

# ARGAL

CHEMICAL PUMPS  
*sealed close coupled pumps*



**ZM centrifugal**



**ZMA self-priming**

**ZM** and **ZMA** are different configurations of the same range of centrifugal axle pumps, self-priming which offers reliability in use. Specifically designed to handle chemical and corrosive fluids.

The whole structure has been conceived in order to make all the components extremely resistant to the aggression, even in the smallest parts.

The pump is close coupled and the parts are supported by the motor, therefore the dimensions are restricted.

Front suction, central upward delivery, mechanically sealed with sliding counterfaces (with an external, single or double flush) or radial elastic ring.

The motors with specially designed shaft and flange are usually IP 55 protected, with Class F Insulation, 240/400 voltage, three phase with 50/60 Hz frequency.

### ZM

This range is close coupled, with pump casing supported directly by the motor. These are optimal when needed to transfer chemicals with a specific gravity up to 1,8. Three different motors are available for each model.

The impeller is open, so there is no contraidication to transfer liquids containing solids in suspension.

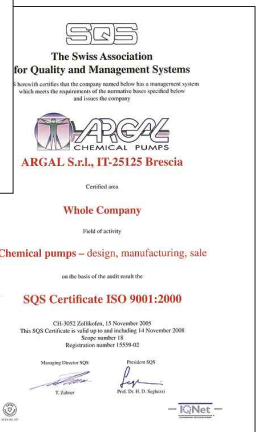
### ZMA

Self-priming without the need of having check valves.

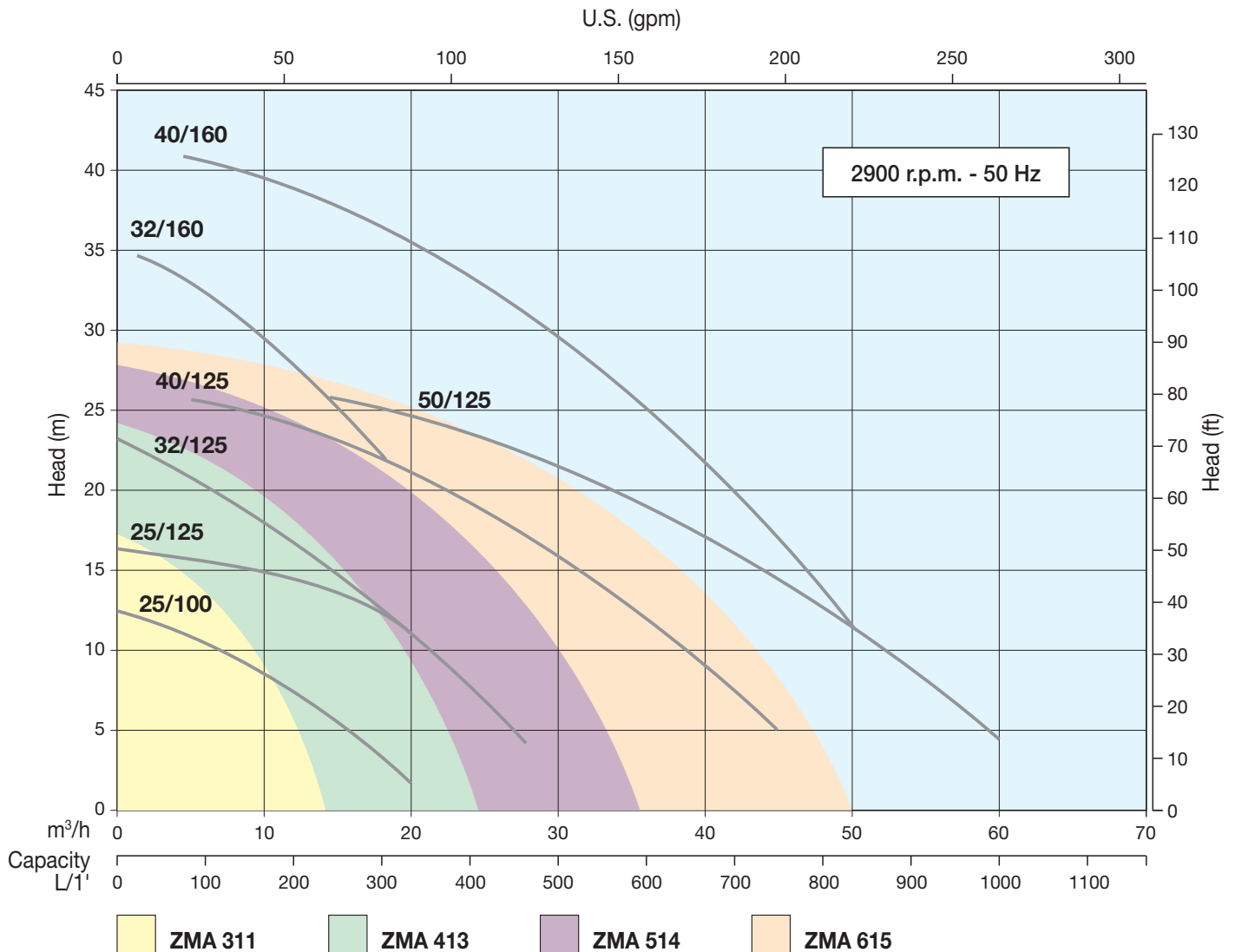
Thanks to the specific structure, after the first filling, they are able to self-prime automatically even in presence of empty pipes.

