

INSTRUCTIONS FOR INSTALLATION, ASSEMBLY AND DISASSEMBLY SINGLE STAGE CENTRIFUGAL ELECTRIC PUMPS WITH VERTICAL AXIS



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CONTENTS

1 - General information

- 1.1- *Introduction*
- 1.2- *Testing*
- 1.3- *Nameplate*
- 1.4- *Pump description*
- 1.5- *Installation*
- 1.6- *Discharge pipe*
- 1.7- *Measuring instruments*
- 1.8- *Operating valves*
- 1.9- *Direction of rotation*
- 1.10 - *Pump starting*
- 1.11 - *Checking during pump running*
- 1.12 - *Lubrication of bearing of bushes for pumps having an intermediate guide*
- 1.13 - *Maintenance*

2 - Disassembly

- 2.1- *First phase: Checking the transmission coupling*
- 2.2- *Second phase: Checking the impeller and the casing wear ring*
- 2.3- *Third phase: Checking the bearing bush and the shaft sleeve (and, if required, the casing cover wear ring)*
- 2.4- *Checking the intermediate guide (when required)*
 - 2.5.1 - *Fourth phase: Checking the bearing and the bearing housing for standard pumps with radial seal ring*
 - 2.5.2 - *Fifth phase: Checking the bearing and the mechanical seal for pumps having double back to back mechanical seal*

3 - Assembly

- 3.1- *Preparation of the parts for assembly*
 - 3.2.1 - *Assembly sequence for standard pumps with radial seal ring*
 - 3.2.2 - *Assembly sequence for pumps with double back to back mechanical seal*
- 3.3- *Assembly sequence common to all types of pumps*

4 - Spare parts



The liquids 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 is strictly forbidden to 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.

1 - GENERAL INFORMATION

1.1 - INTRODUCTION

We guarantee that the materials used by us are suitable for the construction of the pump, only if this is used for the characteristics indicated on our confirmation of order.

The personnel in charge shall be trained for these standards before starting up the pump.

If these standards are not complied with, the guarantee terms will fall off and we shall have no responsibility as to possible damages.

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.

The repairs and the interventions made by the customer on the pump shall not be guaranteed by us.

Note: The numbers called VDMA identify all parts differing one from the other, that form the pump; they can be consulted on the sections with the names enclosed to these instructions.

All represented drawings are only schematic and not engaging.

For further information consult our Technical Office.

1.2 - TESTING

All pumps are subjected to tests and are supplied with the characteristics confirmed.

The compliance with these standards allows to obtain a service having the desired characteristics without any inconveniences.

1.3 - NAMEPLATE

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).

1.4 - PUMP DESCRIPTION

The monocellular centrifugal electric pump with vertical axis consists of different materials required by special applications and is formed of a spiral casing with the axial suction inlet and with the discharge outlet perpendicular to the axis, of a dynamically balanced impeller in the axial thrusts by means of holes drilled in the hub or by means of dorsal paddles, of a ground shaft guided in its upper part by a largely dimensioned ball bearing, in its lower part by a bearing bush and, according to its length, by an intermediate guide.

A protection pipe of the shaft connects the pump casing to a supporting plate.

The pump is complete with a discharge pipe, a motor lantern and, if required, a lantern for stuffing box or mechanical seal for aggressive liquids.

1.5 - INSTALLATION

Unpack the pump and check that during the transport no damages have been caused to the structure.

Also check that all connections are perfectly connected and that the pump shaft freely rotates by hand.

The centrifugal electric pump with vertical axis does not require any particular operation of installation: it is sufficient to house it in the special hole or support applied or located in the collecting tanks and to screw it tightly with bolts located in the special holes that are on the supporting trap.

During the installation all precautions shall be taken in order to prevent damaging the pump.

It is necessary to avoid blows, welding of lifting lugs or lifting connections and to prevent that the pump is started before all installation works have been completed.

This requires only to take care of laying the pump in perfectly vertical position.

After laying the cables, proceed to accomplish the electric connection which is recommended to be carried out by qualified personnel.

1.6 - DISCHARGE PIPE

The discharge pipe shall not be subjected to sudden changes of section and direction. It must meet the hydraulic requirements suitable for its specific use.

Care should be taken not to subject the pump to tensions and pipe torque moments.

Therefore, it shall be mounted on suitable supports and if hot water is delivered, it shall be equipped with dilatation compensators.

1.7 - MEASURING INSTRUMENTS

In order to check the service, it is advisable to equip the discharge pipe with well dimensioned gauges with on-off valves. The full scale value of the instruments shall exceed at least 50% of the maximum operating pressure.

The gauges shall be mounted in such a way as to withstand the pump vibrations and shall not be kept steadily under load: this is obtained by closing the on-off valve of the gauges during the time, in which their reading is not required.

In such a way their duration shall be guaranteed.

1.8 - VALVES FOR OPERATION

Each pump normally requires an on-off element mounted on the discharge pipe (gate or valve).

This on-off element shall be located as near as possible the pump.

