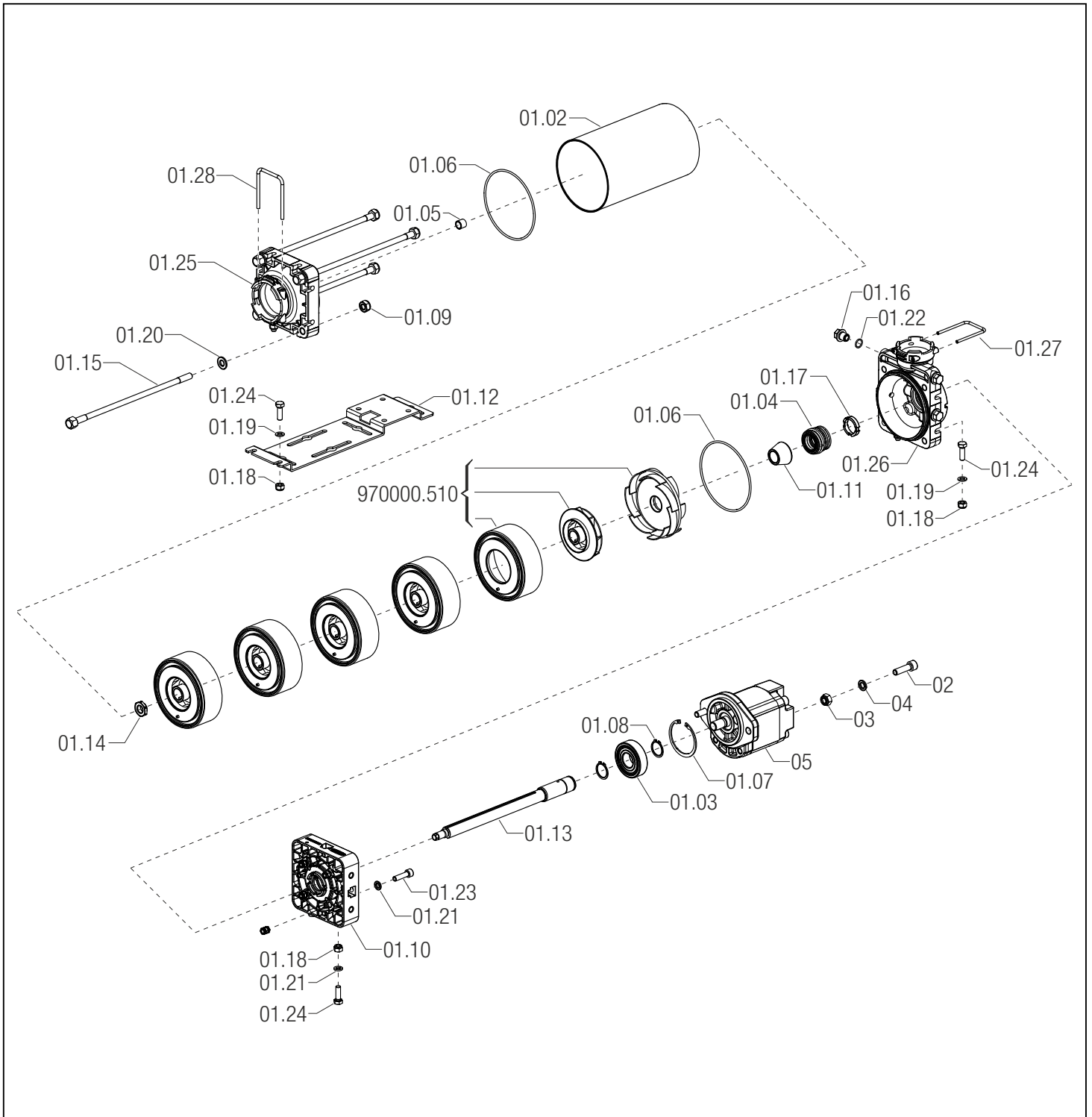


97005001

MSP MULTISTAGE CENTRIFUGAL PUMP MSP400  
With hydraulic motor

REFERENCE	CODE	DESCRIPTION
01.02	970050.040	TUBO ESTERNO POMPA MSP400 5S
01.03	970000.061	RADIAL BALL BEARING 6305-2RS
01.04	970000.070	MECHANICAL SEAL
01.05	970000.081	BOCCOLA IGUS XSM-1214-12
01.06	G11093V	OR 3,00X114,50 ORM1145-30 VITON
01.07	B33222	SEEGER INTERNO D.62 INOX UNI7437
01.08	B322X1	SEEGER ESTERNO D.25 INOX UNI7435
01.09	B12261	DADO AUTOBLOCC. M10 INOX UNI7474
01.10	970000.060	BEARING SUPPORT PUMP MP400
01.11	970000.080	DISTANZIALE INTERNO POMPA MSP400
01.12	970050.090	STAFFA FISSAGGIO POMPA MSP400 5S
01.13	970050.050	ALBERO POMPA MSP400 5S COMPLETO
01.14	970000.082	DADO SERRAGGIO GIRANTI POMPA MSP400
01.15	970050.091	TIRANTE 10X268 INOX
01.16	970000.084	TAPPO 1/4" M
01.17	970000.083	ESTRATTORE ANELLO TENUTA MECCANICA

REFERENCE	CODE	DESCRIPTION
01.18	B12251	SELF-LOCKING NUT M8 INOX UNI7474
01.19	B202H0	FLAT WASHER 8,4X15X1,5 INOX
01.20	B202J0	FLAT WASHER D.10,5X21X2 * INOX
01.21	B222H0	WASHER GROVER D 8,2 INOX UNI1751
01.22	G11015V	OR 1,78X12,42 VITON
01.23	V1C25L	VITE TCEI 8X 30 INOX UNI5931
01.24	V1M25K	SCREW TE 8X25 INOX
01.25	970000.115	FLANGIA ASP. T7F POMPA MSP400
01.26	970000.110	FLANGIA MAND. T6F POMPA MSP400
01.27	010006	FORK D.4 DIST.47
01.28	010007	FORK D.5 DIST.59
02	V1C26M	VITE TCEI 10X 35 INOX UNI5931
03	B12261	DADO AUTOBLOCC. M10 INOX UNI7474
04	B222J0	WASHER GROVER 10,5X17,5X2,2 * INOX
05	9700000.100	MOTOR 11.2 CC



