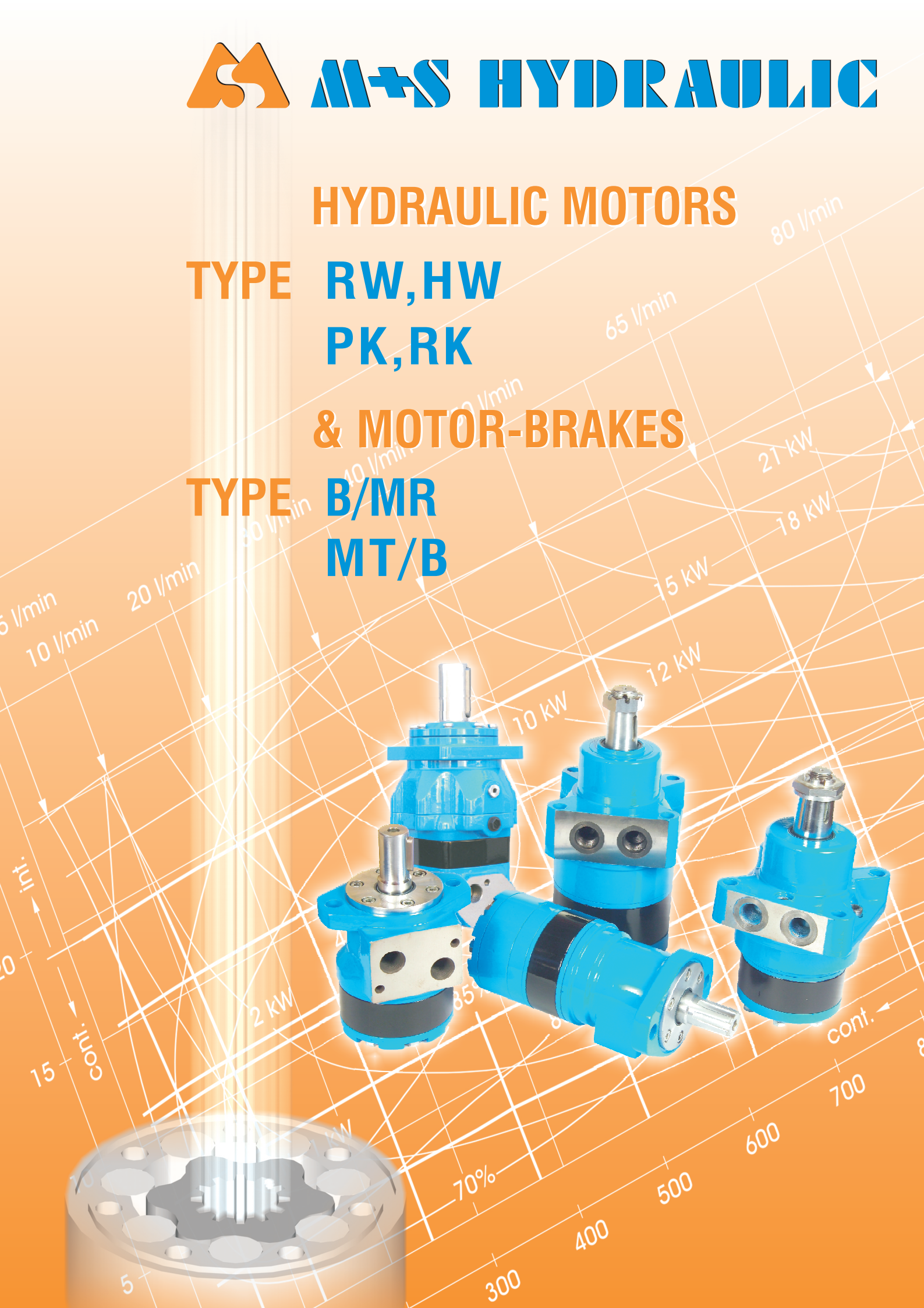
M+S HYDRAULIC

HYDRAULIC MOTORS

TYPE RW,HW
PK,RK

& MOTOR-BRAKES

TYPE B/MR
MT/B



HYDRAULIC MOTORS

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HYDRAULIC MOTORS AND MOTOR-BRAKES

GENERAL INFORMATION:

Orbit motors convert hydraulic energy (pressure, oil flow) into mechanical energy (torque, speed). Hydraulic orbit motors operate on the principle of an internal gear (rotor) rotating within a fixed external gear (stator). The internal gear transmits the torque generated by the application of pressure from hydraulic oil fed into motor which is then delivered via the motor's output shaft. Orbit motors have high starting torque and constant output torque at wide speed range.

DISTRIBUTOR VALVE

PK, RK, RW, HW series motors have spool valve: the distributor valve has been integrated with the output shaft. The cardan shaft rotates distributor valve and transfers mechanical energy from gerotor set to output shaft. The valve has hydrodynamic bearings and has infinite life when load ratings are not exceeded.

GEARWHEEL SET

There are two forms of gearwheel set:

- Gerotor set have plain teeth. These types motors are suitable for long operating periods at moderate pressures or short operating periods at high pressures. PK series motors have gerotor set.

- Roll-gerotor set have teeth fitted with rollers. The rollers reduce local stress and the tangential reaction forces on the rotor reducing friction to a minimum. This gives long operating life and better efficiency even at continuous high pressures. Roll-gerotor sets are recommended for operation with thin oil and for applications with continually reversing loads. RK, RW and HW series motors have roll-gerotor set.

FEATURES:

Standard Motor The standard motor mounting flange is located as close to the output shaft as possible. This type of mounting supports the motor close to the shaft load. This mounting flange is also compatible with many standard gear boxes.

Wheel Motor W mounting flange makes the motors RW and HW possible to fit a wheel hub or a winch drum so that the radial load acts closer to motor bearings. The output shaft is supported on needle bearings and it makes RW and HW suitable to absorb static and dynamic loads. This gives the best utilization of the bearing capacity and is a very compact solution.

Low Leakage **LL** Series hydraulic motors are 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 drain ports. This motors are suitable for hydraulic systems with series-conected motors with demands for low leakage.

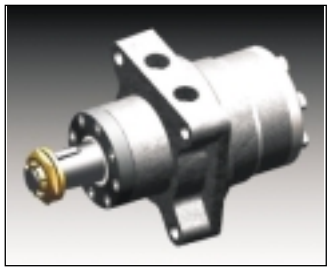
Low Speed Valve **LSV** feature optimizes the motor for low-speed performance. Motors with this valving provide very low speed while maintaining high torque. They are designed to run continuously at low speed (up to 200 min^{-1}) at normal pressure drop and reduced flow. Optimal run is guaranteed at frequency of rotation from 20 to 50 min^{-1} . Motors with this valving have an increased starting pressure and are not recommended for using at pressure drop less than 40 bar.

Free Running **FR** motors are with increased clearance at all friction parts, allowing the shaft to rotate more freely with less mecanical drag. The increased clearance also improves lubrication of the wear surfaces of gear set and friction parts. Additional advantages of "FR" version are prolonging of the life of the hydraulic motors at high speeds , as well as the possibility to use them in systems with wide variation of the loading. **FR** Series motors are designed to operate with high speed /over than 300 min^{-1}/ and low pressure drop. Volumetric efficiency may be reduced slightly.

Motor-brake B/MR B/MR is a combination between spool valve hydraulic motors, type MR and parking brake with friction discs, built in the end side of the hydraulic motor. The disk brake is released by hydraulic pressure. This motor-brakes is very compact solution for applications like winches and small automotive transmission systems.

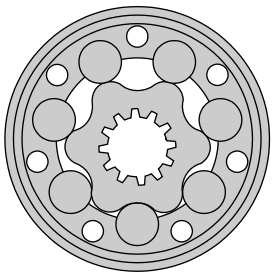
Motor-brake MT/B Motor-brakes MT/B are intended for hydraulic drive of operating systems, where the block and the release of the drive must be by means of hydraulic energy. The system has small overall dimensions and minimum weight. In the package are combined efficient hydraulic power of motors type MT with a reliable integral hydraulic disc brake. Motor-brakes are intended to operate as static or parking brakes.

HYDRAULIC MOTORS RW



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
» Wheel mount
» Shafts- straight and tapered
» Shaft seal for high and low pressure
» Metric and BSPP ports
» Other special features

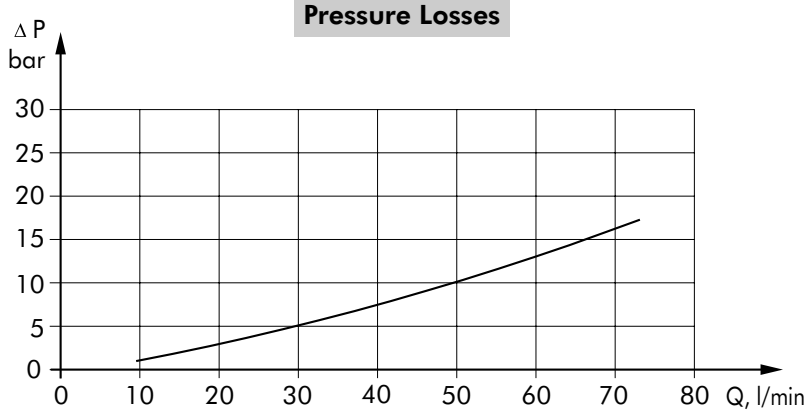
GENERAL

Displacement, [cm^3/rev.]	51,5÷397
Max. Speed, [RPM]	150÷775
Max. Torque, [daNm]	10÷61
Max. Output, [kW]	7÷13
Max. Pressure Drop, [bar]	110÷175
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)

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

Pressure Losses



SPECIFICATION DATA

Type		RW								
		50	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**
Displacement, [cm³/rev.]		51,5	80,3	99,8	125,7	159,6	199,8	250,1	315,7	397
Max. Speed,	cont.	775	750	600	475	375	300	240	190	150
[RPM]	int.*	970	940	750	600	470	375	300	240	190
Max.	cont.	10	20	24	30	39	45	54	55	61
Torque	int.*	13	22	28	34	43	50	61	69	69
[daNm]	peak**	17	27	32	37	46	56	71	84	87
Max. Output,	cont.	7	12,5	13	12,5	11,5	11	10	9	7,8
[kW]	int.*	8,5	15	15	14,5	14	13	12	10	10,6
Max. Pressure	cont.	140	175	175	175	175	175	175	135	110
Drop	int.*	175	200	200	200	200	200	200	175	140
[bar]	peak**	225	225	225	225	225	225	225	210	175
Max. Oil Flow	cont.	40	60	60	60	60	60	60	60	60
[l/min]	int.*	50	75	75	75	75	75	75	75	75
Max. Inlet	cont.	175	175	175	175	175	175	175	175	175
Pressure	int.*	200	200	200	200	200	200	200	200	200
[bar]	peak**	225	225	225	225	225	225	225	225	225
Max. Return Pressure	cont.	175	175	175	175	175	175	175	175	175
with Drain Line	int.*	200	200	200	200	200	200	200	200	200
[bar]	peak**	225	225	225	225	225	225	225	225	225
Max. Starting Pressure with Unloaded Shaft, [bar]		10	10	10	9	7	5	5	5	5
Min. Starting Torque	at max. press. drop cont.	8	15	20	25	32	41	50	50	50
[daNm]	at max. press. drop int.*	10	17	23	28	37	46	55	66	61
Min. Speed***, [RPM]		10	10	10	10	10	10	10	10	10
Weight, avg. [kg]		9,6	9,7	9,8	10,0	10,3	10,8	11,3	11,8	12,5

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

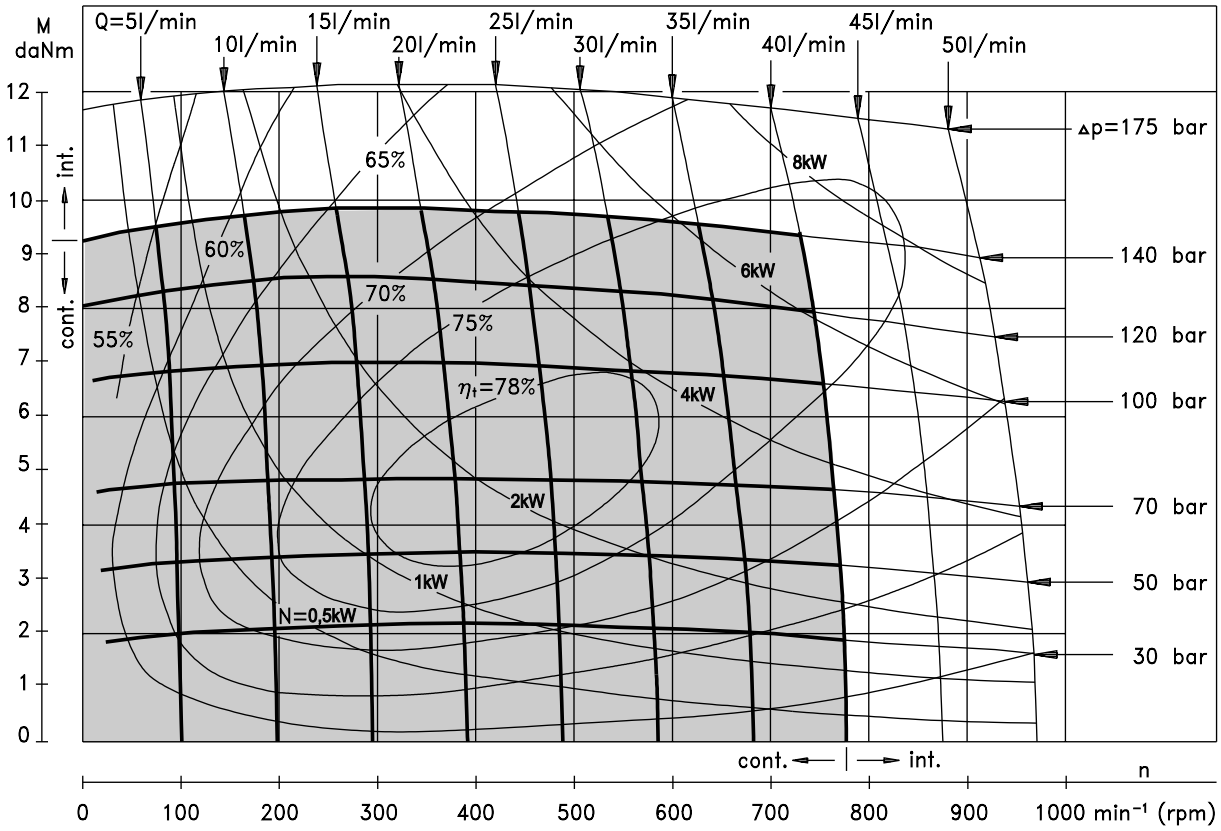
** Peak load: the permissible values may occur for max. 1% for every minute.

