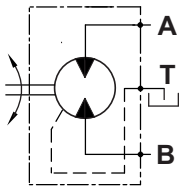
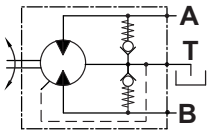
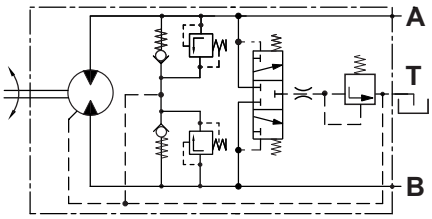
HIDRĀULICA ROGIMAR

Hydraulic Motors Type MAP62

Heavy Duty Axial Piston Motors Fixed Displacement







open drain line is always required

APPLICATION

- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industry machines
- » Swing drives
- » Hydraulic transmissions
- » Vibration machines
- » Fan drives
- » Special vehicles

OPTIONS

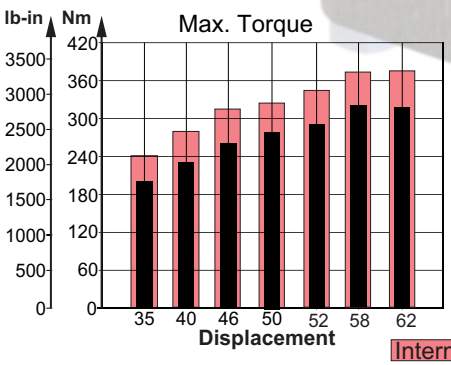
- » Port options
- » Shaft options
- » High pressure ports
- » Integrated valves

ADVANTAGES

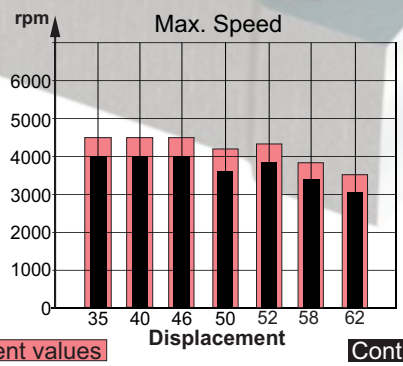
- » High starting torque
- » Smooth operation
- » Long service life
- » High power density

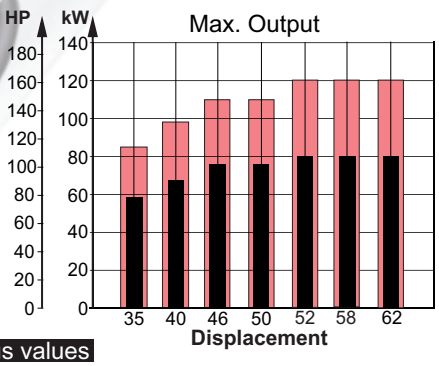
GENERAL

Displacement,	cm^3/rev [in^3/rev]	**36.16÷62.4 [2.21÷3.81]**
Max. Speed,	RPM	**4000**
Max. Torque,	Nm [lb-in]	**320 [2832]**
Max. Output,	kW [HP]	**80 [107]**
Max. Pressure Drop,	bar [PSI]	**350 [5080]**
Max. Oil Flow,	l/min [GPM]	**200 [52.8]**
Min. Speed,	RPM	**500**
Fluid		**Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)**
Temperature Range,	°C [°F]	**-40÷82 [-40÷180]**
Optimal Viscosity Range,	mm^2/s [SUS]	**12÷68 [66÷311]**
Filtration		**ISO code 18/16/13 (Min. recommended fluid filtration of 10 micron)**



Intermittent values





Continuous values

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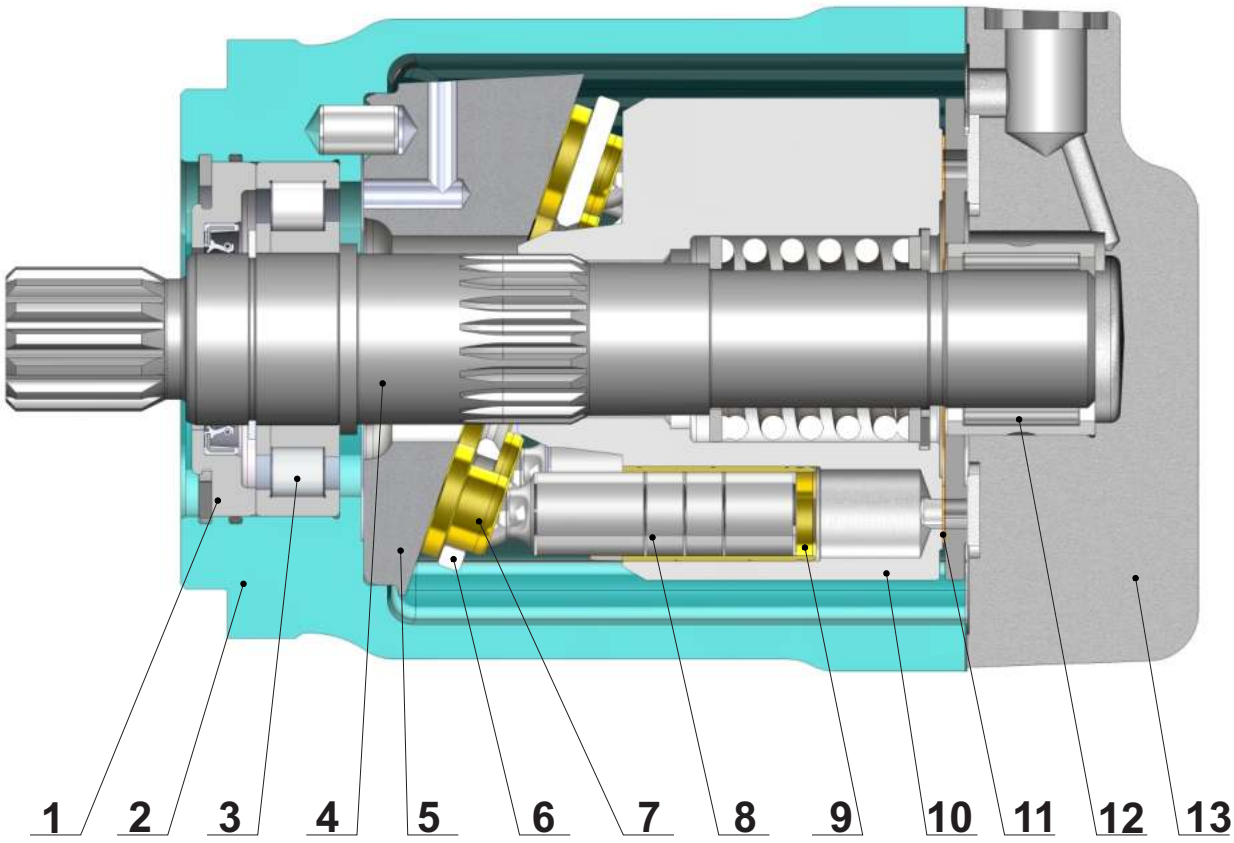
SECTION VIEW



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.

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SPECIFICATION DATA

Type		MAP 35	MAP 40	MAP 46	MAP 50	MAP 52	MAP 58	MAP 62
Displacement, cm³/rev [in³/rev]		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]
Max. Speed, [RPM]	Cont.	4000	4000	4000	3600	3850	3398	3050
	Int.*	4500	4500	4500	4200	4330	3823	3500
Max. Torque,*** Nm [lb-in]	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]
Output, kW [HP]	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]
Max. Pressure, bar [PSI]	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]
Max. Oil Flow, l/min [GPM]	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]
Torque Constant ***** Nm/bar [lb-in/PSI]		0.52 [0.32]	0.6 [0.364]	0.68 [0.41]	0.72 [0.437]	0.75 [0.454]	0.85 [0.515]	0.9 [0.546]
Speed Constant ***** RPM/(l/min) [RPM/GPM]		26.3 [99.4]	22.84 [86.5]	20.2 [76.3]	19.02 [72]	18.28 [70.2]	16.13 [61.1]	15.23 [57.6]
Permissible Shaft Load max Axial**** N[lb]		Fa=2000 [450]						
max Radial**** N[lb]		Fr=3600 [810]				Fr=3200 [720]		
Min. Speed, [RPM]		500						
Max. Pressure in Drain Line, bar [PSI]		5 [70] open drain line is always required						
Weight, kg [lb]		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 η =0.95 and η mh=0.9.v

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 or see page 84.
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. For more detailed calculations please see efficiencies on page 74 and formulas on page 85.

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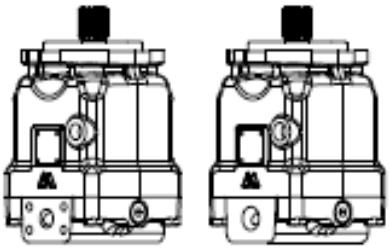
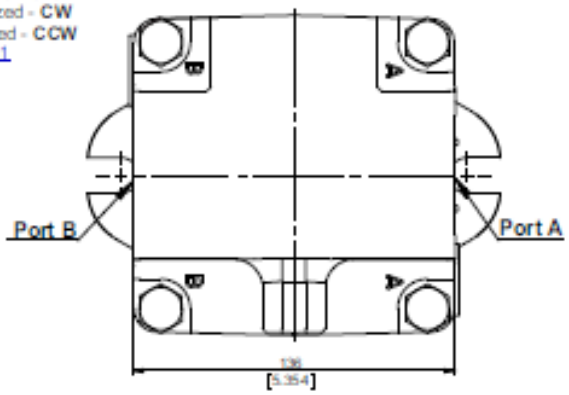
OVERALL DIMENSIONS AND PORTS

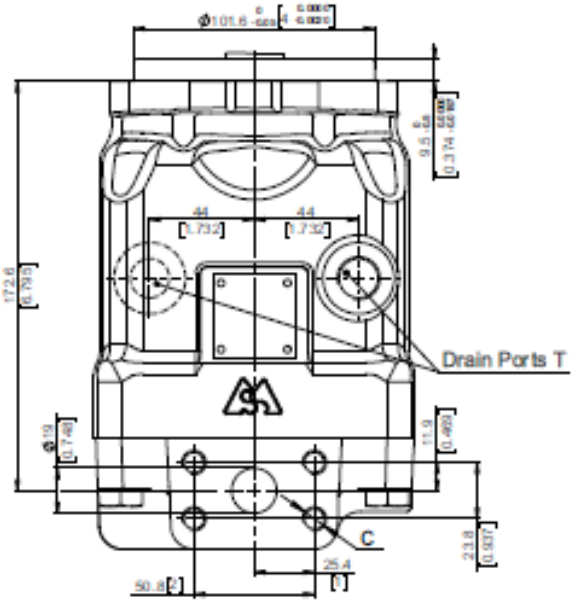
Side Ports - **Default** Mounting Flange - Type **SAE-B**

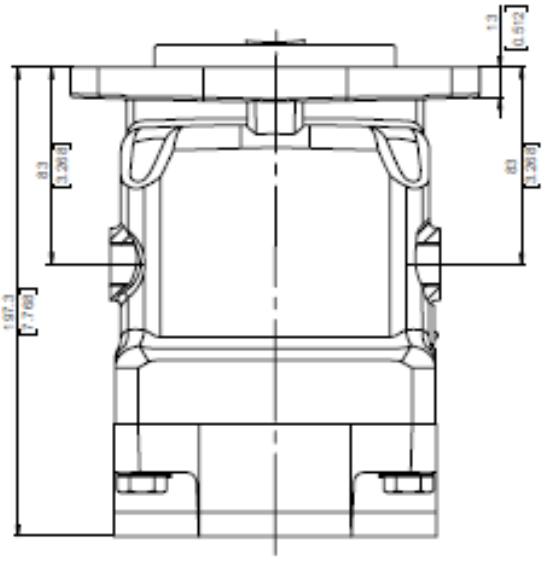
Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81





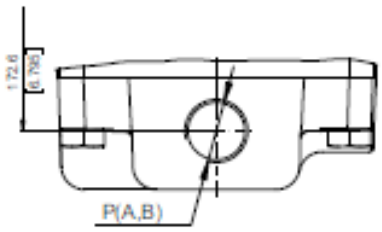
Side ports, port size **default, 5** and **9**

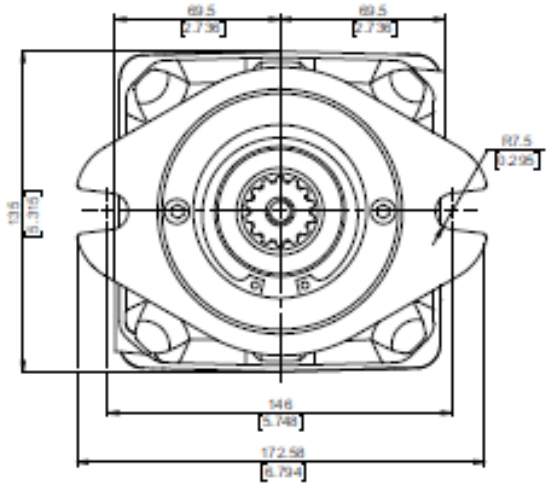




	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN19	2xSAE J518 3/4" PSI6000	2xISO 6162-2 DN19
T	M18x1.5	7/8-14 UNF	G1/2
C	8xM10	8x3/8-16 UNC	8xM10