It can be used not only to block the discharge pipe but also to adjust the flowrate.

If the back pressure is missing, the pump shall be started with a closed on-off element, opening it only when the pump has reached the running rotation speed.

The pump that sucks from a channel or from a tank, shall be equipped, in suction, with a filter or a suction rose which detains possible suspended substances.

Therefore, periodically check that the filter or the suction rose are not clogged, otherwise arrange for it.

1.9 - ROTATION DIRECTION

After having carried out the electric connections, it is necessary to check the correct rotation direction.

To this purpose, turn on the power for the electric motor for a moment only and examine the elastic coupling located in the motor lantern. It shall turn in clockwise direction, namely from left to right, seen from the drive side.

If the rotation direction is wrong, it is sufficient, for the three-phase motors, to exchange among them the connections of any two phases.

CAUTION: An even short period of rotation in the wrong direction can cause the slackening of the locking nut of the impeller and, if the pump runs dry, it can cause an overheating of the bushes and their damage.

1.10 - PUMP STARTING UP

Since the pump is in STANDARD construction, it must not run dry, care shall be taken that at start up, the pump casing is immersed in the liquid to be pumped.

If it is not possible to let the liquid flow into the pump casing, it is warmly recommended not to start the pump and, if required, only for a few seconds.

Even when the pump is installed, it is necessary to make sure that, during its normal lifting and emptying work, it does not run in dry conditions, namely with the pump casing above the minimum level of liquid to be pumped as indicated by the dimension "X" in the enclosed drawing.

1.11 - CHECKS TO BE CARRIED OUT DURING PUMP RUNNING

During the pump running it is necessary to check the following points:

- The pump does not work dry but always in a regular way and without vibrations.
- The pump performances always are at the required point of work, assessing the final pressure of the pump or the power absorbed by the electric motor.
- There is a sufficient amount of flushing on the bushes.
- The correct flushing pressure has been arranged on the mechanical seals: act on the on-off valve checking the correct pressure on the gauge given as outfit.
- No leakages occurs on the mechanical seals.
- The bearing temperature is kept within acceptable limits and has the required lubrication.

1.12 - LUBRICATION OF BEARING BUSHES FOR PUMPS WITH INTERMEDIATE GUIDE

The lubrication of the bush of the intermediate guide VDMA 310.1, for pumps that deliver clean liquids, is obtained by means of the pumped liquid with intake from the discharge pipe VDMA 713.

The lubrication of the bearing bush VDMA 310 and of the bush of the intermediate guide VDMA 310.1, for pumps delivering dirty liquids, shall be carried out from an external source, by means of a small pipe, using clean liquid compatible with the delivered liquid.

The bush lubrication is essential: an even short period of rotation without lubrication can cause overheating and ensuing damage.

1.13 - MAINTENANCE

The maintenance is limited to the periodic restoring of the grease, if required, on the ball bearing located in the bearing housing by means of the special grease cup.

The watertight bearing requires no maintenance.

For the lubrication of the bearing, which is not required to be watertight, it is necessary to keep scrupulously to the requirements of the bearing supplier.

For the normally running pumps, bearings greasing shall occur after maximum 1000 working hours.

However, the frequency of lubrication depends above all on the temperature and on the stress the bearing can stand.

Therefore, always keep under control the running of the bearing checking its temperature and the noise level.

For the maintenance of bearings that have been disassembled and can still be used, it is necessary to remove all the old grease and dirt in the interstices (if possible, also from the sealing rings), then fill with new lubricating grease.

The lubricant type used by us is type "EP 3", grease with temperature limits of use of -30°C to $+140^{\circ}\text{C}$.

Equivalent greases or greases with greater performances can be used.

It is recommended to avoid mixing various different types of grease.

Before running, for safety reasons, it is better to carry out greasing by using a special grease gun.

When required, the maximum amount of lubricant is given on table 4 on page 10.

We remind you that the amount of lubricant required for a correct operation is of about 50% of the total capacity of the bearing chamber.

2 - DISASSEMBLY

2.1 - FIRST PHASE: CHECKING THE TRANSMISSION COUPLING

Disjoin the electric connections marking the wires, remove the bolts VDMA 901.9 or the screws VDMA 901.2 and the motor VDMA 801, disconnecting it from the upper lantern VDMA 341.

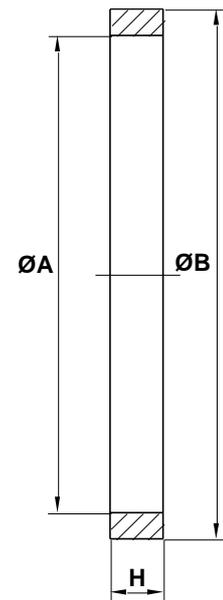
Check the conditions of the two half-couplings VDMA 861.1 and 861.2, of the corresponding security dowels and especially of the rubber dowels VDMA 867, which shall be replaced, if they are worn out.

