

Manuale d'uso e manutenzione

Instructions for use and maintenance

Manuel d'utilisation et d'entretien

Betriebs-und Wartungsanleitung

Manual de uso y mantenimiento

Pompe con moltiplicatore

Pumps with overgear

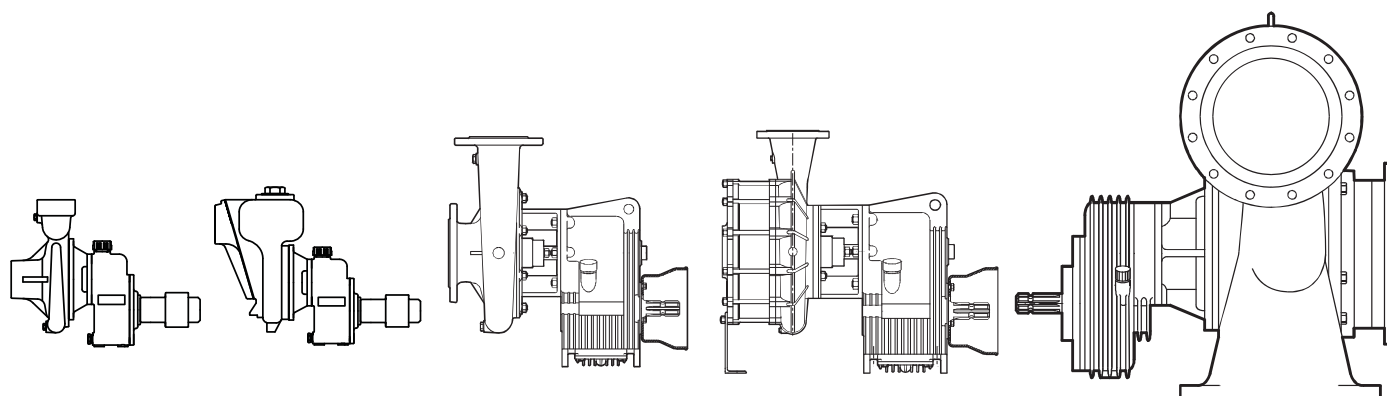
Pompes avec multiplicateur

Pumpen mit Multiplikator

Bombas con multiplicador

Serie - Series - Série - Baureihe - Serie

T - TK - MB - T0 - T0A



TRADUZIONE DELLE ISTRUZIONI ORIGINALI

ORIGINAL INSTRUCTIONS

TRADUCTION DES INSTRUCTIONS ORIGINALES

ÜBERSETZUNG DER ORIGINALANLEITUNG

TRADUCCIÓN DE LAS INSTRUCCIONES ORIGINALES



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1. Machine identification

1.1 Manufacturer's identification

Manufacturer	Rovatti A. & Figli Pompe S.p.a.
Address	42042 Fabbrico (Reggio Emilia) - Italy Tel. +39 0522 66 50 00 Fax + 39 0522 66 50 20 mail info@rovatti.it www.rovatti.it

1.2 Identification

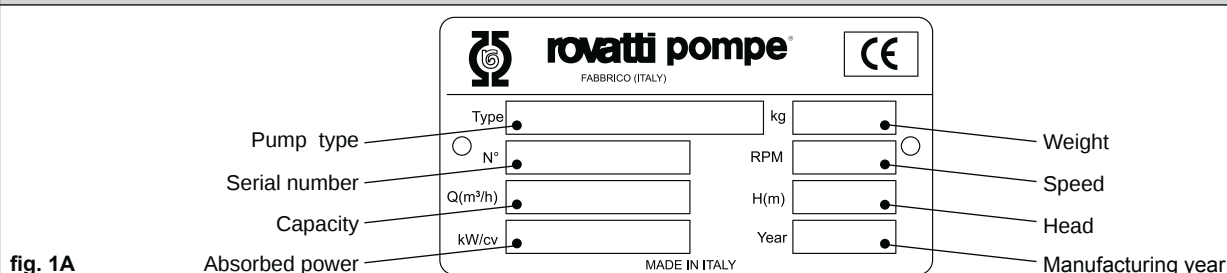
This manual describes the operating instructions relative to:

- Horizontal single-stage pumps with overgear **T** series;
- Horizontal multistage pumps with overgear **TK** series;
- Horizontal single-stage pumps with overgear **MB** series;
- Horizontal single-stage pumps with overgear **T0** series;
- Horizontal self-priming pumps with overgear **T0A** series.

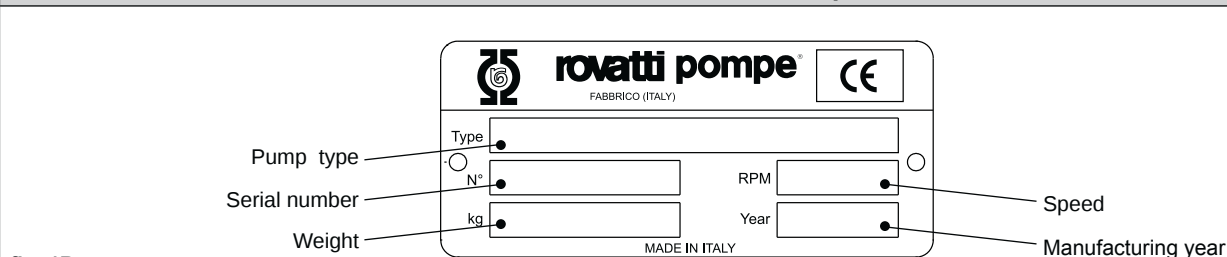
1.3 Identification plate

All products described in this manual are provided with an identification plate (fig. 1A - 1B) reporting the characteristic data. In case of warranty claim, it's important to inform the manufacturer of all characteristic data.

T - TK - MB series identification plate



T0 - T0A series identification plate



2. Description of the manual

2.1 Introduction

The good functioning of the product, its reliability and life depend on the severe respect of the present prescriptions by the installer and the end user. Read carefully and take note of prescriptions, suggestions and indications necessary for a correct use.

2.2 Purpose of the manual

This manual has been prepared considering the needs of the user that bought our product. You can find topics and instructions illustrating the correct use of the product in order to maintain characteristics, functionality and quality of the product unchanged over the time. The instructions for use contained in the present manual refer to products in standard execution and functioning in normal conditions; therefore, for the use of a pump-motor unit, the present instructions must be integrated with the documentation provided by the motor/engine manufacturer. Keep this manual and any eventual further documentation in a suitable place on hand of operators when necessary.

2.3 Update procedure

The manual is subject to revisions and modifications by **Rovatti A. & Figli Pompe s.p.a.** without prior notice. Once updated, the manual in the new version will be supplied with the sold product.

3. Preliminary information

3.1 Standard references

Horizontal single-stage pumps with overgear **T** series, horizontal multistage pumps with overgear **TK** series, horizontal single-stage pumps with overgear **MB** series, horizontal single-stage pumps with overgear **T0** series, and horizontal self-priming pumps with overgear **T0A** series have been designed and manufactured in compliance with:

Machine Directive 2006/42/CE
Standard EN-ISO 12100
EN809

3.2 Simbology

Here below the symbols used in this manual to ensure safety for persons, machines and all electrical and mechanical equipment:

	General danger	The non observance of the prescription involves the risk of damages to persons and/or things
	Electric danger	The non observance of the prescription involves electric shock risk
	Technical danger	The non observance of the prescription involves the risk of technical damages to the product and/or to the installation

3.3 General warnings



Operations reported in this manual, with particular reference to **transport, installation, electrical and mechanical connections, starting, maintenance or off-service operations** must be carried out by skilled personnel well experienced with the rules concerning safety of the working environment and who has taken vision and carefully verified the content of this manual and/or any other documentation enclosed to the product. It must also be considered and followed any more restrictive local regulations.

3.4 Operators skills

Below are listed the operators skills:

Generic operator	Not skilled personnel, who can drive the machine using the controls on the push-button panel; simply re-start or re-set the machine after forced interruption.
Mechanical maintener	Skilled engineer who can drive the machine in normal conditions; operate on the mechanical components for setting, maintenance and repairs, if any. He's not allowed to operate on the electric system when live.
Electrical maintener	Skilled engineer who can drive the machine in normal conditions; make all electric operations necessary to setting, maintenance and repair. He can operate inside control and jack boxes, when live.
Rovatti technical operator	Skilled engineer. He's available for clients directly by Rovatti A. & Figli Pompe Spa or by one of their agent, when particularly difficult operations are required.

3.5 Protective equipment required



During installation, maintenance or off-service operations all individual protective devices are necessary to operate in safety conditions (proper gloves, clothes, protection masks, etc.). To prevent accidents be sure that unauthorized persons cannot approaching or standing in dangerous areas.

3.6 Residual risks

  Danger due to moving mechanical components	Hazard of getting caught and drawn into machine pinch points by loose clothing that become entangled. Pinch points are represented by all rotating or revolving parts and by power transmission apparatus. Follow lockout procedure before servicing. Do not operate without proper protective guards. Stay clear of the machine area while operating
 Danger due to edges and angles	Whenever possible we have provided for corner guards and eliminated protruding parts. Use proper protective guards, like gloves, eye-glasses etc. during maintenance and cleaning operations
 Danger due to electric hazard	The terminal block connecting the electric network to general panel remains live also when in stand-by for servicing operation. Before making any connection or maintenance on these parts disconnect electric power from network supply cable to the machine. We recommend to mount a disconnecting switch upstream in order to insulate the power supply, to ensure safety maintenance operations
 Danger due to thermal hazard	Thermal hazards on this type of machine are concentrated determined areas. While operating the temperature of these areas can reach and exceed 50° C. Avoid any direct contact with these components. Wait for complete cooling in order to prevent burns

3.7 Prohibitions

In particular, employees must not:

-  - mount on the pump to prevent falls;
-  - remove or modify without authorization any security device, security signal or security control;
- perform operations on its own initiative that could compromise the safety of themselves or other operators;
- wear bracelets, rings and necklaces that can be hanged or dragged by moving parts, creating danger conditions;
- use the machinery if there is any malfunction;
- apply any precarious repairs.

3.8 Noise level

The acoustic pressure levels of the products, properly installed and functioning within the use limits foreseen in the relative technical catalog are reported on the annex.

3.9 Unintended and/or improper uses

Do not use the machine in the following conditions:

-  - waterless;
 - without the protection grids properly installed;
 - exceeding the limits specified on the identification plate;
 - for pumping different liquids from those specified in the relative catalog.
-  Do not use the machine for different purposes than those specified in the relative product catalog. Any different use from those specified in the relative product catalog is to be considered improper and therefore potentially dangerous to the safety of workers, as well as to invalidate the contractual warranty.

3.10 Warranty

Warranty of the products are subject to **ROVATTI A. & FIGLI POMPE S.p.A. general sale conditions**. For more information about Rovatti terms and conditions, please visit "www.rovatti.it". Warranty is recognized when all mechanical, hydraulic, electric norms and correct use indicated on the present manual are respected.

4. Description of the machine

4.1 Purpose of the machine

The machines described in this manual are widely used in livestock systems, filling tanks and reservoirs, irrigation systems, spraying systems and liquid transfer.

4.2 Use conditions

For all machines described in this manual it is necessary to respect the following use limits:

Max pumped liquid temperature	60°C
Max. solids contents	40 g/m³
Max running time with closed delivery (Q = 0)	1 min.
Max. suction pressure	9 bar



The presence of abrasive substances causes wearing and premature deterioration of the internal components of the pump. The presence of pollutants, such as residues of hydrocarbon, solvents, detergents, natural gas, may cause heavy damages producing the blowing of the rubber components (bearings, wear rings) and even the consequent pump rotor locking.



In case of use in conditions different from the suggested ones or constructive modifications made without previous authorization, warranty foreseen in the general sale conditions will be no longer valid and the manufacturer will not be responsible of eventual damages caused to persons, animals or things.

4.3 General characteristics

Centrifugal pumps with overgear driven by PTO cardan shaft. Available with 3-point linkage or on 2-wheel trolley and suitable for all irrigation systems. A tested water circulation cooling device of the overgear (**T - TK series**) guarantees safety functioning in continuous working periods. The pumps described in this manual are suitable for pumping non-abrasive, chemically and mechanically non-aggressive waters.

