

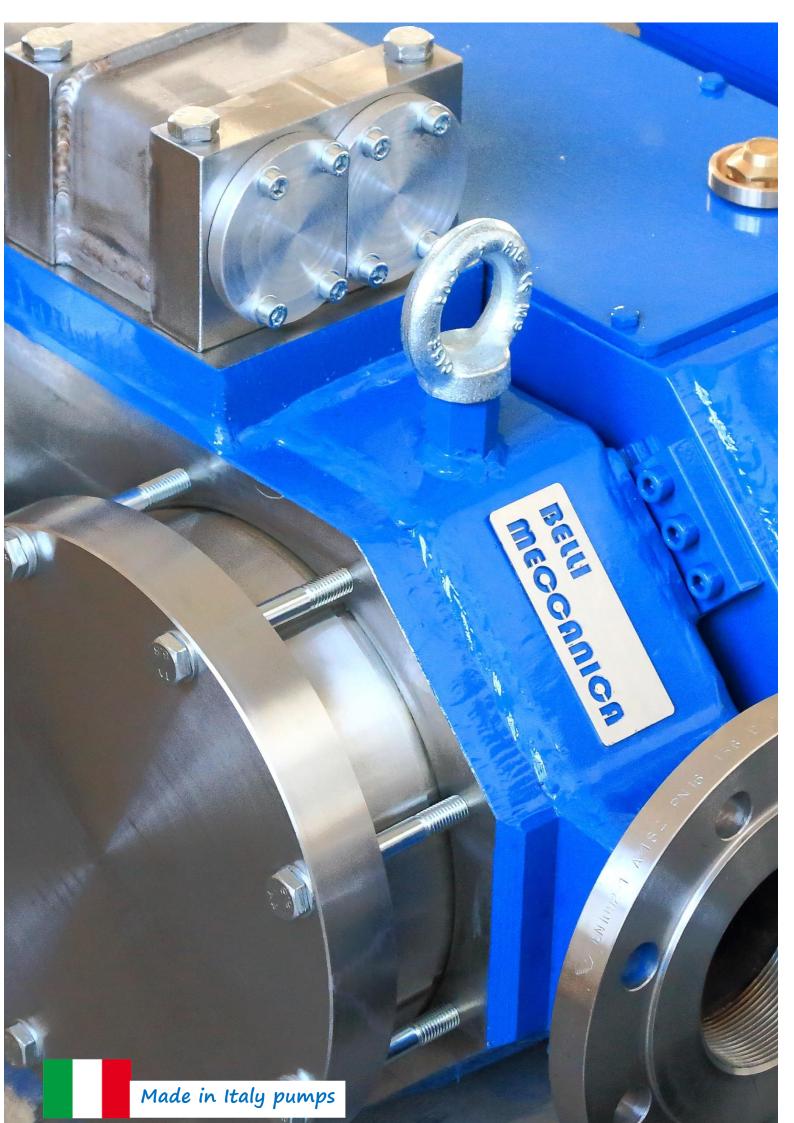
The only "full metal-positive displacement-solid handling-self priming-dry running-reversible" process pump available on market

#### **Belli Meccanica Firenze**

Via Bruno Storti, 1 – Sesto Fiorentino – Florence - Italy p.iva. 05993150480 Ph. +390553850774



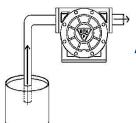




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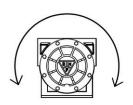
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### HOLLOW DISK PUMPS



# POSITIVE DISPLACEMENT -SELF PRIMING – HIGH SUCTION

Vacuum creation in suction side



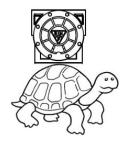
#### REVERSIBLE

Fully reversible with same features in the two senses of rotation



#### Elastic-soud parts handling

The hollow disk sliding piston system enables the passing through of considerable sized solid parts

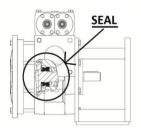


#### **LOW ROTATION SPEED - DRY RUNNING**

High reliability and performance with every fluid viscosity Dry running is allowed too

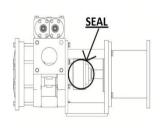


Atex zone 1 intrinsically safe certification



### TWO SEAL CONFIGURATIONS REAR EXTERNAL SEAL - INTERNAL SEAL

Internal seal version "C" Compact dimensions and lover cost



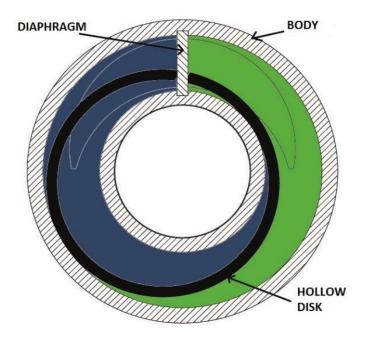
Rear external seal version Maximum reliability for process heavy duty applications Installation of every type of seal allowed (cartridge seal, double seal, pressurized Api plan seal with guench liquid)

#### SMART OPERATING PRINCIPLE

**The hollow disk oscillating piston** moves inside the pump body creating two different volumes, the suction volume and the discharge volume. The two volumes are separated by a diaphragm and the fluid passes through the openings of the pump body.

