



Drives



O&K Antriebstechnik

A Carraro Group
Company

Introduction

Carraro Group

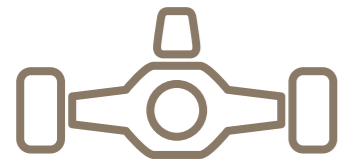
Carraro is a multinational Group and world leader in power transmission systems. Its core business consists in conceiving, designing, validating, manufacturing and marketing drive systems for construction equipment, agricultural tractors, material handling, light commercial vehicles, automobiles, renewable energies and stationary applications (such as escalators and wind generators).

The Group, whose holding company Carraro Spa has been listed on the Italian Stock Exchange since 1995, is based in Campodarsego (Padua) and has manufacturing facilities in Italy, Germany, Argentina, the United States, India and China.

The Group Business Areas

CARRARO DRIVETECH

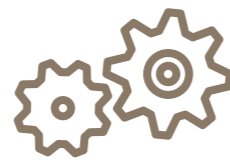
Integrated solutions (axles, transmissions, final & swing drives) for a wide range of applications: mining, construction equipment, agricultural tractors, light commercial vehicles, material handling and stationary applications (such as escalators & wind energy generators).



GearWorld

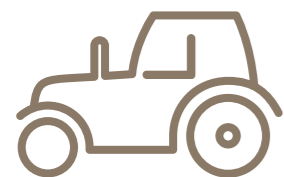
A Carraro Group Company

Low & high diameter steel gears, sinterized components and gears for earth-moving machines, agricultural tractors, cars, light commercial vehicles, two-wheel vehicles, power tools, garden equipment, railway and industrial applications, in particular for wind and solar energy.



CARRARO AGRITALIA

Design and manufacturing of standard, vineyard & orchard tractors, from 50 to 100 HP; offering a wide range of engineering services, from simple consultancy to “turnkey” projects.



