

Dipl.-Ing. Herwarth Reich GmbH

D2C
Designed to Customer

TECHNODRIVE-PTO

Power take-off clutches
with speed reducing gearboxes



Your drive is our strength. Your strength is our drive.



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D2C – Designed to Customer



The principle of Designed to Customer describes the recipe for success of REICH-KUPPLUNGEN: Utilizing our product knowledge, our customers are supplied with couplings which are developed and tailor-made to their specific requirements. The designs are mainly based on modular components to provide effective and efficient customer solutions. The unique form of close cooperation with our partners includes consultation, design, calculation, manufacture and integration into existing environments. Adapting our manufacturing to customer-specific production and utilizing global logistics concepts provides better after sales service - worldwide. This customer-oriented concept applies to both standard products and production in small batch sizes.

The company policy of REICH-KUPPLUNGEN embraces, first and foremost, principles such as customer satisfaction, flexibility, quality, prompt delivery and adaptability to the requirements of our customers.

REICH-KUPPLUNGEN supplies not only a coupling, but a solution: Designed to Customer.

Edition July 2014

Proprietary notice pursuant to ISO 16016 to be observed:

The present TECHNODRIVE edition renders parts of the previous TECHNODRIVE catalogues obsolete. All dimensions in millimeters. We reserve the right to change dimensions and / or design details without prior notice.

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General technical description

TECHNODRIVE clutches are mechanically actuated dry friction clutches.

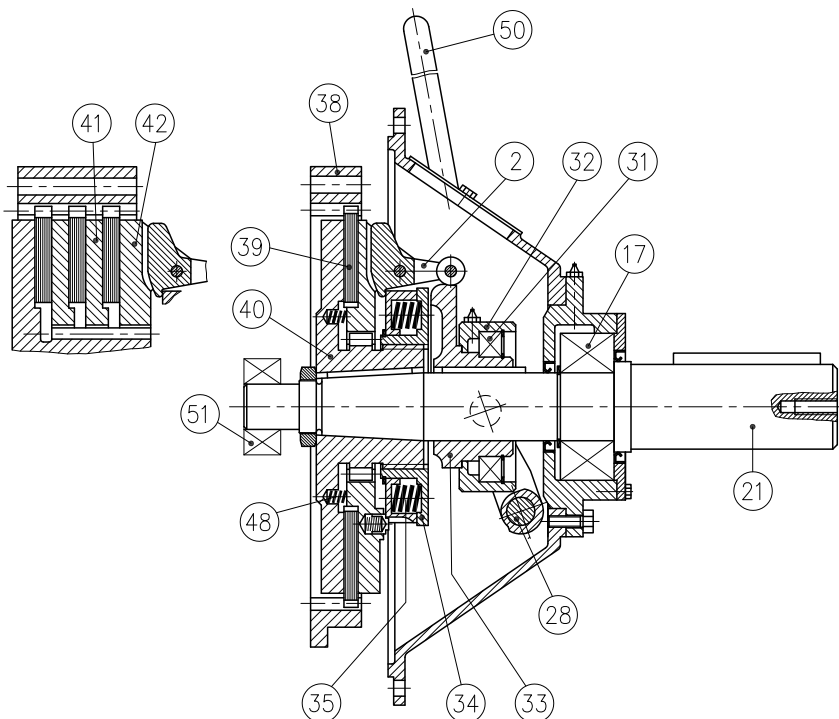
Type BD is specifically developed for attachment to diesel engines with housing and flywheel connection dimensions corresponding to the SAE standard. The clutch, complete with mechanical actuating device, housing, and rolling bearing supported input shaft, forms a complete attachment unit that perfectly matches the diesel engine.

TECHNODRIVE clutches are designed for switching the driven machine on and off at rotational speed. The enclosed clutch housing protects the mechanics of the clutch from environmental effects and contamination. The resilient compression of the friction material discs allows for a largely automatic wear adjustment feature. The amply dimensioned bearing arrangement of the output shaft is designed for radial power take-off with pulley.

The actuating forces are transmitted to the actuating sleeve via a ball bearing for all clutch sizes so that high operating speeds are permissible.

Torque transmission is effected via a dry frictional connection through the resilient compression of the friction material discs when the clutch is engaged. An axially displaceable, torsionally rigid positive connection is provided via a tothing between the outside ring screwed to the engine flywheel and the friction material discs. Depending on the clutch size, the clutches are equipped with 1 to 3 friction material discs made from asbestos-free friction material.

When engaging the clutch, the actuating force is transmitted via the cross shaft with actuating fork to the actuator ring with ball bearing and then to the actuating sleeve. During this operation, the angle levers on the pressure plate are pushed outwardly by rollers running against the actuating sleeve, thus creating a resilient compression of the friction material discs due to the lever action generated by pre-tensioned pressure springs in the adjusting ring. When the clutch is disengaged, the pressure springs cause the pressure plate to lift and the inner discs to return into their original position. The actuating mechanism is self-locking in its end positions and free from reactive forces so that unintended engagement or disengagement is not possible.

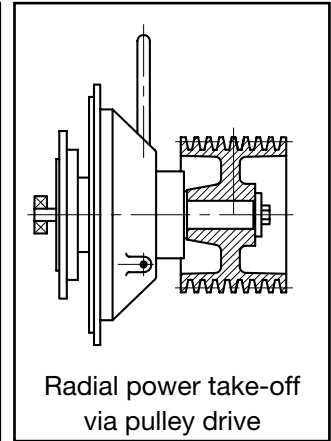
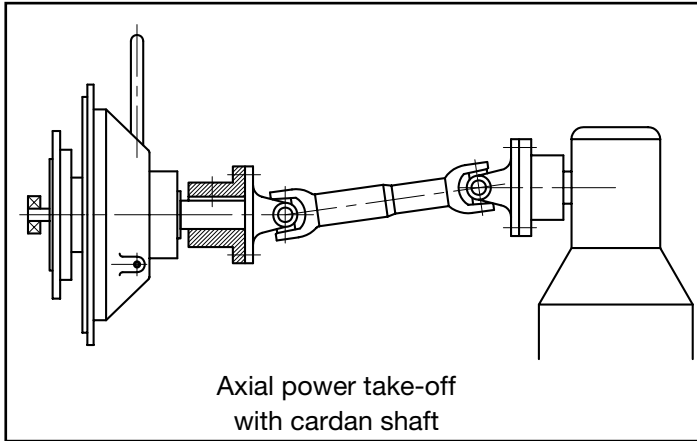
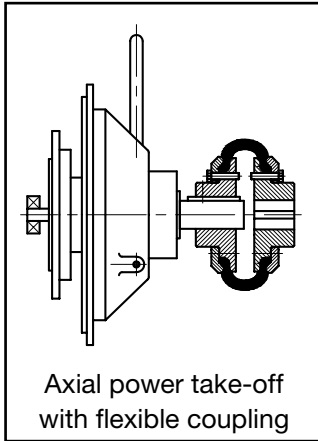


The most important components are:

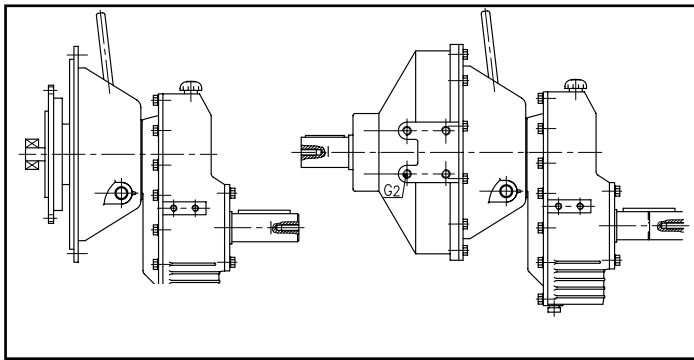
- 2 Angle lever
- 17 Shaft bearing arrangement
- 21 Output shaft
- 28 Cross shaft with actuating fork
- 31 ball bearing
- 32 actuator ring
- 33 actuating sleeve
- 34 adjusting ring
- 35 pressure ring
- 38 outside ring with internal teeth
- 39 friction lining disc with external teeth
- 40 hub
- 41 internal disc
- 42 pressure plate
- 48 pressure spring
- 50 actuating lever
- 51 flywheel pilot bearing with lip seal lubricated for life

