EMOTOR ELECTROMOBILITY OFFER



TECHNICAL CATALOG





EMOTORS

Electric motor solutions for all vehicle classes: scalable and flexible, eMotors are designed for the most demanding uses. eMotors are available with flanges for traction systems, steerings, hydraulic pumps or in IEC and NEMA standard.

Innovative eMotors are they key technology to space-saving in electrification. eMotors utilizes highly engineered rotor design to achieve the highest efficiencies. Higher power density comes from NeFeB rare earth magnet NiCuNi surface-coated. High modularity thanks to lamination stack length and great scalability in performances, eMotors fit within a wide-range of applications.

Poclain ME1 emotors offer Permanent Magnet Synchronous technology boasting up to 97% efficiency that enables the production of motors a third of the size and weight of typical inducton ones.

Scalable design and high-speed performance thanks to field weakening equates to an unbeatable overall package, available for wide-range of applications.



e-

CONTENT



16/02/2024





SAFETY INSTRUCTIONS

Display of safety instructions

Standardized safety instructions, symbols, terms and abbreviations are used so that you can use this documentation to work quickly and safely with your product. To give you a better understanding they are explained in the sections below.

SIGNAL WORD Type and source of the hazard! Consequences of not avoiding the hazard.

Indication of how to avoid the hazard.

- **Safety sign:** Draws attention to the hazard.
- Signal word: Identifies the degree of the hazard.
- **Type and source of hazard:** Identifies the type and source of the hazard.
- Precautions: States how to avoid the hazard.

Danger classes in accordance with ANSI Z535.6



Symbols

The following symbols mark notes that are not relevant to personal safety, but are intended to make this documentation easier to understand.

Symbol	Meaning
P	Poclain Hydraulics disclaims any liability for damage of any kind if use of the product is not compliant with a recommendation identified with this symbol.
\bigcirc	General information regarding the product or the repair procedure.
C	Information on the model number.
$\hat{\Box}$	Weight of component without oil.
Y	Indication of necessary volume of oil.
	Units.
	Indication of necessary tightening torque.
	Screws.
Â	Information intended for Poclain-Hydraulics personnel.

AND METHODOLOGY

The views in this document are created using metric standards. The dimensional data is given in mm and in inches (inches are between brackets and italic)

General safety instruction

This manual describes the activities for the installation of permanent magnet synchronous motors (eMotor) and is an integral part of the motors themselves, for this reason it must be preserved and stored with the utmost care.

Inappropriate installation of the product can cause damage to product itself, to other components or to injuries to		Risk for product user and by-stander!
users and by-standers.		
Follow Poclain instructions for mounting in Installation Guide – B59689D.		

Read these instructions before proceeding with any transportation, installation, start-up, maintenance, or repair of the motor.

In case of doubts or misunderstandings, immediately interrupt the installation and contact your Poclain Hydraulics application engineer.

Only specialized personnel can work on our products in accordance with the rules and regulations in force. For any doubt, please contact your Poclain Hydraulics application engineer.

Intended use

Poclain ME1 emotors are is specifically designed for Poclain "e+h" Electrohydraulic systems to drive hydraulic pumps on mobile applications.

Refer to Poclain Electromobility system technical catalog B79372X for more details about intended use.



Any use other than that described as Intended use is considered improped and is therefore impermissible. Poclain Hydraulics accepts no liability whatsoever for damage resulting from improper use. The user bears all risks arising from improper use.

Declaration of conformity

UE Declaration of conformity declares that the synchronous motor comply with the following European Directives:

- 2011/65/UE, RoHs II
- 2014/30/UE, Electromagnetic Compatibility (EMC)
- 2014/35/UE, Low Voltage (BT)

The compliance with European Directives has been achieved by reference to the following standards:

- CEI EN 50581: 2013-05 Technical documentation for the assessment of electrical and electronic products in relation to the restriction of hazardous substances.
- CEI EN 62474: 2013-02 Declaration of materials for products of and for the electrical industry.
- CEI EN 61000-6-1: 2007-10 Electromagnetic Compatibility (EMC), Parts 6-1: Generic norms Immunity for residential, commercial and light industrial environments.
- CEI EN 61000-6-3: 2007-11 Electromagnetic Compatibility (EMC), Parts 6-3: Generic norms Emission for residential, commercial and light industry environments.
- CEI EN 61000-6-3/A1: 2013-06 Electromagnetic Compatibility (EMC) Parts 6-3: Generic norms emission for residential, commercial and light industrial environments.
- CEI EN 61000-6-2 Electromagnetic Compatibility (EMC) Parts 6-2: Generic norms Immunity for industrial environments.
- CEI EN 61000-6-4 Electromagnetic Compatibility (EMC) Parts 6-4: Generic norms Immunity for industrial environments.
- CEI EN 61800-3: 2005-04 Variable Speed Electric Drives, Part 3: EMC Requirements and specific test methods.