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***CENTRIFUGAL PUMP SERIES MP***

**MP400**


**970050XX**

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**INSTALLATION AND MAINTENANCE**

## LEGEND OF SYMBOLS

 = Generic danger

 = Warning

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*This manual is an integral part of the equipment to which it refers and must accompany the equipment in case of sale or change of ownership. Keep it for any future reference; ARAG reserves the right to modify product specifications and instructions at any moment and without notice.*

## 1 PRODUCT DESCRIPTION

The series MP400 ARAG pumps are multistage centrifugal pumps designed to work on agricultural machinery for spraying and crop spraying. Thanks to their flexibility they can be positioned on different points of the agricultural machinery and can be used on many different systems.

## 2 INTENDED USE

**CAUTION!**  
This device is designed to be used **ONLY ON AGRICULTURAL MACHINERY FOR SPRAYING AND CROP SPRAYING**. It is **FORBIDDEN** to use the device for other purposes as this may cause serious accidents.

ARAG can not be held responsible for damages to the equipment, persons, animals or properties caused by the non-observance of these rules.

**CAUTION:**  
**THOROUGHLY FOLLOW ALL SAFETY GUIDELINES DESCRIBED IN THE FOLLOWING CHAPTERS.**  
**DO NOT START THE PUMP BEFORE READING CHAPTER 7 'STARTING THE PUMP'.**

## 3 PACKAGE CONTENT

The table below indicates the components that you will find in the MP400 PUMP package:

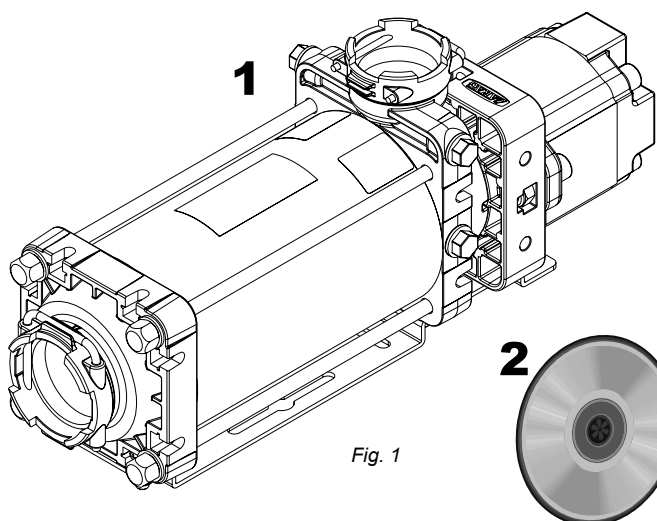


Fig. 1

Legend:

- 1 MP400 Pump
- 2 Instruction manual (CD-ROM)

## 4 VERSIONS, CODES AND OPERATING CURVES

### 4.1 Versions and codes

Coupling				Max. water flowrate		Max. water pressure		Max. oil flowrate		Max. oil pressure		Motor <i>cm<sup>3</sup>/rev.</i>
Fork	Thread (BSP)	Thread (NPT)	Clamp	<i>l/min</i>	<i>GPM</i>	<i>bar</i>	<i>PSI</i>	<i>l/min</i>	<i>GPM</i>	<i>bar</i>	<i>PSI</i>	
CODE	CODE	CODE	CODE									
970 05021	970 05022	970 05023	970 05024	517	137	7.5	109	26.5	7	135	1955	7.2
970 05001	970 05002	970 05003	970 05004	560	148	10.6	154	49.2	13	120	1735	11.2
970 05031	970 05032	970 05033	970 05034	567	150	11.0	160	64.3	17	106	1537	14.5