2.2 - SECOND PHASE: CHECKING THE IMPELLER AND THE CASING WEAR RING

Tab. 1 - WEAR RINGS DIMENSIONS

PUMP MODEL	NOMINAL DIMENSIONS OF WEAR RINGS			RADIAL CLEARANCE in mm BETWEEN IMPELLER HUB AND WEAR RING				IMPELLER MINIMUM BALL SIZE mm
				CASING		CASING COVER		
	A	B	H	DESIGN F - RA	DESIGN A3	DESIGN F - RA	DESIGN A3	
25-125	72	84	13	0,33 - 0,48	0,43 - 0,58			6
25-160	72	84	13	0,33 - 0,48	0,43 - 0,58			6
32-125	72	84	13	0,33 - 0,48	0,43 - 0,58			6
32-160	72	84	13	0,33 - 0,48	0,43 - 0,58			5
32-200	72	84	13	0,33 - 0,48	0,43 - 0,58			5
32-250	85	97	13	0,44 - 0,59	0,74 - 0,89			6
40-125	85	97	13	0,34 - 0,49	0,44 - 0,59			10
40-160	85	97	13	0,34 - 0,49	0,44 - 0,59			7,5
40-200	85	97	13	0,34 - 0,49	0,44 - 0,59			6
40-250	95	110	16	0,44 - 0,59	0,74 - 0,89			6,5
40-315	95	110	16	0,44 - 0,59	0,74 - 0,89			8
50-125	95	110	16	0,34 - 0,49	0,44 - 0,59			16
50-160	95	110	16	0,34 - 0,49	0,44 - 0,59			13
50-200	95	110	16	0,34 - 0,49	0,44 - 0,59			9
50-250	105	120	16	0,44 - 0,59	0,74 - 0,89			5
50-315	105	120	16	0,44 - 0,59	0,74 - 0,89			7,5
65-160	120	135	16	0,44 - 0,59	0,74 - 0,89			18
65-200	120	135	16	0,44 - 0,59	0,74 - 0,89			14
65-250	120	135	16	0,44 - 0,59	0,74 - 0,89			12
65-315	130	150	18	0,44 - 0,61	0,84 - 1,01			10
65-315	130	190	26			0,44 - 0,61	0,84 - 1,01	10
80-160	135	150	16	0,44 - 0,61	0,74 - 0,91			25
80-200	135	150	16	0,44 - 0,61	0,74 - 0,91			21
80-250	135	150	16	0,44 - 0,61	0,74 - 0,91			15
80-315	140	160	18	0,44 - 0,61	0,84 - 1,01			13
80-315	140	190	24			0,44 - 0,61	0,84 - 1,01	13
100-200	150	170	18	0,44 - 0,61	0,74 - 0,91			27
100-250	150	170	18	0,44 - 0,61	0,84 - 1,01			18
100-250	150	200	22			0,44 - 0,61	0,84 - 1,01	18
100-315	180	200	20	0,44 - 0,61	0,84 - 1,01	0,44 - 0,61	0,84 - 1,01	14,5
100-400	180	200	20	0,44 - 0,61	0,84 - 1,01	0,44 - 0,61	0,84 - 1,01	12
125-250	180	200	20	0,44 - 0,61	0,84 - 1,01	0,44 - 0,61	0,84 - 1,01	30
125-315	200	220	18	0,45 - 0,62	0,85 - 1,02	0,45 - 0,62	0,85 - 1,02	24
125-400	200	220	18	0,45 - 0,62	0,85 - 1,02	0,45 - 0,62	0,85 - 1,02	15

Fig. 1



After having carried out the operations of the first phase, extract the pump from the tank or from the channel in which it was working, disconnecting the plant pipe from the discharge pipe VDMA 713 of the pump.

If it is possible, completely remove the pumped liquid from the pump and, in case of dangerous or harmful liquid, arrange to clean completely the parts before carrying any further operation.

Remove the bolts VDMA 901.8 of the discharge pipe and, if required, the small pipe VDMA 701 of lubrication and flushing of the intermediate guide VDMA 383, removing the pump casing VDMA 102, after having unscrewed the studs VDMA 902.2 or the screws VDMA 901.3.

It is thus possible to check the casing cover wear ring VDMA 502.1 of the impeller VDMA 230 (see page 7, figure 1 and table 1 for the general dimensions).

If it is required to replace it, unscrew the locking ring VDMA 904, strike out the old ring and press the new one inside.

At this point, it is possible to check also the impeller VDMA 230.

If its replacement is required, unscrew the locking nut VDMA 922 or 925, withdraw the impeller from the shaft VDMA 210, put the new one and tighten the locking nut.

2.3 - THIRD PHASE: CHECKING THE BEARING BUSH AND THE SHAFT SLEEVE (AND, IF REQUIRED, THE CASING COVER WEAR RING)

After having carried out the operations of the first and second phase, remove the studs VDMA 902.1 fastening the casing cover VDMA 161, disassemble the part and check the bearing bush VDMA 310 (see page 9, figure 2 and table 2 for the general dimensions).

