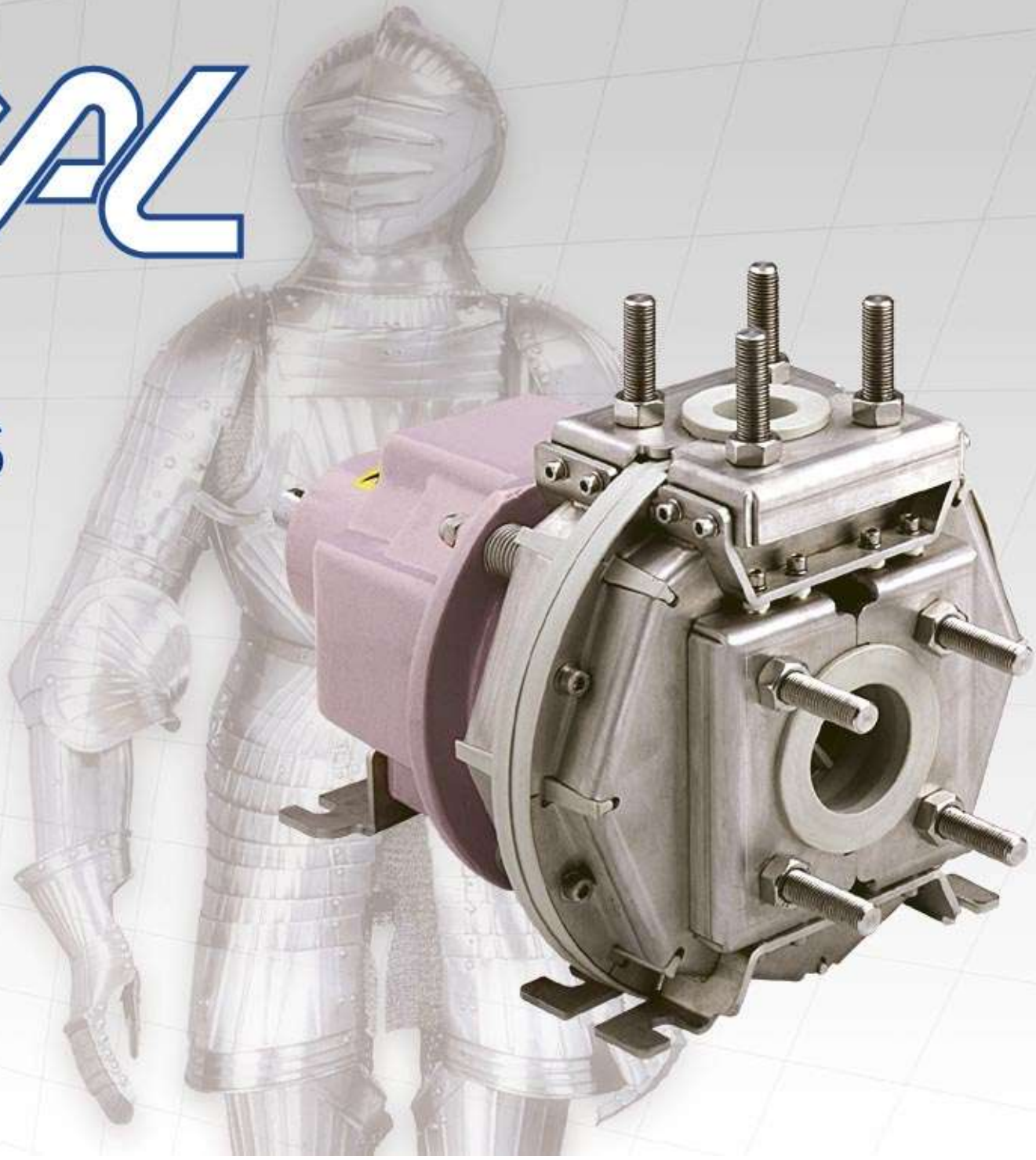
ARGAL

FRONTIERA
CHEMICAL PUMPS

"INTRASET SYSTEM"



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ARGAL CENTRIFUGAL PUMPS FOR LIQUID CHEMICALS

For twenty years, Argal has been making centrifugal horizontal and vertical pumps in thermoplastic corrosion-resistant resins. This catalogue brings you the new FRONTIERA series of chemical pumps.
They have been designed to respond positively to the processing requirements of the chemical and pharmaceutical industries as they can be used for different environmental applications, surface treatments, industrial washing and can handle all other uses of highly corrosive fluids.

INTRASET

The FRONTIERA pumps have an innovative internal structure that Argal has developed on the basis of years of direct experience in the field and they are part of the INTRASET project.

INTRASET is a two-level system:
Level 1, structure. Different mechanical sections are designed and engineered to form different centrifugal pump units (close- or long-coupled, with magnetic or mechanical drive, armoured or integral, etc);
Level 2, applications. The needs of the individual user are catered for by the configurations of the pumps whilst the guided settings set out in the different sections of this catalogue (and/or of the other interactive multimedia tools) enable the pump model to be defined stage by stage until the correct final model is created.
ARGAL's Quality Assurance System has been registered to ISO 9002 since 1999.

Frontiera pump: armoured, magnetical version, long-coupled with base, back pull-out execution, in accordance to ISO 2858.


IQNet
THE INTERNATIONAL CERTIFICATION NETWORK
CERTIFICATE
IQNet and SQS
hereby certify that the organization
ARGAL S.r.l.
IT-25125 Brescia
Certified area
Whole company
Fields of activity
Chemical pumps
has implemented and maintains a
Quality Management System
which fulfills the requirements of the following standard
ISO 9002
Scope No: 18
Issued on: 25.12.1999
Validity date: 24.12.2002
Registration Number: 15559-01
IQNet
Catherine Neville
President of IQNet
Theodor Zahner
Managing Director SQS
SQS

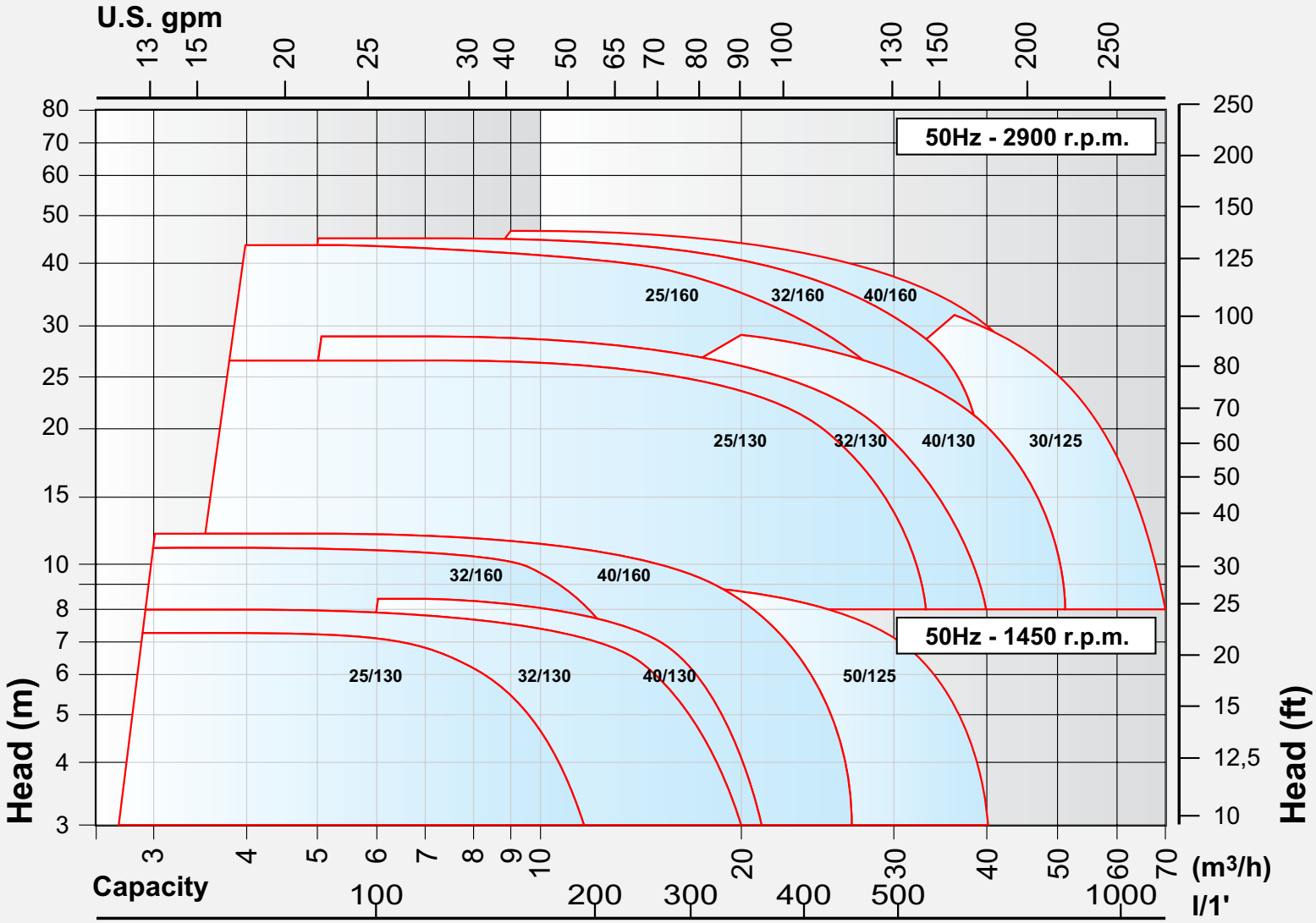
Frontiera pump: integral (only plastic), with mechanical seal, close-coupled execution.


SQS
The Swiss Association for Quality and Management Systems
SQS herewith certifies that the company named below has an appropriate management system which meets the requirements of the international standard for quality management and quality assurance (ISO 9002) and issues the company
ARGAL S.r.l.
IT-25125 Brescia
the
SQS Certificate ISO 9002
on the basis of the audit result
Certified area
Whole Company
Field of activity
Chemical Pumps
CH-3052 Zollikofen, 25 December 1999
This SQS Certificate is valid upto and including 24 December 2002
Scope number 18
Registration number 15559-01
Managing Director SQS
President SQS
T. Zahner
Prof. Dr. H. D. Seghezzi
IQNet

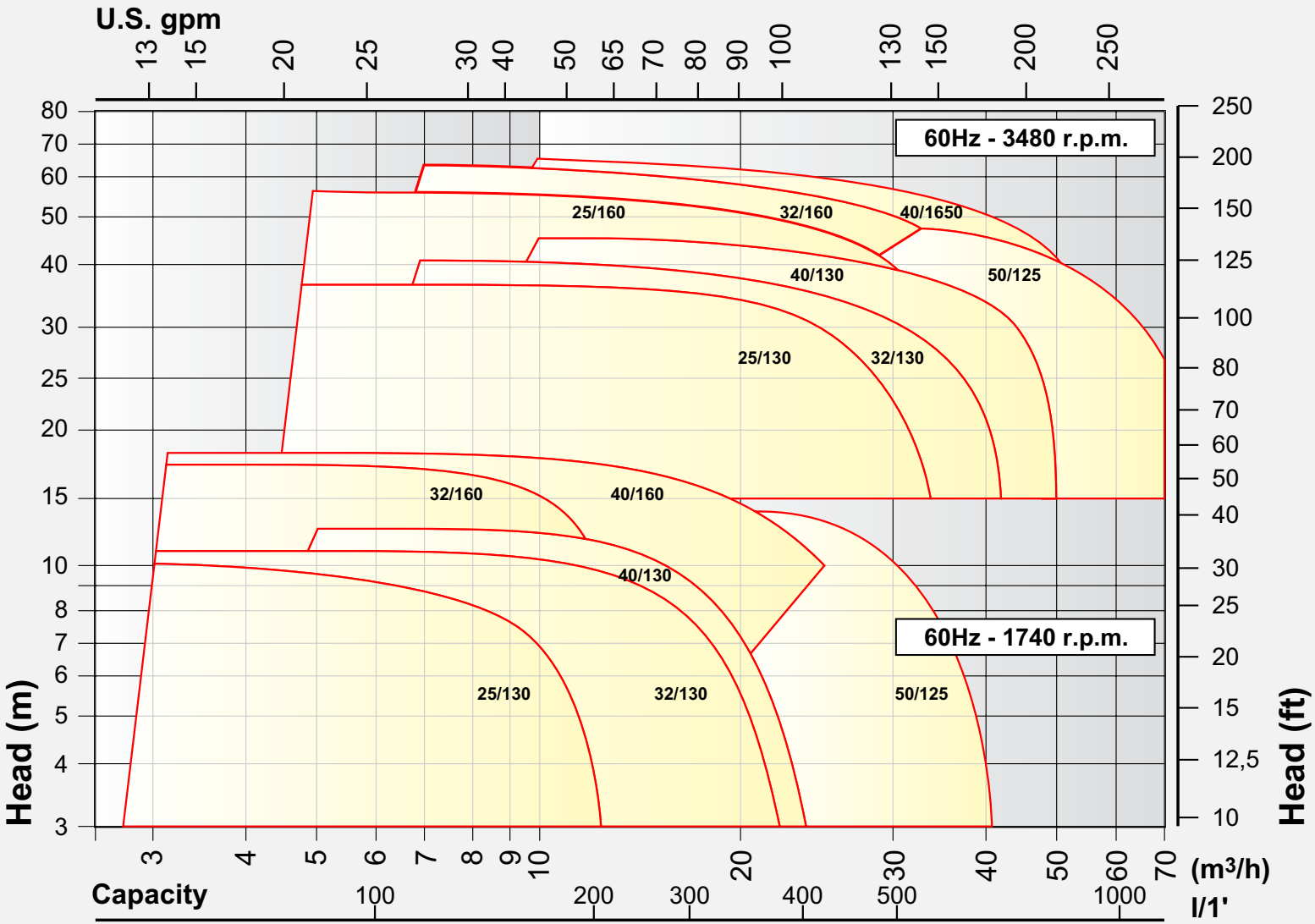
I N D E X

INTRASET SYSTEM:

GENERAL PERFORMANCE CURVES 50 HZ



GENERAL PERFORMANCE CURVES 60 HZ



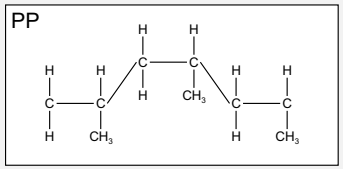
FEATURES OF FRONTIERA PUMPS

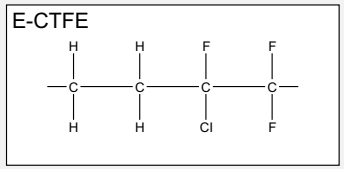
- Conform to international standards ISO 2858 (DIN 24256 - BS5257)
  The standards refer to the pump size, bases, couplings, size of inlet/outlet connections and performance of each pump.