*** For speeds of 10 RPM or lower, consult factory or your regional manager.

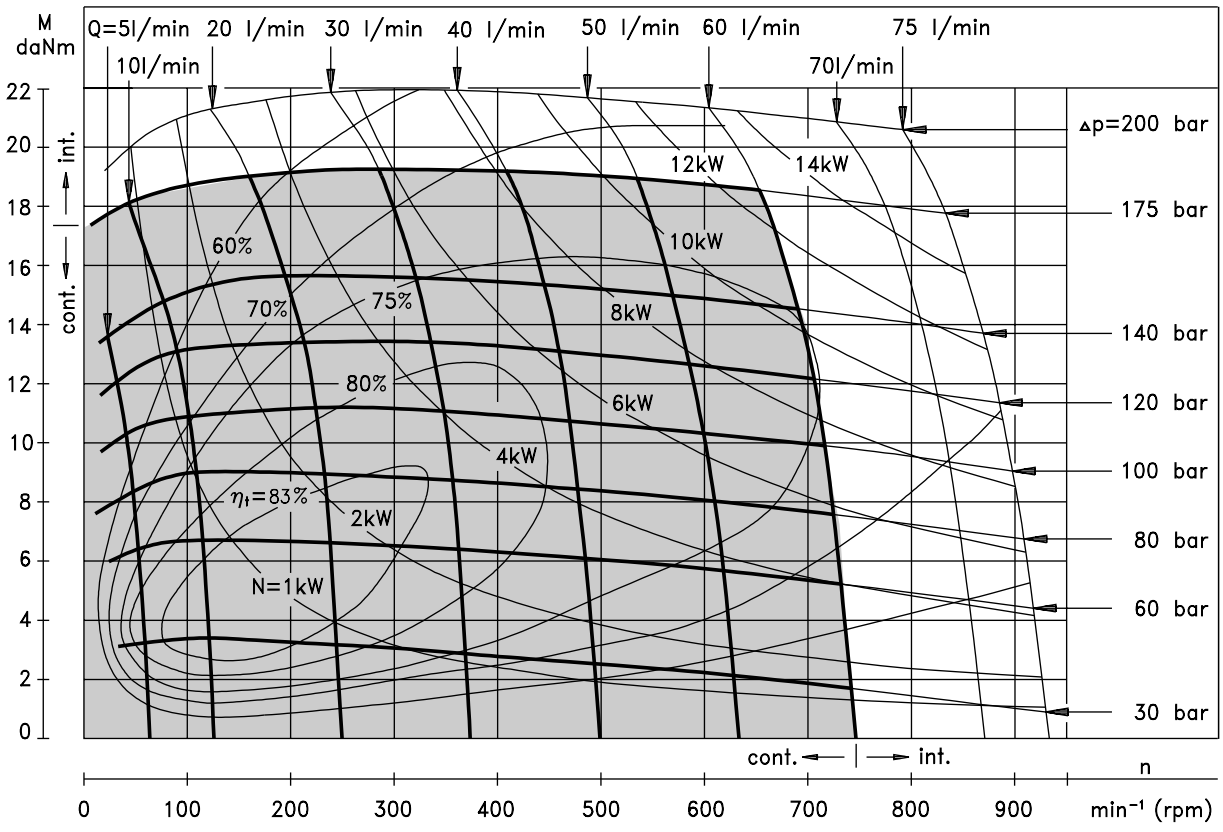
1. Intermittent speed and intermittent pressure drop must not occur simultaneously!
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommended using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). 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.

FUNCTION DIAGRAMS

RW 50



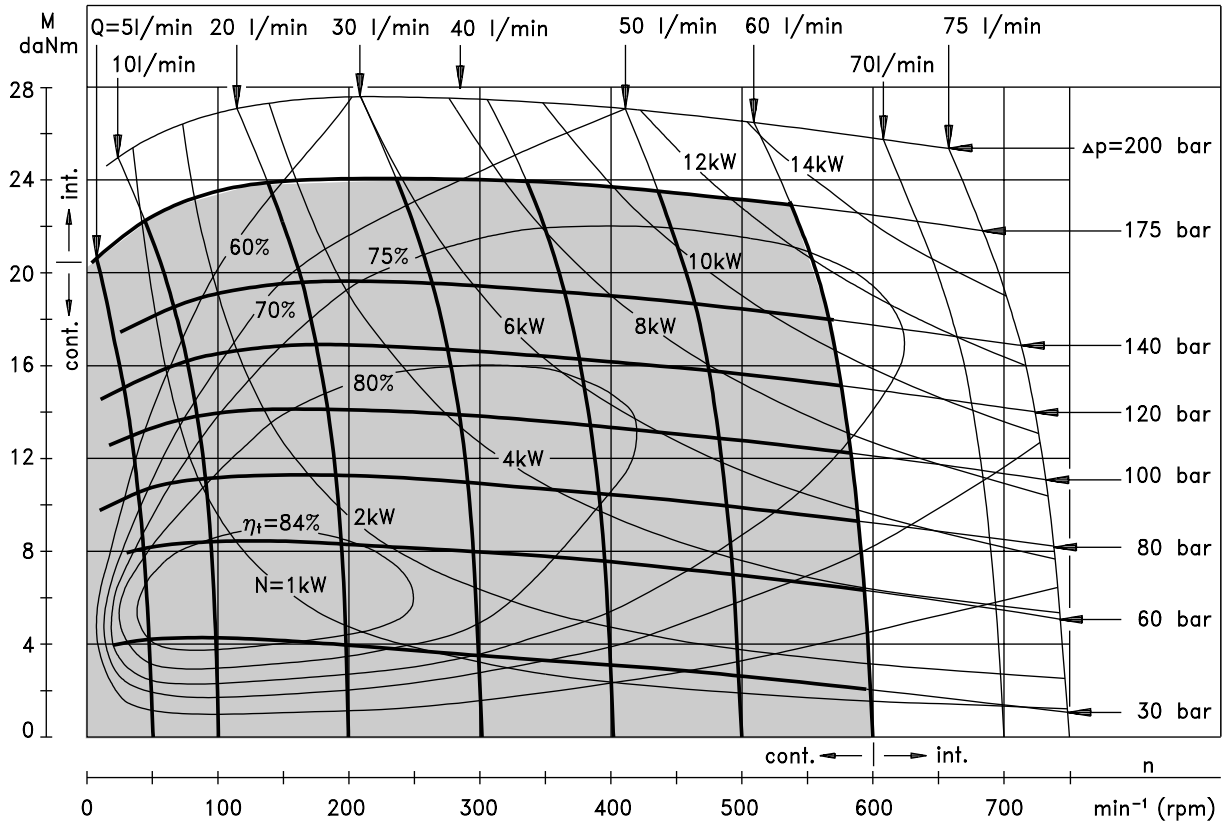
RW 80



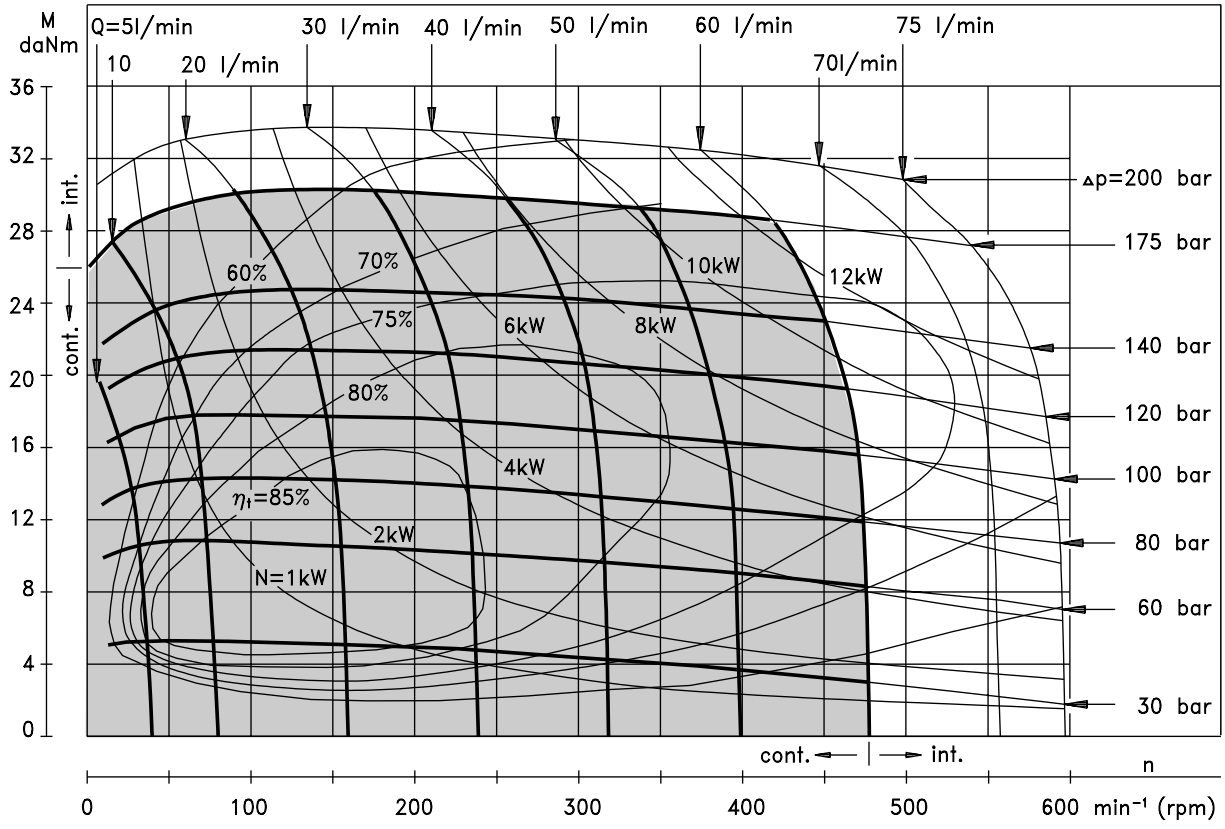
The function diagrams data was collected at back pressure 5÷10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

RW 100



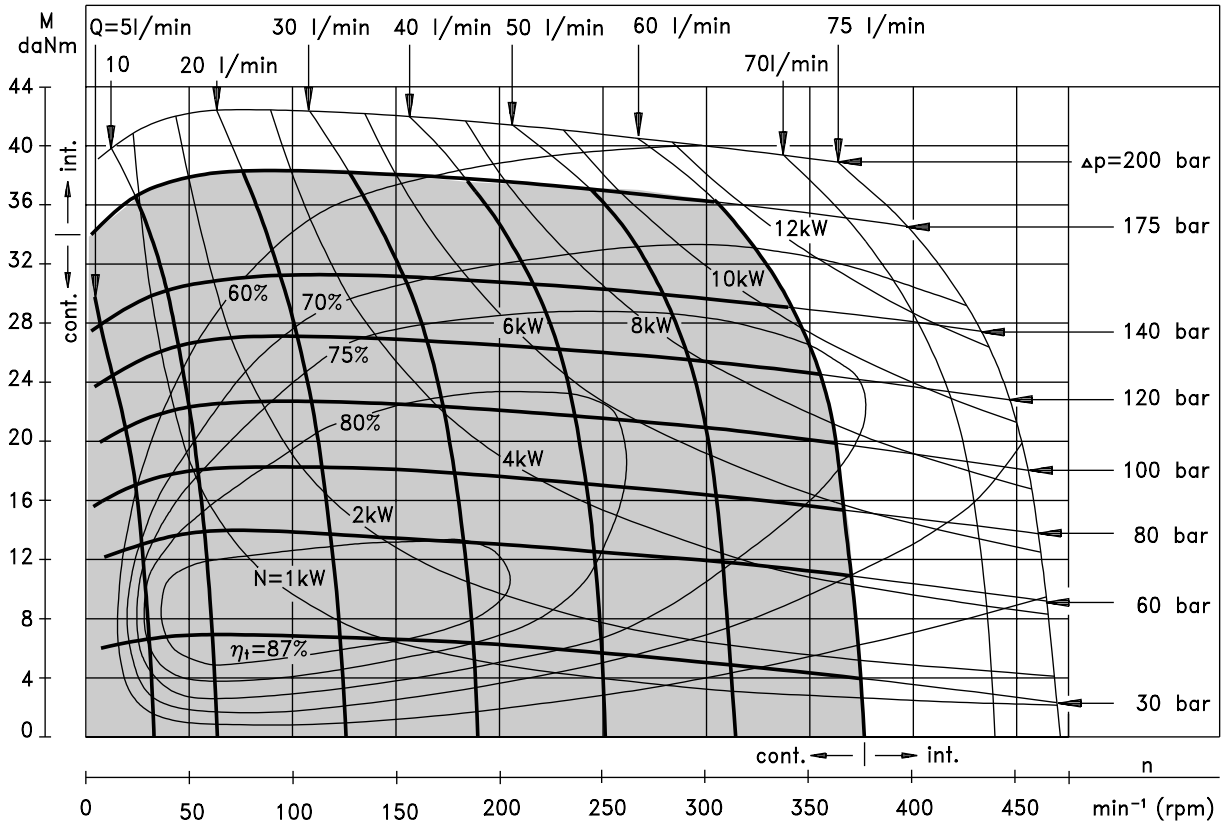
RW 125



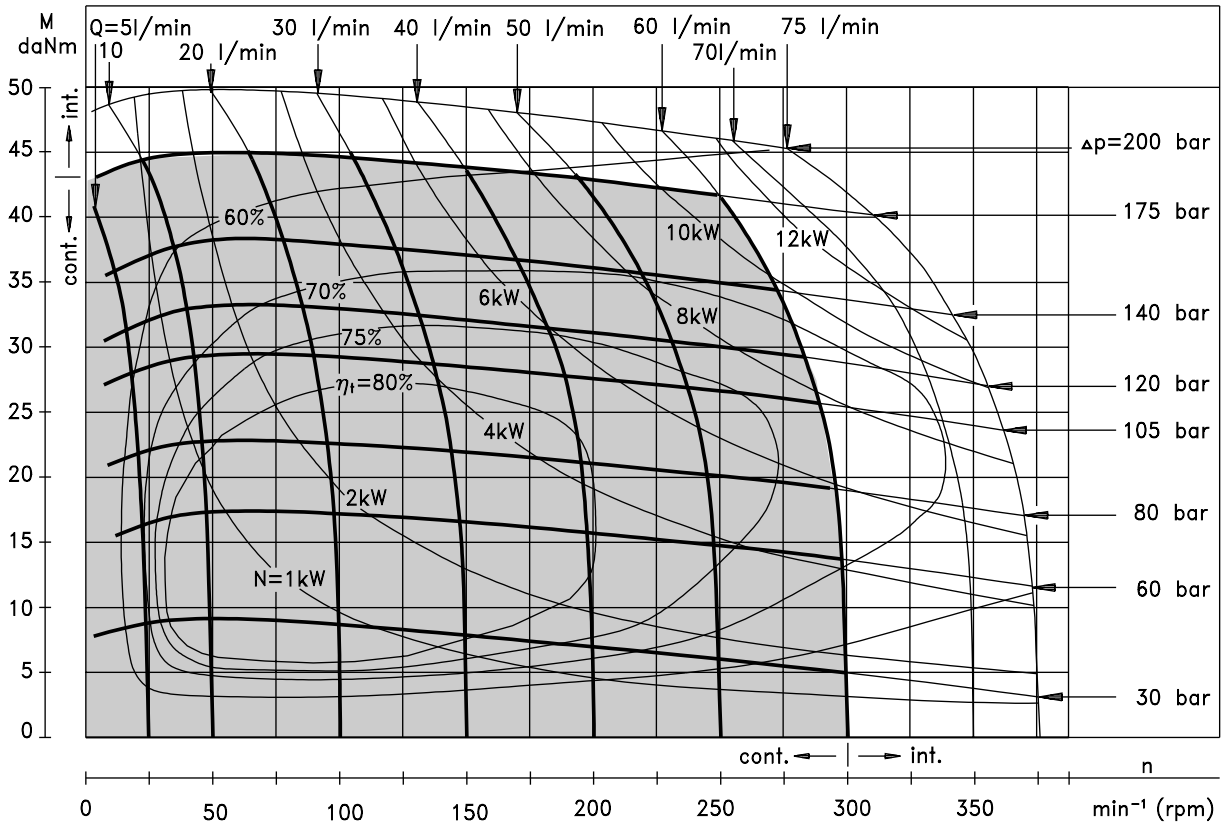
The function diagrams data was collected at back pressure 5÷10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

