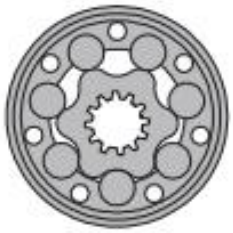
Hydraulikmotoren HMR

APPLICATION

- Conveyors;
- Feeding mechanism of robots and manipulators;
- Metal working machines;
- Textile machines;
- Machines for agriculture;
- Food industries;
- Grass cutting machinery etc.



CONTENTS

OPTIONS

- Model- Spool valve, roll-gerotor;
- Flange and wheel mount;
- Motor with needle bearing;
- Side and rear ports;
- Shafts- straight, splined and tapered;
- Shaft seal for high and low pressure;
- Metric and BSPP ports;
- Other special features.

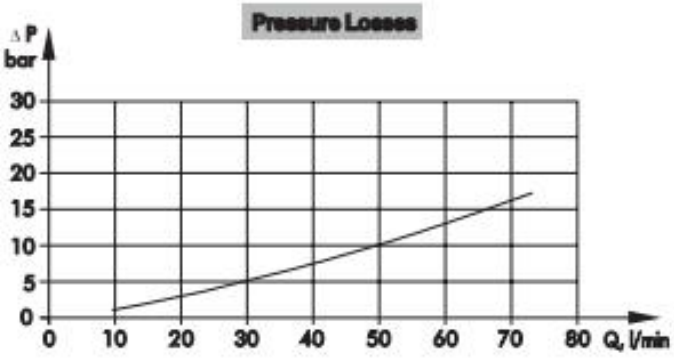
GENERAL

Displacement, [cm³/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, [mm²/s]	20÷75
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

Oil flow in drain line

Pressure drop (bar)	Viscosity (mm²/s)	Oil flow in drain line (l/min)
100	20	2,5
	35	1,8
140	20	3,5
	35	2,8

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
Displacement, [cm³/u]		51,5	51,5	80,3	80,3	99,8	99,8
Max. Speed,	cont.	775	775	750	750	600	600
[RPM]	int.*	970	970	940	940	750	750
Max. Torque	cont.	10,1	10,1	19,5	19,5	24	24
[daNm]	int.*	13	13	22	22	28	28
	peak**	17	17	27	27	32	32
Max. Output,	cont.	7	7	12,5	12,5	13	13
[kW]	int.*	8,5	8,5	15	15	15	15
Max. Pressure Drop	cont.	140	140	175	175	175	175
[bar]	int.*	175	175	200	200	200	200
	peak**	225	225	225	225	225	225
Max. Oil Flow	cont.	40	40	60	60	60	60
[l/min]	int.*	50	50	75	75	75	75
Max. Inlet Pressure	cont.	175	175	175	175	175	175
[bar]	int.*	200	200	200	200	200	200
	peak**	225	225	225	225	225	225
Max. Return Pressure	cont.0-100 RPM	150	100	150	100	150	100
w/o Drain Line or	cont.100-300 RPM	75	30	75	30	75	30
max. Pressure in Drain	cont.300-600 RPM	50	15	50	15	50	15
Line, [bar]	cont.>600 RPM	20	-	20	-	20	-
	int.* 0-max. RPM	150	100	150	100	150	100
Max. Return Pressure	cont.	175	175	175	175	175	175
with Drain Line	int.*	200	200	200	200	200	200
[bar]	peak**	225	225	225	225	225	225
Max. Starting Pressure with Unloaded Shaft, [bar]		10	10	10	10	10	10
Min. Starting Torque	at max. press.	8	8	15	15	20	20
[daNm]	drop cont.						
	at max. press. drop int.*	10	10	17	17	23	23
Min. Speed***, [RPM]		10	10	10	10	10	10
Weight, avg., [kg]	OR(F)	6,8	6,9	6,9	7,0	7,2	7,3
	ORW	-	10,4	-	10,5	-	10,6
	ORQ	6,2		6,3		6,6	

* Intermittent operation: the permissible values may occur for max. 10% of every minute.
** Peak load: the permissible values may occur for max. 1% for every minute.
*** For speeds of 10 RPM or lower, consult factory or your regional manager.
1. Intermittent speed and intermittent pressure drop must not occur simultaneously!
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommended 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 at operating temperatures.
5. Recommended maximum system operating temperature - 82°C.
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 min.

SPECIFICATION DATA (continued)

Type		OR 125	ORW 125 OR 125...B	OR 160	ORW 160 OR 160...B	OR 200	ORW 200 OR 200...B
Displacement, [cm³/u]		125,7	125,7	159,6	159,6	199,8	199,8
Max. Speed,	cont.	475	475	375	375	300	300
[RPM]	Int.*	600	600	470	470	375	375
Max. Torque	cont.	30	30	39	39	38,5	45
[daNm]	Int.*	34	34	43	43	46	50
	peak**	37	37	46	46	56	56
Max. Output,	cont.	12,5	12,5	11,5	11,5	9	11
[kW]	Int.*	14,5	14,5	14	14	11,5	13
Max. Pressure Drop	cont.	175	175	175	175	140	175
[bar]	Int.*	200	200	200	200	175	200
	peak**	225	225	225	225	225	225
Max. Oil Flow	cont.	60	60	60	60	60	60
[l/min]	Int.*	75	75	75	75	75	75
Max. Inlet Pressure	cont.	175	175	175	175	175	175
[bar]	Int.*	200	200	200	200	200	200
	peak**	225	225	225	225	225	225
Max. Return Pressure	cont.0-100 RPM	150	100	150	100	150	100
w/o Drain Line or	cont.100-300 RPM	75	30	75	30	75	30
max. Pressure in Drain	cont.300-600 RPM	50	15	50	15	50	15
Line, [bar]	cont.>600 RPM	-	-	-	-	-	-
	Int.* 0-max. RPM	150	100	150	100	150	100
Max. Return Pressure	cont.	175	175	175	175	175	175
with Drain Line	Int.*	200	200	200	200	200	200
[bar]	peak**	225	225	225	225	225	225
Max. Starting Pressure with Unloaded Shaft, [bar]		9	9	7	7	5	5
Min. Starting Torque	at max. press.	25	25	32	32	33	41
[daNm]	drop cont.						
	at max. press. drop Int.*	28	28	37	37	40	46
Min. Speed***, [RPM]		10	10	10	10	10	10
Weight, avg., [kg]	OR(F)	7,3	7,4	7,5	7,6	8	8,1
	ORW	-	10,8	-	11,1	-	11,6
	ORQ	6,8		7,6		7,2	

* Intermittent operation: the permissible values may occur for max. 10% of every minute.
** Peak load: the permissible values may occur for max. 1% for every minute.
*** For speeds of 10 RPM or lower, consult factory or your regional manager.
1. Intermittent speed and intermittent pressure drop must not occur simultaneously!
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommended 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 at operating temperatures.
5. Recommended maximum system operating temperature - 82°C.
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 min.