CHEMICALLY RESISTANT

Al the components that come into contact with pumped liquids are exceptionally resistant to chemicals.
The polymers used in the standard versions of the volute casings and impellers are:

- Polypropylene (PPH), a pure thermoplastic material with ultra-violet ray stabiliser;
- Ethylene-chlorotrifluoroethylene (E-CTFE), a fluorinated polymer that is free of any additives.
- Versions in polyvinyldene fluoride (PVDF) and polyethylene with a high molecular weight (PE-HMW) are also available.





MAGNETIC DRIVE OR MECHANICAL SEAL PUMPS

The Frontiera pumps are centrifugal and basically consist of a casing (volute casing) inside which a bladed impeller rotates that is driven by the motor. Operation may be of 2 types: mechanical or magnetic.

1. In the first case the impeller is fitted to the motor shaft (of the electric motor or the support) and the liquid is prevented from leaking out in the direction of the motor by sliding washers (mechanical seals) in appropriate material.
2. In the case of magnetic drive the impeller is not fixed to the motor shaft and is rotated by magnetic pull exerted by magnets placed on the motor shaft which, on their turn, pull other magnets embedded in the impeller itself. This version does not require any type of rolling seal: the volute casing is hermetically sealed only by means of static washers (O-rings) that are housed in the couplings.

DIFFERENT SOLUTION INSIDE THE VOLUTE CASING

The magnetic drive pumps come with different internal structures:

- **T** (standard) for clean liquid chemicals
- **R** (critical) for frequent risks of dry operation or cavitation risks
3. • **X** (extreme) for liquid chemicals with suspended solids

The mechanical pumps can be fitted with the usual commercially available mechanical seals with combinations of material that suit all types of liquid:

4. • external seals washed by the pumped liquid
- internal seals (also washed externally)
- double seals washed externally

SPECIAL CARE OF PUMP INTERNAL PARTS

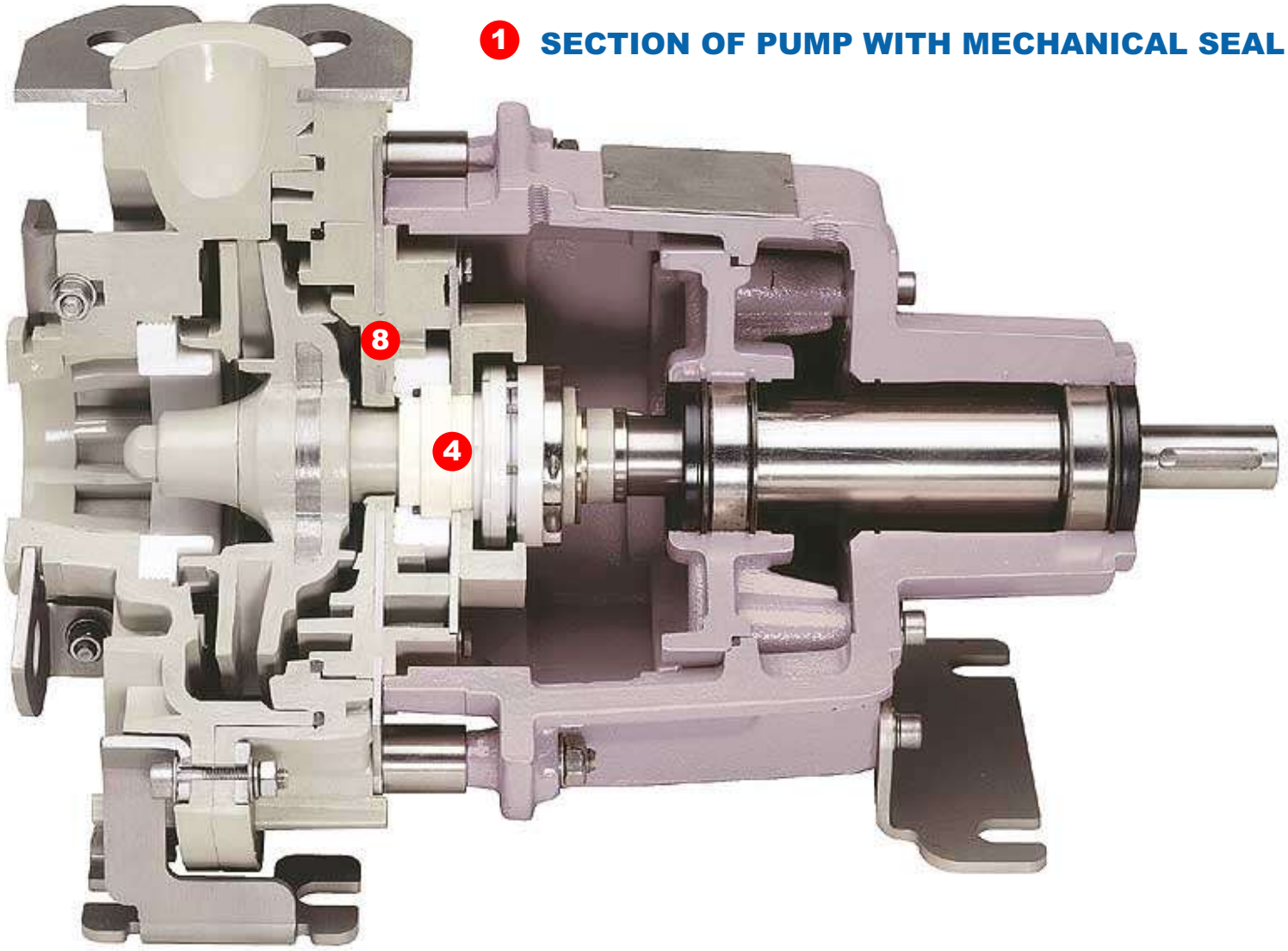
For magnetic drive pumps:

- hydrodynamic balancing of impeller;
5. • magnets housing and protection;
6. • volute casing with double rear chamber: one for chemical resistance and the other to increase mechanical strength;
7. • great attention to problem of safety during dismantling and reassembly of magnetic coupling through use of springs that gradually weaken the attraction pull of the magnet pairs to prevent danger to the operator and/or damage through involuntary blows to the hydraulic parts.

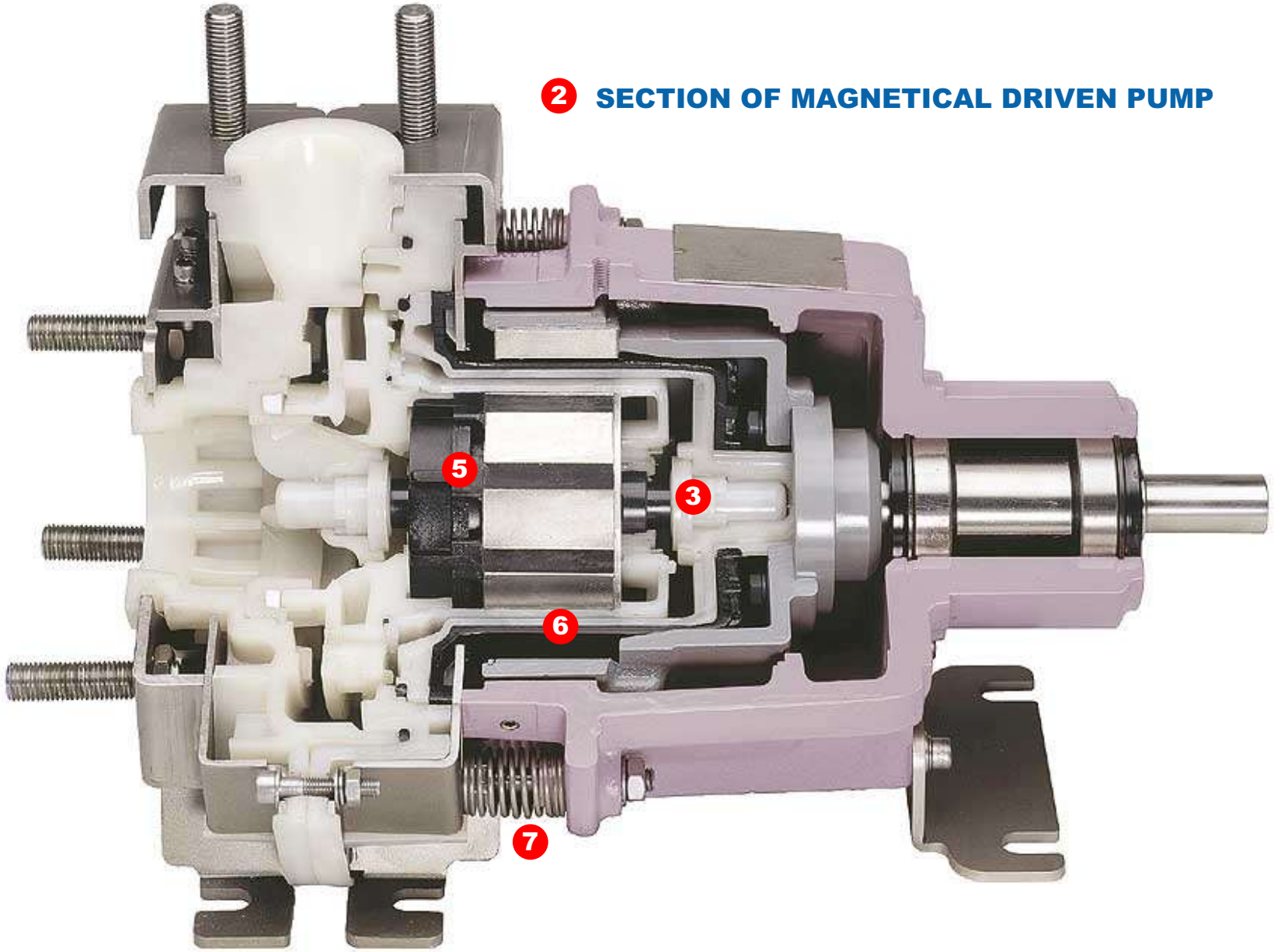
For mechanical seal pumps:

- internal circulation to cool mechanical seal and take any solid bodies to the edge of the rear casing;
8. • composite structure of rear disk: the thermoplastic material is reinforced inside by a stainless-steel core (that does not come into contact with the liquid) as far as the fixed seat of the mechanical seal;
- a roller bearing efficiently supports the dynamic stress on the impeller in all pump versions (including close-coupled versions).

1 SECTION OF PUMP WITH MECHANICAL SEAL



2 SECTION OF MAGNETICAL DRIVEN PUMP



INNOVATIVE EXTERNAL STRUCTURE OF STAINLESS-STEEL SHEETING

1 • For the entire range, the ground supports of the pump are in AISI 304 sheeting.
This lends stability to the anchor bolts and prolongs the pump's useful life.

2 • In the **N**-series “integral” pump (traditional pump only in thermoplastic) stainless steel replaces the traditional plastic flanges and the special design of the fastening fittings minimises the mechanical load exerted on the volute casing.

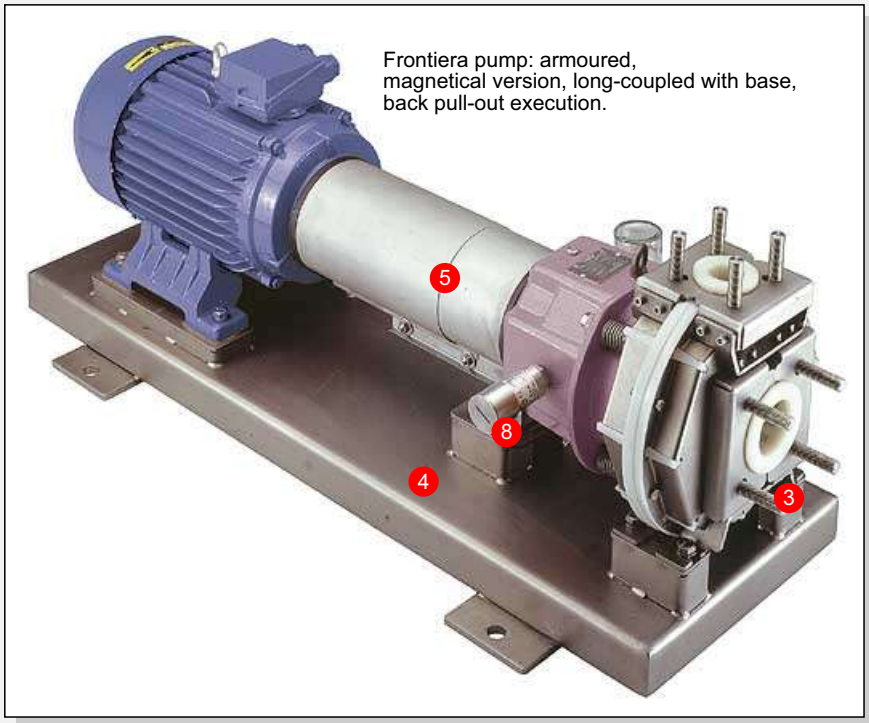
3 • In the 'armoured' **R** series the stainless steel sheeting replaces all the old cast iron armour that often deteriorated after only a short period. The new armour (that is not drawn but only folded with tools of a radius that are appropriate to the thickness) both supports the loads on the inlet/outlet fittings and protects the volute casing from internal liquid hammers and from accidental external blows;

4 • The bases are in AISI 304 stainless steel throughout in place of the traditional sections in painted steel;

5 • The circular safety guards that cover the flexible coupling are in stainless-steel sheeting.

