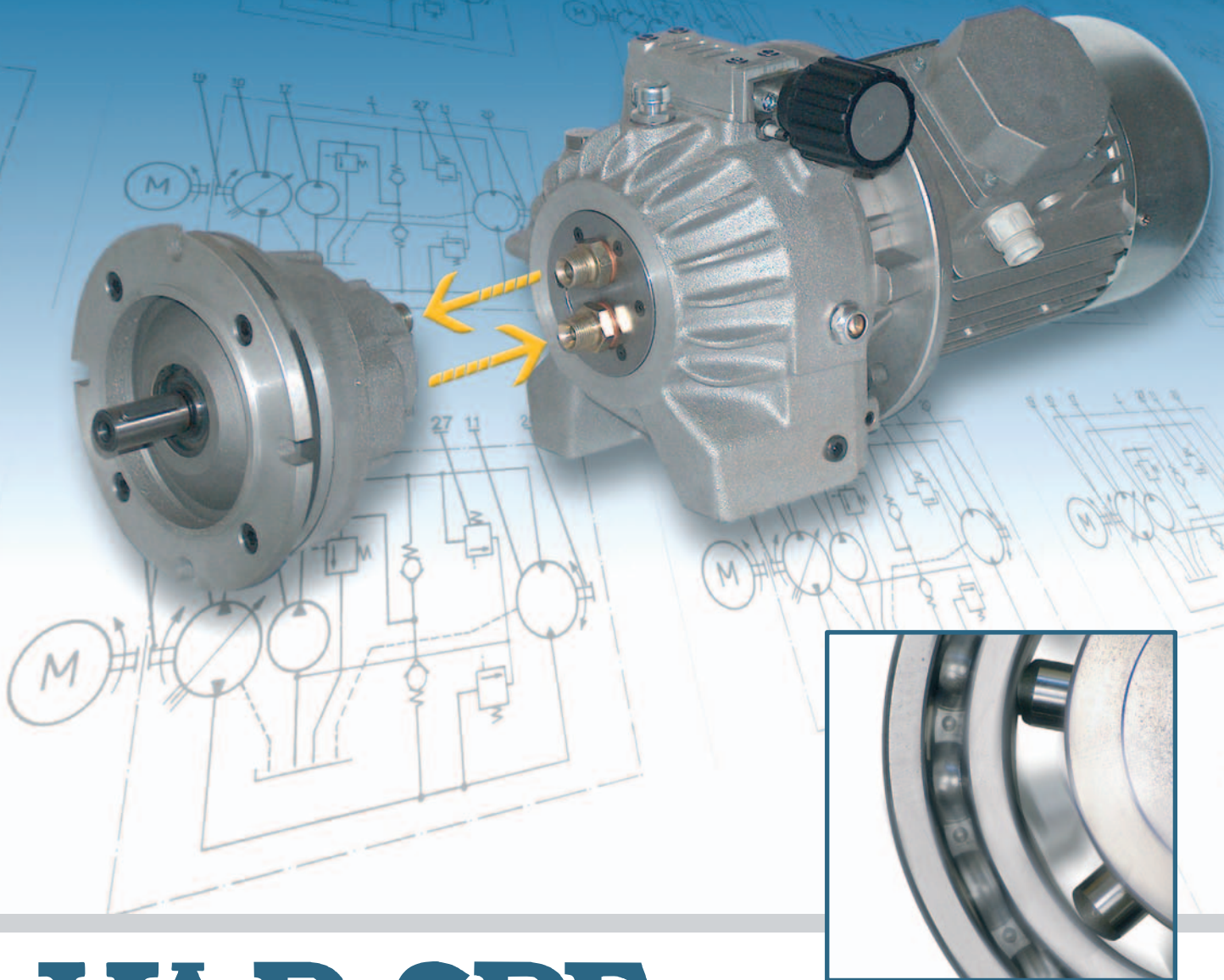


CHT

COMPACT HYDROSTATIC TRANSMISSION

LIGHT DUTY HYDRO PACKS



VAR-SPE

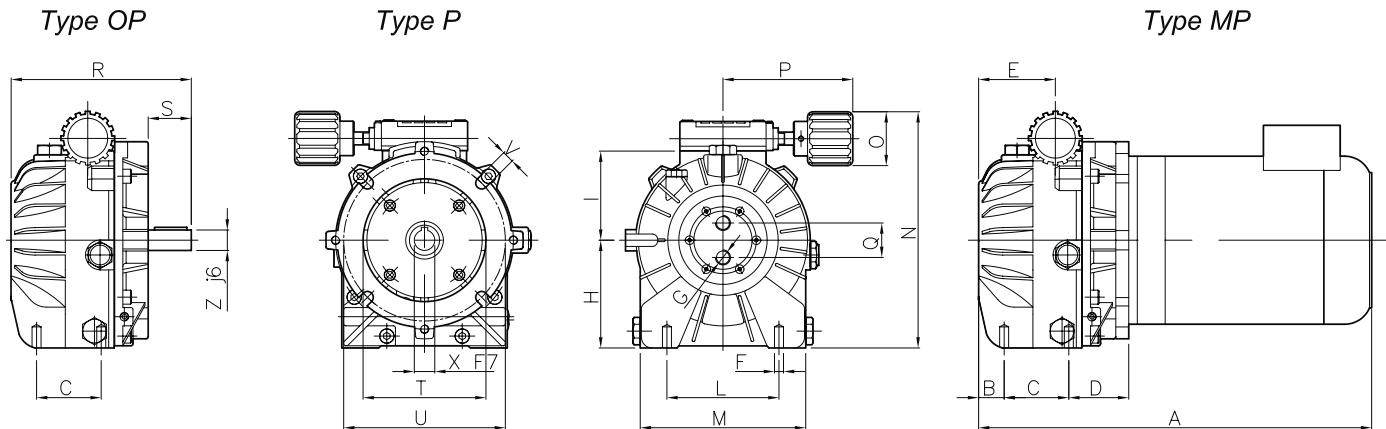
 SpA

VIA CORDELLINA, 81 - 36077 ALTAVILLA VICENTINA (VI) - ITALY / TEL. (+39) 0444.57.20.11 - FAX (+39) 0444.57.31.88
WWW.VARSPE.COM - INFO@VARSPE.COM - MARKETING@VARSPE.COM

