

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" 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.

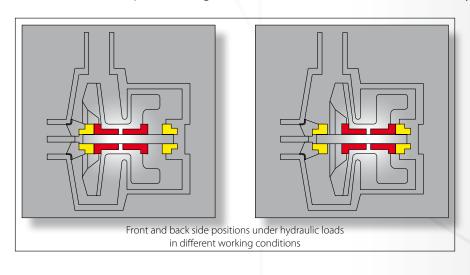


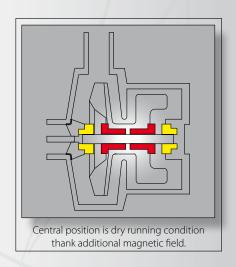
PATENTED SYSTEM: THE PRINCIPLE OF TWO AXIAL DIRECTIONS SELF-ALIGNMENT SYSTEM

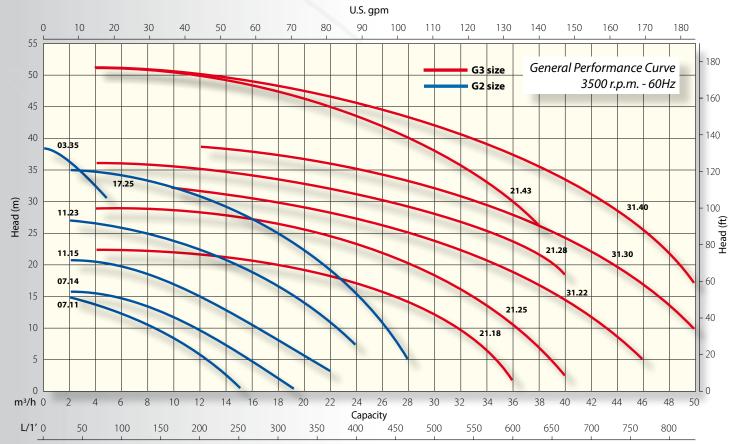
The impeller subjected to different hydraulic load is free to move axially.

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.







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



View of Route range pumps in different materials and constructions.

Labels in this catalog

Eubers III tills eu	9		
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 hight 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 Trifluoro Etylene carbon fibre filled).

• LOADED FLUIDS, LIGHTLY ABRASIVE

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

HEAVY FLUIDS

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 (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.

POSSIBLE ROTATION OF VOLUTE CASING

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.

CENTRIFUGAL IMPELLER PROPERLY BALANCED

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.

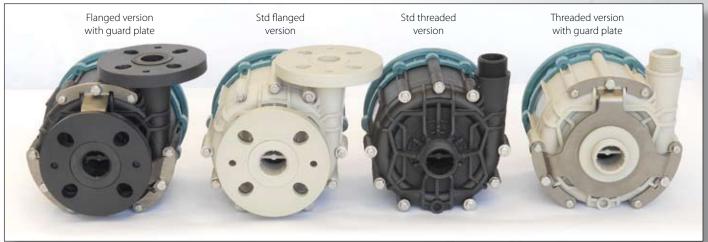
GUARD PLATE

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.

BASE AVAILABILITY

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			
Rear casing	GFR/PP	CFF/E-CTFE	CFF/E-CTFE
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

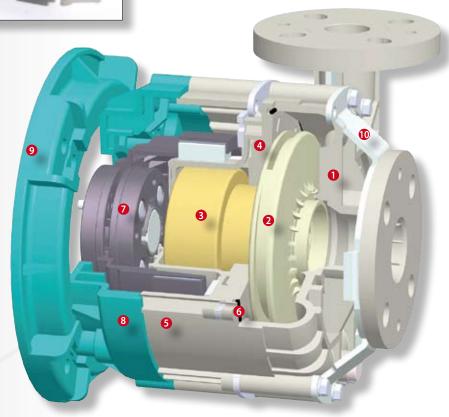
TMR (G2 - G3 sizes)	R1	X1	N1	R2	X2	N2	R2	N2		
Guide bushing	Carbon HD	SiC	GFR/PTFE	Carbon HD	SiC	GFR/PTFE	Carbon HD	GFR/PTFE		
Thrust bush		CER			SiC		SiC			
Shaft		CER			SiC		SiC			



- 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 " \mathbf{N} " (standard) " \mathbf{P} " (powered) or " \mathbf{S} " (strong-powered) versions. They allow to pump, also at maximum flow, liquids with 1,05 – 1,35 – 1,8 specific gravity respectively.