The hollow disk is pressed against the body walls by a spring allowing the working principle to be elastic and the solid bodies' transit is allowed too.

Belli Meccanica pumps can work with high viscosity liquids up to 500000 cSt





Thanks to the elastic device clearances due to abrasion wear are self-recovered and the hollow disk is pressed constantly in contact with the pump body The elastic device allows the passage of considerable sized solids particles without seriously damaging the rotating parts and without blocking the pump





## PERFORMANCES

	SINGLE B	ODY PUMPS	
SIZE	Ø PIPES	FLOW MAX	MOTOR POWER
M 40	1 <sup>1/4</sup> "-1 <sup>1/2</sup> "	5000 l/h	kW 1,1 – 1,5
M 60	2"- 2 <sup>1/2</sup> "	11000 l/h	kW 1,5 – 2,2
M 70	2 <sup>1/2</sup> "	20000 l/h	kW 2,2 – 3
M 85	3"	30000 l/h	kW 4 – 7,5
M 100	4"	48000 l/h	kW 7.5 - 11

	DOUBLE B	ODY PUMPS	
SIZE	Ø PIPES	FLOW MAX	MOTOR POWER
D 90	3"-4"	45000 l/h	kW 7.5 - 11
D 100	4"	70000 l/h	kW 15 - 18,5
D 140	5"	120000 l/h	kW 18,5 - 22

	TRIPLE B	ODY PUMPS	
SIZE	Ø PIPES	FLOW MAX	MOTOR POWER
T 110	4"-5"	65000 l/h	kW 15 – 18,5
Т 130	5"	100000 l/h	kW 18,5 – 22
T 160	6"	190000 l/h	kW 37 - 45
T 250	8"-10"	500000 l/h	kW 90

- -MAX OPERATING TEMPERATURE: 250°C
- -MAX LIQUID VISCOSITY: 500000 cSt
- -MAX DIFFERENTIAL PRESSURE:
  - 8 Bar(g) FOR STANDARD VERSION
- 12 Bar(g) FOR HIGH PRESSURE VERSION
- -MAX DRY SUCTION CAPABILITY: up to -0,9Bar(g) (9 meters water)
- -SPEED ROTATION RANGE: 100-350rpm
- -ATEX ZONE 1 CONFORMITY (Ex)

#### TYPES

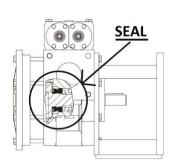
# Internal seal pumps "C" series



Single body pumps Sizes: M 40,60,70,85,100



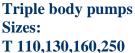
Double body pumps Sizes: D 90,100,140



Triple Sizes:

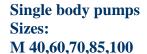
The seal is set inside pump's body near the bearings.

This arrangement makes the pump compact





## Rear external seal pumps "L" series

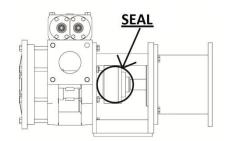




Double body pumps Sizes: D 90,100,140



Triple body pumps Sizes: T 110,130,160,250



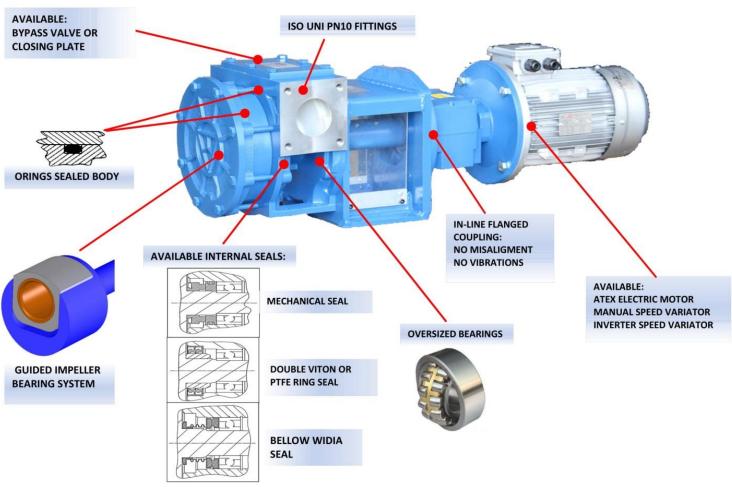
The seal is set inside the rear casing in a visible and reachable position. This arrangement makes the pump suitable for heavy applications and for continuous service.