SIZE			P02	P04	P08	P10	
Max. displacement	C	in ³ /rev	0,20	0,36	0,75	1,22	
Max. flow at 1800 rpm *	Q _{nom}	U.S. gpm	1,48	2,66	5,55	9,03	
Max. pressure	continuous **	p _{nom}	psi (bar)		1450 (100)	1250 (85)	1160 (80)
	peak	p _{peak}	psi (bar)		4350 (300) ***		
Input speed	4 poles	V _{nom}	rpm		1800		
	min-max	V _{min-max}	rpm		600÷2000		
Input power *-*	1800 rpm	P _{nom}	hp	1,5	3	5	7,5
Inside tank (without circuit)	V	U.S. g	0,079	0,11	0,16	0,24	
Weight (handwheel control)	W	lbs	14,33	19,84	28,66	55,12	
Max. fluid temperature	T	°F (°C)	176°F (80°C)				
Viscosity range suggested	0,031-0,054 in ² /s [20-35 cSt] at 104°F						
Filtering	NAS 1638, lev 9 ISO/DIN 4406, lev 18/15						

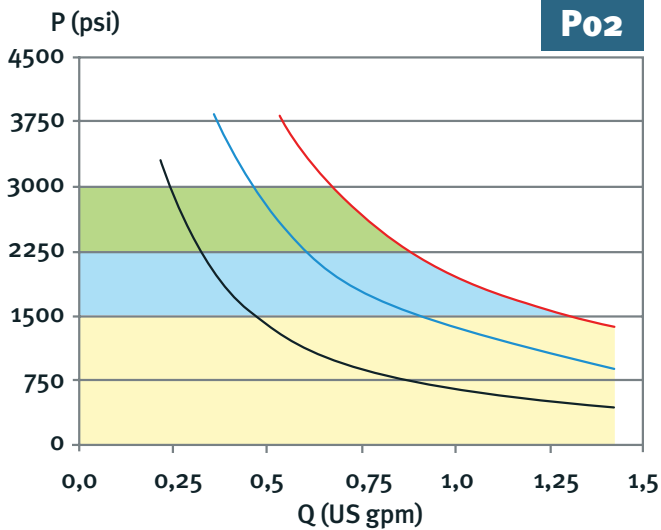
- * These values are for closed circuit; for open circuit consider 75% of the oil flow
 - ** Without additional tank or oil cooler (depends also in environment temperature)
 - *** 300 bar are possible at about 17% of oil flow; to be used for a short time (not exceed 2% of every minute)
 - *-* Required input power to have max oil flow and nominal pressure
- External tank suggested for open circuit: 4-5 times the working oil flow

PUMPS DIMENSIONS

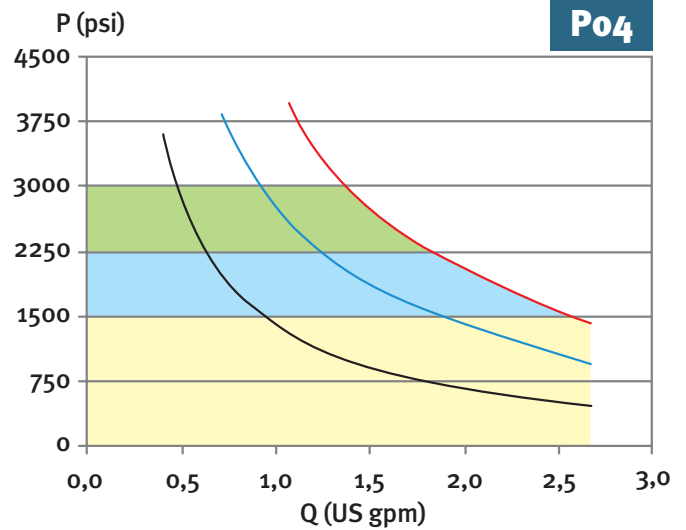


Pumps dimensions with Nema motor flange (inch)

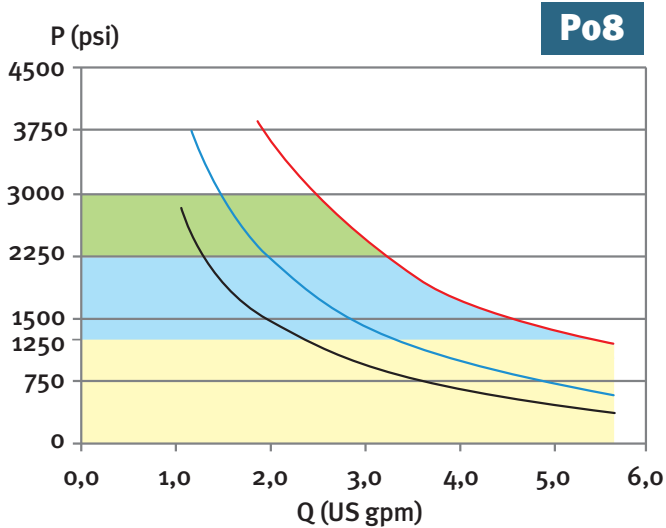
	A	B	C	D			E	F		G (GAS)	H	I	L	M	N	O	P	Q
				56C	143/145TC	182/184TC		TAP	DEPTH									
P02	14,87	0,92	2,12	2,99	5,6		2,65	M8	0,47	3/8	3,19	2,91	3,23	4,92	7,54	1,97	4,76	1,26
P04	16,12	0,93	2,36	2,95	2,95	6,35	2,8	M10	0,71	3/8	3,94	3,27	4,1	5,9	8,64	1,97	4,76	1,26
P08	19,83	0,9	2,95	2,91	2,91	6,31	3,27	M10	0,71	1/2	3,94	3,83	4,88	7,08	9,2	1,97	4,76	1,38
P10	22,39	1,38	3,07			5,74	3,58	M12	0,79	3/4	5,00	4,52	6,06	8,7	10,96	1,97	4,76	1,73
	R	S	T			U			V			X			Z	NEMA FLANGE		
			56C	143/145TC	182/184TC	56C	143/145TC	182/184TC	56C	143/145TC	182/184TC	56C	143/145TC	182/184TC				
P02	6,35	1,75	4,5	4,5		5,875	5,875		0,41	0,41		0,625	0,875		0,625	56C - 143/145TC		
P04	7,18	2,125	4,5	4,5	8,5	5,875	5,875	7,25	0,41	0,41	0,53	0,625	0,875	1,125	0,875	56C-143/145TC-182/184TC		
P08	8,1	2,125	4,5	4,5	8,5	5,875	5,875	7,25	0,41	0,41	0,53	0,625	0,875	1,125	0,875	56C-143/145TC-182/184TC		
P10	9,5	2,875			8,5			7,25			0,53			1,125	1,125	182/184TC		