Negative suction head of 5 meters (to be reduced according to the specific gravity).

As in the ZM range, there are different motors available and the impeller is open.



GENERAL PERFORMANCE CURVES



NOTES. All curves are referred to: water at 20°C - viscosity 1 °E - specific gravity 1 kg/dm<sup>3</sup>

PUMP SPECIFICATIONS

table 1

PUMPS	ZM							ZMA			
	25/100	25/125	32/125	32/160	40/125	40/160	50/125	311	413	514	615

Ø inlet (BSP)	DeA	1 ¼" f	1 ¼" f	2" f	/	/	/	/	1 ¼" f	1 ½" f	2" f	2 ½" f
Ø outlet (BSP)	DeM	1 ¼" m	1 ¼" m	1 ½" m	/	/	/	/	1 ¼" f	1 ½" f	2" f	2 ½" f
ISO flange	NDA	40	40	50	50	65	65	80	32	40	50	60
	NDM	25	25	32	32	40	40	50	32	40	50	60
ANSI flange	NDA	40	40	50	50	65	65	80	32	40	50	60
	NDM	25	25	32	32	40	40	80	32	40	50	60

Motor power	kW	0,75	1,5	2,2	4	4	5,5	5,5	0,75	2,2	4	5,5
		1,1	2,2	3	5,5	5,5	7,5	7,5	1,1	3	5,5	7,5
		1,5	3	4	7,5	7,5			1,5	4	7,5	
Phases	N°	3										
Std. voltage	V	400 ± 5%										
Motor protect.	IP	55										

## THE MATERIALS

table 2

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)
WF	GFR-PP/PVDF	-5°C (23°F)	80°C (176°F)	0÷40°C (14÷104°F)
FC	CFF-PVDF	-30°C (-22°F)	110°C (230°F)	-20÷40°C (-4÷104°F)
QR	UPVC/PVDF	0°C (32°F)	40°C (104°F)	0÷40°C (14÷104°F)

**WR** - The main resin is PP (polypropylene) reinforced with 30% glass fibre. It has a good mechanical resistance and has good dimensional stability when hot.

**WF** - The main resin is PP (polypropylene) reinforced with 30% fibre glass. The main components are in PVDF because this material has got a higher resistance to abrasion and use.

**FC** - The main resin is PVDF (Vinylidene polyfluoride) reinforced with 20% fibre glass. Good resistance to abrasion and is also mechanically resistant.

**QR** - Main resin is PVC (Polyvinyl chloride). Other parts are made in PVDF. This version is particularly suitable to chromic acid, sulphur nitrite mixtures, sulphuric acid, sodium hypochlorite, turpentine and ozone.

