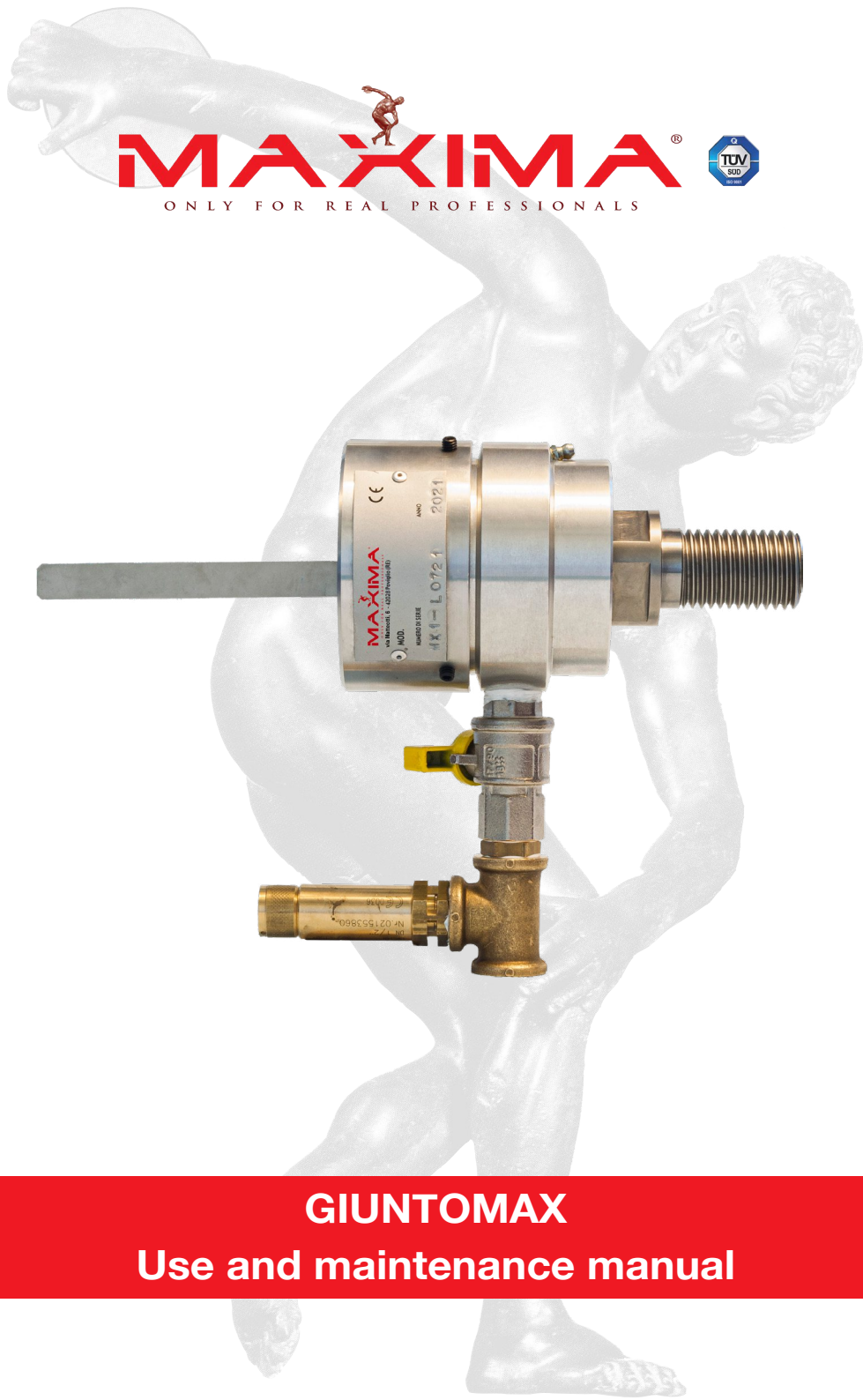
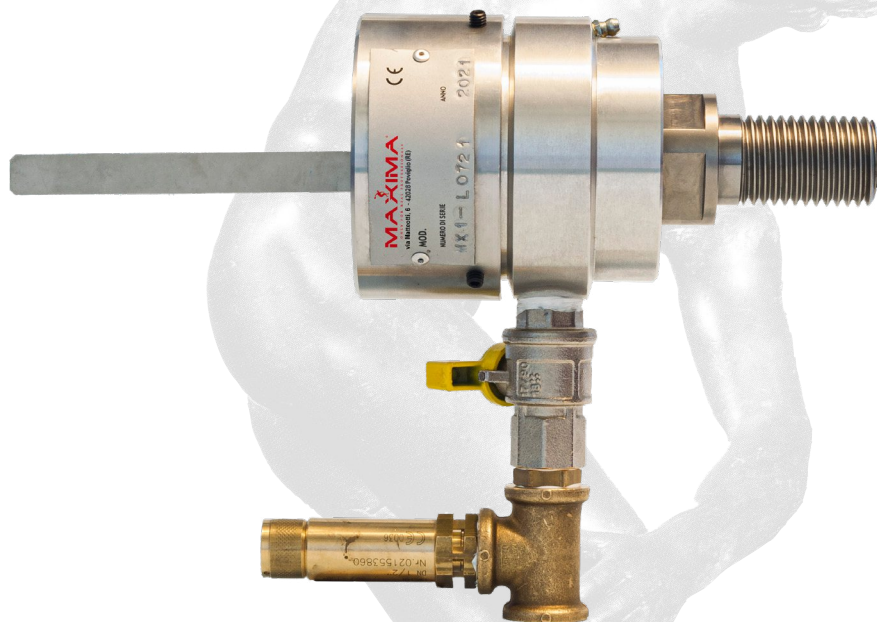