Side ports, port size **2, 3** and **4**





	Port Size		
	2	3	4
$P_{A,B}$	2xG 3/4	2xM27x2	2x1 5/16-12UN
T	G 1/2	M18x1.5	7/8-14UNF

Shaft Mounting
see page 28

mm [in]

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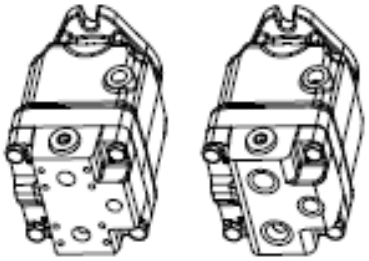
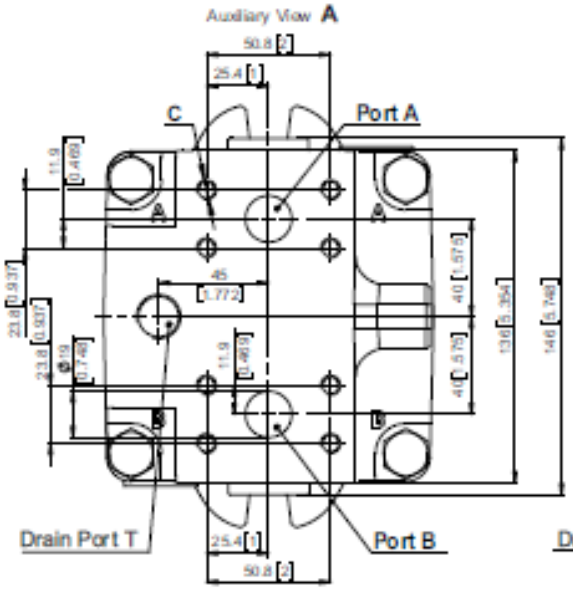
OVERALL DIMENSIONS AND PORTS

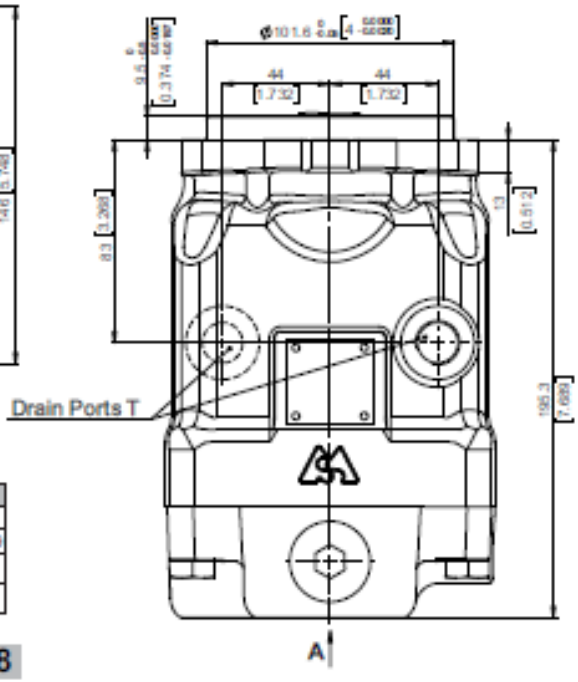
Rear Ports - Type **E** Mounting Flange - Type **SAE-B**

Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** - **CCW**
see page 81



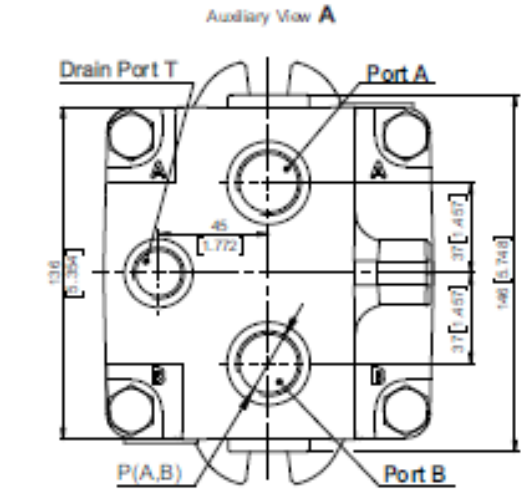
Rear ports **E**, port size **default**, **5** and **9**

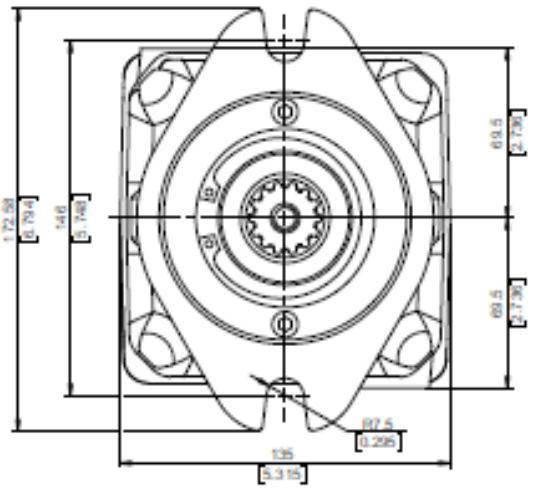




	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN19	2xSAE J518 3/4"PSI6000	2xISO 6162-2 DN19
T	M18x1.5	7/8-14 UNF	G1/2
C	8xM10	8x3/8-16 UNC	8xM10

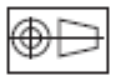
Rear ports **E**, port size **2**,**3**,**4**,**6**,**7** and **8**





	Port Size					
	2	3	4	6	7	8
$P_{A,B}$	2xG 3/4	2xM27x2	2x1 1/16-12 UN	2xG 1/2	2xM22x1.5	2x7/8-14 UNF
T	G 1/2	M18x1.5	7/8-14 UNF	G 1/2	M18x1.5	3/4-16 UNF

Shaft Mounting
see page 26



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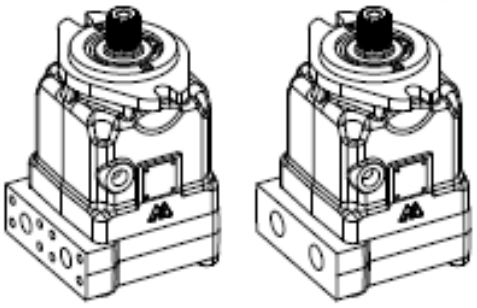
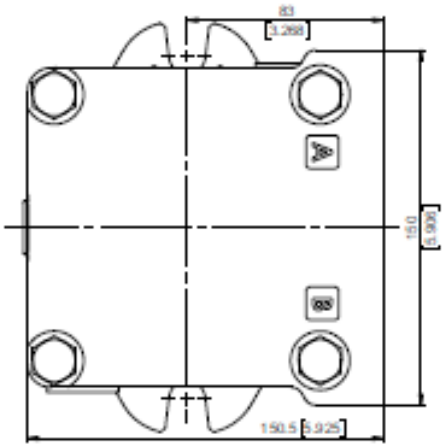
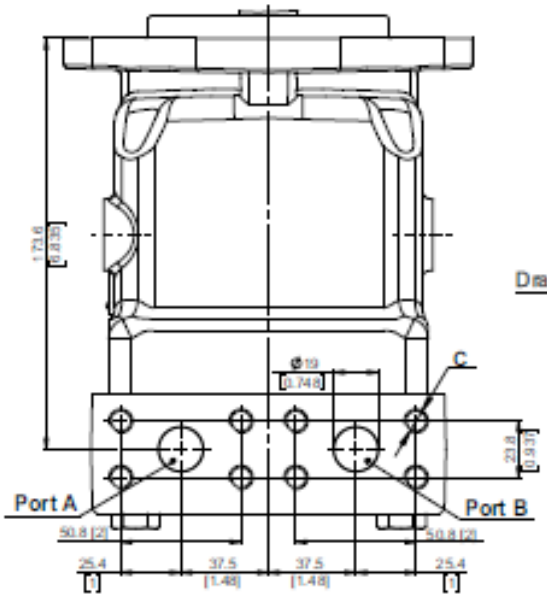
OVERALL DIMENSIONS AND PORTS

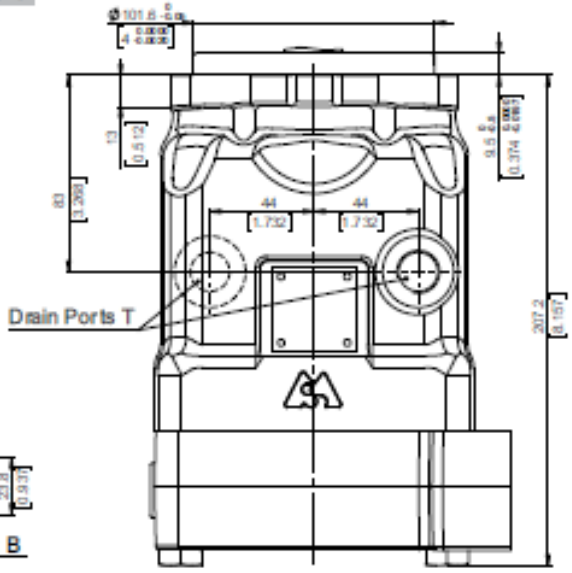
Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81





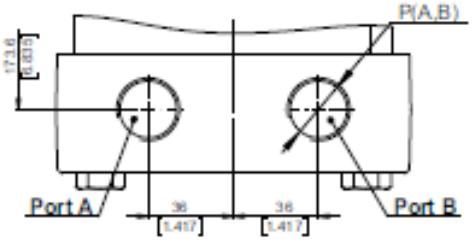
Twin side ports, port size default, 5 and 9

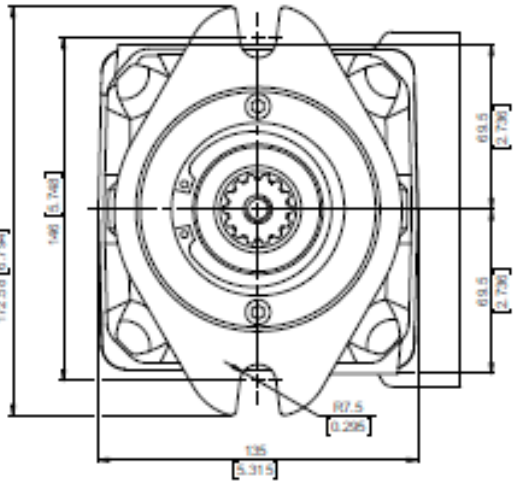




	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN19	2xSAE J518 3/4" PSI6000	2xISO 6162-2 DN19
T	M18x1.5	7/8-14 UNF	G1/2
C	8xM10	8x3/8-16 UNC	8xM10

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





	Port Size					
	2	3	4	6	7	8
$P_{A,B}$	2xG 3/4	2xM27x2	2x1 1/16-12UN	2xG 1/2	2xM22x1.5	2x7/8-14 UNF
T	G 1/2	M18x1.5	7/8-14UNF	G 1/2	M18x1.5	3/4-16 UNF

Shaft Mounting
see next page

mm [in]

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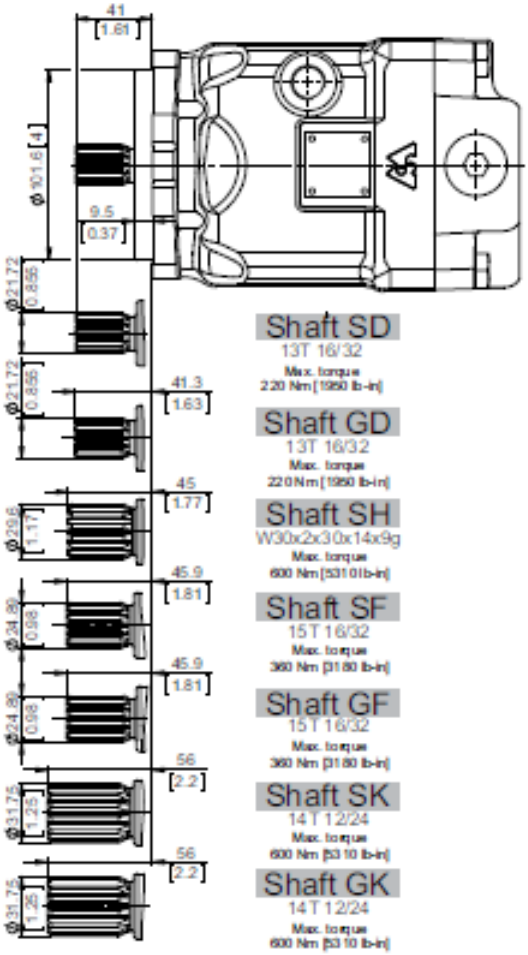
SHAFTS MOUNTING

Mounting Flange - Type **SAE-B**



Shaft SD
13T 16/32
Max. torque
220 Nm [1950 lb-in]

Shaft GD
13T 16/32
Max. torque
220 Nm [1950 lb-in]

