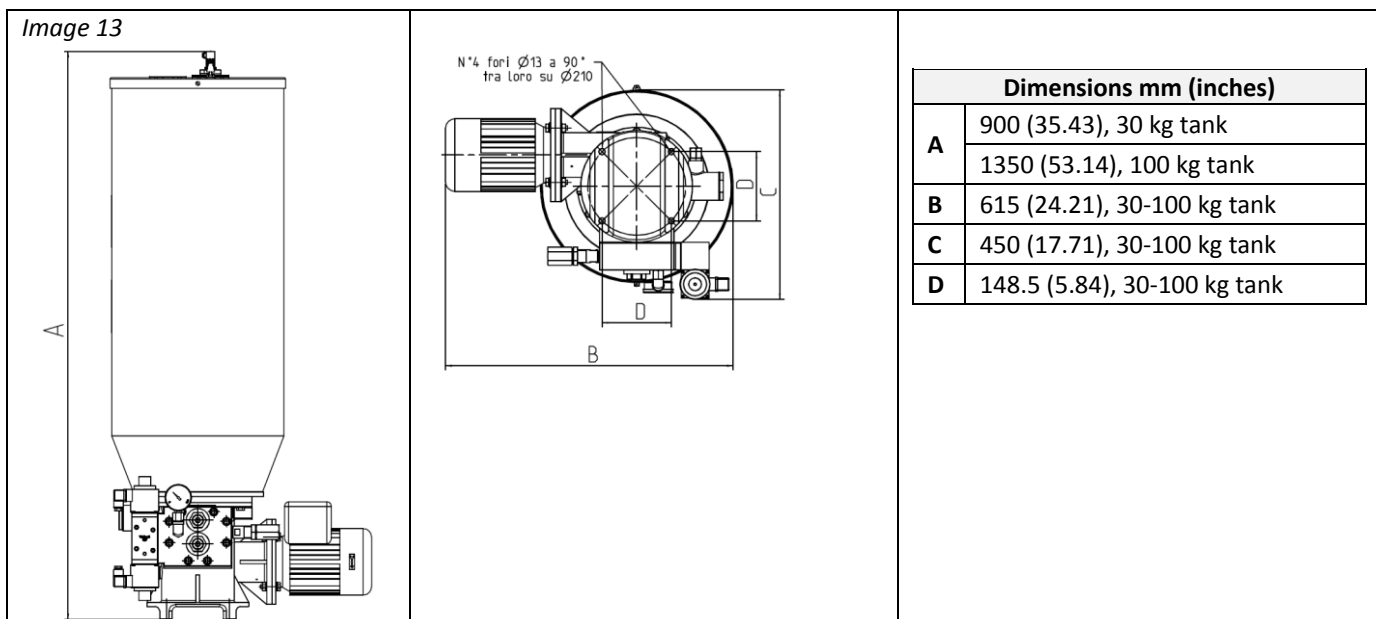
PRECAUTIONS FOR USE 使用注意事项

It is necessary to carefully read the warnings and risks associated with using a lubricant pump. The operator must understand how it works and must clearly understand the dangers by studying the user manual.

有必要仔细阅读与使用润滑泵相关的警告和风险。操作人员必须了解它的工作原理，必须通过研究使用手册清楚地了解其危险。

DIMENSIONS 外形尺寸

To facilitate future maintenance, increase the spaces indicated by at least 200 mm (7.87 in.).
 为了便于将来的维护，请将指示的空间增加至少200mm(7.87英寸)。



Electric system – Technical data 电气系统-技术数据

Electrical supply 电源输入:	230-400 Volt \pm 5% 50 Hz 240-440 Volt \pm 5% 60 Hz
Power absorbed 功率:	0.75 kW

DX-CU is a latest generation electrical device suitable to control double line lubrication systems in which you want to monitor and control all the functions. All the various functions and program choices are made via the front panel controls of the PLC on the outside of the closing door. DX-CU是最新一代的电气设备，适用于控制双线润滑系统，您想要监控和控制的所有功能。所有的各种功能和程序选择都是通过关闭门外侧PLC的前面板控制来实现的

