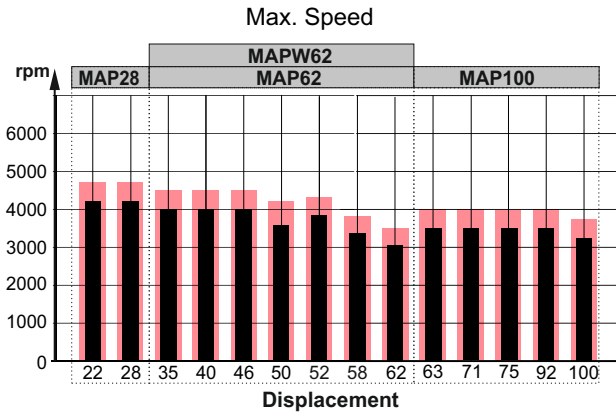
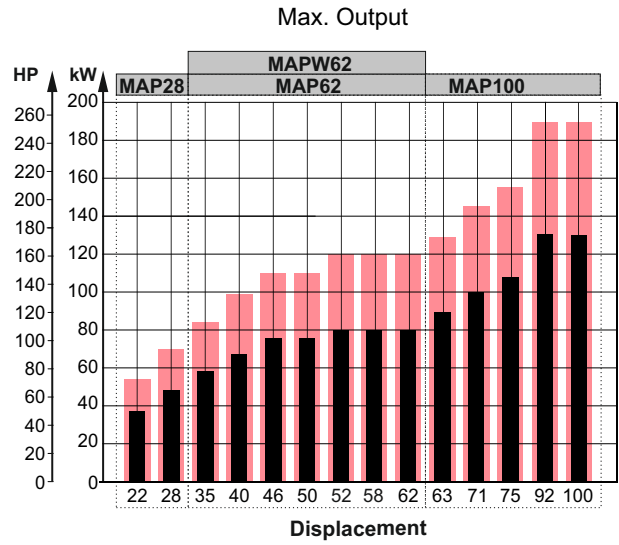
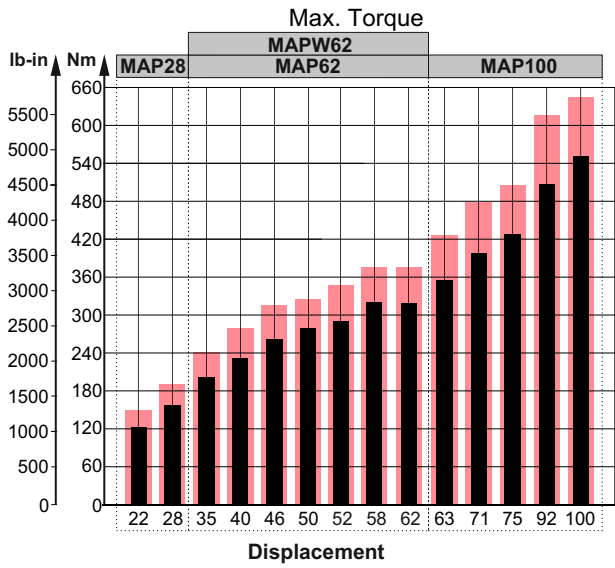


## SPECIFICATION DATA MOTORS TYPE MAP

Intermittent values

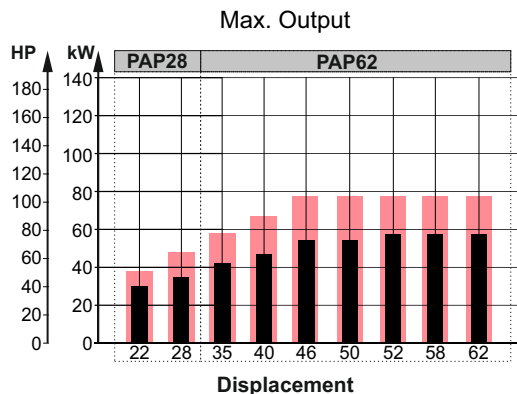
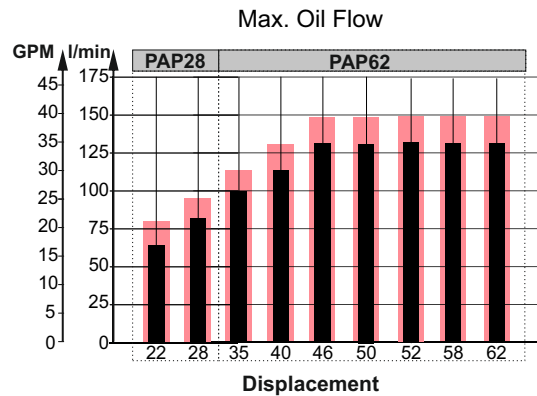
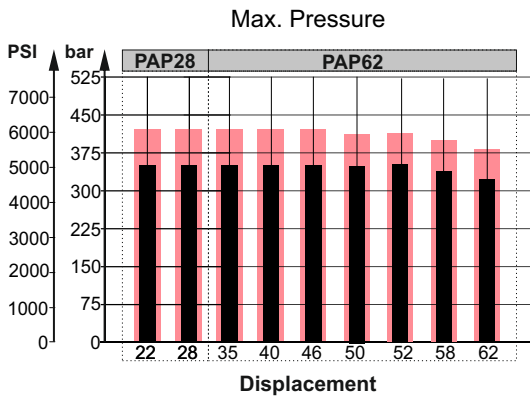
Continuous values