Features of the couplings and pipelines to use: Tab. 5 + 6

Tab. 1

CONTINUES

## 4.2 Operating curves

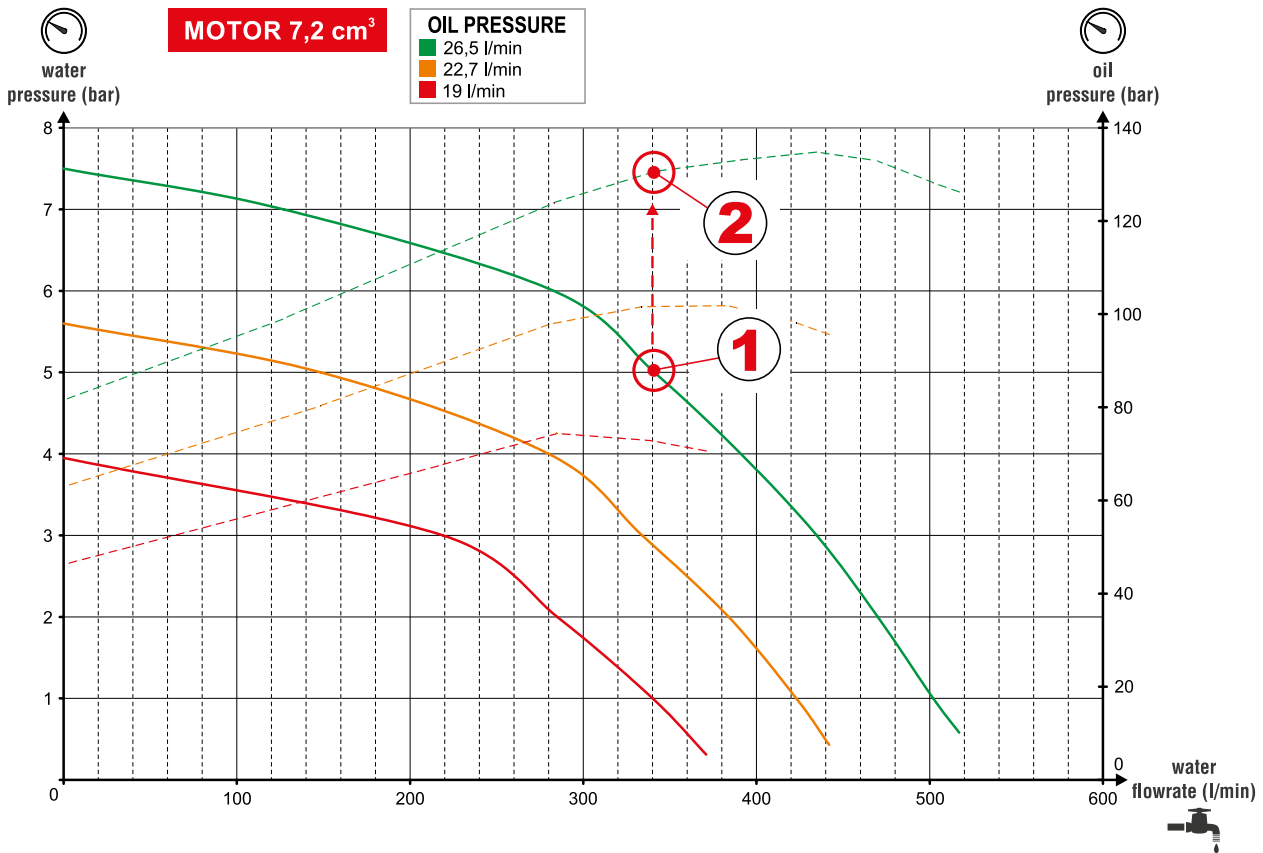
### 4.2.1 How to read the diagrams:

The following diagrams show 2 curves, one continuous and one with a dotted line.

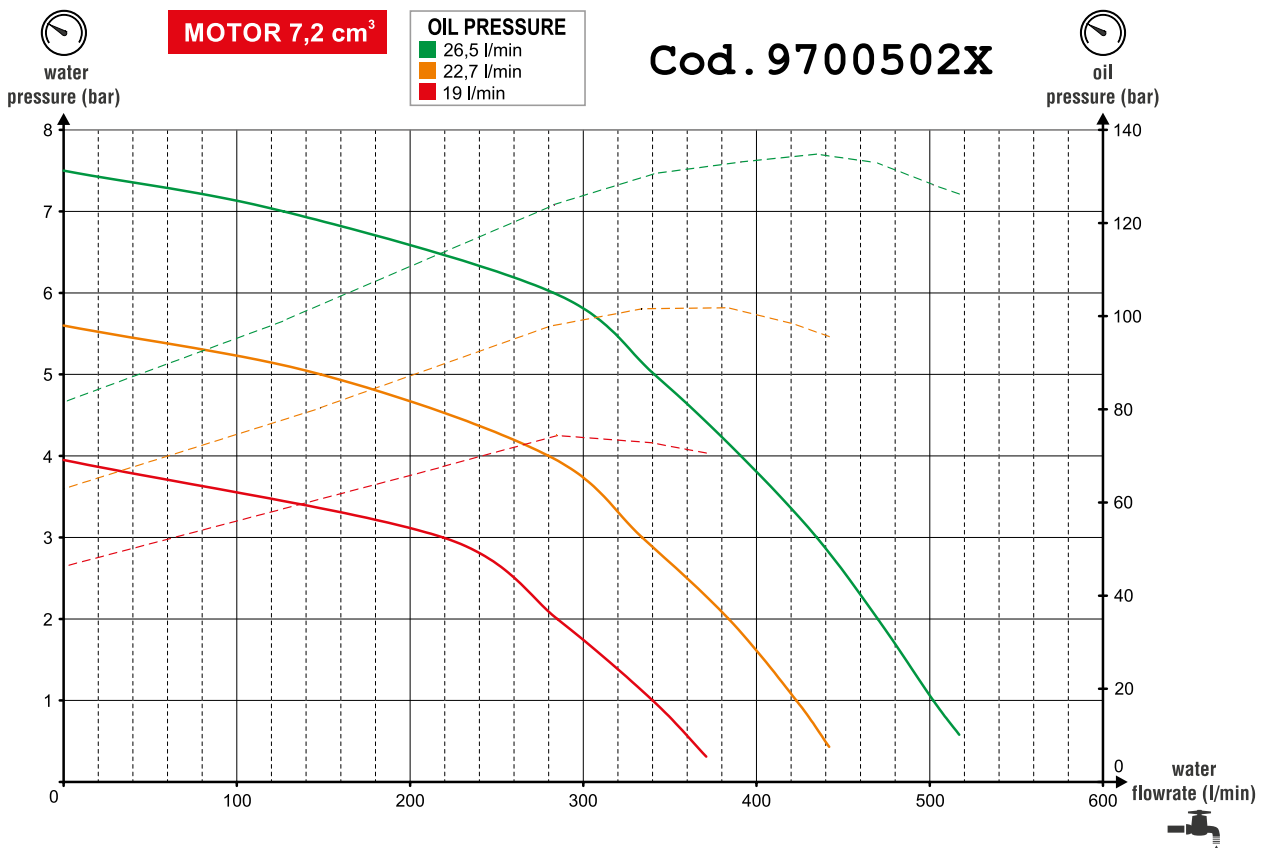
The continuous line shows the water flowrate at a specific operating pressure. The dotted line shows the motor oil pressure.

