



General guidelines for the use and  
maintenance of  
Mini Hydraulic Power Packs

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## INTRODUCTION

This document contains some general guidelines on the use and maintenance of Nexoil Mini Hydraulic Power Units. Always refer, if required, to the specific manual of the unit purchased.

## PRODUCT IDENTIFICATION

NEXOIL power units are identified by means of an adhesive label placed on the tank indicating the product code, manufacturing date and bar code.

## LIMITS OF USE

NEXOIL warns all users against using the control units in the following applications:

- environments where there is a risk of explosion and fire;
- aeronautical and space vehicles and systems;
- steering systems and systems on vehicles and on means used for the transport of people, things and animals
- braking, blocking and stalling systems in general;
- equipment and systems for application in the military, nuclear, medical and hospital fields

However, the Technical Management of NEXOIL reserves the right, upon request, to evaluate the applications mentioned above and to grant authorization if it deems it appropriate.

## INTENDED USE

NEXOIL power units are designed for use on hydraulically controlled machines and equipment. Since the final destination of the product is not always known, this document has been created with generic applications in mind.

**NEXOIL warns against the use of the control unit to carry out safety functions.**

## GENERAL SAFETY RULES

### 1. Recommendations

- Do not tamper with valves, fittings, accessories or components of the power unit; a simple loosening of a valve could cause loads to fall freely or structures to collapse.
- All installation, assembly, maintenance and disassembly operations of the power unit and components must be carried out in full compliance with safety regulations. During these operations, there must never be pressure inside the hydraulic circuit and there must be no type of load on the structure.

## 2. Safety

- Use safety protection;
- Work in conditions of maximum cleanliness;
- Use suitable tools, equipment and service benches;
- During start-up operations, normal work, maintenance, adjustment, venting of the system, intervention and operation of valves and various control elements, sudden splashes and leaks of hydraulic fluid may occur, which can reach temperatures high enough to cause burns to the skin. Hydraulic fluid can be dangerous to your health as contact with the skin and eyes can cause serious damage. Carefully follow the protection and safety provisions imposed by the hydraulic fluid manufacturer reported on the technical and toxicological data sheet of the product. Hydraulic fluid can be a polluting product. It is important to avoid hydraulic fluid leaks by using collection tanks and to protect against accidental leaks and spills of hydraulic fluid with oil-absorbent products.

## 3. Electrical specifications

- All electrical connections and disconnections must be carried out by specialized and competent personnel.
- Before carrying out any operation or intervention on the control unit, the motors and any other electrical device must be disconnected from the power supply line.
- In the case of devices other than electrical ones (pneumatic, hydraulic, mechanical, etc.), they must always be previously disconnected from the power supply network and made in conditions where they do not produce, even in accidental conditions, energy and therefore movement.

## 4. Choice of hydraulic fluid

In hydraulic circuits, the fluid is the medium that transmits power and simultaneously lubricates all the components of the system.

Use only mineral-based fluid ISO 6743/4 (DIN 51524).

The use of other fluids can damage and compromise the proper functioning of the system.

### ***Viscosity***

The recommended viscosity must follow the parameters ISO 3448 (DIN 51519)

- Min. viscosity 22 mm<sup>2</sup>/s.
- Max. viscosity 100 mm<sup>2</sup>/s.
- Recommended viscosity 46 mm<sup>2</sup>/s.

## INSTALLATION AND START-UP PROCEDURES

### 1. Installation

Correct installation is an essential factor for the good functioning of a hydraulic system over time. During assembly, therefore, ensure maximum cleanliness by carrying out the main connection operations in a clean and dust-free area.

The control unit must be installed in such a way as to allow easy accessibility to the controls, inspections, maintenance and repairs. Furthermore, it is equally essential that it is mounted in an area protected from accidental impacts and sheltered from casual physical contact, since the temperature reached during operation can cause burns.

