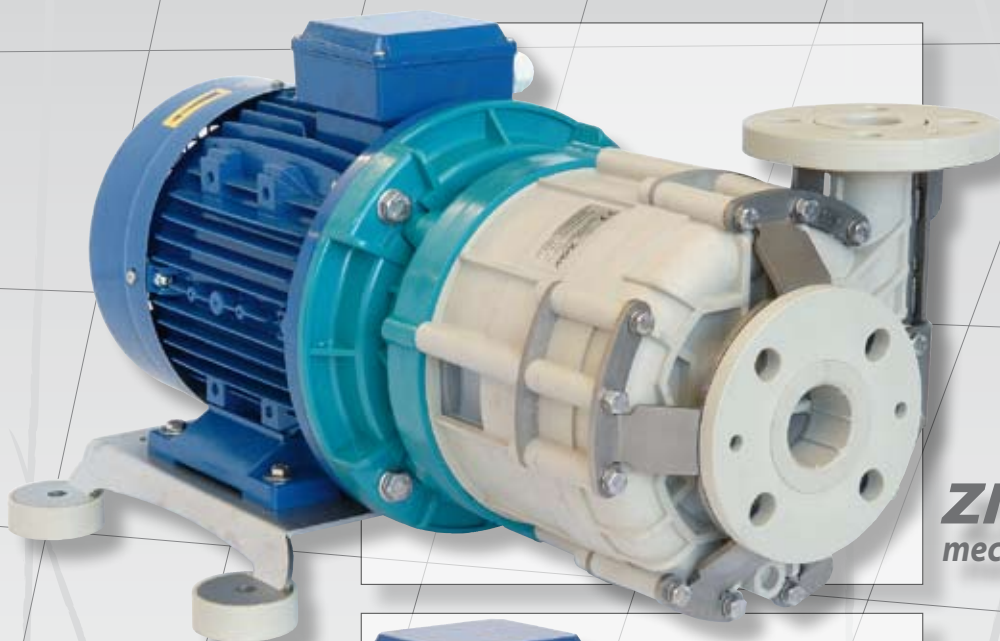


50Hz

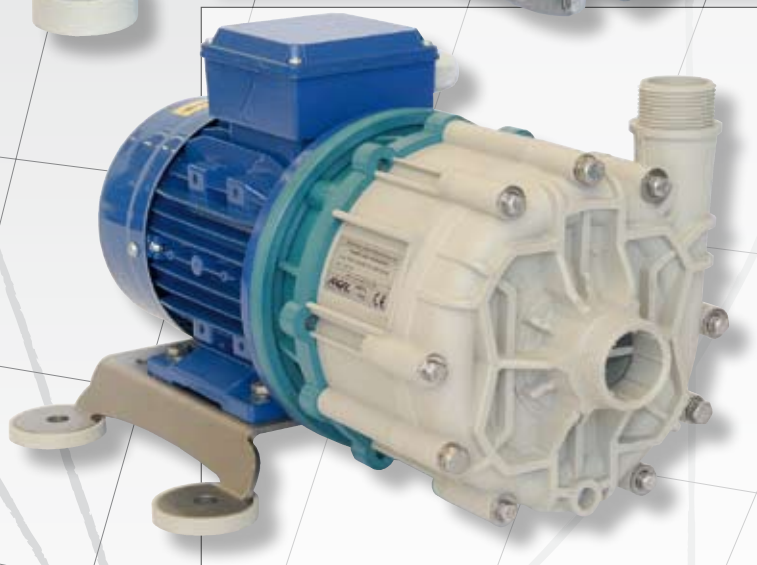
ARGAL

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" 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.



is member of



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



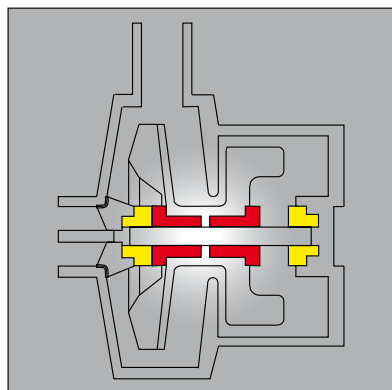
Magnetic driven pump G3 size
in reinforced polypropylene (WR).

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

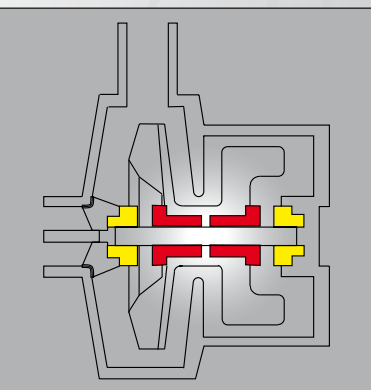
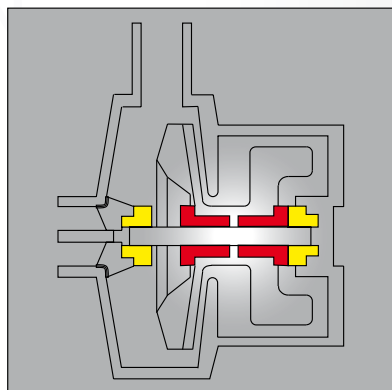
The impeller subjected to different hydraulic load is free to move axially.

