pompetravaini

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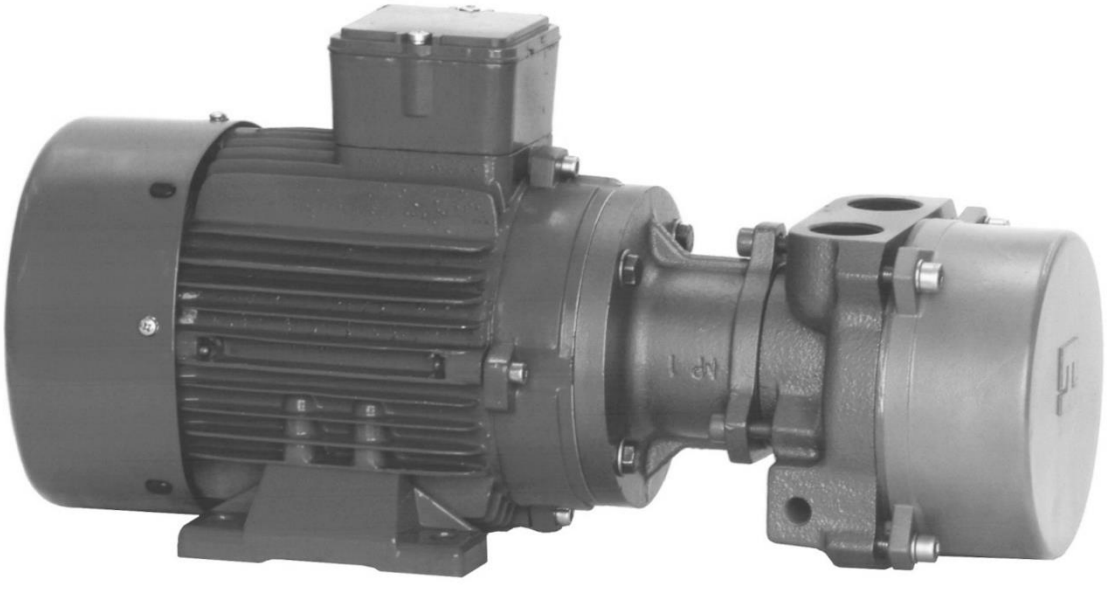
DISASSEMBLY AND ASSEMBLY INSTRUCTIONS FOR LIQUID RING VACUUM PUMP SINGLE STAGE WITH MECHANICAL SEAL

TRVX 255/1



CE

INTRODUCTION

These instructions are for the maintenance staff in case of repair for the following pumps:

TRVX 255/1

These instructions are supplied together with the manual of “INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS FOR LIQUID RING VACUUM PUMPS”.
They provide a reference for safe operation, installation, maintenance and repairing of the pumps.
Prior to working on the pump it is recommended to follow the instructions of safety listed in chapters 2 and 15 of the above manual, as well is absolutely important to:

- wear safety clothing, hard hat, safety shoes, safety eye glasses
- disconnect the electrical power
- close suction valves and service liquid valves
- remove pump from installation without damaging other system components
- assume all safety measures if pump has been handling dangerous fluids
- drain pump casings through the draining connections and flush the pump with clean liquid, if required.

When requesting spare parts or technical information for the pump, always quote the pump model number and serial number which is printed on the pump nameplate: therefore it is recommended not to remove the pump nameplate or, in case this action will be necessary, write the serial number on the pump (for example on the flange).
Should additional information be required, please do not hesitate to contact POMPETRAVAINI or the closest representative. Should there be any difficulties in repairing the pump, it is recommended to send the pump for repair to POMPETRAVAINI or the local authorised representative.
Any pump repairs and/or system work carried out by others will not be guaranteed by POMPETRAVAINI.

NOTE: VDMA numbers identify all pump components.
Refer to parts list in chapter 4 and to the section drawings in chapter 5.
All drawings are schematic only and are not certified for construction.
For further information please consult POMPETRAVAINI or its closest representative.

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The liquids and the gases handled by the pumps and also their parts could be potentially dangerous for persons and environment: provide their eventual disposal in conformity with the laws into force and a proper environment management.

The present manual is not assigned for pumps subjected to the ATEX 94/9/CE directive. In case the pump is assigned in environments subjected to the application ATEX 99/92/CE directive or in case the pump is provided with a nameplate indicating the ATEX stamp, it strictly forbidden proceed to start up the pumps but necessary to consult POMPETRAVAINI for clarifications.
For pumps subjected to the ATEX 94/9/CE directive it is available a dedicated integrative manual.