MAXIMA®

ONLY FOR REAL PROFESSIONALS



GIUNTOMAX

Use and maintenance manual

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ATTACHMENTS:

ANNEX 1: Air Water Rotary Joint Machine Declaration of Conformity

ANNEX 2: Safety Valve Certification

GIUNTOMAX

1 FOREWORD

This document contains the information necessary for the use and maintenance of the AIR/WATER ROTARY JOINT (hereinafter called GR) machine.

The GR machine was designed and manufactured by Maxima S.p.A, via Matteotti,6 Poviglio (RE).

This manual deals mainly with safety aspects relating to the operation, management and control of the GR machine as a whole, the management of signals that intervene at global level and the management of interface signals between the different machines and equipment.

The manual also covers the checks and maintenance required to maintain safety levels, and the types of work carried out on individual machines, such as commissioning, cleaning, and segregation from energy sources.

In drawing up this manual, we have followed the indications and contents of the Machinery Directive, the UNI EN 12100-2 standard and the standards referred to in the Declaration of Conformity and the Machinery Directive issued by the company itself.

2. Machine description

2.1 OVERVIEW OF THE MACHINE

MANUFACTURER:	Maxima S.p.A.
NAME:	Air/Water Rotary Joint (GR)
MODEL:	n/a
TYPE:	n/a
YEAR OF CONSTRUCTION:	2010

2.2 GENERAL DESCRIPTION OF THE MACHINE

(Ref: Directive 2006/42/EC: Annex VII, Part A, par. 1(a), 1st indent).

The air-water rotary joint is designed to be assembled to a drilling machine tool (e.g. core drill, gear motor, motor) in order to improve machining performance in terms of:

- cooling of the tool during machining,
- debris removal capacity;
- extension of the operating conditions to cooling fluids other than water.

With the use of the Air/water rotary joint it is possible to operate:

- with higher flow rates and working fluid pressures;
- with a working fluid (fluxing fluid) consisting of air, water and/or aerosols.

With reference to the machinery directive, the air/water rotary joint is "interchangeable equipment" according to the definition in art. 2(2)(b), and as such must be considered a "machine" for all intents and purposes.

The GR can be used with 3 different types of drilling fluid: water, air and aerosols.

In general, an increase in the flow rate of the drilling fluid improves the cooling effect of the tool, increasing its life cycle especially on applications with large diameter tools on very hard materials, such as granite, quartzite and hard quartz sandstone.