RW 160



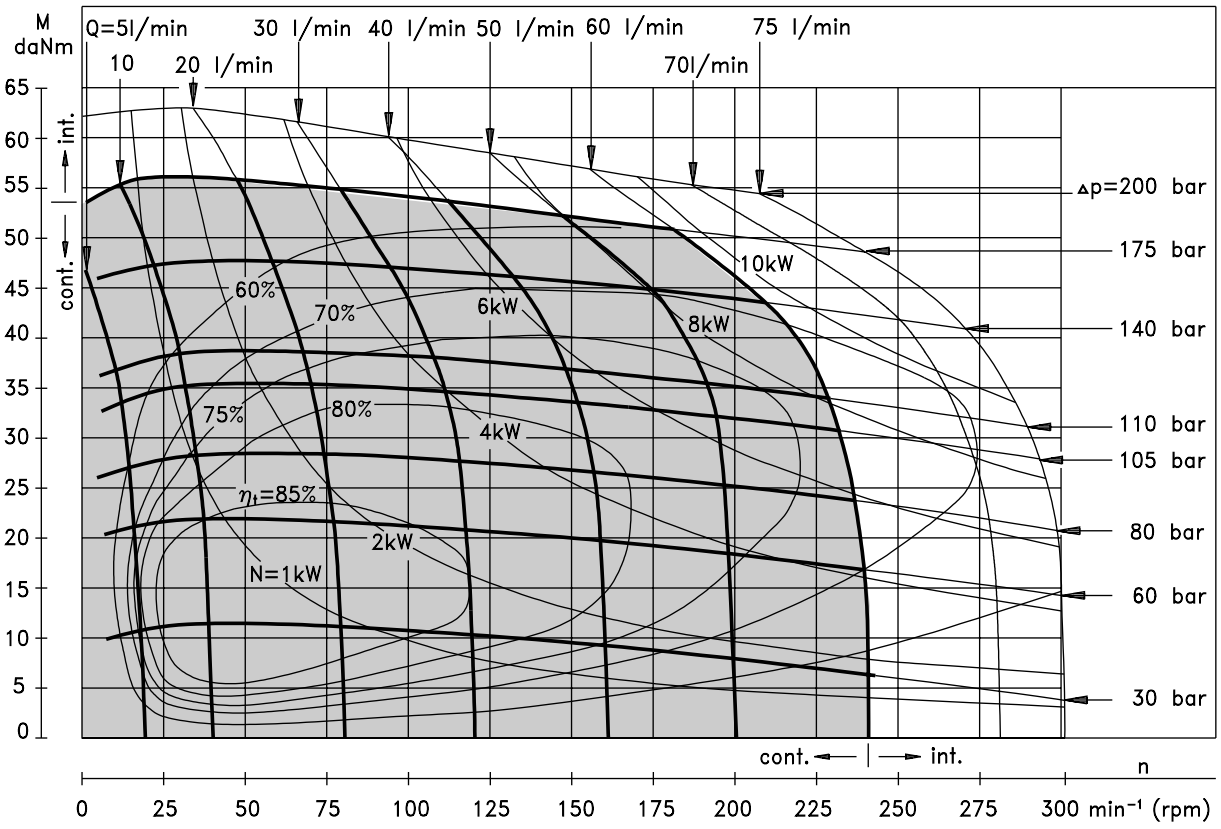
RW 200



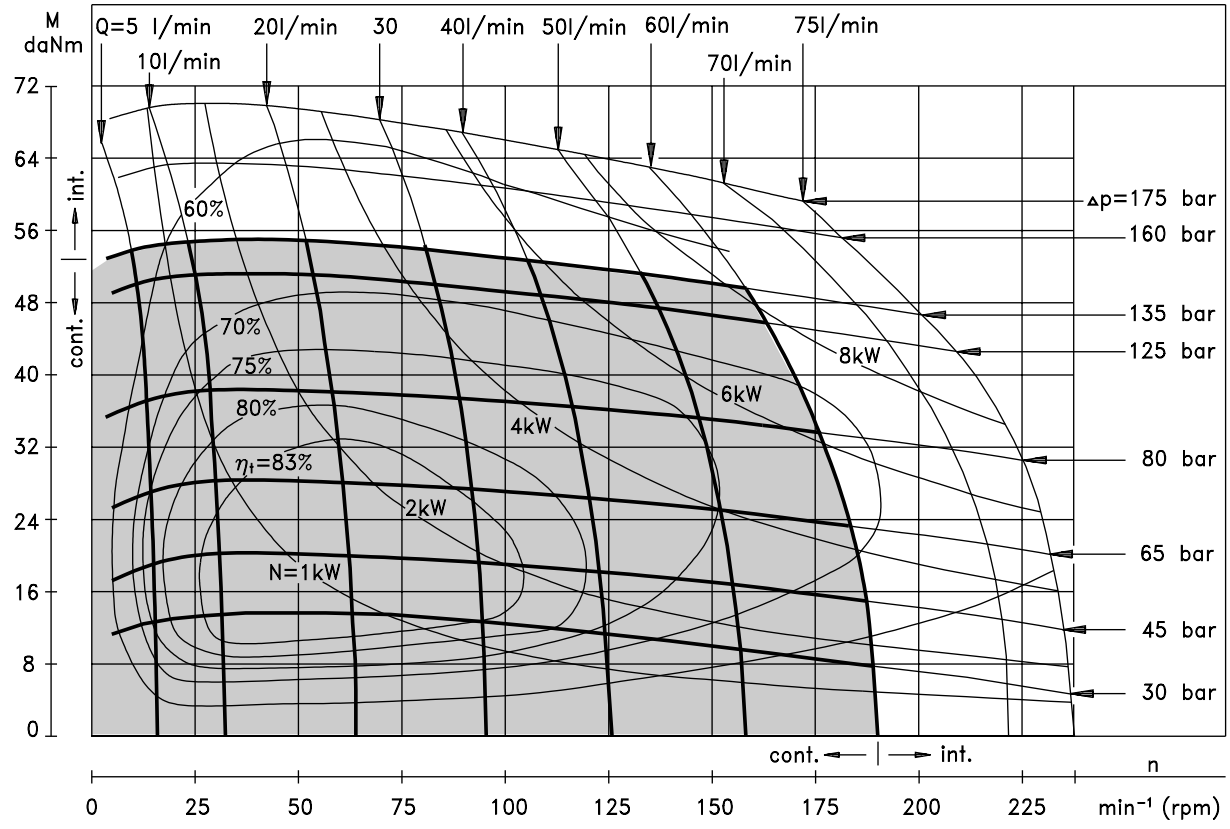
The function diagrams data was collected at back pressure 5÷10 bar and oil with viscosity of 32 mm²/s at 50° C.

FUNCTION DIAGRAMS

RW 250



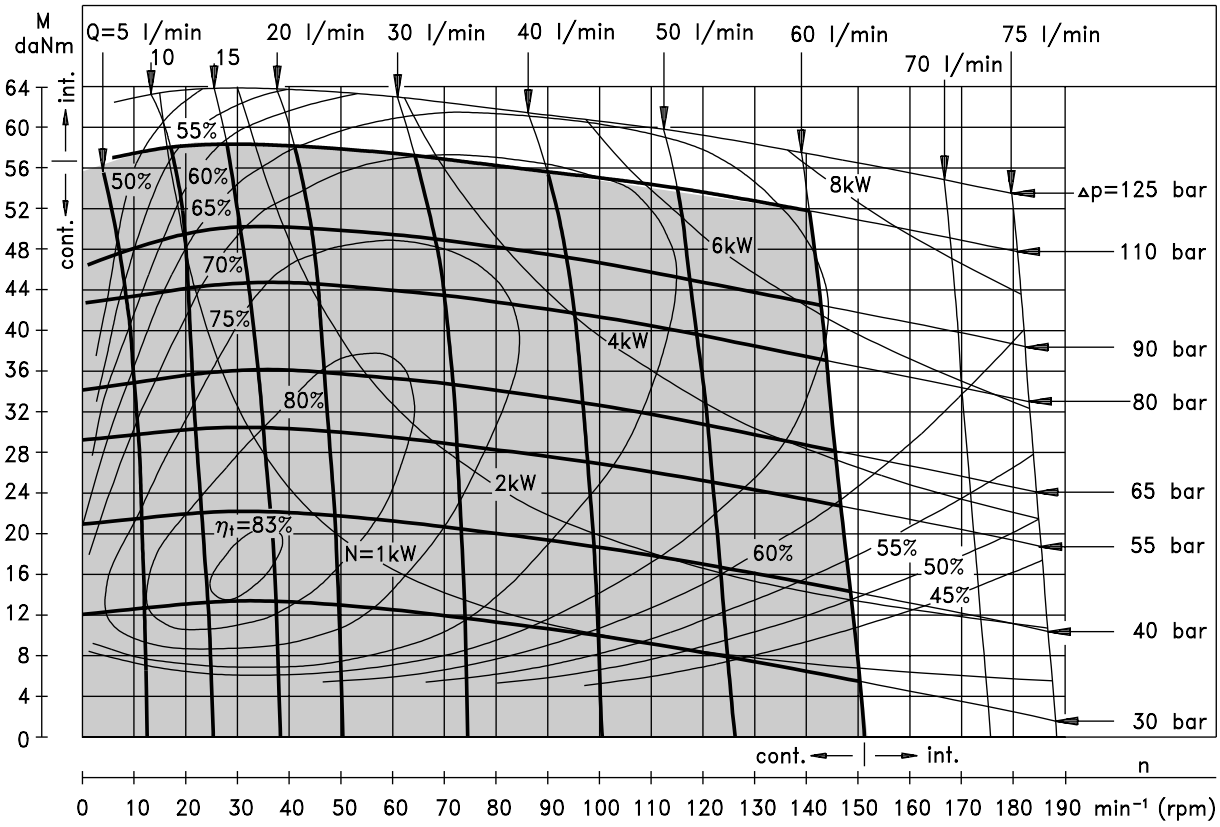
RW 315



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

RW 400

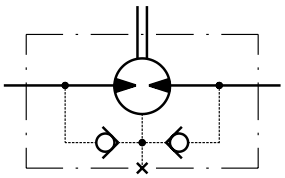


The function diagram data was collected at back pressure 5÷10 bar and oil with viscosity of 32 mm²/s at 50° C.

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

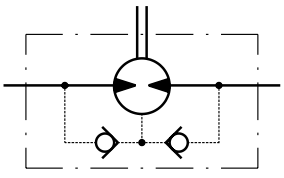
RW...; RW...UK motors with drain connection:

The shaft seal pressure equals the pressure in the drain line.



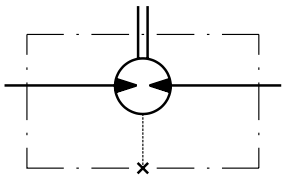
RW...1 motors without drain connection:

The shaft seal pressure never exceeds the pressure in the return line.

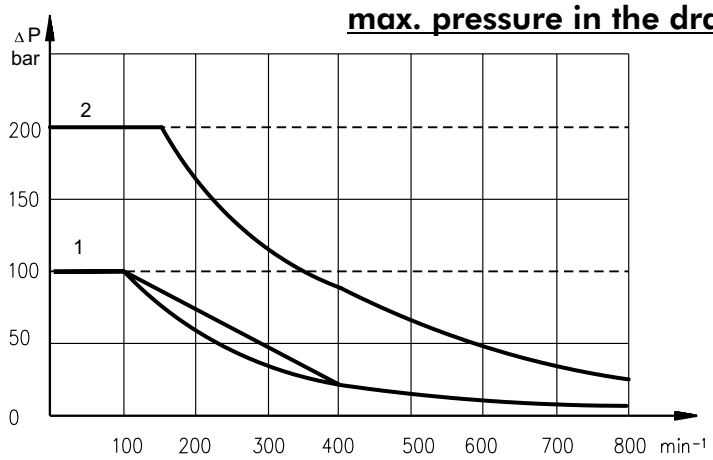


RW...U motors with high pressure seal and drain connection:

The shaft seal pressure equals the pressure in the drain line.



Max. return pressure without drain line or max. pressure in the drain line



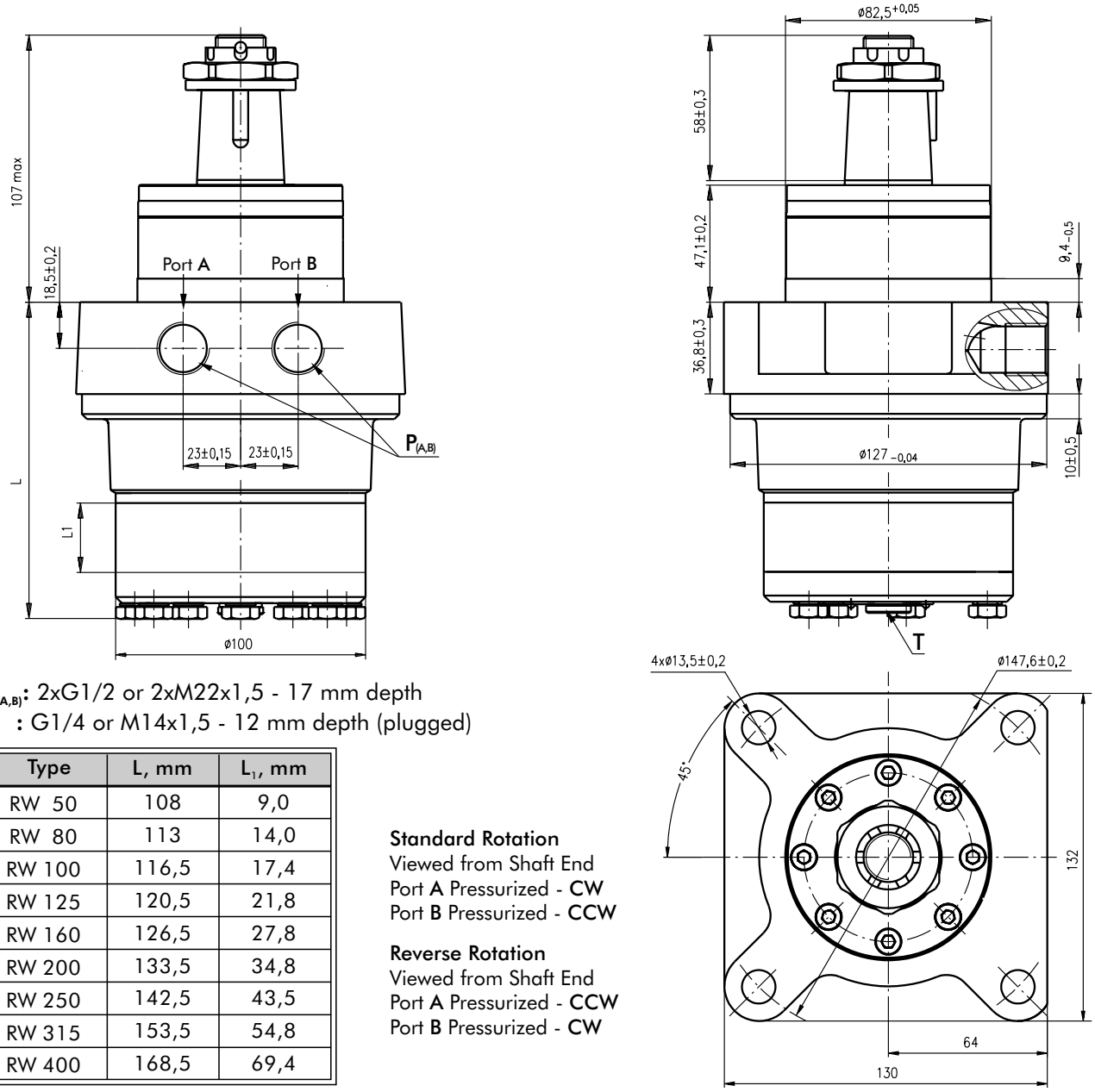
1: Drawing for Standard Shaft Seal

2: Drawing for High Pressure Seal ("**U**" Seal)

——— - continuous operations

– – – – – - intermittent operations

DIMENSIONS AND MOUNTING DATA



$P_{(A,B)}$: 2xG1/2 or 2xM22x1,5 - 17 mm depth
T : G1/4 or M14x1,5 - 12 mm depth (plugged)

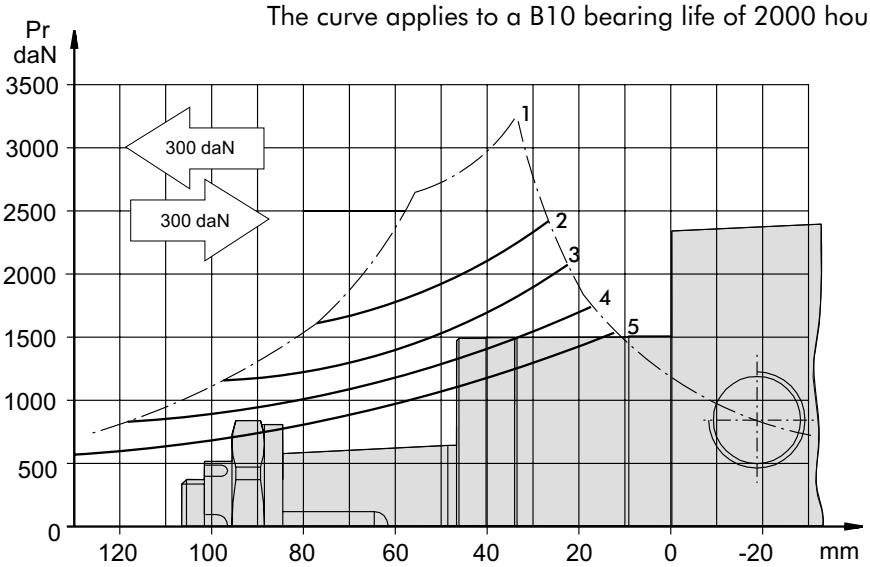
Type	L, mm	L_1, mm
RW 50	108	9,0
RW 80	113	14,0
RW 100	116,5	17,4
RW 125	120,5	21,8
RW 160	126,5	27,8
RW 200	133,5	34,8
RW 250	142,5	43,5
RW 315	153,5	54,8
RW 400	168,5	69,4

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

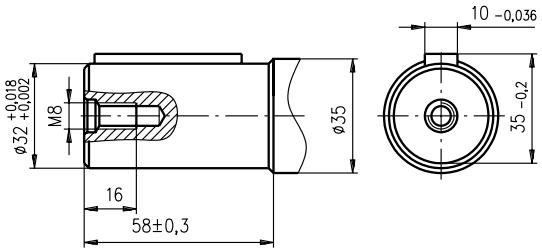
The curve applies to a B10 bearing life of 2000 hours.