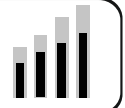


## Specification Data Pumps Type PAP

Intermittent values

Continuous values





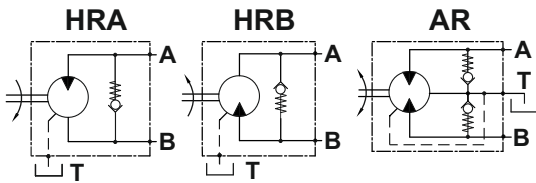
**PORT, SHAFT AND FLANGE TYPES**

PORTS SIZE - THREAD OPTION		Type of threads
PAP28	PAP62	
default		Inlet ISO 6162-1 DN32, Outlet ISO 6162-2 DN19, drain ports M18x1.5
5		Inlet SAE J518 1 1/2 PSI3000, Outlet SAE J518 3/4 PSI6000, drain ports 7/8-14 UNF
9		Inlet ISO 6162-1 DN32, Outlet ISO 6162-2 DN19, drain ports G1/2
	default	Inlet ISO 6162-1 DN38, Outlet ISO 6162-2 DN19, drain ports M18x1.5
	5	Inlet SAE J518 1 1/2 PSI3000, Outlet SAE J518 3/4 PSI6000, drain ports 7/8-14 UNF
	9	Inlet ISO 6162-1 DN38, Outlet ISO 6162-2 DN19, drain ports G1/2

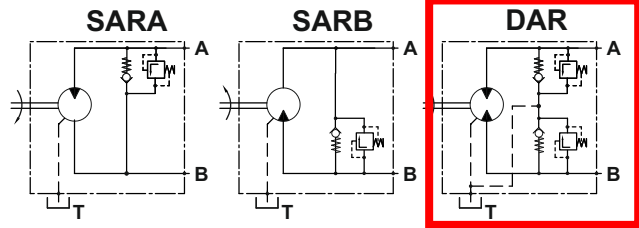
**Cross Table - Port Types For Pumps**

**VALVE OPTIONS FOR MOTORS**

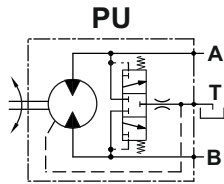
**Anti-Cavitation Valve**



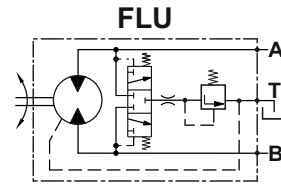
**Combined Anti-Cavitation and Relief Valve**



