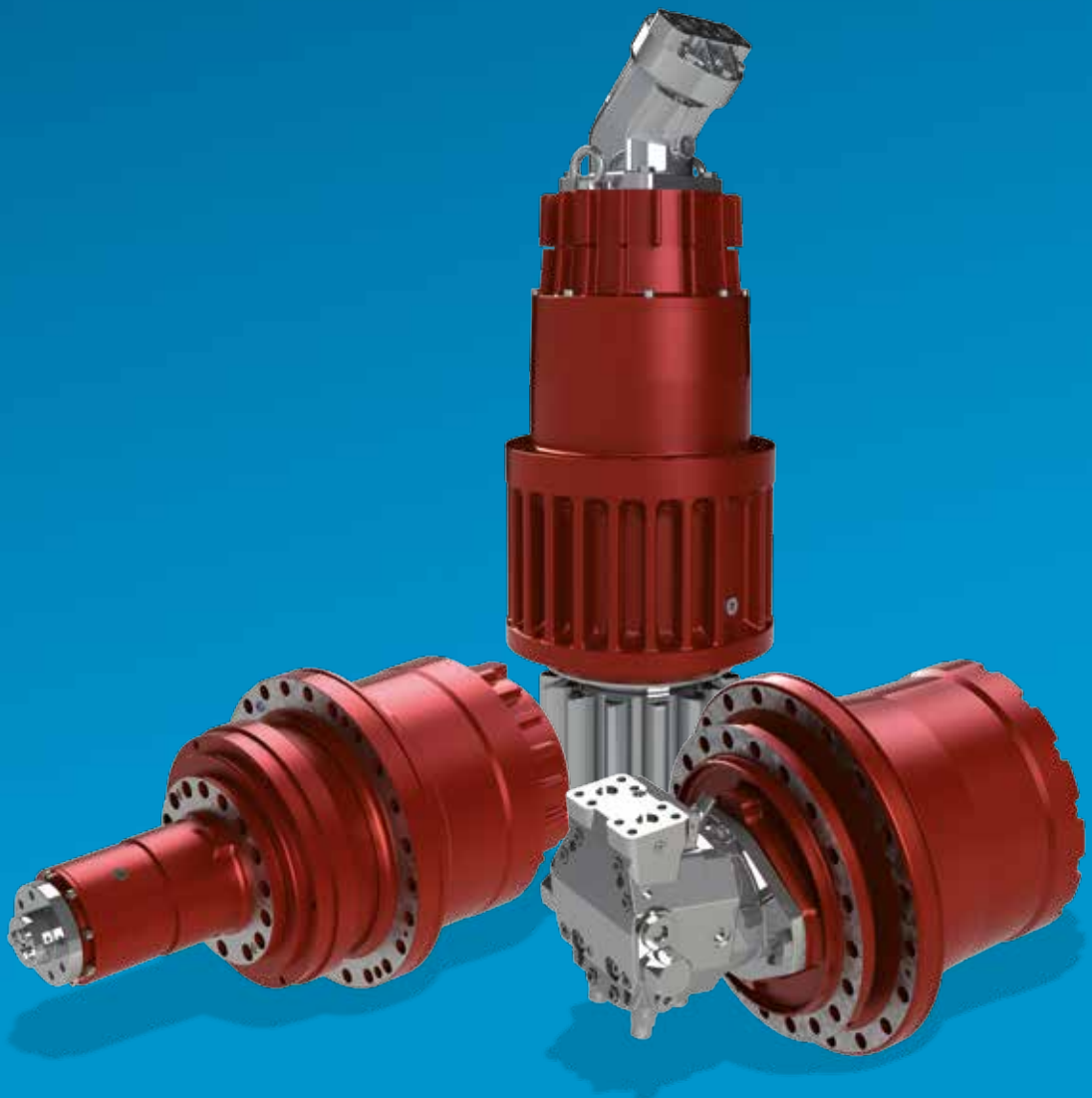
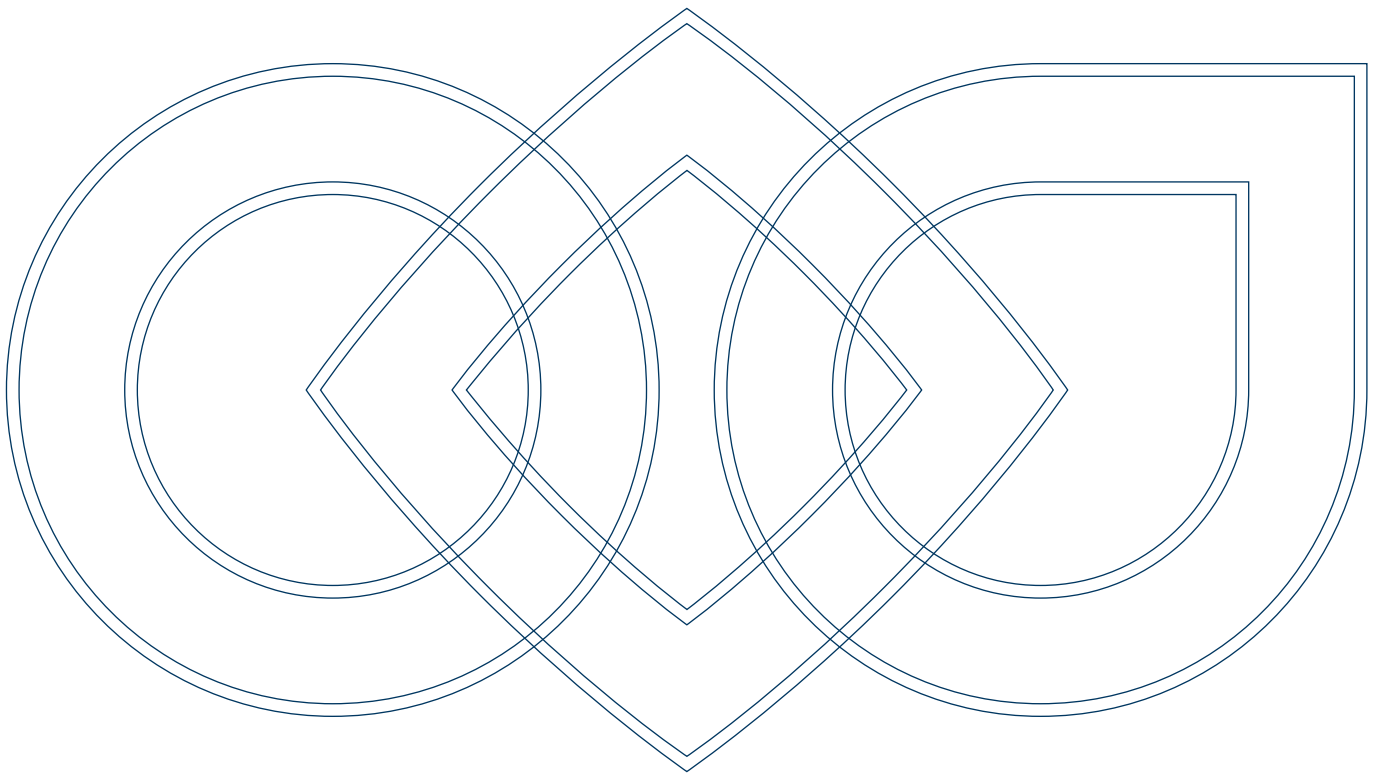


Bonfiglioli O&K Antriebstechnik

Product range



 **Bonfiglioli**
Forever Forward



The widest range of final drives on the market

Bonfiglioli Riduttori today is one of the top brands in the power transmission industry.

The company's success is the result of a business strategy that relies on three fundamental factors: know-how, innovation and quality.

The complete range of Bonfiglioli gearmotors and final drives offers excellent technical characteristics and guarantees the highest performance. Substantial investment and technical expertise have enabled the company to achieve an annual production output of 1600000 units using completely automated processes.

Certification of the company's Quality

System by DNV and TÜV is proof of the high quality standards achieved.

With the acquisition of several brands, including Vectron, Tecnoingranaggi and O&K Antriebstechnik, Bonfiglioli is an established leader in drives and controls, power transmission and industrial automation, enabling Bonfiglioli to deliver completely integrated solutions to a wide variety of business sectors and applications.

For mobile machinery, Bonfiglioli focuses on special applications that offer 100% reliability in the manufacturing of gearmotors and travel drives for top manufacturers worldwide.



O&K Antriebstechnik SOLUTIONS



O&K: Technical heritage and excellence

With over 130 years of history, O&K Antriebstechnik is a centre of engineering excellence, recognized worldwide for high quality “made in Germany” products for applications in mining, construction and marine and offshore.

The origins of the company date back to the founders, Benno Orenstein and Arthur Koppel, who at the end of the 19th century began – in the middle of the Ruhr – to develop railway systems for foundries and mines.

Step by step, O&K became the benchmark for heavy duty machines and the best-known brand in the world for the design and manufacture of excavators and mining shovels.

Today, O&K is recognised for solid expertise, significant ability in adapting design solutions to meet different requirements and excellent product quality.

High technological standards of development, production and quality ensure the highest performance and reliability in today’s market.



O&K Antriebstechnik PRODUCTS

COMPACT DRIVES

- 8 Planetary Gear Box with integrated kit motor

TRAVEL DRIVES

- 10 Final Drives Small
- 12 Final Drives Medium
- 14 Final Drives Large
- 18 Final Drives XLarge
- 22 Final Drives Angular Input
- 24 Final Drives 2 - Speed
- 26 Wheel Drives

SLEW DRIVES

- 28 Slew Drives

CUTTER DRIVES

- 30 Cutter Drives Medium
- 32 Cutter Drives Large
- 34 Cutter Drives 2-Speed

WINCH DRIVES

- 36 Classification of crane
- 37 Torque conversion factors k
- 38 Winch Drives Small
- 40 Winch Drives Medium
- 42 Winch Drives Large
- 44 Winch System for Vertical Drills with External or Internal Brake
- 45 Winch System for Harbour Cranes

OTHER DRIVES

- 46 Torque Units & Tunneling Drives
- 48 Jack-up Drives

50 MATCHING PRODUCTS/APPLICATIONS CHARTS

52 WORLDWIDE NETWORK

Compact Drives

Planetary Gear Box with integrated kit motor

Output torque

45 kNm

Gear Ratios

45.2 i

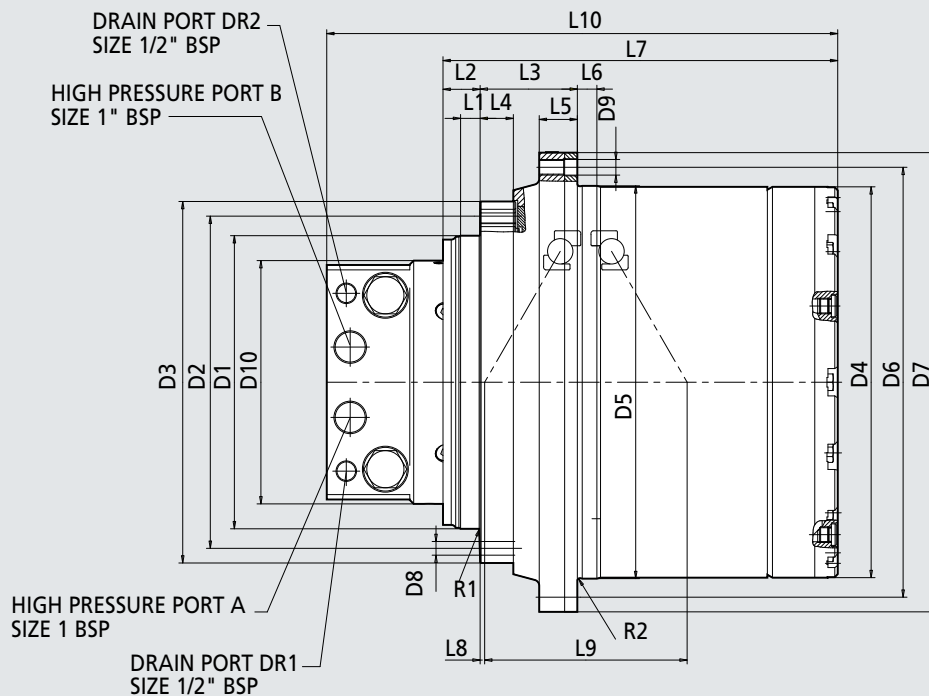
Features

- Integrated hydraulic motor
- 2 – Stage planetary drive
- 2 – Speed hydraulic motor
- Counterbalance travel valve
- High pressure relief valves
- 2 – Speed shift function by external pilot control
- Automatically release park brake



Type	Output torque (kNm)
F45K	45

F30K, F55K, F80K, F100K under development



Overall dimensions and technical data

F45K		
Ratio ²	i	45.2
CAPACITY OF BEARING		
C-dynamic	kN	215
Co-static	kN	291
Weight ⁴	kg	296
PARK BRAKE		
Locking torque	Nm	400
Automatic release		–
HYDRAULIC MOTOR		
Variable displacement	ccm	175 max / 99 min
Max. pressure	bar	350
Max. pump flow	L/min	240
Pilot pressure	bar	10-40
DIMENSIONS		
L1	mm	20
L2	mm	34
L3	mm	98.5
L4	mm	34
L5	mm	39
L6	mm	20
L7	mm	404
L8	mm	6
L9	mm	213
L10	mm	523
R1	mm	1
R2	mm	2.5
D1	mm	300
D2	mm	340
D3	mm	370
D4	mm	400
D5	mm	402
D6	mm	440
D7	mm	370
D8	mm	M16x2
D9	mm	M16x2
Qty. D8 / D9		30/30
D10	mm	249

Note: size of high pressure ports A and B optionally PF1" or SAE 1"

Travel Drives

Final Drives Small

Output torque

5 ... 30 kNm

Gear Ratios

30 ... 305 i

Standard features

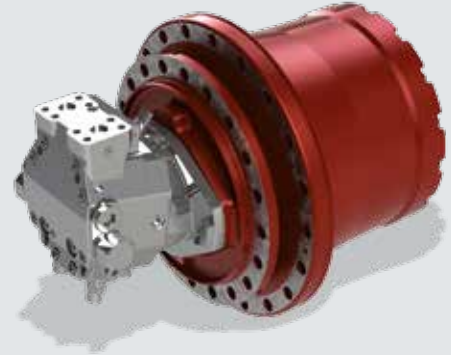
- Compact structure
- High performance
- 3-7 Planetary wheels per stage
- Notchless ground tooth root
- Different ratios
- Integrated disc-brake
- High availability by highest teeth and production quality

Proven applications

- Track drives
- Chain drives
- Wheel drives
- Reel and winchdrives
- Road cutter drum drives