## ELASTOMERS

table 3

Version	Material	Description
V	FKM	Fluorine elastomer
E	EPDM	Ethylene-propylene rubber
K	FFKM	Perfluorelastomer

## THE CONSTRUCTION OF MECHANICAL SEALS

table 4

MECHANICAL SEALS	External - Single					Double		
	T1	T3	T4	T5	T8*	T6	T9	T10
SEAL MODEL								
ROTATING PART	Carbon	SiC	PTFE/GFR	SiC	CER	Carbon	SiC	SiC
FIXED RING	CER	CER	CER	SiC	FKM/EPDM	CER	CER	SiC
BELLOWS	FKM	FKM	PTFE	FKM/EPDM	/	FKM	FKM	FKM/EPDM
2^ ROTATING PART	/	/	/	/	/	Carbon	Carbon	Carbon
2^ FIXED RING	/	/	/	/	/	CER	CER	CER

\* Radial seal



## SPECIFICATION OF MECHANICAL SEALS

table 5

Condition of work	Model	Tipology	Code
Clean chemical mediums – max pressure 3 bar	T1	Single external, elastomer bellows	10
Clean chemical mediums – suspended solids	T3	Single external, elastomer bellows	30
Concentrated acids – no suspended solids	T4	Single external, PTFE bellows	40
Clean chemical mediums – hard suspended solids	T5	Single external, elastomer bellows	50
General purpose	T6	Double flushed, elastomer bellows	16
Clean chemical mediums – low cost	T8	Elastomeric radial seal	80
Suspended solids	T9	Double flushed, elastomer bellows	39
Hard suspended solids / salts	T10	Double flushed, elastomer bellows	51

THE CONSTRUCTION OF PUMPS

table 6

Versions	WR	WF	FC	QR
Pump casing	GFR-PP	GFR-PP	CFF-PVDF	PVC
Bracket	GFR-PP	GFR-PP	CFF-PVDF	CFF-PVDF
Impeller	GFR-PP	CFF-PVDF	CFF-PVDF	CFF-PVDF
Ogive	GFR-PP	CFF-PVDF	CFF-PVDF	CFF-PVDF
Diaphragm	PP	PP	PVDF	GFR-PTFE
Sleeve	GFR-PTFE	GFR-PTFE	PVDF	GFR-PTFE
Gasket	FKM (1)	FKM (1)	FKM (1),(2)	FKM (1),(2)
Baseplate	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Screws	Stainless steel	Stainless steel	Stainless steel	Stainless steel

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

TECHNICAL SPECIFICATIONS

**1** Stable dimension and strong structure guaranteed by the molding of thermoplastic materials; these features are insured by the thickness of each part.

**2** Bracket with large windows in order to void accumulation of corrosive vapours

**3** Solid plastic open impeller with metal core to allow frequent start-stop cycles

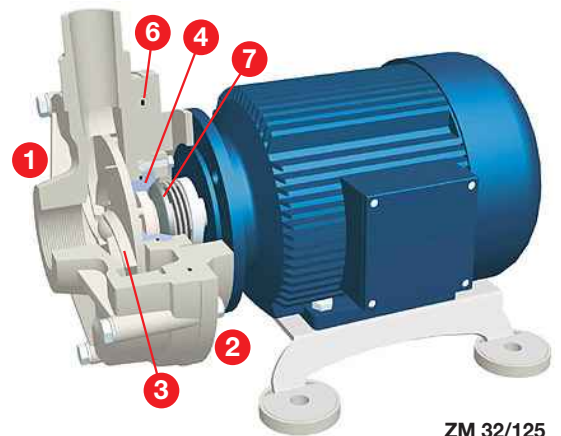
**4** Diaphragm: special building procedure limits the damages in case of dry running and allows a quicker intervention and easy maintenance