The electrical equipment operates by setting the machine pause or pulse time and a working time. The cycle consists of: pump start-up signal reception from the pressure switch line 1 or line 2 for inversion If this signal is not received, an alarm is generated

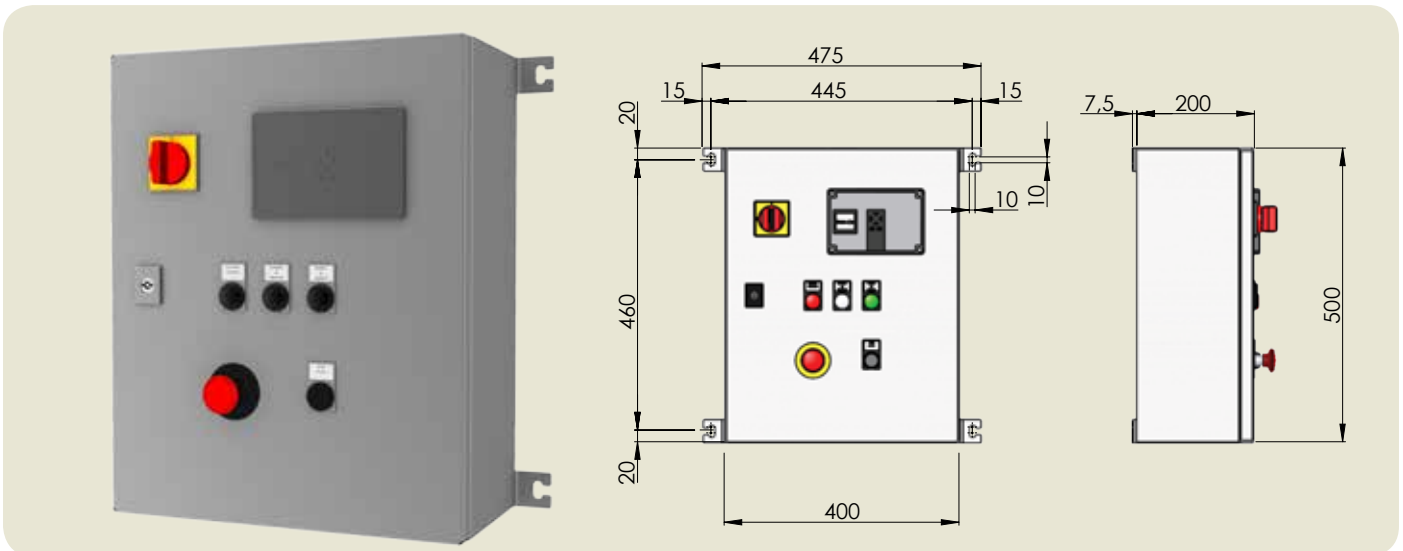
Start-up is also possible from an external pulse

电气设备通过设置机器暂停或脉冲时间和工作时间来操作。循环过程包括:泵启动

从压力开关1号线或2号线接收信号进行反转

如果没有收到该信号，则产生告警外部脉冲也可以启动

TECHNICAL FEATURES 产品特点		PART NUMBER	POWER SUPPLY VOLTAGE	INVERTER POWER
Power supply voltage	110V~ - 230V~ - 400V~ - 460V~	7000201	115 V	24 V DC
Absorption	2 W (In Stop) - 10 W (In Start)	7000202	230 V	24 V DC
Operating temperature	- 10 °C ÷ + 70° C	7000203	480 V	24 V DC
Storage temperature	- 20°C ÷ + 80 °C	7000204	115 V	115 V
Operating humidity	90% max	7000205	230 V	230 V
Frequency	50/60 Hz			



- SINGLE-PHASE POWER
- THREE-PHASE POWER
- EMERGENCY BUTTON
- MAIN SWITCH
- DOOR BLOCKING SWITCH
- ADDITIONAL TERMINAL BOARD
- DOUBLE LINE COMMAND AND CONTROL SYSTEM WITH HYDRAULIC INVERTER
- POWER CONTACTS FOR INVERSION CONTROL (ELECTROMAGNETIC AND ELECTROPNEUMATIC)
- PAINTED STEEL BOX IP55
- MINIMUM CAPACITIVE - REED LEVEL CONTROL
- MAXIMUM CAPACITIVE - REED LEVEL CONTROL
- ULTRASOUND CONTINUOUS LEVEL CONTROL
- THERMAL PROTECTION CONTROL
- REMOTE ALARM FREE CONTACT
- LOCAL/REMOTE SELECTOR WITH START AND RESET
- PUMP-ON REMOTE CONTACT
- POSSIBILITY OF SEPARATE POWER TO THE INPUT AND OUTPUT CIRCUITS
- POSSIBILITY OF SEPARATE INVERTER POWER

ORDERING CODE 7000001

Reggiane Cranes now part of Terex group was looking for an automatic lubrication system to reduce maintenance time.