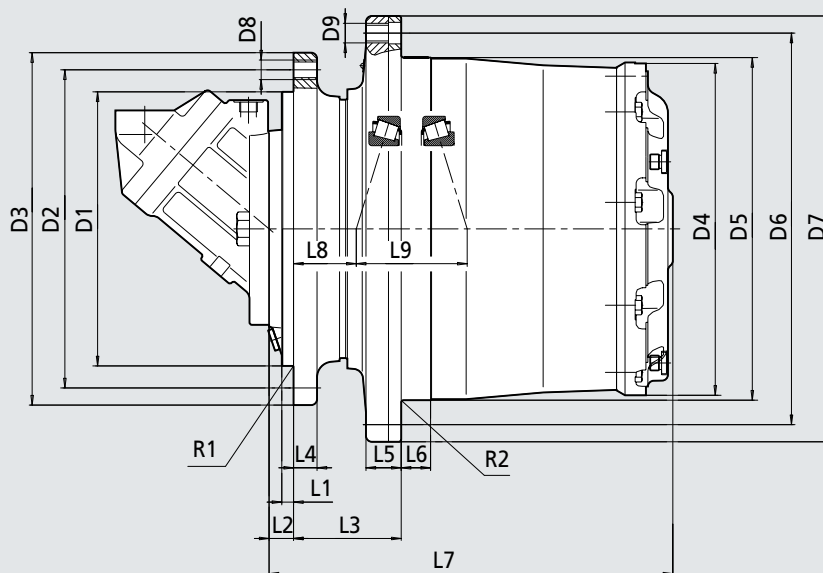
Special executions on request

- Mechanical disconnect device



Type	Output torque* (kNm)
F5	5
F10A	10
F13A	13
FD20	20
F30	30

* Stated torques are peak values for short duration



Overall dimensions and technical data

		F5	F10A	F13A	FD20	F30
Ratio ²	i	30-35-53	35-51-65	93 (41) ¹ -108-122-140-178-229	81-90-101-137-171-228	61 (19) ¹ -66 (32) ¹ -81-90-101-114-121-137-171-228-305
CAPACITY OF BEARING						
C-dynamic	kN	194	132	132	194/194	132/194
Co-static	kN	315	255	255	325/315	255/325
Weight ⁴	kg	43	45	50	72	94
MULTI-DISK BRAKE						
Locking torque	Nm	–	200	200	300	300 (255; 400) ³
Release pressure min.	bar	–	17	17	16	16 (16; 22) ³
Hydraulic motor plug in fixed	ccm	–	28-30-32	28-30-32	28-30-32	28-30-32-40-45-56-60-63
Plug in variable	ccm	–	25-45	28-45	28-45	28-45-55-60
DIMENSIONS						
L1	mm	8	10	10	10	13
L2	mm	8	30	30	41	25/22
L3	mm	70	72	72	75	75
L4	mm	19	13.5	13.5	15	15
L5	mm	18.5	15	15	28	29
L6	mm	20	16	16	25	25
L7	mm	220	230	255	300	323/320
L8	mm	38.4	28	28	15.3	28.5
L9	mm	80.2	79	79	86.3	89
R1	mm	0.6	0.6	0.6	2.5	2.5
R2	mm	0.6	0.6	0.6	2.5	2.5
D1	mm	165	190	190	240	240
D2	mm	192	230	230	275	275
D3	mm	215	256	256	304	304
D4	mm	190	216	216	250	269
D5	mm	204	220	220	270	270
D6	mm	232	260	260	305	305
D7	mm	255	290	290	335	335
D8	mm	M12x1.75	M16x2	M16x2	M16x2	M16x2
D9	mm	M12x1.75	M16x2	M16x2	M16x2	M16x2
Qty. D8 / D9		9/9	12/8	12/8	18/18	18/18

1) 2-stage

2) Other ratios on demand

3) Optional brake torques

4) Without Hydraulic motor

Travel Drives

Final Drives Medium

Output torque

40 ... 105 kNm

Gear Ratios

57 ... 226 i

Standard features

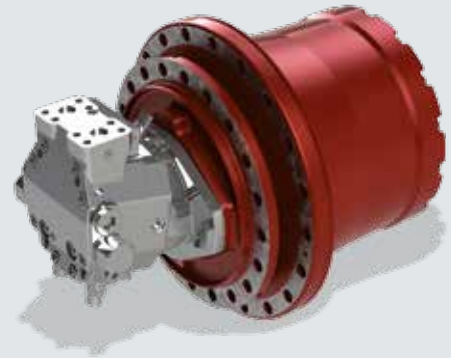
- Compact structure
- High performance
- 3-7 Planetary wheels per stage
- Notchless ground tooth root
- Different ratios
- Integrated disc-brake
- High availability by highest teeth and production quality

Proven applications

- Track drives
- Chain drives
- Wheel drives
- Reel and winchdrives
- Road cutter drum drives

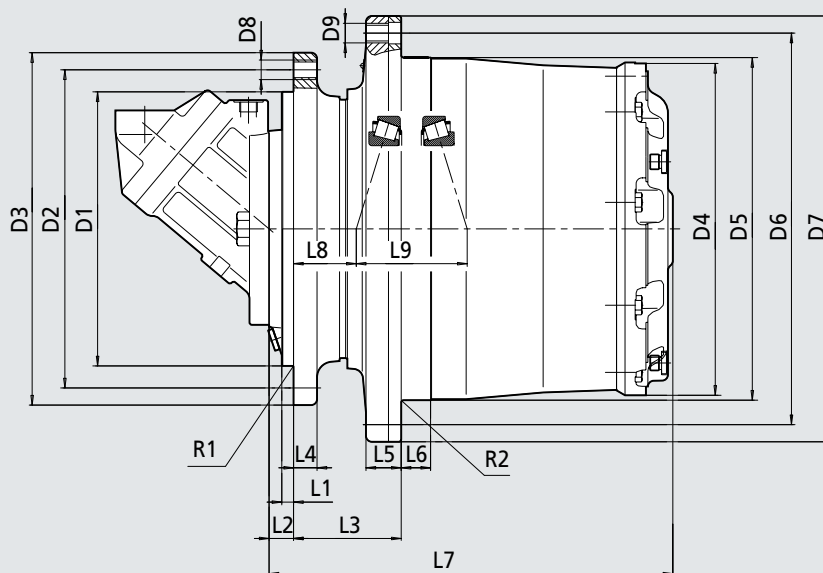
Special executions on request

- Mechanical disconnect device



Type	Output torque * (kNm)
F40	40
F40A	40
F55	55
F55A	55
F55B	55
F80	80
F80XR	80
F100	100
F100XR	100

* Stated torques are peak values for short duration



Overall dimensions and technical data

		F40	F40A	F55	F55A	F55B	F80	F80XR	F100	F100XR	
Ratio ²	i	61 (19) ¹ -66 (22) ¹ -81 (32) ¹ -85-101-110-117-124-142-181			63 (16) ¹ -68 (19) ¹ -87 (22) ¹ -94 (32) ¹ -103-117-124-137-148-185			61 (19) ¹ -81 (32) ¹ -101-114-121-137-147-171-187-206		77 (21) ¹ -84 (22) ¹ -95 (32) ¹ -121-142-175-192-226	
CAPACITY OF BEARING											
C-dynamic	kN	224	224	224	224	224	300	300	498	498	
Co-static	kN	405	405	405	405	405	570	570	1010	1010	
Weight ⁴	kg	115	123	165	177	181	230	240	330	341	
PARK BRAKE											
Locking torque	Nm	420	420	420 (390; 500) ³	420 (390; 500) ³	420 (390; 500) ³	600 (375; 550; 1000) ³	600	600 (900) ³	600	
Release pressure min.	bar	18	18	15 (15; 21) ³	15 (15; 21) ³	15 (15; 21) ³	18 (18; 19; 28) ³	18	15 (13) ³	15	
HYDRAULIC MOTOR											
Plug in fixed	ccm	40-45-56-60-63	80-90	80-90	40-45-56-60-63	–	80-90-107-110-125-160-180	80-90-107-110-160-180	107-125-160-180		
Plug in variable	ccm	55-60	80	80	55-60	107-110	80-107-110-160		107-110-160		
DIMENSIONS											
L1	mm	16	13	12	20	12	20	20	35/37	22	
L2	mm	16	35	25	30	37	35	35	35/37	35	
L3	mm	91	91	110	91	110	90	90	165	148	
L4	mm	21	21	24	24	24	22	22	28	29	
L5	mm	34	34	36	36	36	37	37	53	53	
L6	mm	26	26	30	30	30	24	23	43	30	
L7	mm	338	357	413	399	425	415	414.5	461/463	463	
L8	mm	38	38	64	45	64	34	68.5	32	32	
L9	mm	100	100	113	113	113	123	123	139	139	
R1	mm	2.5	2.5	1	4	1	4	4	10 (12)/60	2.5	
R2	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	2.5	
D1	mm	240	270	280	240	290	330	330	390	380	
D2	mm	285	310	325	285	335	370	370	460	430	
D3	mm	320	345	360	320	370	410	410	500	480	
D4	mm	294	294	340	340	340	374	374	407	407	
D5	mm	295	295	350	350	350	400	400	408	430	
D6	mm	335	335	400	400	400	450	450	460	480	
D7	mm	370	370	435	435	435	490	490	500	520	
D8	mm	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M24x2	M20x1.5	M24x2	M24x3	
D9	mm	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M24x2	M20x1.5	M24x2	M24x3	
Qty. D8 / D9		20/20	16/20	24/20	20/20	20/20	20/20	20/20	30/24	20/20	

1) 2-stage

2) Other ratios on demand

3) Optional brake torques

4) Without Hydraulic motor

Travel Drives

Final Drives Large

Output torque
130 ... 560 kNm

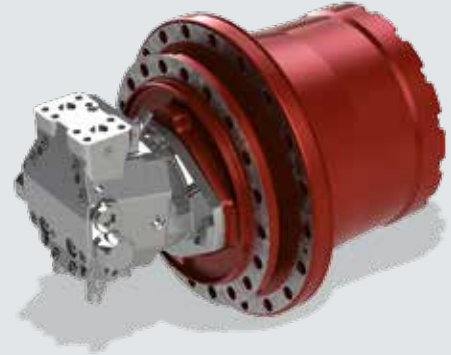
Gear Ratios
69 ... 1784 i

Standard features

- Compact structure
- High performance
- 3-7 Planetary wheels per stage
- Notchless ground tooth root
- Different ratios
- Integrated disc-brake
- Different hydraulic motors
- High availability by highest teeth and production quality

Special executions on request

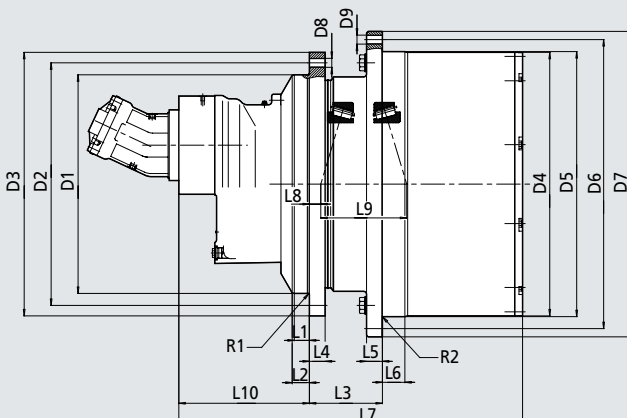
- Mechanical disconnect device



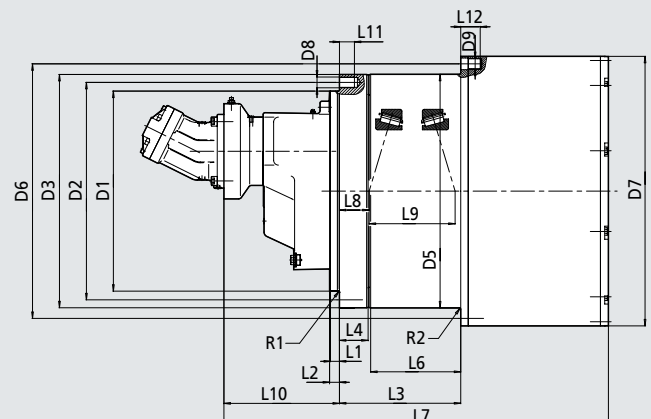
Type	Output torque * (kNm)
F130	130
F130XR	130
F180	180
F180XR	180
F220	220
F220XBR	220
F260	260
F280	280
F360	360
F420	420
F440	440
F560	560

* Stated torques are peak values for short duration

STANDARD INPUT VERSION - ST



CRAWLER CRANE VERSION - CC



Overall dimensions and technical data

		F130	F130XR	F180	F180XR	
Ratio ²	i	69 (14) ¹ -81 (18) ¹ -85 (21) ¹ -95 (26) ¹ -115-159-167-180-206	81-85-115-159-167-180-206	206-281-(412) ⁶ -(618) ⁶ -(824) ⁶		
Version ⁴		ST	ST	ST	CC	ST
CAPACITY OF BEARING						
C-dynamic	kN	523	–	787	787	787
Co-static	kN	980	–	1650	1650	1650
Weight ⁵	kg	452	465	636	636	636
PARK BRAKE						
Locking torque	Nm	750	750	1375 (800) ³	1375 (800) ³	1375 (800) ³
Release pressure min.	bar	19	19	35 (35) ³	35 (35) ³	35 (35) ³
HYDRAULIC MOTOR						
Plug in fixed	ccm	107-125-160-180		160-180	180	160-180
Plug in variable	ccm	107-160		160	–	
DIMENSIONS						
L1	mm	45	20	30	25	30
L2	mm	45	70	30	30	30
L3	mm	190	165	168	171	168
L4	mm	35	35	40	80	40
L5	mm	58	58	56	–	56
L6	mm	45	45	21.5	86	21.5
L7	mm	530	532	534.5	564.5	534.5
L8	mm	50.5	25	50.3	80.3	50.3
L9	mm	147	147	141.4	141.4	141.4
L10	mm	–	–	–	–	–
L11	mm	–	–	–	35	–
L12	mm	–	–	–	81.5	–
R1	mm	25	1.2	4	4	4
R2	mm	4	1.2	3	5	3
D1	mm	390	420	450	340	450
D2	mm	500	460	510	400	510
D3	mm	550	500	560	444	560
D4	mm	449	449	528	–	528
D5	mm	450	460	535	445	535
D6	mm	500	500	600	495	600
D7	mm	550	540	650	528	650
D8	mm	M24x2	M24x3	M24x2	M33x1.5	M24x2
D9	mm	M24x2	M18x1.5	M27x2	M27x2	M24x2
Qty. D8 / D9		32/32	24/36	30/30	24/30	30/30

