

TMR SERIES

IDENTIFICATION CODE												
PUMP DATA						MOTOR DATA						
ange	model		execution	material O-ring	inside structure	connections	rpm	motor	voltage/EEEx	phases	powers	
	50Hz	60Hz									kW	HP
TMR	<input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> S	<input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> S	<input type="checkbox"/> WR GFR-PP	<input type="checkbox"/> V FPM	<input type="checkbox"/> R1 C/Al2O3	<input type="checkbox"/> B filettate BSP	<input type="checkbox"/> 1450	<input type="checkbox"/> E IEC	<input type="checkbox"/> 0 senza motore	<input type="checkbox"/> 3 fasi	<input type="checkbox"/> 0.55	<input type="checkbox"/> ¾
	<input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> S	<input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> S	<input type="checkbox"/> GF CFF-E-CTFE	<input type="checkbox"/> E EPDM	<input type="checkbox"/> X1 SiC/Al2O3	<input type="checkbox"/> N filettate NPT	<input type="checkbox"/> 2900	<input type="checkbox"/> U NEMA	<input type="checkbox"/> N V std	<input type="checkbox"/> 1 fase	<input type="checkbox"/> 0.75	<input type="checkbox"/> 1
	<input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> S	<input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> S		<input type="checkbox"/> K FFKM	<input type="checkbox"/> R2 C/SiC	<input type="checkbox"/> I flangiate ISO	<input type="checkbox"/> 1740		<input type="checkbox"/> S V speciale		<input type="checkbox"/> 1.1	<input type="checkbox"/> 1½
	<input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> S	<input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> S			<input type="checkbox"/> X2 SiC/SiC	<input type="checkbox"/> A flangiate ANSI	<input type="checkbox"/> 3500		<input type="checkbox"/> E EEx		<input type="checkbox"/> 1.5	<input type="checkbox"/> 2
	<input type="checkbox"/> N <input type="checkbox"/> P	<input type="checkbox"/> N				<input type="checkbox"/> J flangiate JIS					<input type="checkbox"/> 2.2	<input type="checkbox"/> 3
	<input type="checkbox"/> N <input type="checkbox"/> P	<input type="checkbox"/> N									<input type="checkbox"/> 3	<input type="checkbox"/> 5
Year of manufacture			Part number								<input type="checkbox"/> 4	<input type="checkbox"/> 5

1 TABLE OF CONTENTS

1	TABLE OF CONTENTS	1
2	DISASSEMBLING SEQUENCE	2
2.1	HYDRAULIC PARTS LEGEND	3
2.2	MOTOR PARTS LEGEND	3
3	IDENTIFICATION CODES	4
4	GENERAL NOTES	4
5	OPERATING PRINCIPLE	5
6	MOTOR	6
7	DRY RUNNING SURVEY	6
8	INSTRUCTIONS ON INSTALLATION AND USE	7
8.1	TRANSPORT	7
8.2	INSTALLATION	7
8.3	START-UP	8
8.4	USE	9
8.5	SHUTDOWN	9
9	MAINTENANCE	9
9.1	DISMANTLING	9
9.2	INSPECTION	10
9.3	ASSEMBLY	11
10	SAFETY RISKS	12
10.1	INSTALLATION AND COMMISSIONING PERSONNEL	13
10.2	OPERATORS AND MAINTENANCE PERSONNEL	13
10.3	REPAIR PERSONNEL	13
10.4	WASTE DISPOSAL	14
11	IMPROPER USE	14
12	OPERATING FAULTS AND POSSIBLE CAUSES	14
13	TECHNICAL DATA	15
14	GENERAL CONDITIONS OF SALE	18
15	MANUFACTURER DATA	19

for MAINTENANCE
date of commissioning
position / system reference
service

DEALER

2 DISASSEMBLING SEQUENCE

TOOLS



- ☐ Spanner No 13

EXECUTION NOTES

- ☐ To facilitate the pump disassembling operations, first disassembly the **HYDRAULIC PARTS** from the **MOTOR PARTS**
- ☐ unscrew the connections (**POS.1**)
- ☐ **warning!** The disassembly operations of parts magnetically connected involve great opposed forces: keep the **MOTOR PARTS** fixed on floor during the removing of the **HYDRAULIC PARTS**.

WARNING

The interventions must be performed under supervision of qualified personnel.
Before starting remember:

- ☐ cut off the power supply from the motor and disconnect the electrical wiring; pull the wires out from the terminal box and isolate their extremities accordingly
- ☐ close the suction and discharge valves; open the drain valve
- ☐ use appropriate gloves, protective glasses and acid proof-clothing when disconnecting and washing the pump
- ☐ disconnect hydraulic connections: leave enough time for the residual liquid to exit the pump casing and atmospheric air to fill the empty volume
- ☐ wash the pump before starting maintenance operations
- ☐ do not scatter the washing liquid in the environment
- ☐ before attempting to dismantle the pump ensure that its motor is disconnected and that it may not be started accidentally
- ☐ before the inspection, check that you have spare O-rings ready to hand for re-installing at the end of operations
- ☐ **warning!** Operations near the magnets attract the tools. Proceed with caution to avoid damages.

For further details see paragraph 9.1 "Disassembling"

DISASSEMBLING STEPS SEQUENCE

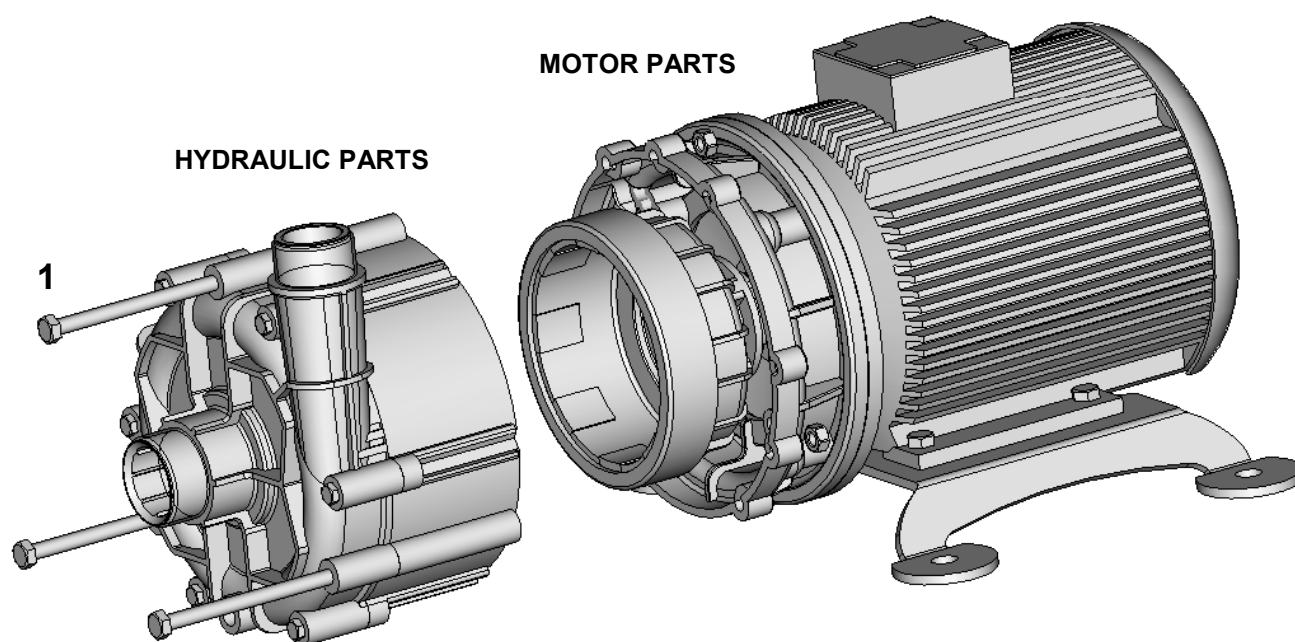


Fig. 2.A – disassembling steps sequence

Pos.	Ref.	Part name	Q.ty No	Disassembling steps sequence										Spare stock for working years	
				1	2	3	4	5	6	7	8	9	10	2	5
1	910.1	Connection volute casing/strainer	3	•											

2.1 HYDRAULIC PARTS LEGEND

TOOLS



- ☐ Spanner No 10

EXECUTION NOTES

- ☐ Disassembly keeping the pump in vertical position (suction on top)
- ☐ unscrew the connections (POS.2).

