HANSA · TMP srl

HYDRAULIC COMPONENTS
HYDROSTATIC TRANSMISSIONS
GEARBOXES - ACCESSORIES

Certified Company ISO 9001 - 14001

TÜV InterCert SAAR ISO 9001 Certificate N° 12-Q-0200545-TIC
TÜV InterCert SAAR ISO 14001 Certificate N° 12-E-0200545-TIC

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HT 16 / M / 3004 / 0716 / E

THE PRODUCTION LINE OF HANSA-TMP

Fixed Displacement Axial Piston Motor for Open and Closed Loop System

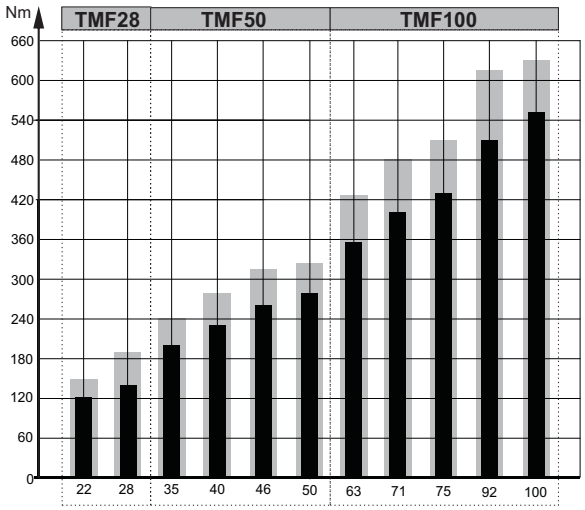
TMF 600
(22 ÷ 98 cm³/rev.)

CONTENTS

Specification Data TMF

Intermittent values

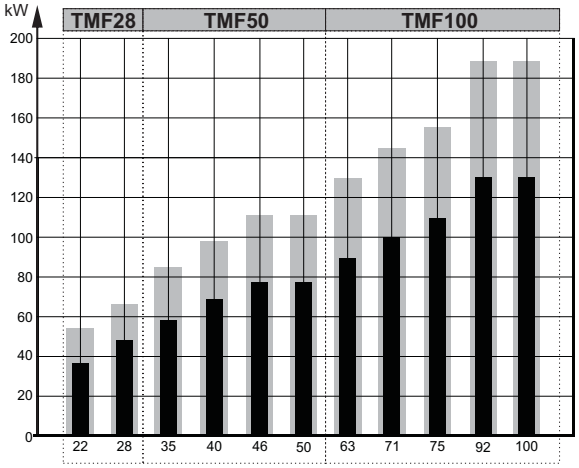
Max. Torque



Displacement TMF

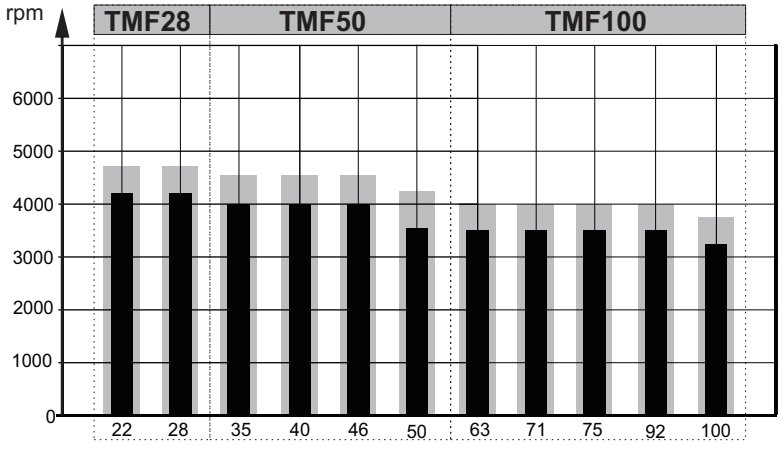
Continuous values

Max. Output



Displacement TMF

Max. Speed

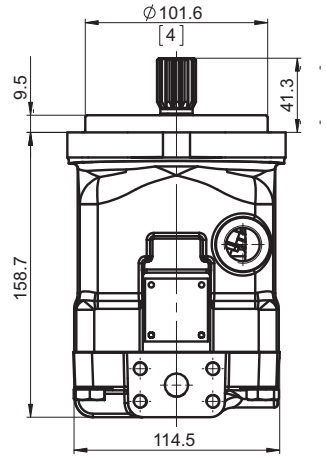


Displacement TMF

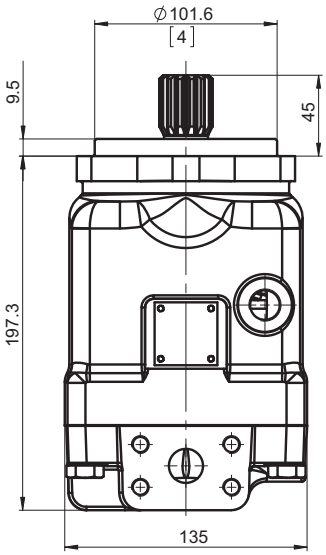
MOTOR DIMENSIONS

The below dimensions are for **comparison only**. The motors can have different flanges, shafts and end covers.

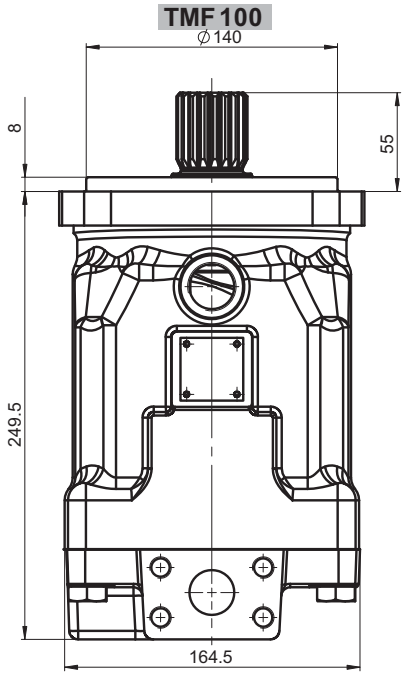
TMF 28



TMF 50

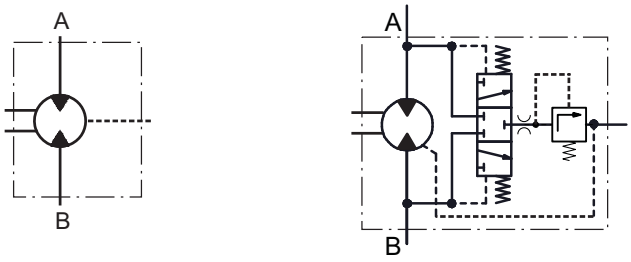


TMF 100



Hydraulic Motors Type TMF 28

Heavy Duty Axial Piston Motors Fixed Displacement



open drain line is always required

OPTIONS

- » Swash plate
- » Flange options
- » Port options
- » Shaft options
- » High pressure ports

APPLICATION

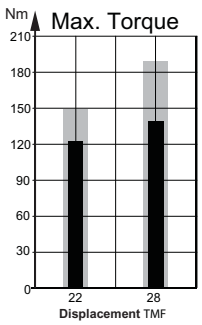
- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industry machines
- » Special vehicles