ALSO IN CLOSE-COUPLED VERSION

6 A close-coupled version of the Frontiera pumps is available that enables IEC or NEMA-standard motors to be directly flanged onto the pump unit.
For all the magnetic and mechanical versions, this connection can also be made remotely without any dismantling of the pump unit. A rolling-contact bearing in the intermediate support guides the shaft supporting the impeller and absorbs its dynamic loads.



Frontiera pump: armoured, magnetical version, long-coupled with base, back pull-out execution.

ACCESSORIES

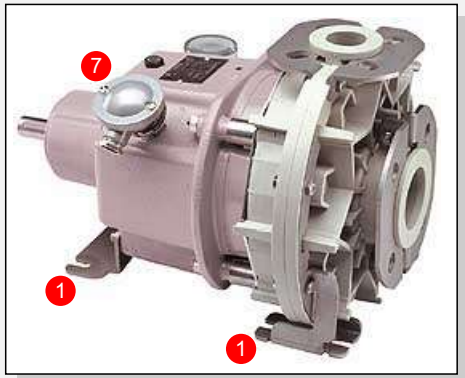
- Drain plug connection
- Dry run protector

7 • Temperature control

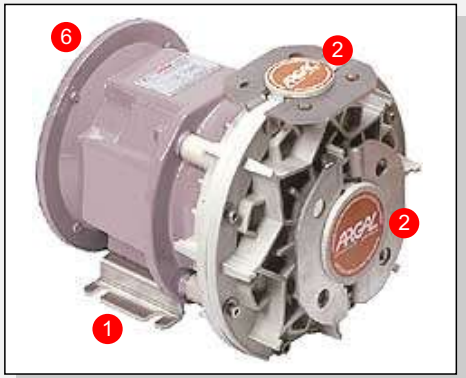
8 • Vibration control

- Support loses ceck control
- Insulation of pump bodies

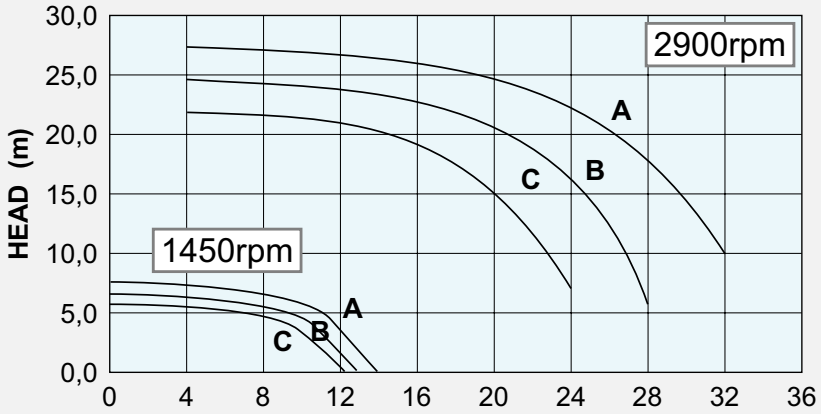
Frontiera pump: integral (only plastic), with mechanical seal, long-coupled execution.

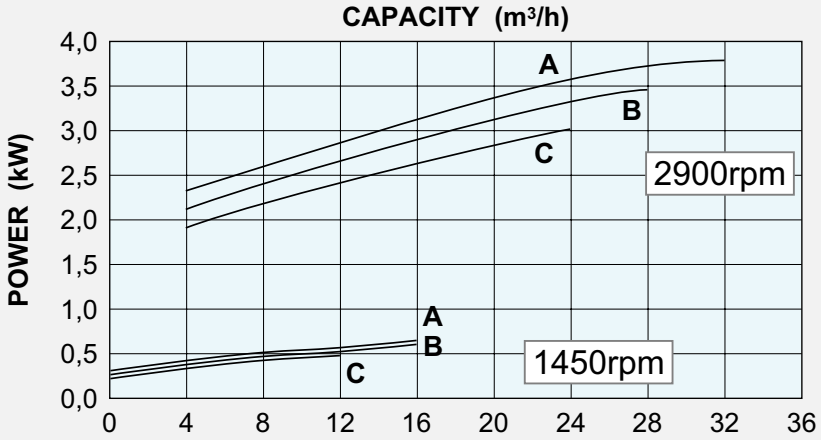


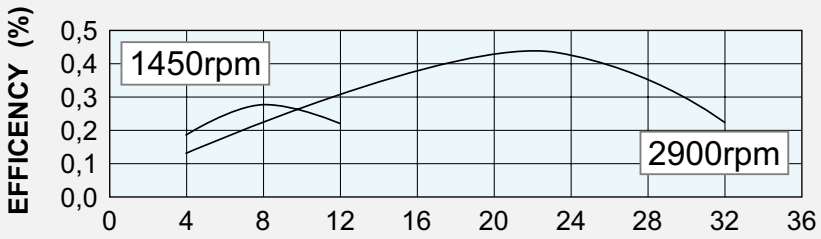
Frontiera pump: integral (only plastic), with mechanical seal, close-coupled execution.



CURVES 50 HZ FOR FRONTIERA MODELS







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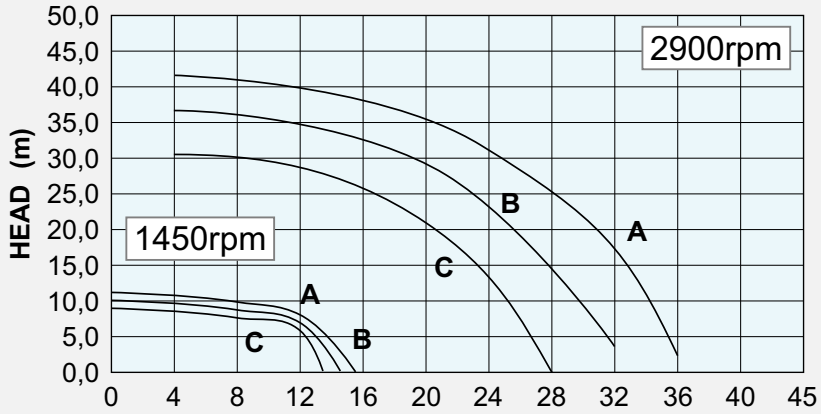

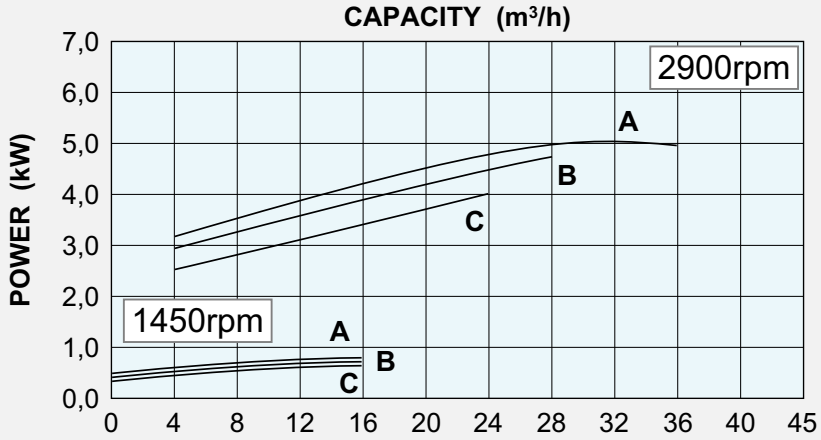

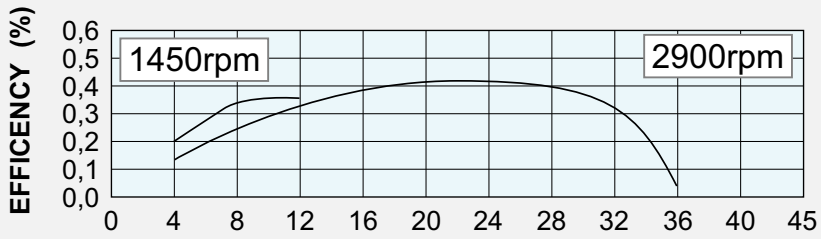

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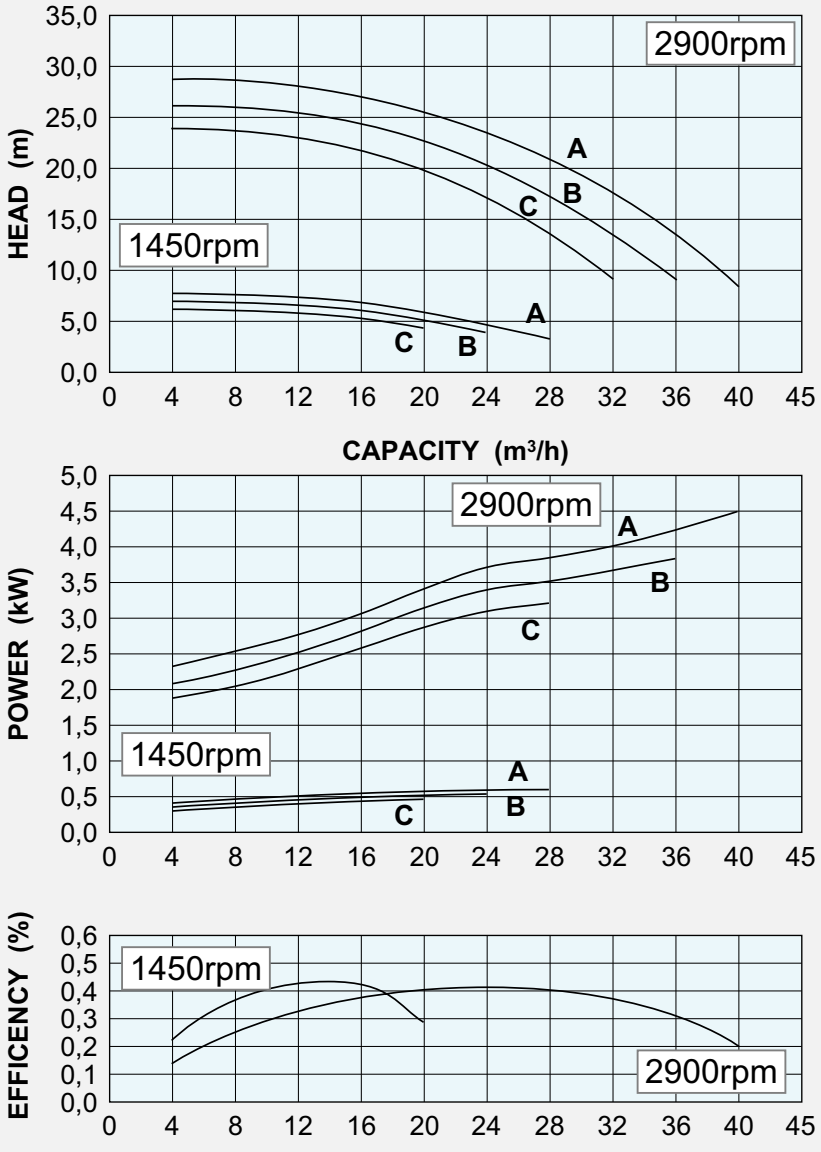

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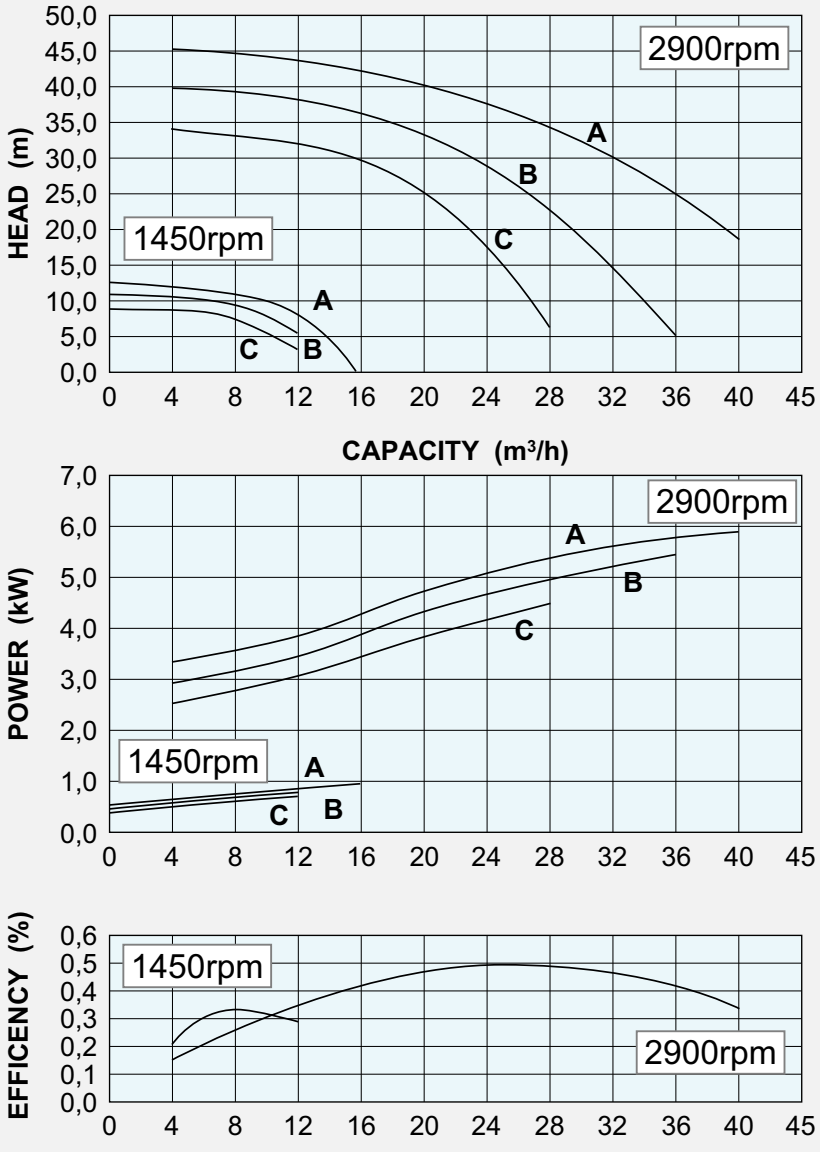