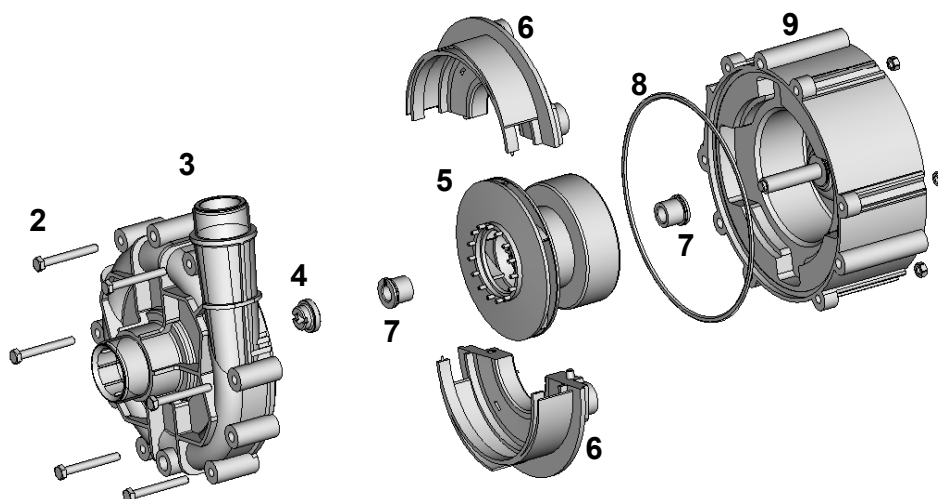


Fig. 2.1 A – disassembling sequence HYDRAULIC PARTS

Pos.	Ref.	Part name	Q.ty No	Disassembling steps sequence										Spare stock for working years	
				1	2	3	4	5	6	7	8	9	10	2	5
2	910.2	Connection volute casing/rear casing	6		•										
3	102	VOLUTE CAGING	1			•									1
4	331	FRONT THRUST BEARING	1				•							1	2
5	233	IMPELLER	1					•						1	1
6	134	CENTER DISC	2					•							
7	545	GUIDE BUSHING	2						•					2	4
8	412	OR VOLUTE CASING	1							•				1	2
9	162	REAR CASING	1								•				1

2.2 MOTOR PARTS LEGEND

STRUMENTI



- ☐ Screw driver
Type Phillips
- ☐ punch $\phi < 4$ mm



- ☐ Spanner No 13

NOTE OPERATIVE

- ☐ Unscrew the connections (POS.10)
- ☐ Remove the collar from the drive magnet assembly using the punch (see paragraph 9.1)

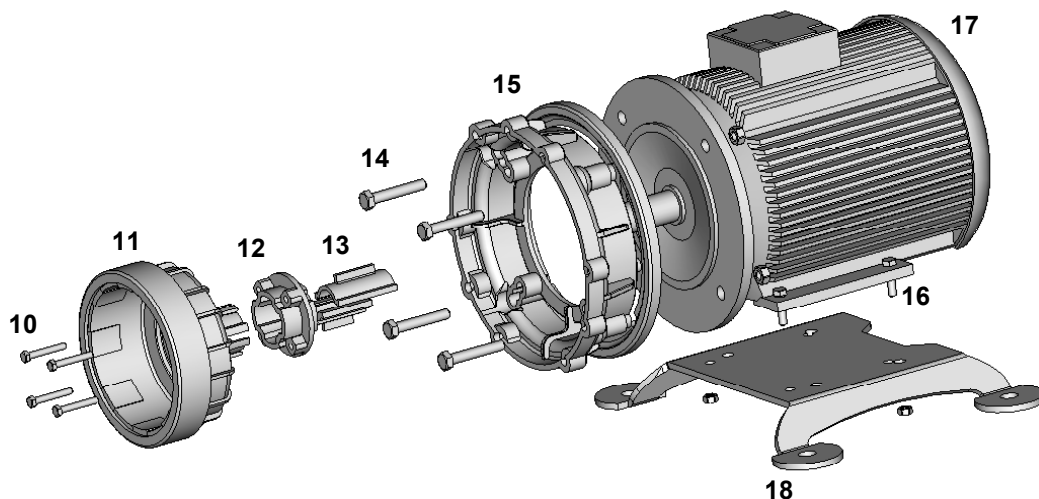


Fig. 2.2 A – disassembling sequence MOTOR PARTS

Pos.	Ref.	Part name	Q.ty No	Disassembling steps sequence										Spare stock for working years	
				1	2	3	4	5	6	7	8	9	10	2	5
10	910.3	Connection drive magnet assembly / electric motor	4			•									
11	855	DRIVE MAGNET ASSEMBLY	1				•								
12	518	COLLAR (drive magnet assembly)	1					•						1	
13	523	SOCKET	2					•						2	
14	910.4	Connection strainer / electric motor	4						•						
15	807	STRAINER	1							•					
16	910.5	Connection electric motor / baseplate	4								•				
17	800	ELECTRIC MOTOR	1									•			
18	890	BASEPLATE	1										•		

3 IDENTIFICATION CODES

Each pump is supplied with the serial and model abbreviation and the serial number on the rating plate, which is riveted onto the support side. Check these data upon receiving the goods. Any discrepancy between the order and the delivery must be communicated immediately.

In order to be able to trace data and information, the abbreviation, model and serial number of the pump must be quoted in all correspondence.

The diagram shows a rectangular rating plate for a centrifugal pump. At the top, it says 'Clockwise rotation looking at the motor-fan'. Below this, the plate is divided into several sections. The top left section is yellow and contains the text 'CENTRIFUGAL PUMP'. To its right, there is a section for 'serie' (serial number) and 'type'. Below these, there are sections for 'seal', 'item', 'n' (rpm), 'H' (head), 'Q' (flow rate), 'capacity', 'V1', 'pressure', 'min/max', and 'Bar'. The bottom section contains 'Year of manufacture', 'MADE IN ITALY', and the company name 'ARGAL pompe' with a logo. The plate is labeled with 'RANGE' on the left, 'SERIAL NUMBER' on the top right, and 'MODEL' on the bottom right.

Fig. 3 A – Rating plate

4 GENERAL NOTES

"TRM" pumps are designed and built for the transfer of liquid chemical products having a specific weight, viscosity, temperature and stability of state appropriate for use with centrifugal pumps in a fixed installation, from a tank at a lower level to a tank or a pipe to a higher level. The characteristics of the liquid (pressure, temperature, chemical reactivity, specific weight, viscosity, vapour tension) and the ambient atmosphere must be compatible with the characteristics of the pump and are defined upon ordering.

The pump's performance (capacity, head, rpm) is defined upon ordering and specified on the identification plate.

"TMR" and pumps are centrifugal, horizontal, single stage, coupled to a non-synchronous electric motor via a magnetic coupling, with axial inlet and radial outlet for connection to the hydraulic system. They are foot-mounted for floor fixing.

"TMR" pumps are not self priming.

R₁-R₂ execution "TMR" pumps can run dry.

The liquid to be pumped must be clean for the R₁₋₂ execution, the X₁₋₂ execution may contain solid (% dimension and solid part hardness must be agreed during the offer).

Clockwise rotation seen from the motor side.

Make sure that the chemical and physical characteristics of the liquid have been carefully evaluated for pump suitability.

Verify the compatibility with the physical-chemical characteristics of the liquid.

The specific weight that can be pumped at 25 °C (liquid and environment) referred to max flow (50 e 60 Hz) depend upon the type of construction:

normal construction N (stamped on the rating plate)	1,10	kg/dm ³
heavy duty construction P (stamped on the rating plate)	1,60	kg/dm ³

The specific weight that can be pumped at 70°C is 10% less than that at 25°C.

The level of cinematic viscosity must not exceed 30 cSt so as not to significantly modify the pump's performance. Higher values up to a maximum of 100 cSt are possible provided that the pump is equipped with suitable impeller to be defined upon ordering.

The maximum continuous working temperature referred to water depends on the choice of materials (specified on the identification plate):

80 °C (176 °F)	execution WR
110 °C (230 °F)	execution GF

The ambient temperature interval is related to the choice of materials (specified on the identification plate):

0 - +40°C (14÷104 °F)	execution WR
-20 - +40°C (-4 ÷104 °F)	execution GF

The maximum pressure the pump may be subjected to is 1.5 times the head value developed with the outlet closed.

The vapour pressure value of the liquid to be pumped must exceed (by at least 1m w.c) to the difference between the absolute total head (suction side pressure added to the positive suction head, or subtracted by the suction lift) and the pressure drops in the suction side piping (including the inlet NPSHr drops shown on the specific tables).