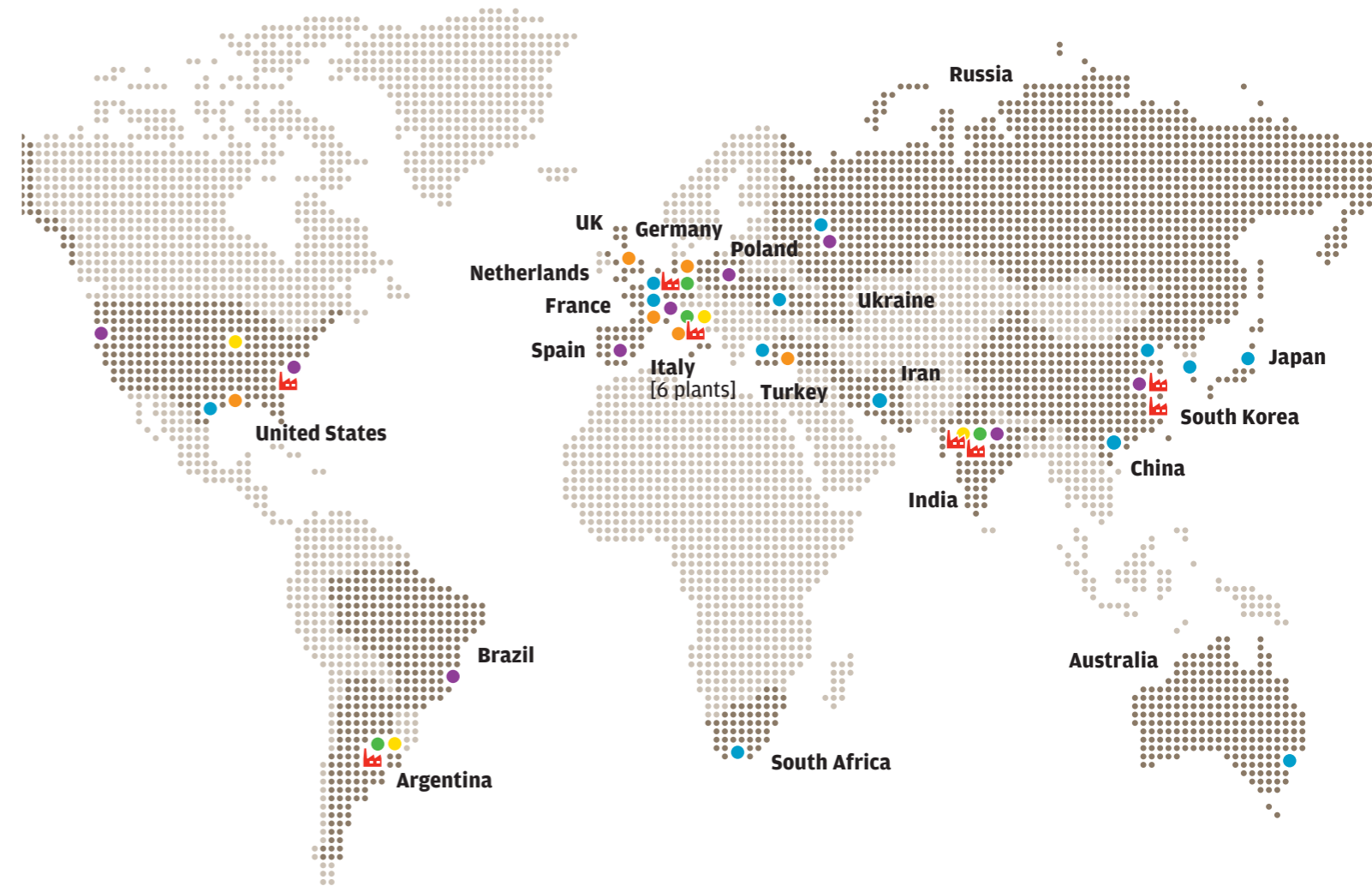
SANTERNO

CARRARO GROUP







Inverters and power control, frequency converters, applied electronics for industrial plants, automation, renewable energies management (photovoltaic & wind energy), hybrid and electric vehicle powertrains.



Global footprint Where we are



HIGHLIGHTS

-  Manufacturing sites
-  Sales Offices
-  Engineering & Innovation Centers
-  Dealers
-  Service providers
-  Logistics & Spare Parts Centers

Carraro Drive Tech Drivelines & Drives

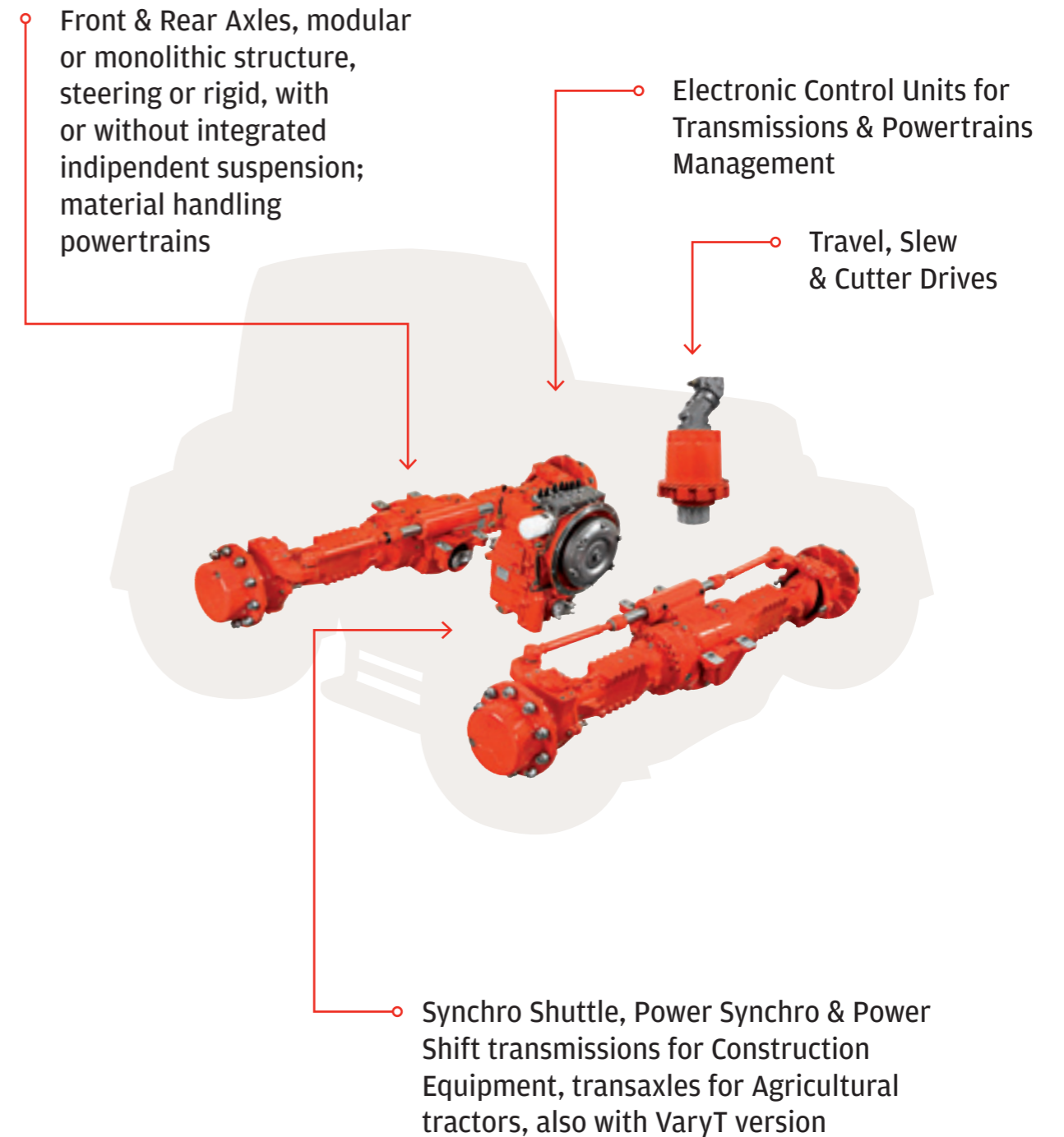
Carraro Drive Tech is the Business Unit managing the Carraro Group core business: designing, manufacturing and marketing drivelines, axles and transmissions, travel & cutter drives and electronic control units.