If the bearing bush must be replaced (when in doubt, it is recommended to replace it always in any case) unscrew the three locking dowels VDMA 904.1, remove the worn bush by turning and put the new one with a press, checking that one of the vertical lubrication grooves corresponds to the lubrication hole through which even the bush must be drilled with a 5 diameter drill, and at last fasten the three locking dowels.

On the pumps equipped with casing wear ring VDMA 502.2 of the impeller VDMA 230, check this ring (see page 7, figure 1 and table 1 for the general dimensions).

If it has to be replaced, unscrew the locking dowels VDMA 904, strike out the old ring and press the new one inside. Remove the key VDMA 940.2 from the shaft and withdraw the protection sleeve VDMA 523 from the shaft (see page 9, figure 3 and table 3 for the general dimensions).

If it must be replaced, drive a new bush on the shaft up to the ledge inserting the gasket VDMA 400.3 in-between and place the key VDMA 940.2 again.

Tab. 2 - BEARING BUSHES DIMENSIONS

PUMPS SERIES	CASING COVER BEARING BUSH			INTERM. GUIDE BEARING BUSH		
	A	B	C	A	B	C
Group 1 (with Seal Ring)	30	51	65	35	48	70
Group 1 (with Mechanical or Packing Seal)				45	60	
Group 2 (with power up to 4 kW)	45	70	75	50	70	100
Group 2 (with power over 4 kW)						
Group 3 (Old Series)	60	80	75	55	75	110
Group 3 (New Series)						

Fig. 2

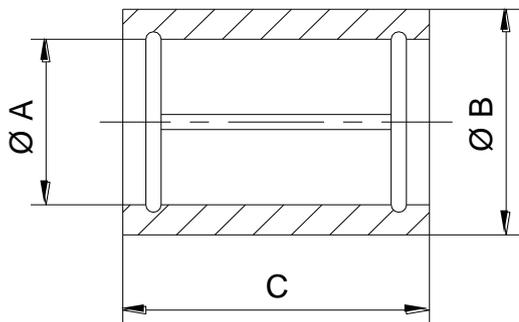
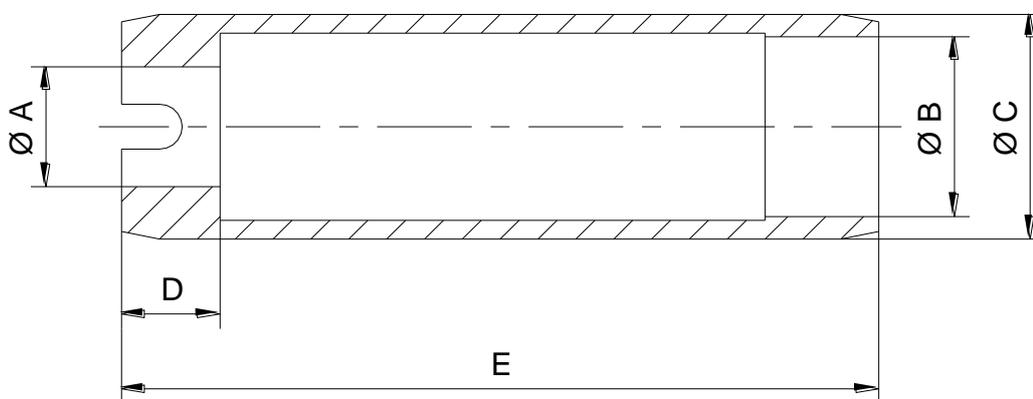


Fig. 3



Tab. 3 - SHAFT PROTECTION SLEEVES DIMENSIONS

PUMPS SERIES	A	B	C	D	E
Group 1	19	24	30	13	118
Group 2	28	35	45	16	148
Group 3 (Old Series)	37	45	55	17	150
Group 3 (New Series)				20	143

2.4 - FOURTH PHASE: CHECKING THE INTERMEDIATE GUIDE (WHEN REQUIRED)

After having carried out the operations of the first, second and third phase, unscrew the screws VDMA 914.3 and remove the lower part of the supporting pipe VDMA 711.

Withdraw the intermediate guide VDMA 383 from the shaft and check the bush VDMA 310.1 (see page 9, figure 2 and table 2 for the general dimensions).

If the bearing bush must be replaced (when in doubt, it is recommended to replace it always in any case), unscrew the three locking dowels, remove the worn bush by turning and put the new one with a press, checking that one of the vertical lubrication grooves corresponds to the lubrication hole through which even the bush must be drilled using a 5 diameter drill, and at last fasten the three locking dowels.

Check that shaft coincides with the bush.