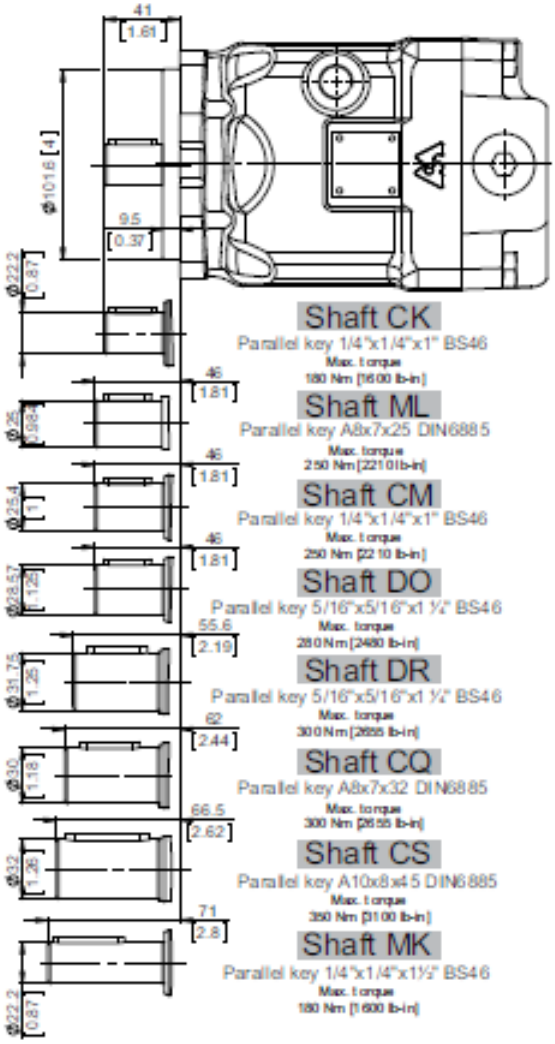
Shaft SH
W30x2x30x14x9g
Max. torque
600 Nm [5310 lb-in]

Shaft SF
15T 16/32
Max. torque
360 Nm [3180 lb-in]

Shaft GF
15T 16/32
Max. torque
360 Nm [3180 lb-in]

Shaft SK
14T 12/24
Max. torque
600 Nm [5310 lb-in]

Shaft GK
14T 12/24
Max. torque
600 Nm [5310 lb-in]



Shaft CK
Parallel key 1/4"x1/4"x1" BS46
Max. torque
180 Nm [1600 lb-in]

Shaft ML
Parallel key A8x7x25 DIN6885
Max. torque
250 Nm [2210 lb-in]

Shaft CM
Parallel key 1/4"x1/4"x1" BS46
Max. torque
250 Nm [2210 lb-in]

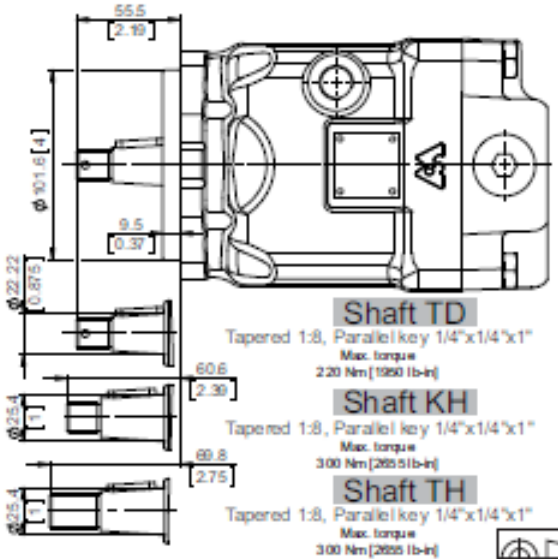
Shaft DO
Parallel key 5/16"x5/16"x1 ½" BS46
Max. torque
280 Nm [2480 lb-in]

Shaft DR
Parallel key 5/16"x5/16"x1 ½" BS46
Max. torque
300 Nm [2655 lb-in]

Shaft CQ
Parallel key A8x7x32 DIN6885
Max. torque
300 Nm [2655 lb-in]

Shaft CS
Parallel key A10x8x45 DIN6885
Max. torque
350 Nm [3100 lb-in]

Shaft MK
Parallel key 1/4"x1/4"x1½" BS46
Max. torque
180 Nm [1600 lb-in]



Shaft TD
Tapered 1:8, Parallel key 1/4"x1/4"x1"
Max. torque
220 Nm [1950 lb-in]

Shaft KH
Tapered 1:8, Parallel key 1/4"x1/4"x1"
Max. torque
300 Nm [2655 lb-in]

Shaft TH
Tapered 1:8, Parallel key 1/4"x1/4"x1"
Max. torque
300 Nm [2655 lb-in]

Shaft Dimensions
See Page 69+73

PERMISSIBLE SHAFT LOAD

Permissible shaft load		
max Axial	N[lb]	Fa=2000 [450]
max Radial	N[lb]	Fr=3600 [810]

The calculated max values are based on the optimal direction of the forces Fr, Fa and optimal position of the shaft (see page 81).

mm [in]

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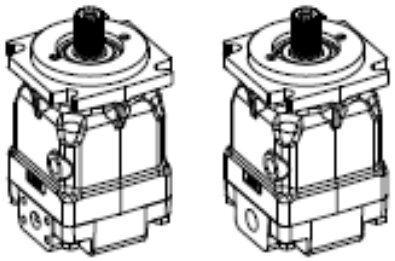
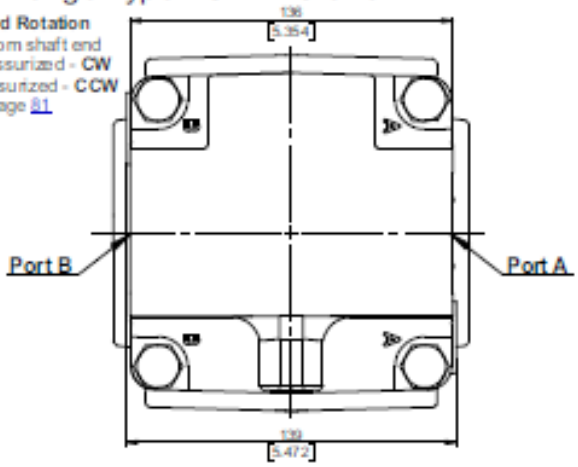
OVERALL DIMENSIONS AND PORTS

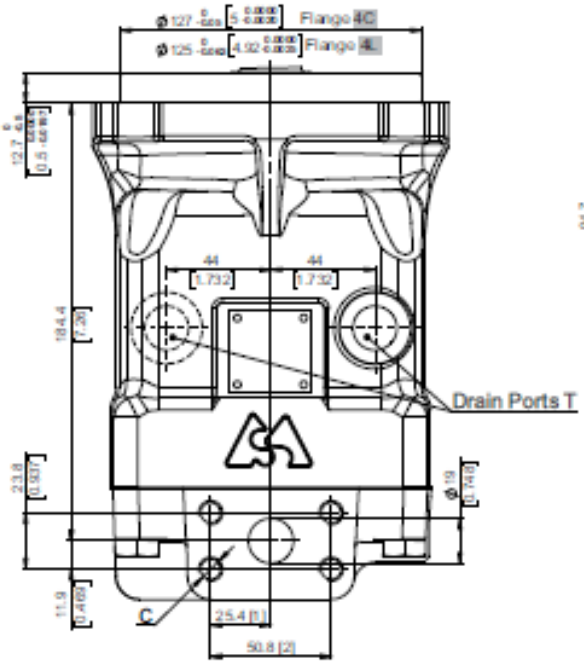
Side Ports - **Default** Mounting Flange Type - **SAE 4C and 4L**

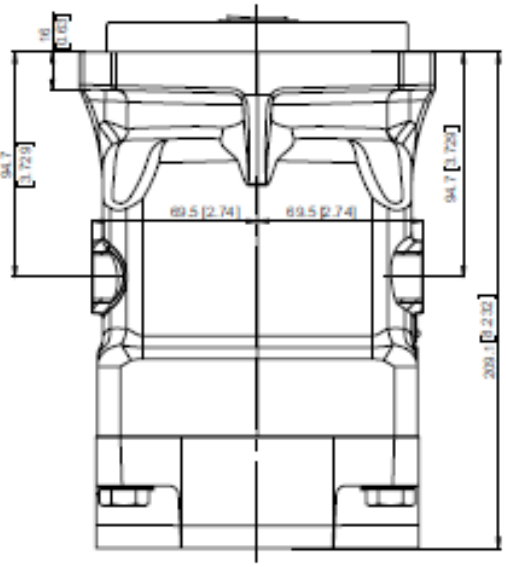
Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81



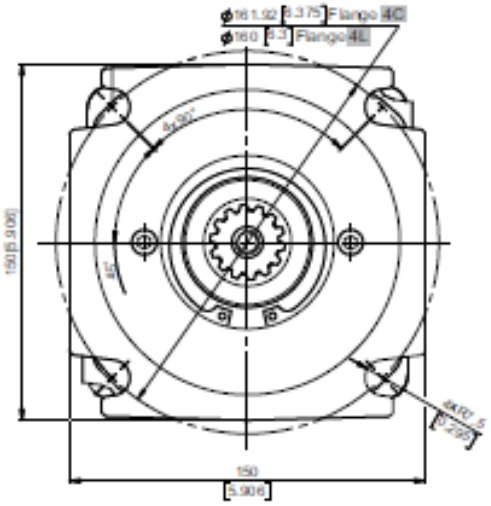


Side ports, port size **default, 5** and **9**

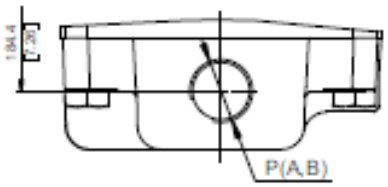




	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN19	2xSAE J518 3/4" PSI6000	2xISO 6162-2 DN19
T	M18x1.5	7/8-14 UNF	G1/2
C	8xM10	8x3/8-16 UNC	8xM10



Side ports, port size **2,3** and **4**



	Port Size		
	2	3	4
$P_{A,B}$	2xG 3/4	2xM27x2	2x1 1/16-12 UN
T	G 1/2	M18x1.5	7/8-14UNF

Shaft Mounting
see page 30

mm [in]

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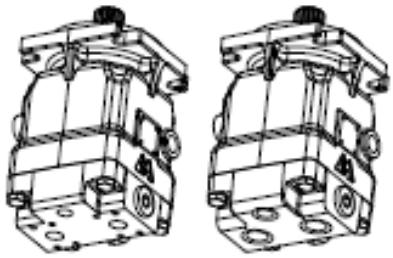
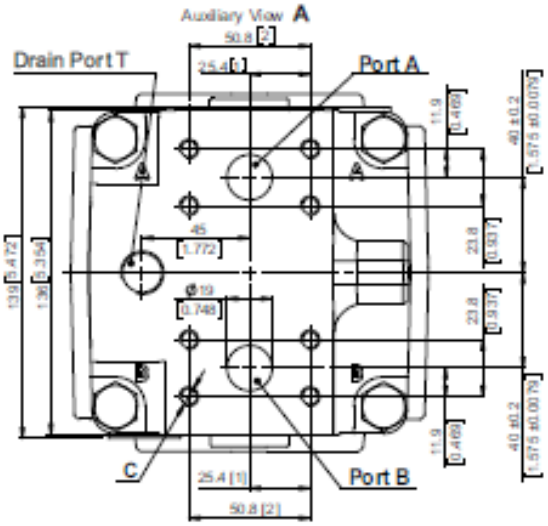
OVERALL DIMENSIONS AND PORTS

Rear Ports - Type **E** Mounting Flange Type - **SAE 4C and 4L**

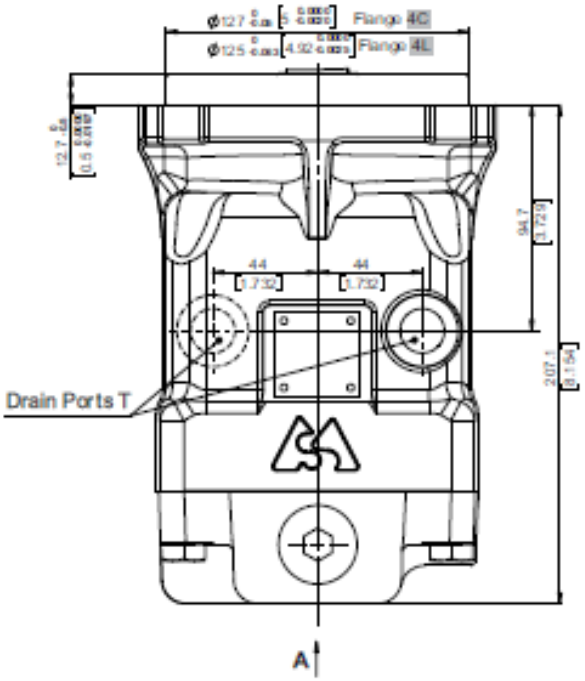
Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81



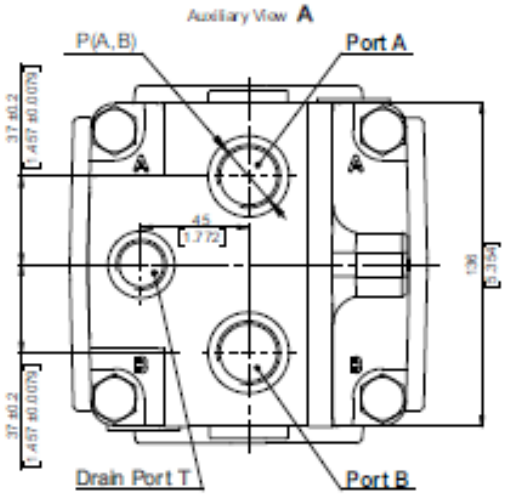
Rear ports, port size **default, 5** and **9**