Types and application examples

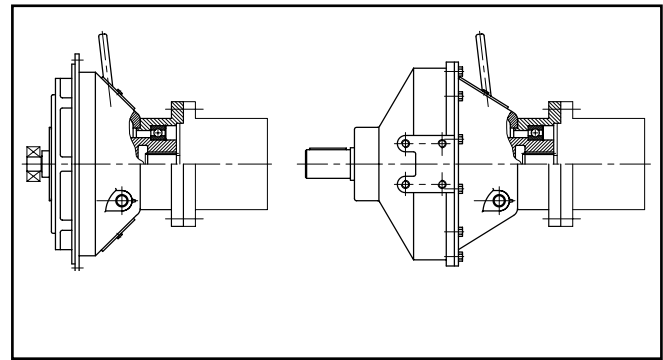
Standard clutches of type BD for attachment to diesel engines



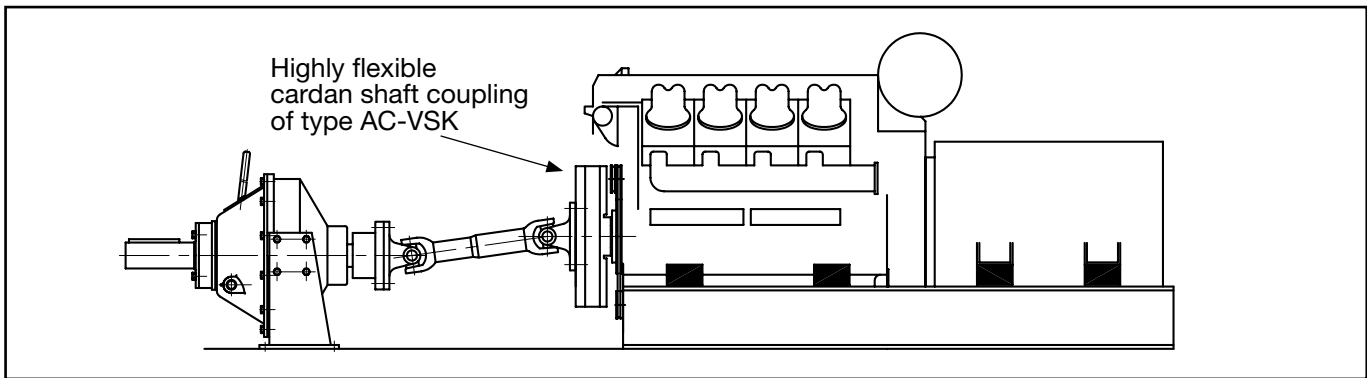
Clutches of types RM-BD / RM-BDS with speed reducing or speed increasing gearbox



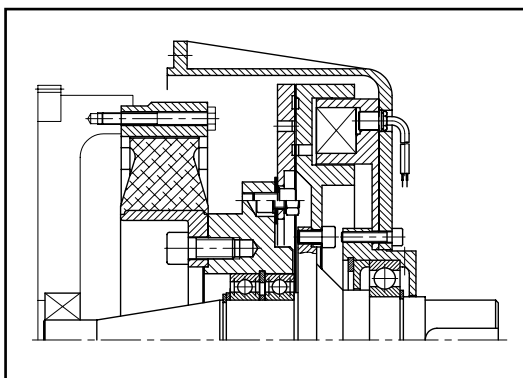
Clutches of types BDP / BDSP with hollow shafts for flange-mounting to hydraulic pumps or transfer gearboxes



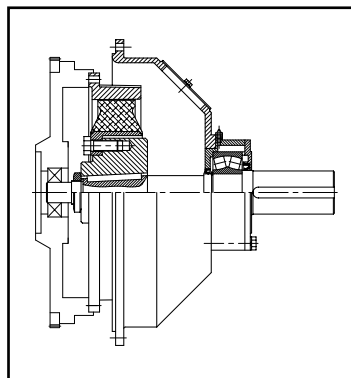
Clutches of type BDS within an enclosed housing version with input shaft and output shaft



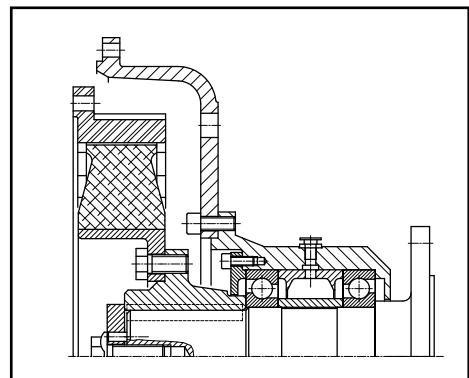
PTO special types with highly flexible coupling and electromagnetic clutch



PTO with highly flexible ARCUSAFLEX coupling



PTO Integral shaft support with ARCUSAFLEX coupling with cardan shaft attachment



Selection of the proper clutch size

When selecting the clutch size, a safety factor S needs to be applied for the maximum input torque T.

The following details are required for the clutch design:

1. Connection dimensions of the internal combustion engine, number of cylinders
2. Power P (kW) at rotational speed n (rpm)
3. Max. operating speed
4. Type of the driven machine
5. Moment of inertia of the driven machine
6. Breakaway torque of the driven machine at engagement, if known
7. Number of clutch engagements

Prime mover:		Safety factor S			
- Diesel engine, 1 and 2 cylinders - Diesel engine, 3 and 4 cylinders - Hydraulic motor, diesel engine ≥ 6 cylinders - Electric motor, turbine					
Driven machine and reference values for the number of clutch engagements		Safety factor S			
A	Uniform operation with small masses to be accelerated up to 5 engaging operations per hour	1.1	1.3	1.3 - 1.4	1.4 - 1.6
	Centrifugal pumps, deep well pumps, fire fighting pumps, hydraulic pumps, light-weight conveyors, small fans				
B	Uniform operation with medium masses to be accelerated up to 20 engaging operations per hour	1.2	1.5	1.6 - 1.8	2 - 2.2
	Reciprocating compressors (≥ 4 cylinders), generators, marine drives, construction machines, piston pumps, mixers, woodworking machines				
C	Non-uniform operation with medium masses to be accelerated Driving machine running up to speed within 5 seconds up to 20 engaging operations per hour	1.6	2.1	2.2 - 2.4	2.7 - 2.9
	Reciprocating compressors (≥ 2 cylinders), flour mills, brick molding machines, cement mixers, gas compressors				
D	Non-uniform operation with large masses to be accelerated Driving machine running up to speed within 5 seconds up to 40 engaging operations per hour	2.2	2.8	3 - 3.3	3.6 - 3.9
	1-cylinder reciprocating compressors, ball mills, crushers				

Calculation of the drive-side or load-side input torque T_a :

$$T_a \text{ [Nm]} = 9550 \frac{P[\text{kW}]}{n[\text{rpm}]}$$

Determination of the clutch size:

$$T_a \cdot S \leq T_{\ddot{U}}$$

(transmission torque of the clutch)

Example: You are looking for a Technodrive clutch of type BD for driving a centrifugal pump by a 3 cylinder diesel engine with P= 30 kW at 1800 rpm.