SPECIFICATION DATA (continued)

Type		OR 250	ORW 250 OR 250...B	OR 315	ORW 315 OR 315...B	OR 400	ORW 400 OR 400...B
Displacement, [cm³/u]		250,1	250,1	315,7	315,7	397	397
Max. Speed,	cont.	240	240	190	190	150	150
[RPM]	int.*	300	300	240	240	190	190
Max. Torque	cont.	39	54	39	55	38	61
[daNm]	int.*	58	61	57	63	60	69
	peak**	71	71	83	83	87	87
Max. Output,	cont.	6,5	10	6	9	4,8	7,8
[kW]	int.*	10,5	12	9,6	11	8,8	10,6
Max. Pressure Drop	cont.	110	175	90	135	70	115
[bar]	int.*	175	200	140	160	115	140
	peak**	225	225	210	210	175	175
Max. Oil Flow	cont.	60	60	60	60	60	60
[l/min]	int.*	75	75	75	75	75	75
Max. Inlet Pressure	cont.	175	175	175	175	175	175
[bar]	int.*	200	200	200	200	200	200
	peak**	225	225	225	225	225	225
Max. Return Pressure	cont.0-100 RPM	150	100	150	100	150	100
w/o Drain Line or	cont.100-300 RPM	75	30	75	30	75	30
max. Pressure in Drain	cont.300-600 RPM	-	-	-	-	-	-
Line, [bar]	int.* 0-max. RPM	150	100	150	100	150	100
Max. Return Pressure	cont.	175	175	175	175	175	175
with Drain Line	int.*	200	200	200	200	200	200
[bar]	peak**	225	225	225	225	225	225
Max. Starting Pressure with Unloaded Shaft, [bar]		4	4	3	3	3	3
Min. Starting Torque	at max. press. drop cont.	31	50	33	50	30	49
[daNm]	at max. press. drop int.*	48	55	58	66	50	61
Min. Speed***, [RPM]		10	10	10	10	10	10
Weight, avg., [kg]	OR(F)	8,4	8,5	9,1	9,2	9,8	9,9
	ORW	-	12,1	-	12,6	-	13,3
	ORQ	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% for every minute.
*** For speeds of 10 RPM or lower, consult factory or your regional manager.
1. Intermittent speed and intermittent pressure drop must not occur simultaneously!
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommended 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 at operating temperatures.
5. Recommended maximum system operating temperature - 82°C.
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 min.

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	Cont.	200	200	200	200	200	200	160	126	100
[RPM]	Int.*	250	250	250	250	250	250	200	158	126
Max. Output	Cont.	2	4,0	5,0	6,2	7,0	6,8	6,2	5,8	5,2
[kW]	Int.*	3	5,7	7,3	8,5	8,8	8,3	7,8	7,6	6,8
Max. Oil Flow	Cont.	13	23	26	33	40	40	40	40	40
[lpm]	Int.*	16	31	34	45	50	50	50	50	50
Max. Starting Pressure with unloaded Shaft, [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 purposeis to operatees 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	Cont.	9,6	18,5	22,8	28,5	37,1	42,8	51,3	52,2	58,0
[daNm]	Int.*	12,4	20,9	26,6	32,3	40,9	47,5	58,0	60,0	65,6
Max. Output	Cont.	9,0	12,3	12,8	12,4	11,4	10,9	9,9	8,9	7,7
[kW]	Int.*	11,9	14,8	14,8	14,3	13,8	12,8	11,8	10,9	10,5
Max. Pressure Drop	Cont.	140	175	175	175	175	175	175	135	115
[bar]	Int.*	175	200	200	200	200	200	200	160	140
Min. Starting Torque	Cont.	7,6	14,2	19,0	23,8	30,4	39,0	47,5	47,5	46,5
[daNm]	Int.*	9,5	16,2	21,8	26,6	35,2	43,7	52,2	62,7	58,0

SPECIFICATION DATA for OR...FR

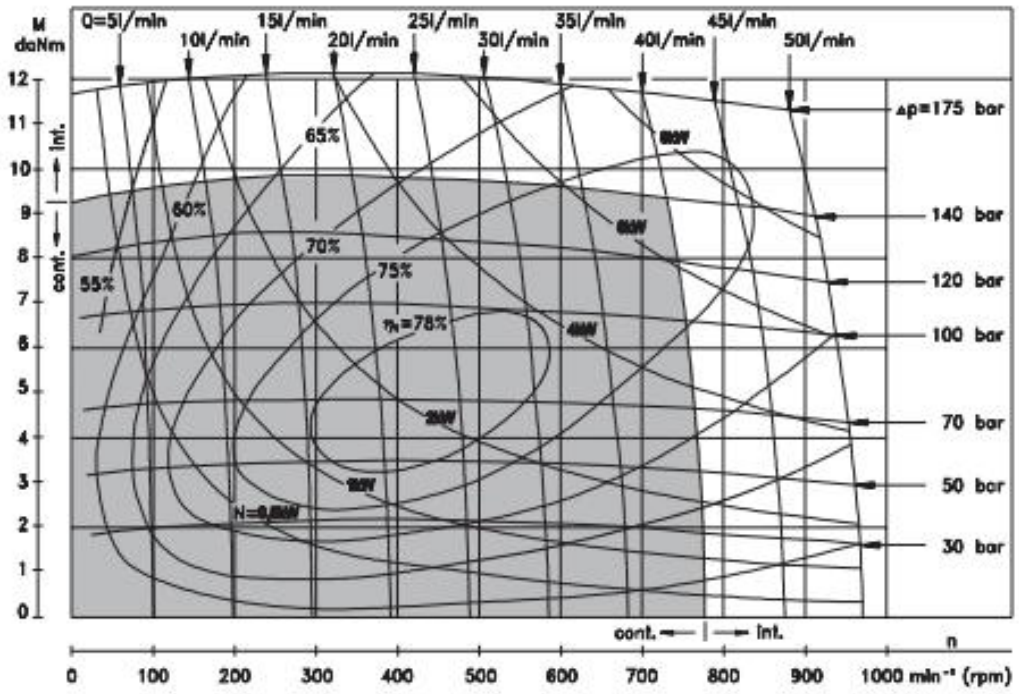
Free Running version "FR" these are the hydraulic motors with reduced mechanical losses , for wich at disengaged condition / unconnected with driving mechanism / the rotation of the shaft could be realized by means of small torque. This advantage is especially useful at operating with high frequencies of rotation /over than 300 min^{-1} / and low pressure drop , which is inbred for types with displacements of up to 200 cm^3. 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 these of the normal versions. That's why the recommended operatingfor "FR version is for applications with pressure dropup 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.