4.4 Pumps identification

The pumps described in this manual are available in several versions, indicated by the designation of the pump:

Pump with overgear						
T				MB		
Version						
R				N		
Gearbox size						
2K	3K	4K	1	2	3	4
Nominal Ø suction port [mm] (for TK - TK Europa series)						
50		65		80		100
Nominal capacity in m³/h (for TK Europa series)						
90 ÷ 160						
Hydraulic size (for T series)						
40 ÷ 150						
Version (for T series)						
A						
Nominal Ø delivery port (for MB series)						
20				25		
Number of stages (for TK - TK Europa series)						
2				3		
Impeller size						
E	F	G	H	I	L	

Example: T3K80-90/2G

Pump with overgear	
T	
Drive type	
0	0F
Nominal Ø suction port [mm]	
50	
Self-priming version	
A	

Example: T0-50A

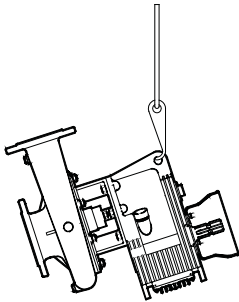
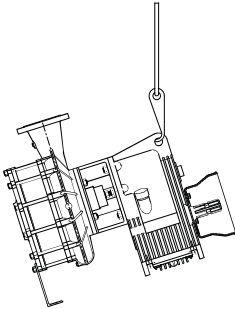
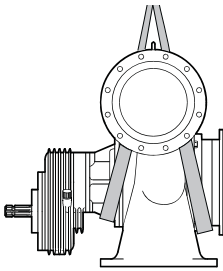
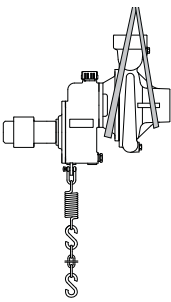
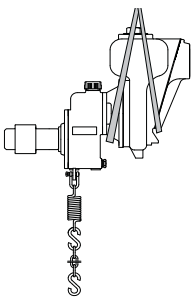
5. Transport, handling and storage

5.1 Transport and handling

When packed, the products described in this manual can be moved with a forklift but in case it is possible to move them even with a crane. Once unpacked, identify the weights of the product (detectable on the identification plates) and use the lifting hooks points **fig. 2 ÷ 6**.



To reduce risks during lifting and handling operations, be sure to operate in safety conditions checking that equipments are complying with safety norms and are suitable for the weights, dimensions and shape of the product. **Handle the product with protective gloves avoiding cut risks to hands. When lifting and placing the pump be sure of its stability before releasing the lifting equipment.**

T series	TK series	MB series	T0 series	T0A series
				
fig. 2	fig. 3	fig. 4	fig. 5	fig. 6

5.2 Storage



The products described in this manual must be stored in covered and dry rooms. **In case of a long storage period (over 3 months) and/or storage in conditions with low ambient temperature, you should empty the pump (the water may freeze and cause serious damages) and protect it with special product against oxidation and rotate periodically by hand the shaft to avoid the possible locking of the same.**

5.3 Packing disposal

The products described in this manual are normally packed in wooden boxes that must be disposed as prescribed by the local regulations prevailing in the country in which the disposal occurs. For further informations contact the relevant authorities.

6. Installation

6.1 Inspections before installation

After receiving the product ensure that during transport it has not been damaged and that the data reported on the identification plate of the product correspond to the submitted order.



Before installing the pump be sure that the rotating components rotate freely. Be sure that the support base is solid, regular and adequate to the pump weight (refer to the identification plate).

6.2 Installation of T, TK, MB pump series



Pump coupling must be performed only when tractor is off. Make sure that the tractor cannot be accidentally started accidentally. All T, TK, MB pumps can be either mounted on permanent stations or on mobile trolley.



The cardan shaft should be connected with an alignment angle less than 10° (fig. 7). Suction and delivery pipes must be correctly mounted and not subject to stress during pump operation.

Ensure in suction that:

- NPSH available is 1 meter approx. higher than the NPSH requested by the pump and that friction losses in suction pipe, bends, foot valve and filter do not exceed 1 meter.
- Suction pipe has a diameter larger than the inlet of pump and that the horizontal section of the suction pipe does not exceed a gradient of 2%.
- All joints are perfectly airtight.
- Anchorages and supports to prevent damages and possible breakage of suction flange are properly secured.
- Foot valve is vertically positioned and equipped with adequate sized grid to protect against possible obstructions (free surface of filter must be minimum twice suction pipeline surface).
- The suction pipe has no narrow bends and diameter variations.

Ensure in delivery that:

- All pipes and fittings are adequately dimensioned to reduce pressure loss and to withstand the maximum operating pressure of the pump.
- A gate valve is fitted to regulate delivery flow.
- The suction pipe has not narrow bends and diameter variations.
- Anchorages and supports to prevent damages and possible breakage of delivery flange are properly secured.

Typical installation

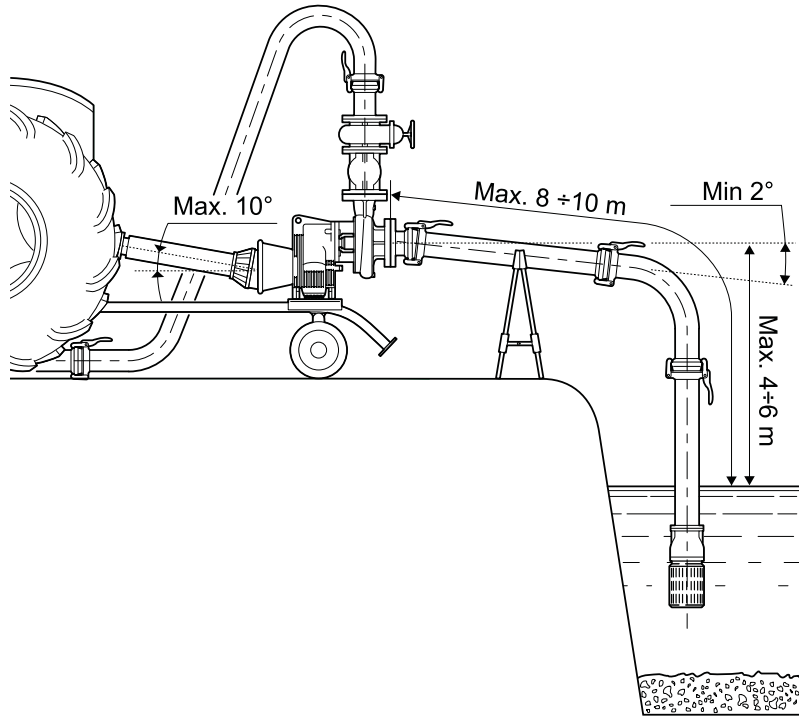


fig. 7

6.3 Installation of T0, T0A pump series



Pump coupling must be performed only when tractor is off. Make sure that the tractor cannot be accidentally started accidentally. All T0 and T0A pumps can be either mounted on permanent stations or on mobile trolley.



The cardan shaft should be connected with an alignment angle less than 10° (fig. 7). Suction and delivery pipes must be correctly mounted and not subject to stress during pump operation. Also refer to paragraph 6.2.

In T0F and T0FA execution (fig. 8) these pumps are fitted for direct coupling to the p.t.o. of tractors. For installation proceed as follows:

- Lift the pump until the p.t.o. is aligned with the pump coupling; slightly rotate the coupling to meet the splines and push the pump towards the p.t.o.
- Pull the coupling external ring towards the pump, overcoming the return spring resistance; now push the pump towards the p.t.o. to find the foreseen coupling position.
- Release the ring back to its original position. Check that installation is made correctly by pushing the pump forward and backward: the pump must remain firmly anchored to the p.t.o.
- The pump will result radially swinging on the p.t.o. Complete anchorage is made by hooking the two chains at the ends of the traverse anchor bar fixed on pump support. Chains prevent the pump to rotate further to the p.t.o. motion.
- To grant a firm anchorage it is important to find suitable points/positions on the tractor where chains can be hooked. On the other hand, chains shall be long enough to reach any anchorage point under or above the p.t.o.
- If anchorage points are under the p.t.o., the chain with the spring will be at the left of the pump. Of course, if anchorage points are above the p.t.o., the chain with the spring will be at the right of the pump.
- Use the accessories supplied with the pump (elbow, connection and foot valve) to connect the pipes.
- Refer to paragraph 6.2.

Typical installation

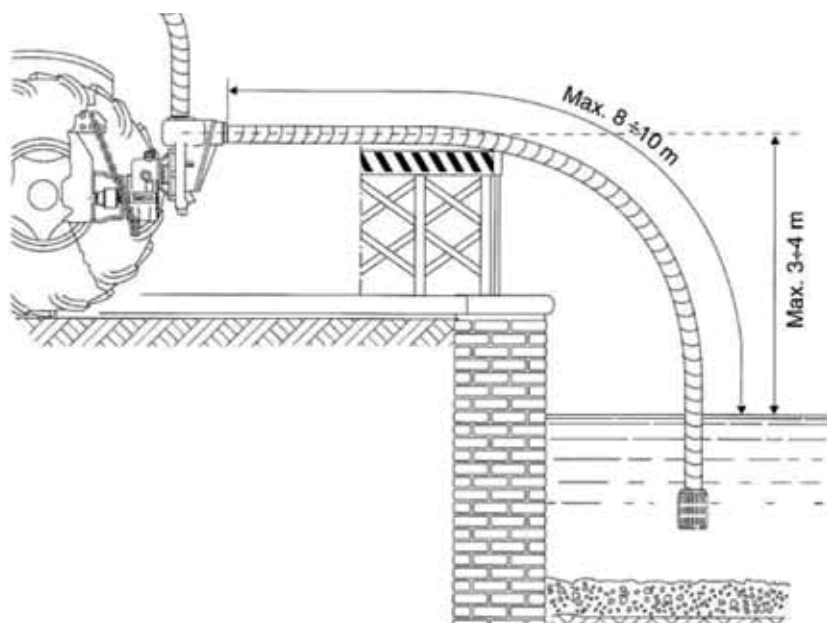


fig. 8

7. Starting

7.1 Preliminary information before starting



The starting must be performed by qualified and skilled personnel. The protection must cover all rotating components. Activate all security procedures and monitor the efficiency of the protections. Isolate the area within a radius of 2 metres and avoid access to unauthorized persons.



Never run the pump without water; dry functioning, even brief, can destroy the hydraulic components.

7.2 Lubrication



The pumps described in this manual are supplied without lubricating oil and **before starting it is necessary to proceed with oil filling. Refer to tab.1 for quantity and type of oil.**

7.3 Starting of T, TK, MB pump series

- Carefully fill the pump body and the suction pipes checking that no air is trapped inside. If possible turn the shaft manually maneuvering the coupling.
- Start the pump-motor unit with gate valve slightly open.
- With running pump gradually open the gate valve to obtain the desired operating performance.
- On pumps equipped with gland packing, make sure that the packing leaks approx. 20 to 60 drops per minute to allow adequate cooling and shaft lubrication. If necessary, adjust the flow slowly and progressively loosening or tightening the packing nuts (this adjustment must be performed with running pump). **Be careful not to touch moving parts.**



7.4 Starting of T0 pump series

- Carefully fill the pump body and the suction pipes checking that no air is trapped inside. If possible, turn the shaft manually maneuvering the coupling.
- Start the pump-motor unit with gate valve slightly open.
- With running pump gradually open the gate valve to obtain the desired operating performance.

7.5 Starting of T0A pump series

- These pumps could be used even without footvalve. Anyway, the use of a grid (with max. 10 mm mesh) is recommended.

- When starting for the first time, the pump body must be filled with water: use the port in the upper part of the pump body or the outlet. This operation is not required prior to following startings, because the built-in-check valve prevents the emptying of the delivery pipe and guarantees enough water for a correct priming. Time of priming may depend on rotation speed as well as on length and diameter of inlet pipe and can vary from few seconds to a few minutes.



The pump operation must stay within the limits and must take place without abnormal vibration and noise. Maintain the data provided on the operating plate. The use of the pump with different data may cause irreparable damage. After starting check again the alignment of the pumping units.