$$T_a = 9550 \frac{30}{1800} = 159.1 \text{ Nm}$$

Calculation of the engaging input torque:

$$T_{\ddot{U}} = T_a \cdot 1.4$$

$$T_a = 159.1 \cdot 1.4 = 222.74 \text{ Nm} \leq T_{\ddot{U}}$$

Selected service factor S = 1,4

Required clutch torque:

Selected clutch: Type BD 118 with

$$T_{\ddot{U}} = 240 \text{ Nm} \geq T_a \cdot 1.4$$

Clutches of type BD

Technical data and connection dimensions

For attachment to diesel engines with SAE connection dimensions

Size	Housing SAE			T _Ü Nm	n _{max} rpm	Flywheel connection				Actuating force			Weight kg			
						SAE	D ₄ mm	D ₅ mm	D ₆ mm	J _{total} kgm ²	eng. mm	diseng. mm			α	
BD 110	4	5		170	3500	6½"	215.9	200	6x8.5	0.05	70	50	18°	21	22	
BD 112	4			200	3500	7½"	241.3	222.3	8x8.5	0.07	90	50	18°	24	24	
BD 112	4	3		200	3500	8"	263.5	244.5	6x10.5	0.08	90	50	18°	24	25	
BD 118	4	3		240	3500	8"	263.5	244.5	6x10.5	0.09	110	80	18°	29	31	
BD 130	4	3		330	3100	10"	314.3	295.3	8x11	0.14	220	80	18°	44	47	
BD 145	4	3		450	3100	11½"	352.4	333.4	8x10.5	0.26	220	80	20°	48	52	
BD 290	3	2	1	880	2900	11½"	352.4	333.4	8x10.5	0.48	220	80	20°	68	70	75
BD 290 (R)	3	2	1	880	2900	11½"	352.4	333.4	8x10.5	0.48	220	80	20°	77	79	84
BD 390	3	2		1320	2900	11½"	352.4	333.4	8x10.5	0.79	220	80	20°	95	98	
BD 2200 (R)	1			1960	2400	14"	466.7	438.2	8x13	1.82	400	180	15°	156	170*	
BD 3300 (R)	1			2940	2400	14"	466.7	438.2	8x13	2.61	500	180	15°	170	193*	
BD 3500	0			4150	2000	18"	571.5	542.9	6x17	6.12	600	300	15°	420		

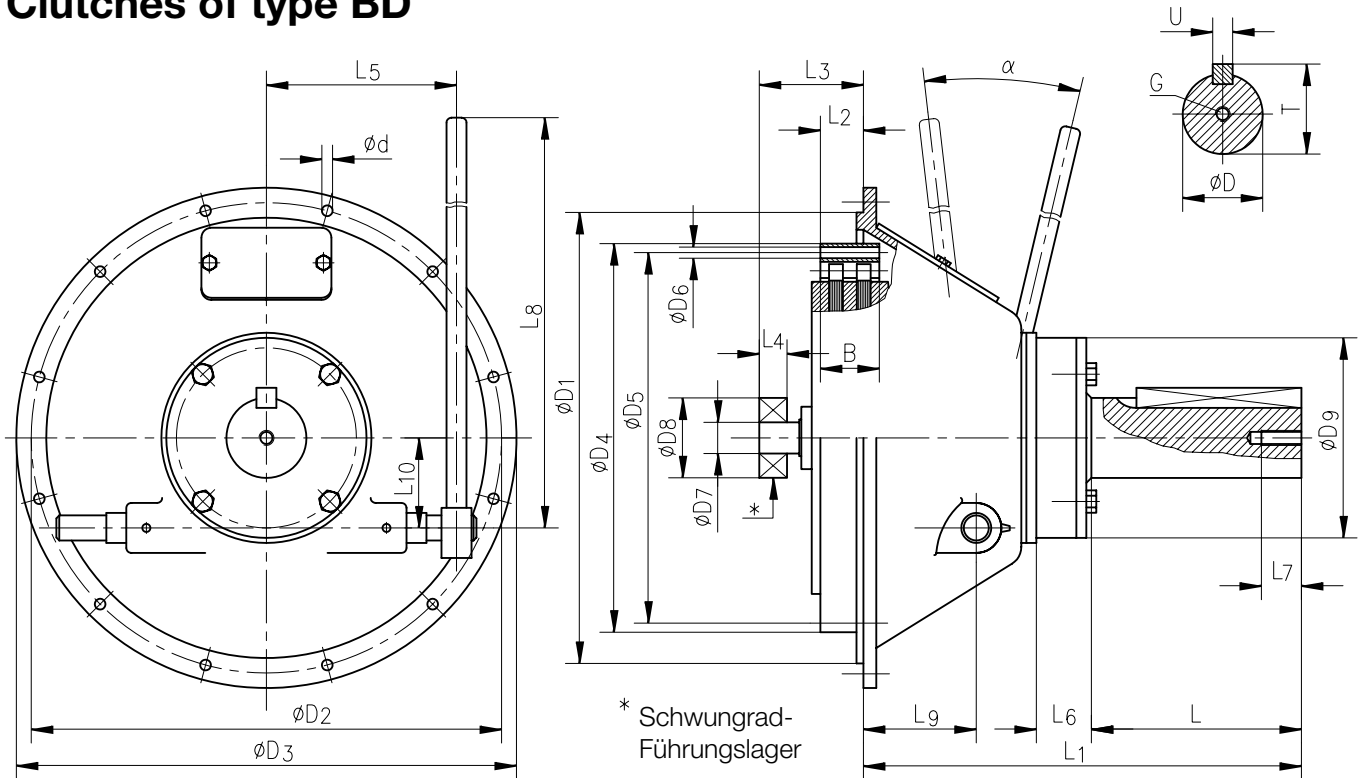
* R version

Dimension table

Size	Fylwheel SAE	Shaft																		
		L ₁ mm	L mm	D mm	T mm	U mm	G	L ₂ mm	B mm	L ₃ mm	L ₄ mm	L ₅ mm	L ₆ mm	L ₇ mm	L ₈ mm	L ₉ mm	L ₁₀ mm	D ₇ mm	D ₈ mm	D ₉ mm
BD 110 SAE 5	6 ½"	212.5	80	36.51	41.3	9.52	M 10	30.2	14	71.4	18	148	12	25	400	68.5	70	25	52	96
BD 112 SAE 4	7 ½"	212.5	80	36.51	41.3	9.52	M 10	30.2	22	71.4	18	148	12	25	400	68.5	70	25	52	96
BD 112 SAE 4/3	8"	184	80	36.51	41.3	9.52	M 10	62	16	100	24	148	12	25	400	40	70	25	62	96
BD 118 SAE 4/3	8"	221	100	44.45	50.8	12.7	M 10	62	18	100	24	148	29	28	400	40	70	25	62	138
BD 130 SAE 4/3	10"	297	140	57.15	65.1	15.87	M 10	53.8	35	100	27	160	33	30	400	78	70	30	72	122
BD 145 SAE 4/3	11 ½"	334	165	57.15	65.1	15.87	M 14	39.6	29	100	27	155	45	30	400	78	70	30	72	170
BD 290 SAE 3	11 ½"	367	165	63.50	71.4	15.87	M 14	39.6	50	100	27	155	45	35	400	111	70	30	72	170
BD 290 (R) SAE 2/1	11 ½"	367	165	63.50	71.4	15.87	M 14	39.6	50	100	27	200	45	35	600	107	80	30	72	170
BD 290 (R) SAE 3	11 ½"	461	150	63.50	71.4	15.87	M 14	39.6	50	100	27	155	134	35	400	111	70	30	72	154
BD 290 (R) SAE 2/1	11 ½"	461	150	63.50	71.4	15.87	M 14	39.6	50	100	27	200	134	35	600	107	80	30	72	154
BD 390 SAE 3/2	11 ½"	488	150	63.50	71.4	15.87	M14*	39.6	75	100	27	155	134	35	400	138	70	30	72	154
BD 2200 SAE 1	14"	467	140	88.90	100	22.22	M 20	25.4	62	100	31	215	77	40	600	179	114	35	80	220
BD 2200 (R) SAE 1	14"	571	140	88.90	100	22.22	M 20	25.4	62	100	31	215	181	40	600	179	114	35	80	220
BD 3300 SAE 1	14"	495	140	88.90	100	22.22	M 20	25.4	90	100	31	215	77	40	600	207	114	35	80	220
BD 3300 (R) SAE 1	14"	600	140	88.90	100	22.22	M 20	25.4	90	100	31	215	181	40	600	207	114	35	80	220
BD 3500 SAE 0	18"	663	200	114.30	127	25.40	M 24	15.7	24	100	29	305	105	60	600	265	145	55	120	290