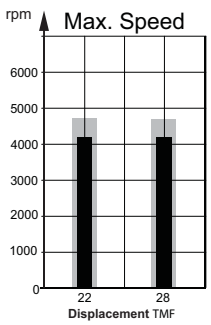
ADVANTAGES

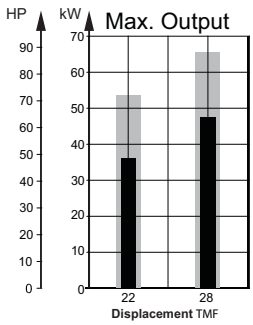
- » High starting torque
- » Smooth operation
- » Long service life
- » High power density

GENERAL

Displacement	cm^3/rev	22,15÷28.47
Max. Speed	RPM	4200
Max. Torque	Nm	159
Max. Output	kW	48
Max. Pressure Drop	bar	350
Max. Oil Flow	lpm	120
Min. Speed	RPM	500
Fluid		Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature Range	°C	-40÷80
Optimal Viscosity Range	mm^2/s	12÷60
Filtration		ISO code 18/16/13 (Min. recommended fluid filtration of 10 micron)







Intermittent values Continuous values

TMF 28 Motors Series

SPECIFICATION DATA

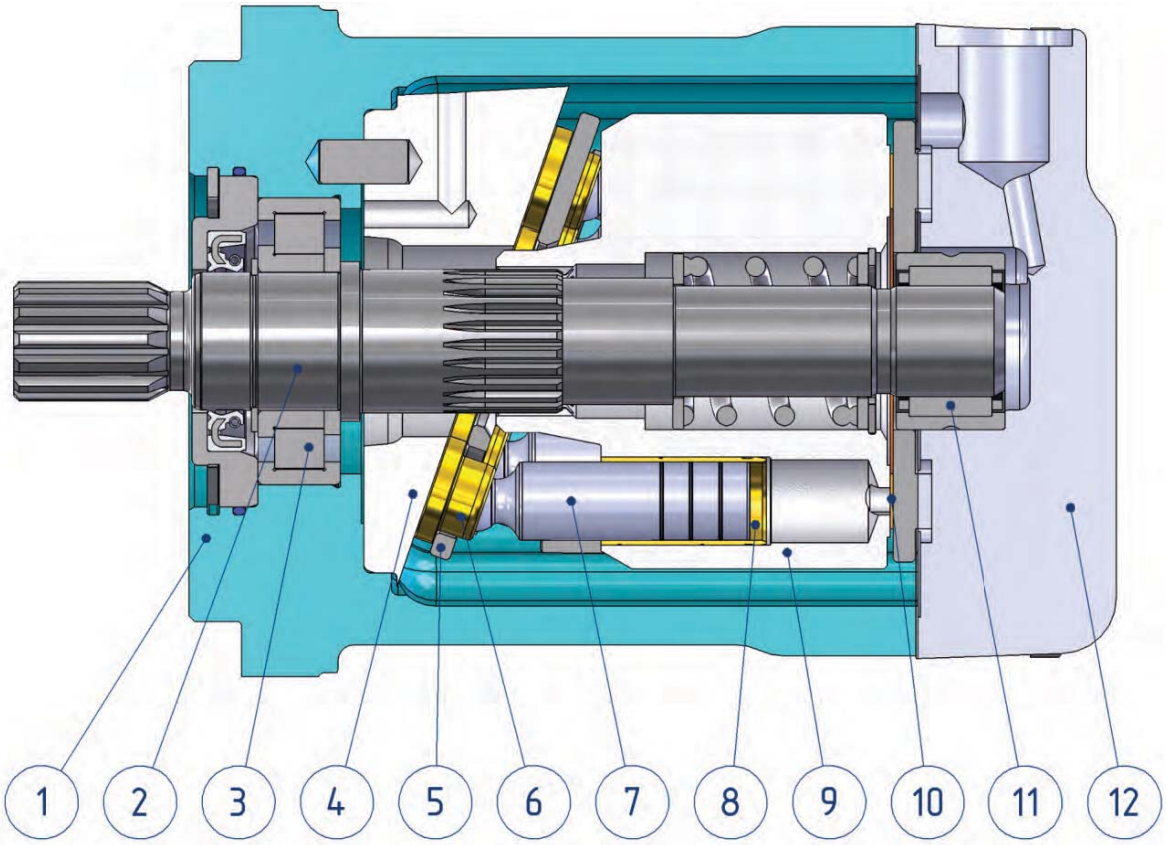
Type		TMF 22	TMF 28
Displacement cm.^{3}/rev.		22.15	28.47
Max. Speed [RPM]	Cont.	4200	4200
	Int.*	4700	4700
Max. Torque *** Nm	Cont.	123	159
	Int.**	148	190
Output kW	Cont.	37	48
	Int.**	54	70
Max. Pressure bar	Cont.	350	350
	Int.**	420	420
Max. Oil Flow lpm	Cont.	93	120
	Int.*	104	134
Permissible Shaft Load max Axial**** N		Fa=1300	
max Radial**** N		Fr=2200	
Min. Speed [RPM]		500	
Max. Pressure in Drain Line, bar		5 open drain line is always required	
Weight kg		11.3	

* Intermittent speed (flow) is for pressure up to 150 bar.
** Intermittent load: the permissible values may occur for max. 10% of every minute.
*** Theoretical torque
**** The calculated max values are based on the optimal direction of the forces Fr, Fa and optimal position of the shaft.

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 using of a premium quality, anti-wear type mineral based hydraulic oil, HLP(DIN51524) or HM(ISO6743/4).
4. Recommended oil viscosity - 15...30 cSt or less.
5. Recommended maximum system operating temperature 80°C.
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.

TMF 28 Motors Series

SECTION VIEW



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

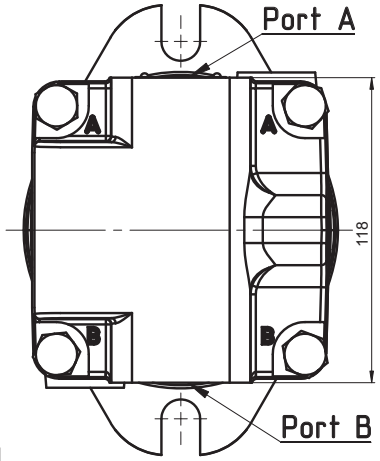
The heavy duty design of the TMF motor gains big advantage over the typical swash plate motors. The starting torque is close to the starting torque of the bent axis motors and the total efficiency of our design in normal working modes is similar to the bent axis motors. The main advantage of our design over the bent axis motors is that the pulsations and vibrations during the operation are much less. Another advantage is that the swash plate motors are more reliable than the bent axis motors.