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.

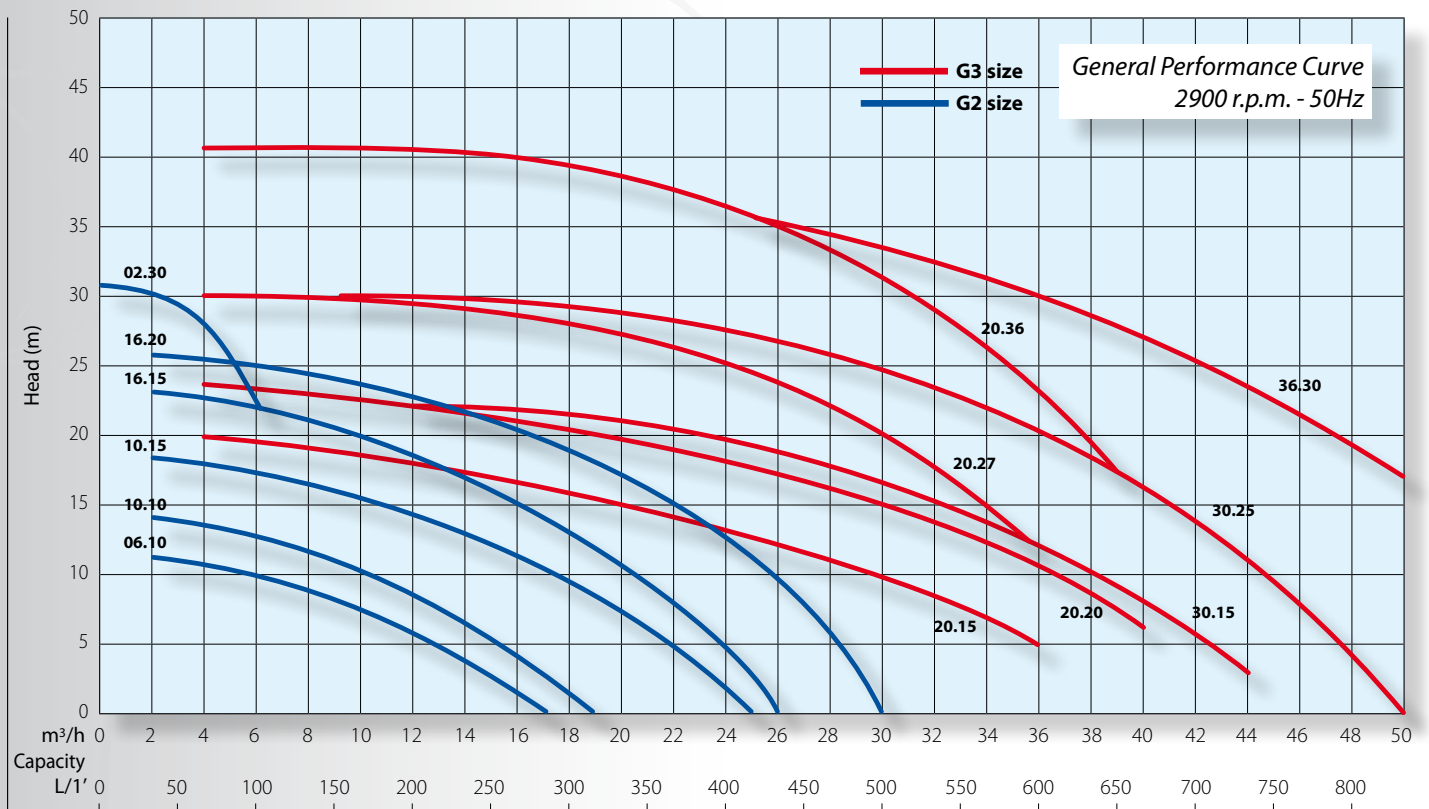
This distinctive automatism precisely prevents the contact with the rings (limiting devices) and consequently avoids frictions and heat increase. The shape of the magnets and the orientation of the fields are the key that shows the desired action.



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	Ethylene-Propylene rubber
CFF/E-CTFE	Ethylene-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	According 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).

• 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 lenght 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.