Wherever there is a need for integrated transmission systems for off- and on-highway vehicles, Carraro Drive Tech has the solution, with a complete, diversified product range for agriculture, construction equipment, mining, and material handling.

Carraro drivelines have been optimised for the individual markets of application, to guarantee the very best efficiency and most practical vehicle layout.

All this is possible thanks to the wide range of combinations of rigid and steering axles and mechanical, automatic or semi-automatic transmissions. The Carraro systems have been designed for the optimal integration of mechanics and hydraulics, under the supervision of an advanced electronic control unit. This can best manage the whole driveline while monitoring and diagnosing the vehicle functions.

Our solutions



O&K Antriebstechnik

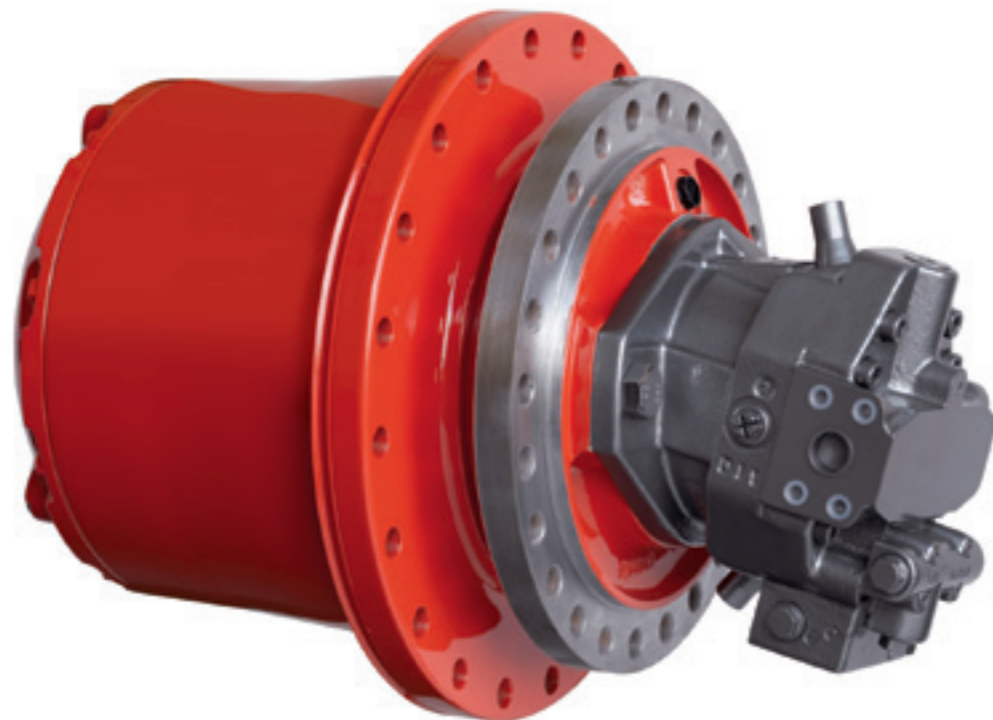
Drives and gearboxes for Construction Equipment applications

When it comes to advanced modular powertrain components, O&K Antriebstechnik is acknowledged to be foremost. Decades of experience in engineering sophisticated drives & gearboxes have benefited a wide range of customers.

Today O&KA is one of the world's leading producers of planetary drives. As a competence centre within the Carraro Group, the company develops final drives, slew drives, cutter drives for mobile applications as well as drives for wind generators, walkways and escalators.

Ever shrinking dimensions enable the units to be installed wherever space is of the essence. The vast array of standard reductions and add-on hydraulic motors allows O&K Antriebstechnik to provide individual product configurations, while remarkable flexibility allows customer wishes to be met in a very short time.

This is the result of an outstanding & deep knowledge in terms of Research & Development. O&KA means quality & technology from Germany.