2.5.1 - FIFTH PHASE: CHECKING THE BEARING AND THE BEARING HOUSING FOR STANDARD PUMPS WITH RADIAL SEAL RING

Fig. 4

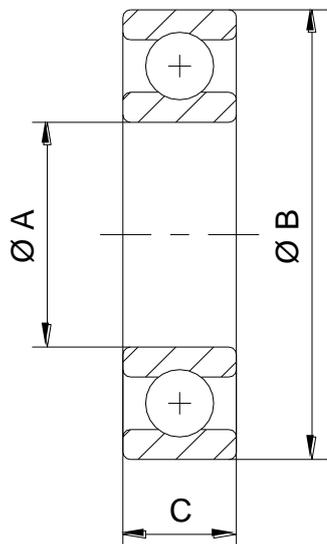
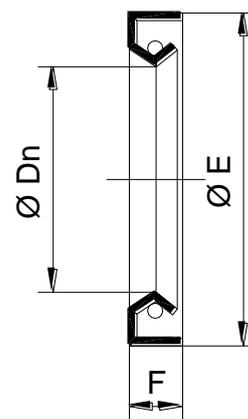


Fig. 5



Tab. 4 - BALL BEARINGS AND SEAL RINGS DIMENSIONS

PUMPS SERIES	BEARINGS DIMENSIONS					SEAL RINGS DIMENSIONS		
	A	B	C	BALL BEARING TYPE	Q.tà of GREASE for BEARING in g.	Dn	E	F
Group 1 Group 2 (with power up to 4 kW)	30	72	19	6306-C3-2RS	18	35	55	10
Group 2 (with power over 4 kW) Group 3 (Old Series)	40	90	23	6308-C3	20	43	60	
Group 3 (New Series)	50	110	27	6310-C3	35	55	75	

After having carried out the operations of the first, second, third and fourth phase, remove the lantern VDMA 341 that supports the motor, removing the screws VDMA 914.2 and, after having unscrewed the locking dowel, remove the half-coupling of motoring over VDMA 861.1.

Remove the fastening screws VDMA 914.1 of the bearing housing VDMA 357 from the supporting pipe VDMA 711 and, later on, also remove the bearing housing together with the shaft from the pipe.

Tighten the shaft VDMA 210 in horizontal position using a special vice, taking care not to damage it, extract the key drive side VDMA 940 and remove the bearing cover VDMA 360 or 365 from the housing.

According to the pump type, the bearing cover can be removed either by removing the screws VDMA 914 or removing the circlip VDMA 932.2.

Also remove the external shoulder rings VDMA 505.1, if any, or the elastic ring VDMA 935 and at this point, with a suitable key, unscrew the locking nut VDMA 923 of the bearing.

Then, using a proper puller, remove the bearing housing VDMA 357 and the bearing VDMA 320 laying bare the shaft (see page 10, figure 4 and table 4 for the general dimensions).

Then, extract the bearing together with the internal shoulder rings VDMA 505 from the bearing housing.

Later on, remove the seal ring VDMA 421 from the bearing housing (see page 10, figure 5 and table 4 for the general dimensions).

2.5.2 - FIFTH PHASE: CHECKING THE BEARING AND THE MECHANICAL SEALS FOR PUMPS HAVING DOUBLE BACK TO BACK MECHANICAL SEAL

After having carried out the operations of the first, second, third and fourth phase, disconnect the flushing pipes VDMA 701.1 and 701.2 of the mechanical seals VDMA 433.1 and 433.2.

Remove the bolts VDMA 901.1 from the supporting pipe VDMA 711 so that it can be extracted from the supporting plate VDMA 187.

Remove the screws VDMA 910.6 from the mechanical seal housing VDMA 451.1 and extract the latter together with the lanterns VDMA 341, the shaft VDMA 210 and the bearing housing VDMA 357 from the supporting pipe VDMA 711.

Tighten the shaft VDMA 210 in horizontal position in a special vice taking care not to damage it and remove the upper lantern VDMA 341 of the electric motor VDMA 801. Loosen the dowel of the half-coupling drive side VDMA 861.2 and withdraw the half-coupling.

Remove the key drive side VDMA 940.2, remove the circlip VDMA 932.3, the bearing cover VDMA 365 and the elastic ring VDMA 935 or the locking screws VDMA 914 of the bearing cover VDMA 360 and the two external shoulder rings VDMA 505.1.

Unscrew the nut VDMA 923 and using a special puller, remove the bearing housing VDMA 357 together with the corresponding reducing flange VDMA 185.1 and the lower lantern VDMA 341 from the shaft VDMA 210.

After this, extract the bearing VDMA 320 (see page 10, figure 4 and table 4 for the general dimensions) from the bearing housing together with the two shoulder rings VDMA 505, then extract the radial seal ring VDMA 421 (see page 10, figure 5 and table 4 for the general dimensions).