Pump	Oil quantity	Oil type		
		Ambient temperature up to 35 °	Ambient temperature over 35 °	Arab countries
T2K50/3	1550 ml	SAE 80W/90	SAE 85W/140	SAE 85W/140
T2K65/2	1550 ml			
T3K65/2	2270 ml			
T3K80/2	2270 ml			
T3K80-90/2	2270 ml			
TR3K100-120/2	2270 ml			
TR3K100/160/2	2270 ml			
TR4K100-120/2	3100 ml			
TR4K100-160/2	3100 ml			
T4K100/2	3100 ml			
T1-40	1240 ml			
T1-50	1240 ml			
T1-65A	1240 ml			
T1-80	1240 ml			
T1-100	1240 ml			
T2-40	1550 ml			
T2-50	1550 ml			
T2-65	1550 ml			
T2-80	1550 ml			
T2-85	1550 ml			
T2-150	1550 ml			
T3-80A	2270 ml			
T3-100A	2270 ml			
T3-110	2270 ml			
T4-100	3100 ml			
T4-110	3100 ml			
T4-125	3100 ml			
TR4-125	3100 ml			
MBN20				
MB25				
T0-50	300 g			
T0F-50	300 g			
T0-50A	300 g			
T0F-50A	300 g			

tab. 1

8. Maintenance

8.1 Bearings lubrication

Provide oil replacement after the first 80 hours of operation. It is necessary to repeat this operation every 400 / 1000 operation hours. Provide oil replacement also in case of sudden oil lowering. For oil replacement refer to tab. 1.
DON'T WASTE THE ENVIRONMENT WITH OUT OF USE OIL.



When the pump remains inactive for a long period (especially during cold season), drain out the water from the drainage plug in order to prevent freezing damages. It is advisable to protect the rotating internal parts with antirust oil (without solvent) and, when possible, rotate by hand the pump shaft.

9. Off service and demolition

In case of dismantling and demolition, the pump components are not so dangerous and do not require special precautions. In order to facilitate recycling, all materials composing electrical system and thermoplastic components shall be separated from the machine.

INFORMATION TO USERS - under Article 13 of Law 25, July 2005, n° 151 "Implementation of Directives 2002/95/EC, 2002/96/EC and 2003/108/EC: Restriction of the use of certain Hazardous Substances in electrical and electronic equipment and Waste of Electrical and Electronic Equipment"

Suitable separate collection, followed by decommissioned pump recycling, treatment and environmentally-sound disposal, helps to avoid possible negative effects on health and the environment and promotes re-use and/or recycling of the materials of which the equipment is made. Owners who dispose of the product illegally will be liable to the administrative penalties envisaged by the regulations in force. In case of off service and demolition, follow scrupulously the local antipollution norms. Proceed to the differentiated disposals according to the list of different materials composing the pumps in the standard version reported in the annex.

DON'T WASTE THE ENVIRONMENT WITH OUT OF USE MATERIALS

10. Spare parts

In order to see spare parts tables or to order spare parts please refer to the spare parts catalog "Rovatti Spares Pro" available on www.rovatti.it.

11. Troubleshooting



It is important to always check that the installation complies with current regulations and that the operating conditions comply with the specifications for which the pump was purchased (refer to the identification plate fixed on the machine). The following is a diagram indicating the most frequent faults and their possible causes / remedies. For any further information contact the Rovatti Service Centres.

Faults	Possible causes	Remedies
Blocked pump	Moving parts rusted due to long period of non-use	Fill the pump with antirust oil, wait for few minutes and try to move by hand the pump shaft. Disassemble pump if necessary
	Foreign bodies inside the pump	Disassemble suction support or pump
	Breakage of some internal components	Disassemble the pump and replace parts
Pump does not prime	Pump body not totally filled	Provide to fill the pump
	Air inside the suction pipe	Check gaskets and connections
	Excessive suction head	Reduce the suction head
	Too low rotation speed	Increase the rotation speed
	Insufficient diameter of suction pipe	Replace the suction pipe
	Wrong rotation (pump driven by electric motor)	Invert the rotation
	Impellers and wear plate worn-out	Replace
	Pressure in delivery pipe	Breath air by the drainage cock
Insufficient pressure and/or capacity	Increased water temperature in the pump body	Fill with cold water
	Clogged suction grid	Wash and remove clogging
	Suction pipe reduces the section due to crushing depressure	Replace the suction pipe
	Rotation speed too low	Increase the rotation speed
	Excessive suction head	Reduce the suction level
	Impeller clogged by foreign body	Remove clogging. Disassemble pump if necessary
	Air inside the suction pipe	Check gaskets and connections
Pump is noisy and vibrates	Impellers and wear plate worn-out	Replace
	Functioning in cavitation	Find causes and reduce suction level if necessary
	Unbalanced moving parts: bearings or gears worn-out	Disassemble pump, check and replace
	Pump and pipes not securely fixed	Provide to fix the pump

Appendice - Annex - Annexe - Anhang - Anexo

Livello di pressione sonora media ad 1 metro di distanza dalla pompa in campo libero

Average sound pressure level at 1-metre distance from the pump in an open field

Niveau de pression sonore moyenne à 1 mètre de distance de la pompe en champ libre

Durchschnittlicher Geräuschpegel der installierten Pumpe gemessen in ca. 1 m Entfernung im freien Feld

Nivel de presión acústica mediana a 1 metro de distancia de la bomba en campo libre

Pompa Pump Pompe Pumpe Bomba	db [A]
MBN20	76
MB25	76
T1-40	79
T2-40	80
T1-65A	78
T1-50	81
T2-50	85
T2-65	81
T1-80	80
T2-80	80
T2-85	83
T3-80A	84
T1-100	77
T3-100A	83
T3-110	85
T4-100	85
T4-110	85
T4-125	85
TR4-125	85
T2-150	75
T2K50/3	79
T2K65/2	81
T3K65/3	83
T3K80/2	83
T3K80-90/2	85
T4K100/2	84
TRK100-120/2	85
TRK100-160/2	85
T0-50	79
T0F-50	79
T0-50A	78
T0F-50A	78

Se il livello di rumorosità deve essere garantito, aggiungere +3db per tolleranze di misura e costruttive

If the noise level is to be guaranteed, please add +3db for measure or constructive tolerance

Si le niveau sonore doit être garanti, ajouter +3db pour tolérances de mesure et de construction

Muss der geräuschpegel gewährleistet werden, so sind 3 db als toleranz für messung und konstruktion hinzuzufügen

Si se debe garantizar el nivel sonoro, sumar + 3 db en concepto de tolerancia de medición y/o construcción

Pompe con moltiplicatore

Pumps with overgear
Pompes avec multiplicateur
Pumpen mit Multiplikator
Bombas con multiplicador

Manuale d'uso e manutenzione

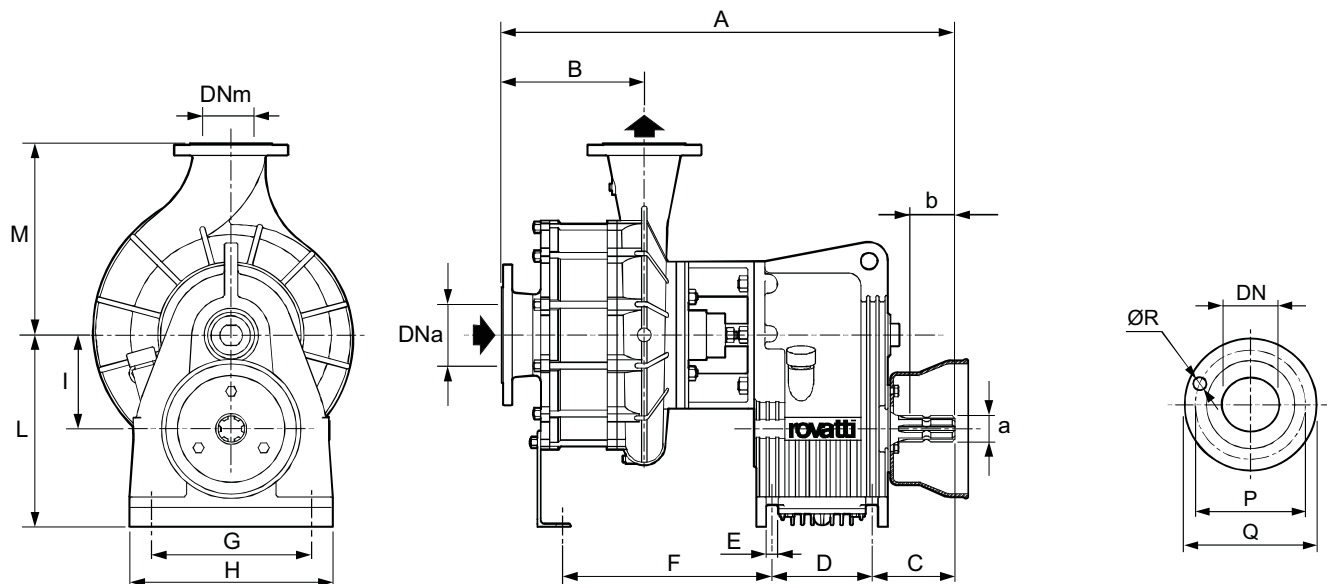
Instructions for use and maintenance
Manuel d'utilisation et d'entretien
Betriebs- und Wartungsanleitung
Manual de uso y mantenimiento

Appendice - Annex - Annexe - Anhang - Anexo

Dimensioni di ingombro in mm e peso in kg

Overall dimensions in mm and weight in kg
Dimensions en mm et masse en kg
Abmessungen in mm, Gewicht in kg
Medidas en mm, peso en kg

TK



Pompa Pump Pompe Pumpe Bomba	DNa	DNm	A	B	C	D	E	F	G	H	I	L	M	a	b	Peso Weight Masse Gewicht Peso	DN	P	Q	R	Fori Holes Perçages Löcher Agujeros
T2K50/3	50	40	602	234	101	120	14	300	210	242	115	222	180	1 3/8"	60	83	40	110	148	18	4
T2K65/2	65	50	571	190	101	120	14	259	210	242	115	222	240	1 3/8"	60	90	50	125	165	18	4
T3K65/2	65	50	592	190	111	130	15	260	240	270	130	254	240	1 3/8"	60	96	65	145	185	18	4
T3K80/2	80	65	599	195	111	130	15	266	240	270	130	254	260	1 3/8"	60	99	65	145	185	18	8
T3K80-90/2	80	65	615	231	111	130	15	289	240	270	130	254	220	1 3/8"	60	129	80	160	200	18	8
TR3K100-120/2	100	80	712	313	111	130	15	402	240	270	130	254	275	1 3/8"	60	145	100	180	220	18	8
TR3K100-160/2	100	80	712	313	111	130	15	402	240	270	130	254	275	1 3/8"	60	145					
TR4K100-120/2	100	80	758	313	123	150	18	412	270	300	140	277	275	1 3/4"	65	165					
TR4K100-160/2	100	80	758	313	123	150	18	412	270	300	140	277	275	1 3/4"	65	165					
T4K100/2	100	80	689	237	123	150	18	311	270	300	140	277	330	1 3/4"	65	162					

Appendice - Annex - Annexe - Anhang - Anexo

Dimensioni di ingombro in mm e peso in kg

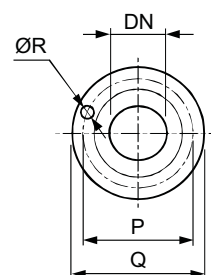
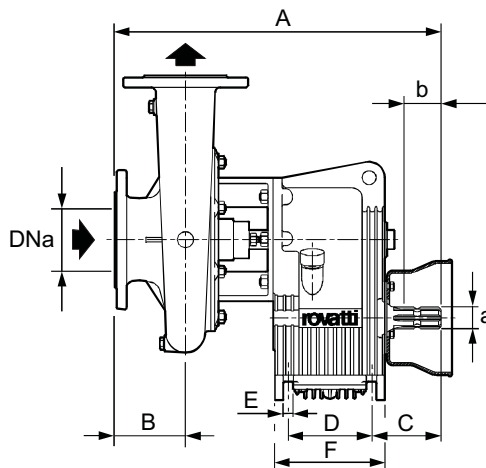
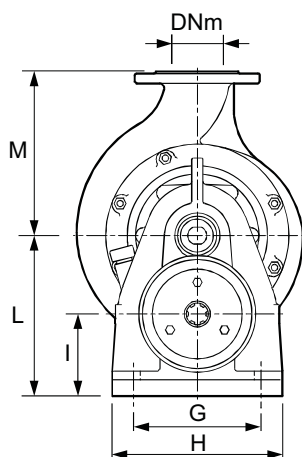
Overall dimensions in mm and weight in kg