1) 2-stage on demand
2) Other ratios on demand

3) Optional brake torques
4) ST= Standard CC= Crawler Crane

5) Without hydraulic motor
6) In combination with input bevel drive

Travel Drives

Final Drives Large

		F220		F220XBR		F260		F280
Ratio ²	i	97 (298) ⁶ -119 (372) ⁶ -120 (572) ⁶ -190 (744) ⁶ -248 (805) ⁶ -290-345		97-119-190-248-290-345		69-97-168-245-345-(670) ⁶ -(1115) ⁶ -(1784) ⁶		201
Version ⁴		ST	CC	ST	ST	CC	ST	
CAPACITY OF BEARING								
C-dynamic	kN	765	750	–	750	750	1180	
Co-static	kN	1660	1560	–	1560	1560	2600	
Weight ⁵	kg	740	895	800	865	895	1037	
PARK BRAKE								
Locking torque	Nm	1200	1000	1200	1000	1000	1650	
Release pressure min.	bar	15	15	15	15	15	15	
HYDRAULIC MOTOR								
Plug in fixed	ccm	107-180	107-180	107-180	–	–	–	
Plug in variable	ccm	160-200-215-250-280	160	160-200-215-250-280	355-250	160	250	
DIMENSIONS								
L1	mm	18	21	52	21	21	52	
L2	mm	52	25	52	45	25	125	
L3	mm	166.5	165.5	170	170	165.5	125	
L4	mm	40	54	40	40	54	40	
L5	mm	61	–	40	48	–	65	
L6	mm	35	106.5	50	60	106.5	45	
L7	mm	580.5	631.5	580.5	579	631.5	627	
L8	mm	16	42	16	18.5	42	89.3	
L9	mm	187.5	189.5	187.5	189.5	189.5	180.4	
L10	mm	–	–	–	–	–	–	
L11	mm	–	54	–	–	54	–	
L12	mm	–	75	–	–	75	–	
R1	mm	35°/16/16	–	2.5	2	–	18°/50/5	
R2	mm	4	4	–	–	4	4	
D1	mm	460	428	460	460	428	530	
D2	mm	600	474	600	520	474	630	
D3	mm	650	521	650	570	521	685	
D4	mm	540	–	538	608	–	608	
D5	mm	542	523	610	610	523	610	
D6	mm	600	570	680	680	570	685	
D7	mm	650	608	735	735	608	740	
D8	mm	M24x2	M30x2	M30x3.5	M30x2	M30x2	M30x3.5	
D9	mm	M24x2	M24x1.5	M30x3.5	33	M24x1.5	M30x3.5	
Qty. D8 / D9		38/38	30/36	30/24	24/24	30/36	28/28	

1) 2-stage on demand
2) Other ratios on demand

3) Optional brake torques
4) ST= Standard CC= Crawler Crane

5) Without hydraulic motor
6) In combination with input bevel drive

Overall dimensions and technical data

		F360	F420	F440	F560
Ratio ²	i	94 (385) ⁶ -128 (446) ⁶ -161 (670) ⁶ -168 (848) ⁶ -186 (1115) ⁶ -223 (1784) ⁶ -242-257-283-490	259	352-555-637-(445) ⁶ -(528) ⁶ -(705) ⁶	357-739-(887) ⁶
Version ⁴		ST	ST	CC	CC
CAPACITY OF BEARING					
C-dynamic	kN	1040	1120	1040	1040
Co-static	kN	2450	2555	2450	2450
Weight ⁵	kg	1080	1500	1300	2000
PARK BRAKE					
Locking torque	Nm	1700	1000	1700 (1000)*	900
Release pressure min.	bar	12	18	15 (7.8)*	13
HYDRAULIC MOTOR					
Plug in fixed	ccm	355	–	–	–
Plug in variable	ccm	355	(2x) 160	250-160	160
DIMENSIONS					
L1	mm	100	60	40	40
L2	mm	100	132	43	43
L3	mm	130	130	255	255
L4	mm	40	40	40	45
L5	mm	60	60	25	45
L6	mm	80	80	25	120
L7	mm	658	1026	820	831.5
L8	mm	25	43.5	80	80
L9	mm	215	210.7	213	213
L10	mm	–	–	–	–
L11	mm	–	–	40	45
L12	mm	–	–	70	70
R1	mm	18°/100/16	10	4	4
R2	mm	10	10	4	4
D1	mm	580	660	450	450
D2	mm	680	744	515	515
D3	mm	735	795	569	569
D4	mm	649	670	669	763
D5	mm	650	674	570	570
D6	mm	720	744	620	620
D7	mm	775	795	670	670
D8	mm	M30x3.5	M30x2	M36x3	M36x1.5
D9	mm	M30x3.5	M30x2	M30x3	M30x1.5
Qty. D8 / D9		30/30	42/42	30/30	29/42

* Park brake integrated in hydraulic motor

1) 2-stage on demand

2) Other ratios on demand

3) Optional brake torques

4) ST= Standard CC= Crawler Crane

5) Without hydraulic motor

6) In combination with input bevel drive

Travel Drives

Final Drives XLarge

Output torque

620 ... 2916 kNm

Gear Ratios

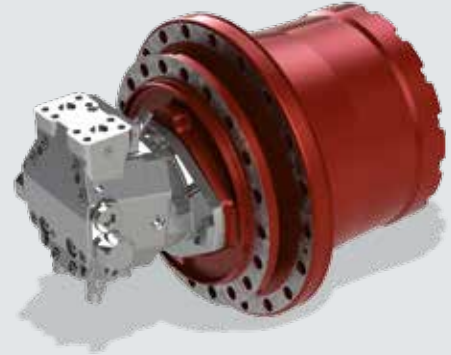
249 ... 989 i

Standard features

- Compact structure
- High performance
- 3-7 Planetary wheels per stage
- Notchless ground tooth root
- Different ratios
- Integrated disc-brake
- Suitable for various hydraulic motors
- High availability by highest teeth and production quality

Special executions on request

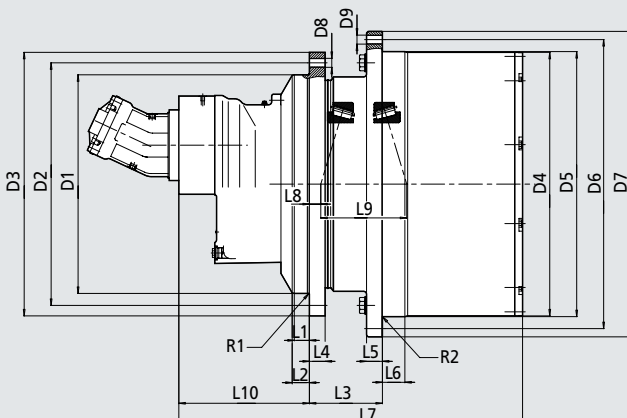
- Mechanical disconnect device



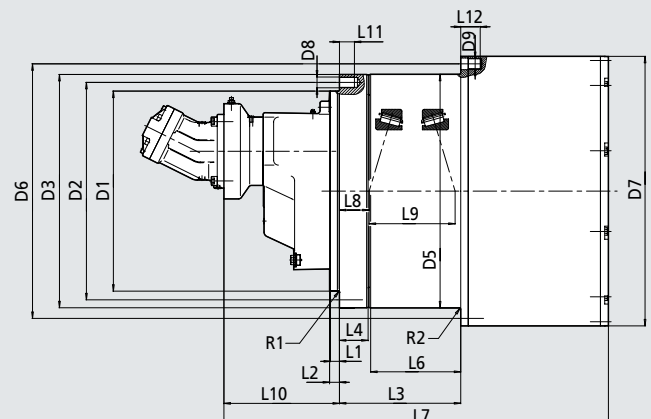
Type	Output torque * (kNm)
F620	620
F650	650
F700	700
F700A	700
F800	800
F1100	1100
F1300	1300
F1800	1800
F2200	2200
F3000	2916

* Stated torques are peak values for short duration

STANDARD INPUT VERSION - ST



CRAWLER CRANE VERSION - CC



Overall dimensions and technical data

		F620	F650	F700
Ratio ¹	i	249-293-328-462		682
Version ²		ST	CC	CC
CAPACITY OF BEARING				
C-dynamic	kN	1320	1320	1040
Co-static	kN	3150	3150	2450
Weight ³	kg	2897	2897	1660
PARK BRAKE				
Locking torque	Nm	1200	1200	1150
Release pressure min.	bar	28	28	17
HYDRAULIC MOTOR				
Fixed	ccm	(2x) 250-(1x) 500	(2x) 200-(2x) 160	–
Variable	ccm	(2x) 250-(2x) 280-(1x) 500	(2x) 160	(2x) 215
DIMENSIONS				
L1	mm	50	30	40
L2	mm	57.5	33	43
L3	mm	245	405	255
L4	mm	52.5	96	89
L5	mm	53	–	–
L6	mm	75	306	117
L7	mm	1232	1159	846.5
L8	mm	38	99	133
L9	mm	287	287	213
L10	mm	341	352.8	–
L11	mm	–	50	45
L12	mm	–	65	70
R1	mm	4	4	4
R2	mm	–	5	4
D1	mm	730	668	450
D2	mm	810	726	515
D3	mm	880	779	563
D4	mm	880	–	–
D5	mm	885	782	570
D6	mm	965	830	620
D7	mm	1020	880	763
D8	mm	M30x2	M36x1.5	M36x1.5
D9	mm	M30x2	M30x1.5	M30x1.5
Qty. D8 / D9		41/48	30/45	29/42

* Park brake integrated in hydraulic motor
 1) Other ratios on demand

2) ST= Standard CC= Crawler Crane
 3) Without hydraulic motor

Travel Drives

Final Drives XLarge

		F700A	F800	F1100	F1300
Ratio ¹	i	648	283-298	406	461
Version ²		CC	ST	ST	ST
CAPACITY OF BEARING					
C-dynamic	kN	1320	2485	3900	3900
Co-static	kN	3150	5941	7650	7650
Weight ³	kg	3350	3764	7220	7400
PARK BRAKE					
Locking torque	Nm	1200	1000*	1750	1750
Release pressure min.	bar	28	7.8*	20	20
HYDRAULIC MOTOR					
Fixed	ccm		(2x) 250	(2x) 250	(2x) 250
Variable	ccm	(2x) 160	(2x) 250-(2x) 280	(2x) 250-(2x) 280	
DIMENSIONS					
L1	mm	30	20	57	57
L2	mm	33	25	60	60
L3	mm	405	229	503	503
L4	mm	96	60	74	74
L5	mm	–	58	–	–
L6	mm	306	170	–	–
L7	mm	1372.5	1315	1483	1623
L8	mm	99	161/163	176	176
L9	mm	287	257/253	368	368
L10	mm	474.8	713	713	395.5
L11	mm	50	–	–	–
L12	mm	65	–	–	–
R1	mm	4	6	10	10
R2	mm	5	8	6	6
D1	mm	668	830	1110	1110
D2	mm	726	980	1230	1230
D3	mm	779	1050	1310	1310
D4	mm	–	916	1116	1116
D5	mm	780	920	-	1100
D6	mm	850	976	1170	1170
D7	mm	900	1055	1226	1226
D8	mm	M36x1.5	M30x2	M36x4	M36x4
D9	mm	M36x1.5	M30x2	M30x3.5	M30x3.5
Qty. D8 / D9		30/45	48/48	48/52	48/52

* Park brake integrated in hydraulic motor

1) Other ratios on demand

2) ST= Standard CC= Crawler Crane

3) Without hydraulic motor

Overall dimensions and technical data

		F1800		F2200		F3000
Ratio ¹	i	656-744		552-989		699
Version ²		ST	CC	ST	CC	ST
CAPACITY OF BEARING						
C-dynamic	kN	3900	3900	5100	3900	6110
Co-static	kN	7650	7650	11600	7650	11900
Weight ³	kg	7500	9000	10736	9000	11500
PARK BRAKE						
Locking torque	Nm	1200	1200	2300	1200	1700
Release pressure min.	bar	28	28	22	28	12
HYDRAULIC MOTOR						
Fixed	ccm		(2x) 250	(2x) 355	(2x) 250	
Variable	ccm	(2x) 250-(2x) 280	(2x) 250-(2x) 280	(2x) 355	(2x) 250-(2x) 280	(2x) 250-(2x) 280
DIMENSIONS						
L1	mm	54	55	60	55	60
L2	mm	60	60	70	60	70
L3	mm	310	478	343	478	343
L4	mm	74	158	80	158	80
L5	mm	107	–	100	–	100
L6	mm	191.5	239	80	239	80
L7	mm	1839.5	1785.5	1846	1956,5	2000
L8	mm	176	171	217	171	217
L9	mm	368	375	376	375	376
L10	mm	615.5	602.5	591	626	606
L11	mm	–	50	–	55	–
L12	mm	–	90	–	93	–
R1	mm	10	4	10	4	10
R2	mm	10	6	10	6	10
D1	mm	1110	785	1288	785	1288
D2	mm	1230	851	1400	858	1400
D3	mm	1310	923	1500	930	1500
D4	mm	1224	–	1224	–	1224
D5	mm	1250	935	1230	935	1230
D6	mm	1350	1016	1320	1016	1320
D7	mm	1430	1224	1400	1224	1400
D8	mm	M36x1.5	M42x2	M42x3	M48x2	M42x3
D9	mm	M42x2	M42x2	M42x3	M48x2	M42x3
Qty. D8 / D9		48/40	40/40	50/48	36/36	50/48

* Park brake integrated in hydraulic motor
1) Other ratios on demand

2) ST= Standard CC= Crawler Crane
3) Without hydraulic motor

Travel Drives

Final Drives Angular Input

Output torque
100 ... 900 kNm

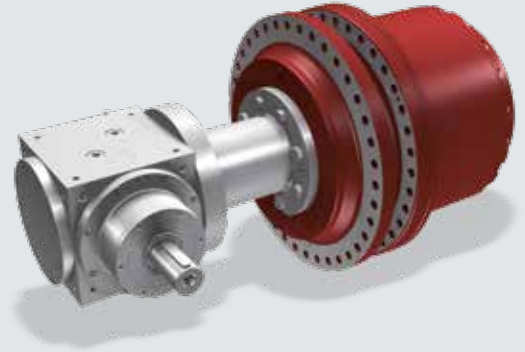
Gear Ratios
406 ... 825 i

Standard features

- Compact structure
- High performance
- 3-7 Planetary wheels per stage
- Notchless ground tooth root
- Different ratios
- Integrated disc-brake
- High availability by highest teeth and production quality

Special executions on request

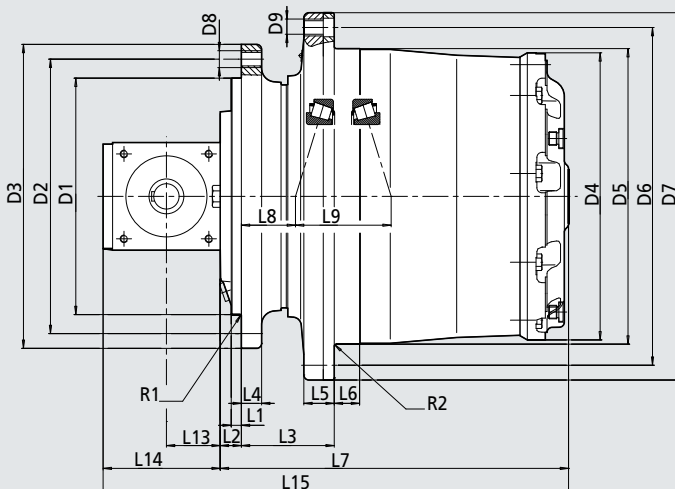
- Mechanical disconnect device



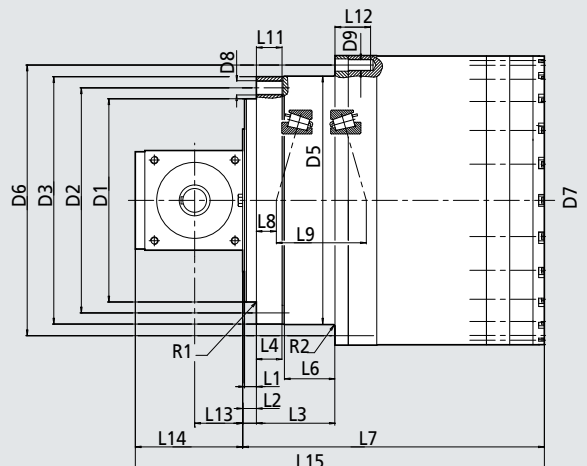
Type	Output torque * (kNm)
FP100	100
FP130	130
FP180	180
FP220	220
FP360	360
FP440	440
FP560	560
FP900	900