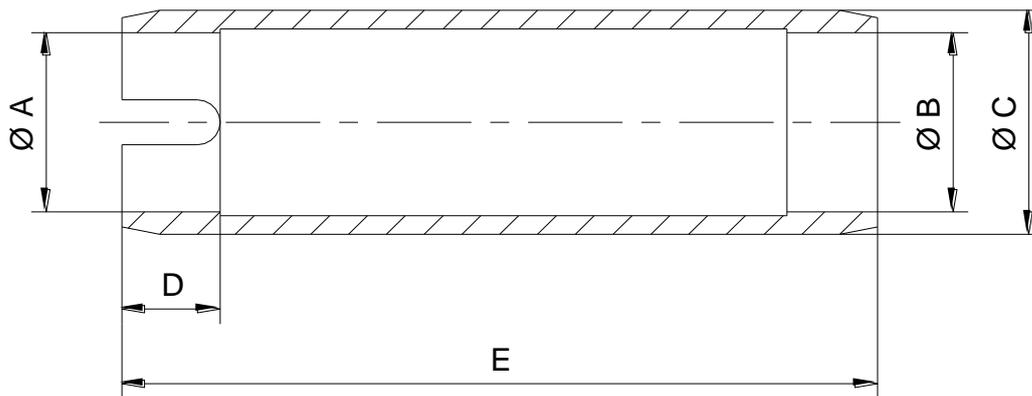
Loosen the stud nuts VDMA 902.3 of the mechanical seal cover VDMA 471 and remove this cover, the gaskets VDMA 400.5 and the stationary part of the mechanical seal VDMA 433.2 with the corresponding O-Ring.

Unscrew the nut VDMA 923.1 and remove from the shaft VDMA 210, the bush VDMA 525, the key VDMA 940.1 and then the seal bush VDMA 523.1 (see page 13, figure 6 and table 5 for the general dimensions) complete with the two rotating parts of the mechanical seals VDMA 433.1 and 433.2.

Remove the mechanical seal chamber VDMA 451.1 complete with the stationary part of the mechanical seal VDMA 433.1 with the corresponding O-Ring.

Note: The mechanical seals mounted on the pumps are of standard type, according to DIN 24960/K (with shorter dimension L1: for the general dimensions see page 13, figure 7 and table 6).

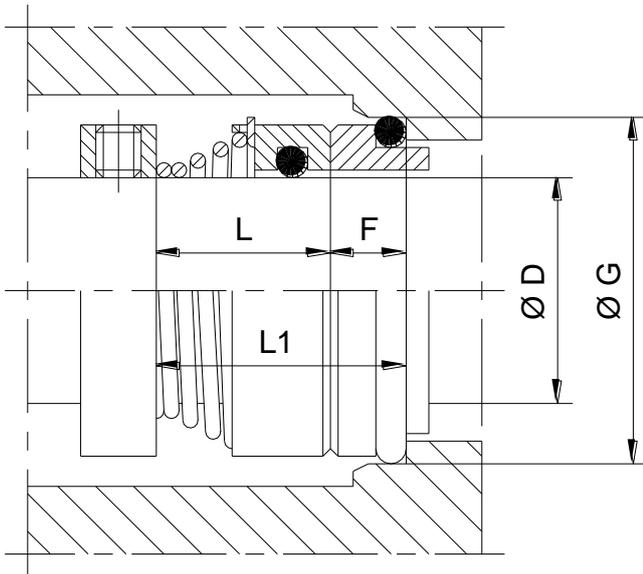
Fig. 6



Tab. 5 - MECHANICAL SEAL BUSHES DIMENSIONS

POMPE SERIE	A	B	C	D	E
Gruppo 1	38	45	16	147	

Fig. 7



Tab. 6 – MECHANICAL SEALS DIMENSIONS

PUMPS SERIES	D	G	F	L	L1
Group 1 – 2 – 3	45	63	13	32	45

3 - ASSEMBLY

3.1 - PREPARATION OF PARTS FOR THE ASSEMBLY

- 1 - Press the wear ring VDMA 502.1 into the pump casing VDMA 102 and fasten it with M6 or M8 dowel after having carried out the drilling and tapping.
If the pump is of the series TCTV, these first two phases shall not be carried out.
With Loctite, mount the two taps VDMA 903.1 and 903.3 into the pump casing.
Insert the studs VDMA 902.2 into the pump casing.
- 2 - Press the bush VDMA 310 into the casing cover VDMA 161, in which the groove corresponds to the lubrication hole through which even the bush shall be drilled using a 5 diameter drill.
Place the three locking dowels VDMA 904.1 into the casing cover VDMA 161.
According to the required lubrication type, close the flushing hole using a 1/4" gas tap or mount a fitting for pipe.
In this case, being the lubrication externally operated, close the M8 hole with a dowel.
- 3 - Press the bush VDMA 310.1 into the intermediate guide VDMA 383 in which the groove corresponds to the lubrication hole through which even the bush shall be drilled using a 5 diameter drill.
Lock the three locking dowels of the bush VDMA 310.1 with Loctite.
On the pumps, where this is available, press the wear ring VDMA 502.2 into the casing cover VDMA 161 and fasten it with a M6 or M8 dowel after having carried out the drilling and the tapping.
Mount the fitting VDMA 731.4 for the small pipe VDMA 701.
- 4 - Mount the seal ring VDMA 421 into the bearing housing VDMA 357 with the open part in direction of the bearing VDMA 320 and fill it with grease.

