

Orbital Motors

ORBITAL MOTORS

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MOTOR APPLICATION

VEHICLE DRIVE CALCULATIONS

1. Motorspeed: n , [min^{-1}]

$$n = \frac{2.65 \times v \times i}{R}$$

v - vehicle speed, [km/h];

R - wheel rolling radius, [m];

i - gear ratio between motor and wheels. If no gearbox, use $i=1$.

2. Rolling resistance: RR, [daN]

The resistance force resulted in wheels contact with different surfaces:

$$RR = G \times \rho$$

G - total weight loaded on vehicle, [daN];

ρ - rolling resistance coefficient (Table 1).

Table 1

Rolling resistance coefficient In case of rubber tire rolling on different surfaces	
Surface	ρ
Concrete- faultless	0,010
Concrete- good	0,015
Concrete- bad	0,020
Asphalt- faultless	0,012
Asphalt- good	0,017
Asphalt- bad	0,022
Macadam- faultless	0,015
Macadam- good	0,022
Macadam- bad	0,0370
Snow - 5 cm	0,025
Snow - 10 cm	0,037
Polluted covering- smooth	0,025
Polluted covering- sandy	0,040
Mud	0,037 ÷ 0,150
Sand - Gravel	0,060 ÷ 0,150
Sand - loose	0,160 ÷ 0,300

3. Grade resistance: GR, [daN]

$$GR = G \times (\sin \alpha + \rho \times \cos \alpha)$$

α - gradient negotiation angle (Table 2)

Table 2

Grade %	Degrees α	Grade %	Degrees α
1%	0° 35'	12%	6° 5"
2%	1° 9'	15%	8° 31'
5%	2° 51'	20%	11° 19'
6%	3° 26'	25%	14° 3'
8%	4° 35'	32%	18°
10	5° 43'	60%	31°

4. Accelerate force: FA, [daN]

Force **FA** necessary for acceleration from 0 to maximum speed v and time t can be calculated with a formula:

$$FA = \frac{v \times G}{3.6 \times t}, \text{ [daN]}$$

FA - accelerate force, [daN];

t - time, [s].

5. Tractive effort: DP, [daN]

Tractive effort DP is the additional force of trailer. This value will be established as follows:

-according to constructor's assessment;

-as calculating forces in items 2, 3 and 4 of trailer; the

calculated sum corresponds to the tractive effort requested.

6. Total tractive effort: TE, [daN]

Total tractive effort TE is total effort necessary for vehicle motion; that the sum of forces calculated in items 2 to 5 and increased with 10 % because of air resistance.

$$TE = 1,1 \times (RR + GR + FA + DP)$$

RR - force acquired to overcome the rolling resistance;

GR - force acquired to slope upwards;

FA - force acquired to accelerate (acceleration force);

DP - additional tractive effort (trailer).

7. Motor Torque: M, [daNm]

Necessary torquemoment for every hydraulic motor:

$$M = \frac{TE \times R}{N \times i \times \mu_M}$$

N - motor numbers;

μ_M - mechanical gear efficiency (if it is available).

8. Cohesion between tire and road covering: Mw, [daNm]

$$M_w = \frac{G_w \times f \times R}{i \times \mu_M}$$

To avoid wheel slipping, it should be observed the following condition $M_w > M$

f - frictional factor;

G_w - total weight over the wheels, [daN].

Table 3

Surface	Frictional factor f
Steel on steel	0,15 ÷ 0,20
Rubber tire on polluted surface	0,5 ÷ 0,7
Rubber tire on asphalt	0,8 ÷ 1,0
Rubber tire on concrete	0,8 ÷ 1,0
Rubber tire on grass	0,4

9. Radial motor loading: Prad, [daN]

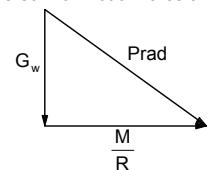
When motor is used for vehicle motion with wheels mounted directly on motor shaft, the total radial loading of motor shaft Prad is a sum of motion force and weight force acting on one wheel.

$$Prad = \sqrt{G_w^2 + \left(\frac{M}{R}\right)^2}$$

G_w - Weight held by wheel;

Prad - Total radial loading of motor shaft;

M/R - Motion force.

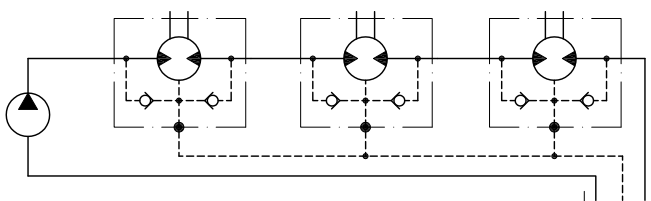


In accordance with calculated loadings the suitable motor from the catalogue is selected.

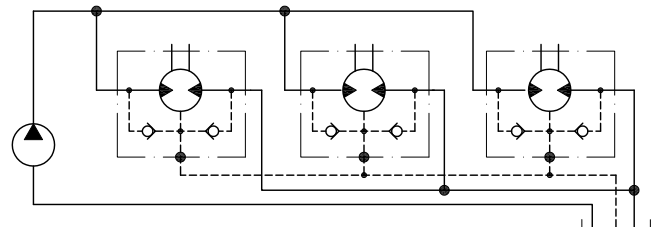
DRAINAGE SPACE AND DRAINAGE PRESSURE

Advantages in oil drainage from drain space: Cleaning; Cooling and Seal lifetime prolonging.

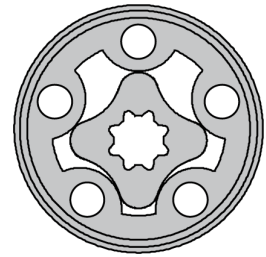
Series connection



Parallel connection

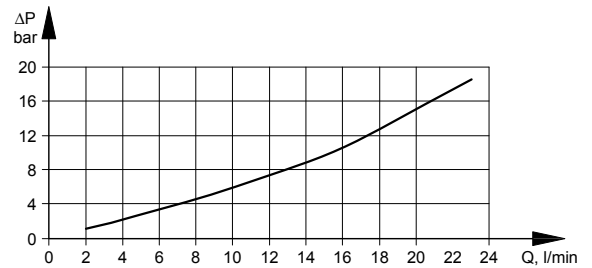


HYDRAULIC MOTORS OM



GENERAL	
Displacement, (cm ³ /rev)	8.2 ÷ 50
Max. Speed, (RPM)	1950 ÷ 400
Max. Torque, (daNm)	1.1 ÷ 4.5
Max. Output, (kW)	1.8 ÷ 2.4
Max. Pressure Drop, (bar)	100 ÷ 70
Max. Oil Flow, (l/min)	16 ÷ 20
Min. speed, (RPM)	50 ÷ 20
Pressure fluid	Mineral based - HLP (DIN 51524) or HM (ISO 6743/4)
Temperature range, (°C)	-30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES

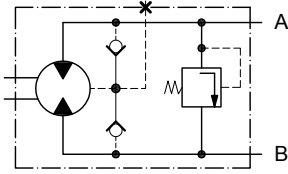


SPECIFICATION DATA

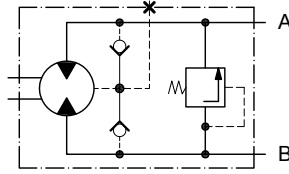
Type				OM 8	OM 12.5	OM 20	OM 32	OM 40	OM 50
Displacement [cm ³ /rev.]				8,2	12,9	20	31,8	40	50
Max. Speed, [RPM]	cont.			1950	1550	1000	630	500	400
	int.			2440	1940	1250	790	625	500
Max. Torque [daNm]	cont.			1,1	1,6	2,5	4	4,1	4,5
	int.			1,5	2,3	3,5	5,7	5,7	5,8
	peak			2,1	3,3	5,1	6,4	6,6	8
Max. Output [kW]	cont.			1,8	2,4	2,4	2,4	1,8	1,7
	int.			2,6	3,2	3,2	3,2	3,0	2,1
Max. Pressure Drop [bar]	cont.			100	100	100	100	80	70
	int.			140	140	140	140	110	90
	peak			200	200	200	200	140	125
Max. Oil Flow [l/min]	cont.			16	20	20	20	20	20
	int.			20	25	25	25	25	25
Max. Inlet Pressure, [bar]	cont.			140	140	140	140	140	140
	int.			175	175	175	175	175	175
	peak			225	225	225	225	225	225
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	140	140	140	140	140	140
	cont.	100-400	RPM	100	100	100	100	100	100
	cont.	400-800	RPM	50	50	50	50	50	-
	cont.	>800	RPM	20	20	20	-	-	-
	int.	0-max.	RPM	140	140	140	140	140	140
Max. Return Pressure with Drain Line [bar]	cont.			140	140	140	140	140	140
	int.			175	175	175	175	175	175
	peak			225	225	225	225	225	225
Max. Starting Pressure with Unloaded Shift, [bar]				4	4	4	4	4	4
Min. Starting Torque [daNm]	at max	press.	drop cont.	0,7	1,2	2,1	3,4	3,3	3,7
	at max	press.	drop int.	1,0	1,7	2,9	4,8	4,6	4,8
Min. Speed, [RPM]				50	40	30	30	25	20
Weight, avg. [kg]	OM			1,9	2	2,1	2,2	2,3	2,5
	OMF(S)			2,3	2,4	2,5	2,6	2,7	2,9
	OMFS			2,7	2,8	2,9	3,0	3,1	3,3
	OMP			2,5	2,6	2,7	2,8	2,9	3,1
	OMPF			2,7	2,8	2,9	3,0	3,1	3,3
	OMD			2,6	2,7	2,8	2,9	3,0	3,2
OMDF			2,8	2,9	3,0	3,1	3,2	3,4	

Intermittent operation: the permissible values may occur for max. 10% of every minute.
 Peak load: the permissible values may occur for max. 1% of every minute.

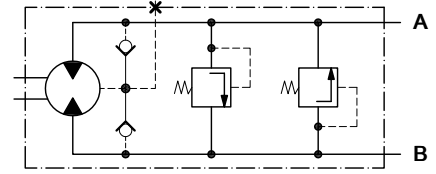
OMP Series with Integrated
Internal Crossover Relief Valve
A → B, $\Delta p = 100$ bar (50 bar)



OMP Series with Integrated
Internal Crossover Relief Valve
B → A, $\Delta p = 100$ bar (50 bar)

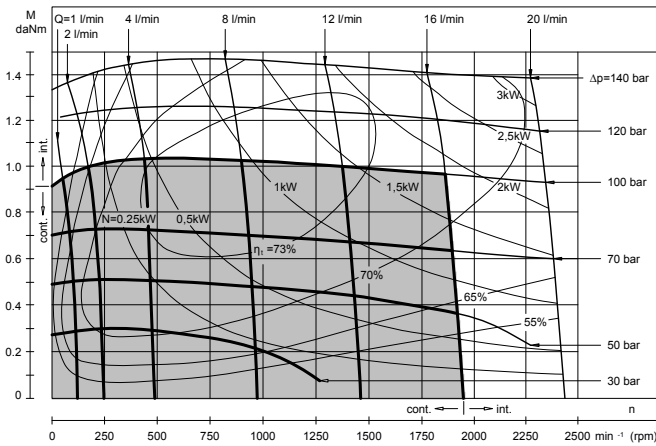


OMD Series with Integrated
Internal Crossover Relief Valve
B → A, $\Delta p = 100$ bar (50 bar)

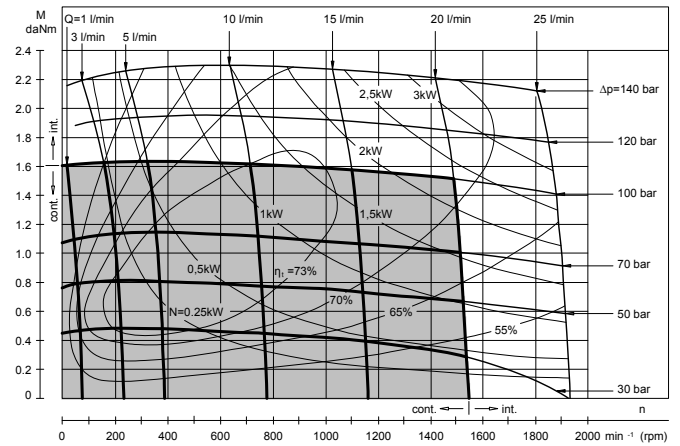


FUNCTION DIAGRAMS

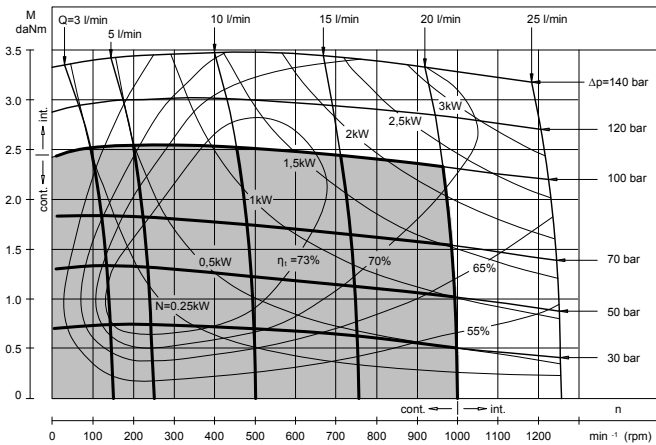
OM 8



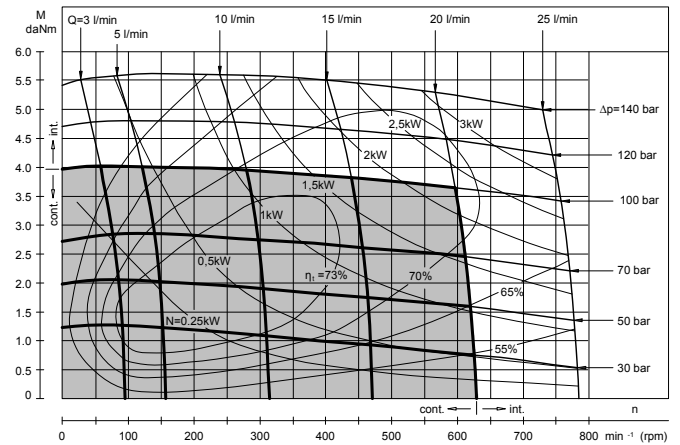
OM 12.5



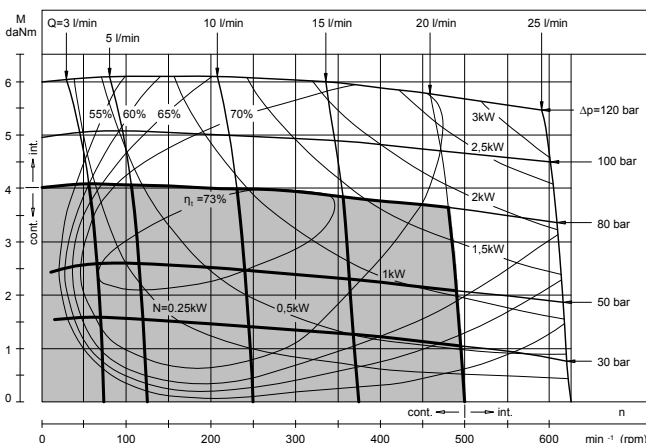
OM 20



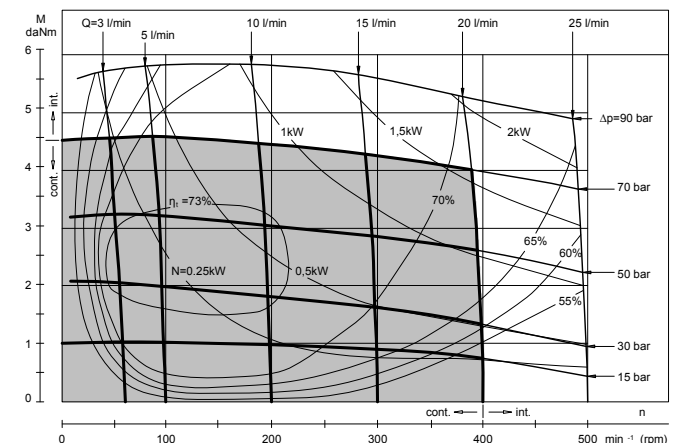
OM 32



OM 40

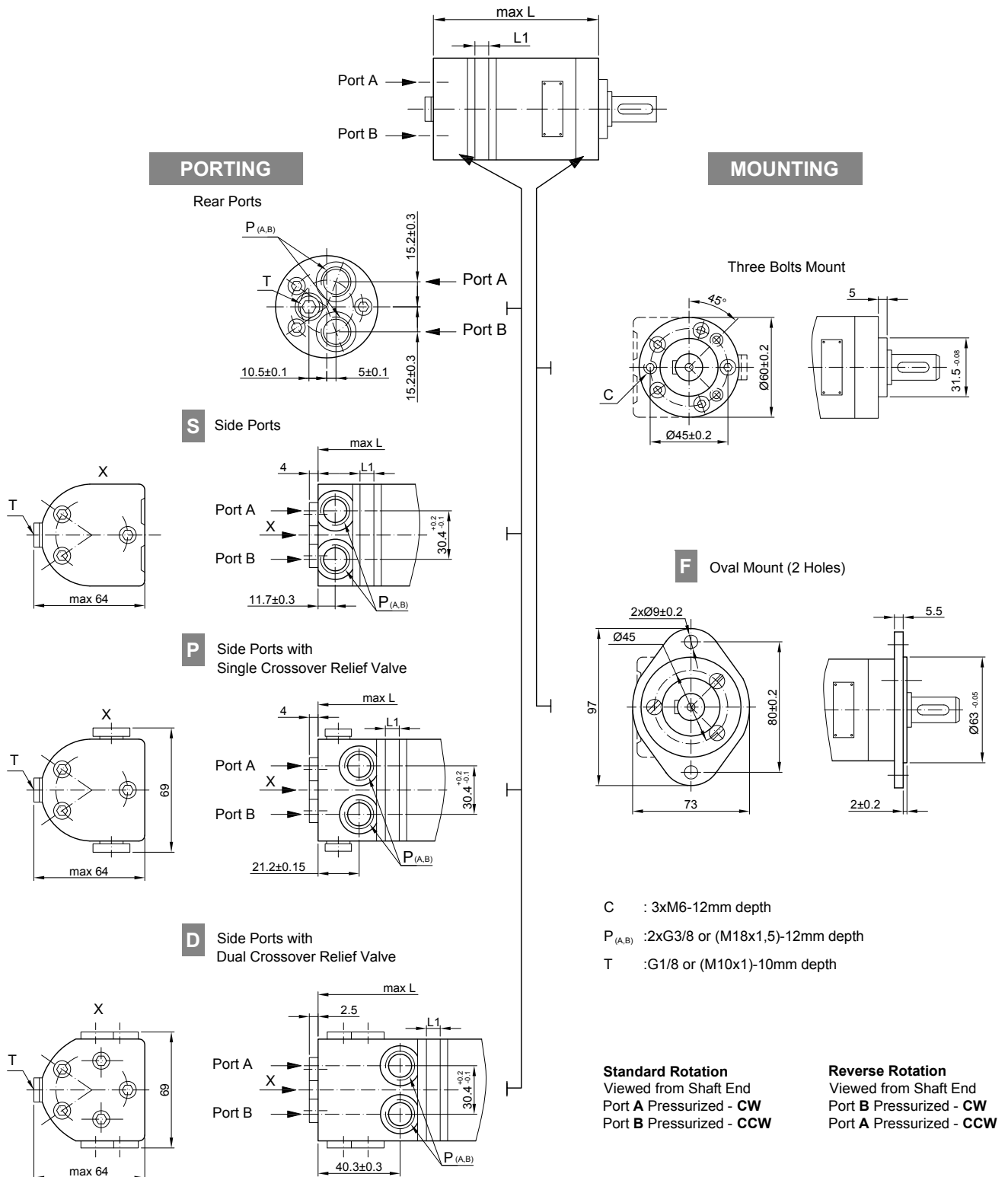


OM 50



The function diagrams data was collected at back pressure $5 + 10$ bar and oil with viscosity of $32 \text{ mm}^2/\text{s}$ at 50°C .

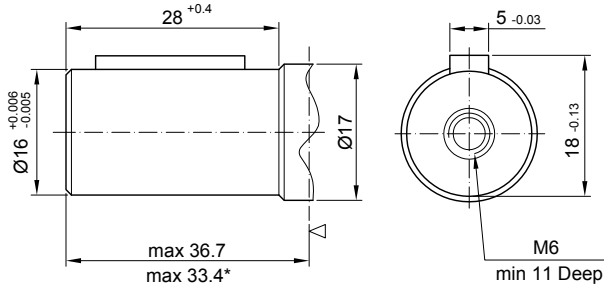
DIMENSIONS AND MOUNTING DATA



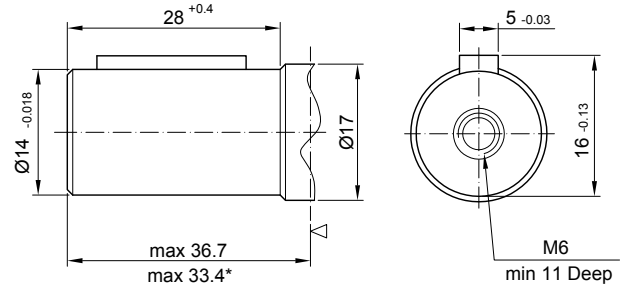
Type	L , mm	Type	L , mm	Type	L , mm	Type	L , mm	L1 , mm
OM 8	104	OMS 8	105	OMP 8	115	OMD 8	134	3.5
OM 12.5	106	OMS 12.5	107	OMP 12.5	117	OMD 12.5	136	5.5
OM 20	109	OMS 20	110	OMP 20	120	OMD 20	139	8.5
OM 32	114	OMS 32	115	OMP 32	125	OMD 32	144	13.5
OM 40	117.5	OMS 40	118.5	OMP 40	128.5	OMD 40	147.5	17
OM 50	121.5	OMS 50	122.5	OMP 50	132.5	OMD 50	151.5	21

SHAFT EXTENSIONS

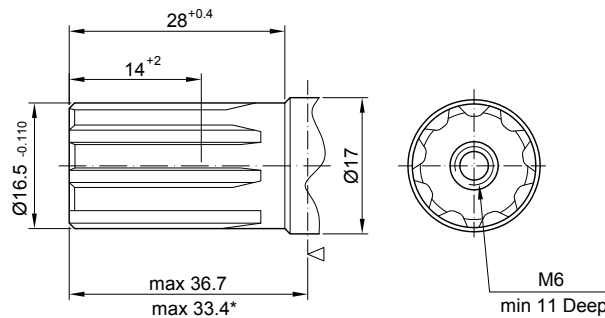
C Ø16 straight, Parallel key 5x5x16 DIN 6885
Max. Torque 3,9 daNm



CK Ø14 Straight, Paralle key 5x5x16 DIN 6885
Max. Torque 3 daNm

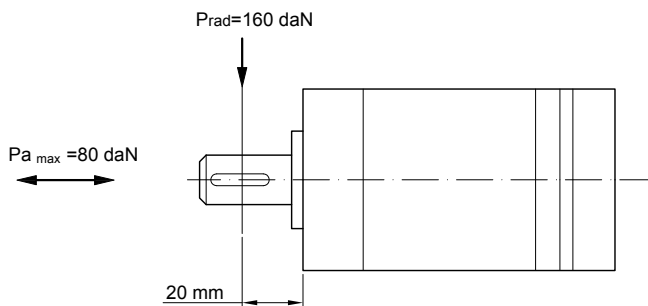


SH Ø16,5 Splined, B17x14 DIN 5482
Max. Torque 4,4 daNm



▽ Motor Mounting Surface
* For F Mounting

PERMISSIBLE SHAFT LOAD



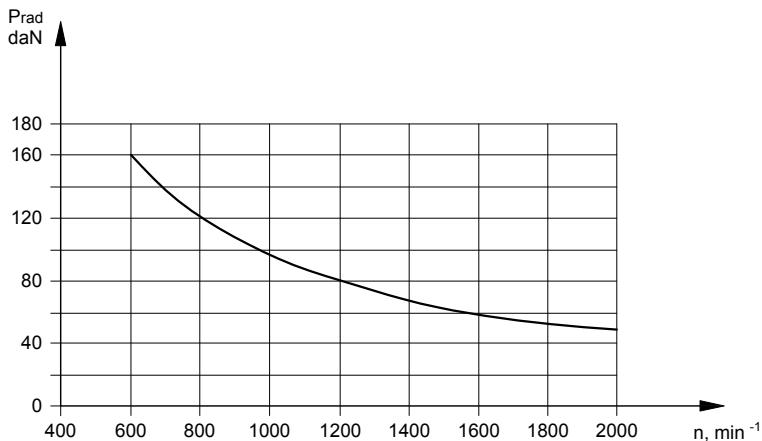
The permissible radial shaft load (P_{rad}) is calculated from the distance (L) between the point of load application and the mounting surface:

$$P_{rad} = \frac{130040}{(61.5+L)}, \text{ (daN)}$$

(L in mm; $L \leq 80$)

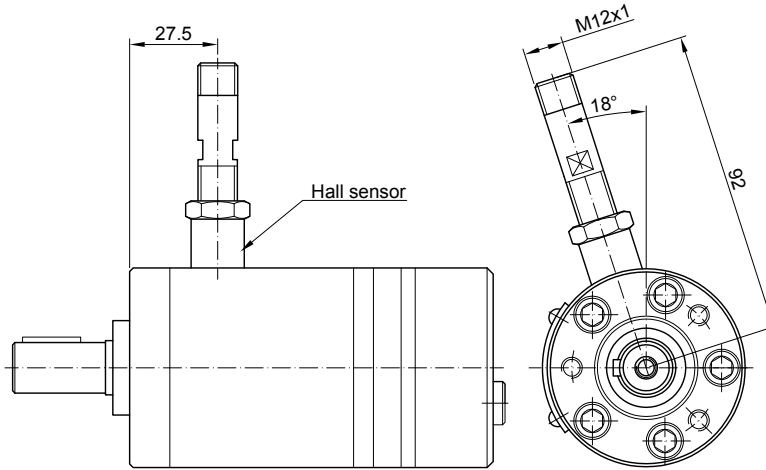
The drawing shows the permissible radial load when $L=20$ mm.

If the calculated shaft load exceeds the permissible, a flexible coupling must be used.



HYDRAULIC MOTORS WITH SPEED SENSOR TYPE OM...RS

Meta Hydraulic is introducing hydraulic motor with a new generation of speed sensor. The electric output signal is a standard voltage signal that can be used for regulating the speed of a motor. The speed is measured by a sensor in accordance with the Hall principle. Signal processing and amplification are performed in the sensor housing. Connection is provided in the housing by a Plug connector M12 Series.



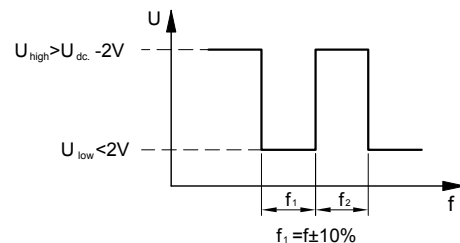
This performance is applicable for all motors of OM series. The main technical features correspond to the standard motors series OM.

DIFFERENTIAL HALL SENSOR

TECHNICAL DATA

Frequency range	3...20 000 Hz
Output	PNP
Power supply	10...36 VDC
Current input	20 mA (@24 VDC)
Current load	500 mA (@24 VDC;24°C)
Ambient Temperature	minus 40... plus 125°C
Protection	IP 67
Plug connector	M12-Series
Mounting principle	ISO 6149
Pulses per revolution	30

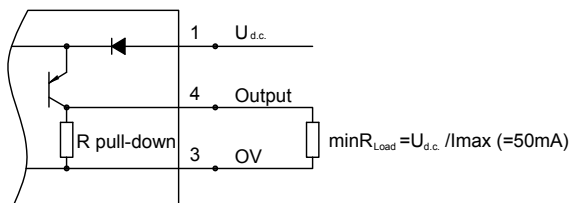
OUTPUT SIGNAL



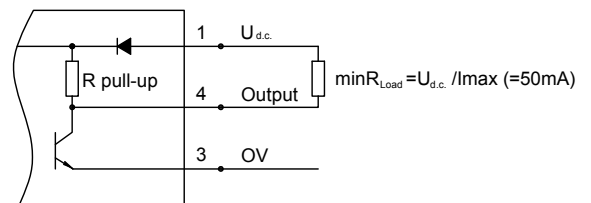
Load max.: $I_{high}=I_{low}<50\text{mA}$
No load current, max: 20 mA

WIRING DIAGRAM

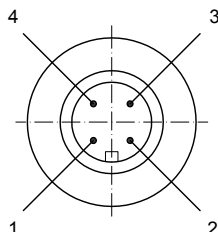
PNP



NPN



STICK TYPE



Terminal No.	Connection
1	U _{d.c.}
2	No connection
3	0V
4	Output signal

ORDER CODE

	1	2	3	4	5	6	7	8	9	10	11	12
OM												

1 Adjustment Option

omit	without valve
P	Side ports with single crossover relief valve
D	Side ports with dual crossover relief valve

2 Mounting Flange

omit	Three bolts mount
F	Oval mount, two holes

3 Port type (not valid for P and D version)

omit	Rear ports
S	Side ports

4 Displacement code

8	8,2 [cm ³ /rev]
12.5	12,9 [cm ³ /rev]
20	20 [cm ³ /rev]
32	31,8 [cm ³ /rev]
40	40 [cm ³ /rev]
50	50 [cm ³ /rev]

5 Shaft Extensions

C	ø16 straight Parallel key 5x5x16 DIN 6885
VC	ø16 straight Parallel key 5x5x16 DIN 6885 with corrosion resistant bushing
CK	ø14 straight, Parallel key 5x5x16 DIN 6885
SH	ø16,5 splined, B17x14 DIN 5482

6 Ports

omit	BSPP (ISO 228)
M	Metric (ISO 262)

7 Line to control *

L	B → A (left running)
R	A → B (right running)

8 Valve Rated Pressure**

/50	Δp=50 bar
/100	Δp=100 bar

9 Speed Monitoring

omit	none
RS-P	with speed sensor (PNP pull-down resistor)
RS-N	with speed sensor (NPN pull-up resistor)

10 Rotation

omit	Standard Rotation
R	Reverse Rotation

11 Option (Paint)

omit	no paint
P	Painted
PC	Corrosion Protected Paint

12 Design Series

omit	Factory specified
-------------	-------------------

The permissible output torque for shafts must not be exceeded

* For "P" option useful only

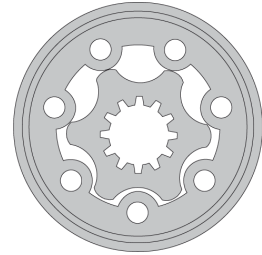
** For "P" and "D" option useful only

HYDRAULIC MOTORS OP



OIL FLOW IN DRAIN LINE

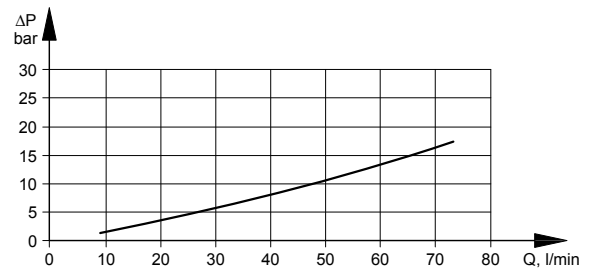
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
100	20	2,5
	35	1,8
140	20	3,5
	35	2,8



GENERAL

Displacement, (cm ³ /rev)	25 ÷ 623,6
Max. Speed, (RPM)	1600 ÷ 95
Max. Torque, (daNm)	3,3 ÷ 50
Max. Output, (kW)	3,3 ÷ 10,5
Max. Pressure Drop, (bar)	140 ÷ 55
Max. Oil Flow, (l/min)	40 ÷ 60
Min. speed, (RPM)	10
Pressure fluid	Mineral based - HLP (DIN 51524) or HM (ISO 6743/4)
Temperature range, (°C)	- 30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES



SPECIFICATION DATA

Type		OP 25	OP 32	OP 40	OP(W) 50	OP 50..B...	OP(W) 80	OP 80..B...	OP(W) 100	OP 100..B...	OP125	OP 125	OP 125..B...	OP 160
Displacement [cm ³ /rev.]		25	32.0	40.0	49,5	49,5	79,2	79,2	99	99	123,8	123,8	123,8	158,4
Max. Speed, [RPM]	cont.	1600	1560	1500	1210	1210	755	755	605	605	486	486	486	378
	int.	1800	1720	1750	1515	1515	945	945	755	755	605	605	605	472
Max. Torque [daNm]	cont.	3.3	4.3	6.2	9.4	9.4	15.1	15.1	19.3	19.3	23.7	23.7	23.7	31.3
	int.	4.7	6.1	8.2	11.9	11.9	19.5	19.5	23.7	23.7	29.8	29.8	29.8	37.8
	peak	6.7	8.6	10.7	14.3	14.3	22.4	22.4	27.5	27.5	36.5	36.5	36.5	43.8
Max. Output [kW]	cont.	4.5	5.8	8.4	10.1	10.1	10.2	10.2	10.5	10.5	10	10	10	10.1
	int.	6.1	7.8	11.6	12.2	12.2	12.5	12.5	12.8	12.8	12	12	12	12.1
Max. Pressure Drop [bar]	cont.	100	100	120	140	140	140	140	140	140	140	140	140	140
	int.	140	140	155	175	175	175	175	175	175	175	175	175	175
	peak	225	225	225	225	225	225	225	225	225	225	225	225	225
Max. Oil Flow [l/min]	cont.	40	50	60	60	60	60	60	60	60	60	60	60	60
	int.	45	55	70	75	75	75	75	75	75	75	75	75	75
Max. Inlet Pressure, [bar]	cont.	175	175	175	175	175	175	175	175	175	175	175	175	175
	int.	200	200	200	200	200	200	200	200	200	200	200	200	200
	peak	225	225	225	225	225	225	225	225	225	225	225	225	225
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	150	150	150	150	100	150	100	150	100	150	100
	cont.	100-300	RPM	75	75	75	75	30	75	30	75	30	75	30
	cont.	300-600	RPM	50	50	50	50	15	50	15	50	15	50	15
	cont.	>600	RPM	20	20	20	20	-	20	-	20	-	20	-
	int.	0-max.	RPM	150	150	150	150	100	150	100	150	100	150	100
Max. Return Pressure with Drain Line [bar]	cont.			175	175	175	175	175	175	175	175	175	175	175
	int.			200	200	200	200	200	200	200	200	200	200	200
	peak			225	225	225	225	225	225	225	225	225	225	225
Max. Starting Pressure with Unloaded Shift, [bar]				10	10	10	10	10	10	10	9	9	9	8
Min. Starting Torque [daNm]	at max press. drop cont.			3	4	5.4	7.8	7.8	13.2	13.2	16.6	16.6	20.7	20.7
	at max press. drop int.			4.2	5.6	6.9	10	10	16.8	16.8	21	21	26.6	26.6
Min. Speed, [RPM]				20	15	10	10	10	10	10	10	10	10	10
Weight avg, [kg]	OP(F)			5.6	5.6	5.7	5.8		5.9		6.1		6.2	
	OP(F)(E)...B...							5,9(6,4)		6(6,5)		6,2(6,7)		6,3(6,8)
	OPQ(N)						5.2		5.3		5.5		5.6	
	OP(F)(N)E						6.3		6.4		6.6		6.7	
	OPW(N)						5.5		5.6		5.8		5.9	
OPQ(N)E						5.7		5.8		6.0		6.1		

Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

SPECIFICATION DATA

Type		OP	OP 200	OP	OP(W)	OP	OP(W)	OP	OP(W)	OP	OP	OP	OP
		160...B...	OPW 200	200...B...	250	250...B...	315	315...B...	400	400...B...	500	630	
Displacement [cm ³ /rev.]		158,4	198	198	247,5	247,5	316,8	316,8	396	396	495	623,6	
Max. Speed, [RPM]	cont.	378	303	303	242	242	190	190	150	150	120	95	
	int.	472	378	378	303	303	236	236	189	189	150	120	
Max. Torque [daNm]	cont.	31,3	36,6	36,6	38	47	38	48,6	36	50	39	44	
	int.	37,8	45,6	45,6	58,3	58,3	56	56	59	59	57	64	
	peak	43,8	55	55	68,5	68,5	85	85	85,4	85,4	78	82	
Max. Output [kW]	cont.	10,1	10	10	7,5	9,5	5,7	7,6	4,6	6,2	3,5	3,3	
	int.	12,1	12	12	12	12	9	9	7,8	7,8	7,2	5,6	
Max. Pressure Drop [bar]	cont.	140	140	140	110	140	90	120	70	95	60	55	
	int.	175	175	175	175	175	140	140	115	115	90	80	
	peak	225	225	225	225	225	225	225	180	180	130	110	
Max. Oil Flow [l/min]	cont.	60	60	60	60	60	60	60	60	60	60	60	
	int.	75	75	75	75	75	75	75	75	75	75	75	
Max. Inlet Pressure, [bar]	cont.	175	175	175	175	175	175	175	175	175	140	140	
	int.	200	200	200	200	200	200	200	200	200	175	175	
	peak	225	225	225	225	225	225	225	225	225	225	225	
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	100	150	100	150	100	150	100	150	150	
	cont.	100-300	RPM	30	75	30	75	30	75	30	75	-	
	cont.	300-600	RPM	15	50	15	-	-	-	-	-	-	
	cont.	>600	RPM	-	-	-	-	-	-	-	-	-	
	int.	0-max.	RPM	100	150	100	150	100	150	100	150	150	
Max. Return Pressure with Drain Line [bar]	cont.	175	175	175	175	175	175	175	175	175	140	140	
	int.	200	200	200	200	200	200	200	200	200	175	175	
	peak	225	225	225	225	225	225	225	225	225	225	225	
Max. Starting Pressure with Unloaded Shift, [bar]		8	7	7	6	6	5	5	5	5	5	5	
Min. Starting Torque [daNm]	at max press. drop cont.	28,2	33,5	33,5	33,6	42,8	34,4	45,8	34,5	46,8	36	41,5	
	at max press. drop int.	35,5	42,6	42,6	54,2	54,2	61,9	61,9	60,8	60,8	54	62	
Min. Speed, [RPM]		10	10	10	10	10	10	10	10	10	10	10	
Weight, avg. [kg]	OP(F)		6,6		6,8		7,1		7,6		8,9	9,5	
	OP(F)(E)...B...	6,5(6,9)		6,7(7,2)		6,9(7,4)		7,2(7,7)		7,7(8,2)			
	OP(Q)(N)		6,0		6,2		6,5		6,8		8,3	9,0	
	OP(F)(N)(E)		7,1		7,3		7,6		8,1		9,3	10	
	OP(W)(N)		6,3		6,5		6,8		7,2				
	OP(Q)(N)(E)		6,5		6,7		7,0		7,3		8,8	8,5	

Intermittent operation: the permissible values may occur for max. 10% of every minute.

Peak load: the permissible values may occur for max. 1% of every minute.

SPECIFICATION DATA for OP...LSV

Low Speed Valve (LSV) "LSV" Series hydraulic motors have been designed to operate with normal pressure drop and to ensure smooth run at low speed (up to 200 RPM), as the best security for operation is guaranteed at frequency of rotation 20 ÷ 50 RPM. They have an increased starting pressure drop and are not recommended for using at pressure less than 40 bar.

Look at specification data for hydraulic motors standard version. The modification concerns only the following parameters: maximum speed, maximum output, maximum Oil flow and maximum starting pressure.

Type		OP 25	OP 32	OP 40	OP 50	OP 80	OP 100	OP 125	OP 160	OP 200	OP 250	OP 315	OP 400	OP 500	OP 600
Max. Speed, [RPM]	cont.	200	200	200	200	200	200	200	200	200	200	190	150	80	64
	int.	250	250	250	250	250	250	250	250	250	250	236	190	101	80
Max. Output [kW]	cont.	0,7	0,9	1,2	2,0	3	3,8	4,9	6,1	7,0	5,2	4,2	3,4	2,9	2,6
	int.	1,2	1,5	2,0	3,2	5	6,0	7,2	9,5	9,8	9,1	7,2	6,0	5,0	4,2
Max. Oil Flow [l/min]	cont.	9,0	11,0	11	15	22	24	30	34	40	40	40	40	40	40
	int.	13,5	16,5	14	20	29	33	38	46	50	50	50	50	50	50
Max. Starting Pressure with Unloaded Shift, [bar]		25	25	25	20	20	20	20	15	15	15	12	12	10	10

SPECIFICATION DATA for OP...LL

Low Leakage (LL) "LL" Series hydraulic motors have been designed to operate at the whole standard range of working conditions (pressure drop and frequency of rotation), but with considerable decreased volumetric losses in the drainage ports. Their main purpose is to operate as series-connected motors in hydraulic systems. For this version is permissible decreasing of the maximal torque with up to 5% (at middle speed) and up to 10% (at high speed) in comparison to the standard versions of motors.

Look at specification data for hydraulic motors series OP standard version. The modification concerns only the parameters: maximum torque, maximum output, minimum starting torque.

Type		OP 25	OP 32	OP 40	OP 50	OP 80	OP 100	OP 125	OP 160	OP 200	OP 250	OP 315	OP 400	OP 500	OP 600
Max. Torque [daNm]	cont.	3,1	4,1	5,8	9,0	14,4	18,4	22,5	29,8	34,8	44,6	46,2	47,5	38	42,8
	int.	4,3	5,8	7,8	11,3	18,5	22,5	28,3	36,0	43,3	55,4	53,2	56,0	55	62,0
Max. Output [kW]	cont.	4,3	5,6	8,2	10	10,1	10,4	9,9	10	9,9	9,4	7,5	6,1	3,4	3,2
	int.	6,0	7,7	11,5	12	12,3	12,6	11,8	12	11,8	11,8	8,9	7,7	7,1	5,5
Max. Pressure Drop [bar]	cont.	100	100	120	140	140	140	140	140	140	140	120	95	60	55
	int.	140	140	155	175	175	175	175	175	175	175	140	115	90	80
Min. Starting Torque [daNm]	cont.	4,5	5,7	6,8	7,4	12,5	15,8	19,6	26,8	31,8	40,7	43,5	44,5	46	50
	int.	6,0	7,0	8,0	9,5	16,0	20,0	25,2	33,7	40,5	51,5	58,8	57,8	52	60

SPECIFICATION DATA for OP...FR

Free Running version "FR": These are the hydraulic motors with reduced mechanical losses, for which at disengaged condition (unconnected with driving mechanism) the rotation of the shaft could be realized by means of small torque.

This advantage is especially useful at operating with high frequencies of rotation (over 300 min⁻¹) and low pressure drop, which is inbred for types with displacements of up to 200 cm³. It is normal for these for the different condition of operation to have high torque, as well as high volume losses: the values of the volumetric efficiency are lower (up to 5% for middle and up to 10% for high values of the pressure drop), than those of the normal versions. That's why the recommended operating for "FR" version is for applications with pressure drop up to 100 bar.

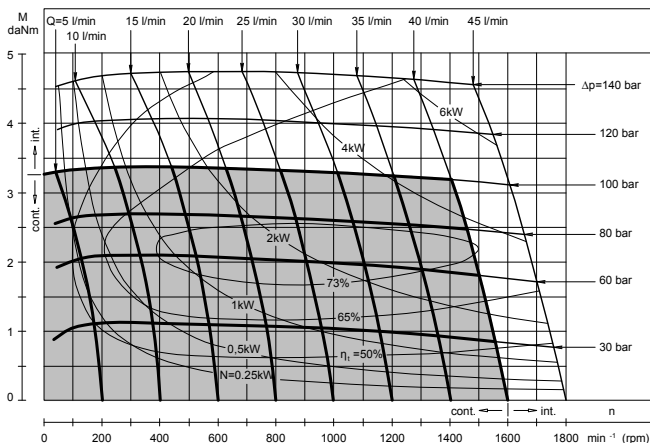
Additional advantages of "FR" version are prolonging of the life of the hydraulic motors at high frequencies of rotation, as well as the possibility to use them in systems with big variation of the loading.

Look at specification data for hydraulic motors series OP standard version. Only the parameter Starting Pressure is modified.