Travel Drives

Final Drives Small

Standard features

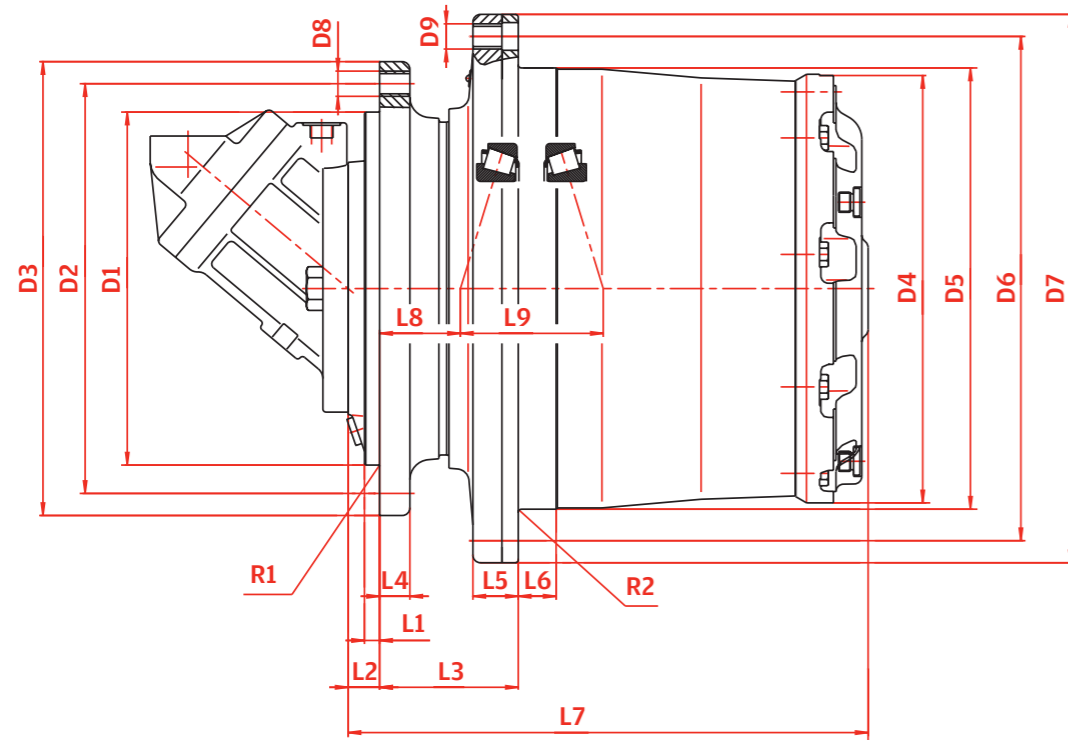
- › Compact structure
- › High performance
- › 3-7 Planetary wheels per stage
- › Notchless ground tooth root
- › Different ratios
- › Integrated disc-brake
- › High availability by highest teeth and production quality

Proven applications

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

Special executions on request

- › Mechanical disconnect device



		F 5	F10A	F13A	FD 20	F 30	F 30K
Output torque ²	kNm	5	10	13	20	30	30
Ratio ³	i	30	35	93 (41) ¹	81	61 (19) ¹	61 (19) ¹
		35	51	108	90	66 (32) ¹	66 (32) ¹
		53	65	122	101	81	81
				140	137	90	90
				178	171	101	101
			229	228	114	114	
					121	121	
					137	137	
					171	171	
					228	228	
					305	305	

CAPACITY OF BEARING

C-dynamic	kN	194	132	132	194/194	132/194	132/194
Co-static	kN	315	255	255	325/315	255/325	255/325
Weight ⁵	kg	43	45	50	72	94	94

MULTI-DISK BRAKE

Locking torque	Nm		200	200	300	300 (255; 400) ⁴	300 (255; 400) ⁴
Release pressure min.	bar		17	17	16	16 (16; 22) ⁴	16 (16; 22) ⁴
Hydraulic motor plug in fixed	ccm		28	28	28	40	28
			30	30	30	45	30
			32	32	32	56	32
					60		
					63		
plug in variable	ccm		28	28	28	55	28
			45	45	45	60	45

DIMENSIONS

L 1	mm	8	10	10	10	13	13
L 2	mm	8	30	30	41	25	22
L 3	mm	70	72	72	75	75	75
L 4	mm	19	13.5	13.5	15	15	15
L 5	mm	18.5	15	15	28	29	29
L 6	mm	20	16	16	25	25	25
L 7	mm	220	230	255	300	323 (278) ¹	320 (275) ¹
L 8	mm	38.4	28	28	15.3	28.5	28.5
L 9	mm	80.2	79	79	86.3	89	89
R 1	mm	0.6	0.6	0.6	2.5	2.5	2.5
R 2	mm	0.6	0.6	0.6	2.5	2.5	2.5
D 1	mm	165	190	190	240	240	240
D 2	mm	192	230	230	275	275	275
D 3	mm	215	256	256	304	304	304
D 4	mm	190	216	216	250	269	269
D 5	mm	204	220	220	270	270	270
D 6	mm	232	260	260	305	305	305
D 7	mm	255	290	290	335	335	335
D 8 / D 9	M	12/12	16/16	16/16	16/16	16/16	16/16
Qty. D 8 / D 9		9/9	12/8	12/8	18/18	18/18	18/18