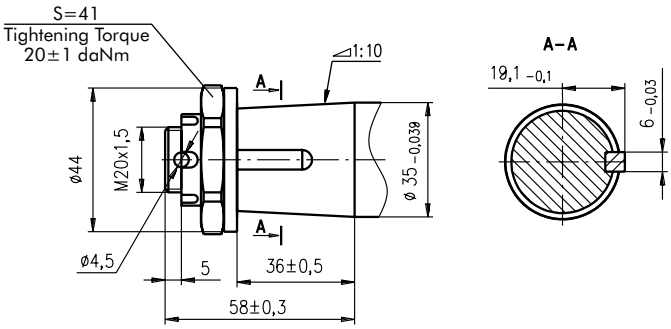
1. Permissible radial shaft load
2. Drawing by n= 50 min^{-1}
3. Drawing by n=100 min^{-1}
4. Drawing by n=200 min^{-1}
5. Drawing by n=400 min^{-1}

SHAFT EXTENSIONS

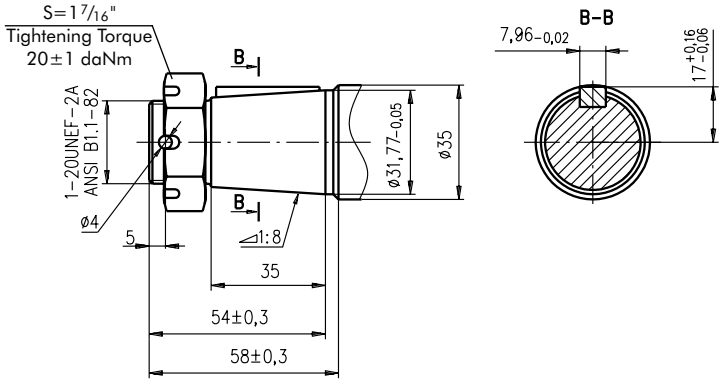
CB - ø32 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm



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



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



ORDER CODE

	1	2	3	4	5	6	7
R W							

Pos.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]

Pos.2 - Shaft Extensions*

CB	- ø32 straight, Parallel key A10x8x45 DIN6885
KB	- ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
OB	- ø1¼" tapered1:8, Parallel key 5/16"x5/16"x1¼" BS46

Pos. 3 - Shaft Seal Version

omit	- Standard shaft seal
U	- High pressure shaft seal without check valves
UK	- High pressure shaft seal with check valves

Pos. 4 - Drain Port

omit	- with drain port
1	- without drain port

Pos. 5 - Ports

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

Pos. 6 - Special Features (see page 37)

Pos. 7 - Design Series

omit - Factory specified

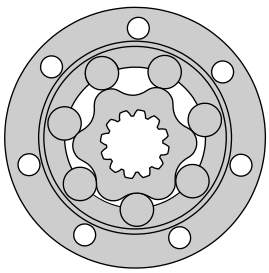
* The permissible output torque for shafts must not be exceeded!

NOTE:
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTORS HW

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
» Wheel mount
» Shafts- straight, splined and tapered
» BSPP ports
» Other special features

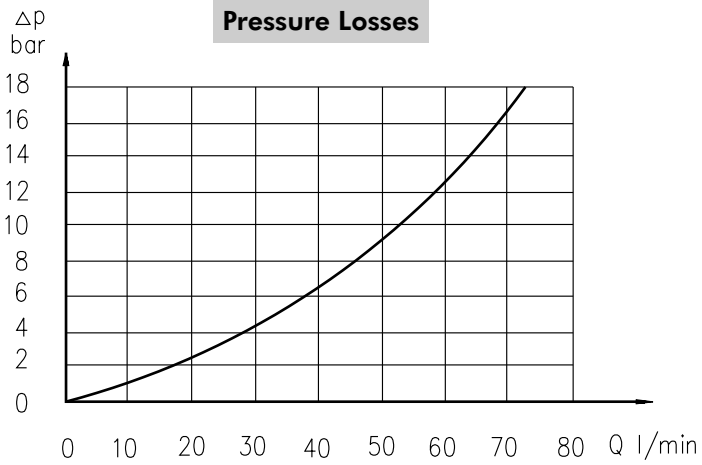
GENERAL

Displacement, [cm^3/rev.]	126÷550
Max. Speed, [RPM]	136÷380
Max. Torque, [daNm]	35÷96
Max. Output, [kW]	9÷17,6
Max. Pressure Drop, [bar]	125÷205
Max. Oil Flow, [l/min]	45÷75
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)

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

Pressure Losses



SPECIFICATION DATA

Type		HW						
		125	**160**	**200**	**235**	**250**	**300**	**315**
Displacement, [cm^3/rev.]		126	157,8	201,3	235,3	252	300	314,9
Max. Speed,	cont.	357	380	348	298	298	250	238
[RPM]	int.*	476	475	422	361	357	300	286
Max. Torque	cont.	35	44	55	64,5	69	81	85
[daNm]	int.*	38,5	48	60	70	75	89	93
Max. Output,	cont.	16,2	17,6	17,4	17	16,8	16,5	16,4
[kW]	int.*	19,8	21,6	19,6	19,2	18,7	18,7	18,7
Max. Pressure	cont.	205	205	205	205	205	205	205
Drop, [bar]	int.*	225	225	225	225	225	225	225
Max. Oil Flow	cont.	45	60	70	70	75	75	75
[l/min]	int.*	60	75	85	85	90	90	90
Max. Inlet	cont.	210	210	210	210	210	210	210
Pressure, [bar]	int.*	250	250	250	250	250	250	250
Max. Starting Pressure with Unloaded Shaft, [bar]		10	10	10	10	10	10	10
Min. Starting Torque	at max. press. drop cont.	28,7	36	41,5	52,8	56,5	66,4	69,7
[daNm]	at max. press. drop int.*	31,5	39,3	49,2	57,4	61,5	72,9	76,2
Min. Speed**, [RPM]		10	10	10	10	10	10	10
Weight, avg. [kg]		14,3	14,6	15,1	15,5	15,7	16,1	16,3

* Intermittent operation: the permissible values may occur for max. 10% of 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 mm^2/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

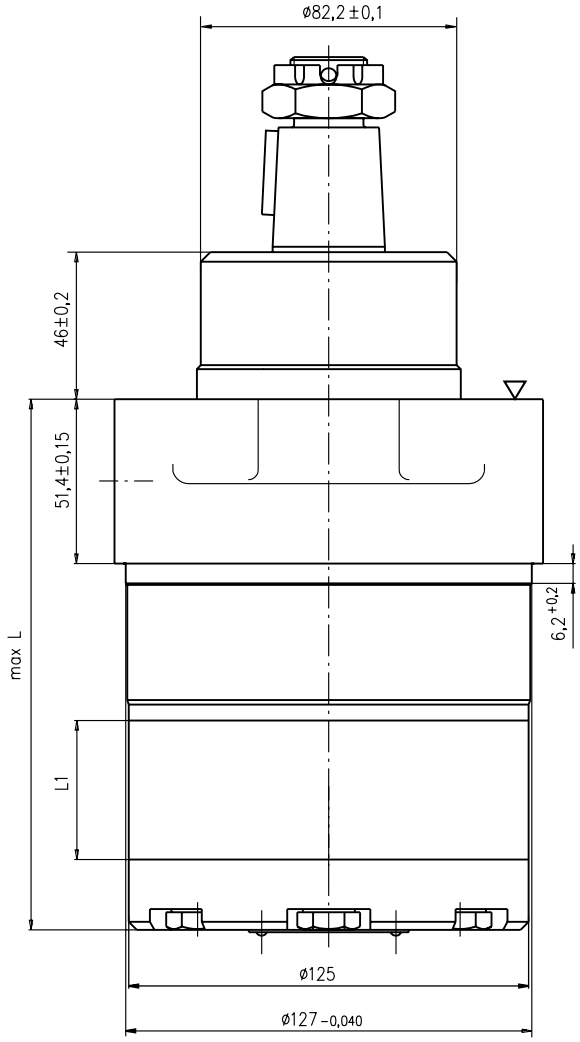
Type		HW						
		350	370	400	470	500	535	550
Displacement, [cm^3/rev.]		347,8	369,2	396,8	470,6	502,4	535	550
Max. Speed,	cont.	216	203	189	159	149	140	136
[RPM]	int.*	259	244	227	191	179	168	164
Max. Torque	cont.	94	96	96	92	91	90	89
[daNm]	int.*	102	105	98	101	101	104	103
Max. Output,	cont.	16,5	13,2	12,5	10,6	10,8	9,4	9,0
[kW]	int.*	18,7	17,3	16,7	13,6	13,9	12,8	12,4
Max. Pressure	cont.	205	200	185	150	140	130	125
Drop, [bar]	int.*	225	225	190	165	155	150	145
Max. Oil Flow	cont.	75	75	75	75	75	75	75
[l/min]	int.*	90	90	90	90	90	90	90
Max. Inlet	cont.	210	210	210	210	210	210	210
Pressure, [bar]	int.*	250	250	250	250	250	250	250
Max. Starting Pressure with Unloaded Shaft, [bar]		10	10	10	10	10	10	10
Min. Starting Torque	at max. press. drop cont.	77	79,5	78,7	75,4	74,6	73,8	72,9
[daNm]	at max. press. drop int.*	83,6	86	80,3	82,8	82,8	85,2	84,4
Min. Speed**, [RPM]		8	8	8	8	8	5	5
Weight, avg. [kg]		16,7	16,9	17,3	18,1	18,4	18,8	18,9

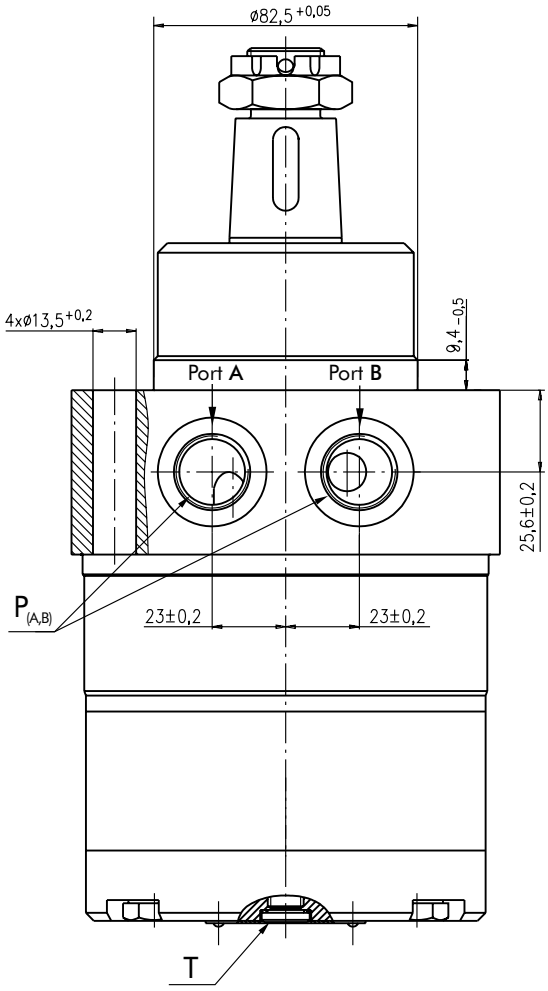
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

** 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 mm^2/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.

DIMENSIONS AND MOUNTING DATA



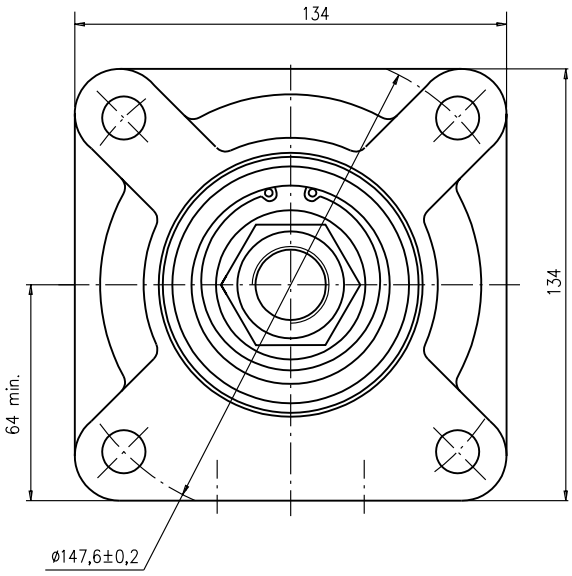


▽ - Motor Mounting Surface

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**

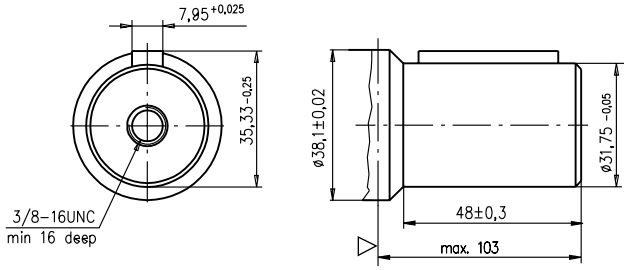
Type	L, mm	L_1, mm
HW 125	140,5	17,4
HW 160	145,0	21,8
HW 200	151,0	27,8
HW 235	155,5	32,5
HW 250	158,0	34,8
HW 300	164,5	41,4
HW 315	166,5	43,5
HW 350	171,0	48,0
HW 370	174,0	51,0
HW 400	178,0	54,8
HW 470	188,0	65,0
HW 500	192,5	69,4
HW 535	197,0	74,1
HW 550	199,0	76,0



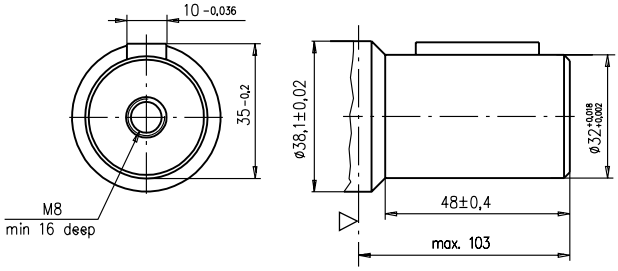
	Versions	
	2	4
P(A,B)	2xG½	2x⅞-14UNF, O-ring
T	G ¼	7/16-20UNF, O-ring

SHAFT EXTENSIONS

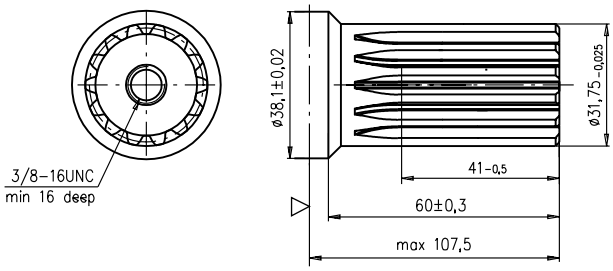
K - 1 ¼" straight, Parallel key 5/16"x5/16"x1 ½" BS46
Max. Torque 77 daNm