eMotol

- CEI EN 61800-3/A1: 2013-09 Variable Speed Electric Drives, Part 3: EMC Requirements and specific test methods.
- CEI EN 60034-1:2011-03 Rotating electrical machines, Part 1: Rating and operational characteristics.
- CEI EN 60034-1/EC: 2015-10 Rotating electrical machines, Part 1: Nominal and operating characteristics.
- CEI EN 60034-2-1: 2015-01 Rotating electrical machines, Part 2-1: Standardised methods for documentation by leakage and
 efficiency tests (excluding machines for traction vehicle application).
- CEI EN 60034-5: 2001-10 Rotating electrical machines, Part 5: Protection grades of the rotating machines casings (integral project) (IP code) – Classification.
- CEI EN 60034-5/A1: 2007-03 Rotating electrical machines, Part 5: Protection grades of the rotating machines casings (integral project) (IP code) Classification.
- CEI EN 60034-6: 1997-09 Rotating electrical machines, Part 6: cooling methods (IC code).
- CEI EN 60034-7: 1997-09 Rotating electrical machines, Part 7: Classification of constructive forms and types of installation (IM Code).
- CEI EN 60034-18-1: 2011-07 Rotating electrical machines, Part 18-1: Functional assessment of insulation systems General guiding principles.
- CEI EN 60034-18-21: 2014-02 Rotating electrical machines, Parts 18-21: Functional evaluation of insulation systems Test
 procedures for wire windings Thermal evaluation and classification.
- CEI EN 60034-18-41: 2014-08 Rotating electrical machines, Parts 18-41: Electrical Insulation Systems Exempt from Partial Discharge (Type I) used in rotating electrical machines powered by voltage converters - Quality control qualification tests.
- CEI TS 60034-27: 2012-01 Rotating electrical machines, Parts 27: Offline measurements of partial discharge on the insulation of the stator winding of rotating electrical machines.
- CEI EN 60270: 2002-06 High voltage testing techniques, partial discharge measurements.



Low-voltage rotating electrical machines contain tensioned parts, rotating or moving parts, surface and internal parts with temperatures above 50°C in normal operation.

WARNING Dangerous electrical voltage with risk of electric shock!

Risk of electric shock to personnel or equipment.

■ All transport, installation, start-up, maintenance and repair operations must be carried out by qualified personnel under the supervision of the responsible experts (IEC 60364).



Hot surface temperature!

Improper use of motors and/or removal or disconnection of protective devices can cause serious injury to people, animals and things.

All transport, installation, start-up, maintenance and repair operations must be carried out by qualified personnel under the supervision of the responsible experts.



Poclain Hydraulics declines all responsibility in case of accidents and/or damages due to negligence and/or lack of observation of the instructions described, the general safety rules or for usage in conditions outside the ones indicated on the nameplate.

Poclain Hydraulics declines any responsibility for damage caused by improper use of the motors and/or removal or disconnection of the electrical and mechanical protections.

Installation and start-up of the motors may only be carried out by qualified personnel who, as a result of their specific knowledge and experience and the training they have received, have sufficient knowledge about:

Safety guidelines Injury prevention guidelines Guidelines and technical regulations (e.g.CE, IEC etc.)

The qualified personnel must be able to assess the work they have been assigned to carry out and to recognize and avoid possible dangers. They must also be authorized by the safety officer to carry out the necessary work and activities.

"Qualified personnel" means the personnel authorized by the "Safety Officer" of the plant to carry out any necessary activities. During these activities they must be able to recognize and avoid any possible danger.

Appropriate training, experience and know-how will be required, as well as knowledge of the relevant standards, regulations and measures regarding service conditions and accident prevention.



Poclain Hydraulics accepts no responsibility for damages resulting from incorrect use of this information or use of outdated versions.