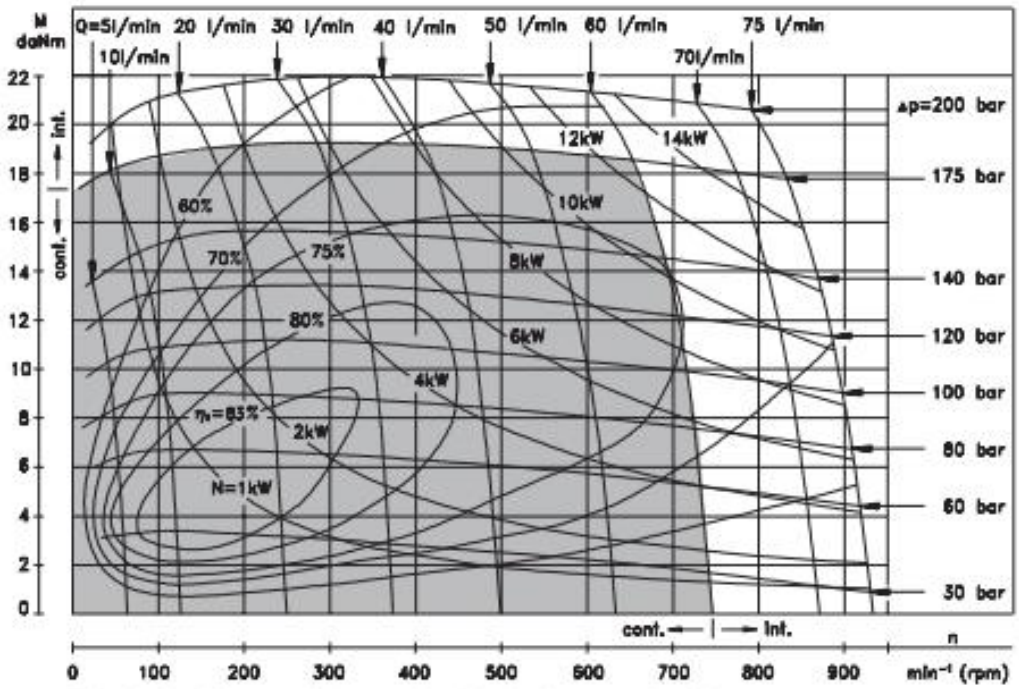
Type	OR 50	OR 80	OR 100	OR 125	OR 160	OR 200
Max. Starting Pressure with Unloaded Shaft, [bar]	8	8	8	7,5	5,5	4

FUNCTION DIAGRAMS

OR 50



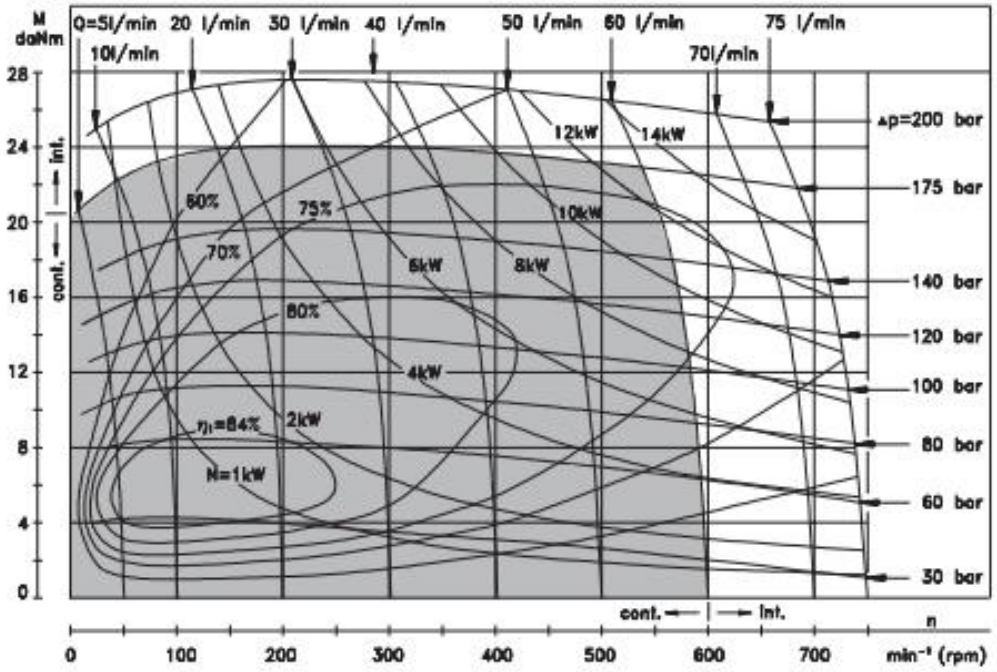
OR 80



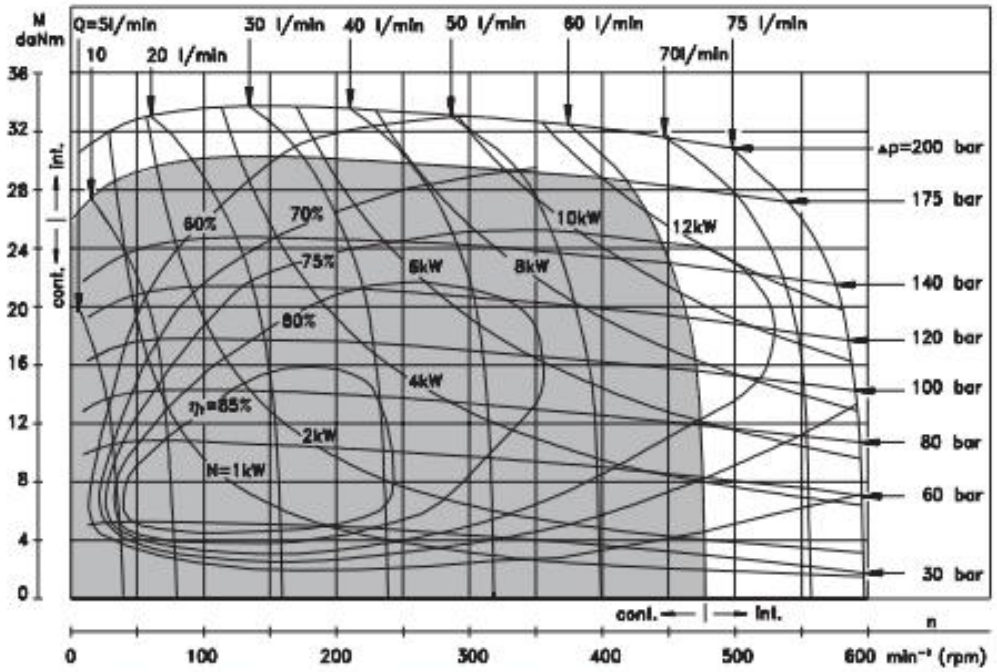
The function diagrams data was collected at back pressure 5+10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