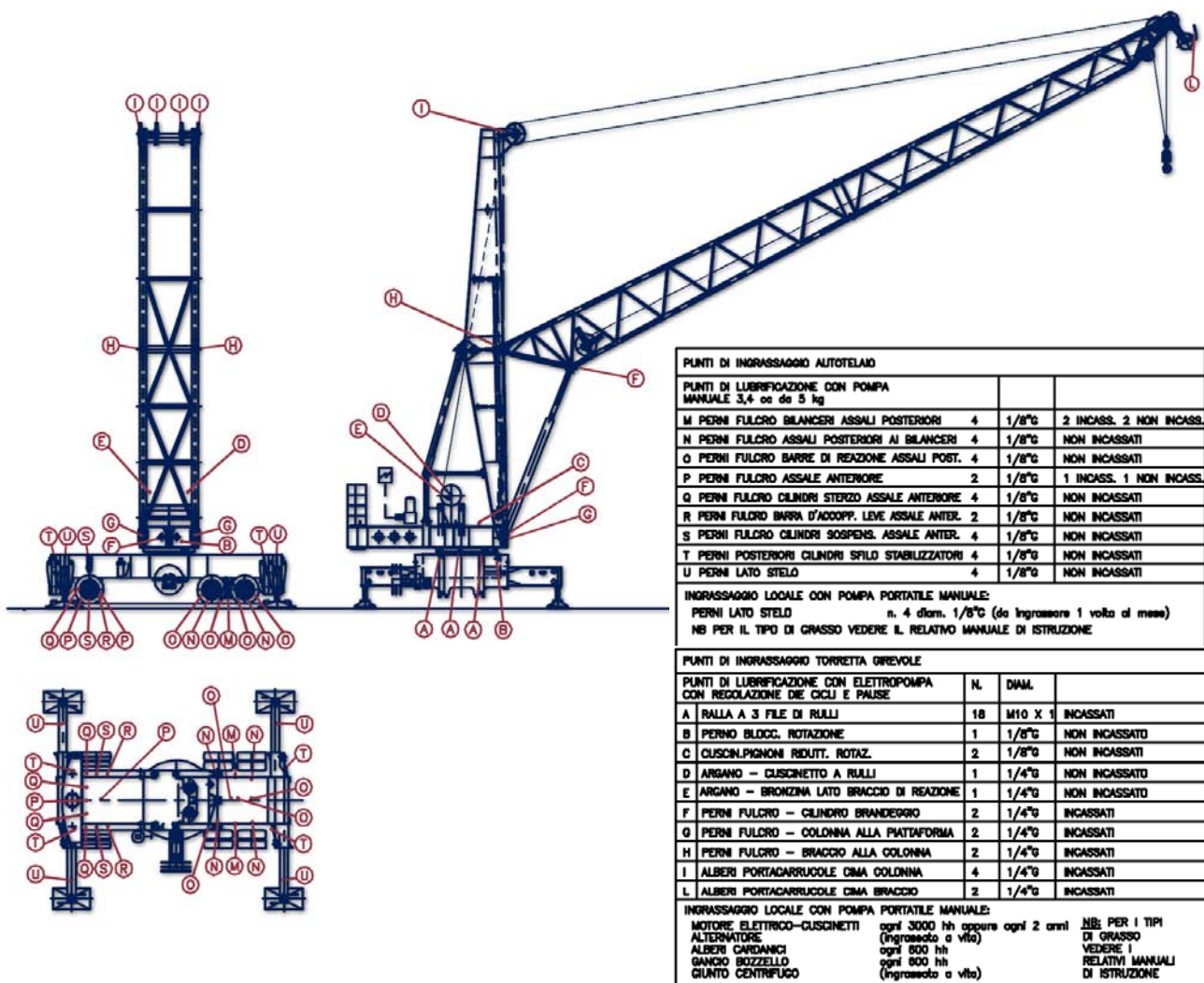
The actual cost of bearing replacement was not high but the downtime cost for its customers was significant.