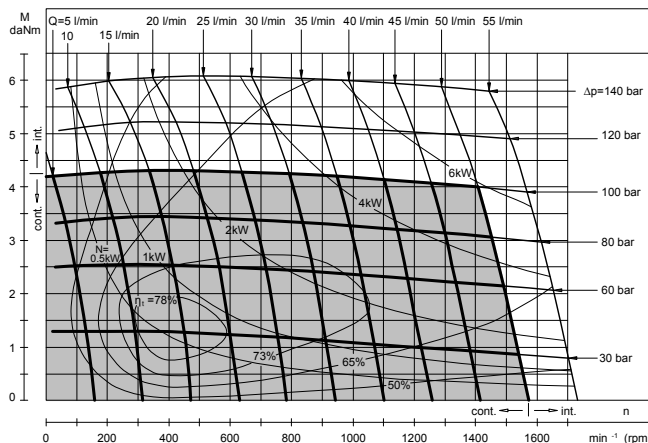
Type	OP 25	OP 32	OP 40	OP 50	OP 80	OP 100	OP 125	OP 160	OP 200
Max. Starting Pressure with Unloaded Shaft, [bar]	8	8	8	8	8	8	7,5	6,5	5,5

FUNCTION DIAGRAMS

OP 25



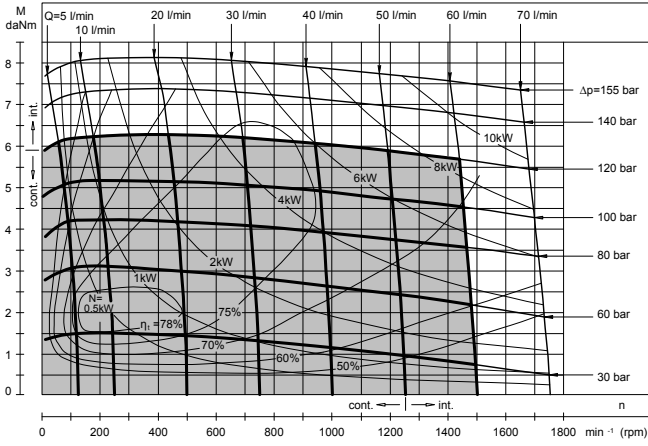
OP 32



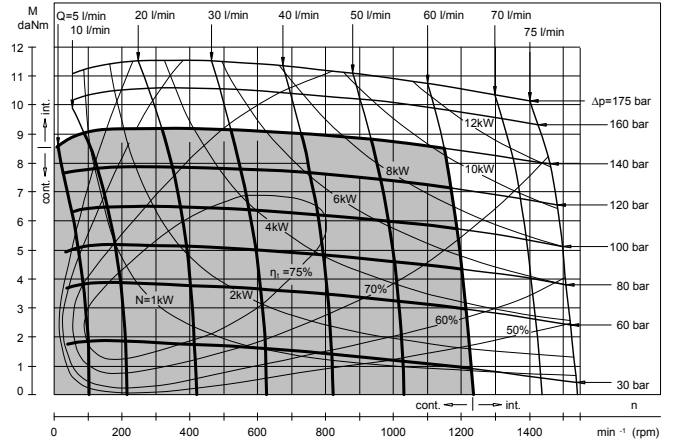
The function diagrams data was collected at back pressure 5+10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

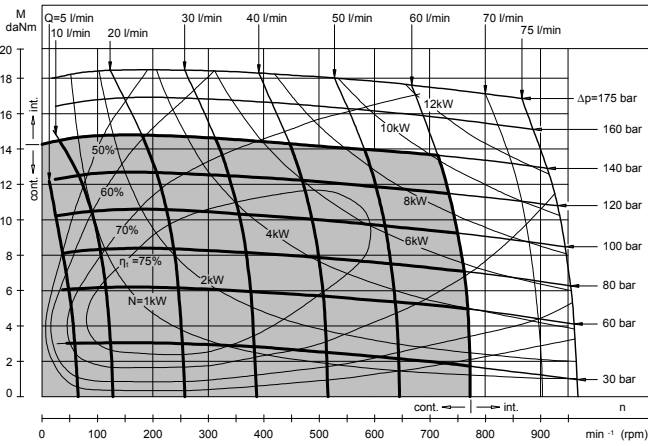
OP 40



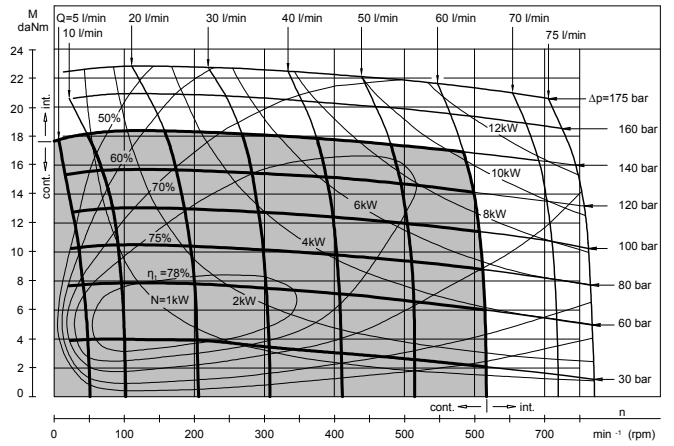
OP 50



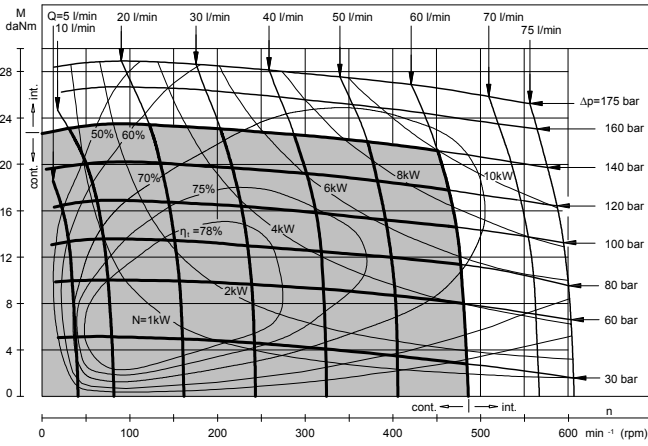
OP 80



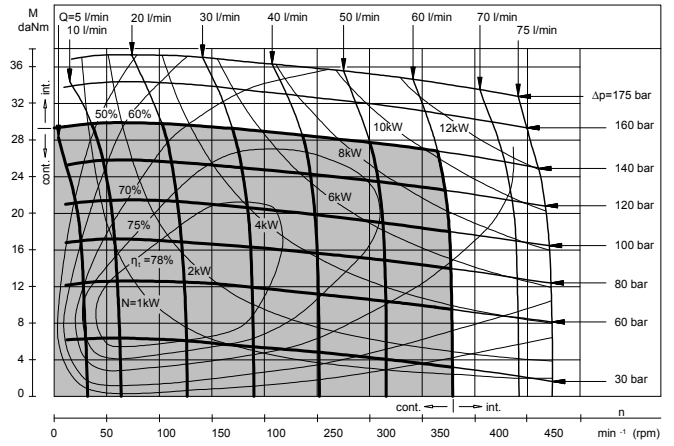
OP 100



OP 125



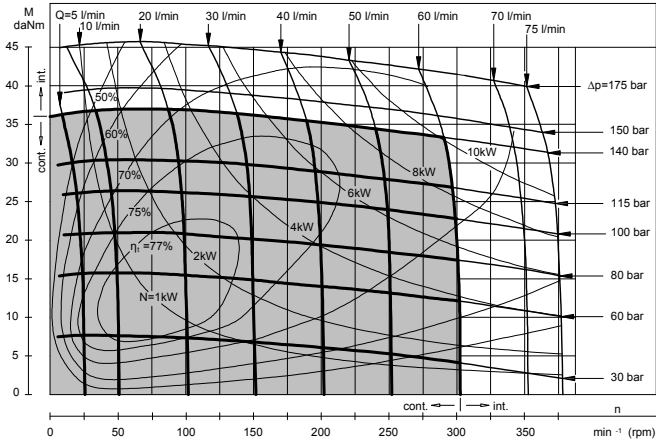
OP 160



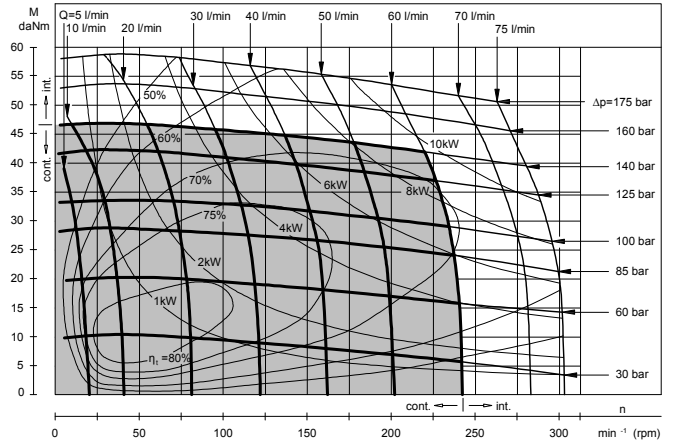
The function diagrams data was collected at back pressure 5±10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

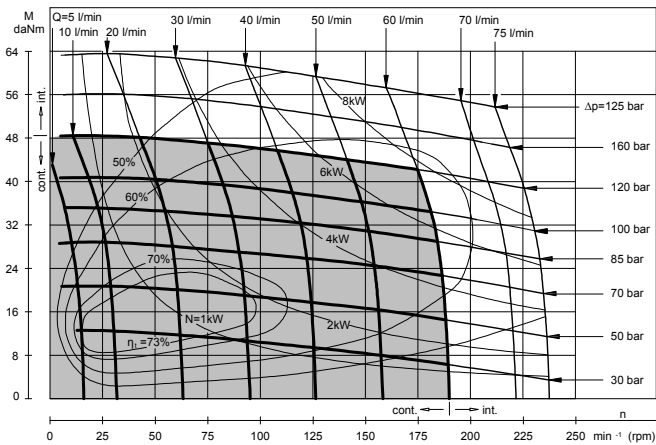
OP 200



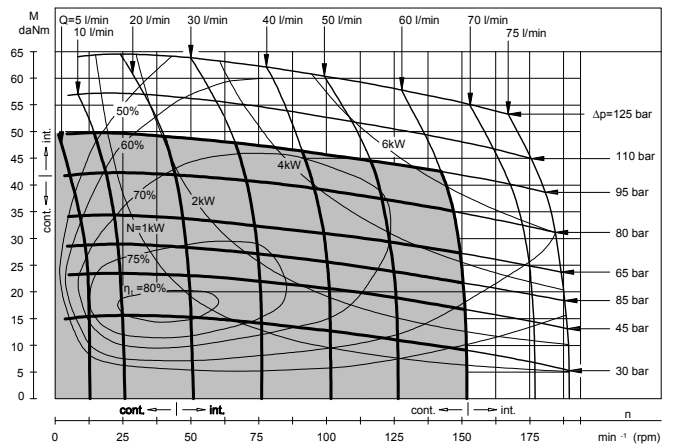
OP 250



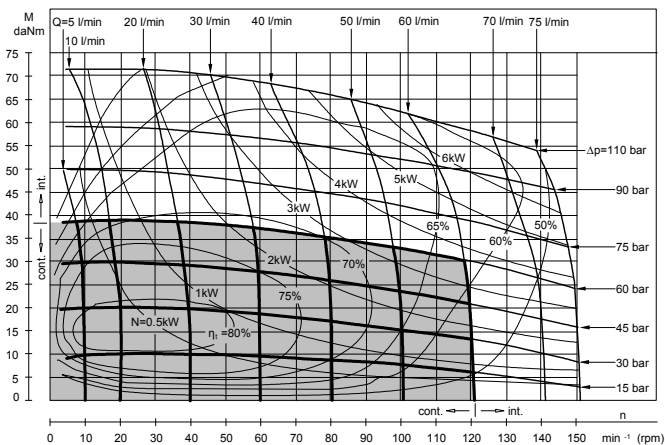
OP 315



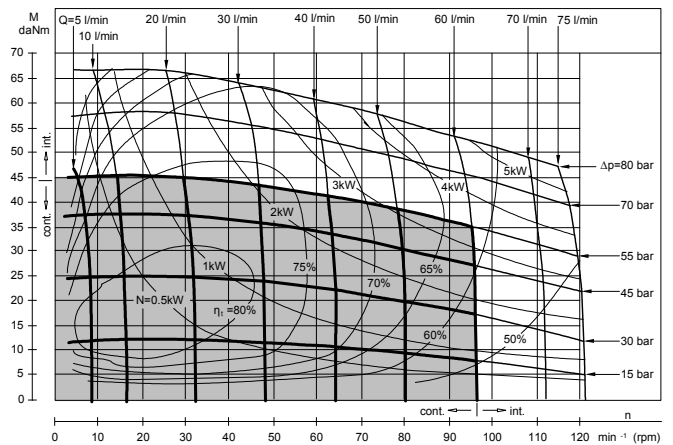
OP 400



OP 500



OP 630

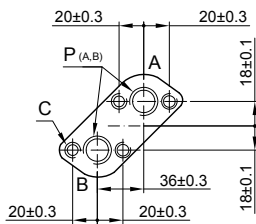


The function diagrams data was collected at back pressure 5+10 bar and oil with viscosity of 32 mm²/s at 50° C.

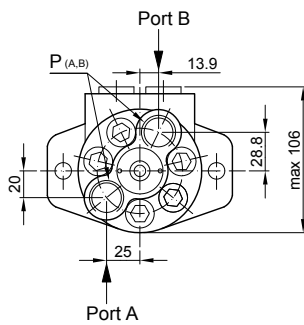
DIMENSIONS AND MOUNTING DATA

PORTING

Side Ports



E Rear Ports



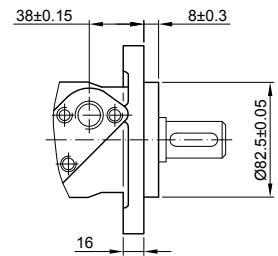
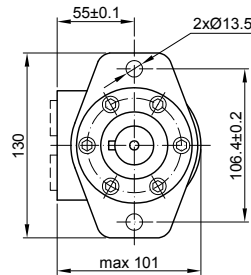
- C : 4xM8 - 13mm depth
- P_(A,B) : 2xG1/2 or 2xM22x1,5 - 15 mm depth
- T : G1/4 or M14x1,5 - 12 mm depth (plugged)

Standard Rotation
Viewed from Shaft End
Port A Pressurized - CW
Port B Pressurized - CCW

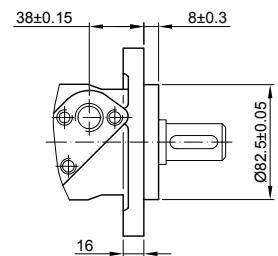
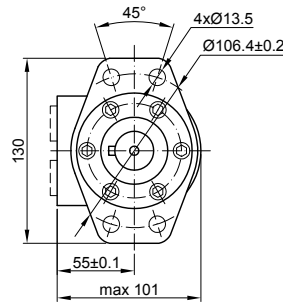
Reverse Rotation
Viewed from Shaft End
Port A Pressurized - CCW
Port B Pressurized - CW

MOUNTING

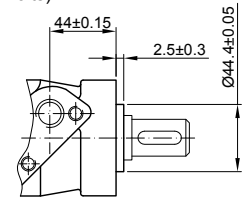
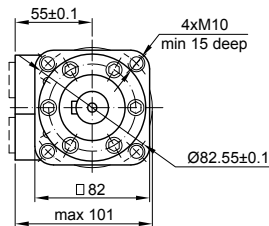
Oval Mount (2 Holes)



F Oval Mount (4 Holes)

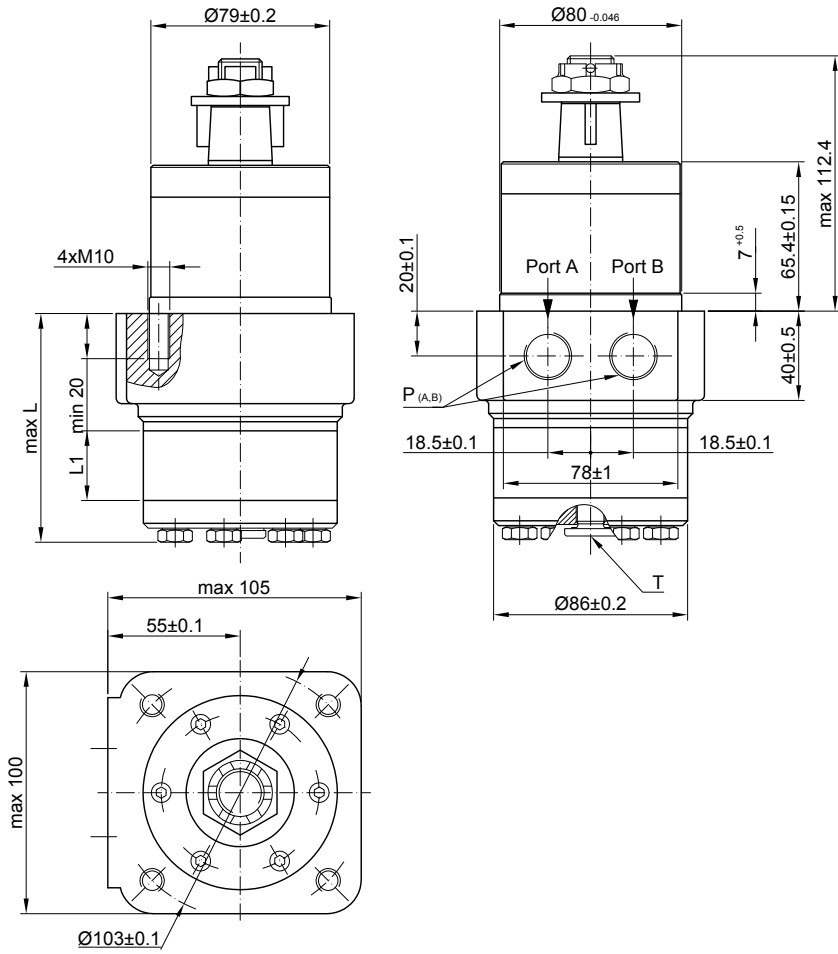


Q Square Mount (4 Bolts)



Type	L , mm	Type	L , mm	Type	L , mm	Type	L , mm	L1 , mm
OP(F) 25	133,2	OPQ 25	139,4	OP(F)E 25	151,2	OPQE 25	157,4	4,6
OP(F) 32	137	OPQ 32	143	OP(F)E 32	155	OPQE 32	161	7
OP(F) 40	137	OPQ 40	143	OP(F)E 40	155	OPQE 40	161	7
OP(F) 50	137	OPQ 50	143	OP(F)E 50	155	OPQE 50	161	7
OP(F) 80	140,5	OPQ 80	146,5	OP(F)E 80	160,5	OPQE 80	167	10,5
OP(F) 100	143	OPQ 100	149	OP(F)E 100	163	OPQE 100	169,5	13
OP(F) 125	146	OPQ 125	152	OP(F)E 125	166	OPQE 125	172,5	16
OP(F) 160	151	OPQ 160	157	OP(F)E 160	171	OPQE 160	177,5	21
OP(F) 200	157	OPQ 200	163	OP(F)E 200	177	OPQE 200	183,5	26
OP(F) 250	162	OPQ 250	168	OP(F)E 250	182	OPQE 250	188,5	32
OP(F) 315	172	OPQ 315	178	OP(F)E 315	192	OPQE 315	198,5	42
OP(F) 400	182	OPQ 400	188	OP(F)E 400	202	OPQE 400	208,5	52
OP(F) 500	193	OPQ 500	199	OP(F)E 500	213	OPQE 500	219	66,6
OP(F) 630	210,5	OPQ 630	216,5	OP(F)E 630	230,5	OPQE 630	236,5	84

DIMENSIONS AND MOUNTING DATA



Type	L , mm	L1 , mm
OPW(N) 32	81	7
OPW(N) 40	81	7
OPW(N) 50	81	7
OPW(N) 80	84,5	10,5
OPW(N) 100	87	13
OPW(N) 125	90	16
OPW(N) 160	95	21
OPW(N) 200	100	26
OPW(N) 250	106	32
OPW(N) 315	116	42
OPW(N) 400	126	52

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**

$P_{(A,B)}$: 2xG1/2 or 2xM22x1,5 - 15 mm depth

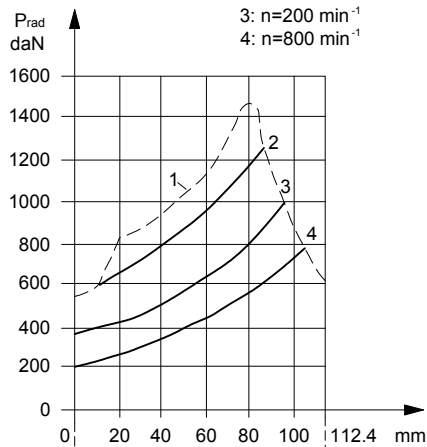
T : G1/4 or M14x1,5 -12 mm depth (plugged)

PERMISSIBLE SHAFT LOADS

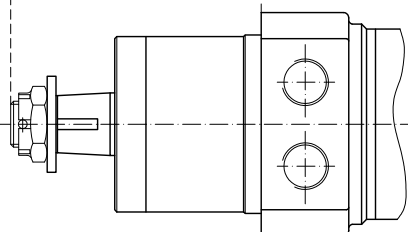
OPWN

The curves apply to a B10 bearing life of 2000 hours.

- 1: Max. radial shaft load
- 2: $n = 50 \text{ min}^{-1}$
- 3: $n = 200 \text{ min}^{-1}$
- 4: $n = 800 \text{ min}^{-1}$

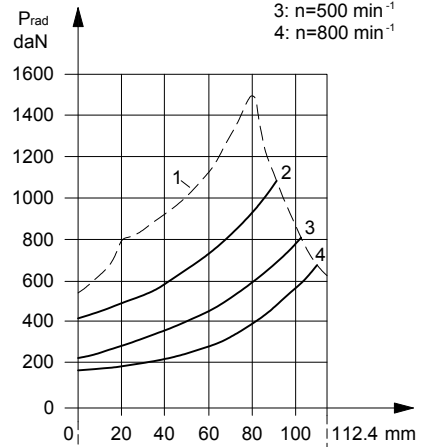


$P_{a_{max}} = 150 \text{ daN}$
 $P_{a_{max}} = 200 \text{ daN}$

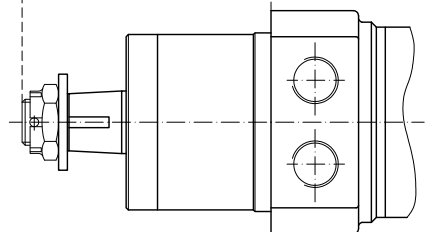


OPW

- 1: Max. radial shaft load
- 2: $n = 300 \text{ min}^{-1}$
- 3: $n = 500 \text{ min}^{-1}$
- 4: $n = 800 \text{ min}^{-1}$

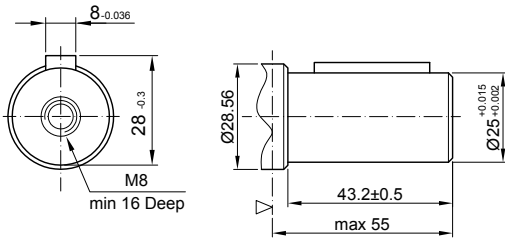


$P_{a_{max}} = 150 \text{ daN}$
 $P_{a_{max}} = 200 \text{ daN}$

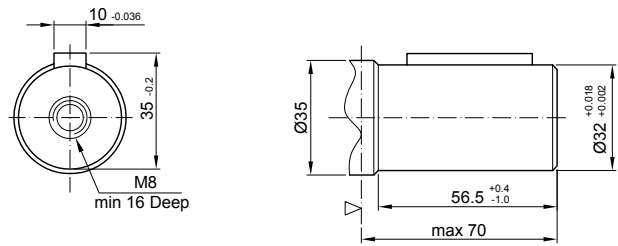


SHAFT EXTENSIONS FOR OP AND OR MOTORS

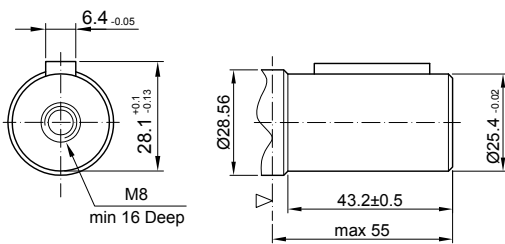
C Ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 44 daNm



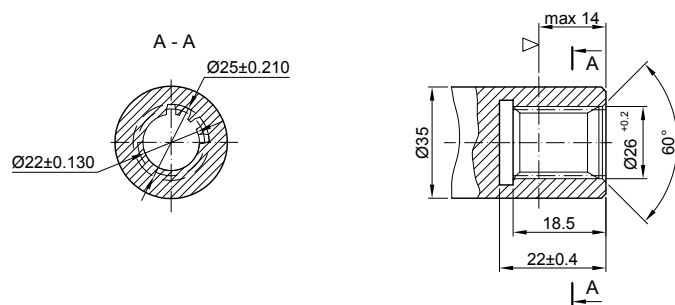
CB Ø32 Straight, Paralle key A10x8x45 DIN 6885
Max. Torque 77 daNm



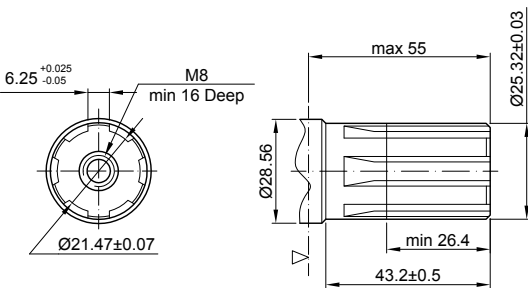
CO Ø1" straight, Parallel key 1/4"x1/4"x1 1/4" BS46
Max. Torque 44 daNm



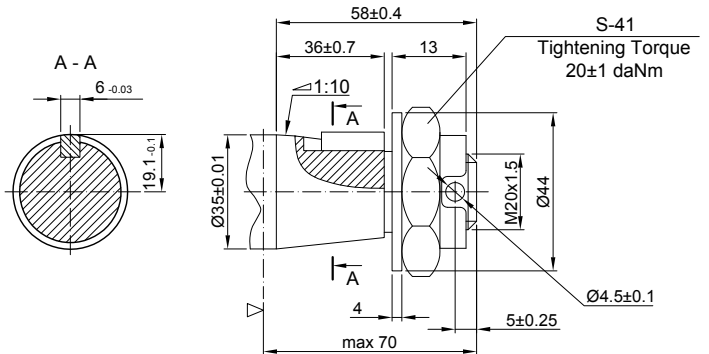
SB splined A25x22xH10 DIN 5482
Max. Torque 44 daNm



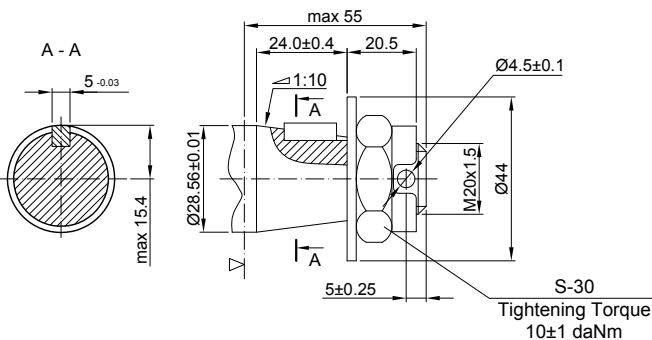
SH splined, BS 2059 (SAE 6B)
Max. Torque 44 daNm



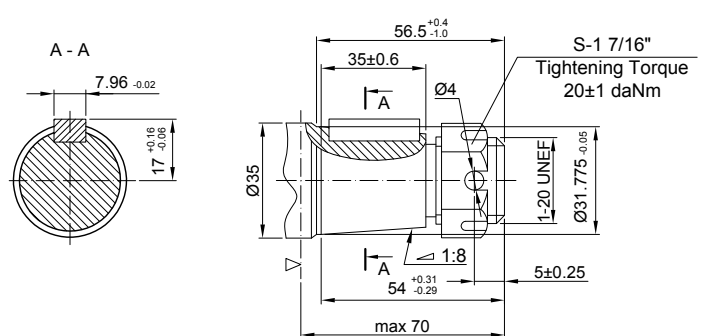
KB tapered 1:10, Paralle key B6x6x20 DIN 6885
Max. Torque 77 daNm



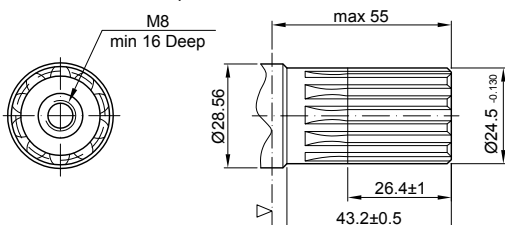
K tapered 1:10, Parallel key B5x5x14 DIN 6885
Max. Torque 40 daNm



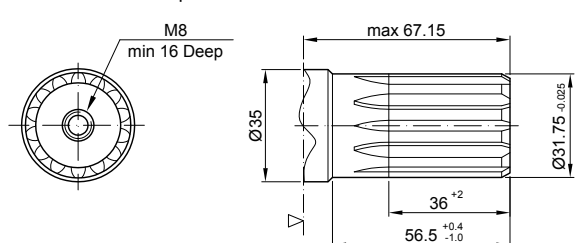
OB tapered 1:8 SAEJ 501, Paralle key 5/16"x5/16"x1 1/4" BS46
Max. Torque 77 daNm



SA splined, B25x22h9 DIN 5482
Max. Torque 40 daNm



HB Ø1 1/4" splined 14T, ANSI B92.1-1976 Norm
Max. Torque 77 daNm



▽ Motor Mounting Surface

PERMISSIBLE SHAFT LOADS FOR OP MOTORS

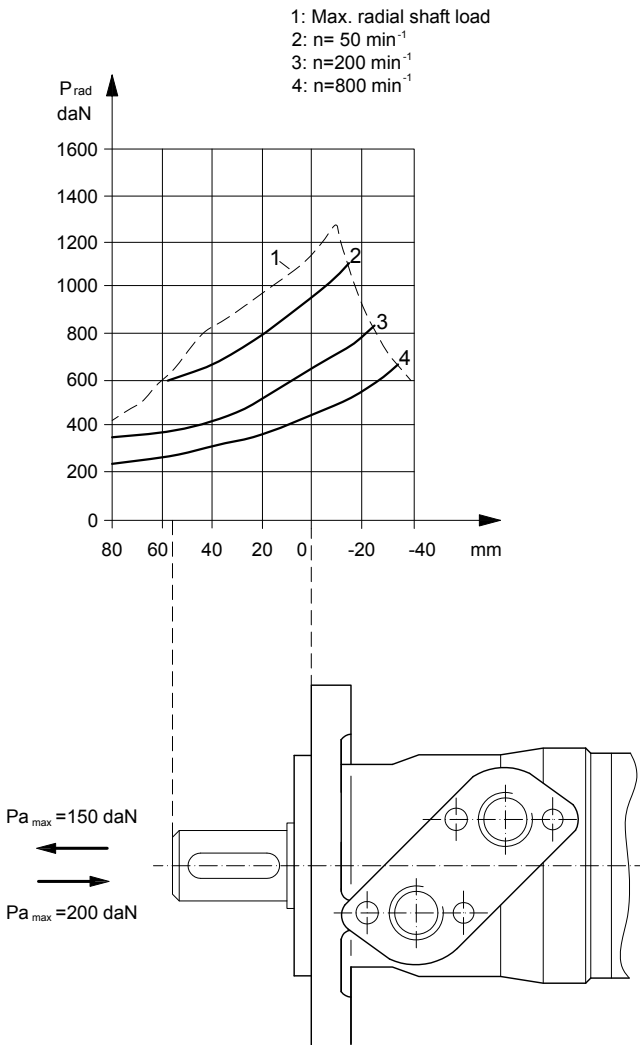
The permissible radial shaft load P_{rad} depends on the speed (RPM) and distance (L) from the point of load to the mounting flange.

Mounting Flange			
Shaft Version	cylindrical - C, CO tapered - K, splined - SH	splined - HB cylindrical - CB	cylindrical - C, CO
Radial Shaft Load P_{rad}	$\frac{800}{n} \times \frac{25000}{95+L}$, daN	$\frac{800}{n} \times \frac{18750}{95+L}$, daN	$\frac{800}{n} \times \frac{25000}{101+L}$, daN

$n < 200 \text{ min}^{-1}$; max $P_{rad} = 800 \text{ daN}$
 $n > 200 \text{ min}^{-1}$; $L < 55 \text{ mm}$

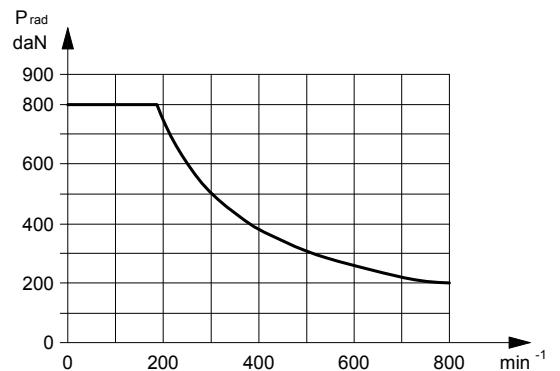
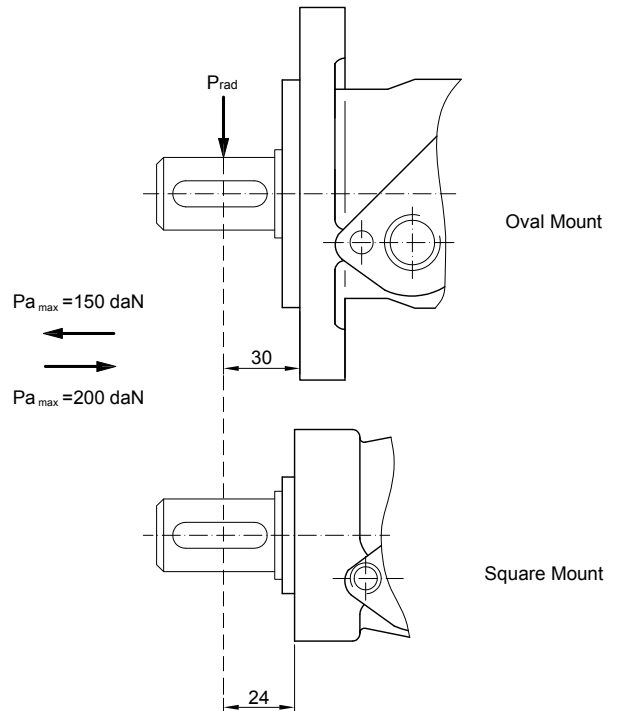
OPN

The curves apply to a B_{10} bearing life of 2000 hours.



OP

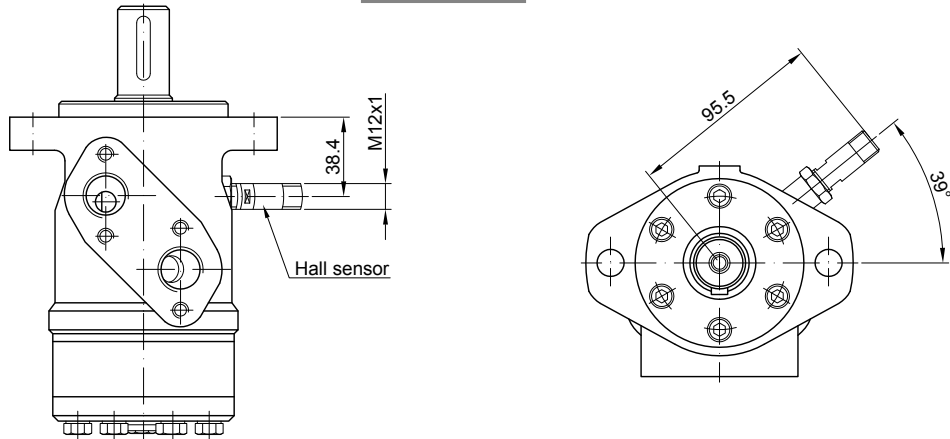
Radial Shaft Load P_{rad} for C, CO Shaft Extensions by $L=30$ (24) mm



HYDRAULIC MOTORS WITH SPEED SENSOR TYPE OP...RS

Meta Hydraulic is introducing hydraulic motor with a new generation of speed sensor. The electric output signal is a standard voltage signal that can be used for regulating the speed of a motor.
The speed is measured by a sensor in accordance with the Hall principle. Signal processing and amplification are performed in the sensor housing. Connection is provided in the housing by a Plug connector M12 Series.

OP...RS



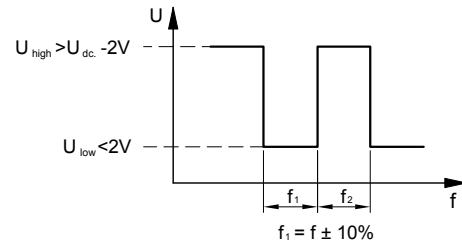
This performance is applicable for all motors of OP and OR series. The main technical features correspond to the standard motors series OP and OR. For detail technical and mounting data please refer to Meta catalogue.

DIFFERENTIAL HALL SENSOR

TECHNICAL DATA

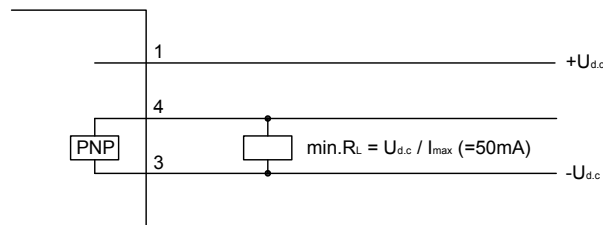
Frequency range	3...20 000 Hz
Output	PNP
Power supply	10...36 VDC
Current input	20 mA (@24 VDC)
Current load	500 mA (@24 VDC;24°C)
Ambient Temperature	minus 40... plus 125°C
Protection	IP 67
Plug connector	M12-Series
Mounting principle	ISO 6149
Pulses per revolution	36

OUTPUT SIGNAL

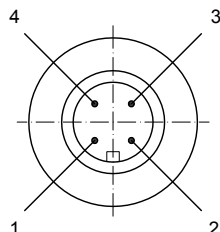


Load max.: $I_{high}=I_{low}<50\text{mA}$
No load current, max: 20 mA

WIRING DIAGRAM



STICK TYPE



Terminal No.	Connection
1	Ud.c. (+supply)
2	No connection
3	Ud.c. (-supply)
4	Output signal

ORDER CODE

	1	2	3	4	5	6	7	8	9	10	11	12
OP												

1	Case Drain
omit	with drain port
U	without drain port

2	Mounting Flange *
omit	Oval mount, two holes
F	Oval mount, four holes
Q	Square mount, four bolts
W	Wheel mount

3	Option (needle bearings) *
omit	none
N	with needle bearings

4	Port type
omit	Side ports
E	Rear ports

5	Displacement code
25	25,0 [cm ³ /rev]
32	32,0 [cm ³ /rev]
40	40,0 [cm ³ /rev]
50	49,5 [cm ³ /rev]
80	79,2 [cm ³ /rev]
100	99,0 [cm ³ /rev]
125	123,8 [cm ³ /rev]
160	158,4 [cm ³ /rev]
200	198,0 [cm ³ /rev]
250	247,5 [cm ³ /rev]
315	316,8 [cm ³ /rev]
400	396,0 [cm ³ /rev]
500	495,0 [cm ³ /rev]
630	623,6 [cm ³ /rev]

6	Shaft Extensions * (see page OP - 08)
C	ø25 straight, Parallel key A8x7x32 DIN6885
VC	ø25 straight, Parallel key A8x7x32 DIN6885 with corrosion resistant bushing
CO	ø1" straight, Parallel key 1/4"x1/4"x1 1/4" BS46
VCO	ø1" straight, Parallel key 1/4"x1/4"x1 1/4" BS46 with corrosion resistant bushing
SH	ø25,32 splined BS 2059 (SAE 6B)
VSH	ø25,32 splined BS 2059 (SAE 6B) with corrosion resistant bushing
K	ø28,56 tapered 1:10, Parallel key B5x5x14 DIN6885
SA	ø24,5 splined B 25x22 DIN 5482
VSA	ø24,5 splined B 25x22 DIN 5482 with corrosion resistant bushing
CB	ø32 straight, Parallel key A10x8x45 DIN6885
KB	ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
SB	splined A 25x22 DIN 5482
OB	ø1 1/4" tapered 1:8, Parallel key 5/16"x5/16"x1 1/4" BS46
HB	ø1 1/4" splined 14T ANSI B92.1 - 1976

7	Ports
omit	BSPP (ISO 228)
M	Metric (ISO 262)

8	Special Features (see Specification data on page OP - 02 - OP - 03)
omit	none
LL	Low Leakage
LSV	Low Speed Valve
FR	Free Running

9	Rotation
omit	Standard Rotation
R	Reverse Rotation

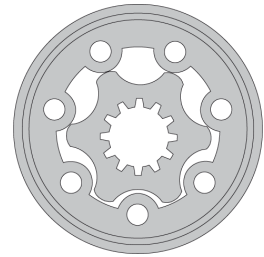
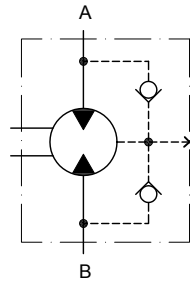
10	Option (Paint)
omit	no paint
P	Painted
PC	Corrosion Protected Paint

11	Speed Monitoring
omit	none
RS-P	with speed sensor (PNP pull-down resistor)
RS-N	with speed sensor (NPN pull-up resistor)

The permissible output torque for shafts must be not exceeded!

* The following combinations are not allowed - **Q, W, N** options with "...B" shafts.

LOW SPEED HIGH TORQUE MOTORS OZ

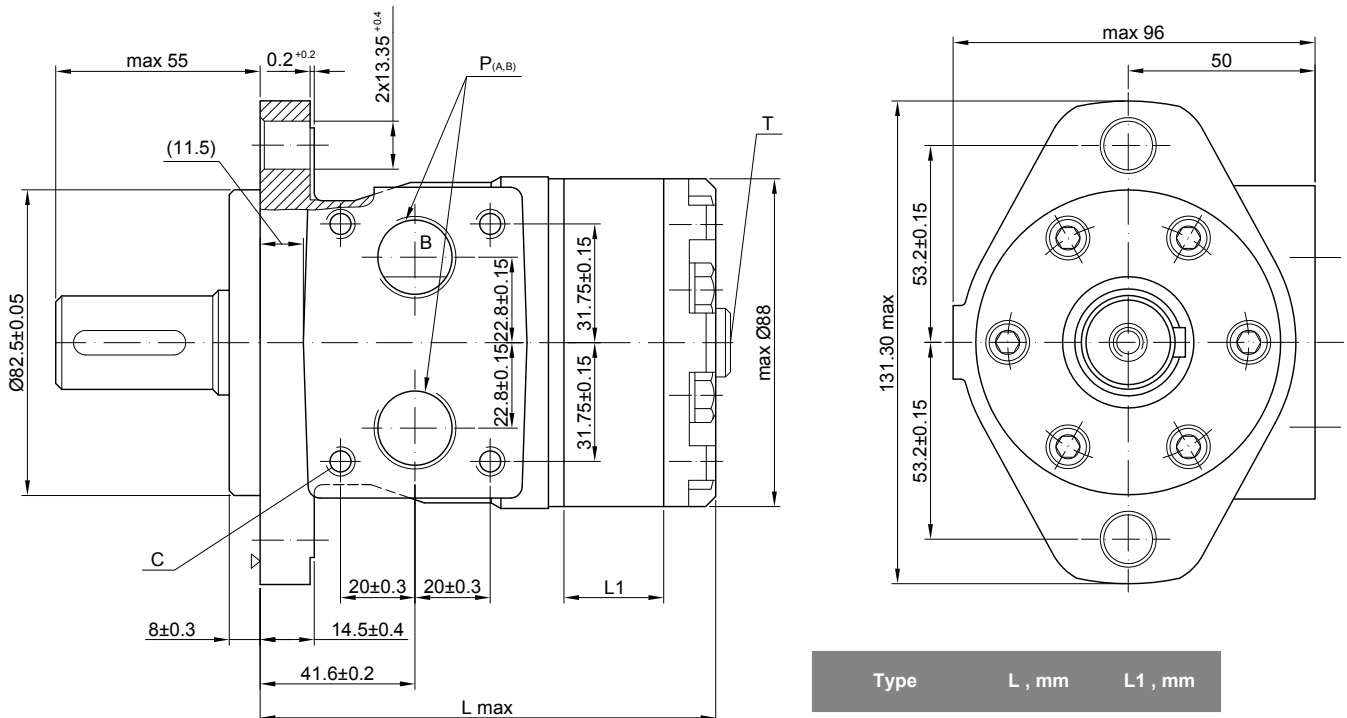


SPECIFICATION DATA

Code	Displacement [cm ³ /rev.]	Max. Speed [RPM]	Max. Torque [daNm]		Max. Output [kW]		Max. Pressure Drop [bar]		Max. Oil Flow [l/min]
OZ 32	32	1050	4,6	5,9	3,2	5,5	105	140	40
OZ 40	40	970	5,6	7,4	4,2	6,9	105	140	40
OZ 50	49,5	808	7	9,2	5,2	8,6	105	140	40
OZ 80	79,2	505	10,8	14,6	5,2	8,6	105	140	40
OZ 100	99	404	14,4	18,3	5,2	8,6	105	140	40
OZ 125	123,8	232	17	22,9	5,2	8,6	105	140	40
OZ 160	158,4	252	22	29,3	5,2	8,6	105	140	40
OZ 200	198	202	27,5	36,6	5,2	8,6	105	140	40
OZ 250	247,5	160	30,1	37,6	4,6	7	90	115	40
OZ 315	316,8	126	31,7	44	3,4	5,8	70	105	40
OZ 400	369	100	40,8	55,6	3,4	5,8	70	105	40

Intermittent operation: the permissible values may occur for max. 10% of every minute.

OUTLINE DIMENSIONS REFERENCE



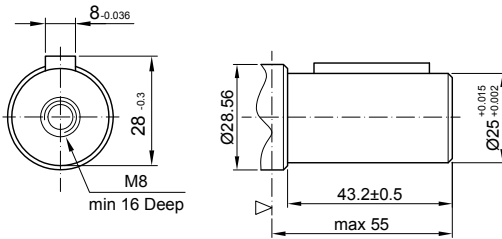
- C :2 x M8 - 13 mm depth
- P_(A,B) :2 x G1/2 - 15 mm depth
- T :G1/4 -12 mm depth (plugged)

Standard Rotation
Viewed from Shaft End
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**

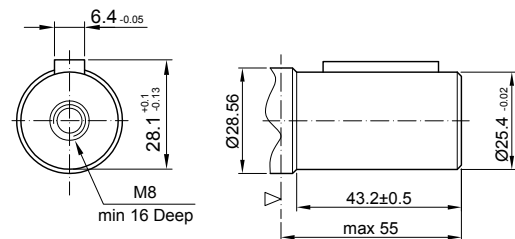
Type	L , mm	L1 , mm
OZ 32	101	7
OZ 40	101	7
OZ 50	101	7
OZ 80	104,5	10,5
OZ 100	107	13
OZ 125	110	16
OZ 160	115	21
OZ 200	120	26
OZ 250	126	32
OZ 315	136	42
OZ 400	146	52

SHAFT EXTENSIONS

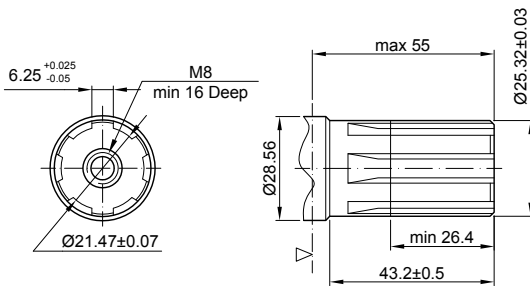
C Ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 44 daNm



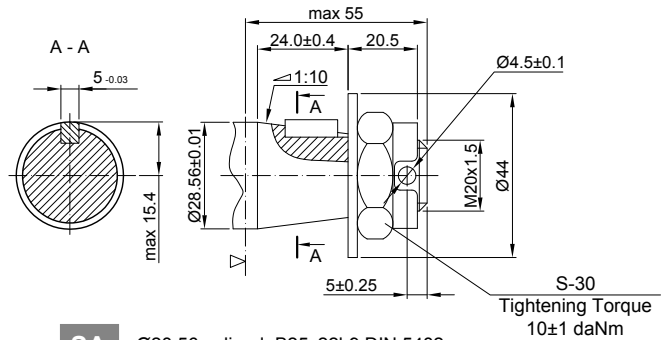
CO Ø25,4 straight, Parallel key 1/4"x1/4"x1 1/4" BS46
Max. Torque 44 daNm



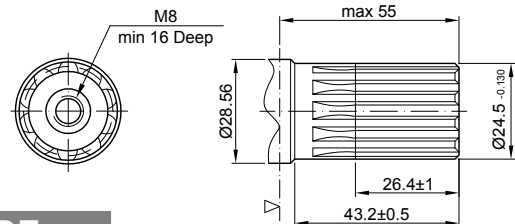
SH Ø28,56 splined, BS 2059 (SAE 6B)
Max. Torque 44 daNm



K Ø28,56 tapered 1:10, Parallel key B5x5x14 DIN 6885
Max. Torque 44 daNm



SA Ø28,56 splined, B25x22h9 DIN 5482
Max. Torque 44 daNm



▽ Motor Mounting Surface

ORDER CODE

	1	2	3	4	5	6	7
OZ							

1	Displacement code
50	49,5 [cm³/rev]
80	79,2 [cm³/rev]
100	99,0 [cm³/rev]
125	123,8 [cm³/rev]
160	158,4 [cm³/rev]
200	198,0 [cm³/rev]
250	247,5 [cm³/rev]
315	316,8 [cm³/rev]
400	398,0 [cm³/rev]
2	Shaft Extensions
C	Ø25 straight, Parallel key A8x7x32 DIN6885
CO	Ø25,4 straight, Parallel key 1/4"x1/4"x1 1/4" BS46
SH	Ø28,56 splined BS 2059 (SAE 6B)
K	Ø28,56 tapered 1:10, Parallel key B5x5x14 DIN6885
SA	Ø28,56 splined B25x22h9 DIN 5482

3	Ports
omit	BSP (ISO 228)
M	Metric (ISO 262)
4	Rotation
omit	Standard Rotation
R	Reverse Rotation
5	Option (Paint)
omit	no paint
P	Painted Low Gloss Color
PC	Corrosion Protected Paint
6	Special Features
omit	none
FR	Free Running
7	Design Series
omit	Factory specified

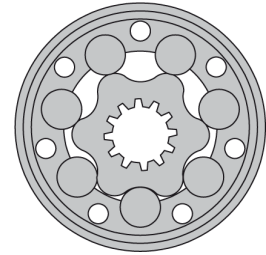
The permissible output torque for shafts must be not exceeded!
Color at customer's request.

HYDRAULIC MOTORS OR



OIL FLOW IN DRAIN LINE

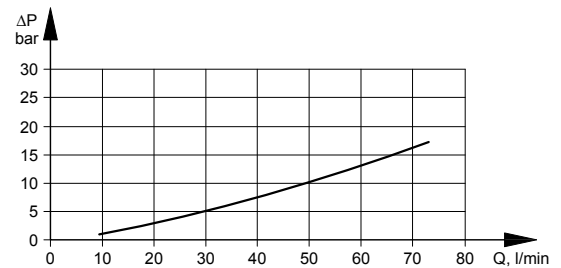
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
100	20	2,5
	35	1,8
140	20	3,5
	35	2,8



GENERAL

Displacement, (cm ³ /rev)	51,5 ÷ 397
Max. Speed, (RPM)	775 ÷ 150
Max. Torque, (daNm)	10,1 ÷ 61
Max. Output, (kW)	5 ÷ 13
Max. Pressure Drop, (bar)	175 ÷ 70
Max. Oil Flow, (l/min)	40 ÷ 60
Min. speed, (RPM)	10
Pressure fluid	Mineral based - HLP (DIN 51524) or HM (ISO 6743/4)
Temperature range, (°C)	- 30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES



SPECIFICATION DATA

Type		OR 50	ORW 50 OR 50...B	OR 80	ORW 80 OR 80...B	OR 100	ORW 100 OR 100...B	OR 125	ORW 125 OR 125...B	OR 160
Displacement [cm ³ /u]		51,5	51,5	80,3	80,3	99,8	99,8	125,7	125,7	159,6
Max. Speed, [RPM]	cont.	775	775	750	750	600	600	475	475	375
	int.	970	970	940	940	750	750	600	600	470
Max. Torque [daNm]	cont.	10,1	10,1	19,5	19,5	24	24	30	30	39
	int.	13	13	22	22	28	28	34	34	43
	peak	17	17	27	27	32	32	37	37	46
Max. Output [kW]	cont.	7	7	12,5	12,5	13	13	12,5	12,5	11,5
	int.	8,5	8,5	15	15	15	15	14,5	14,5	14
Max. Pressure Drop [bar]	cont.	140	140	175	175	175	175	175	175	175
	int.	175	175	200	200	200	200	200	200	200
	peak	225	225	225	225	225	225	225	225	225
Max. Oil Flow [l/min]	cont.	40	40	60	60	60	60	60	60	60
	int.	50	50	75	75	75	75	75	75	75
Max. Inlet Pressure, [bar]	cont.	175	175	175	175	175	175	175	175	175
	int.	200	200	200	200	200	200	200	200	200
	peak	225	225	225	225	225	225	225	225	225
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	150	100	150	100	150	100	150
	cont.	100-300	RPM	75	30	75	30	75	30	75
	cont.	300-600	RPM	50	15	50	15	50	15	50
	cont.	>600	RPM	20	-	20	-	20	-	-
	int.	0-max.	RPM	150	100	150	100	150	100	150
Max. Return Pressure with Drain Line [bar]	cont.	175	175	175	175	175	175	175	175	175
	int.	200	200	200	200	200	200	200	200	200
	peak	225	225	225	225	225	225	225	225	225
Max. Starting Pressure with Unloaded Shift, [bar]		10	10	10	10	10	10	9	9	7
Min. Starting Torque [daNm]	at max press. drop cont.	8	8	15	15	20	20	25	25	32
	at max press. drop int.	10	10	17	17	23	23	28	28	37
Min. Speed, [RPM]		10	10	10	10	10	10	10	10	10
Weight avg, [kg]	OR(F)	6,8	6,9	6,9	7,0	7,2	7,3	7,3	7,4	7,5
	ORW	-	10,4	-	10,5	-	10,6	-	10,8	-
	ORQ	6,2	-	6,3	-	6,6	-	6,8	-	7,6

Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

SPECIFICATION DATA

Type		ORW 160	OR	ORW 200	OR	ORW 250	OR	ORW 315	OR	ORW 400
		OR 160...B	200	OR 200...B	250	OR 250...B	315	OR 315...B	400	OR 400...B
Displacement [cm³/u]		159,6	199,8	199,8	250,1	250,1	315,7	315,7	397	397
Max. Speed, [RPM]	cont.	375	300	300	240	240	190	190	150	150
	int.	470	375	375	300	300	240	240	190	190
Max. Torque [daNm]	cont.	39	38,5	45	39	54	39	55	38	61
	int.	43	46	50	58	61	57	63	60	69
	peak	46	56	56	71	71	83	83	87	87
Max. Output [kW]	cont.	11,5	9	11	6,5	10	6	9	4,8	7,8
	int.	14	11,5	13	10,5	12	9,6	11	8,8	10,6
Max. Pressure Drop [bar]	cont.	175	140	175	110	175	90	135	70	115
	int.	200	175	200	175	200	140	160	115	140
	peak	225	225	225	225	225	210	210	175	175
Max. Oil Flow [l/min]	cont.	60	60	60	60	60	60	60	60	60
	int.	75	75	75	75	75	75	75	75	75
Max. Inlet Pressure, [bar]	cont.	175	175	175	175	175	175	175	175	175
	int.	200	200	200	200	200	200	200	200	200
	peak	225	225	225	225	225	225	225	225	225
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	100	150	100	150	100	150	100
	cont.	100-300	RPM	30	75	30	75	30	75	30
	cont.	300-600	RPM	15	50	15	-	-	-	-
	cont.	>600	RPM	-	-	-	-	-	-	-
	int.	0-max.	RPM	100	150	100	150	100	150	100
Max. Return Pressure with Drain Line [bar]	cont.	175	175	175	175	175	175	175	175	175
	int.	200	200	200	200	200	200	200	200	200
	peak	225	225	225	225	225	225	225	225	225
Max. Starting Pressure with Unloaded Shift, [bar]		7	5	5	4	4	3	3	3	3
Min. Starting Torque [daNm]	at max press. drop cont.	32	33	41	31	50	33	50	30	49
	at max press. drop int.	37	40	46	48	55	58	66	50	61
Min. Speed, [RPM]		10	10	10	10	10	10	10	10	10
Weight avg, [kg]	OR(F)	7,6	8	8,1	8,4	8,5	9,1	9,2	9,8	9,9
	ORW	11,1	-	11,6	-	12,1	-	12,6	-	13,3
	ORQ	-	7,2	-	7,8	-	8,6	-	9,3	-

Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

SPECIFICATION DATA for OR...LSV

Low Speed Valve (LSV) "LSV" Series hydraulic motors have been designed to operate with normal pressure drop and to ensure smooth run at low speed (up to 200 RPM), as the best security for operation is guaranteed at frequency of rotation 20 ± 50 RPM. They have an increased starting pressure drop and are not recommended for using at pressure less than 40 bar.