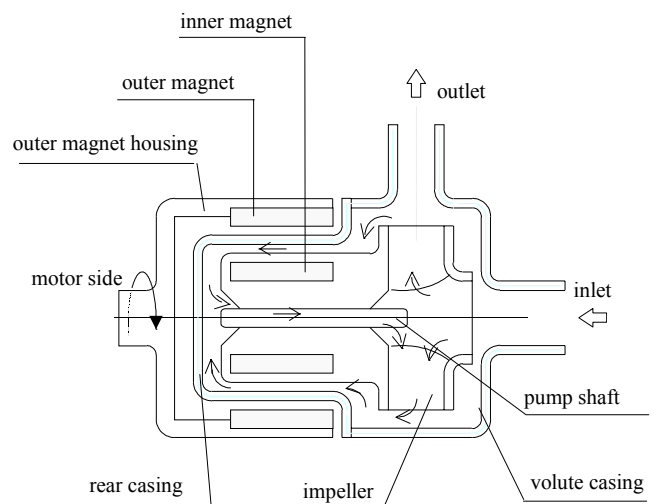
The pump does not include any non return valve nor any liquid flow control or motor stop device.

5 OPERATING PRINCIPLE

HYDRAULICALLY alike to all centrifugal pumps, it is equipped with a blade-type impeller rotating within a fixed housing. It has a tangential outlet (or radial with an internal deflector) and, by creating a depression in the center, it allows the liquid to flow from the central suction side. Then, flowing through the impeller's blades, the fluid acquires energy and is conveyed towards the outlet.

MECHANICALLY different from the traditional centrifugal pumps in the impeller motion drive thanks to the magnetic field created between the primary outer magnet and the inner magnet (not visible because housed inside the impeller hub). The magnetic field crosses the plastic parts and the liquid, and firmly couples the two magnet assemblies. When the motor causes the outer magnet to rotate together with its housing, the inner magnet assembly is dragged at the same speed. As a result the impeller, which is integral to it, is maintained in rotation.

The SHAFT, totally within the housing, is not involved in the transmission of rotary motion; its only function is to act as a centering guide and support for the impeller. To this end the components are designed so that a spontaneous cooling circuit (due to a simple effect of pressure) is established to cool the surfaces subject to friction. Periodic inspections prevent the build-up of sediments between the shafts and the guide bushes significantly lengthening their working life. □

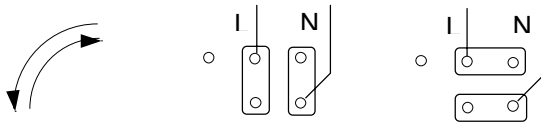


6 MOTOR

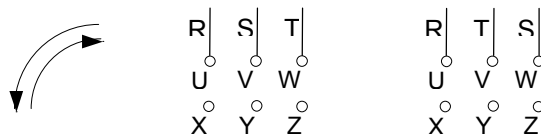
Electrical connections

The electrical connection to the motor terminal determines the direction of rotation of the motor and can be verified by looking at the cooling fan at the rear of the motor (for the Argal pump this has to rotate clockwise looking at the front end).

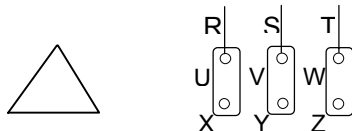
With single phase motors the direction of rotation may be reversed by changing the position of the connection plates:



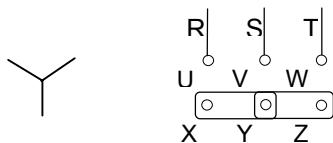
With three-phase motors the direction of rotation may be changed by swapping any two of the three conductors independently of the type of connection to the windings:



The windings of three-phase motors (e.g. with (a) 230-400 V; (b) 400-600 V) require a delta-connection for lower voltage (230 volts for a ; 400 volts for b).



They require a star-connection for higher voltage (400 volts for a; 690 volts for b).



Star/Delta starting is used when the motor power is above 7.5 kW (10 HP) only in case of frequent starts and short running times, but always when the motor power is above 15kW (20 HP). All this is also to safeguard the structure of the pump.

Protection level

The initials IP are followed by two numbers :

The first number indicates the level of protection against penetration of solid objects and in particular :

- 4 for solids whose dimension is greater than 1mm
- 5 for dust (eventual internal deposits will not harm operation)
- 6 for dust (no penetration)

The second number indicates the protection against the penetration of liquids. In particular:

- 4 for water sprays from all directions
- 5 for jets of water from all directions
- 6 for tidal and sea waves.

According to the IP protection indicated on the identification plate of the motor and to the environmental conditions, arrange for opportune extra protections allowing in any case correct ventilation and rapid drainage of rainwater.

7 DRY RUNNING SURVEY

Though the pump can run dry (execution R₁-R₂) , it is therefore suitable to safeguard the pump and the plant to use:

- pressure switch;
- fluxmeter;
- control devices for the motor power absorption.

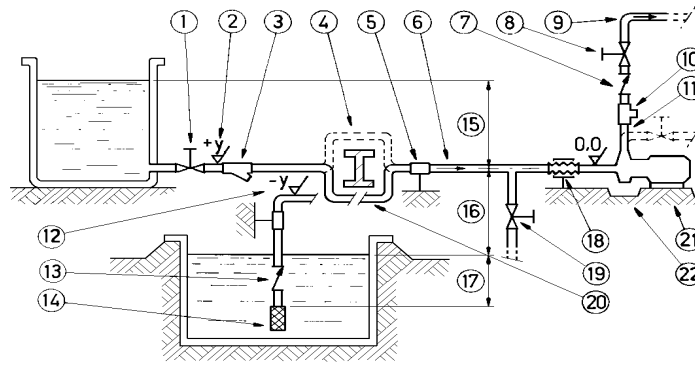
8 INSTRUCTIONS ON INSTALLATION AND USE

8.1 TRANSPORT

- cover the hydraulic connections
- when lifting the unit do not exert force on the plastic fittings
- lay the pump on its base or fixing plate during transport
- if the road is particularly rough, protect the pump by means of adequate shock absorbing supports
- bumps and shocks may damage important working parts vital for safety and functionality of the machine

8.2 INSTALLATION

- clean the plant before connecting the pump
- make sure that no foreign bodies are left in the pump. Remove safety caps on the hydraulic connections.
- follow the instructions indicated in the following diagram:
 - 1) YES: gate valve (may also be near pump in the case of long piping)
 - 2) With positive head: tilt of piping towards pump
 - 3) YES: line strainer (3-5 mm mesh)
 - 4) NO: air pockets: the circuit must be short and straight
 - 5) YES: pipe fixing parts
 - 6) Fluid speed suction: 2.5 m/s
 - 7) YES: check valve (especially for long vertical or horizontal pipes; compulsory with parallel pumps).
 - 8) YES: adjusting gate valve on outlet
 - 9) speed of delivered fluid: 3.,5 m/s max. .
 - 10) YES: attachment for gauge or safety pressure switch
 - 11) NO: elbow joints (and other parts) on the pump (discharge and suction lines)
 - 12) With negative suction lift: tilt of piping towards suction tank
 - 13) YES: check valve (with negative suction lift)
 - 14) YES: strainer (3-5 mm mesh)
 - 15) Suction head varies according to flow in order to prevent windage (min. 0.5 m, max. 15% of pump head)
 - 16) Suction head, 3 m max.
 - 17) Immersion depth: 0.3 m min.
 - 18) YES: expansion joint (indispensable with long pipes or hot liquids) and/or anti-vibration facility during discharge and suction; anchored near to pump
 - 19) YES: pipe discharge (completely sealed), discharge valve shut during normal operations
 - 20) YES: overcoming obstacles at lower depths.
 - 21) Fix the pump by the fixing holes provided: the supports must be level
 - 22) YES: drainage channel around base



- anchor the pump to an adequate base plate having a mass at least 5 times that of the pump
- do not use anti-vibration mounts to fix the pump
- anti-vibration joints are recommended on the pipe connections
- manually verify that all rotating parts are free to turn without abnormal friction by turning the motor cooling fan
- make sure that the power supply is compatible with the data shown on the pump motor identification plate
- connect the motor to the power supply via a magnetic/thermal control switch
- ensure that star-delta starting is implemented for motors whose power is more than 15kW
- install emergency stop devices to switch off the pump in case of low liquid level (floating, magnetic, electronic, pressure- sensitive)
- ambient temperature as a function of the physical-chemical characteristics of the liquid to be pumped and in any case not greater or lower than the interval indicated in the GENERAL HINTS
- other environmental conditions in accordance with the IP protection of the motor
- install a drainage pit to collect any liquid overflow from the base drainage channel due to normal maintenance work
- leave enough free space around the pump for a person to move
- leave free space above the pump for lifting operations
- highlight the presence of aggressive liquids with coloured tags following the local safety regulations
- do not install the pump (made in thermoplastic material) in close proximity to heating apparatus
- do not install the pump in areas subject to solid or liquid matter falling
- do not install the pump in an explosive atmosphere unless the motor and its coupling have been adequately pre-arranged
- do not install the pump in close proximity to workplaces or crowded areas
- install extra protection guards for the pump or persons as the need arises
- install a spare equivalent pump in parallel

8.3 START-UP

- verify that the instructions outlined in the INSTALLATION have been followed
- verify the correct direction of rotation (clockwise from the motor side) supplying the motor with short impulses
- ensure that the NPSH available is greater than that required by the pump (in particular for hot liquids, liquids with high vapour pressure, very long suction pipes or negative suction lift)
- close the drain valve (pos. 19); totally flood the suction pipe and the pump
- start the pump with the suction valve completely open and the discharge valve partially closed
- slowly regulate the flow by opening or closing the discharge valve (never the suction valve). Make sure that the power absorbed by the motor does not exceed the rated one indicated on the motor identification plate
- do not operate the pump at the limit values of its performance curve: maximum head (discharge valve excessively closed) or maximum capacity (total absence of drops and geodetic head on the discharge side)
- set the operating point to that for which the pump was requested
- ensure that there are no abnormal vibrations or noise due to inadequate mounting or cavitation
- avoid short and/or frequent starts by properly setting the control devices
- ensure that the temperature, pressure and liquid characteristics are as those specified at the time of order.