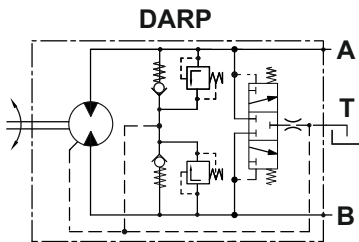
**Purge Valve**



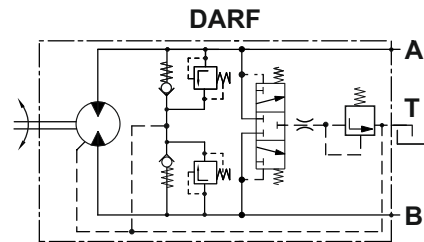
**Flush Valve**



**Dual Anti-Cavitation, Relief and Purge Valve**



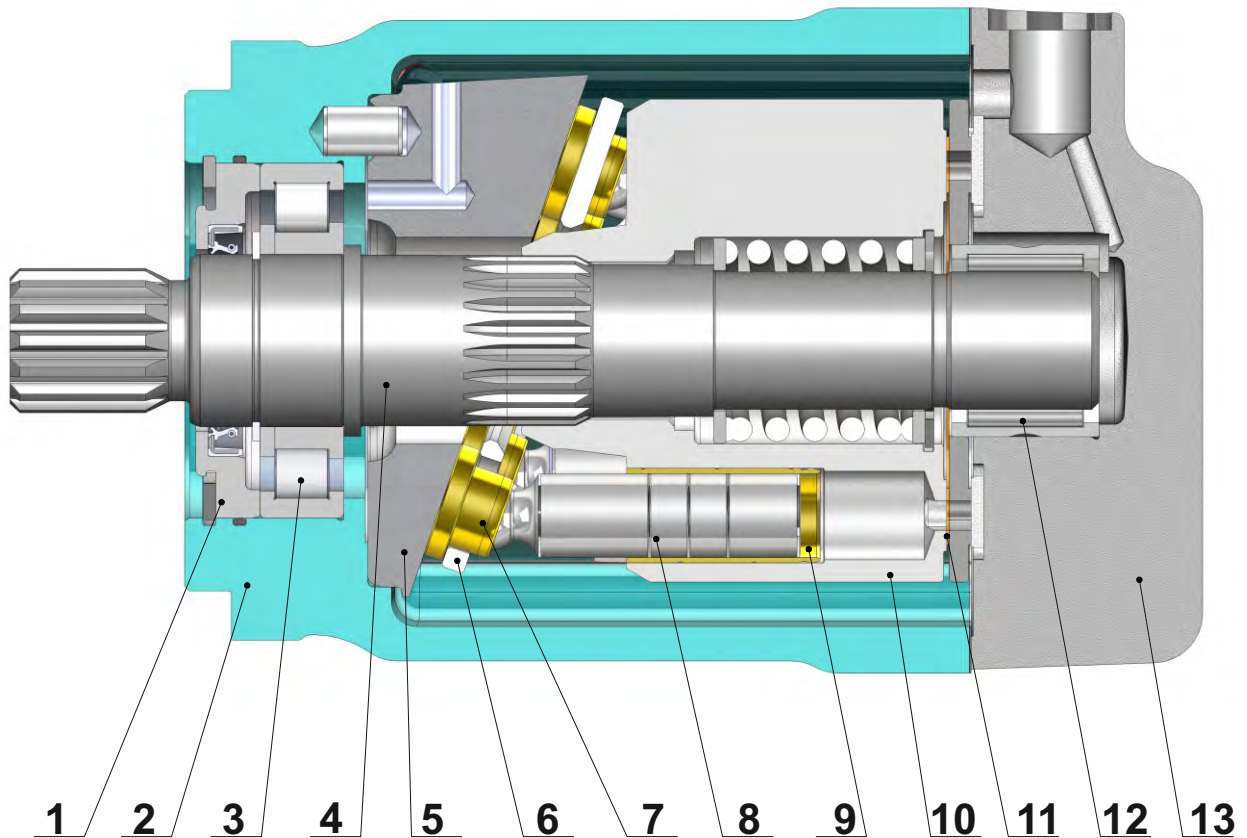
**Dual Anti-Cavitation, Relief and Flush Valve**



**Cross Table - Valve Types**

Type of valves	MAP28			MAP62			MAP100			MAPW62		
	omit	T	E	omit	T	E	omit	T	E	omit	T	E
HRA	x	x	x	x	x	x	x	x	x	x	x	x
HRB	x	x	x	x	x	x	x	x	x	x	x	x
AR	x	x		x	x	x	x	x	x	x	x	x
SARA	x	x		x	x	x	x	x	x	x	x	x
SARB	x	x		x	x	x	x	x	x	x	x	x
DAR	x	x		x	x	x	x	x	x	x	x	x
PU	x	x	x	x	x	x	x	x	x	x	x	x
FLU	x	x	x	x	x	x	x	x	x	x	x	x
DARP		x		x	x		x	x	x	x	x	
DARF		x		x	x		x	x	x	x	x	

## SECTION VIEW



1. Front cover
2. Cast iron body
3. Robust radial - axial roller bearing
4. Hardened shaft
5. Solid swash plate
6. Retainer plate
7. Improved piston shoes
8. Improved pistons
9. Brass bushings
10. Hardened steel cylinder block
11. Bimetal distributor
12. Needle bearing
13. Solid end cover

The main advantages of the heavy duty design of the MAP motors over the typical swash plate motors are the higher starting torque and the higher total efficiency. In regards to these two parameters, under normal working mode, the MAP is comparable to the bent axis motors. The advantages of the MAP over the bent axis motors are the higher reliability and the lower degree of pulsation and vibration during operation.