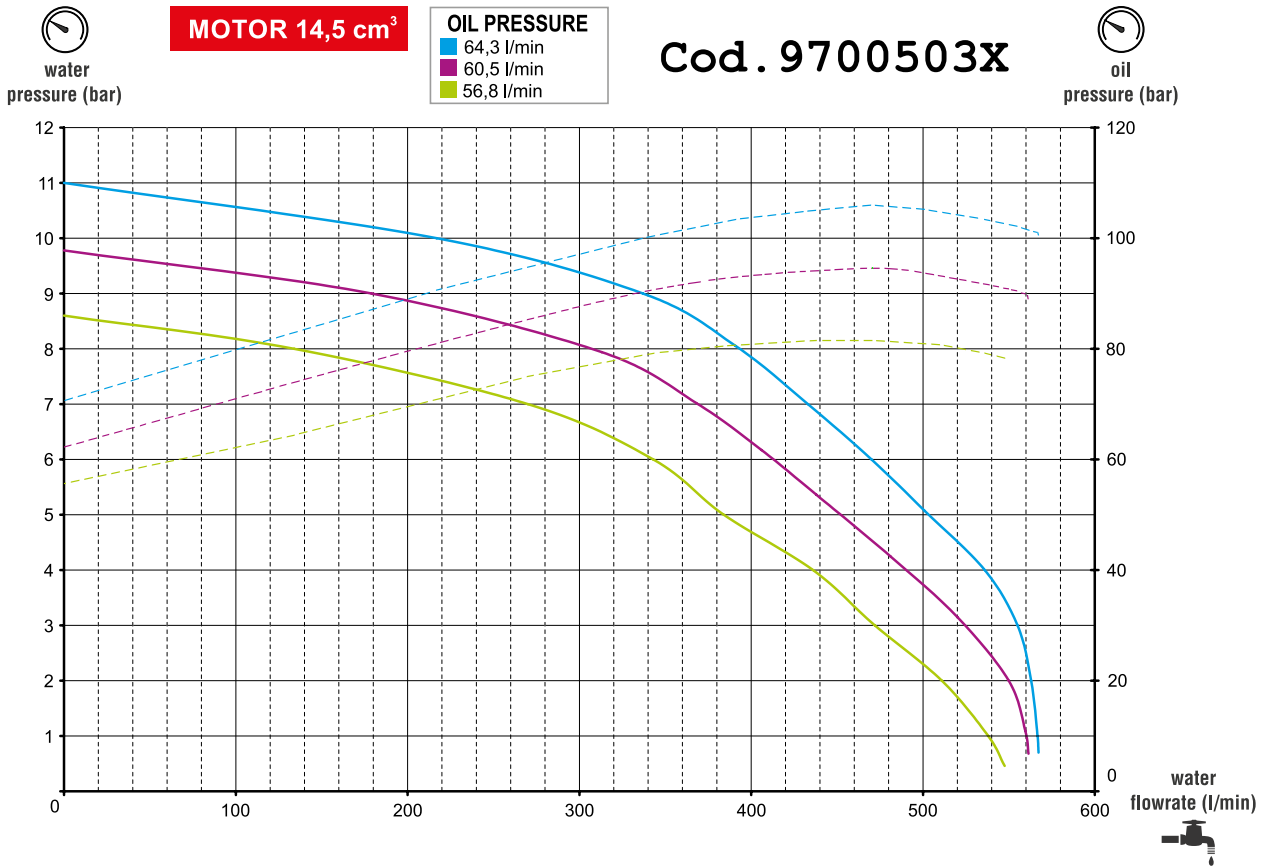
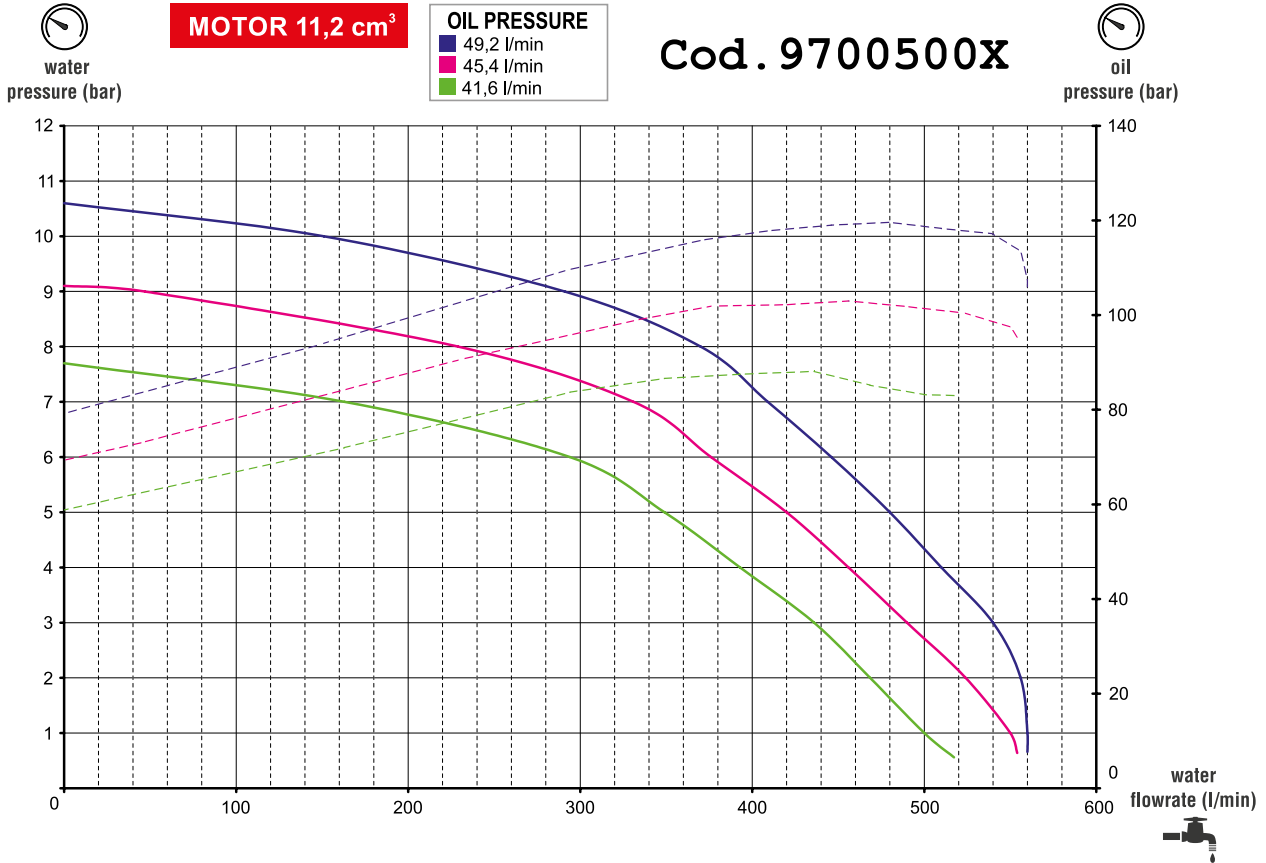
**Example:** Diagram of a pump (Code 9700502x) with a motor of 7,2 cm<sup>3</sup>:

To obtain a water flowrate equal to 340 l/min with a pressure of 5 bar (1), the pump will have to be powered by an oil circuit that can guarantee a flowrate of 26,5 l/min with a pressure of about 128 bar (2).



### 4.2.2 Curves





## 5 INSTALLATION

### 5.1 Example of a typical system composition

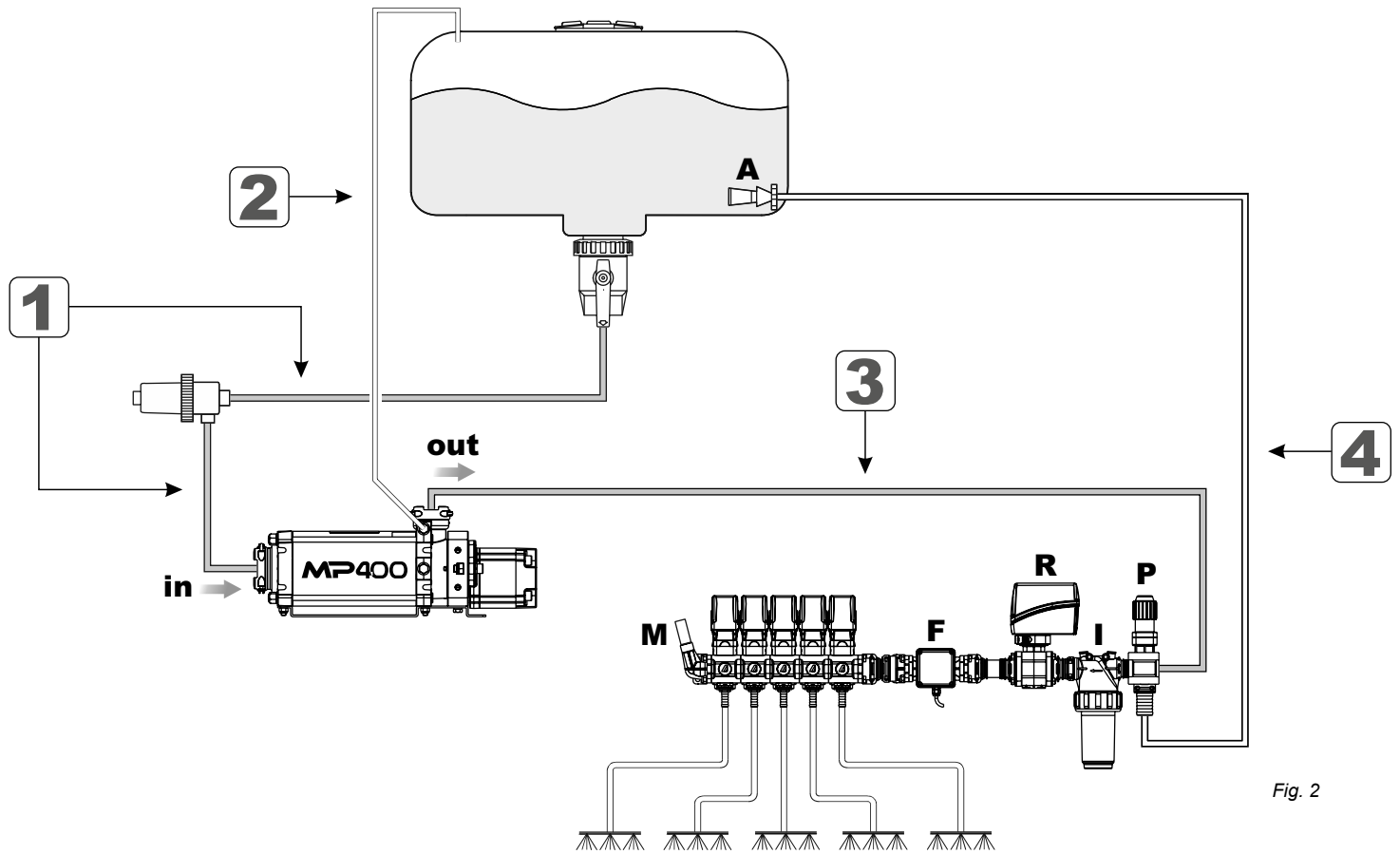


Fig. 2

Legend:			
<b>A</b>	Agitator	<b>M</b>	Pressure gauge
<b>F</b>	Flowmeter	<b>P</b>	Proportional valve
<b>I</b>	Filter	<b>R</b>	Control valve
<b>1</b>	suction	<b>2</b>	bleed line
<b>3</b>	main delivery	<b>4</b>	agitation delivery

Tab. 2

 **CAUTION:** The pump must always be fitted under the liquid level, with a suction line as short and direct as possible and with a size of AT LEAST the nominal diameter of the inlet.