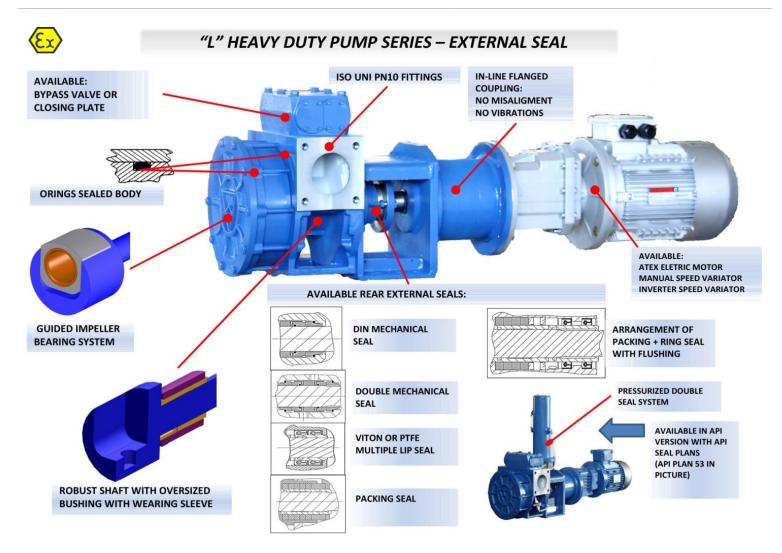
Tecnhical advantages:

- -Installation of every type of seal i.e. cartridge seals, double flushed seals, Api plan seals, or heated up seals. (see section "Seals")
- -Easy seal inspection and fast seal replacement without disconnecting the pump from the pipes reducing the downtime.
- -Seal leakages are visible and the pump can continue working also with broken seal.



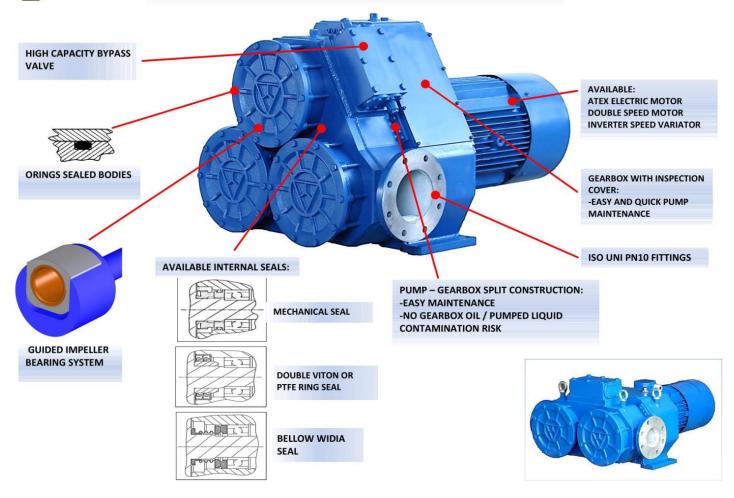
#### "C" PUMP SERIES - INTERNAL SEAL





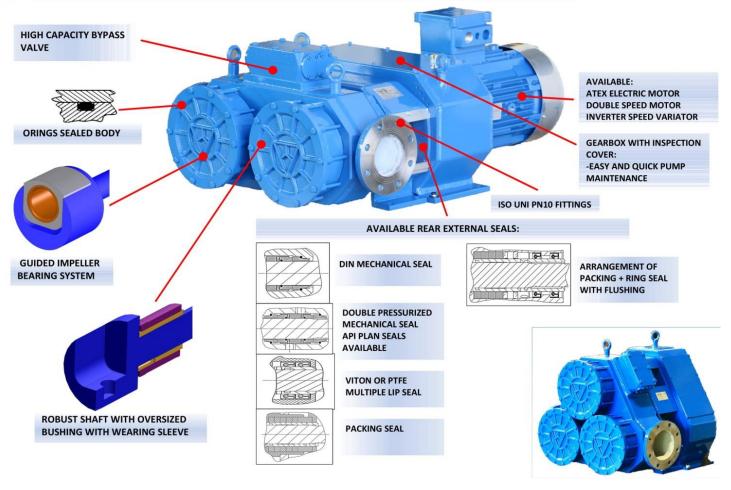


#### "C" TRIPLE AND DOUBLE BODY PUMPS SERIES-HIGH FLOWRATE



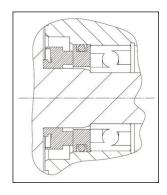


#### "L" TRIPLE AND DOUBLE BODY PUMPS SERIES— HEAVY DUTY PROCESS PUMPS - HIGH FLOWRATE

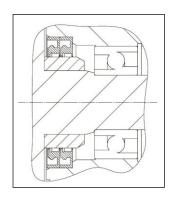


#### SEAL TYPES

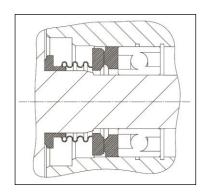
#### SEAL TYPES IN INTERNAL SEAL PUMP "C" SERIES