* M 14 x 1,5

Clutches of type BD



Housing connection dimensions

SAE-Size	D ₁ mm	D ₂ mm	D ₃ mm	d mm
5	314.3	333.4	355	8x11
4	362	381	403	12x11
3	409.6	428.6	451	12x11
2	447.7	466.7	489	12x11
1	511.2	530.2	552	12x11
0	647.7	679.5	711	16x13.5

Ordering example:

Clutch designation **BD-290 - 11,5 - 2**

PTO clutch type/size

Flywheel connection
SAE size

Housing connection
SAE size

Permissible radial load on the output shaft

For radial power take-off, the permissible radial load F_R in N is to be calculated according to the following formula while taking a service factor S_R for the type of drive into account:

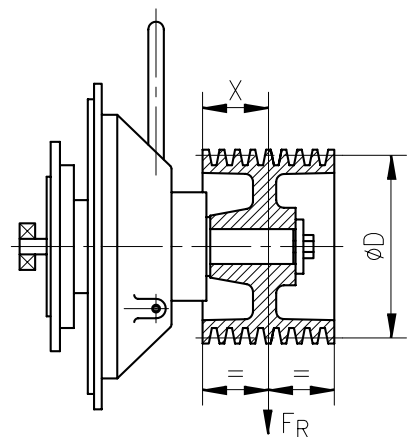
$$F_R = \frac{P \cdot 19100}{n \cdot D} \cdot S_R$$

P [kW] input power
 n_2 [rpm] output speed
D pitch diameter in m

Type of drive

Gear or chain drive $S_R = 1.0$
V-belt drive $S_R = 2.5$
Flat belt drive $S_R = 3.5$
V-belt drive (compressor) $S_R = 5$

Size	n rpm	Perm. radial load F_R [N] at distance X [mm]					
		30	50	80	100	120	140
BD 110	2600	3700	2800	-	-	-	-
BD 112	2600	3700	2800	-	-	-	-
BD 118	2600	5600	4300	3350	-	-	-
BD 130	2300	9300	6000	4300	-	-	-
BD 145	2300	18000	12000	7500	6500	-	-
BD 290	2100	18000	12000	7500	6500	-	-
BD 390	2100	25000	20000	15000	12500	-	-
BD 2200	1800	-	21500	16000	13500	12000	-
BD 3300	1800	-	21500	16000	13500	12000	-
BD 3500	1500	-	28000	27000	26500	26000	25000



Attachment gearboxes of types RM-S and RM-D

For diesel engines with SAE connection dimensions

Speed reducing or speed increasing gearbox for attachment with a clutch:

$$\text{Transmission ratio } i = \frac{\text{engine speed}}{\text{gearbox output speed}} = \frac{n_e}{n_2}$$

T_e = perm. max. input torque for continuous operation

n_e = max. input speed

P_e = max. Nennleistung nominal power

A service factor S, as defined in the selection guidelines, is to be taken into account when selecting the PTO size with gearbox.

Lubrication: We recommend to use oil with EP additives and a viscosity of SAE 90 for the gearbox. The gearbox is delivered without oil filling.

Oil operating temperature: The maximum oil temperature must not exceed 95 °C in continuous operation. In the case of a higher power-take off or operation near the load limit, the gearbox types RM 120 and RM 150 can be supplied with an oil cooling system.

Motor connection dimensions

PTO - Size

Gearbox design

Housing: SAE -5 -4 -3 Clutch: BD 110 - 6½" 170 Nm BD 112 - 8" (7½") 200 Nm	Type	Identical direction of rotation RM 20 S					Reverse direction of rotation RM 20 D						
	i		0.64	1.89	2.47			0.57	1.00	2.00	2.71		
	T_e [Nm]		75	55	50			75	75	55	50		
	n_e [rpm]		2800	3500				3500					
	P_e [kW]		12						15				

Housing: SAE -5 -4 -3 Clutch: BD 118 - 8" 240 Nm	Type	Identical direction of rotation RM 45 S					Reverse direction of rotation RM 45 D								
	i		0.57	1.50	1.81	2.65	4.09		0.67	1.00	2.00	2.88	3.40	4.00	5.00
	T_e [Nm]		160	130	110	90	70		165	160	120	120	80	80	70
	n_e [rpm]		3500						2800	3500					
	P_e [kW]		24						30						

Housing: SAE -4 -3 Clutch: BD 130 - 10" 330 Nm	Type	Identical direction of rotation RM 70 S						Reverse direction of rotation RM 70 D									
	i		0.50	0.63	0.70	1.32	1.88	2.73	3.25		0.58	1.00	1.58	2.00	2.45	3.00	3.75
	T_e [Nm]		280	280	260	220	200	160	120		290	290	250	210	190	170	155
	n_e [rpm]		2400	2600	2700	3200				2500	3200						
	P_e [kW]		38							48							

Housing: SAE -4 -3 Clutch: BD 130 - 10" 330 Nm BD 145 - 11½" 450 Nm	Type	Identical direction of rotation RM 100 S						Reverse direction of rotation RM 100 D											
	i		0.51	0.81	1.23	1.50	1.86	2.80	4.21		0.60	0.67	1.00	1.20	1.50	2.00	3.00	3.65	5.00
	T_e [Nm]		400	380	380	350	320	260	230		400	400	400	380	350	320	260	230	230
	n_e [rpm]		2000	2700	3000				2400	2500	3000								
	P_e [kW]		60							75									

Housing: SAE -4 -3 -2 -1 Clutch: BD 145 - 11½" 450 Nm BD 290 - 11½" 900 Nm	Type	Identical direction of rotation RM 120 S						Reverse direction of rotation RM 120 D							
	i		0.67	1.50	2.00	2.60	2.80	3.00		0.50	1.02	1.70	2.00	3.00	3.55
	T_e [Nm]		830	500	480	480	480	480		1000	880	740	700	510	450
	n_e [rpm]		2000	2500				2000	2500						
	P_e [kW]		68*							85*					

