

ARGAL

CHEMICAL PUMPS



Prima range

TMP
centrifugal



Alifter range

TMA
self-priming

*magnetical driven pumps
in thermoplastic materials*

In this catalog Argal proposes the range of PRIMA pumps, magnetical driven, inclusive of centrifugal serie named **TMP** and the self-priming volumetric execution named **TMA** of the ALIFTER range.

Single stage, close-coupled execution, strongly built through an injection-moulding process and ready to fit normalized motors. Argal operates with ISO 9001:2000 Quality System certified by SQS-IQNet.



View of TMP and TMA pumps in different materials.

TMP PUMPS SERIE

The pumps of the **TMP** serie, magnetically driven, have been developed following the idea of previous AM serie, but trying to give a more concise answer to the actual demands of the market. These pumps are centrifugal, horizontal axis, close-coupled types, the bodies are entirely built with reinforced thermoplastic polymers, and materials for internal components are: ceramic oxides, HD carbon, fluorinated elastomers: which mean any contact of metallic parts with the pumped fluid is avoided. This combination of materials is correctly chosen to obtain the best in the performances and on a small scale: "chemical pumps".

MAIN FEATURES

Versatility and performances.

You can practically pump all the chemicals at low and medium temperatures with all the bodies in GFR-PP (glass fibre reinforced polypropylene) or CFF-E-CTFE (Etylene-ChloroTrifluoroEtylene carbon fibre filled).

Strong magnetic coupling made up of rare-earth materials (Neodimium Iron Boron) and "**N**" (standard), "**P**" (powered) or "**S**" (strong-powered) versions allow to pump, also at maximum flow, liquids with 1.05 - 1.35 - 1.8 specific gravity respectively.

R-N-X: three internal configuration of constructive materials for many applications: from clean water to waste and slightly

abrasive liquids, strong alkali or salts such as sodium hypochlorite, and acids such as chromic, nitric, sulphuric, etc..

"Hermetic" pump

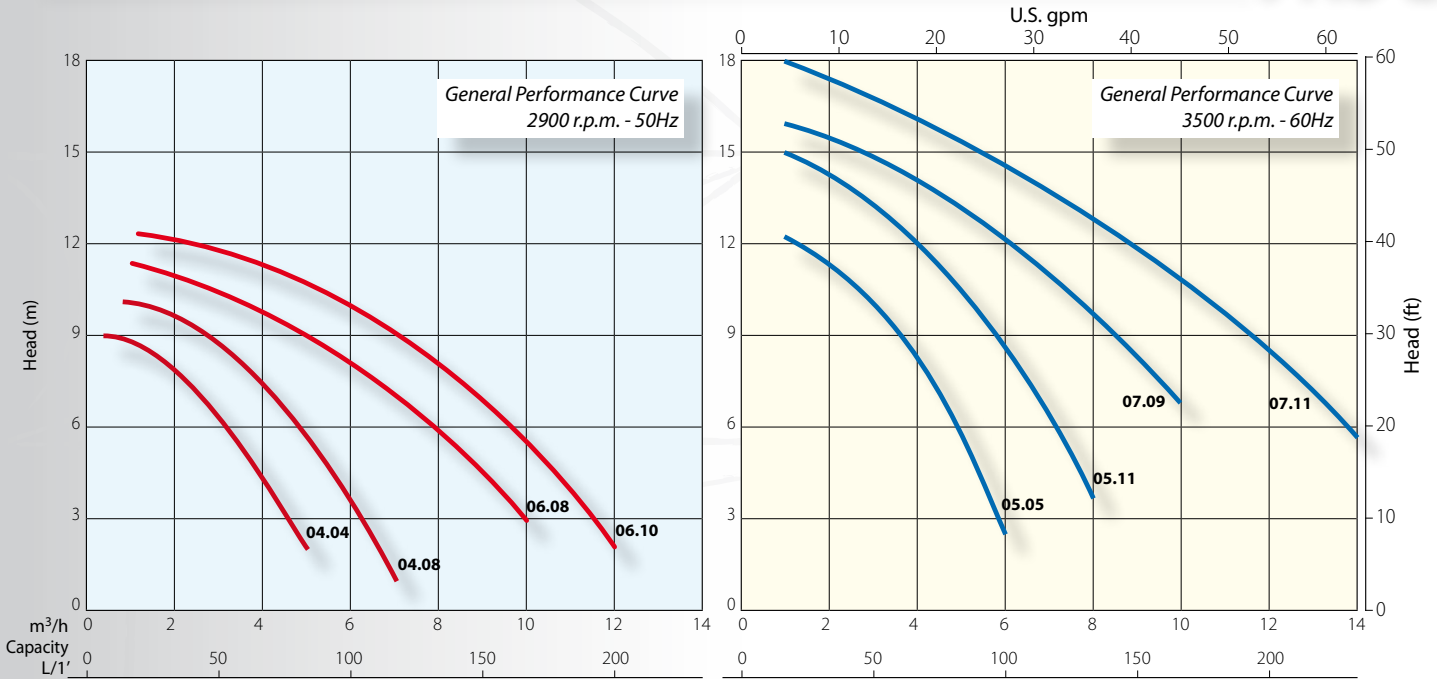
The outlet magnet assembly driven by the motor shaft, produces a magnetic torque dragging up in rotation the inside magnet assembly on which the impeller is over moulded.

The rear casing, having appropriate shape and joined to the volute casing, divides the two magnetic units, making an hermetic case all around the impeller.

Safety and life

The drive magnetic system finally excludes any type of rotating seal. The only need of the seal is guaranteed thanks to an O-ring static gasket, in the connection between volute casing and rear casing.

Special solutions and employed materials occasionally allow dry running operation (starting from 15 min. up to many hours in function of working conditions), avoiding any damages inside the TMP pumps. These solutions require an internal structure "**R**".



NOTES: All curves are referred to: water at 20°C - viscosity 1 °E - specific gravity 1 kg/dm² pt

THE MATERIALS

table 1

VERSION	REINFORCED POLYMERS	MIN. TEMP.	MAX TEMP.	ENVIRONMENT TEMP.
WR	GFR/PP	-5°C (23°F)	80°C (176°F)	0÷40°C (14÷104°F)
GF	CFF/E-CTFE	-20°C (-4°F)	100°C (212°F)	-20÷40°C (-4÷104°F)
GX*				

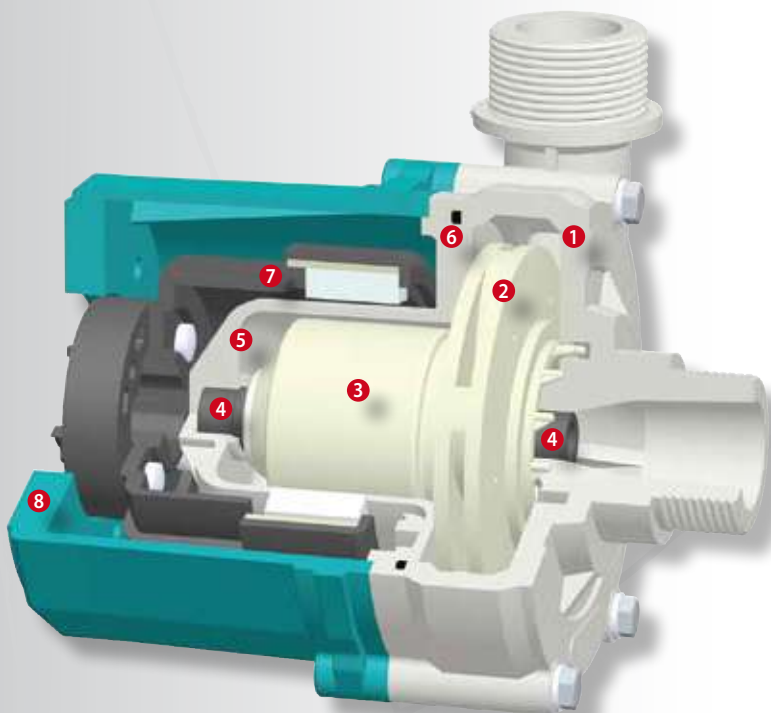
Note: Maximum inlet pressure: 1,5 bar - (*) Compliant to ATEX 94/9/EC regulations

THE CONSTRUCTIONS

table 2

VERSION	WR			GF			GX*	
	R1	X1	N1	R2	X2	N2	R2	X2
Volute casing	GFR-PP			CFF-E-CTFE				
Rear casing	GFR-PP			CFF-E-CTFE				
Centrifugal impeller	GFR-PP			CFF-E-CTFE				
Guide bushing	CARB.HD	SiC	GFR-PTFE	CARB.HD	SiC	GFR-PTFE	CARB.HD	GFR-PTFE
Shaft	CER			SiC				
Thrust bush	CER			SiC				
OR gasket	FKM (1)			FKM (1) (2)				
Screws	Stainless steel							

Upon request:(1)EPDM and (2) FFKM - * Compliant to ATEX 94/9/EC regulations



TMP - SECTION VIEW

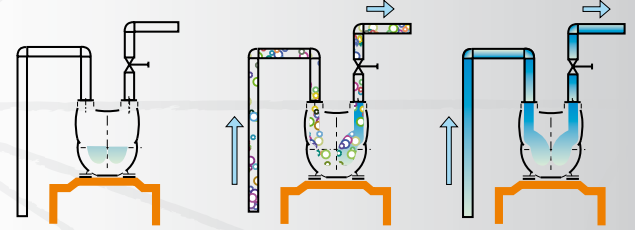
- 1 - Volute casing
- 2 - Centrifugal impeller (covered type)
- 3 - Centrifugal impeller (magnetic part)
- 4 - Guide bushings
- 5 - Rear casing
- 6 - OR gasket
- 7 - Drive magnet assembly
- 8 - Bracket

The self priming , magnetic drive pumps of the TMA serie are volumetric, can deliver the flow in both directions reversing the direction of rotation of the motor and are adequate to speedily prime chemical liquids with high specific gravity and/or high vapour tension.

MAIN FEATURES

- Start-up with empty pipes
- Fast priming-phase
- Maximum Lift = -5 m
- Reversible (inlet-outlet reversal)
- Suitable for specific weight up to 2 kg/dm^3
- Suitable for vapour pressure up to 1 m (H₂O @ 45°C)
- Minimum NPSHa (available on the plant) = 3 m (abs)
- Impeller replaceable apart from magnets
- IEC or NEMA standard motors can be installed

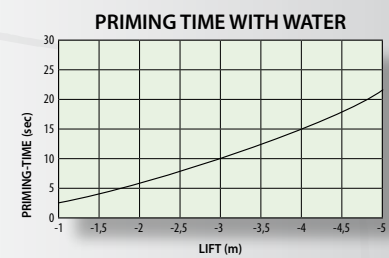
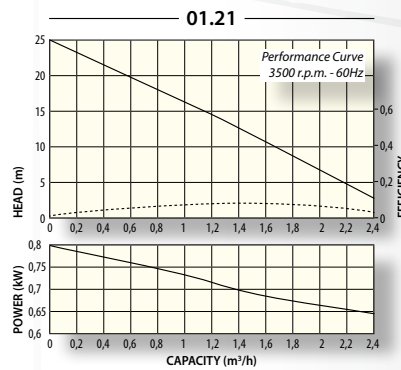
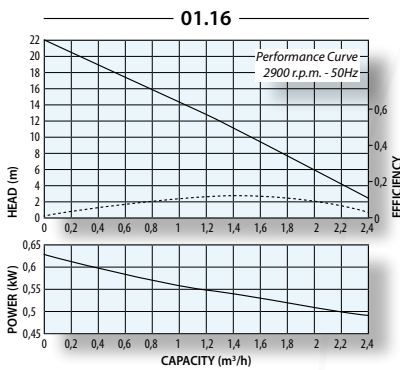
OPERATING PRINCIPLES OF THE PUMP



Stopping phase: a small quantity of liquid is trapped into the pump to enable the next starting.

Priming phase: the impeller gives a specific circulation of air-liquid mixture moving air from the suction pipe to the discharge side in the atmosphere.

Pumping phase: after the air is totally removed from the suction side, the pipe is flooded by the liquid and the pumping phase can start.



THE MATERIALS

VERSION	REINFORCED POLYMERS	MIN. TEMP.	MAX TEMP.	ENVIRONMENT TEMP.
WR	GFR/PP	-5°C (23°F)	60°C (140°F)	0÷40°C (14÷104°F)
GF	CFF/E-CTFE	-20°C (-4°F)	90°C (194°F)	-20÷40°C (-4÷104°F)

table 3

Note: Maximum inlet pressure: 1,5 bar

THE CONSTRUCTIONS

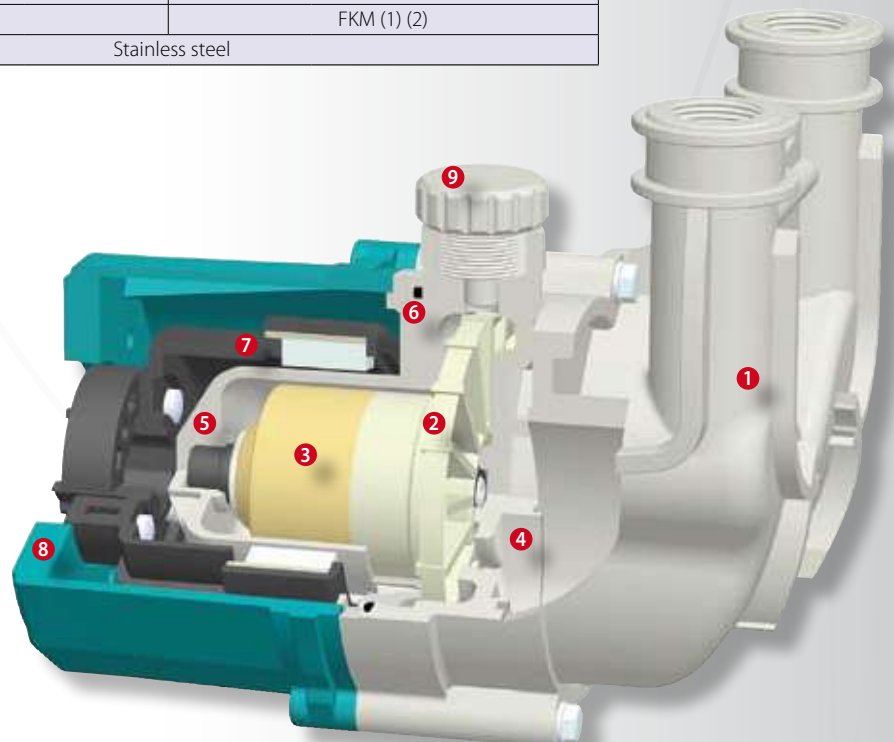
VERSION	WR			GF		
	R1	X1	N1	R2	X2	N2
Volute casing	GFR-PP			CFF-E-CTFE		
Rear casing	GFR-PP			CFF-E-CTFE		
Centrifugal impeller	GFR-PP			CFF-E-CTFE		
Guide bushing	CARB.HD	SiC	GFR-PTFE	CARB.HD	SiC	GFR-PTFE
Shaft	CER			SiC		
Thrust bush	CER			SiC		
OR gasket	FKM (1)			FKM (1) (2)		
Screws	Stainless steel					

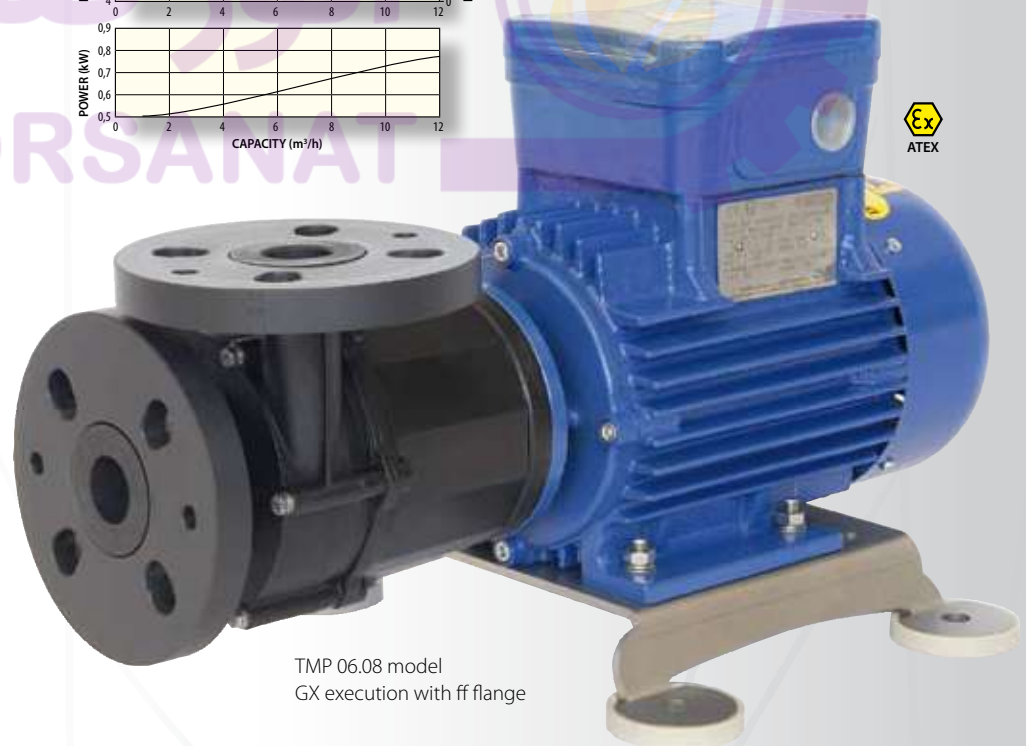
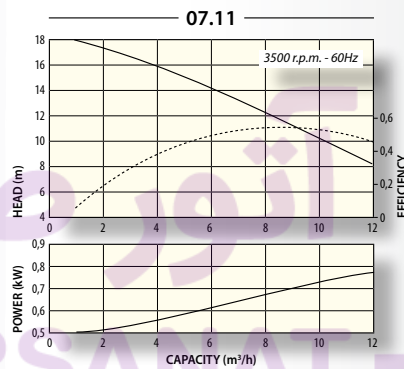
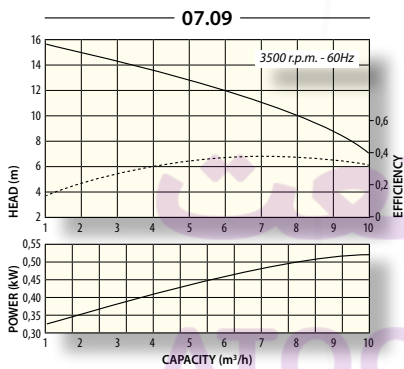
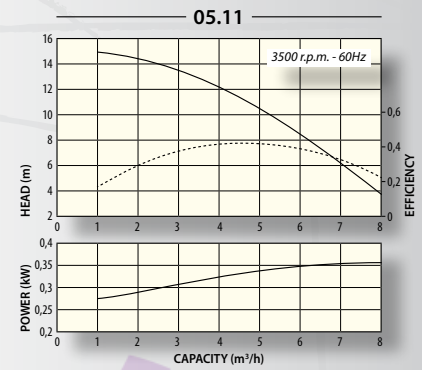
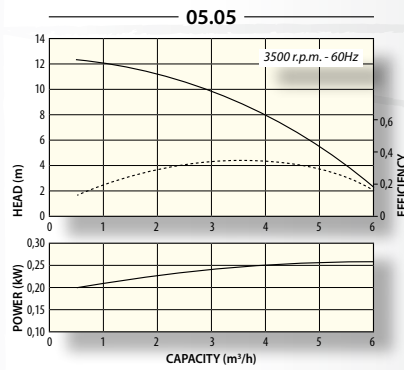
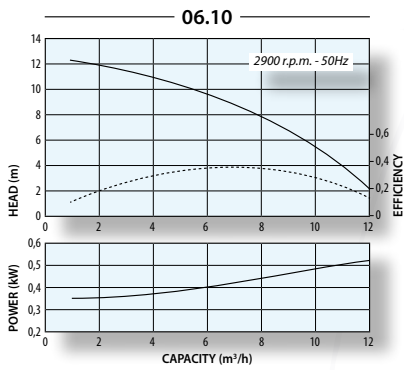
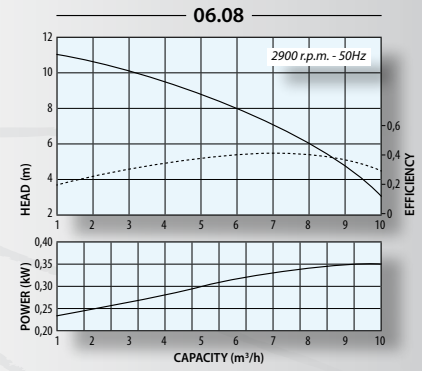
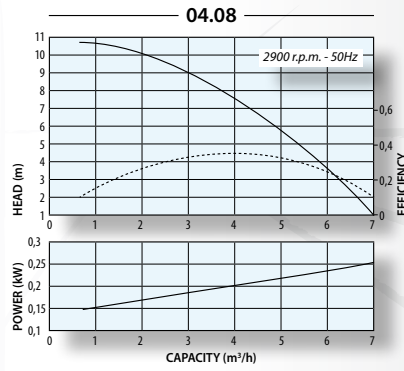
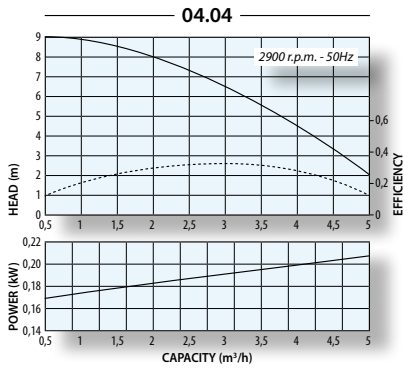
table 4