In preparing this manual, every possible effort has been made to help the customer and operator with the proper installation and operation of the pump and/or system. Should you find errors, misunderstandings or discrepancies please do not hesitate to bring them to our attention.

1 – PUMP DISASSEMBLY

1.1 - COMMON DISASSEMBLY
Remove the 4 screws VDMA 914.1, then the casing cover VDMA 161.
Remove the bearing nut VDMA 923 and slip off the impeller VDMA 230 verifying that it is free of defects (wear, corrosion, cracks, etc.).
Remove the suction/discharge plate VDMA 137 and check that the special valve including the metal valve plate VDMA 180.5, and particularly the Teflon component VDMA 400.9 is intact.
Extract the key VDMA 940 from its slot on the shaft VDMA 210 and slip off the impeller and mechanical seal spacer VDMA 485.
Remove the 3 screws VDMA 914.2 and remove the pump casing VDMA 101: in this way the mechanical seal VDMA 433.2 will slip off the shaft.
Push out the stationary part of the mechanical seal from the pump casing using a light pressure.
Check that also the internal side of the pump casing doesn't bear defects or wear signs. Slip off the thrower VDMA 507.
Continue with the checking on the components to be replaced (only with original replacing parts from POMPETRAVAINI) after having verified the wear and the integrity of every component.
It is good practice to replace all the components that bear wear signs.
If it would be necessary disassembly the bearings housing component with ball bearings VDMA 320 and 320.1, remove the 4 screws that hold the bearing housing VDMA 330 to the motor's flange and, depend on type of motor used, look at the following.

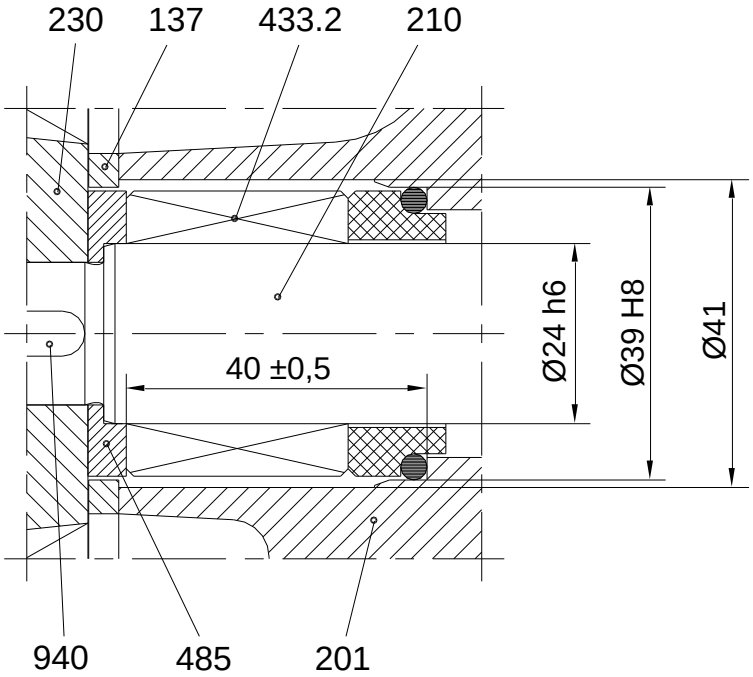
1.2 - DISASSEMBLY of VERSION /1/M (with **IEC 72-1** motor: see fig. 4, chapter 5)
Push the assembly of shaft VDMA 210 and ball bearings VDMA 320 toward the smaller flange side of bearing housing VDMA 330.

1.3 - DISASSEMBLY of VERSION /1/N (with **NEMA** motor: see fig. 5, chapter 5)
After having removed the Seeger ring VDMA 932.3, push the assembly of shaft VDMA 210 and ball bearings VDMA 320 toward the bigger flange side of bearing housing VDMA 330.

2 – PUMP ASSEMBLY

(See fig.1 and tab.1 for mechanical seal and ball bearing dimensions).