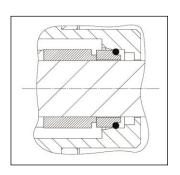
RING SEAL VITON OR TEFLON



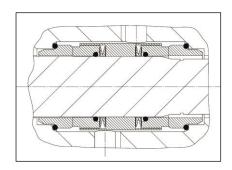
**BELLOW SEAL** 

#### SEAL TYPES IN REAR EXTERNAL SEAL PUMP "L" SERIES

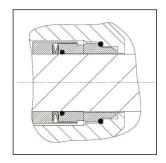
THE REAR SEAL POSITION ALLOWS THE INSTALLATION OF EVERY TYPE OF SEAL DOUBLE SEALS, SEALS WITH QUECH LIQUID, DOUBLE CARTRIDGE SEALS, API PLAN SEAL ARRANGEMENTS



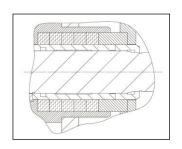
**MECHANICAL SEAL** 



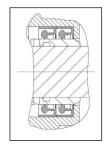
DOUBLE MECHANICAL FLUSHED SEAL



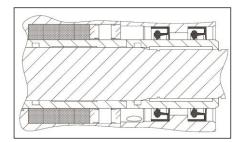
**DIN OR API SEALS** 



**PACKING SEAL** 



RING LIP SEAL



ARRANGEMENT OF PACKING/RING SEALS WITH FLUSHING

OUR TECHNICAL STAFF DEVELOPES CUSTOM SOLUTIONS FOR ANY TYPE OF APPLICATION ACCORDING TO CUSTOMER'S REQUIREMENTS

#### HOLLOW DISK MAGNETIC DRIVE PUMPS

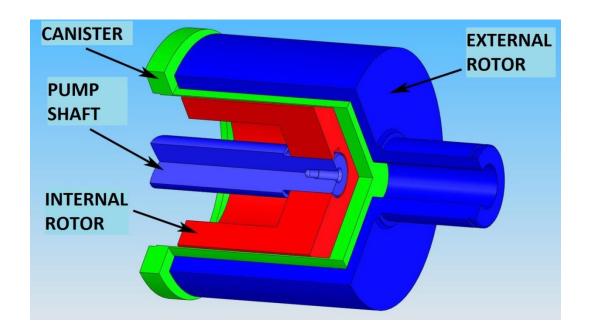
**Belli Meccanica hollow disk magnetic drive pumps** are designed and developed for ensuring the highest quality standards, and to provide excellent performance in every critical application

Belli Meccanica magnetic drive pumps have been developed as a stand-alone project, not just as a magnetic retrofit of existing pumps like many competitors do.

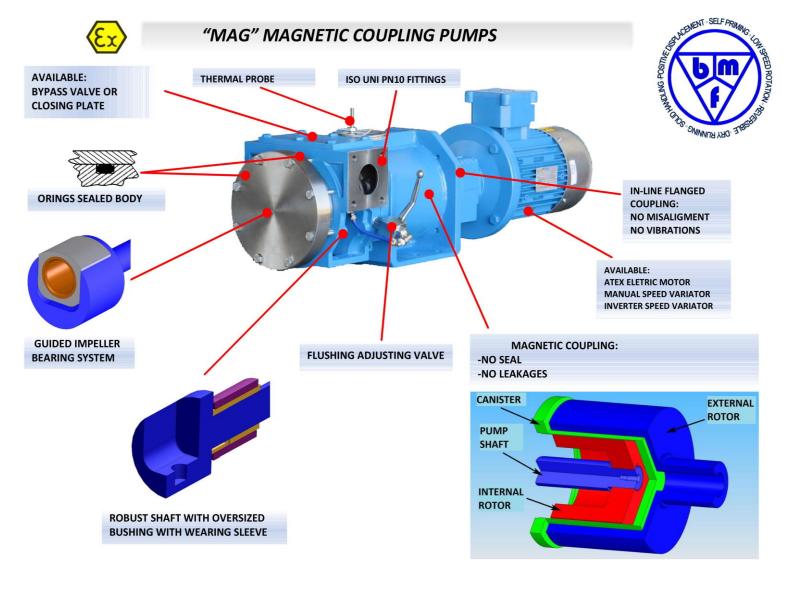
Magnetic rotors, canister and supports are designed by Belli Meccanica for a robust and compact design.

The magnetic drive transmits the motion to the pump shaft through the driving of powerful cobalt-samarium Sm-Co permanent magnets.

The torque transmission happens without any contact between any mechanical part and the external housing canister hermetically encapsulates the pumped fluid without using any type of seal and guarantees a completely leak-proof separation of product and atmosphere.







The magnetic coupling system it's the final solution for avoiding any possibility of leakage, a perfect solution for hazardous liquids and when normal types of seals are ineffective. Magnetic drive it's normally employed for acids, toxic substances, resins, isocyanates, paints.