Look at specification data for hydraulic motors standard version. The modification concerns only the following parameters: maximum speed, maximum output, maximum Oil flow and maximum starting pressure.

Type		OR 50	OR 80	OR 100	OR 125	OR 160	OR 200	OR 250	OR 315	OR 400
Max. Speed, [RPM]	cont.	200	200	200	200	200	200	160	126	100
	int.	250	250	250	250	250	250	200	158	126
Max. Output [kW]	cont.	2	4,0	5,0	6,2	7,0	6,8	6,2	5,8	5,2
	int.	3	5,7	7,3	8,5	8,8	8,3	7,8	7,6	6,8
Max. Oil Flow [l/min]	cont.	13	23	26	33	40	40	40	40	40
	int.	16	31	34	45	50	50	50	50	50
Max. Starting Pressure with Unloaded Shift, [bar]		20	20	20	20	15	15	15	12	12

SPECIFICATION DATA for OR...LL

Low Leakage (LL) "LL" Series hydraulic motors have been designed to operate at the whole standard range of working conditions (pressure drop and frequency of rotation), but with considerable decreased volumetric losses in the drainage ports. Their main purpose is to operate as series-connected motors in hydraulic systems. For this version is permissible decreasing of the maximal torque with up to 5% (at middle speed) and up to 10% (at high speed) in comparison to the standard versions of motors.

Look at specification data for hydraulic motors series OR standard version. The modification concerns only the parameters: maximum torque, maximum output, minimum starting torque.

Type		OR 50	OR 80	OR 100	OR 125	OR 160	OR 200	OR 250	OR 315	OR 400
Max. Torque [daNm]	cont.	9,6	18,5	22,8	28,5	37,1	42,8	51,3	52,2	58,0
	int.	12,4	20,9	26,6	32,3	40,9	47,5	58,0	60,0	65,6
Max. Output [kW]	cont.	9,0	12,3	12,8	12,4	11,4	10,9	9,9	8,9	7,7
	int.	11,9	14,8	14,8	14,3	13,8	12,8	11,8	10,9	10,5
Max. Pressure Drop [bar]	cont.	140	175	175	175	175	175	175	135	115
	int.	175	200	200	200	200	200	200	160	140
Min. Starting Torque [daNm]	cont.	7,6	14,2	19,0	23,8	30,4	39,0	47,5	47,5	46,5
	int.	9,5	16,2	21,8	26,6	35,2	43,7	52,2	62,7	58,0

SPECIFICATION DATA for OR...FR

Free Running version "FR": These are the hydraulic motors with reduced mechanical losses, for which at disengaged condition / unconnected with driving mechanism / the rotation of the shaft could be realized by means of small torque. This advantage is especially useful at operating with high frequencies of rotation /over 300min / and low pressure drop, which is inbred for types with displacements of up to 200 cm³. It is normal for these for the different condition of operation to have high torque, as well as high volume losses: the values of the volumetric efficiency are lower (up to 5 % for middle and up to 10% for high values of the pressure drop), than those of the normal versions. That's why the recommended operating for "FR" version is for applications with pressure drop up to 100 bar.

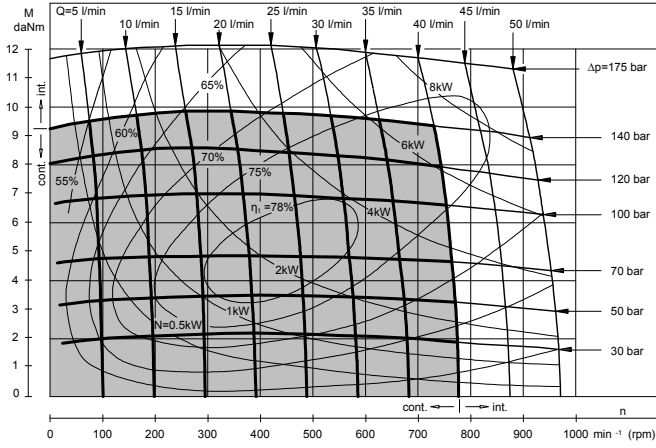
Additional advantages of "FR" version are prolonging of the life of the hydraulic motors at high frequencies of rotation, as well as the possibility to use them in systems with big variation of the loading.

Look at specification data for hydraulic motors series OR standard version. Only the parameter Starting Pressure is modified.

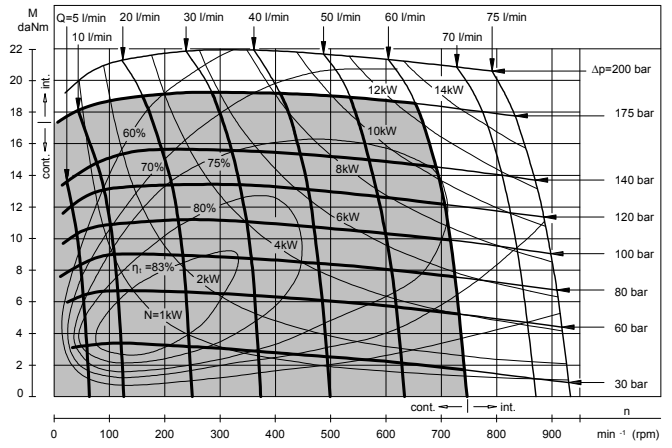
Type	OR 50	OR 80	OR 100	OR 125	OR 160	OR 200
Max. Starting Pressure with Unloaded Shaft, [bar]	8	8	8	7,5	5,5	4

FUNCTION DIAGRAMS

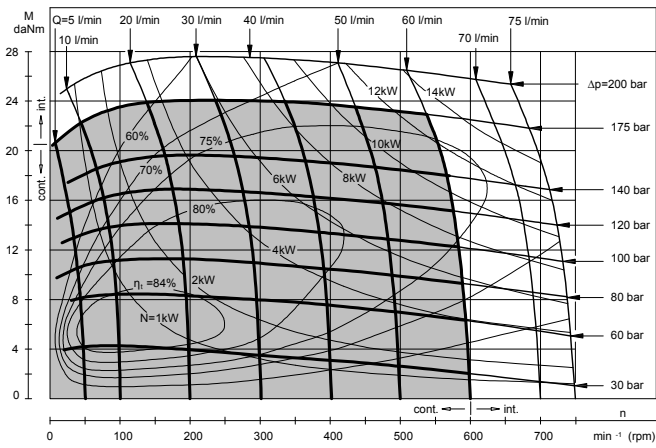
OR 50



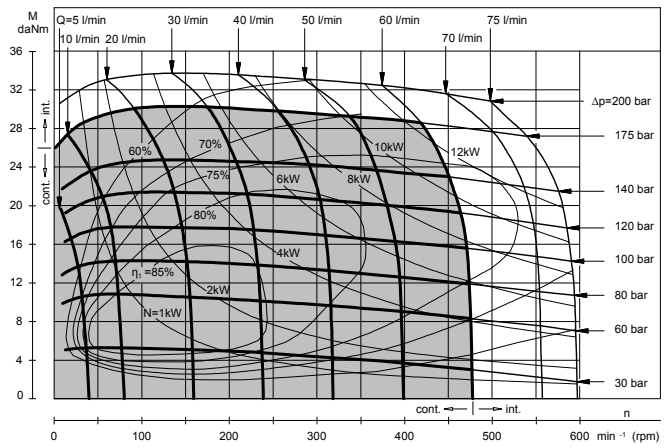
OR 80



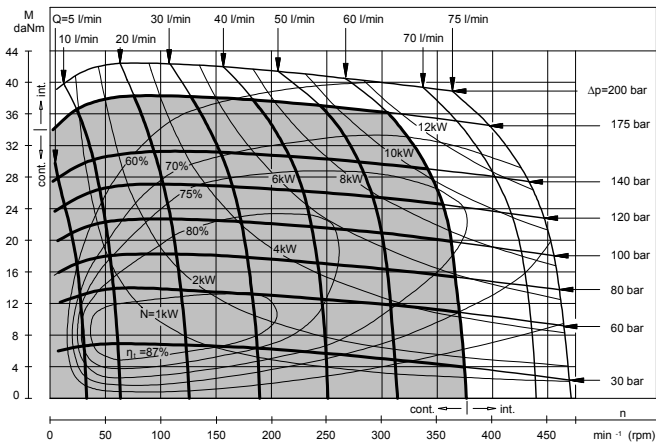
OR 100



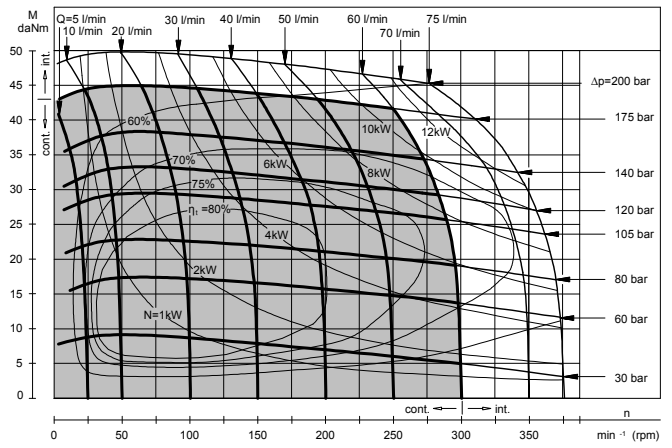
OR 125



OR 160



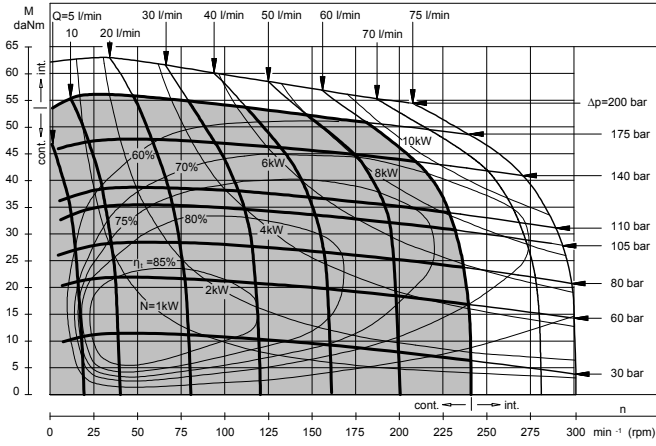
OR 200



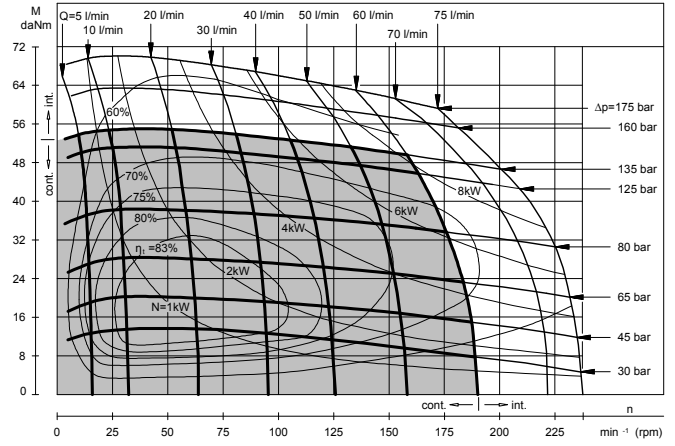
The function diagrams data was collected at back pressure 5+10 bar and oil with viscosity of 32 mm^2/s at 50° C.

FUNCTION DIAGRAMS

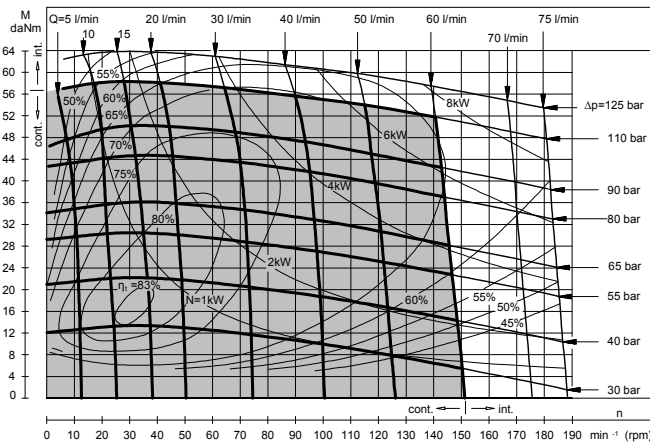
OR 250



OR 315

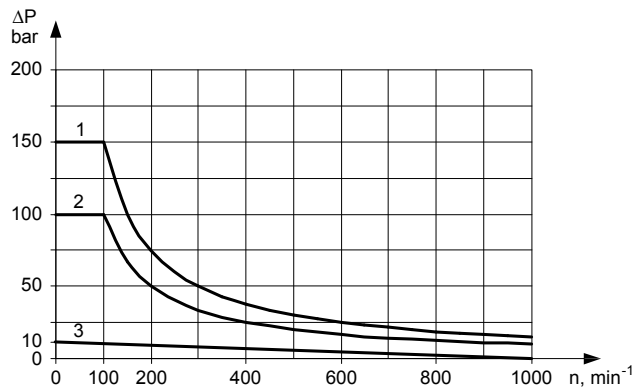


OR 400



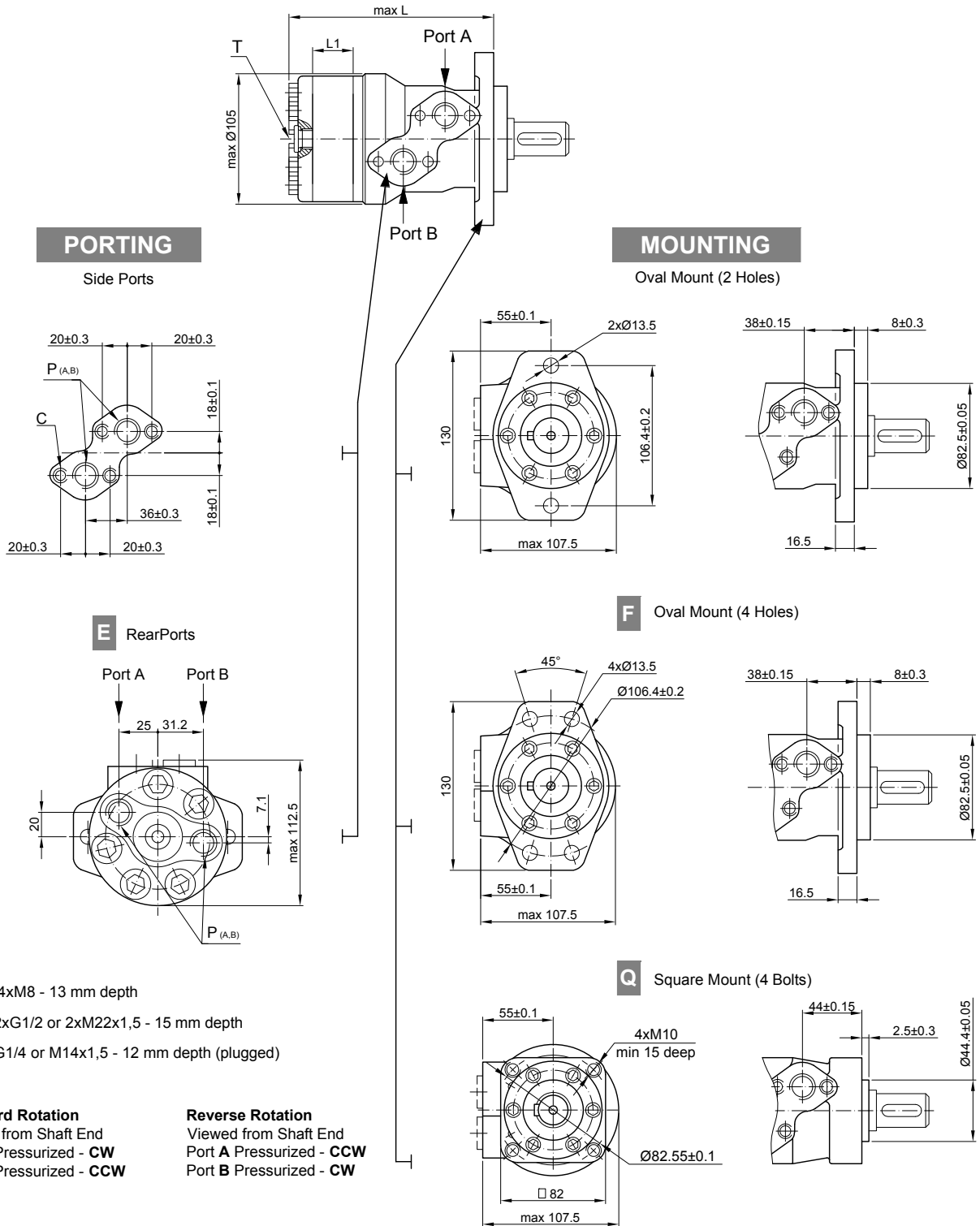
The function diagrams data was collected at back pressure 5-10 bar and oil with viscosity of 32 mm²/s at 50° C.

Max. Permissible Shaft Seal Pressure for OP and OR Motors



- 1: Drawing for "D" Seal
- 2: Drawing for "...B" Shaft Seal
- 3: Drawing for Quadring

DIMENSIONS AND MOUNTING DATA



- C : 4xM8 - 13 mm depth
- P_(A,B) : 2xG1/2 or 2xM22x1,5 - 15 mm depth
- T : G1/4 or M14x1,5 - 12 mm depth (plugged)

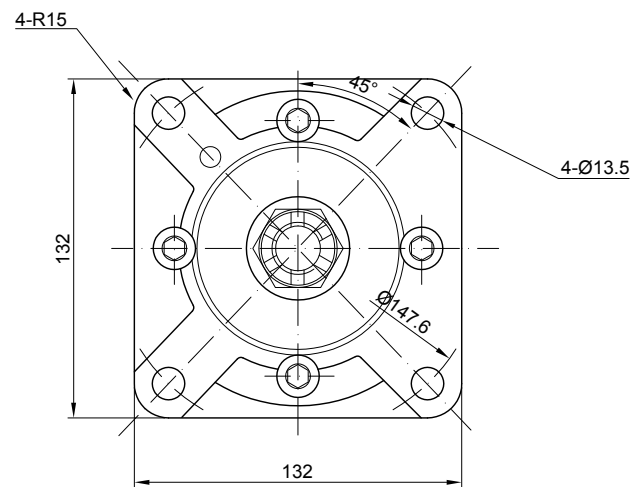
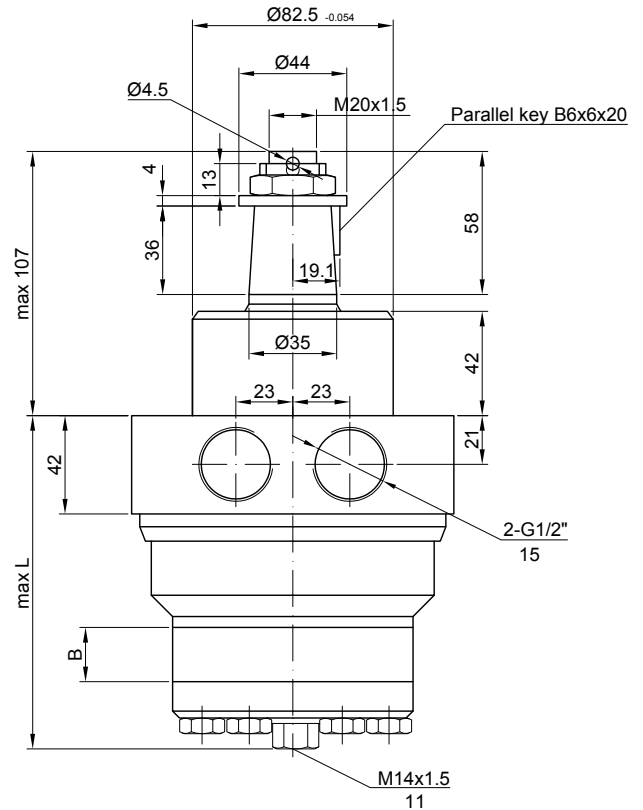
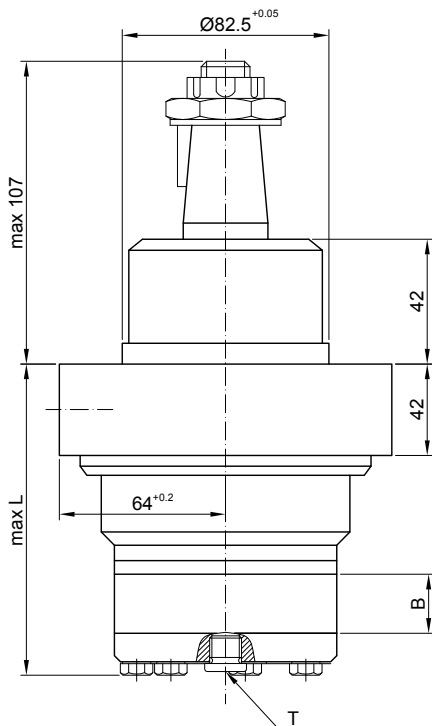
Standard Rotation
 Viewed from Shaft End
 Port A Pressurized - CW
 Port B Pressurized - CCW

Reverse Rotation
 Viewed from Shaft End
 Port A Pressurized - CCW
 Port B Pressurized - CW

Type	L, mm	Type	L, mm	Type	L, mm	Type	L, mm	L1, mm
OR(F) 50	140	ORQ 50	145,5	ORFE 50	159,5	ORQE 50	165,5	10
OR(F) 80	146	ORQ 80	151,5	ORFE 80	165,5	ORQE 80	171,5	16
OR(F) 100	150	ORQ 100	156	ORFE 100	169,5	ORQE 100	175,5	20
OR(F) 125	155	ORQ 125	161	ORFE 125	174,5	ORQE 125	180,5	25
OR(F) 160	161,5	ORQ 160	167,5	ORFE 160	181	ORQE 160	187	30,5
OR(F) 200	170	ORQ 200	176	ORFE 200	190	ORQE 200	195,5	38,1
OR(F) 250	180	ORQ 250	186	ORFE 250	200	ORQE 250	206	58
OR(F) 315	192	ORQ 315	198	ORFE 315	212	ORQE 315	218	62
OR(F) 400	204	ORQ 400	210	ORFE 400	224	ORQE 400	230	74

DIMENSIONS AND MOUNTING DATA - ORW

W Wheel Mount

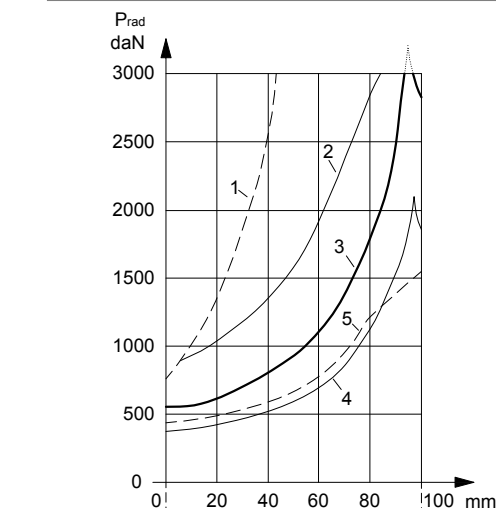


$P_{(A,B)}$: 2xG1/2 or 2xM22x1,5 - 15 mm depth
 T : G1/4 or M14x1,5 - 12 mm depth (plugged)

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

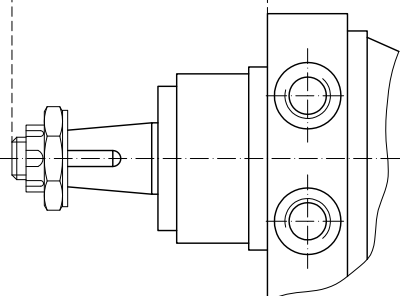
Permissible Shaft Loads ORW



$L_h=2500h$

1. Permissible radial shaft load
2. Drawing by $n=50 \text{ min}^{-1}$
3. Drawing by $n=200 \text{ min}^{-1}$
4. Drawing by $n=800 \text{ min}^{-1}$
5. Drawing by $n=200 \text{ min}^{-1}$ and $P_a \text{ max}=500 \text{ daN}$

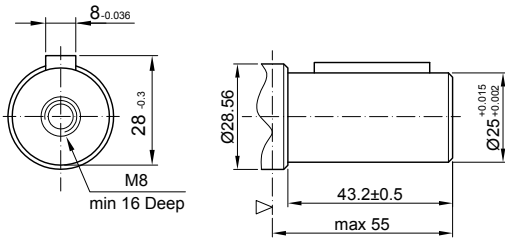
$P_{a \text{ max}}=500 \text{ daN}$



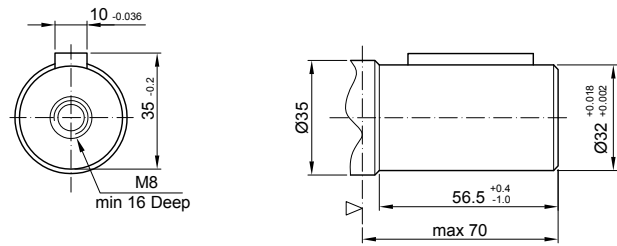
Type	B, mm	L, mm
ORW 050	9	125
ORW 080	14	130
ORW 100	17,5	134
ORW 125	22	138
ORW 160	28	144
ORW 200	35	151
ORW 250	44	160
ORW 315	56	172
ORW 400	70	186

SHAFT EXTENSIONS FOR OP AND OR MOTORS

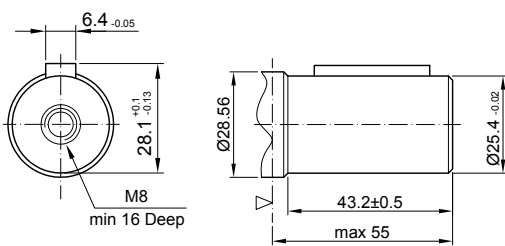
C Ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 44 daNm



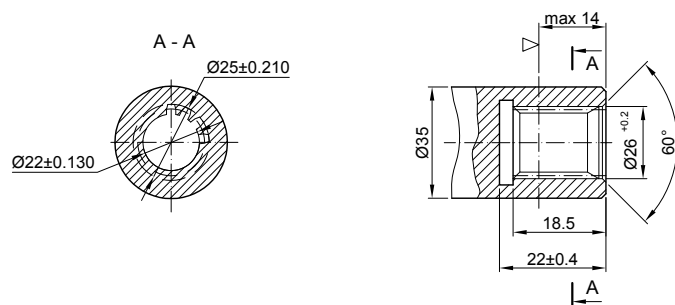
CB Ø32 Straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm



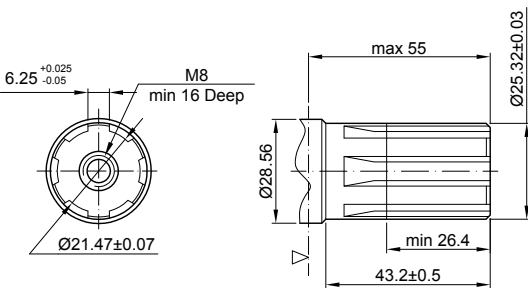
CO Ø1" straight, Parallel key 1/4"x1/4"x1 1/4" BS46
Max. Torque 44 daNm



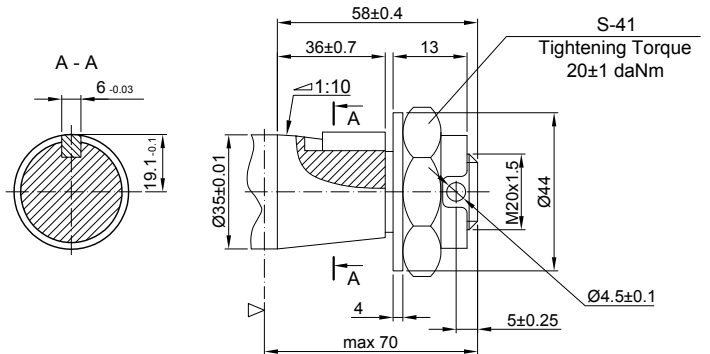
SB splined A25x22xH10 DIN 5482
Max. Torque 44 daNm



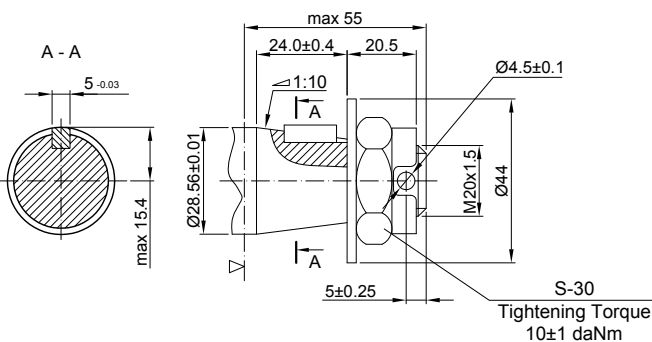
SH splined, BS 2059 (SAE 6B)
Max. Torque 44 daNm



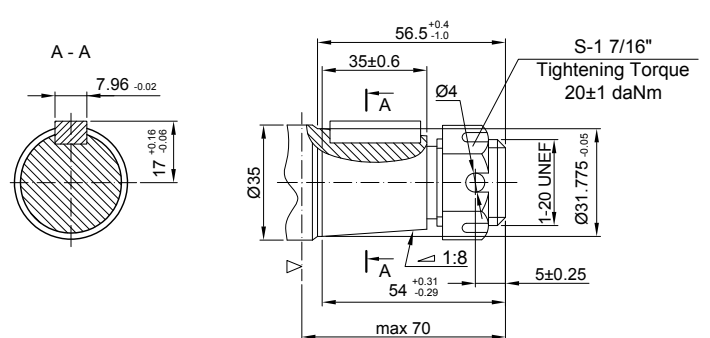
KB tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 77 daNm



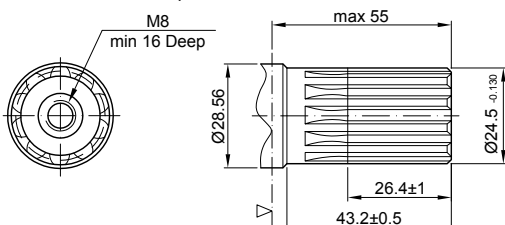
K tapered 1:10, Parallel key B5x5x14 DIN 6885
Max. Torque 40 daNm



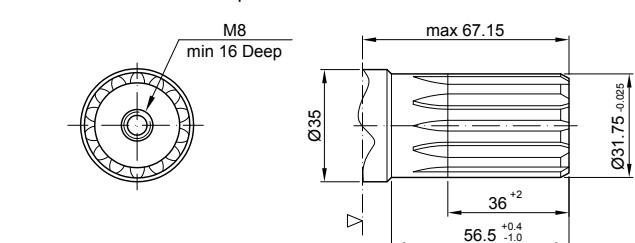
OB tapered 1:8 SAEJ 501, Parallel key 5/16"x5/16"x1 1/4" BS46
Max. Torque 77 daNm



SA splined, B25x22h9 DIN 5482
Max. Torque 40 daNm



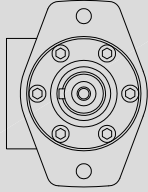
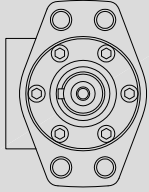
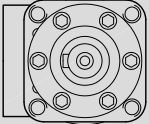
HB Ø1 1/4" splined 14T, ANSI B92.1-1976 Norm
Max. Torque 77 daNm



▽ Motor Mounting Surface

PERMISSIBLE SHAFT LOADS FOR OR MOTORS

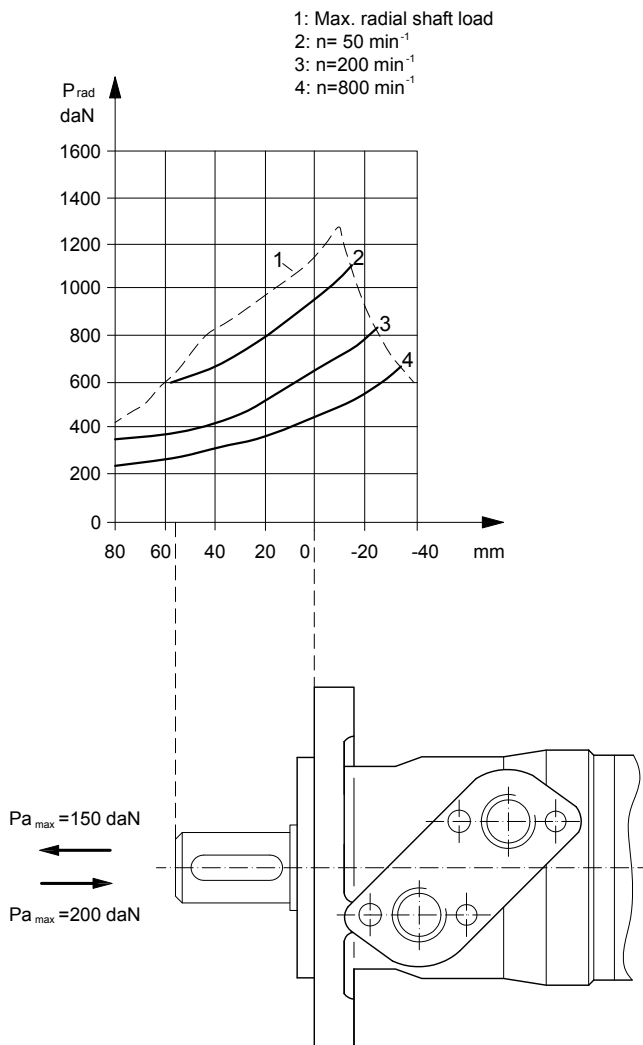
The permissible radial shaft load P_{rad} depends on the speed (RPM) and distance (L) from the point of load to the mounting flange.

Mounting Flange			
Shaft Version	cylindrical - C, CO tapered - K, splined - SH	splined - HB cylindrical - CB	cylindrical - C, CO
Radial Shaft Load P_{rad}	$\frac{800}{n} \times \frac{25000}{95+L}$, daN	$\frac{800}{n} \times \frac{18750}{95+L}$, daN	$\frac{800}{n} \times \frac{25000}{101+L}$, daN

$n < 200 \text{ min}^{-1}$; max $P_{rad} = 800 \text{ daN}$
 $n > 200 \text{ min}^{-1}$; $L < 55 \text{ mm}$

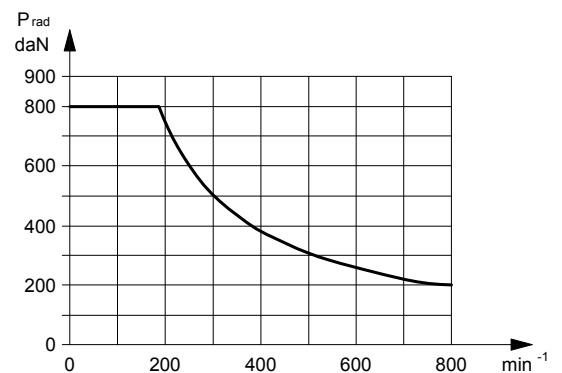
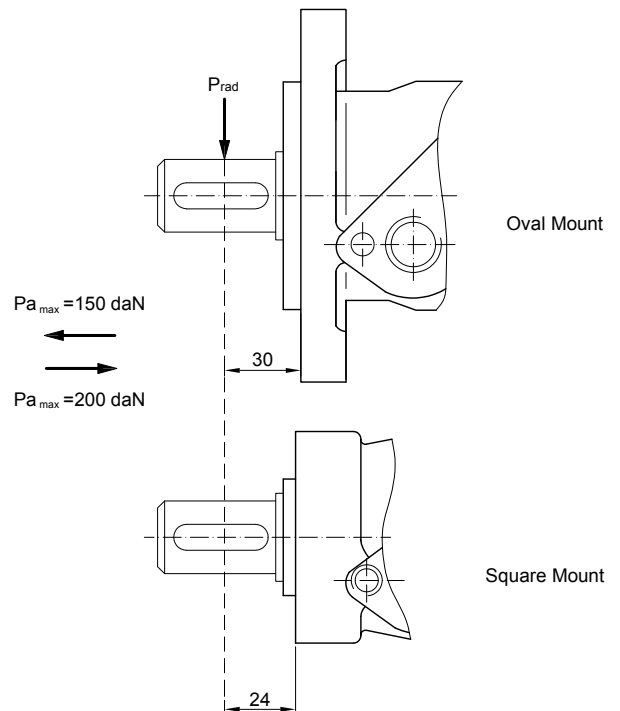
ORN

The curves apply to a B_{10} bearing life of 2000 hours.



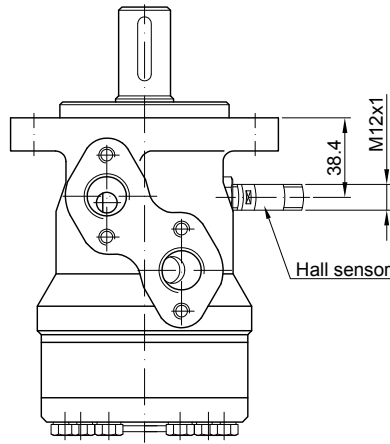
OR

Radial Shaft Load P_{rad} for C, CO Shaft Extensions by $L=30$ (24) mm

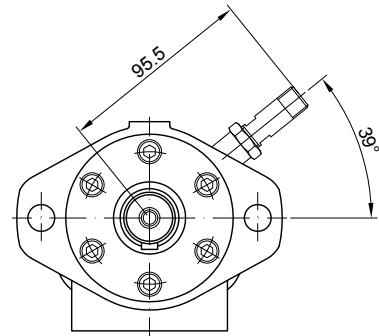


HYDRAULIC MOTORS WITH SPEED SENSOR TYPE

Meta Hydraulic is introducing hydraulic motor with a new generation of speed sensor. The electric output signal is a standard voltage signal that can be used for regulating the speed of a motor.
The speed is measured by a sensor in accordance with the Hall principle. Signal processing and amplification are performed in the sensor housing. Connection is provided in the housing by a Plug connector M12 Series.



OR...RS



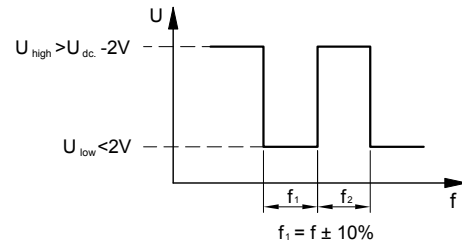
This performance is applicable for all motors of OR series. The main technical features correspond to the standard motors series OR.

DIFFERENTIAL HALL SENSOR

TECHNICAL DATA

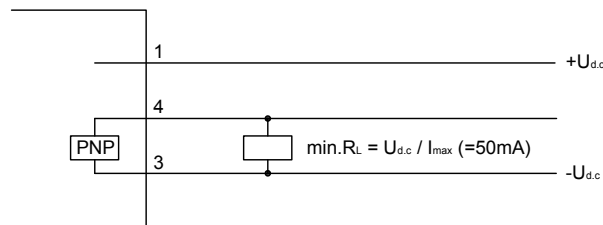
Frequency range	3...20 000 Hz
Output	PNP
Power supply	10...36 VDC
Current input	20 mA (@24 VDC)
Current load	500 mA (@24 VDC;24°C)
Ambient Temperature	minus 40... plus 125°C
Protection	IP 67
Plug connector	M12-Series
Mounting principle	ISO 6149
Pulses per revolution	36

OUTPUT SIGNAL

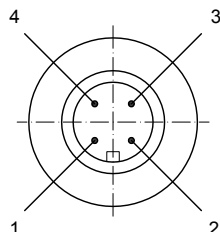


Load max.: $I_{high}=I_{low}<50\text{mA}$
No load current, max: 20 mA

WIRING DIAGRAM



STICK TYPE



Terminal No.	Connection
1	Ud.c. (+supply)
2	No connection
3	Ud.c. (-supply)
4	Output signal

ORDER CODE

OR	1	2	3	4	5	6	7	8	9	10	11	12
-----------	---	---	---	---	---	---	---	---	---	----	----	----

1 Shaft Seal Version (see page OR-04)

omit	Low pressure seal or Seal for "...B" shaft
D	High pressure seal not for "...B" shaft

2 Case Drain

omit	with drain port
U	without drain port

3 Mounting Flange

omit	Oval mount, two holes
F	Oval mount, four holes
Q	Square mount, four bolts
W*	Wheel mount

4 Option (needle bearings)

omit	none
N	with needle bearings (not valid for ORW)

5 Port type

omit	Side ports
E	Rear ports

6 Displacement code

50	51,5 [cm ³ /rev]
80	80,3 [cm ³ /rev]
100	99,8 [cm ³ /rev]
125	125,7 [cm ³ /rev]
160	159,6 [cm ³ /rev]
200	199,8 [cm ³ /rev]
250	250,1 [cm ³ /rev]
315	315,7 [cm ³ /rev]
400	397,0 [cm ³ /rev]

7 Shaft Extensions (see page OR - 08)

C	ø25 straight, Parallel key A8x7x32 DIN6885
VC	ø25 straight, Parallel key A8x7x32 DIN6885 with corrosion resistant bushing
CO	ø1" straight, Parallel key 1/4"x1/4"x1 1/4" BS46
VCO	ø1" straight, Parallel key 1/4"x1/4"x1 1/4" BS46 with corrosion resistant bushing
SH	ø25,32 splined BS 2059 (SAE 6B)
VSH	ø25,32 splined BS 2059 (SAE 6B) with corrosion resistant bushing
K	ø28,56 tapered 1:10, Parallel key B5x5x14 DIN6885
SA	ø24,5 splined B 25x22 DIN 5482
VSA	ø24,5 splined B 25x22 DIN 5482 with corrosion resistant bushing
CB	ø32 straight, Parallel key A10x8x45 DIN6885
KB	ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
SB	splined A 25x22 DIN 5482
OB	ø1 1/4" tapered 1:8, Parallel key 5/16"x5/16"x1 1/4" BS46
HB	ø1 1/4" splined 14T ANSI B92.1 - 1976

8 Ports

omit	BSPP (ISO 228)
M	Metric (ISO 262)

9 Special Features (see Specification data on page OR - 03)

omit	none
LL	Low Leakage
LSV	Low Speed Valve
FR	Free Running

10 Rotation

omit	Standard Rotation
R	Reverse Rotation

11 Option (Paint)

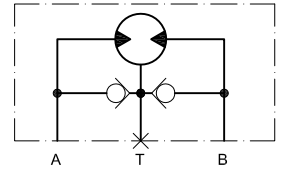
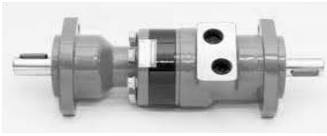
omit	no paint
P	Painted
PC	Corrosion Protected Paint

12 Speed Monitoring

omit	none
RS-P	with speed sensor (PNP pull-down resistor)
RS-N	with speed sensor (NPN pull-up resistor)

The permissible output torque for shafts must be not exceeded!
 The following combinations are not allowed - **Q, W, N** options with "...B" shafts.
 *ORW is available only with CB, KB and OB shafts

HYDRAULIC MOTORS WITH DUAL SHAFT TYPE ORB...CC



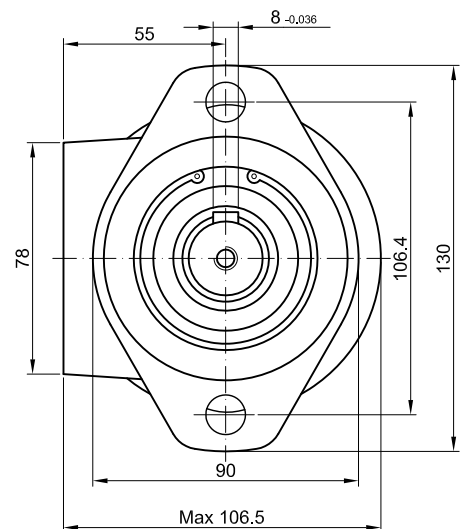
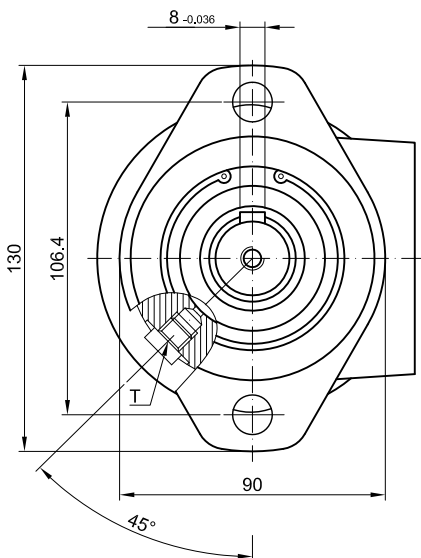
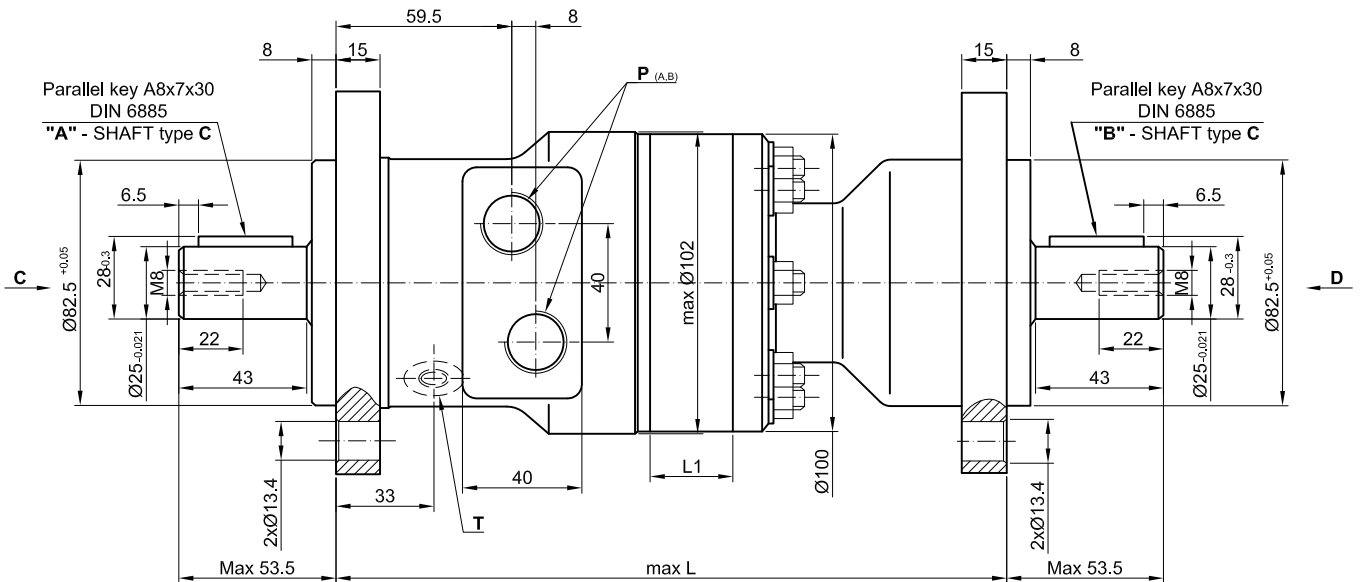
OPTIONS

Model- Spool valve, roll-gerotor
 Dual shaft;
 Oval flange;
 Side port;
 Straight shafts;
 BSPP ports;
 Other special features.