An increase in the flow rate of the drilling fluid also increases the drilling speed, improving the potential for debris removal. This translates into an increase in tool life in terms of linear metres drilled, and an increase in the drilling depths achievable under the same working conditions and tool diameter.

In fact, the GR has a minimum passage for the drilling fluid with a cross-section of 15 mm compared to the 8-10 mm typical of standard machine adducts, thus increasing the flow rate of the drilling fluid.

In addition, the GR can withstand pressures of up to 12 bar without the seals coming out of their seats or breaking, whereas the adductors of core drilling machines are only designed to withstand pressures of 2 bar.

The extension of the range of materials that can be drilled with diamond tools in fluxing air is further increased when a small quantity of water is added to the air in a controlled manner, so as to create an aerosol, as can be done with the use of the MX2 Vaporizer manufactured by Maxima S.p.A.

It should be noted that once the GR has been assembled to the core drill, the maximum mounting clearance for the rods is reduced by 125 mm.

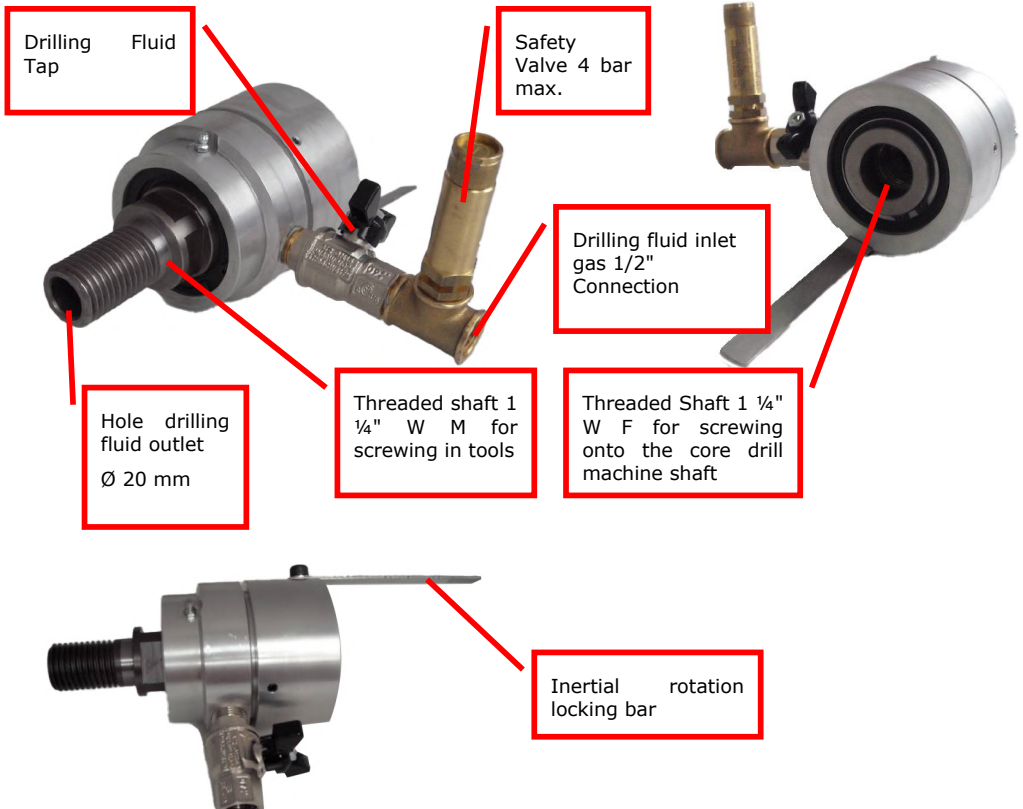
2.2.1 Technical data

Length including tab:	313 mm
Width including tap and safety valve:	202 mm
Weight:	3.54 Kg
Noise:	94 dbA at 7 bar
Maximum Torsion Load	1400 Nm
Maximum Thrust	1500 Kg
Maximum Rotational Eccentricity	1 mm
Max. Bending Moment	120 Kgm
Maximum Rotation Speed	1200 rpm
Maximum Drilling Fluid Pressure	12 bar