Dimensions en mm et masse en kg

Abmessungen in mm, Gewicht in kg

Medidas en mm, peso en kg

T



Pompa Pump Pompe Pumpe Bomba	DNa	DNm	A	B	C	D	E	F	G	H	I	L	M	a	b	Peso Weight Masse Gewicht Peso
T1-40	65	40	438	100	98	110	12	147	185	210	105	199	180	1 3/8"	60	42
T1-50	65	50	444	100	98	110	12	147	185	210	105	199	200	1 3/8"	60	46
T1-65A	65	50	429	90	98	110	12	147	185	210	105	199	170	1 3/8"	60	40
T1-80	80	65	444	105	98	110	12	147	185	210	105	199	195	1 3/8"	60	45
T1-100	100	80	477	125	98	110	12	147	185	210	105	199	225	1 3/8"	60	48
T2-40	65	40	465	100	101	120	14	162	210	242	115	222	225	1 3/8"	60	59
T2-50	65	50	474	100	101	120	14	162	210	242	115	222	200	1 3/8"	60	53
T2-65	65	50	455	95	101	120	14	162	210	242	115	222	210	1 3/8"	60	56
T2-80	80	65	470	105	101	120	14	162	210	242	115	222	195	1 3/8"	60	53
T2-85	80	65	470	105	101	120	14	162	210	242	115	222	210	1 3/8"	60	56
T2-150	150	125	540	140	101	120	14	162	210	242	115	222	315	1 3/8"	60	88
T3-80A	80	65	506	105	111	130	15	174	240	270	130	254	250	1 3/8"	60	80
T3-100A	100	80	515	110	111	130	15	174	240	270	130	254	230	1 3/8"	60	75
T3-110	100	80	515	110	111	130	15	174	240	270	130	254	260	1 3/8"	60	82
T4-100	100	80	551	110	123	150	18	200	270	300	140	277	290	1 3/4"	65	114
T4-110	100	80	592	140	123	150	18	200	270	300	140	277	330	1 3/4"	65	114
T4-125	125	100	567	120	123	150	18	200	270	300	140	227	280	1 3/4"	65	112
TR4-125	125	100	567	120	123	150	18	200	270	300	140	227	280	1 3/4"	65	112

DN	P	Q	R	Fori Holes Perçages Löcher Agujeros
40	110	150	18	4
50	125	160	18	4
65	145	185	18	4
80	160	200	18	8
100	180	220	18	8
125	210	250	18	8
150	240	285	18	8

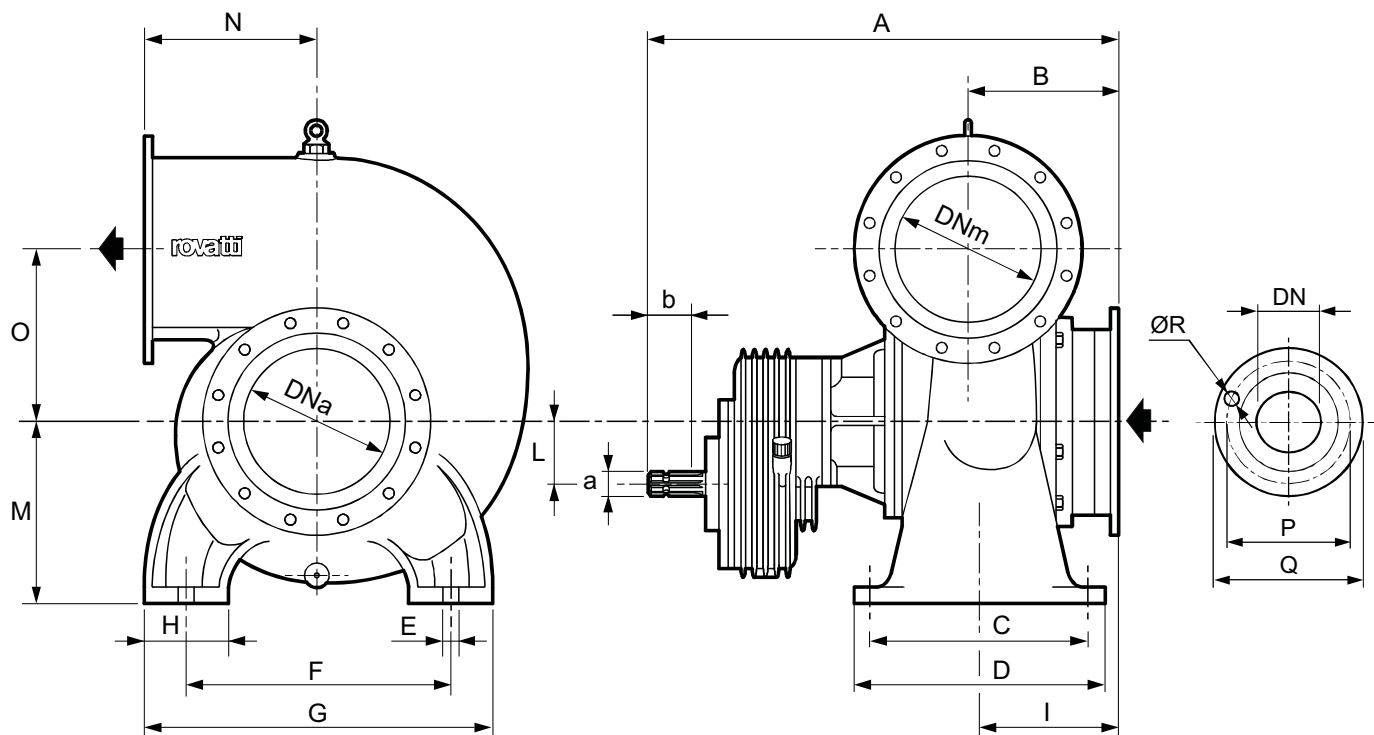
Pompe con moltiplicatore
Pumps with overgear
Pompes avec multiplicateur
Pumpen mit Multiplikator
Bombas con multiplicador

Manuale d'uso e manutenzione
Instructions for use and maintenance
Manuel d'utilisation et d'entretien
Betriebs- und Wartungsanleitung
Manual de uso y mantenimiento

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Dimensioni di ingombro in mm e peso in kg
Overall dimensions in mm and weight in kg
Dimensions en mm et masse en kg
Abmessungen in mm, Gewicht in kg
Medidas en mm, peso en kg

MB



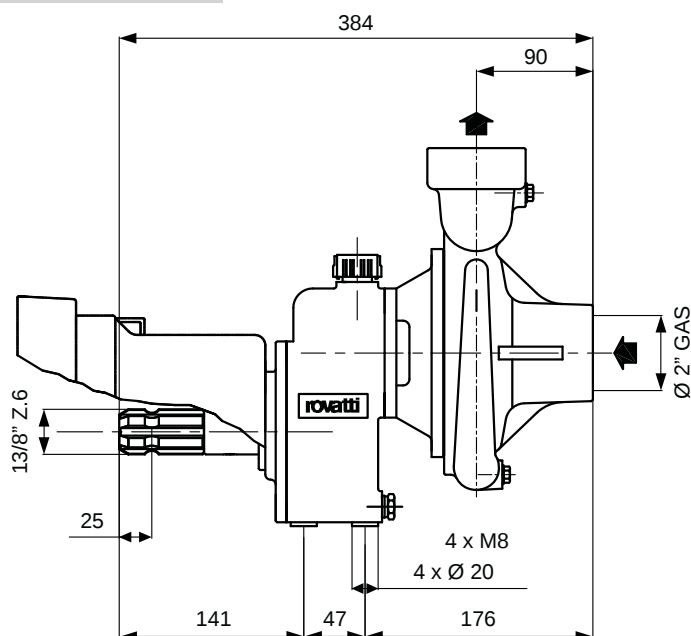
Pompa Pump Pompe Pumpe Bomba	DNa	DNm	A	B	C	D	E	F	G	H	I	L	M	N	O	a	b	Peso Weight Masse Gewicht Peso
MBN20	200	200	641	183	230	280	20	372	464	92	183	91,5	255	255	190	1 ³ / ₈ "	60	143
MB25	250	250	703	248	270	320	25	520	620	100	225	91,5	315	310	270	1 ³ / ₈ "	60	230

DN	P	Q	R	Fori Holes Perçages Löcher Agujeros
200	280	320	18	8
250	335	375	18	12

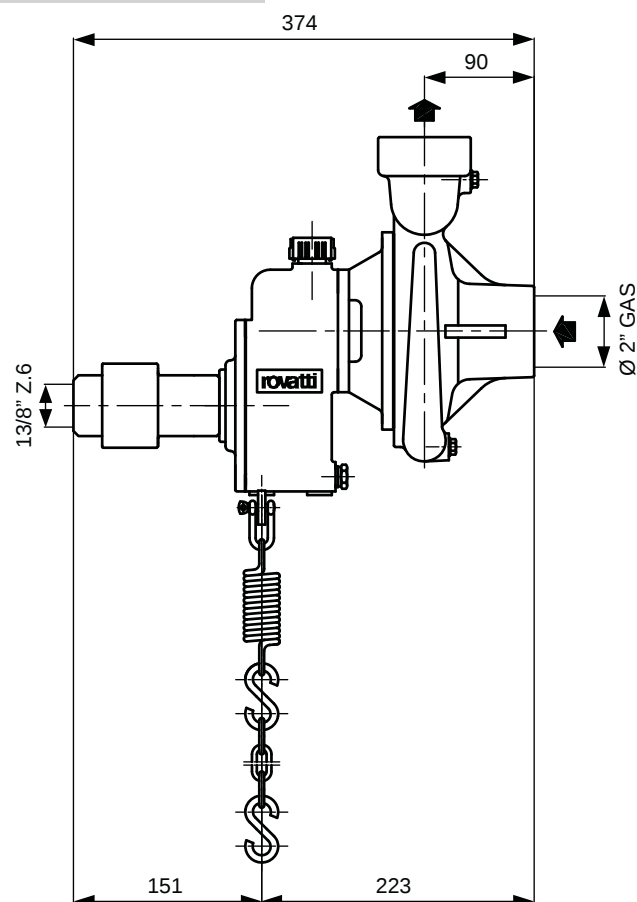
Appendice - Annex - Annexe - Anhang - Anexo

Dimensioni di ingombro in mm e peso in kg
Overall dimensions in mm and weight in kg
Dimensions en mm et masse en kg
Abmessungen in mm, Gewicht in kg
Medidas en mm, peso en kg

T0-50



T0F-50



Peso pompa: 20 kg
Pump weight: 20 kg
Masse de pompe: 20 kg
Gewicht der Pumpe: 20 kg
Peso bomba: 20 kg

Pompe con moltiplicatore

Pumps with overgear
Pompes avec multiplicateur
Pumpen mit Multiplikator
Bombas con multiplicador