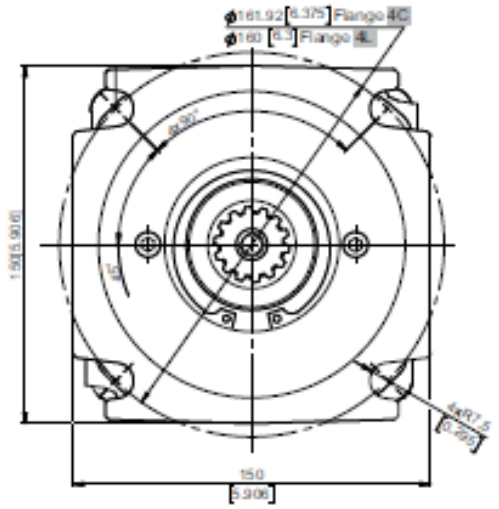
	Port Size		
	default	5	9
$P_{(A,B)}$	2xISO 6162-2 DN19	2xSAE J518 3/4" PSI6000	2xISO 6162-2 DN19
T	M18x1.5	7/8-14 UNF	G1/2
C	8xM10	8x3/8-16 UNC	8xM10



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



	Port Size					
	2	3	4	6	7	8
$P_{(A,B)}$	2xG 3/4	2xM27x2	2x1 5/16"-12UN	2xG 1/2	2xM22x1.5	2x7/8-14UNF
T	G 1/2	M18x1.5	7/8-14UNF	G 1/2	M18x1.5	3/4-16UNF



Shaft Mounting
see page 30

mm [in]

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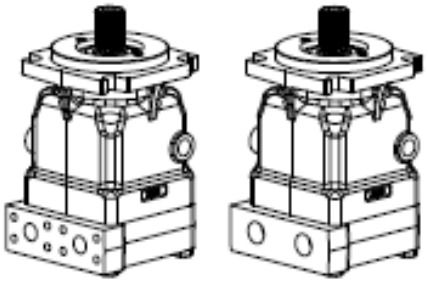
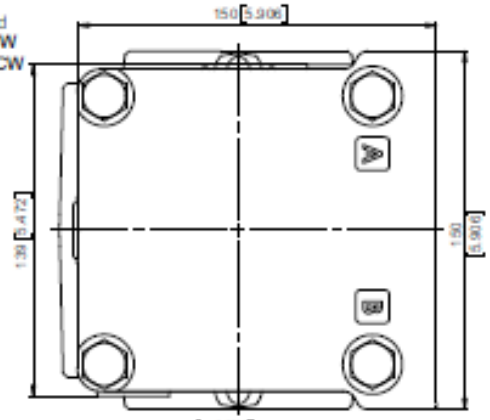
OVERALL DIMENSIONS AND PORTS

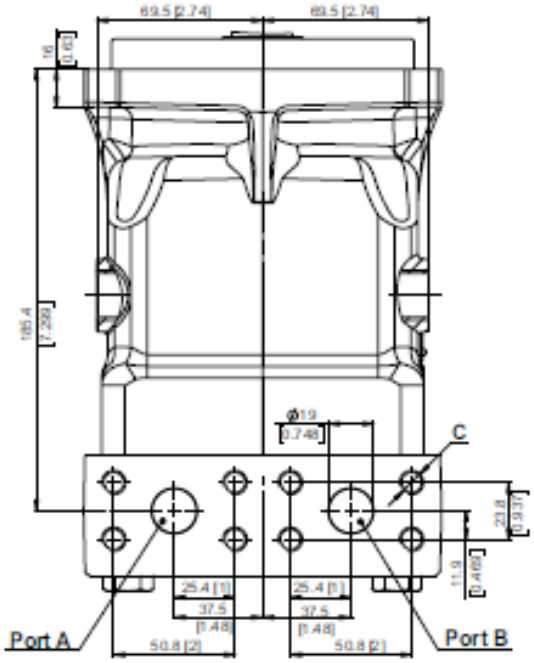
Twin Ports - Type **T** Mounting Flange Type **- SAE 4C and 4L**

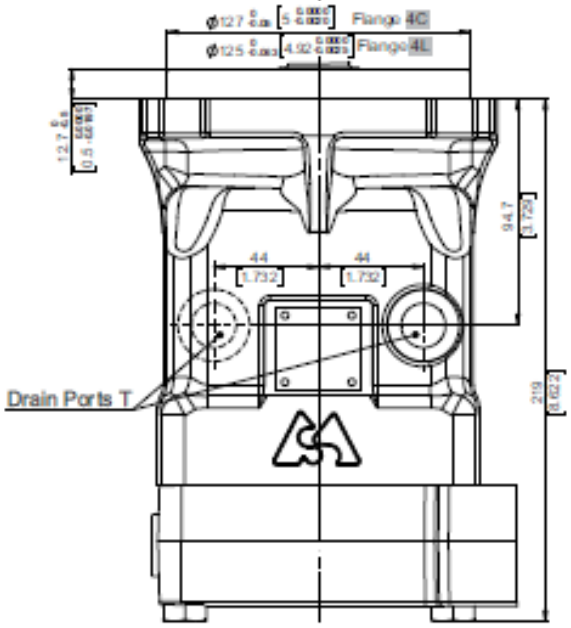
Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81





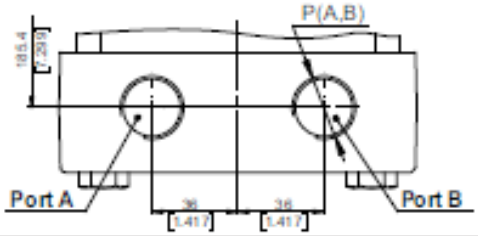
Twin ports, port size **default, 5** and **9**



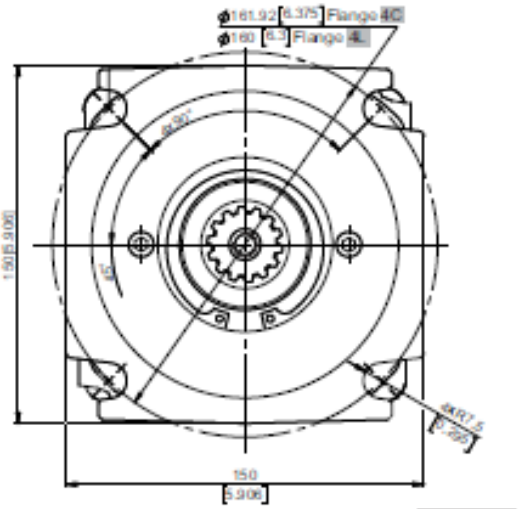


	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN19	2xSAE J518 3/4" PSI6000	2xISO 6162-2 DN19
T	M18x1.5	7/8-14 UNF	G1/2
C	8xM10	8x3/8-16 UNC	8xM10

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



	Port Size					
	2	3	4	6	7	8
$P_{A,B}$	2xG 3/4	2xM27x2	2x1 5/16-12UN	2xG 1/2	2xM22x1.5	2x7/8-14UNF
T	G 1/2	M18x1.5	7/8-14 UNF	G 1/2	M18x1.5	3/4-16UNF



Shaft Mounting
see page 30

mm [in]

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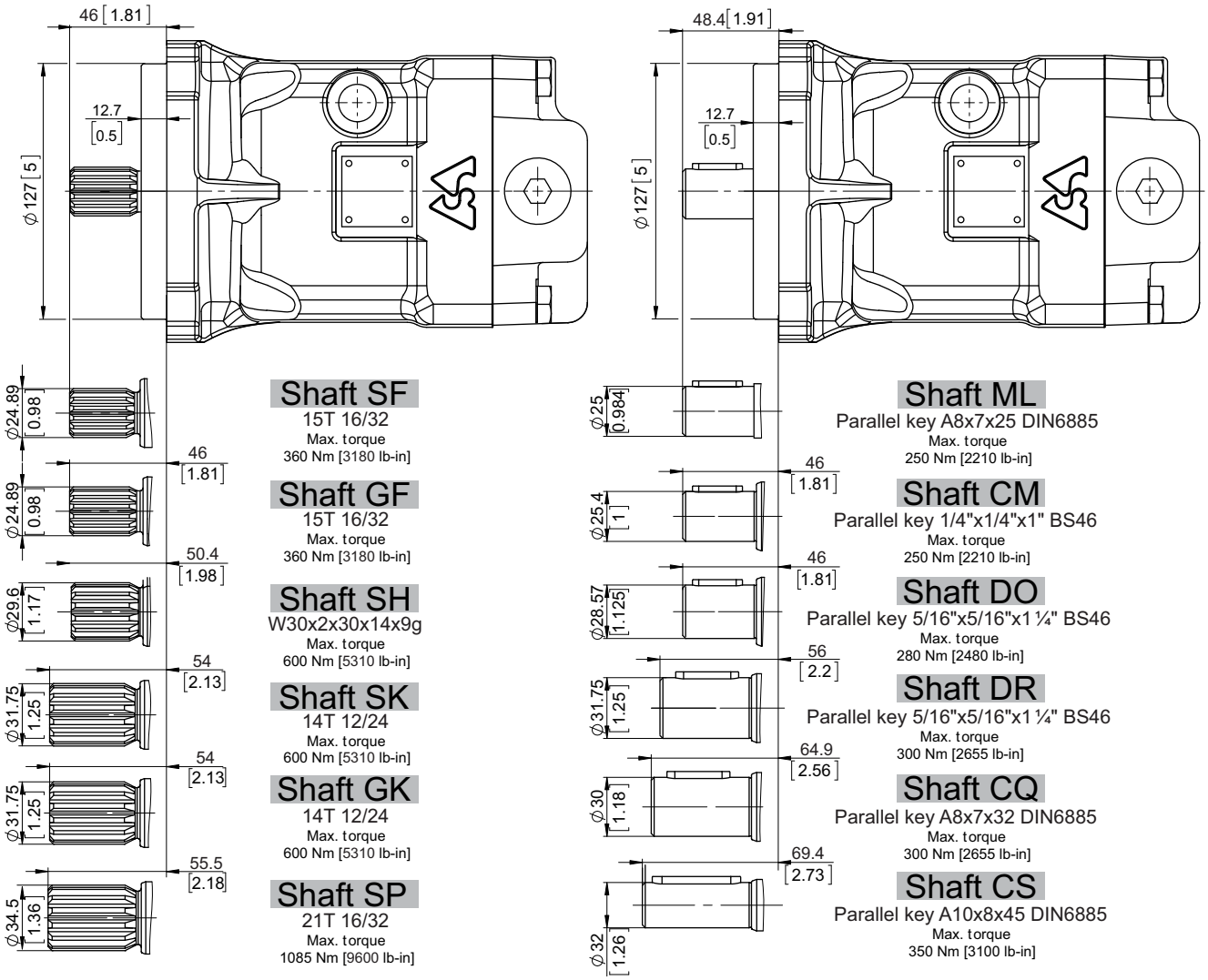
SHAFTS MOUNTING

Mounting Flange - Type - **SAE 4C and 4L**



Shaft SF
15T 16/32
Max. torque
360 Nm [3180 lb-in]

Shaft GF
15T 16/32
Max. torque
360 Nm [3180 lb-in]

Shaft SH
W30x2x30x14x9g
Max. torque
600 Nm [5310 lb-in]

Shaft SK
14T 12/24
Max. torque
600 Nm [5310 lb-in]

Shaft GK
14T 12/24
Max. torque
600 Nm [5310 lb-in]

Shaft SP
21T 16/32
Max. torque
1085 Nm [9600 lb-in]

Shaft ML
Parallel key A8x7x25 DIN6885
Max. torque
250 Nm [2210 lb-in]

Shaft CM
Parallel key 1/4"x1/4"x1" BS46
Max. torque
250 Nm [2210 lb-in]

Shaft DO
Parallel key 5/16"x5/16"x1 ¼" BS46
Max. torque
280 Nm [2480 lb-in]

Shaft DR
Parallel key 5/16"x5/16"x1 ¼" BS46
Max. torque
300 Nm [2655 lb-in]

Shaft CQ
Parallel key A8x7x32 DIN6885
Max. torque
300 Nm [2655 lb-in]

Shaft CS
Parallel key A10x8x45 DIN6885
Max. torque
350 Nm [3100 lb-in]

Shaft Dimensions
See Page 69÷73

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 (see page 81).