Fig. 1



Tab. 1
BALL BEARINGS,
MODELS AND DIMENSIONS

BALL BEARINGS MODELS	
With IEC 72-1 motor	With NEMA motor
N° 2 6007-2RS-C3 (35x62x14)	N° 1 6007-2RS-C3 (35x62x14)
	N° 1 6008-2RS-C3 (40x68x15)

2.1 - ASSEMBLY of VERSION /1/M (with **IEC 72-1** motor: see fig. 4, chapter 5)
Slip on one of the 2 ball bearings VDMA 320 on the right side of the shaft VDMA 210 and the other on the opposite side (for this type of pump the ball bearings have tolerance "C3").
Put the bearing housing VDMA 330 with the bigger flange side on a plane surface and slip on the shaft with ball bearings, keep the treated side up, until the bearing will touch the spacer bottom then put the elastic ring VDMA 935 on the upper ball bearing.

2.2 - ASSEMBLY of VERSION /1/N (with **NEMA** motor: see fig. 4, chapter 5)

Slip the bigger ball bearing VDMA 320.1 on the holed side of the shaft VDMA 210 and the other ball bearing on the opposite side (for this type of pump the ball bearings have tolerance “C3”).

Slip in the shaft, from the treated side, and the bearings in the bearing housing VDMA 330 from the bigger flange side pushing until it is possible set the external circlip VDMA 932.3, put the bearing housing with the bigger flange side on a plane surface, press the assembly of shaft and bearings toward the and slip on the shaft with ball bearings, keep the treated side up, until the bearing will touch the bearing housing bottom then put the elastic ring VDMA 935 on the upper ball bearing VDMA 320.

2.3 - COMMON ASSEMBLY

Install inside the pump casing VDMA 101 the stationary part of the mechanical seal VDMA 433.2 lubricate the O-ring and its room with compatible liquid and centring the eventual locating pin VDMA 904.

Slip on the thrower VDMA 507 on the shaft VDMA 210 and put the pump casing on the bearing housing VDMA 330.

Press the ball bearings VDMA 320 (and VDMA 320.1) and the elastic ring VDMA 935 screwing the 3 screws VDMA 914.2 with related washers, with a torque of 1,5 kgm: pay attention that an excessive torque could lead to a deformation of the bearing housing.

Execute a **pre-assembly** on the shaft of the impeller and mechanical seal spacer VDMA 485, of the suction/discharge plate VDMA 137 and following, of the impeller VDMA 230. The impeller is usually lower of at least 0,30 mm than its housing in the casing cover VDMA 161 (see fig. 2).

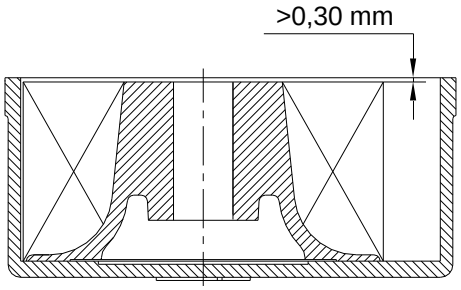


Fig. 2

In case act on the impeller and mechanical seal spacer inserting other rings so that the impeller will be kept at a distance of 0,10 - 0,15 mm from the suction/discharge plate (see fig. 3).

Remove the impeller, the suction/discharge plate and all of the impeller and mechanical seal spacer and move to the final assembly.

Install the 2 reference pins VDMA 561 in their holes on the lower part of the pump casing. Slip on the haft the rotary part of the mechanical seal VDMA 433.2 lubricate the O-ring and the shaft with a compatible liquid, pay attention keep clean the 2 sliding surfaces of the mechanical seal and use a dedicated guide.

Slip on the shaft the impeller and mechanical seal spacer VDMA 485, with all the other rings previously used.

Press the mechanical seal spring and insert the shaft key VDMA 940 in its slot on the shaft.

Lay a strip of glue type “Superbond 539” or equivalent on the machined contour of the pump casing and lay over that the suction/discharge plate with the flapper VDMA 400.9 and the metal valve plate VDMA 180.5 toward the pump casing, centre the suction/discharge plate with the 2 reference pins.

Then assembly the impeller and fix it to the shaft with the bearing nut VDMA 923 with a torque of 2 kgm.

Lay a strip of glue type “Superbond 539” or equivalent on the casing cover border and, referring to the reference pins, assembly to the pump casing. Screw in the 4 screws VDMA 914.1 with a torque of 2 kgm.

Working on the shaft hole, slip in a dedicated instrument and check that the pump turns freely by hands.

To verify the correct assembly and perfect hydraulic tight of the pump, after 2 hours of the assembly to let the glue dry, do a static test under a maximum pressure of 3 bar.