The power unit must be securely fixed to the machine at the points of greatest resistance, far from any source or part of the machine that can vibrate, transmit or amplify noise and vibrations. All installation and start-up operations must be carried out by competent, adequately trained personnel.

The temperatures that the motors, especially if in direct current, and the tanks can reach, in many cases, exceed the "Burn Threshold" (as defined in the UNI EN 563 standard); Since the "reduction of surface temperature" (UNI EN563 appendix "C") cannot be taken into consideration as a technical solution, protections (screens or barriers), warning signs and personal protective measures (gloves) must be used by the user.

### 2. Temperature range

- Ambient temperature:  $-15^{\circ}\text{C}$   $+50^{\circ}\text{C}$
- Fluid temperature:  $-15^{\circ}\text{C}$   $+70^{\circ}\text{C}$

**Temperature variations can affect both the characteristics and the duration of the product, therefore it is essential to protect it from these situations.**

### 3. Rules for correct assembly

View the hydraulic diagram and any electrical diagram (our technical/sales office is at your disposal for any clarification). Avoid removing the protective plastic caps until the moment of connecting the pipes. Use rigid or flexible pipes with a diameter corresponding to or greater than the connection ports of the power unit, with reference to the following fluid speed parameters within the pipes:

- Delivery: 4 – 6 m/sec
- Return: 1.5 – 3 m/sec

For sections of pipe of considerable length (over 3 m), the recommended values must be increased.

For power units with electrical intervention control, the coils must be powered with the voltage value expected and described on the same.

The supply voltage must not exceed the following limits nominal voltage  $\pm 10\%$

Exceeding these limits may compromise the operation of the valve and the life of the coil itself.

The coil connection is performed using DIN43650 connectors; the choice of connector depends on the type of solenoid valve used.

Some solenoid valves are equipped with a manual screw emergency, this emergency must always be deactivated before restarting the system.

For power units with a manually controlled valve, apply a maximum voltage of 24V-AC/DC to the microswitch.

For power units with CETOP modular blocks useful for connecting electro-distributors, use cylindrical fittings for the attachment holes according to DIN3852 and threads in accordance with UNI-ISO 22 standards.

**Please remember that the use of fittings (in steel) with dents on the male thread causes a removal of shavings in the female seat (in aluminium), the main cause of the defective functioning of solenoid valves and one-way valves.**

#### **4. Filling the tank**

Fill with filtered hydraulic fluid with a grade of 25 $\mu$ m or lower and check the level visually.

### **START-UP**

#### **1. Direction of rotation of the motor-pump group**

Connect the motor electrically by relying on expert and competent personnel. When starting the motor for the first time, check that the direction of rotation is correct. The direction of rotation is indicated by an adhesive label on the motor. Remember that just a few seconds of operation in the wrong direction can compromise the operation and life of the pump.

#### **2. Maximum pressure valve**

The maximum pressure valve is an intrinsic safety device, therefore it must not be tampered with.

To avoid tampering, it is possible to carry out sealing

#### **3. Air vent**

It is necessary to bleed the air contained in the system to avoid the formation of foam in the tank and any unwanted and uncontrolled movements of the actuators.

At the same time, check the fluid level again and if necessary restore the level.

After a few hours of operation, check for any leaks throughout the power unit, check the fluid level in the tank again and for any foam.

## **DISPOSAL OF POWER UNIT AND HYDRAULIC FLUID**

### **1. Power unit disposal**

The power units are mainly made of aluminium alloy, steel alloy and plastic material; they can be disposed of as normal materials sent for recycling with the only warning to empty the hydraulic fluid in all its parts.

### **2. Fluid disposal**

Hydraulic fluids are subject to special disposal requirements:

Follow the instructions provided by the manufacturers and comply with the legislative provisions in force in the country of use.