3.2.1 - ASSEMBLY SEQUENCE FOR STANDARD PUMPS WITH RADIAL SEAL RING

- 5 - Tighten the shaft VDMA 210 in horizontal position in a special vice taking care not to damage it. On the shaft, insert the thrower VDMA 507 and the bearing housing drive end VDMA 357.
Place the two internal shoulder rings VDMA 505 and mount the bearing VDMA 320 after having heated it in an induction furnace. After that, screw and tighten the nut VDMA 923 using a special key.
If the bearing VDMA 320 is not of the watertight type, fill it with grease and then fit the housing on the bearing.
At this point put the external elastic ring VDMA 935, the bearing cover in steel plate VDMA 365 and lock everything using the circlip VDMA 932.3 applying a slight pressure to press the elastic ring.
If the bearing cover is of the type equivalent to VDMA 360, which must be fastened with the screws, put the two external shoulder rings VDMA 505.1 and fasten the four screws VDMA 914.
Insert the key drive end VDMA 940 into the shaft VDMA 210.
- 6 - Mount the upper part of the supporting pipe VDMA 711 on the bearing plate VDMA 187.
Insert the shaft VDMA 201 with the corresponding bearing housing VDMA 357 into the supporting pipe VDMA 711 and fasten the housing to the flange of the supporting pipe, keeping the upper part of the housing turned towards the discharge pipe VDMA 713, namely with its inspection slot turned to the opposite side.
If the housing has the grease cup VDMA 636 for the bearing, it shall be turned to the right with respect to the discharge pipe positioned above.

3.2.2 - ASSEMBLY SEQUENCE FOR PUMPS HAVING A DOUBLE BACK TO BACK MECHANICAL SEAL

- 5 - Tighten the shaft VDMA 210 in horizontal position in a special vice taking care not to damage it and insert, on the shaft, the seal bush VDMA 523.1 together with the corresponding gasket VDMA 400.4.
Position the two locking rings of the mechanical seals VDMA 433.1 and 433.2 in their correct position referring to the shaft ledge of the bearing VDMA 320 (see the specific drawing).
Disassemble the seal bush VDMA 523.1 and mount it on the two rotating parts of the mechanical seals VDMA 433.1 and 433.2 using a lubrication liquid compatible with the material of the O-Ring.
Press the stationary part of the mechanical seal VDMA 433.1 in the seal chamber VDMA 451.1 after having lubricated the corresponding O-Ring.
Using Loctite, on the seal chamber VDMA 451.1, mount the union elbow VDMA 731.3 and screw the studs VDMA 902.3.
Press the stationary part of the mechanical seal VDMA 433.2 into the seal cover VDMA 471 after having lubricated the corresponding O-Ring.
Using Loctite, on the seal cover, mount the straight fitting VDMA 731.3.
On the shaft VDMA 210, insert the seal chamber VDMA 451.1 together with the stationary part of the mechanical seal VDMA 433.1 and, after this, also the seal bush VDMA 523.1 together with the rotating parts of both mechanical seals, checking the correct position of the junk gasket VDMA 400.4.
When mounting the seal chamber keep the union elbow VDMA 731.3 turned towards the discharge pipe VDMA 713.
On the shaft VDMA 210, insert the seal cover VDMA 471 with the corresponding gasket VDMA 400.5 and the stationary part of the mechanical seal VDMA 433.2, tighten the locking nuts of the studs VDMA 902.3 keeping the two fittings VDMA 731.3 in opposed position one with respect to the other.
Insert the key VDMA 940.1, the bush VDMA 525, screw and tighten the nut VDMA 923.1 on the shaft VDMA 210 using a proper key.
- 6 - Mount the bearing housing VDMA 357 on the reducing flange VDMA 185.1 and the latter on the lower lantern VDMA 341 locking the three details with the screws VDMA 914.1 and 914.3.
Insert the whole unit on the shaft VDMA 210, insert the two internal shoulder ring VDMA 505 and assemble the bearing VDMA 320 after having heated it in an induction furnace, after that, screw and tighten the nut VDMA 923 using a key.
If the bearing is not of the watertight type, it is necessary to fill it up with grease.
At this point, place the external elastic ring VDMA 935, the steel plate bearing cover VDMA 365 and lock everything with the circlip VDMA 932.3 applying a light pressure to press the elastic ring.
If the bearing cover is of VDMA 360 type, which has to be fastened with the screws, place the two external shoulder rings VDMA 505.1 and fasten the four screws VDMA 914.
Insert the key drive end VDMA 940 into the shaft VDMA 210.
Mount the upper part of the supporting pipe VDMA 711 on the seal chamber VDMA 451.1 placing the corresponding gasket VDMA 400.6 between the two details and taking care of the orientation of the flushing details VDMA 731.3.
Insert the whole unit into the supporting plate VDMA 187 with the corresponding gasket VDMA 400.7 and with the screws VDMA 901.1 tighten the supporting plate VDMA 187, the supporting pipe VDMA 711 and the lower lantern VDMA 341.