Analysis of the lubrication system

Operating in an outdoor environment SOATOER offered their dual line system in Stainless Steel 316. The long tube lines meant that a dual line system was necessary to avoid the risk of pressure drops. The slew ring was lubricated as well as various point along the boom. Some points had flexible hose to allow for the movement of the bearing in operation.



Its necessary to have a powerful pump ,such as DX1, to maintain constant and even lubrication even when temperatures drop. Its recommend to use Soatoer Polar Grease for system operating under -10 Degrees Celsius.



PUNTI DI INGRASSAGGIO AUTOTELAIO			
PUNTI DI LUBRIFICAZIONE CON POMPA MANUALE 3,4 oo da 5 kg			
M PERNI FULCRO BILANCIERI ASSALI POSTERIORI	4	1/8"Ø	2 INCASS. 2 NON INCASS.
N PERNI FULCRO ASSALI POSTERIORI AI BILANCIERI	4	1/8"Ø	NON INCASSATI
O PERNI FULCRO BARRE DI REAZIONE ASSALI POST.	4	1/8"Ø	NON INCASSATI
P PERNI FULCRO ASSALE ANTERIORE	2	1/8"Ø	1 INCASS. 1 NON INCASS.
Q PERNI FULCRO CILINDRI STERZO ASSALE ANTERIORE	4	1/8"Ø	NON INCASSATI
R PERNI FULCRO BARRA D'ADDOPP. LEVE ASSALE ANTER.	2	1/8"Ø	NON INCASSATI
S PERNI FULCRO CILINDRI SOSPENS. ASSALE ANTER.	4	1/8"Ø	NON INCASSATI
T PERNI POSTERIORI CILINDRI SFILDO STABILIZZATORI	4	1/8"Ø	NON INCASSATI
U PERNI LATO STELO	4	1/8"Ø	NON INCASSATI
INGRASSAGGIO LOCALE CON POMPA PORTATILE MANUALE: PERNI LATO STELO n. 4 diam. 1/8"Ø (da ingrassare 1 volta al mese) NB PER IL TIPO DI GRASSO VEDERE IL RELATIVO MANUALE DI ISTRUZIONE			
PUNTI DI INGRASSAGGIO TORRETTA GIREVOLE			
PUNTI DI LUBRIFICAZIONE CON ELETTROPOMPA CON REGOLAZIONE DIE CICLI E PAUSE			
	N.	DIAM.	
A RULLA A 3 FILE DI RULLI	18	M10 X 1	INCASSATI
B PERNO BLOCC. ROTAZIONE	1	1/8"Ø	NON INCASSATO
C CUSCIN.PIGNONI RIDUTT. ROTAZ.	2	1/8"Ø	NON INCASSATI
D ARGANO - CUSCINETTO A RULLI	1	1/4"Ø	NON INCASSATO
E ARGANO - BRONZINA LATO BRACCIO DI REAZIONE	1	1/4"Ø	NON INCASSATO
F PERNI FULCRO - CILINDRO BRANDEGGIO	2	1/4"Ø	INCASSATI
G PERNI FULCRO - COLONNA ALLA PIATTAFORMA	2	1/4"Ø	INCASSATI
H PERNI FULCRO - BRACCIO ALLA COLONNA	2	1/4"Ø	INCASSATI
I ALBERI PORTACARRUCOLE CIMA COLONNA	4	1/4"Ø	INCASSATI
L ALBERI PORTACARRUCOLE CIMA BRACCIO	2	1/4"Ø	INCASSATI
INGRASSAGGIO LOCALE CON POMPA PORTATILE MANUALE: MOTORE ELETTRICO-CUSCINETTI ogni 3000 hh oppure ogni 2 anni ALTERNATORE (Ingrassato a vita) ALBERI CARDANICI ogni 800 hh GANCIO BOZZELLO ogni 800 hh GIUNTO CENTRIFUGO (Ingrassato a vita)			
			NB: PER I TIPI DI GRASSO VEDERE I RELATIVI MANUALI DI ISTRUZIONE

Spreader Lubrication

Spreader Lubrication

Advanced Technology for Sandvik Machinery

Spreaders are used in the open pit mining industry to move or “spread” different sorts of raw materials from one location to another.