The instructions contained in this document cannot contain detailed information on all possible design variants, nor every single case of assembly, service or maintenance.

Field of application

The instructions given in this manual refer to three-phase synchronous motors with permanent magnets in compliance with standard **CEI EN 60034-1** and powered by an appropriate control device (controller / inverter).



The eMotor of this manual cannot be operated directly connected to the energy supply. The use of a controller is necessary.



Verify that the conditions of use are aligned to the conditions of use indicated on the nameplate.

eMotors are considered "Components" according to Guideline 2006/42/EC (Machinery Directive).

Therefore, the motor cannot be put into service until the machine, in which it will be installed, has been declared in conformity with the provisions of the Directive itself in the European context (or in conformity with other directives for countries other than the European Union) and with Directive 2014/30/EU (EMC Directive also for the European context or other directives for countries other than the EU).

eMotors are compliant with the LV Directive 2014/35/EU and EMC Directive 2014/30/EU.

However, with regard to the incorporation of the motor into the machine, it is the responsibility of the machine manufacturer that the EMC requirements of the entire machine are respected.



This manual refers to eMotors, which are not allowed to be used in explosive atmospheres. If you need to use the motors in environments with increased safety regulations, please your Poclain Hydraulics application engineer.

It is important to pay attention to the difference in operation between motor and generator, as described below:

Operation as Generator

In the eMotor series, driving the motor shaft produces a voltage at the terminals of the stator winding whose value is proportional to the driving speed of the motor shaft.

Operation as Motor

For motor operation it is necessary to use an inverter suitable for its control. These devices use different control methods, so depending on the type of inverter there may be small thermal variations and deviations from the data on the plate.

TECHNICAL

Contact your Poclain Hydraulics sales engineer for all adaptations.

Commercial name			ME1-S-48-200-052-19-A09-AC-1	ME1-S-48-200-070-28-B13-AC-1
Part number		B81071U	B70266A	
Nominal battery voltage		48V DC		
Max. speed rpm		6 000	7 000	
Rated speed (S2-60min)		rpm	2 000	2 000
Rated performance	Power	kW [HP]	5 [6.7]	7 [9.4]
(S2-60min)	Torque	Nm [lb.ft]	24 [17.7]	33 [24.3]
	Current	Arms	110	160
Ingress protection rating		IP	67	
Cooling system			Air	
Pump coupling standard			SAE A - J744, 9 teeth	SAE B - J744, 13 teeth
Mounting interface			Front flange	

Performance chart for ME1-S-48-200-052-19-A09-AC-1 motor



Performance chart for ME1-S-48-200-070-28-B13-AC-1 motor



SPECIFICATION



Contact your Poclain Hydraulics sales engineer for all adaptations.

Commercial name			ME1-S-48-200-070-19-B13-AC-1	ME1-S-48-200-105-19-B13-AC-1
Part number			B75510A	B70267B
Nominal battery voltage			48V DC	
Max. speed		rpm	7 000 6 000	
Rated speed (S2-60min)		rpm	3 000	2 000
Rated performance	Power	kW <i>[HP]</i>	10 [13.4]	9,8 [13.1]
(S2-60min)	Torque	Nm [lb.ft]	32 [23.6]	46 [33.9]
	Current	Arms	220	210
Ingress protection rating			IP67	
Cooling system			Air	
Pump coupling standard			SAE B - J744, 13 teeth	
Mounting interface			Front f	lange

Performance chart for ME1-S-48-200-070-19-B13-AC-1 motor



Performance chart for ME1-S-48-200-105-19-B13-AC-1 motor



Electrical connection

Start up

Power Torque





Contact your Poclain Hydraulics sales engineer for all adaptations.

Commercial name			ME1-S-48-200-210-19-B13-AC-2	
Part number			B77718A	
Nominal battery voltage			48V DC	
Max. speed		rpm	5 000	
Rated speed (S2-60min)		rpm	1 000	
Rated performance	Power	kW [HP]	11,5 [15.4]	
(S2-60min)	Torque	Nm [lb.ft]	90 [66]	
	Current	Arms	230	
Ingress protection rating			IP67	
Cooling system			Air	
Pump coupling standard			SAE B - J744, 13 teeth	
Mounting interface			Front flange & foot	

Performance chart for ME1-S-48-200-210-19-B13-AC-2 motor



e+h

Overall dimensions for ME1-S-48-200-052-19-A09-AC-1



Overall dimensions for ME1-S-48-200-070-28-B13-AC-1 and ME1-S-48-200-070-19-B13-AC-1





Overall dimensions for ME1-S-48-200-105-19-B13-AC-1



Overall dimensions for ME1-S-48-200-210-19-B13-AC-2





Safety instructions and Methodology

Technical specification

Product identification





All eMotors have a serial number and unique data plate, which must not be tampered or removed from the motor to avoid declination of warranty.



eMotor

OPERATING DESCRIPTION

General description

To cover a wide range of torque and power ratings, eMotors offer versatility by modifying the length of the motor and therefore the length of the central case (see figure below).