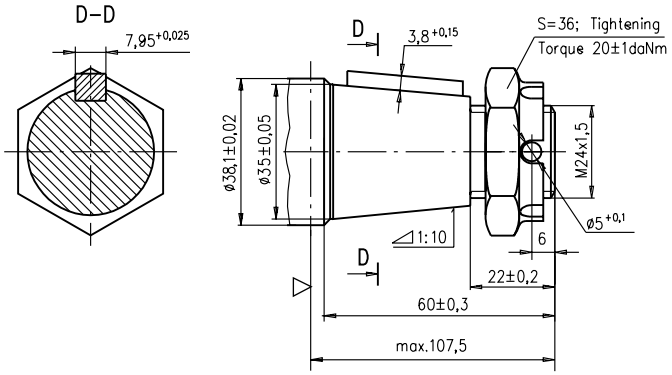
M - ø32 straight, Parallel key A10x8x32 DIN 6885
Max. Torque 77 daNm



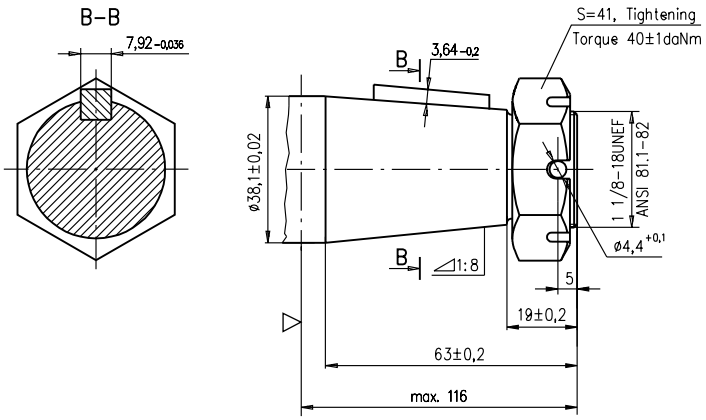
L - ø1 ¼" splined 14T, DP12/24 ANSI B92.1-1976 Norm
Max. Torque 77 daNm



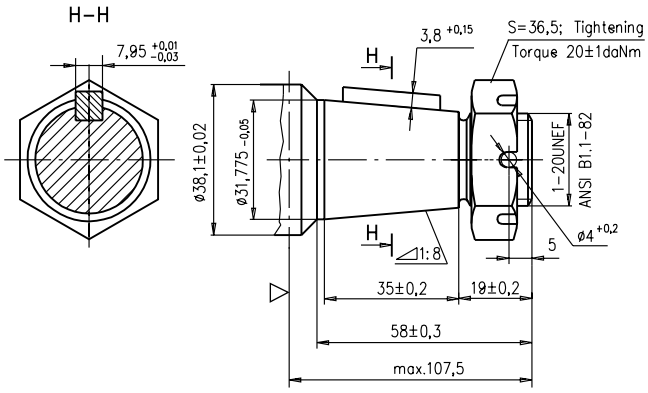
KB - ø35 tapered 1:10 , Parallel key 5/16"x5/16"x1¼" BS46
Max. Torque 95 daNm



T - 1 ½" tapered 1:8 , Parallel key 5/16"x5/16"x1 ¼" BS46
Max. Torque 120 daNm

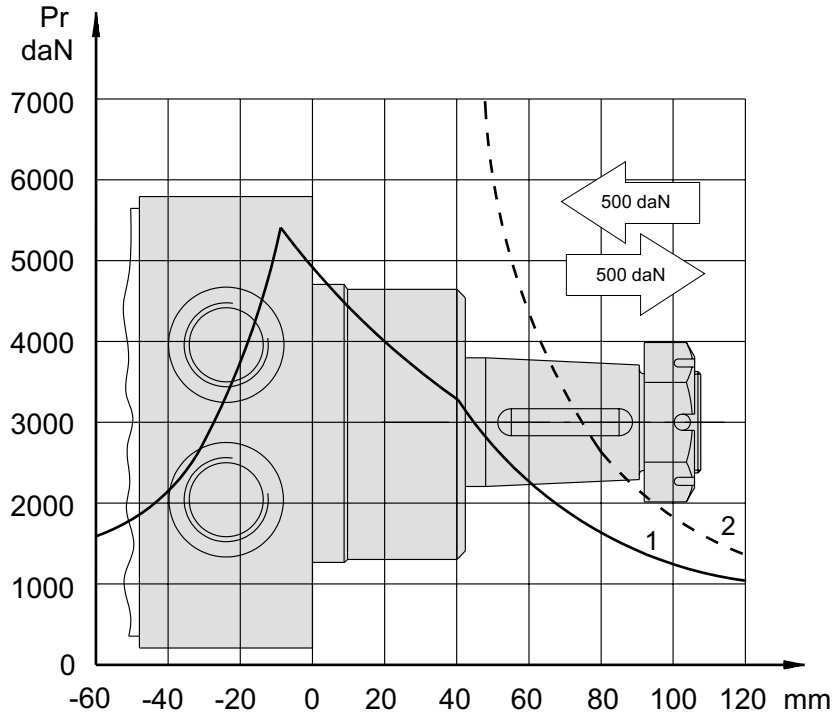


R - 1 ¼" tapered 1:8 , Parallel key 5/16"x5/16"x1" BS46
Max. Torque 77 daNm



▽ - Motor Mounting Surface

PERMISSIBLE SHAFT LOADS



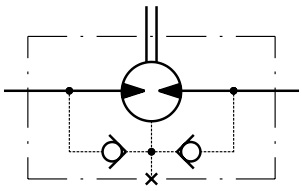
1 - Bearing curve: The curve applies to a B10 bearing life of 2000 hours at 100 RPM.

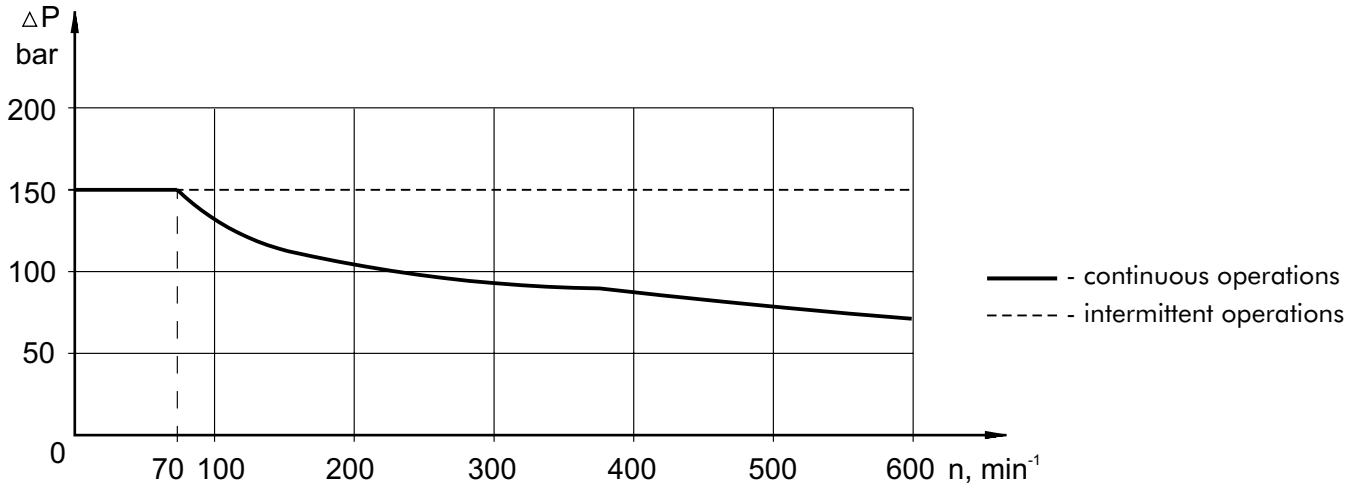
2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 3:1.

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

HW... motors with drain connection:

The shaft seal pressure equals the pressure in the drain line.





ORDER CODE

	1	2	3	4	5
HW					

Pos.1 - Displacement code

125	- 126,00 [cm³/rev]
160	- 158,00 [cm³/rev]
200	- 201,30 [cm³/rev]
235	- 235,00 [cm³/rev]
250	- 252,00 [cm³/rev]
300	- 300,00 [cm³/rev]
315	- 314,90 [cm³/rev]
350	- 347,80 [cm³/rev]
370	- 369,00 [cm³/rev]
400	- 396,80 [cm³/rev]
470	- 470,60 [cm³/rev]
500	- 502,40 [cm³/rev]
535	- 536,00 [cm³/rev]
550	- 550,00 [cm³/rev]

Pos.2 - Shaft Extensions*

K	- 1¼"[31,75] straight, Parallel key 5/16"x5/16"x1½" BS46
KB	- ø35 tapered 1:10, Parallel key 5/16"x5/16"x1¼" BS46
L	- 1¼"[31,75] splined 14T, ANSI B92.1-1976
M	- ø32 straight, Parallel key A10x8x32 DIN 6885
R	- 1¼"[31,75] Tapered 1:8, Parallel key 5/16"x5/16"x1" BS46
T	- 1½"[38,1] Tapered 1:8, Parallel key 5/16"x5/16"x1¼" BS46

Pos. 3 - Ports

2	- BSPP (ISO 228)
4	- SAE (ANSI B1.1-1982)

Pos. 4 - Special Features (see page 37)

Pos. 5 - Design Series

omit - Factory specified

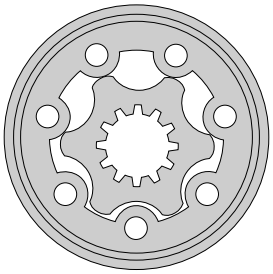
NOTE: * The permissible output torque for shafts must not be exceeded!

The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTORS PK

APPLICATION

» Conveyors
» Feeding mechanism of robots and manipulators
» Metal working machines
» Textile machines
» Machines for agriculture
» Food industries
» Mining machinery etc.



CONTENTS

OPTIONS

» Model- Spool valve, gerotor
» Antifriction conical bearing
» Flange mount
» Shafts- straight, splined and tapered
» Metric and BSPP ports
» Other special features

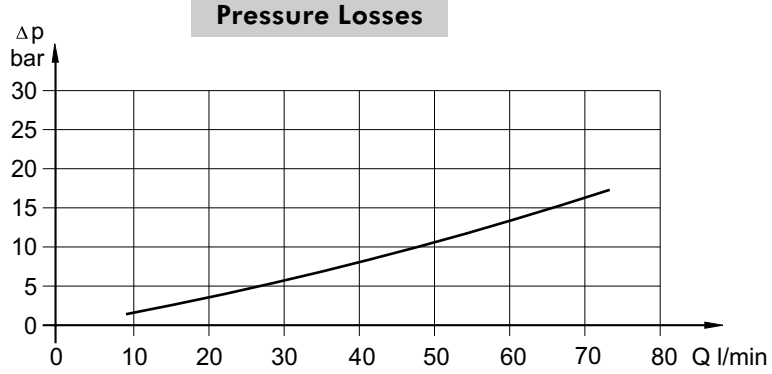
GENERAL

Displacement, [cm^3/rev.]	49,5÷396
Max. Speed, [RPM]	150÷1210
Max. Torque, [daNm]	9,4÷41
Max. Output, [kW]	3,4÷5,2
Max. Pressure Drop, [bar]	95÷140
Max. Oil Flow, [l/min]	40÷60
Min. Speed, [RPM]	10
Permissible Shaft Loads, [daN]	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)

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

Pressure Losses



SPECIFICATION DATA

Type		PK 50	PK 80	PK 100	PK 125	PK 160	PK 200	PK 250	PK 315	PK 400
Displacement, [cm.³/rev.]		49,5	79,2	99	123,8	158,4	198	247,5	316,8	396
Max. Speed,	Cont.	808	505	404	323	252	202	160	126	100
[RPM]	Int.*	1010	630	505	403	315	252	202	157	126
Max. Torque	Cont.	7	10,8	14,4	17	22	27,5	30,1	31,7	40,8
[daNm]	Int.*	9,2	14,6	18,3	22,9	29,3	36,6	37,6	44	55,6
	Peak**	13,6	21,4	26,1	32,6	41,8	52,2	51,5	64,3	80
Max. Output	Cont.	5,2	5,2	5,2	5,2	5,2	5,2	4,6	3,4	3,4
[kW]	Int.*	8,6	8,6	8,6	8,6	8,6	8,6	7	5,8	5,8
Max. Pressure Drop	Cont.	105	105	105	105	105	105	90	70	70
[bar]	Int.*	140	140	140	140	140	140	115	105	105
	Peak**	215	215	215	215	215	215	170	170	170
Max. Oil Flow	Cont.	40	40	40	40	40	40	40	40	40
[l/min]	Int.*	50	50	50	50	50	50	50	50	50
Max. Inlet Pressure	Cont.	140	140	140	140	140	140	140	140	140
[bar]	Int.*	175	175	175	175	175	175	175	175	175
	Peak**	225	225	225	225	225	225	225	225	225
Max. Return Pressure without Drain Line or Max. Pressure in Drain Line, [bar]	Cont. 0-100 RPM	150	150	150	150	150	150	150	150	150
	Cont. 100-300 RPM	75	75	75	75	75	75	75	75	75
	Cont. 300-600 RPM	50	50	50	50	50	50	50	50	50
	Cont. >600 RPM	20	20	20	20	20	20	20	20	20
	Int.* 0-max. RPM	15	15	15	15	15	15	15	15	15
Max. Starting Pressure with Unloaded Shaft, [bar]		10	10	10	10	10	10	10	10	10
Min. Starting Torque [daNm]		5,8	9,1	12,2	14,5	19,5	24,8	27,5	29	35,9
Min. Speed*, [RPM]**		10	10	10	10	10	10	10	10	10
Weight, [kg]		5	5,1	5,3	5,4	5,6	5,8	6	6,3	6,8

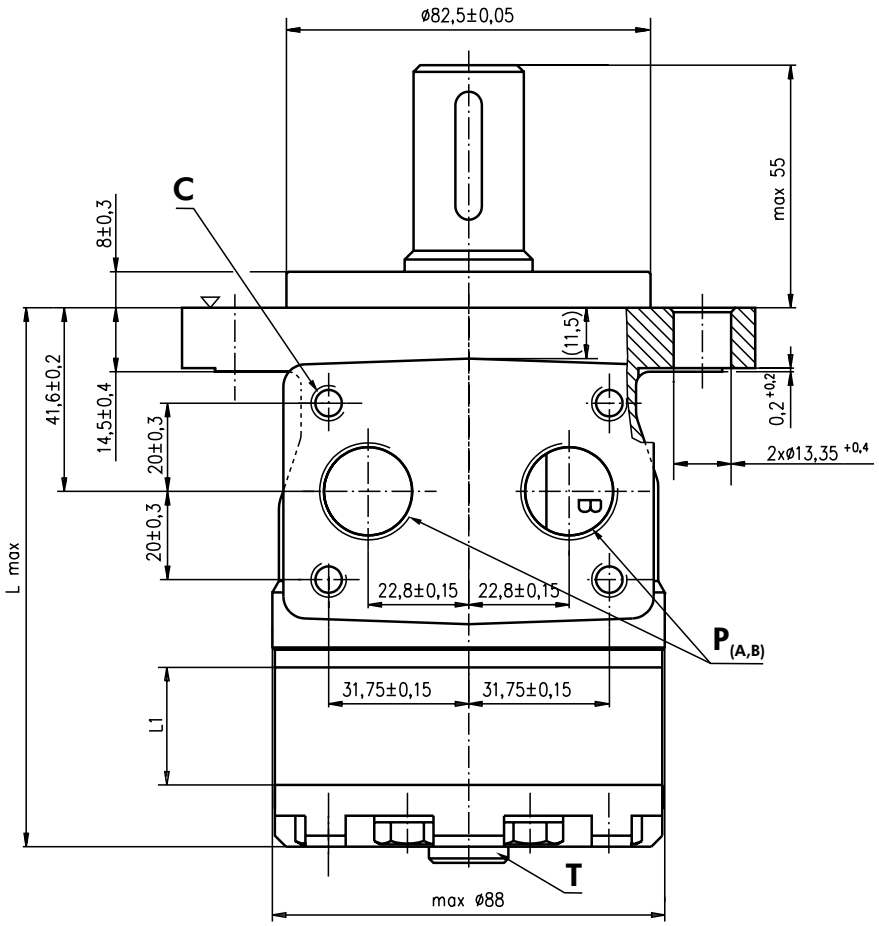
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