Stainless steel magnetic pump with heating chamber

## MAGNETIC DRIVE PUMPS PERFORMANCES

MAC	MAG HOLLOW DISK MAGNETIC PUMPS												
SIZE	Ø PIPES	FLOW MAX	MOTOR POWER										
MAG 40	1 <sup>1/4</sup> "-1 <sup>1/2</sup> "	5000 l/h	kW 1,1 – 1,5										
MAG 60	2"- 2 <sup>1/2</sup> "	11000 l/h	kW 1,5 – 2,2										
MAG 70	2 <sup>1/2</sup> "	20000 l/h	kW 2,2 – 3										
MAG 85	3"	30000 l/h	kW 4 – 7,5										
MAG 100	4"	48000 l/h	kW 7.5 - 11										

- -MAX OPERATING TEMPERATURE: 250°C
- -MAX LIQUID VISCOSITY: 500000 cSt
- -MAX DIFFERENTIAL PRESSURE:
- 8 Bar(g) FOR STANDARD VERSION
- 12 Bar(g) FOR HIGH PRESSURE VERSION
- -MAX DRY SUCTION CAPABILITY: up to -0,9Bar(g) (9 meters water)
- -SPEED ROTATION RANGE: 100-350rpm
- -ATEX ZONE 1 CONFORMITY (Ex)

## HOLLOW DISK PUMPS MATERIALS RANGE

TYPE	IMPELLER / SHAFT	COVER / BODY	BASE	FIELD OF APPLICATION
1	CARBON STEEL	CAST IRON GJL250	CAST IRON GJL250	PETROLEUM PRODUCTS, HYDROCARBONS, CRUDE OIL, FUEL, GASOLINE, DIESEL, KEROSENE, BITUMEN, MINERAL OIL, LUBRICAT GREASE, PARAFFIN, BITUMEN, RFO HEAVY OIL VEGETAL OILS AND FATS: VEGETAL OILS, PALM OIL, ANIMAL FATS, MARGARINE, OLIVE OIL PAINTS, INKS, GLUES, ADHESIVES, RESINS, SOLVENTS, ISOCYANATE, POLYOL, EMULSIONS ANIMAL FATS, MOLASSES STARCH (GLUE) SLUDGE, WASTE SOLVENTS, WASTE OIL, WASTE HYDROCARBONS
2	STAINLESS STEEL	BRONZE B14	CAST IRON GJL250	AS ABOVE PLUS: BILGE WATER, AQUEOUS LIQUIDS, SOAPS
5	STAINLESS STEEL	STAINLESS STEEL	CAST IRON GJL250	AS ABOVE PLUS: LIGHT CORROSIVE LIQUIDS, AQUEOUS LIQUIDS AND EMULSIONS, WATER BASED PAINTS, SOAPS
7	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	AS ABOVE PLUS: ALIMENTARY OILS, CHOCOLATE, GLUCOSE AND ALIMENTARY PRODUCTS, CORROSIVE PRODUCTS

A wide range of materials is available.

The choice of the right materials for every application means reliability. We can provide special materials for every critical application.

▶ Thanks to an exclusive production process developed by Belli Meccanica, stainless steel impellers and bodies achieve very high core and surface hardness avoiding any risk of galling and ensuring high reliability.

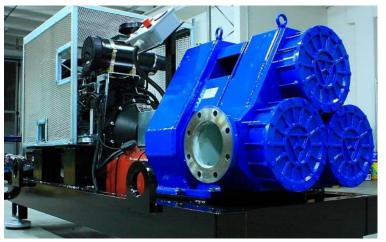




## SOME EXAMPLES OF OUR PRODUCTION



Double seal API pump



Diesel engine pump for refinery use – crude oil pumping 200m<sup>3</sup>/h



Pump with trolley, panel and speed variator



Pump equipped with API plan 32 for offshore application



Stainless steel double body pump with prefilter



Stainless steel pump with speed variator



Triple body process pump 200mc/h



Double body stainless steel pump 50mc/h

## SKIDS DESIGN AND PRODUCTION

We design and produce custom skids and pumps equipped with control panel, flowmeter, piping, trolley, valves and instrumentation, also in accordance with Atex zone 1 explosion proof standards.







#### **ACCESSORIES**



#### **BIDIRECTIONAL BYPASS PSV VALVE**

The bypass psv valve recirculates the pump flow in suction in case of accidental overpressure, avoiding damages to the pump. The bypass psv valve is available also with double oversized passage area for total flow recirculation and is installed on the pump



#### TROLLEY AND ELECTRIC PANEL

Every pump can be equipped with trolley, electric panel and plug, also according to Atex explosion proof zone 1 standards. Electric panels can be supplied with variable frequency drive VFD



#### **BASKET FILTERS**

Belli Meccanica pumps can tolerate small solid parts but for avoiding big solid parts (>6mm) entering the pump we design and produce basket prefilters to be installed in suction side.