**5** Sleeve: a good protection of the shaft

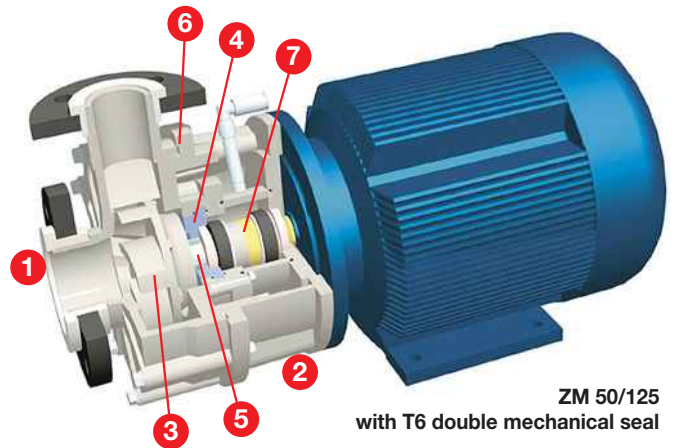
**6** Simple construction: only two parts (casing and bracket) carry out all the hydraulic and mechanical process by reducing the surface of static sealage (OR)

**7** Total interchangeability of the most common mechanical seals. There are different types according to the liquid pumped

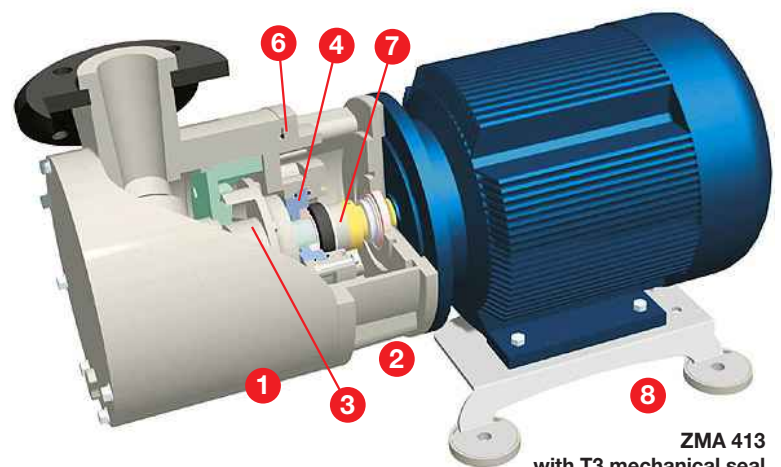
**8** Screws and nuts in stainless steel