OR 100



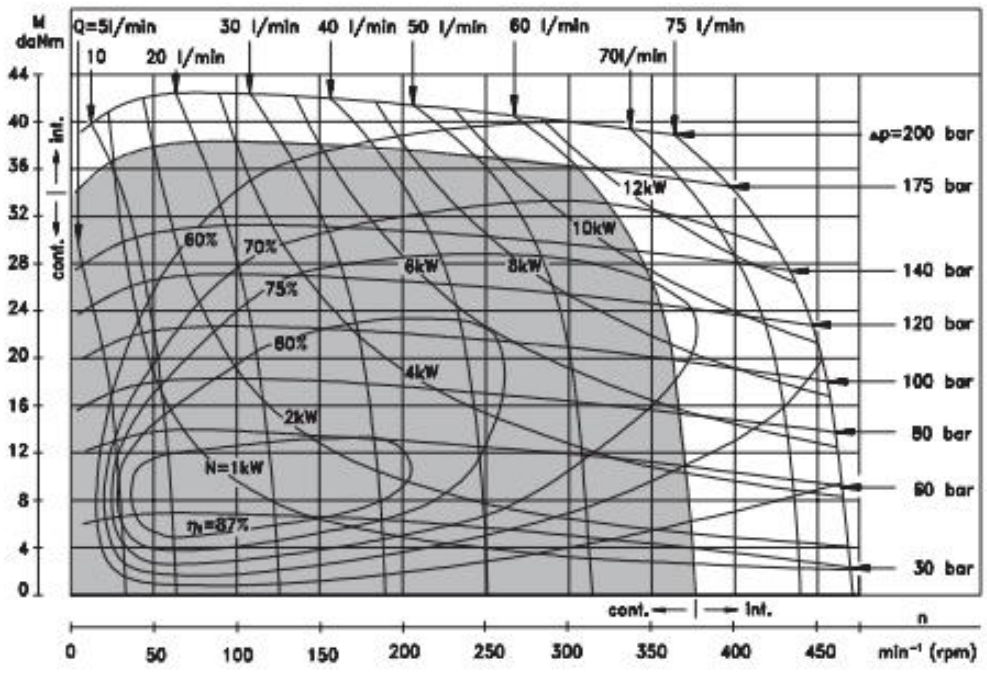
OR 125



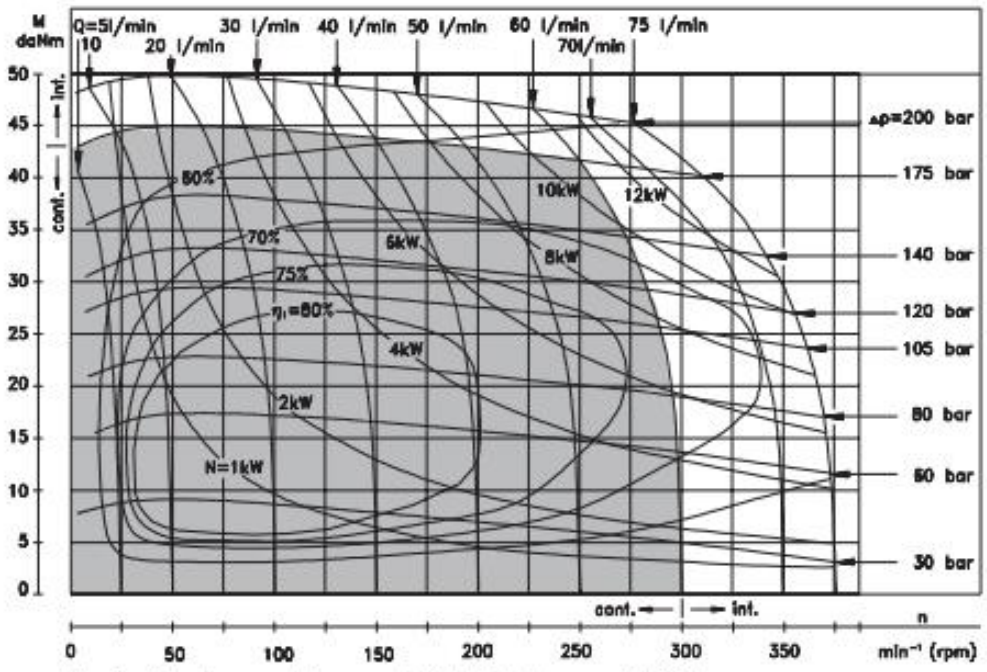
The function diagrams data was collected at back pressure 5÷10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