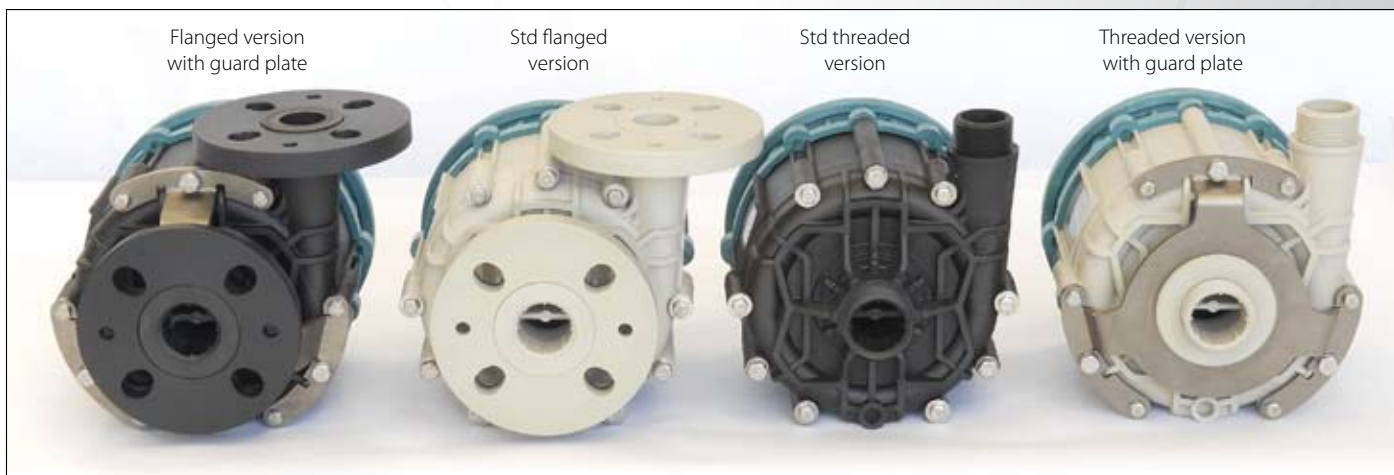
GUARD PLATE

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)

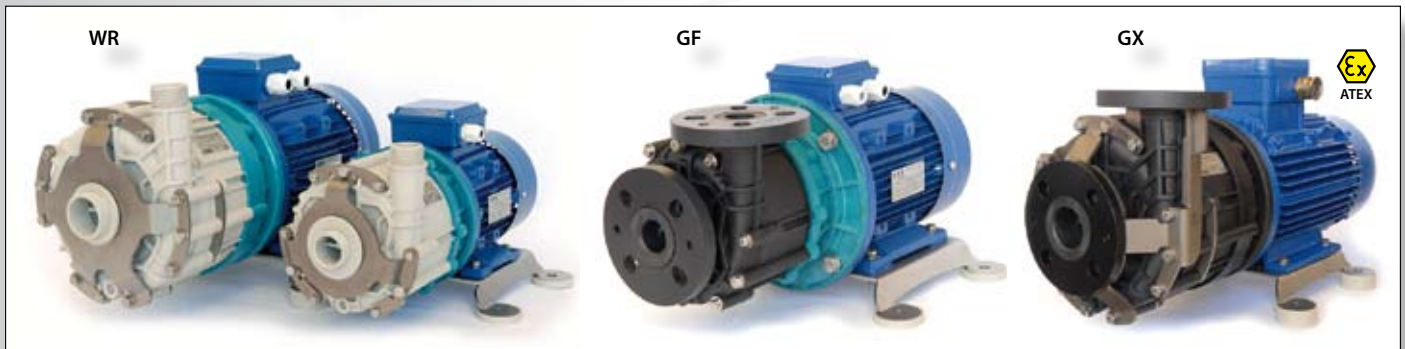
Note: Maximum inlet pressure: 1,5 bar - (*) Compliant to ATEX 94/9/EC regulations

THE CONSTRUCTIONS

table 2

TMR (G2 - G3 sizes)	WR	GF	GX*
Volute casing	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

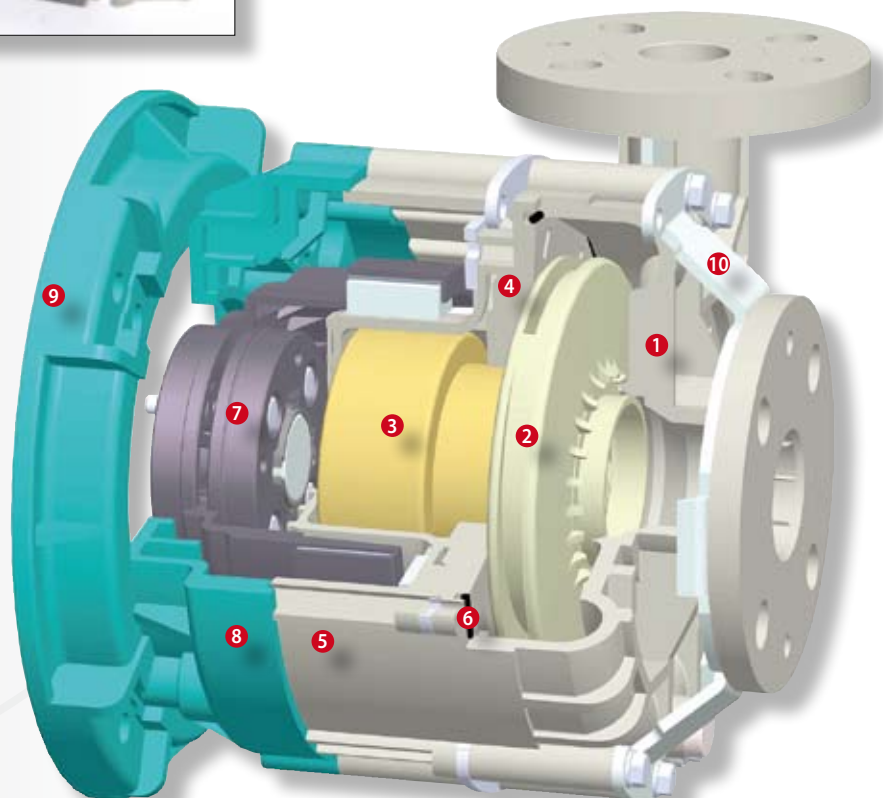


11 - R2 guide system (G2 size)

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.