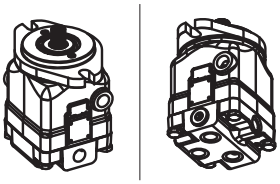
TMF 28 Motors Series

Overall Dimensions and Ports

Side ports - **Standard**

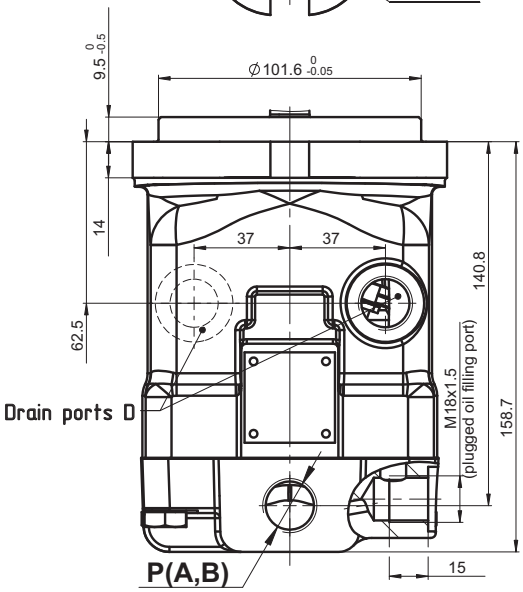
See the port sizes at the bottom of this page

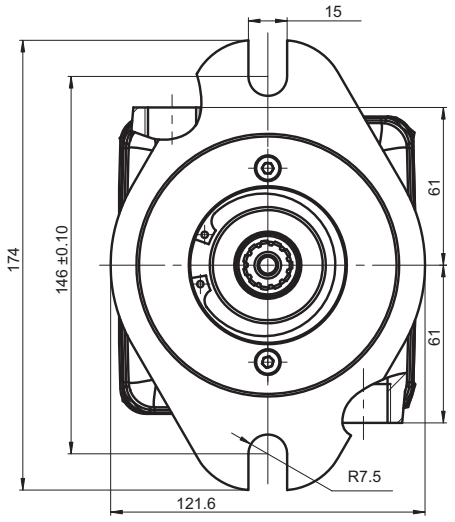




Standard Rotation
Viewed from shaft end
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**

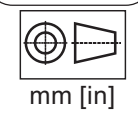
Reverse Rotation
Viewed from shaft end
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**





	Port Size
$P_{(A,B)}$	2xG 1/2
D	G 1/2

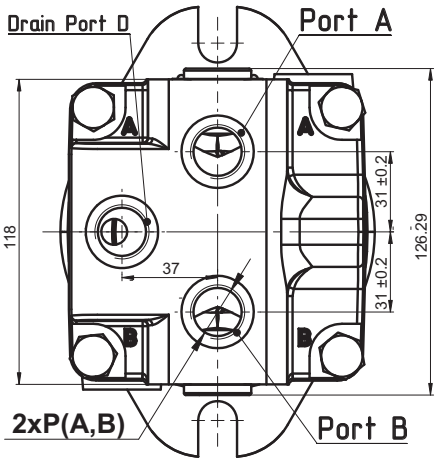
Shaft Mounting
see the next page

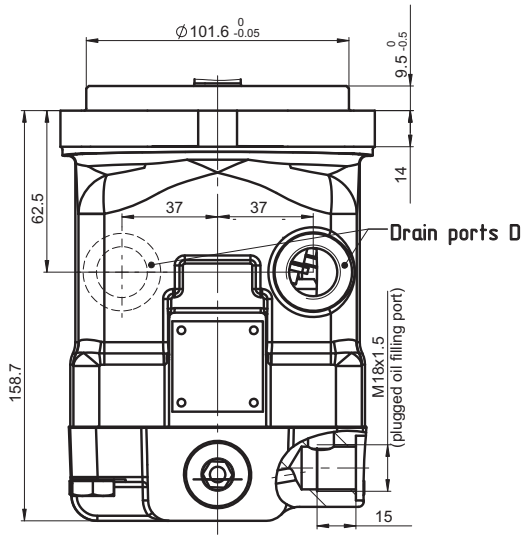


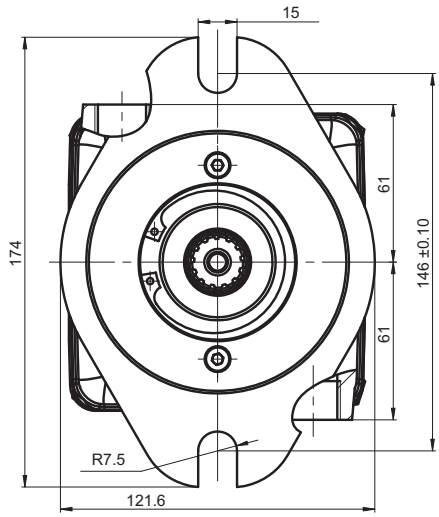
mm [in]

Rear ports - **Type E**

See the port sizes at the bottom of this page



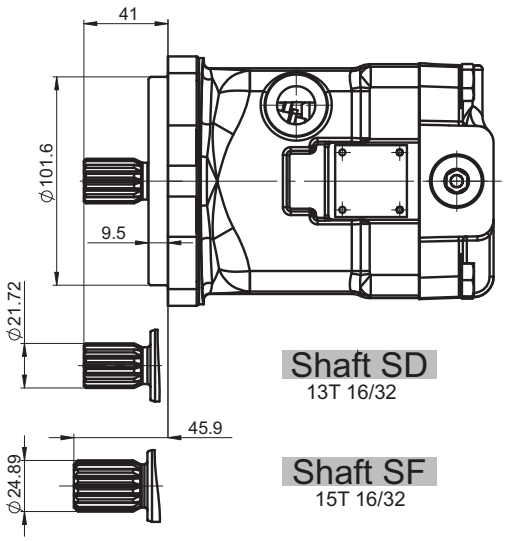




	Port Size
$P_{(A,B)}$	2xG 1/2
D	G 1/2

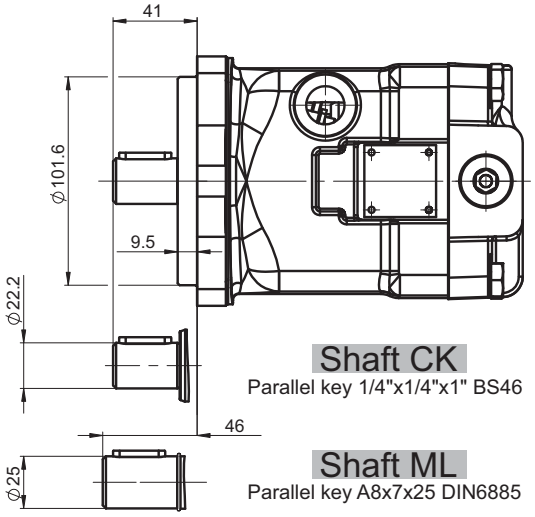
TMF 28 Motors Series

Shafts Mounting



Shaft SD
13T 16/32

Shaft SF
15T 16/32



Shaft CK
Parallel key 1/4"x1/4"x1" BS46

Shaft ML
Parallel key A8x7x25 DIN6885

Shaft Dimensions
See Page 20÷21

PERMISSIBLE SHAFT LOAD

Permissible shaft load		
max Axial	N	Fa=1300
max Radial	N	Fr=2200

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.

mm

TMF 28 Motors Series

ORDERING CODE

	1	2	3	4	5	6	7
T M F							

Pos.1 - Mounting Flange

B - SAE B - 2-Bolt flange
spigot diam. 101,6 mm - BC 146 mm

Pos.2 - Port Type

omit - Side ports on opposite sides
E - Rear ports

Pos.3 - Displacement Code

22 - 22.15 $cm.^3$/rev.
28 - 28.47 $cm.^3$/rev.