Spreaders can be found in Mines, where different environmental conditions are to be taken into consideration.

Some of these conditions such as humidity, temperature, dust contamination, rust considerations will affect the design of the machine and the components used.

A spreader is fully mobile and has many moving parts. These parts include for example chains, tracks, wheels, pulleys, drive belts, slew decks and booms.

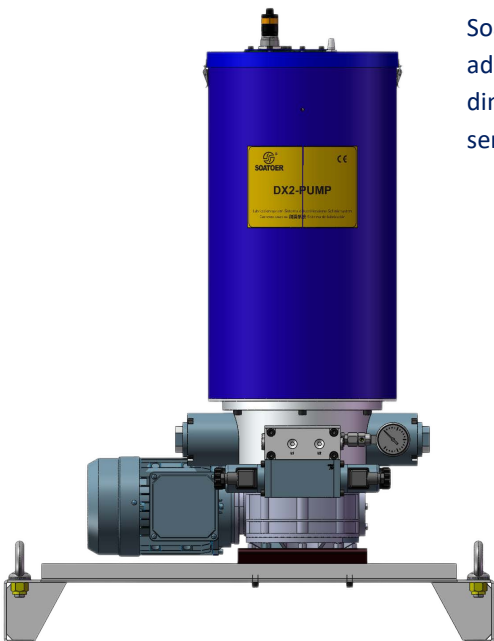
Most of these moving parts are able to move via bearings. In order for the bearings to move smoothly and accurately lubricants are used to stop the metal surfaces from wearing out. When there are many lubrication points an automatic lubrication system can be used to renew the lubricant in regular intervals and increase the life expectancy of the bearings.



Soatoer Lubrications systems provided Sandvik Materials Handling a specialized solution to allow the machines to be lubricated even at cold temperature and ensure no damage to the bearings.



Soatoer developed specialist grease to work with the system and which meant no additional heating for the pipes was necessary and it was not necessary to increase the dimensions of the pipes. The Sandvik engineers were very satisfied with the fast service and expert advice provided from Soatoer for the lubrication system.