POSSIBLE ROTATION OF VOLUTE CASING

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.

BASE AND VOLUTE CASING DRAINING are available upon request.

ZMR CONSTRUCTIONS (G2 - G3 sizes)

table 4

VERSION	WR	GF	GX*						
Volute casing									
Rear casing	GFR/PP	CFF/E	-CTFE						
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



THE CONSTRUCTIONS OF MECHANICAL SEALS

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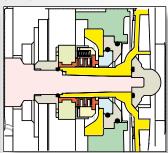
construction	model	rotating part	fixed ring	bellow	2nd rotating part	2nd fixed part	WORKING CONDITIONS
	BS5	CARBON	CER				LOW COST
	BS7	CANDON	SiC				(easy maintenance)
INTERNAL SINGLE	BS6	SiC	CER	FKM			LOW COST HARD PARTICLES (easy maintenance)
	BS8 - BF3**		SiC				HARD PARTICLES
	SF1	GFR/PTFE	CER	PTFE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

(**) Only for ZMR G3 size

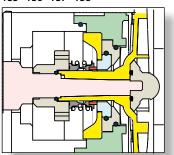
SECTIONS OF VARIOUS KIND OF MECHANICAL SEALS

BS5 - BS6 - BS7 - BS8

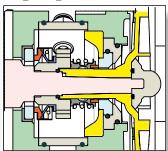
SF1 - SF2



TS5 - TS6 - TS7 - TS8

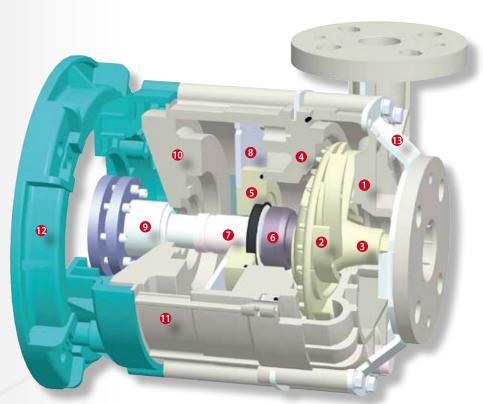


MSF_ - MTS_



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	60Hz	All models (G2 size)	All models (G3 size)
ø Inlet	BSP	1 1/2"	2"
ø Outlet	BSP	1 1/4"	1 1/2"
ø Inlet	NPT	1 1/2"	2"
ø Outlet	NPT	1 1/4"	1 1/2"
ISO flange	DNA (mm)	40	50
150 Harrige	DNM (mm)	32 (40*)	40
ANSI flange	DNA (Inch)	1 1/2"	2"
Andriange	DNM (Inch)	1 1/4"(1 1/2"*)	1 1/2"
JIS flange	DNA (Inch)	1 1/2"	2"
JIS Harige	DNM (Inch)	1 1/4"(1 1/2"*)	1 1/2"

^(*) Available on request

MOTOR SPECIFICATIONS (G2 size)

table 7

		07.11			07.14			11.15			11.23			17.25			03.35		
		N	Р	S	N	Р	S	N	Р	S	N	Р	S	N	Р	S	N	Р	S
Power (IEC) 60 Hz	kW	0,75	1,1	1,5	1,1	1,5	2,2	1,5	2,2	3	2,2	3		4			4		
Motor size	IEC	80A	80B	90S	80B	90S	90L	90S	90L	100	90L	100		112			112		
Phases	N.							3pha	se (all n	nodels)	- 1ph	nase (< 1	3 kW)						
Std. voltage (IEC)	V		460 ± 10% 60Hz - 230 ± 10% 60Hz																
Motor protection	IP		55																