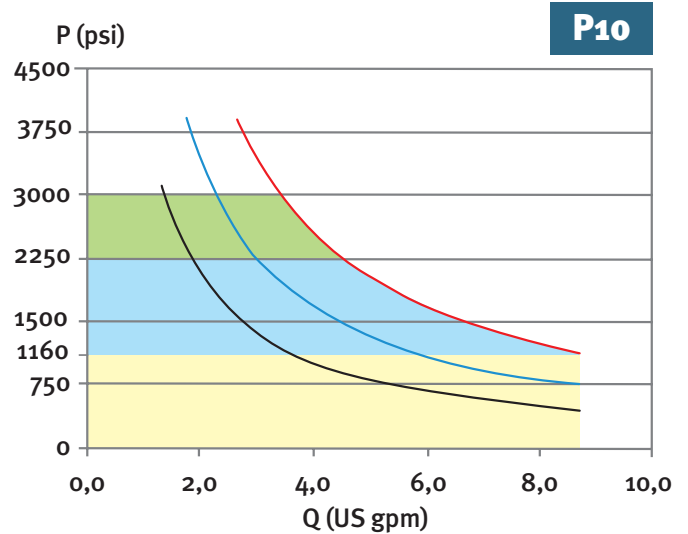
■ 1,5 Hp 56C-145TC ■ 1 Hp 56C-143TC ■ 0,5 Hp S56C



■ 3 Hp 145TC-182TC ■ 2 Hp 56C-145TC ■ 1 Hp 56C-143TC



■ 5 Hp 184TC ■ 3 Hp 145TC-182TC ■ 2 Hp 56C-145TC



■ 7,5 Hp 184TC ■ 5 Hp 184TC ■ 3 Hp 182TC

Diagrams values are for closed circuit.

For open circuit consider that maximum oil flow is 75% of closed circuit max flow.

INPUT SPEED: 1800 RPM

- Continuous working: 8 hour/day
- Intermittent working: not exceed 50% of every minute
- Intermittent working: not exceed 10% of every minute

Pressure peak: 4350 psi, not exceed 2% of every minute

EFFICIENCY

p=0-2176 psi

$\eta_{vol}=0,95-0,99$

$\eta_{mec}=0,82-0,85$

p=2176-4350 psi

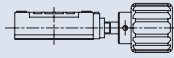
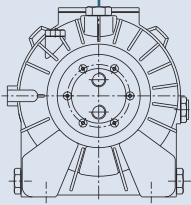
$\eta_{vol}=0,93-0,95$

$\eta_{mec}=0,85-0,9$

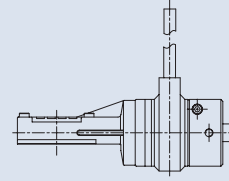
η_{vol} = Volumetric efficiency

η_{mec} = Mechanical efficiency

MANUAL CONTROL

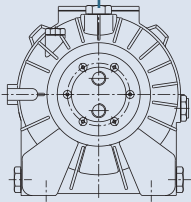


Cod. 00 HANDWHEEL

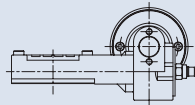


Cod. 02 LEVER

REMOTE CONTROL



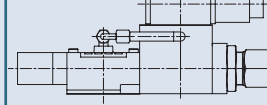
Mono-phase
Three-phase



Cod. 20 ELECTRIC

max - 0 - max oil flow: about 30 sec.

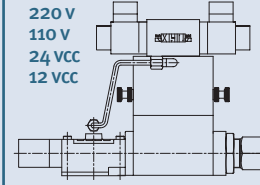
4-20 mA
0-10 V
potentiometer



Cod. 37 PROPORTIONAL

for closed loop circuit

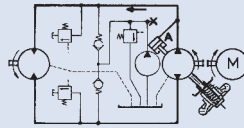
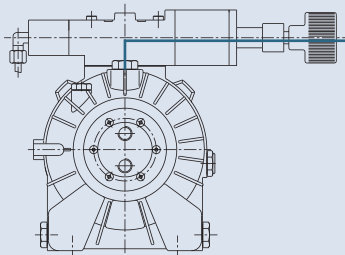
220 V
110 V
24 VCC
12 VCC



Cod. 67 ELECTRO-HYDRAUL

max - 0 - max
oil flow: adjustable 3 - 30 sec.

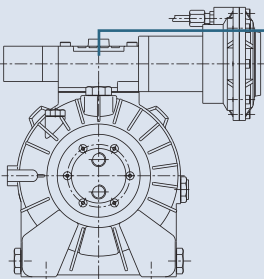
CONSTANT POWER CONTROL



Cod. 00/3 CONSTANT POWER

It permits controlling output oil flow level according to the resistive torque (oil pressure). It's a device for automatic winders: speed automatically decreases according to the increasing diameter of the reel and the corresponding peripheral speed.

PNEUMATIC CONTROL



Pneumatic signal: 3÷15 P.S.I.
Designed to be applied in dangerous and explosion proof environment.

Cod. 52 PNEUMATIC

Devices: Code O indicator dial; code D bidirectional input rotation.

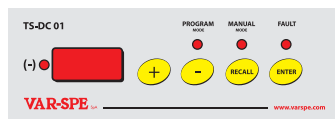
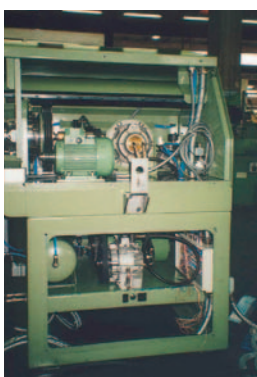


Code 00 – Code 02

Manual control systems of the flow for fine adjustment and quick flow reversing.

- Ideal for:
- self-propelled machines
 - conveyor
 - volumetric pumps
 - hydraulic cylinder

Code 20 – Code 67 – Code 37



Code 20 – Code 67

Remote control systems of the flow through impulse from pushbuttons or PLC

Code 37

Proportional and continuous control of the flow for fine adjustments with dedicated electronic VAR-SPE.

Code 00/3

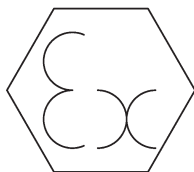


Code 00/3

“Load sensing” control system of the flow.

- Ideal for:
- winding lines
 - hydraulic lift

Code 52



Code 52

Remote control system for fine adjustment of the flow with pneumatic signal. For explosion-proof environment of chemical, petroliferous and extraction sector.