Manuale d'uso e manutenzione

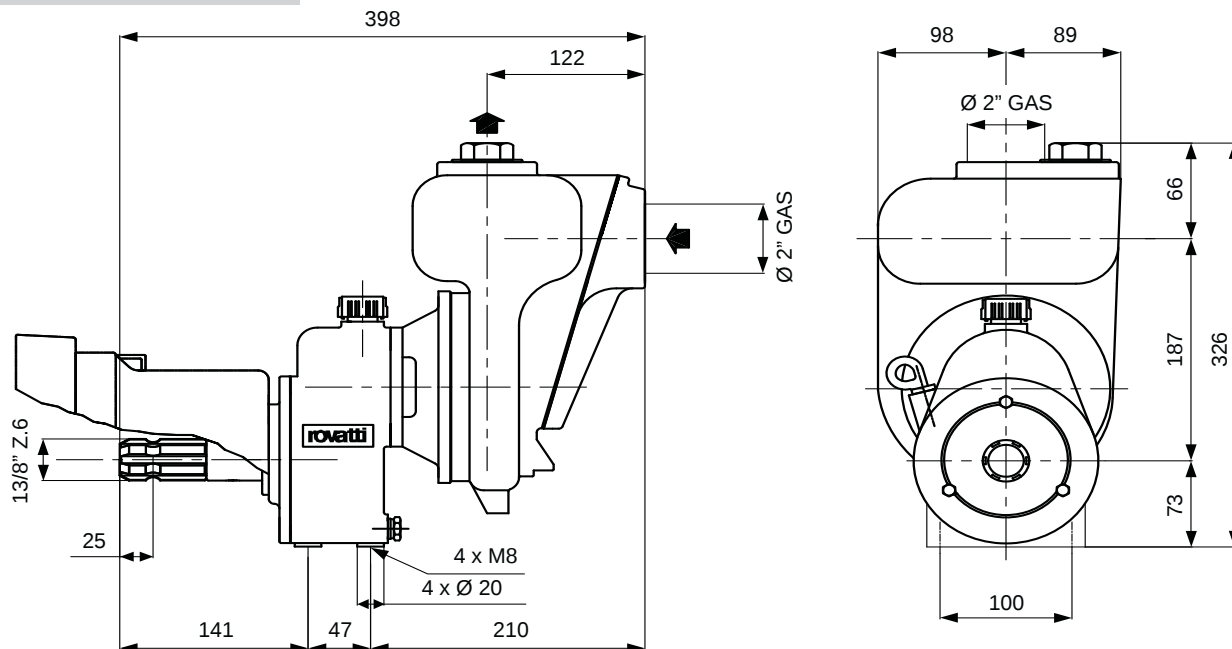
Instructions for use and maintenance
Manuel d'utilisation et d'entretien
Betriebs- und Wartungsanleitung
Manual de uso y mantenimiento

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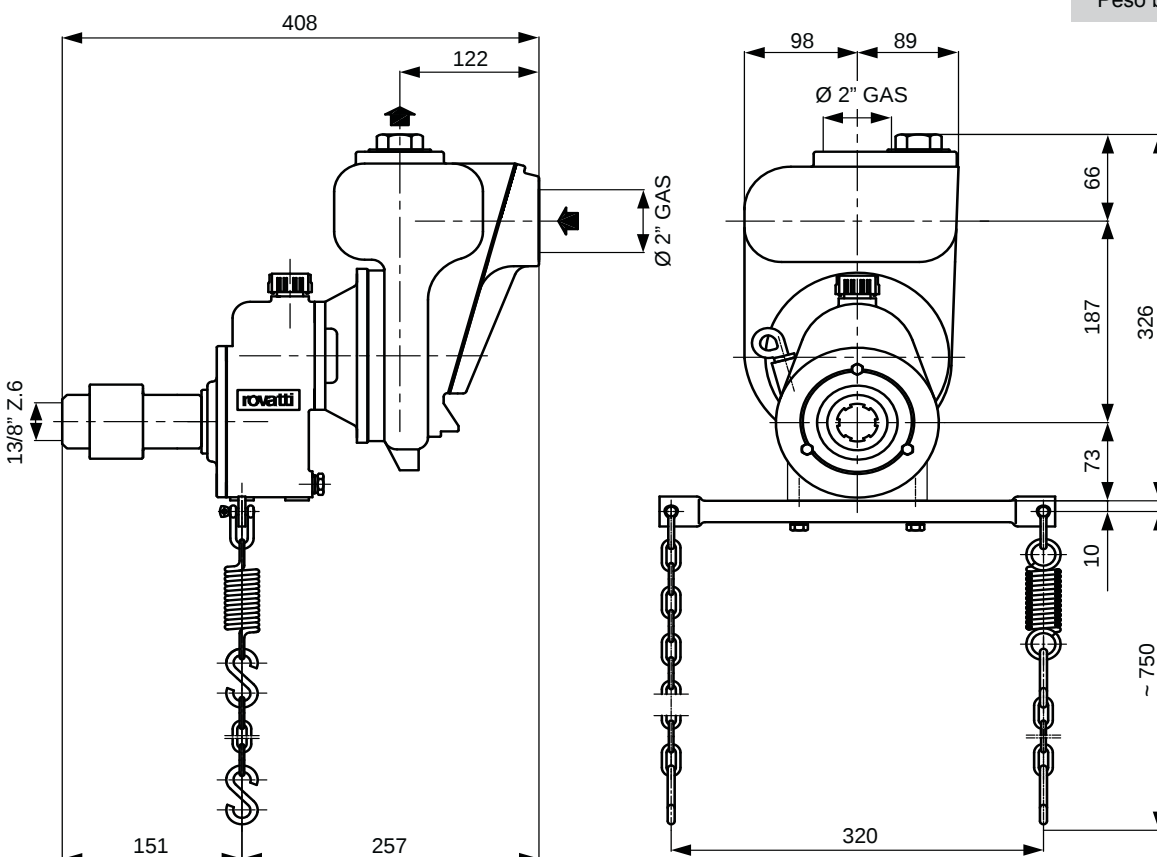
Dimensioni di ingombro in mm e peso in kg

Overall dimensions in mm and weight in kg
Dimensions en mm et masse en kg
Abmessungen in mm, Gewicht in kg
Medidas en mm, peso en kg

T0-50A



T0F-50A



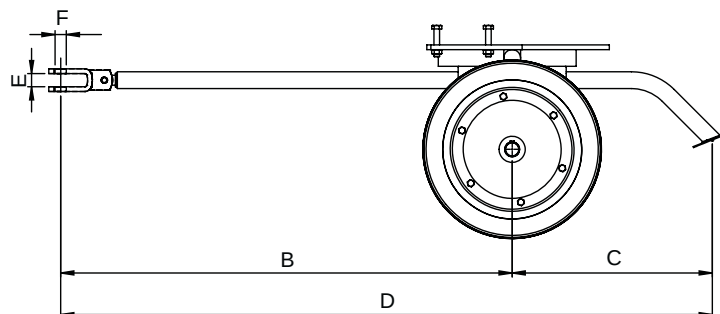
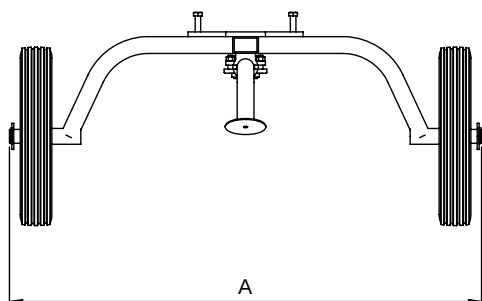
Peso pompa: 21 kg

Pump weight: 21 kg
Masse de pompe: 21 kg
Gewicht der Pumpe: 21 kg
Peso bomba: 21 kg

Appendice - Annex - Annexe - Anhang - Anexo

Dimensioni di ingombro in mm e peso in kg
Overall dimensions in mm and weight in kg
Dimensions en mm et masse en kg
Abmessungen in mm, Gewicht in kg
Medidas en mm, peso en kg

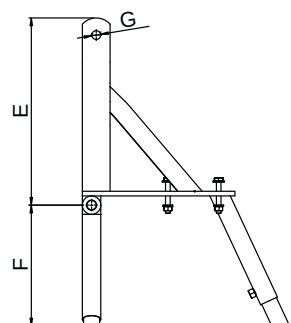
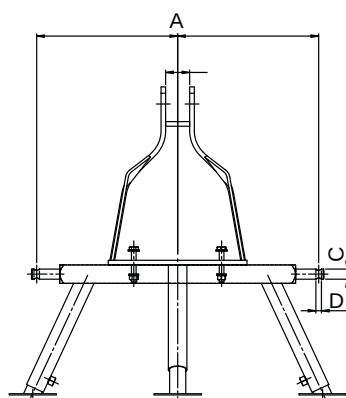
Carrello
Trolley
Chariot tubulaire
Fahrgestell
Carretilla



Tipo Type Type Typ Tipo	A	B	C	D	E	F	Peso Weight Masse Gewicht Peso
CT.1	1025	1000	672	1672	33	Ø 28,5	68
CT.2K	1190	1000	672	1672	33	Ø 28,5	110
CT.2S	1190	1000	672	1672	33	Ø 28,5	110
CT.2-CT.3	1190	1000	672	1672	33	Ø 28,5	78
CT.3K	1250	1000	655	1655	33	Ø 28,5	111
CT.3KM	1250	1000	655	1655	33	Ø 28,5	117
CT.4	1250	1000	655	1655	33	Ø 28,5	106
CT.4K	1250	1000	655	1655	33	Ø 28,5	116
CT.4KM	1250	1000	672	1672	33	Ø 28,5	120
CAR.3	1368	1000	672	1672	33	Ø 28,5	118

Dimensioni di ingombro in mm e peso in kg
Overall dimensions in mm and weight in kg
Dimensions en mm et masse en kg
Abmessungen in mm, Gewicht in kg
Medidas en mm, peso en kg

Attacco a tre punti
Three-point mounting
Chassis trois points
Drei-Punkt-Aufhängung
Ataque con tres puntos

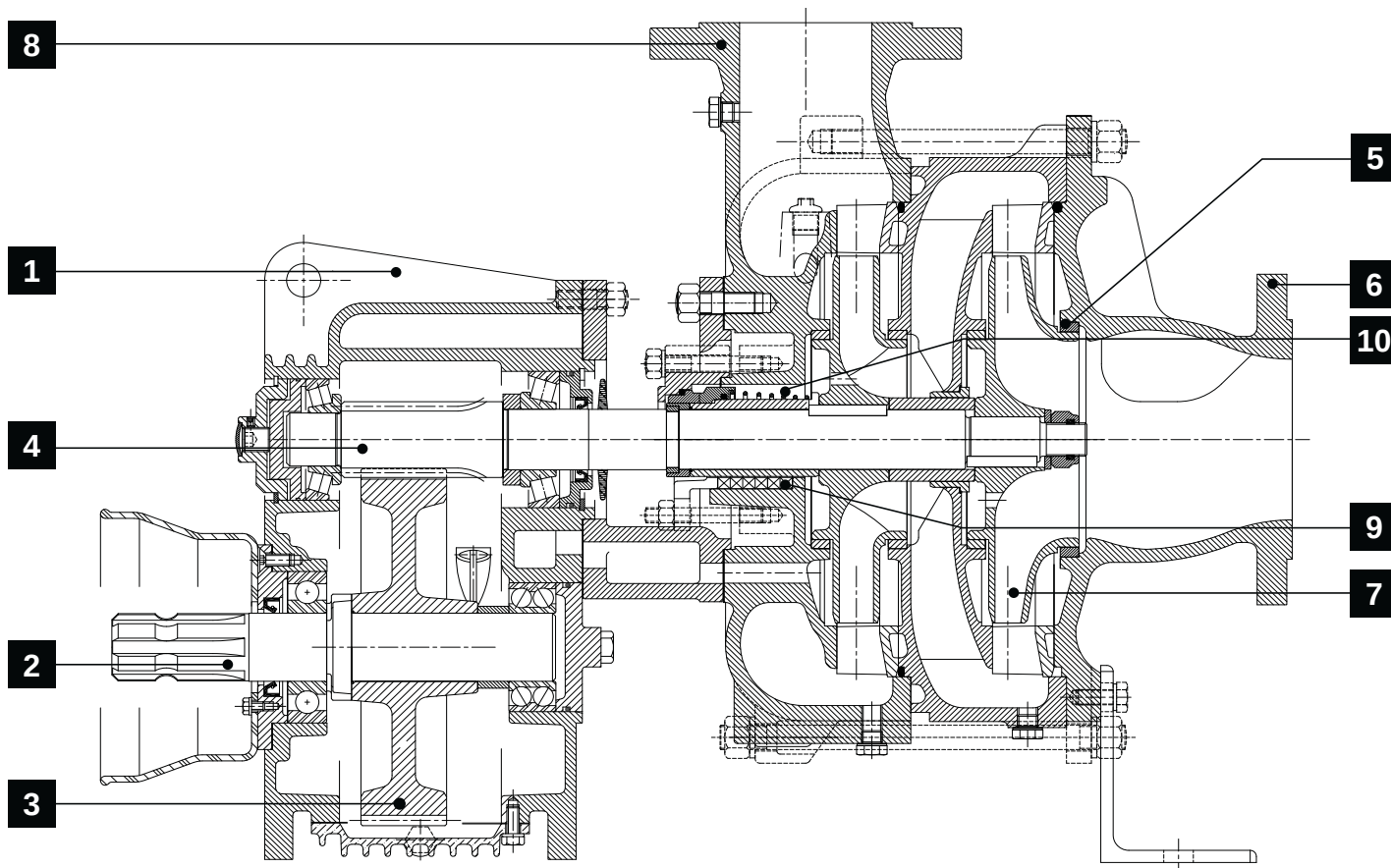


Tipo Type Type Typ Tipo	A	B	C	D	E	F Max	F Min	G	Peso Weight Masse Gewicht Peso
A1T	305	52	Ø 22	Ø12	405	433	261	Ø 19	24
A2T	398,5	52	Ø 22	Ø12	455	605	351	Ø 26	31
A3T	469,5	52	Ø 22	Ø12	455	605	351	Ø 26	33
A4T	472,5	58	Ø 28,5	Ø12	530	605	351	Ø 26	38