WEIGHT (G2 size)

table 8

Pump we	eight (witho	out motor)		Motor weight													
WR	GF	GX	Version	IEC 3phase IEC 3phase E-exd													
4	4 5		Frame	80A	80B	905	90L	100	112*	80A	80B	90S	90L	100	112*		
4			Kg	8	10	13	17	22	31	20	20	30	31	41	65		

^(*) ZMR only

MOTOR SPECIFICATIONS (G3 size)

table 9

		21.18			21.25			21.28		21.43		31.22		31.30			31.40					
		N	Р	S	N	Р	S	N	Р	S	N	Р	S	N	Р	S	N	Р	S	N	Р	S
Power (IEC) 60 Hz	kW	3	4	5,5	4	5,5	7,5	5,5	7,5	11	7,5	11	15*	5,5	7,5	11	7,5	11	15*	11	15*	
Motor size	IEC	100L	112M	132SA	112M	132SA	132SB	132SA	132SB	160MA	132SB	160MA	160MB	132SA	132SB	160MA	132SB	160MA	160MB	160MA	160MB	
Phases	N.											3phase	ة									
Std. voltage (IEC)	V		460 ± 10% 60Hz																			
Motor protection	IP		55																			

^(*) ZMR only

WEIGHT (G3 size)

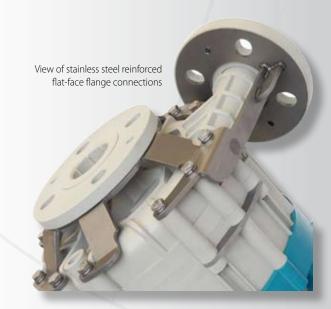
table 10

	,														
Pump wei	ight (witho	ut motor)		Motor weight											
WR	GF	GX	Version			IEC 3p	ohase			IEC 3phase E-exd					
12 (TMR)	13 (7	TMR)	Frame	100L	112M	132SA	132SB	160MA	160MB	100L	112M	132SA	132SB	160MA	160MB
8 (ZMR	9 (Z	MR)	Kg	22	31	53	61	75	85	41	65	80	80	155	155