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	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

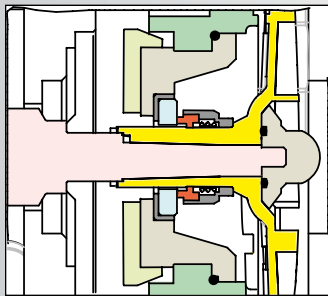
table 5

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				LOW COST HARD PARTICLES (easy maintenance)			
	BS8 - BF3**		SiC				HARD PARTICLES			
EXTERNAL SINGLE	SF1	GFR/PTFE	CER	PTFE					NORMAL USE	
	SF2		SiC							
	TS5	CARBON	CER	FKM						HARD PARTICLES
	TS7		SiC							
	TS6	SiC	CER							
	TS8		SiC							
DOUBLE	MSF1	GFR/PTFE	CER	PTFE	CARBON	CER	CRITICAL			
	MSF2		SiC							
	MTS5	CARBON	CER	FKM				EXTREME		
	MTS7		SiC							
	MTS6	SiC	CER							
	MTS8		SiC							

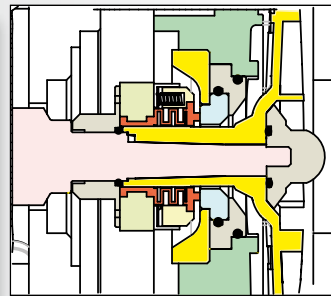
(**) Only for ZMR G3 size

SECTIONS OF VARIOUS KIND OF MECHANICAL SEALS

BS5 - BS6 - BS7 - BS8



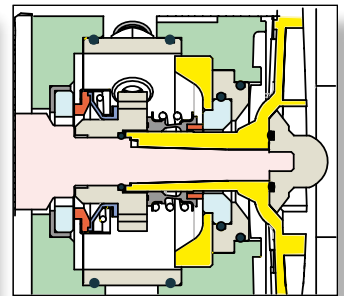
SF1 - SF2



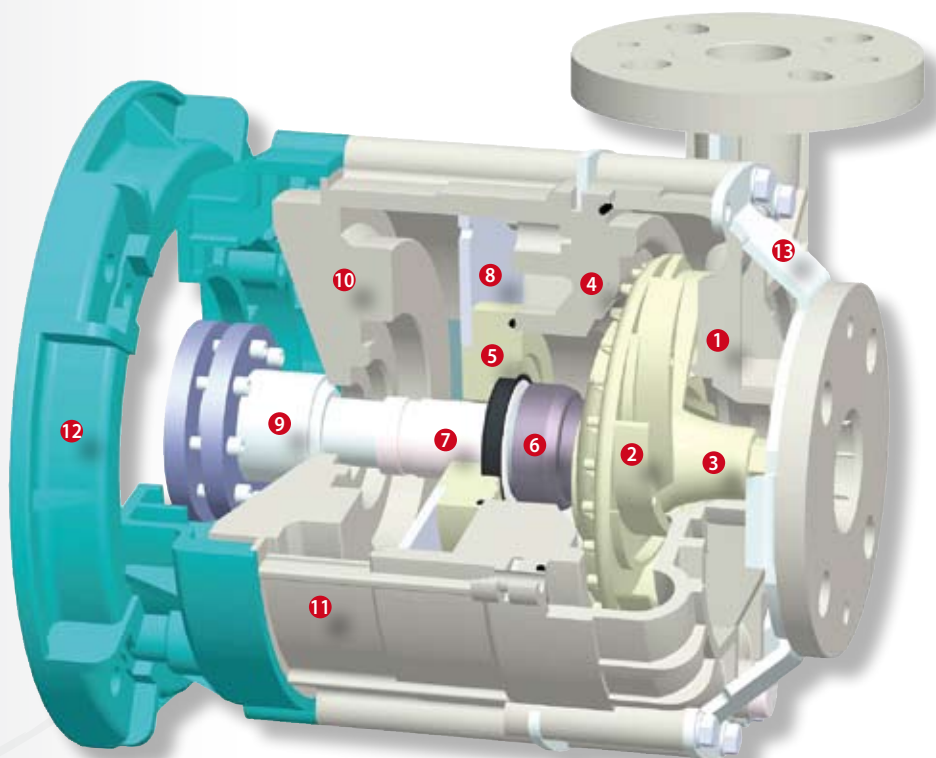
TS5 - TS6 - TS7 - TS8



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*
			Ka	7	8	10	13	17	22	31	15	20	20	30	31	41	65