Pos.4 - Shaft Extensions **

SD - ø21,72 spline SAE 13T 16/32 DP, M8-6H thread
SF - ø24.9 spline SAE 15T 16/32 DP, M8-6H thread
CK - ø22.2 straight, M8-6H thread Parallel key 1/4"x1/4"x1" BS46
ML - ø25 straight, M8-6H thread Parallel key A10x8x32 DIN 6885

Pos.5 - Port Size

2 - 2xG1/2, G1/2

Pos.6 - Seal, Corrosion Resistant Seal Surface

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

Pos.7 - Integrated Valves

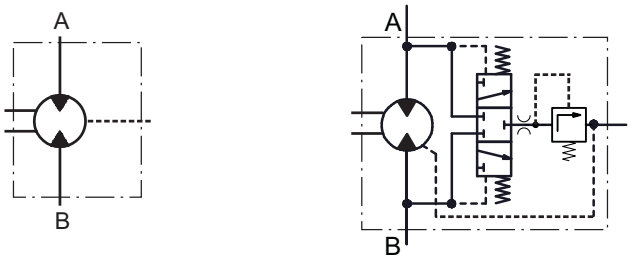
omit - none
FL* - Flush valve

* Under development
** The permissible output torque for shafts must not be exceeded! (see page 20-21)

We remain open to meet your special requirements upon request.

Hydraulic Motors Type TMF 50

Heavy Duty Axial Piston Motors Fixed Displacement



open drain line is always required

OPTIONS

- » Swash plate
- » Flange options
- » Port options
- » Shaft options
- » High pressure ports

APPLICATION

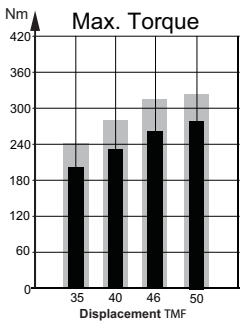
- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industry machines
- » Special vehicles

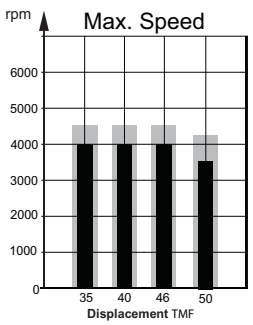
ADVANTAGES

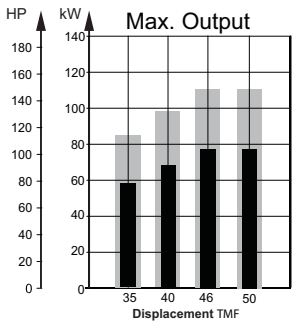
- » High starting torque
- » Smooth operation
- » Long service life
- » High power density

GENERAL

Displacement	cm^3/rev	36,16÷49.94
Max. Speed	RPM	4000
Max. Torque	Nm	278
Max. Output	kW	76
Max. Pressure Drop	bar	350
Max. Oil Flow	lpm	180
Min. Speed	RPM	500
Fluid		Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature Range	°C	-40÷80
Optimal Viscosity Range	mm^2/s	12÷60
Filtration		ISO code 18/16/13 (Min. recommended fluid filtration of 10 micron)







Intermittent values Continuous values

TMF 50 Motors Series

SPECIFICATION DATA

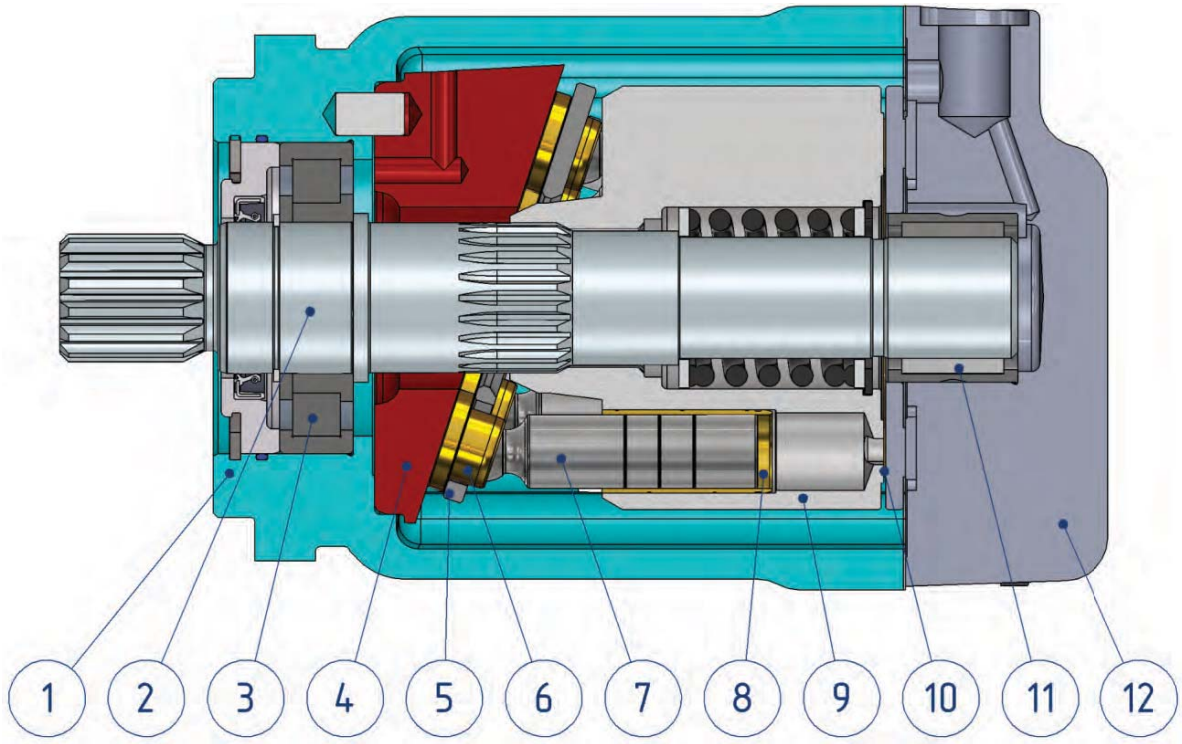
Type		TMF 35	TMF 40	TMF 46	TMF 50
Displacement cm.^{3}/rev.		36.16	41.59	47.13	49.94
Max. Speed [RPM]	Cont.	4000	4000	4000	3600
	Int.*	4500	4500	4500	4200
Max. Torque *** Nm	Cont.	202	232	263	278
	Int.**	242	278	315	326
Output kW	Cont.	58	67	76	76
	Int.**	84	97	110	110
Max. Pressure bar	Cont.	350	350	350	350
	Int.**	420	420	420	410
Max. Oil Flow lpm	Cont.	145	167	189	180
	Int.*	163	187	212	210
Permissible Shaft Load max Axial**** N		Fa=2000			
max Radial**** N		Fr=3600			
Min. Speed [RPM]		500			
Max. Pressure in Drain Line, bar		5 open drain line is always required			
Weight kg		17.8			

* Intermittent speed (flow) is for pressure up to 150 bar.
** Intermittent load: the permissible values may occur for max. 10% of every minute.
*** Theoretical torque
**** The calculated max values are based on the optimal direction of the forces Fr, Fa and optimal position of the shaft.