For the different lengths refer to your Poclain Hydraulics application engineer. The output flange and shaft can be chosen by the customer in different configurations.



IP protection grade

IP67

Handling and storage

During handling avoid shocks (pay attention to the shaft, flanges, sensors and cables), falls and exposure to humidity. Motor lifting eyebolts must be used for handling when equipped, keeping in mind that they can only be used to lift the motors without any additional equipment attached to it.

Waiting for the start-up operations, the motors must be stored:

Indoor (temperature between -15°C and +50°C), dry, free of vibrations, dust, corrosive agents and protected from bad weather and sudden and frequent changes in temperature, to avoid the condensation. Storage in open air under a roof is only permitted for a short period of time, in which case the motors must be protected against all harmful environmental influences.

Protected from humidity

If the above indications cannot be met, it is possible to wrap the machine in a sealed cover (e.g.plastic cover) with humidity-absorbing materials inside.

Initial inspection

Before installation, several checks must be carried out to ensure that the machine is ready for operation:

- Check for visual damage to any of the machine's components.
- If possible, by disengaging (manually or electrically) any EM brakes, rotate the machine shaft manually.

This may require some effort for motors with permanent magnets.

It is important that the shaft is not blocked, then make sure that the shaft rotates without abnormal noise.

Check that there is no humidity inside the terminal block and ensure that the cover gasket (if present) is correctly installed and not damaged.



If any of these checks detect a problem, contact your Poclain Hydraulics application engineer and do not install or use the machine.

Technical

Safety instructions and Methodology





INSTALLATION

Premise

eMotors are industrial products, so their installation must be carried out by qualified, competent and authorised personnel.



By preparing the engine, before the installation procedure on the machine, it is necessary:



Rotate the shaft before assembly in order to detect any defect generated by the handling or installation itself (Note: the magnets may produce resistance to the rotation).

Operation as generator

The dragging of the eMotor shaft produces a voltage at the terminals of the stator winding whose value is proportional to the rotational speed.



If installed outdoors or in humid environments, it must be ensured that the IP rating is adequate for the working conditions.

eMotor orientation

During installation, the eMotor must be installed so to grant sufficient space to ensure proper air circulation.

Insufficient air circulation jeopardizes the thermal exchange of the eMotor with consequent problems of overheating which could limit the performances, according to the load conditions applied to the eMotor itself.

In addition, avoid proximity to other heat sources that may affect the temperature of the cooling air or in general applications that may compromise the regular thermal exchange of the engine with the surrounding environment.



Chassis assembly recommendations (Front flange assembly)		
Number of screws	8	
Screw class	10.9	
Screw type	CHC M8	
Tightening torque (Nm)	27,8 ± 2,8	
Minimum length in thread (mm) - 2x Ø	16	



Safety instructions and Methodology

Start up



Pump assembly recommendations

Pump coupling type standard	SAE-A, 9 teeth	SAE-B, 13 teeth
Number of screws	2	2
Screw class	10.9	10.9
Screw type	CHC M10	CHC M12
Tightening torque	54,5 ± 5,4Nm	92,6 ± 6,6Nm
Minimum length in thread (mm) - 2x Ø	20	24

Seal definition

O-ring 1.78x88.62x92.18 HNBR70

O-ring 2.62x107.62x112.86 HNBR70





Recommendation to assemble pumps on eMotor in vertical position in order to limit parasite radial efforts on spline and ensure centering of the assembly (risk for shafts and threads of pumps assembly on eMotor in case of horizontal mounting).

The bore diameter of the eMotor must enable the pump to fit freely to avoid parasite radial efforts on spline.

Recommendation to apply grease at eMotor and pump coupling – risk for spline damage in case of missing lubrication .