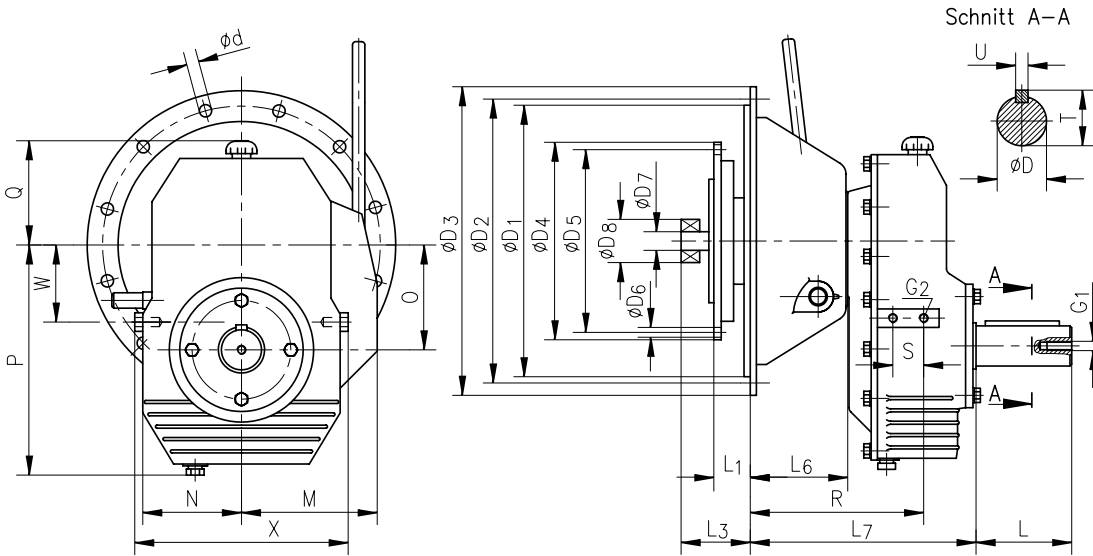
Housing: SAE -3 -2 -1 Clutch: BD 290 - 11½" 900 Nm BD 2200 - 14" 2000 Nm	Type	Identical direction of rotation RM 150 S					Reverse direction of rotation RM 150 D							
	i		1.51	1.96	2.70				0.66	1.02	1.47	2.00	3.04	
	T_e [Nm]		950	950	640				1500	1450	1250	1090	850	
	n_e [rpm]		2500						2000	2500				
	P_e [kW]		80*						100*					

* An oil cooling system is required in the case of higher power ratings

Clutch of type RM-BD with attachment gearbox

For diesel engines with SAE connection dimensions - dimension table page 10.

Gearboxes with output shaft, offset by 180° to the top, upon request.



Gearbox Type	Clutch Type	T _Ü Nm	Housing SAE	Flywheel connection				
				SAE size	D ₄ mm	D ₅ mm	Number of holes Z x D ₆	D ₈ mm
RM 20 (-)	BD 110	170	5	6½"	215.9	200	6 x 8,5	52
	BD 112	200	3 · 4	8"	263.5	244.5	6 x 11	62
RM 45 (-)	BD 110	170	5	6½"	215.9	200	6 x 8,5	52
	BD 118	200	3 · 4	8"	263.5	244.5	6 x 11	62
RM 70 (-)	BD 130	330	3 · 4	10"	314.3	295.3	8 x 11	72
RM 100 (-)	BD 130	330	3 · 4	10"	314.3	295.3	8 x 11	72
	BD 145	450	3 · 4	11½"	352.4	333.4	8 x 11	72
RM 120 (-)	BD 145	450	3 · 4	11½"	352.4	333.4	8 x 11	72
	BD 290	900	1 · 2 · 3	11½"	352.4	333.4	8 x 11	72
RM 150 (-)	BD 290	900	1 · 2 · 3	11½"	352.4	333.4	8 x 11	72
	BD 2200	2000	1	14"	466.7	438.2	8 x 14	80

Clutches of types RM-BD and RM-BDS

Permissible radial load on the gear shaft

For radial power take-off, the permissible radial load F_R in N is to be calculated according to the following formula while taking a service factor S_R for the type of drive into account:

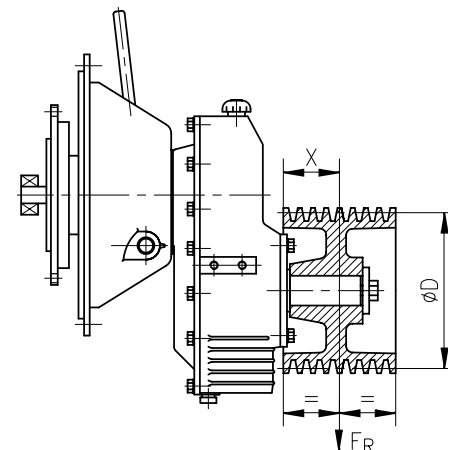
$$F_R = \frac{P \cdot 19100}{n_2 \cdot D} \cdot S_R$$

P [kW]input power
n₂ [rpm] output speed
D pitch diameter in m

Type of drive

Gear or chain drive	S _R = 1.0
V-belt drive	S _R = 2.5
Flat belt drive	S _R = 3.5
V-belt drive (compressor)	S _R = 5

Gearbox Type	n ₂ rpm	Distance X [mm]						
		30	40	50	60	80	100	150
RM 20	1000	4000	3800	3300	2800	2200	-	-
	2500	3300	2800	2400	2000	1600	-	-
RM 45	1000	-	5000	4500	3900	3000	2500	-
	2500	-	3800	3500	2900	2300	1900	-
RM 70	1000	-	10500	9000	7800	6500	5300	-
	2500	-	8000	7000	6000	5000	4100	-
RM 100	1000	-	12000	11000	10000	8300	7000	5300
	2500	-	8500	7200	6500	5400	4700	3500
RM 120	1000	-	-	16000	14000	11500	9700	7500
	2500	-	-	12500	11000	9000	7900	5700
RM 150	1000	-	-	19000	17000	14200	12000	9000
	2500	-	-	17500	15800	13000	11000	8200

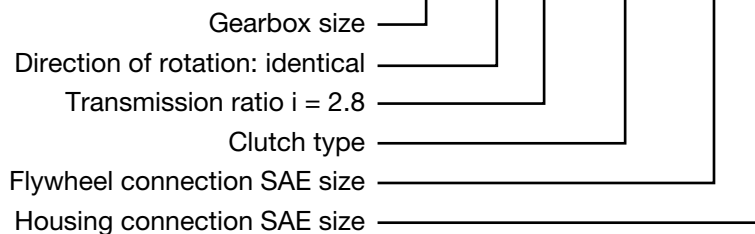


Clutch of type RM-BD with attachment gearbox

Gearbox Type	Clutch Type				Shaft end											Lateral support areas					
		D ₇ mm	L ₁ mm	L ₃ mm	D mm	L mm	U mm	T mm	G ₁	L ₆ mm	L ₇ mm	M mm	N mm	O mm	P mm	Q mm	R mm	S mm	X mm	G ₂	W mm
RM 20 (-)	BD 110	25	30	71	30	50	8	33	M10	108	215.5	110	82	67.5	164	137	-	-	-	-	-
	BD 112		62	100						80	187										
RM 45 (-)	BD 110	25	30	71	40	70	12	43.5	M10	108	239.5	130	103	88.5	215	160	-	-	-	-	-
	BD 118		62	100						80	211										
RM 70 (-)	BD 130	30	54	100	50	80	14	54	M12	114	256	155	125	121.5	278	170	-	-	-	-	-
RM 100 (-)	BD 130	30	54	100	60	120	16*	65	M14	114	286	183	135	135	283	176	-	-	-	-	-
	BD 145		40							114	286										
RM 120 (-)	BD 145	30	40	100	70	140	20	76	M14	114	314	220	170	160	337	208	232	50	380	M12	238
	BD 290		147							347	265										
RM 150 (-)	BD 290	30	40	100	80	140	24*	87	M20	147	409	220	190	189	384	229	292	50	420	M2	159
	BD 2200	35	25	100						236	493						381				