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 using of a premium quality, anti-wear type mineral based hydraulic oil, HLP(DIN51524) or HM(ISO6743/4).
4. Recommended oil viscosity - 15...30 cSt or less.
5. Recommended maximum system operating temperature 80 °C.
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.

TMF 50 Motors Series

SECTION VIEW



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

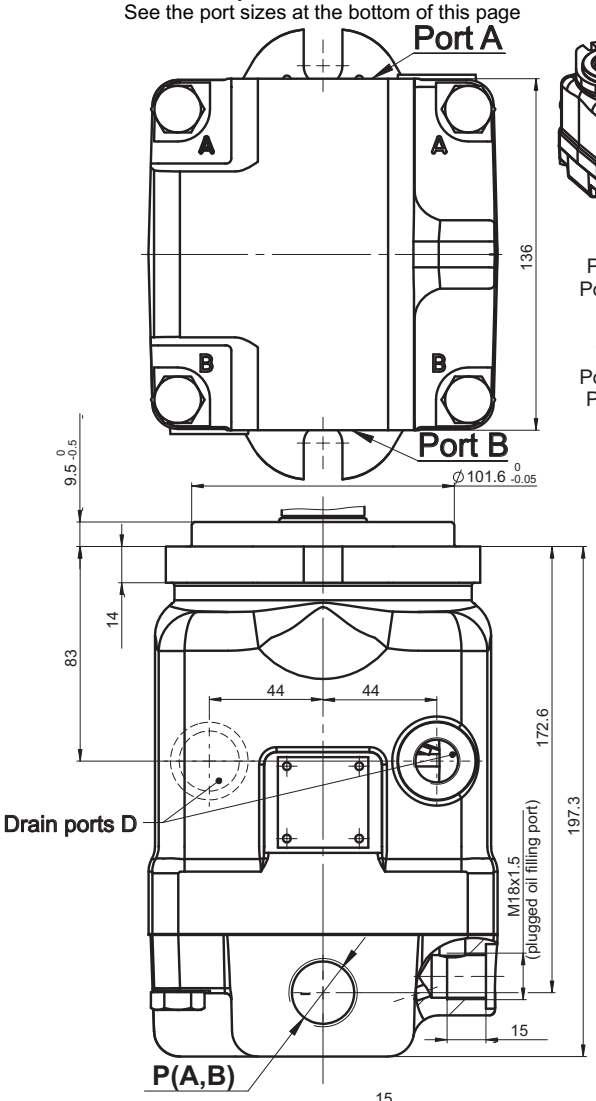
The heavy duty design of the TMF motor gains big advantage over the typical swash plate motors. The starting torque is close to the starting torque of the bent axis motors and the total efficiency of our design in normal working modes is similar to the bent axis motors. The main advantage of our design over the bent axis motors is that the pulsations and vibrations during the operation are much less. Another advantage is that the swash plate motors are more reliable than the bent axis motors.

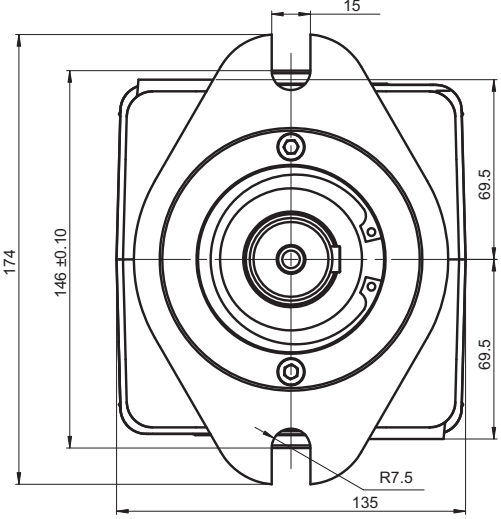
TMF 50 Motors Series

Overall Dimensions and Ports

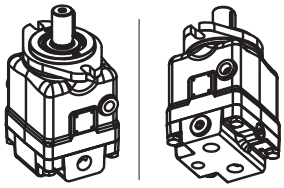
Side ports - **Standard**

See the port sizes at the bottom of this page





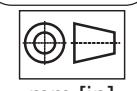
	Port Size
$P_{(A,B)}$	2xG 3/4
D	G 1/2



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

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

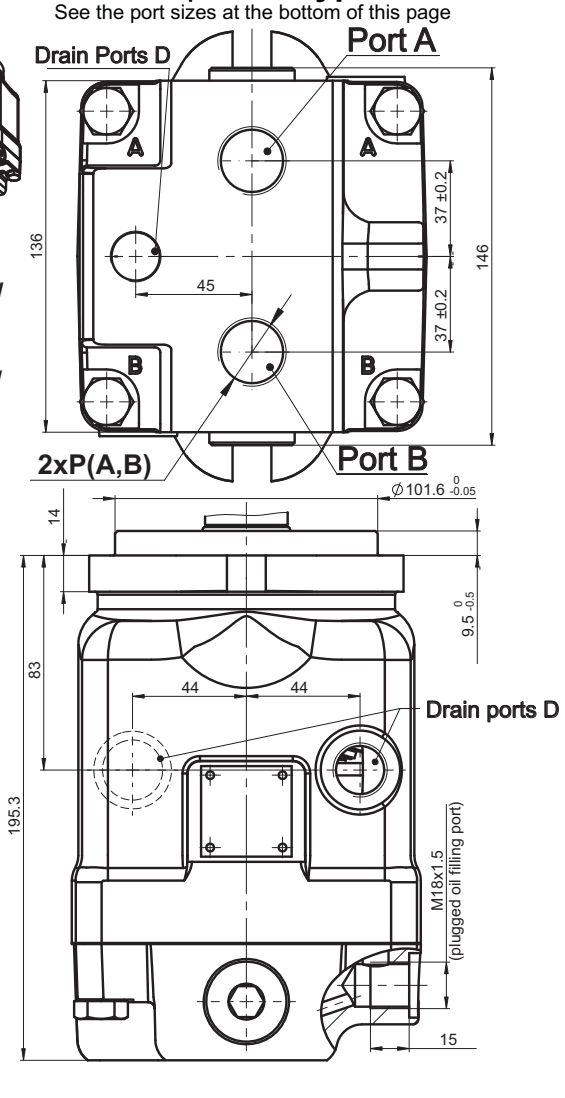
Shaft Mounting
see the next page

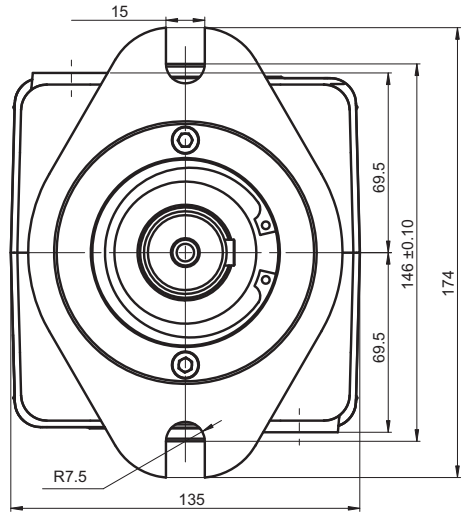


mm [in]