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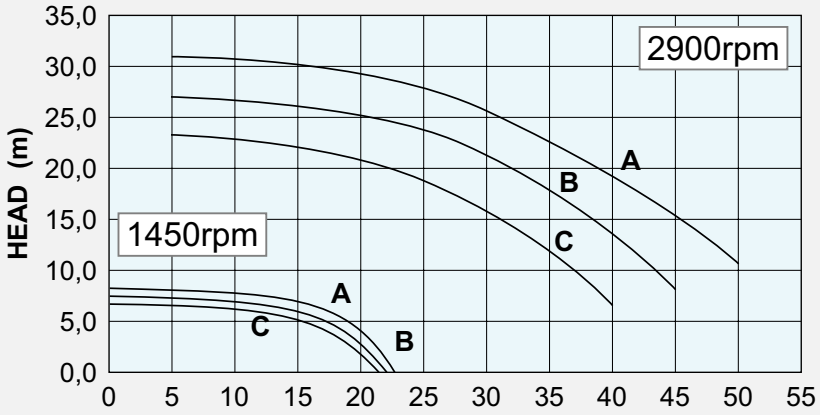

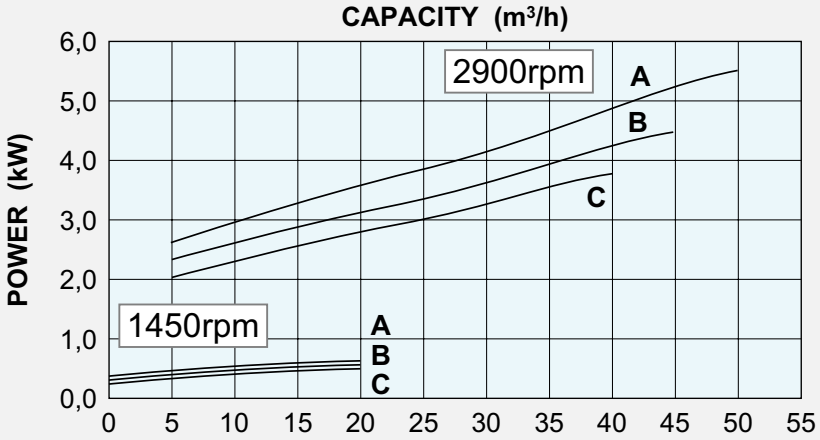

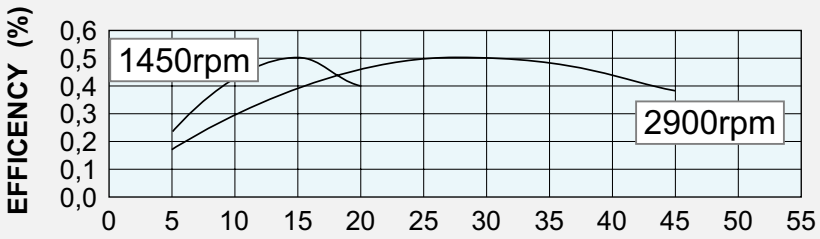

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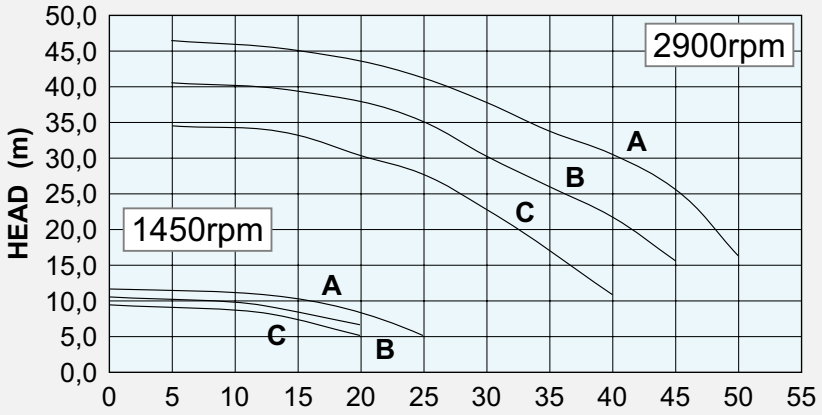

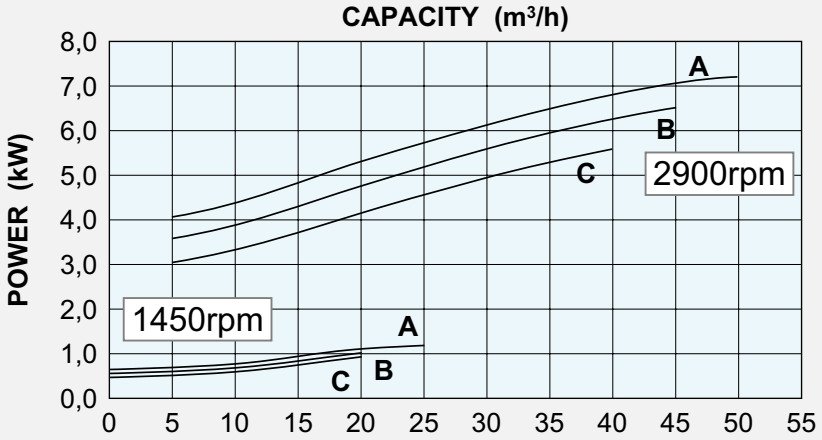

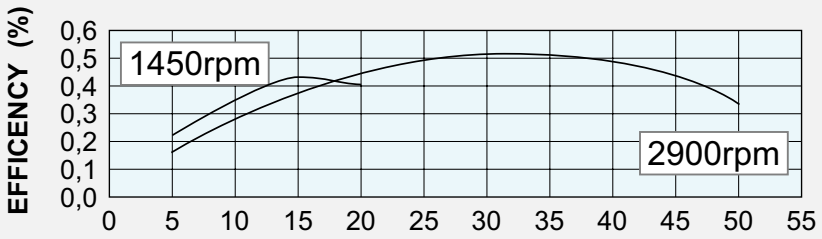

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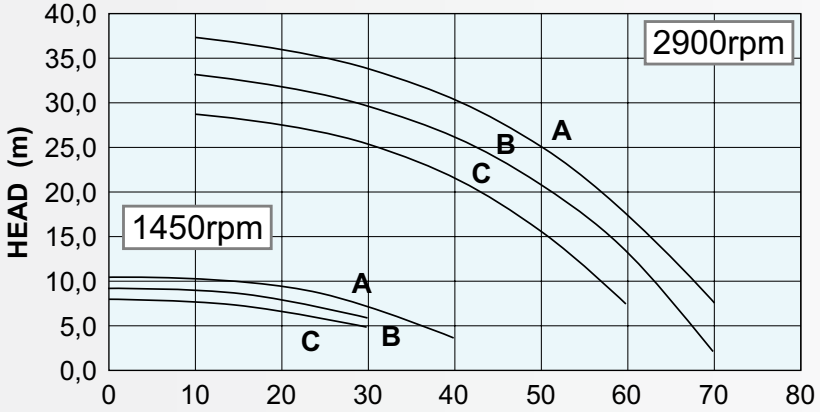
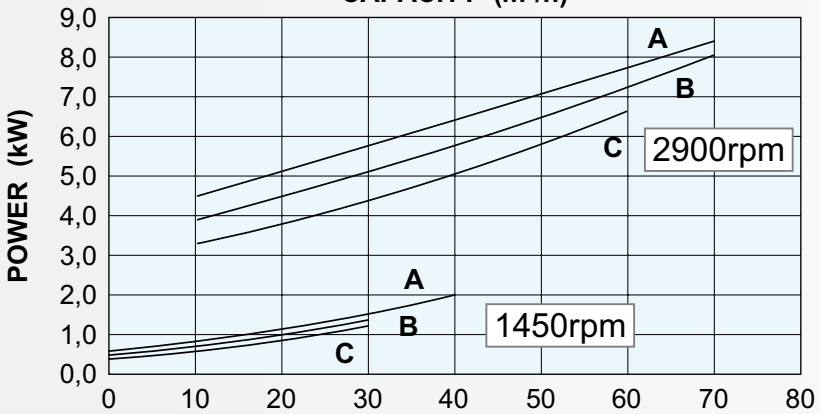
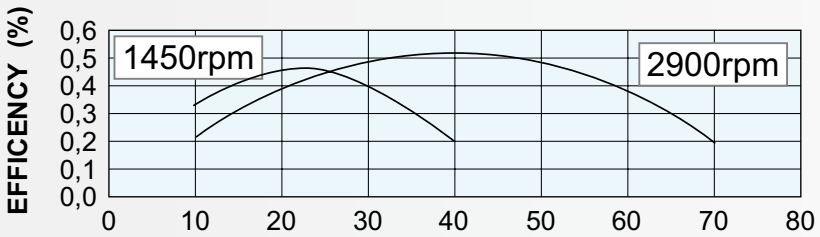


CAPACITY (m^3/h)





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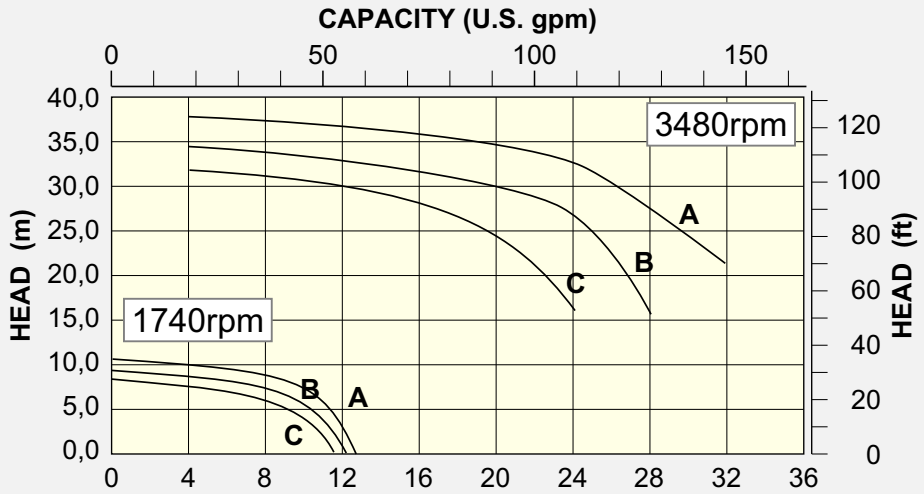

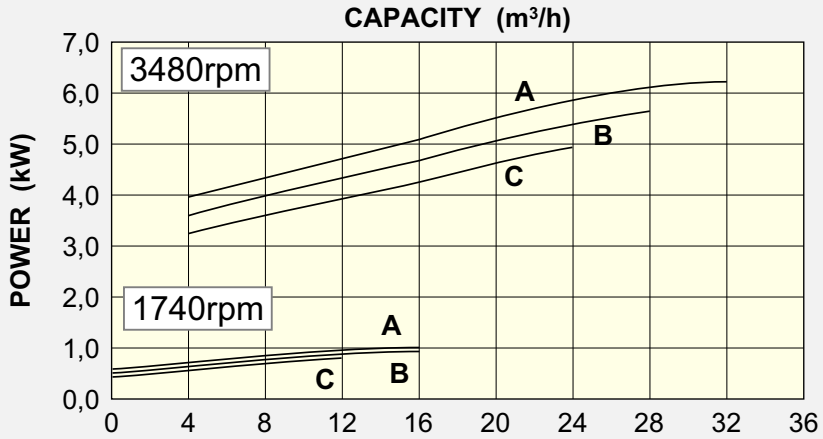

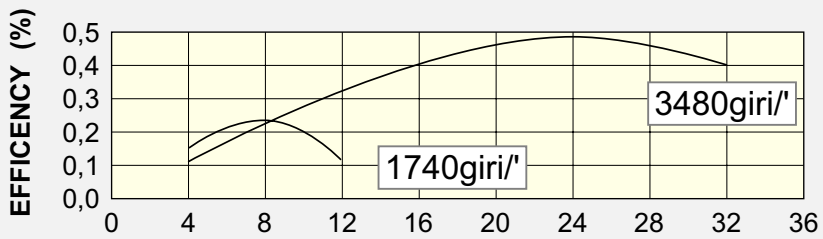

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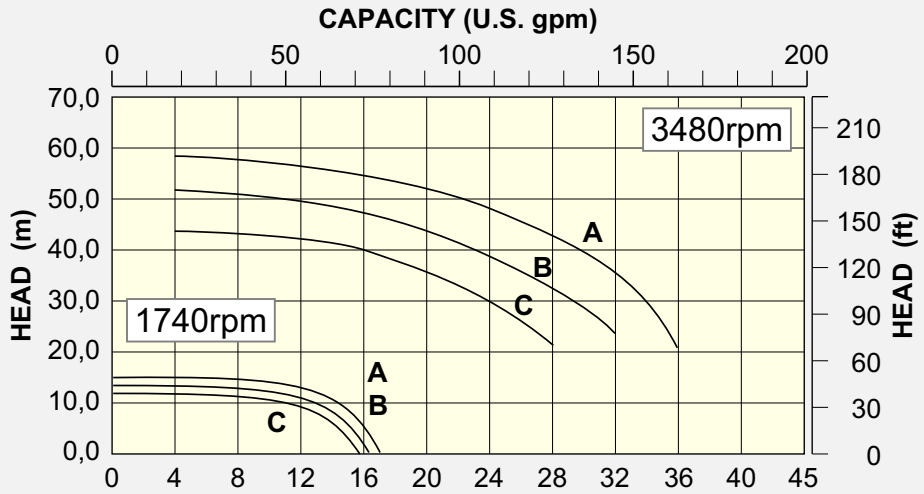