8.4 USE

- switch automatic control on
- do not activate valves whilst the pump is in operation
- risks of dangerous water hammer effects in case of sudden or improper valve actuation (only trained personnel should operate valves)
- completely empty and wash the pump before using a different liquid
- isolate or empty the pump if the crystallization temperature of the liquid is the same or lower than the ambient temperature
- stop the pump if the liquid temperature exceeds the maximum allowed temperature indicated in the general notes; if the increase is of approximately 20%, check internal parts
- close the valves in case of leaks
- wash with water only if compatible from the chemical point of view. As alternative use an appropriate solvent that will not generate dangerous exothermal reactions
- contact the liquid supplier for information on the appropriate fire precautions
- empty the pump in case of long periods of inactivity (in particular with liquids which would easily crystallize)

8.5 SHUTDOWN

- disconnect the motor
- before starting maintenance, turn off the suction and discharge valves

9 MAINTENANCE

All these maintenance operations must be performed under the supervision of qualified personnel

- make periodic inspections (2 to 6 months depending on the type of liquid and the operating conditions) on the rotating parts of the pump; clean or replace as necessary
- make periodic inspections (3 to 5 months depending on the type of liquid and the operating conditions) on the functionality of the motor control system; efficiency must be guaranteed
- make periodic inspections (2 to 30 days depending on the type of liquid and the operating conditions) of the in-line and foot filters as well as of the bottom valve
- the presence of liquid below the pump could be a clue to pump problems
- excessive current consumption could be an indication of impeller problems
- unusual vibrations could be due to unbalanced impeller (due to damage or presence of foreign material obstructing its blades)
- reduced pump performance could be due to an obstruction of the impeller or damages to the motor
- motor damages could be due to abnormal friction within the pump
- damaged parts must be replaced with new original parts
- the replacement of damaged parts must be carried out in a clean dry area

9.1 DISMANTLING

- Tools required: size 10-13 socket spanner, screw driver (Phillips drive type), punch $\phi < 4\text{mm}$. Bolts have right-hand thread
- all these maintenance operations must be performed under supervision of qualified personnel
- cut off the power supply from the motor and disconnect the electrical wiring; pull the wires out from the terminal box and isolate their extremities accordingly
- close the suction and discharge valves and open the drain valve
- use gloves, safety glasses and acid-proof overalls when disconnecting and washing the pump
- disconnect the piping and leave enough time for the residual liquid to exit the pump body and atmospheric air to fill the empty volume
- wash the pump before carrying out any maintenance work
- do not scatter the liquid in the environment
- before attempting to dismantle the pump ensure that its motor is disconnected and that it may not be started accidentally
- before the inspection, check that you have spare O-rings ready to hand for re-installing at the end of operations
- warning: operations near the magnet attract the tools. Proceed with caution to avoid damage.

- As described on paragraph no. 2 “Disassembling sequence”, unscrew the connections (POS.1) and remove the HYDRAULIC PARTS from the MOTOR PARTS

- Proceed separately to disassembly the HYDRAULIC PARTS or the MOTOR PARTS following the sequence described on paragraph no. 2 “ Disassembling sequence ”.

- warning! The disassembly operations of parts magnetically connected involve great opposed forces: keep the MOTOR PARTS fixed on floor during the removing of the HYDRAULIC PARTS.

- to facilitate the disassembly operations keep the pump in vertical position (suction on top)
Fig. 9.1 B

- warning! During the disassembly of the hydraulic parts do not bump the guide components

- warning! After the dismantling of the pump casing extract together the impeller and the central disc; extract avoiding radial movements
Fig. 9.1 C

- disassembly the MOTOR PARTS: unscrew the 4 Phillips drive screws inside the drive magnet assembly, POS. E in Fig. 9.1 D

- warning! During the use of screw driver inside the drive magnet assembly you must oppose the magnetic attraction

- warning! After unscrewing the 4 screw (POS. E in Fig. 9.1 D) insert the punch $\phi < 4\text{mm}$ in one of two extraction holes (POS. D in Fig. 9.1 D) to remove the collar (POS.C in Fig. 9.1 E) from the back and to allow the removing of the drive magnet assembly, sockets and collar (POS.A, POS.B, POS.C in Fig. 9.1 E) from the motor shaft.

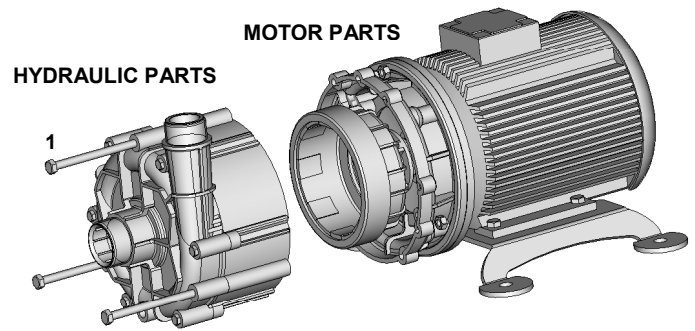


Fig. 9.1 A - First step of disassembling sequence

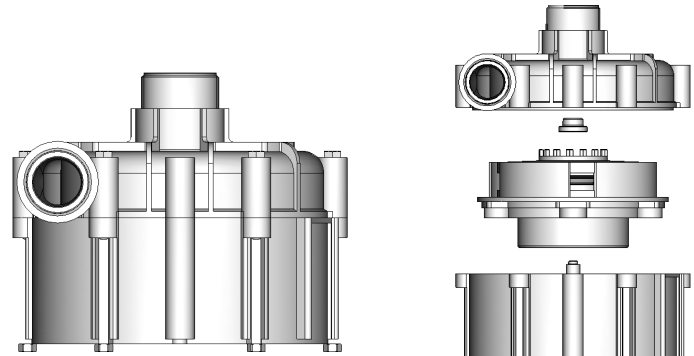


Fig. 9.1 B

Fig. 9.1 C

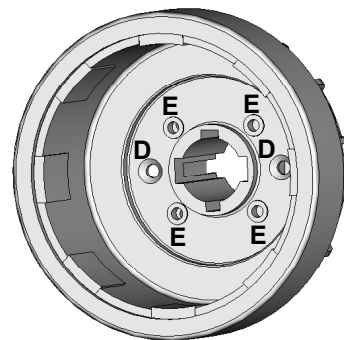


Fig. 9.1 D – Drive magnet disassembly legend

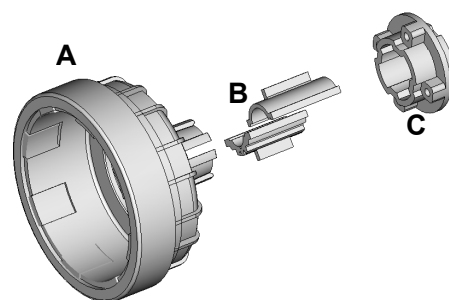


Fig. 9.1 E – Drive magnet assembly - sockets - collar scheme

9.2 INSPECTION

Check:

- the pump shaft for cracks and excessive wear
- guide bushing for excessive wear
- counterthrust bushing for cracks or excessive wear
- pump shaft clutch
- that the guide bushing cooling circuit is not blocked
- the impeller, volute and rear chamber for abrasion and corrosion
- that the pressure balancing holes on the impeller blades are not blocked
- for lumps and clusters created by the pumped liquid (especially at the bottom the rear chamber)

- for infiltration of liquid into the chamber containing the inner magnets
- for abrasion on the external surface of the rear casing due to rubbing of the outer magnets

Replace broken, cracked or deformed parts.

Re-open all the blocked pipes and eliminate any chemical agglomeration.

Clean all the surfaces before re-assembly, especially the O-ring seats (risk of drip leaks).