APPLICATION

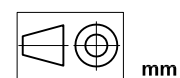
Conveyors;
 Feeding mechanism of robots and manipulators;
 Metal working machines;
 Textile machines;
 Food industries;
 Agriculture machines;
 Mining machinery etc.

OUTLINE DIMENSIONS REFERENCE



Type	H , mm	L , mm
ORB 50	208	9.0
ORB 80	213	14.0
ORB 100	216	17.4
ORB 125	220.5	21.8
ORB 160	226.5	27.8
ORB 200	233.5	34.8
ORB 250	242.5	43.5
ORB 300	253.5	54.8
ORB 400	268	69.4

P_(A,B) : 2xG1/2 - 18 mm depth
 T : G1/8 - 9 mm depth (plugged)





SPECIFICATION DATA

Type		ORB 50 C/C	ORB 80 C/C	ORB 100 C/C	ORB 125 C/C	ORB 160 C/C	ORB 200 C/C	ORB 250 C/C	ORB 315 C/C	ORB 400 C/C
Displacement [cm ³ /rev]		51.5	80.3	99.8	125.7	159.6	199.8	250.1	315.7	397
Max. Speed, RPM	cont.	775	750	600	475	375	300	240	190	150
	int.*	970	940	750	600	470	375	300	240	190
Max. Torque [daNm]	cont.	10	19.5	24	30	30	30	30	30	30
	int.*	13	22	28	34	39	39	38	42	43
Max. Torque "A" Shaft, daNm	cont.	8	11.5	12	20	20	20	20	20	20
	int.*	9.5	13	14	20	23	23	23	23	23
Max. Torque "B" Shaft, daNm	cont.	4	11.5	12	20	20	20	20	20	20
	int.*	5	13	14	23	23	23	20	23	23
Max. Output, [kW]	cont.	7	12.5	13	12.5	10	8	6	5	4
	int.*	8.5	15	15	14.5	12.5	10	8	6.5	6
Max. Pressure Drop, bar	cont.	140	175	175	175	130	110	80	70	55
	int.*	175	200	200	200	175	140	110	100	80
Max. Oil Flow, lpm	cont.	40	60	60	60	60	60	60	60	60
	int.*	50	75	75	75	75	75	75	75	75
Max. Return Pressure without Drain Line, bar	cont.	0-100	RPM	75	75	75	75	75	75	75
	cont.	100-200	RPM	50	50	50	50	50	50	50
	cont.	200-500	RPM	20	20	20	20	20	20	20
	int.*	0-max	RPM	75	75	75	75	75	75	75

* Intermittent operation: the permissible values may occur for max. 10% of every minute.

1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 13 mm²/s [70 SUS] at 50°C.
5. Recommended maximum system operating temperature is 82°C.
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

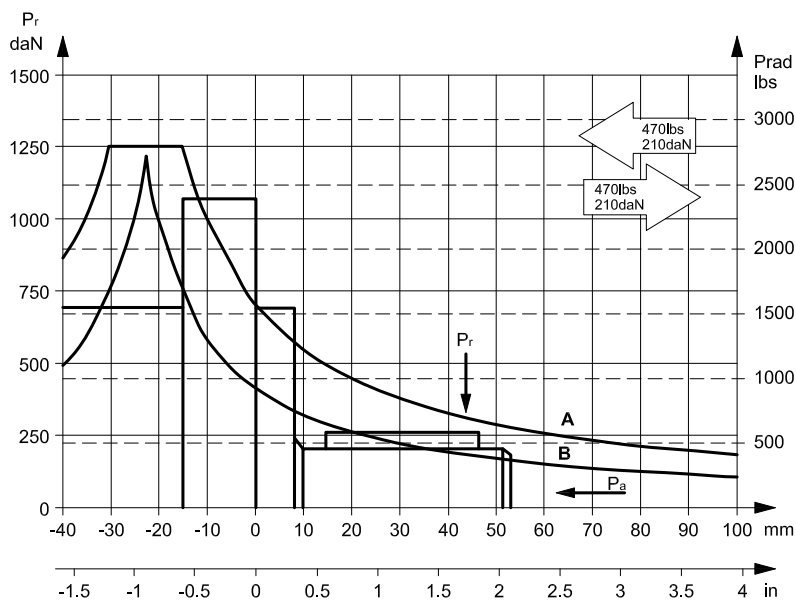


PERMISSIBLE SHAFT LOADS

The load diagrams are valid for an average bearings life of 1600 hrs at 200 r.p.m. with mineral base lubricating containing antiwear additives (ref. ISO 281 (3.3) standard).

The "A" curve gives the maximum static load affordable by the bearings.

The "B" curve gives the radial load top limit without axial load of 200 daN.



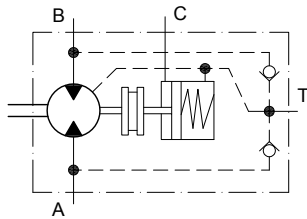
ORDER CODE

	1	2	3	4	5	6
ORB			/			

1	Displacement code
50	51,5 cm ³ /rev
80	80,3 cm ³ /rev
100	99,8 cm ³ /rev
125	125,7 cm ³ /rev
160	159,6 cm ³ /rev
200	199,8 cm ³ /rev
250	250,1 cm ³ /rev
315	315,7 cm ³ /rev
400	397,0 cm ³ /rev
2	"A" Shaft Extensions
C	ø25 straight, Parallel key A8x7x30 DIN6885

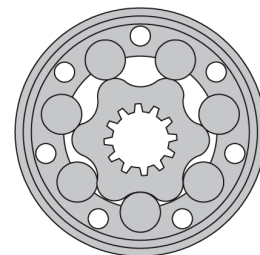
3	"B" Shaft Extensions
C	ø25 straight, Parallel key A8x7x30 DIN6885
4	Special Features
omit	none
LSV	Low Speed Valve
5	Option (Paint)
omit	no Paint
P	Painted
PC	Corrosion Protected Paint
6	Design Series
omit	Factory specified

HYDRAULIC MOTOR-BRAKE ORBR



OIL FLOW IN DRAIN LINE

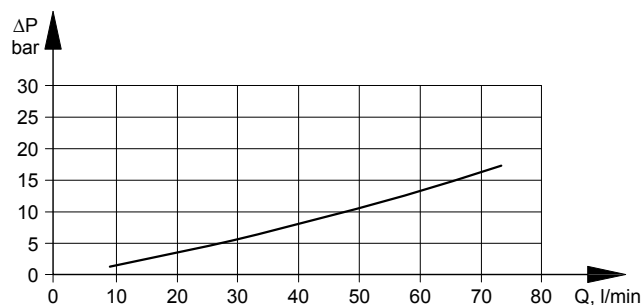
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
100	20	2,5
	35	1,8
140	20	3,5
	35	2,8



GENERAL

Displacement, (cm ³ /rev)	50 ÷ 400
Max. Speed, (RPM)	166 ÷ 509
Max. Torque, (daNm)	10,5 ÷ 47
Max. Output, (kW)	5,2 ÷ 15
Max. Pressure Drop, (bar)	45 ÷ 175
Max. Oil Flow, (l/min)	27 ÷ 60
Min. speed, (RPM)	10
Pressure fluid	Mineral based - HLP (DIN 51524) or HM (ISO 6743/4)
Temperature range, (°C)	- 30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES

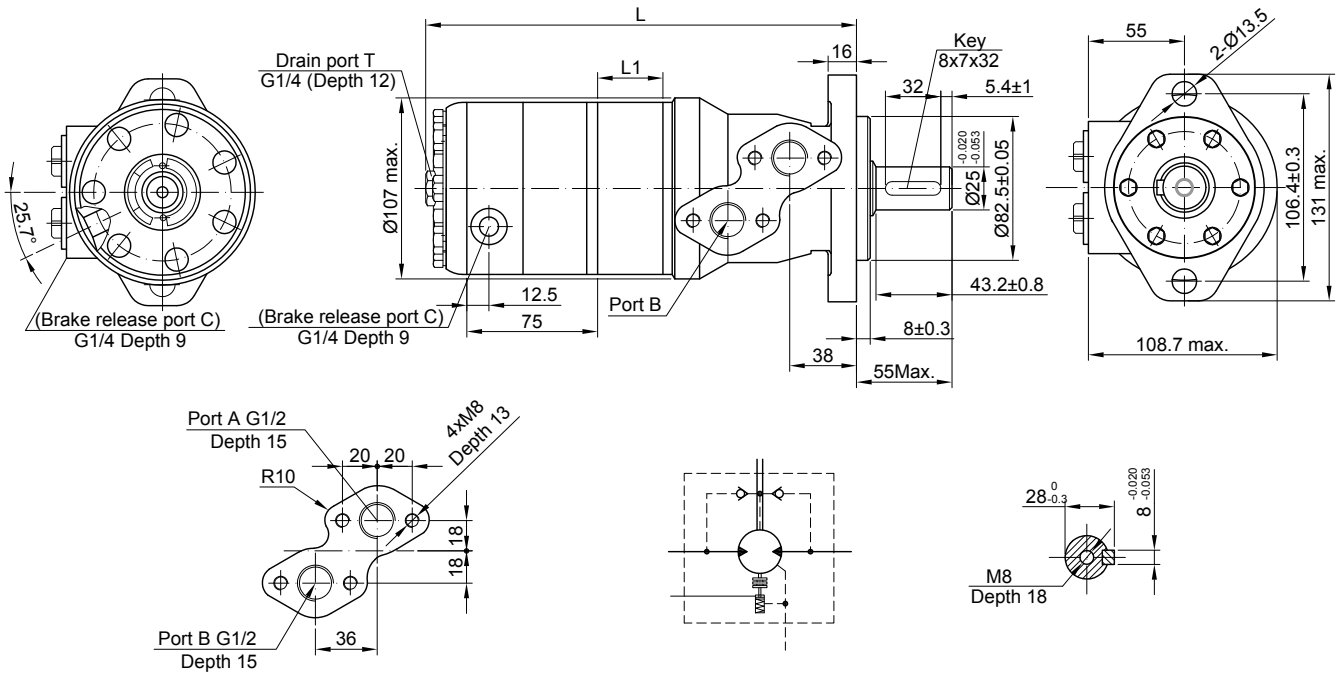


SPECIFICATION DATA

Type		ORBR 50	ORBR 80	ORBR 100	ORBR 125	ORBR 160C	ORBR 160CB	ORBR 200C	ORBR 200CB	ORBR 250C	ORBR 250CB	ORBR 315C	ORBR 315CB	ORBR 400C	ORBR 400CB
Displacement [cm ³ /rev]		51,7	81,5	102	128	157		195		253		318		381	
Max. Speed, [min ⁻¹]	cont.	509	500	497	460	375		300		230		184		166	
	int.	603	600	574	574	465		375		290		230		192	
Max. Torque [daNm]	cont.	10,5	19,5	25	32	30	39	30	36	30	44	30	45	30	47
	int.	12	22	28	35	39	43	39	40,5	39	48	42	51,2	43	53
	peak	14	27	32	38	46	46	50	50	60	60	60	63	60	67
Max. Output [kW]	cont.	5,5	10,7	13,2	15	12	13,7	9,6	11,3	7,3	10,6	5,8	8,8	5,2	8,1
	int.	5,6	12	15	16,5	13,4	15,2	10,7	13,1	8,2	14,3	6,6	12,1	5,5	10,5
Max. Pressure Drop [bar]	cont.	140	175	175	175	135	175	105	130	85	120	65	100	45	85
	int.	175	200	200	200	175	200	145	175	115	130	90	110	75	95
	peak	220	225	225	225	225	225	225	195	200	160	150	135	120	110
Max. Oil Flow [l/min]	cont.	27	42	52	60	60		60				60			
	int.	32	50	60	75	75		75				75			
Max. Inlet Pressure, [bar]	cont.					175						175			
	int.					200						200			
	peak					240						240			
Max. Starting Pressure [bar]		10	10	10	9	7		5		5		5		5	
Min. Starting Torque, [daNm]	at max press. drop cont.	9,5	15	20	25	24	32	26	41	24	50	26	50	24	44
	at max press. drop int.	10,8	17	23	28	32	37	33	46	31	51,5	35	51,8	38	50
Min. Speed, [min ⁻¹]		10	10	10	10	10	10	10	10	10	10	10	10	10	10
Static Torque of Brake, [daNm]		51 ÷ 55													
Min.Brake Release Pressure, [bar]		17 ÷ 21													
Max.Opening Pressure, [bar]		240													
Weight, [kg]		11,7	11,9	11,9	12,2	12,5	12,6	13	13,1	13,5	13,6	14	14,1	14,5	14,6

Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

OUTLINE DIMENSIONS REFERENCE

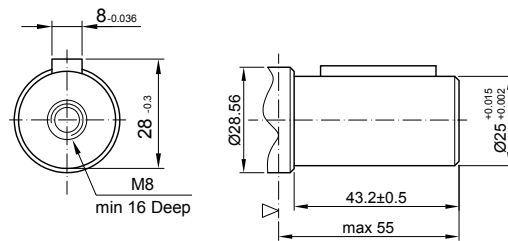


SPECIFICATION DATA

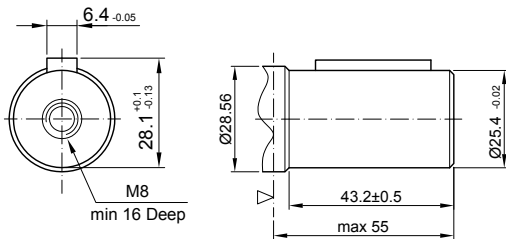
Type	Displacement [ml/r]	L
ORBR 50	51,7	217
ORBR 80	81,5	223
ORBR 100	102	227
ORBR 125	128	232
ORBR 160	157	237,5
ORBR 200	195	245
ORBR 250	253	257
ORBR 315	318	269
ORBR 400	381	281

SHAFT EXTENSIONS FOR ORBR MOTORS

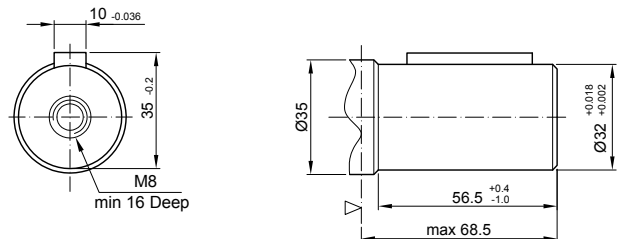
C Ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm



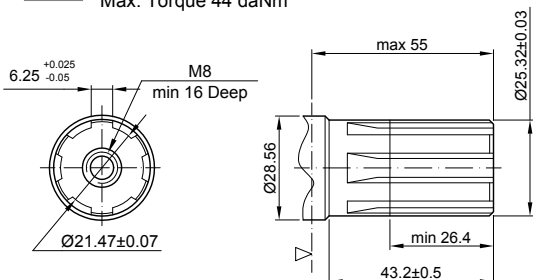
CO Ø1" straight, Parallel key 1/4"x1/4"x1 1/4" BS46
Max. Torque 44 daNm



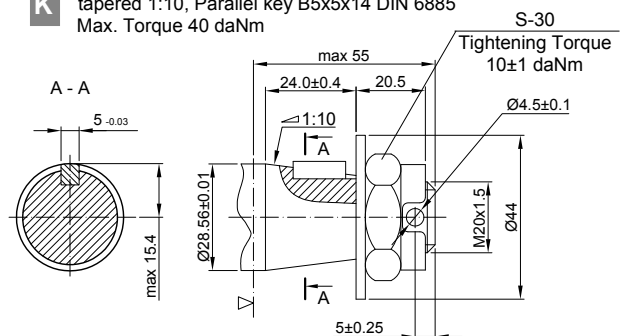
CB Ø32 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm



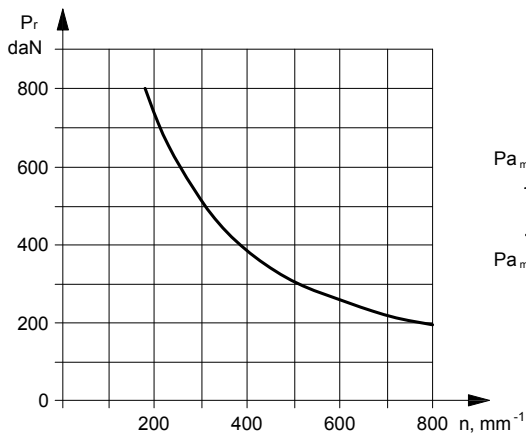
SH splined, BS 2059 (SAE 6B)
Max. Torque 44 daNm



K tapered 1:10, Parallel key B5x5x14 DIN 6885
Max. Torque 40 daNm

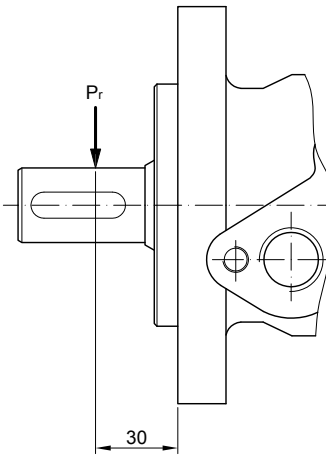


PERMISSIBLE SHAFT LOADS



$P_{a_{max}} = 150 \text{ daN}$

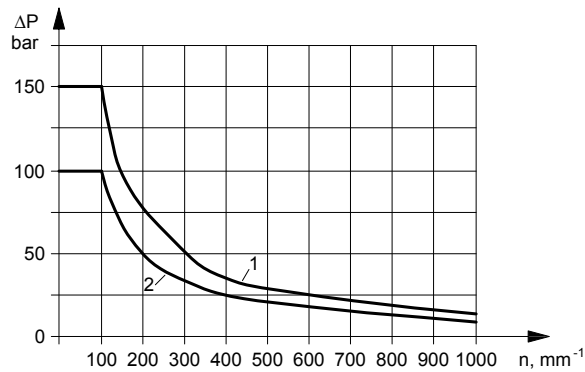
$P_{a_{max}} = 200 \text{ daN}$



For Rotation speed $n \geq 200 \text{ min}^{-1}$
and distance $L \neq 300 \text{ mm}$
the radial load could be
calculated by

$$P_r = \frac{800}{n} \times \frac{25000}{95+L}, \text{ daN}$$

MAX. PERMISSIBLE SHAFT SEAL PRESSURE



1: Drawing for "C" shaft
2: Drawing for "CB" shaft

ORDER CODE

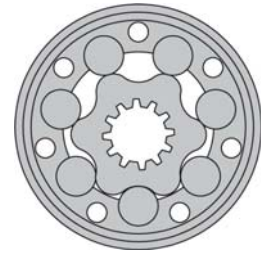
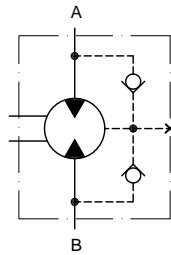
ORBR 1 2 3 4

1	Displacement code
50	51,7 [cm^3/rev]
80	81,5 [cm^3/rev]
100	102 [cm^3/rev]
125	128 [cm^3/rev]
160	157 [cm^3/rev]
200	195 [cm^3/rev]
250	253 [cm^3/rev]
315	318 [cm^3/rev]
400	381 [cm^3/rev]

2	Shaft Extensions
C	$\varnothing 25$ straight, Parallel key A8x7x32 DIN6885
CO	$\varnothing 1$ " straight, Parallel key 1/4"x1/4"x1 1/4" BS46
CB	$\varnothing 32$ straight, Parallel key A10x8x45 DIN6885
SH	$\varnothing 25,32$ splined BS 2059 (SAE 6B)
K	$\varnothing 28,56$ tapered 1:10, Parallel key B5x5x14 DIN6885

The permissible output torque for shafts must be not exceeded!

LOW SPEED HIGH TORQUE MOTORS OK

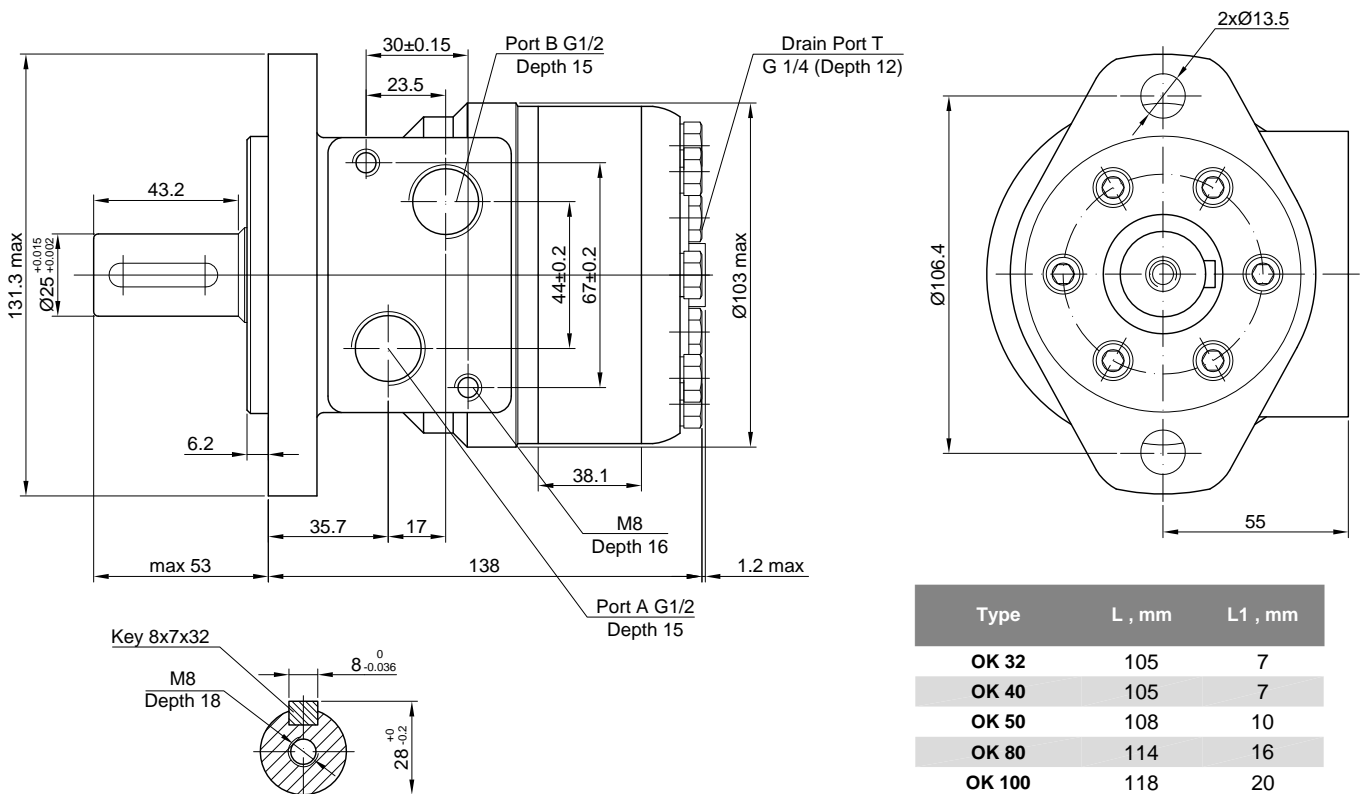


SPECIFICATION DATA

Code	Displacement [cm ³ /rev.]	Max. Speed, [RPM]		Max. Torque [daNm]		Max. Output [kW]		Max. Pressure Drop [bar]		Max. Oil Flow [lpm]
		cont.	int.	cont.	int.	cont.	int.	cont.	int.	
OK 32	32	1000	6,4	8,3	5,7	6,6	140	175	40	
OK 40	40	980	8	10,4	7,1	8,3	140	175	40	
OK 50	51,5	775	10	13	9	10,4	140	175	40	
OK 80	80,3	750	15,7	19,5	10,4	12,6	140	175	60	
OK 100	99,8	600	19,8	24	10,8	12,8	140	175	60	
OK 125	125,7	475	25	30	10,8	12,5	140	175	60	
OK 160	159,6	375	32	39	10,4	11,5	140	175	60	
OK 200	199,8	300	34	42	8,8	10,2	125	155	60	
OK 250	250,1	240	40	47	8,1	9,4	110	140	60	
OK 315	315,7	190	40	50	7,4	7,8	90	125	60	
OK 400	397	150	40	50	6,2	7,1	75	90	60	

Intermittent operation: the permissible values may occur for max. 10% of every minute.

OUTLINE DIMENSIONS REFERENCE



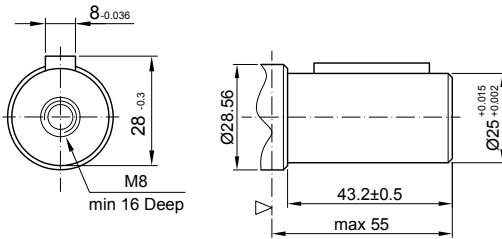
- C :2 x M8 - 13 mm depth
- P_(A,B) :2 x G1/2 - 15 mm depth
- T :G1/4 -12 mm depth (plugged)

Standard Rotation
Viewed from Shaft End
Port A Pressurized - CW
Port B Pressurized - C CW

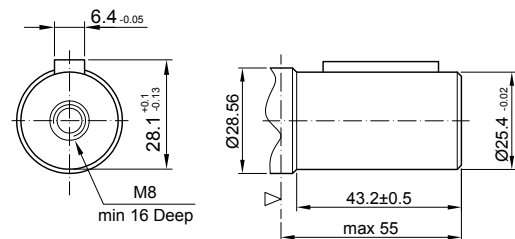
Type	L , mm	L1 , mm
OK 32	105	7
OK 40	105	7
OK 50	108	10
OK 80	114	16
OK 100	118	20
OK 125	123	25
OK 160	129	30,5
OK 200	138	38,1
OK 250	148	50
OK 315	160	62
OK 400	172	74

SHAFT EXTENSIONS

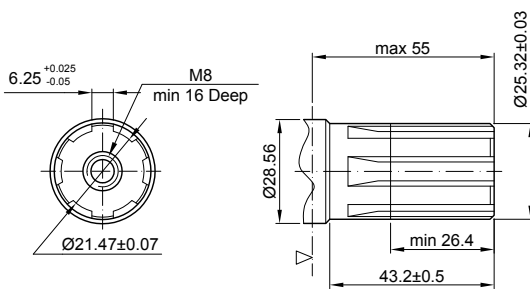
C Ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 44 daNm



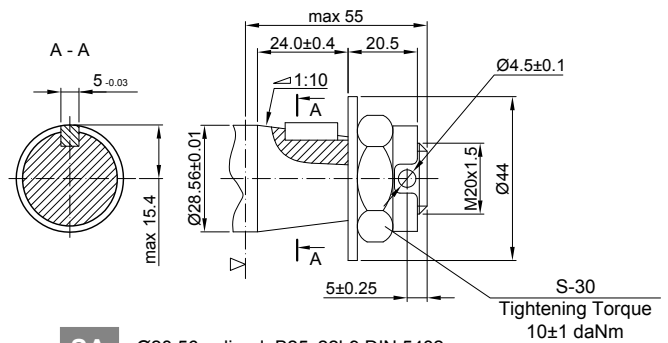
CO Ø25,4 straight, Parallel key 1/4"x1/4"x1 1/4" BS46
Max. Torque 44 daNm



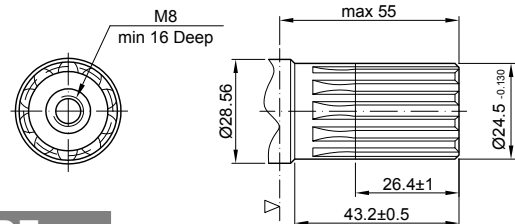
SH Ø28,56 splined, BS 2059 (SAE 6B)
Max. Torque 44 daNm



K Ø28,56 tapered 1:10, Parallel key B5x5x14 DIN 6885
Max. Torque 44 daNm



SA Ø28,56 splined, B25x22h9 DIN 5482
Max. Torque 44 daNm



▽ Motor Mounting Surface

ORDER CODE

	1	2	3	4	5	6	7
OK							

1	Displacement code
50	51,5 [cm³/rev]
80	80,3 [cm³/rev]
100	99,8 [cm³/rev]
125	125,7 [cm³/rev]
160	159,6 [cm³/rev]
200	199,8 [cm³/rev]
250	250,1 [cm³/rev]
315	315,7 [cm³/rev]
400	397,0 [cm³/rev]
2	Shaft Extensions
C	Ø25 straight, Parallel key A8x7x32 DIN6885
CO	Ø25,4 straight, Parallel key 1/4"x1/4"x1 1/4" BS46
SH	Ø28,56 splined BS 2059 (SAE 6B)
K	Ø28,56 tapered 1:10, Parallel key, B5x5x14 DIN6885
SA	Ø28,56 splined B25x22h9 DIN 5482
3	Ports
omit	BSPP (ISO 228)

4	Rotation
omit	Standard Rotation
R	Reverse Rotation
5	Option (Paint)
omit	no paint
P	Painted Low Gloss Color
PC	Corrosion Protected Paint
6	Special Features
omit	none
LL	Low Leakage
LSV	Low Speed Valve
FR	Free Running
7	Design Series
omit	Factory specified

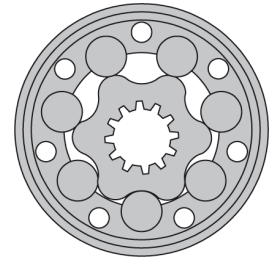
The permissible output torque for shafts must be not exceeded!
Color at customer's request.

HYDRAULIC MOTORS OH



OIL FLOW IN DRAIN LINE

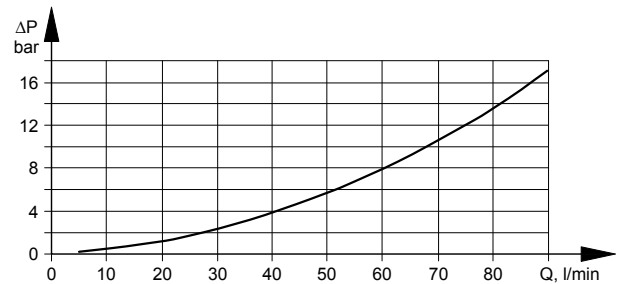
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
100	20	2,5
	35	1,8
140	20	3,5
	35	2,8



GENERAL

Displacement, (cm ³ /rev)	201,3 ÷ 502,4
Max. Speed, (RPM)	370 ÷ 150
Max. Torque, (daNm)	51 ÷ 85
Max. Output, (kW)	16 ÷ 11
Max. Pressure Drop, (bar)	175 ÷ 125
Max. Oil Flow, (l/min)	75
Min. speed, (RPM)	10 ÷ 5
Pressure fluid	Mineral based - HLP (DIN 51524) or HM (ISO 6743/4)
Temperature range, (°C)	- 30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES



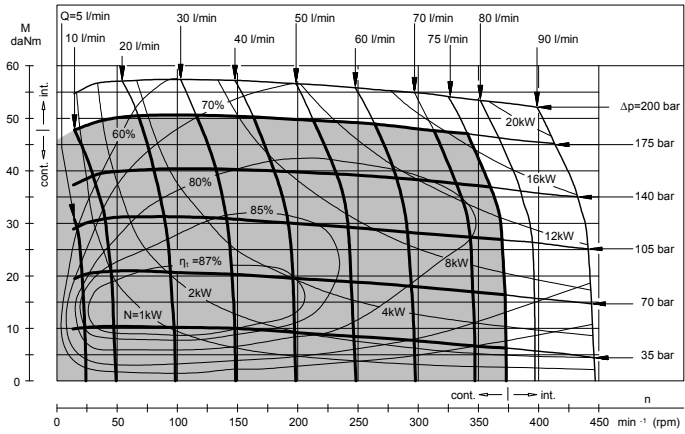
SPECIFICATION DATA

Type		OH 200	OH 250	OH 315	OH 400	OH 500
Displacement [cm ³ /rev]		201,3	252	314,9	396,8	502,4
Max. Speed, [RPM]	cont.	370	295	235	185	150
	int.	445	350	285	225	180
Max. Torque [daNm]	cont.	51	61	74	84	85
	int.	58	70	82	98	104
	peak	64	79	98	109	117
Max. Output [kW]	cont.	16	16	14	12,5	11
	int.	18,5	18,5	15,5	15	14
Max. Pressure Drop [bar]	cont.	175	175	175	155	125
	int.	200	200	200	190	160
	peak	225	225	225	210	180
Max. Oil Flow [l/min]	cont.	75	75	75	75	75
	int.	90	90	90	90	90
Max. Inlet Pressure, [bar]	cont.	200	200	200	200	200
	int.	225	225	225	225	225
	peak	250	250	250	250	250
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	100	100	100
	cont.	100-200	RPM	50	50	50
	cont.	200-300	RPM	20	20	20
	int.	0-max.	RPM	100	100	100
Max. Starting Pressure with Unloaded Shift, [bar]		5	5	5	5	5
Min. Starting Torque [daNm]	at max press. drop cont.	39	52	66	72	72
	at max press. drop int.	45	59	73	88	88
Min. Speed, [RPM]		10	10	8	5	5
Weight, [kg]		10,5	11	11,5	12,3	13

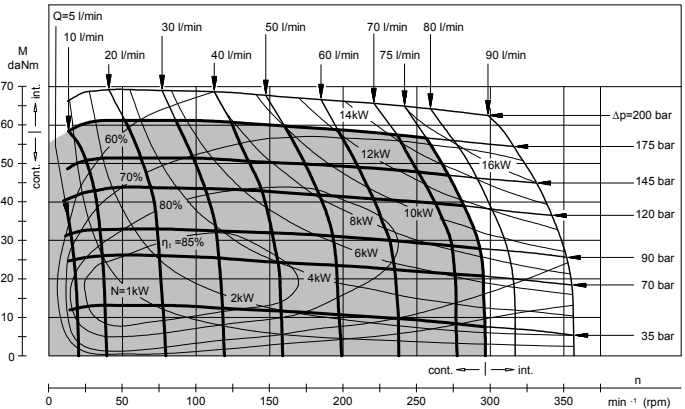
Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

FUNCTION DIAGRAMS

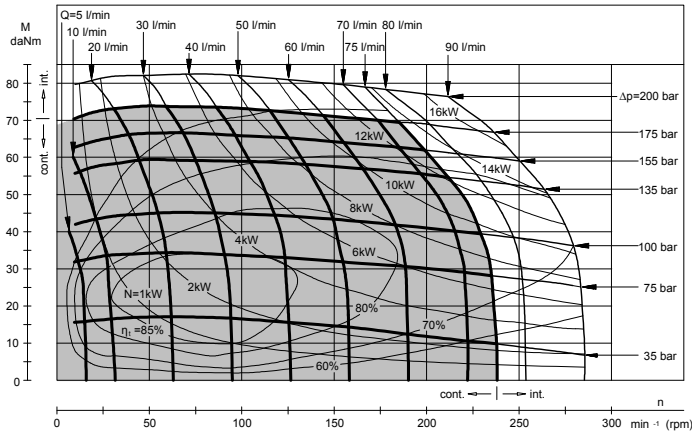
OH 200



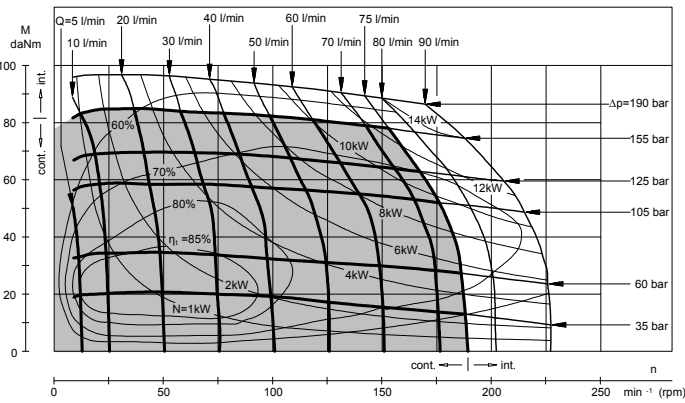
OH 250



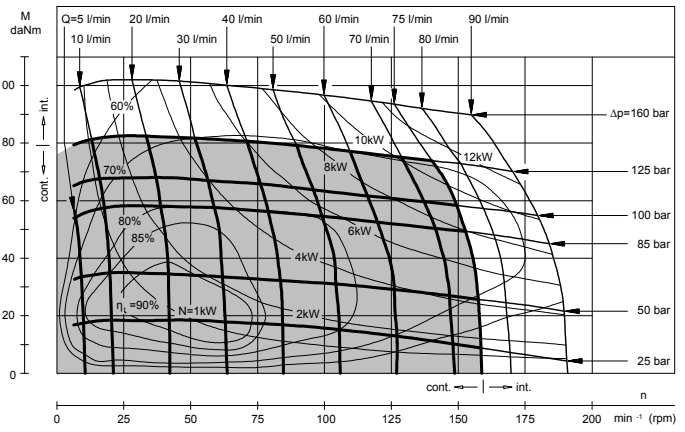
OH 315



OH 400



OH 500

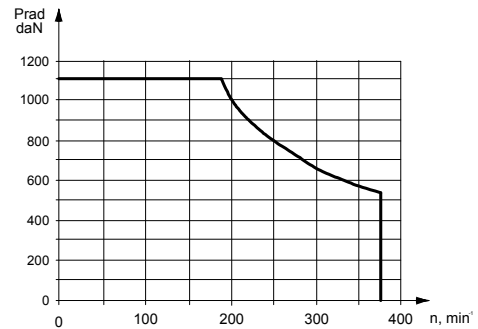


PERMISSIBLE SHAFT LOADS FOR OH MOTORS

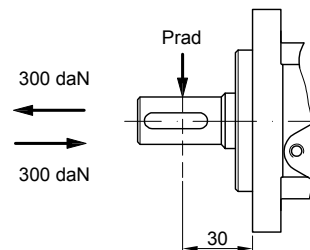
The permissible radial shaft load P_{rad} depends on the speed (RPM) and distance (L) from the point of load to the mounting flange.

$$\text{Radial Shaft Load } P_{rad} = \frac{1100}{n} \times \frac{25000}{103.5+L}, \text{ daN}^*$$

*L < 60 mm; n ≥ 200 min⁻¹

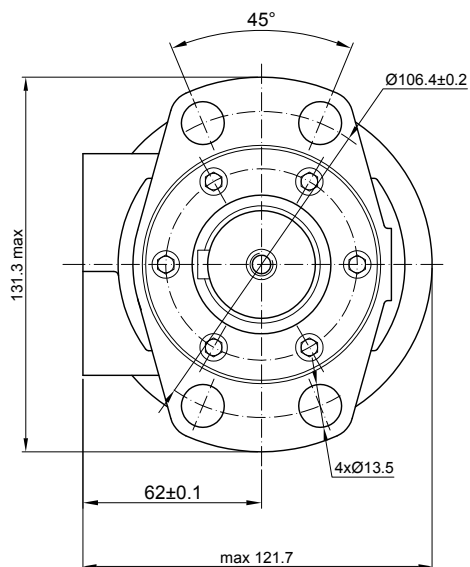
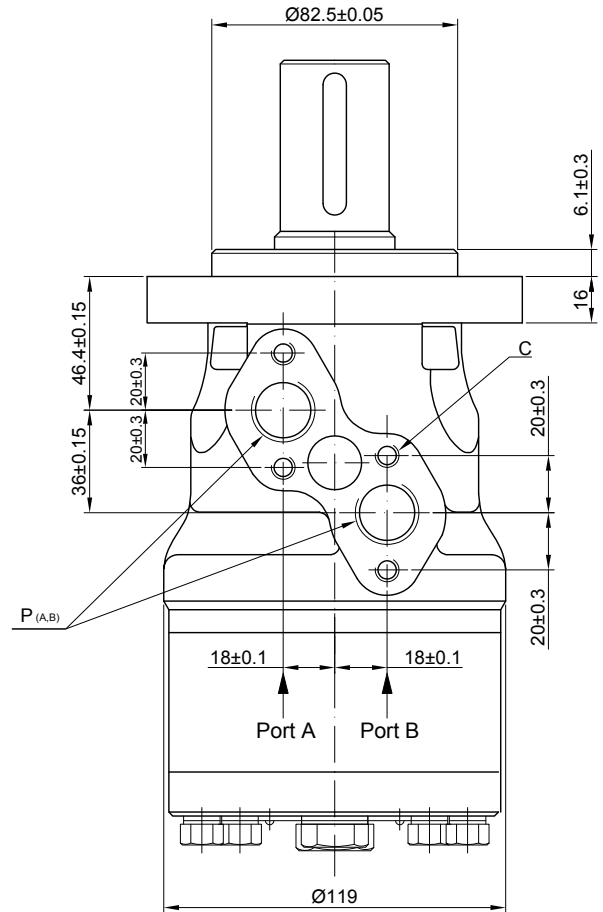
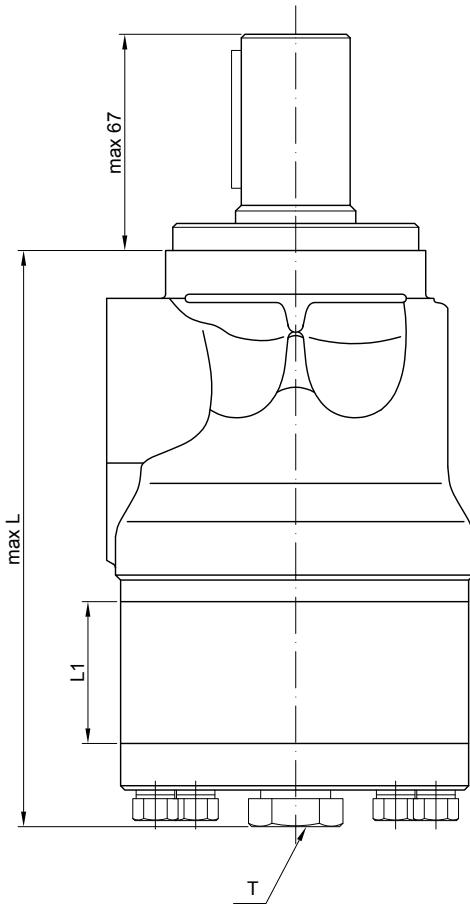


The function diagrams data was collected at back pressure 5 4 10 bar and oil with viscosity of 32 mm²/s at 50° C.



DIMENSIONS

Magneto Mount (4 holes)



Type	B , mm	L , mm
OH 200	168	27
OH 250	175	34
OH 315	184	42
OH 400	195	54
OH 500	206	65

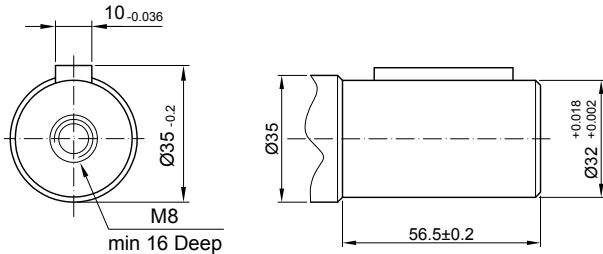
- C :4xM8 - 13 mm depth
- P_(A,B) :2xG1/2 or 2xM22x1,5 - 15 mm depth
- T :G1/4 or M14x1,5 -12 mm depth (plugged)

Standard Rotation
Viewed from Shaft End
Port A Pressurized - **CW**
Port B Pressurized - **CCW**

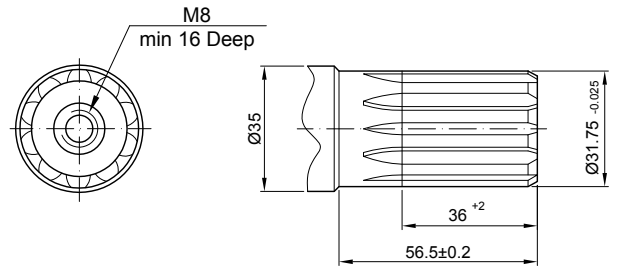
Reverse Rotation
Viewed from Shaft End
Port A Pressurized - **CCW**
Port B Pressurized - **CW**

SHAFT EXTENSIONS

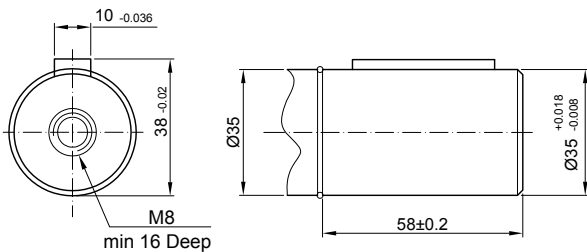
C Ø32 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm



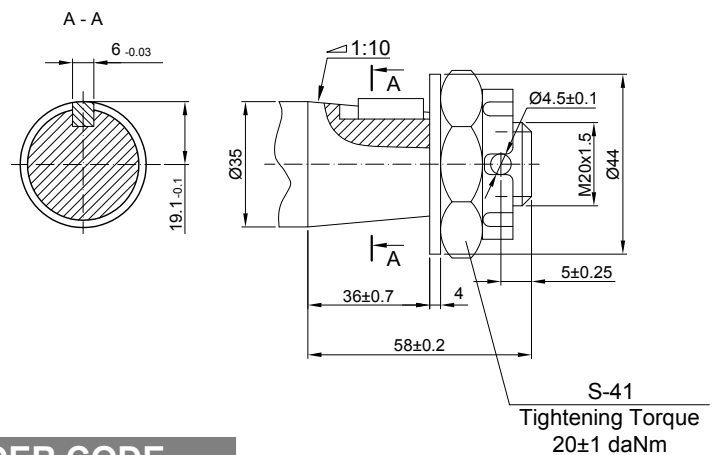
SH Ø1 1/4" splined 14T, DP 12/24 ANSI B92.1-1976
Max. Torque 95 daNm



CB Ø35 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 95 daNm



K tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 95 daNm



S-41
Tightening Torque
20±1 daNm

ORDER CODE

OH	1	2	3	4	5	6	7
----	---	---	---	---	---	---	---

1	Displacement code
200	201,3 [cm ³ /rev]
250	252,0 [cm ³ /rev]
315	314,9 [cm ³ /rev]
400	396,8 [cm ³ /rev]
500	502,4 [cm ³ /rev]
2	Shaft Extensions
C	Ø32 straight, Parallel key A10x8x45 DIN6885
SH	Ø1 1/4" splined 14T ANSI B92.1-1976
CB	Ø35 straight, Parallel key A10x8x45 DIN6885
K	Ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
3	Ports
omit	BSPP (ISO 228)
M	Metric (ISO 262)

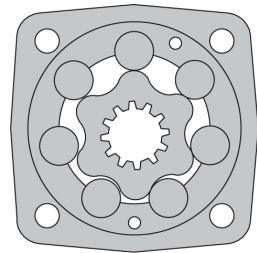
4	Special Features
omit	none
LL	Low Leakage
LSV	Low Speed Valve
FR	Free Running
5	Rotation
omit	Standard Rotation
R	Reverse Rotation
6	Option (Paint)
omit	no paint
P	Painted Low Gloss Color
PC	Corrosion Protected Paint
7	Design Series
omit	Factory specified

HYDRAULIC MOTORS OS



OIL FLOW IN DRAIN LINE

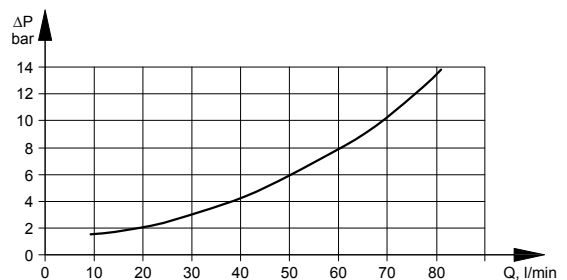
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
140	20	1,5
	35	1
210	20	3
	35	2



GENERAL

Displacement, (cm ³ /rev)	564,9
Max. Speed, (RPM)	1000
Max. Torque, (daNm)	cont.: 85 int.: 99
Max. Output, (kW)	23
Max. Pressure Drop, (bar)	cont.: 210 int.: 275
Max. Oil Flow, (l/min)	90
Min. speed, (RPM)	5
Permissible Shaft Loads, (daN)	Pa=500
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, (°C)	- 40 ÷ 140
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES



SPECIFICATION DATA

Type	OS 80	OS 100	OS 125	OS 160	OS 200		
Displacement [cm ³ /rev.]	80,5	100	125,7	159,7	200		
Max. Speed, [RPM]	cont.	810	750	600	470	375	
	int.	1000	900	720	560	450	
Max. Torque [daNm]	cont.	20	25	32	40	46	
	int.	24	30	38	48	60	
	peak	26	32	40	51	65	
Max. Output [kW]	cont.	16	17,5	17,5	17,5	15,5	
	int.	19	21	21	21	22	
Max. Pressure Drop [bar]	cont.	175	175	175	175	160	
	int.	210	210	210	210	210	
	peak	250	250	225	225	225	
Max. Oil Flow [l/min]	cont.	65	75	75	75	75	
	int.	80	90	90	90	90	
Max. Inlet Pressure, [bar]	cont.	210	210	210	210	210	
	int.	250	250	250	250	250	
	peak	300	300	300	300	300	
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	100	100	100	100
	cont.	100-300	RPM	50	50	50	50
	cont.	>300	RPM	20	20	20	20
	int.	0-max.	RPM	100	100	100	100
Max. Return Pressure with Drain Line [bar]	cont.	140	140	140	140	140	
	int.	175	175	175	175	175	
	peak	210	210	210	210	210	
Max. Starting Pressure with Unloaded Shift, [bar]	12	10	10	8	8		
Min. Starting Torque [daNm]	at max press.	drop cont.	16,5	20,5	26	28	33
	at max press.	drop int.	19,5	25	31	39	41
Min. Speed, [RPM]	10	10	8	8	6		
Weight, [kg]	OS(FE)	9,8(10,2)	10(10,4)	10,3(10,7)	10,7(11,1)	11,1(11,5)	
	OSWE	10,3(10,7)	10,5(10,9)	10,8(11,2)	11,2(11,6)	11,6(12)	
	OSZE	7,8(8,2)	8(8,4)	8,3(8,7)	8,7(9,1)	9,1(9,5)	
	OSVE	5,7(6,1)	5,9(6,3)	6,2(6,6)	6,6(7)	7(7,4)	
	OSQE	10,2(10,6)	10,4(10,8)	10,7(11,1)	11,1(11,5)	11,5(11,9)	
	OSBE	16,8(17,2)	17,0(17,4)	17,3(17,7)	17,7(18,1)	18,1(18,5)	

Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

SPECIFICATION DATA

Type				OS 250	OS 315	OS 400	OS 475	OS 525	OS 565
Displacement [cm³/rev.]				250	314,9	397	474,6	522,7	564,9
Max. Speed, [RPM]	cont.			300	240	185	160	145	130
	int.			360	290	230	190	175	160
Max. Torque [daNm]	cont.			50	63	67	58	58	58
	int.			63	79	79	68	69	69
	peak			69	84	85	84	85	85
Max. Output [kW]	cont.			13,5	11,0	10,5	8,4	7,6	6,9
	int.			19	18	15	11,3	10,4	9,6
Max. Pressure Drop [bar]	cont.			140	140	120	85	80	75
	int.			175	175	140	100	90	85
	peak			200	185	140	115	105	100
Max. Oil Flow [l/min]	cont.			75	75	75	75	75	75
	int.			90	90	90	90	90	90
Max. Inlet Pressure, [bar]	cont.			210	210	210	210	210	210
	int.			250	250	250	250	250	250
	peak			300	300	300	300	300	300
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	100	100	100	100	100	100
	cont.	100-300	RPM	50	50	50	50	50	50
	cont.	>300	RPM	-	-	-	-	-	-
	int.	0-max.	RPM	100	100	100	100	100	100
Max. Return Pressure with Drain Line [bar]	cont.			140	140	140	140	140	140
	int.			175	175	175	175	175	175
	peak			210	210	210	210	210	210
Max. Starting Pressure with Unloaded Shift, [bar]				8	8	8	8	8	8
Min. Starting Torque [daNm]	at max	press.	drop cont.	36	44	47	47	47	47
	at max	press.	drop int.	44	52	55	55	55	55
Min. Speed, [RPM]				6	5	5	5	5	5
Weight, [kg]	OS(FE)			11,6(12)	12,3(12,7)	13,2(13,6)	14(14,4)	14,9(15,3)	14,9(15,3)
	OSWE			12,1(12,5)	12,8(13,2)	13,7(14,1)	14,5(14,9)	15,4(15,8)	15,4(15,8)
	OSZE			9,6(10)	10,3(10,7)	11,2(11,6)	12(12,4)	12,9(13,3)	12,9(13,3)
	OSVE			7,5(7,9)	8,2(8,6)	9,1(9,5)	9,9(10,3)	10,8(11,2)	10,8(11,2)
	OSQE			12(12,4)	12,7(13,1)	13,6(14)	14,4(14,8)	15,3(15,7)	15,3(15,7)
	OSBE			18,6(19)	19,3(19,7)	20,2(20,6)	21(21,4)	21,9(22,3)	21,9(22,3)

Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

SPECIFICATION DATA for OS...LSV

Low Speed Valve (LSV) "LSV" Series hydraulic motors have been designed to operate with normal pressure drop and to ensure smooth run at low speed (up to 200 min⁻¹), as the best security for operation is guaranteed at frequency of rotation 20 ÷ 50 min. They have an increased starting pressure drop and are not recommended for using at pressure less than 40 bars.