* Stated torques are peak values for short duration

STANDARD INPUT VERSION - ST



CRAWLER CRANE VERSION - CC



Overall dimensions and technical data

		FP100	FP130	FP180	FP220	FP360	FP440	FP560	FP900
Ratio ¹	i	426	825	412	248	446	528	450	406
Version ²		ST	ST	ST	ST	ST	CC	CC	CC
CAPACITY OF BEARING									
C-dynamic	kN	498	523	787	765	1040	1040	1040	2800
Co-static	kN	1010	980	1650	1660	2450	2450	2450	6390
Weight	kg	410	452	757	915	1065	1300	2222	3750
PARK BRAKE OPTIONAL									
Locking torque ³	Nm	600	750	1375	1200	1700	1700	900	–
Release pressure min.	bar	15	19	35	15	12	15	13	–
DIMENSIONS									
L1	mm	35	45	30	18	100	40	40	30
L2	mm	65	45	30	52	100	43	43	33
L3	mm	165	190	168	166.5	130	255	255	405
L4	mm	28	35	40	40	40	40	45	96
L5	mm	53	58	56	61	60	–	–	–
L6	mm	43	45	21.5	35	60	120	120	306
L7	mm	463	530	534.5	580.5	657.5	814	831.5	965
L8	mm	32	50.5	50.3	16	25	80	80	129
L9	mm	139	147	141.4	187.5	215	213	213	258.5
L10	mm	–	–	–	–	–	–	–	–
L11	mm	–	–	–	–	–	40	45	50
L12	mm	–	–	–	–	–	70	70	68
L13 ⁴	mm	115	311	437.5	448	380	255	857	612
L14 ⁴	mm	215	411	542.5	593	545	400	1104	859
L15 ⁴	mm	678	941	1077	1173.5	1202.5	1214	1935.5	1824
L16 ⁴	mm	60	60	75	85	110	85	160	120
L17 ⁴	mm	215	215	265	300	387	300	570	540
R1	mm	12 / 60	25	4	35°/16/16	18°/100/16	4	4	4
R2	mm	5	4	3	4	10	4	4	5
D1	mm	390	390	450	460	580	450	450	668
D2	mm	460	500	510	600	680	515	515	726
D3	mm	500	550	560	650	735	569	569	779
D4	mm	407	449	528	540	649.5	–	–	–
D5	mm	408	450	535	542	650	570	570	780
D6	mm	460	500	600	600	720	620	620	850
D7	mm	500	550	650	650	775	670	763	900
D8	mm	M24x2	M24x2	M24x2	M24x2	M30x3.5	M36x1.5	M36x1.5	M36x1.5
D9	mm	M24x2	M24x2	M27x2	M24x2	M30x3.5	M30x2	M30x1.5	M36x1.5
Qty. D8 / D9		30/24	32/32	20/30	38/38	30/30	29/42	29/42	30/45
D10 ⁴	mm	40	40	50	55	60	55	90	75
D10 Key ⁴		DIN6885 (A12x8x50)		DIN6885 (A14x9x70)	DIN6885 (A16x10x80)	DIN6885 (A18x11x100)	DIN6885 (A16x10x80)	DIN6885 (A25x14x150)	

1) Other ratios on demand

2) ST= Standard CC= Crawler Crane

3) Optional brake torques

4) Other dimensions optional

Travel Drives

Final Drives 2 - Speed

Output torque max.

40000 Nm

Input speed max.

3500 rpm

Applicable hydraulic motors

Bosch-rexroth: A6VE55 ~ 107 range

Linde: HMV 55 ~ 75 range

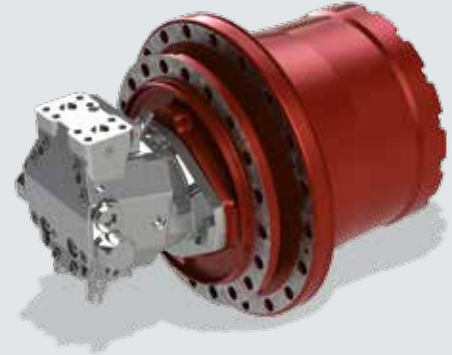
Sauer danfoss: 51C 060 ~ 080 range

Technical features

- Two gear shifting transmission
- Wet disc clutch unit
- Power shift capability
- Hydraulic controlled shifting
- Integrated park & emergency brake
- Optional cooling flow to input stage and clutch unit
- Different hydraulic motors
- Wide variety of ratio combinations

Applications

- Road paving machines
- Construction machines
- Cranes
- Drilling machines
- Winches
- Agricultural machines
- Forestry machines



RATIO COMBINATIONS

Shifting stage versions	Shifting stage ratio ISS
1	5.77
2	5.42
3	4.87*
4	4.44
5	4.26
6	3.81
Main stage versions	Shifting stage ratio IMS
A	19.25
B	26*
C	32.14

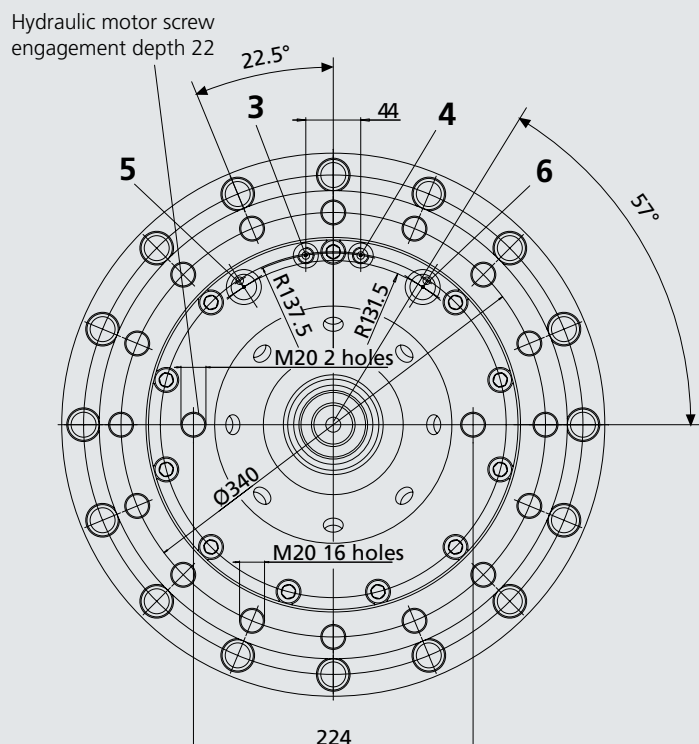
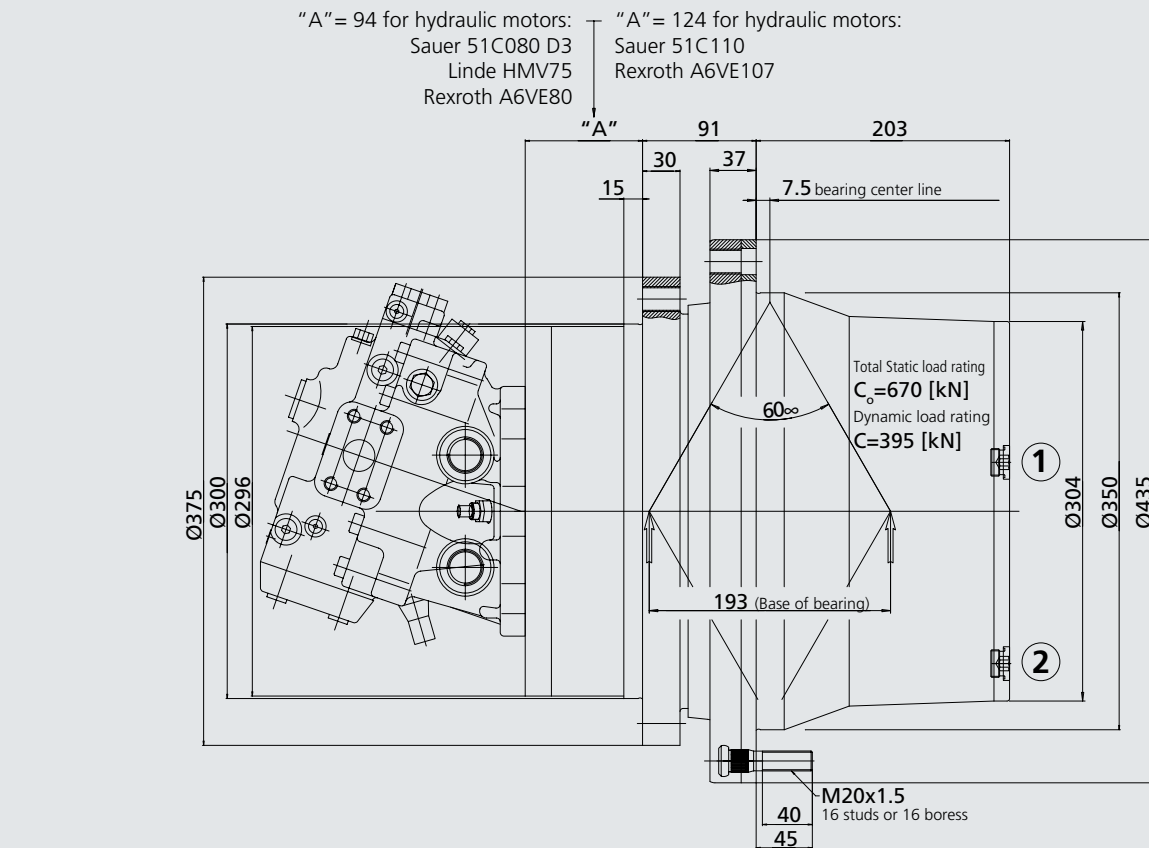
All ratios ISS combinable with all ratios IMS

Final ratio if = ISS*IMS

* Preferred ratios

Brake torque at input shaft	Nm	600
Brake torque at output min.	Nm	40000
Clutch operating pressure	bar	40 ~ 60
Oil quantity	l	3.3
Weight	kg	186

Overall dimensions and technical data



PORT	PRESSURE	FUNCTION
3	40 bar	Small clutch piston pressurized T/M ratio lowgear
4	40 bar	Large clutch piston pressurized T/M ratio highgear
3 & 4	0 bar	Large & small clutch engaged, T/M in park break position

1. Oil filling plug M22x1.5
2. Oil draining plug M22x1.5
3. Low speed clutch port R1/4" G acc. DIN3852 "X"
4. High speed clutch port R1/4" G acc. DIN3852 "X"
5. Flushing oil input port M22x1.5 DIN3852 "X"
6. Flushing oil output port M22x1.5 DIN3852 "X"

Travel Drives Wheel Drives

Max output torque

20 ... 60 kNm

Nominal output torque

16 ... 30 kNm

Gear Ratios

28 ... 34 i

Standard features

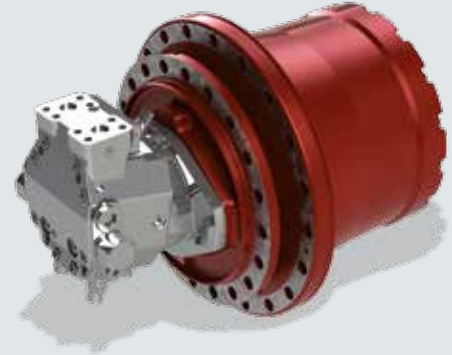
- Compact structure
- High performance
- 3-7 Planetary wheels per stage
- Notchless ground tooth root
- Different ratios
- Integrated disc-brake
- High availability by highest teeth and production quality

Proven applications

- Towbarless aircraft tractor
- Straddle carriers
- Agricultural machines
- Logging machines
- Forklifts

Special executions on request

- Mechanical disconnect device

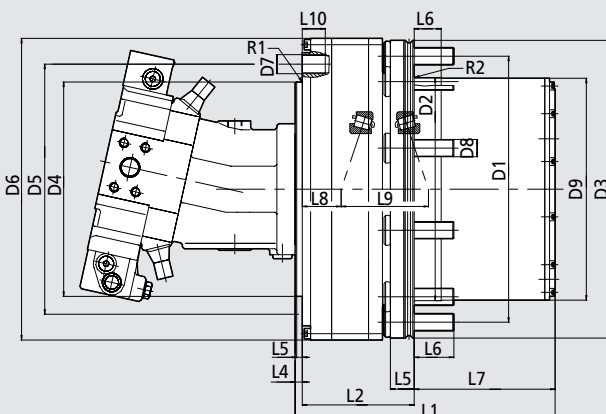


Type	Max output torque * (kNm)
FR20	20
FR40	40
FR60	60

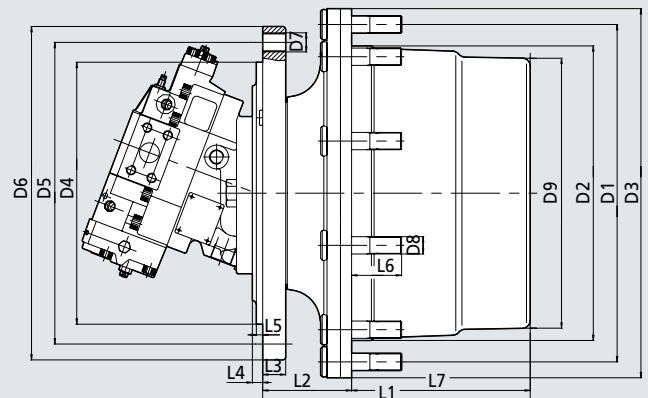
Type	Nominal output torque (kNm)
FR20	16
FR40	23
FR60	30