- Ideal for:
- volumetric pumps
 - mixers
 - rotating filters

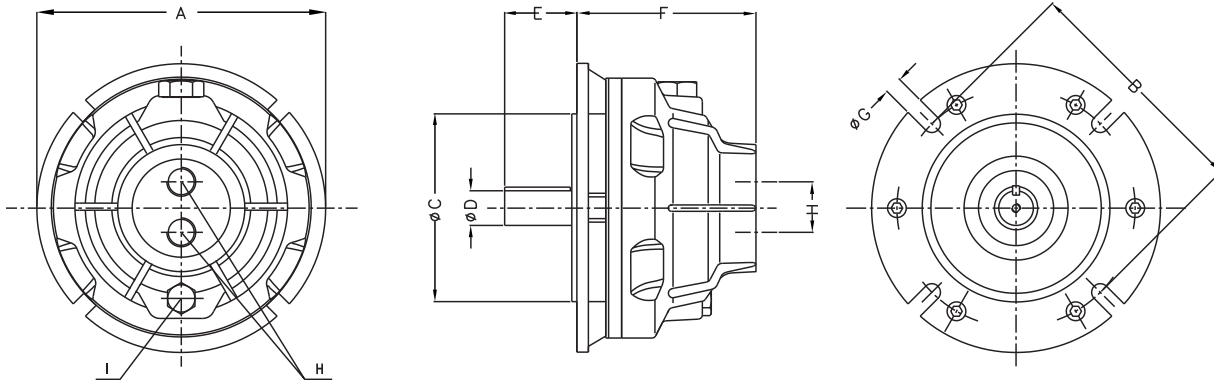
MOTORS HYDRAULIC FIX DISPLACEMENT MOTORS PERFORMANCES

SIZE			Mo2	Mo4	Mo8	M10	
Displacement	C	in ³ /rev	0,20	0,36	0,75	1,22	
Nominal oil flow (1800 rpm)	Q _{nom}	U.S. gpm	1,48	2,66	5,55	9,03	
Max. pressure	continuous	p _{nom}	2175 (150) *				
	peak	p _{peak}	4350 (300) **				
Speed	min	V _{min}	20				
	max cont.	V _{max}	2500		2000		
	peak	V _{peak}	4000		3000	2500	
Nominal torque	cont (P _{nom})	M _{nom}	lb in	59,3	106,2	220,4	356,7
Starting torque	% theoretical torque		80-90				
Weight	W	lbs	6,6	9,7	16	26,9	
Max. fluid temperature	T	°F (°C)	176°F (80°C)				
Viscosity range suggested	0,031-0,054 in ² /s [20-35 cSt] at 104°F						
Filtering	NAS 1638, lev 9 ISO/DIN 4406, lev 18/15						

* in closed circuit without oil cooler

** to be used for a short time (not exceed 2% of every minute)

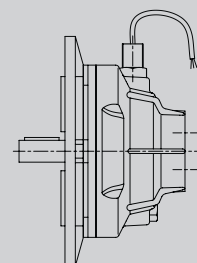
HIDRAULIC MOTORS DIMENSIONS



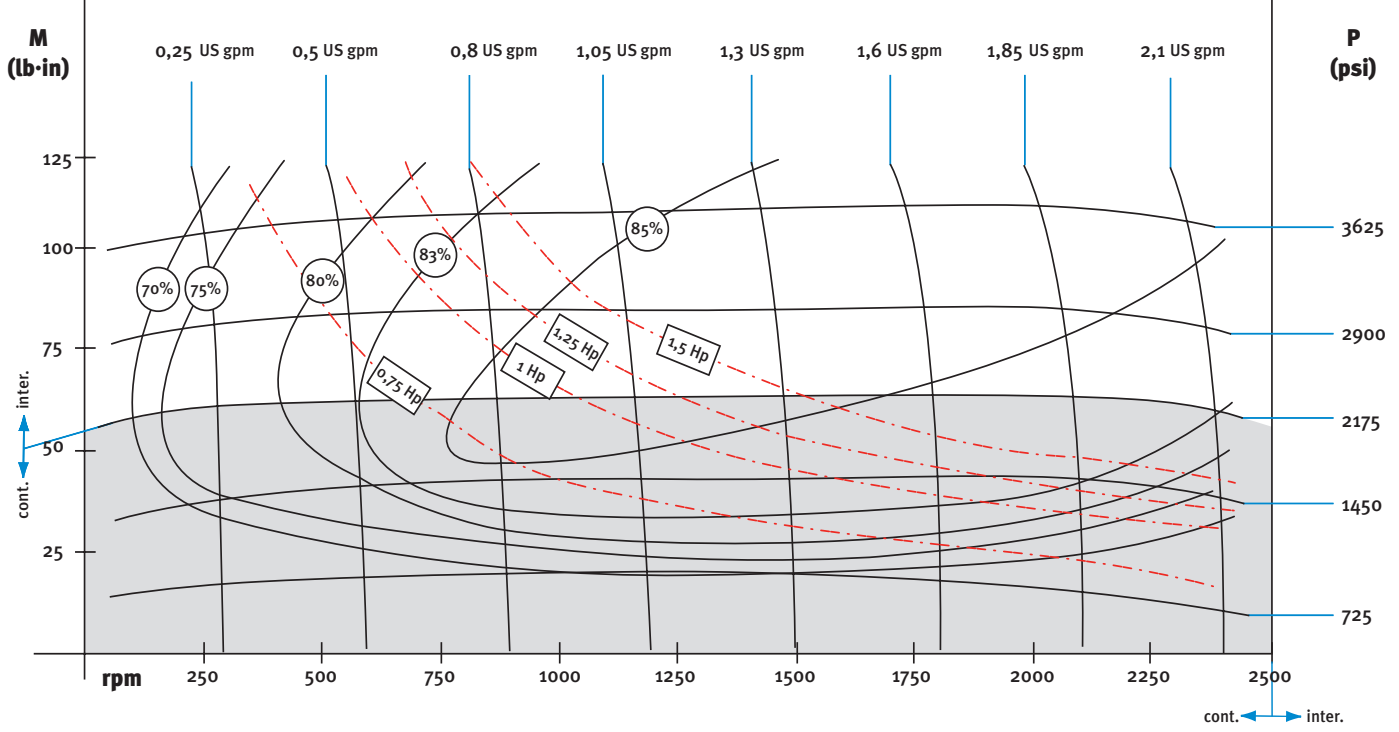
Hydraulic motors dimensions with Nema flange (inch)										
	A	B	C	D	E	F	G	H (GAS)	I (GAS)	NEMA FLANGE
Mo2	6,5	5,875	4,5	0,625	1,75	3,82	0,41	3/8	1/8	56C
Mo4	6,5	5,875	4,5	0,875	2,125	4,21	0,41	3/8	1/4	143TC
Mo8	6,5	5,875	4,5	0,875	2,125	4,88	0,41	1/2	1/4	145TC
M10	9	7,25	8,5	1,125	2,875	5,55	0,55	3/4	3/8	182/184TC

Devices

HYDRAULIC MOTOR: Code 8 speed sensor.