Recommendation for assembly with seal recommended in above table in order to ensure protection index for the eMotor and lubrication of the coupling. Risk for spline wear in case of improper sealing.

eMotor

ELECTRICAL CONNECTION





Avoid unecessary shaft rotation.

To connect the U-V-W phases of the eMotor to the respective contacts of the control inverter, when present, it is necessary to open the cover of the terminal box and pass the connection cable through the predispositions on the box itself.



Power connections

By connecting the U-V-W eMotor phases (terminal block or direct cables) with the corresponding U-V-W terminals of the inverter and providing a positive speed command, the eMotor shaft rotates in accordance with what is indicated in the respective Datasheet.



Once the connection are made, check:

Suitability of eMotor / inverter to power supply voltage.
Absence of loose parts (washers, nuts, etc.) inside the terminal block.
The presence of any gaskets, their integrity and correct positioning to guarantee the degree of protection indicated on the plate.

Initial connection

1. Unscrew 4x M4 terminal box fixing screws	2. Remove the cover and gasket
3. Unscrew 3x screws on the terminal board	4. Unscrew and insert the connection cables through the cable glands
Remove: 3x DIN 125A brass washers 3x Grower washers DIN127/B	
5. Use 3x eyelet terminals, according to the required dimensions for fixing to the terminal board.	6. Secure the cables to the terminal board by tightening the screws and relative washers
B max L max Fixing 20 mm [0.79 in] 40mm [1.57 in] M10	Tightening torque 20 Nm [14.7 lb.ft].







Auxiliary devices

Connection of temperature sensor

The temperature sensor must be connected to a dedicated inverter input for the correct management of the eMotor temperature or to a special release device capable of managing any anomalies.



ter are marked with safety paint and must not be tampered without permission from **Poclain Hydraulics.**

Encoder analogue sinu	soidal innuts
2 channels V_{A} V_{B} sinusoidal (90° pha	se shifted, single ended)
Power supply	$V_{dd} = 5V \pm 5\%$
Current consumption	Max. 30 mA
Outputs	Single ended
Internal serial impedance	100 Ω
Signal offset (V _{ref})	2,5V ± 1%
Maximum speed	40 000 rpm
Temperature (operating and storage)	-30°C to +80°C
Output specifications -	5V supply
Analogue sinusoidal outputs, 5V 2 cha	annels $V_A V_B$ sinusoidal (90° phase shifted, single ended)
Power supply	$V_{dd} = 5V \pm 5\%$
Current consumption	Max. 13 mA
Outputs	Signal amplitude 2 ± 0,2V _{pp} Signal offset 2,5V _{dd} ± 5 mV
Maximum output frequency	1 kHz
Maximum cable length	3m
Operating temperature	-40°C to +80°C
Maximum speed	60 000 rpm

Timing diagram



START UP



Make sure the main mechanical and electrical characteristics of the product correspond to the application needs.

Start up instructions



The start-up operations must be carried out by trained personnel and in compliance with the safety regulations.



Risk of damage to the product or environment.

e-Motors are not suitable for direct connection to the power supply network, but must be managed by a dedicated inverter.

Pay attention that the inverter is suitable for driving the motors before starting the commisioning operations.

	Risk of dangerous voltage on the power terminals!		
When the eMotor is disconnected from the command Inverter, a dangerous voltage may still exist on the power supply terminals when the motor shaft is dragged (generator operation, in permanent magnets synchronous motors).			
Before intervening on the eMot	or, it is necessary to prevent rotation of the its shaft.		
NOTICE	Risk of damage to the product or environment.		
None			
Using the eMotor outside of the plate values could cause damage.			

Contact your Poclain Hydraulics application engineer in case of use in conditions other than the specified.

Before connecting the eMotor to the application of to the transmission system, it is necessary to check that:

- The Inverter parameterization is correct with reference to the eMotor parameters indicated on the plate and on the technical documentation provided.
- The motor warranty cannot be recognized in the event of damage due to incorrect management of the control Inverter.
- The Inverter is compatible with the eMotor to be driven.
- The parking brake, if any, works correctly by carrying out some tests to lock and unlock the braking element.
- Correct management of the temperature sensor.
- The direction of rotation is the desired one (if it is not, the direction of rotation can be reversed by parameterizing the control Inverter
 or by reversing any two phases in the terminal block).