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

*** For speeds of 10 RPM or lower, consult factory or your regional manager.

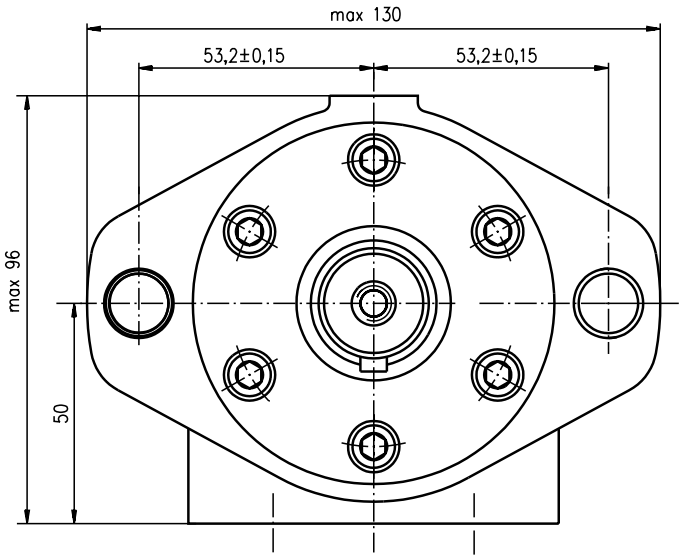
1. Intermittent speed and intermittent pressure drop must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommended using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 13 mm^2/s at operating temperatures.
5. Recommended maximum system operating temperature is 82^0C.
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

OUTLINE DIMENSIONS REFERENCE



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**

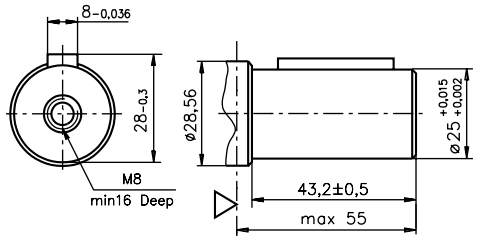


Type	L, mm	L_1, mm
PK 50	102,5	6,67
PK 80	106,5	10,67
PK 100	109	13,33
PK 125	112,5	16,67
PK 160	117	21,33
PK 200	122,5	26,67
PK 250	129	33,33
PK 300	138,5	42,67
PK 400	149	53,33

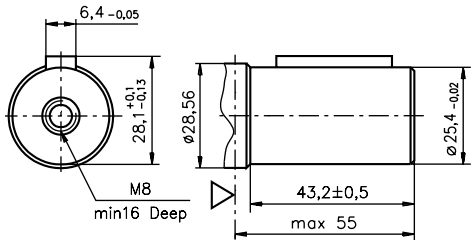
C : 4xM8 - 13 mm depth
$P_{(A, B)}$: 2xG1/2 or 2xM22x1,5 - 15 mm depth
T : G1/4 or M14x1,5 - 8,5 mm depth (plugged)

SHAFT EXTENSIONS

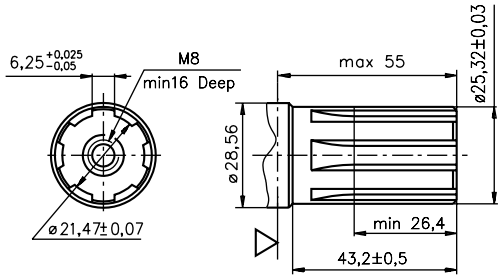
C ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm



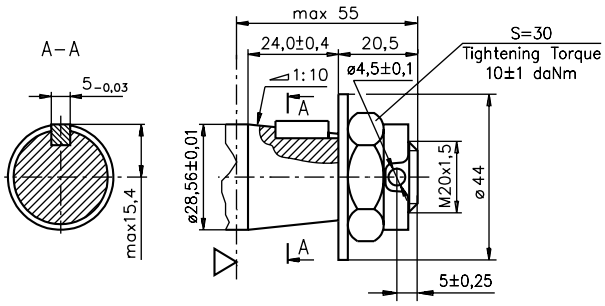
CO ø25,4 straight, Parallel key ¼"x¼"x1¼" BS46
Max. Torque 34 daNm



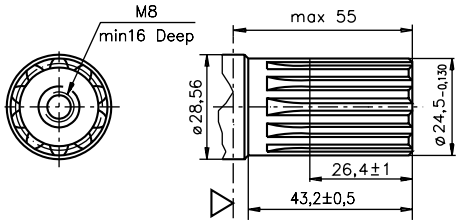
SH Splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm



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



SA Splined, B25x22h9 DIN 5482
Max. Torque 40 daNm



▽- Motor Mounting Surface

ORDER CODE

	1	2	3	4	5
P K					

Pos.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]

Pos.2 - Shaft Extensions*

C	- ø25 straight, Parallel key A8x7x32 DIN6885
CO	- ø25,4 straight, Parallel key ¼"x¼"x1¼" BS46
SH	- ø25,32 splined BS 2059 (SAE 6B)
K	- ø28,56 tapered 1:10, Parallel key, B5x5x14 DIN6885
SA	- ø24,5 splined B25x22h9 DIN 5482

Pos. 3 - Ports

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

Pos. 4 - Special Features (see page 37)

Pos. 5 - Design Series

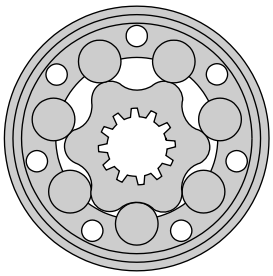
omit - Factory specified

NOTE:
* The permissible output torque for shafts must be not exceeded!
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTORS RK

APPLICATION

» Conveyors
» Feeding mechanism of robots and manipulators
» Metal working machines
» Textile machines
» Machines for agriculture
» Food industries
» Mining machinery etc.



CONTENTS

OPTIONS

» Model- Spool valve, gerotor
» Antifriction conical bearing
» Flange mount
» Shafts- straight, splined and tapered
» Metric and BSPP ports
» Other special features

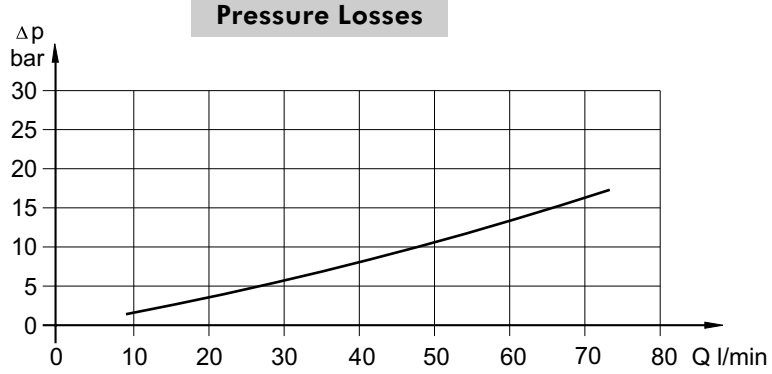
GENERAL

Displacement, [cm^3/rev.]	51,5÷397
Max. Speed, [RPM]	150÷775
Max. Torque, [daNm]	10÷40
Max. Output, [kW]	6,2÷10,8
Max. Pressure Drop, [bar]	75÷140
Max. Oil Flow, [l/min]	40÷60
Min. Speed, [RPM]	10
Permissible Shaft Loads, [daN]	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)

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

Pressure Losses



SPECIFICATION DATA

Type		RK 50	RK 80	RK 100	RK 125	RK 160	RK 200	RK 250	RK 315	RK 400
Displacement, [cm.³/rev.]		51,5	80,3	99,8	125,5	159,6	199,8	250,1	315,7	397
Max. Speed,	Cont.	775	750	600	475	375	300	240	190	150
[RPM]	Int.*	970	940	750	600	470	375	300	240	185
Max. Torque	Cont.	10	15,7	19,8	25	32	34	40	40	40
[daNm]	Int.*	13	19,5	24	30	39	42	47	50	50
	Peak**	17	27	32	37	46	56	64	65	65
Max. Output	Cont.	9	10,4	10,8	10,8	10,4	8,8	8,1	7,4	6,2
[kW]	Int.*	10,4	12,6	12,8	12,5	11,5	10,2	9,4	7,8	7,1
Max. Pressure Drop	Cont.	140	140	140	140	140	125	110	90	75
[bar]	Int.*	175	175	175	175	175	155	140	125	90
	Peak**	225	225	225	225	225	225	200	150	120
Max. Oil Flow	Cont.	40	60	60	60	60	60	60	60	60
[l/min]	Int.*	50	75	75	75	75	75	75	75	75
Max. Inlet Pressure	Cont.	175	175	175	175	175	175	175	175	175
[bar]	Int.*	200	200	200	200	200	200	200	200	200
	Peak**	225	225	225	225	225	225	225	225	225
Max. Return Pres-	Cont. 0-100 RPM	150	150	150	150	150	150	150	150	150
sure without Drain	Cont. 100-300 RPM	75	75	75	75	75	75	75	75	75
Line or Max. Pres-	Cont. 300-600 RPM	50	50	50	50	50	50	50	50	50
sure in Drain Line,	Cont. >600 RPM	20	20	20	20	20	20	20	20	20
[bar]	Int.* 0-max. RPM	15	15	15	15	15	15	15	15	15
Max. Starting Pressure with Unloaded Shaft, [bar]		10	10	10	10	10	10	10	10	10
Min. Starting Torque [daNm]		8	12	16	20	25	29	28	32	35
Min. Speed*, [RPM]**		10	10	10	10	10	10	10	10	10
Weight, [kg]		6,2	6,3	6,6	6,7	6,9	7,4	7,8	8,5	9,3

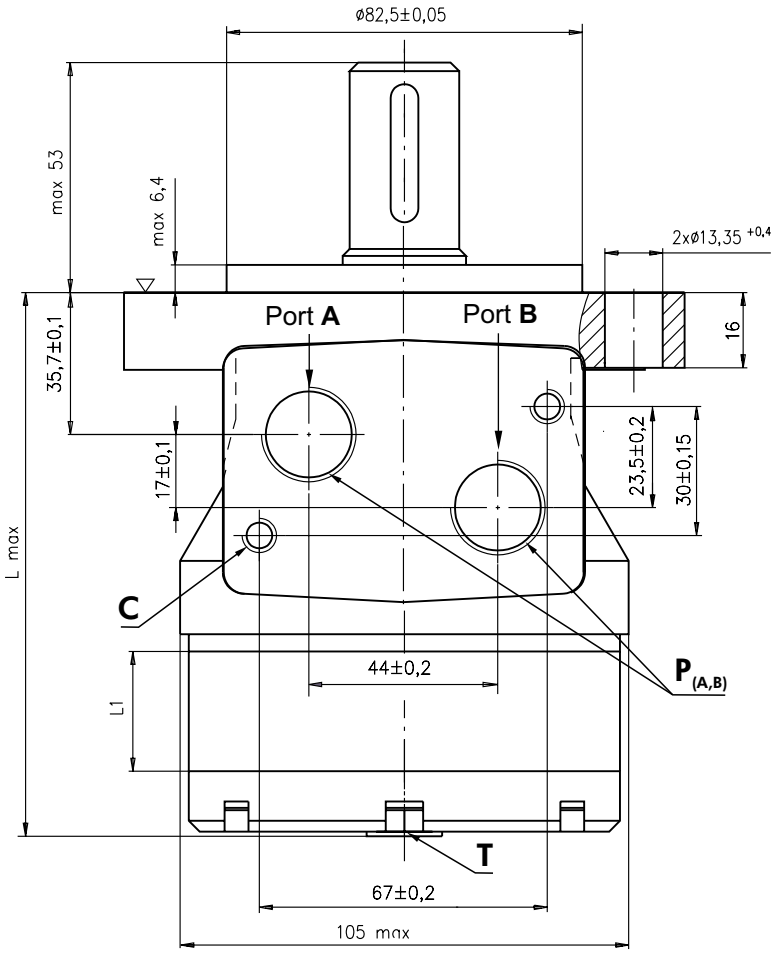
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

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

*** For speeds of 10 RPM or lower, consult factory or your regional manager.

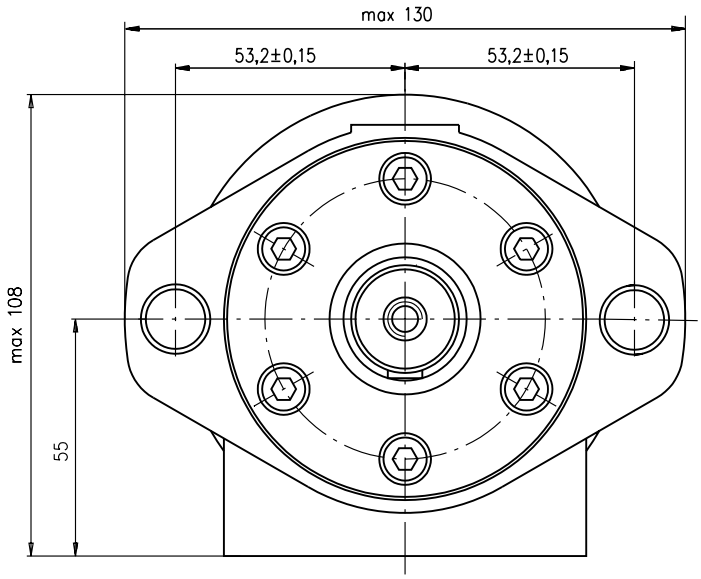
1. Intermittent speed and intermittent pressure drop must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommended using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 13 mm^2/s at operating temperatures.
5. Recommended maximum system operating temperature is 82^0C.
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

OUTLINE DIMENSIONS REFERENCE



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**

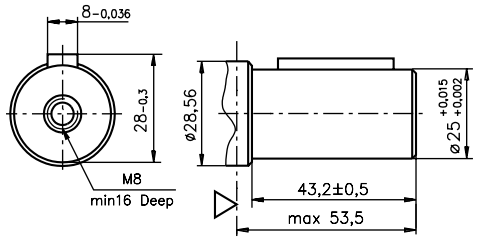


Type	L, mm	L_1, mm
RK 50	109,5	9,0
RK 80	114,5	14,0
RK 100	118	17,4
RK 125	122,5	21,8
RK 160	128,5	27,8
RK 200	135,5	34,8
RK 250	144	43,5
RK 300	155,5	54,8
RK 400	170	69,4

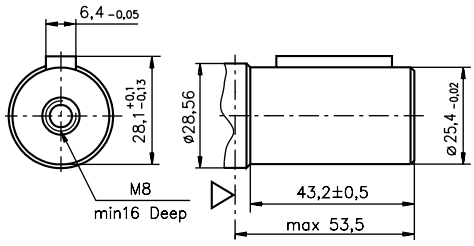
C : 2xM8 - 13 mm depth
$P_{(A, B)}$: 2xG1/2 - 15 mm depth
T : G1/4 - 8,5 mm depth (plugged)

SHAFT EXTENSIONS

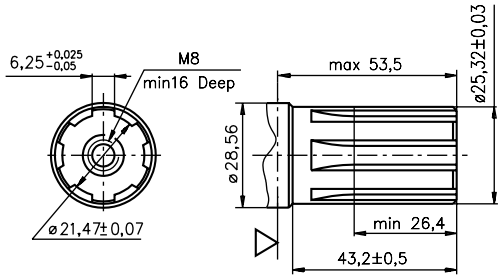
C ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm



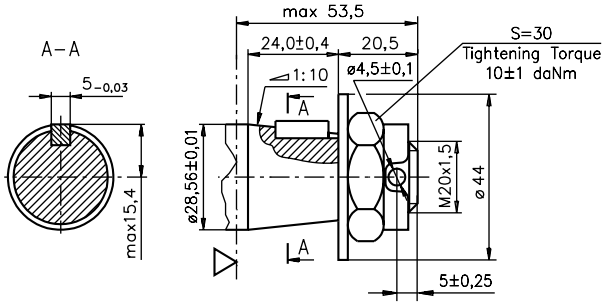
CO ø25,4 straight, Parallel key ¼"x¼"x1¼" BS46
Max. Torque 34 daNm



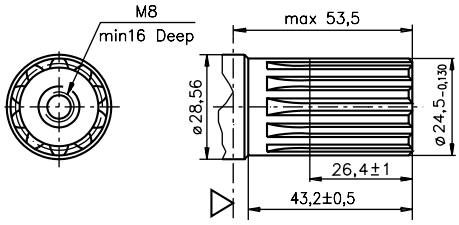
SH Splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm



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



SA Splined, B25x22h9 DIN 5482
Max. Torque 40 daNm



▽- Motor Mounting Surface

ORDER CODE

	1	2	3	4
R K				

Pos. 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]

Pos. 2 - **Shaft Extensions***

C	- ø25 straight, Parallel key A8x7x32 DIN6885
CO	- ø25,4 straight, Parallel key ¼"x¼"x1¼" BS46
SH	- ø25,32 splined BS 2059 (SAE 6B)
K	- ø28,56 tapered 1:10, Parallel key, B5x5x14 DIN6885
SA	- ø24,5 splined B25x22h9 DIN 5482

Pos. 3 - **Special Features** (see page 37)

Pos. 4 - **Design Series**

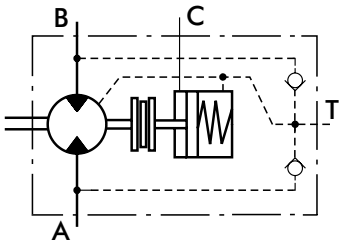
omit - Factory specified

NOTE:

* The permissible output torque for shafts must not be exceeded!