**SPECIFICATION DATA**

Type		MAP 35	MAP 40	MAP 46	MAP 50	MAP 52	MAP 58	MAP 62
<b>Displacement,</b> <b>cm<sup>3</sup>/rev [in<sup>3</sup>/rev]</b>		36.16 [2.21]	41.59 [2.54]	47.13 [2.88]	49.94 [3.05]	51.95 [3.17]	58.8 [3.59]	62.4 [3.81]
<b>Max. Speed,</b> <b>[RPM]</b>	Cont.	4000	4000	4000	3600	3850	3398	3050
	Int.*	4500	4500	4500	4200	4330	3823	3500
<b>Max. Torque,**</b> <b>Nm [lb-in]</b>	Cont.	202 [1789]	232 [2053]	263 [2328]	278 [2460]	290 [2566]	320 [2832]	318 [2814]
	Int.**	242 [2142]	278 [2460]	315 [2788]	326 [2885]	347 [3071]	375 [3320]	377 [3337]
<b>Output,</b> <b>kW [HP]</b>	Cont.	58 [78]	67 [90]	76 [102]	76 [102]	80 [107]	80 [107]	80 [107]
	Int.**	84 [113]	97 [130]	110 [148]	110 [148]	120 [161]	120 [161]	120 [161]
<b>Max. Pressure,</b> <b>bar [PSI]</b>	Cont.	350 [5080]	350 [5080]	350 [5080]	350 [5080]	350 [5080]	340 [4930]	320 [4640]
	Int.**	420 [6100]	420 [6100]	420 [6100]	410 [5950]	420 [6100]	400 [5800]	380 [5510]
	Peak	450 [6527]	450 [6527]	450 [6527]	450 [6527]	450 [6527]	440 [6381]	410 [5950]
<b>Max. Oil Flow,</b> <b>l/min [GPM]</b>	Cont.	145 [38.3]	167 [44.1]	189 [50]	180 [47.5]	200 [52.8]	200 [52.8]	190 [50]
	Int.*	163 [43.1]	187 [49.4]	212 [56]	210 [55.5]	225 [59.4]	225 [59.4]	215 [56.8]
<b>Torque Constant</b> *****		0.52	0.6	0.68	0.72	0.75	0.85	0.9
<b>Nm/bar [lb-in/PSI]</b>		[0.32]	[0.364]	[0.41]	[0.437]	[0.454]	[0.515]	[0.546]
<b>Speed Constant</b> *****		26.3	22.84	20.2	19.02	18.28	16.13	15.23
<b>RPM/(l/min) [RPM/GPM]</b>		[99.4]	[86.5]	[76.3]	[72]	[70.2]	[61.1]	[57.6]
<b>Permissible Shaft Load</b>		Fa=2000 [450]						
<b>max Axial**** N[lb]</b>		Fr=3600 [810]						
<b>max Radial**** N[lb]</b>		Fr=3600 [810]				Fr=3200 [720]		
<b>Min. Speed, [RPM]</b>		500						
<b>Max. Pressure in Drain Line, bar [PSI]</b>		5 [70] open drain line is always required						
<b>Weight, kg [lb]</b>		17.65 [38.9] for SAE-B flange; 19.8 [43.7] for SAE-4C flange						

Peak pressure is the highest allowable pressure, may occur for max. 1% of every minute;  
 \* Intermittent speed (flow): for pressure up to 150[2200] bar[PSI];  
 \*\* Intermittent load: the permissible values may occur for max. 10% of motor lifetime;  
 \*\*\* Theoretical torque;  
 \*\*\*\* The calculated max values are based on the optimal direction of the forces Fr, Fa and optimal position of the shaft.  
 \*\*\*\*\* The constant values are used for calculation of torque and speed with motor efficiencies  $\eta_v=0.95$  and  $\eta_{mh}=0.9$ .

1. The recommended output power for continuous operations should not be exceeded.
2. Recommended filtration as per ISO 4406 cleanliness code 18/16/13 or better. This filtration corresponds to SAE AS 4059 8A/7B/7C. Nominal filtration - 10 micron or better.
3. Recommended a premium quality, anti-wear type mineral based hydraulic oil, HLP(DIN51524) or HM(ISO6743/4).
4. Recommended oil viscosity - 12...68 cSt
5. Recommended maximum system operating temperature - 82°[180°] C[F].
6. To ensure optimum life of the motor, fill it up with fluid prior to load it and run with moderate load and speed for about 10-15 minutes.

**Hint: Motor Torque = Torque Constant \* Pressure Drop**

**Rotation Speed = Speed Constant \* Oil Flow**

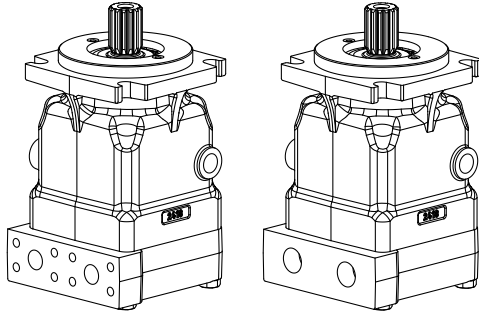
The constant values are approximate. Motor torque and rotation speed for a particular project are depending on the real operating conditions.