(*) ZMR only

MOTOR SPECIFICATIONS (G3 size)

table 9

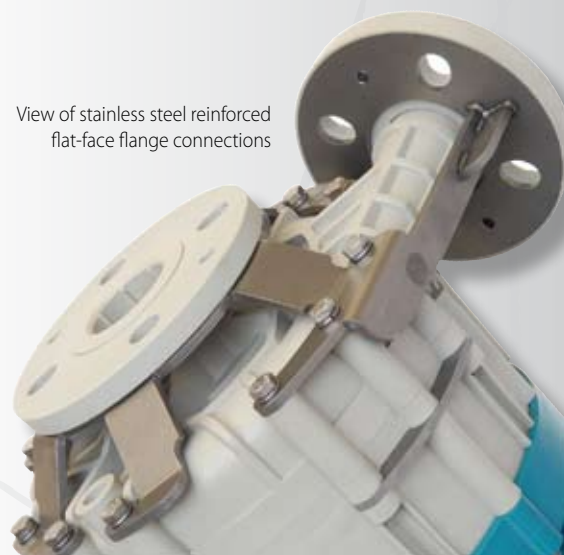
		20.15			20.20			20.27			20.36			30.15			30.25			36.30		
		N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S	N	P	S
Power (IEC) 50 Hz	kW	2,2	3	4	3	4	5,5	4	5,5	7,5	5,5	7,5	11	4	5,5	7,5	5,5	7,5	11	7,5	11	15*
Motor size	IEC	90L	100L	112M	100L	112M	132SA	112M	132SA	132SB	132SA	132SB	160MA	112M	132SA	132SB	132SA	132SB	160MA	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)	13 (TMR)	9 (ZMR)	Frame	90L	100L	112M	132SA	132SB	160MA	160MB	90L	100L	112M	132SA	132SB	160MA	160MB
8 (ZMR)	9 (ZMR)		Kg	17	22	31	53	61	75	85	31	41	65	80	80	155	155

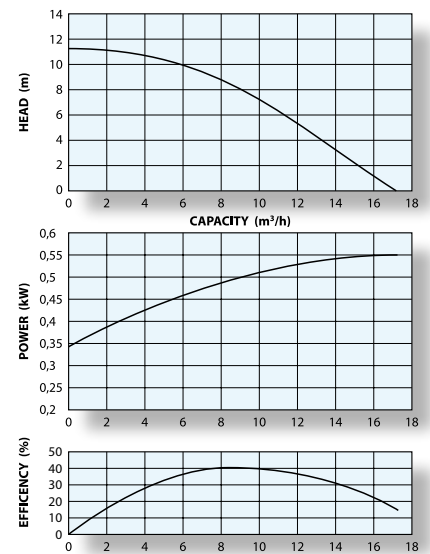
"BSP" outlet cylindrical
threaded connectionDetail of outlet flanged
connection directly to the plant flangeView of stainless steel reinforced
flat-face flange connections

2900 r.p.m. 50Hz

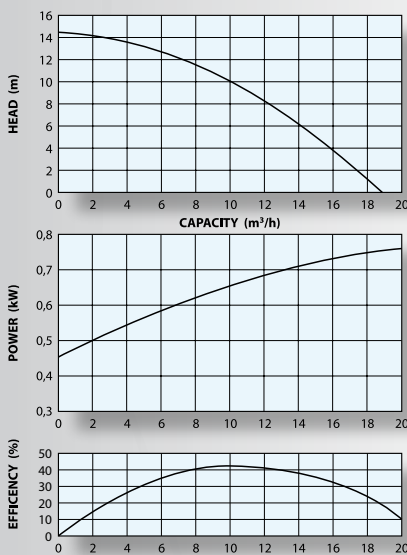


In the magnetical execution the motor is easily installed without disassembling the wet-end.

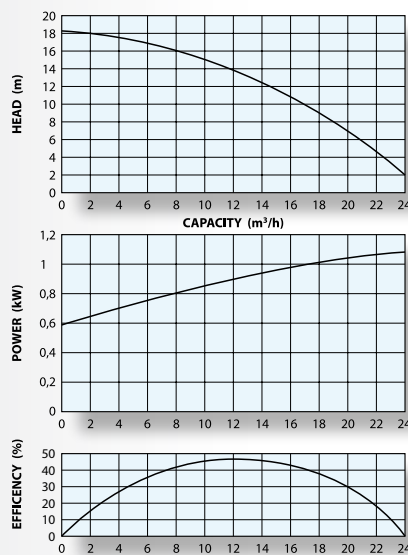
06.10



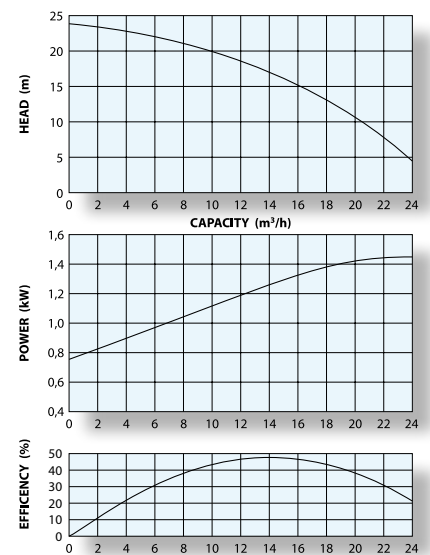
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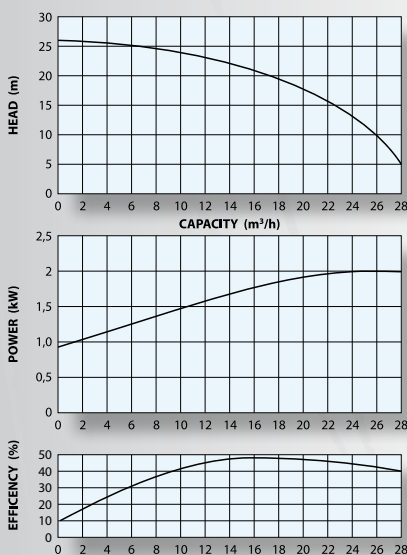
10.15