Look at specification data for hydraulic motors standard version. The modification concerns only the following parameters: maximum speed, maximum output, maximum Oil flow and maximum starting pressure.

Type		OS 80	OS 100	OS 125	OS 160	OS 200	OS 250	OS 315	OS 400
Max. Speed, [RPM]	cont.	200	200	200	200	200	200	200	185
	int.	250	250	250	250	250	250	250	225
Max. Output [kW]	cont.	4,6	6,0	7,4	8,0	8,0	8,8	10,6	9,5
	int.	6,5	8,4	10,0	12,2	12,4	13,4	15,0	12,8
Max. Oil Flow [l/min]	cont.	16	20	25	32	40	50	65	75
	int.	20	25	32	40	50	62,5	80	90
Max. Starting Pressure with Unloaded Shift, [bar]		25	20	20	15	15	15	15	15

SPECIFICATION DATA for OS...LL

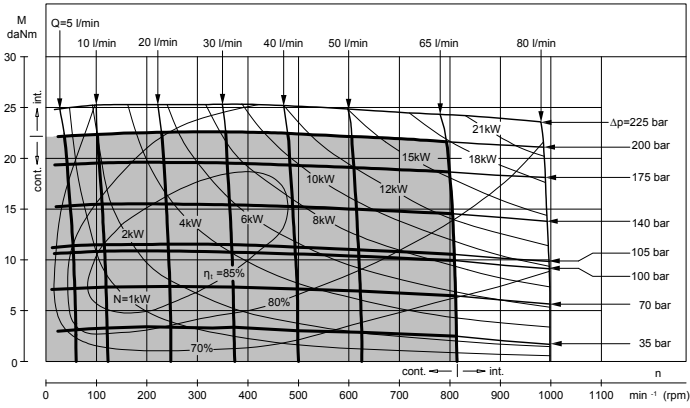
Low Leakage (LL) "LL" Series hydraulic motors have been designed to operate at the whole standard range of working conditions (pressure drop and frequency of rotation), but with considerable decreased volumetric losses in the drainage ports. Their main purpose is to operate as series-connected motors in hydraulic systems. For this version is permissible decreasing of the maximal torque with up to 5% (at middle speed) and up to 10% (at high speed) in comparison to the standard versions of motors.

Look at specification data for hydraulic motors standard version. The modification concerns only the parameters: maximum torque, maximum output, minimum starting torque.

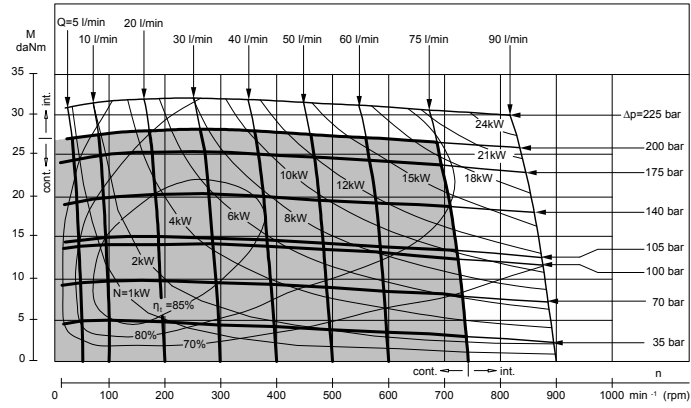
Type		OS 80	OS 100	OS 125	OS 160	OS 200	OS 250	OS 315	OS 400
Max. Torque [daNm]	cont.	22,9	28,5	36,4	33,2	39,0	43,8	52,6	56,5
	int.	25,2	31,1	39,6	46,8	48,8	52,6	61,4	67,2
Max. Output [kW]	cont.	17,8	19,3	19,3	14,8	13,3	11,8	10,9	9,5
	int.	19,3	21,3	21,4	20,0	16,6	14,2	12,8	12,3
Min. Starting Torque [daNm]	cont.	18,7	23,2	29,6	27,3	32,2	35,1	43,0	45,8
	int.	20,3	25,9	32,3	38,0	40,0	43,0	50,7	53,6

FUNCTION DIAGRAMS

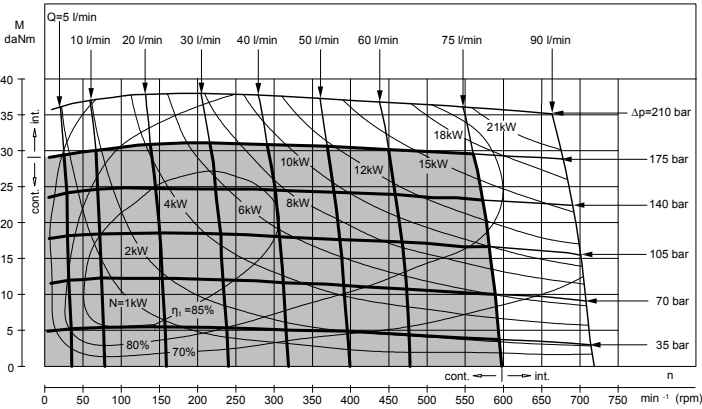
OS 80



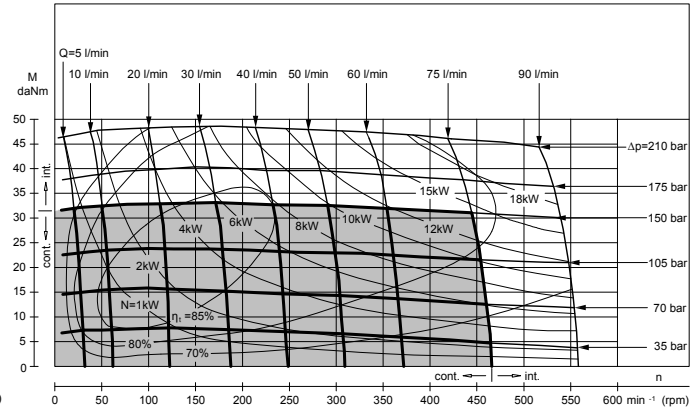
OS 100



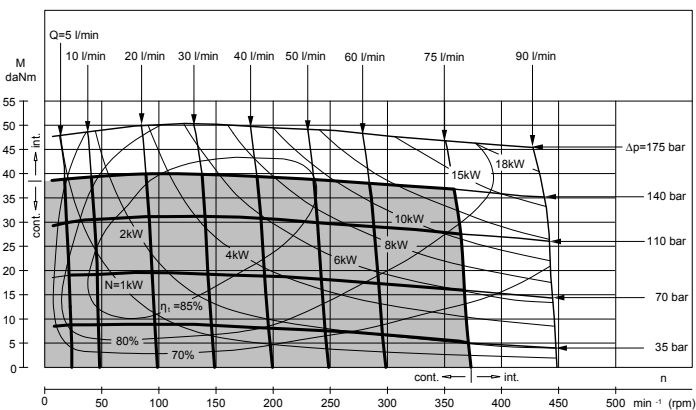
OS 125



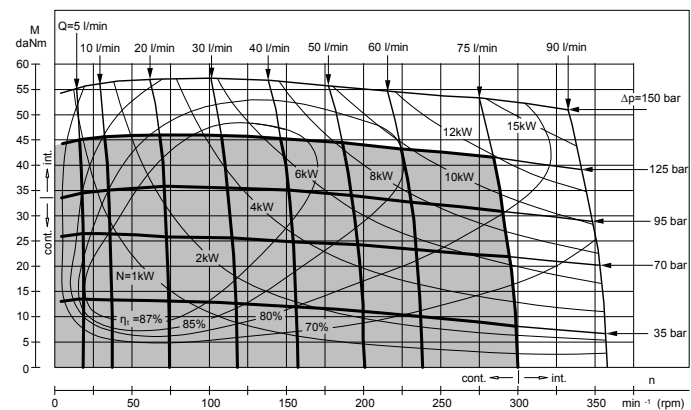
OS 160



OS 200



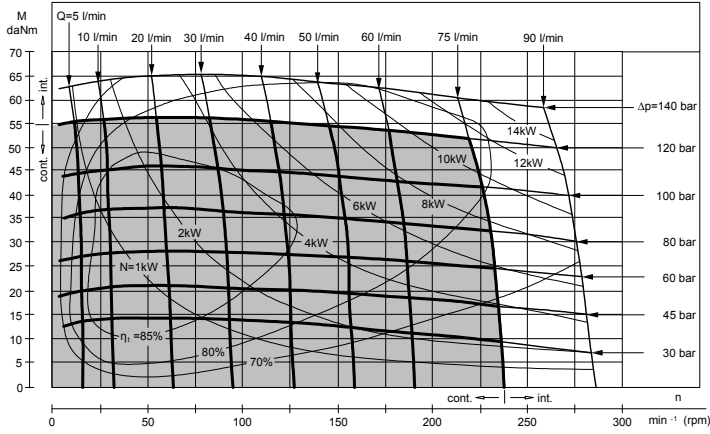
OS 250



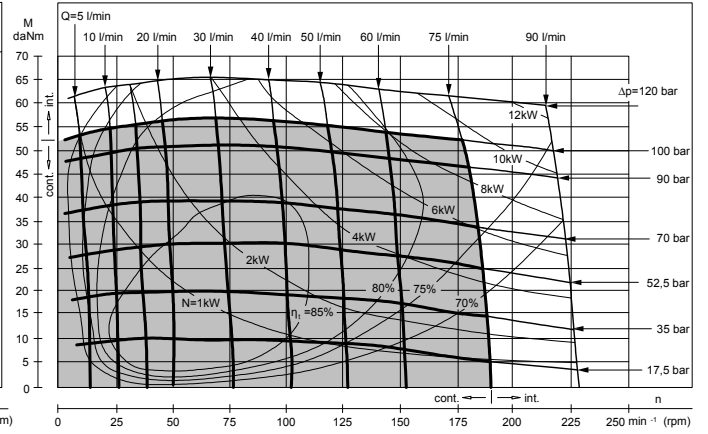
The function diagrams data was collected at back pressure 5+10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

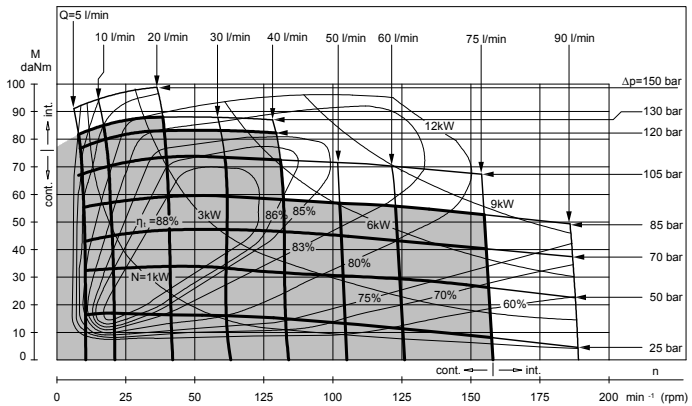
OS 315



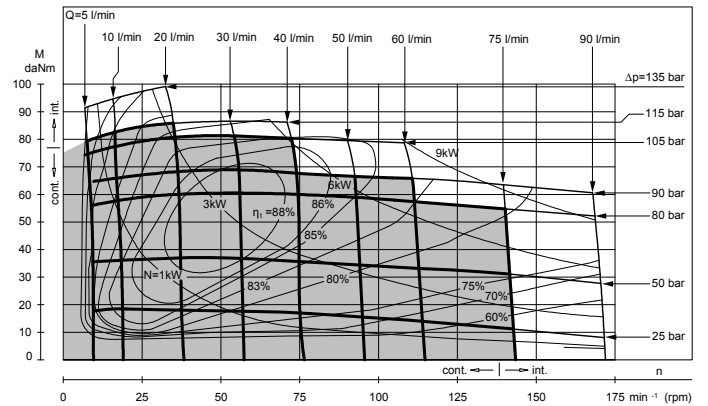
OS 400



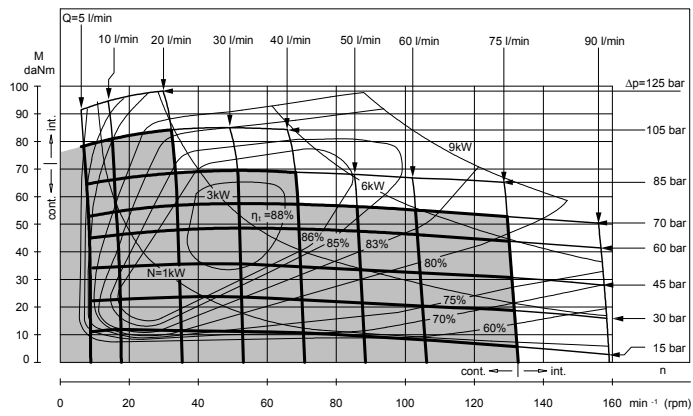
OS 475



OS 525

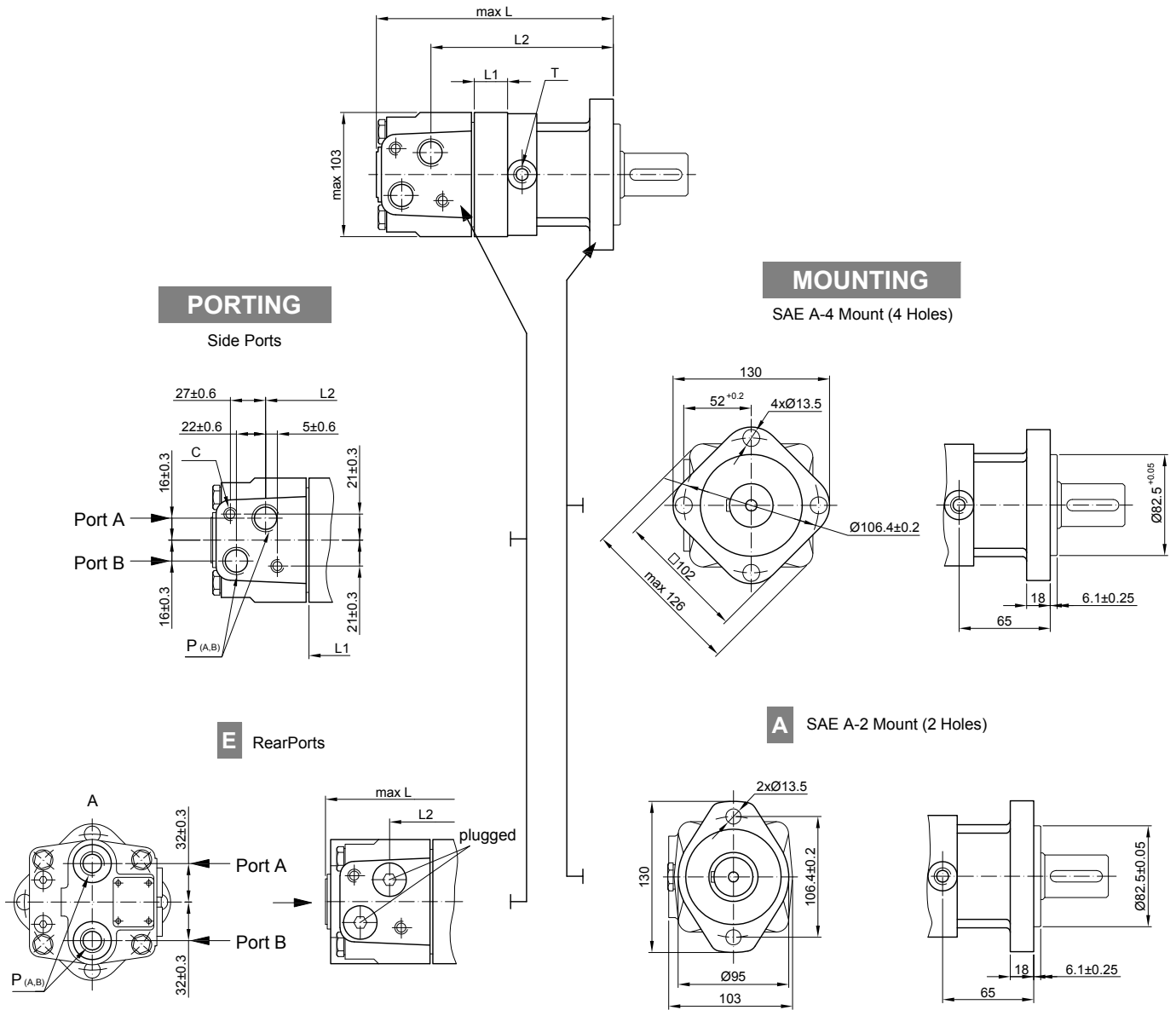


OS 565



The function diagrams data was collected at back pressure 5+10 bar and oil with viscosity of 32 mm²/s at 50° C.

DIMENSIONS AND MOUNTING DATA



C : 2xM10 - 12 mm depth

P_(A,B) : 2xG1/2 or 2xM22x1,5 - 15 mm depth

T : G1/4 or M14x1,5 - 12 mm depth (plugged)

Standard Rotation

Viewed from Shaft End
 Port A Pressurized - CW
 Port B Pressurized - CCW

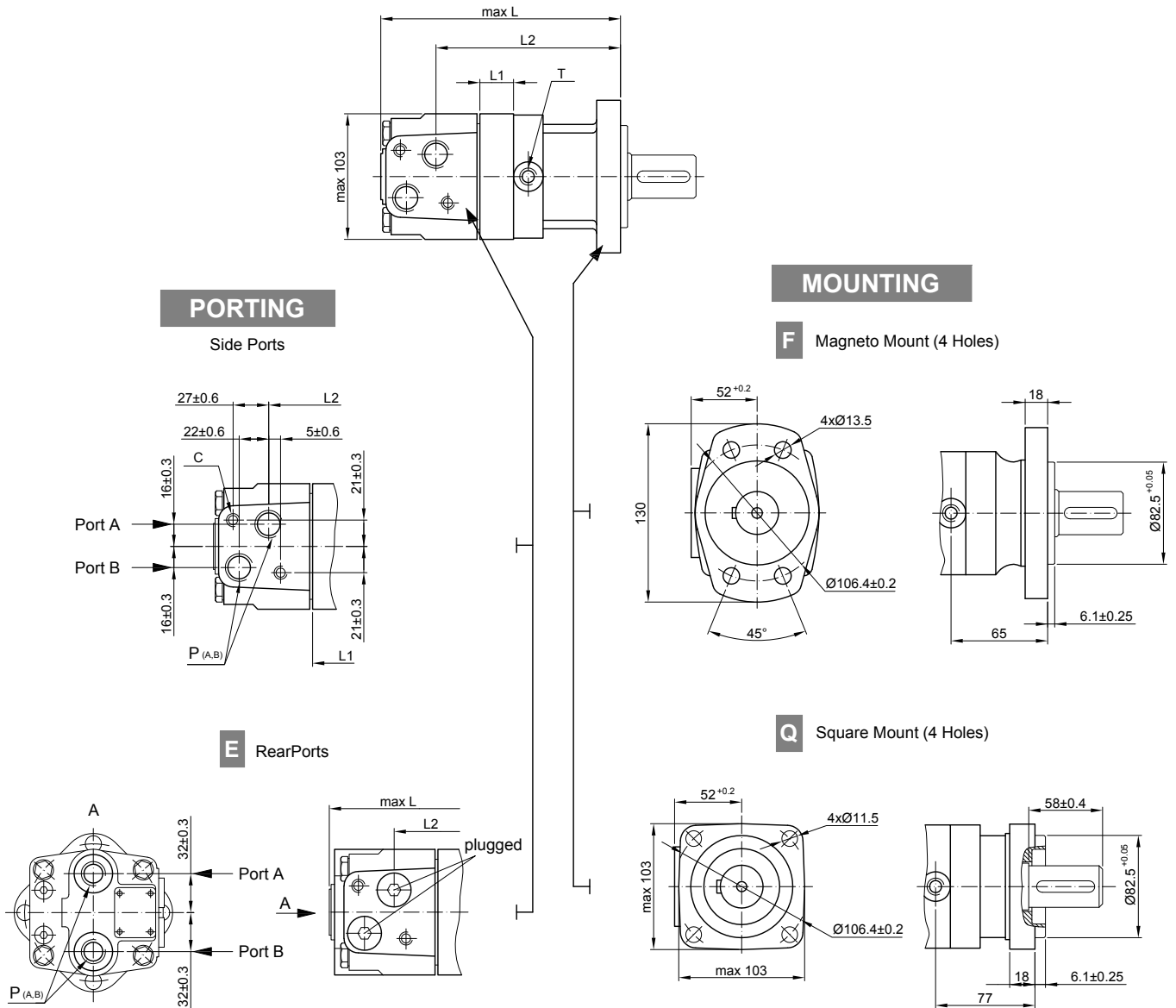
Reverse Rotation

Viewed from Shaft End
 Port A Pressurized - CCW
 Port B Pressurized - CW

Type	L , mm	L2 , mm	Type	L , mm	L1 , mm
OS(A) 80	167	122	OS(A)E 80	174	11
OS(A) 100	170	126	OS(A)E 100	177	14,5
OS(A) 125	175	130	OS(A)E 125	182	19
OS(A) 160	181	136	OS(A)E 160	188	25
OS(A) 200	188	143	OS(A)E 200	195	32
OS(A) 250	197	152	OS(A)E 250	204	41
OS(A) 315	208	163	OS(A)E 315	215	53
OS(A) 400	222	177	OS(A)E 400	229	67
OS(A) 475	237	193	OS(A)E 475	242	82,6
OS(A) 525	229	185	OS(A)E 525	234	74,5
OS(A) 565	235	191	OS(A)E 565	240	80,2

The permissible output torque for shafts must be not exceeded!

DIMENSIONS AND MOUNTING DATA



- C : 2xM10 - 12 mm depth
- P_(A,B) : 2xG1/2 or 2xM22x1,5 - 15 mm depth
- T : G1/4 or M14x1,5 - 12 mm depth (plugged)

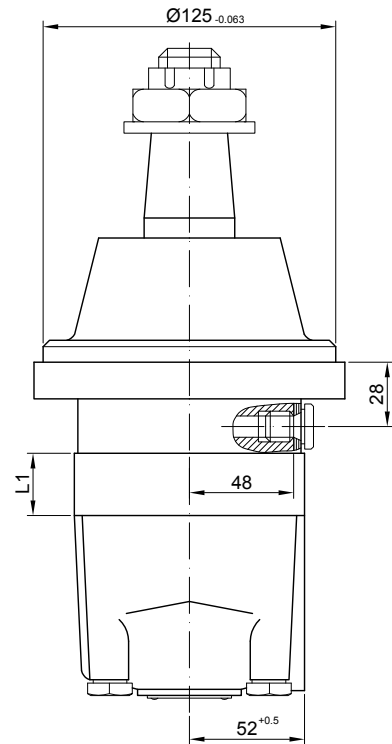
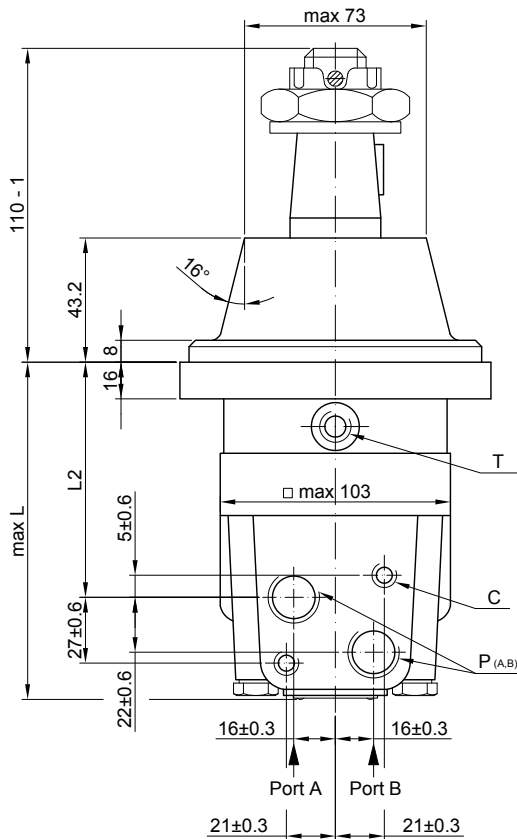
Standard Rotation
Viewed from Shaft End
Port A Pressurized - CW
Port B Pressurized - CCW

Reverse Rotation
Viewed from Shaft End
Port A Pressurized - CCW
Port B Pressurized - CW

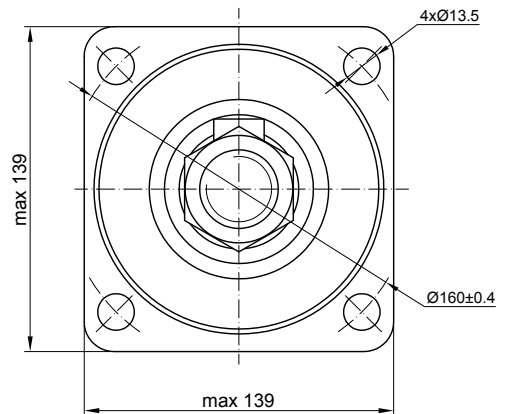
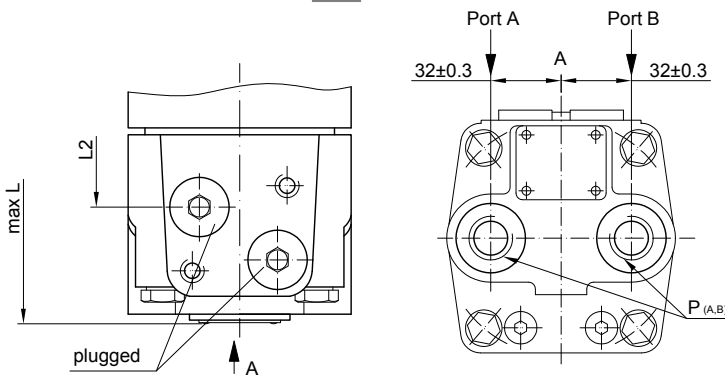
Type	L , mm	L2 , mm	Type	L , mm	L2 , mm	Type	L , mm	Type	L , mm	L1 , mm
OSF 80	167	122	OSQ 80	178	134	OSFE 80	174	OSQE 80	186	11
OSF 100	170	126	OSQ 100	181	138	OSFE 100	177	OSQE 100	189	14,5
OSF 125	175	130	OSQ 125	186	142	OSFE 125	182	OSQE 125	194	19
OSF 160	181	136	OSQ 160	192	148	OSFE 160	188	OSQE 160	200	25
OSF 200	188	143	OSQ 200	199	155	OSFE 200	195	OSQE 200	207	32
OSF 250	197	152	OSQ 250	208	164	OSFE 250	204	OSQE 250	216	41
OSF 315	208	163	OSQ 315	219	175	OSFE 315	215	OSQE 315	227	53
OSF 400	222	177	OSQ 400	233	189	OSFE 400	229	OSQE 400	241	67
OSF 475	237	193	OSQ 475	247	205	OSFE 475	242	OSQE 475	254	82,6
OSF 525	229	185	OSQ 525	240	197	OSFE 525	234	OSQE 525	246	74,5
OSF 565	235	191	OSQ 565	246	203	OSFE 565	240	OSQE 565	252	80,2

DIMENSIONS AND MOUNTING DATA - OSW

W Wheel Mount



E Rear Port



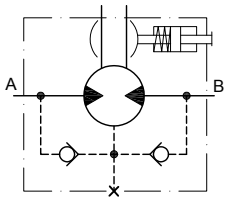
- C :2xM10 -12 mm depth
- P_(A,B) :2xG1/2 or 2xM22x1,5 - 15 mm depth
- T :G1/4 or M14x1,5 -12 mm depth (plugged)

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

Type	L , mm	L1 , mm	L2 , mm	Type	L , mm
OSW 80	129	11	85	OSWE 80	140
OSW 100	132	14,5	88	OSWE 100	143
OSW 125	137	19	93	OSWE 125	148
OSW 160	143	25	99	OSWE 160	154
OSW 200	150	32	106	OSWE 200	161
OSW 250	159	41	115	OSWE 250	170
OSW 315	169	53	126	OSWE 315	181
OSW 400	183	67	141	OSWE 400	194
OSW 475	198	82,6	156	OSWE 475	207
OSW 525	190	74,5	148	OSWE 525	199
OSW 565	196	80,2	154	OSWE 565	205

DIMENSIONS AND MOUNTING DATA - OSB



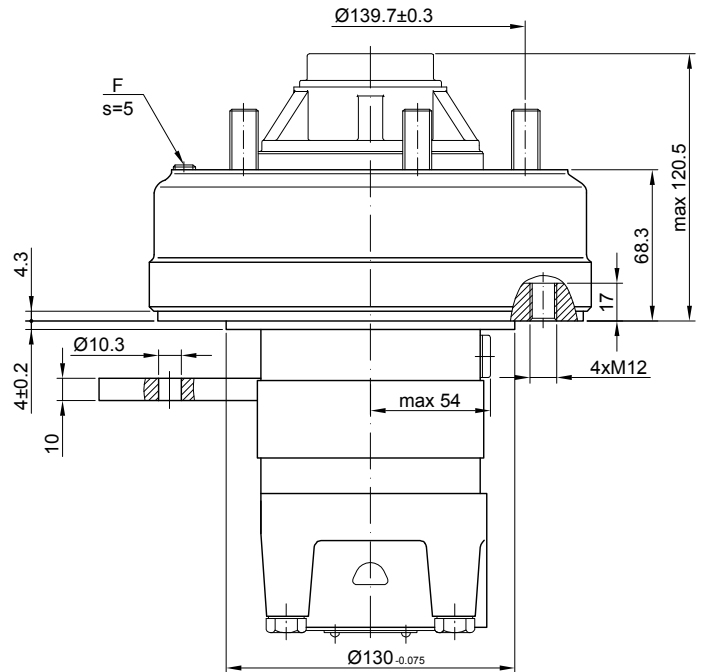
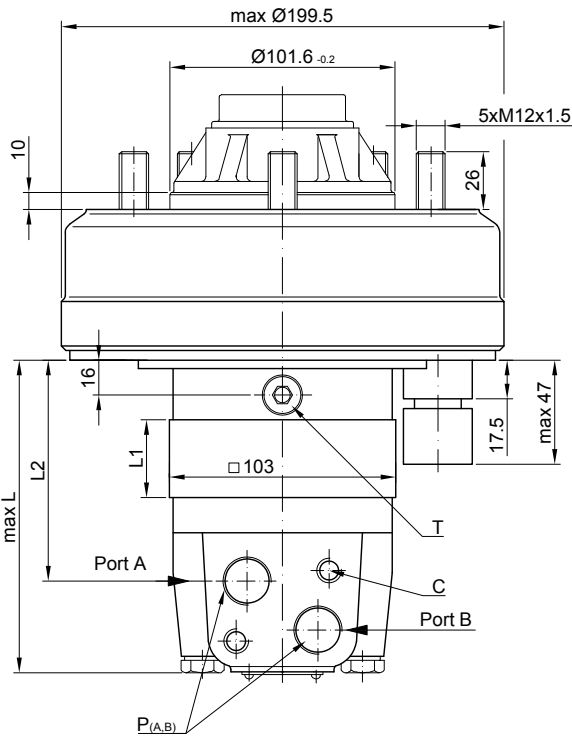
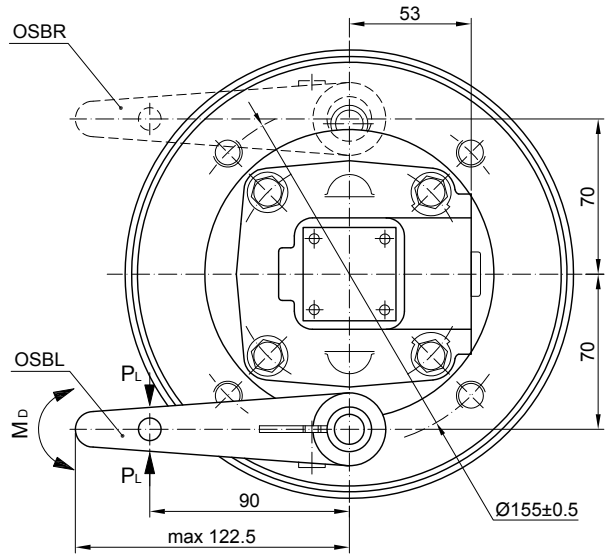
B Motor with Brum Brake

Actuating the brake level, the brake shaft is turned. The rectangular shape of the inner part of this shaft forces the brake pads to be pressed against the brake drum. This brakes the wheel or the winch drum.

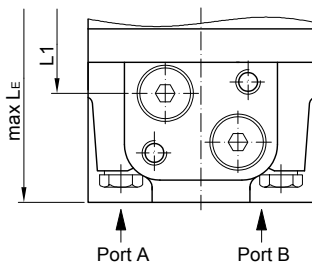
Releasing the level, the springs pull it and the brake pads back to the initial position. The motor output shaft is released. Minimum angle adjustment is 10°. It can be adjusted by dismounting the level. Depending on the application You can choose the actuating direction of the brake level. The rod connection actuating the brake should be capable of moving at last 25 mm from neutral to extreme position.

- C: 2xM10 - 12 mm depth
- D: Wheel bolts 5xM12x1,5
- E: 4xM12; 17mm depth, 90°

- F: Inspection hole for checking brake lining
- T: G 1/4 or M14x1,5 - 12 mm depth (plugged)
- P :2xG1/2 or 2xM22x1,5 - 15 mm depth



E Rear Port



Standard Rotation
Viewed from Shaft End
Port A Pressurized - CW
Port B Pressurized - CCW

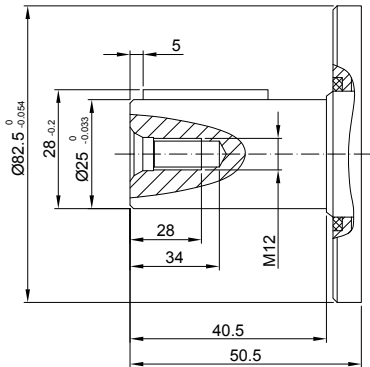
Reverse Rotation
Viewed from Shaft End
Port A Pressurized - CCW
Port B Pressurized - CW

Type	L , mm	L1 , mm	L2 , mm	L _E , mm
OSB 80	119	14,0	74	127
OSB 100	122	17,4	77	130
OSB 125	126	21,8	82	134
OSB 160	132	27,8	88	140
OSB 200	139	34,8	95	147
OSB 250	148	43,5	110	156
OSB 315	159	54,8	115	167
OSB 400	174	69,4	130	182
OSB 475	188	82,6	143	196
OSB 525	180	74,5	135	188
OSB 565	186	80,2	141	192

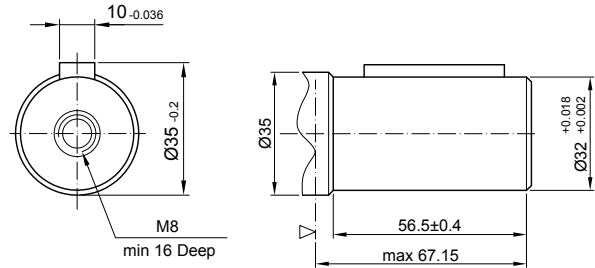
For rear ported motors.

SHAFT EXTENSIONS

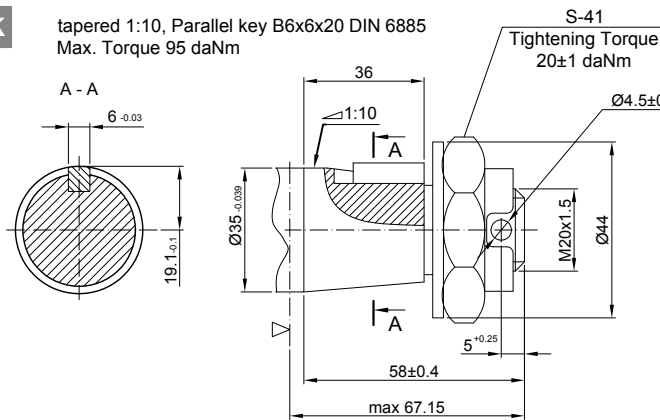
B Ø 25 mm straight



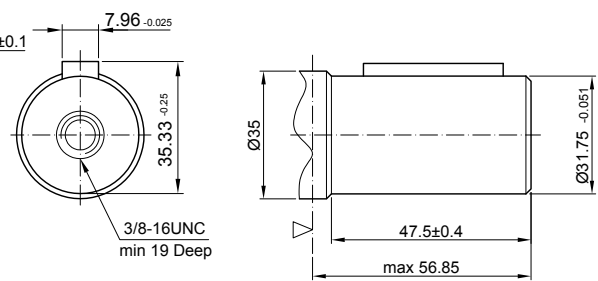
C Ø32 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm



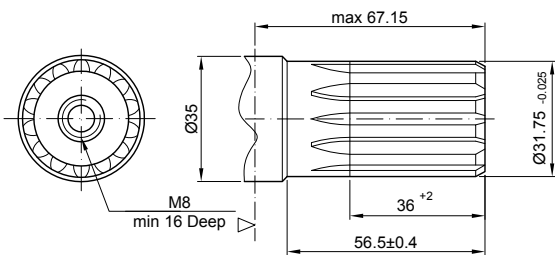
K tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 95 daNm



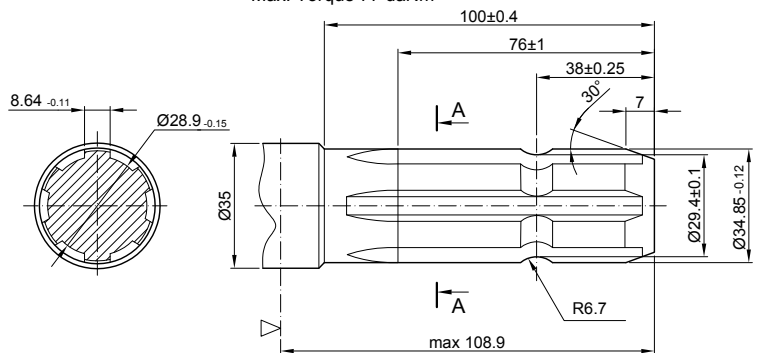
CO Ø1 1/4" straight, Parallel key 5/16"x5/16"x1 1/4" BS46
Max. Torque 77 daNm



SH Ø1 1/4" splined 14T, DP12/24 ANSI B92.1-1976
Max. Torque 95 daNm

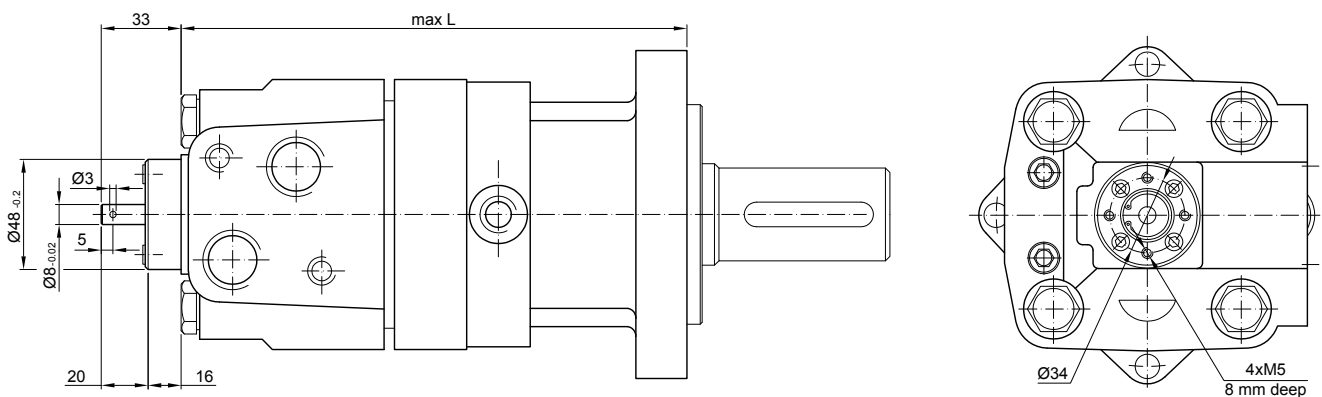


SL Ø34.85 p.t.o. DIN 9611 Form 1
Max. Torque 77 daNm



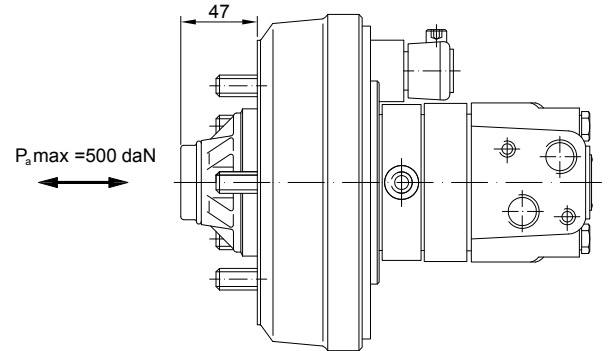
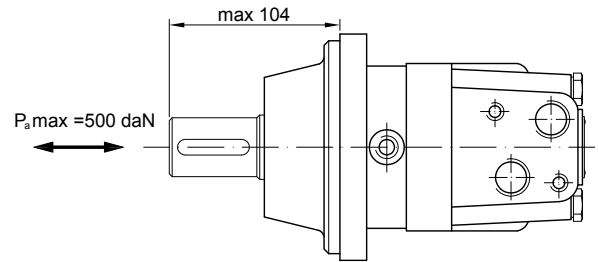
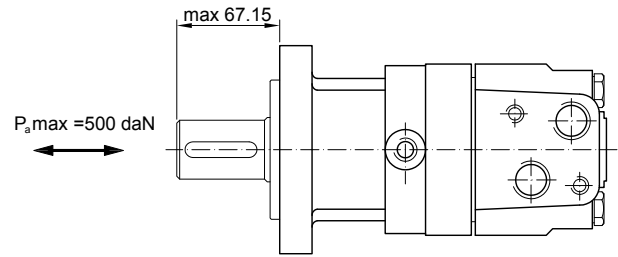
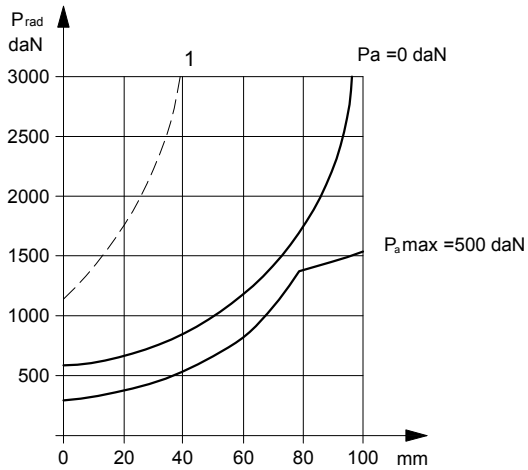
▽ Motor Mounting Surface

MOTORS WITH TACHO CONNECTION - Option "T"

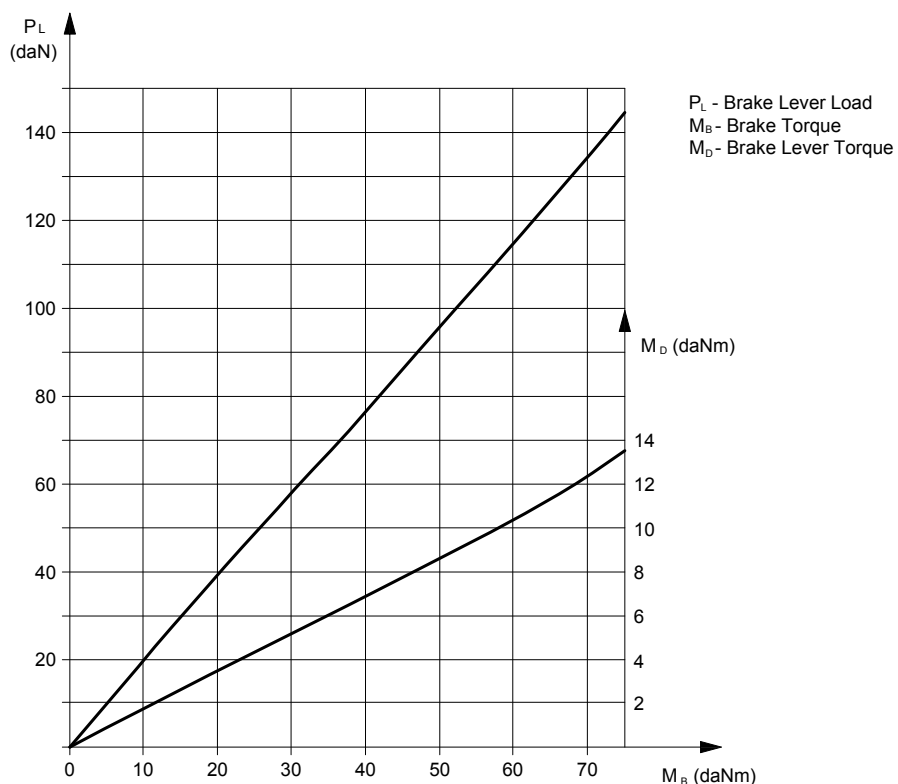


PERMISSIBLE SHAFT LOADS

The output shaft runs in tapered bearings that permit high axial and radial forces. Curve "1" shows max. radial shaft load. Any shaft load exceeding the values quoted in the curve will seriously reduce motor life. The two other curves apply to a B10 bearing life of 3000 hours at 200 RPM.