Upon request:(1)EPDM and (2) FFKM

TMA - SECTION VIEW

- 1 - Connections casing
- 2 - Impeller
- 3 - Magnetic core
- 4 - Front volute casing
- 5 - Rear casing
- 6 - OR gasket
- 7 - Drive magnet assembly
- 8 - Bracket
- 9 - Filling plug





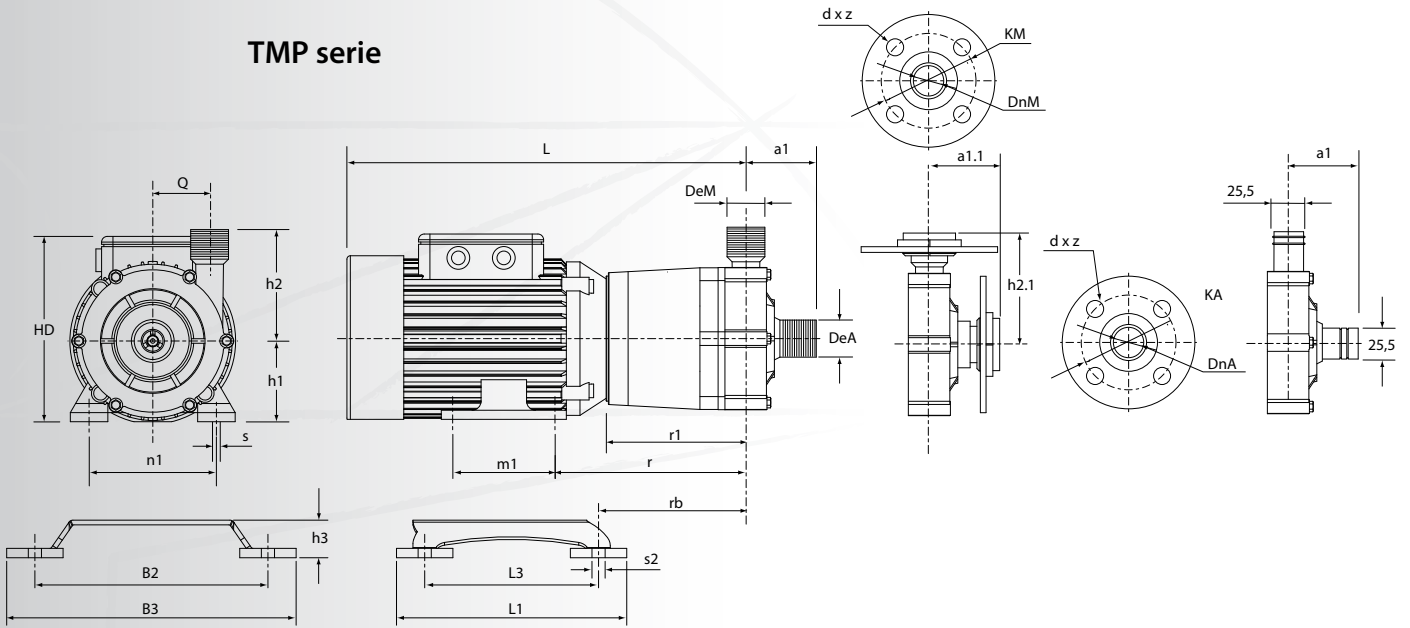
TMP 06.08 model
GX execution with ff flange



Labels in this catalog

GFR/PP	Glass fibre reinforced Polypropylene (30%)	EPDM	Etylene-Propylene rubber
CFF/E-CTFE	Etylene-Chloro Trifluoro Etylene carbon fibre filled (20%)	BSP - m	BSP parallel threaded male connect. (according to ISO 7/1)
CARB. H.D.	Carbon high density	NPT - m	Threaded male NPT connections
SiC	Silicon Carbide	ND	Nominal diameter
CER	Alumina ceramic at 99,7%	ISO	Ref. Flange ISO 2084 - NP10
GFR/PTFE	Glass fibre reinforced PTFE	ANSI	Ref. Flange ANSI B 16.5 - Flat Face
FKM	Fluorine elastomer	IEC	According to E.C. motors
FFKM	Perfluorelastomer	NEMA	Accordind to U.S. motors

TMP serie

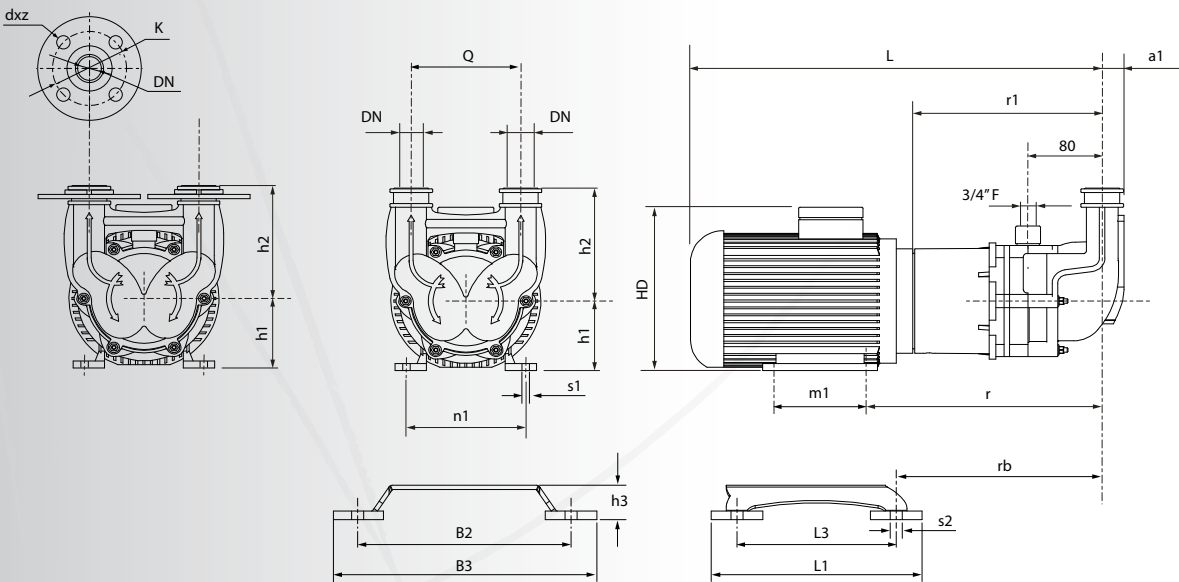


DIMENSIONS WITH IEC MOTORS

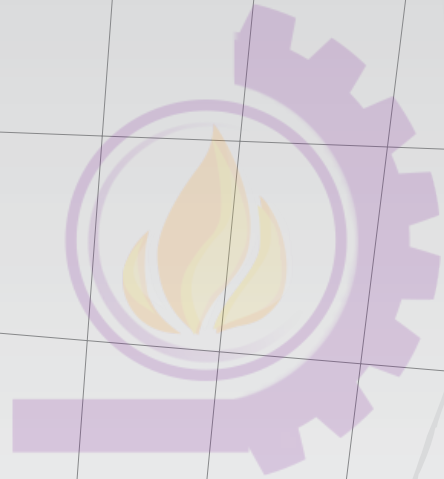
table 8

	TMP 50Hz												TMP 60Hz												TMA 50HZ			TMA 60HZ				
	04.04			04.08			06.08			06.10			05.05			05.11			07.09			07.11			01.16			01.21				
	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P
a1	62			62			62			62			62			62			62			62			23,5			23,5				
a1.1	70			70			70			70			70			70			70			70										
Q	47			49			53			53			47			49			53			53			118			118				
h2	100			100			100			100			100			100			100			100			129			129				
h2.1	108			108			108			108			108			108			108			108										
L(*)	330	330	348	330	348	348	348	348	388	348	388	388	330	348	348	348	348	388	348	388	388	388	388	435	450	450	435	450	450			
h1	63	63	71	63	71	71	71	71	80	71	80	80	63	71	71	71	71	80	71	80	80	80	80	71	80	80	71	80	80			
HD(*)	160	160	177	160	177	177	177	177	190	177	190	190	160	177	177	177	177	190	177	190	190	190	190	177	190	190	177	190	190			
m1	80	80	90	80	90	90	90	90	100	90	100	100	80	90	90	90	90	100	90	100	100	100	100	90	100	100	90	100	100			
n1	100	100	112	100	112	112	112	112	125	112	125	125	100	112	112	112	112	125	112	125	125	125	125	112	125	125	112	125	125			
r1	123	123	123	123	123	123	123	123	133	123	133	133	123	123	123	123	123	133	123	133	133	133	133	205	215	215	205	215	215			
r	163	163	168	163	168	168	168	168	183	168	183	183	163	168	168	168	168	183	168	183	183	183	183	250	265	265	250	265	265			
rb	135	135	135	135	135	135	135	135	145	135	145	145	135	135	135	135	135	145	135	145	145	145	145	216	282	282	216	282	282			
s	7	7	7	7	7	7	7	7	10	7	10	10	7	7	7	7	10	7	10	10	10	10	7	10	10	7	10	10				
B2			248		248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248	248		
B3			308		308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308		
L1			245		245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245		
L3			185		185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185		
h3			40		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
s2			14		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14		

TMA serie



آتور صنعت ATOORSANAT



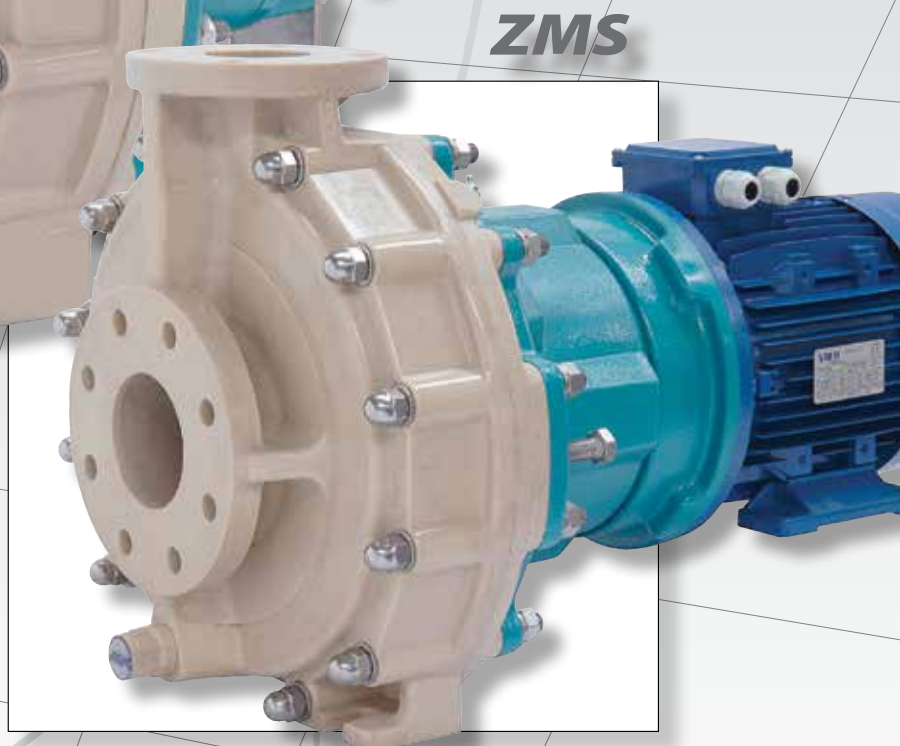
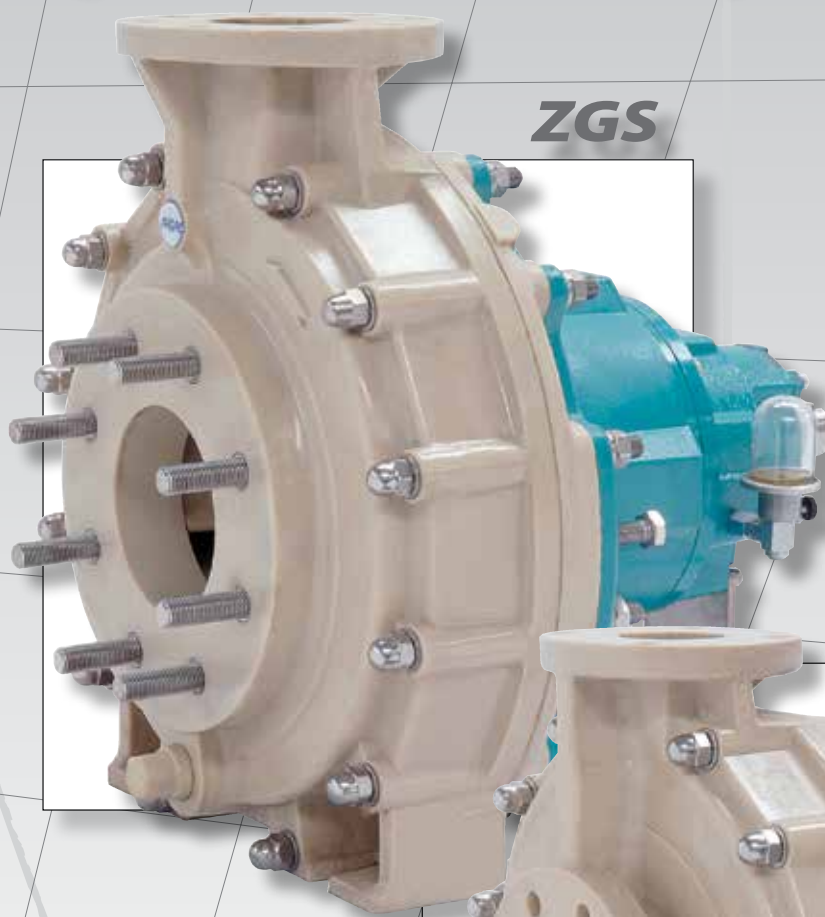
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ARGAL

CHEMICAL PUMPS

SATURN

Fiberglass Reinforced Polyester Pumps



SATURN - Fiberglass Reinforced Polyester Pumps

The Argal pumps of the new range Saturn are centrifugal, single stage and compliant to ANSI/ASME B73.1. Regulation. These pump are manufactured in FRP (fibre reinforced polyester) and do not need a protecting carcass or external frames to reinforce the structure.

Peculiar design and the intrinsic resistance of the material of construction confer to these pumps mechanical resistance comparable to that of the major metallic alloys. Use of different formulations of epoxy vinyl ester resins, extend the spectrum of chemical resistance of these pumps that are adequate and resistant to a large number of corrosive and moderately abrasive medias.

The Saturn pumps are a technical and economical alternative to metallic pumps made of special alloys and can be effectively applied in water treatment applications, water games, depuration of civil and industrial waste waters, and in general in productive processes deploying chemicals.

THE MANUFACTURING PROCESS

The Saturn pumps are produced completely by Argal in its plant located in Italy by RTM injection moulding technology.

By this process parts are manufactured in moulds where reinforcing layers of glass fibre matt are arranged prior to the injection of the resin.

The use of glass fibers in form of layer of tissue of different weight allows to reinforce the structure in the areas of most mechanical stress and at the same time offers an excellent chemical resistance of the surfaces wetted by the liquid pumped.

The thermoset resins, differently from thermoplastics materials, can not be re processed once catalyzed and this is a warrantee for better mechanical properties, thermal and dimensional stability and longer life.



APPLICATIONS

table 1

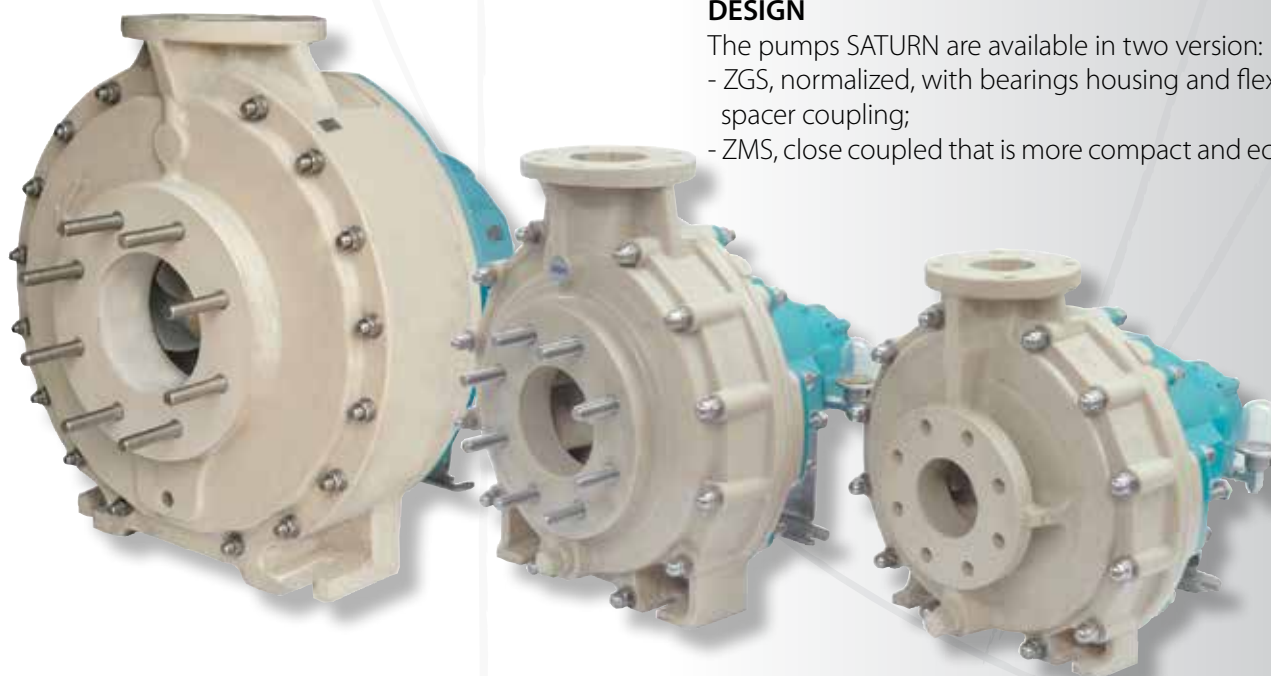
FIBERGLASS RESIN	APPLICATIONS
V1G standard vinyl ester resin compound	General purpose
V1A vinyl ester resin compound	Abrasive liquids
V1C vinyl ester resin compound	Bleaches applications
V1F vinyl ester resin compound	Fluoridric applications

MARKET	APPLICATIONS
Aquariums/Zoos	Salt water
Chemical Process	Acids
	Chemical waste
	Waste water
Desalination	Filtration
	Seawater In-take
	Chemical Transfer
	Concentrated Brine
Electric Utilities	Coal pile run-off
Electronics	Acids
	Chemical waste
	Chromic acids
Metal Finishing	Pickling acids
	Plating solutions
Petrochemical	Acids
	Chemical waste
Pharmaceutical	Organic Solvents
Pulp and Paper	Bleach
Mining	Abrasives and Corrosives
Scrubbers/Odor Control	Acids and Caustics

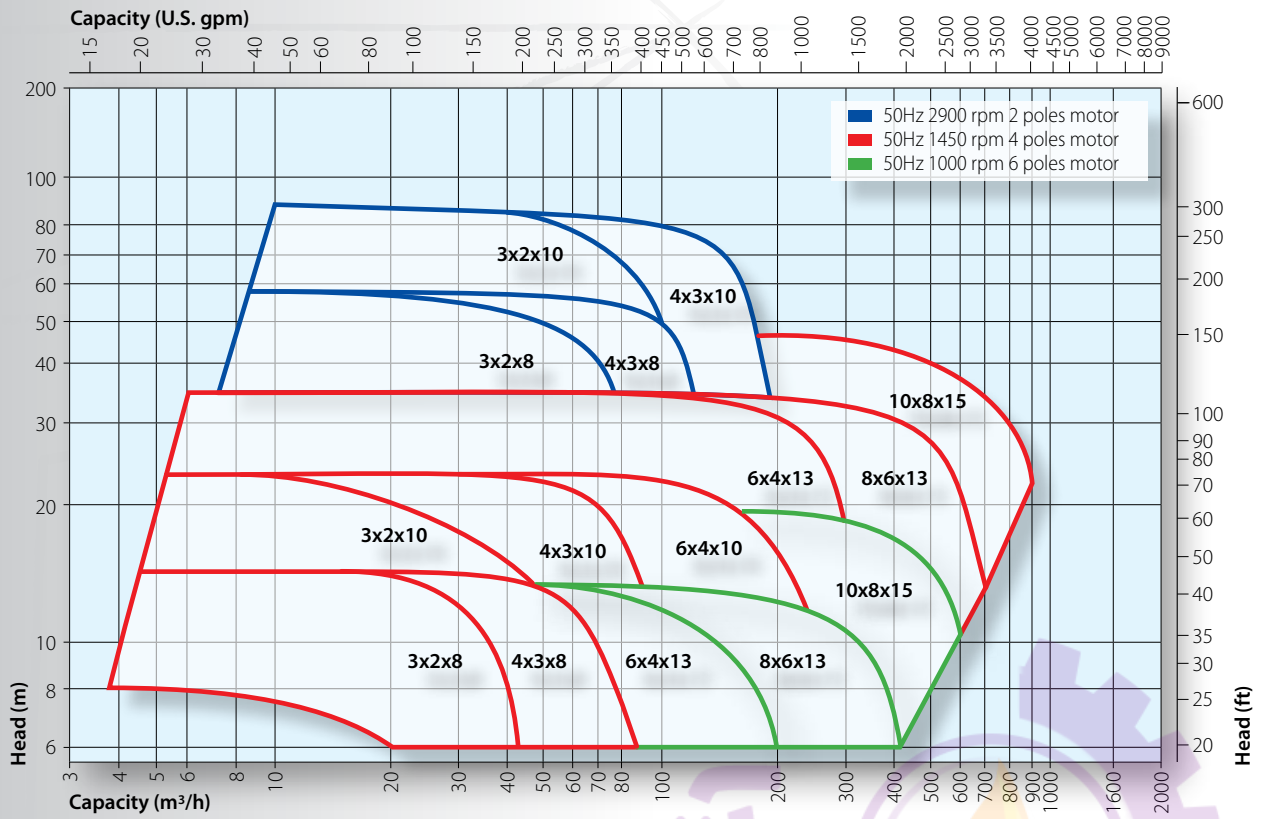
DESIGN

The pumps SATURN are available in two version:

- ZGS, normalized, with bearings housing and flexible spacer coupling;
- ZMS, close coupled that is more compact and economical.