ZM 32/125 with T4 mechanical seal

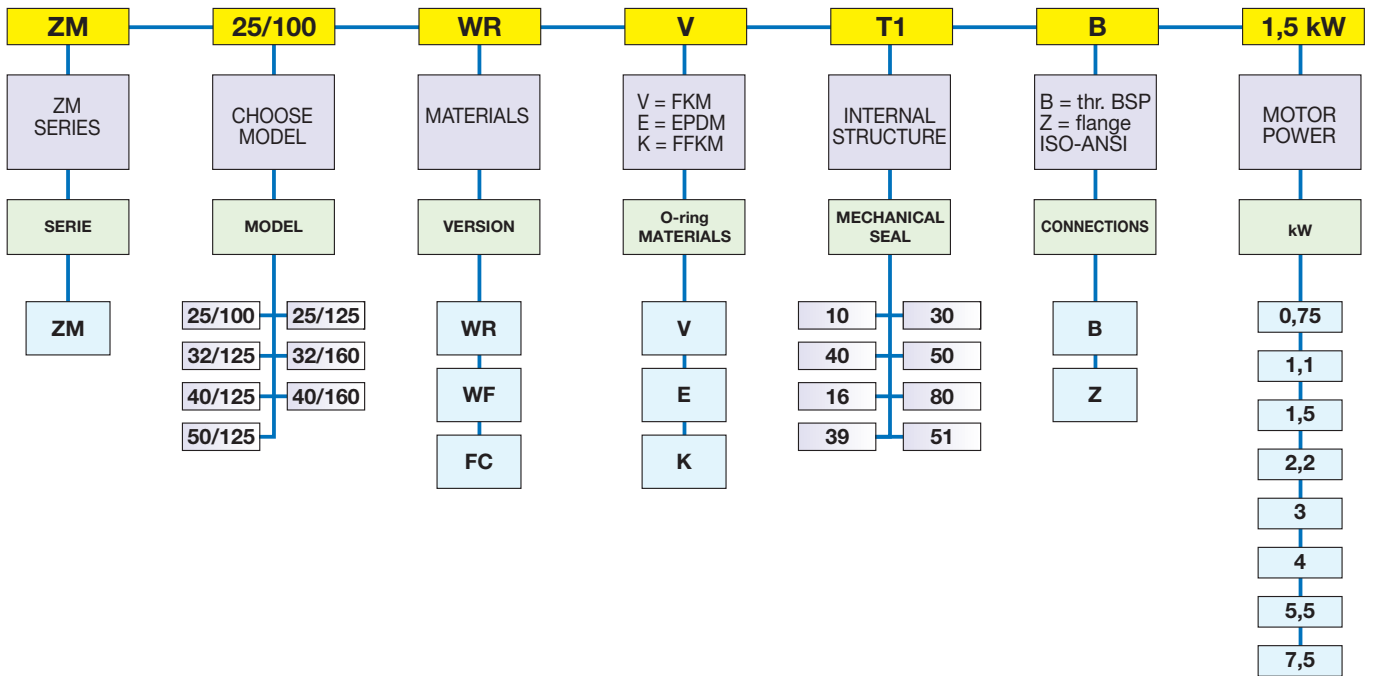


ZM 50/125 with T6 double mechanical seal



ZMA 413 with T3 mechanical seal

IDENTIFICATION LABEL



INSTALLATIONS PROCEDURE

If the specific gravity is more than 1 Kg/dm<sup>3</sup> the maximum suction head is to be reduced (see diagram 1).  
 If the temperature is more than 20 degrees Celsius the maximum suction head is to be reduced (see diagram 2).  
 To self-prime liquid with considerable emission of fumes at normal condition (1 atm; 20 °C) is permittable with limited suction head (e.g. HCL).  
 Maximum value of kinematic viscosità iis 10 cSt.  
 An increase of the nominal diameter of the pipes involves an extension of the self-priming time.  
 In presence of suction horizontal pipes the priming time is extended (e.g. at Ha = 5 m with horizontal pipe lenght of one meter the priming time is of 5.2 minutes [only 4.2 min. with vertical pipe]).  
 Planning the complex system do keep the priming time less than 6 min. ad the NPSH value more than 0,4 atm. (for liquids at room temperature).  
 Siphon-shaped pipes (filled with liquids) could hamper the air flow during the priming phase.  
 In the suction tank the surface of the liquids must be at atmospheric pressure.  
 The delivery pipe outlet has to work at atmospheric pressure.

table 8

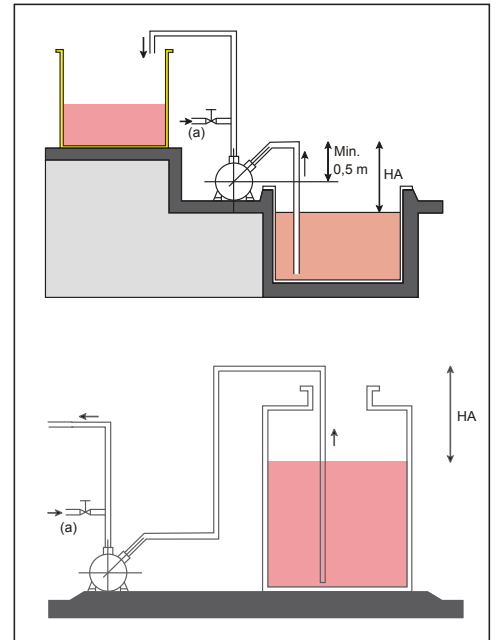
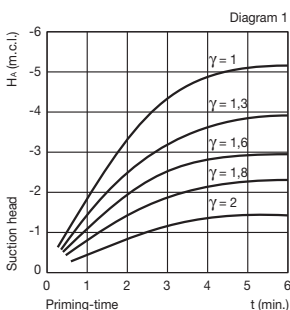
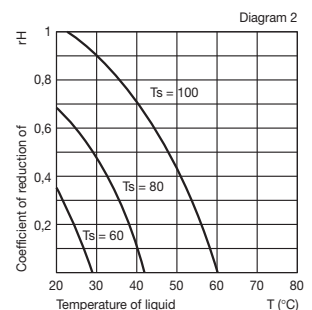