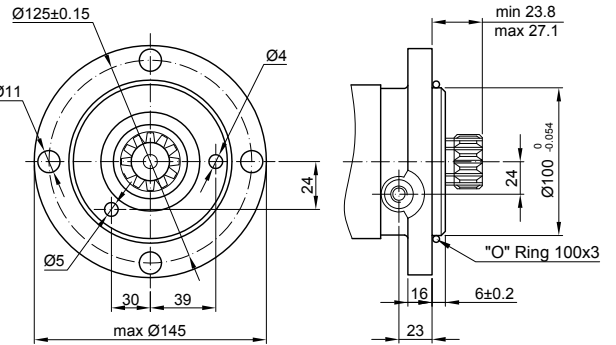
FUNCTION DIAGRAM OSB



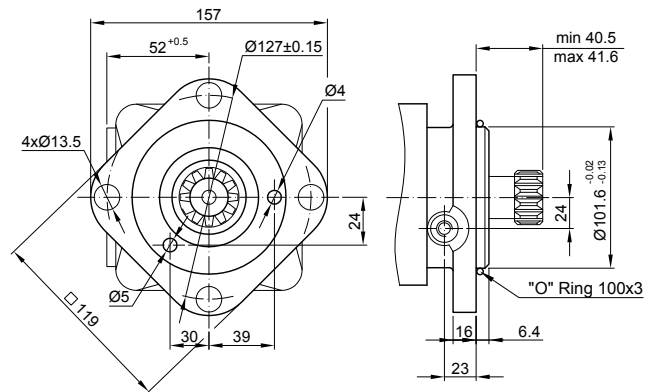
DIMENSIONS AND MOUNTING DATA

MOUNTING

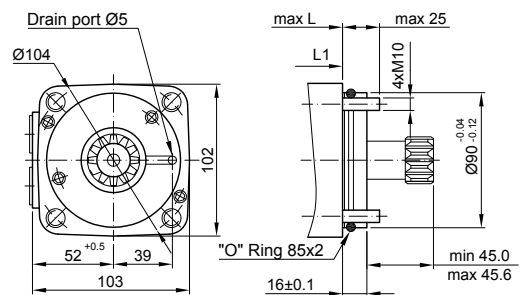
S Short Mount



Z Short Mount

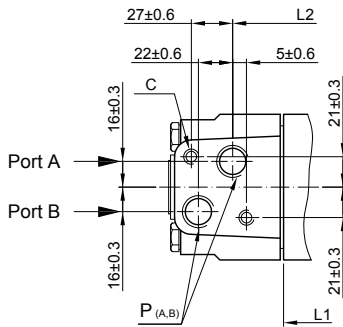


V Very Short Mount

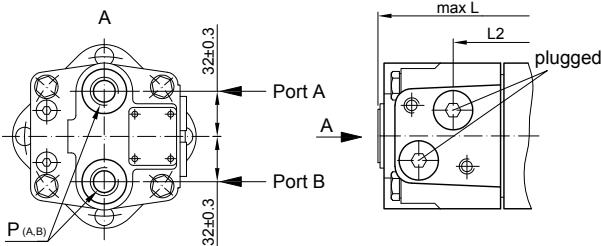


PORTING

Side Ports



E Rear Ports



C : 2xM10 - 12 mm depth

P(A,B) : 2xG1/2 or 2xM22x1,5 - 15 mm depth

T : G1/4 or M14x1,5 - 12 mm depth (plugged)

Standard Rotation

Viewed from Shaft End
Port A Pressurized - **CW**
Port B Pressurized - **CCW**

Reverse Rotation

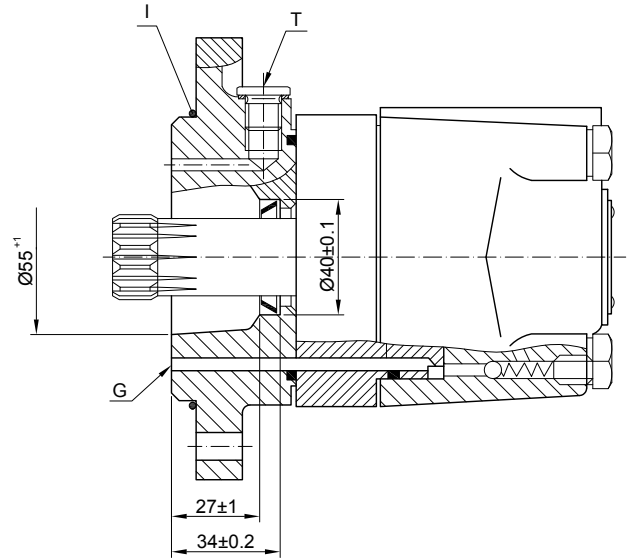
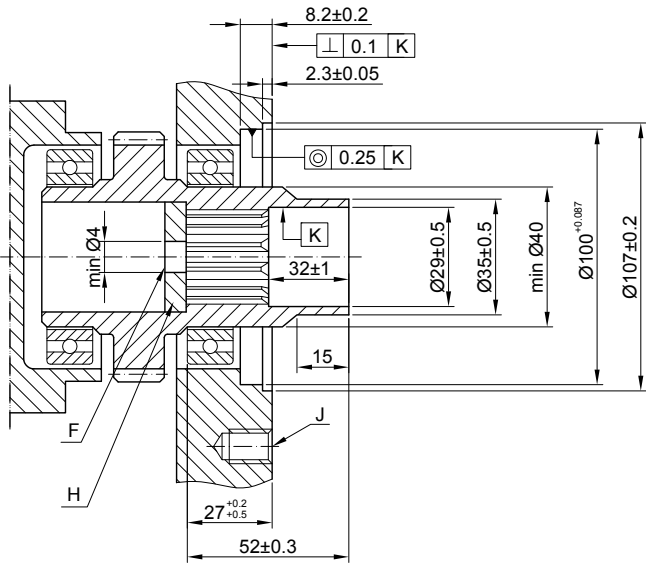
Viewed from Shaft End
Port A Pressurized - **CCW**
Port B Pressurized - **CW**

Type	L , mm	L2 , mm	Type	L , mm	L2 , mm	Type	L , mm	Type	L , mm	L1 , mm
OSS 80	122	79	OSV 80	88	48	OSSE 80	133	OSVE 80	96	11
OSS 100	125	83	OSV 100	91	51	OSSE 100	136	OSVE 100	99	14,5
OSS 125	130	86	OSV 125	96	56	OSSE 125	141	OSVE 125	104	19
OSS 160	136	92	OSV 160	102	62	OSSE 160	147	OSVE 160	110	25
OSS 200	143	100	OSV 200	109	69	OSSE 200	154	OSVE 200	117	32
OSS 250	152	108	OSV 250	118	78	OSSE 250	163	OSVE 250	126	41
OSS 315	163	119	OSV 315	129	89	OSSE 315	174	OSVE 315	137	53
OSS 400	177	133	OSV 400	143	103	OSSE 400	188	OSVE 400	151	67
OSS 475	194	152	OSV 475	160	116	OSSE 475	203	OSVE 475	166	82,6
OSS 525	186	144	OSV 525	152	108	OSSE 525	195	OSVE 525	158	74,5
OSS 565	192	150	OSV 565	158	114	OSSE 565	201	OSVE 565	164	80,2

The width of the geroler is 3 mm greater than L1.
OSZ(E) have the same dimension as type OSS(E)

DIMENSIONS OF THE ATTACHED COMPONENT

For OSS



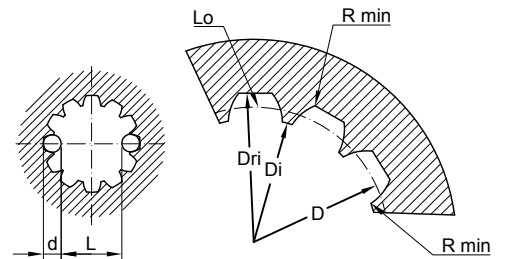
- F:** Oil circulation hole
- G:** Internal drain channel
- H:** Hardened stop plate
- I:** O- Ring 100x3mm (for OSS)

- J:** 2xM 10 - depth 13
- T:** Drain connection G1/4 or M14x1,5

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

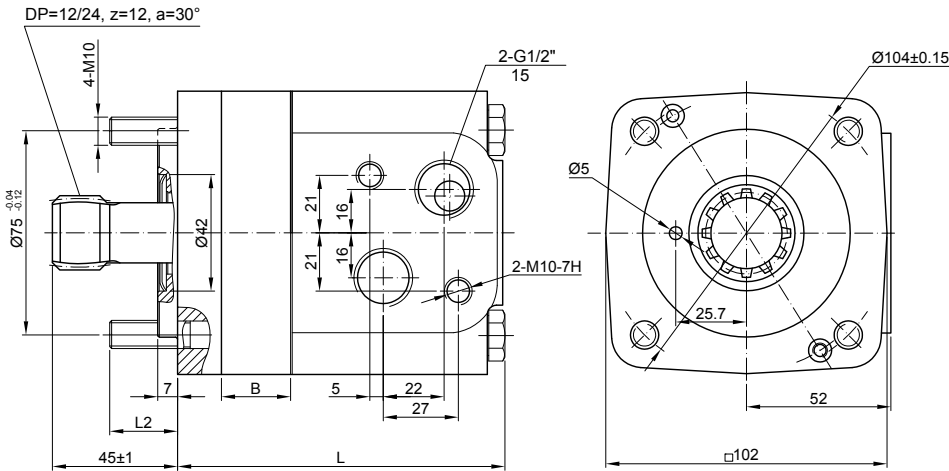
Fillet Root Side Fit	mm	
Number of Teeth	z	12
Diametral Pitch	DP	12 / 24
Pressure Angle		30°
Pitch Dia.	D	25,4
Major Dia.	Dri	28,0 ^{-0,1}
Minor Dia.	Di	23,0 ^{+0,033}
Space Width [Circular]	Lo	4,308±0,020
Fillet Radius	Rmin	0,2
Max. Measurement between Pin	L	17,62 ^{+0,15}
Pin Dia.	d	4,835±0,001

Above are when hardened



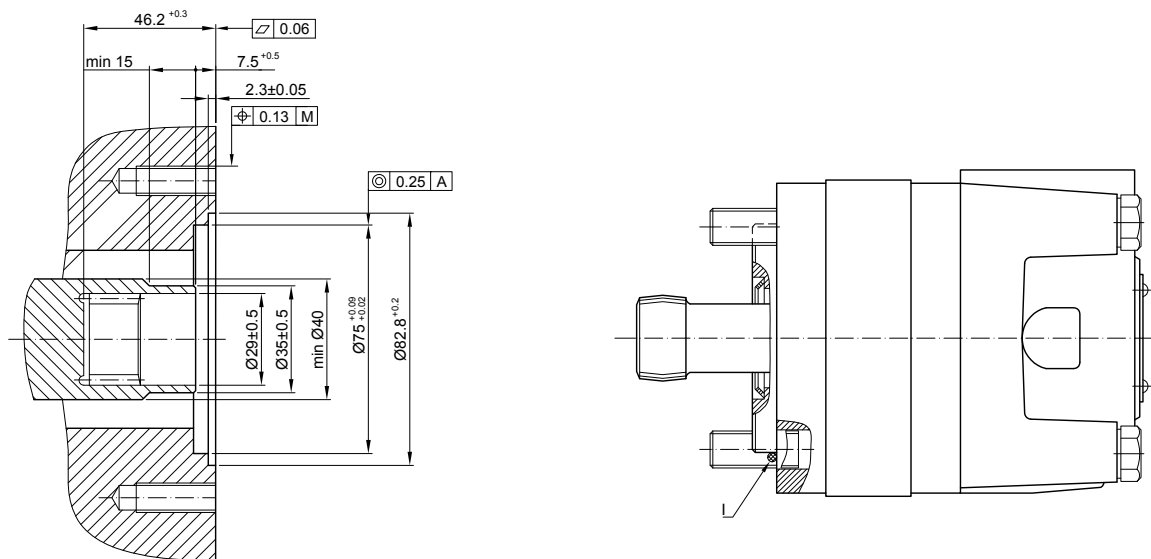
Hardening Specification:
 HRC 60±2
 Effective case depth (HRC 52) 0,7±0,2 mm
 Material 20 MoCr4 DIN 17210 or better

OUTLINE DIMENSIONS REFERENCE for OSU



Type	L , mm	L2 , mm	B , mm
OSU 80	106	22	11,5
OSU 100	111,5	18,5	15
OSU 125	116	19	19,5
OSU 160	122	18	25,5
OSU 200	129	21	33,5
OSU 250	138	22	41,5
OSU 315	150	20	53,5
OSU 400	164	21	67,5

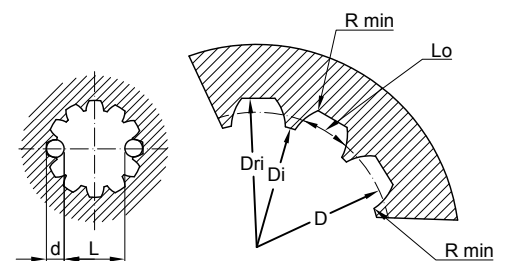
DIMENSIONS OF THE ATTACHED COMPONENT for OSU



- J: 4xM10-26 mm depth, 90°, Ø104
- I: O- Ring 75x3 mm

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Fillet Root Side Fit		mm
Number of Teeth	z	12
Diametral Pitch	DP	12 / 24
Pressure Angle		30°
Pitch Dia.	D	25,4
Major Dia.	Dri	28,0 ^{-0.1}
Minor Dia.	Di	23,0 ^{+0.033}
Space Width [Circular]	Lo	4,308±0,020
Fillet Radius	Rmin	0,2
Max. Measurement between Pin	L	17,62 ^{+0.15}
Pin Dia.	d	4,835±0,001

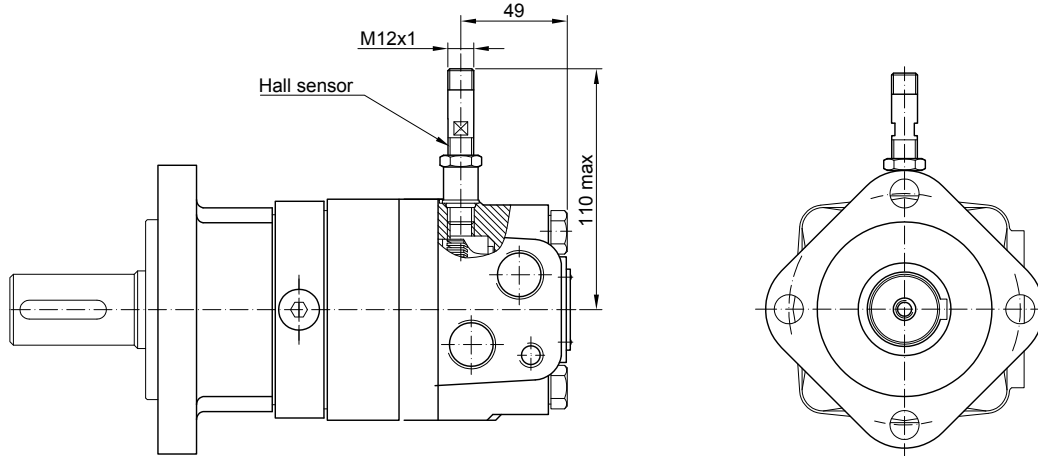


Hardening Specification:
HRC 60±2
Effective case depth (HRC 52) 0,7±0,2 mm
Material 20 MoCr4 DIN 17210 or better

Above are when hardened

HYDRAULIC MOTORS WITH SPEED SENSOR TYPE OS...RS

Meta Hydraulic is introducing hydraulic motor with a new generation of speed sensor. The electric output signal is a standard voltage signal that can be used for regulating the speed of a motor. The speed is measured by a sensor in accordance with the Hall principle. Signal processing and amplification are performed in the sensor housing. Connection is provided in the housing by a Plug connector M12 Series.



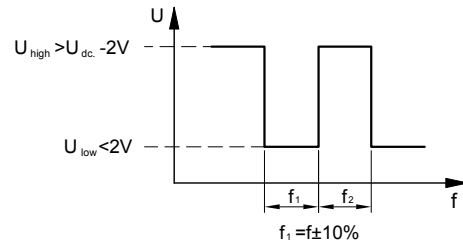
This performance is applicable for all motors of OS series. The main technical features correspond to the standard motors series OS.

DIFFERENTIAL HALL SENSOR

TECHNICAL DATA

Frequency range	3...20 000 Hz
Output	PNP
Power supply	10...36 VDC
Current input	20 mA (@24 VDC)
Current load	500 mA (@24 VDC;24°C)
Ambient Temperature	minus 40... plus 125°C
Protection	IP 67
Plug connector	M12-Series
Mounting principle	ISO 6149
Pulses per revolution	54

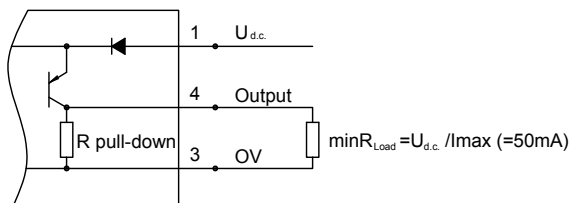
OUTPUT SIGNAL



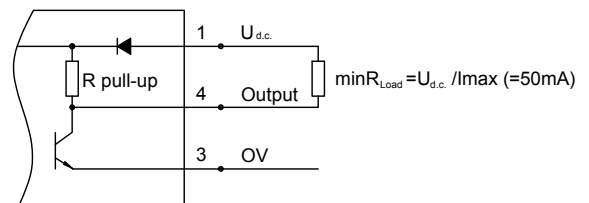
Load max.: $I_{high}=I_{low}<50\text{mA}$
No load current, max: 20 mA

WIRING DIAGRAM

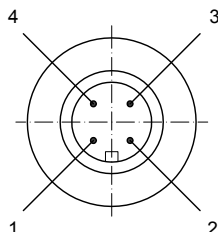
PNP



NPN



STICK TYPE



Terminal No.	Connection
1	U _{d.c.}
2	No connection
3	0V
4	Output signal

ORDER CODE

	1	2	3	4	5	6	7	8	9	10	11
OS											

1	Mounting Flange
omit	SAE A mount, four holes
A	SAE A mount, two holes
F	Magneto mount, four holes
Q	Square mount, four holes
B	Motor with drum brake
S	Short mount
U	Ultra short mount
W	Wheel mount

2	Port type
omit	Side ports
E	Rear ports

3	Displacement code
80	80,5 [cm ³ /rev]
100	100,0 [cm ³ /rev]
125	125,7 [cm ³ /rev]
160	159,7 [cm ³ /rev]
200	200,0 [cm ³ /rev]
250	250,0 [cm ³ /rev]
315	314,9 [cm ³ /rev]
400	397,0 [cm ³ /rev]
475	474,6 [cm ³ /rev] (w/o Function diagram)
525	522,7 [cm ³ /rev] (w/o Function diagram)
565	564,9 [cm ³ /rev] (w/o Function diagram)

4	Shaft Extensions
B	Ø25 mm straight
C	Ø32 straight, Parallel key A10x8x45 DIN6885
CO	Ø1 1/4" straight, Parallel key 5/16"x5/16"x1 1/4" BS46
K	Ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
SL	Ø34,85 p.t.o. DIN 9611 Form 1
SH	Ø1 1/4" splined 14T ANSI B92.1 - 1976

5	Ports
omit	BSPP (ISO 228)
M	Metric (ISO 262)

6	Actuating Direction **
R	Right
L	Left

7	Speed Monitoring
omit	none
T	with tacho connection (only for side ports)
RS-P	with speed sensor (PNP pull-down resistor)
RS-N	with speed sensor (NPN pull-up resistor)

8	Special Features (see Specification data on page OS - 03)
omit	none
LL	Low Leakage
LSV	Low Speed Valve

9	Rotation
omit	Standard Rotation
R	Reverse Rotation

10	Option (Paint)
omit	no paint
P	Painted
PC	Corrosion Protected Paint

11	Design Series
omit	Factory specified

The permissible output torque for shafts must be not exceeded!

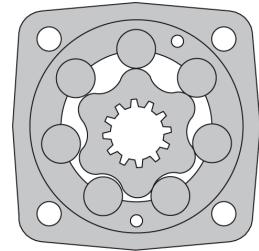
** Only for OSB motors

HYDRAULIC MOTORS OSY



OIL FLOW IN DRAIN LINE

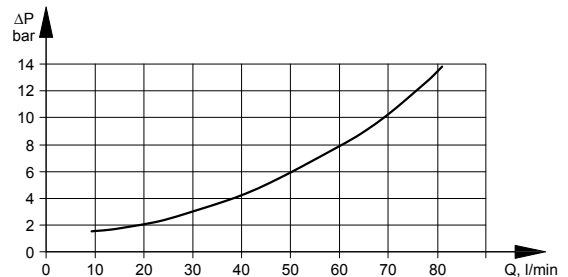
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
140	20	1,5
	35	1
210	20	3
	35	2



GENERAL

Displacement, (cm ³ /rev)	159,7 ÷ 397
Max. Speed, (RPM)	470 ÷ 185
Max. Torque, (daNm)	46,1 ÷ 90
Max. Output, (kW)	11 ÷ 19,5
Max. Pressure Drop, (bar)	205 ÷ 160
Max. Oil Flow, (l/min)	75
Min. speed, (RPM)	8 ÷ 5
Permissible Shaft Loads, (daN)	P _{rad} = 1500; P _a =500
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, (°C)	- 30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES



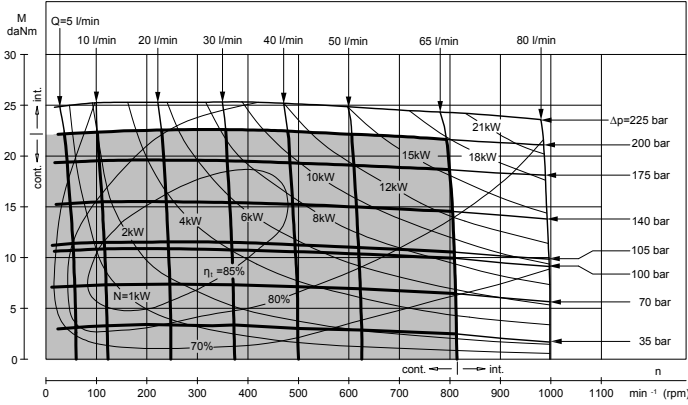
SPECIFICATION DATA

Type		OSY 80	OSY 100	OSY 125	OSY 160	OSY 200	OSY 250	OSY 315	OSY 400	OSY 500
Displacement [cm ³ /rev.]		80,5	100	125,7	159,7	200	250	314,9	397	500
Max. Speed, [RPM]	cont.	810	750	600	470	375	300	240	185	155
	int.	100	900	720	560	450	360	285	225	180
Max. Torque [daNm]	cont.	23	29	37	46,1	58,0	72,5	92,2	90,0	105
	int.	26	32	41	51,5	64,5	80,6	96,0	97,0	112
Max. Output [kW]	cont.	17	19	19	19,5	19,5	18,5	16	11,0	13
	int.	21	24	24	24,0	24,0	23	17,5	12	14,5
Max. Pressure Drop [bar]	cont.	205	205	20,5	205	205	205	205	160	160
	int.	225	225	22,5	225	225	225	220	175	175
Max. Oil Flow [l/min]	cont.	65	75	75	75	75	75	75	75	75
	int.	80	90	90	90	90	90	90	90	90
Max. Inlet Pressure, [bar]	cont.	225	225	225	225	225	225	225	225	225
	int.	250	250	250	250	250	250	250	250	250
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	100	100	100	100	100	100	100
	cont.	100-300	RPM	50	50	50	50	50	50	50
	cont.	>300	RPM	20	20	20	20	-	-	-
	int.	0-max.	RPM	100	100	100	100	100	100	100
Max. Return Pressure with Drain Line [bar]	cont.	140	140	140	140	140	140	140	140	140
	int.	175	175	175	175	175	175	175	175	175
Max. Starting Pressure with Unloaded Shift, [bar]		12	10	10	8	8	8	8	8	8
Min. Starting Torque [daNm]	at max press. drop cont.	18	23	29	36,9	46,2	58,0	73,8	72,0	80
	at max press. drop int.	20	25	32	40,5	50,7	63,6	79,2	78,7	85
Min. Speed, [RPM]		12	10	10	8	6	6	5	5	4
Weight, [kg] For rear ports: +0,400 kg	OSYF	9,8	10	10,3	10,8	11,2	11,7	12,4	13,3	14,2
	OSYW	10,3	10,5	10,8	11,3	11,7	12,2	12,9	13,8	14,7
	OSYQ	10,2	10,4	10,7	11,2	11,6	12,1	12,8	13,7	14,6

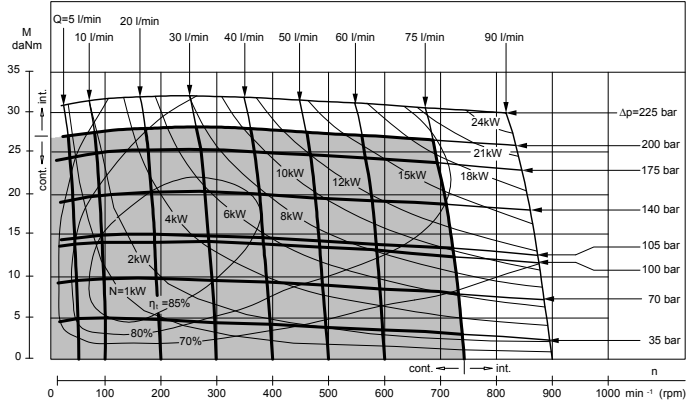
Intermittent operation: the permissible values may occur for max. 10% of every minute.
For speeds of 5 RPM lower than given, consult factory or your regional manager.

FUNCTION DIAGRAMS

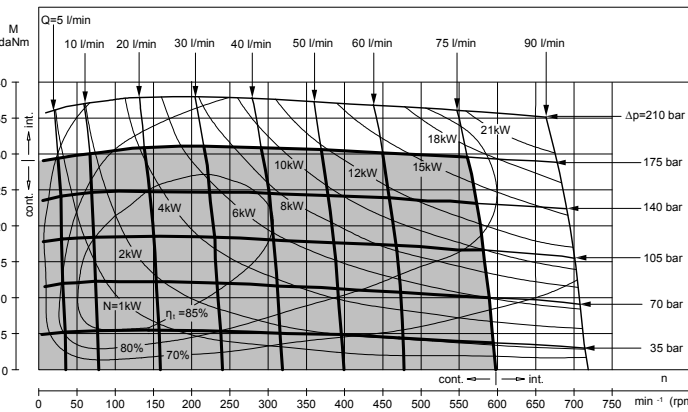
OSY 80



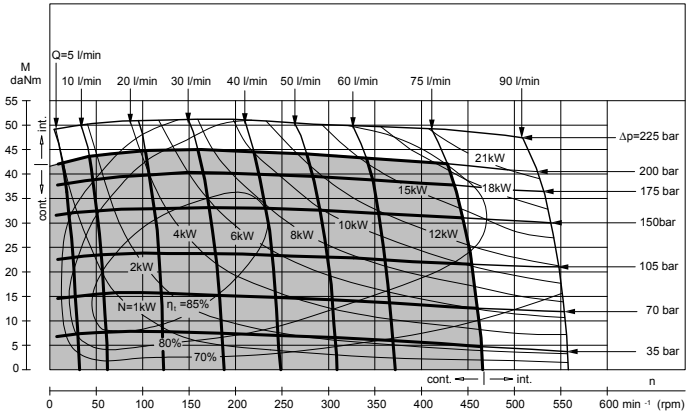
OSY 100



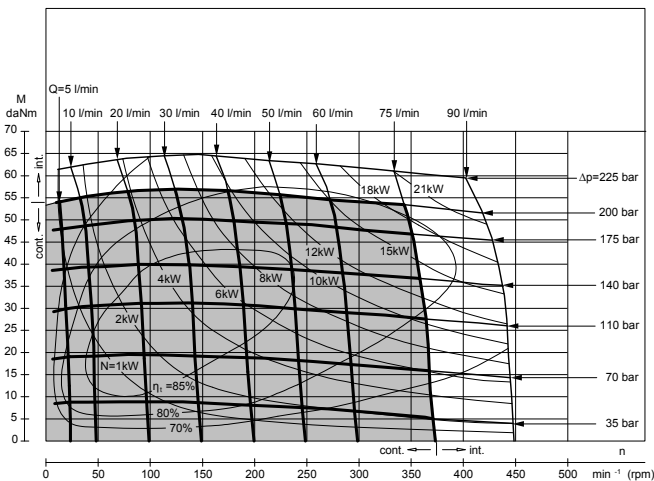
OSY 125



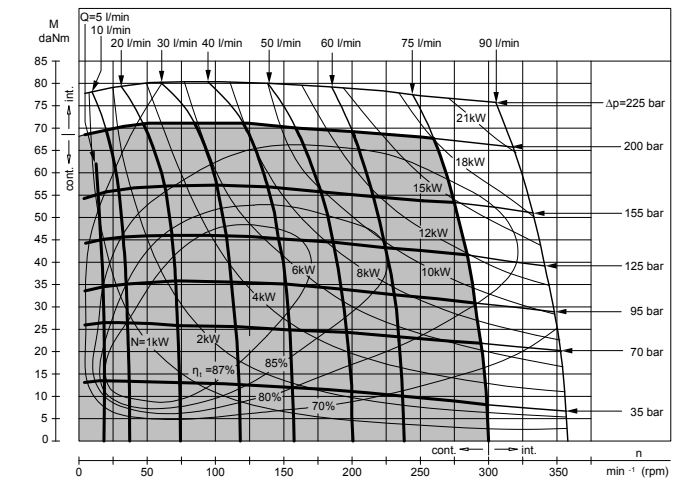
OSY 160



OSY 200



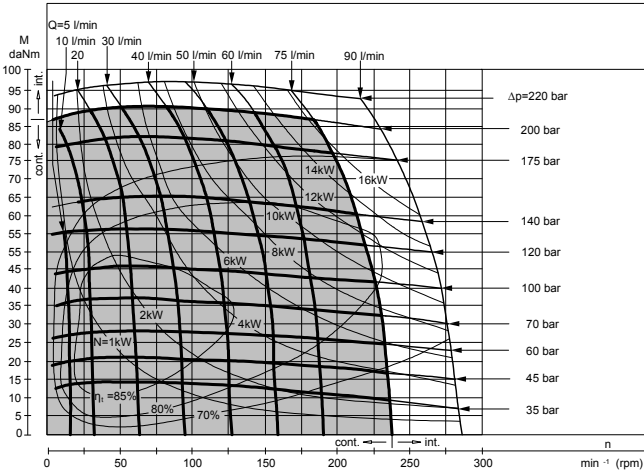
OSY 250



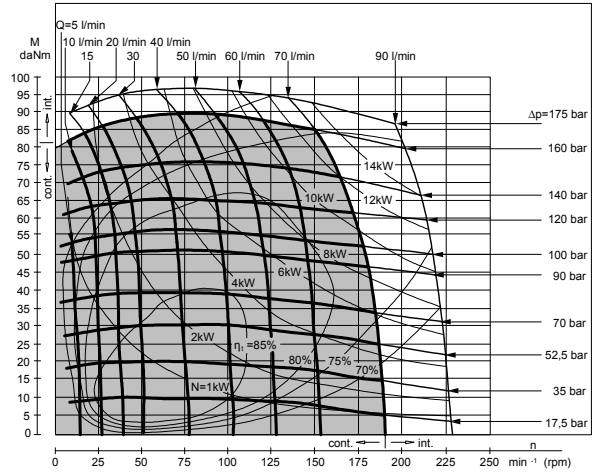
The function diagrams data was collected at back pressure 5 ± 10 bar and oil with viscosity of $32 \text{ mm}^2/\text{s}$ at 50°C .

FUNCTION DIAGRAMS

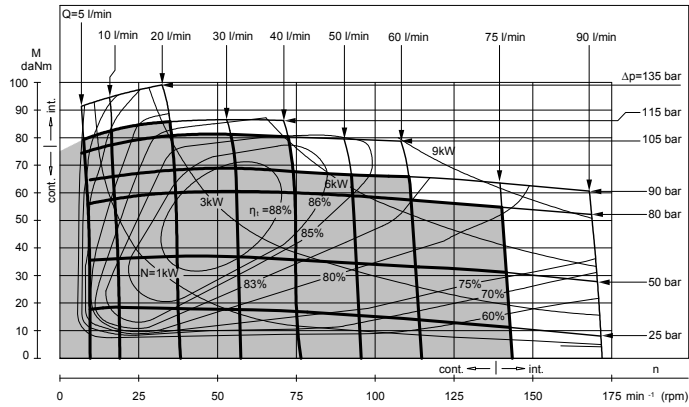
OSY 315



OSY 400

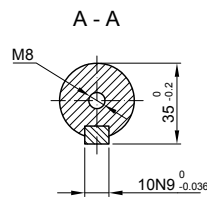
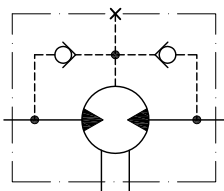
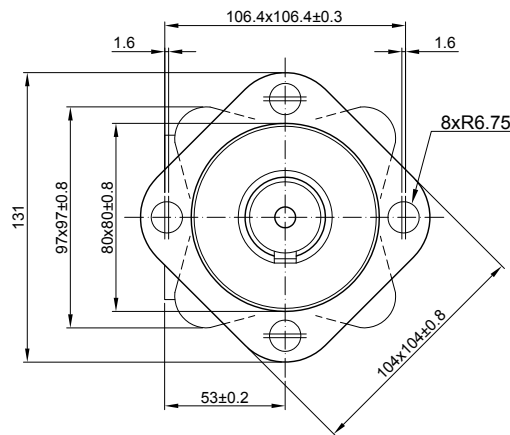
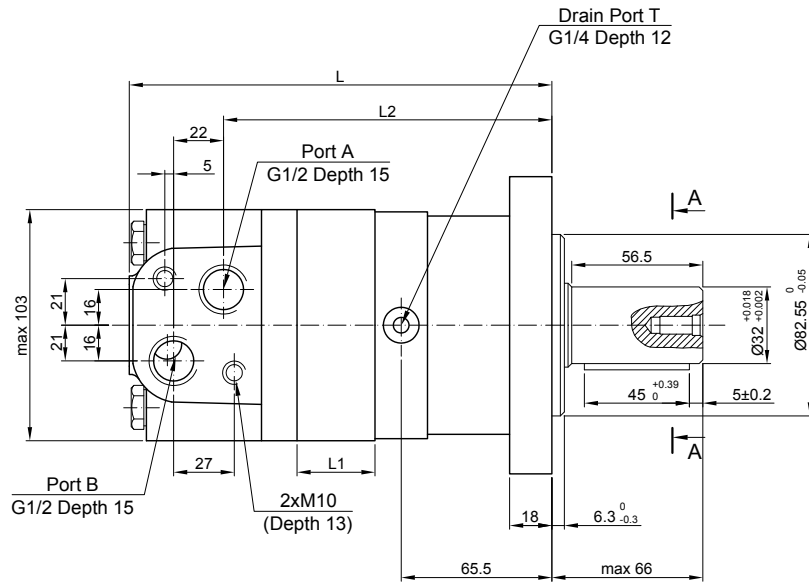


OSY 500



The function diagrams data was collected at back pressure 5 ± 10 bar and oil with viscosity of $32 \text{ mm}^2/\text{s}$ at 50°C .

DIMENSIONS OF THE ATTACHED COMPONENT



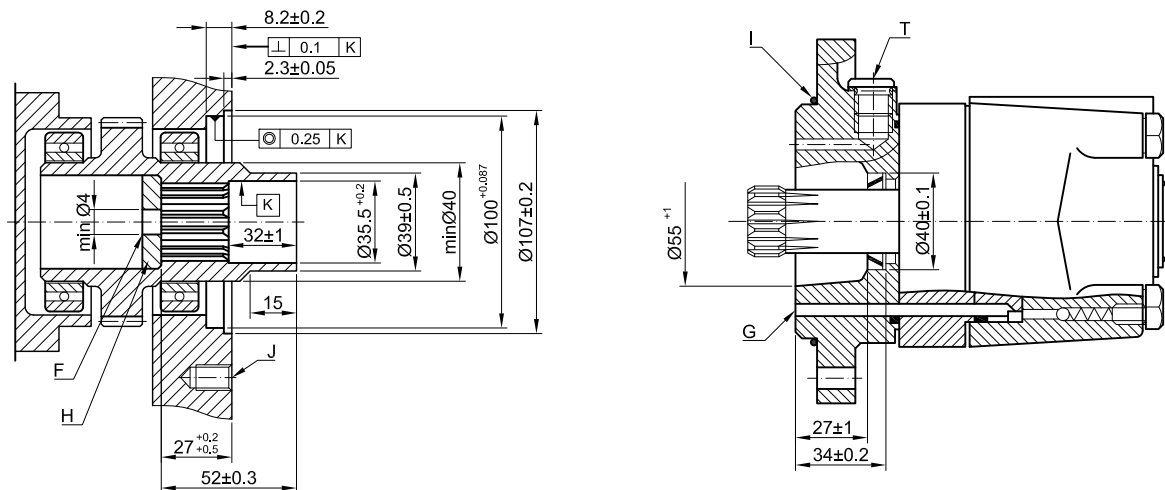
Type	L , mm	L1 , mm	L2 , mm
OSY 80	170	16	126,5
OSY 100	174	20	130,5
OSY 125	179	25	135,5
OSY 160	182	27	137,5
OSY 200	189	34	144,5
OSY 250	197	42	152,5
OSY 315	209	54	164,5
OSY 400	224	69	179,5
OSY 500	238	83	193,5

Direction of shaft rotation: Standard
 When facing shaft end of motor, shaft to rotate:
 Clockwise when port "A" is pressurized.
 Counter-clockwise when port "B" is pressurized.
 Painted: Black

The dimensions, mounting data, shaft extensions and permissible shaft loads are the same as at hydraulic motors type OS except following below.

DIMENSIONS OF THE ATTACHED COMPONENT

For OSYS



F : Oil circulation hole
 G : Internal drain channel
 H : Hardened stop plate
 I : O-Ring 100x3 mm

J : 4xM10-16 mm depth (for OSS)
 N : Needle bearing 1 3/8"x1 3/4"
 T : Drain connection G1/4 or M14x1.5

DRAIN CONNECTION

A drain line ought to be used when pressure in the return line can exceed the permissible pressure. It can be connected:

- For OSYS at the drain port of the motor;

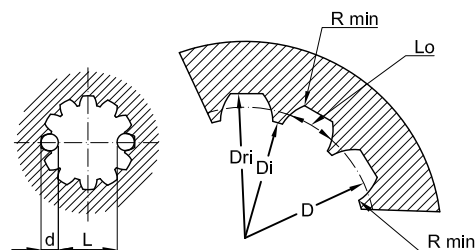
The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard 12 DP 12/24 ANSI B92.1-1976, class 5
[m=2.54; corrected x.m=+0,4]

Fillet Root Side Fit	mm	
Number of Teeth	z	12
Diametral Pitch	DP	12 / 24
Pressure Angle		30°
Pitch Dia.	D	30,48
Major Dia.	Dri	33,2 ^{+0,4}
Minor Dia.	Di	27,8 ^{+0,1}
Space Width [Circular]	Lo	4,45 ^{+0,071}
Fillet Radius	Rmin	0,2
Max. Measurement between Pin	L	22,72 ^{+0,17}
Pin Dia.	d	5±0,001

Above are when hardened



Hardening Specification:
HRC 60±2
Effective case depth (HRC 52) 0,7±0,2 mm
Material 20 MoCr4 DIN 17210 or better

ORDER CODE

	1	2	3	4	5	6	7	8
OSY								

1	Mounting Flange
omit	SAE A mount, four holes
A	SAE A mount, two holes
F	Magneto mount, four holes
W	Wheel mount
S	Short mount
2	Port type
omit	Side ports
E	Rear ports
3	Displacement code
80	80,5 [cm³/rev]
100	100,0 [cm³/rev]
125	125,7 [cm³/rev]
160	159,7 [cm³/rev]
200	200,0 [cm³/rev]
250	250,0 [cm³/rev]
315	314,9 [cm³/rev]
400	397,0 [cm³/rev]
500	500,0 [cm³/rev]
4	Shaft Extensions
C	ø32 straight, Parallel key A10x8x45 DIN6885
K	ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
SL	ø34,85 p.t.o. DIN 9611 Form 1
SH	ø1 1/4" splined 14T ANSI B92.1 - 1976

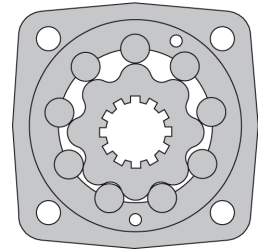
5	Ports
omit	BSPP (ISO 228)
M	Metric (ISO 262)
6	Rotation
omit	Standard Rotation
R	Reverse Rotation
7	Option (Paint)
omit	no paint
P	Painted
PC	Corrosion Protected Paint
8	Design Series
omit	Factory specified

HYDRAULIC MOTORS OT



OIL FLOW IN DRAIN LINE

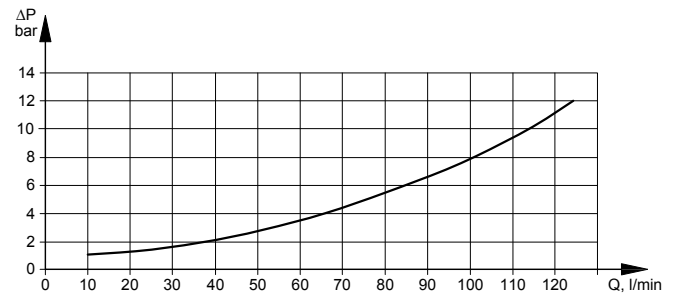
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
140	20	1,5
	35	1
210	20	3
	35	2



GENERAL

Displacement, (cm ³ /rev)	161,1 ÷ 725
Max. Speed, (RPM)	625 ÷ 175
Max. Torque, (daNm)	47 ÷ 125
Max. Output, (kW)	20,2 ÷ 33,5
Max. Pressure Drop, (bar)	200 ÷ 115
Max. Oil Flow, (l/min)	100 ÷ 125
Min. speed, (RPM)	10 ÷ 5
Permissible Shaft Loads, (daN)	P _{rad} = 1700; P _a =1000
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, (°C)	- 30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES



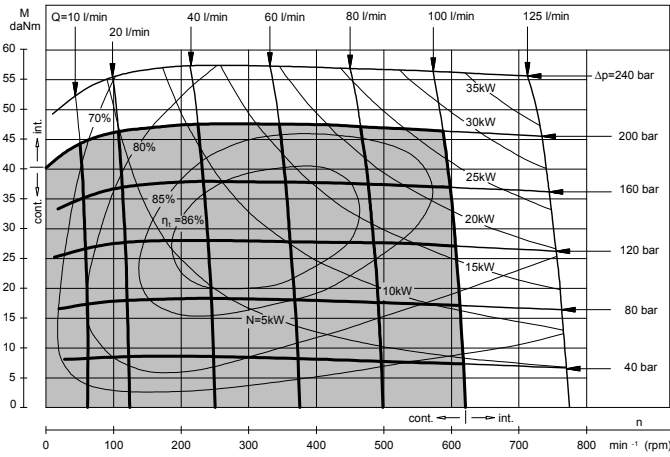
SPECIFICATION DATA

Type	OT 160	OT 200	OT 250	OT 315	OT 400	OT 500	OT 630	OT 725
Displacement [cm ³ /rev.]	161,1	201,4	251,8	326,3	410,9	523,6	612,3	725
Max. Speed, [RPM]	cont.	625	625	500	380	305	240	206
	int.	780	750	600	460	365	285	247
Max. Torque [daNm]	cont.	47	59	73	95	108	122	123
	int.	56	71	88	114	126	137	138
	peak	66	82	102	133	144	160	161
Max. Output [kW]	cont.	26,5	33,5	33,5	33,5	30	26,5	24,3
	int.	32	40	40	40	35	30	27,5
Max. Pressure Drop [bar]	cont.	200	200	200	200	180	160	140
	int.	240	240	240	240	210	180	160
	peak	280	280	280	280	240	210	190
Max. Oil Flow [l/min]	cont.	100	125	125	125	125	125	125
	int.	125	150	150	150	150	150	151,4
	cont.	210	210	210	210	210	210	210
Max. Inlet Pressure, [bar]	int.	250	250	250	250	250	250	250
	peak	300	300	300	300	300	300	300
	cont.	75	75	75	75	75	75	75
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	100-300	RPM	40	40	40	40	40
	cont.	>300	RPM	20	20	20	20	-
	cont.	0-max.	RPM	75	75	75	75	75
	int.			75	75	75	75	75
Max. Return Pressure with Drain Line [bar]	cont.	140	140	140	140	140	140	140
	int.	175	175	175	175	175	175	175
	peak	210	210	210	210	210	210	210
Max. Starting Pressure with Unloaded Shift, [bar]		10	10	10	10	10	10	10
Min. Starting Torque [daNm]	at max press. drop cont.	34	43	53	74	84	95	95
	at max press. drop int.	41	52	63	89	97	106	108
Min. Speed, [RPM]		10	9	8	7	6	5	5
Weight, [kg]	OT	20	20,5	21	22	23	24	25
	OTW	22	22,5	23	24	25	26	27
	OTS	15	15,5	16	17	18	19	20

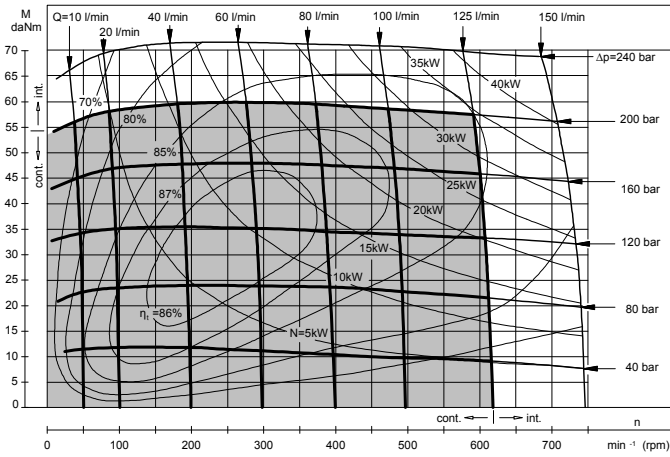
Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

FUNCTION DIAGRAMS

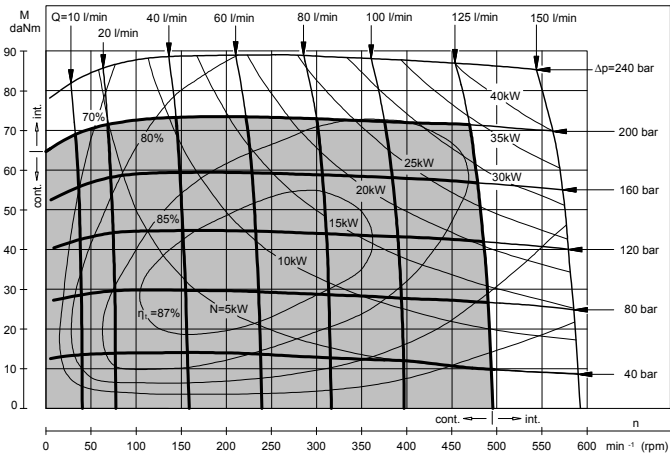
OT 160



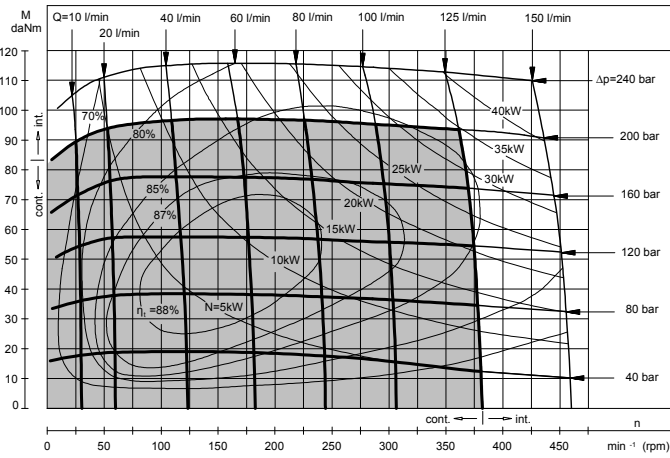
OT 200



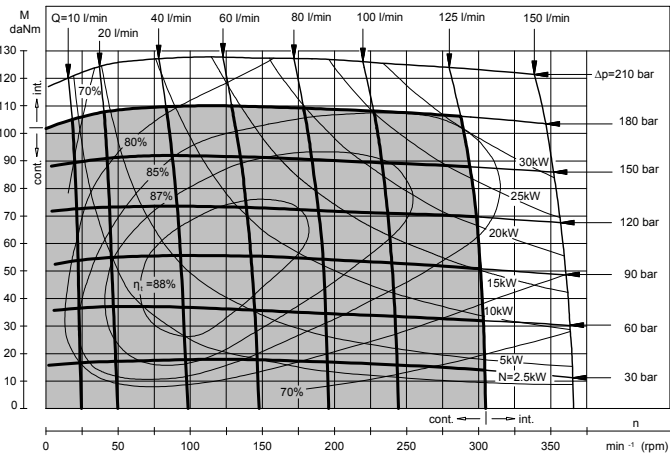
OT 250



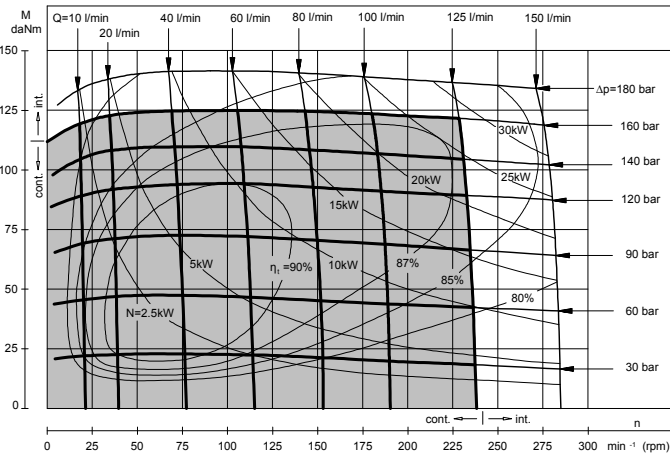
OT 315



OT 400

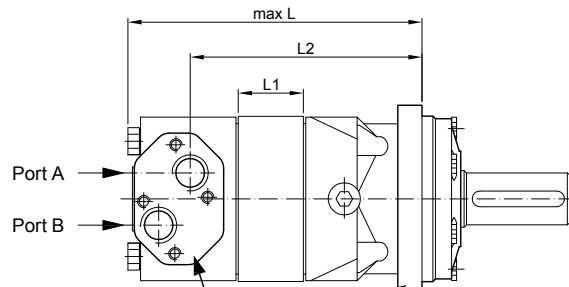


OT 500



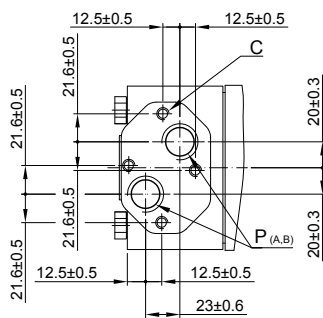
The function diagrams data was collected at back pressure 5 ± 10 bar and oil with viscosity of 32 mm²/s at 50° C.