If no-load tests described above give a positive result, it is possible to mechanically connect the eMotor to the machine and carry out the load tests.

eMoto

Before starting the eMotor, connected to the mechnical load, it is necessary to check that:

- All safety regulations and directives are respected.
- All mechanical and electrical connections are firmly fixed.
- The connections to ground are respected.
- The auxiliary devices (for example temperature sensors, brakes, forced ventilation, etc.) are correctly connected and functioning.
- The absorptions comply with the plate specifications in order to verify the suitability of the system.
- There are no mechanical noises and vibrations.



All eMotors are balanced according to the UNI ISO 1940-1 standard by inserting « half tongue » (if present); therefore it is necessary to communicate to the Poclain Hydraulics application engineer if any application do not require the use of the tab in which the groove is present.

Conditions of use

The eMotors are designed for use in industrial applications and in accordance with the plate data (in compliance with CEI EN 60034-1 standards) and are designed for operation under the following nominal conditions:

- Altitude: no higher than 1 000m [3 280 ft] above sea level
- Ambient temperature in the place of installation: minimum -15 ° C, maximum + 40 ° C (unless otherwise indicated on the plate)
- Relative humidity: ≤ 60%

For environmental conditions different from the nominal ones, the power outputs vary as indicated by the following expression:

If the eMotors are intended to operate at an altitude between 1000 and 4000 m above sea level and / or if the ambient temperature is between +40 and + 60° C, it is necessary to multiply the rated power of the eMotor by a correction factor that allows the motor to comply with the operating class indicated on the plate.



The following tables allow you to separately determine the derating coefficients for ambient temperature and altitude above sea level.

Real output power (P _{real})	Real output power (P _{real})
related to the ambient temperat	re related to the altitude
Ambient temperature °C [°F] P_{real} / P_n	Altitude m [ft] P _{real} / P _n
40 [104] 1,00	1 000 [3 280] 1,00
45 [113] 0,95	2 000 [6 561] 0,93
50 [122] 0,90	3 000 [9 842] 0,85
55 [131] 0,85	4 000 [13 123] 0,74
60 [140] 0.80	

Maintenance

Maintenance, inspections, accurate and periodic reviews are recommended to promptly identify and eliminate any faults before they can cause further damage.

Since the operating conditions are not exactly definable, only general terms can be stated, assuming fault-free operation. The timing of maintenance and inspection planning must always be adapted by the customer to the conditions of the installation site (dirt, applied load, etc.) and to the specific application.



Maintenance, inspection and overhaul operations must be carried out by qualified personnel and in compliance with the safety regulations in force.



WARNING

Risk of damage to the pacemaker!

People with pacemakers are in danger near rotors that have been removed from the motor.

Avoid rotors disassembled from the motor in case you wear pacemaker.

Start up



Maintenance operations

Part	Operations	Recommended time
Mechanical part	Check for increased or atypical noise and vibration levels during operation.	Weekly
	Check the tightening torque of all relevant mounting screws and covers. If necessary, re-tighten the screws. Replace the broken screws.	Yearly
	Check for heavy dirt on any relevant part of the machine (e.g. shaft, housing, bearings, etc.). If necessary, clean the respective parts.	Monthly
	Check for cracks and / or damage of any other nature on the parts making up the eMotor (e.g. flange, feet, etc.)	Yearly
	Check the tension of any belts, as a high tension significantly reduces the life of the bearings and could cause the shaft end to break.	Yearly
	Check the condition of the seals and grease them to reduce wear as they are components in contact with moving parts. Once these parts are worn out, they must be replaced with original components.	Monthly
	Check the condition of the bearings. The latter wear generally manifests itself through excessive noise presented by the engine during its operation.	Yearly
Electrical part	Check the wear of the cables and the integrity of the connections. If necessary, replace damaged cables.	Monthly
	Check the correct functioning of the anti-condensation heater by means of a tester.	Yearly
	Check the integrity of the temperature sensors by checking the condition of the cables and measuring their resistance.	Monthly

Cleaning

Use only non-abrasive and non-corrosive cleaning products compatible with aluminium. When using a pressure hose to clean the machine, make sure the water jet is never aimed directly at items such as gaskets, glands, bearings, or vent plugs.



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Poclain Hydraulics reserves the right to make any modifications it deems necessary to the products described in this document without prior notification. The information contained in this document must be confirmed by Poclain Hydraulics before any order is submitted.

Illustrations are not binding.

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