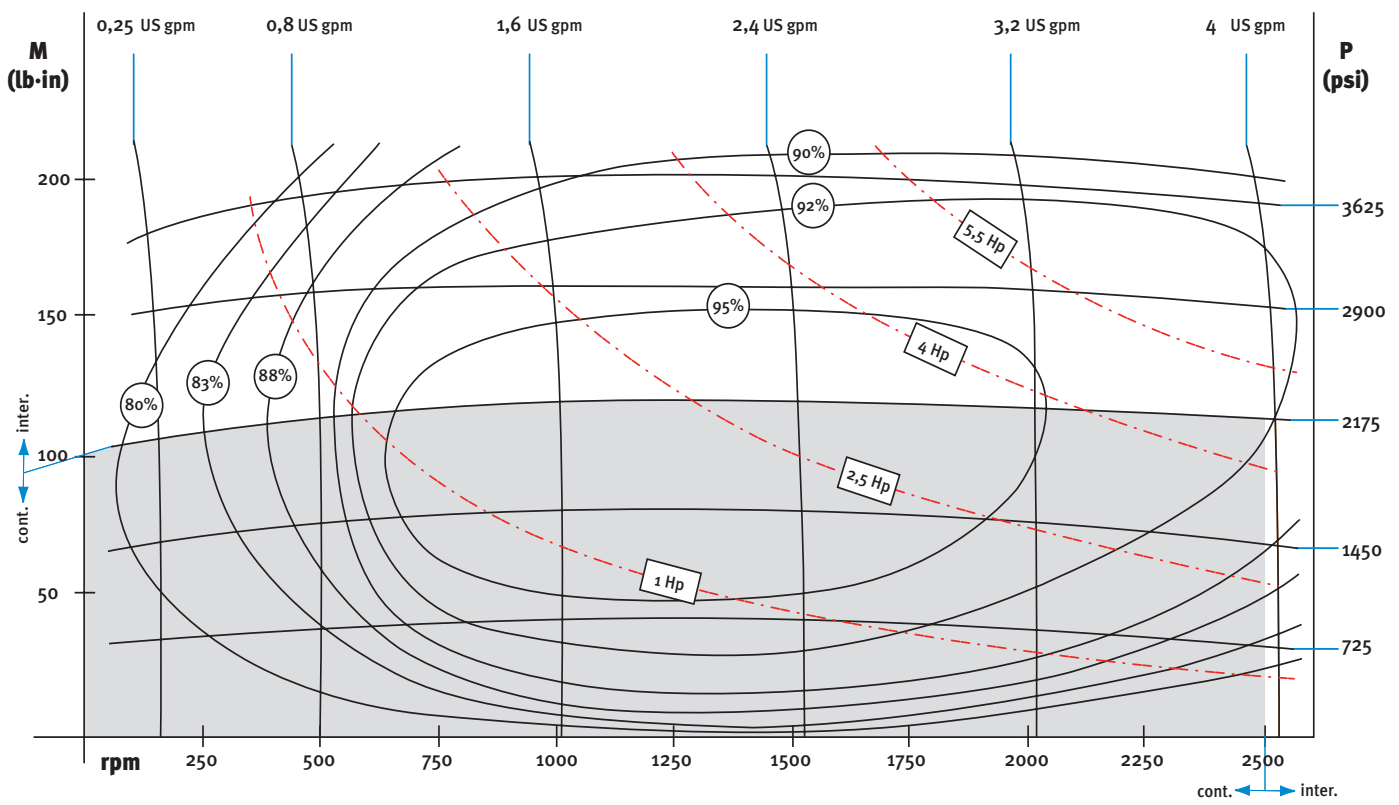


TYPE: Mo2



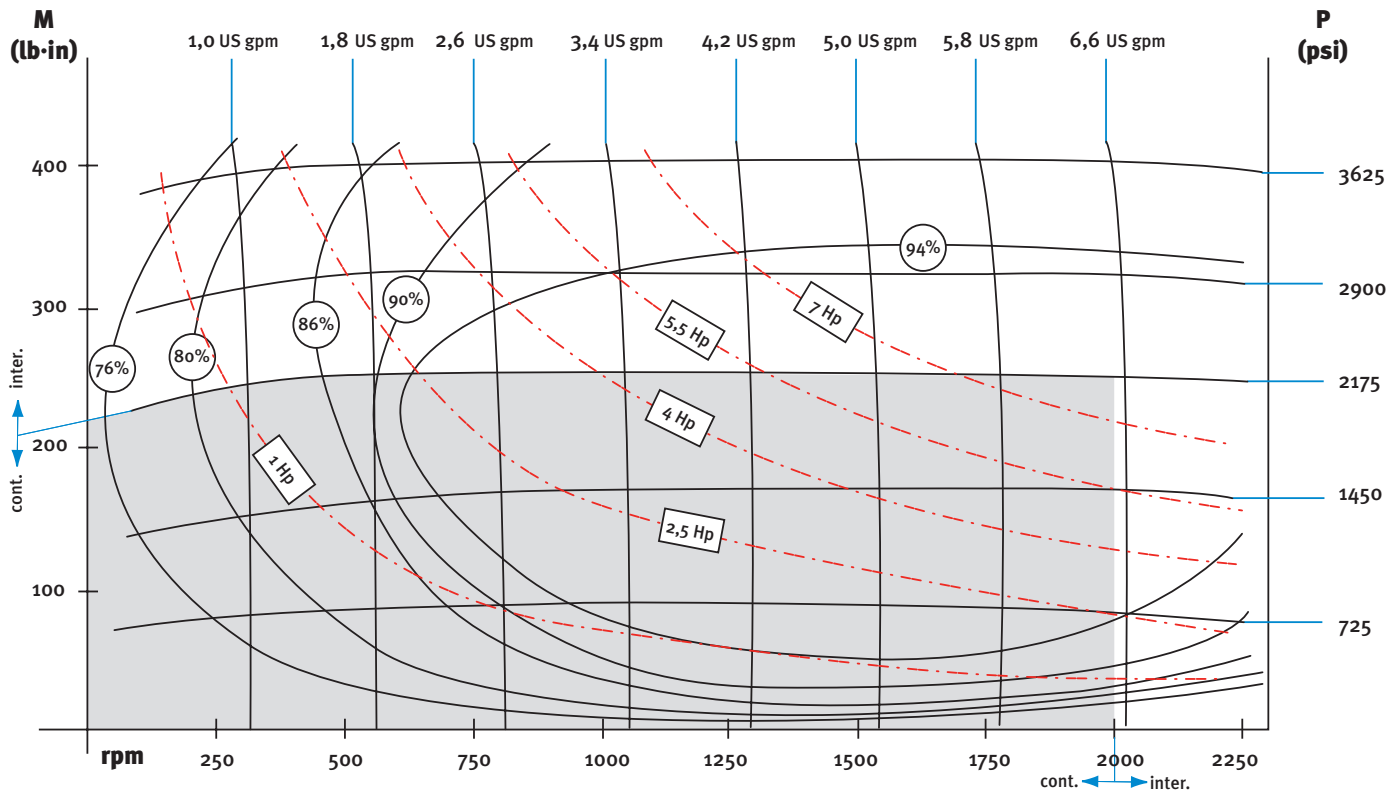
The motor must not be operated above 2175 psi pressure with flow exceeding 2,18 US gpm.