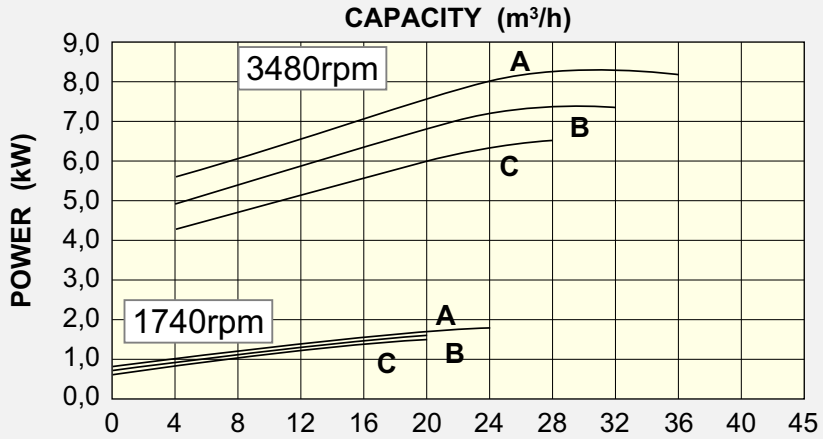

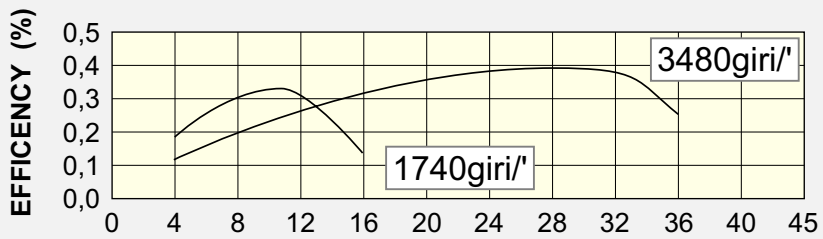

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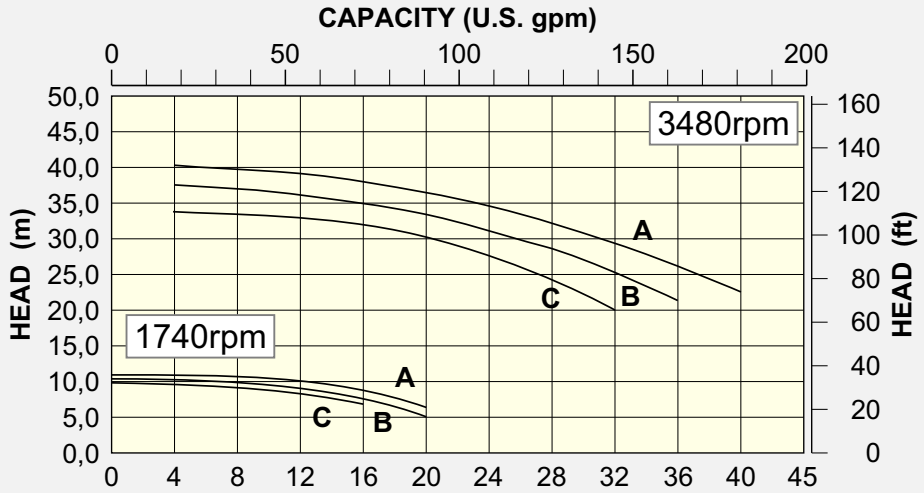

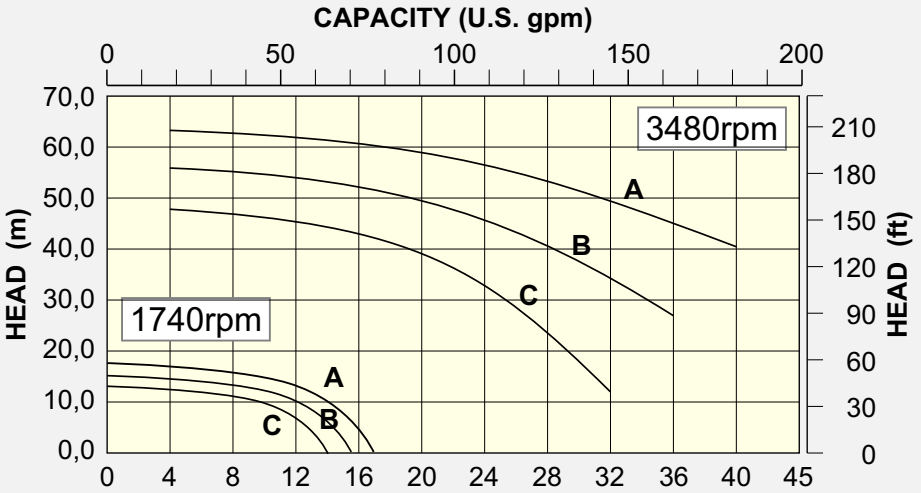

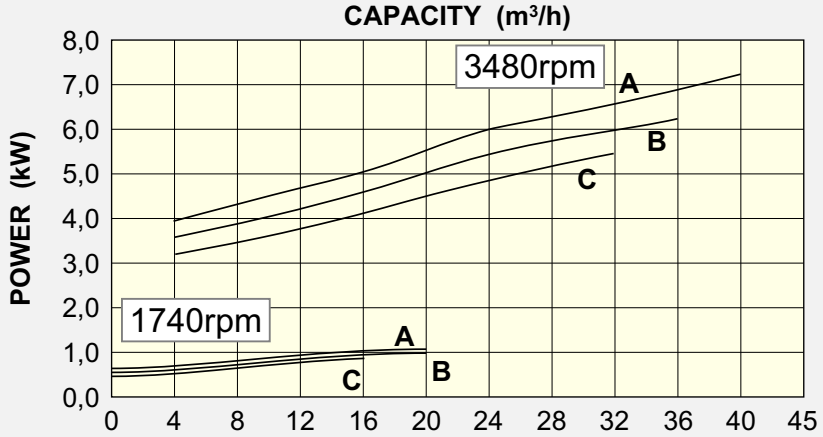

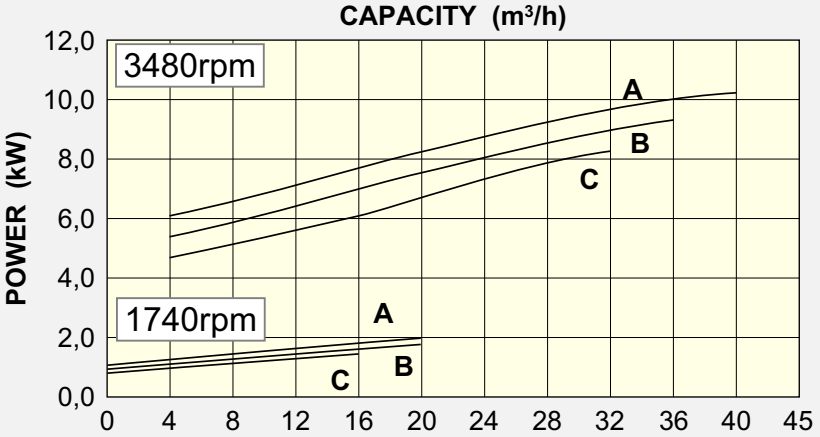

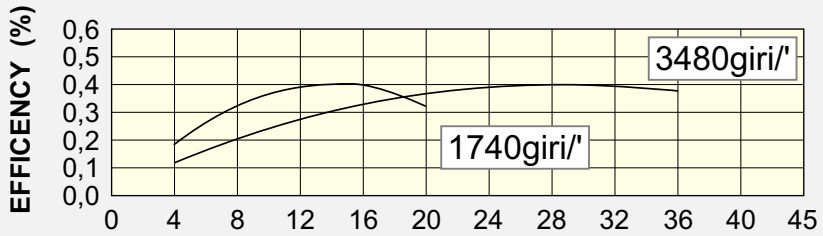

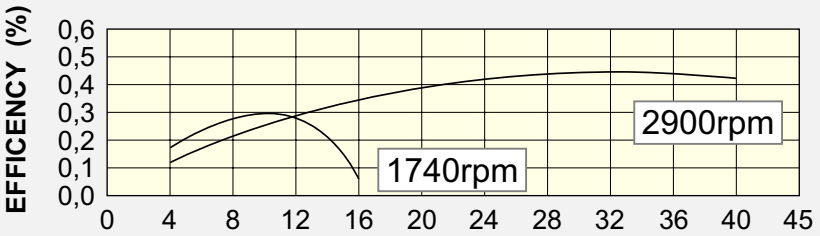

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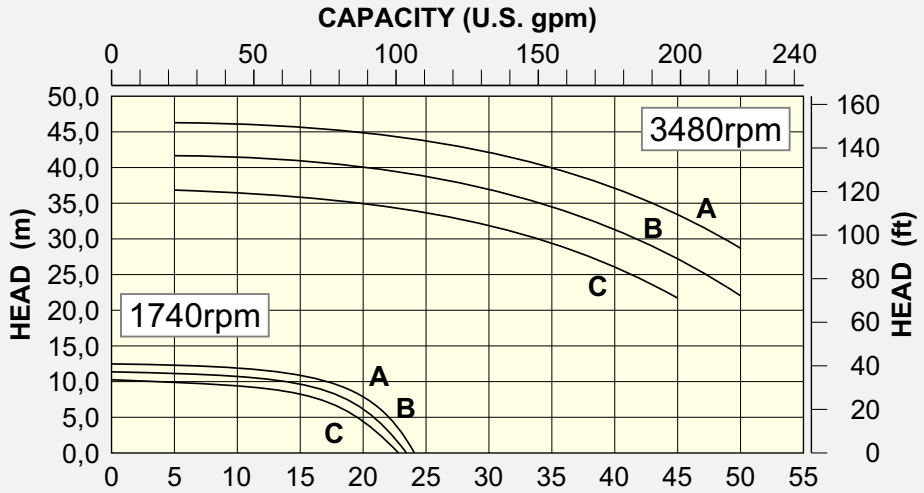

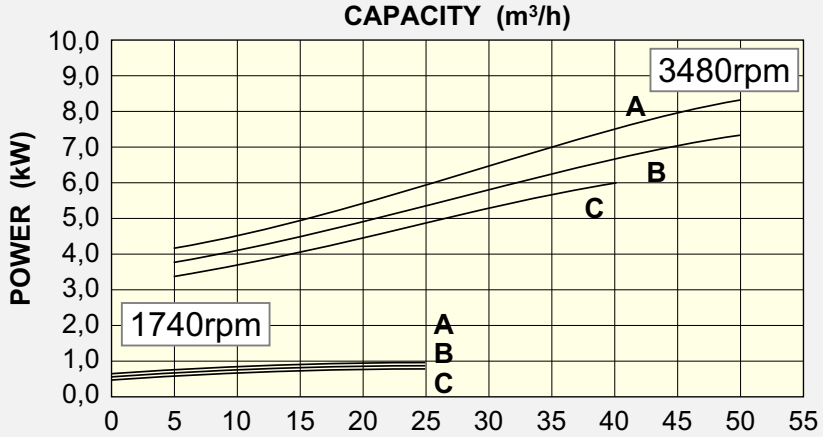

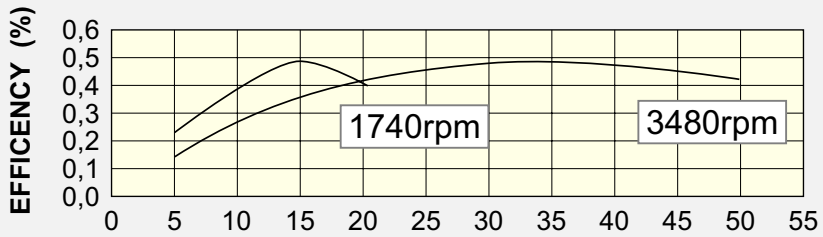

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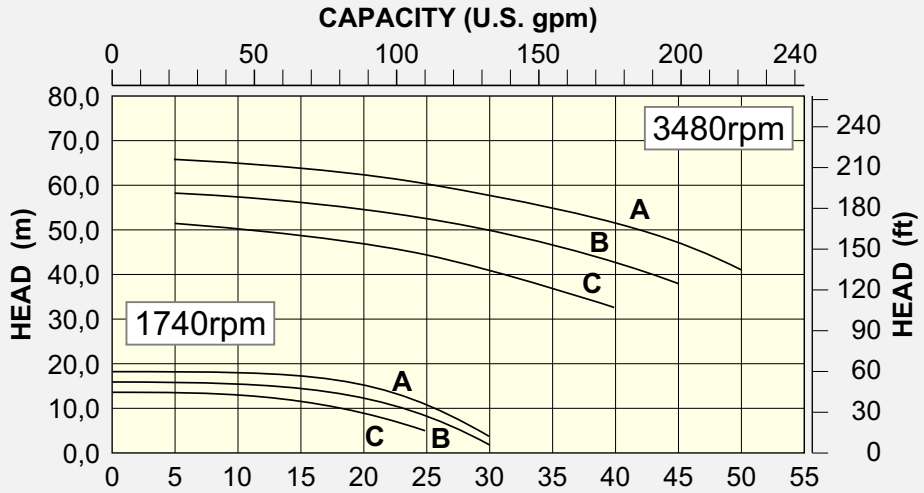