Rear ports - **Type E**

See the port sizes at the bottom of this page

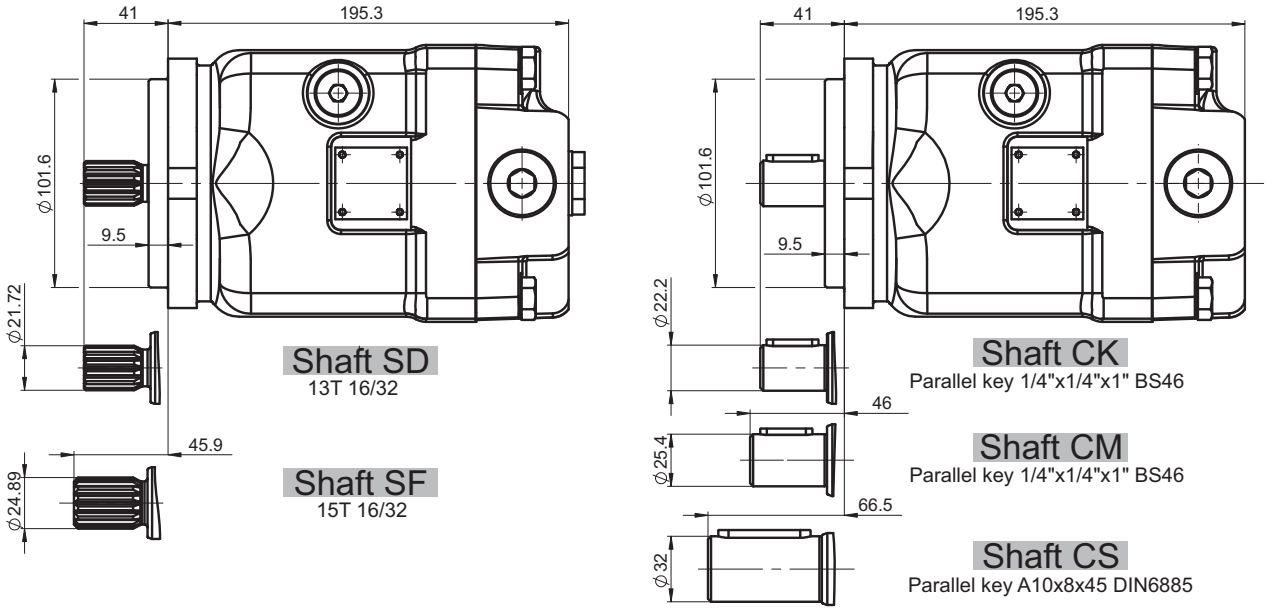




	Port Size
$P_{(A,B)}$	2xG 3/4
D	G 1/2

TMF 50 Motors Series

Shafts Mounting



Shaft Dimensions
See Page 20÷21

PERMISSIBLE SHAFT LOAD

Permissible shaft load		
max Axial	N	Fa=2000
max Radial	N	Fr=3600

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.

mm

TMF 50 Motors Series

ORDERING CODE

	1	2	3	4	5	6	7
T M F							

Pos.1 - Mounting Flange

B - SAE B - 2-Bolt flange
spigot diam. 101,6 mm - BC 146 mm

Pos.2 - Port Type

omit - Side ports on opposite sides
E - Rear ports

Pos.3 - Displacement Code

35 - 36.16 $cm.^3$/rev.
40 - 41.59 $cm.^3$/rev.
46 - 47.13 $cm.^3$/rev.
50 - 49.94 $cm.^3$/rev.

Pos.4 - Shaft Extensions **

SD - ø21,72 spline SAE 13T 16/32 DP, M8
SF - ø24,9 spline SAE 15T 16/32 DP , M8-6H
CK - ø22.2 straight, M8-6H thread
Parallel key 1/4"x1/4"x1" BS46
CS - ø32 straight, M8-6H thread
Parallel key A10x8x45 DIN 6885
CM - ø25.4 straight, M8-6H thread
Parallel key 1/4"x1/4"x1" BS46

Pos.5 - Port Size

2 - 2xG3/4, G1/2

Pos.6 - Seal, Corrosion Resistant Seal Surface

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

Pos.7 - Integrated Valves

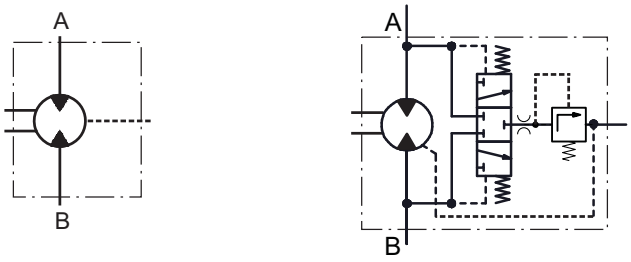
omit - none
FL* - Flush valve

* Under development
** The permissible output torque for shafts must not be exceeded! (see page 20-21)

We remain open to meet your special requirements upon request.

Hydraulic Motors Type TMF 100

Heavy Duty Axial Piston Motors Fixed Displacement



open drain line is always required

OPTIONS

- » Swash plate
- » Flange options
- » Port options
- » Shaft options
- » High pressure ports

APPLICATION

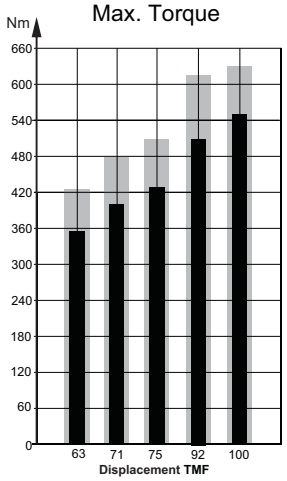
- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industry machines
- » Special vehicles

ADVANTAGES

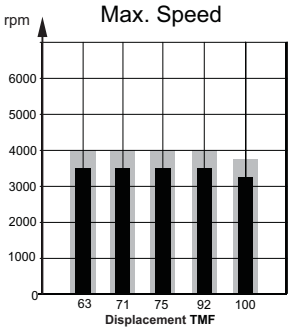
- » High starting torque
- » Smooth operation
- » Long service life
- » High power density

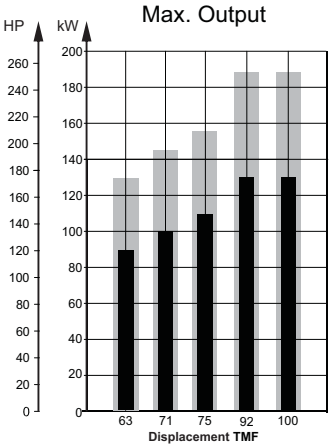
GENERAL

Displacement	cm^3/rev	36,16÷49.94
Max. Speed	RPM	3500
Max. Torque	Nm	550
Max. Output	kW	130
Max. Pressure Drop	bar	350
Max. Oil Flow	lpm	326
Min. Speed	RPM	500
Fluid		Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature Range	^oC	-40÷80
Optimal Viscosity Range	mm^2/s	12÷60
Filtration		ISO code 18/16/13 (Min. recommended fluid filtration of 10 micron)



Intermittent values Continuous values





TMF 100 Motors Series

SPECIFICATION DATA

Type		TMF 63	TMF 71	TMF 75	TMF 92	TMF 100
Displacement cm.^{3}/rev.		63.58	71.5	76.84	93.18	98.75
Max. Speed [RPM]	Cont.	3500	3500	3500	3500	3240
	Int.*	4000	4000	4000	4000	3750
Max. Torque *** Nm	Cont.	354	398	428	514	550
	Int.**	425	478	514	616	645
Output kW	Cont.	89	100	108	130	130
	Int.**	129	145	156	188	188
Max. Pressure bar	Cont.	350	350	350	350	350
	Int.**	420	420	420	420	410
Max. Oil Flow lpm	Cont.	223	250	269	326	320
	Int.*	255	286	308	373	370
Permissible Shaft Load max Axial**** N		Fa=2500				
max Radial**** N		Fr=4500				
Min. Speed [RPM]		500				
Max. Pressure in Drain Line, bar		5 open drain line is always required				
Weight kg		32.5				

* Intermittent speed (flow) is for pressure up to 150 bar.
** Intermittent load: the permissible values may occur for max. 10% of every minute.
*** Theoretical torque
**** The calculated max values are based on the optimal direction of the forces Fr, Fa and optimal position of the shaft.