General Performance Curves 50 Hz



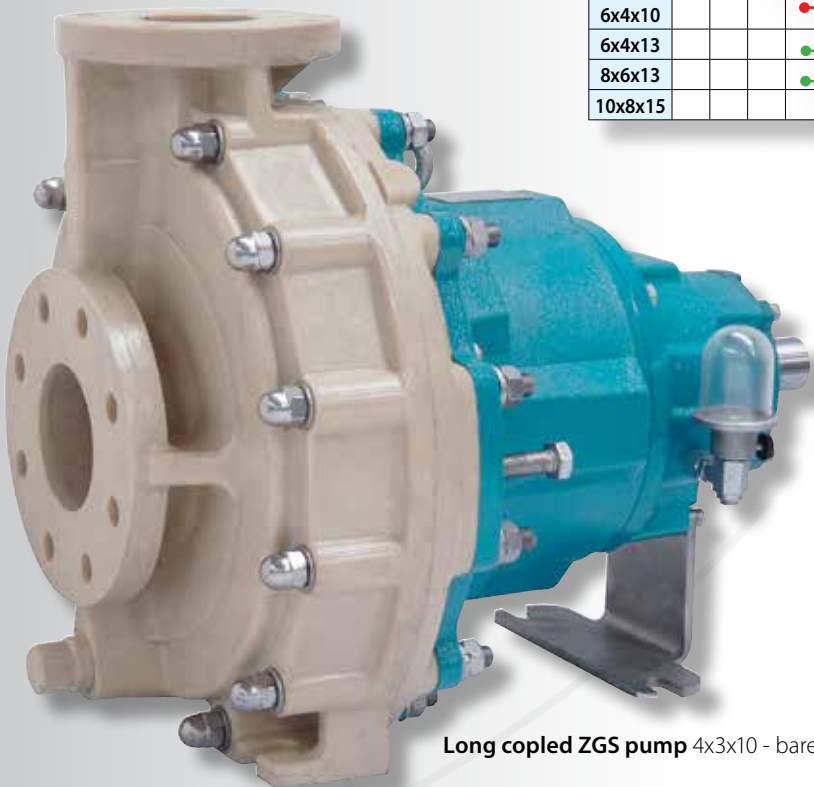
NOTE: All curves are referred to water at 20°C - viscosity 1^eE - specific gravity 1 kg/dm³

MOTOR POWER INSTALLED (50 Hz)

table 2

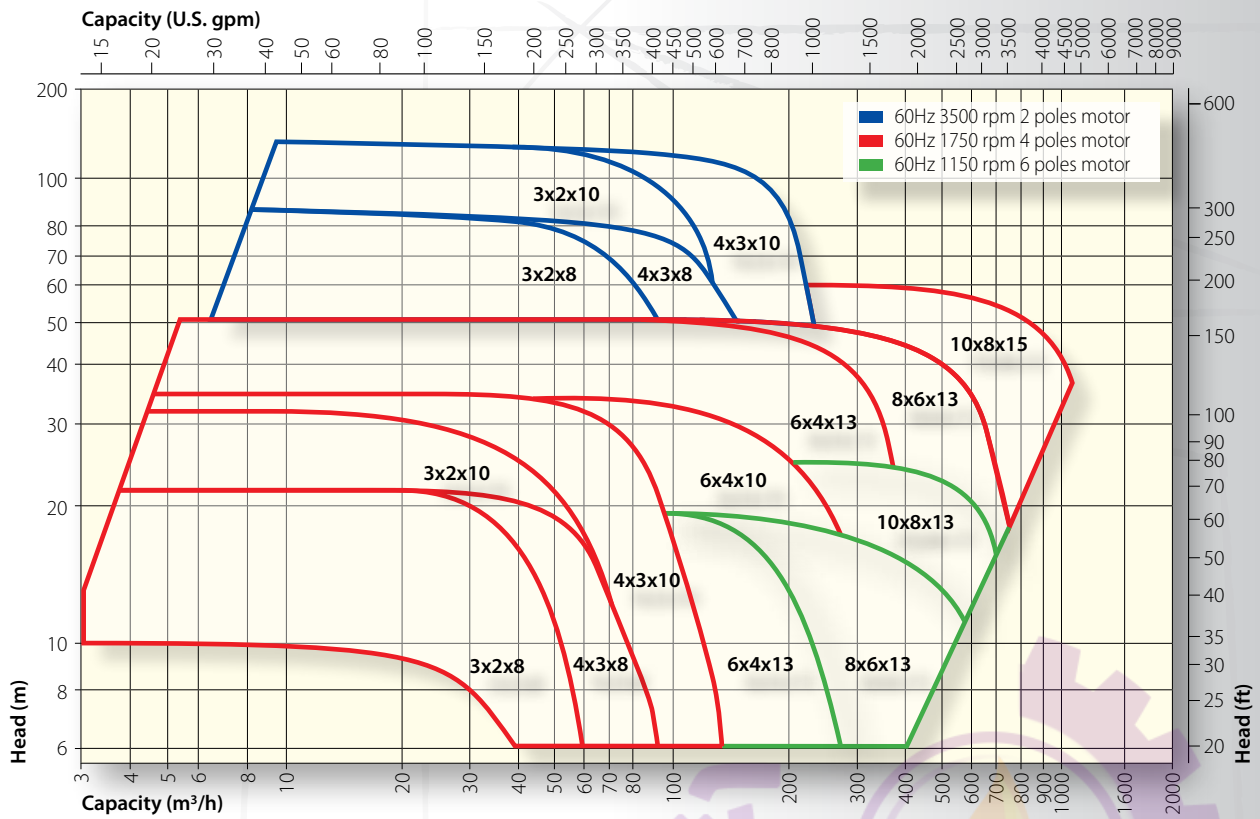
Model	kW																		
	1,5	2,2	3	4	5,5	7,5	11	15	18,5	22	30	37	45	55	75	90	110	132	
3x2x8																			
3x2x10																			
4x3x8																			
4x3x10																			
6x4x10																			
6x4x13																			
8x6x13																			
10x8x15																			

2 poles IEC motors ●●●●●
4 poles IEC motors ●●●●●
6 poles IEC motors ●●●●●



Long coupled ZGS pump 4x3x10 - bare shaft

General Performance Curves 60 Hz



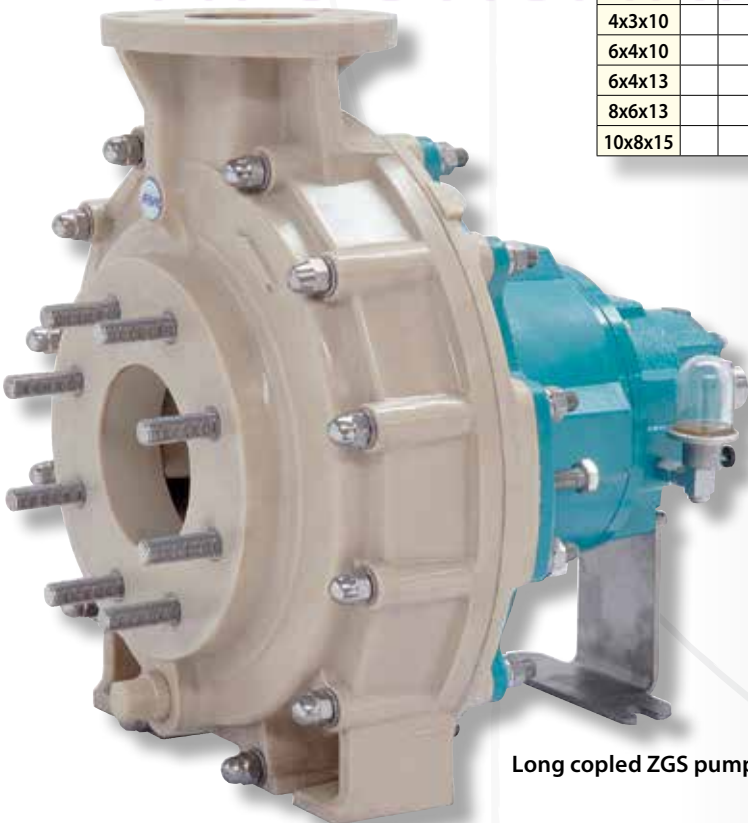
NOTE: All curves are referred to water at 20°C - viscosity 1°E - specific gravity 1 kg/dm³

MOTOR POWER INSTALLED (60 Hz)

table 3

Model	kW																			
	1,5	2,2	3	4	5,5	7,5	11	15	18,5	22	30	37	45	55	75	90	110	132	160	
3x2x8																				
3x2x10																				
4x3x8																				
4x3x10																				
6x4x10																				
6x4x13																				
8x6x13																				
10x8x15																				

2 poles IEC motors (blue dot)
 4 poles IEC motors (red dot)
 6 poles IEC motors (green dot)

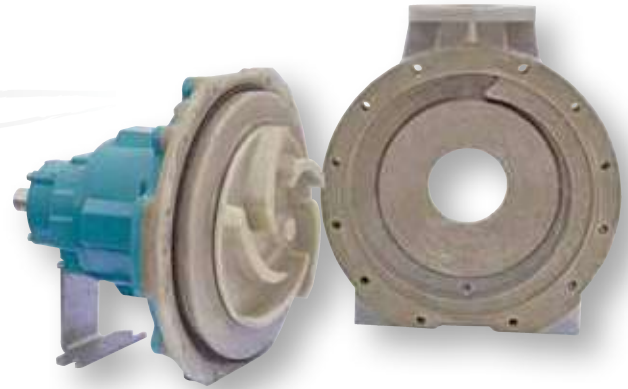
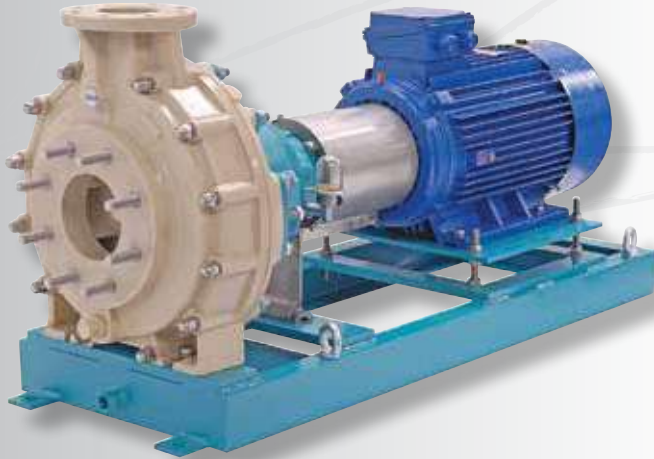


Long coupled ZGS pump 6x4x13 - bare shaft

Saturn ZGS

ZGS. The coupling of the pump to the motor by a flexible joint deliver a longer operative life to the mechanical part of the pump and is the preferred solution for heavy duty application and continuous use.

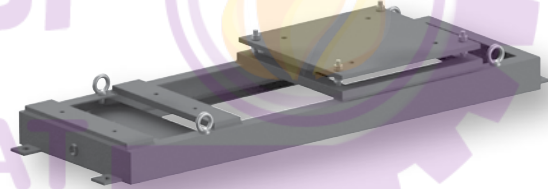
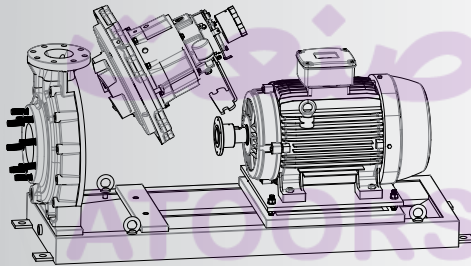
The flexible joint coupling allows maintaining the pump or the motor mounted on a mutual base plate, independently. The back pull-out construction allows to dismantle the support of the pump and some hydraulic parts subjected to periodic inspection without disconnecting the casing from the piping of the plant or removing the electric motor from the base plate.



Long coupled pump ZGS - Pump and electric motor are assembled on a common FRP base plate (optional) and coupled by flexible joint. Guard plate is made of Stainless steel and directly assembled on to the pumps (doesn't need to be anchored to the base plate.)

Detail of the volute casing

Depending from the model the volute casing can be manufactured with a simple volute or with a double volute. In the latter case the final section of the volute is partly divided in two independent section that reduce the radial loads on to the bearings and the transmission shaft.



Back pull-out execution - All the SATURN pumps with elastic coupling are equipped with the back pull out system that allows the dismantling of the internal and mechanic parts of the pump without disconnecting the casing from the fittings and without moving the motor.

Base plate

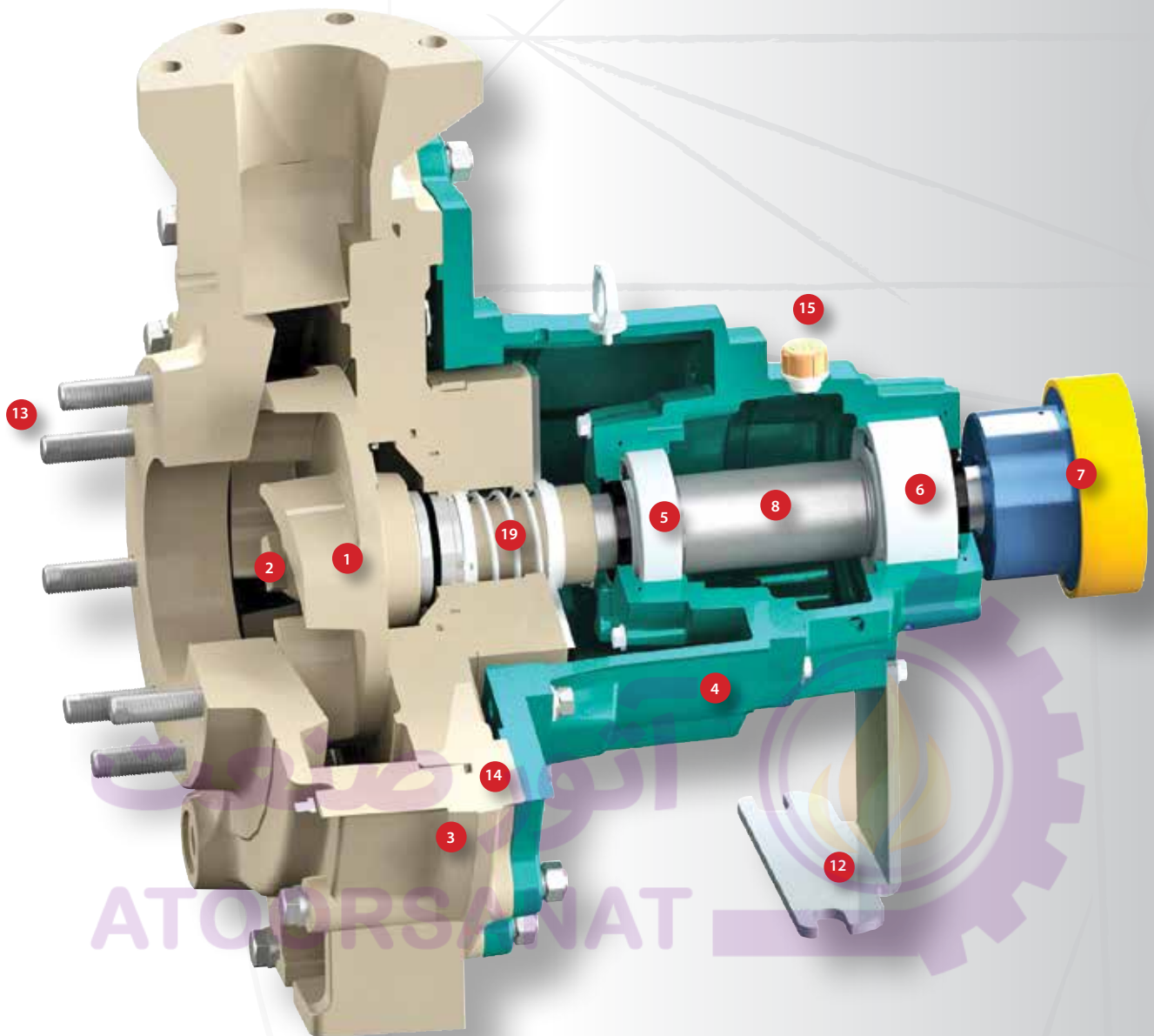
Made of carbon steel profiles, painted with anti corrosion enamel and provided with a system to adjust the position of the motor and ease its alignment with the pump.

PUMP IDENTIFICATION LABEL

table 4

ZGS	4x3x8	V1G	V	TC8	R	E	O	A
SATURN	4" Inlet 3" Outlet 8" impeller ø	Vinyl ester resin for general purpose	V = FKM E = EPDM F = FEP K = FFKM	TC8 ext. single SiC-SiC	Integral	E = IEC U = NEMA	0 = without joint 1 = with joint	ANSI Flange
SERIE	MODEL	VERSION	GASKET MATERIAL	MECHANICAL SEAL	EXTERNAL STRUCTURE	STANDARD MOTOR	COUPLING	CONNECTIONS
ZGS	3x2x8 3x2x10 4x3x8 4x3x10 6x4x10 6x4x13 8x6x13 10x8x15	V1G V1A V1C V1F	V E F K	TR5_ TR8_ TC8_ BF8_ MTR5_ MTR8_ MTC8_	R	E 132 38 ... E 355 95	0 1	A

Saturn ZGS long-coupled pump



1 - Impeller

Centrifugal. Semi open type, with high efficiency vanes is manufactured by RTM injection as single piece with metallic core embedded.

2 - Ogive

It is polyester made part with a stainless steel core embedded in the part when it is injected designed to lock the impeller permanently in its home position. It has a hexagonal shape compatible with a standard wrench.

3 - Volute casing and rear casing

RTM Injection moulded in single piece without joints are extremely resistant.

The areas of the rear casing subjected to localise mechanical stress as flanges and supports are manufactured with peculiar design attentions.

4 - Bearings housing and rear flange

Cast iron parts produced by a mechanised process. The support hosts the bearings' housing and the lubricant oil. The lantern located in intermediate position connects the support to the rear-casing flange.

5 - Bearing pump side

Taper roller bearing to counter axial and radial loads.

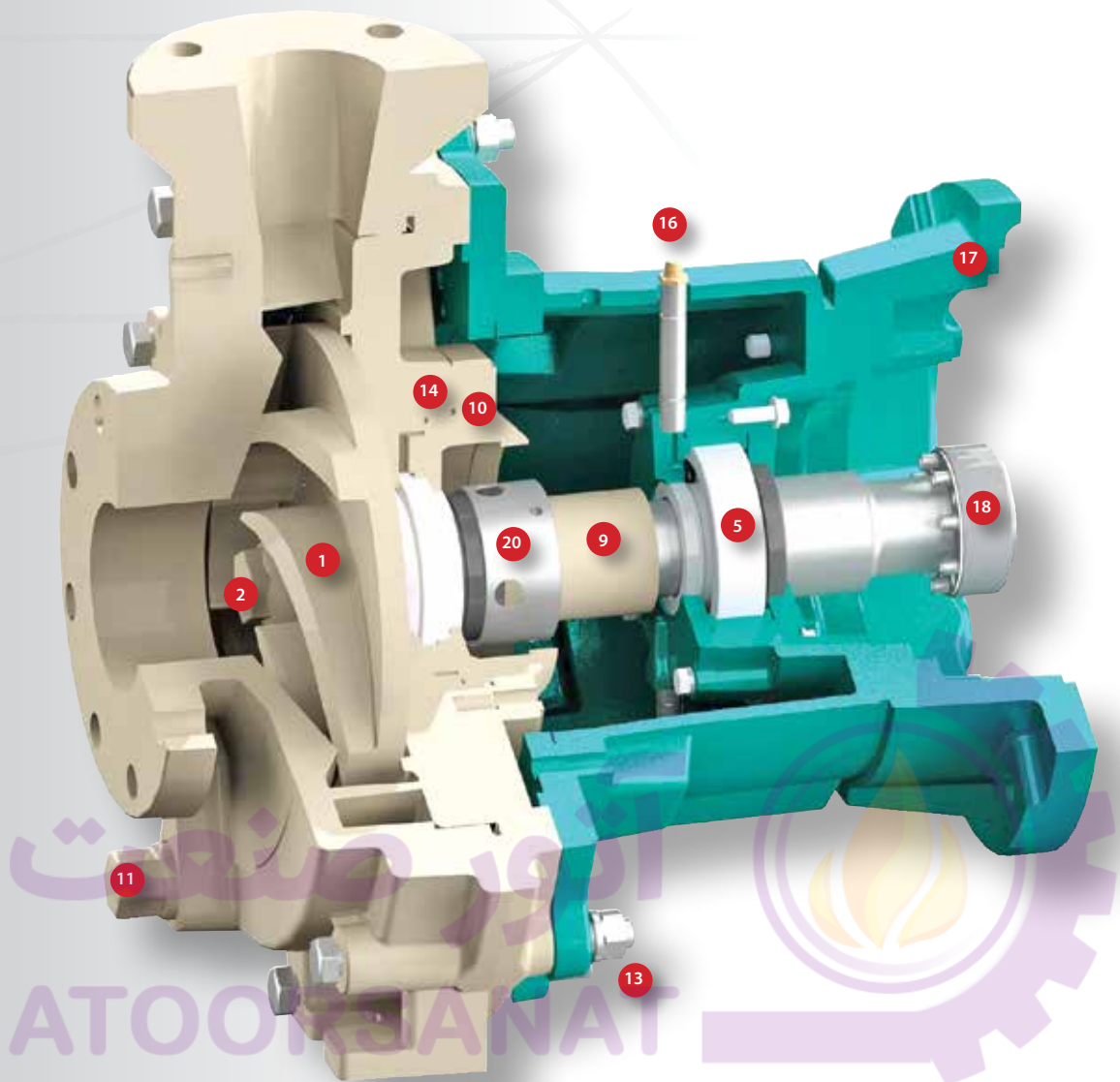
6 - Bearing motor side

Double row ball bearing.