TYPE: Mo4



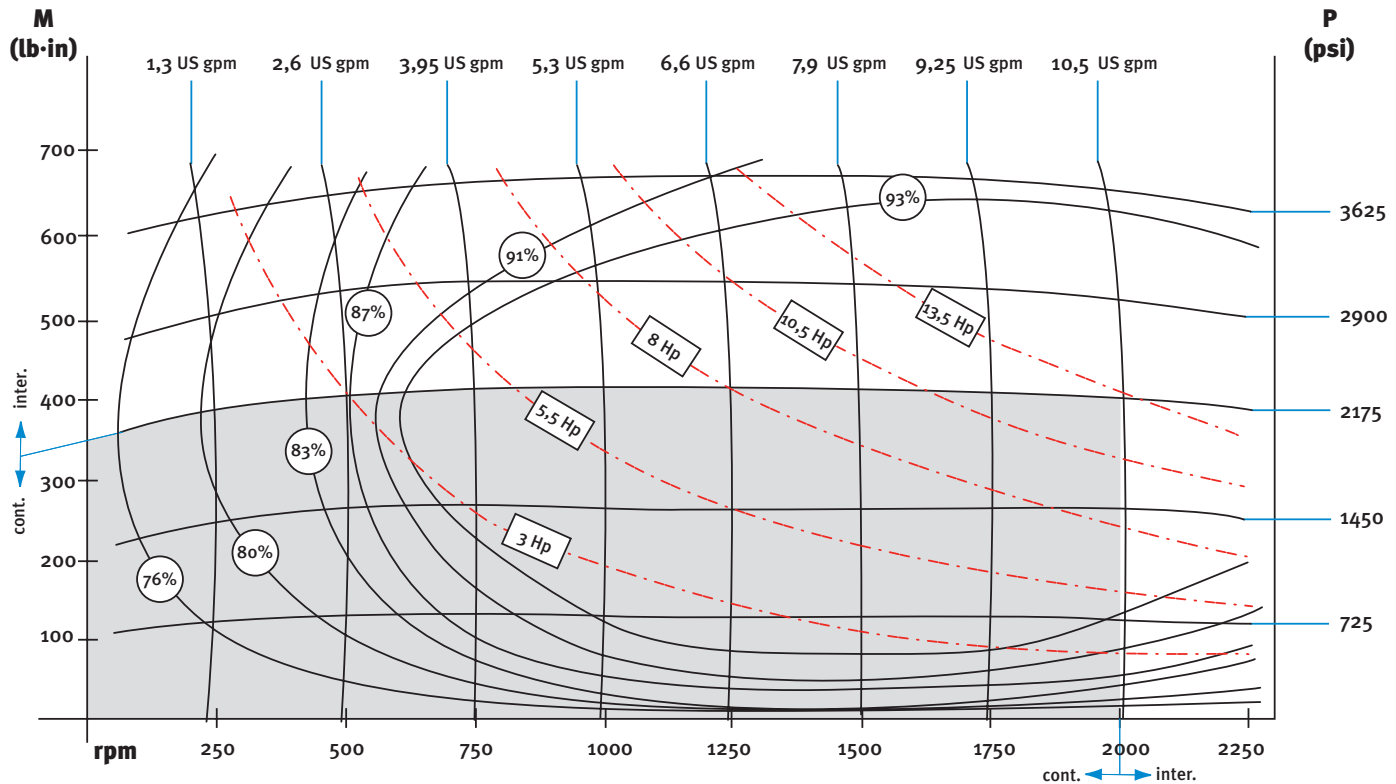
The motor must not be operated above 2175 psi pressure with flow exceeding 3,9 US gpm.

TYPE: Mo8



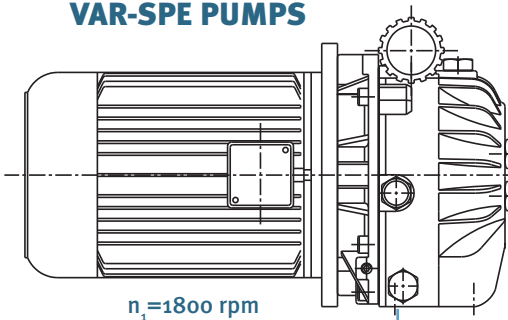
The motor must not be operated above 2175 psi pressure with flow exceeding 6,5 US gpm.

TYPE: M10



The motor must not be operated above 2175 psi pressure with flow exceeding 10,3 US gpm.