3.3 - ASSEMBLY SEQUENCE COMMON TO ALL TYPES OF PUMPS

- 7 - Mount the intermediate guide VDMA 383 and the final piece of the supporting pipe VDMA 711, if the type of pump requires it, taking care to keep the ledge for the bush VDMA 310.1 of the intermediate guide turned downwards and the lubrication hole turned toward the same direction of the hole drilled on the delivery pipe VDMA 713.
- 8 - Insert the bush VDMA 523 that protects the shaft on the shaft VDMA 210 and insert the impeller key VDMA 940.2.
- 9 - Mount the casing cover VDMA 161 keeping the lubrication hole of the bush VDMA 310 or the fitting turned towards the discharge pipe VDMA 713.
- 10 - On the shaft, insert the impeller VDMA 230 and tighten the locking nut VDMA 922 or 925.
- 11 - Mount the impeller casing VDMA 110 with the corresponding gasket VDMA 400.1 (only for the pumps of the series TCTV).
Mount the spiral casing VDMA 102 together with the corresponding gasket of the casing VDMA 400.1 and tighten the nuts of the studs VDMA 902.2.
If required, apply a stup pipe VDMA 138 or a rose pipe VDMA 745 on the suction inlet.
Make sure that the shaft VDMA 210 of the pump turns freely by hand, otherwise arrange for this.
- 12 - Mount the discharge pipe VDMA 713 on the pump casing VDMA 102 fasten the two locking screws VDMA 901.4 of the same pipe located under the plate VDMA 187.
Connect the small pipes VDMA 701, if any are present, for the flushing of bushes VDMA 310 and/or 310.1.
- 13 - Insert the half-coupling VDMA 961.1 on the shaft VDMA 210 of the pump and tighten the corresponding locking dowel.
Mount the upper lantern VDMA 341 of the electric motor VDMA 801 together with the corresponding reducing flange VDMA 185 (if required) fastening the screws VDMA 901.2.
Insert into the lantern the protecting net (if required).
Insert the half-coupling VDMA 961.2 on the shaft of the electric motor VDMA 801 and place the motor on the upper lantern VDMA 341 checking the position of the two half-couplings VDMA 861.1 and 861.2 which must be at a distance of about 3 mm. one from the other, at last tighten the bolts VDMA 901.9 to fasten the motor.

4 - 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 minimise unnecessary down times in the event of pump failure or routine maintenance.

For better parts management, the VDMA 24296 standards suggest to stock the number of parts in function of the number of pumps being used by the plant (see following table).

Spare parts		Identical pumps number (stand-by pumps included)						
		2	3	4	5	6 and 7	8 and 9	10 and more
Components		Number of spare parts						
Suction and discharge elements		1	1	2	2	2	3	30%
Impellers				1				
Radial seal rings		2	2	2	3	3	4	50%
Ball or roller bearings								
Shaft complete with keys, nuts, shoulder rings, etc.		1	1		2	2	3	30%
Bushes					2	2	3	4
Shaft protection sleeves		1	1				2	2
Neck rings					16	16	24	24
Packing rings		4	6	8			8	9
Gaskets for pump casing (Set)					10	100%		
Other gaskets (Set)		2	3	4		5	6	7
Mechanical seals	Rotating part							
	Stationary part							
	Rotating part gasket			6	8	8	10	150%
	Stationary part gasket							
Springs		1	1	1	1	2	2	20%
Bearing housing groups complete with shaft, bearings, covers, seal rings, etc.		---	---	---	---	---	1	2
Coupling inserts (Set)		2	3	4	5	6	7	75%

On the pump nameplate there are printed pump model, year of manufacture and pump serial number.

When ordering spare parts always provide this information.

Pump type, parts item number (VDMA) and description per the pump sectional drawing and parts list is useful information which helps to supply correct spare parts for your pump.

We recommend the use of original spares: in case this is not respected, POMPETRAVAINI declines any responsibility for eventual damages and not correct running caused by not original spare parts.



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.

NOTES

PUMP model	Serial Number	Computer Number	Year of manuf.
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LIQUID handled	Capacitym ³ /h	Suction Pressurem	Discharge Press.m	Temperature°C
<input type="checkbox"/> Lethal	<input type="checkbox"/> Toxic	<input type="checkbox"/> Noxious	<input type="checkbox"/> Corrosive	<input type="checkbox"/> Irritant
<input type="checkbox"/> Clean	<input type="checkbox"/> Dirty	<input type="checkbox"/> With suspended parts	Spec. Gravity.....	Viscosity.....
			PH.....	

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

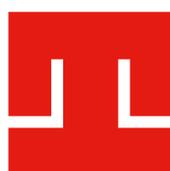
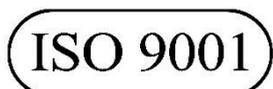
Continuous Intermittent

MOTOR type / Frame	No Poles	No RevolutionsRPM	Absorbed powerAmp	Installed PowerkW /HP
FrequencyHz	SupplyVolt	Enclosure IP.....	Insulation class	Absorbed PowerkW /HP

COMMENTS

NA5.SM.VERT.GB00 / PRINTED IN ITALY
Smontaggio TC... Verticali Inglese

Continuing research of POMPETRAVAINI results in product improvements: therefore any specifications may be subject to change without notice.



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