Basket prefilters are also available in stainless steel material



#### **HEATING CHAMBER**

In case of installations that require an heating up of the fluid, we can supply pumps equipped with heating chambers installed on the pump body and on the seal casing. Heating chambers are usually connected to hot oil or hot water/steam pipeline.

Bitumen, asphalt, heavy RFO, fats, palm oil, are the typical applications.

### MORE THAN 30 YEARS OF EXPERIENCE

Our company makes advanced high quality products and our pumps are the result of a thirty-year experience in the pumps field



In 1987 Belli Meccanica Firenze company obtained the patent for industrial invention for the **Triple Body Hollow Disk Pumps** 



In **2014** Belli Meccanica Firenze obtained another patent for the special **Split-Body design** of double and triple sliding piston pumps





Roma, 23/09/2014

IL DIRIGENTE Dr.ssa Loredana Guglielmetti

## BELLI MECCANICA PUMPS COMPARED

		Ma	in average fea	tures of differe	nt types of pun	nps	
Type of pump	Positive displacement	Suction capability (dry)	Reversible	Solid parts handling	Rotation speed	Dry running allowed	Full metal contruction
BMF SLIDING PISTON	YES	VERY HIGH	YES	YES	Low	Yes	Yes
GEAR	YES	MEDIUM	YES	NO	Medium-high	Yes	Yes
LOBE	YES	MEDIUM	YES	NO	Medium	Yes	Yes
SCREW	YES	MEDIUM-HIGH	NO	NO	Medium	No	Yes
SLIDING VANE	YES	MEDIUM	YES	NO (VERY SMALL)	High	Yes (small time)	Yes
PROGRESSIVE CAVITY	YES	MEDIUM	NO	YES	Low	No	No (rubber)

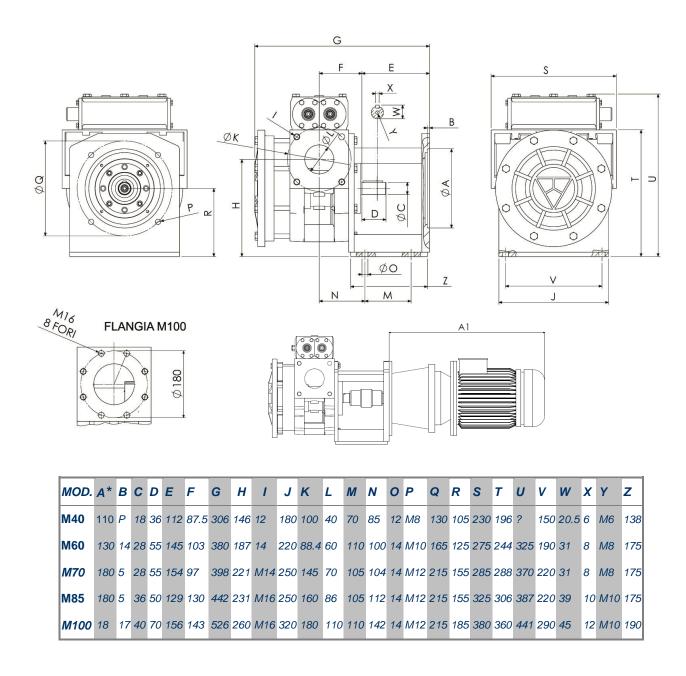
We can say that Belli Meccanica hollow disk sliding piston pumps are the only process full steel pumps with six important features

#### Positive displacement-Self priming-Low speed rotation-Reversible-Dry running-Solid handling



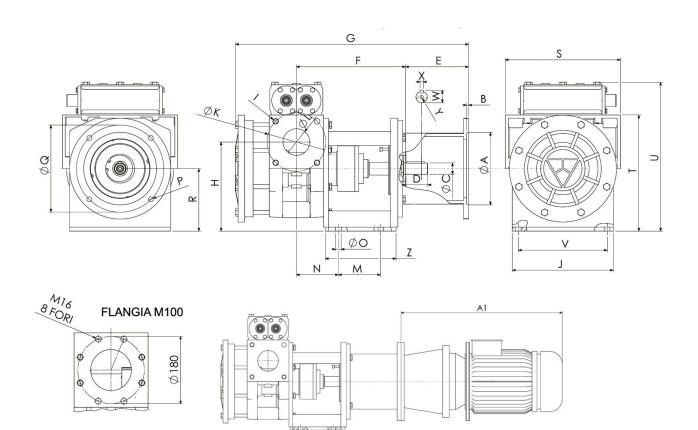
## OVERALL DIMENSIONS

# **SINGLE BODY PUMPS "C" SERIES**With rear support and motor



MOTOR GEARBOX MODEL	A1
HP 1 + RIDUTTORE (M35)	388
HP 2 + RIDUTTORE (M60)	408
HP 3 + RIDUTTORE (M70)	470
HP 5,5 + RIDUTTORE (M85)	528
HP 7.5 + RIDUTTORE (M100)	625