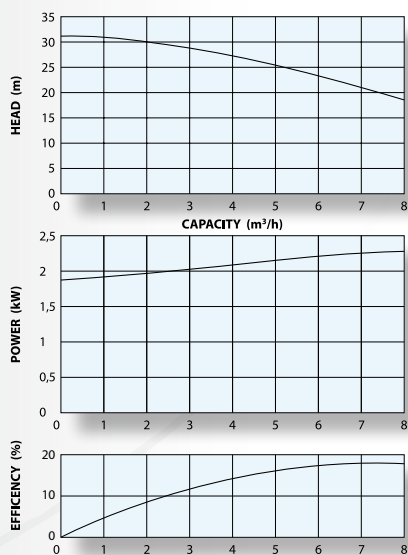
16.15



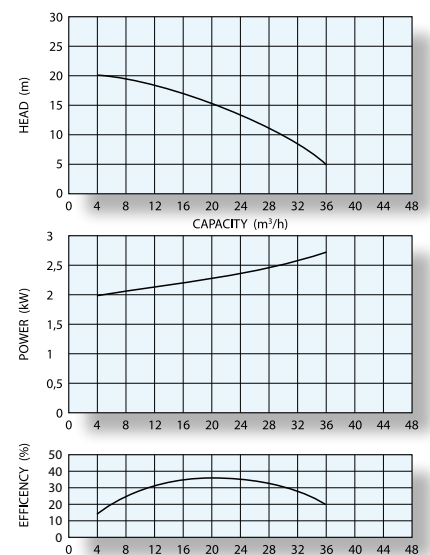
16.20



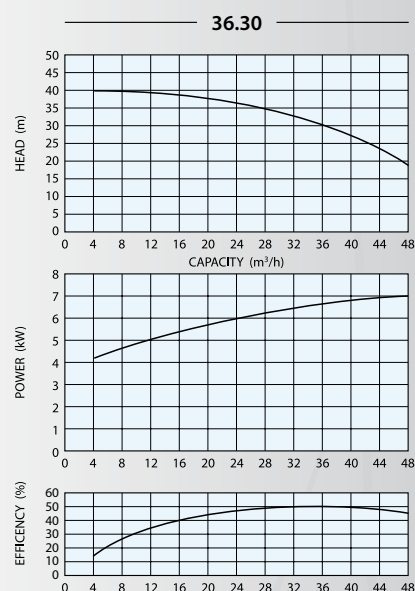
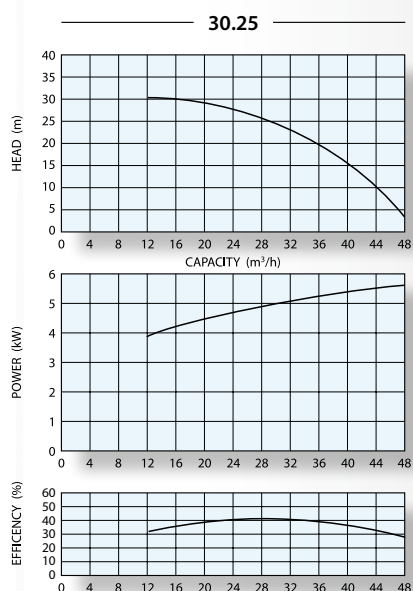
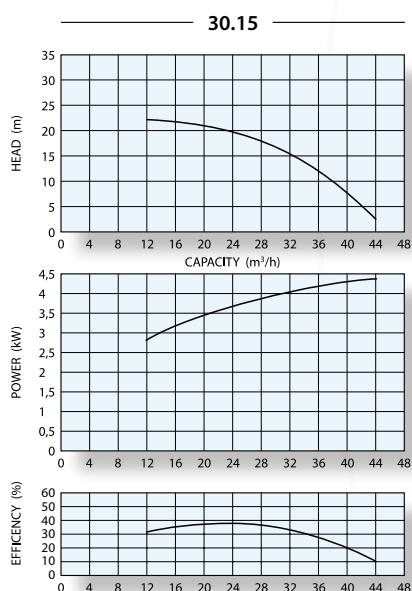
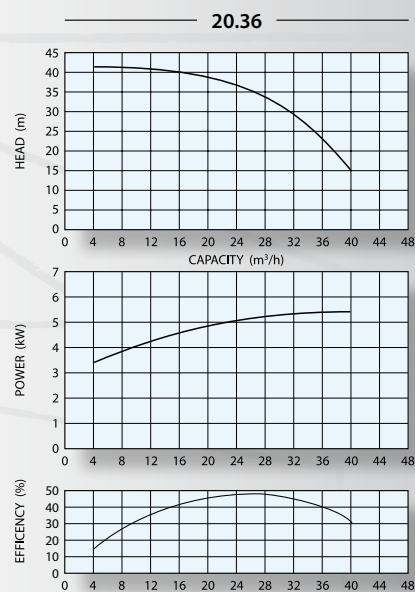
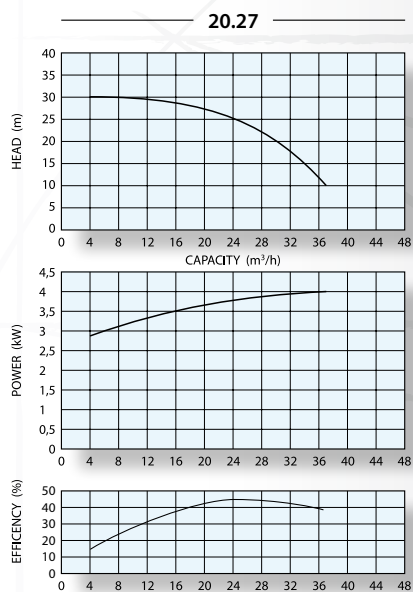
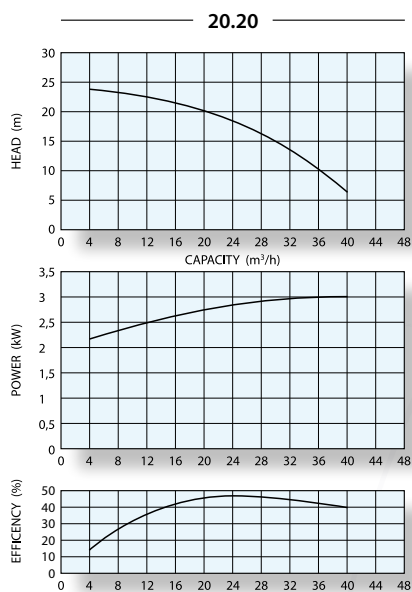
02.30