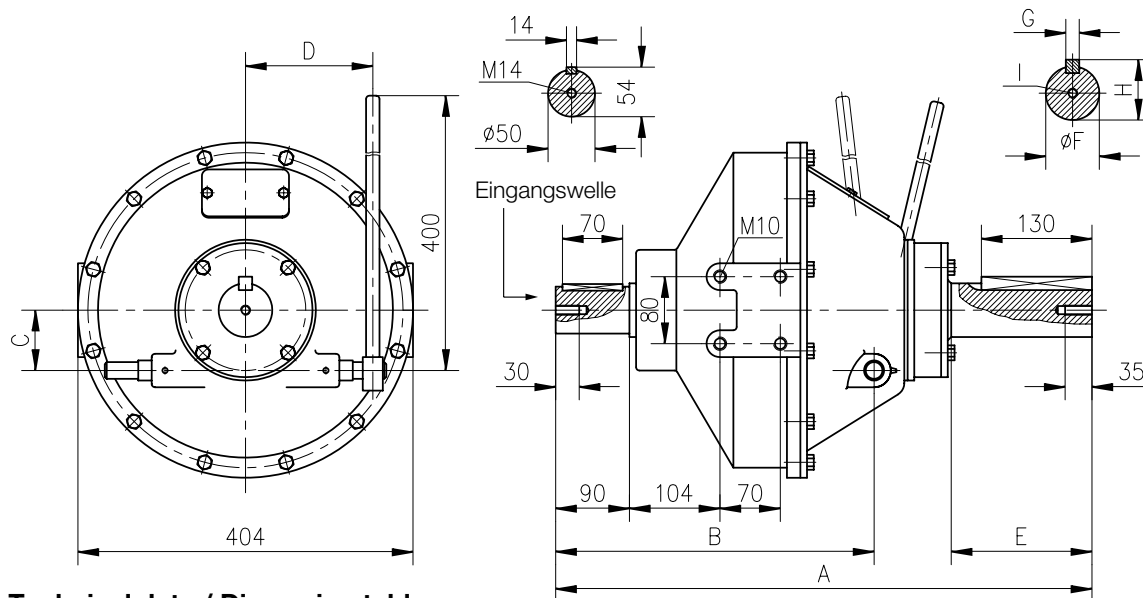
* Key not according to DIN 6885/1

Ordering example: Clutch designation **RM 120-S-2,80 BD 290-11,5-2**



Clutches of type BDS

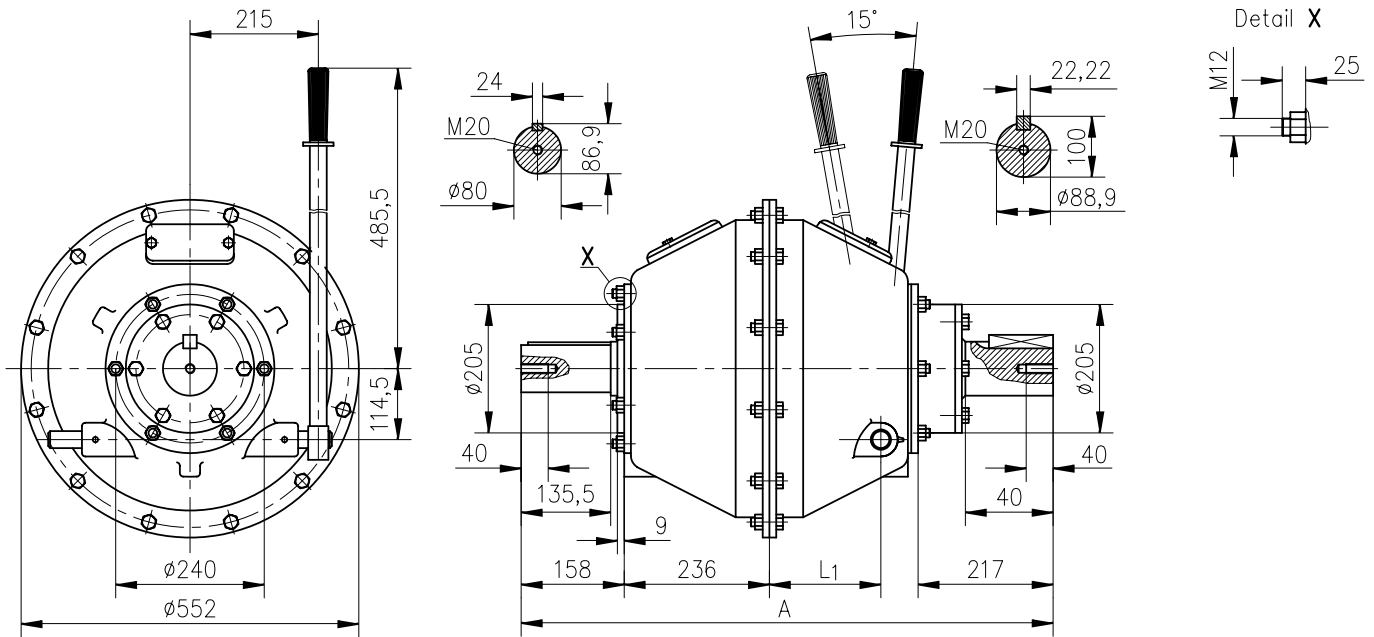
Within an enclosed housing version for free-standing installation



Technical data / Dimension table

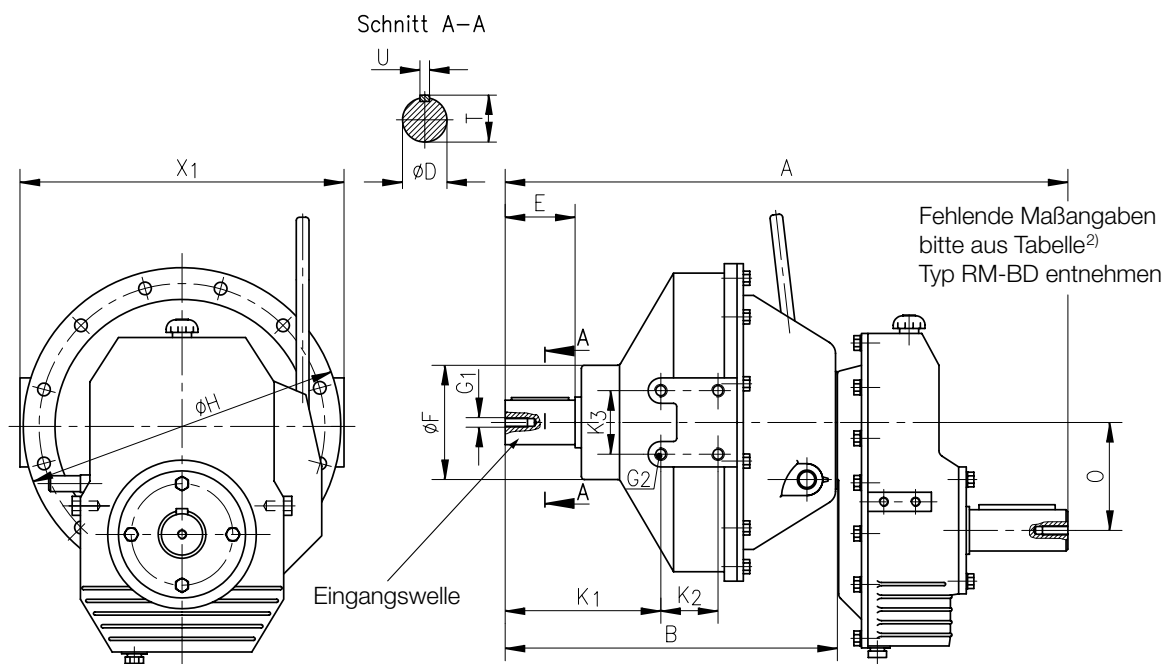
Size	T _Ü Nm	n _{max} rpm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I	m kg	J kgm ²
BDS 112	200	3500	474	330	70	148	80	36.51	9.52	41.3	M10	52	0.1175
BDS 118	240	3500	511	330	70	148	100	44.45	12.70	50.8	M10	57	0.1373
BDS 130	330	3100	587	368	70	160	140	57.15	15.87	65.1	M10	75	0.2875
BDS 145	450	3100	623	368	70	155	165	75.15	15.87	65.1	M14	83	0.4375
BDS 290	900	2900	656	401	70	155	165	63.50	15.87	71.4	M14	106	0.6750
BDS 2200	2000	2400	862	573	114.5	215	140	88.90	22.22	100	M20	264	3.000
BDS 3300	3000	2400	890	601	114.4	215	140	88.90	22.22	100	M20	288	3.3750