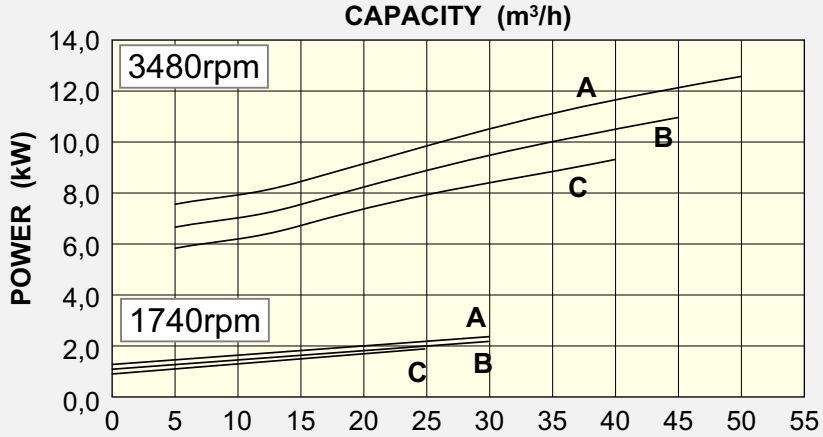

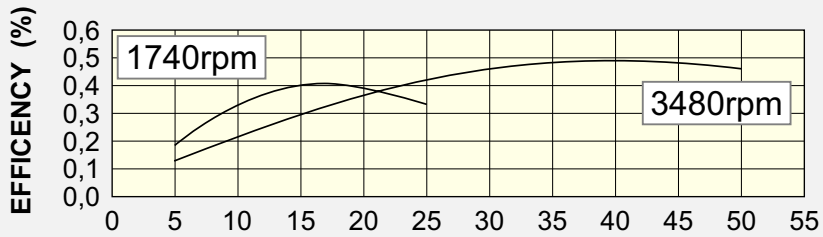

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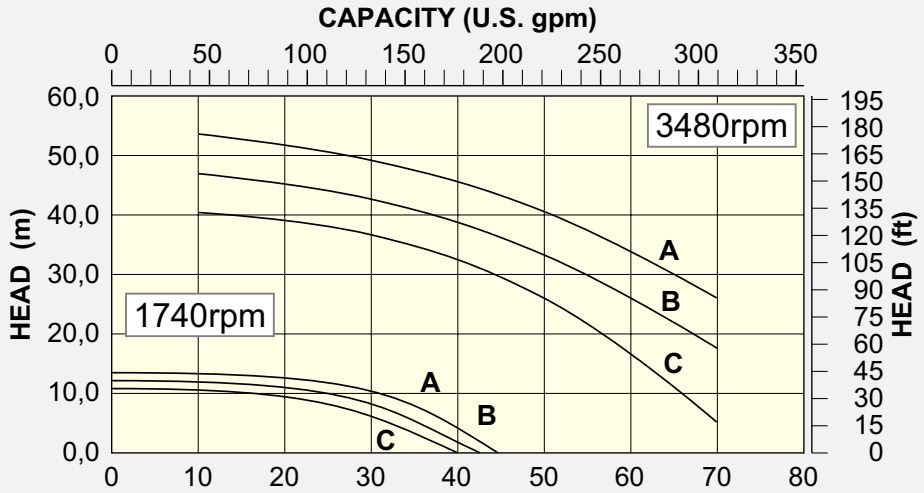
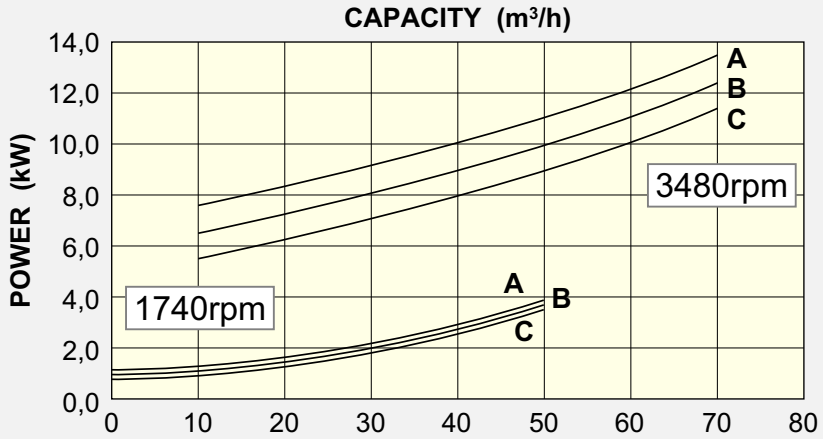
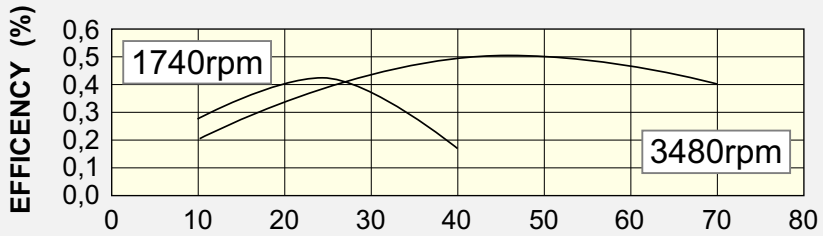
CURVES 60 HZ FOR FRONTIERA MODELS







50/125

Characteristics of IEC electric motors 2 poles

table 1

Model	Size	kW	Frame	Size	kW	Frame	Size	kW	Frame	Size	kW	Frame	Size	kW	Frame
25/130	100	3	B5	112	4	B5	132	5.5	B35	160	7.5	B35	160	11÷15	B35
25/160															
32/130	100	3	B5												
32/160															
40/130															
40/160															
50/125															

Characteristics of IEC electric motors 4 poles

table 2

Model	Size	kW	Frame	Size	kW	Frame	Size	kW	Frame	Size	kW	Frame	Size	kW	Frame
25/130	80	0.55	B5	80	0.75	B5	90	1.1÷1.5	B5	100	2.2÷3	B5			
25/160															
32/130	80	0.55	B5												
32/160															
40/130															
40/160															
50/125															

For TGF and ZGF (long-coupled) the motor frame is B3

Motor protection system typology:

• **N** Motor standard voltage (400÷5%) • **S** Motor special voltage • **E** Motor explosion proof

Notes for specific curves:

Detailed curves for both 1450/1740 and 2900/3480 rpm give the performance curves for each available impeller diameter. These also give NPSHr, Efficency and absorbed motor power.

Liquid viscosities up to 30 cSt will not adversely affect pump performance. For hot liquids especially the NPSH (Net Positive Suction Head) must be considered. Suction pipework should be kept to a minimum, with as few bends/restrictions as possible. The suction pipe diameter should be at least that of the pump inlet, with the fluid velocity as low as is pratical (max 2.5 m/sec.). If you have any problems ARGAL Customer Services will be pleased to advise.

The curves performances are based on the following impeller diameter:

• **A** max. diameter

For reducer performances are available:

• **B** midd. diameter • **C** min. diameter

MAGNETICAL VERSION - MAIN COMPONENTS

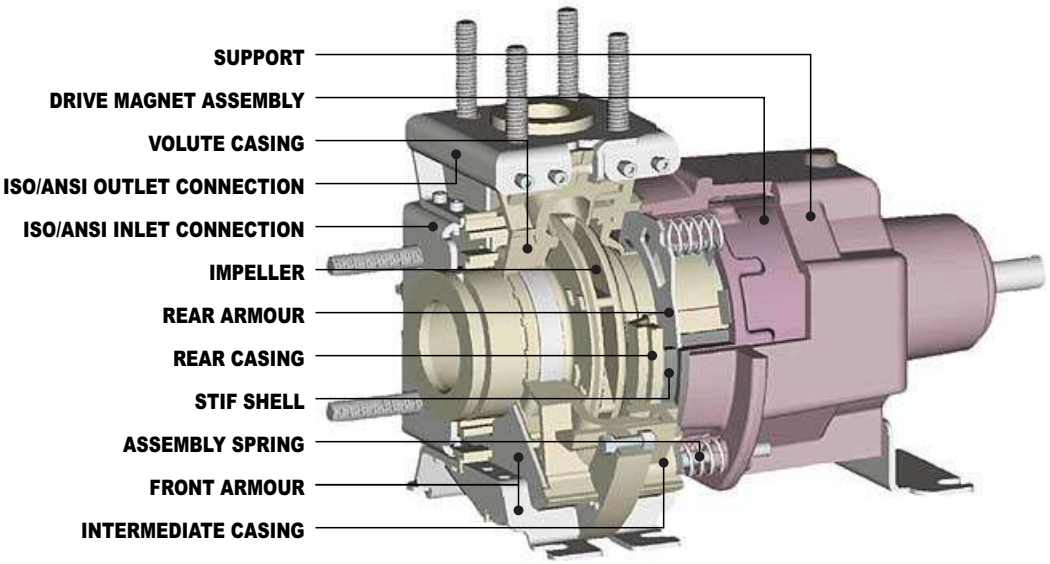


table 3

Pump model TGF

PARTS	STANDARD VERSIONS			SPECIAL VERSIONS	
	WW	**GF**	**WF**	**DF**	**ER**
VOLUTE CASING	PP	E-CTFE	PP	PVDF	PE HMW
IMPELLER	PP	E-CTFE	E-CTFE	PVDF	PE HMW
INTERMEDIATE CASING	PP	E-CTFE	PP	PVDF	PE HMW
SHAFT SLEEVE	POLY-ARYLAMIDE				
FIXED O-RINGS	FKM				
BEARING SUPPORT	CAST IRON				
FLEXIBLE COUPLING	STEEL				
PUMP ARMOUR	STAINLESS STEEL				
FLANGES	STAINLESS STEEL				
FEET	STAINLESS STEEL				
BASE	STAINLESS STEEL				
COUPLING-COVER	STAINLESS STEEL				

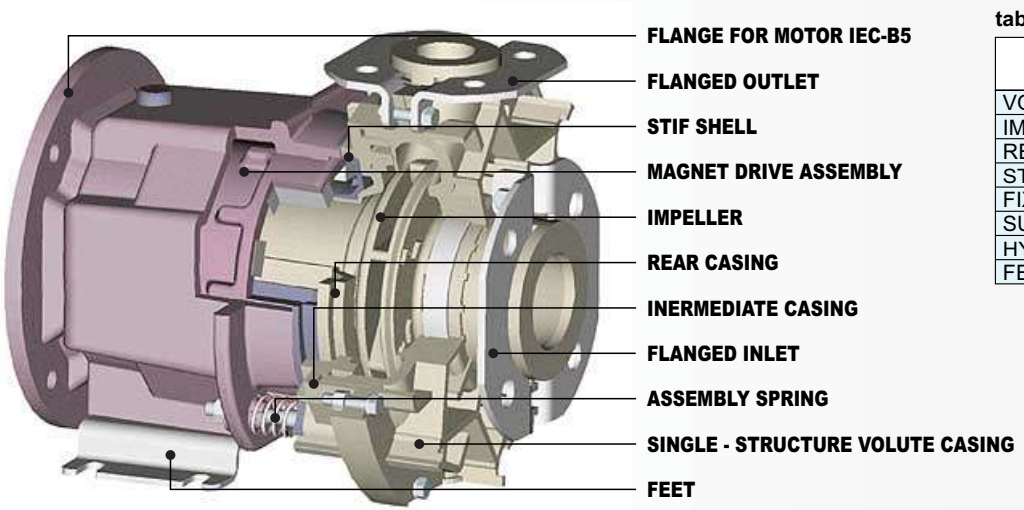


table 4

Pump model TMF

PARTS	STANDARD VERSIONS			SPECIAL VERSIONS	
	WW	**GF**	**WF**	**DF**	**ER**
VOLUTE CASING	PP	E-CTFE	PP	PVDF	PE HMW
IMPELLER	PP	E-CTFE	E-CTFE	PVDF	PE HMW
REAR CASING	PP	E-CTFE	E-CTFE	PVDF	PE HMW
STIF SHELL	POLY-ARYLAMIDE				
FIXED O-RINGS	FKM				
SUPPORT	CAST IRON				
HYDRAULIC CONNECTION	STAINLESS STEEL				
FEET	STAINLESS STEEL				

MECHANICAL VERSION - MAIN COMPONENTS

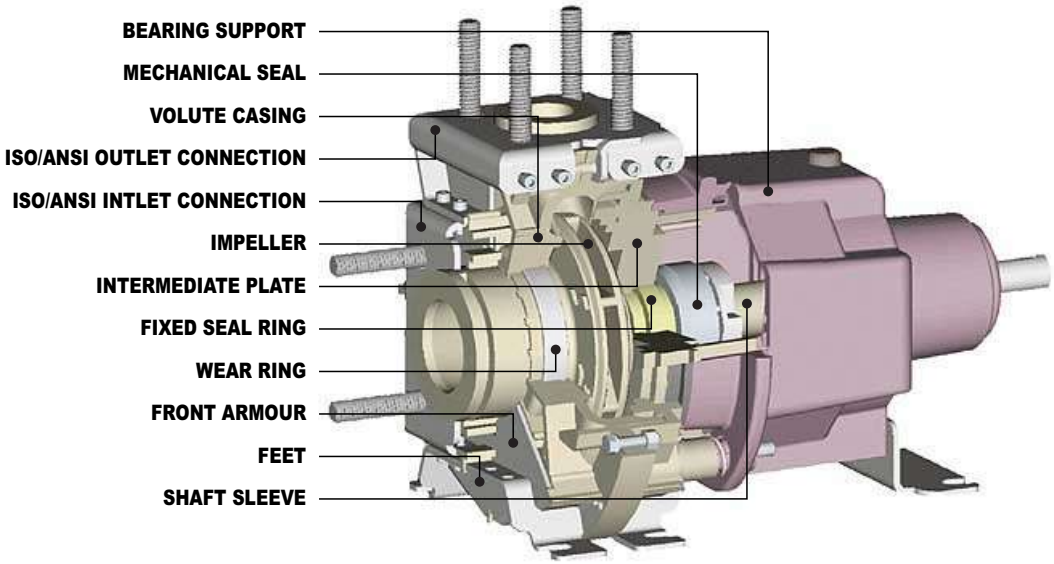


table 5

Pump model ZGF

PARTS	STANDARD VERSIONS			SPECIAL VERSIONS	
	WW	**GF**	**WF**	**DF**	**ER**
VOLUTE CASING	PP	E-CTFE	PP	PVDF	PE HMW
IMPELLER	PP	E-CTFE	E-CTFE	PVDF	PE HMW
INTERMEDIATE CASING	PP	E-CTFE	PP	PVDF	PE HMW
SHAFT SLEEVE	PP	E-CTFE	PP	PVDF	PE HMW
FIXED O-RINGS	FKM				
BEARING SUPPORT	CAST IRON				
FLEXIBLE COUPLING	STEEL				
PUMP ARMOUR	STAINLESS STEEL				
HYDRAULIC CONNECTION	STAINLESS STEEL				
FEET	STAINLESS STEEL				
BASE	STAINLESS STEEL				
COUPLING-COVER	STAINLESS STEEL				