9.3 ASSEMBLY

Tools required: size 10-13 socket spanner, screw driver (Phillips drive type)

Bolts have right-hand thread

- all these maintenance operations must be performed under supervision of qualified personnel
- before the inspection, check that you have spare o-ring ready to hand for re-installing at the end of operations
- Proceed separately to disassembly the HYDRAULIC PARTS or the MOTOR PARTS following the backward sequence described on paragraph no. 2 "Disassembling sequence".
- warning! Assemble the hydraulic parts to the motor parts only after the complete assembling of these two sub-assembly groups
- assembling the hydraulics and the motor parts, oppose the magnetical force keeping the hydraulic parts by the inlet and the outlet connectors
- warning! Locate the strainer on the motor flange as shown in Fig. 9.3 A
- the right location of the strainer allow the assembly of the hydraulic parts as shown in Fig. 9.3 B.
- if necessary insert sockets (POS.B) in the back of the drive magnet assembly (POS.A) Fig. 9.3 C
- the relative position of drive magnet assembly and sockets is shown in Fig. 9.3 C (α and β planes)
- insert the collar (POS. C) on the back of the drive magnet assembly keeping the side pump collar surface far as possible from the plane ϵ
- verify that the collar surface with visible brass inserts is motor side
- insert the assembled group (drive magnet assembly, sockets, collar) on the motor shaft
- after assembling on motor shaft verify the right position of sockets POS.B in drive magnet assembly POS.A (referring to planes α and β shown in Fig. 9.3 C)
- screw the 4 Phillips drive screws repeating the sequence E1, E2, E3, E4 and applying a torque $\cong 6 \text{ Nm}$
- at the end of the screwing operation the collar will be at about 3-4 mm from the ϵ plane shown in Fig. 9.3 C)

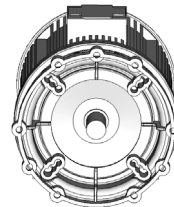


Fig. 9.3 A – Right location of the strainer on the motor flange

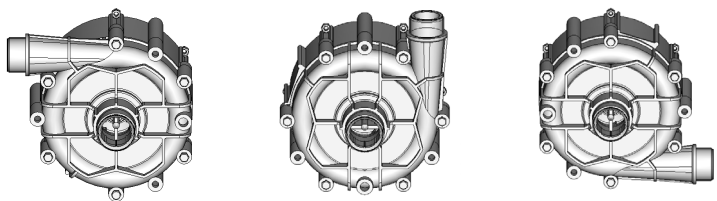


Fig. 9.3 B – Allowed position of the hydraulic parts

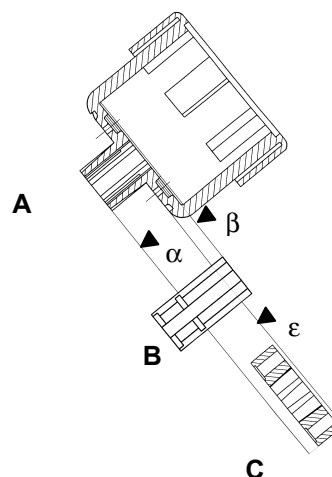


Fig. 9.3 C – Correct alignment of drive magnet assembly, sockets and collar

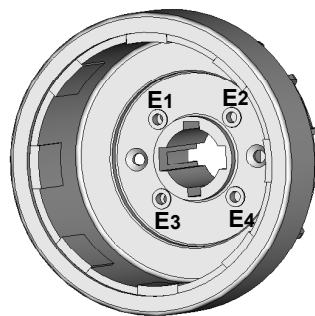


Fig. 9.3 D – Sequenza di avvitamento E1 - E2 - E3 - E4

- warning! during the HYDRAULIC PARTS assembling keep the parts in vertical position
- assembly central disc and impeller before insert them in the rear casing, POS.F in Fig. 9.3 E
- warning! There are magnetical attraction forces in action assembling the central disc and impeller: avoid bump opposing manual force
- avoid radial movements during assembling the sub-assembly central disc-impeller in the rear casing
- the pumps range ROUTE are provided of a bidirectional axially alignment system (patented system)
- warning! verify that the value of the dimension Q shown in Fig. 9.3 F is 3 mm

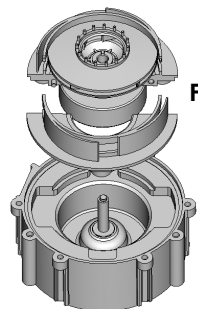


Fig. 9.3 E
Sub-assembly central disc - impeller scheme

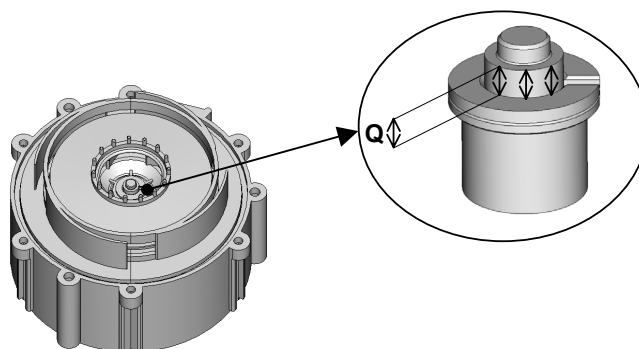


Fig. 9.3 F – Correct alignment sub-assembly impeller - shaft

10 SAFETY RISKS

WARNING! MAGNETIC FIELDS.



Magnetic pumps contain some of the most powerful magnets in existence. The magnets are positioned on the back of the impeller and the outer magnet housing. The magnetic fields may adversely affect persons fitted with electronic devices (e.g. pacemakers and defibrillators): such persons must not be allowed to handle magnetic pumps and magnetic pump components.

WARNING! MAGNETIC FORCE.



Exercise extreme caution and follow instructions carefully during pump assembly/dismantling. Magnetic force attract (cause insertion of) internal and magnetic units, and are therefore a potential source of injury to fingers and hands.

WARNING! CHEMICAL HAZARD.



The pumps are designed to pump different types of liquid and chemical. Follow the specific instructions to decontaminate during inspection or maintenance. §

WARNING!



Safety risks for personnel mainly arise from improper use or accidental damages.

These risks may be of an electrical nature as far as the non-synchronous motor is concerned and may cause injury to hands if working on an open pump. Risks may also arise due to the nature of the liquids pumped. It is therefore of utmost importance to closely follow all the instructions contained in this manual so as to eliminate the causes that may lead to pump failure and the consequent leakage of liquid dangerous for both personnel and the environment.

Risks may also arise from improper maintenance or dismantling practices.

In any case five general rules are important:

- A - all services must be carried out by specialised personnel or supervised by qualified personnel depending on the type of maintenance required
- B - install protection guards against eventual liquid sprays (when the pump is not installed in remote areas) due to an accidental pipe rupture. Arrange for safety basins to collect possible leakage
- C - when working on the pump always wear acid-proof protective clothing
- D - arrange for proper conditions for suction and discharge valve closing during disassembly
- E - make sure that the motor is completely disconnected during disassembly.

Proper design and building of the plants, with well positioned and well marked piping fitted with shut-off valves, adequate passages and work areas for maintenance and inspections are extremely important (since the pressure developed by the pump could give some kind of damage to the plant in case this one should be faulty made or wear and tear-damaged).

It must be stressed that the major cause of pump failures leading to a consequent need to intervene is due to the pump running dry in manually operated plants. This is generally due to:

- the suction valve being open at start-up or
- the suction tank being emptied without stopping

10.1 INSTALLATION AND COMMISSIONING PERSONNEL

Interventions allowed only to specialised personnel who may eventually delegate to others some operations depending on specific evaluations (technical capability required: specialisation in industrial plumbing or electric systems as needed).

10.2 OPERATORS AND MAINTENANCE PERSONNEL

Interventions allowed to general operators (after training on the correct use of the plant):

- pump starting and stopping
- opening and closing of valves with the pump at rest
- emptying and washing of the pump body via special valves and piping
- cleaning of filtering elements

Interventions allowed to qualified personnel (technical capacities required: general knowledge of the mechanical, electrical and chemical features of the plant being fed by the pump and of the pump itself):

- verification of environmental conditions
- verification of the condition of the liquid being pumped
- inspections of the control/stop devices of the pump
- inspections of the rotating parts of the pump
- trouble shooting

10.3 REPAIR PERSONNEL

Interventions allowed to general operators under the supervision of qualified personnel:

- stopping of the pump
- closing of the valve
- emptying of pump body
- disconnection of piping from fittings
- removal of anchoring bolts
- washing with water or suitable solvent as needed
- transport (after removal of electrical connections by qualified personnel)

Interventions by qualified personnel (technical capacities required: general knowledge of machining operations, awareness of possible damage to parts due to abrasion or shocks during handling, know-how of required bolt and screw tightening required on different materials such as plastics and metals, use of precision measuring instruments):

- opening and closing of the pump body
- removal and replacement of rotating parts

10.4 WASTE DISPOSAL

Materials: separate plastic from metal parts. Dispose of by authorized companies.