The flexible high performance heavy duty electric grease pump solution

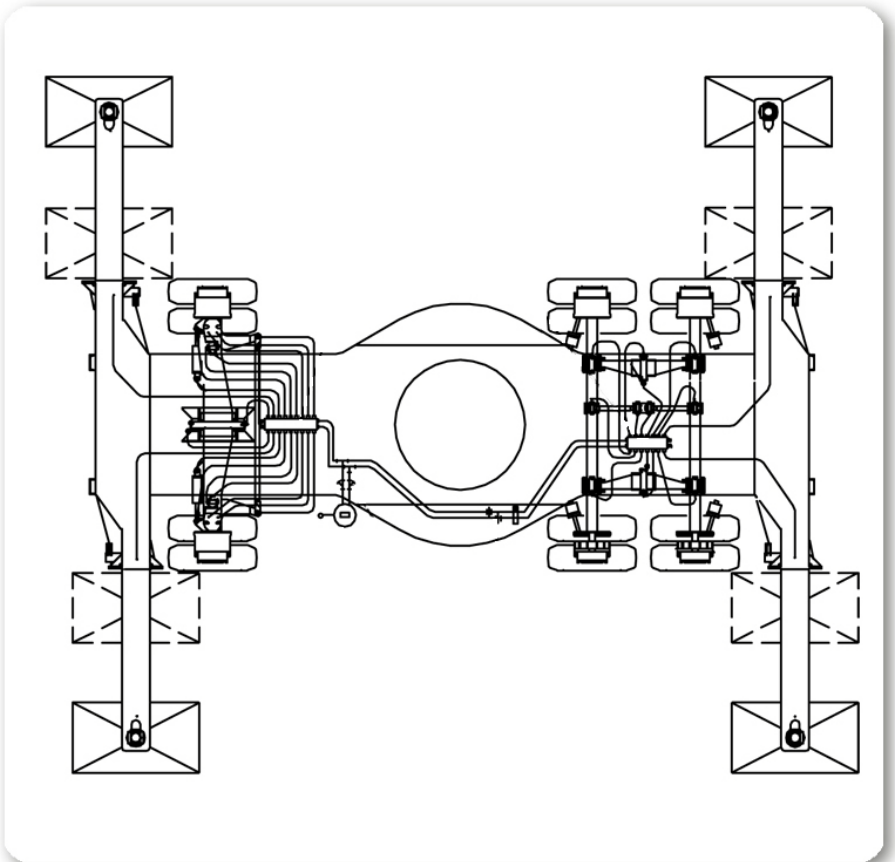


The Modulare DUAL LINE System

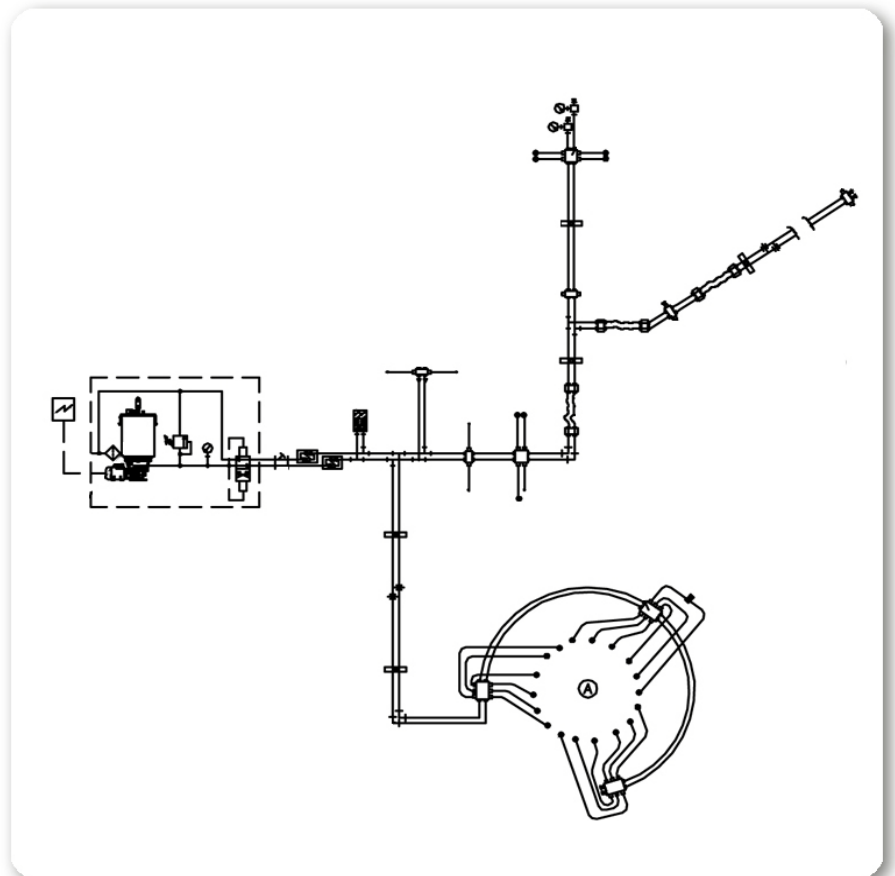


SOATOER proposed:

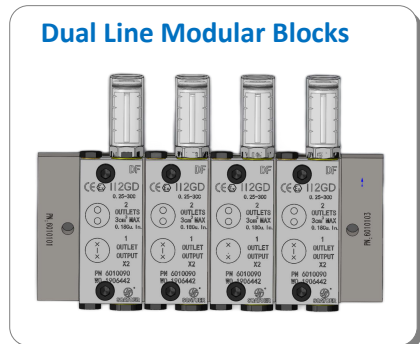
- **DX2 PUMP**
At the top.
- **Stainless Steel 316 Dual Line Modular blocks**
- **PLC**



DX2 PUMP



Dual Line Modular Blocks





SOATOER
AN ISO 9001 APPROVED COMPANY

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