7 - Flexible spacer coupling

Made of cast steel and single piece with crown in plastic polymer: It's complete with removable spacer to allow pulling out the pump for dis assembly purposes.

Saturn ZMS close-coupled pump



8 - Shaft

Is machined from a steel made bar and designed to resist to hydraulic loads and corresponding vibrations. Is totally protected by the shaft sleeve made of FRP.

9 - Shaft Sleeve

Single piece without additional metallic parts.

10 - Diaphragm

Manufactured in FRP, is designed to support the stationary part of the mechanical seal and it is easily replaceable if it fails.

11 - Drain port

Optional.

12 - Support foot

Made of stainless steel plate.

13 - Locking bolts and tie rods

Made of stainless steel.

14 - O-ring gaskets

FKM Standard.

15 - Oil fill plug.

16 - Grease nipple.

17 - Flanged adaptor.

18 - Shrink disc.

19 - BF8 mechanical seal.

20 - TR5 mechanical seal.

Saturn ZMS

ZMS. The close coupled construction, proposed for installed power up to 37 kW has also important functional advantages. The shaft of the pump is supported by a bearing located in the lantern: This bearing counters all the radial load of the shaft and by reducing its overhung section reduces the loads on the bearings of the electric motor contributing to extend their life. This solution is characterized by reduced overall dimensions and allows installing these pumps also in plants dimensioned for different devices.



Detail of the volute casing

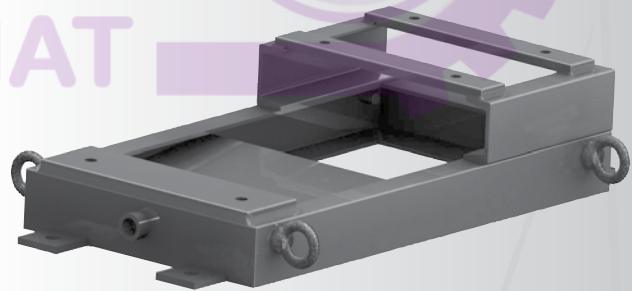
Depending from the model the volute casing can be manufactured with a simple volute or with a double volute. In the latter case the final section of the volute is partly divided in two independent section that reduce the radial loads on to the bearings and the transmission shaft.

Close coupled pump ZMS

Pump and electric motor are assembled directly.

Base plate (optional)

Made of carbon steel profiles, painted with anti corrosion enamel.



PUMP IDENTIFICATION LABEL

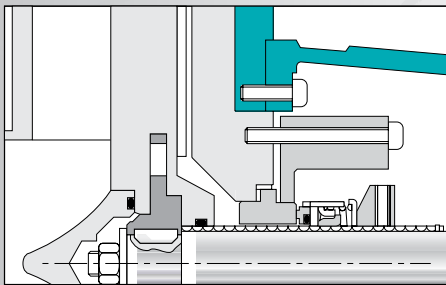
table 5

ZMS	4x3x8	V1G	V	TC8	R	E	T	A	
SATURN	4" Inlet 3" Outlet 8" impeller ø	Vinyl ester resin for general purpose	V = FKM E = EPDM F = FEP K = FFKM	TC8 ext. single SiC-SiC	Integral	E = IEC U = NEMA	T=Shrink disc	ANSI Flange	
SERIE	MODEL	VERSION	GASKET MATERIAL	MECHANICAL SEAL	EXTERNAL STRUCTURE	STANDARD MOTOR	STANDARD MOTOR	COUPLING	CONNECTIONS
ZMS	3x2x8 3x2x10 4x3x8 4x3x10 6x4x10 6x4x13	V1G V1A V1C V1F	V E F K	TR5_ TR8_ TC8_ BF8_ MTR5_ MTR8_ MTC8_	R	E 132 38 ... E 200 55	U 182T 29 ... U 326 TS 48	T	A

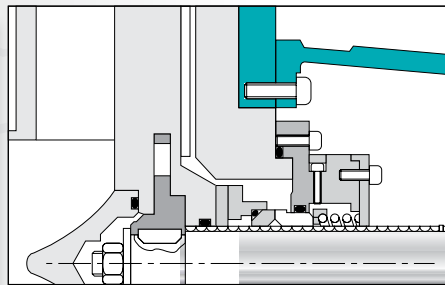
Mechanical Seals

SATURN pumps can be installed with various types of mechanical seals, both those produced by ARGAL and those produced by other leading Manufacturers. These can be classified by type of installation (single internal or external, double fluxing) and by the materials used for the sliding parts and the packing. The metal parts are never in contact with the pumped fluid.

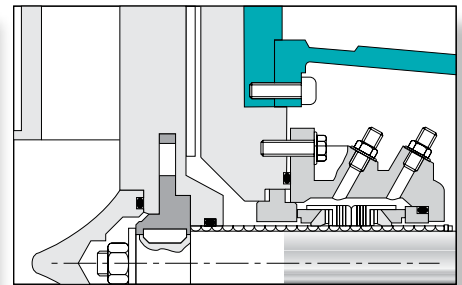
TR5 - TR8 - TC8



BF8



MTR5 - MTR8 - MTC8



APPLICATIONS

table 6

MODEL	TR5 (1)	TR8 (2)	TC8 (3)	BF8 (4)	MTR5 (5)	MTR8 (6)	MTC8 (7)
concentrated fluorine compounds			X	X			
clear chemical	X	X					
volatile liquids					X	X	X
abrasive liquids		X	X	X		X	X
precipitation risk solutions				*	X	X	X
liquids with solids				X		X	X
max. %	1-3	1-3	1-3	1-5	1-3	1-3	1-3
max. dimension (mm)	0,1-0,6	0,1-0,6	0,1-0,6	1-2	0,1-0,6	0,1-0,6	0,1-0,6
max. hardness (Mohs)	1-3	3-6	3-6	3-6	1-2	3-6	3-6
WORKING CONDITIONS	standard	extreme			critical	heavy	

* Only with external flushing

Note 1:

TR5-1 Argal
TR5-2 Crane 8-1T
TR5-3 Flowserve RA-C

Note 2:

TR8-1 Argal
TR8-2 Crane 8-1T
TR8-3 Flowserve RA-C

Note 3:

TC8-1 Argal
TC8-2 Crane 8-1T

Note 4:

BF8-1 Argal
BF8-2 Flowserve Allpac 481

Note 5:

MTR5-1 Argal
MTR5-2 Crane 8-1T/8-1T

Note 6:

MTR8-1 Argal
MTR8-2 Crane 8-1T/8-1T
MTR8-3 Flowserve CRO

Note 7:

MTC8-1 Argal
MTC8-2 Crane 8-1T/8-1T

MATERIALS

table 7

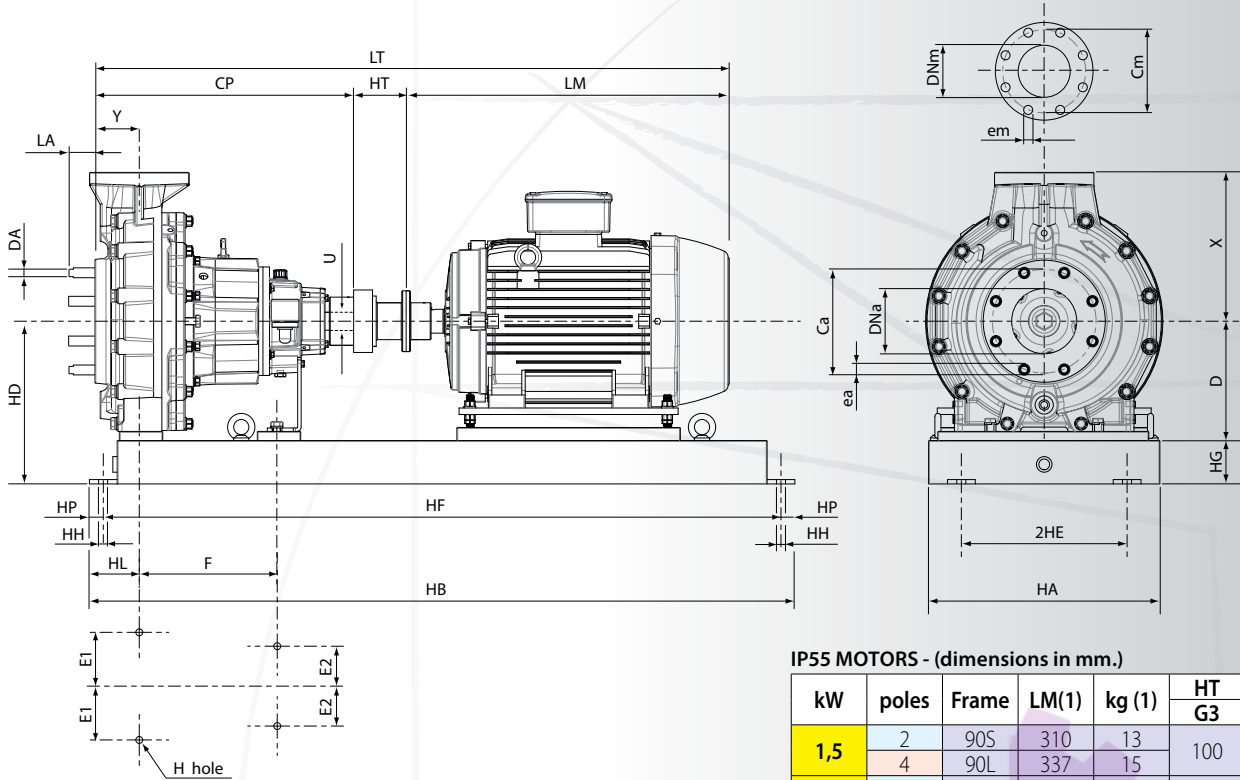
MODEL	TR5 (1)	TR8 (2)	TC8 (3)	BF8 (4)	MTR5 (5)	MTR8 (6)	MTC8 (7)	
Construction	external single			internal single	double flushed			
Part	rotating	Car	SiC	SiC	SiC	Car	SiC	SiC
	fixed	Al ₂ O ₃	SiC	SiC	SiC	Al ₂ O ₃	SiC	SiC
Gasket	FKM*	FKM*	FFKM	FKM*	FKM*	FKM*	FFKM	
Part	2° rotating	-	-	-	Car	Car	Car	
	2° fixed	-	-	-	Al ₂ O ₃	Al ₂ O ₃	Al ₂ O ₃	

* Available also in EPDM

SEAL FLUSHING ARRANGEMENTS

All mechanical seals require flushing to lubricate the seal faces and maintain normal operating temperatures. Seals are normally flushed with either a clean external fluid or by the liquid being pumped.

Saturn ZGS long-coupled pumps



ANSI/ASME B73.1 PUMPS - (dimensions in mm.)

table 8

MODEL	CP	Y	D	X	F	E1	E2	H	U	LA	DA	(kg)
3 x 2 x 8	597	102	210	242	318	124	92	16	41,3	n.a.	n.a.	95
3 x 2 x 10	597	102	210	242	318	124	92	16	41,3	n.a.	n.a.	95
4 x 3 x 8	597	102	210	280	318	124	92	16	41,3	n.a.	n.a.	100
4 x 3 x 10	597	102	210	280	318	124	92	16	41,3	n.a.	n.a.	100
6 x 4 x 10	597	102	254	343	318	124	92	16	41,3	60	20	120
6 x 4 x 13	597	102	254	343	318	124	92	16	41,3	60	20	120
8 x 6 x 13	860	152	368	406	476	203	114,5	22	60,3	60	20	240
10 x 8 x 15	860	152	368	483	476	203	114,5	22	60,3	60	20	280

CONNECTIONS - ANSI/ASME B16.5 class 150 - (dimensions in mm.)

table 9

MODEL	INLET					OUTLET				
	DNa	Ca	ea	n°	type	DNm	Cm	em	n°	type
3 x 2 x 8	80	152	19	4	hole	50	121	19	4	hole
3 x 2 x 10	80	152	19	4	hole	50	121	19	4	hole
4 x 3 x 8	100	191	19	8	hole	80	152	19	4	hole
4 x 3 x 10	100	191	19	8	hole	80	152	19	4	hole
6 x 4 x 10	150	241	20	8	tie rod	100	191	19	8	hole
6 x 4 x 13	150	241	20	8	tie rod	100	191	19	8	hole
8 x 6 x 13	200	298	20	8	tie rod	150	241	22	8	hole
10 x 8 x 15	250	362	20	12	tie rod	200	298	22	8	hole

ISO flanged on request

BASE PLATE - (dimensions in mm.)

table 10

N°	HA	HB	HE	HF	HG	HH	HL	HP	(kg)
245	381	1143	114	1080	95	19	114	32	50
252	457	1321	152	1257	105	19	114	32	65
258	533	1473	191	1410	121	25	114	32	85
264	533	1626	191	1562	121	25	114	32	95
268	660	1727	241	1664	121	25	114	32	110
280	660	2032	241	1969	121	25	114	32	125
368	660	1727	241	1664	121	25	165	32	140
380	660	2032	241	1969	121	25	165	32	150
398	660	2489	241	2426	121	25	165	32	190

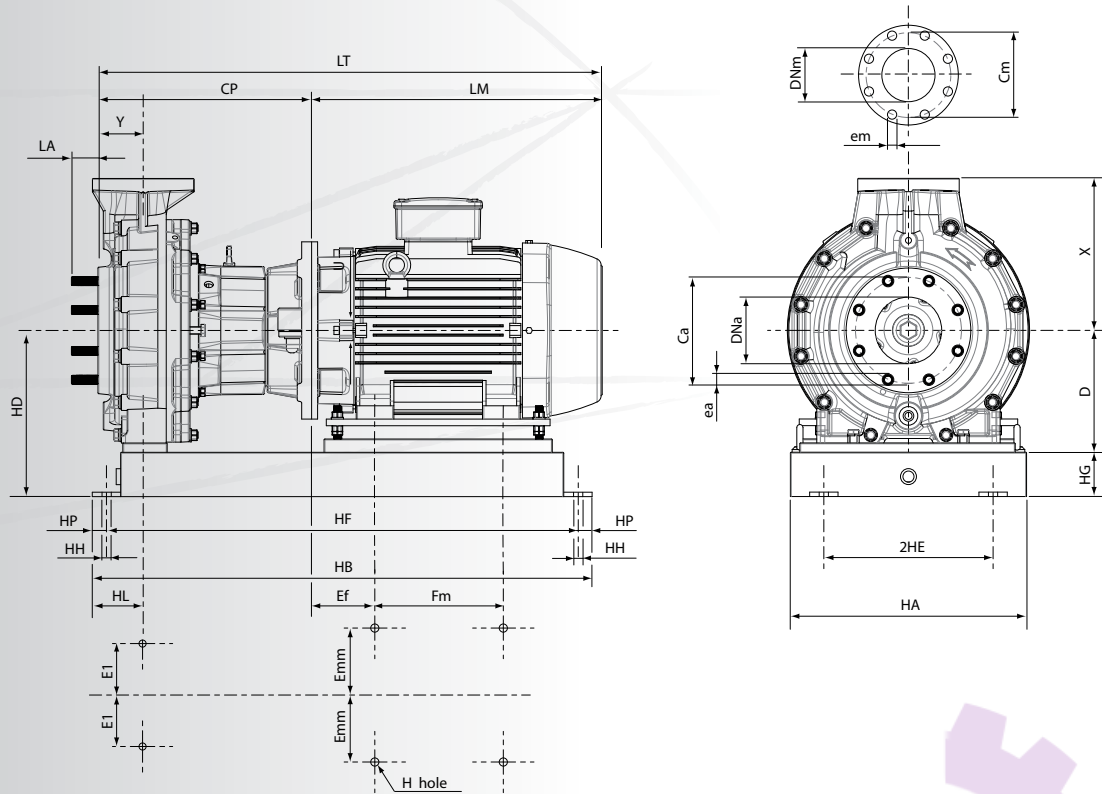
IP55 MOTORS - (dimensions in mm.)

table 11

kW	poles	Frame	LM(1)	kg (1)	HT	HT
					G3	G4
1,5	2	90S	310	13	100	
	4	90L	337	15		
2,2	2	90L	337	16	100	
	4			22		
3	2	100L	368	23	100	
	4			27		
4	2	112	395	27	100	
	4			32		
5,5	2	132S	437	42	100	
	4			43		
7,5	2	132S	437	46	100	
	4	132M	475	53		
11	2	160M	655	122	100	120
	4			134		
15	6	160L	675	121	100	120
	2	160M	655	133		
18,5	4	160L	675	169	100	120
	6	180L	768	173		
22	2	160L	675	163	100	120
	4	180M	720	196		
30	6	200LA	760	221	120	140
	2	180M	720	190		
37	4	180L	768	242	100	120
	6	200LB	760	236		
45	2	200L	760	252	120	140
	4			275		
55	6	225M	850	301	120	140
	2	200L	760	275		
75	4	225S	825	328	120	140
	6	250M	925	370		
90	2	225M	820	315	120	140
	4			355		
110	6	280S	975	478	120	140
	2	250M	925	417		
132	4	280M	1015	615	120	140
	6			280S		
160	2	315S	1190	790	140	180
	4			540		
180	6	280M	1015	615	120	140
	4	315M	1300	880		
200	6	315S	1190	870	140	180
	4	315LA	1300	997		
225	6	315M	1300	990	140	180
	4	315LM	1300	1103		
250	6	315LA	1270	1053	140	180
	4	355MA	1570	1400		

(1) It can change for various manufacturers

Saturn ZMS close-coupled pumps



ANSI/ASME B73.1 PUMPS - (dimensions in mm.)

table 12

MODEL	CP	Y	D	X	E1	H	U	LA	Weight (kg)
3 x 2 x 8	597	102	210	242	124	16	41,3	n.a.	95
3 x 2 x 10	597	102	210	242	124	16	41,3	n.a.	95
4 x 3 x 8	597	102	210	280	124	16	41,3	n.a.	100
4 x 3 x 10	597	102	210	280	124	16	41,3	n.a.	100
6 x 4 x 10	597	102	254	343	124	16	41,3	60	120
6 x 4 x 13	597	102	254	343	124	16	41,3	60	120

CONNECTIONS - ANSI/ASME B16.5 class 150 - (dimensions in mm.)

table 13

MODEL	INLET					OUTLET				
	DNa	Ca	ea	n°	type	DNm	Cm	em	n°	type
3 x 2 x 8	80	152	19	4	hole	50	121	19	4	hole
3 x 2 x 10	80	152	19	4	hole	50	121	19	4	hole
4 x 3 x 8	100	191	19	8	hole	80	152	19	4	hole
4 x 3 x 10	100	191	19	8	hole	80	152	19	4	hole
6 x 4 x 10	150	241	20	8	tie rod	100	191	19	8	hole
6 x 4 x 13	150	241	20	8	tie rod	100	191	19	8	hole

BASE PLATE - (dimensions in mm.)

table 14

N°	HA	HB	HE	HF	HG	HH	HL	HP	Weight (kg)
233	381	838	114	774	95	19	114	32	30
244	381	1143	114	1080	95	19	114	32	40

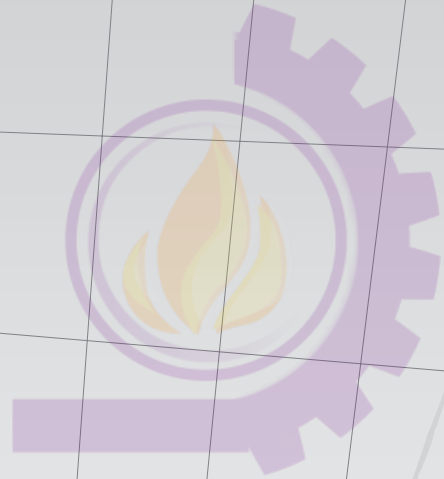
IP55 MOTORS - (dimensions in mm.)

table 15

kW	1,5		2,2		3		4		5,5		7,5		11		15		18,5		22		30		37				
Poles	2	4	2	4	2	4	2	4	2	4	2	4	6	2	4	6	2	4	6	2	4	6	2	4	2		
FRAME	90S	90L	90L	100L	112	132S	132S	132M	160M	160M	160L	160M	160L	180L	160L	180M	200LA	180M	180L	220LA	200LB	200L	200LB				
LM (°)	260	285	285	326	335	356	356	396	500	500	545	500	545	610	545	570	650	570	610	650	650	650	650				
Weight kg(!)	12	15	16	22	23	27	32	42	43	46	53	103	122	134	121	133	169	173	163	196	221	190	242	236	226	240	245