1) 2-stage

2) Stated torques are peak values for short duration

3) Other ratios on demand

4) Optional brake torques

5) Without Hydraulic motor

Final Drives Medium

Standard features

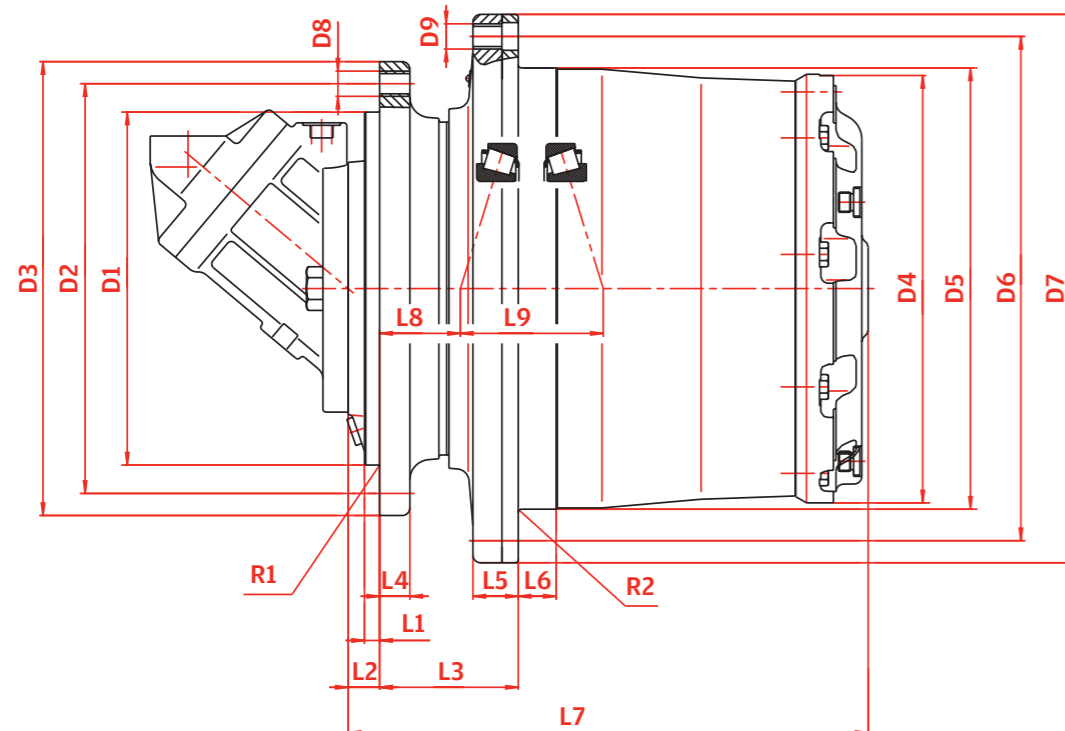
- › Compact structure
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- › High availability by highest teeth and production quality

Proven applications

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

Special executions on request

- › Mechanical disconnect device



		F40	F40A	F 55	F 55A	F 55B
Output torque ²	kNm	40	40	55	55	55
Ratio ³	i	61 (19) ¹	61 (19) ¹	63 (16) ¹	63 (16) ¹	63 (16) ¹
		66 (22) ¹	66 (22) ¹	68 (19) ¹	68 (19) ¹	68 (19) ¹
		81 (26) ¹	81 (26) ¹	87 (22) ¹	87 (22) ¹	87 (22) ¹
		85 (32) ¹	85 (32) ¹	94 (32) ¹	94 (32) ¹	94 (32) ¹
		101	101	117	117	117
		110	110	124	124	124
		117	117	137	137	137
		124	124	148	148	148
		142	142	185	185	185
		181	181			

CAPACITY OF BEARING

C-dynamic	kN	224	224	224	224	224
Co-static	kN	405	405	405	405	405
Weight ⁵	kg	115	123	165	177	181

PARK BRAKE

Locking torque	Nm	420	420	420 (390; 500) ⁴	420 (390; 500) ⁴	420 (390; 500) ⁴
Release pressure min.	bar	18	18	15 (15; 21) ⁴	15 (15; 21) ⁴	15 (15; 21) ⁴

HYDRAULIC MOTOR

plug in fixed	ccm	40	80	80	40	/
		45	90	90	45	
		56			56	
		60			60	
		63			63	
plug in variable	ccm	55	80	80	55	107
		60			60	110