* Stated torques are peak values for short duration

VERSION A



VERSION B



Overall dimensions and technical data

		FR20	FR40	FR60
Ratio ¹	i	28-34	30-32	29-34
Version		A	B	A
CAPACITY OF BEARING				
C-dynamic	kN	194	300	352
Co-static	kN	325	560	735
INPUT TORQUE MAX.	Nm	560	715	1066
Weight ³	kg	129	173	500
HYDRAULIC MOTOR²	ccm	80	107	160
Variable		105	–	–
Operating pressure max. p	bar	420	420	420
SERVICE BRAKE		Multi-disk brake	Multi-disk brake	Multi-disk brake
Pressure max.	bar	100	110	90
Locking torque dyn.	Nm	9500	13000	28000
PARK BRAKE		Multi-disk brake	Multi-disk brake	Multi-disk brake
Release pressure max.	bar	80	80	60
Release pressure max.	bar	40	40	25
Locking torque max. stat.	Nm	24480	23000	30000
DIMENSIONS				
L1	mm	318	441	520
L2	mm	141	135.7	270
L3	mm	–	52.7	–
L4	mm	9	80	10
L5	mm	7	43	7
L6	mm	50	63	60
L7	mm	177.5	225	240
L8	mm	58	80	156
L9	mm	110	105	173
L10	mm	29	32	37
R1	mm	–	5	–
R2	mm	–	1	1.6
D1	mm	335	425	425
D2	mm	280.8 f7	371-0.2	375f8
D3	mm	375	465	559
D4	mm	270 f8	290f8	290f8
D5	mm	315	367	330
D6	mm	380	405	554
D7	mm	10xM 24x2	M24(6x) M20(4x)	10xM24x2
D8	mm	10xM 22x1.5	18xM22x1.5	24 M22x1.5
D9	mm	279.5	340	356

1) Other ratios on demand

2) Other hydraulic motors on request

3) Without hydraulic motor

Slew Drives

Output torque

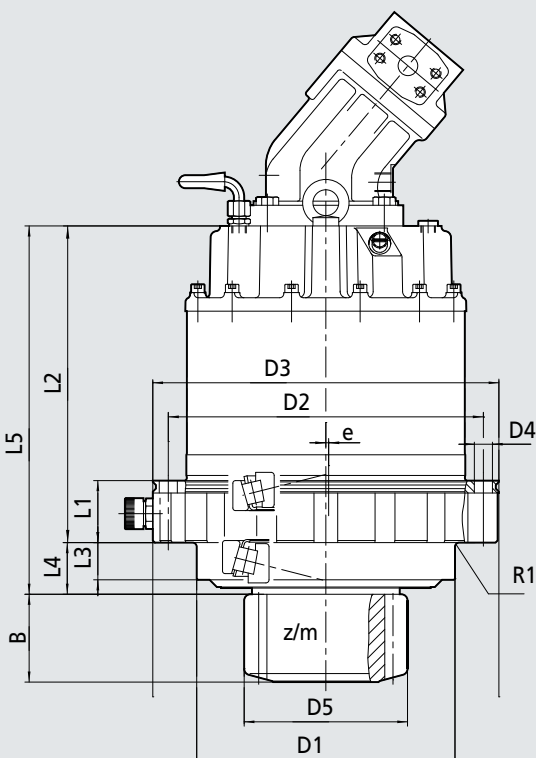
5.5 ... 130 kNm

Gear Ratios

23 ... 67 i

Standard features

- Compact structure
- High performance
- Notchless ground tooth root
- Integrated disc-brake
- Suitable for various hydraulic motors
- High availability by highest teeth and production quality



Type	Output torque* (kNm)
S5	5.5
S7	7
S10	10
S13	13.3
S17	17.5
S30	30
S34	34
S35	35
S54	54
S90	90
S130	130

* Stated torques are peak values for short duration

Overall dimensions and technical data

		S5	S7	S10	S13	S17	S30	S34	S35	S54	S90	S130
Ratio ¹	i	25-33	23-27-33	24-27-31-36	36	33	45	45	35	48	39	67
Version	ccw	28-30-32	45-56-63	45-56-63-80-90	56-63-80-90	80-90	125	160	180	180-200	355-200	Electric ⁵
MULTI-DISC BRAKE												
Braking torque	Nm	310	475	475	740	890	1030	1030	1030	1200	3000	2300
Release pressure min.	bar	14	14	14	18	18	18	18	18	38	14	22.5
Output pinion ³	z/m B D5	10/10 95 130	10/11 79 141	12/12 90 184	10/14 99 181	11/14 109 198	12/16 154 243	12/16 154 243	12/18 160 274	13/22 230 357	16/24 182 464	13/30 230 480
		10/10 79 130	12/10 79 151	13/10 85 158	11/14 99 198	11/16 109 220	–	–	–	12/20 188 301	16/22 177 422	–
		11/10 79 143	13/10 79 158	13/10 94.5 155	12/12 99 184	12/12 104 184	–	–	–	–	–	–
		14/8 69 134	13/10 98 155	13/10 100 158	13/12 88 195	13/12 ⁴ 110 ⁴ 190 ⁴	–	–	–	–	–	–
		15/6.35 77 112	–	13/12 110 190	13/12 ⁴ 110 ⁴ 190 ⁴	13/14 122 221	–	–	–	–	–	–
		–	–	13/12 90 195	14/12 110 199	14/16 150 273	–	–	–	–	–	–
		–	–	–	14/12 110 201	–	–	–	–	–	–	–
Weight without Motor (appr.)	kg	68	98	108-123	147	168	540	480	528	867	1225	2276
DIMENSIONS												
L1	mm	60	60	60	71	86	332	332	239	610	80	578
L2	mm	262	296	306.5-314	340	355	737	785	653	780	730	622
L3	mm	31	31	36	30(50) ⁴	50.5	33	33	30	40	173	95
L4	mm	40	40.5	50	55(75) ⁴	55	65	65	91	87	199	160
L5	mm	302	336.5	356.5-364	395(415) ⁴	410	802	808	744	917	929	1012
D1	mm	175	230	250	275	275	350	350	400	460	500	630
D2	mm	260	285	305	335	335	415	415	460	520	640	675
D3	mm	288	322	335	370	370	450	450	500	562	690	715
D4	mm	12x17.5	12x17.5	18x17.5	20x17.5	20x17.5	24x22	24x22	24x26	24x26	18x30	34x26
e	mm	–	–	–	1	–	–	–	2	–	–	–
R1	mm	6	6	4	4	4	1.6	1.6	10	–	–	–

1) Other ratios on demand

2) Other hydraulic motors on request

3) Output Pinion execution acc. to requirement

4) Optional

5) Hydraulic motor connection on demand

Cutter Drives

Cutter Drives Medium

Max. cutting torque

8.5 ... 32 kNm

Input power

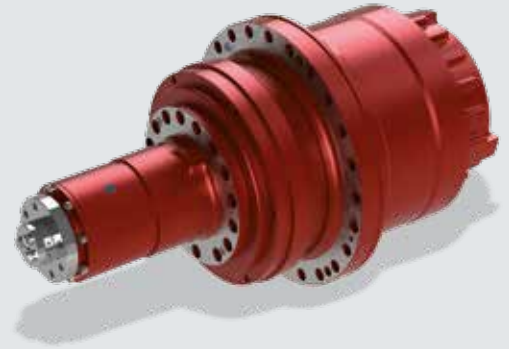
80 ... 300 kW

Gear Ratios

16 ... 26 i

Standard features

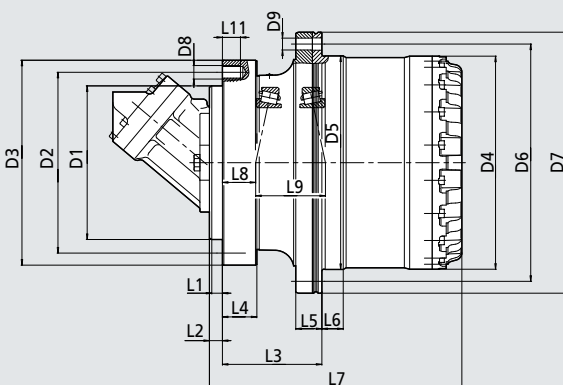
- Compact structure
- High performance
- Notchless ground tooth root
- Different ratios
- Integrated disc-brake
- Suitable for various hydraulic motors
- High availability by highest teeth and production quality



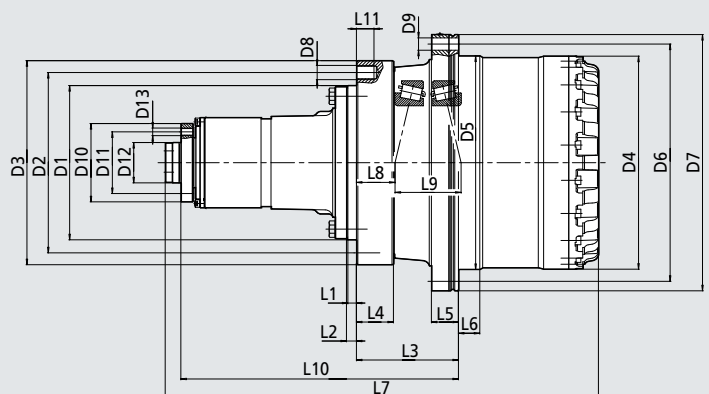
Type	Max. cutting torque (kNm)
FA30	8.5
FA40	12
FA55	16
FA80	23
FA100	32

Type	Input power (kW)
FA30	80
FA40	110
FA55	150
FA80	220
FA100	300

STANDARD INPUT VERSION - **ST**



MECHANICAL INPUT VERSION - **MI**



Overall dimensions and technical data

		FA30	FA40		FA55		FA80	FA100	
Ratio ¹	i	19-22	19		16-19-22		19	14-21-22-26	
Version ²		ST	ST	MI	ST	MI	ST	ST	MI
CAPACITY OF BEARING									
C-dynamic	kN	132/194	224	224	224	224	300	498	498
Co-static	kN	255/325	405	405	405	405	570	1010	1010
Weight	kg	86	122	172	163	223	223	330	360
DIMENSIONS									
L1	mm	13	12	10	12	18	20	35	8
L2	mm	25	35	10	25	18	35	35	8
L3	mm	75	91	125	110	136	90	165	182
L4	mm	15	21	55	24	50	22	28	28
L5	mm	29	34	32	34	34	35	51	40
L6	mm	25	26	26	30	30	24	43	43
L7	mm	278.5	327	631.5	374	688.5	414.5	461	843.5
L8	mm	28	38	72	64	90	34	32	27
L9	mm	89	100	100	113	113	123	139	138
L10	mm	–	–	402	–	421	–	–	540
L11	mm	15	21	55	24	50	22	28	28
R1	mm	2.5	2.5	1	1	1	4	12/60	1.6
R2	mm	2.5	2.5	2.5	2.5	2.5	2.5	5	2.5
D1	mm	–	270	270	280	280	330	390	325
D2	mm	–	310	310	325	325	370	460	380
D3	mm	–	345	360	360	360	410	500	415
D4	mm	269	294	294	329	329	374	407	407
D5	mm	270	295	295	350	350	400	408	408
D6	mm	305	335	335	400	400	450	460	460
D7	mm	335	370	370	435	435	490	502	502
D8	mm	M16x2	M20x1.5	M20x1.5	M20x1.5	M20x1.5	M24x2	M24x2	M20x2.5
D9	mm	17.5	17.5	17.5	22	22	25	26	26
Qty. D8 / D9		18/18	16/20	16/20	24/20	24/20	20/20	30/24	12/12
D10	mm	–	–	138	–	138	–	–	165
D11	mm	–	–	110	–	110	–	–	130
D12	mm	–	–	80	–	80	–	–	85
D13	mm	–	–	M16x2	–	M16x2	–	–	M16x2
Qty. D13		–	–	6	–	6	–	–	8

1) Other ratios on demand

2) ST – Standard Input / MI – Mechanical Input (Hydraulic Motor)

3) Special bearing

Cutter Drives

Cutter Drives Large

Max. cutting torque

38 ... 115 kNm

Input power

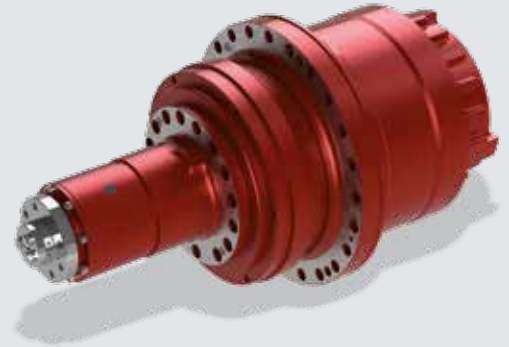
400 ... 1200 kW

Gear Ratios

14 ... 26 i

Standard features

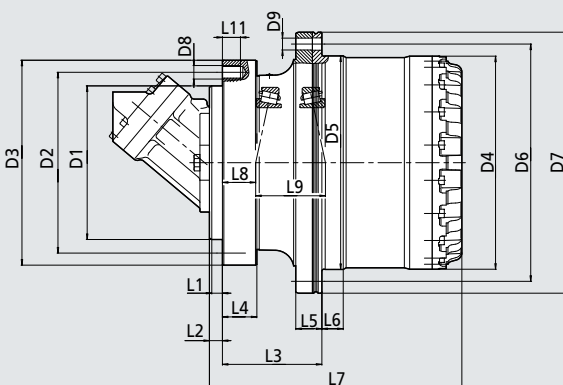
- Compact structure
- High performance
- Notchless ground tooth root
- Different ratios
- Integrated disc-brake
- Suitable for various hydraulic motors
- High availability by highest teeth and production quality



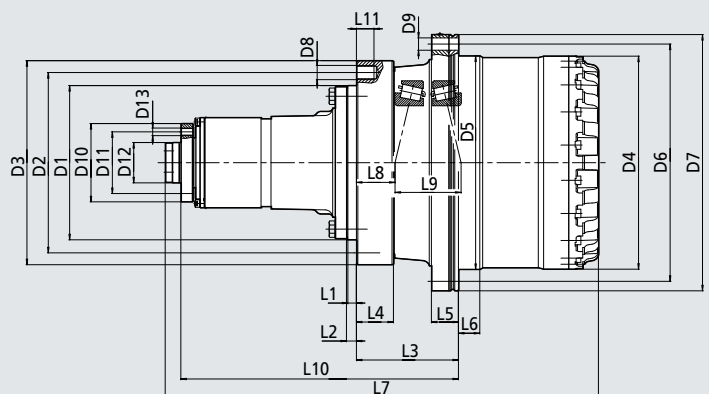
Type	Max. cutting torque (kNm)
FA130	38
FA200	47
FA360	84
FA800	115

Type	Input power (kW)
FA130	400
FA200	500
FA360	880
FA800	1200

STANDARD INPUT VERSION - **ST**



MECHANICAL INPUT VERSION - **MI**



Overall dimensions and technical data

		FA130		FA200		FA360		FA800	
Ratio ¹	i	14-18-21-22-26		20-24		25		24	
Version ²		ST	MI	ST	MI	ST		ST	
CAPACITY OF BEARING									
C-dynamic	kN	750	750	787	787	1040		4300	
Co-static	kN	1290	1290	1650	1650	2450		9650	
Weight	kg	426	490	710	718	1145		4223	
DIMENSIONS									
L1	mm	18	18	20	20	35		20	
L2	mm	20	20	25	25	100		25	
L3	mm	215	215	160	160	130		229	
L4	mm	78	78	102	102	40		60	
L5	mm	57	57	58	58	60		95	
L6	mm	45	45	22	22	80.5		89	
L7	mm	530	913	603.5	890.5	657.5		981	
L8	mm	81.4	81.4	75.8	75.8	75.1		(3)	
L9	mm	139.2	139.2	149.4	149.4	214.8		(3)	
L10	mm	–	585	–	438	–		–	
L11	mm	37	37	37	37	40		60	
R1	mm	2	2	2	2	18°/100/16		6	
R2	mm	2	2	2	2	10		8	
D1	mm	325	325	323.8	323.8	580		830	
D2	mm	380	380	381	381	680		980	
D3	mm	430	430	482	482	735		1050	
D4	mm	449	449	540	540	649.5		930	
D5	mm	450	450	605	605	650		1040	
D6	mm	500	500	635	635	720		1250	
D7	mm	540	540	663	663	775		1329	
D8	mm	M30x3.5	M30x3.5	M30x2	M30x2	M30x3.5		M30x2	
D9	mm	26	26	18	18	M30x3.5		M30x2	
Qty. D8 / D9		12/24	12/24	12/24	12/24	30/30		48/48	
D10	mm	–	165	–	165	–		–	
D11	mm	–	130	–	130	–		–	
D12	mm	–	85 k6	–	85 k6	–		–	
D13	mm	–	M16x2	–	M16x2	–		–	
Qty. D13		–	8	–	8	–		–	