### 5.2 Dimensions (mm)

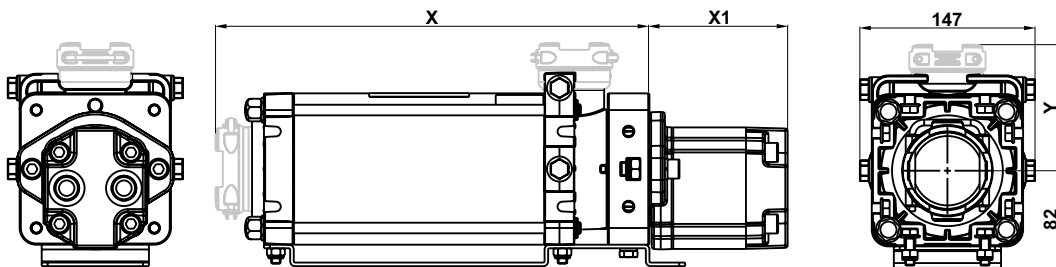






Fig. 3

	Coupling			
	 Fork	 Thread (BSP)	 Thread (NPT)	 Clamp
<b>X (mm)</b>	364	358	358	352
<b>Y (mm)</b>	106	98	98	98
<b>W (mm)</b>	444	438	438	432

Tab. 3a

<b>X1 (mm)</b>	Motor		
	7,2 cm <sup>3</sup> /rev.	11,2 cm <sup>3</sup> /rev.	14,5 cm <sup>3</sup> /rev.
	111	116	121

Tab. 3b

### 5.3 Attachment

The MP400 series pumps are equipped with an attachment with a drilled plate that allows the positioning also in very narrow areas or where there is just the space for the pump. **Use M8 screws and bolts for the fixing.**



**IMPORTANT:**

**IN ORDER TO INSTALL THE PUMP CORRECTLY, OBSERVE THE FOLLOWING PRECAUTIONS:**

- 1) The inlets/outlets must be placed in fixed positions.
- 2) Before drilling and fixing the plate, check the actual space according to the different types of motors or pulleys.
- 3) Take into account the spaces needed for the correct positioning of the hydraulic pipes, where provided, or the power cables.
- 4) Choose a well ventilated point for the positioning, as the pump will become hot while in operation.

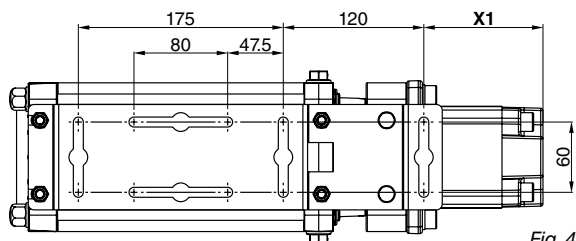


Fig. 4

X1 (mm)	Motor		
	7,2 cm <sup>3</sup> /rev.	11,2 cm <sup>3</sup> /rev.	14,5 cm <sup>3</sup> /rev.
	111	116	121

Tab. 4

### 5.4 Pump assembly direction

The MP400 pump can be fitted in different positions, **but the outlet must never be pointed downwards (Fig. 5).**

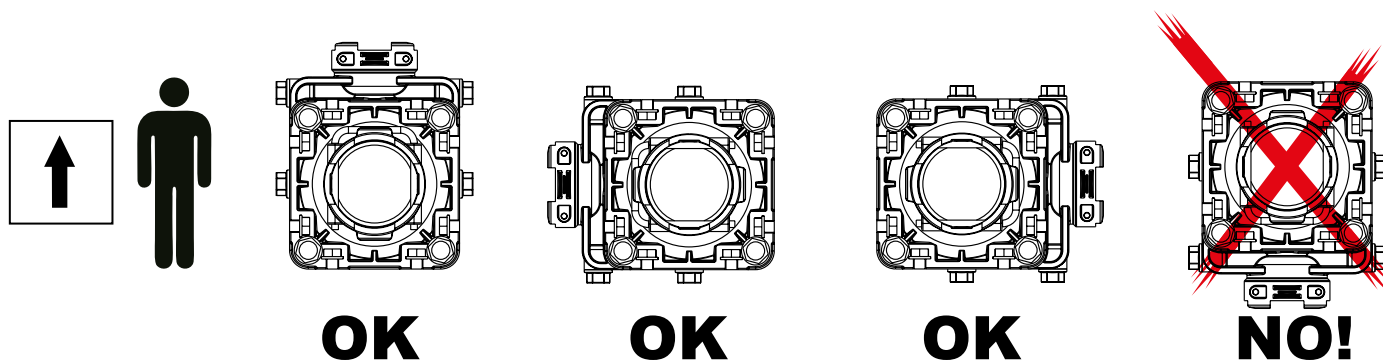


Fig. 5



## 6 CONNECTIONS

### 6.1 Hydraulic motor (OIL) connections

#### 6.1.1 Safety guidelines

- Use tubes that are suitable to the motor flowrate and pressure (ref. Tab. 1).
- Fix the hydraulic tubes checking that after their use under pressure there are no blow-by or oil leakages from the circuit.
- Do not install the pump where it can be subject to severe impacts, or where there is too much heat or in any other point that can cause the machine to malfunction.
- During the insertion in an existing system, follow all the safety guidelines indicated by the system manufacturer.
- Qualified staff must carry out any type of intervention that requires the modification of the original hydraulic connection configuration.

ARAG is not liable for damages to equipment, persons, animals or property caused by wrong or unsuitable pump connections. Furthermore, ARAG can not be held responsible for direct or indirect damages to equipment, machinery, persons or animals caused by the use of pipes, cable clamps, ties, or any other connection or by the use of unsuitable and improper accessories. Damages to the pump or to the circuits/objects connected to it, due to the above-mentioned causes, automatically voids the warranty.