## **MAINTENANCE**

It is necessary that a hydraulic system is well installed and cared for during the assembly and commissioning phase to ensure a long life without inconveniences and does not require particular maintenance care. The basic principle is the need to frequently check the quality and condition of the fluid that transmits power and ensure the absence of impurities in the circuit to which the reliability of any hydraulic machine is related. Among the main causes of failure, we can point out the blocking of equipment following seizures or breakages due to wear and ageing of the fluid that transmits power, with consequent loss of its chemical-physical properties. It is now established that the main cause of all these inconveniences is due to the presence of particles and microparticles that continuously circulate in the fluid and that constitute a cause of wear. These micro particles, if left to circulate in the system, act as an abrasive mixture, scratching the surfaces with which they come into contact and dragging further contaminants into the cycle; the damage is, obviously, all the more serious the more sophisticated the equipment installed is. From the start-up of the system, maintenance is basically made up of small operations that must be carried out regularly to be truly effective. It is therefore extremely important that these control and verification operations are scheduled and reported on machine or system sheets, sheets that must accompany each control unit or each part of the system.

**For further information regarding the use and maintenance of our products, consult our catalogues or contact our technical office**

## PROBLEMS - CAUSES AND REMEDIES

	Fault	Cause	Reasons	Remedy
1	Aeration Of Fluid	Reservoir Fluid Level Too Low		Fill To Correct Level
		Suction Line Joints Or Seals	Seals Damaged	Renew Seals
		Allowing Entry Of Air	Joints Not Tightened Or Damaged	Renew Or Tighten Joints
2	Low Or No Fluid Flow	Pump Not Properly Primed	Pump Running Reverse	Check Direction Of Rotation
			Suction Strainer Clogged	Clean Or Renew
			Suction Line Not Plunged	Fill To Correct Level
		Mechanical Failure	Broken Coupling	Renew Coupling
			Failure To Pump	Renew Pump
High Fluid Viscosity	Cavitation	Replace With Correct Fluid		
3	Inadequate pressure	Relief Valve Unproperly Regulated	Low Pressure Valve Setted	Adjust Setting
		Pump Fails To Delivery	(See Fault 2)	(See Fault 2)
		Pressure Leakage From Pressure To Return	Relief Valve Not Closed Due To Dirt	Check And Clean The Relief Valve
4	Noisy Pump	Aeration Of Fluid	(See Fault 1)	(See Fault 1)
		High Fluid Viscosity	(See Fault 2)	( See Fault 2)
		Coupling Worn	Excessive Clerance	Renew Coupling
		Pump Worn	Excessive Mechanical Clearance	Renew Pump
5	Leakage At The Gaskets	Dirt Contaminated Fluid	Filter Elements Clogged	Renew Filter Elements And Gaskets
		High Setting Pressure	Gap In The Valves Mounting Surface	Adjust The Right Pressure Valve
		Excessive Fluid Temperature	Collapsed Gaskets	Fit Cooling System And Renew Gaskets
6	Excessive Fluid Temperature	Leakage From Pressure To Return	Pump Worn	Renew Pump
			Unloading Taps Opened	Close Unloading Taps
		Inadequate Cooling	Failure Of Cooling	Renew Cooling
			Below Standard Cooling	Change Cooling Type
			No Cooling In The System	Cooling Must Be Fitted
High Setting Pressure		Adjust The Right Value		
7	Erratic Movement Of The Actuators	Air In Circuit	(See Fault 1)	(See Fault 1)
		Inadequate Pressure	(See Fault 3)	(See Fault 3)
		Inadequate Flow	(See Fault 2)	(See Fault 2)
			Accumulator Unloading Taps Opened	Close Unloading Taps
			Braekdown Accumulator Bladder	Renew Bladder
			Low Pre-Charge Pressure	Adjust Pre-Charge Pressure
		Valves Do Not Work Properly	Dirt Contaminated Fluid	Clean The System And Renew Fluid
			Coils Not Energized	Check Electrical Connections



NOTE



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