table 9



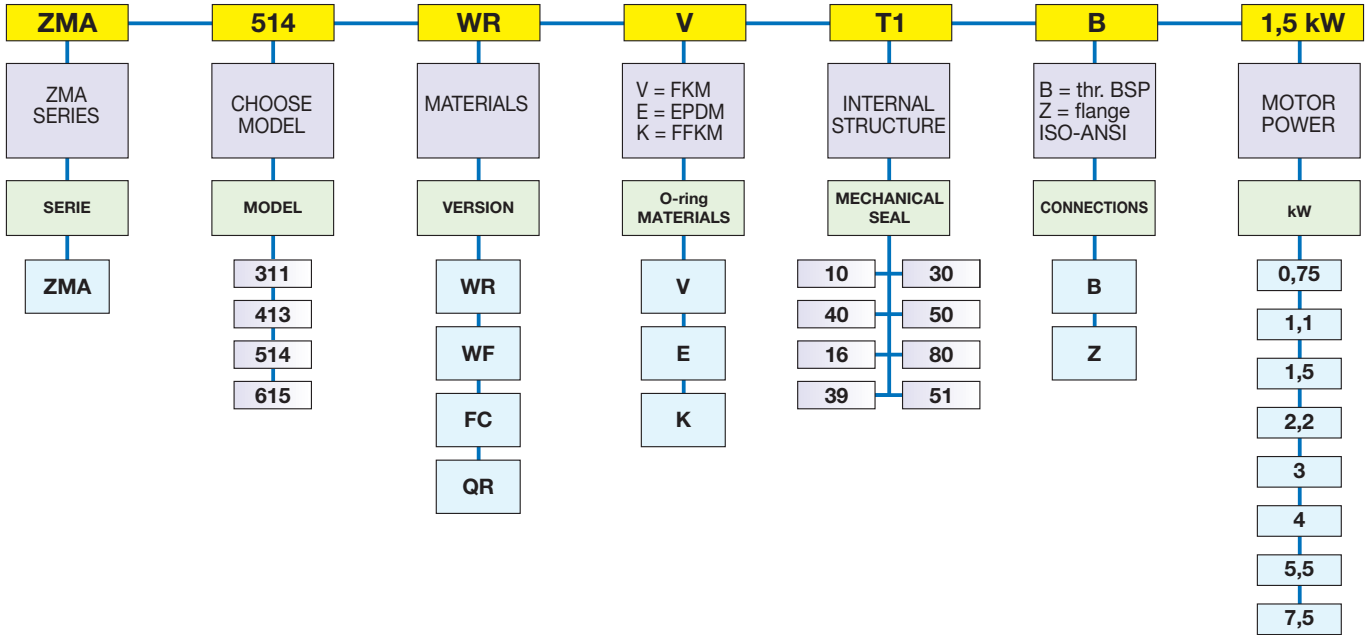
Example:

liquid: NaOH 42 Bè ( $\gamma = 1,41 \text{ Kg/ dm}^3$ )  $T = 40^\circ \text{C}$   
 plant: HA = 2 m  
 suction head check  
 diagram 1: HA max (rif.:  $\gamma = 1,41 \text{ Kg/ dm}^3$ ) = 3,5 m  
 diagram 2: rH (rif.:  $T = 40^\circ \text{C}$ ) = 0,7; HA max =  $3,5 \times 0,7 = 2,45 \text{ m}$  ( $> 2$ ; OK).  
 Please contact us in order to give you our technical support and assistance.  
 $\gamma = (\text{Kg/dm}^3)$  specific gravity of the liquid.  
 TS = boiling or decomposition temperature ( $^\circ\text{C}$ ).