#### 6.1.2 Hydraulic motor oil line connection

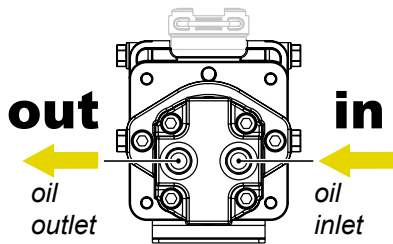


Fig. 6

Oil tubes diameter	
in	1/2"
out	1/2" - max length 10 m or 3/4" - no length limit

Tab. 5



#### IMPORTANT:

**TO AVOID THE BREAKAGE OF THE MOTOR, PAY ATTENTION NOT TO INVERT THE OIL TUBES CONNECTION.** For this purpose, it is recommended to install a check valve.

ARAG check valve (Code 970001 - Ref. ARAG Catalog), to be purchased separately, must be installed in the oil output branch (out) **PAYING ATTENTION TO THE REFERENCE OF THE FLOW DIRECTION**, as indicated on the valve body (Fig. 7).

Use the gaskets provided and a tightening torque of 20 Nm.



ARAG is not liable for damages to the system, persons, animals or property caused by the use of a check valve different from the one indicated. The warranty is to be considered automatically void in case of damages to the pump caused by failure to observe the above-mentioned instructions.

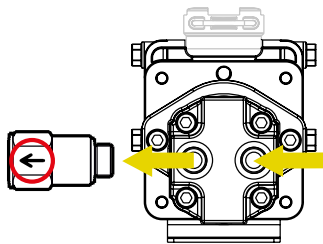


Fig. 7

- The maximum value of the back pressure on the outlet is 3 bar.
- The oil outlet line (drain) should be directed into the oil tank.
- The pipelines must have a nominal diameter not lower than the diameter of the fittings on the motor and they must be perfectly sealed.
- To avoid loss of pressure, the pipelines should be as short as possible reducing to a minimum the number of hydraulic resistances (elbows, bottle necks, quick-couplings).
- It is advisable to place a section of flexible tube in between the pipelines, this is to reduce the transmission of vibrations.
- All the return pipelines must end below the minimum oil level, this is to avoid the formation of foam.
- Before connecting the pipelines, remove all closing plugs, if any, and make sure they are perfectly clean.

- The pump must always be installed below the liquid level.
- The suction line must be as short and direct as possible.
- Avoid elbows and the enlargement of the diameter in the pipeline to avoid air stagnation.
- The size of the suction and delivery lines must be AT LEAST equal to the nominal diameter of the size of the relevant opening.
- The suction line must be free from air leaks.
- Avoid, if possible, elbows and narrowing in the pipeline on the delivery line, this is to limit possible loss of pressure.

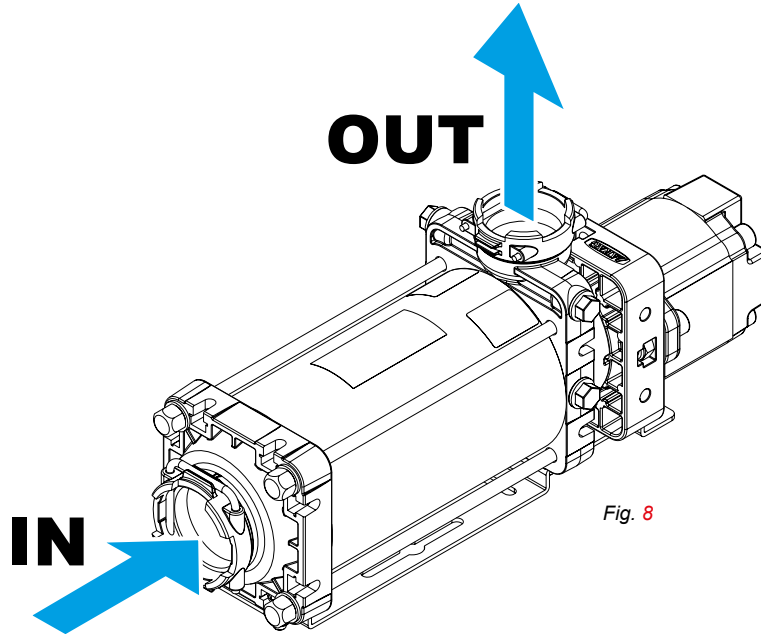





Fig. 8

Couplings diameter and recommended pipelines

		Inlet/outlet coupling				Pipelines minimum diameter	
suction (IN)		T7F		2"		2" Full Port	50 mm / 2"
delivery (OUT)		T6F		1 1/2"		2" Std. Port	38 mm / 1 1/2"

Tab. 6

- Install a breather pipe (Item 2 Fig. 2) in one of the delivery retaining plugs placed on the pump. The tube diameter must be 6 mm or 1/4".
- Choose the plug located in the highest point according to the installation position of the pump (Fig. 9) in order to eliminate any air trapped in the pump and to allow a minimum motion of the liquid also when the control unit connected to the pump is not spraying.

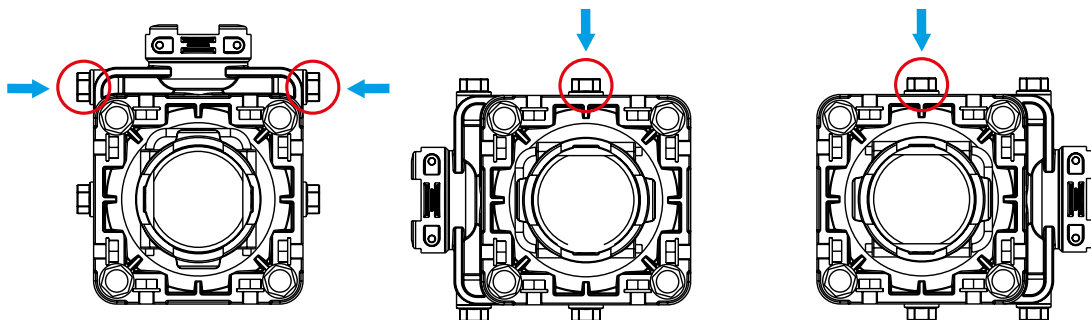


Fig. 9

## 7 STARTING THE PUMP

### **IMPORTANT: DO NOT RUN DRY THE PUMP (WITHOUT LIQUID).**

- Do not use the pump with pressure values above those indicated in the technical specifications.
- Do not pump explosive or inflammable liquids such as gasoline, kerosene, fuel oil etc. Do not use in explosive atmospheres.
- The pump must be used only with liquids compatible with the materials of its components.
- Do not aim water jets at the equipment.
- Do not use solvents or fuel to clean the case outer surface.
- Only use ARAG genuine spare parts and accessories.