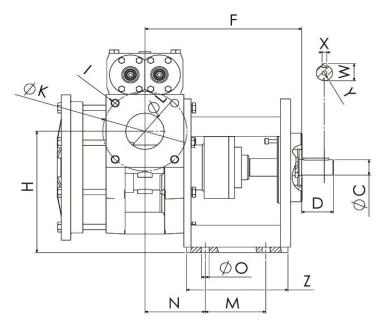
# SINGLE BODY PUMPS WITH REAR EXTERNAL SEAL "L" SERIES With rear support and motor



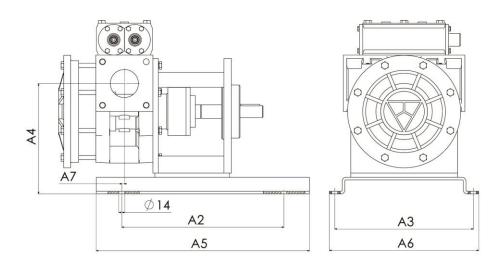
MOD.	<b>A</b> *	В	C	D	E	F	G	Н	1	J	K	L	M	N	0	P	Q	R	S	<b>T</b>	U	V	W	X	X	Z
M40	110		18	36	5	230	431	146	12	180	100	35	75	86.5	12	M8	130	105	230	196	220	150	20.5	6	M6	138
M60	130		28	55	5	277	526	187	14	220	88.4	56	110	98.5	14	M10	165	125	275	244	325	190	31	8	M8	175
M70	180		28	55	5	270	573	221	M14	250	145	66	105	104	14	M12	215	155	285	288	370	220	31	8	M8	175
M85	180		36	50	5	281	617	231	M16	250	160	86	105	112	14	M12	215	155	325	306	387	220	39	10	M10	175
M100	180		40	70	5	317	701	260	M16	320	180	110	110	142	14	M12	215	185	380	360	441	290	45	12	M12	190

GEARBOX-MOTOR	A1
HP 1 + RIDUTTORE (M40)	388
HP 2 + RIDUTTORE (M60)	408
HP 3 + RIDUTTORE (M70)	470
HP 5,5 + RIDUTTORE (M85)	528
HP 7.5 + RIDUTTORE (M100)	625

#### BARE SHAFT VERSION

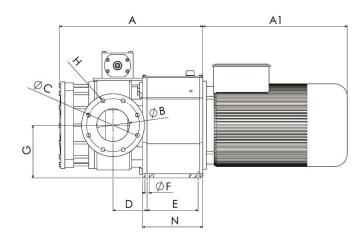


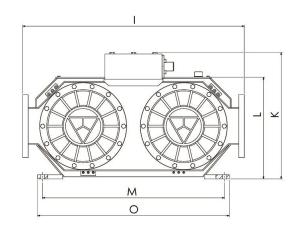
## BASEPLATE FOR SINGLE BODY PUMPS



MOD.	A2	А3	A4	A5	<b>A6</b>	A7	G	Н	1
M40	110	Р	18	36	112	87.5	306	146	12
M60	130	14	28	55	145	103	380	187	14
M70	180	5	28	55	154	97	398	221	M14
M85	180	5	36	50	129	130	442	231	M16
M100	18	17	42	70	156	143	526	260	M16

## DOUBLE BODY PUMPS "C" SERIES"

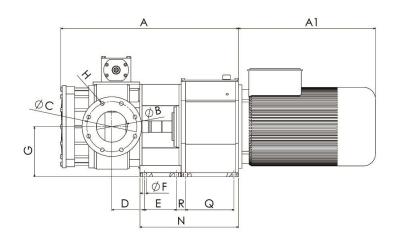


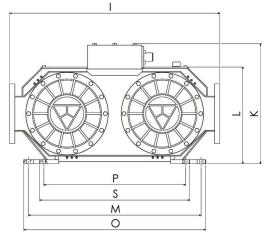


MOD.	A	В	С	D	Ε	F	G	Н	1	K	L	М	N	0
D90	405	105	180	84	150	17	175	M16	675	414	308	520	185	<b>57</b> 0
D100	514	105	180	111	190	17	185	M16	775	454	348	605	226	660
D140	570	130	210	135	203	17	210	M16	880	504	398	725	240	764

GEARBOX-MOTOR	A1
HP 7.5 (D90)	363
HP 10 ( D90)	363
HP 15 (D100)	474
HP 20 ( D100)	474
HP 25 ( D140)	534
HP 30 ( D140)	534