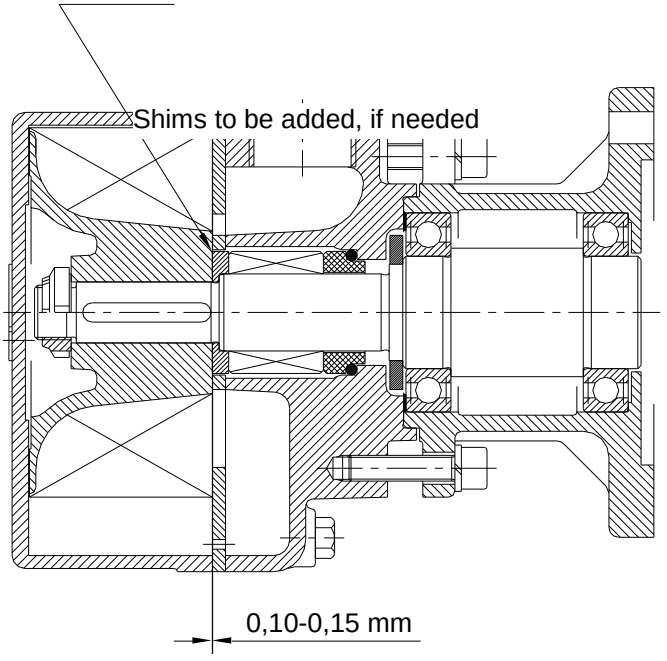


Fig. 3

3 - RECOMMENDED SPARE PARTS

When ordering the pump it is good practice to also order the necessary spare parts, especially when there are no stand-by pumps in the installation.
This will minimize unnecessary down times in the event of pump failures or routine maintenance.
It is therefore, recommended to stock the following spare parts for each pump size:

1 Impeller
1 Shaft assembly
1 Mechanical seal
2 Ball bearings
1 Gasket compound

For better parts management, the VDMA 24296 standards suggest to stock the number of parts as a function of the number of pumps being used in the plant.
On the pump nameplate are printed the pump model, year of manufacture and pump serial number. When ordering spare parts always refer to this information.
Pump type, parts item number (VDMA) and description, as per the parts list on chapter 4 and pump sectional drawings on chapter 5, are useful information that helps to supply and ensure correct spare parts for your pump.
We recommend the use of original parts: in case of deviation, POMPETRAVAINI declines any responsibility for damages that may be derived from the use of non original spare parts.

4 - PARTS LIST

VDMA NO	DESCRIPTION
101	Pump casing
137	Suction/discharge plate
161	Casing cover
180.5	Valve plate
210	Shaft
230	Impeller
320…	Ball bearing
330	Bearing housing
400.9	Flapper
433.2	Mechanical seal
485	Impeller and mechanical seal spacer
507	Thrower

VDMA NO	DESCRIPTION
554.5	Lock washer
554.6	Lock washer
561	Reference pin
903…	Plug
904	Locating pin
914…	Screw
923…	Bearing nut
932.3	Circlip
935	Elastic ring
940	Key
Z	Liquid supply inlet

According to what expected from 2012/19/UE Directive on Waste Electric and Electronic Equipment the electrical pump assembly from us supplied (pump coupled with an electrical motor of Pompetravaini supply or customer supply) placed on the market after the 15th of August 2018 fell within the limits of application of the Directive. As a consequence, conforming to article 14 of the 2012/19/UE Directive of the European Parliament of the 4th of July 2012, Pompetravaini Spa is registered on the Italian list of EEE manufacturer.
The electrical pump assembly supplied by Pompetravaini Spa that should be discontinued from use must not be disposed with common waste because it is composed of different materials that can be recycled at the appropriate facilities. If it is not intended to proceed autonomously at the management of the electrical pump assembly at authorized disposal companies it is possible to contact the Pompetravaini branch closer to you that will give you the necessary information on a proper disposal in accordance with mandatory laws.
The pump unit must be previously cleaned up by the pumped product upon disposal.
After reclamation the electrical pump assembly is not potentially dangerous for human health and environment, not containing harmful substances according to 2011/65/UE (RoHs) Directive, but if abandoned in the environment will have a negative impact on the ecosystem.
Sending the electrical pump assembly to an adequate process of disposal and recovery of materials protect the environment and help to limits consumption of available resources with effective recycling of materials.
The abandonment in the environment of the apparatus or the illegal disposal of the same are punished by law.