Für Halteplatten
befestigung



Clutches of type RM-BDS with gearbox

Type with gearbox within an enclosed housing version for free-standing installation



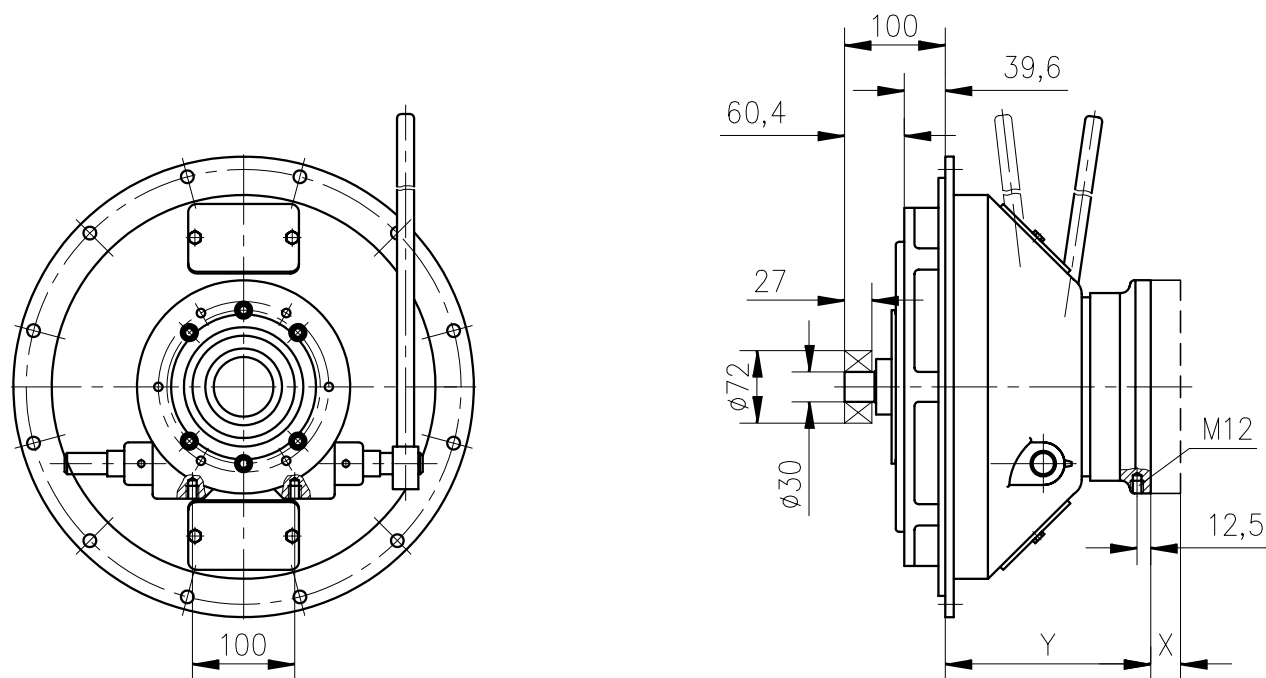
Size		Inout shaft								Lateral support areas							
		A mm	B mm	C mm	E mm	D mm	U mm	T mm	G ₁	F mm	H mm	K ₁ mm	K ₂ mm	K ₃ mm	G ₂	X ₁ mm	O mm
RM 20	BD 112	526	369	128	90	50	14	54	M14	140	403	194	70	80	M10	404	67.5
RM 45	BD 118	570	369	128	90	50	14	54	M14	140	403	194	70	80	M10	404	88.5
RM 70	BD 130	627	403	128	90	50	14	54	M14	140	403	194	70	80	M10	404	121.5
RM 100	BD 145	695	403	128	90	50	14	54	M14	140	403	194	70	80	M10	404	135
RM 120	BD 145	743	403	128	90	50	14	54	M14	140	403	194	70	80	M10	404	160
RM 120	BD 290	776	436	128	90	50	14	54	M14	140	403	194	70	80	M10	404	160
RM 150	BD 290	838	436	128	90	50	14	54	M14	140	403	194	70	80	M10	404	189
RM 150	BD 2200	1027	630	135	135	80	24 ¹⁾	87	M20	2)	552	2)	2)	2)	2)	552	189

1) Keyway not according to DIN 6885/1

Clutches of type BDP

For attachment to diesel engines

With hollow shaft and internal teeth for mounting the pump shaft



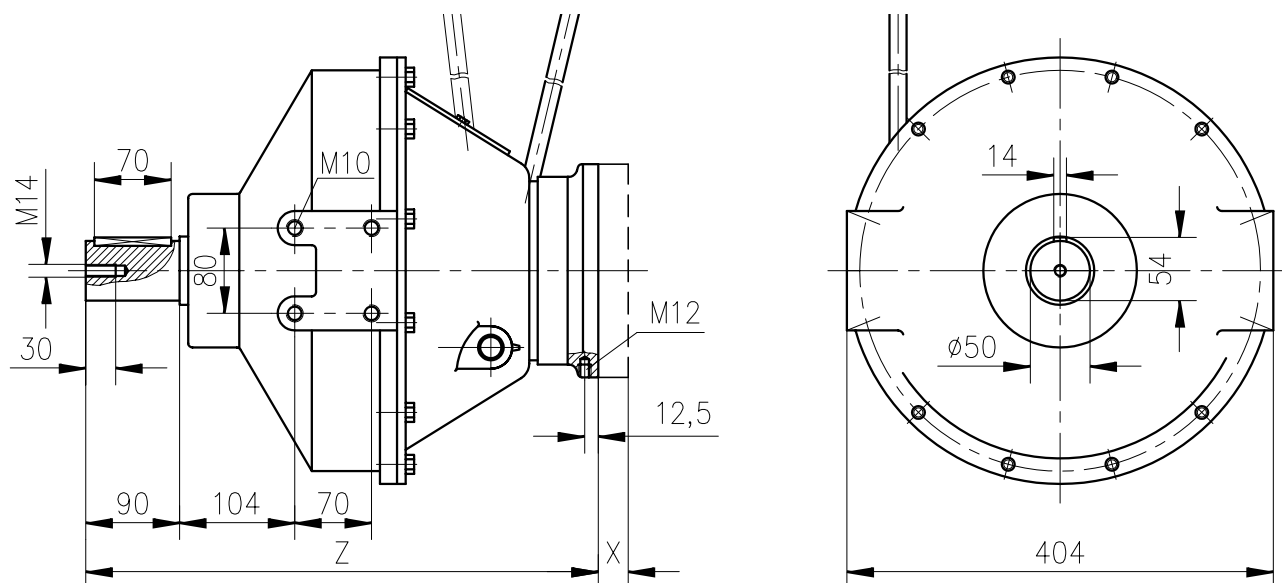
Size	SAE	Flywheel	Maximum torque - $T_{\bar{U}}$ Nm	n_{\max} rpm	Y mm
BDP 145	3 - 4	11"½	450	3100	174
BDP 290	1 - 2 - 3	11"½	880	2900	207

Pump	X mm
SAE B	20
SAE C	28

Clutches of type BDSP

For free-standing installation

For attachment of a hydraulic pump



Size	Maximum torque - $T_{\bar{U}}$ Nm	n_{\max} rpm	Z mm
BDSP 145	450	3100	463
BDSP 290	880	2900	496

Pump	X mm
SAE B	20
SAE C	28

Installation and operating instructions

General

The clutches are factory adjusted and lubricated and need not be additionally adjusted or lubricated before use.