IDENTIFICATION LABEL

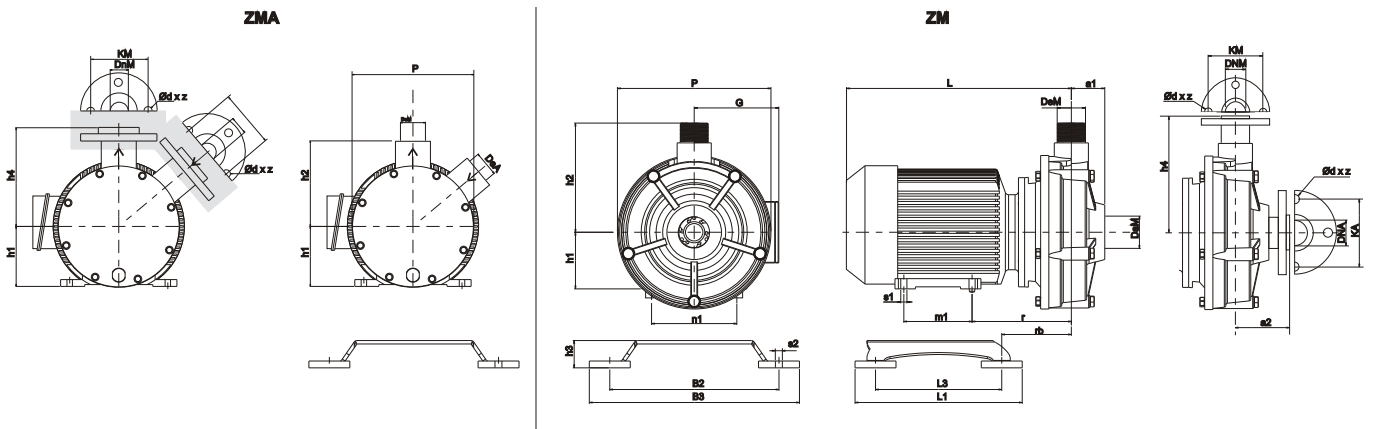
table 10



DIMENSIONS

table 11

ZM - ZMA		Flanged connections				Pump and motor dimensions													Baseplate dimensions														
Pump model	Motor power (kW)	Outlet (ISO/ANSI)		Inlet (ISO/ANSI)		a1	a2	L	P	h1	h2	h4	r	m1	n1	s1	G	B2	B3	L1	L3	s2	h3	rb									
		KM	Ødxz	KA	Ødxz																												
25/100	0,75	100 / 89	Ø18 x 4 / Ø16 x 4	110 / 98	Ø18 x 4 / Ø16 x 4	45	78	330	185	80	125	130	145	100	125	9	126	248	308	245	185	14	40	107									
	1,1																																
	1,5																																
25/125	1,5	100 / 89	Ø18 x 4 / Ø16 x 4	110 / 98	Ø18 x 4 / Ø16 x 4	50	90	335	222	80	160	165	145	100	125	9	126	248	308	245	185	14	40	111									
	2,2							365		90															155	125	140	10	142				
	3																																
32/125	2,2	110 / 98	Ø18x4 / Ø16x4	125 / 121	Ø18x4 / Ø19x4	50	90	365	222	90	166	174	155	124	140	10	142	248	308	245	185	14	40	111									
	3							395		100															165	140	160	12	155	305	305	265	205
	4							460		112															300	190	12	166	305	365	265	205	
32/160	4	100 / 89	Ø18x4 / Ø16x4	125 / 121	Ø18x4 / Ø19x4	n.a	70	475	268	112	n.a	180	335	140	216	13	200	359	429	333	263	14	55	263									
	5,5							570		132															300	190	12	166	305	365	265	205	
	7,5							570		132															335	140	216	13	200	359	429	333	263
40/125	4	110 / 98	Ø18x4 / Ø16x4	145 / 140	Ø18x4 / Ø19x4	n.a	80	475	268	112	n.a	180	344	140	216	13	200	359	429	333	263	14	55	272									
	5,5							575		132															305	190	12	166	305	365	265	205	
	7,5							575		132															344	140	216	13	200	359	429	333	263
40/160	5,5	110 / 98	Ø18x4 / Ø16x4	145 / 140	Ø18x4 / Ø19x4	n.a	80	575	268	132	n.a	180	344	140	216	13	200	359	429	333	263	14	55	272									
	7,5							575		132															305	190	12	166	305	365	265	205	
	5,5							575		132															344	140	216	13	200	359	429	333	263
50/125	5,5	125/121	Ø18x4 / Ø19x4	160 / 152	Ø18x8 / Ø19x4	n.a	90	583	268	132	n.a	185	352	140	216	13	200	359	429	333	263	14	55	272									
	7,5							583		132															352	140	216	13	200	359	429	333	263
311	0,75	100 / 89	Ø18 x 4 / Ø16 x 4	100 / 89	Ø18 x 4 / Ø16 x 4	53	53	392	185	80	107	200	260	100	125	9	126	248	308	245	185	14	40	223									
	1,1																																
	1,5																																
413	2,2	110/ 98	Ø18x4 / Ø16x4	110/ 98	Ø18x4 / Ø16x4	73	73	445	223	90	130	210	295	125	140	10	142	248	308	245	185	14	40	252									
	3							475		100															310	140	160	12	155	305	365	265	205
	4							540		112															390	140	190	12	166	248	308	245	185
514	4	125/121	Ø18x4 / Ø19x4	125/121	Ø18x4 / Ø19x4	79	79	540	268	112	165	230	455	140	216	13	200	359	429	333	263	14	55	385									
	5,5							670		132															390	140	190	12	166	248	308	245	185
	7,5							670		132															455	140	216	13	200	359	429	333	263
615	5,5	145/140	Ø18x4 / Ø19x4	145/140	Ø18x4 / Ø19x4	124	124	688	268	132	165	250	473	140	216	13	200	359	429	333	263	14	55	402									
	7,5							688		132															473	140	216	13	200	359	429	333	263