(1) It can change for various manufacturers

آتور صنعت ATOORSANAT



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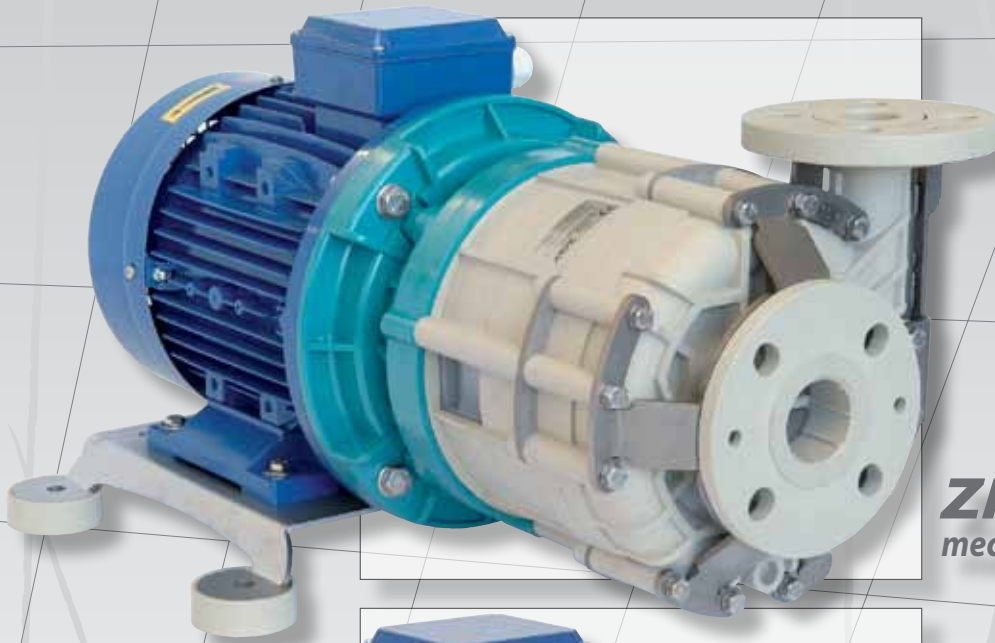
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Tel. +39.030.3507011 - Fax +39.030.3507077 - Export dpt. Tel. +39.030.3507033
Web: www.argal.it - E-mail: export@argal.it

50Hz

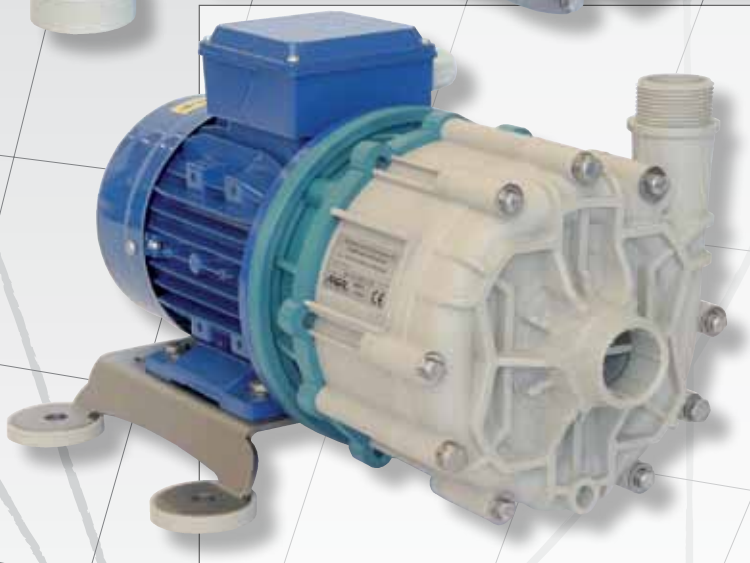
ARGAL

CHEMICAL PUMPS

Route range



ZMR
mechanical sealed



TMR
magnetical driven

*centrifugal pumps
in thermoplastic materials*

In this catalog Argal proposes the range of ROUTE pumps, inclusive of magnetical driven serie named **TMR** embedding innovative patented technology, and traditional mechanical sealed serie named **ZMR**.

ARGAL with these series, offers more than competitors a complete solutions to pump almost all the chemical liquids: aggressive, clean or with solid in suspension included lightly abrasives.

The advantages of these series are

- ☑ simple and innovative constructions
- ☑ suitability to transfer chemicals in industrial applications
- ☑ minimised maintenance
- ☑ no need of specialized after sales service centers
- ☑ affordable purchase price and low operative cost.

To improve existing technology our R&D department developed and patented a solution called "two axial directions self alignment system" (optional) that controls the movement of the impeller through additional magnetic field.

ARGAL exploited this innovative idea to its best eliminating almost all frictions (both front and rear) except the attrition of rotation; In absence of hydraulic flow the magnetic field of this new system pulls the impeller in a central neutral position: the tolerance to dry running of the pump with the "R" self lubricating guide system is therefore guaranteed.



Argal operates with ISO 9001:2000 Quality System certified by SQS-Iqnet.



Magnetic driven pump G3 size in reinforced polypropylene (WR).

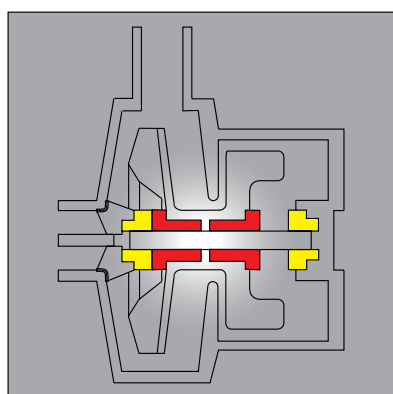


PATENTED SYSTEM: THE PRINCIPLE OF TWO AXIAL DIRECTIONS SELF-ALIGNMENT SYSTEM

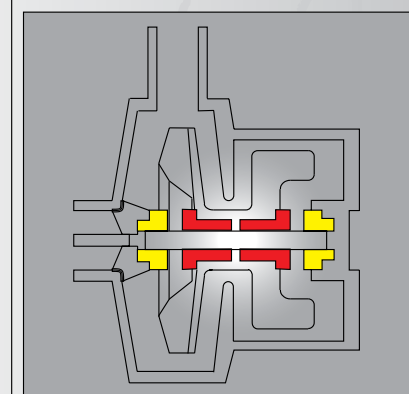
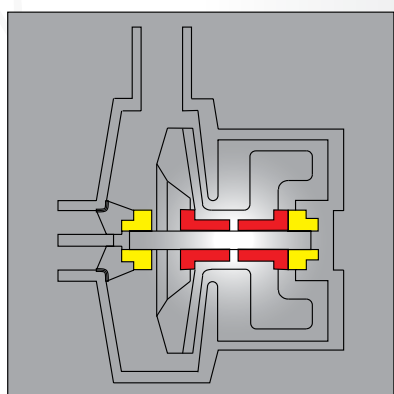
The impeller subjected to different hydraulic load is free to move axially.

Two rings which are limit devices of its excursion fix the work-space it engages during the standard operation. In case of anomalies due to pressure loss as dry running, the extra magnetic field (always active) contrasting the axial pushes, calls back the impeller in the neutral position.

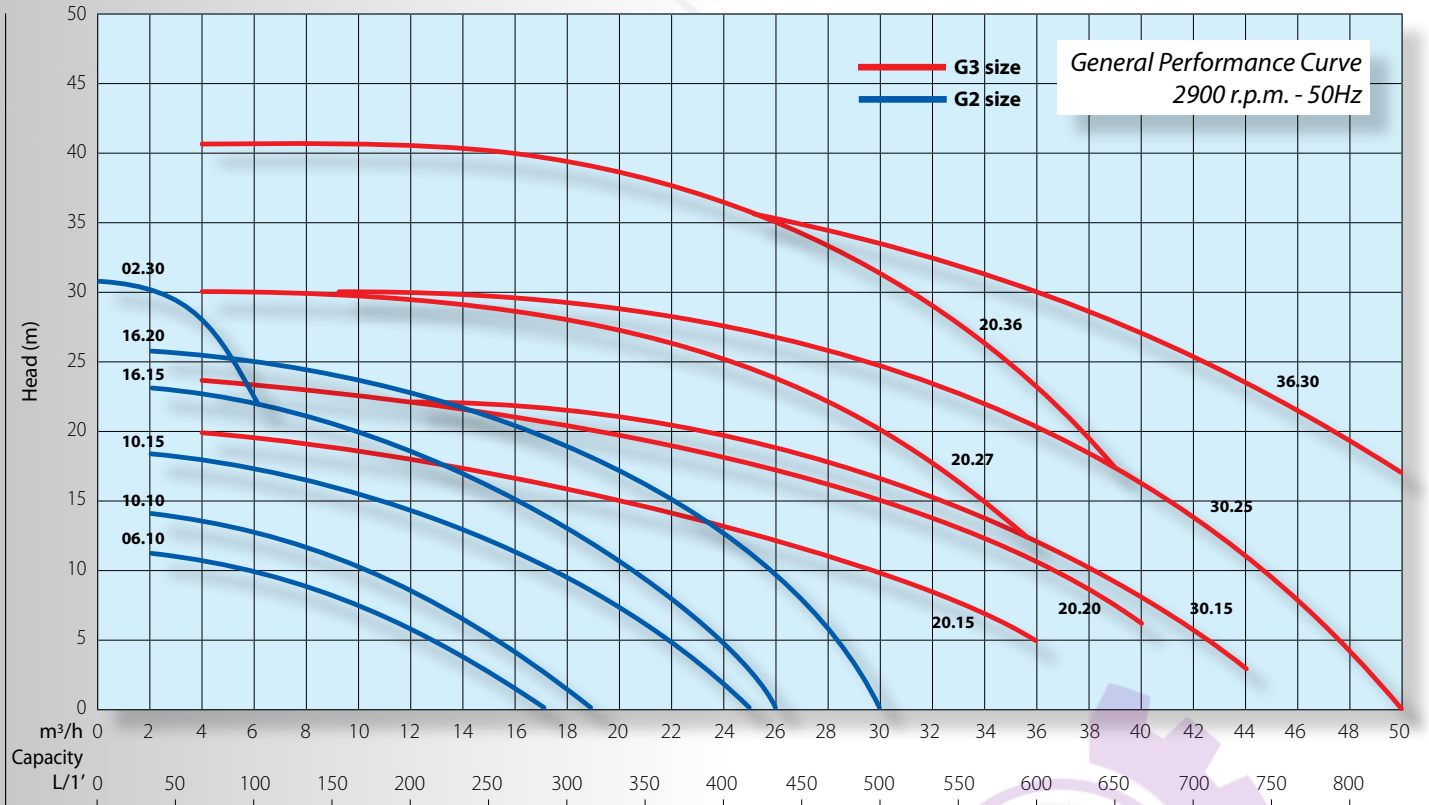
This distinctive automatism precisely prevents the contact with the rings (limiting devices) and consequently avoids frictions and heat increase. The shape of the magnets and the orientation of the fields are the key that shows the desired action.



Front and back side positions under hydraulic loads in different working conditions



Central position is dry running condition thank additional magnetic field.



NOTES: All curves are referred to: water at 20°C - viscosity 1^e - specific gravity 1 kg/dm³ pt



View of Route range pumps in different materials and constructions.

Labels in this catalog

GFR/PP	Glass fibre reinforced Polypropylene (30%)	EPDM	Etylene-Propylene rubber
CFF/E-CTFE	Etylene-Chloro Trifluoro Ethylene carbon fibre filled (20%)	BSP - m	BSP parallel threaded male connect. (according to ISO 7/1)
CARB. H.D.	Carbon high density	NPT - m	Threaded male NPT connections
SiC	Silicon Carbide	ND	Nominal diameter
CER	Alumina ceramic at 99,7%	ISO	Ref. Flange ISO 2084 - NP10
GFR/PTFE	Glass fibre reinforced PTFE	ANSI	Ref. Flange ANSI B 16.5 – Flat Face
FKM	Fluorine elastomer	IEC	According to E.C. motors
FFKM	Perfluorelastomer	NEMA	Accordind to U.S. motors

MAIN FEATURES OF SEAL-LESS MAGNETICAL DRIVEN "TMR"

HERMETIC PUMPS

The magnetical driven pumps are defined "hermetic" because of the exclusion of any rotating component of seal. The only necessity of seal between the volute casing and the back casing is guaranteed from a static gasket: O-ring type.

FOR ALL CHEMICALS

You can practically pump all the chemicals at low and medium temperatures with all the bodies in GFR-PP (glass fibre reinforced polypropylene) or CFF-E-CTFE (Etylene- Chloro TrifluoroEtylene carbon fibre filled).

• • • L O A D E D F L U I D S , • • • L I G H T Y • A B R A S I V E

The different internal configurations of the materials allow to pump both clean fluids and mediums with solids in suspensions or moderately abrasive

• • • H E A V Y F L U I D S

Strong magnetic coupling made up of rare-earth materials (Neodimium Iron Boron) and "N" (standard), "P" (powered) or "S" (strong-powered) versions allow to pump, also at maximum flow, liquids with 1.05 – 1.35 – 1.8 specific gravity respectively.

DRY RUNNING OPERATION

Dry running conditions with guide bushings in Carbon HD is guaranteed without damages thanks to the "two axial directions self-alignment" system (optional and with models 20.36 - 36.30 excluded). The conformation of the industrial plant, the fluid presence or absence in the pump body and its nature, affect the length of the dry running phase without damages or anomalous wear. All these details are listed in special time tables in the pumps manual.

P O S S I B L E C O N F I G U R A T I O N S

Various shifts of the volute casing can be obtained thanks to rotation. The joint of the outlet connection of the pump with the tube of the plant is made easier.

C E N T R I F U G A L I M P E L L E R P R O P E R T Y B A L A N C E

Thanks to particular hydraulic and structural changes, the impeller is effectively balanced in order to reduce the assistance for maintenance. The separability of the bladed part from the one containing all magnets with driving and axial control, a significant amount of money is saved in case of impeller substitution (only G3 size).

VARIOUS TYPOLOGIES OF CONNECTIONS

Connections with BSP cylindrical thread or NPT; flanges ISO, ANSI, JIS.

INDEPENDENT MOTOR APPLICATION

The motor can be installed and removed easily without dismantling or opening the volute casing. Standard motors are IEC or NEMA.

VOLUTE CASING DRAINING

Draining connection is arranged and it is available upon request.

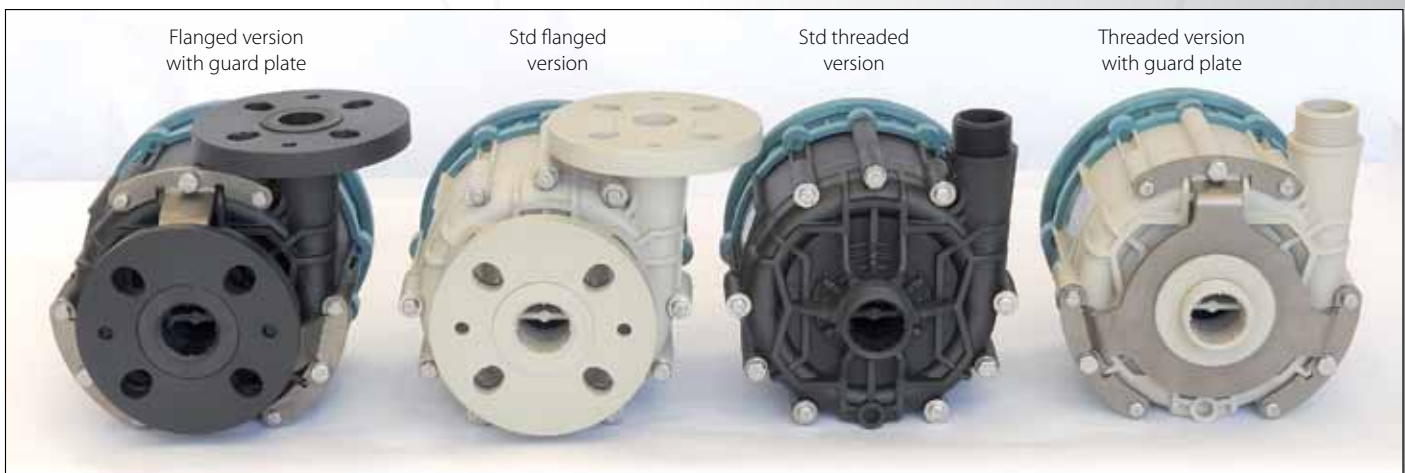
GUARD PLATE

A stainless steel guard plate is designed and fitted onto all models in order to protect the front casing from accidental mechanical shocks of various nature (e.g.: starts up with vacuum in inlet piping with possible piping excursions due to elastic brackets or thermal elongation). The guard plate is optional for G2 size of pumps.

B A S E T A B L E

The base for anchorage of the pump is in stainless steel with ground terminals in chemical-resistant thermoplastic materials. It is supplied upon request.

PREPARATIONS OF G2 SIZE



THE MATERIALS

table 1

VERSION	REINFORCED POLYMERS	MIN. TEMP.	MAX TEMP.	ENVIRONMENT TEMP.
WR	GFR/PP	-5°C (23°F)	80°C (176°F)	0÷40°C (14÷104°F)
GF	CFF/E-CTFE	-20°C (-4°F)	100°C (212°F)	-20÷40°C (-4÷104°F)
GX*	CFF/E-CTFE	-20°C (-4°F)	100°C (212°F)	-20÷40°C (-4÷104°F)

Note: Maximum inlet pressure: 1,5 bar - (*) Compliant to ATEX 94/9/EC regulations

THE CONSTRUCTIONS

table 2

TMR (G2 - G3 sizes)	WR	GF	GX*
Volute casing	GFR/PP	CFF/E-CTFE	CFF/E-CTFE
Rear casing			
Centrifugal impeller			
OR gasket	FKM (1)	FKM (1); (2)	FKM (1); (2)

Upon request: (1) EPDM - (2) FFKM - (*) Compliant to ATEX 94/9/EC regulations



GUIDE SYSTEMS

table 3

TMR (G2 - G3 sizes)	R1	X1	N1	R2	X2	N2	R2	N2
Guide bushing	Carbon HD	SiC	GFR/PTFE	Carbon HD	SiC	GFR/PTFE	Carbon HD	GFR/PTFE
Thrust bush		CER			SiC			SiC
Shaft		CER			SiC			SiC

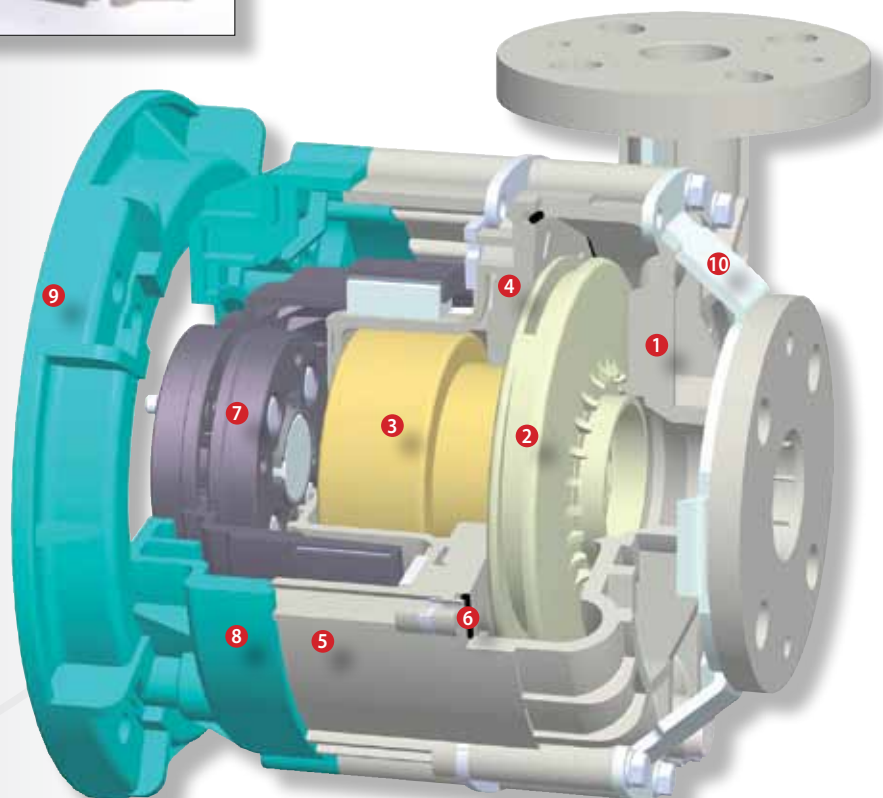


11 - R2 guide system (G2 size)

12 - X1 guide system (G3 size)

TMR - SECTION VIEW (G3 size)

- 1 - Volute casing
- 2 - Centrifugal impeller (covered type)
- 3 - Centrifugal impeller (magnetic part)
- 4 - Central disk
- 5 - Rear casing
- 6 - OR gasket
- 7 - Drive magnet assembly
- 8 - Bracket
- 9 - Motor adapter
- 10 - Guard plate



MAIN FEATURES OF MECHANICAL SEALED "ZMR"

VARIOUS TYPES OF MECHANICAL SEALS FOR ALL CHEMICALS

Different types of mechanical seals are available, single lubricated by pumped liquid or with flushing systems with liquid from the outside. Thanks to bodies in GFR-PP (glass fibre-reinforced polypropylene) or in CFF-E-CTFE (Etylene-ChloroTrifluoroEtylene carbon fibre filled) all chemicals at low and medium temperatures can be pumped.

The different combinations of materials of the sliding counter-face of the mechanical seal allow to pump liquids with solids in suspensions or abrasive. Various electrical powers are available in the "N" (standard) "P" (powered) or "S" (strong-powered) versions. They allow to pump, also at maximum flow, liquids with 1,05 – 1,35 – 1,8 specific gravity respectively.