11 IMPROPER USE

The pump must not be used for purposes other than the transfer of liquids.

The pump cannot be used to generate isostatic or counter pressures.

The pump cannot be used to mix liquids generating an exothermal reaction

The pump must be installed horizontally on a firm base.

The pump must be installed on a suitable hydraulic plant with inlet and outlet connections to proper suction and discharge pipes.

The plant must be able to shut off the liquid flow independently from the pump.

Handling of aggressive liquids requires specific technical knowledge

12 OPERATING FAULTS AND POSSIBLE CAUSES

Pump does not deliver:

1. rotates in wrong direction
2. suction pipe is excessively long and tortuous
3. insufficient geodetic pump head or excessive suction geodetic lift
4. air infiltration into the suction pipe or branches
5. pump or suction pipe not completely covered by liquid
6. impeller channels blocked by impurities
7. check valve on discharge pipe jammed
8. geodetic system height is greater than maximum potential pump head
9. impeller jammed by considerable layer of crystals or by melting of materials for dry rotation.
10. bottom valve blocked by mud or other debris
11. bottom valve insufficiently immersed
12. bottom valve faulty, thereby causing suction valve to empty when pump stops
13. magnets release a much greater specific weight and flow rate of liquid than planned

Pump discharge rate or pressure insufficient:

see 01, 02, 03, 04, 05, 06, 10, 11, 12, 13

14. system's resisting head is greater than expected
15. suction pipe, closing valve and other items have an insufficient nominal diameter
16. small geometric pump suction head
17. damaged or worn impeller
18. liquid viscosity greater than expected
19. excessive quantities of air or gas in liquid
20. elbow joints, check valves or other items on the outlet port
21. liquid (especially if hot) with tendency to change into gaseous state

Pump absorbs too much power:

see 18

22. pump operates at greater capacity than expected
23. specific weight of liquid is greater than expected
24. impurities inside pump create abnormal wear
25. electric motor supply voltage is not rated voltage

Pump vibrates and is noisy

see 24

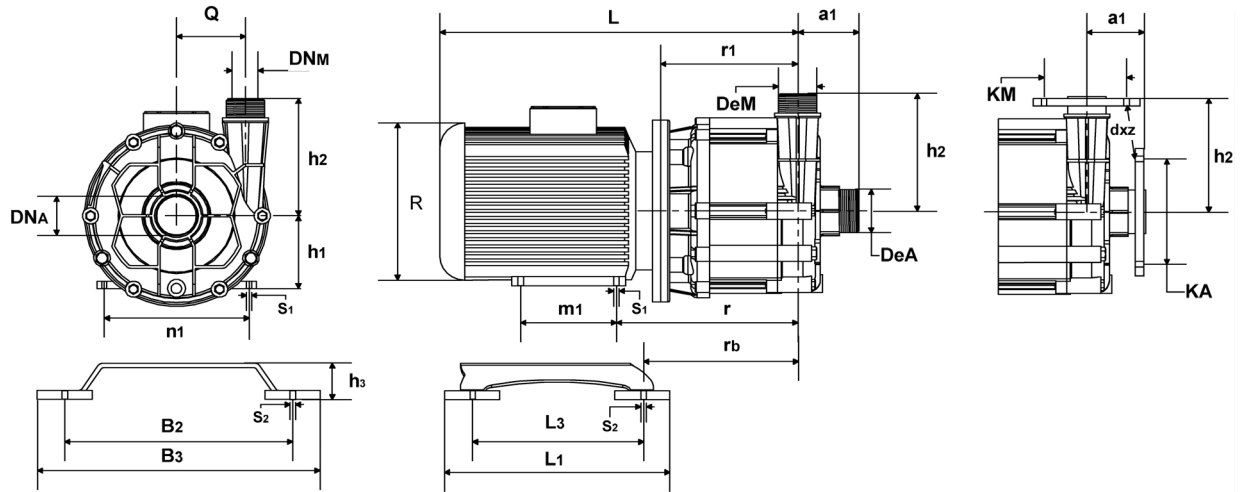
26. operates at full capacity (no head)
27. pump or pipes inadequately fixed
28. eccentric impeller operation because of worn bushes

Pump's internal parts wear out too quickly:

see 24

29. liquid excessively abrasive
30. recurring cavitation problems (see. 02, 15, 19, 17)
31. high tendency of liquid to crystallise or polymerise when pump is not operating.
32. pump made of materials that are unsuitable for pumped liquid
33. operation with capacity too reduced

13 TECHNICAL DATA



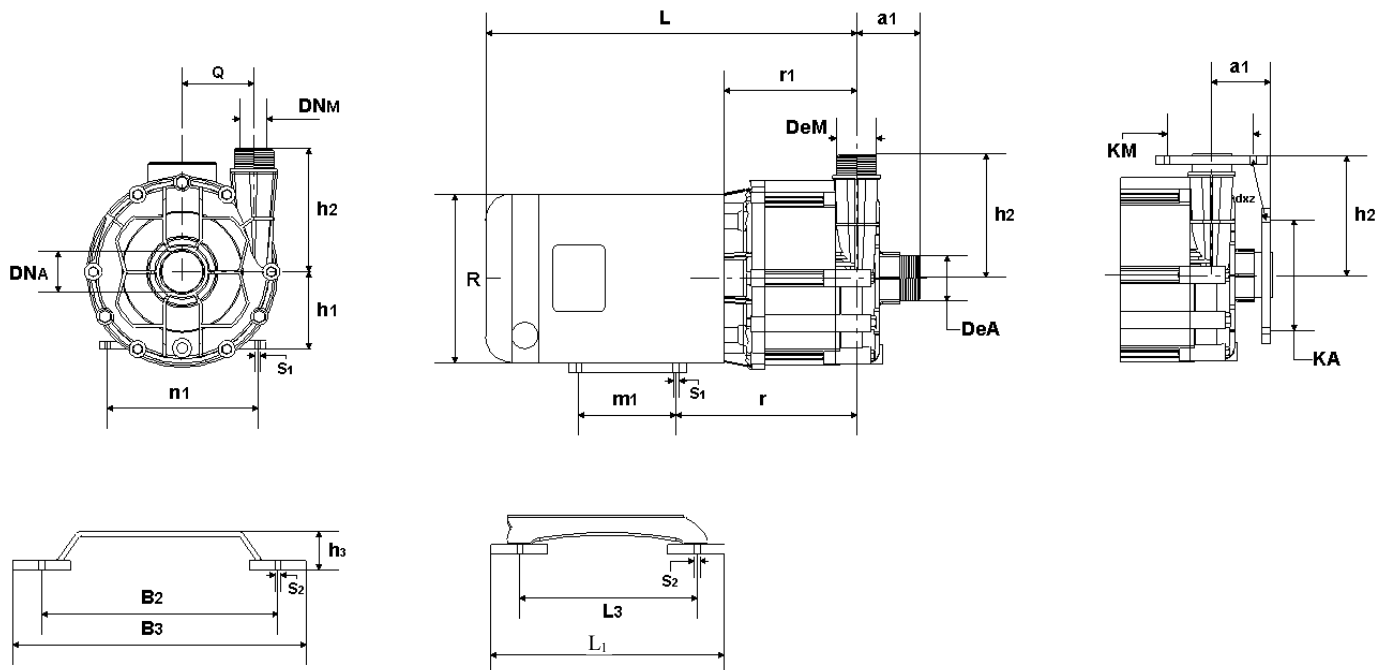
MOTOR IEC - 50 Hz

Model TMR	06.10			10.10			10.15			16.15			16.20	
IEC frame	71	80A	80B	80A	80B	90S	80B	90S	90L	90S	90L	100	90L	100
a1	67			67			67			67			67	
L	356	385		385		405	385	405	430	405	430	478	430	478
Q	75			75			75			75			75	
h1	71	80		80		90	80	90		90		100	90	100
h2	130			130			130			130			130	
r	194	199		199		205	199	205		205		227	205	227
r1	149			149			149			149		164	149	164
rb	161			161			161			161		176	161	176
m1	90	100		100			100		125	100	125	140	125	140
n1	112	125		125		140	125	140		140		160	140	160
s1	7	8		8			8			8		10	8	10
L3	185			185			185			185		205	185	205
B2	248			248			248			248		305	248	305
S2	14			14			14			14			14	
L1	245			245			245			245		259	245	259
B3	308			308			308			308		359	308	359
h3	40			40			40			40			40	
KM (ISO)	100			100			100			100			100	
KA (ISO)	110			110			110			110			110	
KM (ANSI)	89			89			89			89			89	
KA (ANSI)	98			98			98			98			98	
d x z (ISO)	18 x 4			18 x 4			18 x 4			18 x 4			18 x 4	
d x z (ANSI)	16 x 4			16 x 4			16 x 4			16 x 4			16 x 4	