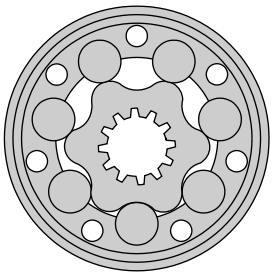
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTOR-BRAKE B/MR



APPLICATION

» Conveyors
» Feeding mechanism of robots and manipulators
» Metal working machines
» Textile machines
» Machines for agriculture
» Food industries
» Mining machinery etc.



CONTENTS

OPTIONS

» Model- Spool valve, roll-gerotor;
» Fully integrated friction disk brake;
» Side port;
» Shaft - straight;
» BSPP ports.

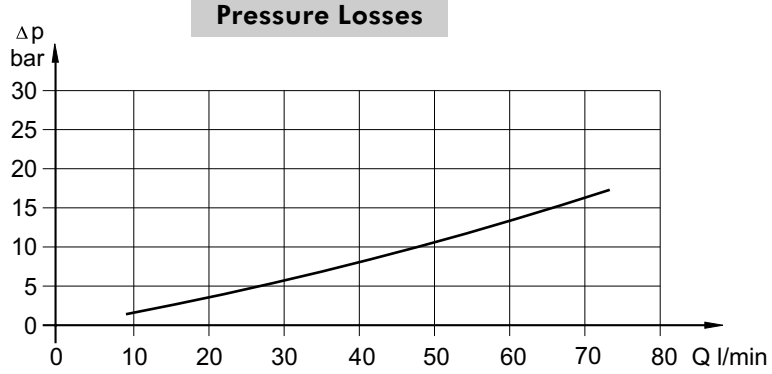
GENERAL

Displacement, [cm^3/rev.]	80,3÷397
Max. Speed, [RPM]	150÷500
Max. Torque, [daNm]	19,5÷55
Max. Output, [kW]	2,2÷16
Max. Pressure Drop, [bar]	45÷175
Max. Oil Flow, [l/min]	40÷60
Min. Speed, [RPM]	10
Permissible Shaft Loads, [daN]	P_a=200
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)

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

Pressure Losses



SPECIFICATION DATA

Type		B/MR 80	B/MR 100	B/MR 125	B/MR 160 C	B/MR 160 CB	B/MR 200 C	B/MR 200 CB
Displacement, cm.³/rev.		80,3	99,8	125,7	159,6		199,8	
Max. Speed,	Cont.	500	500	475	375		300	
[min^{-1}]	Int.*	600	600	600	470		375	
Max. Torque	Cont.	19,5	24	30	30	39	30	45
[daNm]	Int.*	22	28	34	39	43	39	50
	Peak**)	27	32	37	46	46	56	56
Max. Output	Cont.	16,6	18,6	12,5	10	11,5	7,8	11
[kW]	Int.*	16	16	14,5	12,5	14	12,4	13
Max. Pressure	Cont.	175	175	175	135	175	105	175
Drop, [bar]	Int.*	200	200	200	175	200	145	200
	Peak**	225	225	225	225	225	225	225
Max. Oil Flow	Cont.	40	50	60	60		60	
[l/min]	Int.*	48	60	75	75		75	
Max. Inlet	Cont.	175						
Pressure	Int.*	200						
[bar]	Peak**	225						
Max. Starting Pressure [bar]		10	10	9	7		5	
Min. Starting	At max.press.dropCont	15	20	25	24	32	26	41
Torque, [daNm]	At max.press.dropInt.*	17	23	28	32	37	33	46
Min. Speed*, [min^{-1}]**		10	10	10	10	10	10	10
Static Torque of Brake, [daNm]		55						
Min. Brake Release Pressure**, [bar]**		21						
Max.Opening Pressure, [bar]		200						
Weight, [kg]		11,0	11,2	11,4	11,6	11,7	12,2	12,3

* 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.

*** For speeds of 10 RPM or lower, consult factory or your regional manager.

**** Motor-brakes must always have a drain line. The brake release pressure is the difference between the pressure in the brake release line and the pressure in the drain line.

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 mm^2/s at operating temperatures.
5. Recommended maximum system operating temperature is 82^{0}C.
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

SPECIFICATION DATA (continued)

Type		B/MR 250 C	B/MR 250 CB	B/MR 315 C	B/MR 315 CB	B/MR 400 C	B/MR 400 CB
Displacement, cm.³/rev.		250,1		315,7		397	
Max. Speed,	Cont.	240		190		150	
[min⁻¹]	Int.*	300		240		190	
Max. Torque	Cont.	30	54	30	55	30	55
[daNm]	Int.*	39	57	42	57	43	57
	Peak**)	60	71	61	71	60	70
Max. Output	Cont.	6.2	10	4,5	9	2,2	7
[kW]	Int.*	9.5	11	7,5	10	5,6	8,7
Max. Pressure	Cont.	85	175	65	135	45	105
Drop, [bar]	Int.*	115	185	90	145	75	115
	Peak**	200	225	150	180	120	140
Max. Oil Flow	Cont.	60					
[l/min]	Int.*	75					
Max. Inlet	Cont.	175					
Pressure	Int.*	200					
[bar]	Peak**	225					
Max. Starting Pressure [bar]		5		5		5	
Min. Starting	At max.press.drop Cont	24	50	26	50	24	44
Torque, [daNm]	At max.press.drop Int.*	31	51,5	35	51,8	38	50
Min. Speed*, [min⁻¹]**		10	10	10	10	10	10
Static Torque of Brake, [daNm]		55					
Min. Brake Release Pressure**, [bar]**		21					
Max.Opening Pressure, [bar]		200					
Weight, [kg]		12,6	12,7	13,3	13,4	14	14,1

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

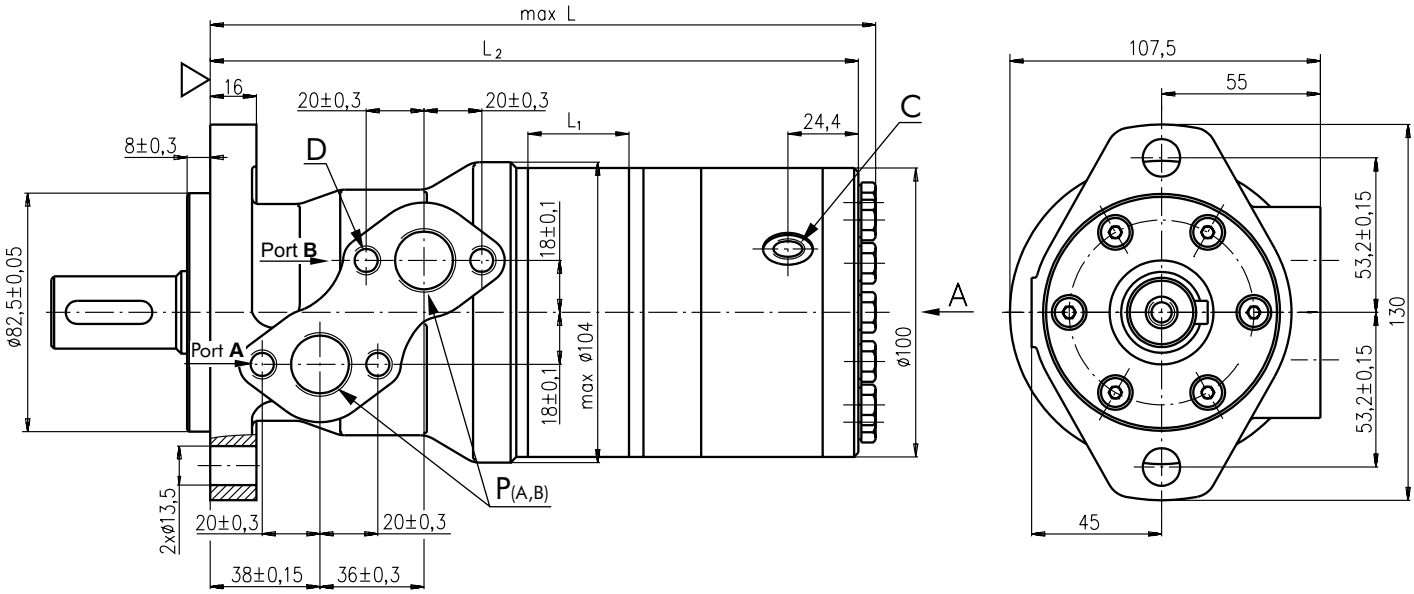
** Peak load: the permissible values may occur for max. 1% of every minute.

*** For speeds of 10 RPM or lower, consult factory or your regional manager.

**** Motor-brakes must always have a drain line. The brake release pressure is the difference between the pressure in the brake release line and the pressure in the drain line.

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 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.

OUTLINE DIMENSINS REFERENCE

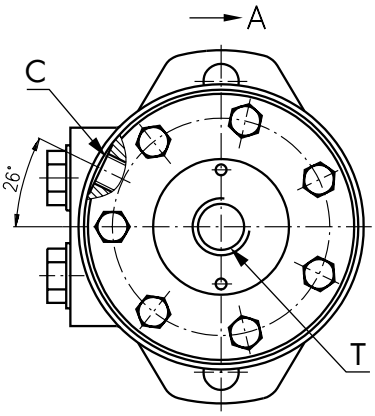


D : 4xM8 - 13 mm depth
C : G1/4 - 12 mm depth
$P_{(A, B)}$: 2xG1/2 - 15 mm depth
T : G1/4 - 10 mm depth

Type	L_1, mm	L_2, mm	L_{max}, mm
B/MR 80	14,0	205,5	213,5
B/MR 100	17,4	209,0	217,0
B/MR 125	21,8	213,5	221,5
B/MR 160	27,8	219,5	227,5
B/MR 200	34,8	226,5	234,5
B/MR 250	43,5	235,0	243,0
B/MR 315	54,8	246,5	254,5
B/MR 400	69,4	261,0	269,0

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

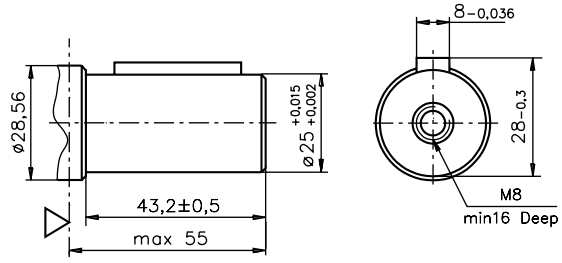
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**



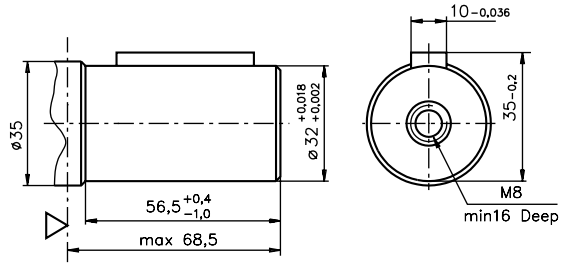
▽- Motor Mounting Surface

SHAFT EXTENSIONS

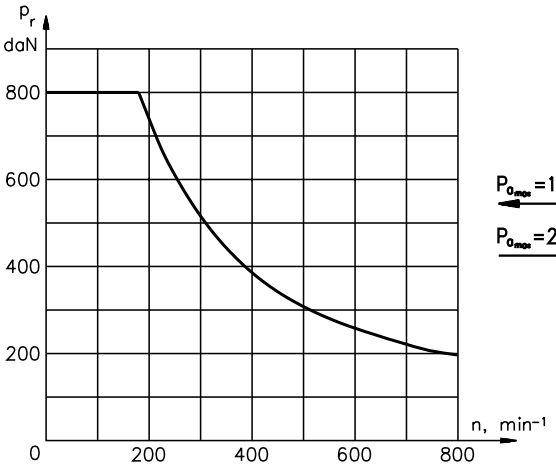
C - ø25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm



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

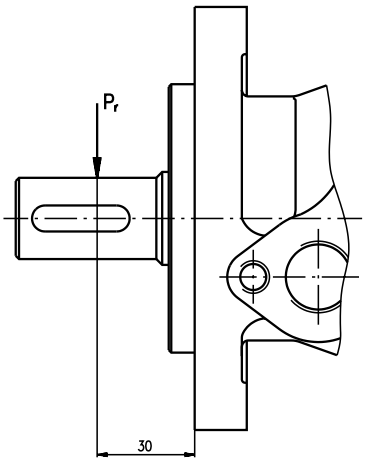


PERMISSIBLE SHAFT LOADS



$P_{o_{max}}$=150 daN

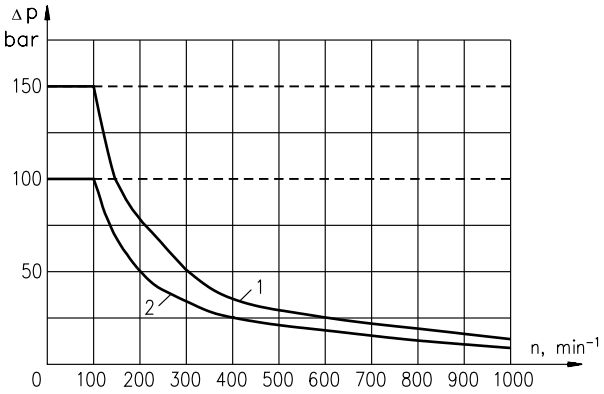
$P_{o_{max}}$=200 daN



For Rotation speed n≥200 min^{-1} and distance L≠30 mm the radial load could be calculated by

$$P_r = \frac{800}{n} \times \frac{25\,000}{95+L}, \text{ daN}$$

MAX. PERMISSIBLE SHAFT SEAL PRESSURE



1: Drawing for "C" shaft

2: Drawing for "CB" shaft

——— - continuous operations

- - - - - - intermittent operations

ORDER CODE

	1	2	3	4
B/MR				

Pos.1 - Displacement code

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]

Pos. 2 - Shaft Extensions*

C	- ø25 straight, Parallel key A8x7x32 DIN 6885
CB	- ø32 straight, Parallel key A10x8x45 DIN 6885

Pos. 3 - Special Features (see page 37)

Pos. 4 - Design Series

omit - Factory specified

NOTES:

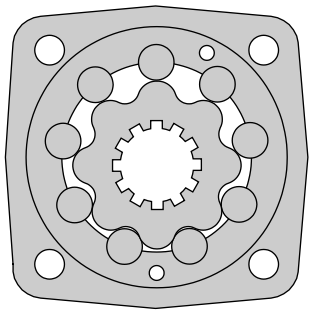
* The permissible output torque for shafts must be not exceeded!

The hydraulic motors are mangano phosphatized as standard.

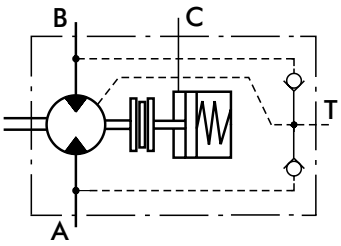
HYDRAULIC MOTOR-BRAKE MT/B

APPLICATION

» Conveyors
» Metal working machines
» Machines for agriculture
» Road building machines
» Mining machinery
» Food industries
» Special vehicles
» Plastic and rubber machinery etc.