VAR-SPE PUMPS

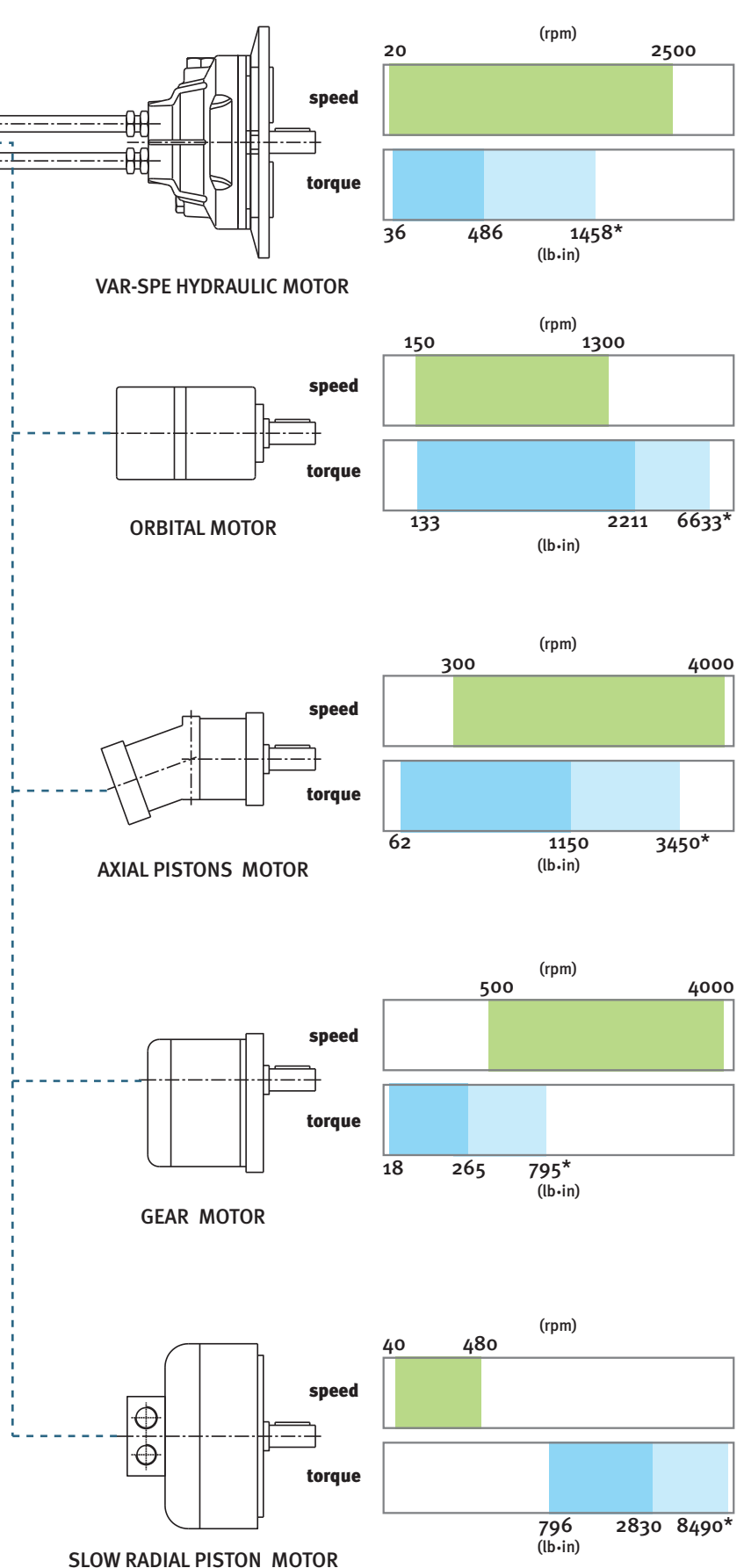


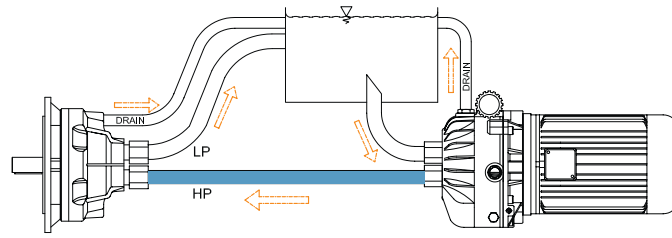
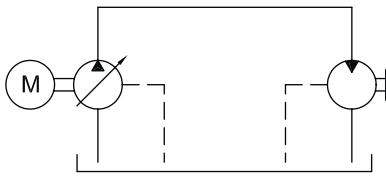
PUMPS DISPLACEMENT

0,20	Inch ³ /rev
0,36	Inch ³ /rev
0,75	Inch ³ /rev
1,22	Inch ³ /rev

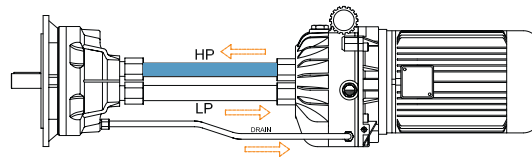
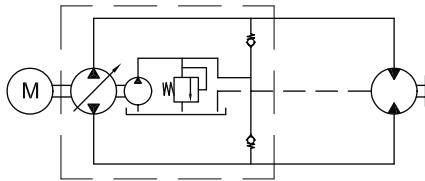
Torque range is calculated with $p=1450$ psi (nominal pressure), torque valve with * is for peak pressure (4351 psi)

SPEED/TORQUE RANGES





OPEN CIRCUIT



CLOSED CIRCUIT

OPEN CIRCUIT

Pumps must be mounted below the tank.

FIRST STARTING

Before starting pre-fill all the system components: pump, hydraulic motor, tank, etc., with new and filtered oil. Run for few seconds and then control oil level into the pump. Then, run at low pressure until the hydraulic system has been deaerated.

PUMP INPUT ROTATION

The input direction is indicated by the arrow in the input cover; normal sense of rotation is clockwise. To use both directions it's necessary to fit the cod.D device.

TYPES OF FLUID

Use a good quality mineral hydraulic oil: for example ATF Dexron, Esso Univas, Shell Tellus, Mobil DTE.

To choose the oil you must consider working temperature.

OPEN CIRCUIT

Oil temperature 104°F: oil ISO VG22 o ISO VG32

Oil temperature 122°F: oil ISO VG32 o ISO VG46

Oil temperature 140°F: oil ISO VG46 o ISO VG68

CLOSED CIRCUIT

Oil temperature 158°F: oil ISO VG68

Oil temperature 176°F: oil ISO VG100

Viscosity rating: optimal 15-40 cSt; min. 10 cSt; max 100 cSt.

MAINTENANCE

Change the oil after the first 200 hours of operation and then every 2000 hours. Such intervals should be reduced when the system works in heavy conditions or in a heavily polluted environment.

MOUNTING POSITION

Universal mounting position is possible in pumps and motors, but for pump it must be indicated in the order.