1) Other ratios on demand

2) ST – Standard Input / MI – Mechanical Input (Hydraulic Motor)

3) Special bearing

Cutter Drives

Cutter Drives 2-Speed

Max. cutting torque

38 ... 47 kNm

Input power

400 ... 540 kW

Gear Ratios

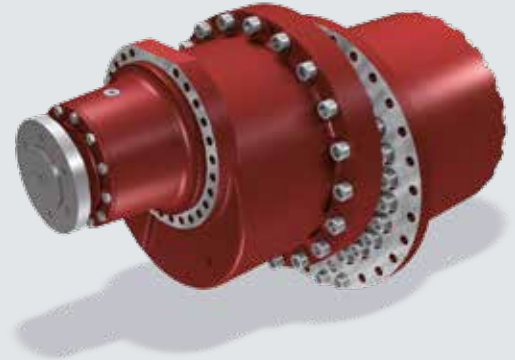
13 ... 22 i

Standard features

- Two speed shifting transmission
- Main drive from proven cutter standard range (FA130/FA200)
- Hydraulic shifting unit for gear change
- Cutter main drive & shifting unit modular concept for easy maintenance

Proven applications

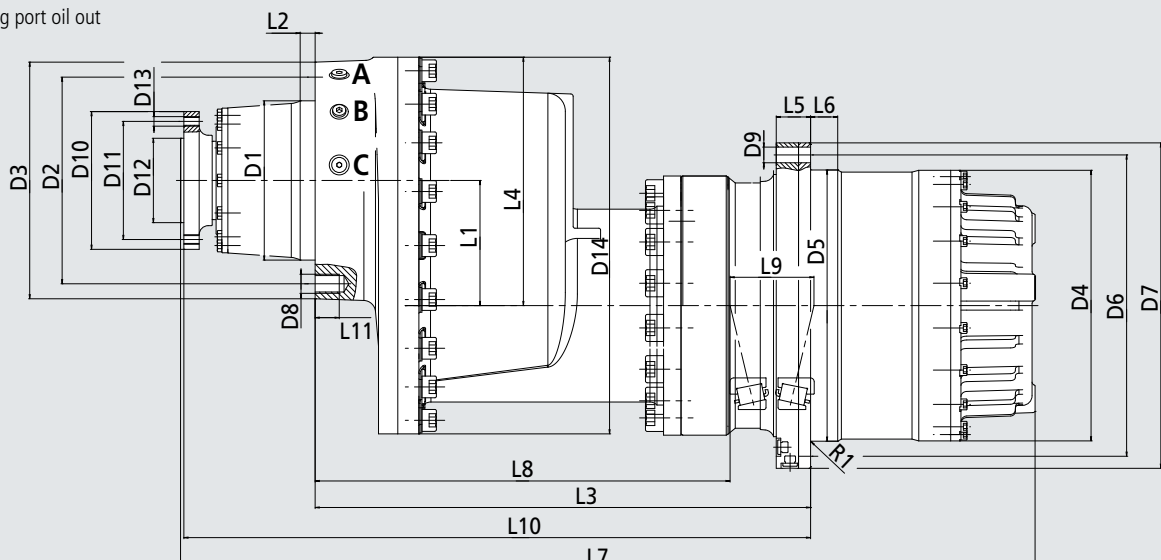
- Road rehabilitation
- Surface mining



Type	Max. cutting torque (kNm)
FA130 - 2S	38
FA200 - 2S	47

Type	Input power (kW)
FA130 - 2S	400
FA200 - 2S	540

- A. Flushing port oil in
- B. Shifting port 50 bar
- C. Flushing port oil out



Overall dimensions and technical data

		FA130 - 2S		FA200 - 2S	
Version	i	1	2	1	2
Ratio	i	21-13.67	22.235-18.01	19.877-13	21.05-17.05
Rotating direction input		ccw		ccw	
CAPACITY OF BEARING					
C-dynamic	kN	750		787	
Co-static	kN	1290		1650	
Weight	kg	900		1050	
SHIFTING PRESSURE					
Min.	bar	35		35	
Max.	bar	50		50	
DIMENSIONS					
L1	mm	207.65		207.65	
L2	mm	25		25	
L3	mm	822.2		807.2	
L4	mm	413		413	
L5	mm	57		32	
L6	mm	45		25	
L7 optional	mm	1418		1378	
L8	mm	1442.5		1402.5	
L9	mm	688.6		683	
L10	mm	139.2		149.4	
L11	mm	822.2		1025	
R1	mm	40		40	
R2	mm	2		2	
D1	mm	264.265		264.265	
D2	mm	342.9		342.9	
D3	mm	393		393	
D4	mm	449		533.5	
D5	mm	450		590.8	
D6	mm	500		641.35	
D7	mm	540		679.32	
D8	mm	1.25-7 UNC		1.25-7 UNC	
Qty. D8		12		12	
D9	mm	26		19.84	
Qty. D9		24		20	
D10	mm	228.6		228.6	
D10 optional	mm	196.85		196.85	
D11	mm	140		140	
D11 optional	mm	158.75		158.75	
D12	mm	140		140	
D12 optional	mm	120.7		120.7	
D13	mm	5/8-11 UNC		5/8-11 UNC	
D13 optional	mm	STUD 5/8-11 UNF		STUD 5/8-11 UNF	
Qty. D13	mm	8		8	

Winch Drives

Classification of crane

		HOISTING	SLEWING	BOOM ACTIVATION	TROLLEY TRAVELLING	CRANE TRAVELLING
Erection cranes		M 2 - M 3	M 2 - M 3	M 1 - M 2	M 1 - M 2	M 2 - M 3
Loading bridges	hook	M 5 - M 6	M 4	—	M 4 - M 5	M 5 - M 6
Loading bridges	grab or magnet	M 7 - M 8	M 6	—	M 6 - M 7	M 7 - M 8
Workshop cranes		M 6	M 4	—	M 4	M 5
Overhead travelling cranes, ram cranes, scrap yard cranes	grab or magnet	M 8	M 6	—	M 6 - M 7	M 7 - M 8
Unloading bridges, container gantry cranes	hook or spreader	M 6 - M 7	M 5 - M 6	M 3 - M 4	M 6 - M 7	M 4 - M 5
Other gantry cranes (with trolley and/or live ring)	hook	M 4 - M 5	M 4 - M 5	—	M 4 - M 5	M 4 - M 5
Unloading bridges, container gantry cranes (with trolley and/or live ring)	grab or magnet	M 8	M 5 - M 6	M 3 - M 4	M 7 - M 8	M 4 - M 5
Berth cranes, shipyard cranes, dismantling cranes	hook	M 5 - M 6	M 4 - M 5	M 4 - M 5	M 4 - M 5	M 5 - M 6
Dockside cranes (sleuable, gantry type, ...), floating cranes, floating sheerlegs	hook	M 6 - M 7	M 5 - M 6	M 5 - M 6	—	M 3 - M 4
Dockside cranes (sleuable, gantry type, ...), floating cranes, floating sheerlegs	grab or magnet	M 7 - M 8	M 6 - M 7	M 6 - M 7	—	M 4 - M 5
Floating cranes and floating sheerlegs for very high loads (normally above 100 t)		M 3 - M 4	M 3 - M 4	M 3 - M 4	—	—
Shipboard cranes	hook	M 4	M 3 - M 4	M 3 - M 4	M 2	M 3
Shipboard cranes	grab or magnet	M 5 - M 6	M 3 - M 4	M 3 - M 4	M 4 - M 5	M 3 - M 4
Tower cranes for construction sites		M 4	M 5	M 4	M 3	M 3
Derrick tower gantry		M 2 - M 3	M 1 - M 2	M 1 - M 2	—	—
Railroad cranes, approved for service in trains		M 3 - M 4	M 2 - M 3	M 2 - M 3	—	—
Vehicle-mounted cranes	hook	M 3 - M 4	M 2 - M 3	M 2 - M 3	—	—

Winch Drives

Torque conversion factors k according to FEM 1.001 3rd edition, Section 1

	T2	T3	T4	T5	T6	T7	T8
Average usage per day [h]	0.25 - 0.5	0.5 - 1	1 - 2	2 - 4	4 - 8	8 - 16	about 16
Total service life [h]	400 - 800	800 - 1600	1600 - 3200	3200 - 6300	6300 - 12500	12500 - 25000	25000 - 50000
DUTY CYCLE LOAD CLASS	MACHINE CLASS & TORQUE CONVERSION FACTOR K						
L1 light	M 1 1.24	M 2 1.24	M 3 1.11	M 4 1.11	M 5 0.95	M 6 0.91	M 7 0.85
L2 medium	M 2 1.24	M 3 1.24	M 4 1.08	M 5 1	M 6 0.87	M 7 0.80	M 8 0.67
L3 heavy	M 3 0.98	M 4 0.95	M 5 0.91	M 6 0.80	M 7 0.71	M 8 0.59	M 8 0.56
L4 extremely heavy	M 4 0.80	M 5 0.75	M 6 0.71	M 7 0.63	M 8 0.56	M 8 0.5	M 8 0.44

Definition of Nominal Torque T_{Nom}

- Drum output speed 25 rpm
- FEM class M5 / T5 / L2

Torque calculation T_{eff} for alternative FEM – class

- $T_{eff} = K \times T_{Nom}$
- **K**: torque conversion factor

Additional check - conditions

1. For all machine classes > M5 (M6-M8): to be checked, whether drum output speed 25rpm must be reduced. Refer to Carraro Sales or Application engineering.

2. Brake torque safety must be checked upon formula:

$$V = \frac{T_{Brake} \times i}{T_{eff}} > 1.6$$

T_{Brake} : brake torque at drive input

i: drive ratio

If brake safety < 1.6 refer to Carraro Sales or Application engineering.

Winch Drives

Winch Drives Small

Nominal torque T_{Nom} (M5 / T5 / L2)

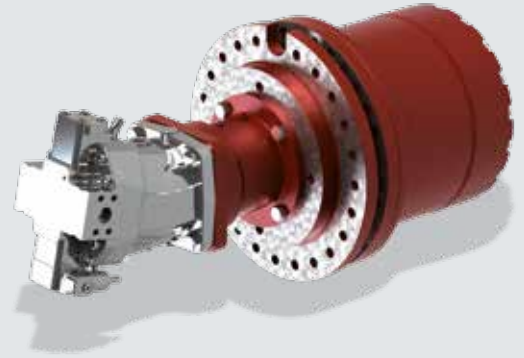
5.4 ... 20 kNm

Gear Ratios

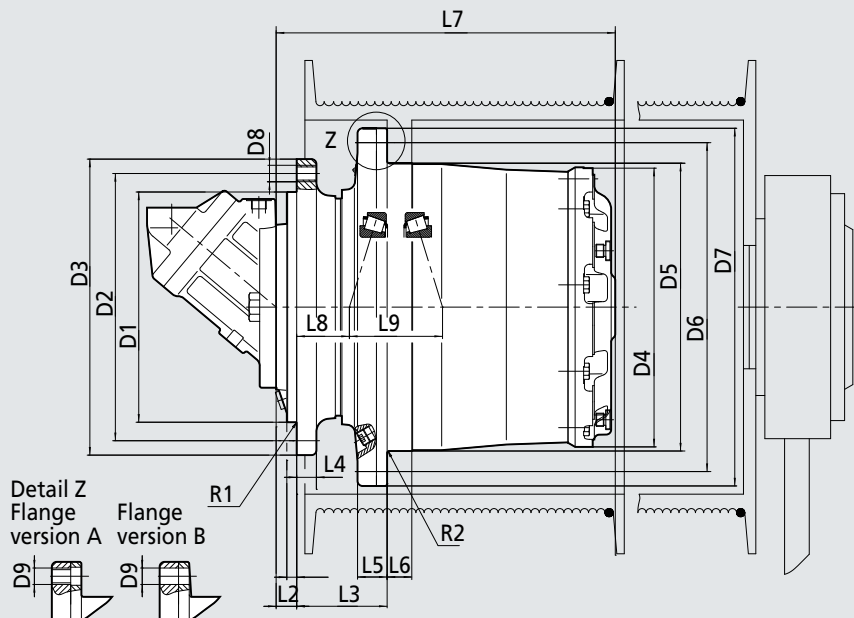
35 ... 305 i

Standard features

- Compact structure
- Robust layout of planetary gear unit
- Robust taper roller bearings for drum support and cable pull
- Integrated disc-brake
- Easy oil change from front side
- Easy drum mounting
- High variety of ratios and hydraulic motors



Type	Nominal torque T_{Nom} (kNm)
FW10	5.4
FW13	7.25
FW30	17.6
FW40	20
FW40A	20



Overall dimensions and technical data

		FW10	FW13	FW30	FW40	FW40A
Ratio ¹	i	35-51	93-108-122-140-178-229	61-66-81-90-101-114-121-137-171-228-305	61-66-81-85-101-110-117-124-142-181	
CAPACITY OF BEARING						
C-dynamic	kN	132	132	132/194	224	224
Co-static	kN	255	255	255/325	405	405
Weight ²	kg	45	50	94	115	123
MULTI-DISK BRAKE						
Locking torque version ³	Nm	200	200	300/400	420	420
Release pressure min.	bar	17	17	16/22	18	18
Brake features ⁴		–	–	–	–	–
HYDRAULIC MOTOR						
Plug in fixed	ccm	28-30-32	28-30-32	28-30-32-40-45-56-60-63	40-45-56-60	80-90
Plug in variable	ccm	28-45	28-45	28-55-60	55-60	80
DIMENSIONS						
L1	mm	10	10	13	16	13
L2	mm	30	30	25/22	16	35
L3	mm	72	72	75	91	91
L4	mm	13.5	13.5	15	21	21
L5	mm	15	15	29	34	34
L6	mm	16	16	25	26	26
L7	mm	230	255	323/320	338	357
L8	mm	28	28	28.5	38	38
L9	mm	79	79	89	100	100
R1	mm	0.6	0.6	2.5	2.5	2.5
R2	mm	0.6	0.6	2.5	2.5	2.5
D1	mm	190	190	240	240	270
D2	mm	230	230	275	285	310
D3	mm	256	256	304	320	345
D4	mm	216	216	269	294	294
D5	mm	220	220	270	295	295
D6	mm	260	260	305	335	335
D7	mm	290	290	335	370	370
D8	mm	M16x2	M16x2	M16x2	M16x1.5	M16x1.5
D9 Version A	mm	M16x2	M16x2	M16x2	M16x1.5	M16x1.5
D9 Version B	mm	17	17	17	17.5	17.5
Qty. D8 / D9		12/8	12/8	18/18	20/20	16/20