DIMENSIONS AND MOUNTING DATA

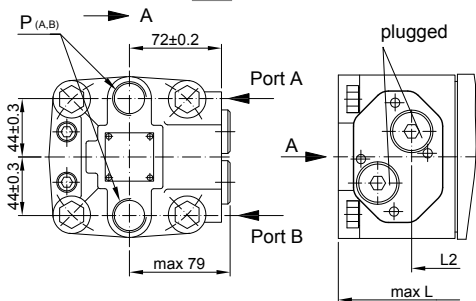


PORTING

Side Ports

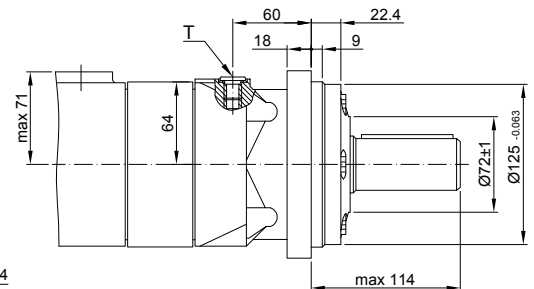
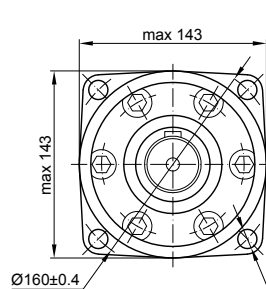


E Rear Ports

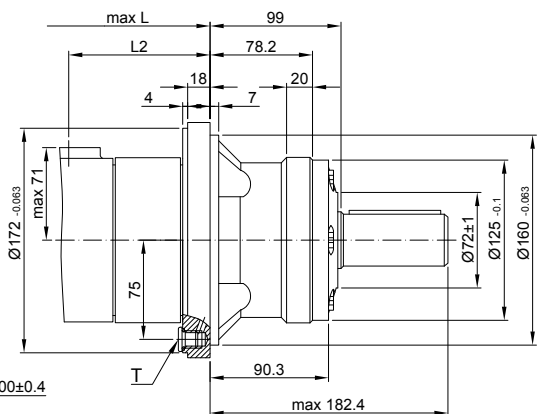
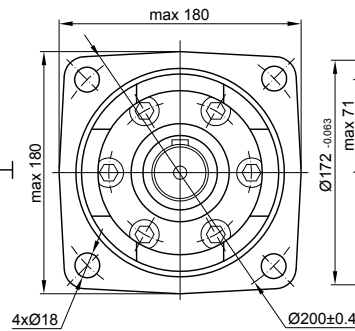


MOUNTING

Square Mount (4 Holes)



W Wheel Mount



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**

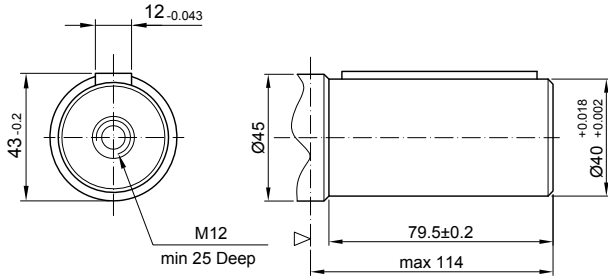
C : 4xM10 - 10 mm depth
P_(A,B) : 2xG3/4 or 2xM27x2 - 17 mm depth
T : G1/4 or M14x1,5 - 12 mm depth (plugged)

Type	L , mm	L2 , mm	Type	L , mm	Type	L , mm	L2 , mm	Type	L , mm	L1 , mm
OT 160	210	150	OTE 160	220	OTW 160	127	67	OTWE 160	137	12
OT 200	215	155	OTE 200	225	OTW 200	132	72	OTWE 200	142	16,5
OT 250	220	160	OTE 250	230	OTW 250	138	78	OTWE 250	148	22
OT 315	227	167	OTE 315	237	OTW 315	145	85	OTWE 315	155	29
OT 400	236	176	OTE 400	246	OTW 400	154	94	OTWE 400	164	38
OT 500	255	195	OTE 500	265	OTW 500	172	112	OTWE 500	182	56,5
OT 630	261	201	OTE 630	271	OTW 630	162,5	115	OTWE 630	172,5	61
OT 725	272	216	OTE 725	282	OTW 725	180	130	OTWE 725	180	70

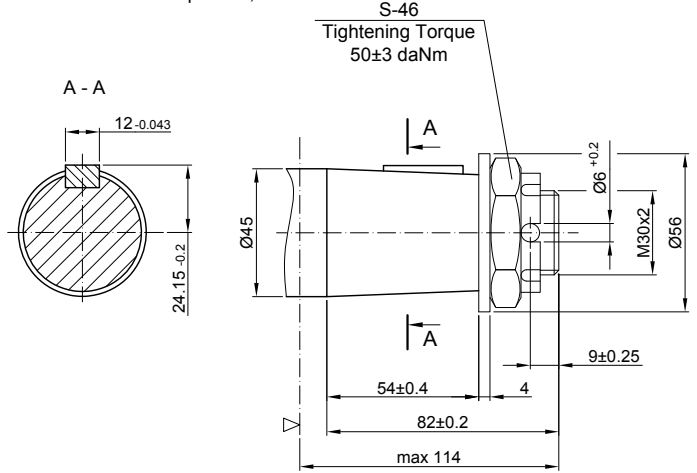
The width of the geroler is 3 mm greater than L1.

SHAFT EXTENSIONS

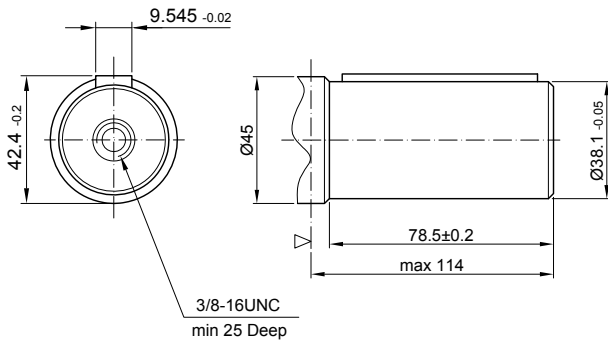
C Ø40 straight, Parallel key A12x8x70 DIN 6885
Max. Torque 132,8 daNm



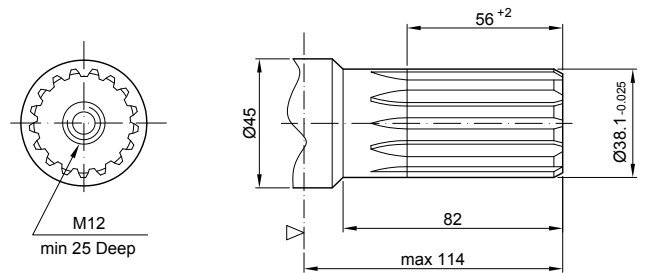
K tapered 1:10, Parallel key B12x8x28 DIN 6885
Max. Torque 210,7 daNm



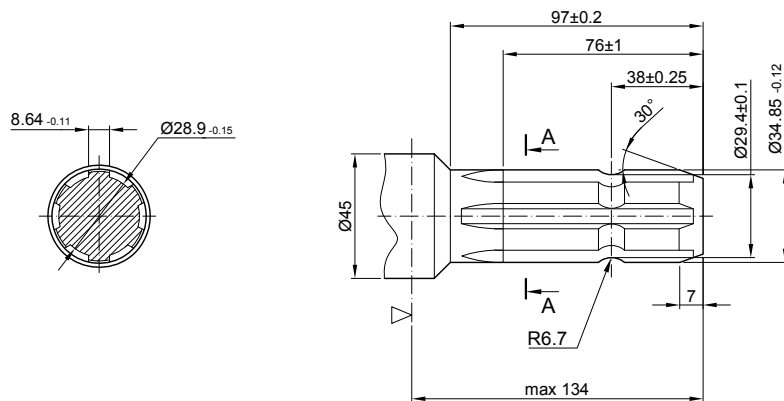
CO Ø1 1/2" straight, Parallel key 3/8"x3/8"x2 1/4" BS46
Max. Torque 132,8 daNm



SH Ø1 1/2" splined 17T, DP12/24 ANSI B92.1-1976
Max. Torque 132,8 daNm

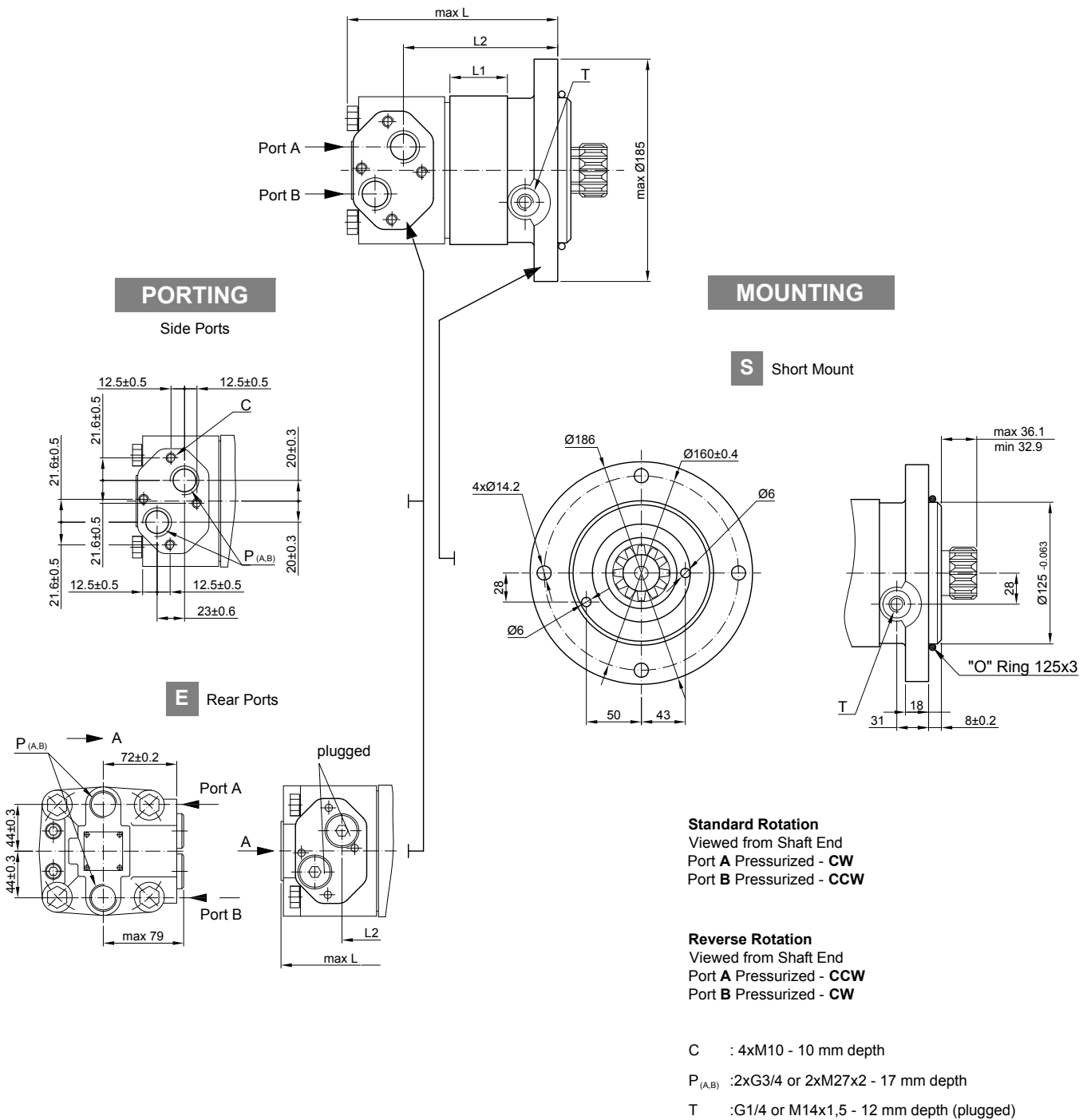


SL Ø34.85 p.t.o. DIN 9611 Form 1
Max. Torque 77 daNm



▽ Motor Mounting Surface

DIMENSIONS AND MOUNTING DATA

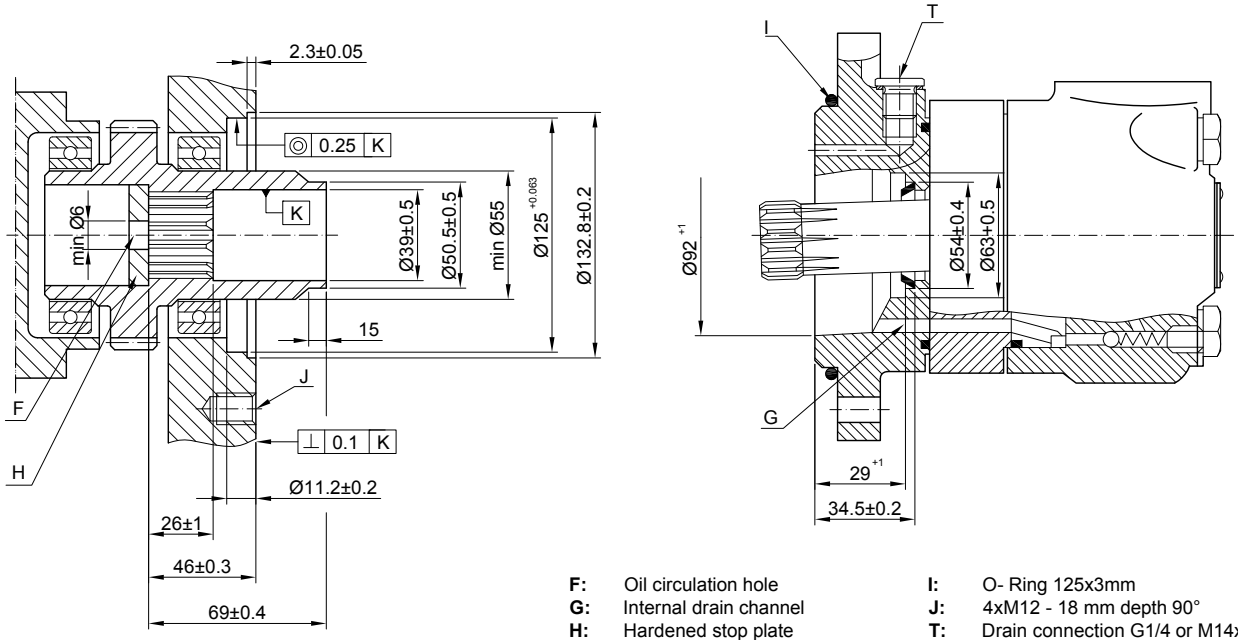


Type	L , mm	L2 , mm	Type	L , mm	L1 , mm
OTS 160	144	94	OTSE 160	154	12
OTS 200	149	99	OTSE 200	159	16,5
OTS 250	154	104	OTSE 250	164	22
OTS 315	161	111	OTSE 315	171	29
OTS 400	170	120	OTSE 400	180	38
OTS 500	189	139	OTSE 500	199	56,3
OTS 630	198,5	146,5	OTSE 630	208,5	72,5
OTS 725	216	167	OTSE 725	226	86,5

The width of the geroler is 3,5 mm greater than L1.

DIMENSIONS OF THE ATTACHED COMPONENT

OTS



- | | |
|----------------------------------|--|
| F: Oil circulation hole | I: O- Ring 125x3mm |
| G: Internal drain channel | J: 4xM12 - 18 mm depth 90° |
| H: Hardened stop plate | T: Drain connection G1/4 or M14x1,5 |

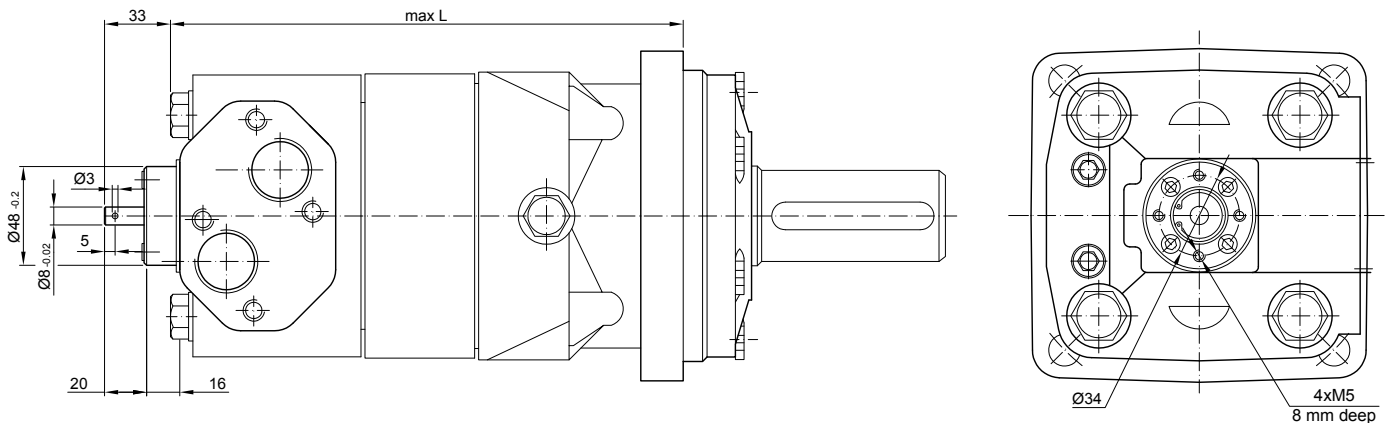
DRAIN CONNECTION

A drain line ought to be used when pressure in the return line can exceed the permissible pressure. It can be connected:

- For OTS at the drain port of the motor;
- For OTV at the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component and its shaft seal.

The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

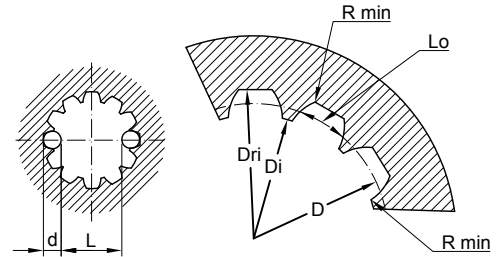
MOTORS WITH TACHO CONNECTION - Option "T"



INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard ANSI B92.1-1976, class 5
[m=2.1166; corrected x.m=+1,0]

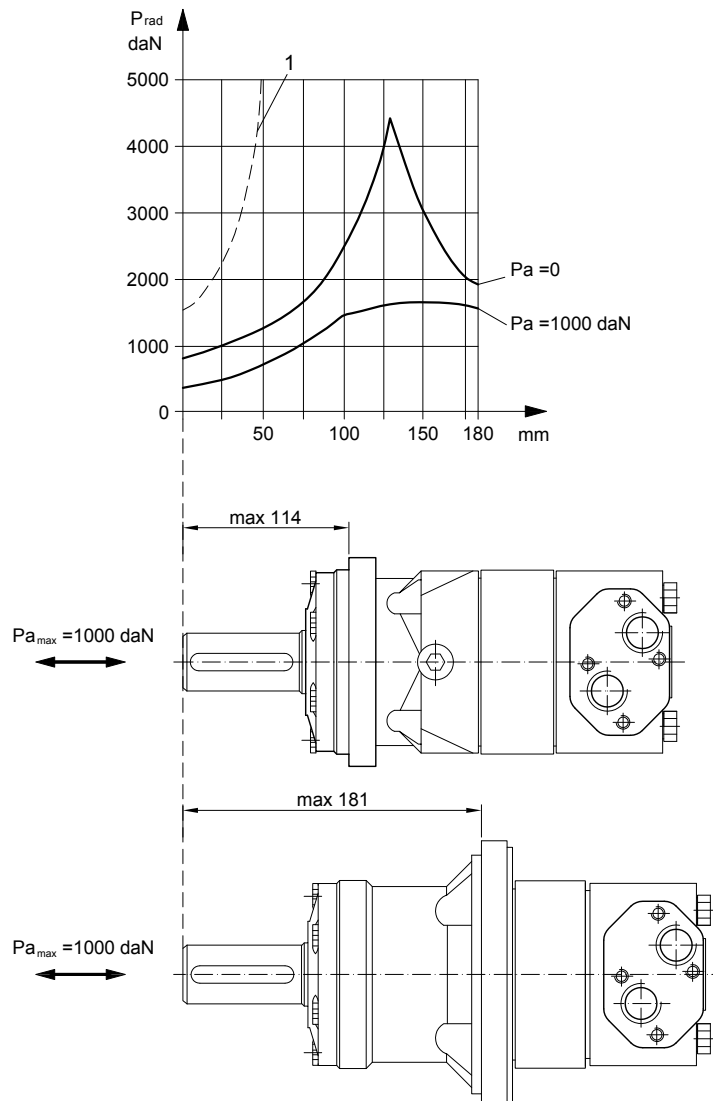
Fillet Root Side Fit	mm	
Number of Teeth	z	16
Diametral Pitch	DP	12 / 24
Pressure Angle		30°
Pitch Dia.	D	33,8656
Major Dia.	Dri	38,4 ^{+0.4}
Minor Dia.	Di	32,15 ^{+0.04}
Space Width [Circular]	Lo	4,516±0,037
Fillet Radius	Rmin	0,5
Max. Measurement between Pin	L	26,9 ^{+0.10}
Pin Dia.	d	4,835±0,001



Hardening Specification:
HRC 60±2
HRC 52
0,7±0,2 mm effective case depth
Material 20 MoCr4 DIN 17210 or better

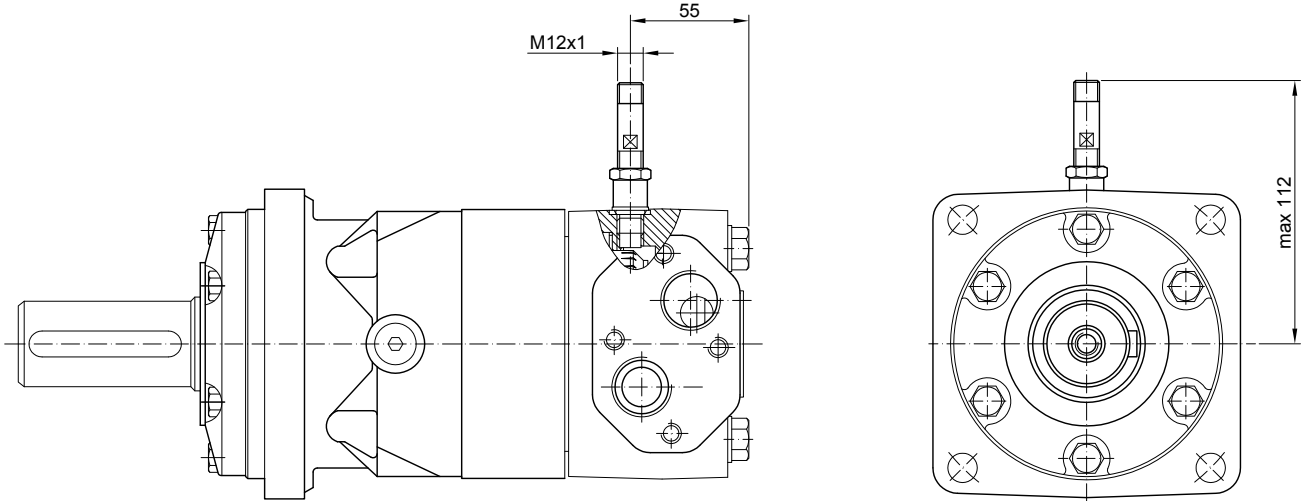
PERMISSIBLE SHAFT LOADS

The output shaft runs in tapered bearings that permit high axial and radial forces. Curve " 1 " shows max. radial shaft load. Any shaft load exceeding the values quoted in the curve will seriously reduce motor life. The two other curves apply to a B10 bearing life of 3000 hours at 200 RPM.



HYDRAULIC MOTORS WITH SPEED SENSOR TYPE OT...RS

Meta Hydraulic is introducing hydraulic motor with a new generation of speed sensor. The electric output signal is a standard voltage signal that can be used for regulating the speed of a motor. The speed is measured by a sensor in accordance with the Hall principle. Signal processing and amplification are performed in the sensor housing. Connection is provided in the housing by a Plug connector M12 Series.



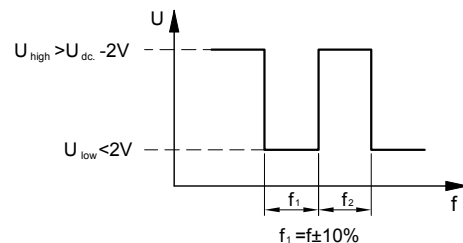
This performance is applicable for all motors of OT series. The main technical features correspond to the standard motors series OT.

DIFFERENTIAL HALL SENSOR

TECHNICAL DATA

Frequency range	3...20 000 Hz
Output	PNP
Power supply	10...36 VDC
Current input	20 mA (@24 VDC)
Current load	500 mA (@24 VDC;24°C)
Ambient Temperature	minus 40... plus 125°C
Protection	IP 67
Plug connector	M12-Series
Mounting principle	ISO 6149
Pulses per revolution	84

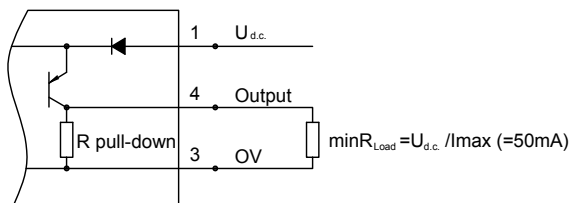
OUTPUT SIGNAL



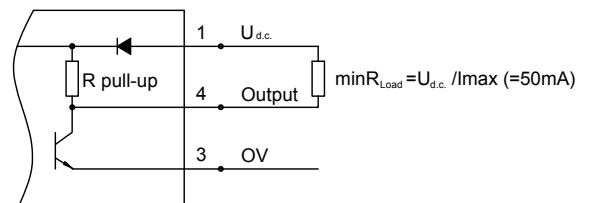
Load max.: $I_{high} = I_{low} < 50\text{mA}$
No load current, max: 20 mA

WIRING DIAGRAM

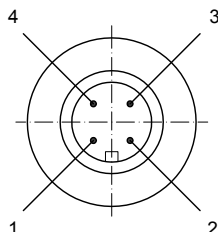
PNP



NPN



STICK TYPE



Terminal No.	Connection
1	U _{d.c.}
2	No connection
3	0V
4	Output signal

ORDER CODE

	1	2	3	4	5	6	7	8	9	10
OT										

1 Mounting Flange

omit	Square mount, four holes
S	Short mount
W	Wheel mount

2 Port type

omit	Side ports
E	Rear ports

3 Displacement code

160	161,1 [cm ³ /rev]
200	201,4 [cm ³ /rev]
250	251,8 [cm ³ /rev]
315	326,3 [cm ³ /rev]
400	410,9 [cm ³ /rev]
500	523,6 [cm ³ /rev]
630	612,3 [cm ³ /rev] (w/o Function diagram)
725	725,0 [cm ³ /rev] (w/o Function diagram)

4 Shaft Extensions

C	ø40 straight, Parallel key A12x8x70 DIN6885
CO	ø1 1/2" straight, Parallel key 3/8"x3/8"x2 1/4" BS46
K	ø45 tapered 1:10, Parallel key B12x8x28 DIN6885
SL	ø34,85 p.t.o. DIN 9611 Form 1
SH	ø1 1/2" splined 17T ANSI B92.1 - 1976

5 Ports

omit	BSPP (ISO 228)
M	Metric (ISO 262)

6 Speed Monitoring

omit	none
T	with tacho connection (only for side ports)
RS-P	with speed sensor (PNP pull-down resistor)
RS-N	with speed sensor (NPN pull-up resistor)

7 Special Features

omit	none
LL	Low Leakage
LSV	Low Speed Valve

8 Rotation

omit	Standard Rotation
R	Reverse Rotation

9 Option (Paint)

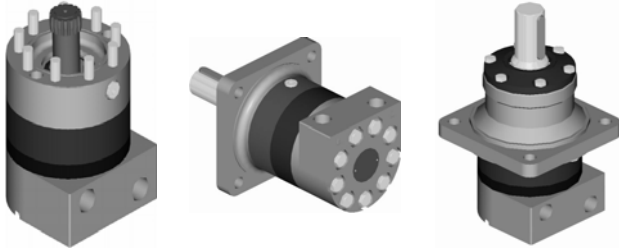
omit	no paint
P	Painted
PC	Corrosion Protected Paint

10 Design Series

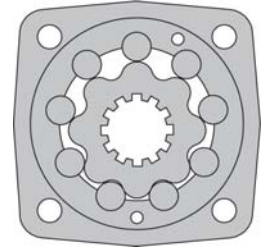
omit	Factory specified
-------------	-------------------

The permissible output torque for shafts must not be exceeded!

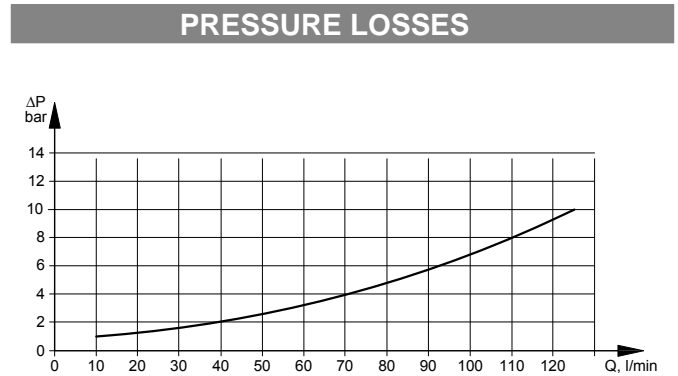
LOW SPEED HIGH TORQUE MOTORS OTM



OIL FLOW IN DRAIN LINE		
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
140	20	1,5
	35	1
210	20	3
	35	2



GENERAL	
Displacement, (cm ³ /rev)	201,4 ÷ 523,6
Max. Speed, (RPM)	625 ÷ 240
Max. Torque, (daNm)	72 ÷ 172
Max. Output, (kW)	29 ÷ 37,5
Max. Pressure Drop, (bar)	230 ÷ 185
Max. Oil Flow, (l/min)	125
Min. speed, (RPM)	5
Permissible Shaft Loads, (daN)	P _a =1000
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, (°C)	- 30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

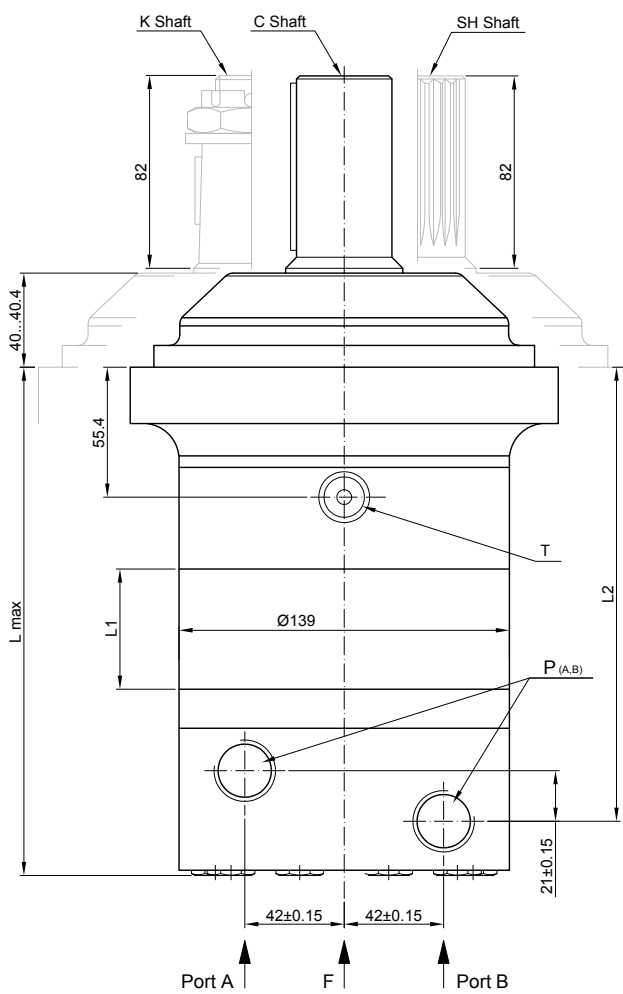


SPECIFICATION DATA

Type	OTM 200	OTM 250	OTM 315	OTM 400	OTM 470	OTM 500	
Displacement [cm ³ /rev.]	201,4	251,8	326,3	410,9	475	523,6	
Max. Speed, [RPM]	cont.	625	500	380	305	240	
	int.	750	600	460	365	285	
Max. Torque [daNm]	cont.	72	90	116	147	171	
	int.	102	128	163	206	215	
	peak	115	144	186	235	240	
Max. Output [kW]	cont.	41	41	41	41	37,5	
	int.	65	70	70	75	51	
Max. Pressure Drop [bar]	cont.	250	250	250	250	230	
	int.	350	350	350	350	280	
	peak	400	400	400	400	320	
Max. Oil Flow [l/min]	cont.	125	125	125	125	125	
	int.	150	150	150	150	150	
Max. Inlet Pressure, [bar]	cont.	270	270	270	270	270	
	int.	370	370	370	370	370	
	peak	420	420	420	420	420	
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	75	75	75	75
	cont.	100-300	RPM	40	40	40	40
	cont.	>300	RPM	20	20	20	-
	int.	0-max.	RPM	75	75	75	75
Max. Return Pressure with Drain Line [bar]	cont.	270	270	270	270	270	
	int.	370	370	370	370	370	
	peak	420	420	420	420	420	
Max. Starting Pressure with Unloaded Shift, [bar]	6	6	6	6	6	6	
Min. Starting Torque [daNm]	60	75	97	122	142	143	
Min. Speed, [RPM]	5	5	5	5	5	5	
Weight, [kg]	MTM	26,9	27,3	28,1	29	29,7	30,2
	MTMW	27,4	27,8	28,6	29,5	30,2	30,7
	MTMV	15,7	16,1	16,9	17,8	18,5	19

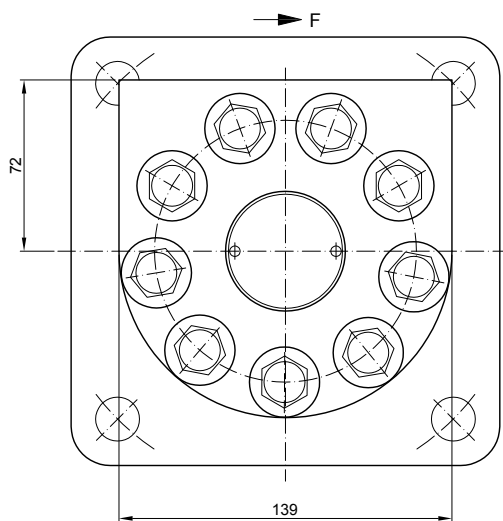
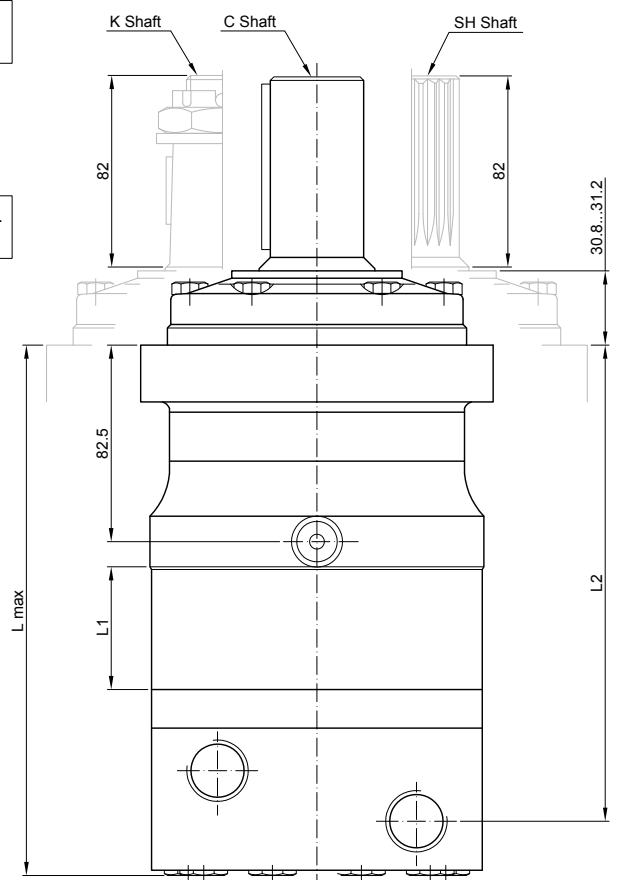
Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

DIMENSIONS - OTM AND OTMC



Shaft Dim.
See page 6

Flange Dim.
See page 5



Standard Rotation
Viewed from Shaft End
Port A Pressurized - **CW**
Port B Pressurized - **CCW**

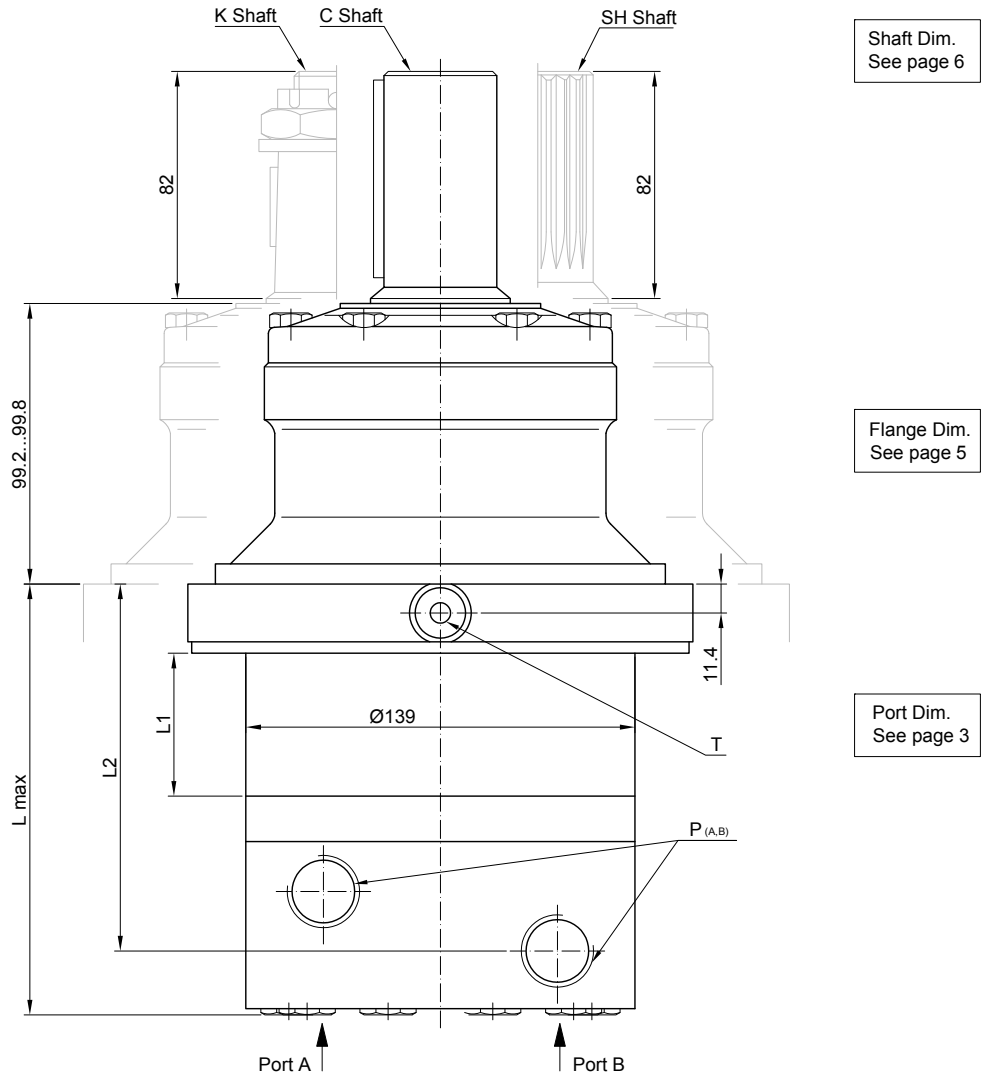
Reverse Rotation
Viewed from Shaft End
Port A Pressurized - **CCW**
Port B Pressurized - **CW**

P_(A,B) :2xG3/4 - 17 mm depth

T :G1/4 - 12 mm depth (plugged)

Type	L _{max} , mm	L ₂ , mm	Type	L _{max} , mm	L ₂ , mm	L ₁ , mm
OTM 200	188	163,3	OTMC 200	197	174	25
OTM 250	194	169,6	OTMC 250	203	180,3	31,3
OTM 315	203	178,5	OTMC 315	212,2	189,5	40,5
OTM 400	214	189,3	OTMC 400	223	200	51
OTM 470	222	197,3	OTMC 470	231	208	59
OTM 500	228	203,3	OTMC 500	237	214	65

DIMENSIONS - OTMW



$P_{(A,B)}$:2xG3/4 - 17 mm depth
 T :G1/4 - 12 mm depth (plugged)

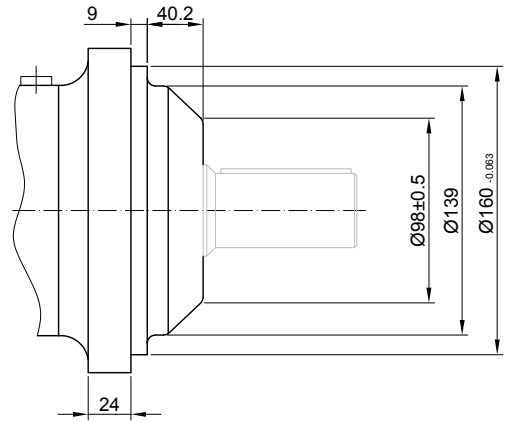
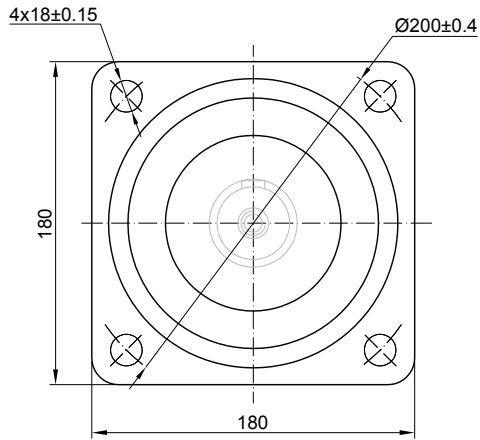
Standard Rotation
 Viewed from Shaft End
 Port A Pressurized - CW
 Port B Pressurized - CCW

Reverse Rotation
 Viewed from Shaft End
 Port A Pressurized - CCW
 Port B Pressurized - CW

Type	L _{max} , mm	L ₂ , mm	L ₁ , mm
OTMW 200	129	104,8	25
OTMW 250	135	112,1	31,3
OTMW 315	144	120,3	40,5
OTMW 400	155	130,8	51
OTMW 470	163	138,8	59
OTMW 500	169	144,8	65

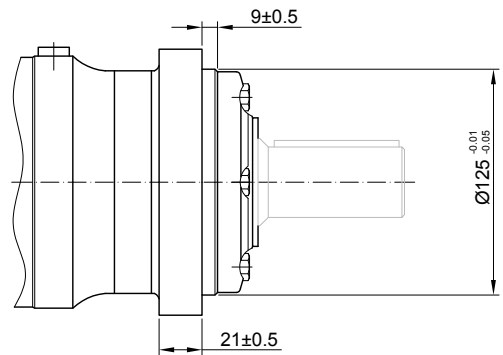
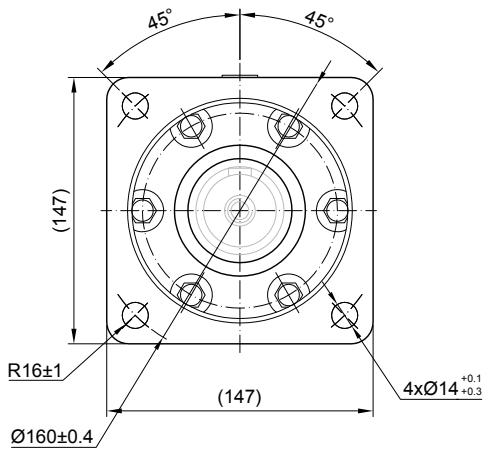
DIMENSIONS OF MOUNTING FOR OTM

4 - Bolt flange spigot diameter $\varnothing 160$ mm - BC $\varnothing 200$ mm.



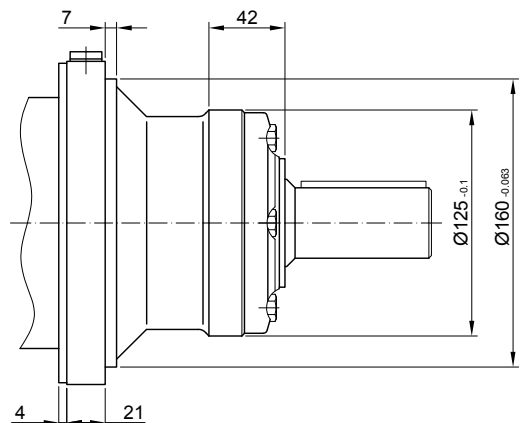
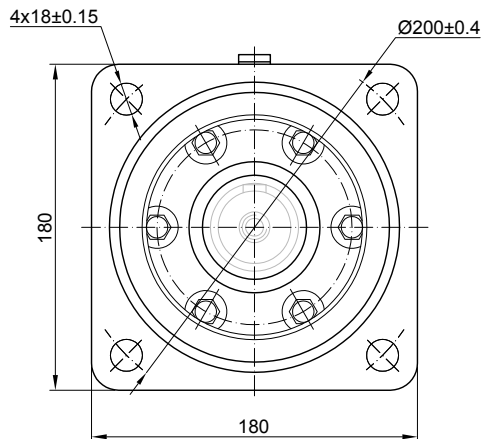
DIMENSIONS OF MOUNTING FOR OTM C

4 - Bolt flange spigot diameter $\varnothing 125$ mm - BC $\varnothing 160$ mm.



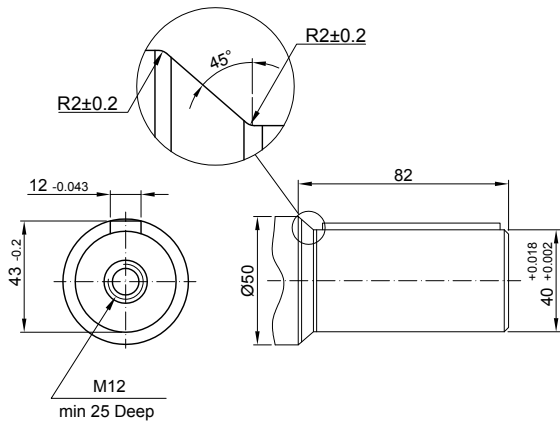
DIMENSIONS OF MOUNTING FOR OTM W

4 - Bolt flange, Wheel Motor spigot diameter $\varnothing 160$ mm - BC $\varnothing 200$ mm.