2.3 INTENDED USE

2.3.1 Overview

2.3.1.1		The GR is supplied complete with a tap to regulate the access of the drilling fluid to the drilling system, and a safety valve set at a maximum pressure of 4 bar, as indicated on the label on the valve itself.
2.3.1.2		The safety valve is used to provide a safe exit route in the event of any obstruction of the drilling fluid exit route.
2.3.1.3		WARN: The 4 bar max safety valve provides a safety guarantee for most, but not all, applications.
2.3.1.4		For each application, refer to the tables A at the end of this paragraph and assess the maximum allowable pressure for safe working. Then replace the safety valve supplied with a valve set to the value required for safe operation.
2.3.1.5		On the outer sleeve there is a steel bar fixed with a screw. As there may be a slow inertial rotation of the GR outer casing, place the bar on the casing of the core drill in such a way as to prevent the drilling fluid supply pipe from screwing onto the GR casing.



2.3.2 Installation of the GR

2.3.2.1		Wear personal protective equipment, such as: dust mask, goggles, gloves, safety shoes and ear muffs.
2.3.2.2		Operators are authorised to use the GR if they have received specific instructions on the safe use of the GR under high pressure.
2.3.2.3		CAUTION: the GR can only be mounted on core drills with a 1 1/4" W male thread, and tools with a 1 1/4" W female connection must be mounted to the GR.
2.3.2.4		Screw the GR onto the core drill spindle to the end of the stroke with the core drill machine switched off and the drilling fluid line disconnected.
2.3.2.5		Screw the diamond tool onto the male shaft of the GR.
2.3.2.6		Connect the drilling fluid line to the 1/2" Gas connection located after the safety valve.
2.3.2.7		Ensure that the throttle valve on the GR is closed, i.e. with the flaps at right angles to the fluid flow line.

2.3.2.8		Refer to tables A at the end of this paragraph and check that for the tool diameter in use and the type of feed installed, the maximum pressure that can be developed is less than the 4 bar of the safety valve fitted.
2.3.2.9		Otherwise, equip yourself with a suitable safety valve and replace the one mounted on the GR.
2.3.2.10		The GR is equipped with a 10 cm long bar that is placed in contact with the casing of the core drilling machine so that the slow inertial rotation of the GR casing does not cause the drilling fluid tube to twist around the GR.

2.3.3 GR use

2.3.3.1		Switch on the drilling fluid source and check that the pressure is below the maximum values for safe operation as shown in Table A.
2.3.3.2		Slowly open the tap on the rotary joint with the butterfly flaps parallel to the fluid flow line, making sure the handwheel is firmly in your hands.
2.3.3.3		Switch on the core drill and turn the handwheel on the core drill, bringing the tool into contact with the material to be drilled.
2.3.3.4		Caution: when working at pressures of 2 bar or more, you may experience a counter-thrust on the feed handwheel that pushes the core drill out of the hole. Adjust the flow of drilling fluid by turning the tap on the GR if the counter-thrust becomes difficult to counteract.
2.3.3.5		If it is necessary to dismantle the tool during drilling, close the drilling fluid tap and switch off the core drill.
2.3.3.6		Use a size 41 spanner and by inserting it into the spanner on the GR shaft, lock its rotation on a contrast. Use another spanner and the tool and unscrew it.
2.3.3.7		Then re-screw the tool onto the GR shaft and put the tool back into the bore.
2.3.3.8		Hold the handwheel of the core drill firmly, slowly open the drilling fluid tap and switch on the core drill.
2.3.3.9		Caution: never put your hands on the slide or place any object on it.
2.3.3.10		Caution: pay attention if one or more of the following signs occur during drilling: significant reduction in the flow rate of the drilling fluid at the inlet; drastic reduction in drilling speed; progressive increase in counter-thrust.
2.3.3.11		Should one or more of these signs occur, obstruction of the exit route of the drilling fluid may be in progress.
2.3.3.12		Immediately close the drilling fluid tap, and retract the diamond tool 10 to 20 centimetres, maintaining the rotation.
2.3.3.13		Check that the drilling fluid outlets are clear. If they are partially clogged, turn the handwheel back and forth about 20 cm repeatedly and then open the drilling fluid tap while continuing to move the tool back and forth.
2.3.3.14		Ensure that the drilling fluid outlets are clear and proceed with drilling.
2.3.3.15		If the problem persists, remove the tool and check its integrity.
2.3.3.16		CAUTION: when drilling through holes, near the end of the hole (approximately the last 5 to 10 cm) reduce the air pressure considerably, either by adjusting the pressure regulator on the MX2 or by closing the GR tap a little.
2.3.3.17		In fact, once the core is completely detached, the pressurised air could project the core out of the hole and become dangerous.