ARAG is not liable for serious personal injuries, damages to the system, to persons, animals or property caused by the non-observance of the above-mentioned rules, that will automatically void the warranty.

## 8 MAINTENANCE / DIAGNOSTICS / REPAIRS

### 8.1 Troubleshooting

CAUSE	MALFUNCTION	REMEDY
Insufficient flowrate (H2O)	Hydraulic motor not suitable for the system	• Refer to the data/diagrams table.
	Loss of air in the suction line	• Check and seal tubes and fittings.
	Suction line below standard size or collapsed tube	• Replace tube (ref. 'connection' section).
	Clogged filters	• Carry out an adequate maintenance (filter cartridge cleaning).
	Rotors clogged	• Contact a Service Center to have the rotors checked and cleaned.
	Rotor seizure (dry running)	• Contact a Service Center to have the rotors replaced.
Hydraulic system (OIL) overheating	Hydraulic motor not suitable for the system	• Refer to the data/diagrams table.
	Motor hydraulic tube insufficient size	• Check the size of the tubes (Table 4).

Tab. 7

### 8.2 Technical data

Description	MP400 Pump
Operating temperature	0 °C ÷ 60 °C 32 °F ÷ 140 °F
Storage temperature	-30 °C ÷ 80 °C -22 °F ÷ 176 °F
Size	ref. Par. 5.2
Weight	9,8 kg

## 9 END-OF-LIFE DISPOSAL

Dispose of the system in compliance with the established legislation in the country of use.

1. ARAG s.r.l. guarantees this apparatus for a period of 360 days (1 year) from the date of sale to the client user (date of the goods delivery note). The components of the apparatus, that in the unappealable opinion of ARAG are faulty due to an original defect in the material or production process, will be repaired or replaced free of charge at the nearest Assistance Center operating at the moment the request for intervention is made. The following costs are excluded:
  - disassembly and reassembly of the apparatus from the original system;
  - transport of the apparatus to the Assistance Center.
2. The following are not covered by the guarantee:
  - damage caused by transport (scratches, dents and similar);
  - damage due to incorrect installation or to faults originating from insufficient or inadequate characteristics of the electrical system, or to alterations resulting from environmental, climatic or other conditions;
  - damage due to the use of unsuitable chemical products, for spraying, watering, weedkilling or any other crop treatment, that may damage the apparatus;
  - malfunctioning caused by negligence, mishandling, lack of know how, repairs or modifications carried out by unauthorized personnel;
  - incorrect installation and regulation;
  - damage or malfunction caused by the lack of ordinary maintenance, such as cleaning of filters, nozzles, etc.;
  - anything that can be considered to be normal wear and tear.
3. Repairing the apparatus will be carried out within time limits compatible with the organizational needs of the Assistance Center. No guarantee conditions will be recognized for those units or components that have not been previously washed and cleaned to remove residue of the products used;
4. Repairs carried out under guarantee are guaranteed for one year (360 days) from the replacement or repair date.
5. ARAG will not recognize any further expressed or intended guarantees, apart from those listed here. No representative or retailer is authorized to take on any other responsibility relative to ARAG products. The period of the guarantees recognized by law, including the commercial guarantees and allowances for special purposes are limited, in length of time, to the validities given here. In no case will ARAG recognize loss of profits, either direct, indirect, special or subsequent to any damage.
6. The parts replaced under guarantee remain the property of ARAG.
7. All safety information present in the sales documents regarding limits in use, performance and product characteristics must be transferred to the end user as a responsibility of the purchaser.
8. Any controversy must be presented to the Reggio Emilia Law Court.

# Conformity Declaration **CE**



ARAG s.r.l.  
Via Palladio, 5/A  
42048 Rubiera (RE) - Italy  
P.IVA 01801480359

Dichiara

che il prodotto

descrizione: **Pompa centrifuga**

modello: **MP400**

serie: **97005xxx**

risponde ai requisiti di conformità contemplati nella seguente Direttiva Europea:

**2006/42/CE** e successive modificazioni

Applicata nei seguenti requisiti essenziali:

**1.1.1, 1.1.2, 1.1.3, 1.3.1, 1.3.4, 1.5.5, 1.6.5, 1.7.4, 1.7.4.1, 1.7.4.2.;**

e che la documentazione tecnica pertinente è stata compilata in conformità dell'allegato VII B di tale direttiva e alle disposizioni nazionali di attuazione della Direttiva Macchine.

Si precisa inoltre che:

- la documentazione tecnica pertinente è custodita da ARAG, nella persona del suo legale rappresentante, sig. Giovanni Montorsi;
- ci si impegna a trasmettere, in risposta ad una richiesta adeguatamente motivata delle Autorità Nazionali, informazioni pertinenti sulle quasi-macchine. Tale impegno comprende le modalità di trasmissione e lascia impregiudicati i diritti di proprietà intellettuale del fabbricante della quasi-macchina;
- la presente quasi-macchina non deve essere messa in servizio finché la macchina finale in cui deve essere incorporata non sia stata dichiarata conforme alle prescrizioni di cui alla Direttiva Macchine 2006/42/CE.

Rubiera, 16 Marzo 2015

*Giovanni Montorsi*

A handwritten signature in black ink, appearing to read "G. Montorsi", written over a horizontal line.

(Presidente)

---

*Only use genuine ARAG accessories or spare parts to make sure manufacturer guaranteed safety conditions are maintained in time. Always refer to ARAG spare parts catalog.*

02/2016

D20333\_GB-m02



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