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

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ORDERING CODE

	1	2	3	4	5	6	7	8	9	10	11	12	13	13	13
MAP													[		]

Pos.1 - Mounting Flange

- **B** - SAE B - 2-Bolt flange spigot diam.101.6 [4"] - BC 146 [5.75"]
- **4L** - 4-Bolt flange spigot diam.125 [4.92"] - BC 160 [6.3"]
- **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 cm³/rev [2.21 in³/rev]
- **40** - 41.59 cm³/rev [2.54 in³/rev]
- **46** - 47.13 cm³/rev [2.88 in³/rev]
- **50** - 49.94 cm³/rev [3.05 in³/rev]
- **52** - 51.95 cm³/rev [3.17 in³/rev]
- **58** - 58.8 cm³/rev [3.59 in³/rev]
- **62** - 62.4 cm³/rev [3.81 in³/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"x1½" 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"x1¼" 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"x1¼" 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 and 4L

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

See page 77÷78 for information about 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

for more information see page 77÷78

Pos.10 - Flow Setting of Integrated Valves

- omit - None
- **Lx** - For value - see page 77÷78

Pos.11 - Special Features*

- omit - None
- **R2S** - Speed Sensor Two Directional (see page 79)
- **R** - Reverse Rotation (see page 81)

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

MAPBE40GD4P

MAP	B	E	40	GD	4						P	[		]
Flange B	Rear Ports	Disp. 40cc	Shaft GD	Port size 4	Painted									

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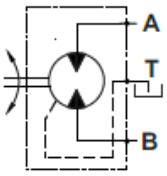
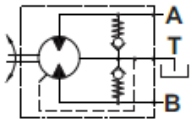
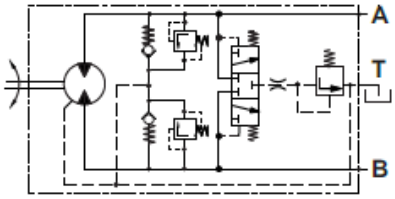
Hydraulic Motors Type MAP100

Heavy Duty Axial Piston Motors Fixed Displacement







open drain line is always required

APPLICATION

- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industry machines
- » Swing drives
- » Hydraulic transmissions
- » Vibration machines
- » Fan drives
- » Special vehicles

OPTIONS

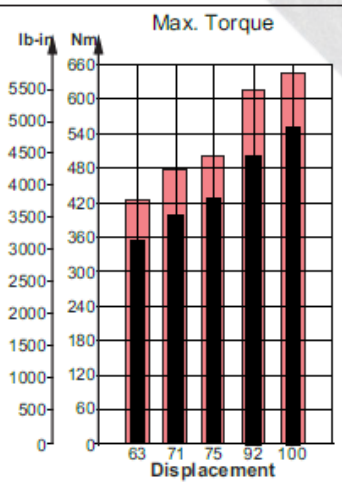
- » Flange options
- » Port options
- » Shaft options
- » High pressure ports
- » Integrated valves

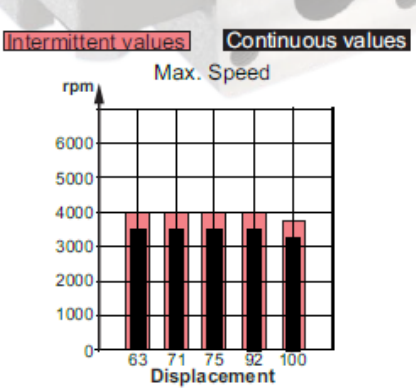
ADVANTAGES

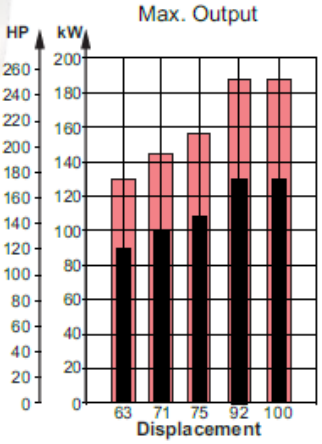
- » High starting torque
- » Smooth operation
- » Long service life
- » High power density

GENERAL

Displacement,	cm^3/rev [in^3/rev]	**63.58÷98.75 [3.88÷6.03]**
Max. Speed,	RPM	**3500**
Max. Torque,	Nm [lb-in]	**550 [4870]**
Max. Output,	kW [HP]	**130 [174]**
Max. Pressure Drop,	bar [PSI]	**350 [5080]**
Max. Oil Flow,	l/min [GPM]	**326 [86.1]**
Min. Speed,	RPM	**500**
Fluid		**Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)**
Temperature Range,	°C [°F]	**-40÷82 [-40÷180]**
Optimal Viscosity Range,	mm^2/s [SUS]	**12÷68 [66÷311]**
Filtration		**ISO code 18/16/13 (Min. recommended fluid filtration of 10 micron)**







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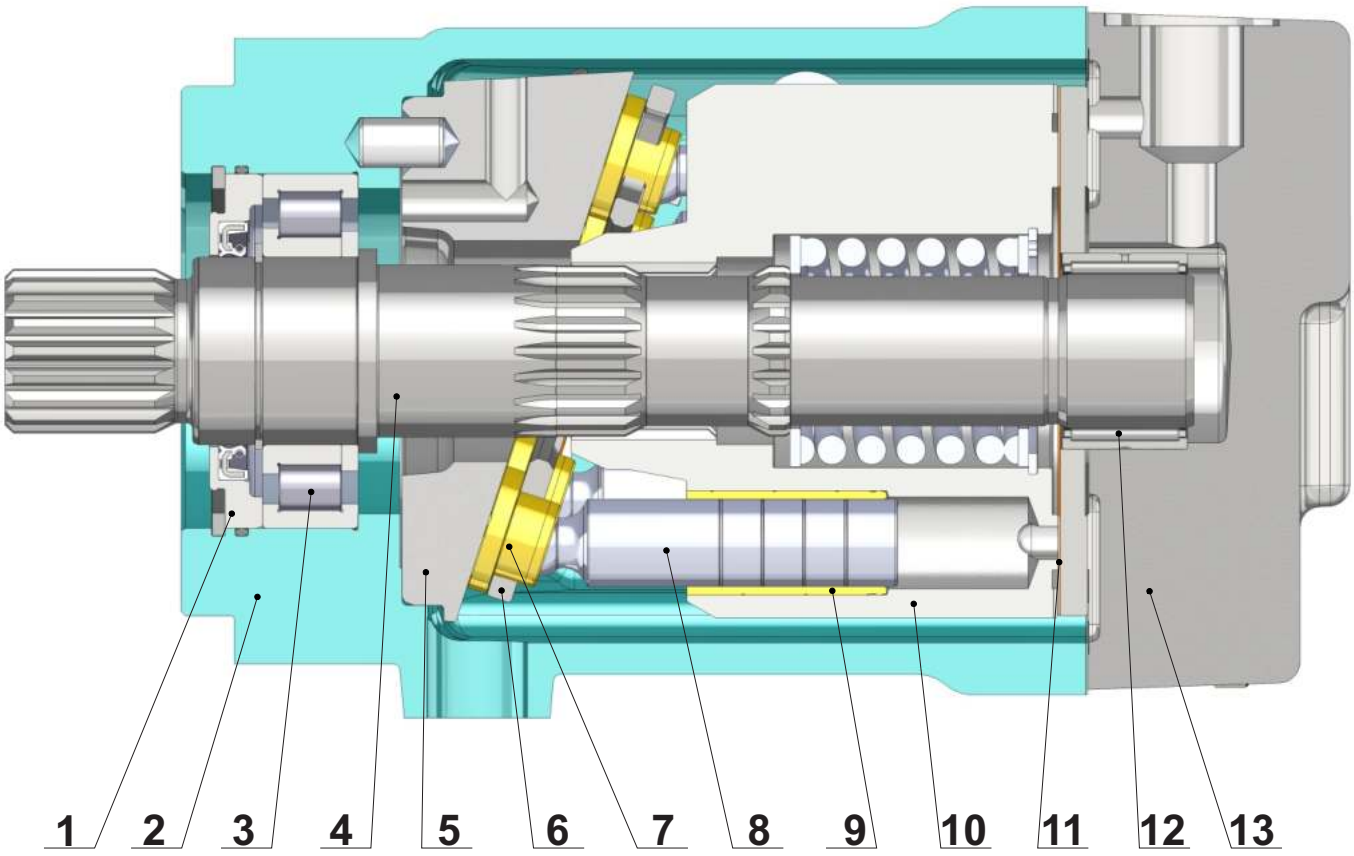
SECTION VIEW



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.

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SPECIFICATION DATA

Type		MAP 63	MAP 71	MAP 75	MAP 92	MAP 100
Displacement, cm³/rev [in³/rev]		63.58 [3.88]	71.5 [4.36]	76.84 [4.69]	93.18 [5.69]	98.75 [6.03]
Max. Speed, [RPM]	Cont.	3500	3500	3500	3500	3240
	Int.*	4000	4000	4000	4000	3750
Max. Torque,*** Nm [lb-in]	Cont.	354 [3133]	398 [3523]	428 [3788]	514 [4549]	550 [4870]
	Int.**	425 [3762]	478 [4230]	514 [4549]	616 [5452]	645 [5710]
Output, kW [HP]	Cont.	89 [120]	100 [134]	108 [145]	130 [174]	130 [174]
	Int.**	129 [173]	145 [195]	156 [209]	188 [252]	188 [252]
Max. Pressure, bar [PSI]	Cont.	350 [5080]	350 [5080]	350 [5080]	350 [5080]	350 [5080]
	Int.**	420 [6100]	420 [6100]	420 [6100]	420 [6100]	410 [5950]
	Peak	450 [6527]	450 [6527]	450 [6527]	450 [6527]	450 [6527]
Max. Oil Flow, l/min [GPM]	Cont.	223 [58.9]	250 [66]	269 [71.1]	326 [86.1]	320 [84.5]
	Int.*	255 [67.4]	286 [75.6]	308 [81.4]	373 [98.5]	370 [97.7]
Torque Constant ***** Nm/bar [lb-in/PSI]		0.91 [0.56]	1.03 [0.63]	1.1 [0.67]	1.32 [0.81]	1.42 [0.87]
Speed Constants ***** RPM/(l/min) [RPM/GPM]		14.94 [56.56]	13.3 [50.3]	12.36 [46.8]	10.2 [38.6]	9.62 [36.42]
Permissible Shaft Load max Axial**** N[lb]		Fa=2500 [562]				
max Radial**** N[lb]		Fr=4500 [1010]				
Min. Speed, [RPM]		500				
Max. Pressure in Drain Line, bar [PSI]		5 [70] open drain line is always required				
Weight, kg [lb]		34.3 [75.62] for SAE-**4C** flange; 35.3 [77.82] for SAE-**4M** 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 η_v=0.95 and η_{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 or see page 84.
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. For more detailed calculations please see efficiencies on page 74 and formulas on page 85.

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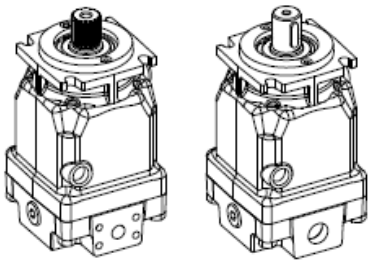
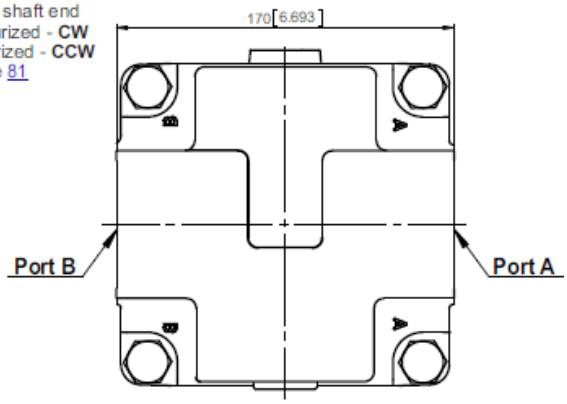
OVERALL DIMENSIONS AND PORTS

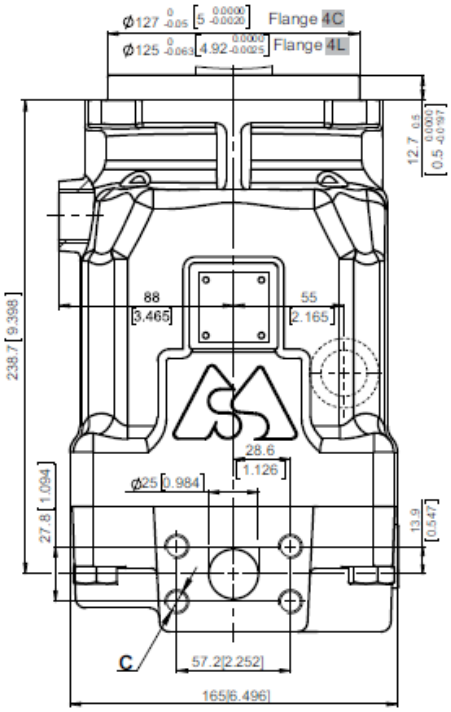
Side Ports - **Default** Mounting Flange - Type **SAE 4C and 4L**

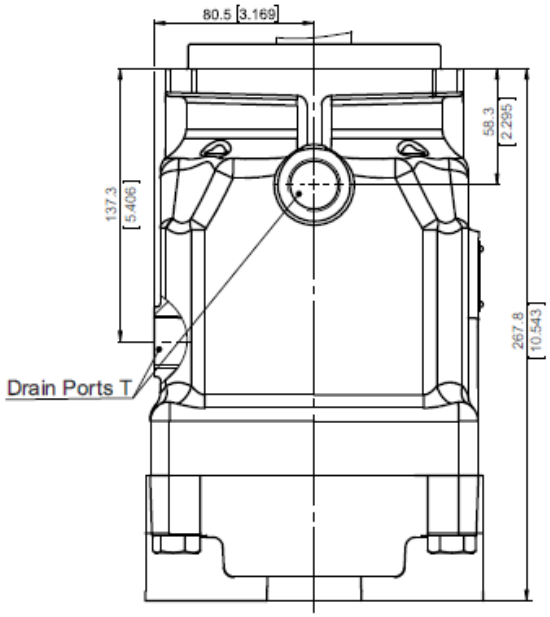
Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81