2.3.3.18

Alternatively, a wooden board can be fixed on the wall opposite the drilling wall at the exit of the hole, taking possible deviations into account.

Tables A**Manual Advancement**

Tool Diameter (mm)	Maximum Air Pressure (bar)	Thrust applied to the tool @ Maximum Pressure (Kg)
20-64	12	40-400
65-100	5-10	400
101-120	3.5-5	400
121-150	2-3.5	400
151-180	2	400-500
181-220	2	500-750
221-260	2	750-1050
261-300	2	1050-1400
301-400	2	1400-2500

Automatic Advancement

Tool Diameter (mm)	Maximum Air Pressure (bar)	Thrust applied to the tool @ Maximum Pressure (Kg)
20-64	12	40-600
65-100	7-10	600
101-120	5.5-7	600
121-150	4-5.5	600
151-180	2	600
181-220	2	760
221-260	2	760-1060
261-300	2	1000-1400
301-400	2	1400-2500

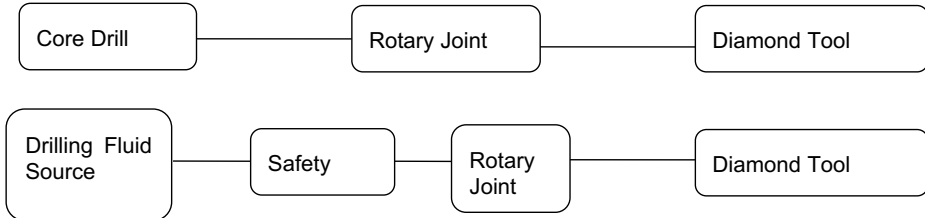
The boxes in red are those tool diameters for which the counter-pressure force, if any, is greater than the safety limit with the minimum applied pressure value

2.3.4 Conditions for storage and handling of the GR

2.3.4.1	When you have finished using the GR, disassemble the tool, remove the drilling fluid line from the GR, and remove the GR from the core drill.
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2.3.4.2	Transport the GR in a box to prevent it from rolling during transport.
2.3.4.3	If the GR is not to be used for a long time, spread a film of oil on the M and F 1 ¼" W threads with a brush and store the GR wrapped in plastic foil

2.3.5 Mechanical and Hydraulic functional diagram:



2.3.6 Safety Regulations



Only personnel with personal safety equipment, such as safety shoes, goggles, earphones, gloves and a dust mask are permitted to use the GR;



Assembly and disassembly of the GR and drilling fluid pipe must be carried out with the drill machine switched off and the drilling fluid source switched off or disconnected.



Assembly and disassembly of the diamond tool must be carried out with the drill machine switched off and the drilling fluid tap on the GR closed.



In the case of automatic feed, never leave the drilling system running unattended. The presence of the operator is always required to supervise drilling activities.



When the core drill is switched on, the GR shaft starts rotating. In addition to the safety instructions in this document, please **refer to the safety instructions in the Operation and Maintenance Manual for the core drilling machine.**



When the GR tap is opened, drilling fluid enters the GR and the drilling system. The drilling system consisting of the GR, the diamond tool and the core drilling machine is therefore subject to fluid pressure. The use of the GR at pressures above 1 bar exposes operators and third parties in the work area to residual hazards and risks.

Provide specific training for personnel on the safety precautions to be taken listed in this operating and maintenance manual.



Check that the device bears the original CE marking and that this document is contained in the packaging.



The use of GR at high pressures can produce a counter-thrust on the core drill which the operator will experience as a force pushing the machine backwards.



In the case of manual advancement, this force may cause the feed wheel to involuntarily rotate and the core drill to move backwards on the slide.



Always open the tap on the GR slowly and only with your hands firmly on the steering wheel.