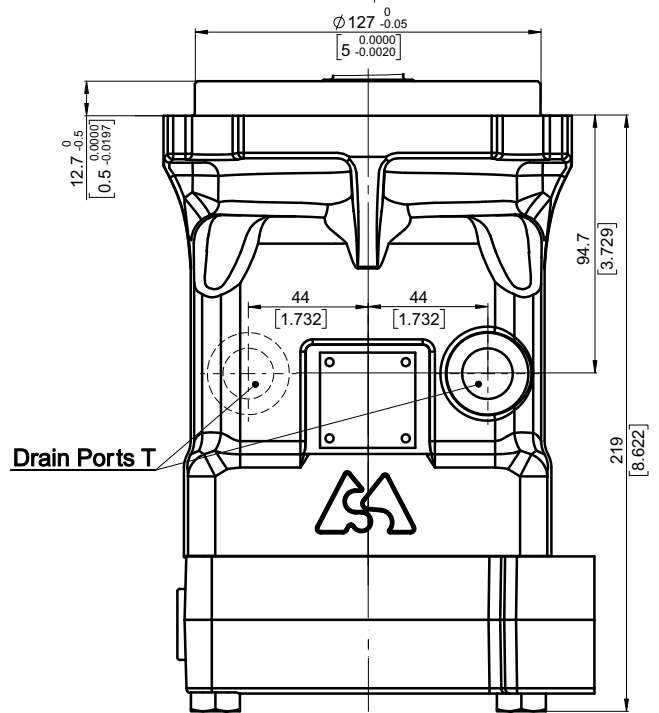
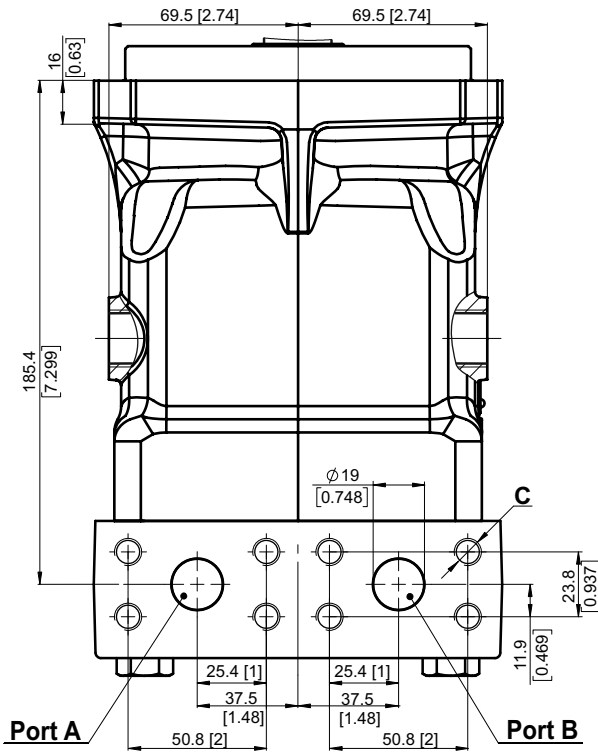
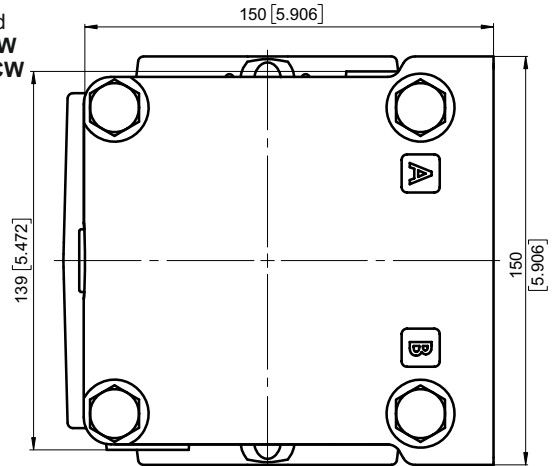
**OVERALL DIMENSIONS AND PORTS**