CONTENTS



OPTIONS

» Model- Disc valve, roll-gerotor;
» Fully integrated friction disk brake;
» Side ports;
» Shafts- straight, splined and tapered;
» BSPP ports
» Other special features

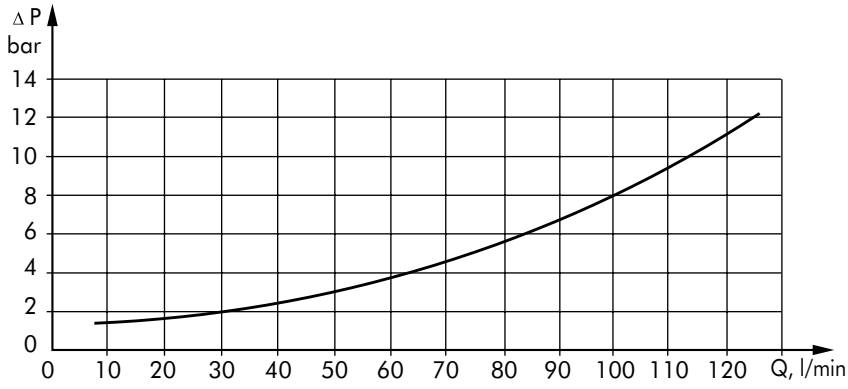
GENERAL

Displacement, [cm^3/rev.]	161,1÷523,6
Max. Speed, [RPM]	240÷625
Max. Torque, [daNm]	47÷122
Max. Output, [kW]	26,5÷33,5
Max. Pressure Drop, [bar]	160÷200
Max. Oil Flow, [l/min]	100÷125
Min. Speed, [RPM]	5÷10
Permissible Shaft Loads, [daN]	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)

Oil flow in drain line

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

Pressure Losses



SPECIFICATION DATA

Type		MT/B 160	MT/B 200	MT/B 250	MT/B 315	MT/B 400	MT/B 500
Displacement [cm^3/rev.]		161,1	201,4	251,8	326,3	410,9	523,6
Max. Speed,	cont.	625	625	500	380	305	240
[RPM]	Int.*	780	750	600	460	365	285
Max. Torque	cont.	47	59	73	95	108	122
[daNm]	Int.*	56	71	88	114	126	137
Max. Output	cont.	26,5	33,5	33,5	33,5	30	26,5
[kW]	int.*	32	40	40	40	35	30
Max. Pressure Drop	cont.	200	200	200	200	180	160
[bar]	Int.*	240	240	240	240	210	180
Max. Oil Flow	cont.	100	125	125	125	125	125
[l/min]	Int.*	125	150	150	150	150	150
Max. Inlet Pressure	cont.	210	210	210	210	210	210
[bar]	Int.*	250	250	250	250	250	250
Max. Return Pressure	cont.	140	140	140	140	140	140
with Drain Line, [bar]	Int.*	175	175	175	175	175	175
Max. Starting Pressure with Unloaded Shaft, [bar]		10	10	10	10	10	10
Min. Starting Torque	at max. press. drop cont.	34	43	53	74	84	95
[daNm]	at max. press. drop Int.*	41	52	63	89	97	106
Min. Speed**, [RPM]		10	9	8	7	6	5
Static Torque of Brake, [daNm]		143	143	143	143	143	143
Min. Brake Release Pressure***, [bar]		32-35	32-35	32-35	32-35	32-35	32-35
Max. Opening Pressure, [bar]		280	280	280	280	280	280
Max. Pressure in Drain Line, [bar]		5	5	5	5	5	5
Weight, [kg]		27,5	28,0	28,5	29,5	30,5	31,5

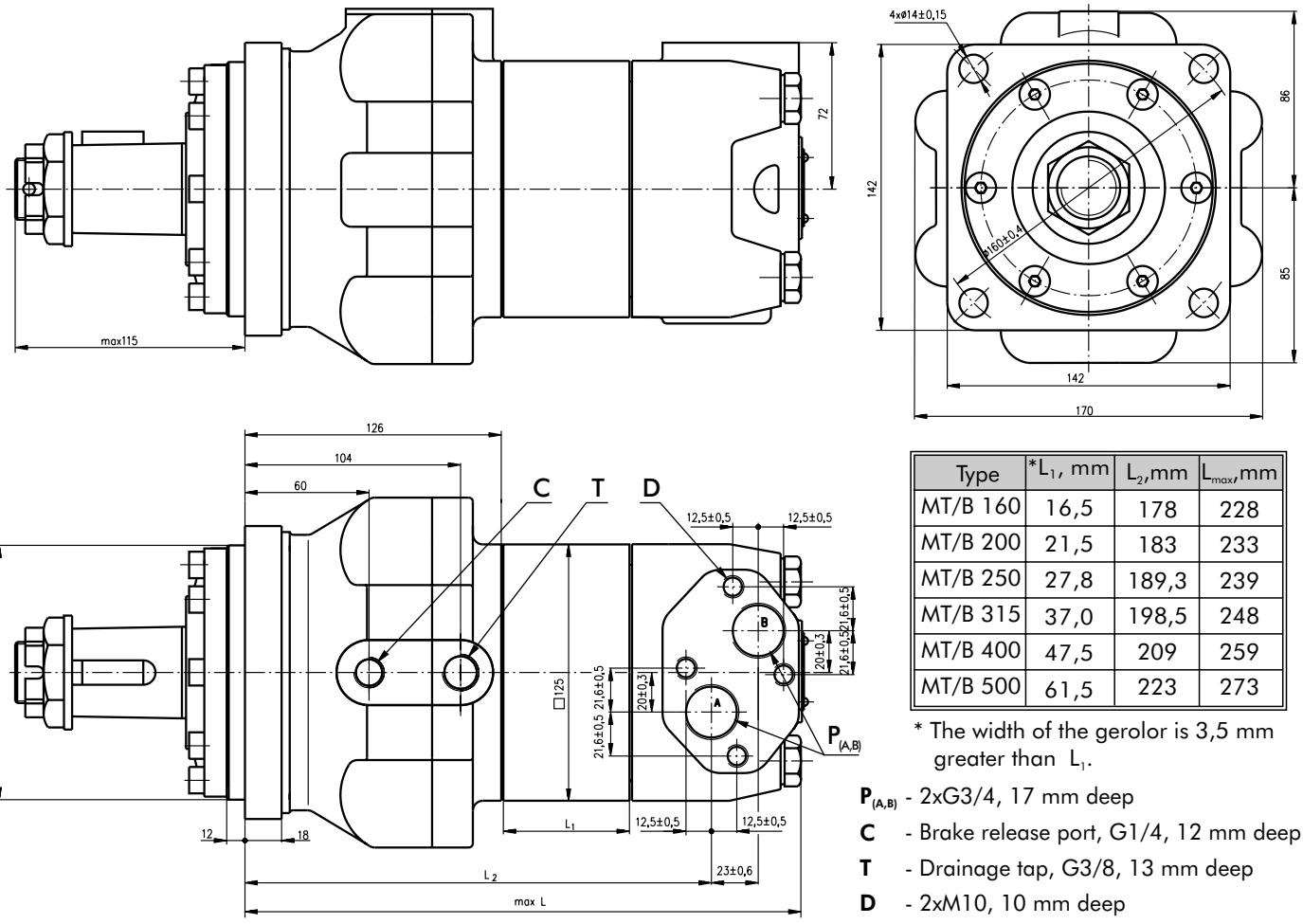
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

** For speeds of 5 RPM or lower, consult factory or your regional manager.

*** Motor-brakes must always have a drain line. The brake release pressure is the difference between the pressure in the brake release line and the pressure in the drain line.

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 mm^2/s at operating temperatures.
5. Recommended maximum system operating temperature is 82^0C.
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

OUTLINE DIMENSIONS REFERENCE



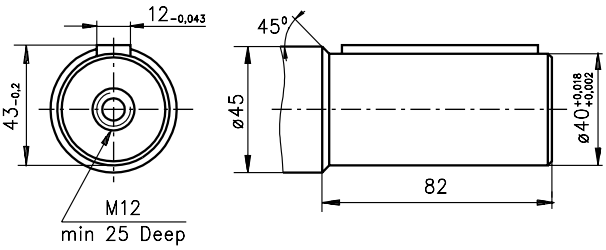
Type	*L_1, mm	L_2,mm	L_{max},mm
MT/B 160	16,5	178	228
MT/B 200	21,5	183	233
MT/B 250	27,8	189,3	239
MT/B 315	37,0	198,5	248
MT/B 400	47,5	209	259
MT/B 500	61,5	223	273

* The width of the gerolor is 3,5 mm greater than L_1.

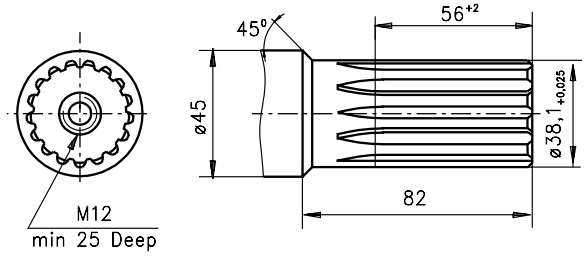
$P_{(A,B)}$ - 2xG3/4, 17 mm deep
C - Brake release port, G1/4, 12 mm deep
T - Drainage tap, G3/8, 13 mm deep
D - 2xM10, 10 mm deep

SHAFT EXTENSIONS

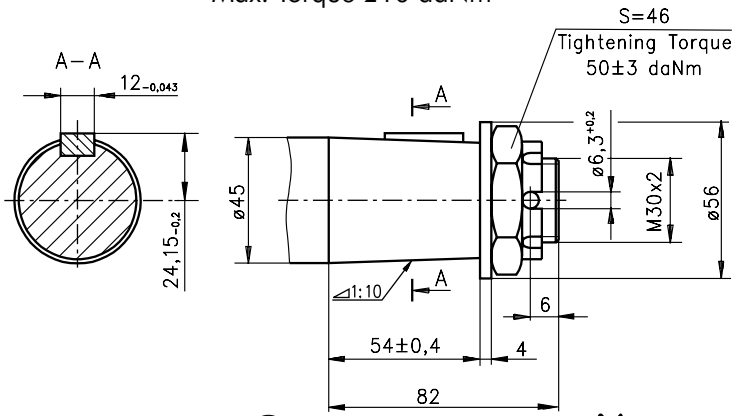
C -ø40 straight, Parallel key A12x8x70 DIN 6885
Max. Torque 123 daNm



SH -ø1½" splined 17T, DP 12/24 ANSI B92.1-1976
Max. Torque 123 daNm

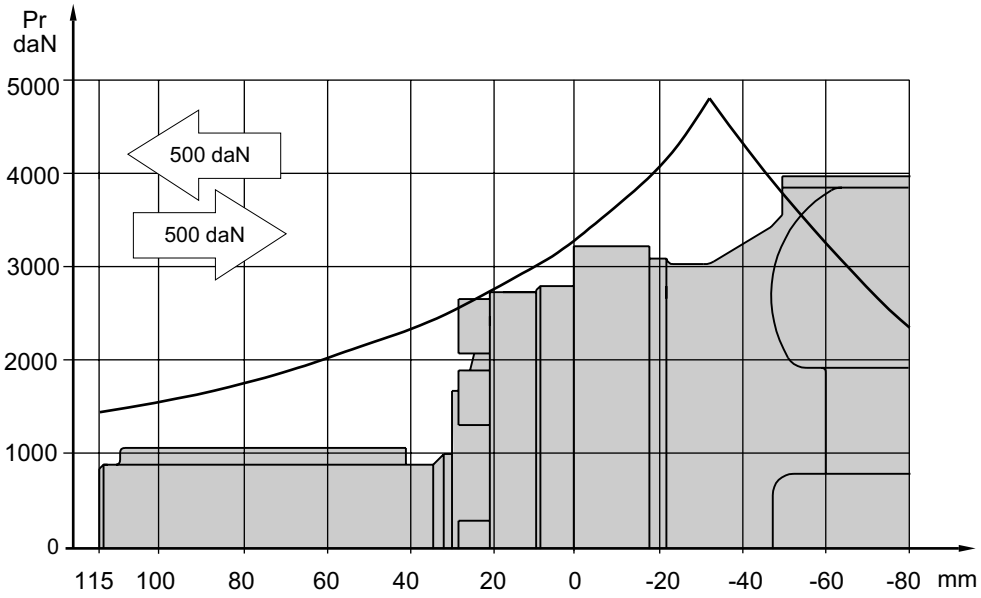


K -tapered 1:10, Parallel key B12x8x28 DIN 6885
Max. Torque 210 daNm



PERMISSIBLE SHAFT LOADS

The curve applies to a B10 bearing life of 3000 hours at 200 RPM.



Warning: Drain line should always be used.

ORDER CODE

	1	2	3	4
MT/B				

Pos.1 - **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

Pos.2 - **Shaft Extensions***

C	- ø40 straight, Parallel key A12x8x70 DIN6885
SH	- 1 1/2" splined 17 DP12/24 ANS B92.1-76
K	- 1:10 Tapered, Parallel key B12x8x28 DIN6885

Pos. 3 - **Special Features** (see page 37)

Pos. 4 - **Design Series**

omit - Factory specified

NOTES:

* The permissible output torque for shafts must be not exceeded!

The hydraulic motors are mangano phosphatized as standard.

MOTOR SPECIAL FEATURES

Special Feature Description	Order Code	Motor type					
		RW	HW	PK	RK	B/MR	MT/B
Low Leakage	**LL**	O	O	O	O	O	-
Low Speed Valving	**LSV**	O	O	O	O	O	-
Free Running	**FR**	O	O	O	O	-	-
Reverse Rotation	**R**	O	O	O	O	O	O
Paint*	**P**	O	O	O	O	O	O
Corrosion Protected Paint*	**PC**	O	O	O	O	O	O
Check Valves		S	S	S	S	S	S

* color at customer's request.

O Optional
- Not applicable
S Standard

MOTOR APPLICATION

VEHICLE DRIVE CALCULATIONS

1.Motor speed: 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	0,037
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 %	α Degrees	Grade %	α Degrees
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:
-acc.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 from 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 torque moment for every hydraulic motor:

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

N- motor numbers;
η_M- mechanical gear efficiency (if it is available).

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

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

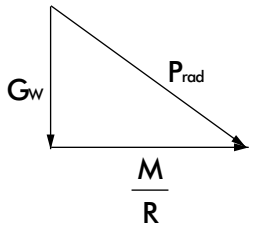
To avoid wheel slipping, it should be observed the following condition $M_w > M$
f - frictional factor;
G_w- total weight over the wheels, [daN].

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: P_{rad} , [daN]

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



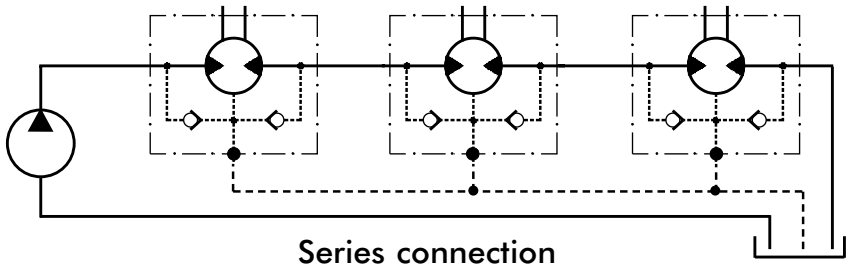
$$P_{rad} = \sqrt{G_w^2 + \left(\frac{M}{R}\right)^2}$$

G_w - Weight held by wheel;
P_{rad} - Total radial loading of motor shaft;
M/R- Motion force.

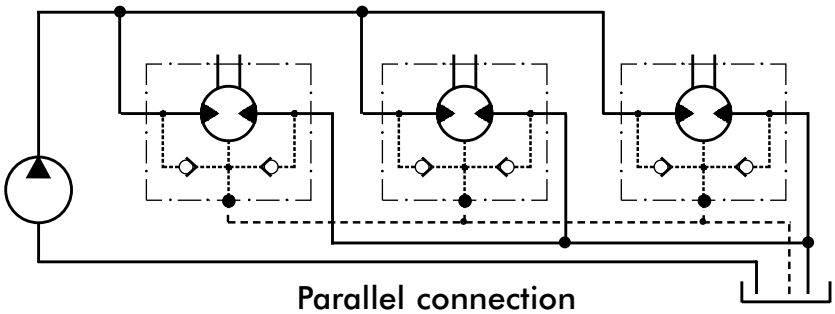
In accordance with calculated loadings the suitable motor from the catalogue is selected.

DRAINAGE SPACE AND DRAINAGE PRESSURE

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



Series connection



Parallel connection