OR 160



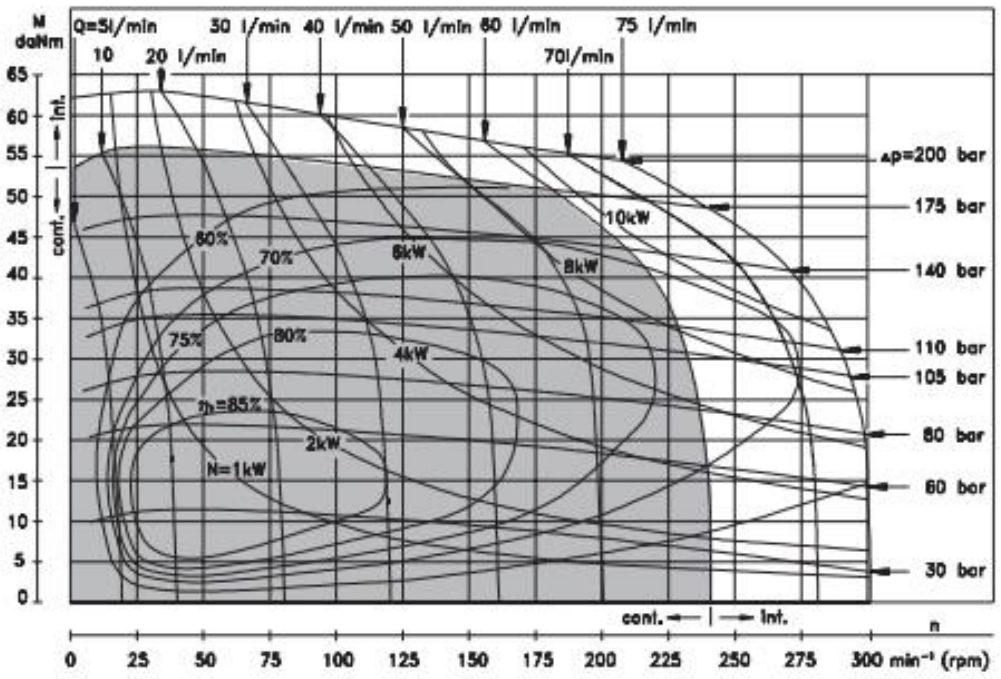
OR 200



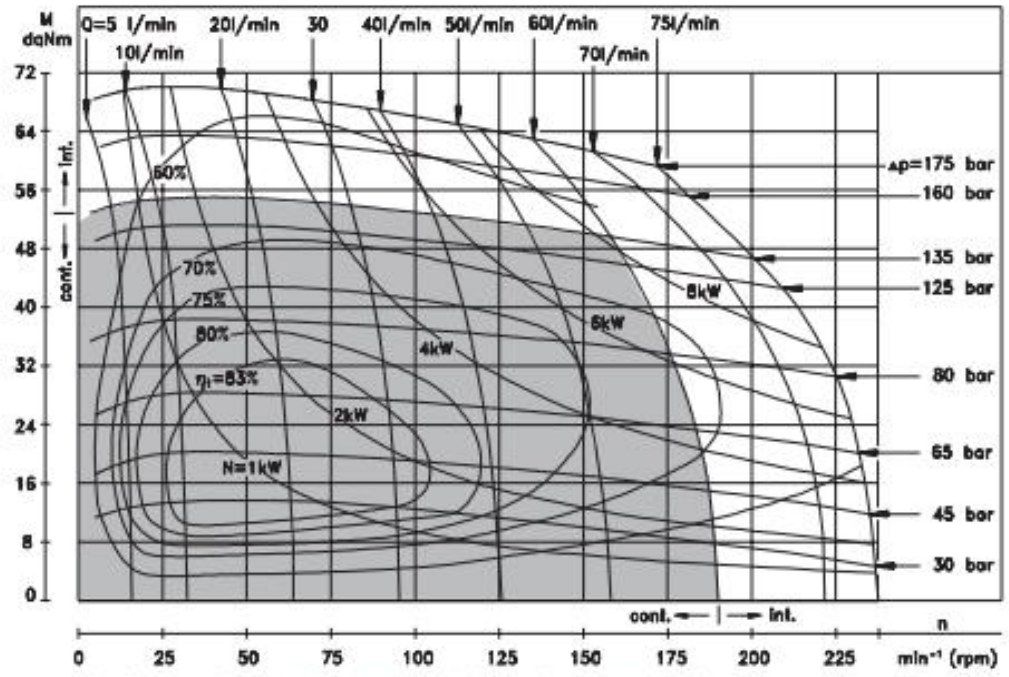
The function diagrams data was collected at back pressure 5÷10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

OR 250



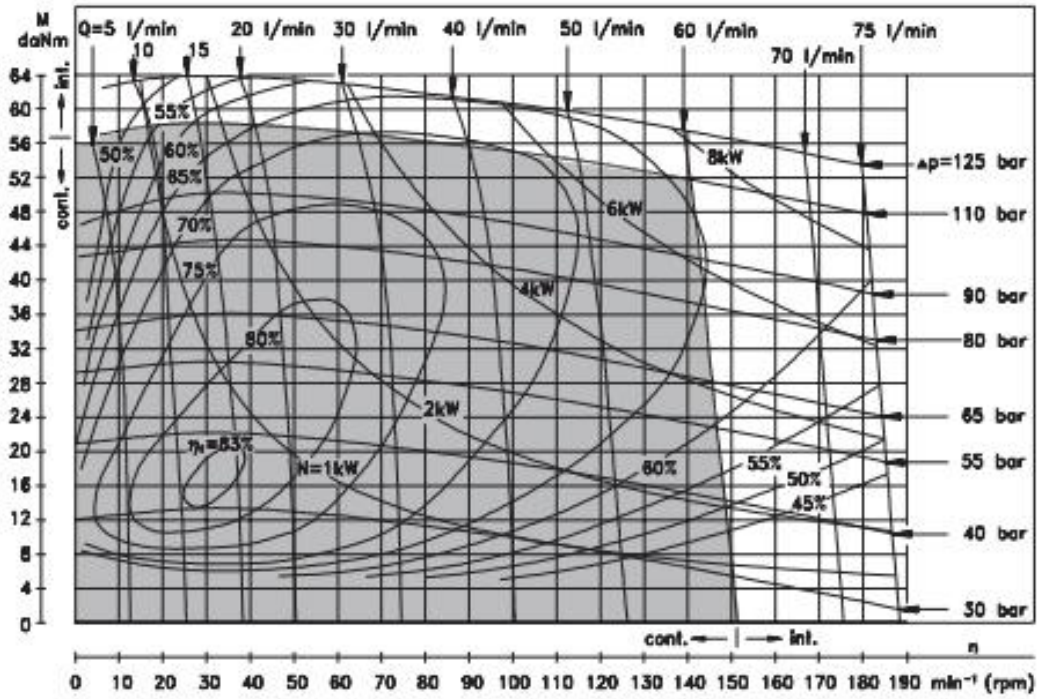
OR 315



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

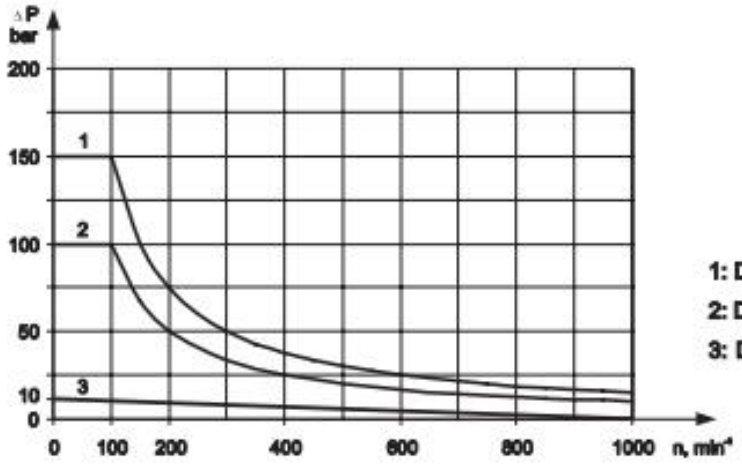
FUNCTION DIAGRAM

OR 400



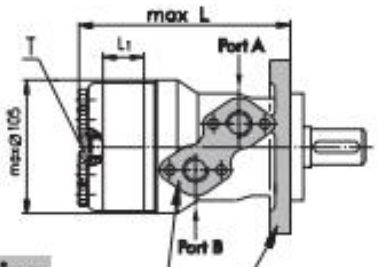
The function diagram data was collected at back pressure 5÷10 bar and oil with viscosity of 32 mm²/s at 50° C.