5 – TYPICAL SECTIONAL DRAWING

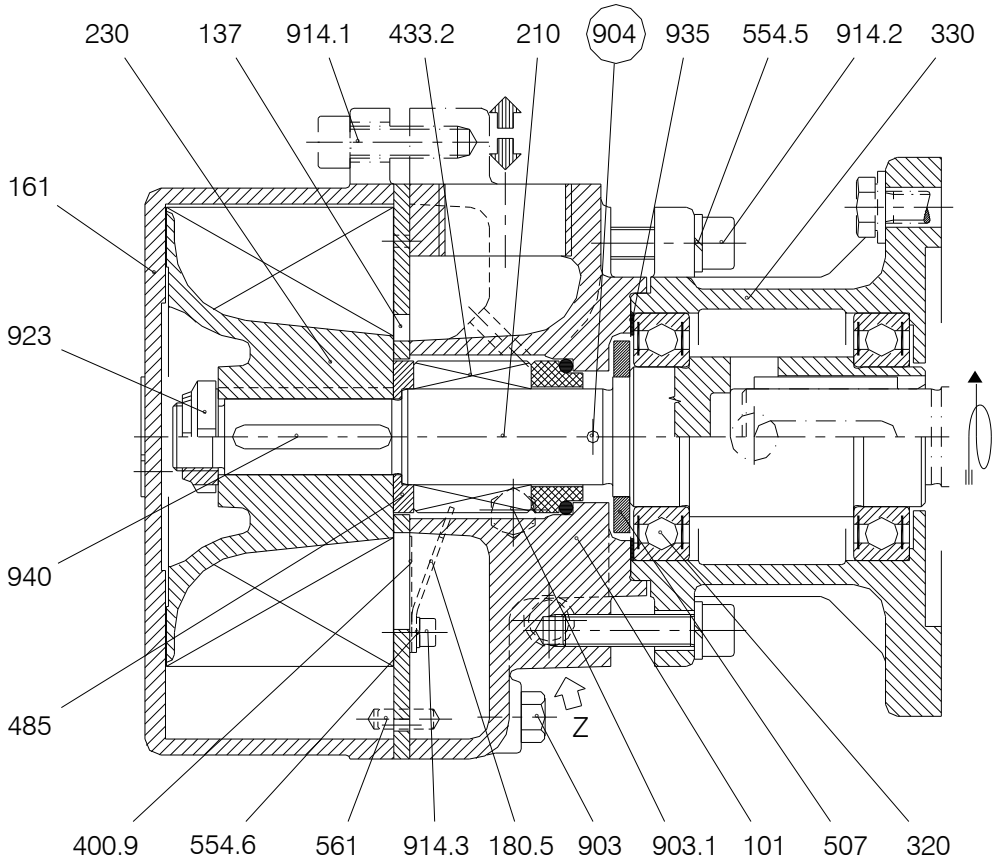


Fig. 4 - TRVX 255/1/M (with IEC 72-1 motor)