**Twin Ports - Type T Mounting Flange Type - 4C**

**Standard Rotation**  
Viewed from shaft end  
Port A Pressurized - CW  
Port B Pressurized - CCW



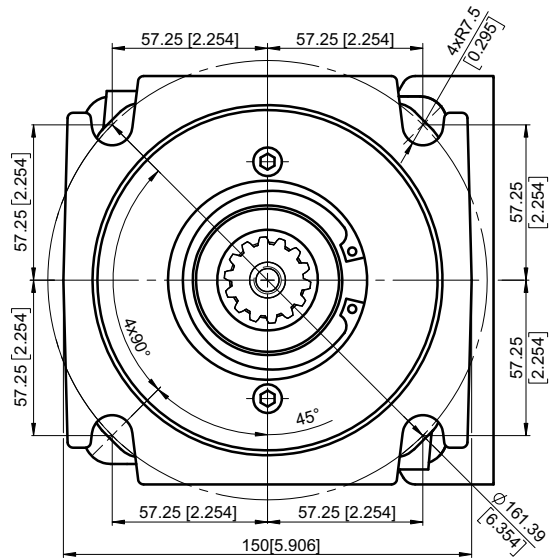
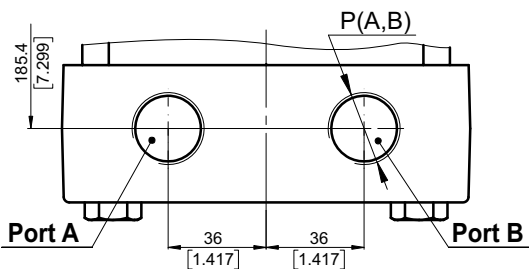
**Twin ports, port size default, 5 and 9**



Drain Ports T

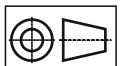
	Port Size		
	default	5	9
<b>P<sub>(A,B)</sub></b>	2xISO 6162-2 DN19	2xSAE J518 3/4" PSI6000	2xISO 6162-2 DN19
<b>T</b>	M18x1.5	7/8-14 UNF	G1/2
<b>C</b>	8xM10	8x3/8-16 UNC	8xM10

**Twin ports, port size 2,3,4,6,7 and 8**



	Port Size							
	2	3	4	6	7	8		
<b>P<sub>(A,B)</sub></b>	2xG 3/4	2xM27x2	2x1 1/16-12UN	2xG 1/2	2xM22x1.5	2x7/8-14UNF		
<b>T</b>	G 1/2	M18x1.5	7/8-14UNF	G 1/2	M18x1.5	3/4-16UNF		