Max. Permissible Shaft Seal Pressure for OP and OR Motors



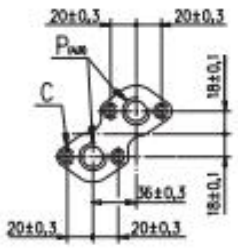
1: Drawing for "D" Seal
2: Drawing for "...B" Shaft Seal
3: Drawing for Quadring

DIMENSIONS AND MOUNTING DATA

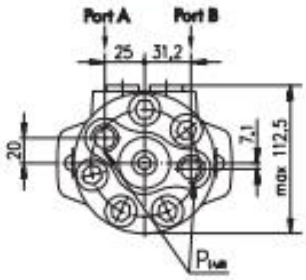


Porting

Side Ports

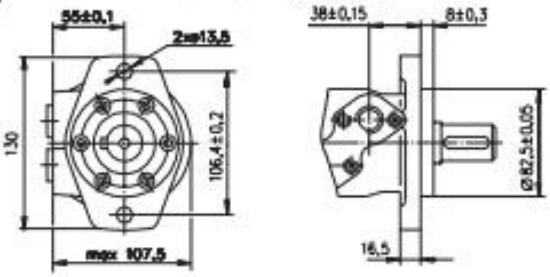


E Rear Ports

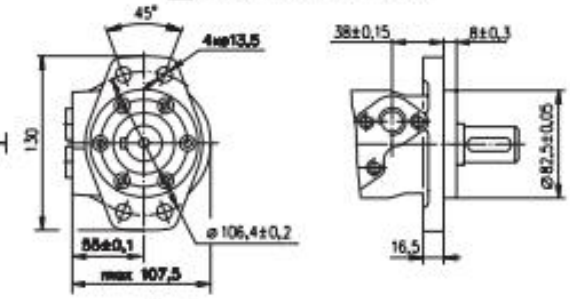


Mounting

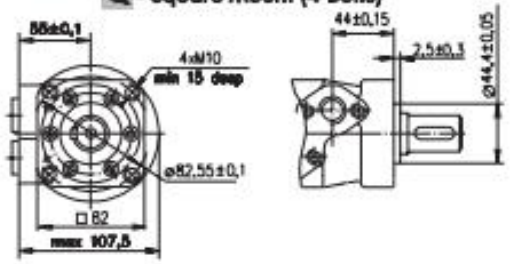
Oval Mount (2 Holes)



F - Oval Mount (4 Holes)



Q - Square Mount (4 Bolts)



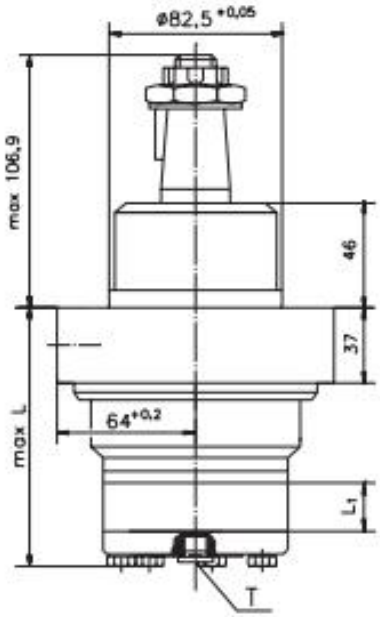
C : 4xM8 - 13 mm depth
$P_{H,R}$:2xG1/2 or 2xM22x1,5 - 15 mm depth
T : G1/4 or M14x1,5 - 12 mm depth (plugged)

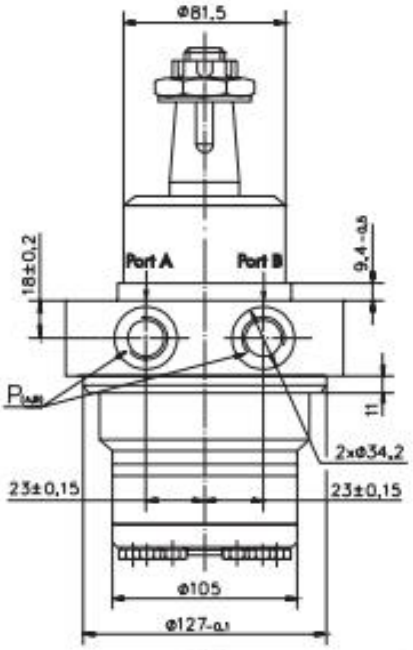
Standard Rotation	Reverse Rotation
Viewed from Shaft End	Viewed from Shaft End
Port A Pressurized - CW	Port A Pressurized - CCW
Port B Pressurized - CCW	Port B Pressurized - CW

Type	L,mm	Type	L,mm	Type	L,mm	Type	L,mm	L_1 mm
ORF 50	138,0	ORQ 50	143,5	ORFE 50	157,5	ORQE 50	163,5	9,0
ORF 80	143,0	ORQ 80	148,5	ORFE 80	162,5	ORQE 80	168,5	14,0
ORF 100	146,0	ORQ 100	152,0	ORFE 100	165,5	ORQE 100	171,5	17,4
ORF 125	150,5	ORQ 125	156,5	ORFE 125	170,0	ORQE 125	176,0	21,8
ORF 160	156,5	ORQ 160	162,5	ORFE 160	176,0	ORQE 160	182,0	27,8
ORF 200	163,5	ORQ 200	169,5	ORFE 200	183,0	ORQE 200	189,0	34,8
ORF 250	172,0	ORQ 250	179,0	ORFE 250	192,0	ORQE 250	198,0	43,5
ORF 315	183,0	ORQ 315	189,0	ORFE 315	204,0	ORQE 315	210,0	54,8
ORF 400	198,0	ORQ 400	204,0	ORFE 400	218,0	ORQE 400	224,0	69,4

DIMENSIONS AND MOUNTING DATA - ORW

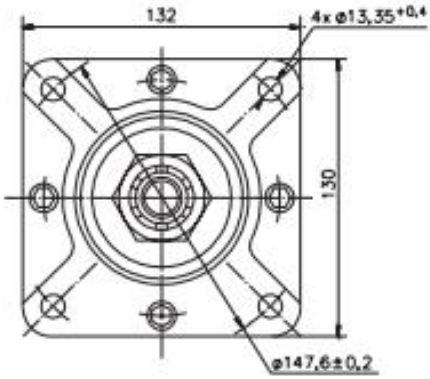
W Wheel Mount



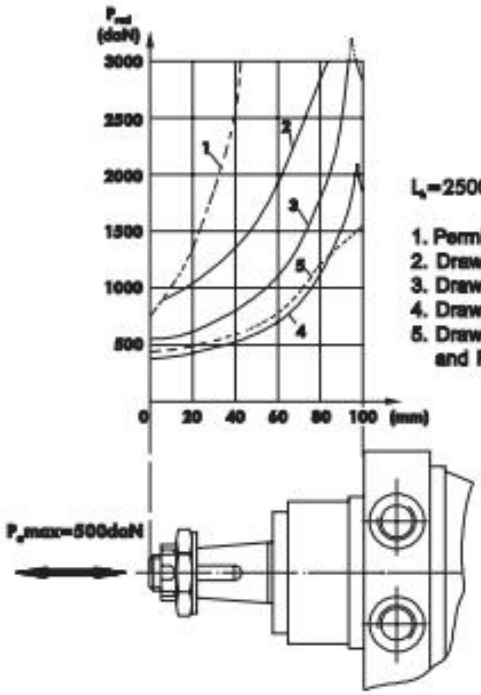


P_{PLUG}: 2xG1/2 or 2xM22x1,5 - 15 mm depth
T : G1/4 or M14x1,5 - 12 mm depth (plugged)