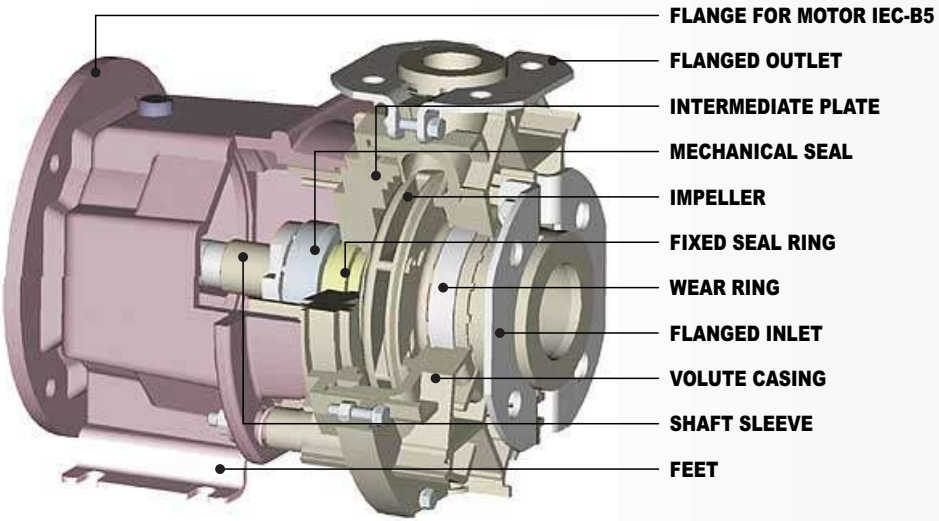


table 6

Pump model ZMF

PARTS	STANDARD VERSIONS			SPECIAL VERSIONS	
	WW	**GF**	**WF**	**DF**	**ER**
VOLUTE CASING	PP	E-CTFE	PP	PVDF	PE HMW
IMPELLER	PP	E-CTFE	E-CTFE	PVDF	PE HMW
INTERMEDIATE PLATE	PP	E-CTFE	PP	PVDF	PE HMW
SHAFT SLEEVE	PP	E-CTFE	PP	PVDF	PE HMW
FIXED O-RINGS	FKM				
SUPPORT	CAST IRON				
HYDRAULIC CONNECTION	STAINLESS STEEL				
FEET	STAINLESS STEEL				

table 7 **Standard versions** **Materials of the pumps**

WW	POLYPROPYLENE	U.V. stabilized Polypropylene.
GF	E-CTFE	Ethylene-Trifluorochloroethylene.
WF	PP / E-CTFE	Polypropylene (casing) /Ethylene-Trifluorochloroethylene (impeller).
		Special versions
DF	PVDF	Polyvinylidene Fluoride.
ER	POLYETHYLENE 500	Polyethylene high molecular weight.
		Static elastomers
V	FKM	Flourinated Elastomer (e.g.: Viton ®).
E	EPDM	Ethylene Propylene rubber.
K	FFKM	Perfluore Elastomer (e.g.: Karlez ®).

table 8 **Mechanical, thermal and chemical characteristics of the materials**

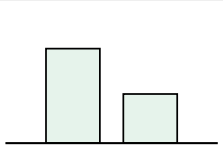
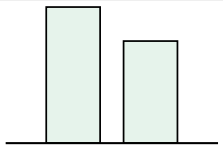
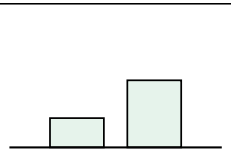
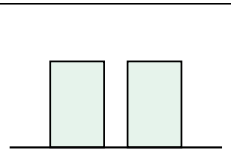
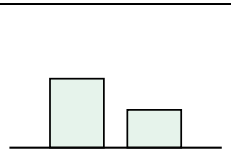
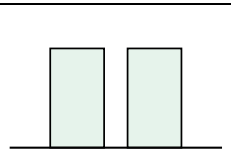
Material characteristics	**PP**	**E-CTFE**
Mechanical: Structural (traction) (flession) Superficial (hardness) (abrasion)		
Thermal: Low temperatures High temperatures		
Chemical: Inorganic compounds Organic compounds		

table 9 **Chemical resistance of materials**

ELEMENTS OF VALUTATION	VERSIONS			
	WW	**GF**	**V**	**K**
MEDIUMS CHEMICAL:				
Cold mineral acids	++	++	+	+
Hot mineral acids	0	++	-	+
Cold oxidizing acids	-	++	+	+
Hot oxidizing acids	-	++	0/-	+
Cold inorganic salts	++	++	+	+
Hot inorganic salts	+	++	+	+
Cold inorganic bases	++	++	-(*)	+
Hot inorganic bases	++	++	-(*)	+
Cold alogens	-	+	+	+
Hot alogens	-	+	-	+
Cold aliphatic solvents	+	+	+	+
Hot aliphatic solvents	-	0	0/-	+
Cold aromatic solvents	-	+	0/-	+
Hot aromatic solvents	-	0	-	+
Cold functional aromatic solvents	-	+	-	+
Hot functional aromatic solvents	-	0	-	+
Cold chlorinated solvents	-	+	-	+
Hot chlorinated solvents	-	0	-	+
Cold alcohols	++	++	-(*)	+
Hot alcohols	+	+	-(*)	+
Cold ethers	-	+	-	+
Hot ethers	-	+	-	+
Cold ketones	+	+		+
Hot ketones	0	0	-(*)	+
Cold amines	+	++	-(*)	+
Cold polymer solvents	++	0	+	+
Field of admitted temperatures °C	**0/+70**	**-30/+110**	(*) use E = EPDM	
Abrasion resistance Mohs index	1÷3	3÷5		

Legend: Excellent ++ Good + Moderate 0 Not resistant -

Other labels in this catalog:

CER Alumina ceramic 99,7% hight purity

CARBON H.D. Carbon hight density

SiC Silicon Carbide

PTFE Polytetrafluoroetylene

The pump structure

table 10

FEATURES OF COUPLING EVALUATION	LONG-COUPLED **G**	CLOSE-COUPLED **M**
Conformity ISO 2858	Complete*	Only for the flanged connections
Pump dimensions	According to ISO 2858	Less than about 60%
Facilities for automatic check control	• Vibrations • Temperature • Losses	• Losses • Wear
Maintenance	Planned services for mechanical stucture and spares	Planned services only for spares
Working conditions	10-24 hours at day	Until 16 hours at day
Investment	Superior	Reduced

* Partial for models 25-32/130 — 25/160 — 40/130

The need of external armour

table 11

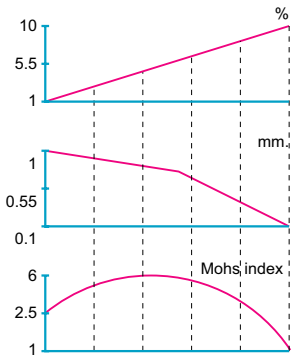
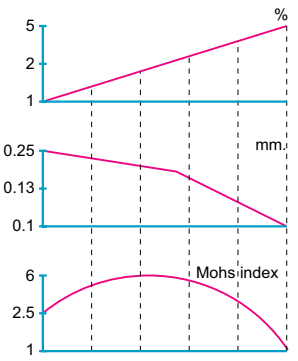
FEATURES OF EVALUATION	ARMOURED **R**	INTEGRAL **N**
PN (nominal pressure of the pump) (Ref. H_2O at 20°C)	12 bar	8 bar
Presence of water hammer and/or over pressure	Good resistance	Middle resistance
External mechanical stress (e.g. loads on the hydraulic connections, accidental impacts)	Excellent resistance	Good resistance
Heat insulation	Y6 version (on request)	Not available

Sequence of the values in the appliability scale

–	~	+	++
Not applicable	Unadvised	Applicable	Adequate

The rotation transmission model

table 12

FEATURES OF EVALUATION	MECHANICAL DRIVEN PUMPS **Z**	MAGNETICAL DRIVEN PUMPS **T**
Hermetic structure	By mechanical seal	Total
EXAMINATION OF SOLIDS IN SUSPENSION General characteristics (to correlate) • Quantity in weight % • Dimensions in mm. • Hardness in Mohs		
• Inclination to precipitate (crystallizzation, polymerization)	Applicable	Applicable if the general characteristics are close to the Minimum values
• Sensitivity to the magnetic field	Applicable	Not applicable
Wear parts numbers	2	4+5
Maintenance	Normal	Simple
Viscosity (over 30cSt it is necessary to adjust the impeller dimension and the driving torque)	<250 cSt	<150 cSt

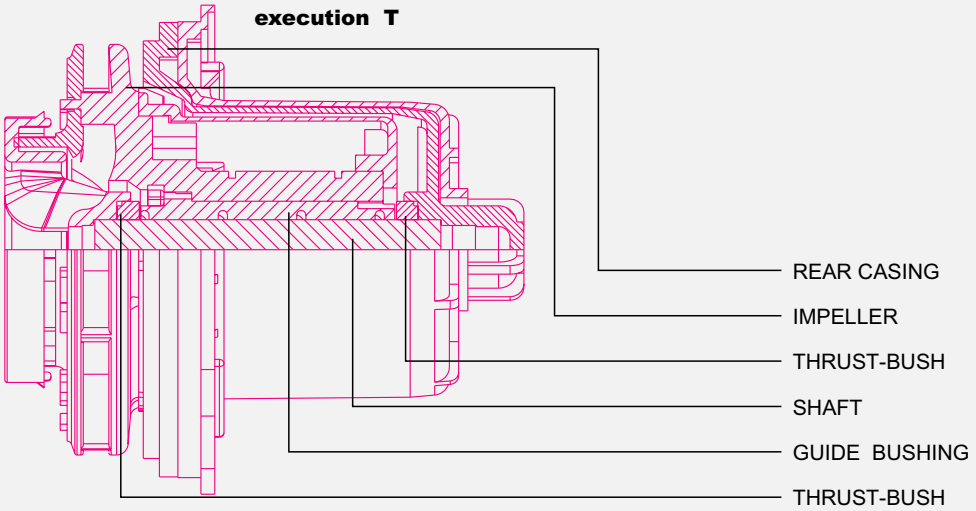
The configuration of the internal structure for magnetical pumps

table 13

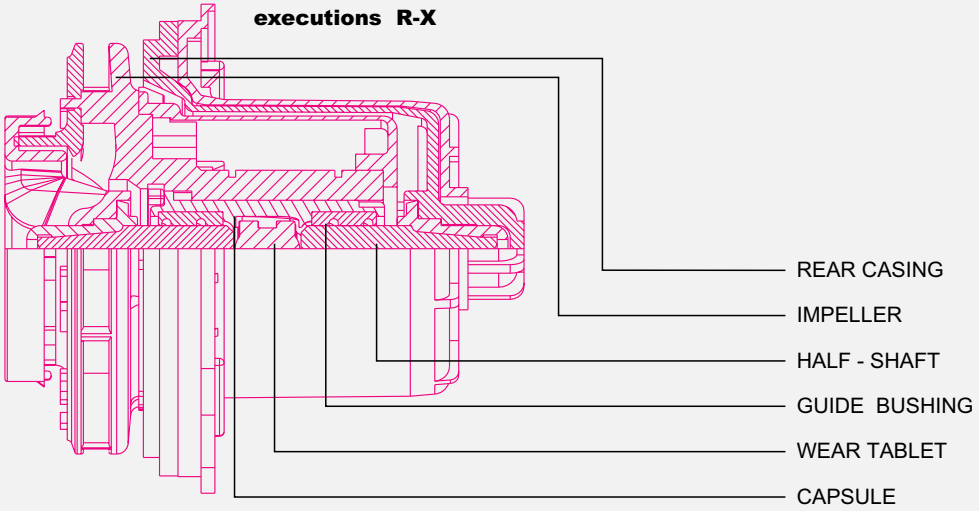
Used materials	T	R	X
Rotating part	CARBON H.D.	CARBON H.D.	SiC
Fixed part	CER	SiC	SiC

- **T** Standard working conditions
- **R** Critical working conditions
- **X** Extreme working conditions

execution T



executions R-X



Sequence of the values in the appliability scale

–	~	+	++
Not applicable	Unadvised	Applicable	Adequate

table 14

The internal structure

FEATURES OF EVALUATION	TYPE OF INTERNAL STRUCTURE		
	T	R	X
Concentrated acid compounds of flourine; strong concentrated hot alkali	Not applicable	Adequate	Applicable
Clean chemical mediums; hot/cold; concentrated/in solution	Adequate	Applicable	Applicable
Exam of suspended solids (to correlate):			
• Max. Quantity in weight %	3	5	5
• Max. Dimensions mm	0.5	0.5	0.5
• Max. Hardness index Mohs	2	2	6
Mediums which are inclined to produce gas when used	Not applicable	Adequate	Unadvised
Mediums with air in dispersion	Unadvised	Adequate	Applicable

The mechanical seal

table 15

CONDITION OF WORK	MODEL	TIPOLOGY	CODE
Standard	**SF 1**	single external, ptfe bellows	**10**
Standard	**TS 5**	single external, elastomer bellows	**50**
Extreme	**SF 2**	single external, ptfe bellows	**20**
Extreme	**BF 3**	single internal, OR-ring	**30**
Critical	**M.SF A**	Double flushed, ptfe bellows	**A0**
Critical	**M.TS C**	Double flushed, elastomer bellows	**C0**
Hard	**M.SF B**	Double flushed, ptfe bellows	**B0**
Hard	**M.TS D**	Double flushed, elastomer bellows	**D0**

table 16

EXECUTIONS	SF1	TS5	SF2	BF3	M.SF A	M.TS C	M.SF B	M.TS D
Rotating part	PTFE+V	CARB	SiC	SiC	PTFE+V	CARB	SiC	SiC
Fixed ring	CER	CER	SiC	SiC	CER	CER	SiC	CER
Bellows or OR *	PTFE	FKM	PTFE	FKM	PTFE	FKM	PTFE	FKM
2^ rotating part	-	-	-	-	CARB	CARB	CARB	CARB
2^ fixed ring	-	-	-	-	CER	CER	CER	CER

* Elastomer in EPDM is used when necessary

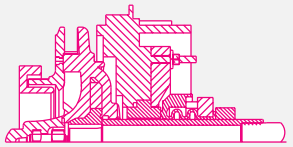
table 17

EVALUATION FEATURES	SF1 - TS5	SF2 - BF3	M.SE A - M.TS C	M.SE B - M.TS D
Concentrated acid compunds of flourine; strong concentrated hot alkali	Not Applicable	Applicable	Not Applicable	Applicable The M.SE B only
Clean chimical mediums; hot/cold; concentrated/in solution	Adequate	Applicable	Applicable	Applicable
Mediums which are inclined to produce gas when are used	Adequate the SF1	Applicable the SF2	Applicable	Applicable
Exam of suspended solids (to correlate):				
• Max. Quantity in weight %	1÷3	1÷3 (a) -1÷5 (b)	1÷11	1÷5 (a) - 1÷10 (b)
• Max. Dimensions mm	0.1÷0.6	0.1÷0.6 (a) - 1÷2 (b)	0.1÷0.8	0.1÷0.7 (a) - 0.1÷0.5 (b)
• Max. Hardness index Mohs	1÷2		1÷2	3÷6
Mediums which are inclined to precipitate	Not Applicable	Applicable the BF3 only *	Adequate	Adequate

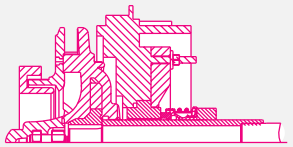
* With external flushing
IMPORTANT: See our chemical resistance tables and mechanical seal applications.