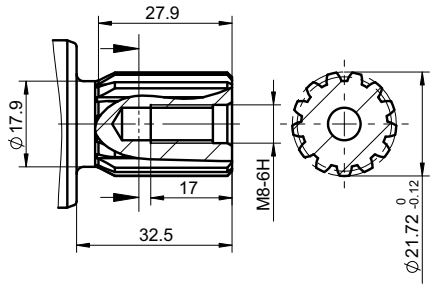
1. The recommended output power for continuous operations should not be exceeded.
2. Recommended filtration as per ISO 4406 cleanliness code 18/16/13 or better. This filtration corresponds to SAE AS 4059 8A/7B/7C. Nominal filtration - 10 micron or better.
3. Recommended using of a premium quality, anti-wear type mineral based hydraulic oil, HLP(DIN51524) or HM(ISO6743/4).
4. Recommended oil viscosity - 15...30 cSt or less.
5. Recommended maximum system operating temperature 80°C.
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.

Under development. Please contact our Sales Office.

Shaft Types and Dimensions

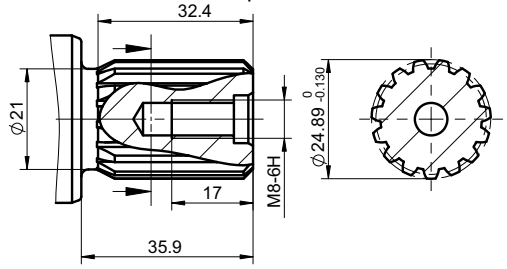
SD

ø21.72 M8-6H thread
13T 16/32 DP splined ANSI B92.1-1970
Max. torque 220 Nm

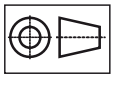


SF

ø24.89 M8-6H thread
15T 16/32 DP splined ANSI B92.1-1970
Max. torque 360 Nm



The required max. torque must not be exceeded

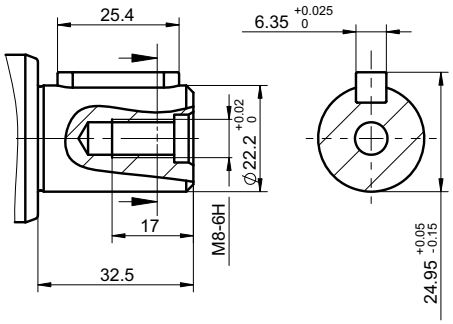


mm

Shaft Types and Dimensions

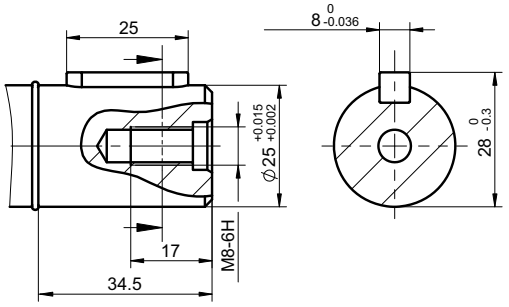
CK

ø22.2 straight, M8-6H thread
Parallel key **1/4"x1/4"x1**" BS46
Max. torque 180 Nm



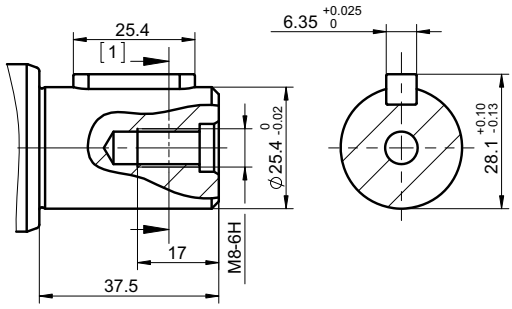
ML

ø25 straight, M8-6H thread
Parallel key **A8x7x25** DIN6885
Max. torque 250 Nm



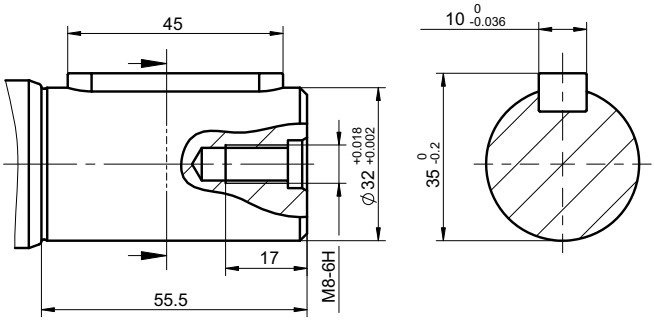
CM

ø25.4 straight, M8-6H thread
Parallel key **1/4"x1/4"x1**" BS46
Max. torque 250 Nm



CS

ø32 straight, M8-6H thread
Parallel key **A10x8x45** DIN6885
Max. torque 565 Nm



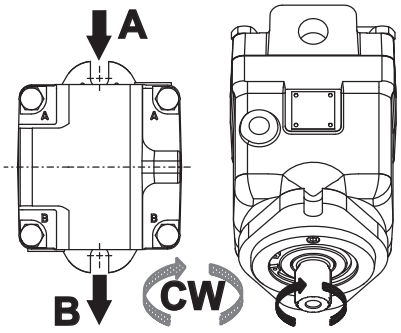
The required max. torque must not be exceeded

mm

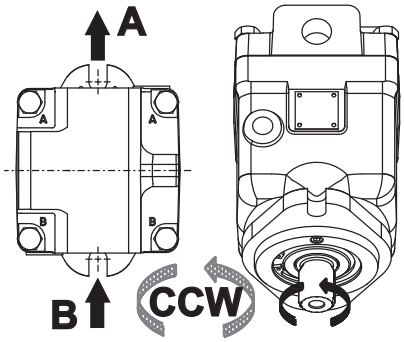
INSTALLATION

DIRECTION OF ROTATION

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



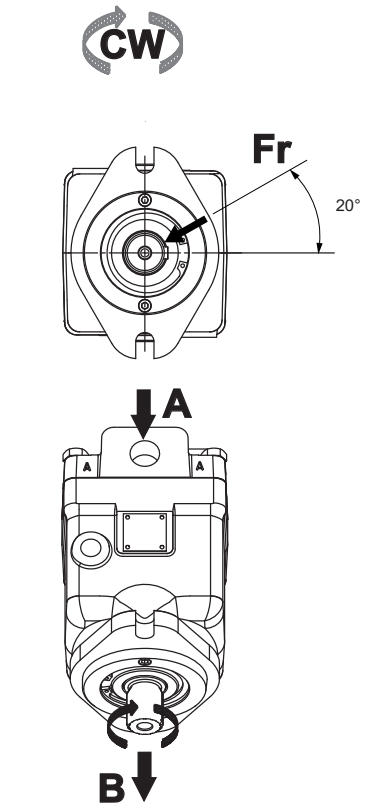
Reverse Rotation
Viewed from shaft end
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**