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



Permissible Shaft Loads ORW



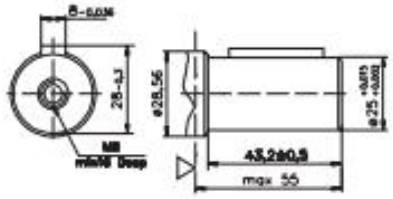
L_h=2500 h

1. Permissible radial shaft load
2. Drawing by n= 50 min^{-1}
3. Drawing by n=200 min^{-1}
4. Drawing by n=600 min^{-1}
5. Drawing by n=200 min^{-1} and P_a max=500 daN

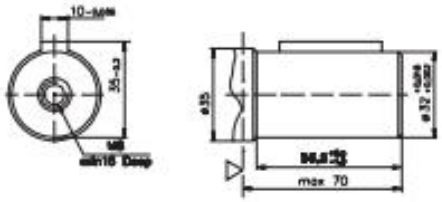
Type	L_1 mm	L_{11} mm
ORW 50	108,0	9,0
ORW 80	113,0	14,0
ORW 100	116,5	17,4
ORW 125	121,0	21,8
ORW 160	127,0	27,8
ORW 200	134,0	34,8
ORW 250	142,5	43,5
ORW 315	154,0	54,8
ORW 400	168,5	69,4

SHAFT EXTENSIONS FOR OP AND OR MOTORS

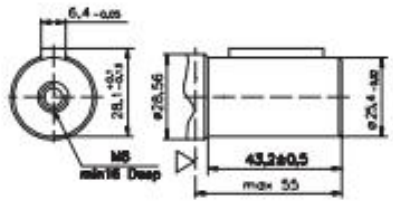
C - ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 44 daNm



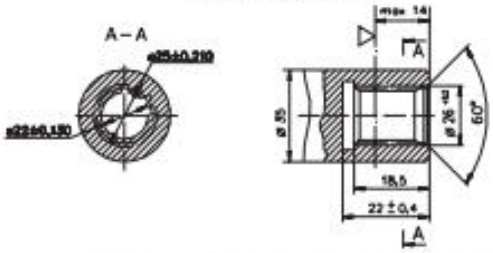
CB - ø32 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm



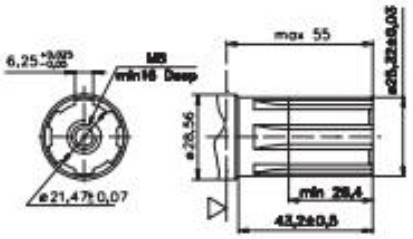
CO - ø1" straight, Parallel key ¼"x¼"x1¼" BS46
Max. Torque 44 daNm



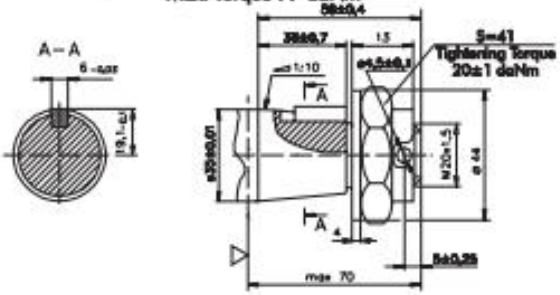
SB - splined A25x22xH10 DIN 5482
Max. Torque 44 daNm



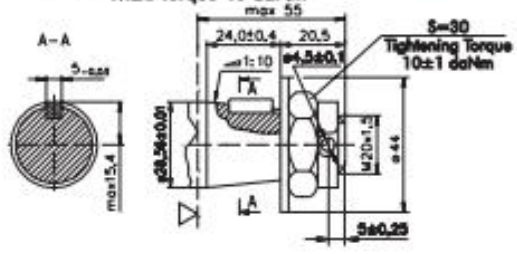
SH - splined, BS 2059 (SAE 6B)
Max. Torque 44 daNm



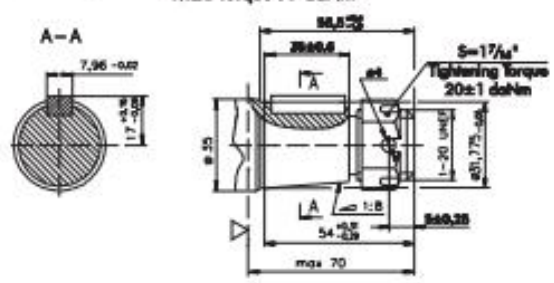
KB - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 77 daNm



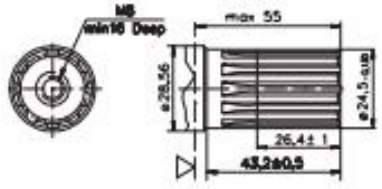
K - tapered 1:10, Parallel key B5x5x14 DIN 6885
Max. Torque 40 daNm



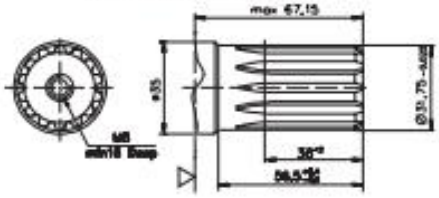
OB - tapered 1:8 SAEJ 501, Parallel key 5/16"x5/16"x1¼" BS46
Max. Torque 77 daNm



SA - splined, B25x22h9 DIN 5482
Max. Torque 40 daNm



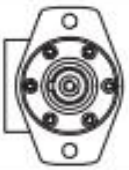
HB - ø1¼" splined 14T, ANSI B92.1-1976 Norm
Max. Torque 77 daNm



▽- 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.