☒ P ☒ O ☒ S ☒ S ☒ I ☒ B ☒ L ☒ V ☒ C ☒ R ☒ E ☒ C ☒ U ☒ T ☒ I ☒ A ☒ E ☒ T ☒ I ☒ O ☒ N ☒ N ☒ I ☒ O ☒ F ☒ C

Various shifts of the volute casing can be obtained thanks to rotation. The joint of the outlet connection of the pump with the tube of the plant is made easier.

VARIOUS TYPOLOGIES OF CONNECTIONS

Connections with BSP cylindrical thread or NPT; flanges ISO, ANSI, JIS.

ELECTRICAL MOTORS

IEC or NEMA standard motors can be installed.

GUARD PLATE

A stainless steel guard plate is designed and fitted onto all models in order to protect the front casing from accidental mechanical shocks of various nature (e.g.: starts up with vacuum in inlet piping with possible piping excursions due to elastic brackets or thermal elongation). The guard plate is optional for G2 size of pumps.

☒ B ☒ A ☒ S ☒ V ☒ C ☒ R ☒ E ☒ C ☒ U ☒ T ☒ I ☒ A ☒ E ☒ T ☒ I ☒ O ☒ N ☒ G ☒ D ☒ R ☒ A ☒ I ☒ N ☒ G are available upon request.

ZMR CONSTRUCTIONS (G2 - G3 sizes)

table 4

VERSION	WR	GF	GX*
Volute casing	GFR/PP		CFF/E-CTFE
Rear casing			
Centrifugal impeller			
OR gasket	FKM (1)		FKM (1); (2)

Note: Maximum inlet pressure: 1,5 bar - Upon request: (1) EPDM or (2) FFKM - (*) Compliant to ATEX 94/9/EC regulations

Mechanical sealed
Route ZMR G3 size pump
in PP reinforced material (WR)



Mechanical sealed
Route ZMR G2 size pump
in E-CTFE reinforced material (GF)

THE CONSTRUCTIONS OF MECHANICAL SEALS

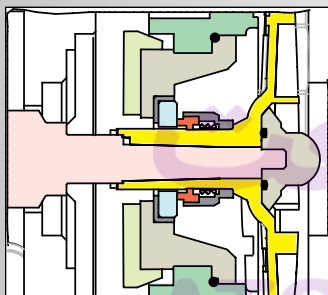
table 5

construction	model	rotating part	fixed ring	bellow	2nd rotating part	2nd fixed part	WORKING CONDITIONS
INTERNAL SINGLE	BS5	CARBON	CER	FKM			LOW COST (easy maintenance)
	BS7		SiC				
	BS6	SiC	CER				HARD PARTICLES
	BS8 - BF3**	SiC	SiC				
EXTERNAL SINGLE	SF1	GFR/PTFE	CER	PTFE	CARBON	CER	NORMAL USE
	SF2		SiC				
	TS5	CARBON	CER	FKM			
	TS7		SiC				
	TS6		SiC				CER
	TS8	SiC	SiC				
	DOUBLE	MSF1	GFR/PTFE	CER			PTFE
MSF2		SiC					
MTS5		CARBON	CER	FKM	EXTREME		
MTS7			SiC				
MTS6		SiC	CER				
MTS8		SiC	SiC				

(**) Only for ZMR G3 size

SECTIONS OF VARIOUS KIND OF MECHANICAL SEALS

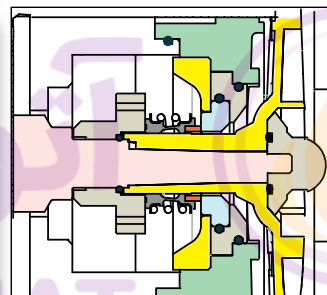
BS5 - BS6 - BS7 - BS8



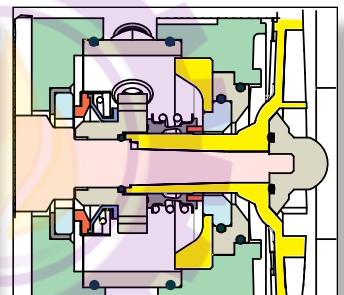
SF1 - SF2



TS5 - TS6 - TS7 - TS8

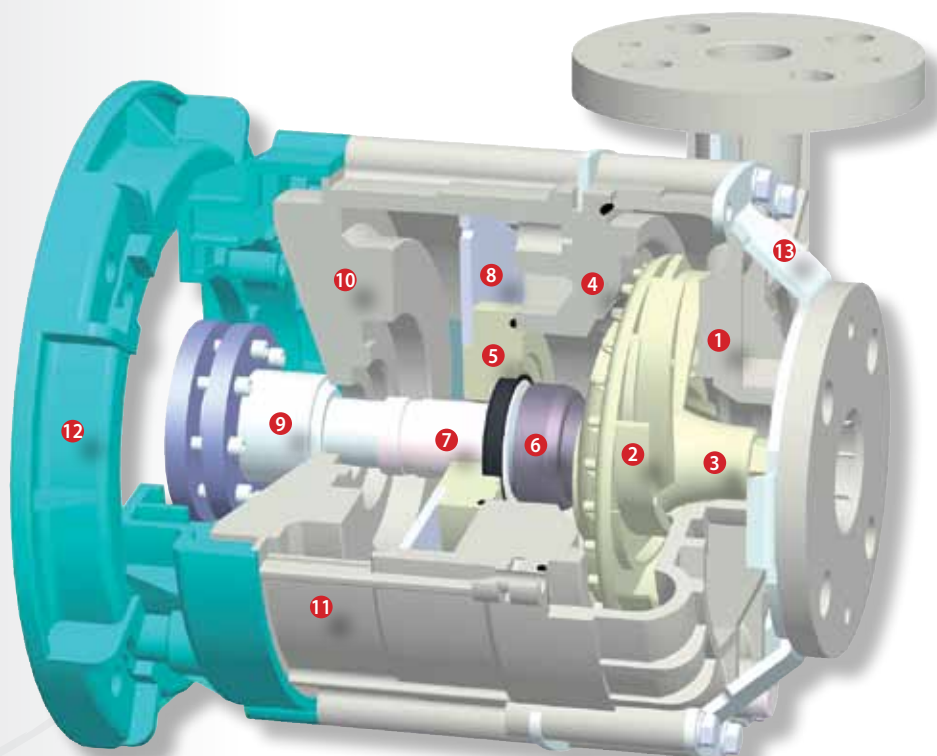


MSF_ - MTS_



ZMR - SECTION VIEW (G3 size)

- 1 - Volute casing
- 2 - Centrifugal impeller (open type)
- 3 - Ogive
- 4 - Rear casing
- 5 - Diaphragm
- 6 - Internal mechanical seal
- 7 - Sleeve shaft
- 8 - Counter plate
- 9 - Shaft
- 10 - Dividing plate
- 11 - Bracket
- 12 - Motor adapter
- 13 - Guard plate



PUMP SPECIFICATIONS (G2 - G3 sizes)

table 6

TMR - ZMR	50Hz	All models (G2 size)	All models (G3 size)
∅ Inlet	BSP	1 1/2"	2"
∅ Outlet	BSP	1 1/4"	1 1/2"
∅ Inlet	NPT	1 1/2"	2"
∅ Outlet	NPT	1 1/4"	1 1/2"
ISO flange	DNA (mm)	40	50
	DNM (mm)	32 (40*)	40
ANSI flange	DNA (Inch)	1 1/2"	2"
	DNM (Inch)	1 1/4" (1 1/2"*)	1 1/2"
JIS flange	DNA (Inch)	1 1/2"	2"
	DNM (Inch)	1 1/4" (1 1/2"*)	1 1/2"

(*) Available on request

MOTOR SPECIFICATIONS (G2 size)

table 7

		06.10			10.10			10.15			16.15			16.20			02.30		
		N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S
Power (IEC) 50 Hz	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	4*	2,2	3	4*
Motor size	IEC	71	80A	80B	80A	80B	90S	80B	90S	90L	90S	90L	100	90L	100	112	90L	100	112
Phases	N.	3phase (all models) - 1phase (< 3 kW)																	
Std. voltage (IEC)	V	400 ± 5% 50Hz - 220 ± 5% 50Hz																	
Motor protection	IP	55																	

(*) ZMR only

WEIGHT (G2 size)

table 8

Pump weight (without motor)			Motor weight																
WR	GF	GX	Version	IEC 3phase								IEC 3phase E-exd							
4	5		Frame	71	80A	80B	90S	90L	100	112*	71	80A	80B	90S	90L	100	112*		
			Kg	7	8	10	13	17	22	31	15	20	20	30	31	41	65		

(*) ZMR only

MOTOR SPECIFICATIONS (G3 size)

table 9

		20.15			20.20			20.27			20.36			30.15			30.25			36.30		
		N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S
Power (IEC) 50 Hz	kW	2,2	3	4	3	4	5,5	4	5,5	7,5	5,5	7,5	11	4	5,5	7,5	5,5	7,5	11	7,5	11	15*
Motor size	IEC	90L	100L	112M	100L	112M	132SA	112M	132SA	132SB	132SA	132SB	160MA	112M	132SA	132SB	132SA	132SB	160MA	132SB	160MA	160MB
Phases	N.	3phase																				
Std. voltage (IEC)	V	400 ± 5% 50Hz																				
Motor protection	IP	55																				

(*) ZMR only

WEIGHT (G3 size)

table 10

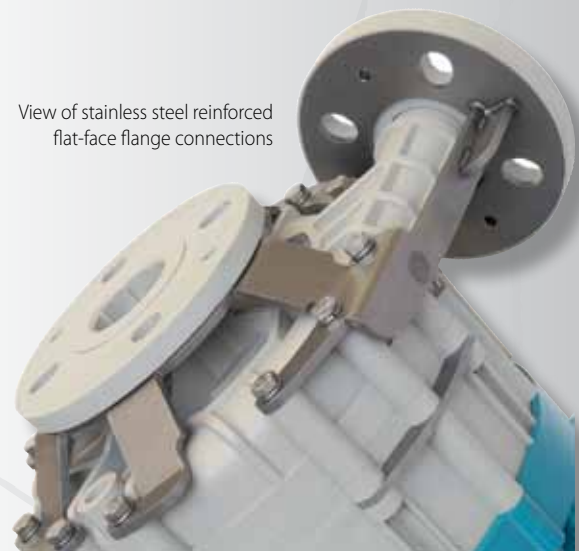
Pump weight (without motor)			Motor weight																
WR	GF	GX	Version	IEC 3phase								IEC 3phase E-exd							
12 (TMR) 8 (ZMR)	13 (TMR) 9 (ZMR)		Frame	90L	100L	112M	132SA	132SB	160MA	160MB	90L	100L	112M	132SA	132SB	160MA	160MB		
			Kg	17	22	31	53	61	75	85	31	41	65	80	80	155	155		

"BSP" outlet cylindrical threaded connection

Detail of outlet flanged connection directly to the plant flange



View of stainless steel reinforced flat-face flange connections

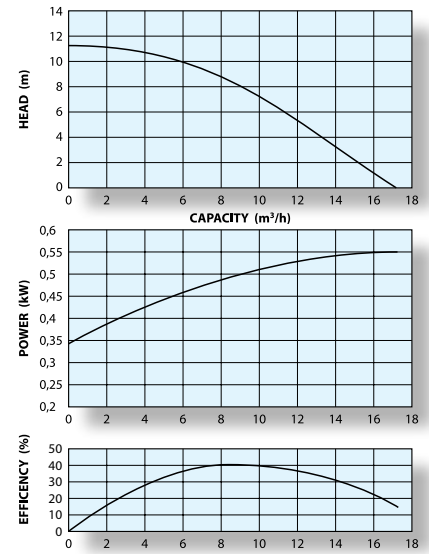


2900 r.p.m. 50Hz

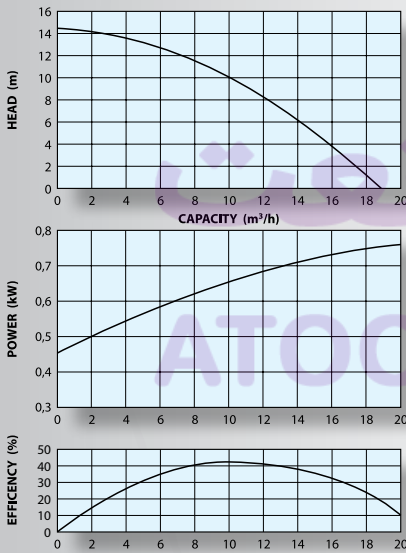


In the magnetical execution the motor is easily installed without disassembling the wet-end.

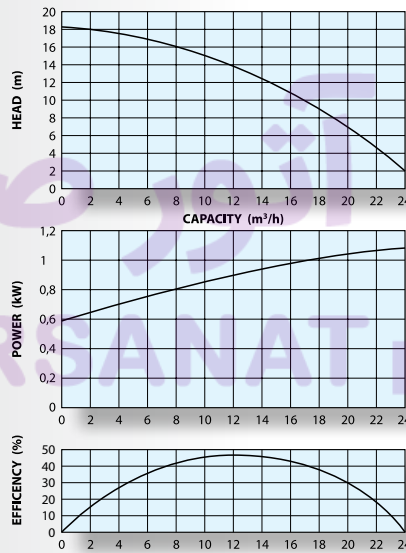
06.10



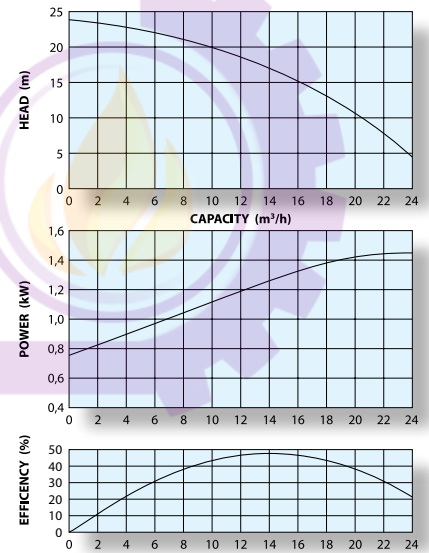
10.10



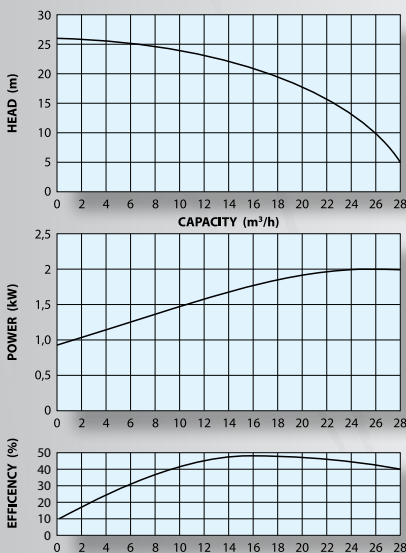
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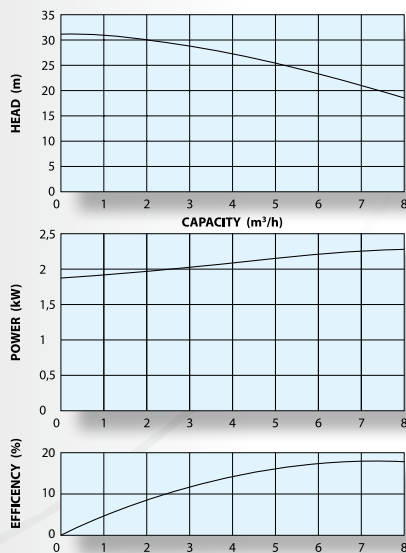
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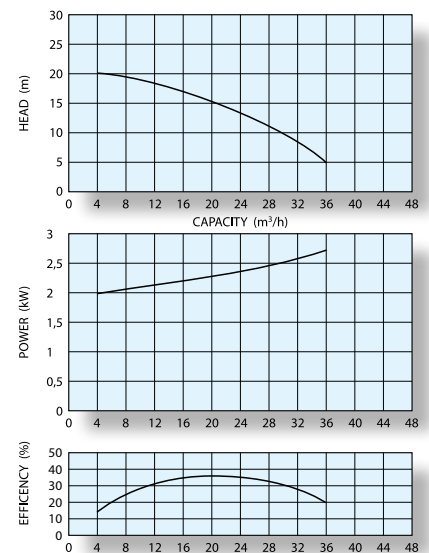
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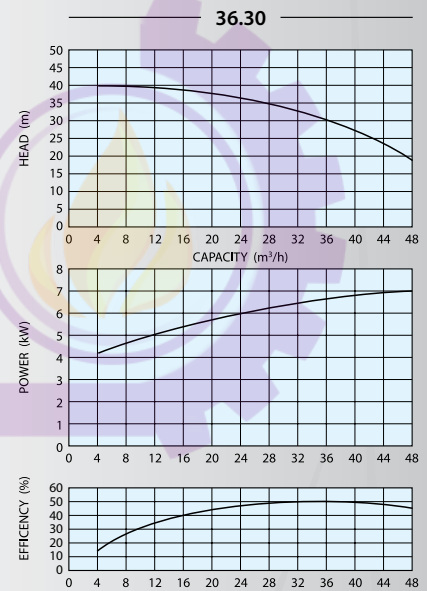
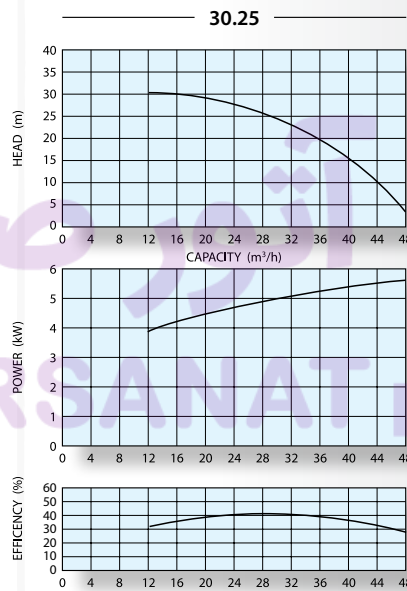
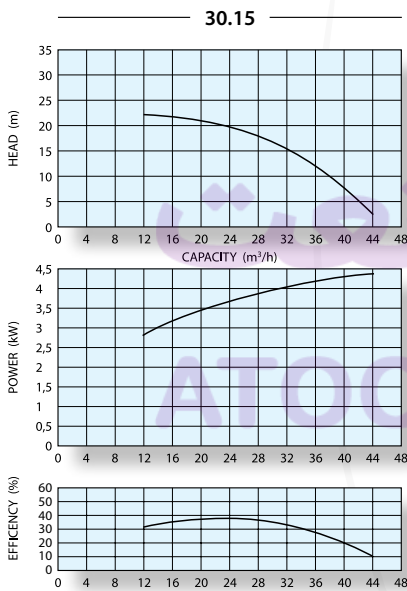
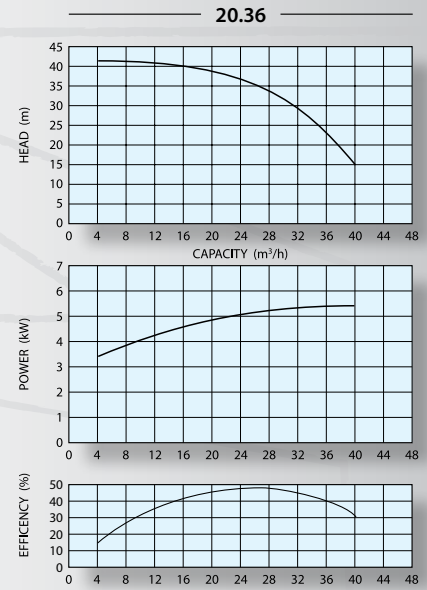
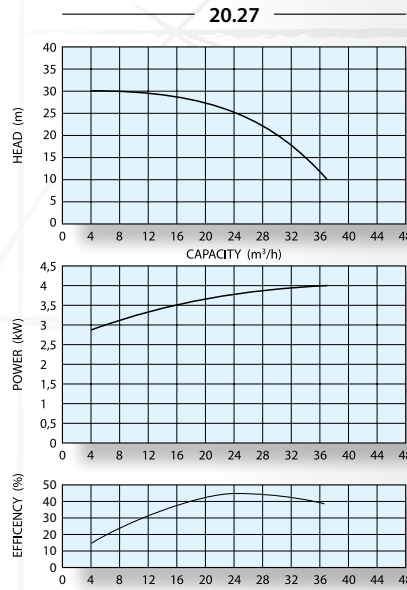
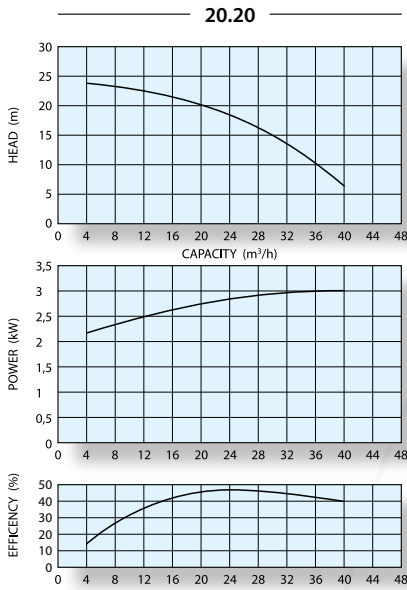
02.30