 Do not place your hands on the core drill slide, danger of crushing due to unintentional movement of the core drill.

 Do not place objects on the core drill slide.

 In the event of any suspension of drilling, stop the core drill, close the drilling fluid tap and, if necessary, with the machine switched off.

 Grease the GR every 4-6 working hours using the two grease pumps. Without effective lubrication, seizure of the shaft may occur, resulting in fusion or damage to the bearing. This could lead to rotation of the GR housing, which is accessible to the operator.

 In the case of through-hole drilling, the pressurised drilling fluid may push the core out of the hole, once the core detaches from the wall at the end of drilling. Therefore, reduce the pressure of the drilling fluid a few centimetres from the end of the drilling (5 - 10 cm) by partially closing the GR tap, or fix a wooden board at the exit point of the drilling, on the wall opposite the drilling wall.

The diamond tool or drilling system used is generally a single or compound body, virtually sealed. Therefore, in the event of an obstruction in the passage of the drilling fluid outside the tool, pressure is created inside the tool. Excessive pressure in the tool could produce a thrust outwards from the hole, becoming very dangerous for the operator.

To avoid this, the GR is equipped with a safety valve which is calibrated to intervene at pressures above 4 bar.

 4 bar is only an indicative pressure and represents the operating pressure for most applications.

 The maximum permissible pressure for safe working must be commensurate with the diameter of the tool used, which gives the surface area over which the pressure inside the tool is applied.

To evaluate the value of the safety valve to be used instead of the one supplied with the GR, according to the application conditions, refer to tables A at the end of the paragraph "Use of the GR" of this manual.

 Obstruction of the drilling fluid outlets is always preceded by one or more of the following signs: 1) pressure drop of the drilling fluid exiting the hole; 2) increase in the counter-pressure inside the tool; 3) drastic reduction in the advancement rate;

 If one or more of these signals is present, immediately close the drilling fluid tap and retract the tool a few centimetres, and check that the drilling fluid outlet is clear.

Although obstruction of the drilling fluid outlets is an extremely unlikely event, the following additional safety precautions are recommended:

 the use of tools with slots or holes in the holder;

 the use of remotely controlled automatic advancement devices so that the operator does not have to stand on the machine but can operate at a distance of 2-3 m from the machine.

The GR assembled with core drill and drilling system can be operated by only one drilling operator. Sometimes the drilling operator is accompanied by a support operator for the assembly and disassembly of the drill rods.

 For both operators, the danger zones are: behind the core drilling machine, at the slide of the core drilling machine, in the area next to the hand wheel of the core drilling machine, and in the case of through drilling, on the axis of rotation of the diamond tool, beyond the wall opposite the drilling wall.

 It is forbidden to stand behind the core drilling machine along the rotation axis of the diamond tool, near the advancement handwheel, near the slide and on the rotation axis of the diamond tool, beyond the wall opposite the drilling wall.

 Take care not to trip over the air or water supply hose that reaches the GR.

 The use of the GR in a well-lit environment should be foreseen.

 Do not use GR on core drilling machines with an installed power of more than 40 KW;

 Do not use GR on core drilling machines with a thread other than 1 ¼" W. In the case of machines with a different thread, do not use GR in the absence of nipples supplied by Maxima S.p.A.;

 Do not use drilling fluids other than water air and water vapour aerosols.

 Do not apply pressures exceeding 12 bar to the GR.

 do not use the GR without a suitable safety valve of certified value equal to or less than the pressure value for safe operation indicated in the tables above.

 do not use the GR at speeds above 1500 rpm.

 do not use the GR in environments with temperatures close to 0°C, nor should drilling fluids be used at temperatures close to 0°C.

 do not use the GR in applications with eccentric rotations greater than 1 mm;

 do not use the GR in applications involving the application of cantilever weights exceeding 5000 kg to the GR;

3 MARKINGS AND DECLARATION OF CONFORMITY

(Ref: Directive 2006/42/EC: Annex VII, Part A, par. 1(a), 8th, 9th and 10th indents).

An original copy of the declaration of conformity of the GR machine is shown in Annex 11.

An original copy of the safety valve certification is attached.