1) Other ratios on demand
2) Without Hydraulic motor

3) Optional brake torques on demand
4) Option: external brake

Winch Drives

Winch Drives Medium

Nominal torque T_{Nom} (M5 / T5 / L2)

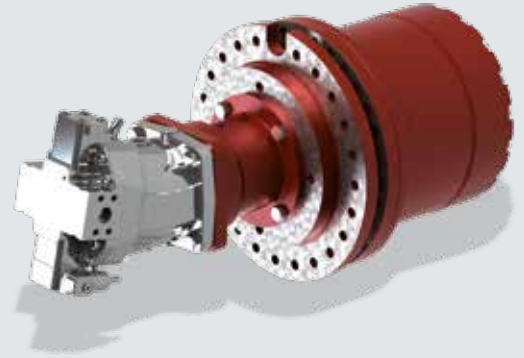
25.4 ... 70 kNm

Gear Ratios

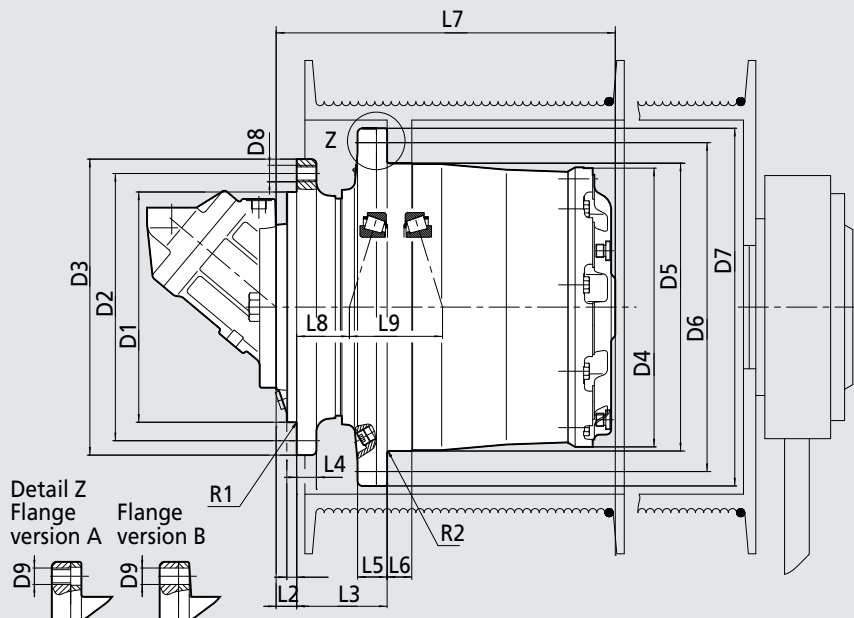
63 ... 226 i

Standard features

- Compact structure
- Robust layout of planetary gear unit
- Robust taper roller bearings for drum support and cable pull
- Integrated disc-brake
- Easy oil change from front side
- Easy drum mounting
- High variety of ratios and hydraulic motors



Type	Nominal torque T_{Nom} (kNm)
FW55	25.4
FW55A	25.4
FW55B	25.4
FW80	42.8
FW100	70



Overall dimensions and technical data

		FW55	FW55A	FW55B	FW80	FW100
Ratio ¹	i	63-68-87-94-117-124-137-148-185			61-81-101-114-121-137-147-171-187-206	77-84-95-121-142-175-192-226
CAPACITY OF BEARING						
C-dynamic	kN	224	224	224	300	498
Co-static	kN	405	405	405	570	1010
Weight ²	kg	165	177	181	255	330
MULTI-DISK BRAKE						
Locking torque version ³	Nm	420/500	420/500	420/500	600/1000	600/1500
Release pressure min.	bar	15/21	15/21	15/21	18/28	15/41
Brake features ⁴		–	–	–	–	–
HYDRAULIC MOTOR						
Plug in fixed	ccm	80-90	40-45-56-60	–	80-90-107-110-160-180	107-125-160-180
Plug in variable	ccm	80	55-60	107-110	80-107-110-160	107-110-160
DIMENSIONS						
L1	mm	12	20	12	20	35 / 37
L2	mm	25	30	37	35	35 / 37
L3	mm	110	91	110	90	165
L4	mm	24	24	24	22	28
L5	mm	36	36	36	37	53
L6	mm	30	30	30	24	43
L7	mm	413	399	425	415	461 / 463
L8	mm	64	45	64	34	32
L9	mm	113	113	113	123	139
R1	mm	1	4	1	4	10 (12) / 60
R2	mm	2.5	2.5	2.5	2.5	5
D1	mm	280	240	290	330	390
D2	mm	325	285	335	370	460
D3	mm	360	320	370	410	500
D4	mm	340	340	340	374	407
D5	mm	350	350	350	400	408
D6	mm	400	400	400	450	460
D7	mm	435	435	435	490	500
D8	mm	M20x1.5	M20x1.5	M20x1.5	M24x2	M24x2
D9 Version A	mm	M20x1.5	M20x1.5	M20x1.5	M24x2	M24x2
D9 Version B	mm	22	22	22	26	26
Qty. D8 / D9		24/20	20/20	20/20	20/20	30/24

1) Other ratios on demand
2) Without Hydraulic motor

3) Optional brake torques on demand
4) Option: external brake

Winch Drives

Winch Drives Large

Nominal torque T_{Nom} (M5 / T5 / L2)

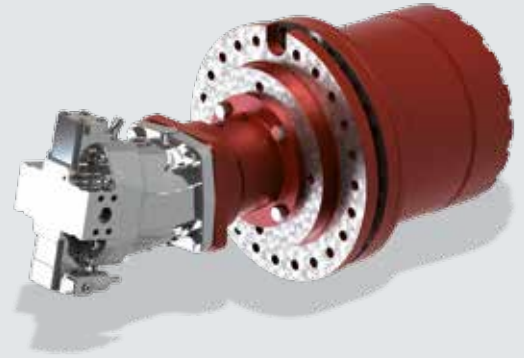
100 ... 210 kNm

Gear Ratios

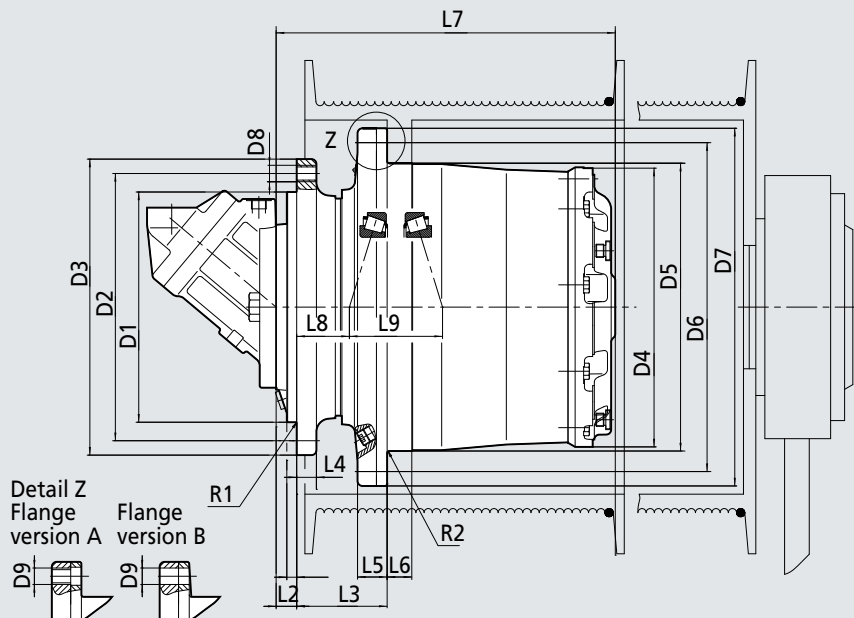
24 ... 490 i

Standard features

- Compact structure
- Robust layout of planetary gear unit
- Robust taper roller bearings for drum support and cable pull
- Integrated disc-brake
- Easy oil change from front side
- Easy drum mounting
- High variety of ratios and hydraulic motors



Type	Nominal torque T_{Nom} (kNm)	
FW130		100
FW180		112.5
FW220		140
FW260		175
FW360		210



Overall dimensions and technical data

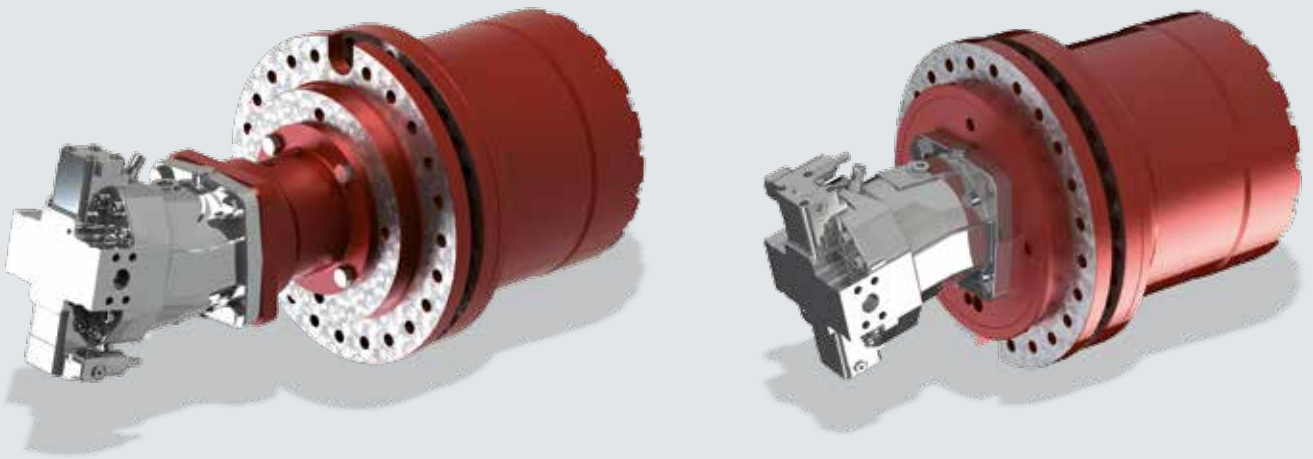
		FW130	FW180	FW220	FW260	FW360
Ratio ¹	i	81-85-115-159-167-180-206	206-281	97-119-165-190-248-290-345	69-97-245-251-345	24-94-128-223-257-490
CAPACITY OF BEARING						
C-dynamic	kN	523	787	765	750	1040
Co-static	kN	980	1650	1660	1560	2450
Weight ²	kg	452	636	740	865	1080
MULTI-DISK BRAKE						
Locking torque version ³	Nm	750/2200	1200	1200	1000	1700
Release pressure min.	bar	19/23	35	15	15	12
Brake features ⁴		–	–	–	–	–
HYDRAULIC MOTOR						
Plug in fixed	ccm	107-125-160-180	180	107-180	–	355
Plug in variable	ccm	107-160	–	160-200-250	355-250	355
DIMENSIONS						
L1	mm	45	30	18	21	100
L2	mm	45	30	52	45	100
L3	mm	190	168	166.5	170	130
L4	mm	35	40	40	40	40
L5	mm	58	56	61	48	60
L6	mm	45	21.5	35	60	80
L7	mm	530	534.5	580.5	579	658
L8	mm	50.5	50.3	16	18.5	-25
L9	mm	147	141.4	187.5	189.5	215
R1	mm	25	4	35°/16/16	2	18°/100/16
R2	mm	4	3	4	–	10
D1	mm	390	450	460	460	580
D2	mm	500	510	600	520	680
D3	mm	550	560	650	570	735
D4	mm	449	528	540	608	649
D5	mm	450	535	542	610	650
D6	mm	500	600	600	680	720
D7	mm	550	650	650	735	775
D8	mm	M24x2	M24x2	M24x2	M30x2	M30x3.5
D9 Version A	mm	M24x2	M24x2	M24x2	M30x2	M30x3.5
D9 Version B	mm	26	26	26	32	32
Qty. D8 / D9		32/32	30/30	38/38	24/24	30/30

1) Other ratios on demand
2) Without Hydraulic motor

3) Optional brake torques on demand
4) Option: external brake

Winch Drives

Winch System for Vertical Drills with External or Internal Brake



MACHINE WEIGHT TONS

WINCH DRIVE

Up to 15	FW13
15–20	FW30
20–28	FW30
28–33	FW40
33–40	FW40
40–50	FW55
50–70	FW80
70–80	FW130
80–100	FW130
100–120	FW180
120–150	FW180
150–180	FW220
180–200	FW620
200–300	FW1100

Winch Drives

Winch System for Harbour Cranes



General requirements

- Planetary drive
- Winch drum
- Dynamic safety brake & elastic couplings
- Winch drum support / Torque arm
- Motor support for IEC electric motor

		F560TPS	F260TPS
Ratio gearbox	(-)	38.462	36
Nominal load	t	50	32
FEM – CLASS	(-)	M8 - T9	M8 - T7
Requested lifetime according FEM	h	50000	25000
Drum winding diameter	mm	950	725
Rope diameter	mm	38	29
Nominal torque	Nm	129941	65166
Max rope speed (empty)	m/min	140	120
Max torque (grab bulk mode)	Nm	253700	155800
Max drum speed (grab bulk mode)	U/min	14	23,7
Max torque (cargo mode)	Nm	259900	130300
Max drum speed (cargo mode)	U/min	36.9	35.2