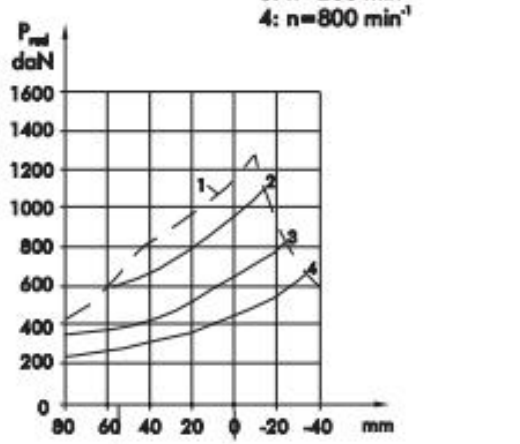
Mounting Flange			
Shaft Version	cylindrical - C, CO tapered - K, splined - SH	splined - HB cylindrical - CB	cylindrical - C, CO
Radial Shaft Load P^{*}_{rad}	$\frac{800}{n} \times \frac{25000}{95+L}$, daN	$\frac{800}{n} \times \frac{18750}{95+L}$, daN	$\frac{800}{n} \times \frac{25000}{101+L}$, daN

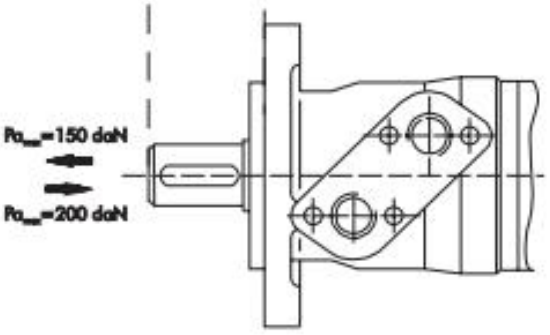
n<200 min^{-1}; max P_{rad} =800 daN
*n≥200 min^{-1}; L<55 mm

ORN

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

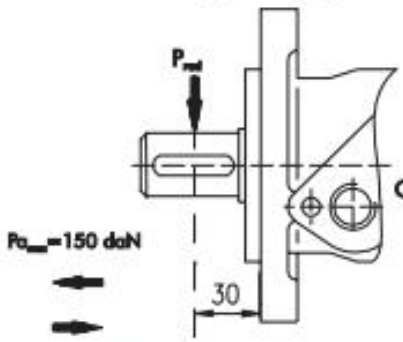
1: Max. radial shaft load
2: n= 50 min^{-1}
3: n=200 min^{-1}
4: n=800 min^{-1}

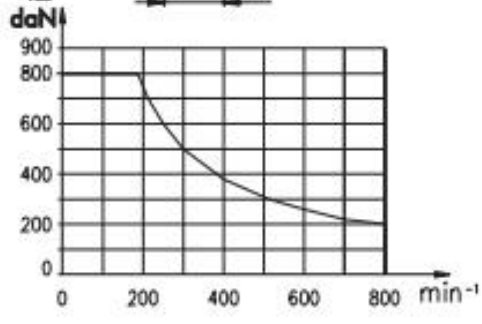




OR

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



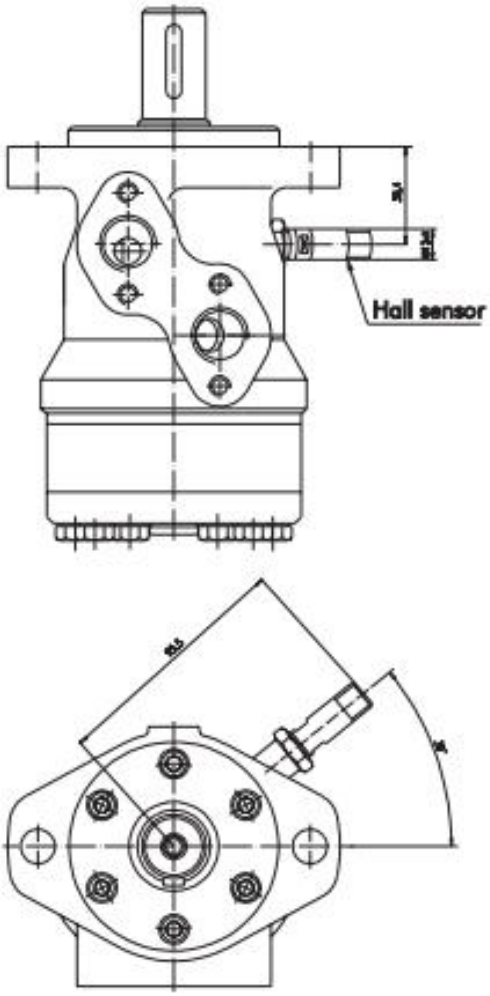


HYDRAULIC MOTORS WITH SPEED SENSOR TYPE

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. A connection is provided in the housing by a Plug connector M12 Series.

OR...RS



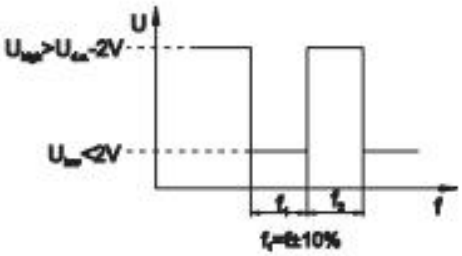
This performance is applicable for all motors of OR series. The main technical features correspond to the standard motors series OR.

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

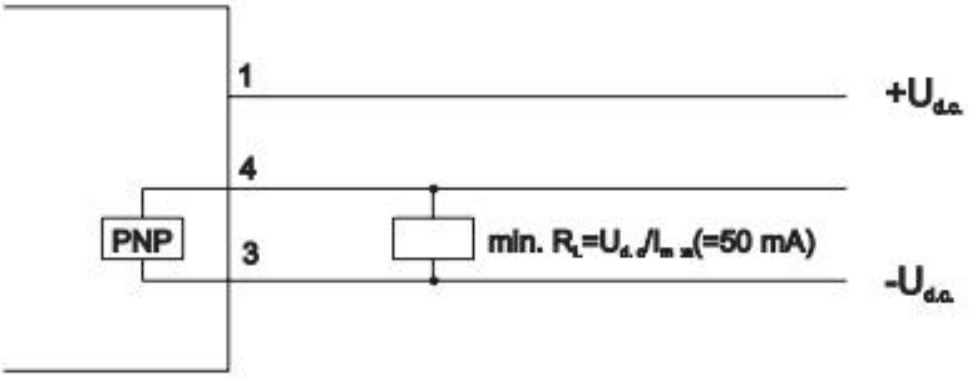
Output signal



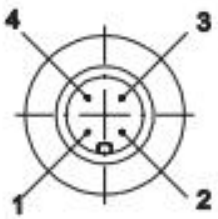
Load max.: $I_{high} = I_{low} < 50mA$

No load current, max: 20 mA

Wiring diagram



Stik type



Terminal No.	Connection
1	$U_{d.c.}$ (+supply)
2	No connection
3	$U_{d.c.}$ (-supply)
4	Output signal