4. Machine-related training

4.1 TRAINING AND INFORMATION

4.1.1 Information to operators and department personnel:

Operators must be provided with information on:

- Residual risks present when using the GR machine under normal operating conditions;
- Residual risks present in machine failure conditions GR

Reported in this manual.

4.1.2 Information and training:

The GR machine may only be operated by personnel who have been specifically trained on the safety aspects of this manual and the operating and maintenance manual for the core drill.

The training of operators should include:

- Provision of user and maintenance manuals for the GR machine;
- Training courses on risk conditions when using GR machines;
- Training courses related to the mechanical maintenance of the GR machine;

Machine operators must be trained on:

- Risks associated with the use of GR with pressurised drilling fluids
- routine maintenance operations
- the correct use of PPE
- the management of hazardous situations related to residual risks.

4.2 PERSONAL PROTECTIVE EQUIPMENT

The PPE that operators must have available and wear, when necessary, for the operation and maintenance of the GR machine is set out here in tabular form.

Machine device	Operation	Danger	PPE
GR machine	Assembly and Disassembly	Falling and crushing	Gloves safety shoes
GR machine	Perforation	Dust and pressurised air	Goggles and mask.

The personal protective equipment used must comply with current legislation and applicable standards.

4.3 ROUTINE AND EXTRAORDINARY MAINTENANCE

4.3.1		All extraordinary maintenance activities must be carried out by specialised personnel of Maxima S.p.A.
4.3.2		Particularly if the operator notes that it is no longer possible to turn the shaft by hand while holding the outer casing fixed, grease the GR with a grease pump. If the defect persists, send the GR to Maxima S.p.A to check the condition of the bearings and the shaft.
4.3.3		Particularly in the case of between drilling fluid filaments, send the GR to Maxima S.p.A to check the condition of the seals.
4.3.4		It is forbidden to open the GR for any reason.
4.3.5		The only routine maintenance activity for the GR is greasing with a grease pump through the two nozzles mounted on the GR housing, every 4-6 working hours.
4.3.6		CAUTION: failure to grease could lead to seizure of the outer sleeves with the shaft, causing the sleeves to rotate. This could represent a possible danger to the operator.

GR Machine: Maintenance table

Machine	Operation	Frequency (weeks)	Hazards	Measures to be taken	Notes
GR	Grease GR through the grease nozzles with a grease pump	1 time per 4-6 working hours	Shaft seizure with external protective sleeves	Intervention during the GR stop	

4.4 INFORMATION TO CARRY OUT MAINTENANCE IN A RATIONAL WAY

Routine maintenance consists exclusively of greasing the GR with a grease pump through the two grease nozzles shown in the photo:

**5. Decommissioning, Dismantling and Disposal**

The GR's component parts are almost entirely made of steel.

Therefore, the disposal of the GR must involve: disassembling the shaft from the outer sleeves, removing the Seeger spring at the top.

The shaft must be cast with steel.

The sleeves should be discarded with aluminium, after removing the bearing, which should be discarded with steel.



DICHIARAZIONE DI CONFORMITA'

(ex All. II, punto A della direttiva europea 2006/42/CE)

Il fabbricante

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Dichiara che la macchina

Giunto Rotante Aria/Acqua

Denominazione commerciale

Giunto MAX per carotaggio continuo

Denominazione generica

Adduttore di fluido di perforazione per motoriduttori

Funzione

GR1 - L0721

GR1

Modello

Tipo

Numero di serie

è conforme a

tutte le disposizioni pertinenti della direttiva 2006/42/CE, e in particolare alle norme:

UNI EN ISO 12100-1:2009 Sicurezza del macchinario - Concetti fondamentali, principi generali di progettazione - Parte 1: Terminologia di base, metodologia

UNI EN ISO 12100-2:2009 Sicurezza del macchinario - Concetti fondamentali, principi generali di progettazione - Parte 2: Principi tecnici

UNI EN ISO 14121:2007 Sicurezza del macchinario - Valutazione del rischio - Parte 1: Principi

Poviglio (RE)

08/03/2022

Luogo

Data

per Maxima S.p.A.
il Presidente

Dichiarazione di Conformità