"BSP" outlet cylindrical threaded connection

Detail of outlet flanged connection directly to the plant flange

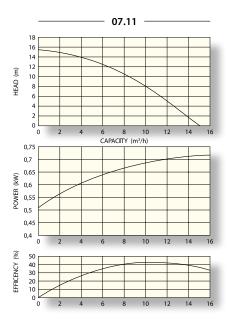


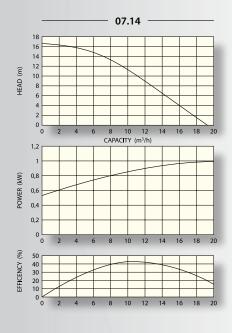


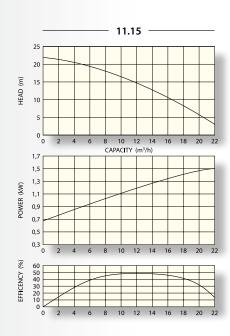
Route TMR - ZMR PCAZ 9

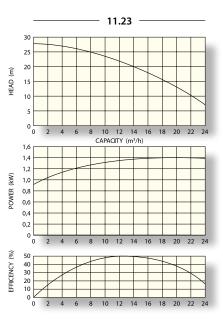
3500 r.p.m. 60Hz

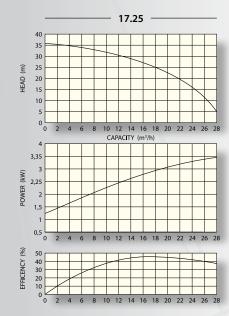


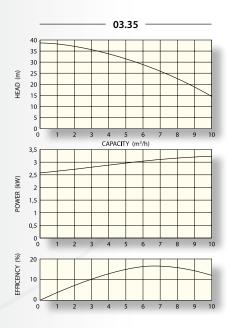


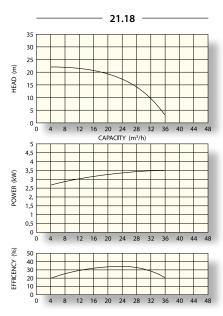












3500 r.p.m. 60Hz





DIMENSIONS WITH IEC MOTORS - 60 Hz

ta	h	ما	1	2

	IMENSIONS WITTIEC MOTORS - 00 TIZ																											C 12				
size	mod	el	IEC frame	DnA	DnM	DeA	DeM	KA iso / ansi / jis	KM iso/ansi/jis	d x z iso / ansi / jis	a1		(¹) ZMR	Q	h1	h2	TMR	r ZMR	r	1	r		m1	n1	s1	g(¹)	L3	B2	S2	L1	В3	h3
		N	80A									117111	ZIVIII				117111	ZIVIII	117111	ZIVIII	TIVII	ZIVIII										
	07.11	-	80B									385	393		80		199	207					125		110							
		s	905									405	413 90 205 213	100	140		142															
		N	80B									385	393		80		199	207	1 40	157	1.61	1.00		125		110	185	240		2.45	200	
	07.14	Р	905	"1/2			* 4			4		405	413						149	157	161	169			8			248		245	308	
		S	90L					7	0	19×		430	438		90		205	213					125	140		142						
		N	905		1" 1/4	. ~		/ 105	/ 100	4		405	405 413 430 438 75 130 1 1	100	140		142															
G G	11.15	Р	90L		1	1"1/2	1"14	/ 98	/ 89	16 x	67	430		125					\perp	14			40									
		S	100	4	32			110/	100/	4/1		478			100			235		172	176	184	140 1	160	10	155	205	305		259	359	
		N	90L					_	_	×		430	438		90			213		157	161	169	125	140	8	142	185	248		245	308	
	11.23	Р	100							_		478	486		100		227	235	164	172	176	184	140	160	10	155	205	305		259	359	
		S																			176											
	17.25	N	112									487	495		112		234	242	164	172		184	140	190	10	168	205	305		259	359	
	03.35	Р																														
		S																														

DI	DIMENSIONS WITH IEC MOTORS - 60 Hz table 13															≥ 13																		
qis	n	node	el	IEC frame	DnA	DnM	DeA	DeM	KA iso / ansi / iis	KM iso/ansi/jis	d x z iso / ansi / jis	1		(¹)	Q	h1	h2		r	r	1 ZMR	r		m1	n1	s1	g(¹)	L3	B2	S2	L1	В3	h3	
	21	.18	N P	100L 112M									512			100		261	307	198	244	214	256		160 190		155 168	205	305 359 305		265	365		
			S	132SA									578	624		132	1	307	353	218	264	235	282		216	10	181	263			333	429		
			N	112M					120				521	587		112		268	314	198	244	214	256	140	190		168	205			265	365		
	21	.25	P S N	132SA 132SB 132SA							* * *		578	624		132		307	353	218	264	235	282		216		181	263 3	359		333	429	1	
	21	.28	P S	132SA 160MA				1"1/2		105	4 / 19		743	864		160	307 160 356	356	402	248 29	294	265	312	210	254		215	335	405		405	475		
١,			N	132SB	.5"	1"1/2			_		×		578 624	624	96	132			353	218	264	235	282	140	216	10	181	263	359		333	429		
E	21	.43	P S	160MA 160MB	ا ا ا	40 - 1	2″		1,,1	5 / 121	110/98	16 - 19	70	743 864		160		356	402	248	294	265	312	210	254	14	215	335	405	14	405	475	55	
	21	.22	N P	132SA 132SB					125	=	4		578	624		132		307	353	218	264	235	282	140	216	10	181	263	359		333	429		
	31	.22	_	160MA							18 ×		743	864		160		356	402	248	294	265	312	210	254	14	215	335	405		405	475		
			N	132SB									578	624		132		307	353	218	264	235	282	140	216	10	181	263	359		333	429		
	31	.30	S 160M	160MA 160MB(²) 160MA										743	864		160		356	402	248	294	265	312	210	254	14	215	335	405		405	475	1
	31	.40	P S	160MB(²)																														

(¹) can change for motors of different brands - (²) only ZMR