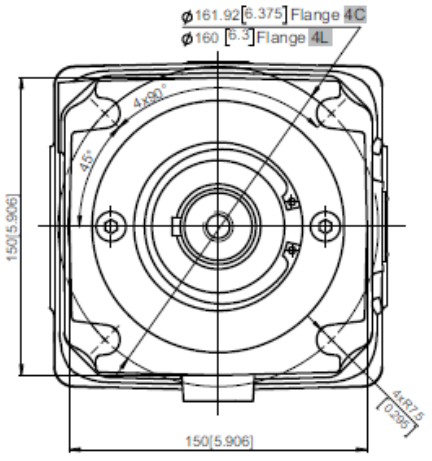


Side ports, port size **default**,**5** and **9**

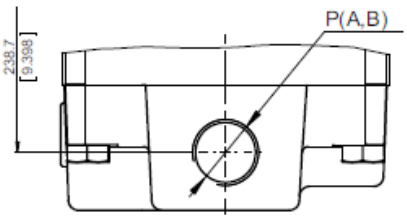




	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN25	2xSAE J518 1" PSI6000	2xISO 6162-2 DN25
T	M27x2	1 5/16 -12 UN	G 3/4
C	8xM12	8x7/16-14 UNC	8xM12



Side ports, port size **2** and **4**



	Port Size	
	2	4
$P_{A,B}$	2xG 1	2x1 5/16-12UN
T	G 3/4	1 5/16-12UN

Shaft Mounting see page 38

mm [in]

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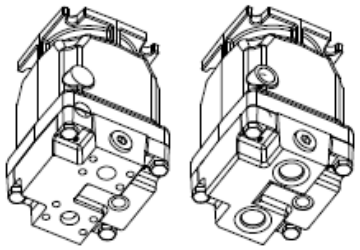
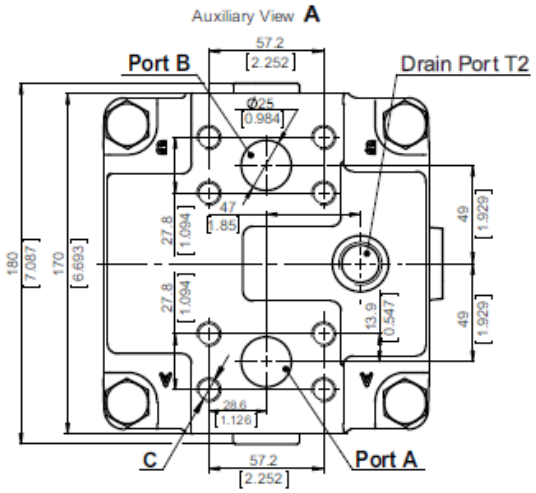
OVERALL DIMENSIONS AND PORTS

Rear Ports - Type **E** Mounting Flange - Type **SAE 4C and 4L**

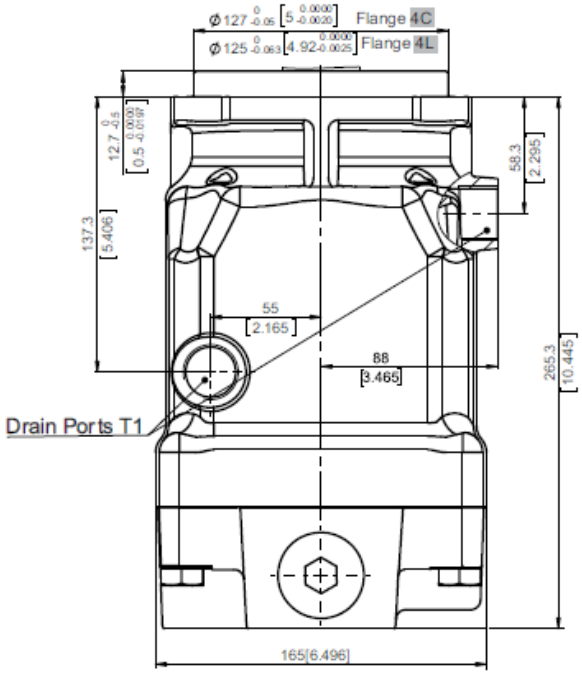
Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81



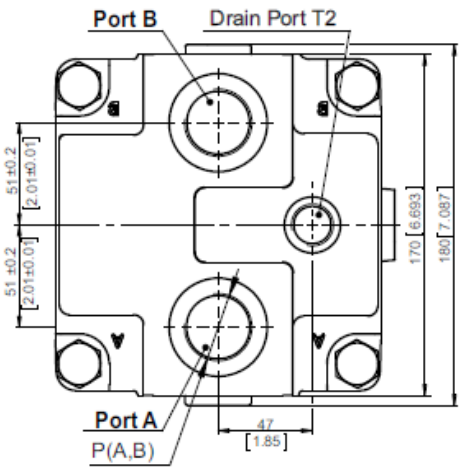
Rear ports, port size default,5 and 9



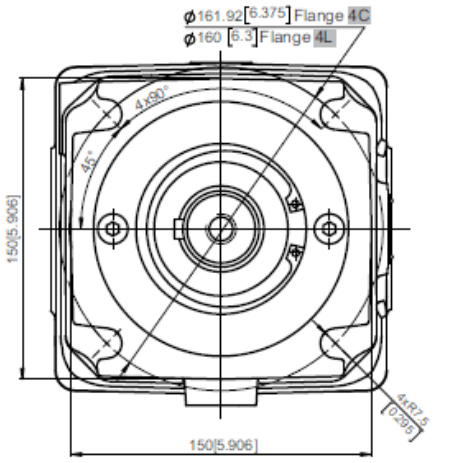
	Port Size		
	default	5	9
$P_{(A,B)}$	2xISO 6162-2 DN25	2xSAE J518 1" PSI6000	2xISO 6162-2 DN25
T1	M27x2	1 5/16-12 UN	G 3/4
T2	M22x1.5	7/8-14 UNF	G 1/2
C	8xM12	8x7/16-14 UNC	8xM12



Rear ports, port size 2 and 4



	Port Size	
	2	4
$P_{(A,B)}$	2xG 1	2x1 5/16-12UN
T1	G 3/4	1 5/16-12UN
T2	G 1/2	7/8 - 14 UNF



Shaft Mounting see page 38

mm [in]

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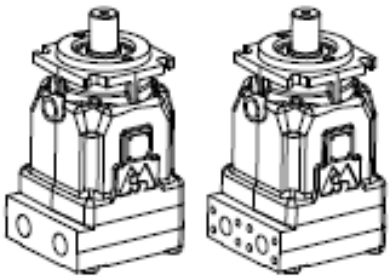
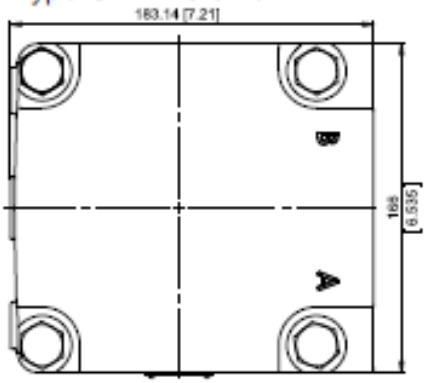
OVERALL DIMENSIONS AND PORTS

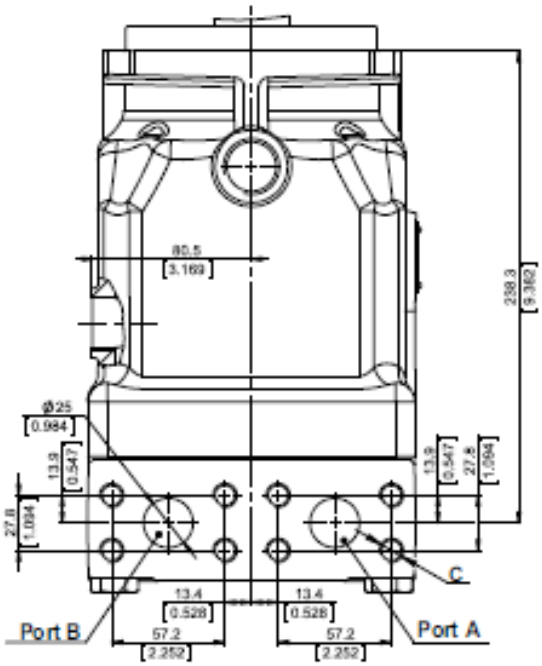
Twin Side Ports - Type **T** Mounting Flange - Type **SAE 4C and 4L**

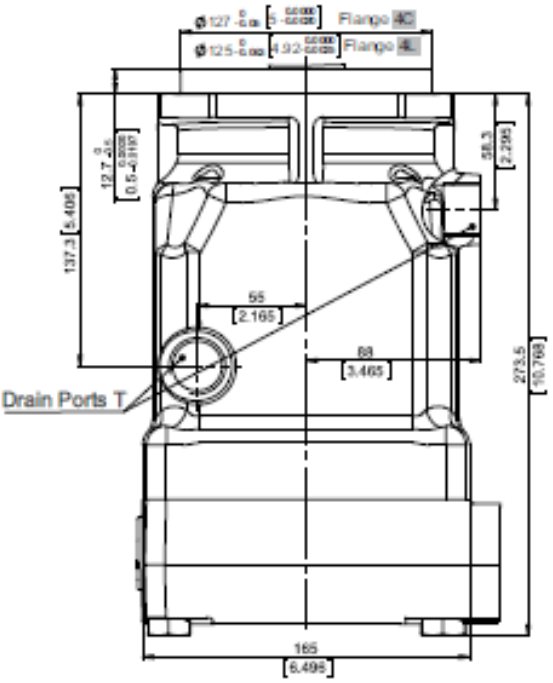


Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 41



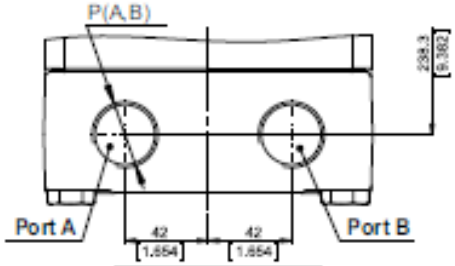
Twin side ports, port size **default**,**5** and **9**



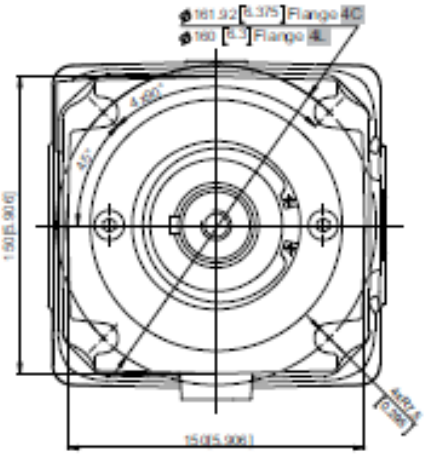


	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN25	2xSAE J518 1" PSI6000	2xISO 6162-2 DN25
T	M27x2	1 1/16"-12 UN	G 3/4
C	8xM12	8x7/16-14 UNC	8xM12

Twin side ports, port size **2** and **4**



	Port Size	
	2	4
$P_{A,B}$	2xG 1	2x1 5/16"-12UN
T	G 3/4	1 1/16"-12UN



Shaft Mounting
see page 38

mm [in]

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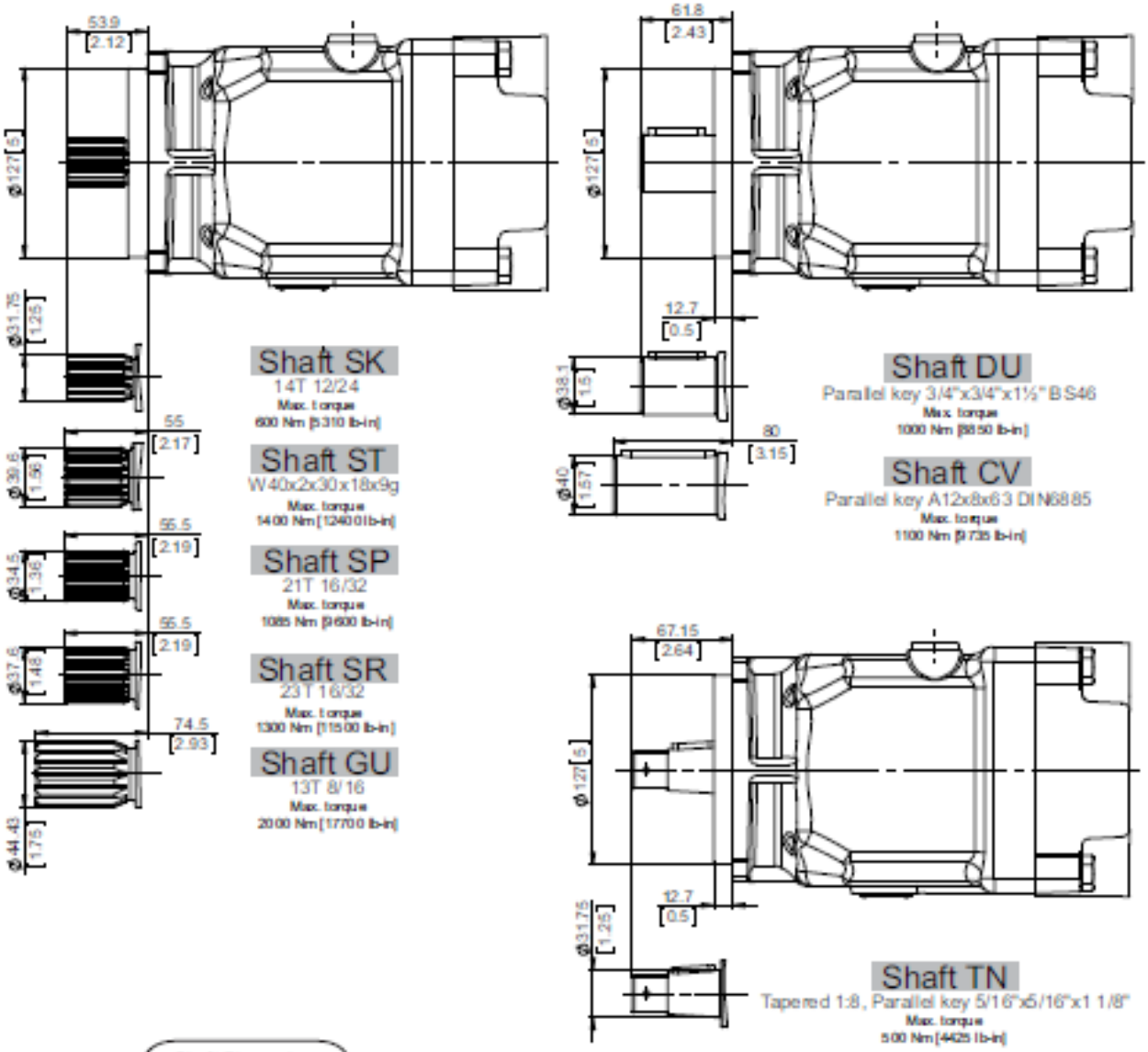
SHAFTS MOUNTING