DIMENSIONS

L 1	mm	16	13	12	20	12
L 2	mm	16	35	25	30	37
L 3	mm	91	91	110	91	110
L 4	mm	21	21	24	24	24
L 5	mm	34	34	36	36	36
L 6	mm	26	26	30	30	30
L 7	mm	338 (308) ¹	357 (327) ¹	413 (374) ¹	399 (360) ¹	425 (386) ¹
L 8	mm	38	38	64	45	64
L 9	mm	100	100	113	113	113
R 1	mm	2.5	2.5	1	4	1
R 2	mm	2.5	2.5	2.5	2.5	2.5
D 1	mm	240	270	280	240	290
D 2	mm	285	310	325	285	335
D 3	mm	320	345	360	320	370
D 4	mm	294	294	340	340	340
D 5	mm	295	295	350	350	350
D 6	mm	335	335	400	400	400
D 7	mm	370	370	435	435	435
D 8 / D 9	M	20x1.5 16x1.5	20x1.5 16x1.5	20x1.5	20x1.5	20x1.5
Qty. D 8 / D 9		20/20	16/20	24/20	20/20	20/20

1) 2-stage

2) Stated torques are peak values for short duration

3) Other ratios on demand

4) Optional brake torques

5) Without Hydraulic motor

Final Drives Medium

Standard features

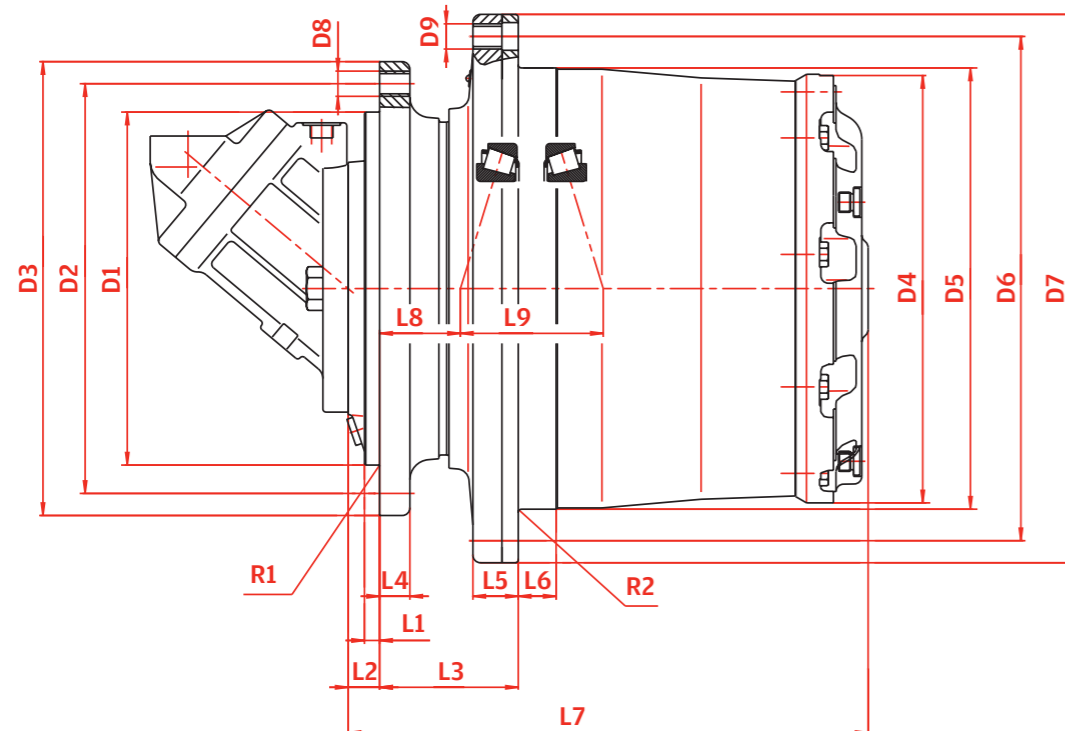
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Proven applications

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

Special executions on request

- › Mechanical disconnect device



		F 80	F80A	F80B	F 100	F 100B
Output torque ²	kNm	80	80	80	100	100
Ratio ³	i	61 (19) ¹	61 (19) ¹	61 (19) ¹	77 (21) ¹	77 (21) ¹
		81	81	81	84 (22) ¹	84 (22) ¹
		101	101	101	95 (32) ¹	95 (32) ¹
		114	114	114	121	121
		121	121	121	142	142
		137	137	137	175	175
		147	147	147	192	192
		171	171	171	226	226
187	187	187				
206	206	206				

CAPACITY OF BEARING

C-dynamic	kN	300	300	300	498	498
Co-static	kN	570	570	570	1010	1010
Weight ⁵	kg	230	227	228	325	338

PARK BRAKE

Locking torque	Nm	600 (375; 550; 1000) ⁴	600 (375; 550; 1000) ⁴	600 (375; 550; 1000) ⁴	600 (900) ⁴	600 (900) ⁴
Release pressure min.	bar	18 (18; 19; 28) ⁴	18 (18; 19; 28) ⁴	18 (18; 19; 28) ⁴	13 (13) ⁴	13 (13) ⁴