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Detalle partes y materiales

TK Europa



	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
1	Scatola ingranaggi Gear box Carter engrenages Getriebegehäuse Cámara de engranajes	Ghisa Cast iron Fonte Grauguss Fundición de hierro
2	Albero PTO PTO shaft Arbre primaire cannelé Zapfwelle Eje PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
3	Ingranaggio PTO PTO transmission gear Engrenage avec arbre cannelé Zahnrad mit Zapfwelle Engranaje con PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
4	Albero pignone Shaft pinion Arbre secondaire Welle Ritzel Eje piñón	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
5	Anello D'usura Wear ring Bague d'usure Schleissring Anillo de desgaste	Ghisa Cast iron Fonte Grauguss Fundición de hierro

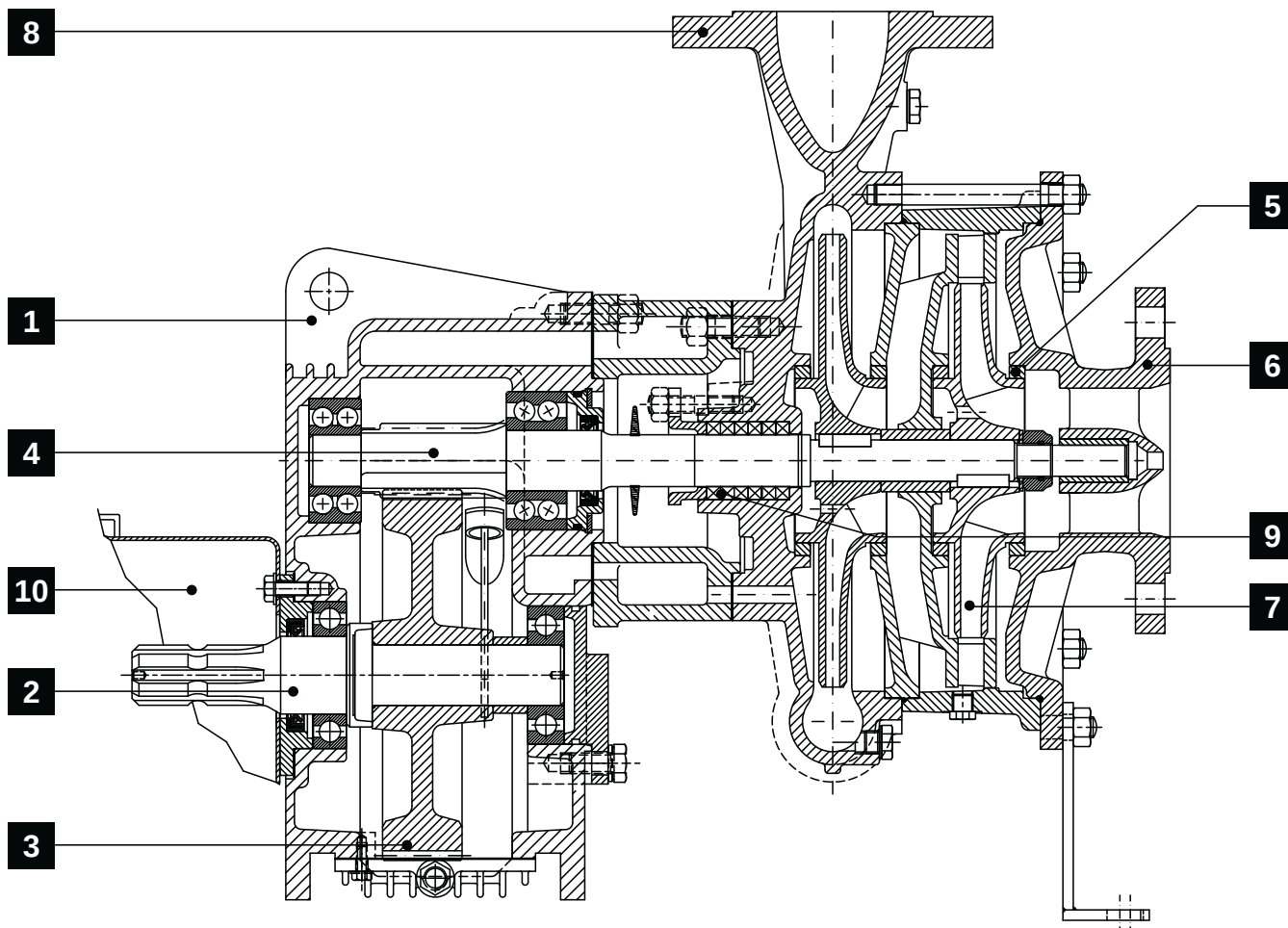
	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
6	Corpo d'aspirazione Suction bowl Corps d'aspiration Saugstutzen Cuerpo de aspiración	Ghisa Cast iron Fonte Grauguss Fundición de hierro
7	Girante Impeller Roue Laufgrad Rodete	Ghisa Cast iron Fonte Grauguss Fundición de hierro
8	Corpo pompa Pump body Corps de pompe Pumpengehäuse Cuerpo bomba	Ghisa Cast iron Fonte Grauguss Fundición de hierro
9	Tenuta a baderna (standard) Packed gland (standard) Presse-étoupe (standard) Stopfbuchse (standard) Sello por estopada (estándar)	PTFE PTFE PTFE PTFE PTFE
10	Tenuta meccanica (a richiesta) Mechanical seal (on request) Garniture mécanique (sur demande) Gleitringdichtung (auf Anfrage) Sello mecánico (a petición)	Widia / Grafite Widia / Graphite Widia / Graphite Widia / Keramik Widia / Grafito

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TK



	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
1	Scatola ingranaggi Gear box Carter engrenages Getriebegehäuse Cámara de engranajes	Ghisa Cast iron Fonte Grauguss Fundición de hierro
2	Albero PTO PTO shaft Arbre primaire cannelé Zapfwelle Eje PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
3	Ingranaggio PTO PTO transmission gear Engrenage avec arbre cannelé Zahnrad mit Zapfwelle Engranaje con PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
4	Albero pignone Shaft pinion Arbre secondaire Welle Ritzel Eje piñón	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
5	Anello D'usura Wear ring Bague d'usure Schleissring Anillo de desgaste	Ghisa Cast iron Fonte Grauguss Fundición de hierro

	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
6	Corpo d'aspirazione Suction bowl Corps d'aspiration Saugstutzen Cuerpo de aspiración	Ghisa Cast iron Fonte Grauguss Fundición de hierro
7	Girante Impeller Roue Laufgrad Rodete	Ghisa Cast iron Fonte Grauguss Fundición de hierro
8	Corpo pompa Pump body Corps de pompe Pumpengehäuse Cuerpo bomba	Ghisa Cast iron Fonte Grauguss Fundición de hierro
9	Tenuta a baderna Packed gland Presse-étoupe Stopfbuchse Sello por estopada	Fibre sintetiche Synthetic fibers Fibres synthétiques Synthetische Fasern Fibras sintéticas
10	Protezione cardano Cardan joint guard Protection cardan Kupplungsschutz Protección cardan	Gomma Rubber Elastomère Gummi Goma

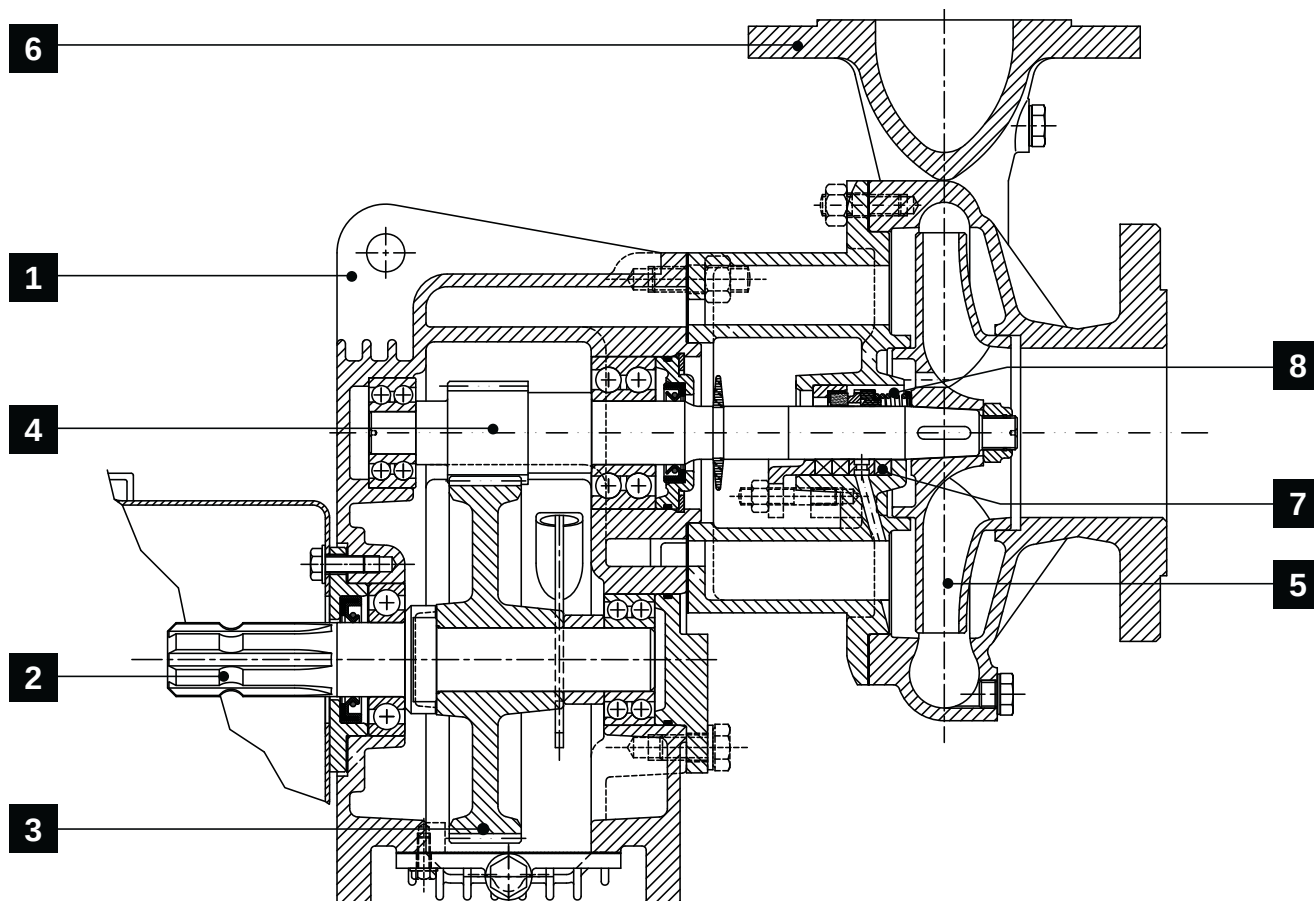
Pompe con moltiplicatore
Pumps with overgear
Pompes avec multiplicateur
Pumpen mit Multiplikator
Bombas con multiplicador

Manuale d'uso e manutenzione
Instructions for use and maintenance
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T