## DOUBLE BODY PUMPS WITH REAR EXTERNAL SEAL "L" SERIES

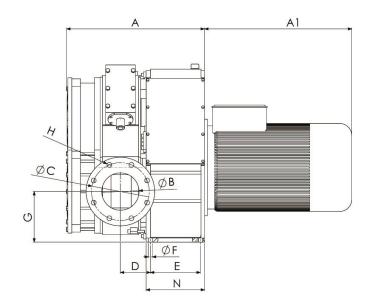


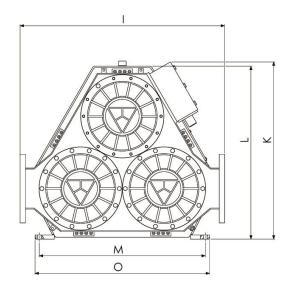


MOD.	A	В	С	D	E	F	G	Н	1	K	L	М	N	0	P	Q	R	s
D90	578	105	180	88	130	17	185	M16	675	414	308	515	357	570	450	150	39	515
D100	665	105	180	114	110	17	185	M16	775	454	348	605	376	660	525	190	38.5	560
D140	744	130	210	136	135	17	210	M16	880	504	398	725	413	764	595	203	38	630

MODELLO MOTORE	A1
HP 7.5 (D90)	363
HP 10 (D90)	363
HP 15 (D100)	474
HP 20 (D100)	474
HP 25 (D140)	534
HP 30 (D140)	534

# TRIPLE BODY PUMPS "C" SERIES"

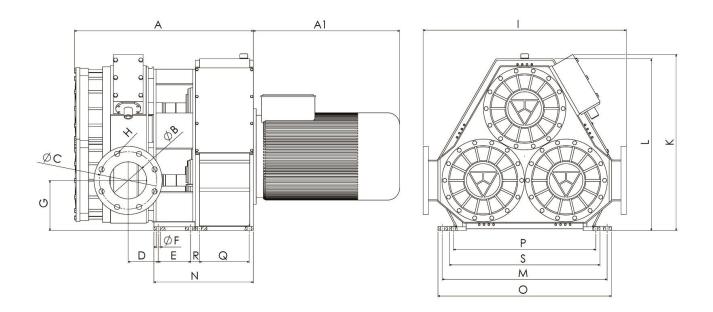




MOD.	Α	В	С	D	E	F	G	Н	1	K	L	М	N	0
T130	510	130	210	103	200	17	185	M16	746	643	632	590	232	630
T160	575	160	240	125	208	17	210	M20	850	736	718	690	243	726

MODELLO MOTORE	A1
HP 20 (T130)	474
HP 25 (T130)	534
HP 30 (T130)	534
HP 40 (T160)	617
HP 50 (T160)	660

# TRIPLE BODY PUMPS WITH REAR EXTERNAL SEAL "L" SERIES



MOD.	A	В	С	D	E	F	G	Н	1	Κ	L	М	N	0	P	Q	R	s
T130	650	130	210	104	115	17	185	M16	746	643	632	590	384	630	525	200	34.5	536
T160	748	160	240	126	135	17	210	M20	850	736	718	675	416	726	595	208	37	630

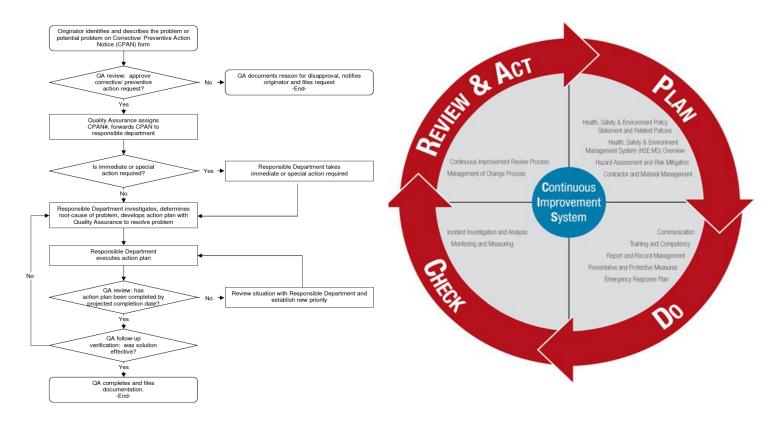
MODELLO MOTORE	A1
HP 20 (T130)	474
HP 25 (T130)	534
HP 30 (T130)	534
HP 40 (T160)	617
HP 50 (T160)	660

#### HEALTH - SAFETY - ENVIRONMENT

# H.S.E.

The health, safety and environmental policy of Belli Meccanica, is for work to be done safely, efficiently and satisfactorily in order to minimize the environmental impacts of our activities and secure the health and safety of all persons involved







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## **POSITIVE DISPLACEMENT PUMPS**

#### **Belli Meccanica Firenze**

Via Bruno Storti, 1 – Sesto Fiorentino – 50019 – Florence - Italy Phone +390553850774

email: info@bellimeccanica.com www.bellimeccanica.com