Flange - Type **SAE 4C and 4L**



Shaft SK
14T 12/24
Max. torque
600 Nm [5310 lb-in]

Shaft ST
W40x2x30x18x9g
Max. torque
1400 Nm [12400 lb-in]

Shaft SP
21T 16/32
Max. torque
1085 Nm [9600 lb-in]

Shaft SR
23T 16/32
Max. torque
1300 Nm [11500 lb-in]

Shaft GU
13T 8/16
Max. torque
2000 Nm [17700 lb-in]

Shaft DU
Parallel key 3/4"x3/4"x1½" BS46
Max. torque
1000 Nm [8850 lb-in]

Shaft CV
Parallel key A12x8x63 DIN6885
Max. torque
1100 Nm [9735 lb-in]

Shaft TN
Tapered 1:8, Parallel key 5/16"x5/16"x1 1/8"
Max. torque
500 Nm [4425 lb-in]

Shaft Dimensions
See Page 69÷73

PERMISSIBLE SHAFT LOAD

Permissible shaft load		
max Axial	N[lb]	Fa=2500 [562]
max Radial	N[lb]	Fr=4500 [1010]

The calculated max values are based on the optimal direction of the forces Fr, Fa and optimal position of the shaft (see page 81).

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

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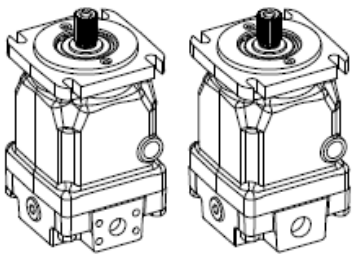
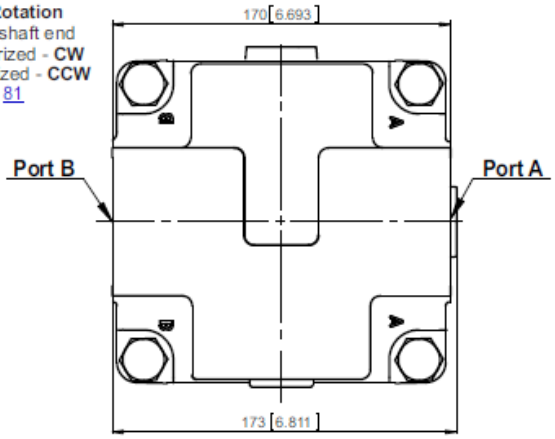
OVERALL DIMENSIONS AND PORTS

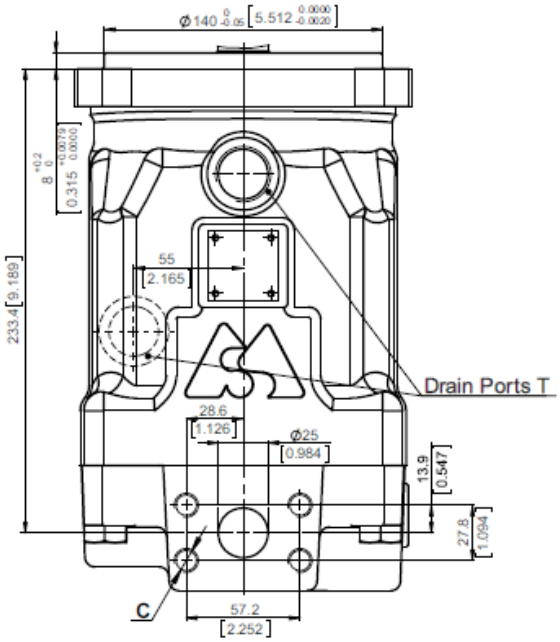
Side Ports - **Default** Mounting Flange - Type **4M**

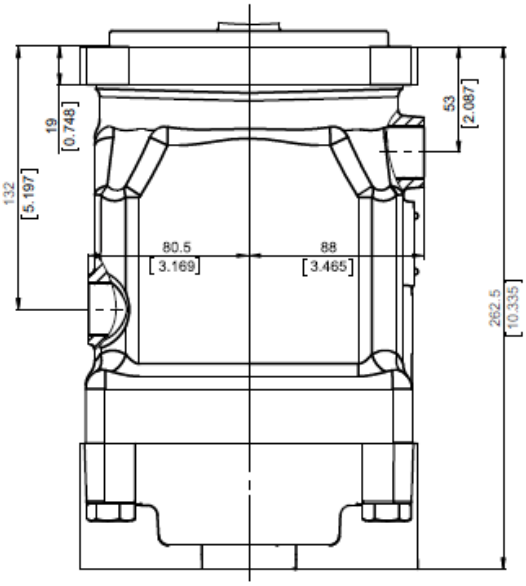


Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81

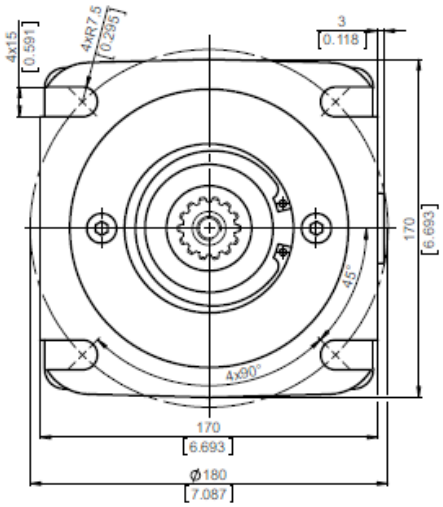


Side ports, port size **default,5** and **9**

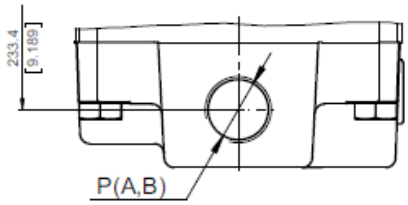




	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN25	2xSAE J518 1" PSI6000	2xISO 6162-2 DN25
T	M27x2	1 1/16 -12 UN	G 3/4
C	8xM12	8x7/16-14 UNC	8xM12

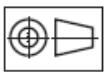


Side ports, port size **2** and **4**



	Port Size	
	2	4
$P_{A,B}$	2xG 1	2x1 5/16-12UN
T	G 3/4	1 1/16-12UN

Shaft Mounting
see page 42



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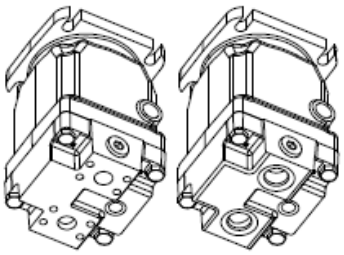
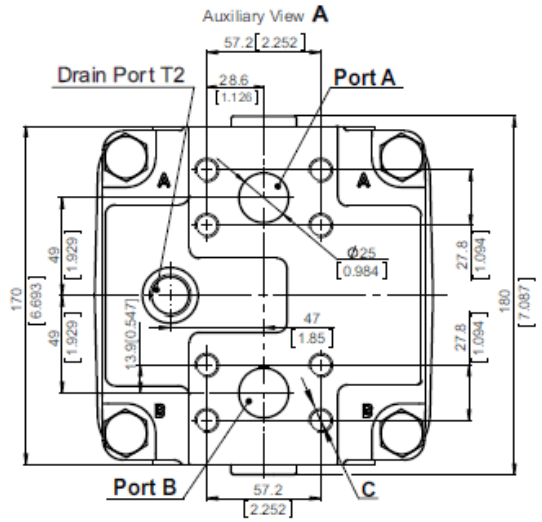
OVERALL DIMENSIONS AND PORTS

Rear Ports - Type **E** Mounting Flange - Type **4M**

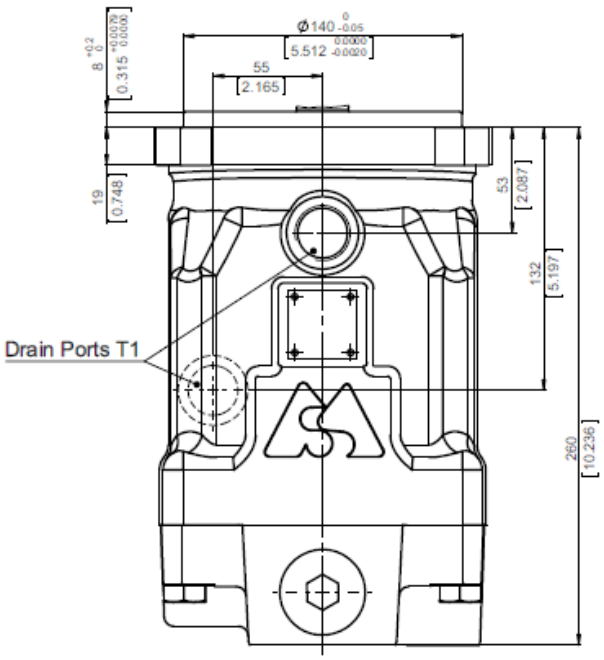
Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81



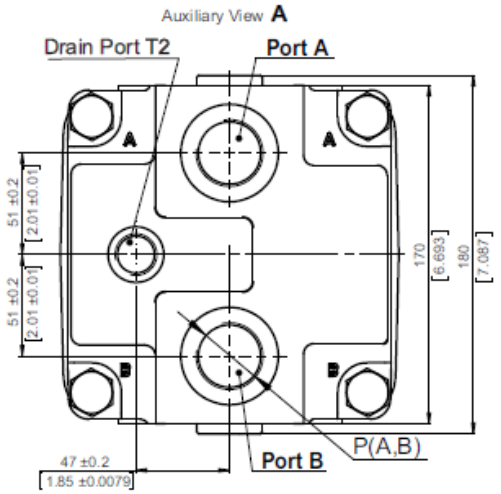
Rear ports, port size **default**,**5** and **9**



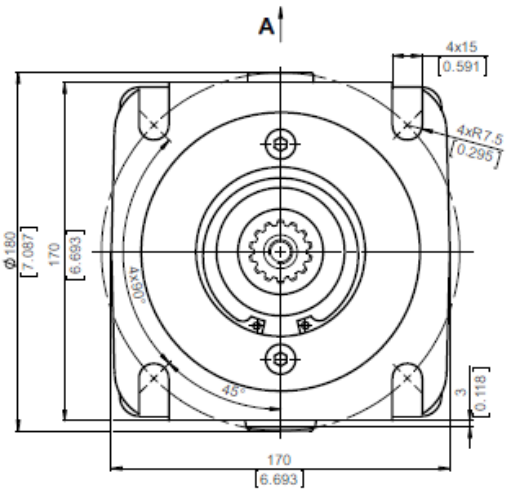
	Port Size		
	default	5	9
$P_{(A,B)}$	2xISO 6162-2 DN25	2xSAE J518 1" PSI6000	2xISO 6162-2 DN25
T1	M27x2	1 1/16-12 UN	G 3/4
T2	M22x1.5	7/8-14 UNF	G 1/2
C	8xM12	8x7/16-14 UNC	8xM12



Rear ports, port size **2** and **4**



	Port Size	
	2	4
$P_{(A,B)}$	2xG 1	2x1 5/16-12UN
T1	G 3/4	1 1/16-12UN
T2	G 1/2	7/8 - 14 UNF



Shaft Mounting see page 42

mm [in]