# Production Program

## TMB range

Installed powers: W 15+100  
Bodies materials: GFR/PP

- Magnetic drive



## AM range

Installed powers: kW 0,18+0,55  
Bodies materials: GFR/PP - E-CTFE

- Magnetic drive



## ROUTE range

Installed powers: kW 0,55+7,5  
Bodies materials: GFR/PP - CFF/E-CTFE

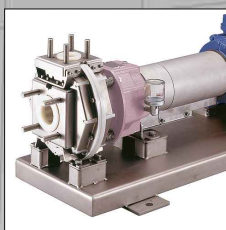
- Magnetic drive
- Sealed



## FRONTIERA range

Installed powers: kW 0,55+15  
Bodies materials: PP - E-CTFE

- Magnetic drive
- Sealed



## ZME range

Installed powers: kW 5,5+15  
Bodies materials: PP - E-CTFE

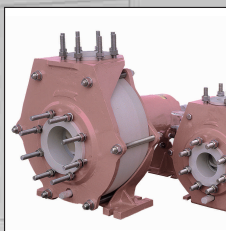
- Sealed



## ZGE range (ISO 2858)

Installed powers: kW 0,55+300  
Bodies materials: PP - PVDF - PVC - PE HMW

- Sealed



## ZMA and ZGA range

Installed powers: kW 0,75+11  
Bodies materials: PP - PVDF - PVC

- Self priming
- Sealed



## ZM range

Installed powers: kW 0,75+11  
Bodies materials: GFR/PP - CFF/PVDF  
Lengths 400+3000 mm

- Sealed



## K range (KM and KMS)

Installed powers: kW 0,75+22  
Bodies materials: GFR/PP - PVDF - PVC  
Lengths 250+2000 mm



## K range (KG and KGS)

Installed powers: kW 0,75+37  
Bodies materials: GFR/PP - PVDF - PVC  
Lengths 400+3000 mm



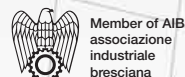
## EQUIPRO range

Available motor power: 0,25+4 kW  
Material versions: GFR/PP - PVDF  
Lengths 275 - 450 mm



## LAGOON range

Range: from 500 to 40.000 l/h  
Filter materials: PP - PVDF  
Pump materials: GFR/PP - CFF/E-CTFE



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