Other Drives

Torque Units & Tunneling Drives

Output torque

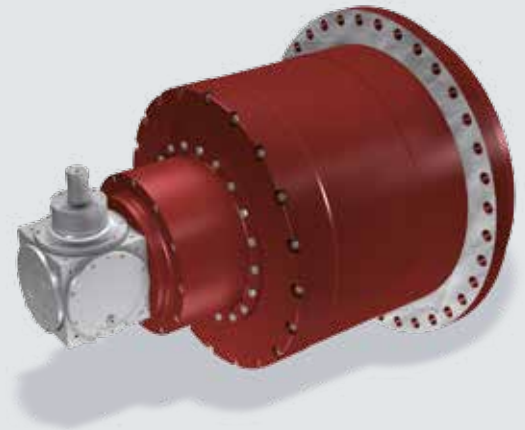
620 ... 3000 kNm

Gear Ratios

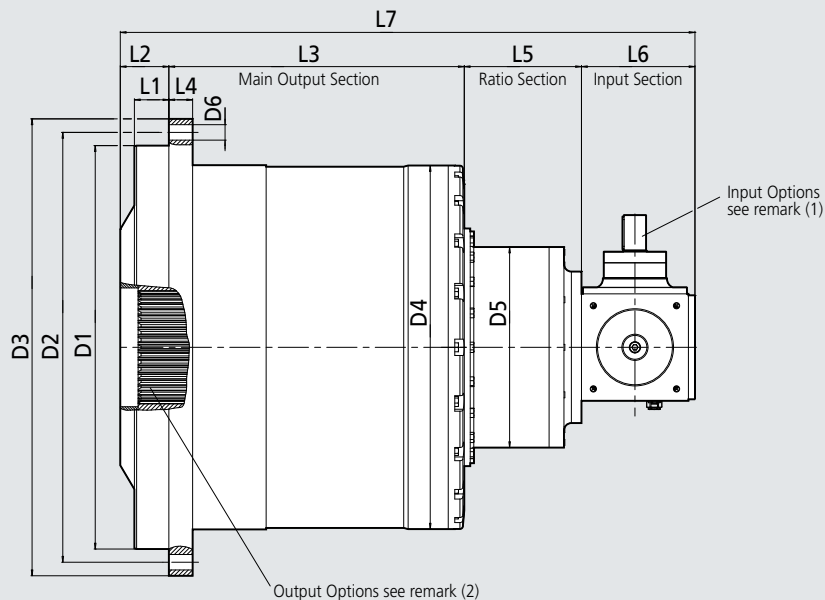
19.8 ... 1500 i

Standard features

- Compact structure
- High performance
- 3–7 Planetary wheels per stage
- Notchless ground tooth root
- Different ratios
- Different input options
- Different output options
- Optional integrated disc-brake
- High availability by highest teeth and production quality



Type	Nominal torque T_{Nom} (kNm)
FTU620	620
FTU800	800
FTU1300	1300
FTU2200	2200
FTU3000	3000



Overall dimensions and technical data

		FTU620	FTU800	FTU1300	FTU2200	FTU3000
Ratio - Range	(-)	24 ... 1500	24.5 ... 1500	34.7 ... 1500	19.8 ... 1500	19.8 ... 1500
Input options		(1)	(1)	(1)	(1)	(1)
Output options		(2)	(2)	(2)	(2)	(2)
DIMENSIONS						
L1	mm	60	65	80	125	125
L2	mm	95	100	110	142.5	142.5
L3	mm	640	730	938	1112	1112
L4	mm	54	58	75	100	80
L5	mm	(3)	(3)	(3)	(3)	(3)
L6	mm	(3)	(3)	(3)	(3)	(3)
L7	mm	(3)	(3)	(3)	(3)	(3)
D1	mm	895	955	1240	1340	1340
D2	mm	1000	1010	1330	1440	1440
D3	mm	1060	1090	1430	1540	1540
D4	mm	885	920	1224	1216	1216
D5	mm	(3)	(3)	(3)	(3)	(3)
D6	mm	33	33	45	45	45
Qty. D6		36	48	52	48	48

1) Input options:

- Hydraulic Motor
- Electric Motor
- Angular / Bevel Gear
- Spline Shaft
- Spline Hollow Shaft
- Hollow Shaft Shrink Disk
- Key Shaft
- Flange

2) Output options:

- Spline Shaft
- Spline Hollow Shaft
- Hollow Shaft Shrink Disk
- Key Shaft
- Flange

3) Depending on ratio and input/output option

Other Drives

Jack-up Drives

Key performance data (both versions)

Max. Jacking Load

560 metric tons / 600 short tons / 1230 Kips

Max. Jacking Torque

1900 kNm

Max. Holding Torque

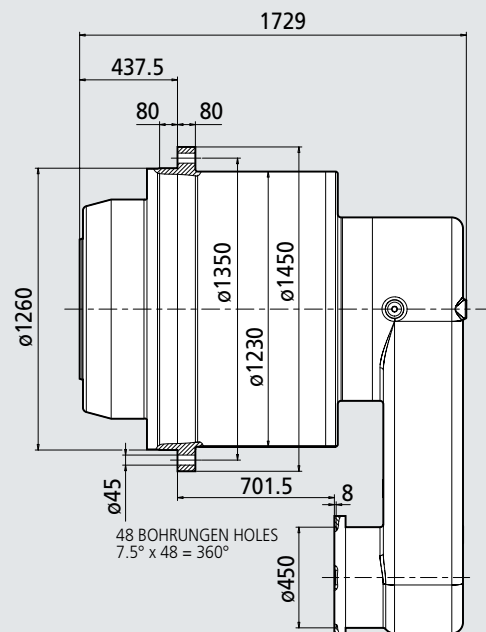
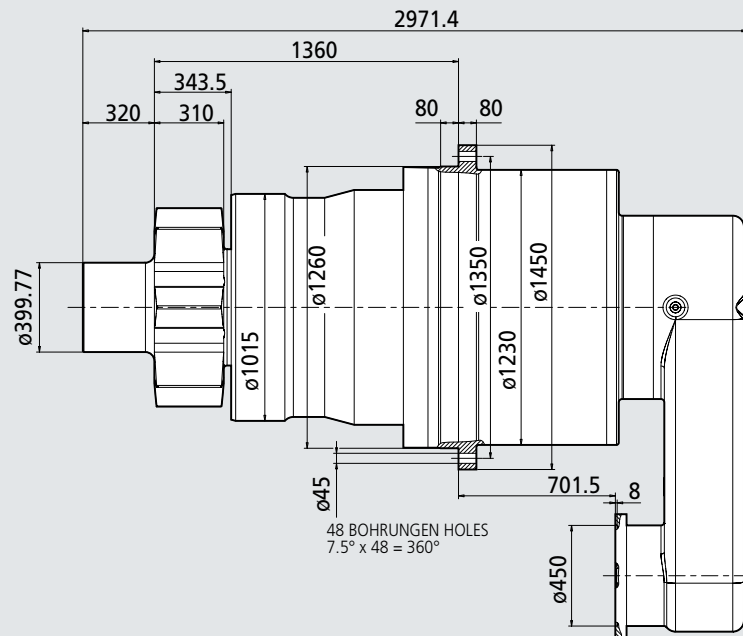
2400 kNm

Max. Storm Holding Torque

2900 kNm



Overall dimensions and technical data



Matching products/applications charts

Excavator Travel Drive CE

EXCAVATOR WEIGHT TONS	TRACK DRIVE	SLEW DRIVE
6-8	F10	S5
8-10	F13	S5
10-12	FD20	S5
12-18	F30	S7
18-22	F40	S10
22-28	F55	S13
28-35	F80	S17
35-50	F100	S30
50-70	F130	S30
70-90	F180	S34

Trencher

MACHINE WEIGHT TONS	TRACK DRIVE
20-30	F55
30-40	F80
40-50	F100
50-80	F130
80-100	F180
100-120	F220
120-150	F280
150-180	F360

Crusher / Screener

MACHINE WEIGHT TONS	TRACK DRIVE
20-30	F30
30-40	F40
40-50	F55
50-70	F80
70-90	F100
90-110	F130

Towing Tractors

MAXIMUM OUTPUT TORQUE	WHEEL DRIVES	AIRCRAFT WEIGHT
19	FR20	160 ton
23	FR40	300 ton
30	FR60	600 ton

Excavator Travel Drive Mining

EXCAVATOR WEIGHT TONS	TRACK DRIVE	SLEW DRIVE
50-70	F130	S30
70-90	F180	S34
90-120	F220	S54 (1x)
120-150	F280	S54 (1x)
150-180	F360	S54 (2x)
180-220	F420	S54 (2x)
220-300	F620	S54 (3x)
300-400	F800	S54 (3x)
400-500	F1100	S54 (4x)
500-600	F1300	S54 (4x)
600-800	F1800	S54 (5x)
800-1000	F2200	S54 (6x)
1200-1400	F3000	S130 (4x)

Crawler Crane

CRANE LIFTING CAPACITY TONS	TRAVEL DRIVE	WINCH DRIVE
40	F80 (2x)	FW80
80	F100 (2x)	FW80
100	F130 (2x)	FW100
130	F180 (2x)	FW100
160	F260 (2x)	FW130
250	F440 (2x)	FW130
300	F560 (2x)	FW180
350	F620 (2x)	FW220
400	F650 (2x)	FW220
600	F700 (2x)	FW220
600	F740 (2x)	FW260
800	F560 (4x)	FW260
1200	F750 (4x)	FW220 (2x)
2500	F1800 (4x)	FW220 (2x)
4000	F2200 (4x)	FW360 (2x)

Matching products/applications charts

Excavator Travel Compact Drives

MACHINE WEIGHT TONS	TRACK DRIVE
14–18	F30K
18–22	F45K
22–28	F55K
28–35	F80K
35–50	F100K

Paver

MACHINE WEIGHT TONS	TRACK DRIVE
Up to 10	FD20
10–14	F30
14–20	F40
20–24	F55
24–33	F80

Soil Compactor

MACHINE WEIGHT TONS	DRUM DRIVE
2.5–5	n.a.
5–7	F10
7–9	FD20
9–12	F30
12–16	F40
16–18	F55
18–20	F80
20–25	F100

Vibrating Tandem Roller

MACHINE WEIGHT TONS	TRACK DRIVE
1–1.5	n.a.
1.5–2.5	n.a.
2.5–5	n.a.
5–7.5	F10
7.5–12	FD20
12–13	F30
13–15	F40
15–17	F55
17–20	F80

Drilling Rigs

MACHINE WEIGHT TONS	TRACK DRIVE	SLEW DRIVE	WINCH DRIVE
Up to 15	FD20	S5	FW13
15–20	F30	S7	FW30
20–28	F40	S10	FW30
28–33	F40	S13	FW40
33–40	F55	S17	FW40
40–50	F80	S20	FW55
50–70	F100	S30	FW80
70–80	F100	S30	FW130
80–100	F130	S20 (2x)	FW130
100–120	F180	S20 (2x)	FW180
120–150	F220	S54	FW180
150–180	F280	S20 (3x)	FW220
180–200	F360	S20 (3x)	FW620
200–300	F620	S54 (3x)	FW1100

Road Milling Machine / Surface Mining Machine - by weight

MACHINE WEIGHT TONS	TRACK DRIVE
5–8	F10
8–25	F30
25–36	F55
36–45	F80

Road Milling Machine / Surface Mining Machine - by input power

INPUT POWER KW	CUTTER DRIVE	CUTTING TORQUE
80	FA30	8.5 kNm
110	FA40	12 kNm
150	FA55	16 kNm
220	FA80	23 kNm
300	FA100	32 kNm
400	FA130	38 kNm
500	FA200	47 kNm
880	FA360	84 kNm
1200	FA800	115 kNm

Bonfiglioli Worldwide



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 Assembly HDP, HDO, 300 series
ITALY • Vignola, Modena
 Gearmotor assembly plant
 Precision gearbox manufacturing and assembly plant
ITALY • Forlì
 Planetary gearboxes manufacturing and assembly plant
ITALY • Rovereto, Trento
 Brushless motor and precision gearboxes production
GERMANY • Krefeld
 Inverter plant
 Photovoltaic Inverter assembly
GERMANY • Hattingen
 Large planetary gearboxes manufacturing and assembly plant
SLOVAKIA • Považská Bystrica
 Large gearboxes manufacturing plant
INDIA • Chennai, Tamil Nadu
 Planetary gearbox manufacturing and assembly plant
INDIA • Mannur, Tamil Nadu
 Gearmotors manufacturing and assembly plant
INDIA • Bangalore, Karnataka
 Photovoltaic Inverter assembly
VIETNAM • Ho Chi Minh
 Electric motor plant
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 Planetary gearboxes manufacturing and assembly plant
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 Planetary gearboxes manufacturing and assembly plant

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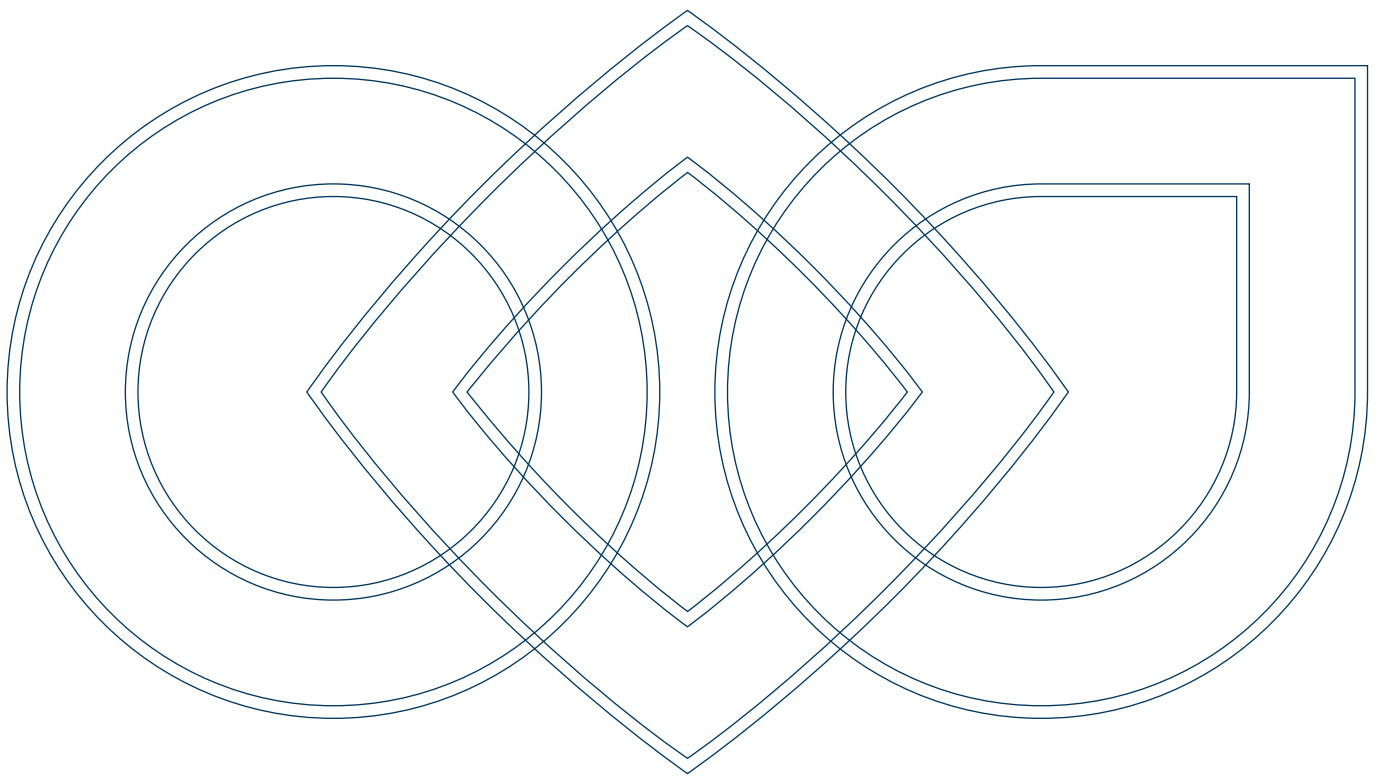
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Bonfiglioli has been designing and developing innovative and reliable power transmission and control solutions for industry, mobile machinery and renewable energy applications since 1956.