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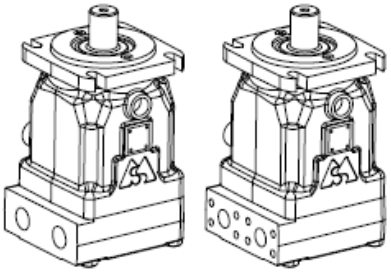
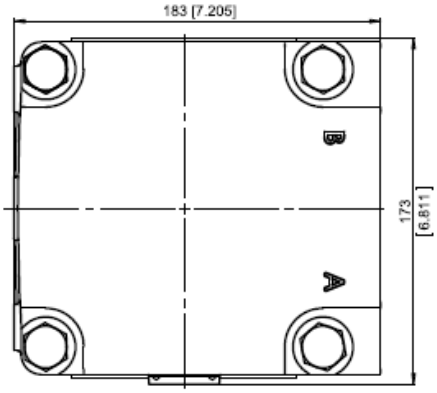
OVERALL DIMENSIONS AND PORTS

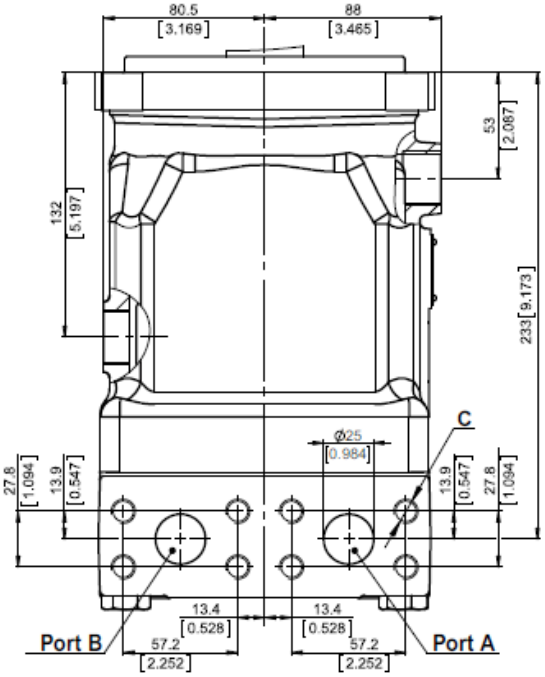
Twin Side Ports - Type **T** Mounting Flange - Type **4M**

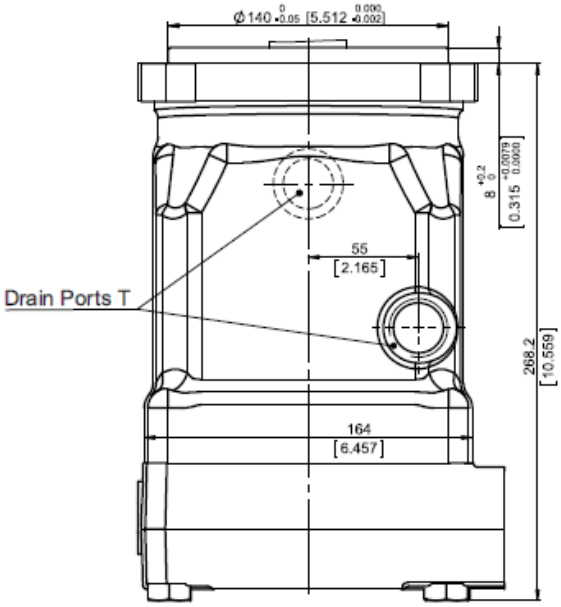


Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**
see page 81

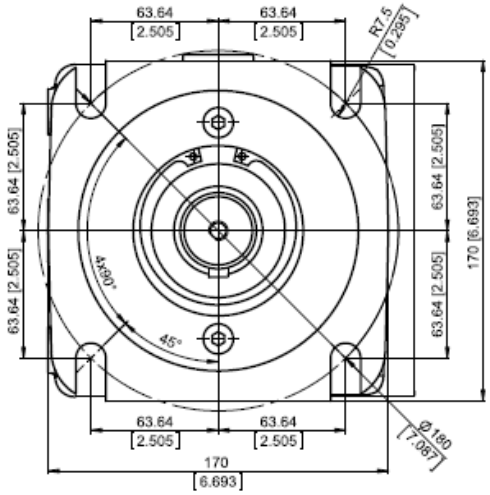


Twin side ports, port size **default,5** and **9**

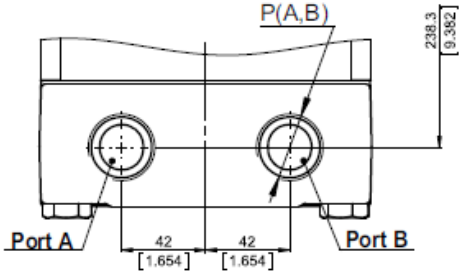




	Port Size		
	default	5	9
$P_{A,B}$	2xISO 6162-2 DN25	2xSAE J518 1" PSI6000	2xISO 6162-2 DN25
T	M27x2	1 1/16-12 UN	G 3/4
C	8xM12	8x7/16-14 UNC	8xM12



Twin side ports, port size **2** and **4**



	Port Size	
	2	4
$P_{A,B}$	2xG 1	2x1 5/16-12UN
T	G 3/4	1 1/16-12UN

Shaft Mounting see page 42

mm [in]

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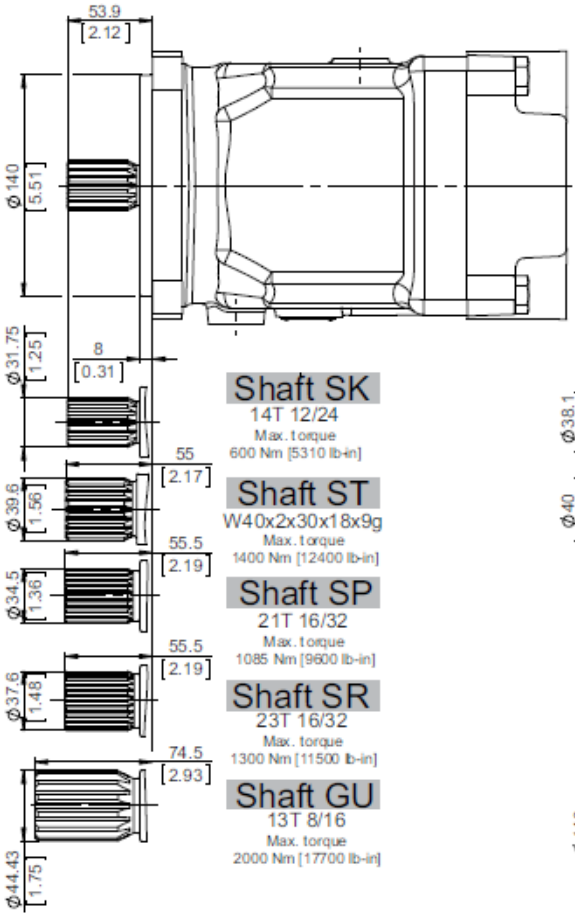
SHAFTS MOUNTING

Flange - Type **4M**



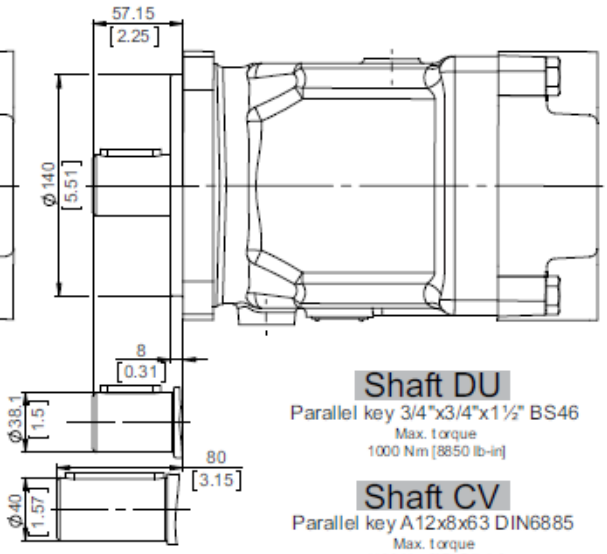
Shaft SK
14T 12/24
Max. torque
600 Nm [5310 lb-in]

Shaft ST
W40x2x30x18x9g
Max. torque
1400 Nm [12400 lb-in]

Shaft SP
21T 16/32
Max. torque
1085 Nm [9600 lb-in]

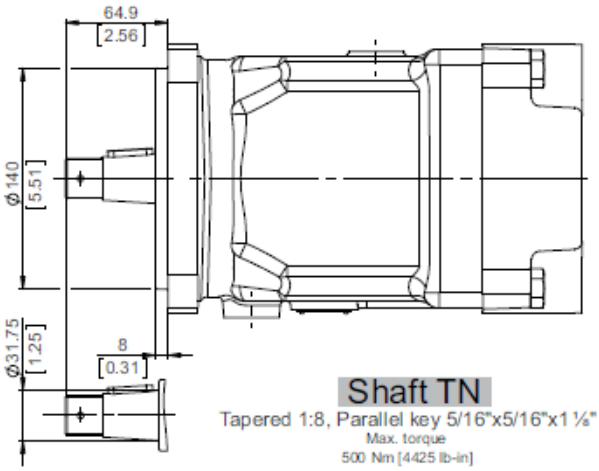
Shaft SR
23T 16/32
Max. torque
1300 Nm [11500 lb-in]

Shaft GU
13T 8/16
Max. torque
2000 Nm [17700 lb-in]



Shaft DU
Parallel key 3/4"x3/4"x1½" BS46
Max. torque
1000 Nm [8850 lb-in]

Shaft CV
Parallel key A12x8x63 DIN6885
Max. torque
1100 Nm [9735 lb-in]



Shaft TN
Tapered 1:8, Parallel key 5/16"x5/16"x1⅛"
Max. torque
500 Nm [4425 lb-in]

Shaft Dimensions
See Page 69÷73

PERMISSIBLE SHAFT LOAD

Permissible shaft load		
max Axial	N[lb]	Fa=2500 [562]
max Radial	N[lb]	Fr=4500 [1010]

The calculated max values are based on the optimal direction of the forces Fr, Fa and optimal position of the shaft (see page 81).

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

mm [in]

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ORDERING CODE

	1	2	3	4	5	6	7	8	9	10	11	12	13	13	13
MAP													[		]

Pos.1 - Mounting Flange

- **4M** - ISO3019-2 4-Bolt flange of spigot diam.140 [5.51"] - BC 180 [7.09"]
- **4C** - SAE C - 4-Bolt flange spigot diam. 127 [5"] - BC 161.92 [6.375"]
- **4L** - 4-Bolt flange spigot diam. 125[4.92"] - BC 160[6.3"]

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

- **63** - 63.58 cm^3/rev [3.88 in^3/rev]
- **71** - 71.5 cm^3/rev [4.36 in^3/rev]
- **75** - 76.84 cm^3/rev [4.69 in^3/rev]
- **92** - 93.18 cm^3/rev [5.69 in^3/rev]
- **100** - 98.75 cm^3/rev [6.03 in^3/rev]

Pos.4 - Shaft Extensions**

- **SK** - ø31.75 [1.25"] Spline SAE 14T 12/24 DP, M10
- **SP** - ø34.5 [1.358"] Spline SAE 21T 16/32 DP, M12
- **SR** - ø37.6 [1.48"] Spline SAE 23T 16/32 DP, M12
- **ST** - ø40 [1.575"] Spline W40x2x30x18x9g DIN 5480, M12 thread
- **GU** - ø43.71 [1.721"] Spline SAE 13T 8/16 DP, 3/8-16UNC
- **DU** - ø38.1[1.5"] Straight, key 9.528[0.375"] L38.1[1.5"], 3/8-16 UNC thread
- **CV** - ø40 [1.575"] Straight, M12 thread Parallel key A12x8x63 DIN6885
- **TN** - ø31.75 [1.25"] Tapered 125:1000, key 7.94[5/16"] x7.94[5/16"] L28[1 ⅛"], 1-12 UNF

Pos.5 - Ports

- omit - 2xISO 6162-2 DN25, drain ports M27x2, for rear drain port M22x1.5
- **2** - 2xG1, drain G3/4, for rear drain ports G1/2
- **4** - 2x1 5/16-12 UN Ports, drain ports 1 ⅛ UNF for rear drain port 7/8-14 UNF
- **5** - 2xSAE 1", PSI6000, drain ports 1 ⅛ UNF for rear drain port 7/8-14 UNF
- **9** - 2xISO 6162-2 DN25, drain ports G3/4, for rear drain port G1/2

Pos.6 - Seal, Corrosion Resistant Seal Surface

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

Pos.7 - Integrated Valves

See page 77÷78 for information about valves

- omit - None
- **HR** - Single anti-cavitation valve
- **AR** - Dual anti-cavitation valve
- **PU** - Purge valve - default - 7±2 l/min
- **FLU** - Flush valve - default - 7±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 - 7±2 l/min
- **DARF** - Dual anti-cavitation, relief and flush valve, default flow - 7±2 l/min at 20 bar

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

for more information see page 77÷78

Pos.10 - Flow Setting of Integrated Valves

- omit - None
- **Lx** - For value - see page 77÷78

Pos.11 - Special Features*

- omit - None
- **R2S** - Speed Sensor Two Directional (see page 79)
- **R** - Reverse Rotation (see page 81)

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

MAP4CE100ST2

MAP	4C		100	ST	2							[		]
Flange 4C	Side Ports		Disp.100cc		Shaft ST		Port size 2					no paint		

MAP4ME92GS4P

MAP	4M	E	92	GS	4						P	[		]
Flange 4M	Rear Ports		Disp. 92cc		Shaft GS		Port size 4				Painted			

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