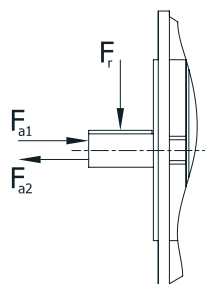
DRAINAGE OF HYDRAULIC MOTORS

The draining line has to be connected with free outlet on the reservoir to avoid pressure into the motor housing (max housing pressure: 21 psi)

PUMP AND MOTOR - RADIAL AND AXIAL LOADS

The permissible radial and axial loads are shown in the following tables

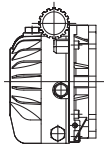
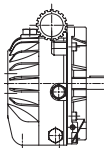
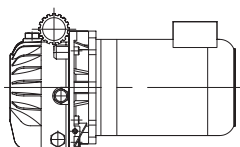
RADIAL LOADS (lbs)			
02	04	08	10
85	112	180	375



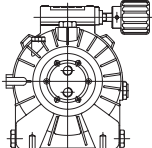
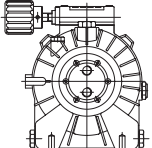
AXIAL LOADS (lbs)			
02	04	08	10
382	495	764	1057

HOW TO ORDER

PUMP **P 04** / **0 00** / **D**

P		FEMALE SHAFT
		MALE SHAFT
		PUMP + ELECTRIC MOTOR

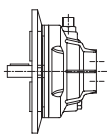
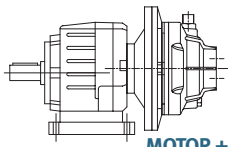
SIZE	IN ³ /REV
02	0,20
04	0,36
08	0,75
10	1,22

CONTROL POSITION AS SEEN FROM PUMP EXIT	
0	1
RIGHT	LEFT
	

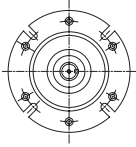
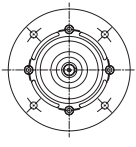
CONTROL CODE (see page 7)
00
02
20
37
67
00/3
52

DEVICES CODE
0
D

MOTOR **M 04** / **N N** / **8**

M		MOTOR
		MOTOR + REDUCER

SIZE	IN ³ /REV
02	0,20
04	0,36
08	0,75
10	1,22

FLANGE TYPE			
N	NEMA	I	IEC
			

SHAFT TYPE	
N	NEMA
I	IEC

DEVICES CODE
8 SPEED SENSOR

USEFUL FORMULAS

Pumps: nominal values determination

Output Flow	$Q = \frac{c \cdot n}{231} \cdot \eta_v$	[US gpm]
Drive torque	$M = 12 \cdot \frac{c \cdot \Delta p}{75,4 \cdot \eta_m}$	[lb · in]
Drive power	$P = \frac{\Delta p \cdot c \cdot n}{395934 \cdot \eta_t}$	[Hp]

Motors: nominal values determination

Input Flow	$Q = \frac{c \cdot n}{231 \cdot \eta_v}$	[US gpm]
Output torque	$M = 12 \cdot \frac{c \cdot \Delta p}{75,4} \cdot \eta_m$	[lb · in]
Output power	$P = \frac{\Delta p \cdot c \cdot n}{395934} \cdot \eta_t$	[Hp]
Output speed	$n = \frac{Q \cdot 231}{c} \eta_v$	[rpm]

Q = flow (US gpm)

c = displacement (in³/rev.)

n = shaft speed

M = torque (lb · in)

Δp = operating pressure drop (psi)

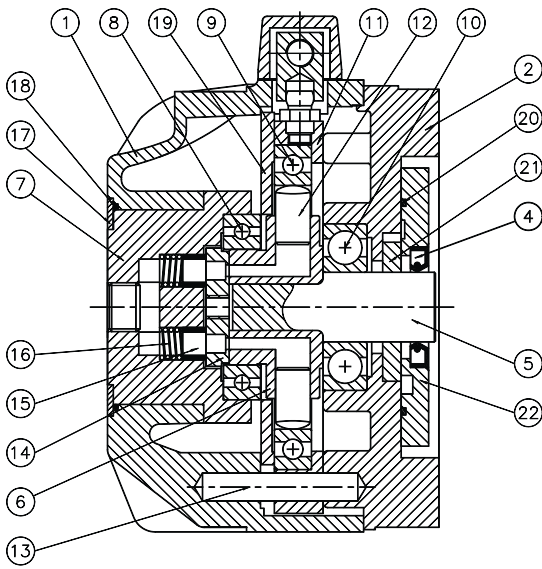
η_v = volumetric efficiency

η_m = mech-hyd. efficiency

η_t = overall efficiency

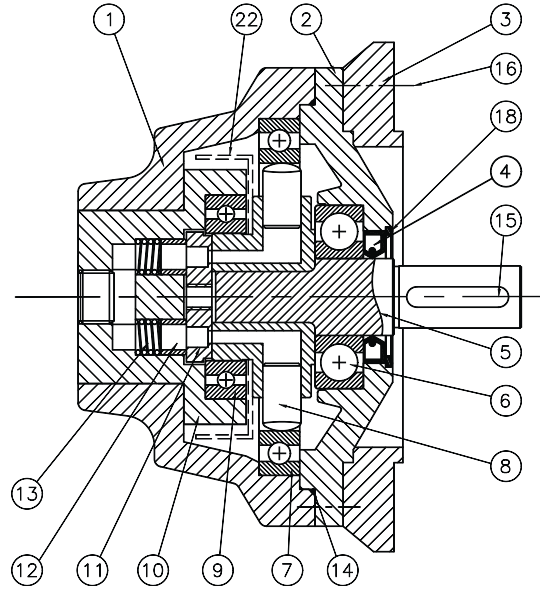
SPARE PARTS

PUMP



	Po2	Po4	Po8	P10
Ref. 4	BA 25x35x7	BA 30x42x7	BA 40x52x7	BA 42x56x7

MOTOR



	Mo2	Mo4	Mo8	M10
Ref. 4	BA B SL 20x35x6	BA B SL 25x42x7	BA B SL 30x52x7	BA B SL 45x65x10

OTHER VAR-SPE PRODUCTS

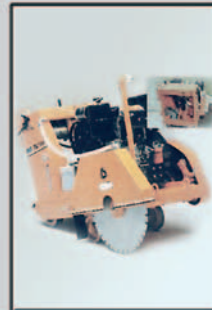
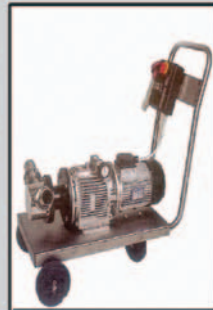


VARIATORS A2-A12
0,5 HP - 5,5 HP



VARIATORS 15-17B
5,5 HP - 30 HP

THE IDEAL SOLUTION FOR SMALL / LIGHT APPLICATIONS



VAR-SPE SpA

VIA CORDELLINA, 81 - 36077 ALTAVILLA VICENTINA (VI) - ITALY
 TEL. (+39) 0444.57.20.11 - FAX (+39) 0444.57.31.88
 WWW.VARSPE.COM - INFO@VAR-SPE.COM - MARKETING@VAR-SPE.COM