20.15

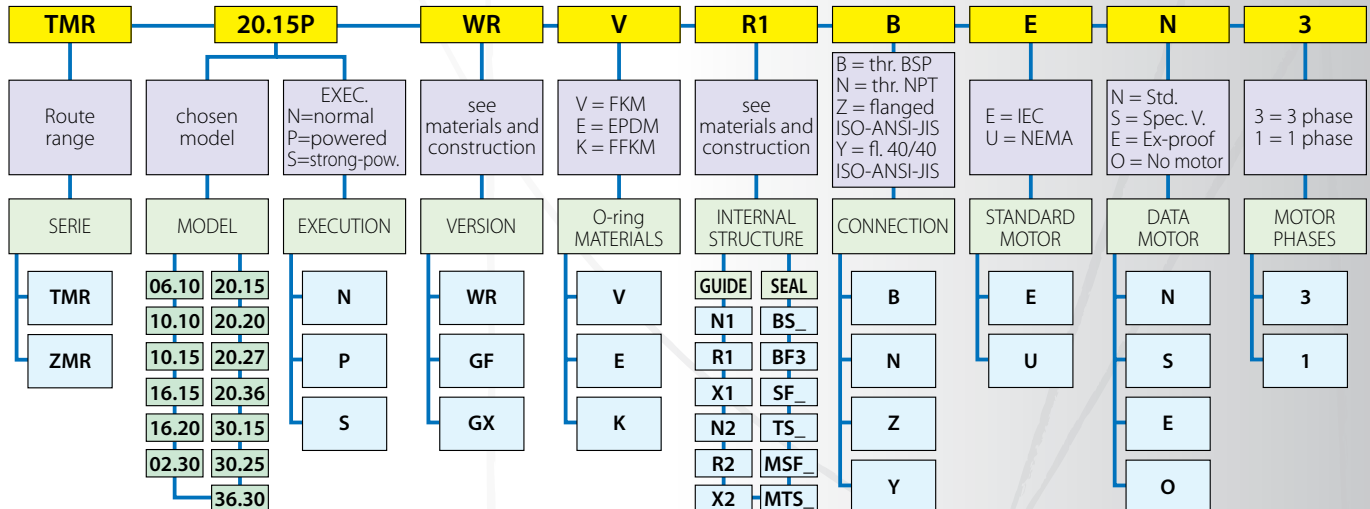


2900 r.p.m. 50Hz



PUMP IDENTIFICATION LABEL

table 11



DIMENSIONS WITH IEC MOTORS - 50 Hz

table 12

size	model	IEC frame	DnA	DnM	DeA	DeM	KA iso./ansi./jis	KM iso./ansi./jis	d x z iso./ansi./jis	a1	L(°)		Q	h1	h2	r		r1		rb		m1	n1	s1	g(°)	L3	B2	S2	L1	B3	h3										
											TMR	ZMR				TMR	ZMR	TMR	ZMR																						
G2	06.10	N	71	40 - 1 1/2"	32 - 1 1/4"	1 1/2"	1 1/4"	110 / 98 / 105	100 / 89 / 100	18 x 4 / 16 x 4 / 19 x 4	67	356	364	71	80	194	202	149	157	161	169	90	112	7	106	185	248	14	245	308	40										
		P	80A																													385	393	205	213	140	142				
		S	80B									405	413			199	207			125	110																				
	10.10	N	80A																													405	413	205	213	140	142				
		P	80B									385	393			199	207			125	110																				
		S	90S																													405	413	205	213	140	142				
	10.15	N	80B									405	413			205	213			140	142																				
		P	90S																													385	393	199	207	125	110				
		S	90L									405	413			205	213			140	142																				
	16.15	N	90S																													405	413	205	213	140	142				
		P	90L									430	438			227	235			164	172																	176	184	140	160
		S	100																													478	486	205	213	149	157				
	16.20	N	90L									430	438			205	213			149	157																	161	169	125	140
		P	100																													478	486	227	235	164	172				
		S	112(°)									487	495			227	235			164	172																	176	184	140	160
	02.30*	N	90L																													478	486	227	235	164	172				
S		112(°)	487	495	227	235	164	172	176	184	140	160	10	155	205	305	259	359																							

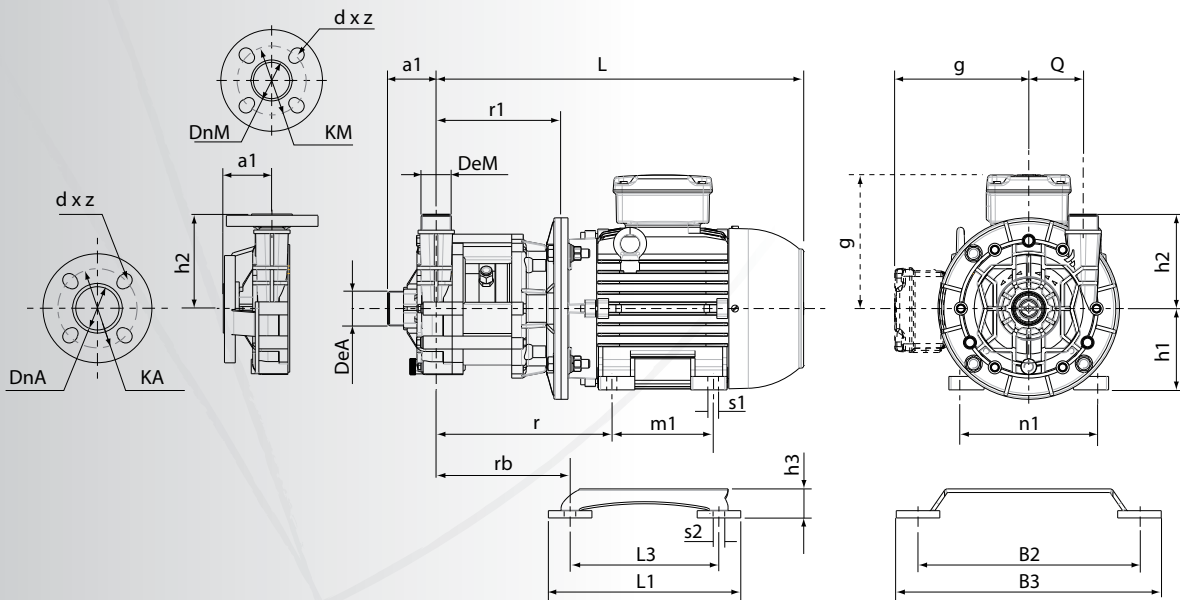
(*) 02.30 close impeller in all ranges

DIMENSIONS WITH IEC MOTORS - 50 Hz

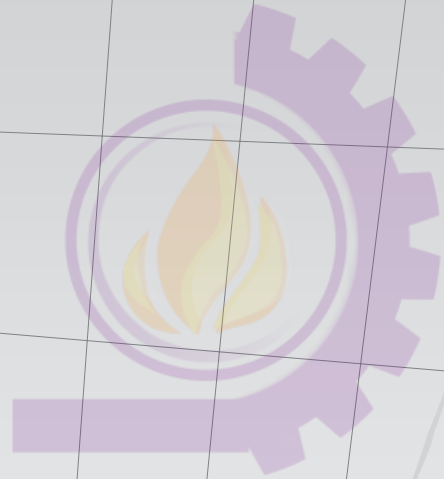
table 13

size	model	IEC frame	DnA	DnM	DeA	DeM	KA iso./ansi./jis	KM iso./ansi./jis	d x z iso./ansi./jis	a1	L(°)		Q	h1	h2	r		r1		rb		m1	n1	s1	g(°)	L3	B2	S2	L1	B3	h3								
											TMR	ZMR				TMR	ZMR	TMR	ZMR																				
G3	20.15	N	90L	50 - 2"	40 - 1 1/2"	2"	1 1/2"	125 / 121 / 120	110 / 98 / 105	18 x 4 / 16 - 19 x 4 / 19 x 4	70	469	515	90	160	244	290	188	234	200	246	125	140	8	142	185	248	14	405	475									
		P	100L																												512	558	261	307	198	244	217	256	160
		S	112M									521	567			268	314	198	244	217	256																		
	20.20	N	100L																												512	558	261	307	198	244	217	256	160
		P	112M									521	567			268	314	198	244	217	256																		
		S	132SA																												578	624	307	353	218	264	235	282	140
	20.27	N	112M									521	567			268	314	198	244	217	256																		
		P	132SA																												578	624	307	353	218	264	235	282	140
		S	132SB									521	567			268	314	198	244	217	256																		
	20.36	N	132SA																												578	624	307	353	218	264	235	282	210
		P	132SB									743	864			356	402	248	294	265	312																		
		S	160MA																												521	567	268	314	198	244	217	256	190
	30.15	N	112M									578	624			307	343	218	264	235	282																		
		P	132SA																												743	864	356	402	248	294	265	312	210
		S	132SB									578	624			307	353	218	264	235	282																		
	30.25	N	132SA																												743	864	356	402	248	294	265	312	210
		P	132SB									578	624			307	353	218	264	235	282																		
		S	160MA																												743	864	356	402	248	294	265	312	210
	36.30	N	132SB									578	624			307	353	218	264	235	282																		
		P	160MA																												743	864	356	402	248	294	265	312	210
		S	160MB(°)									578	624			307	353	218	264	235	282																		

(°) can change for motors of different brands - (°) only ZMR



آتور صنعت ATOORSANAT



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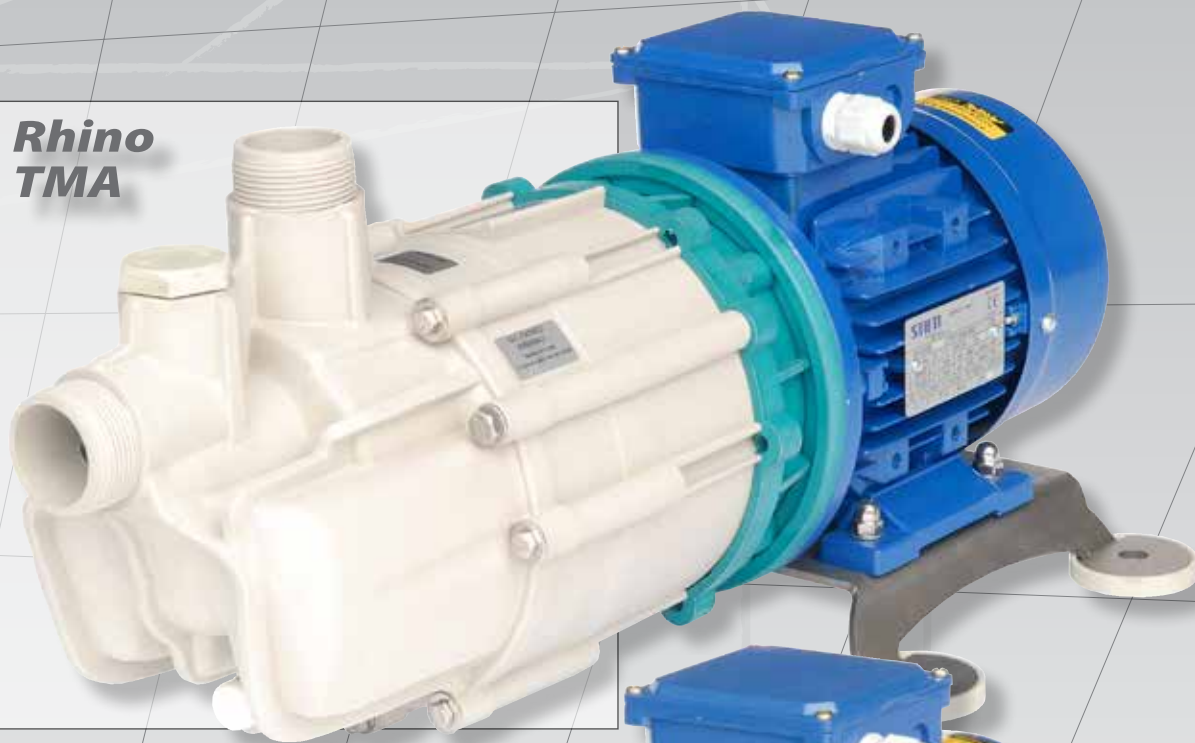
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ARGAL

CHEMICAL PUMPS

**Rhino
TMA**



**Alifter
TMA**



**self-priming thermoplastics
magnetic drive pumps**

Chemical pumps

In this catalog Argal offers self priming pumps with magnetic drive "Rhino" and "Alifter of TMA serie. The structural parts and pump casings are injection molded reinforced thermoplastic polymers. The internal components are: ceramic oxides, HD carbon, fluorinated elastomers, excluding any metal part in contact with the pumped liquid. Are combinations of materials for maximum performance.

Pump "Hermetic"

The outer magnet assembly rotates together with the motor shaft by generating a magnetic torque that rotates a second group of magnets which is overmolded on the internal centrifugal impeller. The rear casing, suitably shaped and coupled to the pump casing, separates the two magnetic groups, forming a hermetic casing.

Safety and Life

The magnetic drive system finally excludes any type of rotating seal. The only necessity of sealing is ensured by static Oring seals.

Versatility and performance

Strong magnetic coupling made up of rare-earth materials (Neodimium Iron Boron) and "N" (standard), "P" (powered) or "S" (strong-powered) versions allow to pump, also at maximum flow, liquids with 1.05 - 1.35 - 1.8 specific gravity respectively.

R-N-X: three internal configuration of constructive materials for many applications: from clean water to waste and slightly abrasive liquids, strong alkali or salts such as sodium hypochlorite, and acids such as chromic, nitric, sulphuric, etc..

Conformity ATEX

All pumps in the range ALIFTER, with specific execution GX (E-CTFE added with conductive carbon fibres and motor E-exd), are approved to operate in explosive atmospheres, classified as per ATEX directive, "CAT 2" Zone 1 (Series II 2GD IIB at 135 °C). Inside of pump should be placed safety device.



is member of



THE MATERIALS

table 1

VERSION	REINFORCED POLYMERS	MIN. TEMP.	MAX TEMP.	ENVIRONMENT TEMP.
WR	GFR/PP	-5°C (23°F)	80°C (176°F)	0÷40°C (14÷104°F)
GF	CFF/E-CTFE	-20°C (-4°F)	100°C (212°F)	-20÷40°C (-4÷104°F)
GX*				

Note: Maximum inlet pressure: 1,5 bar - (*) Compliant to ATEX 94/9/EC regulations

THE CONSTRUCTIONS

table 2

VERSION	WR			GF			GX*	
	R1	X1	N1	R2	X2	N2	R2	N2
Volute casing	GFR-PP			CFF-E-CTFE				
Rear casing	GFR-PP			CFF-E-CTFE				
Centrifugal impeller	GFR-PP			CFF-E-CTFE				
Guide bushing	CARB.HD	SiC	GFR-PTFE	CARB.HD	SiC	GFR-PTFE	CARB.HD	GFR-PTFE
Shaft	CER			SiC				
Thrust bush	CER			SiC				
OR gasket	FKM (1)			FKM (1) (2)				
Screws	Stainless steel							

Upon request:(1)EPDM and (2) FFKM - * Compliant to ATEX 94/9/EC regulations

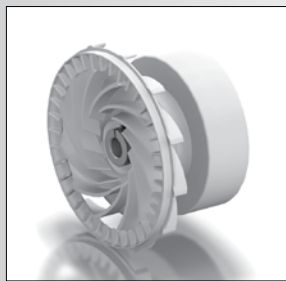
RHINO - TMA

It is an innovative pump designed by the R&D department of Argal with a pending international patent. It is a magnetic drive, self-priming, biphasic turbo radial pump and is manufactured either in polyolefinic thermoplastic polymer (PP) or fluorinated (E-CTFE). Thanks to its construction this TMA pump develops higher suction head and shorter priming time than self priming centrifugal pumps; its biphasic impeller primes fluids with high density, viscosity and vapour such as sulphuric 98%, hydrochloric 33%, nitric, phosphoric acids, sodium hypochlorite, caustic soda, ferric chlorite provided the negative suction head is up to 4 metres.

The high torque magnetic joint and the option to adopt electric motors of increasing rated power allows this device to pump a broad range of chemical liquids of variable specific weight without compromising its typical hydraulic performances.

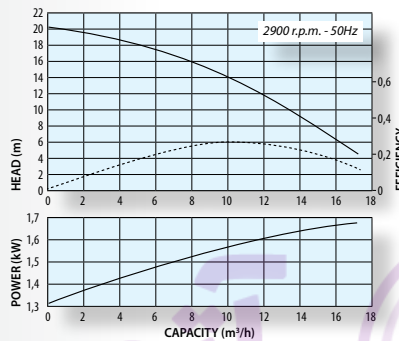
MAIN FEATURES

- Choice of material chemically resistant to all corrosive liquid
- Ability to prime from an empty suction duct
- Fast priming
- Magnetic core embedded in the biphasic impeller
- Max. lift = -6 m
- Max. allowed specific gravity up to 2 kg/dm³
- Minimum NPSHa = 3 m (abs)
- Standard motors IEC or NEMA.

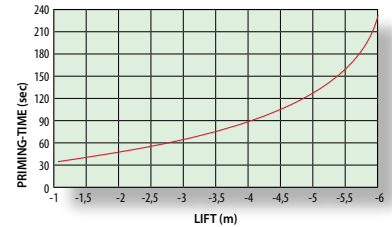


Biphasic patented impeller of self priming Rhino pump.

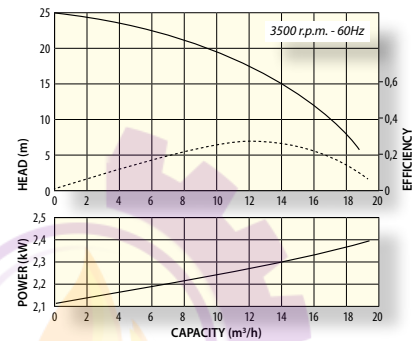
PERFORMANCE CURVE
10.14



PRIMING TIME WITH WATER



PERFORMANCE CURVE
11.18



MOTORS

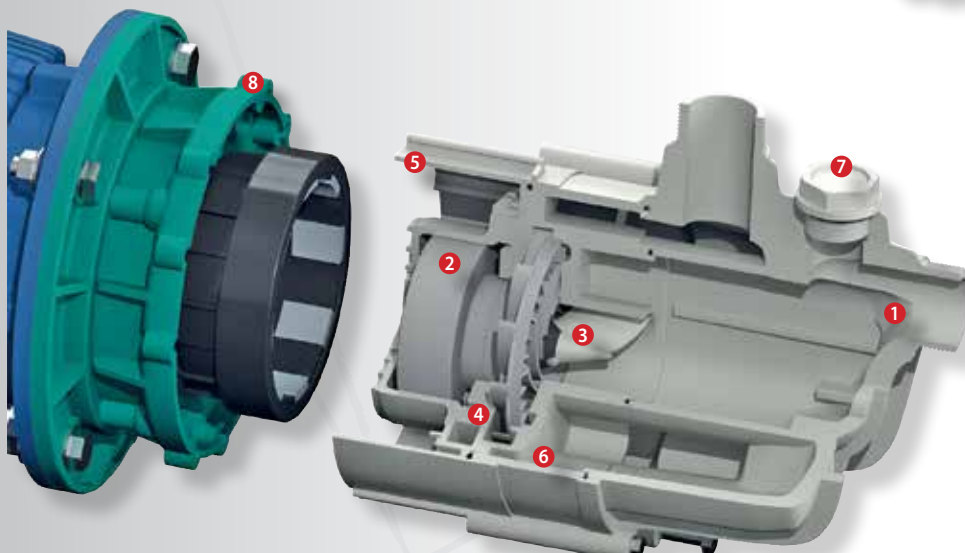
table 3

Model	Power (kW)	IEC frame	Phase	Voltage	Hz	Protection
10.14	P 2.2	90L	3 - 1	400 ± 5%	50	IP 55
	S 3	100	3 - 1	220 ± 5%		
11.18	P 3	100	3 - 3	460 ± 5%	60	IP 55
	S 4	112	3	230 ± 5%		

CONNECTIONS

table 4

Model	DN	DeA	DeM	ISO		ANSI	
				k	d x z	k	d x z
10.14	40	1 1/2"	1 1/2"	110	18 x 4	98	16 x 4
11.18	40	1 1/2"	1 1/2"	110	18 x 4	98	16 x 4



TMA - SECTION VIEW

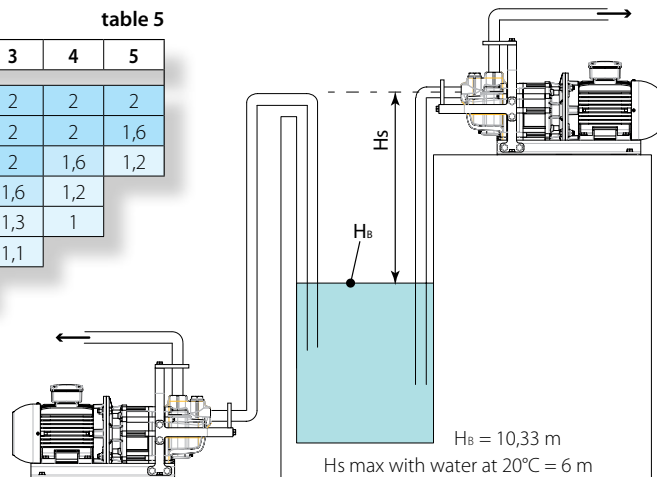
- 1 - Connections casing
- 2 - Impeller
- 3 - Thrust bushing
- 4 - Central disk
- 5 - Rear casing
- 6 - Front volute casing
- 7 - Filling plug
- 8 - Bracket

ASSESS OF MAXIMUM LIFT table 5

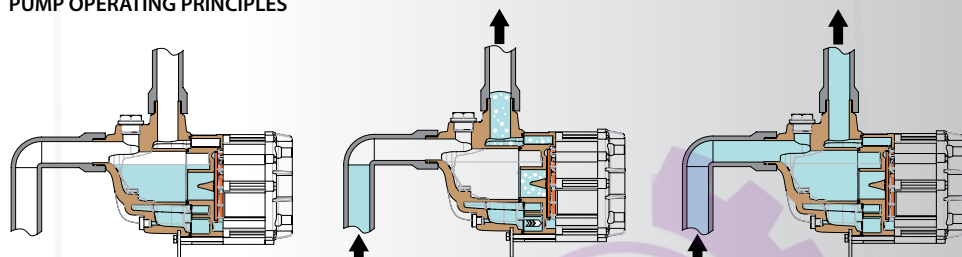
Vapour Pressure			Lift								
Medium	P _v (1)(2)	p.s.(1)(2)	P _v [m _{H2O}]	0,25	0,75	1,25	2	2,5	3	4	5
HF - 50 ~ 40%	0,4	1,15	-1	2	2	2	2	2	2	2	2
HCl - 37%	2	1,17	-1,5	2	2	2	2	2	2	1,6	1,2
NaOCl	0,2	1,26	-2	2	2	2	2	1,8	1,6	1,2	
HNO ₃ - 70%	0,65	1,41	-2,5	2	2	2	2	1,5	1,3	1	
NaOH - 50%	0,02	1,52	-3	2	2	2	1,7	1,2	1,1		
H ₂ SO ₄ - 98%	1x10 ⁻⁴	1,8	-3,5	1,9	1,8	1,6	1,4	1,1			
			-4	1,7	1,5	1,4	1,2				
			-4,5	1,4	1,3	1,2	1				
			-5	1,3	1,2	1,1					
			-5,5	1,1	1,1	1					
			-6	1							

1 [m_{H2O}] = 9806 [Pa]
(1) ref. to 20°C - 68°F

(2) In table 3 select the P_v e p.s. value ≥ respect to the pumped fluid



PUMP OPERATING PRINCIPLES



Stopping phase: a small quantity of liquid is trapped into the pump to enable the next starting.