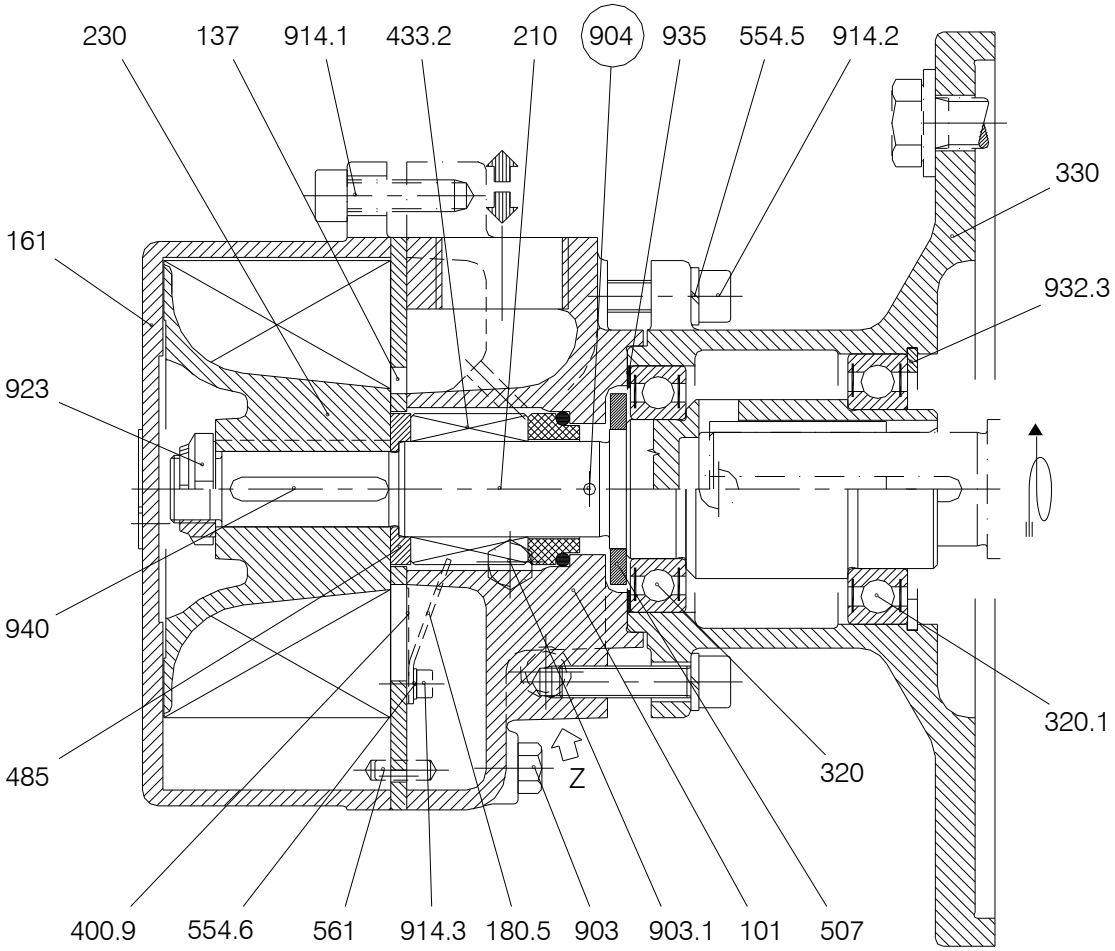


Fig. 5 - TRVX 255/1/N (with NEMA motor)

○ Eventual locating pin for mechanical seal stationary part VDMA 433.2

NOTES

PUMP model	Serial Number	Computer Number	Year of manuf.
.....	.....	.....	.....

GAS handled	Capacity	Suction Pressure	Discharge Press.	Temperature
.....	.....m^3/h	.....mbar	.....mbar	.....°C

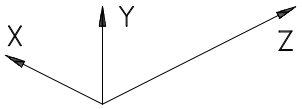
☐ Lethal ☐ Toxic ☐ Noxious ☐ Corrosive ☐ Malodorous ☐ .....

Service LIQUID	Capacity	Temperature
.....	.....m^3/h	.....°C

TOTAL WEIGHT

.....KGS.

MAXIMUM DIMENSIONS



X =.....cm
Y =.....cm
Z =.....cm

NOISE (measured at 1 m)

Pressure =.....dB(A)

Power =.....dB(A)

INSTALLATION

☐ Inside ☐ Outside

☐ Explosive area ☐ .....

SERVICE

☐ Continuous ☐ Intermittent

☐ .....

MOTOR type / Frame	No Poles	No Revolutions	Absorbed power	Installed power
.....	.....	.....RPM	.....Amp	.....kW / .....HP
Frequency	**Supply**	**Enclosure**	**Insulation class**	**Absorbed power**
.....Hz	.....Volt	IP.....	.....	.....kW / .....HP

COMMENTS

MONOSTAGE CENTRIFUGAL PUMPS

MAGNETIC DRIVE MONOSTAGE CENTRIFUGAL PUMPS

SELF-PRIMING CENTRIFUGAL PUMPS

MAGNETIC DRIVE SELF-PRIMING CENTRIFUGAL PUMPS

MULTISTAGE CENTRIFUGAL PUMPS

LIQUID RING VACUUM PUMPS

LIQUID RING COMPRESSORS

PACKAGE VACUUM UNITS WITH PARTIAL OR TOTAL SERVICE LIQUID RECIRCULATION

NA5.SM.TRVX.GB00 / PRINTED IN ITALY
Smontaggio TRVX 255 Inglese

La continua ricerca della POMPETRAVAINI ha come obiettivo il miglioramento del prodotto: per questo si riserva il diritto di modificare le caratteristiche senza alcun preavviso.

ISO 9001

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