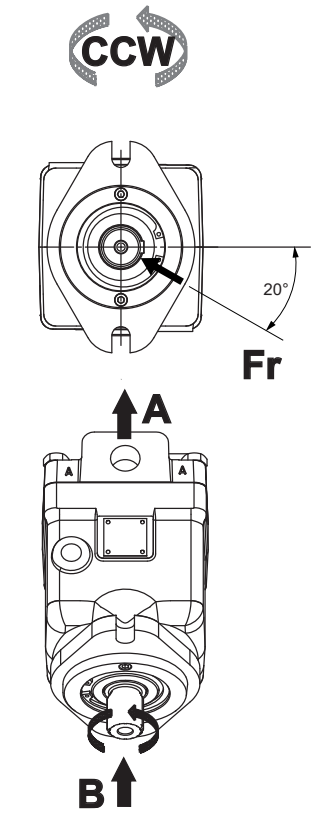
BEST POSITION FOR APPLYING RADIAL LOAD

Optimal position for applying radial load depending on the direction of rotation

Standard Rotation

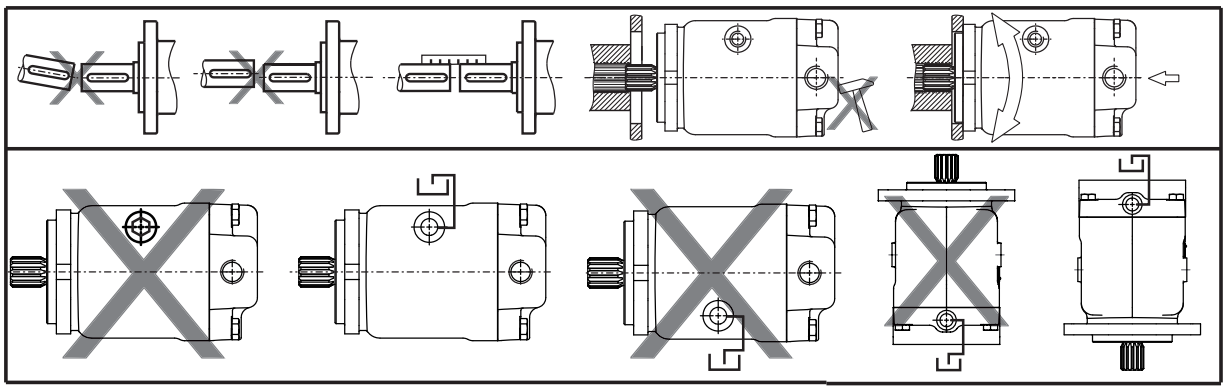


Reverse Rotation



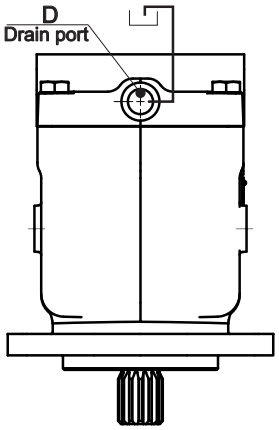
INSTALLATION

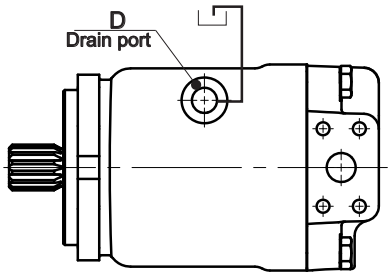
At start-up and during operation the motor housing has to be filled up with hydraulic fluid. Start-up has to be carried out at low or moderate speed and without load (for example 1000 rpm and pressure 50 bar) till the motor and the hydraulic scheme are filled up with oil. Typically the start-up needs 10-15 minutes to finish. The leakage oil in the housing has to be discharged to the tank through the highest positioned drain port D. The max. pressure in the drain line is 5 bar.



Installation below tank level (recommended)

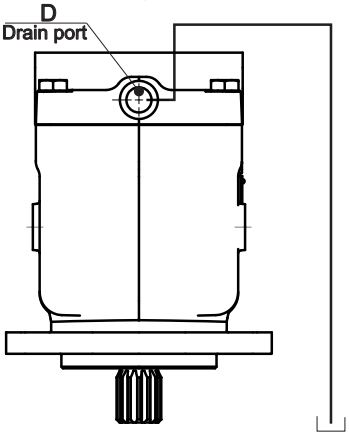
- Fill up the axial piston motor before the start-up through the highest positioned drain port D.
- Operate the motor at low speed till the motor system is completely filled up.
- The minimum immersion depth of the drain line in the tank is 200 mm relative to the minimum oil level in the tank.

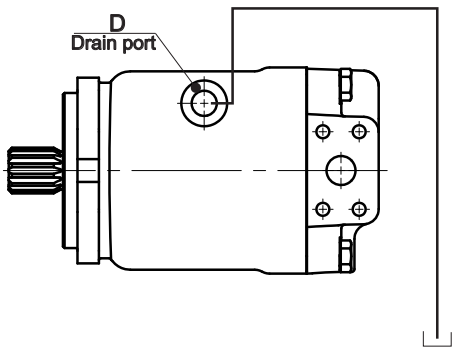




Installation on top of tank level

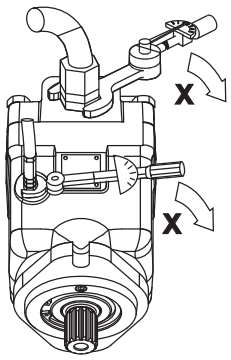
- Fill up the axial piston motor before the start-up through the highest positioned drain port D.
- Operate the motor at low speed till the motor system is completely filled up.
- The minimum immersion depth of the drain line in the tank is 200 mm relative to the minimum oil level in the tank.

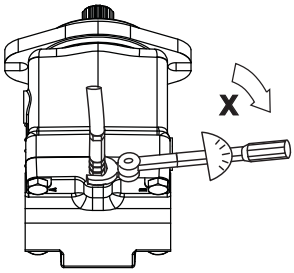


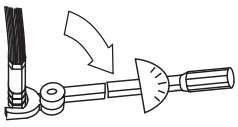
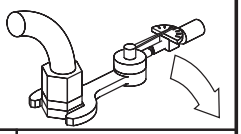


INSTALLATION

Recommended max. tightening torque X for metal plugs and orifice





Screwed connection	 Max. Tightening Torque X, Nm 			
	With copper washer	With aluminium washer	With cutting edge	With “O” ring
G 1/4	20	30	40	20
G 3/8	20	50	60	20
G 1/2	30	80	100	30
G 3/4	50	130	160	50
G 1	80	200	250	80
M 8	20	10	20	
M 10	20	10	20	
M 12	20	30	40	

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