Priming phase: the impeller gives a specific circulation of air-liquid mixture moving air from the suction pipe to the discharge side in the atmosphere.

Pumping phase: after the air is totally removed from the suction side, the pipe is flooded by the liquid and the pumping phase can start.

ACCESSORIES

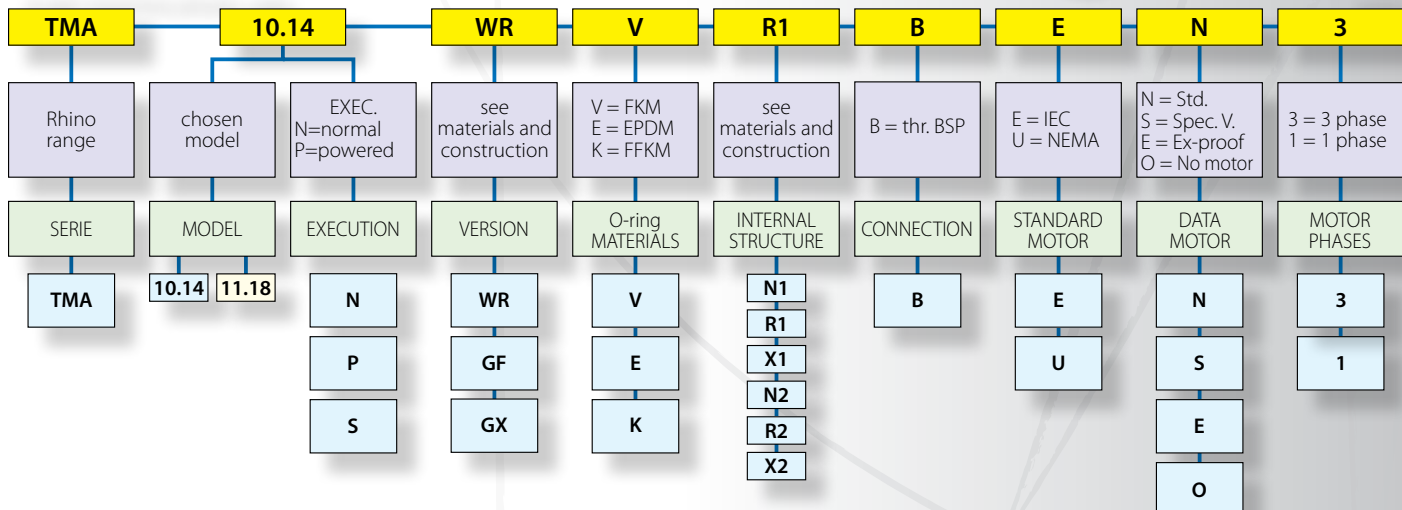
- Base in stainless steel
- Base prepared with pipe support (in stainless steel)
- Trolley in stainless steel (without electric device)
- Trolley in stainless steel (with electric device)

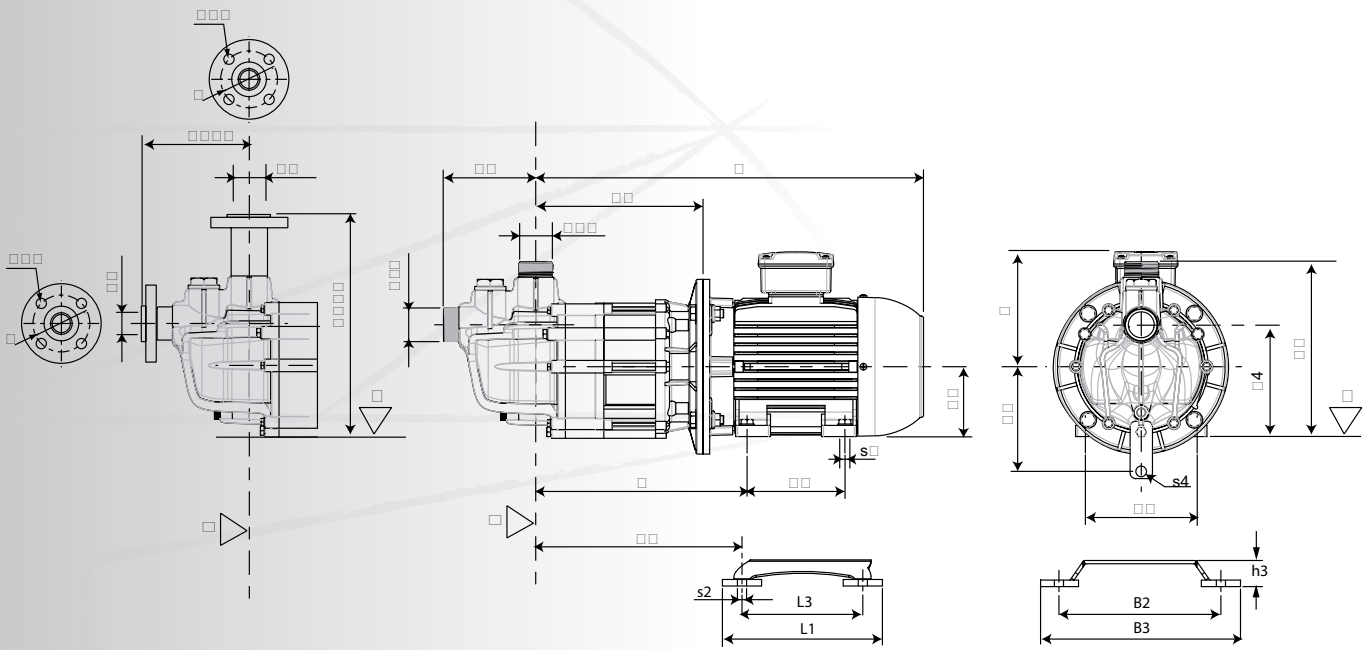
Rhino pump on prepared base



PUMP IDENTIFICATION LABEL

table 6



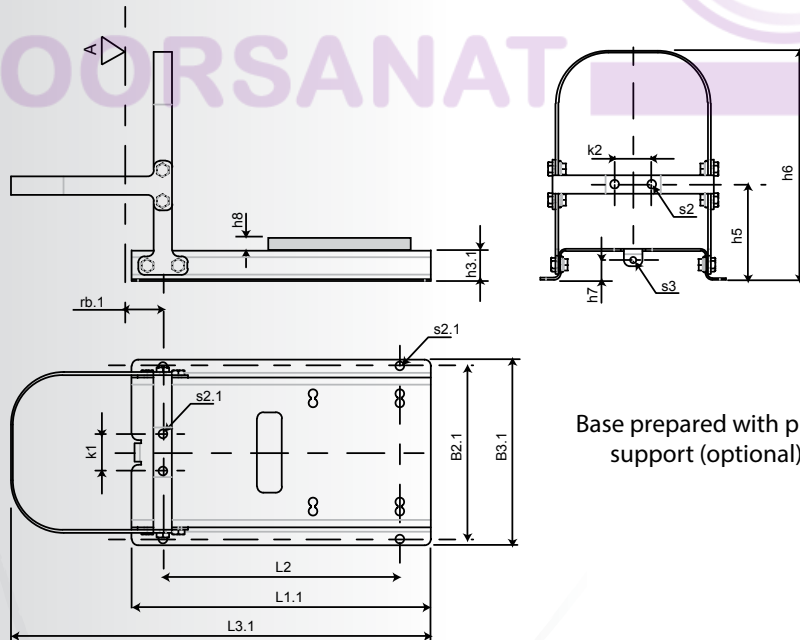


PUMP DIMENSIONS

table 7

model		a1	a1.1	h2	h2.1	h4	L(')	r	r1	g(')	h1	m1	n1	s1	HF	s4
10.14	P	132	140	240	285	150	510	224.5	224.5	140	90	125	140	10	130	ø8
	S			250	295	160	570	239.5	239.5	150	100	140	160	12		
11.18	N	132	140	250	295	160	570	302.5	239.5	150	100	140	160	12	130	ø8
	P			262	307	172	580	309.5		180	112	190				

- (') can change for different motors builder



Base prepared with pipe support (optional)

BASE DIMENSIONS

table 8

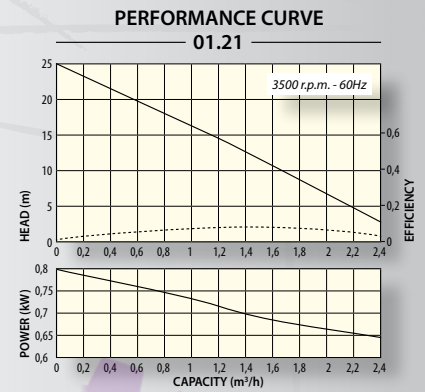
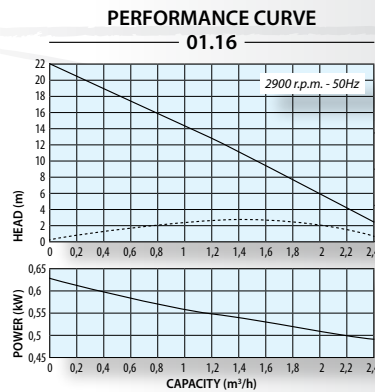
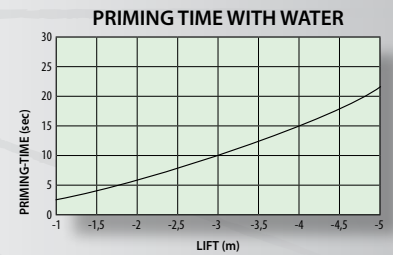
model		Base standard (optional)							Base prepared with pipe support (optional)														
		rb	B2	B3	L1	L3	h3	s2	rb1	B2.1	B3.1	L1.1	L2	L3.1	h3.1	s2.1	h5	h6	h7	h8	k1	k2	s3
10.14	P	237	248	308	245	185	40	ø14	60.5	250	300	482	382	677	50	ø14	154.5	370	32	20	60	60	ø10
	S	252	305	359	259	205	40	ø14	60.5	250	300	482	382	677	50	ø14	154.5	370	32	10			
11.18	N	252	305	359	259	205	40	ø14	60.5	250	300	482	382	677	50	ø14	154.5	370	32	10	60	60	ø10
	P																			0			

ALIFTER TMA

This Peripheral pump is a product between the displacement and the centrifugal pump, in which the medium is pumped in a peripheral channel. It can operate with inlet and outlet reversible by reversing the direction of motor rotation and are adequate to suck up chemical liquids with high specific gravity and/or high vapour tension.

MAIN FEATURES

- Start-up with empty pipes
- Fast priming-phase
- Maximum Lift = -5 m
- Reversible (inlet-outlet reversal)
- Suitable for specific gravity up to 2 kg/dm³
- Suitable for vapour pressure up to 1 m (H₂O @ 45°C)
- Minimum NPSHa (available on the plant) = 3 m (abs)
- Impeller replaceable apart from magnets
- IEC or NEMA standard motors can be installed



MOTORS

table 9

Model	Power (kW)	IEC frame	Phase	Voltage	Hz	Protection	
01.16	N	0.55	71	3	400 ± 5%	50	IP 55
	P	0.75	80	-	-		
	S	1.1	80	1	220 ± 5%		
01.21	P	0.75	80	3	460 ± 5%	60	IP 55
	S	1.1	80	1	230 ± 5%		

CONNECTIONS

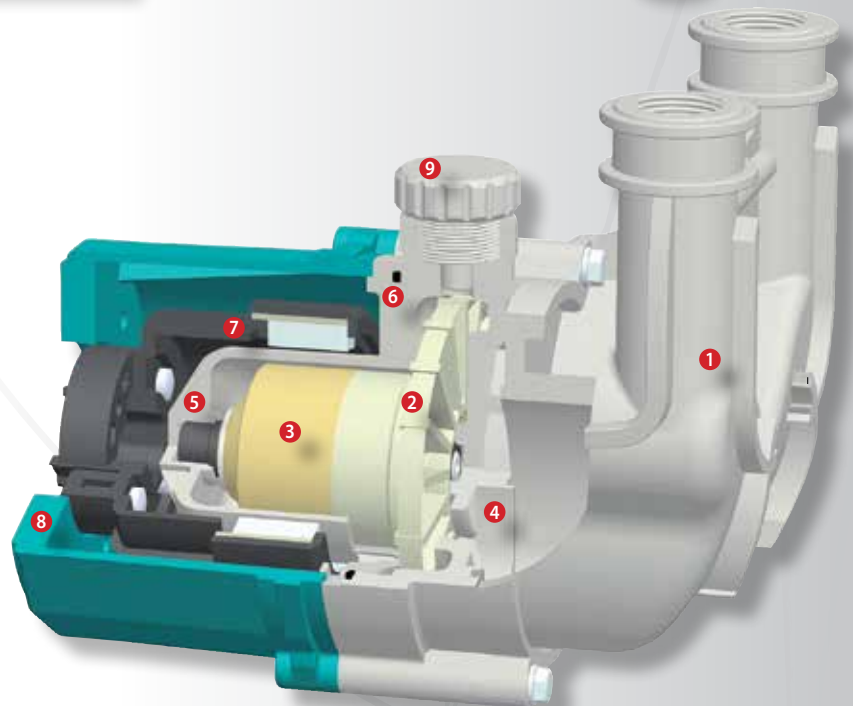
table 10

Model	DN	DeA	DeM	ISO		ANSI		JIS	
				k	d x z	k	d x z	k	d x z
01.16	20	3/4" f	3/4" f	75	14 x 4	70	16 x 4	75	15 x 4
01.21	20	3/4" f	3/4" f	75	14 x 4	70	16 x 4	75	15 x 4



TMA - SECTION VIEW

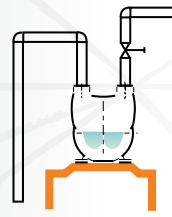
- 1 - Connections casing
- 2 - Impeller
- 3 - Magnetic core
- 4 - Front volute casing
- 5 - Rear casing
- 6 - OR gasket
- 7 - Drive magnet assembly
- 8 - Bracket
- 9 - Filling plug



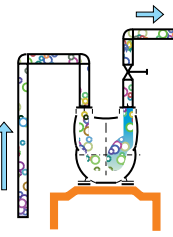
ACCESSORIES

- Base in stainless steel
- Trolley in stainless steel (without electric device)
- Trolley in stainless steel (with electric device)
- Check valve + foot strainer in PP or PVDF
- Drum pipe (m. 1,2) with check valve and foot strainer in PP or PVDF
- Dispenser nozzle in PP or PVDF

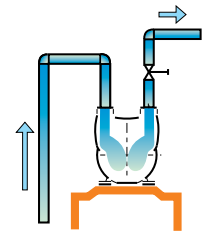
PUMP OPERATING PRINCIPLES



Stopping phase: a small quantity of liquid is trapped into the pump to enable the next starting.



Priming phase: the impeller gives a specific circulation of air-liquid mixture moving air from the suction pipe to the discharge side in the atmosphere.

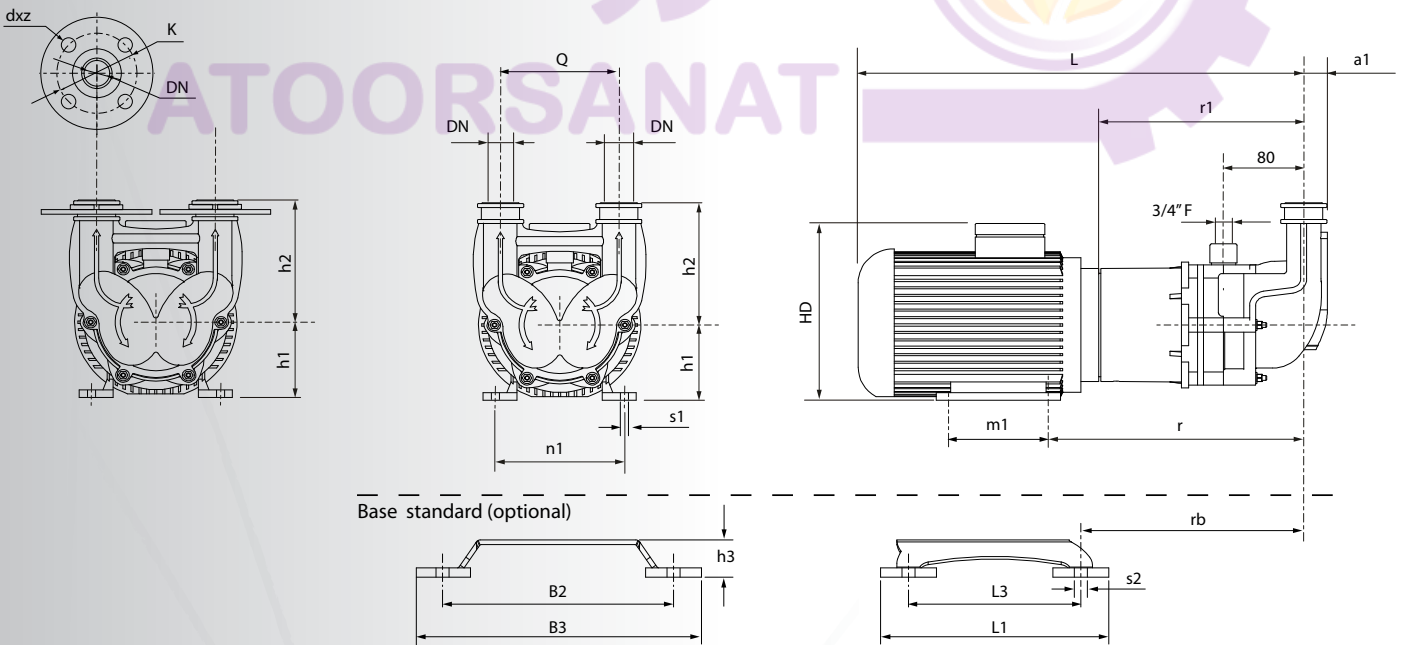


Pumping phase: after the air is totally removed from the suction side, the pipe is flooded by the liquid and the pumping phase can start.

PUMP IDENTIFICATION LABEL

table 11

TMA	06.08		WR	V	R1	B	E	N	3
Alifter range	chosen model	EXEC. N=normal P=powered	see materials and construction	V = FKM E = EPDM K = FFKM	see materials and construction	B = thr. BSP	E = IEC U = NEMA	N = Std. S = Spec. V. E = Ex-proof O = No motor	3 = 3 phase 1 = 1 phase
SERIE	MODEL	EXECUTION	VERSION	O-ring MATERIALS	INTERNAL STRUCTURE	CONNECTION	STANDARD MOTOR	DATA MOTOR	MOTOR PHASES
TMA	01.16 01.21	N P S	WR GF GX	V E K	N1 R1 X1 N2 R2 X2	B	E U	N S E O	3 1



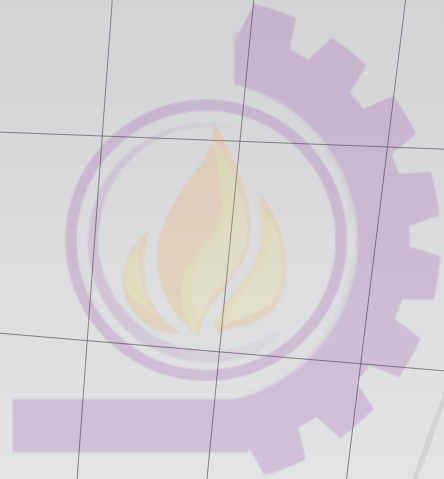
BASE DIMENSIONS

table 12

model	a1	Q	h2	L(!)	r	r1	h1	m1	n1	s1	Base standard (optional)							
											rb	B2	B3	L1	L3	h3	s2	
01.16	N	23.5	118	129	435	249.5	204.5	71	90	112	7	216	248	308	245	185	40	ø14
	P																	
	S																	
01.21	N	23.5	118	129	450	264.5	214.5	80	100	125	10	227	248	308	245	185	40	ø14
	P																	

- (!) can change for different motors builder

آتور صنعت ATOORSANAT



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