Shaft Mounting see page 30

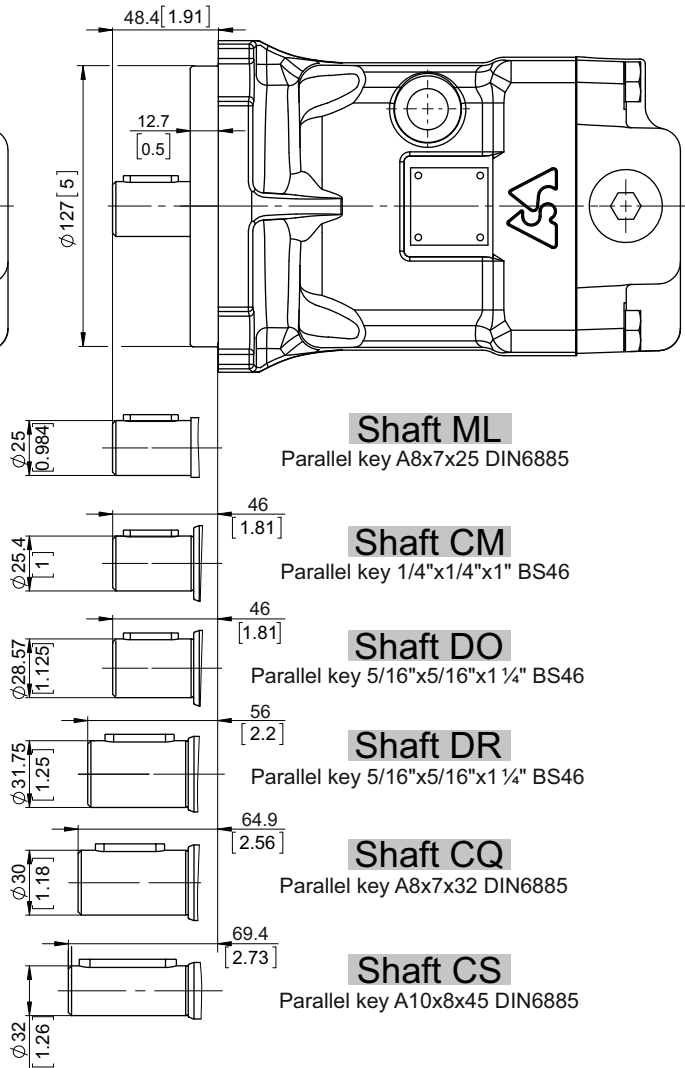
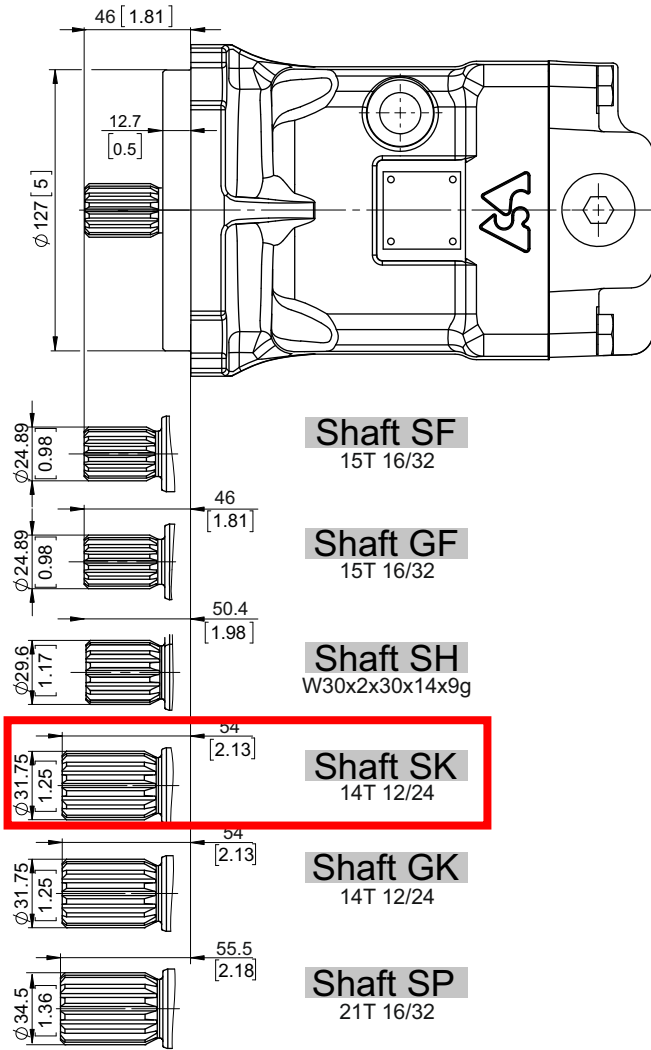


mm [in]



**SHAFTS MOUNTING**

**Mounting Flange - Type - 4C**

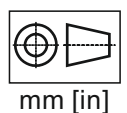


**PERMISSIBLE SHAFT LOAD**

Permissible shaft load		
max Axial	N[lb]	Fa=2000 [450]
max Radial	N[lb]	Fr=3200 [720]

The calculated max values are based on the optimal direction of the forces Fr, Fa and optimal position of the shaft

For more information, please, feel free to contact us.





**ORDERING CODE**

	1	2	3	4	5	6	7	8	9	10	11	12	13	13	13
<b>M A P</b>													[		]

**Pos.1 - Mounting Flange**

- B** - SAE B - 2-Bolt flange  
spigot diam. 101.6 [4"] - BC 146 [5.75"]
- 4C** - SAE C - 4-Bolt flange  
spigot diam. 127 [5"] - BC 161.92 [6.375"]

**Pos.2 - Port Type**

- omit - Side ports on opposite sides
- T** - Twin (Two) side ports on one side
- E** - Rear ports

**Pos.3 - Displacement Code**

- 35** - 36.16 cm<sup>3</sup>/rev [2.21 in<sup>3</sup>/rev]
- 40** - 41.59 cm<sup>3</sup>/rev [2.54 in<sup>3</sup>/rev]
- 46** - 47.13 cm<sup>3</sup>/rev [2.88 in<sup>3</sup>/rev]
- 50** - 49.94 cm<sup>3</sup>/rev [3.05 in<sup>3</sup>/rev]
- 52** - 51.95 cm<sup>3</sup>/rev [3.17 in<sup>3</sup>/rev]
- 58** - 58.8 cm<sup>3</sup>/rev [3.59 in<sup>3</sup>/rev]
- 62** - 62.4 cm<sup>3</sup>/rev [3.81 in<sup>3</sup>/rev]