	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
1	Scatola ingranaggi Gear box Carter engrenages Getriebegehäuse Cámara de engranajes	Ghisa Cast iron Fonte Grauguss Fundición de hierro
2	Albero PTO PTO shaft Arbre primaire cannelé Zapfwelle Eje PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
3	Ingranaggio PTO PTO transmission gear Engrenage avec arbre cannelé Zahnrad mit Zapfwelle Engranaje con PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
4	Albero pignone Shaft pinion Arbre secondaire Welle Ritzel Eje piñón	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado

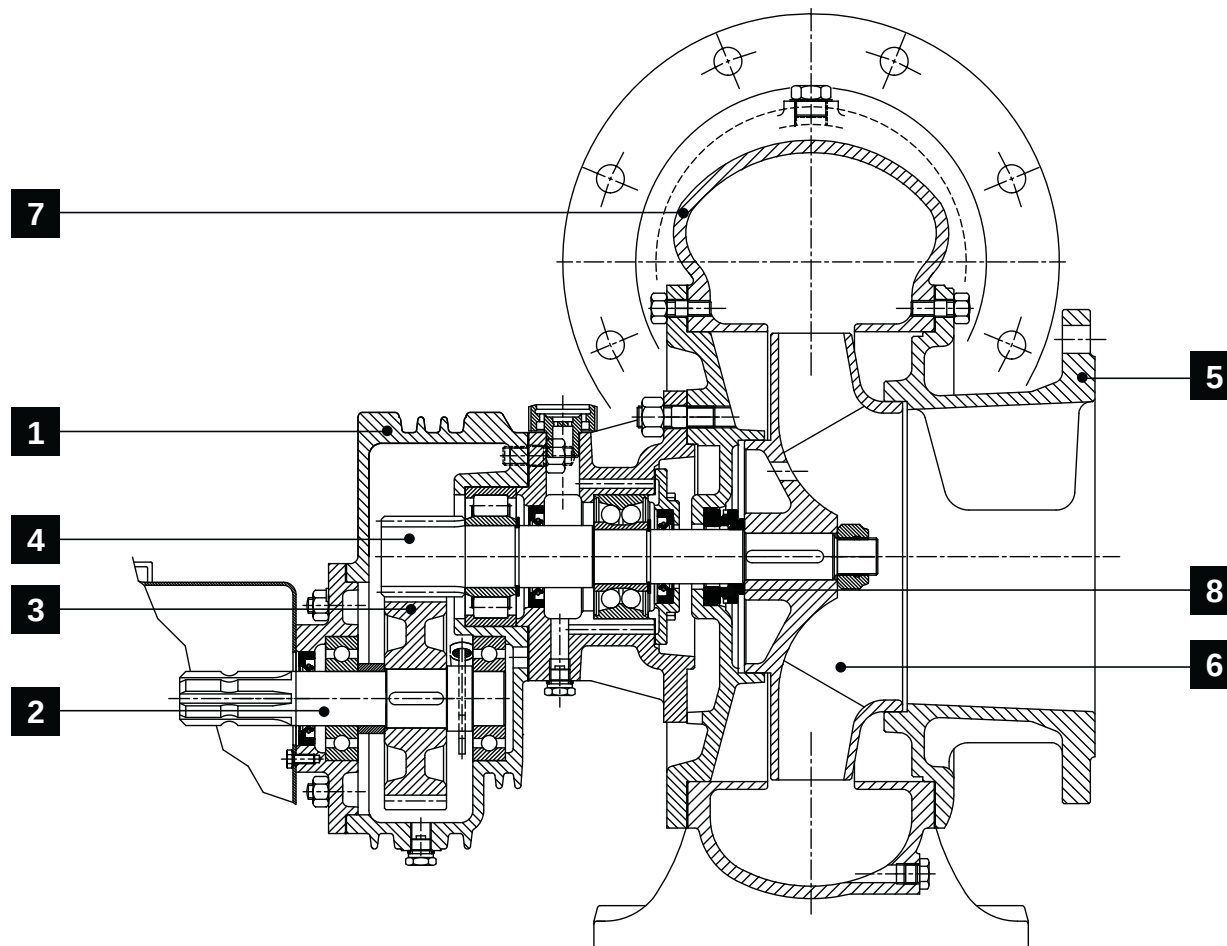
	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
5	Girante Impeller Roue Laufrod Rodete	Ghisa Cast iron Fonte Grauguss Fundición de hierro
6	Corpo pompa Pump body Corps de pompe Pumpengehäuse Cuerpo bomba	Ghisa Cast iron Fonte Grauguss Fundición de hierro
7	Tenuta a baderna (standard) Packed gland (standard) Presse-étoupe (standard) Stopfbuchse (standard) Sello por estopada (standard)	Fibre sintetiche Synthetic fibers Fibres synthétiques Synthetische Fasern Fibras sintéticas
8	Tenuta meccanica (a richiesta) Mechanical seal (on request) Garniture mécanique (sur demande) Gleitringdichtung (auf Anfrage) Sello mecánico (a petición)	SiC / SiC

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Distinta materiali

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MBN20



	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
1	Scatola ingranaggi Gear box Carter engrenages Getriebegehäuse Cámara de engranajes	Ghisa Cast iron Fonte Grauguss Fundición de hierro
2	Albero PTO PTO shaft Arbre primaire cannelé Zapfwelle Eje PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
3	Ingranaggio PTO PTO transmission gear Engrenage avec arbre cannelé Zahnrad mit Zapfwelle Engranaje con PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
4	Albero pignone Shaft pinion Arbre secondaire Welle Ritzel Eje piñón	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado

	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
5	Corpo d'aspirazione Suction bowl Corps d'aspiration Saugstutzen Cuerpo de aspiración	Ghisa Cast iron Fonte Grauguss Fundición de hierro
6	Girante Impeller Roue Laufgrad Rodete	Ghisa Cast iron Fonte Grauguss Fundición de hierro
7	Corpo pompa Pump body Corps de pompe Pumpengehäuse Cuerpo bomba	Ghisa Cast iron Fonte Grauguss Fundición de hierro
8	Tenuta meccanica Mechanical seal Garniture mécanique Gleitringdichtung Sello mecánico	Grafite / Ceramica Graphite / Ceramic Graphite / Céramique Graphit / Keramik Cerámica / Grafit

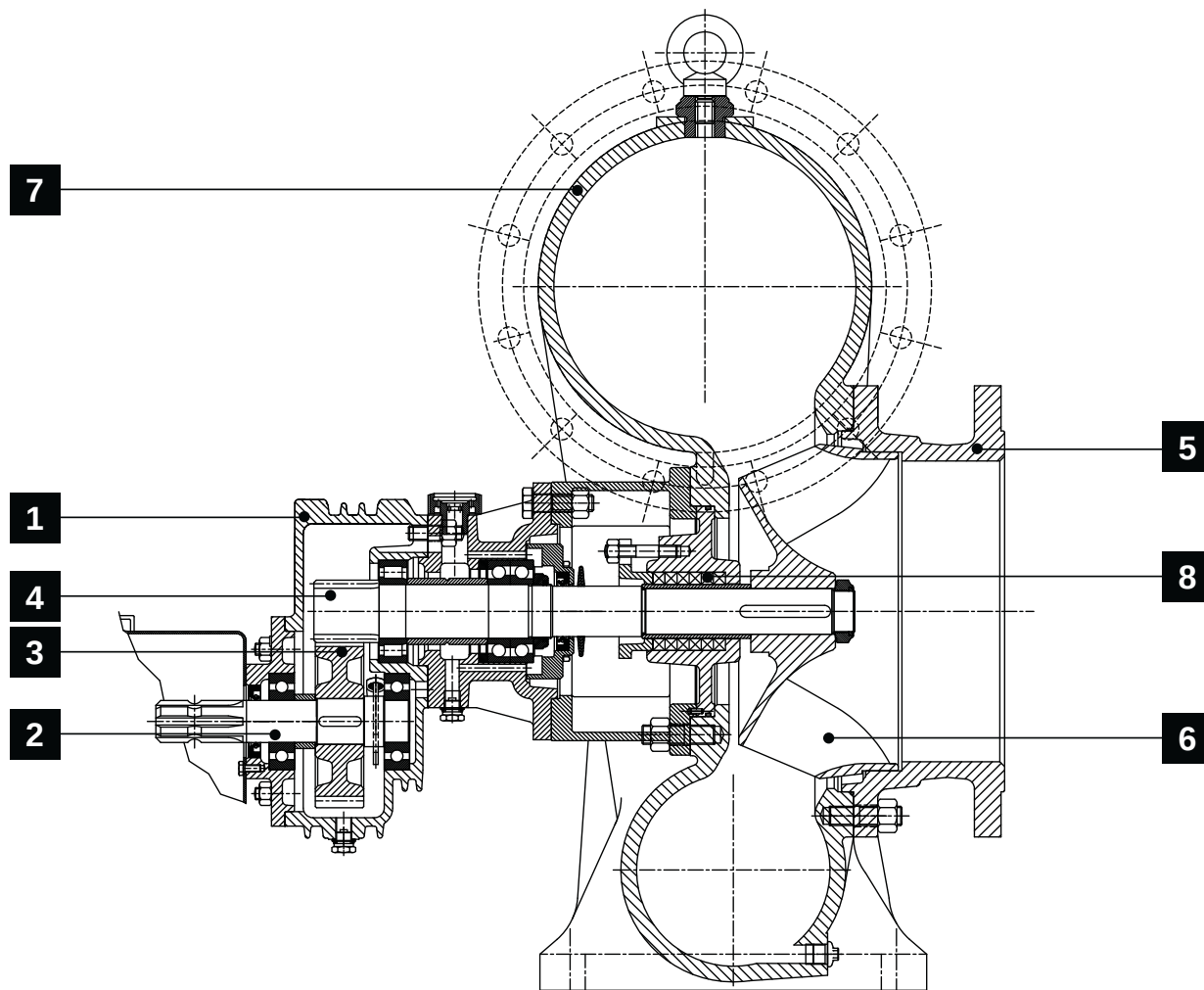
Pompe con moltiplicatore
Pumps with overgear
Pompes avec multiplicateur
Pumpen mit Multiplikator
Bombas con multiplicador

Manuale d'uso e manutenzione
Instructions for use and maintenance
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Manual de uso y mantenimiento

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Distinta materiali
List of parts and materials
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Konstruktion und Werkstoffe
Detalle partes y materiales

MB25



	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
1	Scatola ingranaggi Gear box Carter engrenages Getriebegehäuse Cámara de engranajes	Ghisa Cast iron Fonte Grauguss Fundición de hierro
2	Albero PTO PTO shaft Arbre primaire cannelé Zapfwelle Eje PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
3	Ingranaggio PTO PTO transmission gear Engrenage avec arbre cannelé Zahnrad mit Zapfwelle Engranaje con PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
4	Albero pignone Shaft pinion Arbre secondaire Welle Ritzel Eje piñón	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado

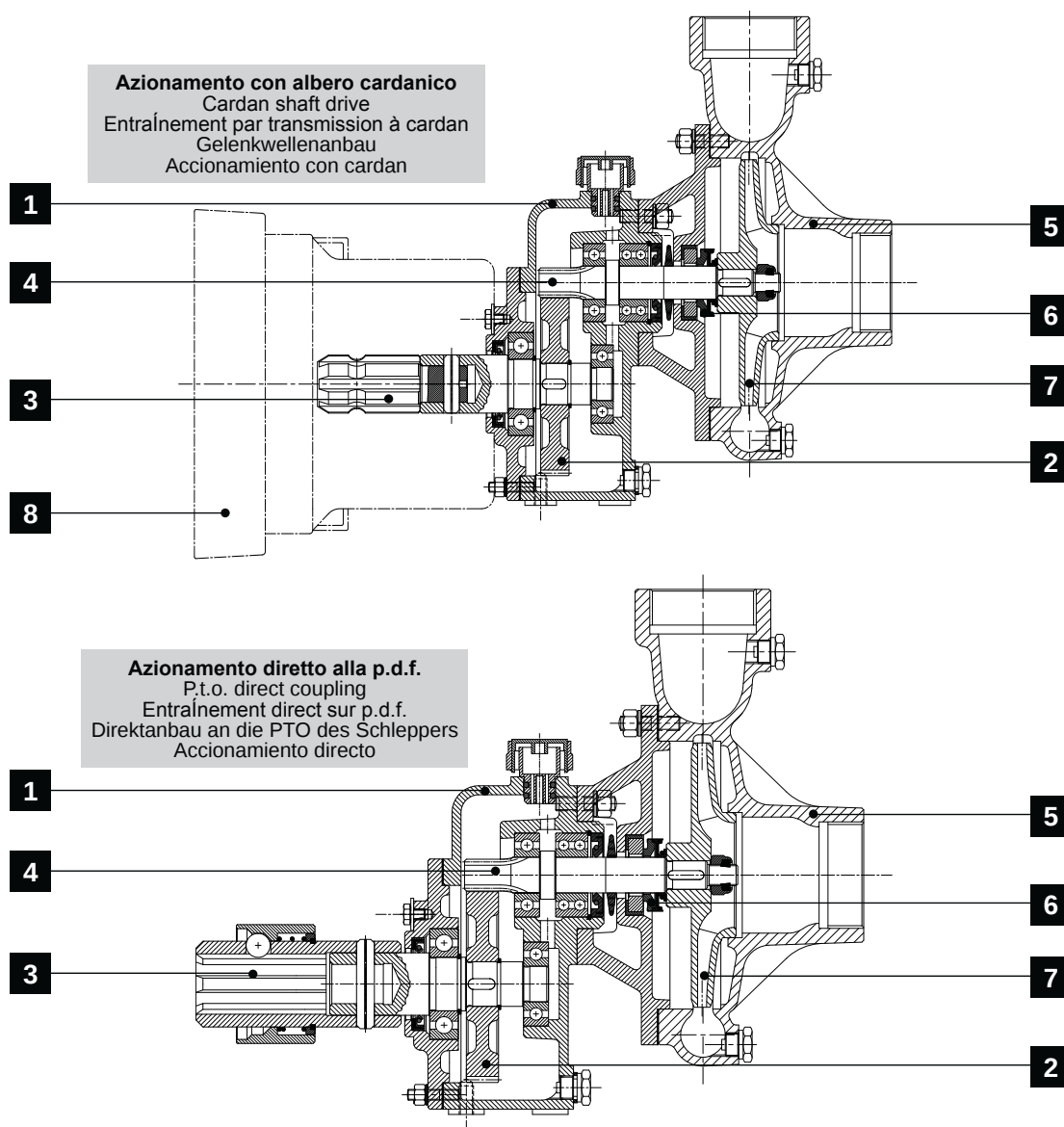
	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
5	Corpo d'aspirazione Suction bowl Corps d'aspiration Saugstutzen Cuerpo de aspiración	Ghisa Cast iron Fonte Grauguss Fundición de hierro
6	Girante Impeller Roue Laufgrad Rodete	Ghisa Cast iron Fonte Grauguss Fundición de hierro
7	Corpo pompa Pump body Corps de pompe Pumpengehäuse Cuerpo bomba	Ghisa Cast iron Fonte Grauguss Fundición de hierro
8	Tenuta a baderna Packed gland Presse-étoupe Stopfbuchse Sello por estopada	Fibre sintetiche Synthetic fibers Fibres synthétiques Synthetische Fasern Fibras sintéticas

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Distinta materiali

List of parts and materials
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Detalle partes y materiales

T0-50



	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
1	Scatola ingranaggi Gear box Carter engrenages Getriebegehäuse Cámara de engranajes	Ghisa Cast iron Fonte Grauguss Fundición de hierro
2	Albero PTO PTO shaft Arbre primaire cannelé Zapfwelle Eje PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
3	Ingranaggio PTO PTO transmission gear Engrenage avec arbre cannelé Zahnrad mit Zapfwelle Engranaje con PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
4	Albero pignone Shaft pinion Arbre secondaire Welle Ritzel Eje piñón	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado

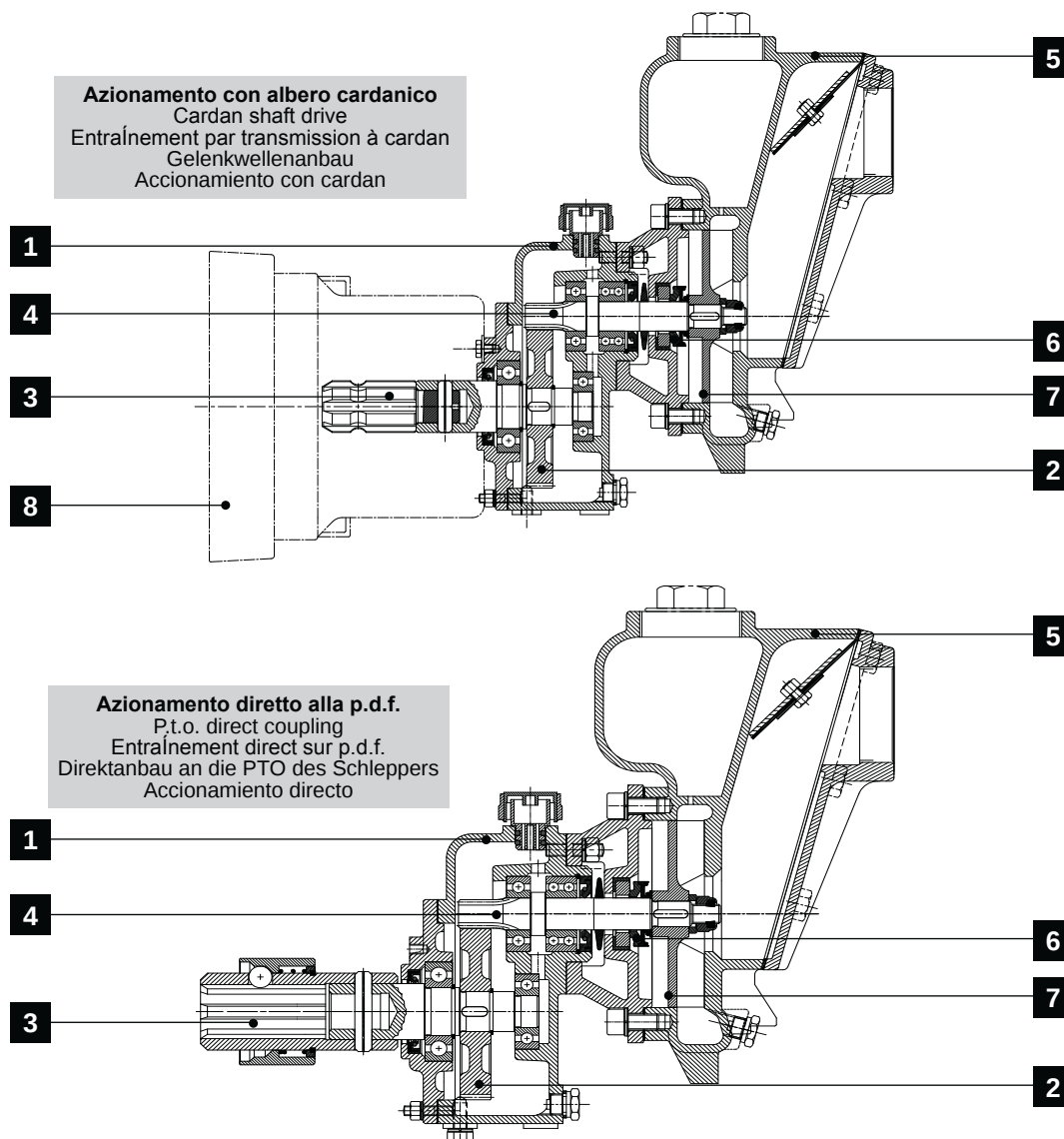
	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
5	Corpo pompa Pump body Corps de pompe Pumpengehäuse Cuerpo bomba	Ghisa Cast iron Fonte Grauguss Fundición de hierro
6	Tenuta meccanica Mechanical seal Garniture mécanique Gleitringdichtung Sello mecánico	Grafite / Ceramica Graphite / Ceramic Graphite / Céramique Graphit / Keramik Cerámica / Grafit
7	Girante Impeller Roue Laufrad Rodete	Ghisa Cast iron Fonte Grauguss Fundición de hierro
8	Protezione cardano Cardan joint guard Protection cardan Kupplungsschutz Protección cardan	Gomma Rubber Elastomère Gummi Goma

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Distinta materiali

List of parts and materials
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Konstruktion und Werkstoffe
Detalle partes y materiales

T0-50A



	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
1	Scatola ingranaggi Gear box Carter engrenages Getriebegehäuse Cámara de engranajes	Ghisa Cast iron Fonte Grauguss Fundición de hierro
2	Albero PTO PTO shaft Arbre primaire cannelé Zapfwelle Eje PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
3	Ingranaggio PTO PTO transmission gear Engrenage avec arbre cannelé Zahnrad mit Zapfwelle Engranaje con PTO	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado
4	Albero pignone Shaft pinion Arbre secondaire Welle Ritzel Eje piñón	Acciaio cementato Case hardened steel Acier cémenté Einsatzstahl Acero cementado

	Componente Component Désignation Komponente Componente	Materiale Material Matière Werkstoff Material
5	Corpo pompa Pump body Corps de pompe Pumpengehäuse Cuerpo bomba	Ghisa Cast iron Fonte Grauguss Fundición de hierro
6	Tenuta meccanica Mechanical seal Garniture mécanique Gleitringdichtung Sello mecánico	Grafite / Ceramica Graphite / Ceramic Graphite / Céramique Graphit / Keramik Cerámica / Grafit
7	Girante Impeller Roue Lauftrad Rodete	Ghisa Cast iron Fonte Grauguss Fundición de hierro
8	Protezione cardano Cardan joint guard Protection cardan Kupplungsschutz Protección cardan	Gomma Rubber Elastomère Gummi Goma

**Dichiarazione CE di Conformità
EC Declaration of Conformity
Déclaration CE de Conformité
Konformitätserklärung CE
Declaración CE de Conformidad**

Ai sensi dell'**allegato II A** - della Direttiva **2006/42 CE**
According to **Annex II A** - Directive **2006/42 EC**
Conformément à l'**annexe II A** - Directive **2006/42 CE**
Gemäß **Anhang II A** - Richtlinie **2006/42 CE**
De acuerdo con el **anexo II A** - Directiva **2006/42 CE**

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dichiara, sotto la propria responsabilità, che le macchine:
declare, under their responsibility, that the machines:
déclare, par la présente et sous sa propre responsabilité, que les machines:
erklärt unter eigener Verantwortung, daß die Maschinen:
declara, bajo propia responsabilidad, que las máquinas:

T - TK - MB - T0 - T0A

Sono conformi alla Direttiva Macchine **2006/42/CE** e, dove applicabile,
agli standard **EN-ISO 12100, EN 809**

Are in conformity with the provisions of the Machine Directive **2006/42/CE** and, where applicable,
to the standards **EN-ISO 12100, EN 809**

Sont conformes à la Directive Machines **2006/42/CE** et, le cas échéant,
aux normes **EN-ISO 12100, EN 809**

Den Richtlinien für Maschinen **2006/42/CE** und ggf.
die Normen erfüllen **EN-ISO 12100, EN 809**

Corresponde a las exigencias básicas de la Directiva Máquinas **2006/42/CE** y, si procede,
a las normas **EN-ISO 12100, EN 809**

Si rammenta che la presente dichiarazione perde validità in caso di modifiche sulla macchina eseguite senza l'approvazione scritta del fabbricante
We must inform you that this declaration becomes void in the event of any modification of the machine without prior written approval of the manufacturer
Il est rappelé que la présente déclaration perd sa validité dans le cas où ce matériel serait modifié sans l'accord écrit de la société signataire
Es wird darauf hingewiesen, dass vorliegende Erklärung ungültig wird falls Änderungen an der Maschine ohne schriftliche Genehmigung des Herstellers vorgenommen werden
Se recuerda que la presente declaración pierde su validez en caso de manipulación de la máquina sin acuerdo escrito del constructor

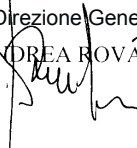
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Direzione Tecnica
TIZIANO GALAVOTTI

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