HYDRAULIC MOTOR

plug in fixed	ccm	107	80	160	107	160
		110	90	180	125	180
		125				
plug in variable	ccm	80	107 110	160	107 110	160

DIMENSIONS

L 1	mm	20	20	20	35	37
L 2	mm	35	35	35	35	37
L 3	mm	90	90	90	165	165
L 4	mm	22	22	22	28	28
L 5	mm	37	37	37	53	53
L 6	mm	24	24	24	43	43
L 7	mm	415	415	415	461	463
L 8	mm	34	34	34	32	32
L 9	mm	123	123	123	139	139
R 1	mm	4	4	4	10/60	12/60
R 2	mm	2.5	2.5	2.5	5	5
D 1	mm	330	330	330	390	390
D 2	mm	370	370	370	460	460
D 3	mm	410	410	410	500	500
D 4	mm	374	374	374	407	407
D 5	mm	400	400	400	408	408
D 6	mm	450	450	450	460	460
D 7	mm	490	490	490	500	500
D 8 / D 9	M	24x2	24x2	24x2	24x2	24x2
Qty. D 8 / D 9		20/20	20/20	20/20	30/24	30/24

1) 2-stage

2) Stated torques are peak values for short duration

3) Other ratios on demand

4) Optional brake torques

5) Without Hydraulic motor

Final Drives Large

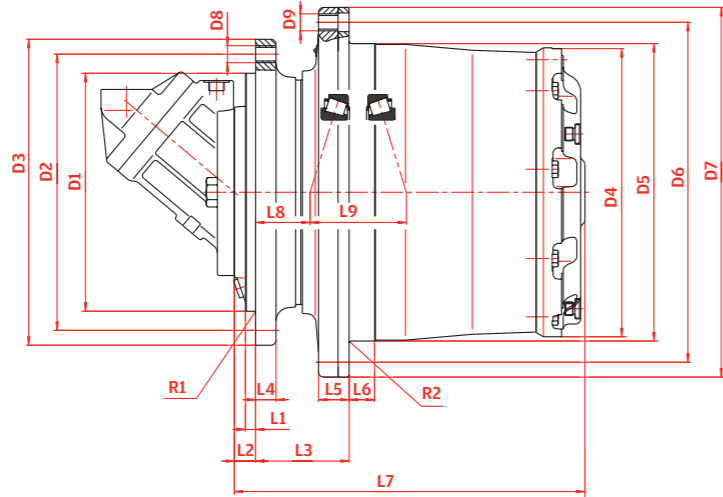
Standard features

- › 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

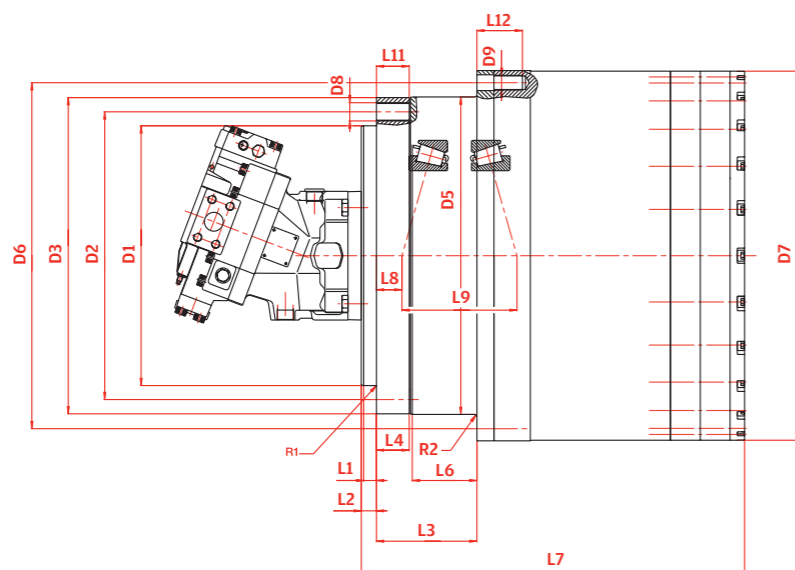
Special executions on request

- › Mechanical disconnect device

Standard input version - ST



Crawler Crane version - CC



		F 130	F 180	F 220	F260	F 360	F 440	F560			
Output torque ²	kNm	130	180	220	260	360	440	560			
Ratio ^{1,3}	i	81	206	97	69	94	352	739			
		85	281	119	97	128					
		115	(412) ⁷	190	245	223					
		159	(824) ⁷	248	345	257					
		167		290	(670) ⁷	490					
		180		345	(1115) ⁷	(385) ⁷					
		206	(744) ⁷	(805) ⁷	(1784) ⁷	(446) ⁷	(1115) ⁷	(1784) ⁷			
VERSION⁵		ST	ST	CC	ST	CC	ST	CC	CC		
CAPACITY OF BEARING											
C-dynamic	kN	523	787	787	765	750	750	1 040	1040	1040	
Co-static	kN	980	1650	1650	1660	1560	1560	2450	2450	2450	
Weight ⁶	kg	452	636	636	740	895	865	895	1080	1300	2000
PARK BRAKE											
Locking torque	Nm	750	1375 (800) ⁴	1375 (800) ⁴	1200	1000	1000	1000	1700	1700 (1000)*	900