MOTOR IEC - 60 Hz

Model TMR	07.11			07.14			11.15			11.23		17.25
IEC frame	80A	80B	90S	80B	90S	90L	90S	90L	100	90L	100	112
a1	67			67			67			67		67
L	385		405	385	405	430	405	430	478	430	478	487
Q	75			75			75			75		75
h1	80	90		80	90		90	100		90	100	112
h2	130			130			130			130		130
r	199	205		199	205		205	227		205	227	234
r1	149			149			149	164		149	164	164
rb	161			161			161	176		161	176	176
m1	100			100	125		100	125	140	125	140	140
n1	125	140		125	140		140	160		140	160	190
s1	8			8			8	10		8	10	10
L3	185			185			185	205		185	205	205
B2	248			248			248	305		248	305	305
S2	14			14			14			14		14
L1	245			245			245	259		245	259	259
B3	308			308			308	359		308	359	359
h3	40			40			40			40		40
KM (ISO)	100			100			100			100		100
KA (ISO)	110			110			110			110		110
KM (ANSI)	89			89			89			89		89
KA (ANSI)	98			98			98			98		98
d x z (ISO)	18 x 4			18 x 4			18 x 4			18 x 4		18 x 4
d x z (ANSI)	16 x 4			16 x 4			16 x 4			16 x 4		16 x 4

(Dimensions in mm)



- MOTOR NEMA - 50Hz

Model TMR	06.10	10.10	10.15	16.15	16.20
NEMA frame	56	56 145	143 145	145 184	145 184
a1	2 21/32	2 21/32	2 21/32	2 21/32	2 21/32
L	14 15/16	14 15/16 16 15/16	15 15/16 16 15/16	16 15/16 19 3/8	16 15/16 19 3/8
Q	2 31/32	2 31/32	2 31/32	2 31/32	2 31/32
h1	3 1/2	3 1/2	3 1/2	3 1/2 4 1/2	3 1/2 4 1/2
h2	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8
r	8 7/16	8 7/16 8 1/8	8 1/8	8 1/8 9 3/8	8 1/8 9 3/8
r1	5 7/8	5 7/8	5 7/8	5 7/8 6 5/8	5 7/8 6 5/8
rb	6 11/32	6 11/32	6 11/32	6 11/32 7 1/8	6 11/32 7 1/8
m1	3	3 5	4 5	5 5 1/2	5 5 1/2
n1	4 7/8	4 7/8 5 1/2	5 1/2	5 1/2 7 1/2	5 1/2 7 1/2
s1	3/8	3/8	3/8	13/8 13/32	13/8 13/32
L3	7 9/32	7 9/32	7 9/32	7 9/32 8 1/16	7 9/32 8 1/16
B2	9 3/4	9 3/4	9 3/4	9 3/4 12	9 3/4 12
S2	9/16	9/16	9/16	9/16	9/16
L1	9 21/32	9 21/32	9 21/32	9 21/32 10 3/16	9 21/32 10 3/16
B3	12 1/8	12 1/8	12 1/8	12 1/8 14 1/8	12 1/8 14 1/8
h3	1 9/16	1 9/16	1 9/16	1 9/16	1 9/16
KM (ISO)	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
KA (ISO)	4 11/32	4 11/32	4 11/32	4 11/32	4 11/32
KM (ANSI)	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
KA (ANSI)	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8
d x z (ISO)	3/4 x 4	3/4 x 4	3/4 x 4	3/4 x 4	3/4 x 4
d x z (ANSI)	5/8 x 4	5/8 x 4	5/8 x 4	5/8 x 4	5/8 x 4

- MOTOR NEMA - 60 Hz

Model TMR	07.11	07.14	11.15	11.23	17.25
NEMA frame	56 145	143 145	145 184	145 184	184
a1	2 21/32	2 21/32	2 21/32	2 21/32	2 21/32
L	14 15/16 16 15/16	15 15/16 16 15/16	16 15/16 19 3/8	16 15/16 19 3/8	19 3/8
Q	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16
h1	3 1/2	3 1/2	3 1/2 4 1/2	3 1/2 4 1/2	4 1/2
h2	5 1/8	5 1/8	5 1/8	5 1/8	5 1/8
r	8 7/16 8 1/8	8 1/8	8 1/8 9 3/8	8 1/8 9 3/8	9 5/8
r1	5 7/8	5 7/8	5 7/8 6 5/8	5 7/8 6 5/8	6 5/8
rb	6 11/32	6 11/32	6 11/32 7 1/8	6 11/32 7 1/8	7 1/8
m1	3 5	4 5	5 5 1/2	5 5 1/2	5 1/2
n1	4 7/8 5 1/2	5 1/2	5 1/2 7 1/2	5 1/2 7 1/2	7 1/2
s1	3/8	3/8	3/8 13/32	3/8 13/32	13/32
L3	7 9/32	7 9/32	7 9/32 8 1/16	7 9/32 8 1/16	8 1/16
B2	9 3/4	9 3/4	9 3/4 12	9 3/4 12	12
S2	9/16	9/16	9/16	9/16	9/16
L1	9 21/32	9 21/32	9 21/32 10 3/16	9 21/32 10 3/16	10 3/16
B3	12 1/8	12 1/8	12 1/8 14 1/8	12 1/8 14 1/8	14 1/8
h3	1 9/16	1 9/16	1 9/16	1 9/16	1 9/16
KM (ISO)	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
KA (ISO)	4 11/32	4 11/32	4 11/32	4 11/32	4 11/32
KM (ANSI)	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
KA (ANSI)	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8
d x z (ISO)	3/4 x 4	3/4 x 4	3/4 x 4	3/4 x 4	3/4 x 4
d x z (ANSI)	5/8 x 4	5/8 x 4	5/8 x 4	5/8 x 4	5/8 x 4

(Dimensions in inches)

Model TMR		06.10						10.10						10.15						16.15						16.20																																													
Execution		N		P		S		N		P		S		N		P		S		N		P		S		N		P																																											
Version		W	R	G	F	W	R	G	F	W	R	G	F	W	R	G	F	W	R	G	F	W	R	G	F	W	R	G	F																																										
IEC frame		71		80A		80B		80A		80B		90S		80B		90S		90L		90S		90L		100L		90L		100L																																											
KW		0.55		0.75		1.1		0.75		1.1		1.5		1.1		1.5		2.2		1.5		2.2		3		2.2		3																																											
NEMA frame		56						56						145						143						145						145						184						145						184																					
HP		¾		1		1½		1		1 ½		2		1½		2		3		2		3		5		3		5																																											
noise dB (A)		45						50						50						55						55																																													
vibration mm/s																																																																							
DeA (BSP-NPT)		1 ½"						1 ½"						1 ½"						1 ½"						1 ½"																																													
DeM (BSP-NPT)		1 ¼"						1 ¼"						1 ¼"						1 ¼"						1 ¼"																																													
DnA (mm-Inch)		40 - 1 ½"						40 - 1 ½"						40 - 1 ½"						40 - 1 ½"						40 - 1 ½"																																													
DnM (mm-Inch)		32 - 1 ¼"						32 - 1 ¼"						32 - 1 ¼"						32 - 1 ¼"						32 - 1 ¼"																																													
Pump weight (Kg)	Senza motore	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4																																										
	Motor IEC																																																																						
	3F-2p	10	11	11	12	13	14	11	12	13	14	16	17	13	14	16	17	20	21	16	17	20	21	25	26	20	21	25	26																																										
	3F-4p	11	12	12	13	15	16	12	13	15	16	19	20	15	16	19	20	26	27	19	20	26	27	28	29	26	27	28	29																																										
	E-exd -2p	18	19	23	24	23	24	23	24	23	24	33	34	23	24	33	34	34	35	33	34	34	35	44	45	34	35	44	45																																										
	E-exd -4p	23	24	23	24	33	34	23	24	33	34	33	34	33	34	33	34	44	45	33	34	44	45	44	45	44	45	44	45																																										
1F	12	13	14	15	17	18	14	15	17	18	20	21	17	18	20	21	27	28	20	21	27	28	35	36	27	28	35	36																																											
Loads (ports-section)		Max. single strength value F(x;y;z) = 2,5																																																																					
Dynamic loads (base)		6,5														11																																																							
Max. Head (m)		13														18														32														25														40													
Max. Capacity (m3/h)		17														20														6														32														8													
Max. NPSH req. mc.l.																																																																							