20.15

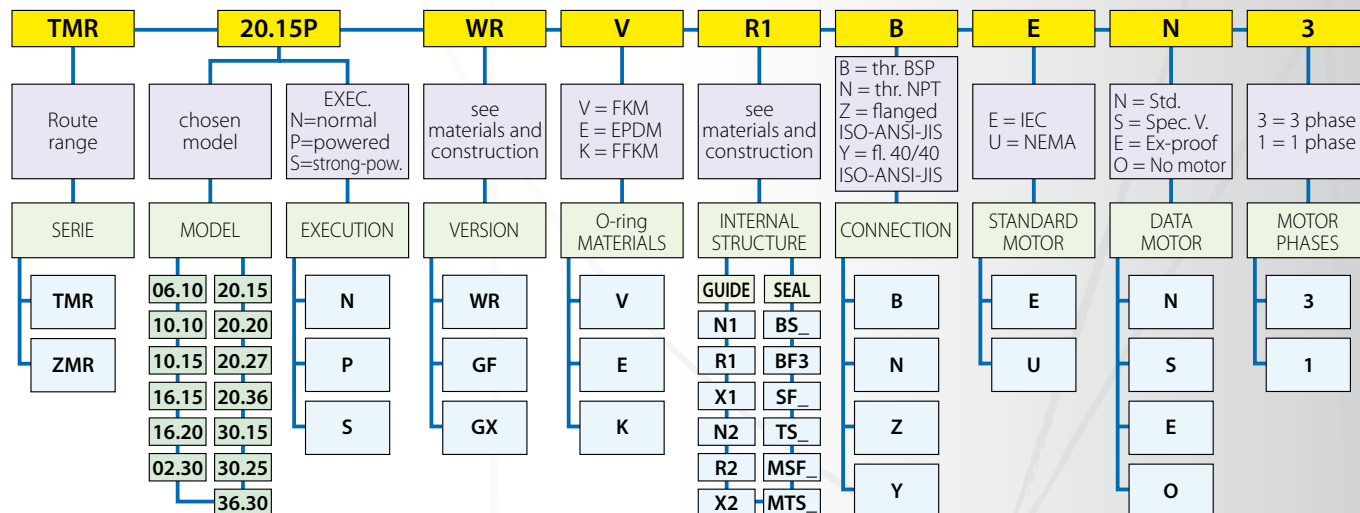


2900 r.p.m. 50Hz



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 ⁽¹⁾		Q	h1	h2	r		r1		rb		m1	n1	s1	g ⁽¹⁾	L3	B2	S2	L1	B3	h3																				
												TMR	ZMR				TMR	ZMR	TMR	ZMR																																
G2	06.10	N	71	40 - 1"½	32 - 1"¼	1"½	1"¼	110 / 98 / 105	100 / 89 / 100	18 x 4 / 16 x 4 / 19 x 4	67	356	364	75	71	130	194	202	149	157	161	169	90	112	7	106	185	248	14	245	308	40																				
		P	80A																																																	
		S	80B																																																	
	10.10	N	80A																														385	393		80		199	207					125		110						
		P	80B																																																	
		S	90S																														405	413		90		205	213	149	157	161	169	100	140	8	142	185	248		245	308
	10.15	N	80B																														385	393		80		199	207						125		110					
		P	90S																														405	413	75																	
		S	90L																														430	438		90								125								
																																	405	413				205	213					100		140		142				
	16.15	N	90S																														430	438										125								
		P	90L																														405	413										100								
		S	100																														430	438										125								
	16.20	N	90L																														478	486		100		227	235	164	172	176	184	140	160	10	155	205	305		259	359
		P	100																														430	438		90		205	213	149	157	161	169	125	140	8	142	185	248		245	308
	02.30*	-	P									100																					478	486		100		227	235	164	172	176	184	140	160	10	155	205	305		259	359
		S	112 ⁽²⁾																														487	495		112		234	242					140	190	10	168					