**Pos.4 - Shaft Extensions\*\***

- SD** - ø21.72 [0.855"] Spline SAE 13T 16/32 DP, M8
  - GD** - ø21.72 [0.855"] Spline SAE 13T 16/32 DP,  
5/16-18 UNC thread
  - SF** - ø24.9 [0.98"] Spline SAE 15T 16/32, M8
  - GF** - ø24.9 [0.98"] Spline SAE 15T 16/32, 3/8-16UNC
  - SH** - ø29.6 [1.165"] Spline W30x2x30x14x9g,M10
  - SK** - ø31.75 [1.25"] Spline SAE 14T 12/24 DP, M10
  - GK** - ø31.75 [1.25"] Spline SAE 14T 12/24 DP,  
7/16-14UNC thread
  - SP** - ø34.5 [1.358"] Spline SAE 21T 16/32 DP, M12
  - CK** - ø22.2 [7/8"] Straight, M8 thread  
Parallel key 1/4"x1/4"x1" BS46
  - MK** - ø22.2 [7/8"] Straight, M8 thread  
Parallel key 1/4"x1/4"x1 1/2" BS46
  - ML** - ø25 [0.984"] Straight, M8 thread  
Parallel key A8x7x25 DIN6885
  - CM** - ø25.4 [1"] Straight, M8 thread  
Parallel key 1/4"x1/4"x1" BS46
  - DO** - ø28.75 [1.125"] Straight, 3/8-16UNC  
Parallel key 5/16"x5/16"x1 1/4" BS46
  - CQ** - ø30 [1.181"] Straight, M8 thread  
Parallel key A8x7x32 DIN6885
  - DR** - ø31.75 [1.25"] Straight, 3/8-16UNC  
Parallel key 5/16"x5/16"x1 1/4" BS46
  - CS** - ø32 [1.26"] Straight, M8 thread  
Parallel key A10x8x45 DIN6885
  - TD** - ø22.22 [7/8"] Tapered 1:8 [125:1000],  
Parallel key 1/4"x1/4"x1", 5/8-18 UNF
  - TH** - ø25.4 [1"] Tapered 1:8 [125:1000],  
Parallel key 1/4"x1/4"x1", 3/4-16 UNF
  - KH** - ø25.4 [1"] Tapered 1:8 [125:1000],  
Parallel key 1/4"x1/4"x1", M16x1.5
- Shaft type SP is available only for Pos.1 option 4C

**Pos.5 - Port Size**

- omit - 2xISO 6162-2 DN19, drain port M18x1.5
  - 2** - 2xG3/4, drain ports G1/2
  - 3** - 2xM27x2, drain ports M18x1.5
  - 4** - 2x1 1/16 -12 UN, drain ports 7/8-14 UNF
  - 5** - 2xSAE 3/4" PSI6000, drain port 7/8-14 UNF
  - 6** - 2xG1/2, drain ports G1/2
  - 7** - 2xM22x1.5, drain ports M18x1.5
  - 8** - 2x7/8-14 UNF Ports, drain ports 3/4-16 UNF
  - 9** - 2xISO 6162-2 DN19, drain port G1/2
- Option 6;7 and 8 are not available for Pos.2 option omit

**Pos.6 - Seal, Corrosion Resistant Seal Surface**

- omit - NBR seal type material
- V** - FKM seal type material

**Pos.7 - Integrated Valves**

- omit - None
- HR** - Single anti-cavitation valve
- AR** - Dual anti-cavitation valve
- PU** - Purge valve - default - 6±2 l/min
- FLU** - Flush valve - default - 6±2 l/min at 20 bar
- SAR** - Single anti-cavitation and relief valve
- DAR** - Dual anti-cavitation and relief valve
- DARP** - Dual anti-cavitation, relief and purge valve, default flow - 6±2 l/min
- DARF** - Dual anti-cavitation, relief and flush valve, default flow - 6±2 l/min at 20 bar

Option DAR,DARF,DARP,SAR, AR and HR are not available for Pos.2 option E  
Option DARF and DARP are not available for Pos.2 option omit

**Pos.8 - Valve's Port for Single Valves**

- omit - None
- A** - Port A
- B** - Port B

**Pos.9 - Pressure Setting of Integrated Valves**

- omit - None
- x** - 250 300 **350**

**Pos.10 - Flow Setting of Integrated Valves**

- omit - None
- Lx** - For value

**Pos.11 - Special Features\***

- omit - None
- R2S** - Speed Sensor Two Directional
- R** - Reverse Rotation

**Pos.12 - Paint and Coating**

- omit - No paint or coating
- P** - Painted
- PC** - Corrosion protected paint

If a painting option is required, the standard color is black-Alkyd-Styrenated Enamel, Black RAL 9005.  
Other color by customer's request.

**Pos.13 - Design Series**

- omit - Factory specified
- \*\*The permissible output torque for shafts must not be exceeded!

**EXAMPLE**