Model TMR		07.11						07.14						11.15						11.23				17.25							
Execution		N		P		S		N		P		S		N		P		S		N		P		N							
Version		W	G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W	G	W	G				
IEC frame		80A		80B		90S		80B		90S		90L		90S		90L		100		90L		100				112					
KW		0.75		1.1		1.5		1.1		1.5		2.2		1.5		2.2		3		2.2		3				4					
NEMA frame		56				145		143		145				145				184		145		184		184							
HP		1		1½		2		1 ½		2		3		2		3		5		3		5				5					
noise dB (A)		45						50						55						60				60							
vibration mm/s																															
DeA (BSP-NPT)		1 ½"						1 ½"						1 ½"						1 ½"				1 ½"							
DeM (BSP-NPT)		1 ¼"						1 ¼"						1 ¼"						1 ¼"				1 ¼"							
DnA (mm-Inch)		40 - 1 ½"						40 - 1 ½"						40 - 1 ½"						40 - 1 ½"				40 - 1 ½"							
DnM (mm-Inch)		32 - 1 ¼"						32 - 1 ¼"						32 - 1 ¼"						32 - 1 ¼"				32 - 1 ¼"							
Pump weight (Kg)	Senza motore	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4				
	Motor IEC																														
	3F-2p	11	12	13	14	16	17	13	14	16	17	19	20	16	17	19	20	25	26	19	20	25	26	32		33					
	3F-4p	12	13	15	16	19	20	15	16	19	20	25	26	19	20	25	26	28	29	25	26	28	29	33		34					
	E-exd -2p	23	24	23	24	33	34	23	24	33	34	33	34	33	34	33	34	44	45	33	34	44	45	69		70					
	E-exd -4p	23	24	33	34	33	34	33	34	33	34	43	44	33	34	43	44	44	45	43	44	44	45	69		70					
	1F	14	15	17	18	20	21	17	18	20	21	26	27	20	21	26	27	35	36	26	27	35	36	35		36					
Loads (ports-section)		Max. single strength value F(x;y;z) = 2,5																													
Dynamic loads (base)		6,5														11															
Max. Head (m)		15						16						21						27.5						35					
Max. Capacity (m3/h)		14						18						23						26						29					
Max. NPSH req. mc.l																															

Dimensions in mm
Weight and loads in kg
Centre of gravity along the motor axis, in the middle of dimension -L-

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14 GENERAL CONDITIONS OF SALE

ACCEPTING ORDER

The order is deemed to be accepted: a) through our order confirmation b) by returning a copy of the customer's order signed by us to indicate our acceptance. Any departure from these conditions and any verbal agreement will be deemed to be valid only if they are accepted by us in writing. The purchaser forgoes the right to raise objections based on any type of verbal agreement. Our offers and quotations are not binding and may be modified. Measurements, weights, drawings and reproductions are not essential parts of the order unless this is specifically stated in writing.

SUPPLIES AND DELIVERY TIMES

Only the supply and delivery dates set out in our order confirmation are binding. The delivery time that we indicate shall be calculated from the moment in which all the details required for meeting the order have been settled. Unavoidable interruptions to work or other cases of force majeure, including decisions by public authorities, procurement difficulties, lack of raw materials, labour disputes, etc, shall, if prompt notification thereof is given, entitle us to put back delivery dates without this giving entitlement to claim any sort of compensation. Without our explicit consent, orders that have been confirmed in writing may not be cancelled either wholly or in part even if deliveries are late. Any order accepted by our agents or representatives is not binding until it has been formally approved by us. Our agents and representatives are not entitled to collect any sort of payment until they are authorised so do in writing by ourselves. Any other payments are made at the purchaser's risk. If the goods have still not been collected seven days after the agreed delivery date the invoice for the goods will be issued and payment will fall due subject to the agreed conditions.

CARRIAGE OF GOODS.

If the method of carriage of goods is not specified in the order documents or agreement, we shall dispatch the goods in the manner that we deem to be most appropriate. We also reserve the right to dispatch goods from places other than our premises. For carriage-paid goods the purchaser must take out insurance to cover carriage and the relative amount will be charged in the invoice.

COMPLAINTS.

Complaints of any type must be made upon receiving the goods and within one week of discovering the defect. Complaints about incomplete orders or deterioration during transit must be made to us immediately and all the proofs of the irregularity must be collected in order to substantiate any claims against the carrier.

WARRANTY.

Specifications, dimensions and any other information contained in our catalogues is to the best of our knowledge accurate. However, the above information is merely illustrative and is subject to modification without warning. In all cases we reserve the right to at any moment make any changes to our products that we deem to be appropriate and such changes shall not entitle the purchaser to make any claims against us. All drawings remain our exclusive property and may not be passed on to third parties or be reproduced without our written approval.

APPROVAL TESTING: the purchaser is entitled to request that the pumps be tested on our premises. Such testing must be requested in good time before the pumps are due to be dispatched and shall be conducted using the instruments in our possession. The cost of the test shall be agreed with our Sales Department in writing. The purchaser will be given ten days' advance notice of the test date. The test will be conducted on this date even if the purchaser (or his official delegate) is absent and they will be informed of the results- If the results are satisfactory, the pump shall be deemed to have been approved.

DURATION OF WARRANTY: Argal manufactures its products from first-class materials, uses qualified personnel and tests the different production stages. Between six and nine months from the date of installation Argal undertakes to examine any defective parts and to promptly replace any faulty parts free of charge if it is responsible for the fault. Such faults must not be due to wear, inexperienced use or carelessness on the purchaser's part, fortuitous events or force majeure. The warranty period is shortened to three months if the machines work continuously twenty-four hours a day. Even machines that are under warranty must be sent to Argal carriage paid. Once the machines have been repaired they will be returned to the purchaser carriage forward. The replaced parts remain the property of Argal and must be returned to Argal. The warranty is voided: 1a) if the machines have not been properly maintained; 1b) if they have not been used in accordance with the technical standards set out in the manuals supplied with the delivery; 1c) if the machines are dismantled without our prior authorisation; 1d) if the machines are 'mistreated'; 1e) if the machines are used to circulate liquids in applications that are different from those which have been specifically approved beforehand by ARGAL.. We shall not be liable for the downtime arising from repairs to or the replacement of any machines of ours that are under warranty.

Argal shall not be responsible for any direct, accidental or indirect damage, injury or loss (including, but not limited to accidental or indirect damage arising from loss or profit or sales, or for any personal injury or damage arising or any other accidental or indirect loss) or for damage and injury caused by use of the machine or inability to use the machine. Before using the machine the user must check the suitability of the machine for its intended purpose and shall use the machine entirely at his own risk and responsibility. The user notes that the pumps supplied to him by us oblige him, in accordance with Article 2050 of the Italian Civil Cod, to comply with all the legislative and regulatory standards governing dangerous activities such as using, storing and conveying aggressive and polluting chemical products. The user also undertakes to comply with the prescriptions that apply to the system (such as guards, washers, seals etc) in which the pumps will be used and to comply with the installation instructions, checks and maintenance prescribed for pumps and installations. The user must also allow us, if necessary, to check the operating efficiency of the systems and to subsequently check that the pump has been correctly installed. If the user fails to comply with the prescriptions laid down by us or prevents us from carrying out the above inspection, he voids all contractual warranty rights and warranty rights under the terms of Articles 1667 and 1668 of the Civil Code.

TERMS OF PAYMENT AND RETENTION OF TITLE

Only the terms of payment set out in the approved documents are valid. We retain title to the goods sold until the goods have been paid for in full. We have the right to cease or suspend deliveries if the purchaser should fall into arrears with his payments by however small an amount or if the state of his assets and/or financial situation should deteriorate after the agreement has been signed. If the purchaser should fall into arrears with his payments, even for other supplies of goods, and even if he falls into arrears by refusing to pay for goods that he deems to be faulty, we shall be entitled to demand full payment of the outstanding amount owing to us or to make good our retention of title by requiring the immediate return of the goods. Interest will be charged on late payments at two percentage points above the current bank rate, without there being any need to declare the purchaser to be in arrears.

DISPUTES.

Any disputes arising over the interpretation or performance of the agreement shall be subject to the exclusive jurisdiction of the Court of Brescia, whatever method of payment is chosen.

15 MANUFACTURER DATA



Administration
Export manager
Customer service
Web
E-mail

Production head and legal office:
Via Labirinto, 159 I - 25125 BRESCIA
Tel: 030 3507011 Fax: 030 3507077

Tel: 030 3507019
Tel: 030 3507017
Tel: 030 3507025
www.argal.it
argal@argal.it

CONTRACTUAL DATA

TECHNICAL DATA

medium	temp
conc.	°C
%
capacity	head
m3/h	m c.l.
..	..

W.O.	
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