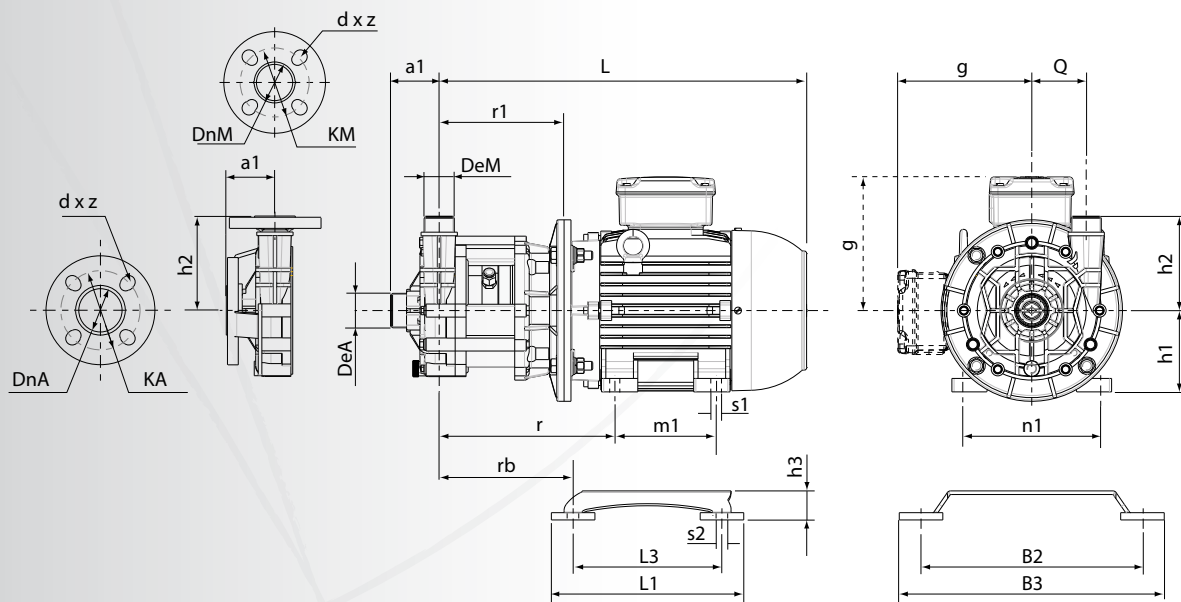
(*) 02.30 close impeller in all ranges

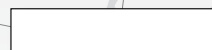
DIMENSIONS WITH IEC MOTORS - 50 Hz

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 ⁽¹⁾		Q	h1	h2	r		r1		rb		m1	n1	s1	g ⁽¹⁾	L3	B2	S2	L1	B3	h3		
											TMR	ZMR				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	96	90	160	244	290	188	234	200	246	125	140	8	142	185	248	14	245	308	55	
		P	100L									512	558		100		261	307	198	244	217	256		160	155	205	305	265		365			
		S	112M									521	567		112		268	314						190							168		
	N	100L	512									558	100		261		307	155						205							305		265
	P	112M	521									567	112		268		314	190	168														
	S	132SA	578									624	132		307		353	218	264	235	282	216			181	263	359	333		429			
	20.20	N	112M									521	567		112		268	314	198	244	217	256	140	216	10	181	263	359	265	365			
		P	112M									521	567		112		268	314	198	244	217	256		190	168	205	305	265	365				
	20.27	P	132SA									578	624		132		307	353	218	264	235	282	140	216	10	181	263	359	333	429			
		N	132SA									578	624		132		307	353	218	264	235	282		190		168	205	305			265		365
		S	132SB									578	624		132		307	353	218	264	235	282		190		168	205	305			265		365
	20.36	N	132SA									578	624		132		307	353	218	264	235	282	140	216	10	181	263	359	333	429			
		P	132SB	578	624	132	307	353	218	264	235	282	190	168	205	305	265	365															
		S	160MA	743	864	160	356	402	248	294	265	312	210	254	14	215	335	405	405	475													
	30.15	N	112M	521	567	112	268	314	198	244	217	256	140	216	10	181	263	359	333	429													
		P	132SA	578	624	132	307	343	218	264	235	282		190		168	205	305			265	365											
		S	132SB	578	624	132	307	343	218	264	235	282		190		168	205	305			265	365											
	30.25	N	132SA	578	624	132	307	343	218	264	235	282	140	216	10	181	263	359	333	429													
		P	132SB	578	624	132	307	343	218	264	235	282		190		168	205	305			265	365											
		S	160MA	743	864	160	356	402	248	294	265	312		210		254	14	215			335	405	405	475									
	36.30	N	132SB	578	624	132	307	353	218	264	235	282	140	216	10	181	263	359	333	429													
P		160MA	743	864	160	356	402	248	294	265	312	210		254		14	215	335			405	405	475										
S		160MB(1)	743	864	160	356	402	248	294	265	312	210		254		14	215	335			405	405	475										

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





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