Sequence of the values in the appliability scale

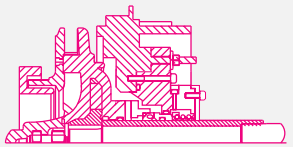
–	~	+	++
Not applicable	Unadvised	Applicable	Adequate



SF 1



TS 5



BF 3

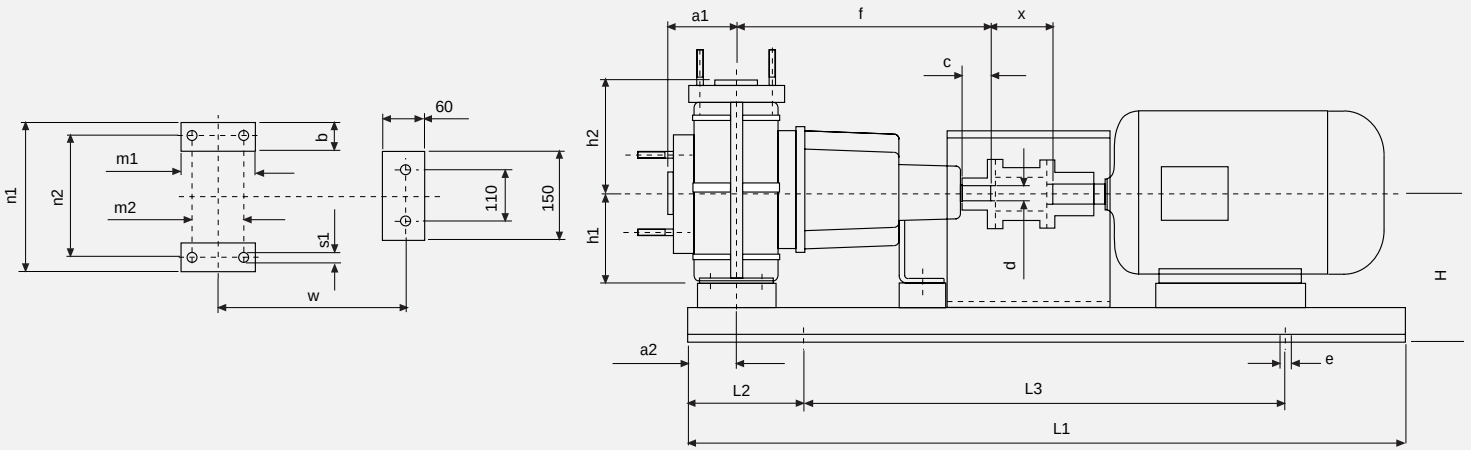
DIMENSIONS

PUMPS DIMENSIONS - ZGF / TGF (long-coupled versions)

table 18

TGF - ZGF		Flanged connection ISO 2084 PN16~ANSI B 16.5								Dimensions																Base ref.
		Outlet				Inlet				Pump				Shaft			Assembly	Fixing								
Pump model	Motor size	ND	k	l	z	ND	k	l	z	a1	f	h1	h2	d	c	x	a2	H	m2	n2	m1	n1	b	s1	w	No
25/130 25/160	80	32	100 ~ 89	M16 ~ 5/8	4	50	125 ~ 121	M16 ~ 3/4	4	80	385	132	160	24	50	100	60	237	70	190	100	240	50	14	285	N2
	90S																									
	90L																									N3
	100																									
	112																									
	132																									N4
32/130 32/160	80	32	100 ~ 89	M16 ~ 5/8	4	50	125 ~ 121	M16 ~ 3/4	4	80	385	132	160	24	50	100	60	237	70	190	100	240	50	14	285	N2
	90S																									
	90L																									N3
	100																									
	112																									
	132																									N4
	160																	257								N5
40/130 40/160	80	40	110 ~ 98	M16 ~ 5/8	4	65	145 ~ 140	M16 ~ 3/4	4	80	385	132	160	24	50	100	60	237	70	190	100	240	50	14	285	N2
	90S																									
	90L																									N3
	100																									
	112																									
	132																									N4
	160																	257								N5
50/125	80	50	125 ~ 121	M16 ~ 3/4	4	80	160 ~ 152	M16 ~ 3/4	8 ~ 4	80	385	132	160	24	50	100	60	237	70	190	100	240	50	14	285	N2
	90S																									
	90L																									N3
	100																									
	112																									
	132																									N4
	160																	257								N5

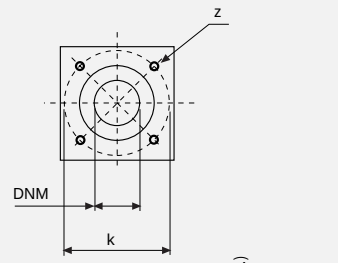
Connections k also available as JIS rules

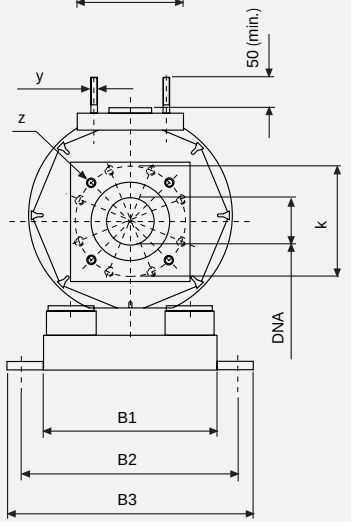


Bases dimensions

table 19

Base number	N2	N3	N4	N5
l1	800	900	1000	1120
b1, max	270	300	340	380
l2	130	150	170	190
l3	540	600	660	740
l4	35	35	40	40
b2	360	390	450	490
b3	320	350	400	450
h3, max	125	125	125	140
d1	19	19	24	24





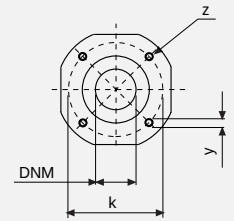
DIMENSIONS

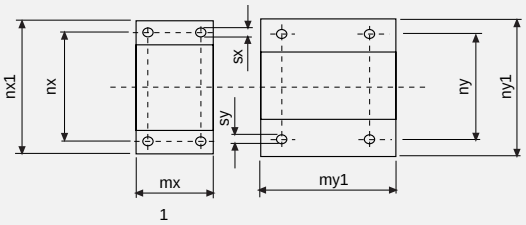
DIMENSIONS TABLE PUMPS TMF / ZMF (close-coupling models)

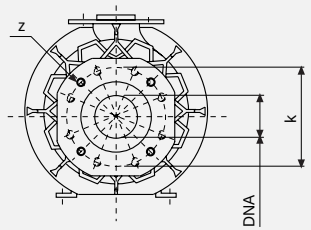
table 20

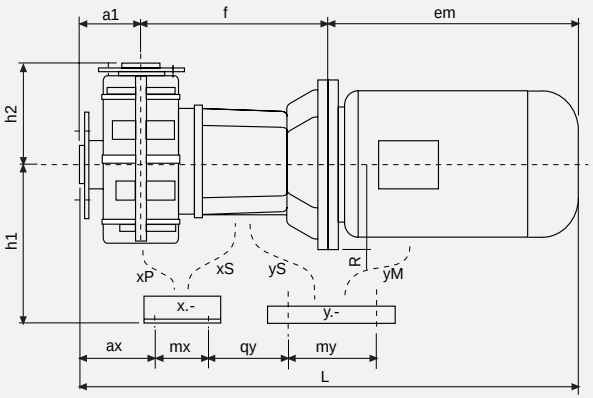
TMF - ZMF		Flanged connection ISO 2084 PN16~ANSI B 16.5								Pump and motor dimensions						Dimensions												Pos. fixing ref.
		Outlet				Inlet										Fixing x						Fixing y						
Pump model	Motor size	ND	k	y	z	ND	k	y	z	a1	f	h1	h2	em	L	ax	mx	nx	mx1	nx1	sx	qy	my	ny	my1	ny1	sy	
	80										265			236	581													xS
	90S-L													281	626													xS
N	100										275	132		314	669	120	80	170	130	200	14	/	/	/	/	/	/	xS
	112													323	678													xS
25/130	132	32	100 ~ 89	M16 ~ 5/8	4	50	125 ~ 121	M16 ~ 3/4	4	80	295		160	360	735							169	140	216	180	274	10	xS+yM
25/160	80										265			236	581													xP+yS
	90S-L													281	626													xP+yS
R	100										275	132		314	669	45	70	190	100	240	14	100	80	170	130	200	14	xP+yS
	112													323	678													xP+yS
	132										295			360	735							350	140	216	180	274	10	xP+yM
	80										265			236	581													xS
	90S-L													281	626													xS
N	100										275	132		314	669	215	80	170	130	200	14	/	/	/	/	/	/	xS
	112													323	678													xS
	132										295			360	735							169	140	216	180	274	10	xS+yM
32/130	160	32	100 ~ 89	M16 ~ 5/8	4	50	125 ~ 121	M16 ~ 3/4	4	80	325	160	160	495	900							218	210	254	256	300	14	xP+yM
32/160	80										265			236	581													xP+yS
	90S-L													281	626													xP+yS
R	100										275	132		314	669	45	70	190	100	240	14	100	80	170	130	200	14	xP+yS
	112													323	678													xP+yS
	132										295			360	735							169	140	216	180	274	10	xP+yM
	160										325	160		495	900			300		340		218	210	254	256	300	14	xP+yM
	80										265			236	581													xS
	90S-L													281	626													xS
N	100										275	132		314	669	215	80	170	130	200	14	/	/	/	/	/	/	xS
	112													323	678													xS
	132										295			360	735							169	140	216	180	274	10	xS+yM
40/130	160	40	110 ~ 98	M16 ~ 5/8	4	65	145 ~ 140	M16 ~ 3/4	4	80	325	160	160	495	900							218	210	254	256	300	14	xP+yM
40/160	80										265			236	581													xP+yS
	90S-L													281	626													xP+yS
R	100										275	132		314	669	45	70	190	100	240	14	100	80	170	130	200	14	xP+yS
	112													323	678													xP+yS
	132										295			360	735							350	140	216	180	274	10	xP+yM
	160										325	160		495	900			300		340		398	210	254	256	300	14	xP+yM
	80										265			236	601													xS
	90S-L													281	646													xS
N	100										275	132		314	689	235	80	170	130	200	14	/	/	/	/	/	/	xS
	112													323	698													xS
	132										295			360	755							169	140	216	180	274	10	xS+yM
	160										325	160		495	920							218	210	254	256	300	14	xP+yM
50/125	80	50	125 ~ 121	M16 ~ 3/4	4	80	160 ~ 152	M16 ~ 3/4	8	100	265		160	236	601													xP+yS
	90S-L													281	646													xP+yS
R	100										275	132		314	689	65	70	190	100	240	14	100	80	170	130	200	14	xP+yS
	112													323	698													xP+yS
	132										295			360	755							350	140	216	180	274	10	xP+yM
	160										325	160		495	920			300		340		398	210	254	256	300	14	xP+yM

Connections **k** also available as JIS rules









ACCESSORIES

By request the pumps are available with the following accessories:

- **Y1** drain plug: ..... all the models:
- **Y2** Bearing temperature check control: ..... only for long-coupled pumps (G);
- **Y3** Dry running protection: ..... all the models;
- **Y4** Vibrations check control: ..... all the models;
- **Y5** Support loses ceck control: ..... only for long-coupled pumps (G);
- **Y6** Pump body heat insulation with expanded polyuretanic: .... only for armoured pumps;

PUMP IDENTIFICATION LABEL

1° Example — **table 21**

T	G	F	32/160	A	R	WW	E	T	N3	2P	kW5.5	I	N	Y1
Ref: to the reader														
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16
Other possibilities:														
	M			B C	N	GF WF DF ER	V K	R X	N2 N4 N5	4P	kW 4÷15	A J	S E	Y2 Y3 Y4 Y5 Y6

2° Example — **table 22**

Z	M	F	32/160	A	N	WW	V	10	0	4P	kW1.1	I	E	00
Ref: to the reader														
1	2	3	4	5	6	7	8	10	11	12	13	14	15	16
Other possibilities:														
	G			B C	R	GF ER WF DF	E K	20 30 50 A0 B0 CO DO		2P	kW 0.75÷3	A J	N S	Y1 Y2 Y3

1	Rotation transmission model (magnetic or mechanic drive) see page 21
2	Pump structure (close-coupled or long-coupled) see page 21
3	Range Frontiera: production program family of ARGAL see pages 6 - 7 - 8 - 9
4	Pump model (according to the required perfrmances) from the diagram see page 4 - 5
5	Centrifugal impeller (as shown from the specific curves for each pump) see pages 10-11-12-13-14-15-16-17
6	Armoured or integral see page 21
7	Materials of volute casing see page 20
8	O-ring materials see page 20
9	Type of configuration of the internal structure of magnetic driven pumps see page 22
10	Type of mechanical seal see page 23
11	Base number for long-coupled pumps see page 24
12	Electric motor rotation speed see pages 10-11-12-13-14-15-16-17
13	Installed motor powers see pages 10-11-12-13-14-15-16-17-24-25
14	Flanged connections: ISO = I – ANSI 150 lb = A – JIS = J
15	Electric motor protection system typology see page 17
16	Accessories see pages 9 - 26

The production program of our plastic pumps
for chemical products includes also:

- Complete range mechanical driven
  ISO 2858 centrifugal pumps.
- Magnetic driven pumps.
- Close-coupled pump with mechanical seal.
- Self-priming pumps.
- Vertical axle pumps.
- Drum pumps.

ARGAL s.r.l.
CHEMICAL PUMPS

Member of AIB
associazione
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