The following instructions are essential to ensure a satisfactory operation of the clutch:

- The friction surfaces of the clutch must not come into contact with fuel or grease.
- Input power and engine speed should be within the permissible range of values.
- The permissible radial loads must not be exceeded in the case of radial shaft loads.
- The clutch must only be engaged at a slow running engine speed of not more than 1000 rpm
- The clutch must be engaged quickly over the full stroke in order to avoid unnecessarily prolonged slip times. This equally applies to the disengagement process.
- The clutch must be adjusted in due time in the case of lining wear.

Assembly to the engine

The clutch is supplied in the engaged position, and the actuating lever (50) is not mounted.

Do not disengage the clutch until it is completely mounted to the engine.

Insert the pilot bearing into the location hole of the engine flywheel. The pilot bearing must be double sealed and lubricated for life.

The pilot bearing usually has an interference fit in the flywheel housing and a slip fit on the shaft end of the clutch.

If the flywheel housing is not provided with an interference fit for the pilot bearing, the pilot bearing must be secured with „Loctite“ to the outside ring to prevent the pilot bearing from slipping out.

Screw the outside ring (38) to the engine flywheel and tighten the retaining screws to the specified tightening torque.

Lift the clutch assembly up into the engine attachment position and carefully bring the teeth of the friction lining (39) into mesh with the teeth of the outside ring (38) without damaging them.

Slide the shaft end of the clutch into the pilot bearing by drawing the clutch as far as possible towards the engine until the centering rim of the clutch housing fits into the centering of the engine housing. Then insert the retaining screws of the engine housing and tighten them crosswise in increments.

Put the actuating lever (50) into the correct position and lock it with the retaining screws. Thereafter, the clutch is ready for engagement and disengagement.

Make sure that the input shaft can be easily rotated by hand when the clutch is disengaged.

After assembly is complete, there must be no axial pressure acting on the crankshaft. Slightly tap against the clutch shaft for relief.

Check the axial clearance of the crankshaft before putting the engine into operation.

Maintenance

Lubrication

Clutches of types BD 110/112/118/130/145/290/390 should be relubricated every 300 operating hours:

- Shaft bearings via grease nipples
- Actuator ring bearing – only accessible after removal of the inspection cover
- Cross shaft via lubrication point

Clutches of types BD 2200/3300/3500 should be relubricated every 100 operating hours:

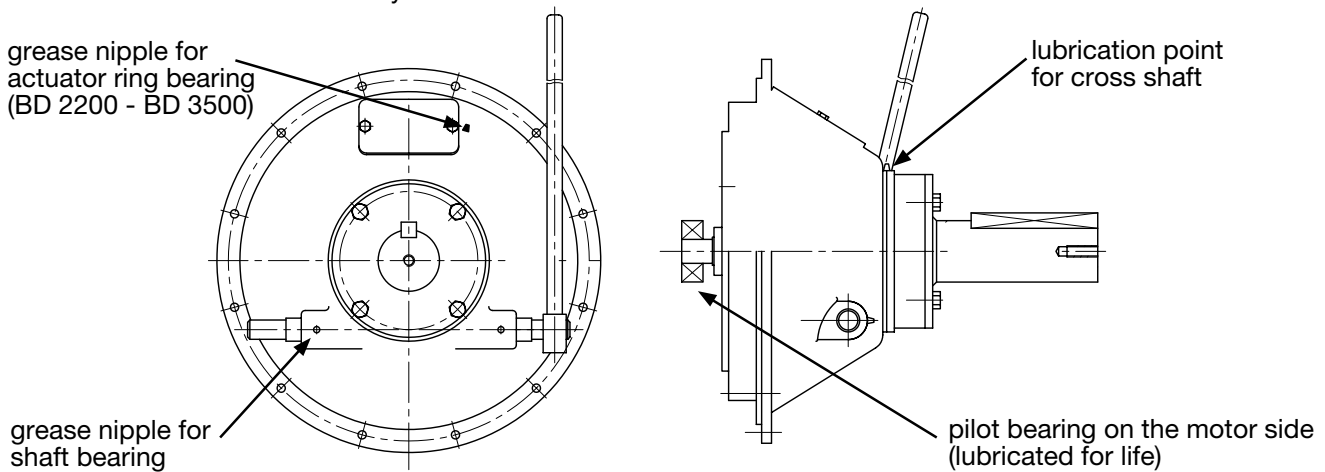
- Shaft bearings via grease nipples
- Actuator ring bearing via grease nipples provided outside the housing
- Cross shaft via grease nipples every 600 operating hours

Clutches of type RM-BD with gearbox

The oil level of clutches with gearbox must be checked at periodic intervals. The first oil change should be carried out after the initial 100 operating hours.

Further oil changes are necessary after 500 to 1000 hours depending on the type of duty cycle.

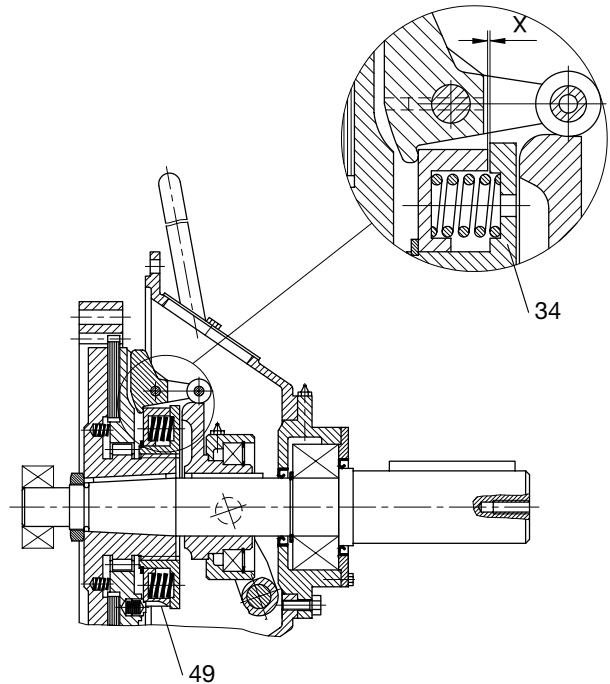
Oil with EP additives and a viscosity of SAE90 should be used.



Clutch adjustment

Proper adjustment of the clutch is of essential importance to ensure a satisfactory service life. It is the responsibility of the user to periodically check for proper adjustment. The clutch must not be adjusted while the engine is running.

The clutch needs adjusting when the engaging force to be applied is found to be less than required or if the gap dimension X is larger than 1.3 mm. For adjustment, remove the inspection cover in front of the clutch housing and disengage the clutch. Rotate the clutch into a position that allows for pressing against the thrust piece (49) with the aid of a screwdriver. Using a screwdriver, rotate the adjusting ring (34) clockwise until the thrust piece locks in place. When the clutch is engaged, a distance dimension of $x = 0.5 - 0.7$ mm must be available. Repeat the adjustment process, if necessary.



Safety precautions

It is the customer's and user's responsibility to observe the national and international safety rules and laws. Proper safety devices must be provided for the coupling to prevent accidental contact.

Check all bolted connections for the correct tightening torque and fit after a short running period preferably after a test run.

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