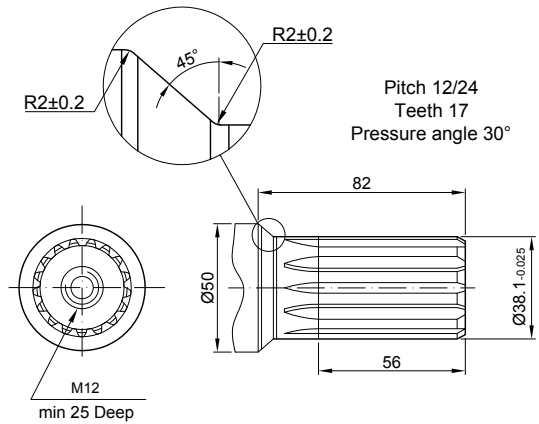


SHAFT EXTENSIONS

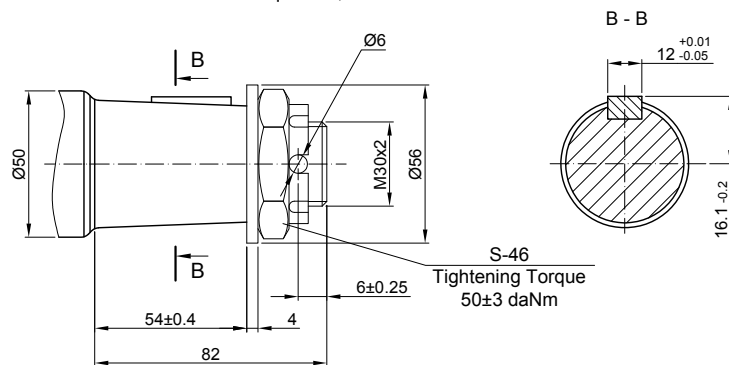
C Ø40 straight, Parallel key A12x8x70 DIN 6885
Max. Torque 132,8 daNm



SH Ø1 1/2" splined 17T, DP12/24 ANSI B92.1-1976
Max. Torque 132,8 daNm

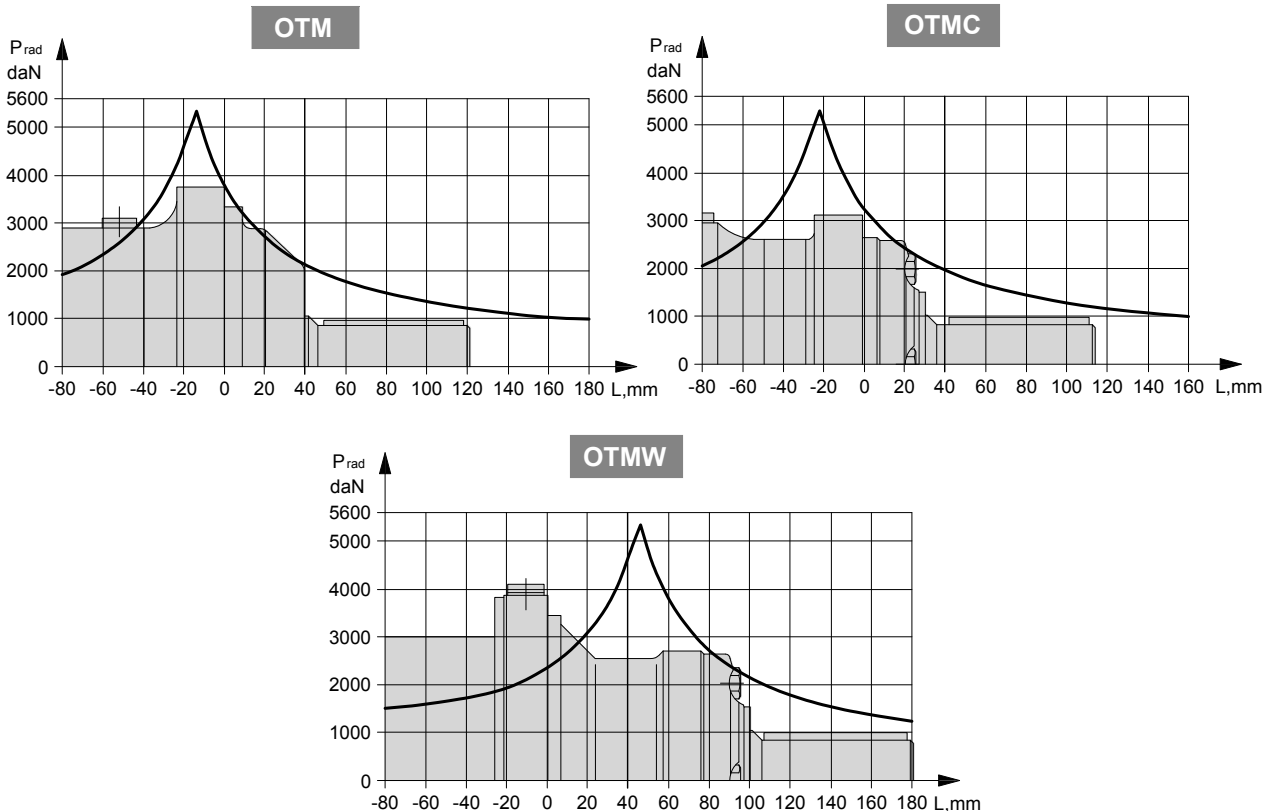


K tapered 1:10, Parallel key B12x8x28 DIN 6885
Max. Torque 210,7 daNm

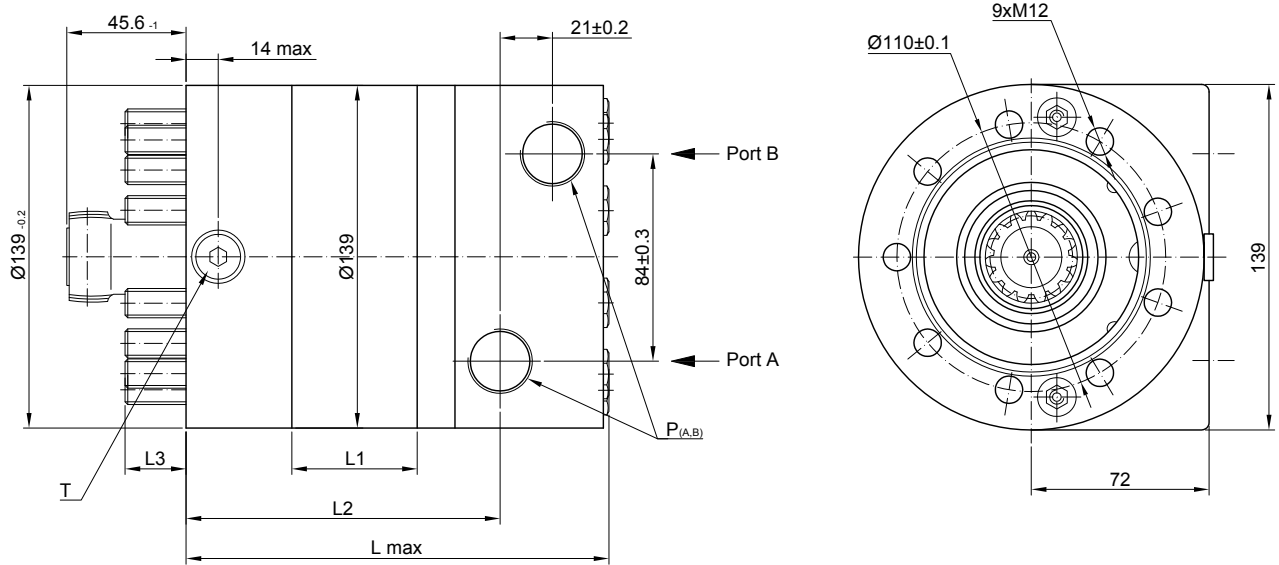


PERMISSIBLE SHAFT LOADS

The curves apply to a B10 bearing life (ISO281) of 2000 hours at 200 RPM



OUTLINE DIMENSIONS REFERENCE FOR OTMV



$P_{(A,B)}$:2xG3/4 - 17 mm depth

T :G1/4 - 12 mm depth (plugged)

Standard Rotation

Viewed from Shaft End

Port A Pressurized - **CW**

Port B Pressurized - **CCW**

Reverse Rotation

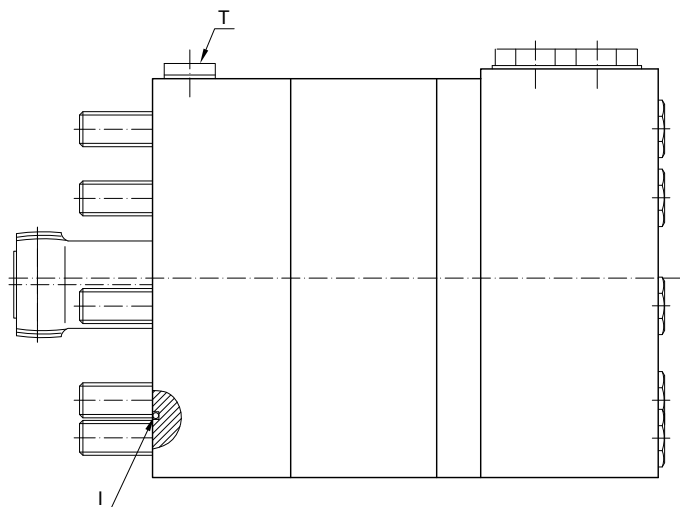
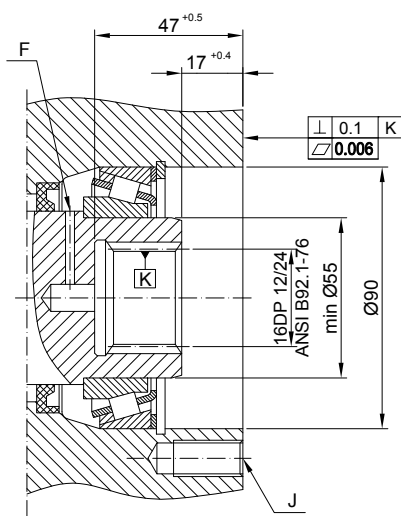
Viewed from Shaft End

Port A Pressurized - **CCW**

Port B Pressurized - **CW**

Type	L1 , mm	L2 , mm	L3 , mm	L , mm
OTMV 200	25	106,5	27,8	151
OTMV 250	31,3	112,8	26,5	157
OTMV 315	40,5	122	22,3	167
OTMV 400	51	132,5	21,8	177
OTMV 470	59	140,5	23,8	185
OTMV 500	65	146,5	27,8	191

DIMENSIONS OF THE ATTACHED COMPONENT FOR OTMV



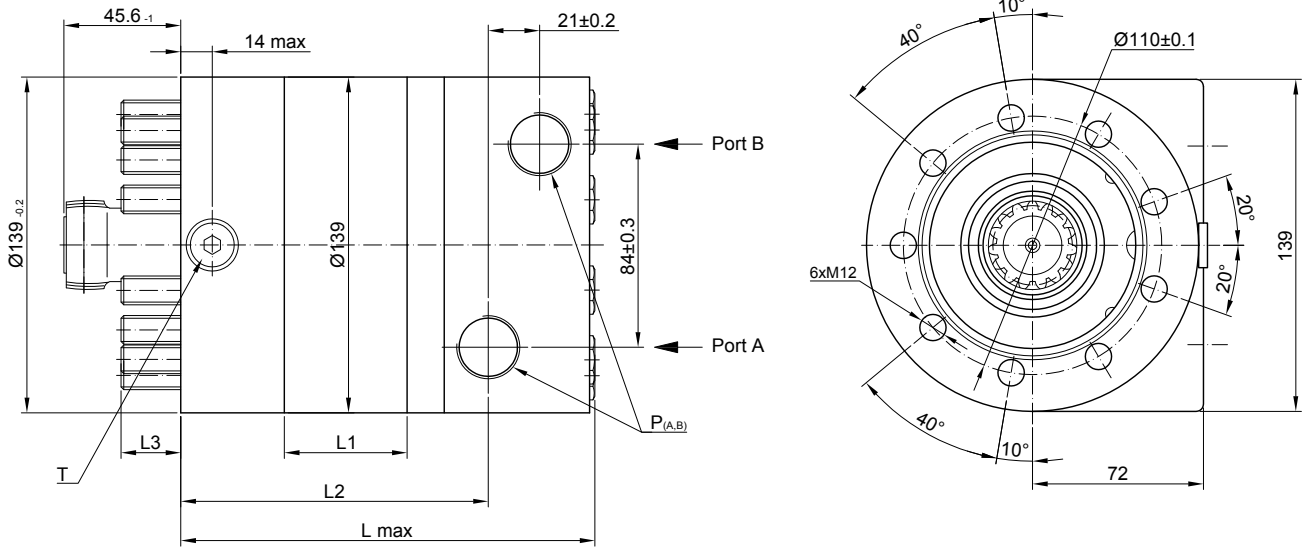
F: Oil circulation hole

J: 9xM12 - 30 mm depth, 40°, Ø110±0,1

I: O- Ring 93x1,5 mm

T: Drain connection G1/4

OUTLINE DIMENSIONS REFERENCE FOR OTM6V



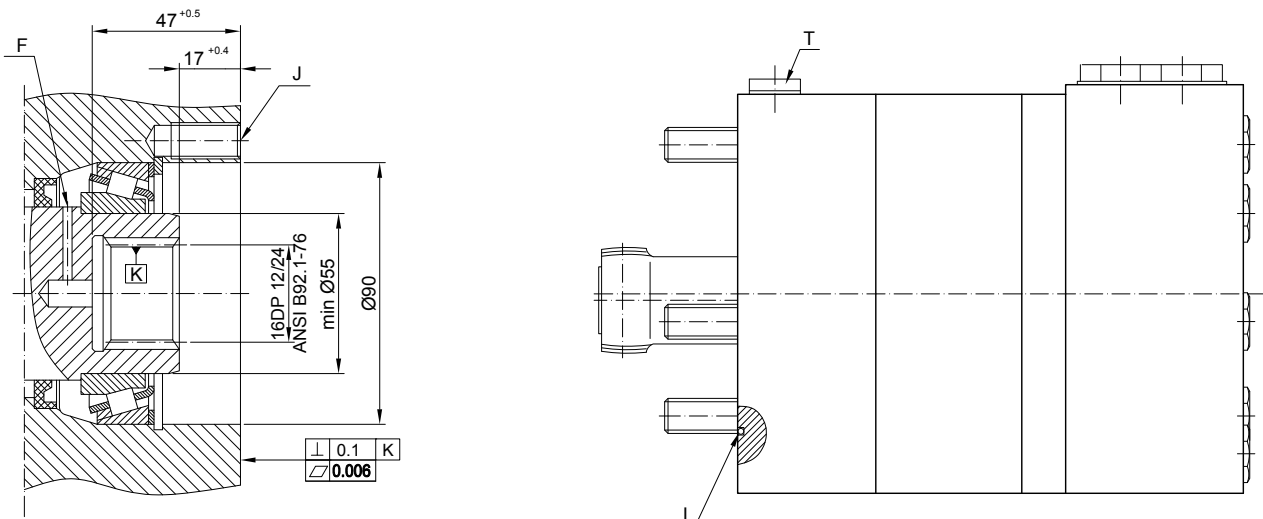
$P_{(A,B)}$:2xG3/4 - 17 mm depth
 T :G1/4 - 12 mm depth (plugged)

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

Type	L1 , mm	L2 , mm	L3 , mm	L , mm
OTM6V 200	25	106,5	27,8	151
OTM6V 250	31,3	112,8	26,5	157
OTM6V 315	40,5	122	22,3	167
OTM6V 400	51	132,5	21,8	177
OTM6V 470	59	140,5	23,8	185
OTM6V 500	65	146,5	27,8	191

DIMENSIONS OF THE ATTACHED COMPONENT FOR OTM6V



F: Oil circulation hole
J: 9xM12 - 30 mm depth, 40°, Ø110±0.1
 or 6xM12 - 30 mm depth, situated in accordance with the bolts M12, shown on Fig. 1, Ø110±0.1

I: O-Ring 93x1,5 mm
T: Drain connection G1/4

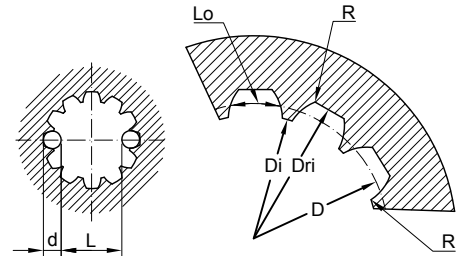
DRAIN CONNECTION

A drain line ought to be used when pressure in the return line can exceed the permissible pressure. It can be connected at the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component and its shaft seal. The drain line must be possible for oil to flow between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard ANSI B92.1-1976, class 5
[m=2.1166; corrected x.m=+1,0]

Fillet Root Side Fit		mm
Number of Teeth	z	16
Pitch DP		12 / 24
Pressure Angle		30°
Pitch Dia.	D	33,8656
Major Dia.	Dri	38,4 ^{+0.4}
Minor Dia.	Di	32,15 ^{+0.04}
Space Width [Circular]	Lo	4,516±0,037
Fillet Radius	R	0,5
Max. Measurement between Pin	L	26,9 ^{+0.10}
Pin Dia.	d	4,835±0,001



Hardening Specification:
 on the surface HV=750±50
 0,7±0,2 mm under the surface HV=560
 Material 20 MoCr4 DIN 17210 or better

ORDER CODE

OTM	1	2	3	4	5	6	7	8

1	Mounting Flange
omit	4-Bolt flange, spigot dia. Ø160, BC Ø200
C	4-Bolt flange, spigot dia. Ø125, BC Ø160
W	Wheel motor
V	Very short mount, 9xM12 mounting bolts
V6	Very short mount, 6xM12 mounting bolts
2	Displacement code
200	201,4 [cm³/rev]
250	251,8 [cm³/rev]
315	326,3 [cm³/rev]
400	410,9 [cm³/rev]
470	475,0 [cm³/rev]
500	523,6 [cm³/rev]
3	Shaft Extensions
C	Ø40 straight, Parallel key A12x8x70 DIN6885
K	Ø45 tapered 1:10, Parallel key B12x8x28 DIN6885
SH	Ø1 1/2" splined 17T ANSI B92.1 - 1976

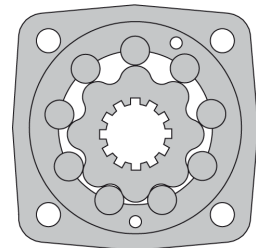
4	Ports
omit	BSPP (ISO 228)
5	Special Features
omit	none
LL	Low Leakage
LSV	Low Speed Valve
6	Rotation
omit	Standard Rotation
R	Reverse Rotation
7	Option (Paint)
omit	no paint
P	Painted
PC	Corrosion Protected Paint
8	Design Series
omit	Factory specified

HYDRAULIC MOTORS OV



OIL FLOW IN DRAIN LINE

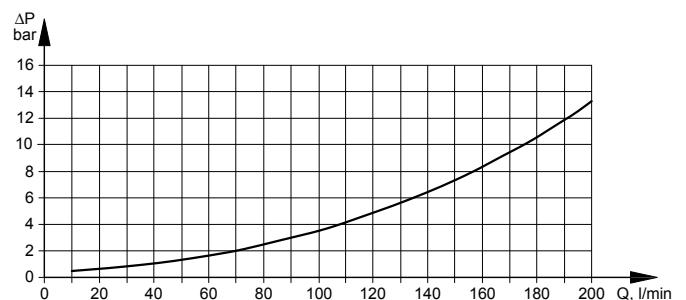
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
140	20	3
	35	2
210	20	6
	35	4



GENERAL

Displacement, (cm ³ /rev)	314,5 ÷ 801,8
Max. Speed, (RPM)	510 ÷ 250
Max. Torque, (daNm)	92 ÷ 188
Max. Output, (kW)	42,5 ÷ 53,5
Max. Pressure Drop, (bar)	200 ÷ 160
Max. Oil Flow, (l/min)	160 ÷ 200
Min. speed, (RPM)	10 ÷ 5
Permissible Shaft Loads, (daN)	P _{rad} = 2800; P _a =1500
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, (°C)	- 30 ÷ 90
Optimal Viscosity range, (mm ² /s)	20 ÷ 75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

PRESSURE LOSSES



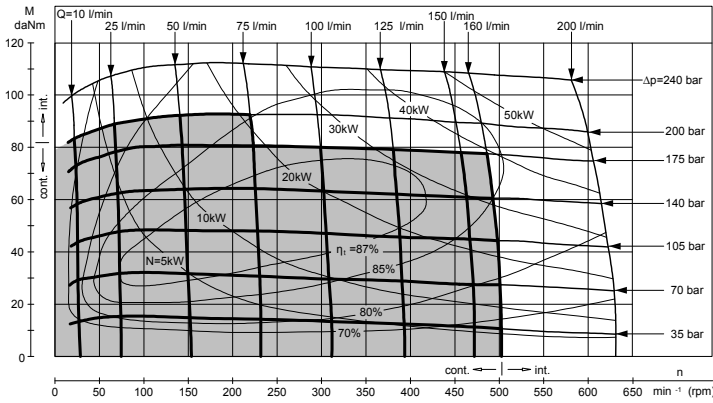
SPECIFICATION DATA

Type		OV 315	OV 400	OV 500	OV 630	OV 800
Displacement [cm ³ /rev.]		314,5	400,9	499,6	629,1	801,8
Max. Speed, [RPM]	cont.	510	500	400	315	250
	int.	630	600	480	380	300
Max. Torque [daNm]	cont.	92	118	146	166	188
	int.	111	141	176	194	211
	peak	129	164	205	221	247
Max. Output [kW]	cont.	42,5	53,5	53,5	48	42,5
	int.	51	64	64	56	48
Max. Pressure Drop [bar]	cont.	200	200	200	180	160
	int.	240	240	240	210	180
	peak	280	280	280	240	210
Max. Oil Flow [l/min]	cont.	160	200	200	200	200
	int.	200	240	240	240	240
Max. Inlet Pressure, [bar]	cont.	210	210	210	210	210
	int.	250	250	250	250	250
	peak	300	300	300	300	300
Max. Return Pressure w/o Drain Line or Max. Pressure in Drain Line, [bar]	cont.	0-100	RPM	60	60	60
	cont.	100-300	RPM	30	30	30
	cont.	>300	RPM	20	20	20
	int.	0-max.	RPM	75	75	75
Max. Return Pressure with Drain Line [bar]	cont.	140	140	140	140	140
	int.	175	175	175	175	175
	peak	210	210	210	210	210
Max. Starting Pressure with Unloaded Shift, [bar]		8	8	8	8	8
Min. Starting Torque [daNm]	at max press. drop cont.	71	91	113	133	151
	at max press. drop int.	85	109	136	155	170
Min. Speed, [RPM]		10	9	8	6	5
Weight, [kg]	OV	31,8	32,6	33,5	34,9	36,5
	OVW	32,4	33,2	34,1	35,5	37,1
	OVS	22,7	23,5	24,4	25,6	27,7

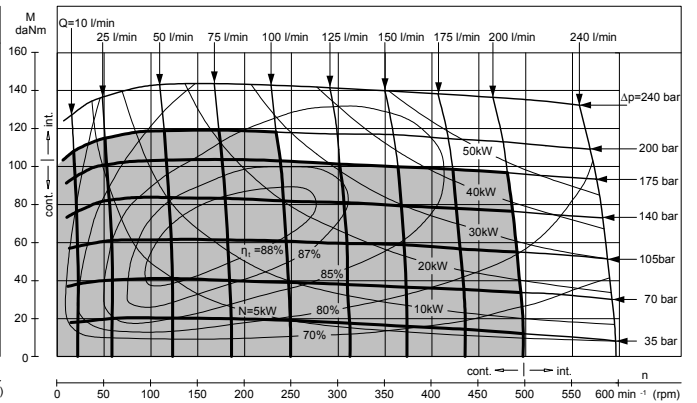
Intermittent operation: the permissible values may occur for max. 10% of every minute.
Peak load: the permissible values may occur for max. 1% of every minute.

FUNCTION DIAGRAMS

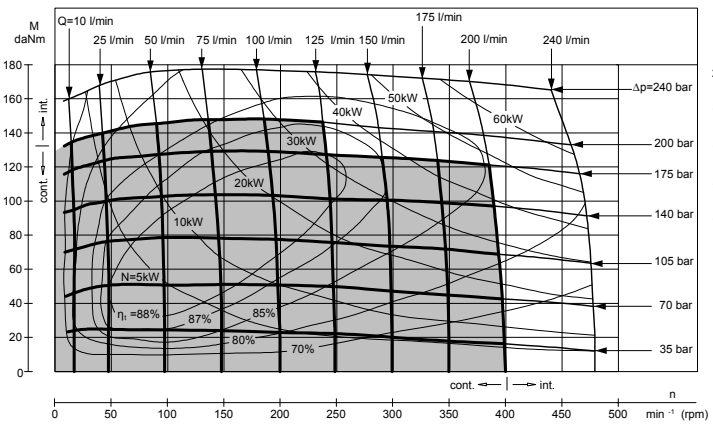
OV 315



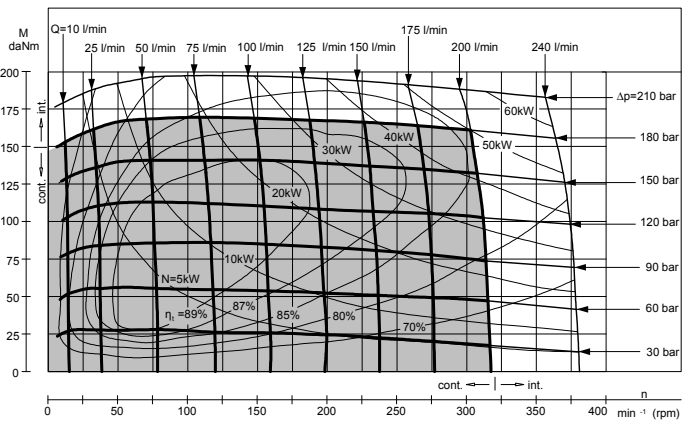
OV 400



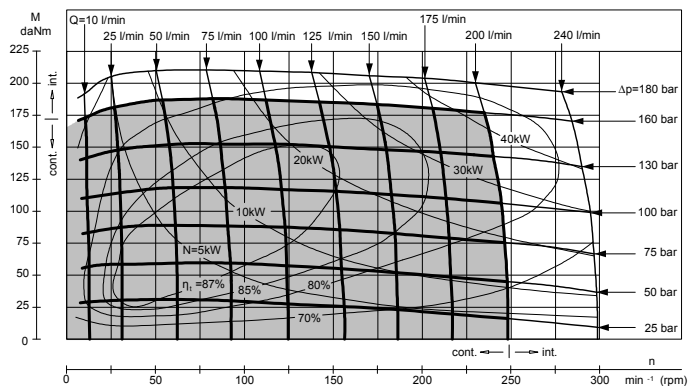
OV 500



OV 630

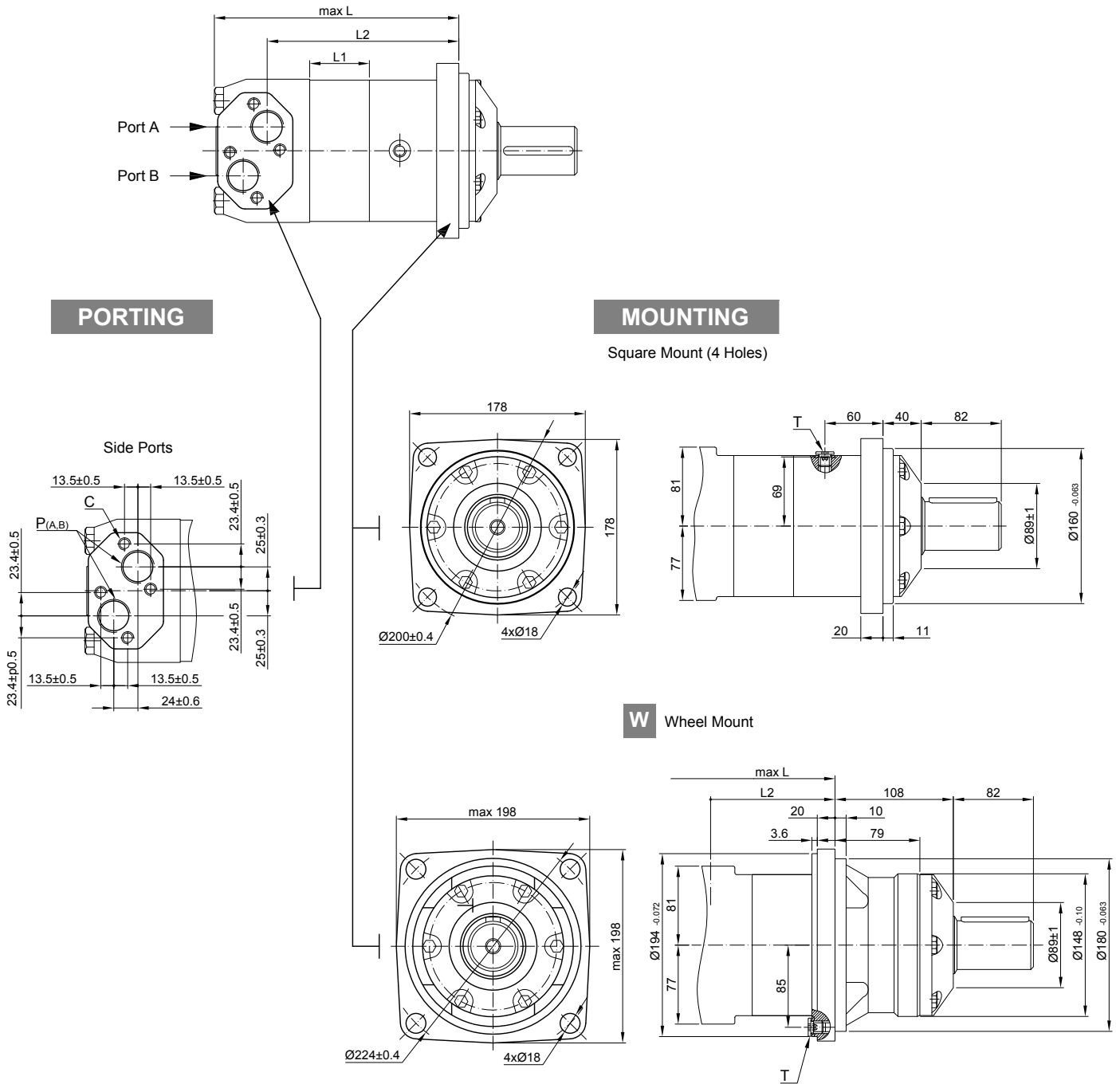


OV 800



The function diagrams data was collected at back pressure 5 ± 10 bar and oil with viscosity of $32 \text{ mm}^2/\text{s}$ at 50°C .

DIMENSIONS AND MOUNTING DATA



- C : 4xM12 - 12 mm depth
- P_(A,B) : 2xG1 - 15 mm depth
- T : G1/4 - 12 mm depth

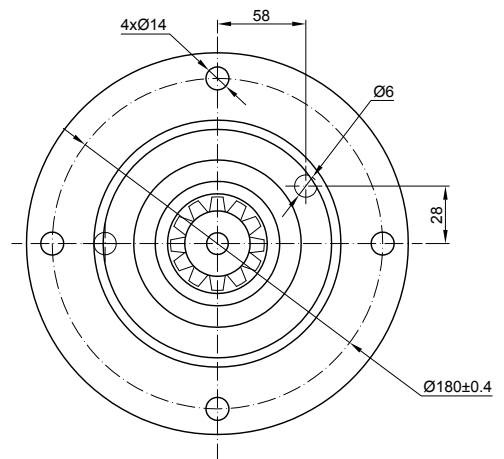
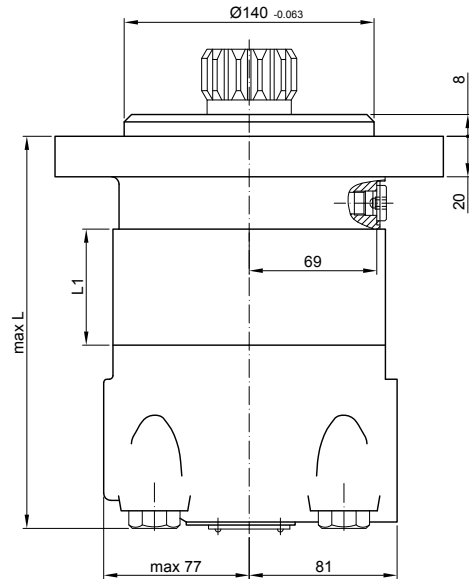
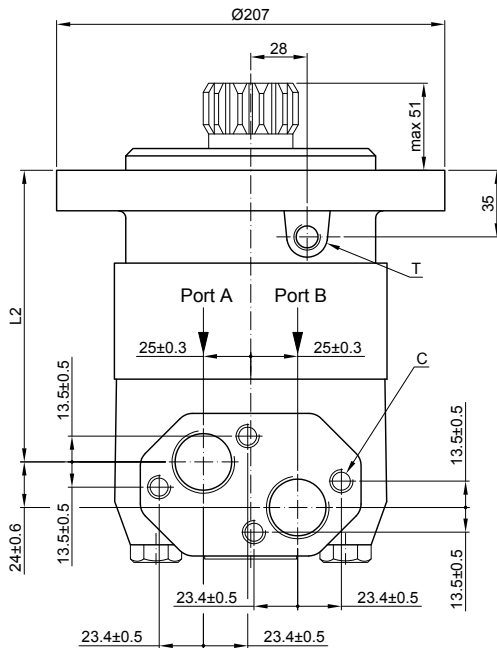
Standard Rotation
 Viewed from Shaft End
 Port A Pressurized - **CW**
 Port B Pressurized - **CCW**

Reverse Rotation
 Viewed from Shaft End
 Port A Pressurized - **CCW**
 Port B Pressurized - **CW**

Type	L , mm	L2 , mm	Type	L , mm	L2 , mm	*L1 , mm
OV 315	211	158	OVW 315	146	86	19
OV 400	218	165	OVW 400	153	93	26
OV 500	226	173	OVW 500	161	101	34
OV 630	237	185	OVW 630	172	111	44
OV 800	251	198	OVW 800	185	125	58

DIMENSIONS AND MOUNTING DATA

S Short Mount



Type	L , mm	L1 , mm	L2 , mm
OVS 315	167	19	110
OVS 400	174	26	117
OVS 500	182	34	125
OVS 630	192	44	135
OVS 800	206	58	149

The width of the geroler is 3,5 mm greater than L1 .

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

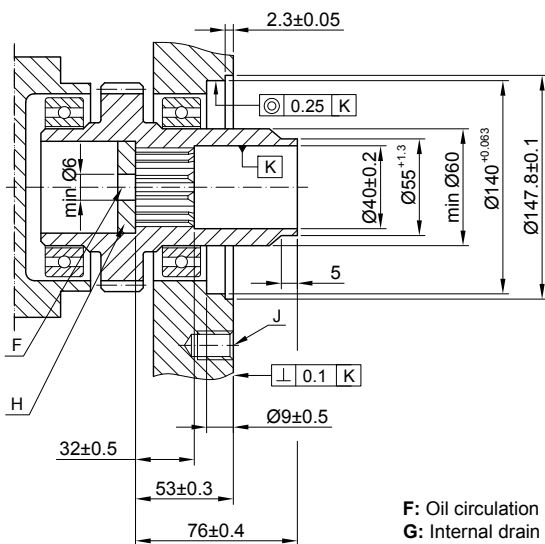
C : 4xM12 - 12 mm depth

P_(A,B) : 2xG1 - 15 mm depth

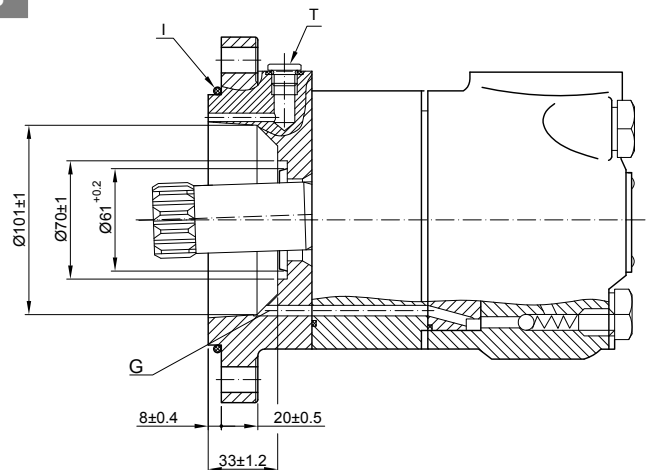
T : G1/4 - 12 mm depth

DIMENSIONS OF THE ATTACHED COMPONENT

OVS



F: Oil circulation hole
G: Internal drain channel
H: Hardened stop plate
I: O - Ring 140x3mm



J: 4xM12 - 18 mm depth, 90°
T: Drain connection G1/4 - 12 mm depth

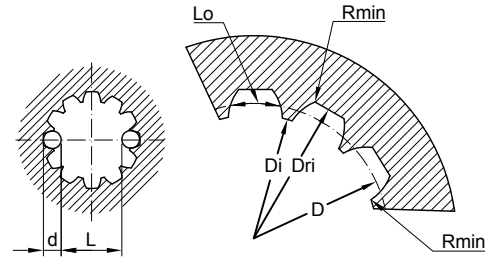
DRAIN CONNECTION

A drain line ought to be used when pressure in the return line can exceed the permissible pressure. It can be connected for OVS at the drain port of the motor. The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

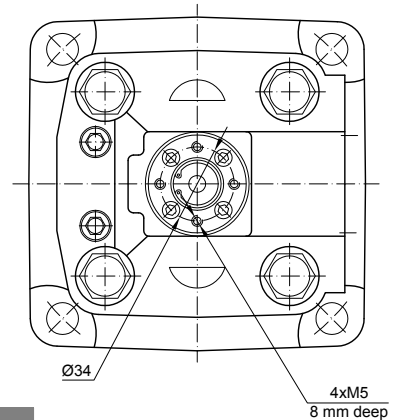
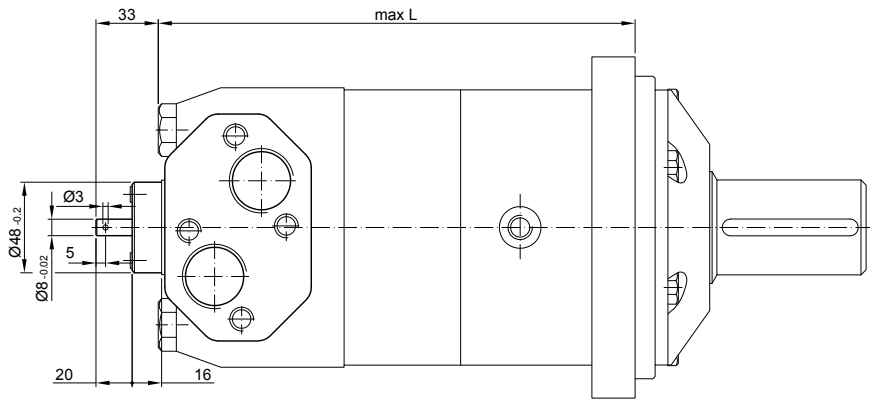
Standard ANSI B92.1-1976, class 5
[m=2.54; corrected x.m=+1,0]

Fillet Root Side Fit		mm
Number of Teeth	z	16
Diametral Pitch		10 / 20
Pressure Angle		30°
Pitch Dia.	D	40,640
Major Dia.	Dri	45,2 ^{+0.4}
Minor Dia.	Di	38,5 ^{+0.039}
Space Width [Circular]	Lo	5,18±0,037
Fillet Radius	Rmin	0,4
Max. Measurement between Pin	L	32,47 ^{+0.15}
Pin Dia.	d	5,5±0,001



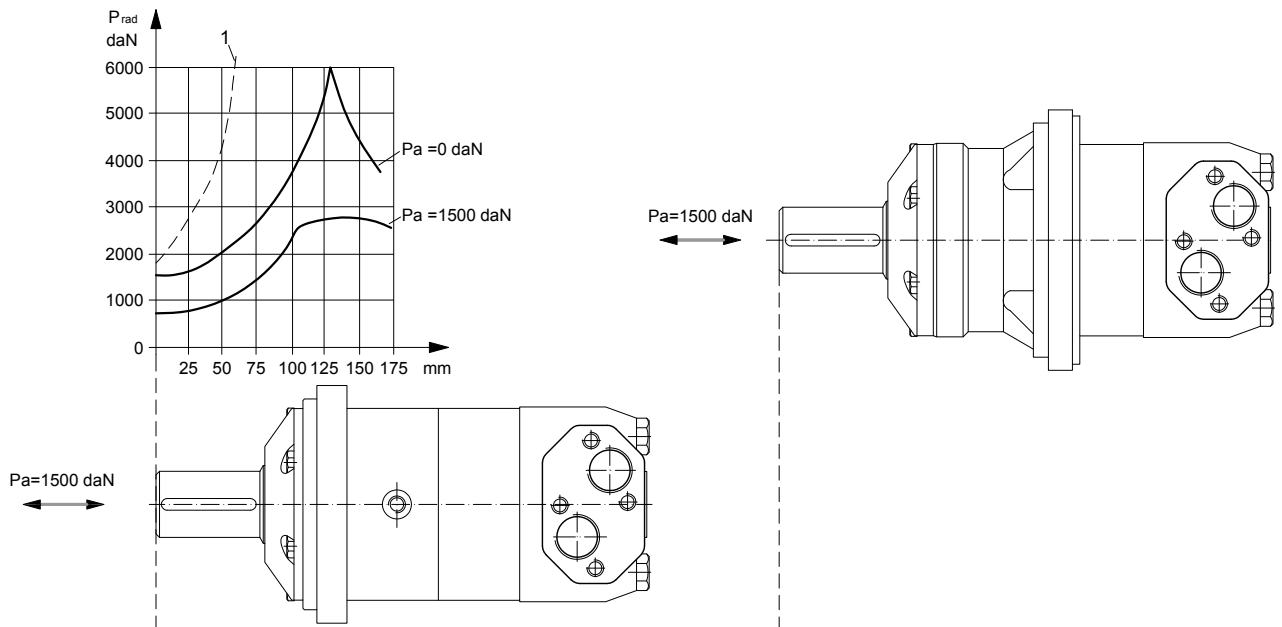
Hardening Specification:
HRC 60±2
HRC 52
0,7±0,2 mm effective case depth
Material 20 MoCr4 DIN 17210 or better

MOTORS WITH TACHO CONNECTION - Option "T"



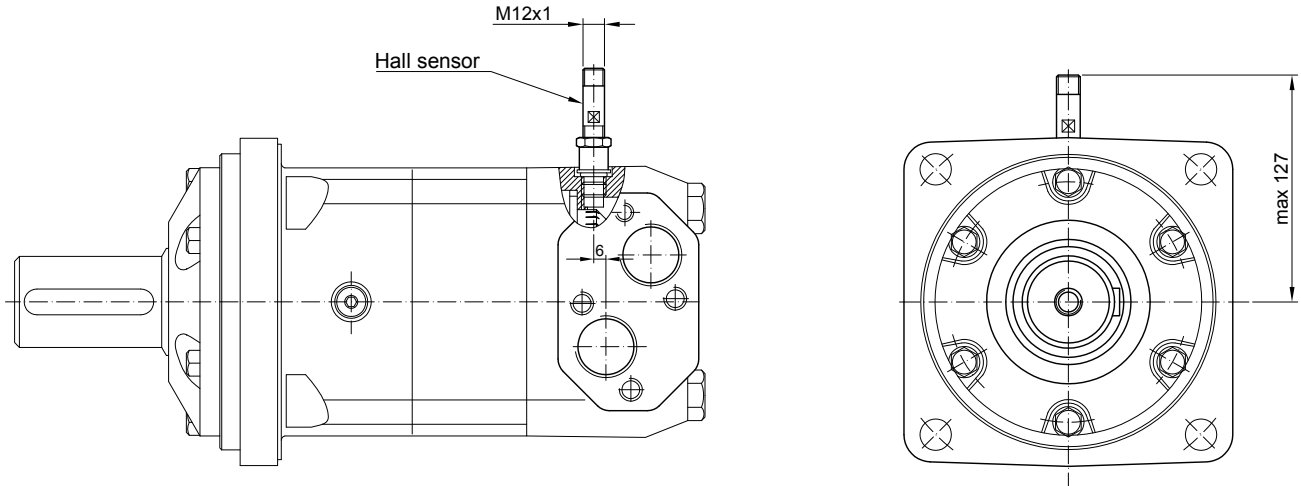
PERMISSIBLE SHAFT LOADS

The output shaft runs in tapered bearings that permit high axial and radial forces. Curve " 1 " shows max. radial shaft load. Any shaft load exceeding the values quoted in the curve will seriously reduce motor life. The two other curves apply to a B10 bearing life of 3000 hours at 200 RPM.



HYDRAULIC MOTORS WITH SPEED SENSOR TYPE OV...RS

Meta Hydraulic is introducing hydraulic motor with a new generation of speed sensor. The electric output signal is a standard voltage signal that can be used for regulating the speed of a motor. The speed is measured by a sensor in accordance with the Hall principle. Signal processing and amplification are performed in the sensor housing. Connection is provided in the housing by a Plug connector M12 Series.



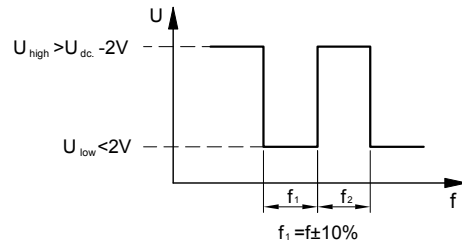
This performance is applicable for all motors of OV series. The main technical features correspond to the standard motors series OV.

DIFFERENTIAL HALL SENSOR

TECHNICAL DATA

Frequency range	3...20 000 Hz
Output	PNP
Power supply	10...36 VDC
Current input	20 mA (@24 VDC)
Current load	500 mA (@24 VDC;24°C)
Ambient Temperature	minus 40... plus 125°C
Protection	IP 67
Plug connector	M12-Series
Mounting principle	ISO 6149
Pulses per revolution	102

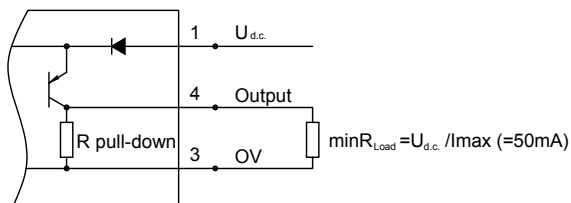
OUTPUT SIGNAL



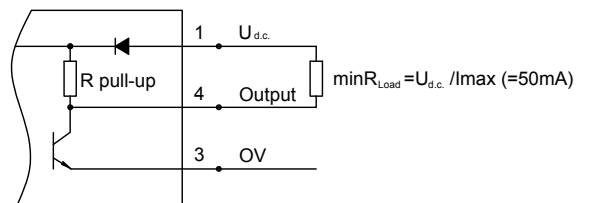
Load max.: $I_{high}=I_{low}<50\text{mA}$
No load current, max: 20 mA

WIRING DIAGRAM

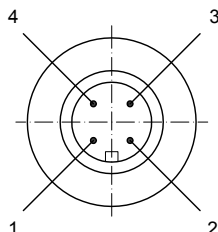
PNP



NPN



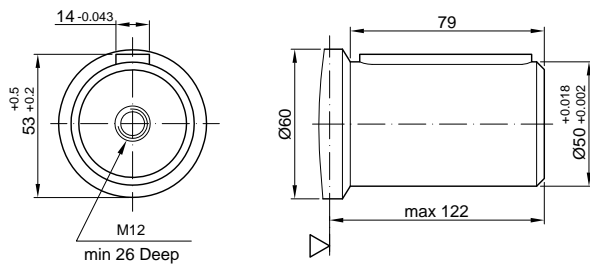
STICK TYPE



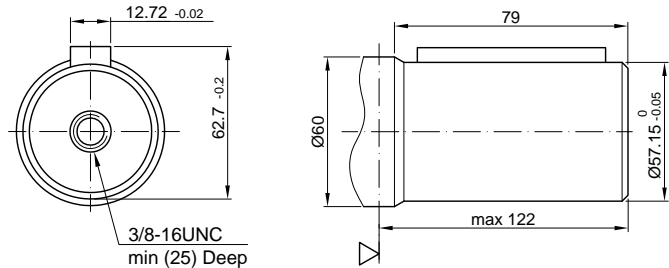
Terminal No.	Connection
1	U _{d.c.}
2	No connection
3	0V
4	Output signal

SHAFT EXTENSIONS

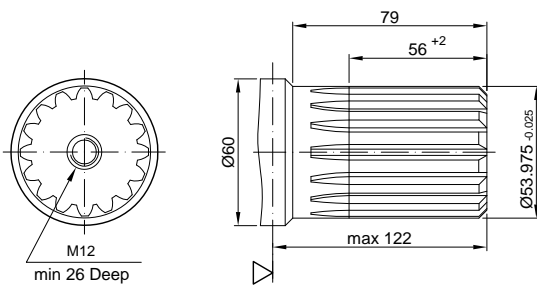
C Ø50 straight, Parallel key A14x9x70 DIN 6885



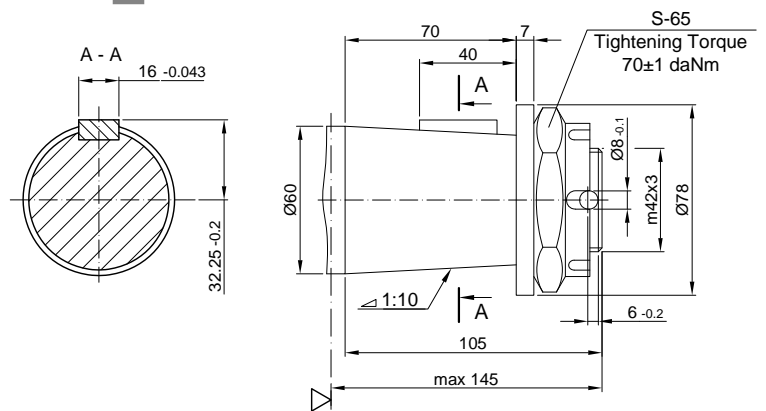
CO Ø2 1/4" (57,15) straight, Parallel key 1/2"x1/2"x2 1/4" BS46



SH Ø2 1/8" splined, 16 DP 8/16 ANSI B92.1-1976



K tapered 1:10, Parallel key B16x10x32 DIN 6885



ORDER CODE

	1	2	3	4	5	6	7	8
OV								

1 Mounting Flange

omit	Square mount, four holes
S	Short mount
W	Wheel mount

2 Displacement code

315	314,5 [cm³/rev]
400	400,9 [cm³/rev]
500	499,6 [cm³/rev]
630	629,1 [cm³/rev]
800	801,8 [cm³/rev]

3 Shaft Extensions

C	Ø50 straight, Parallel key A14x9x70 DIN6885
CO	Ø2 1/4" straight, Parallel key 1/2"x1/2"x2 1/4" BS46
K	Ø60 tapered 1:10, Parallel key B16x10x32 DIN6885
SH	Ø2 1/8" splined, ANSI B92.1 - 1976

4 Speed Monitoring

omit	none
T	with tacho connection
RS-P	with speed sensor (PNP pull-down resistor)
RS-N	with speed sensor (NPN pull-up resistor)

5 Special Features

omit	none
LL	Low Leakage
LSV	Low Speed Valve

6 Rotation

omit	Standard Rotation
R	Reverse Rotation

7 Option (Paint)

omit	no paint
P	Painted
PC	Corrosion Protected Paint

8 Design Series

omit	Factory specified
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