Release pressure min.	bar	17	35 (35) ⁴	35 (35) ⁴	15	15	15	15	12	15 (7.8)*	13
HYDRAULIC MOTOR											
plug in fixed	ccm	107	160	180	107	107			355		
		125	180		180	180					
		160									
		180									
plug in variable	ccm	107	160		160	160	355	160	355	250	160
		160			200	250	250			160	
DIMENSIONS											
L 1	mm	45	30	25	18	21	21	100	40	40	
L 2	mm	45	30	30	52	25	45	25	100	43	43
L 3	mm	190	168	171	166.5	165.5	170	165.5	130	255	255
L 4	mm	35	40	80	40	54	40	54	40	40	45
L 5	mm	58	56	/	61	/	48	/	60	25	45
L 6	mm	45	21.5	86	35	106.5	60	106.5	80	25	120
L 7	mm	530	534.5	564.5	580.5	631.5	579	631.5	658	820	831.5
L 8	mm	50.5	50.3	80.3	16	42	18.5	42	-25	80	80
L 9	mm	147	141.4	141.4	187.5	189.5	189.5	189.5	215	213	213
L10	mm	/	/	/	/	/	/	/	/	/	/
L11	mm	/	/	35	/	54	/	54	/	40	45
L12	mm	/	/	81.5	/	75	/	75	/	70	70
R 1	mm	25	4	4	35°/16/16	/	2	/	18°/100/16	/	4
R 2	mm	4	3	5	4	4	/	4	10	/	4
D 1	mm	390	450	340	460	428	460	428	580	450	450
D 2	mm	500	510	400	600	474	520	474	680	515	515
D 3	mm	550	560	444	650	521	570	521	735	569	569
D 4	mm	449	528	/	540	/	608	/	649	669	763
D 5	mm	450	535	445	542	523	610	523	650	670	570
D 6	mm	500	600	495	600	570	680	570	720	620	620
D 7	mm	550	650	528	650	608	735	608	775	670	670
D 8 / D 9	M	24x2	24x2	33x1.5	24x2	30x2	30x2/	30x2	30	36x3	36x1.5
			27x2	27x2		24x1.5	Ø33	24x1.5		30x2	30x1.5
Qty. D 8 / D 9		32/32	30/30	24/30	38/38	30/36	24/24	30/36	30/30	30/30	29/42

* Park brake integrated in hydraulic motor

1) 2-stage on demand

2) Stated torques are peak values for short duration

3) Other ratios on demand

4) Optional brake torques

5) ST= Standard CC= Crawler Crane

5) Without hydraulic motor

7) In combination with input bevel drive r

Final Drives XLarge

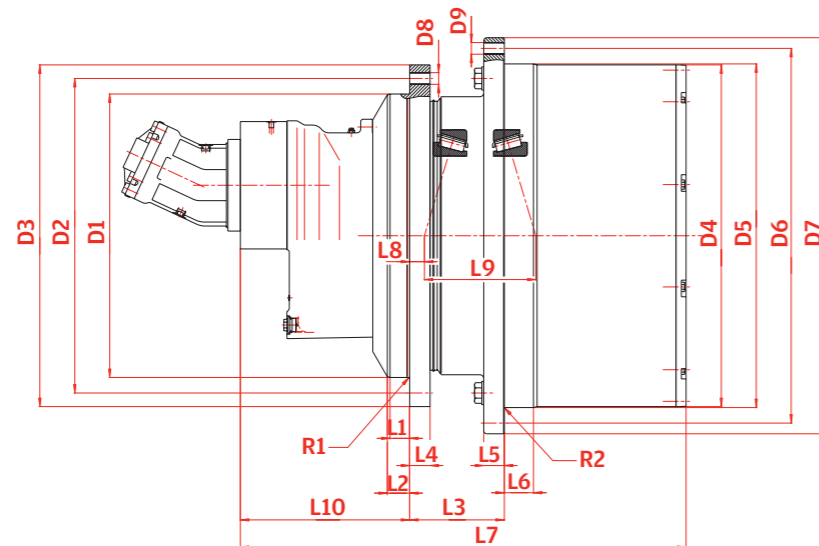
Standard features

- › 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

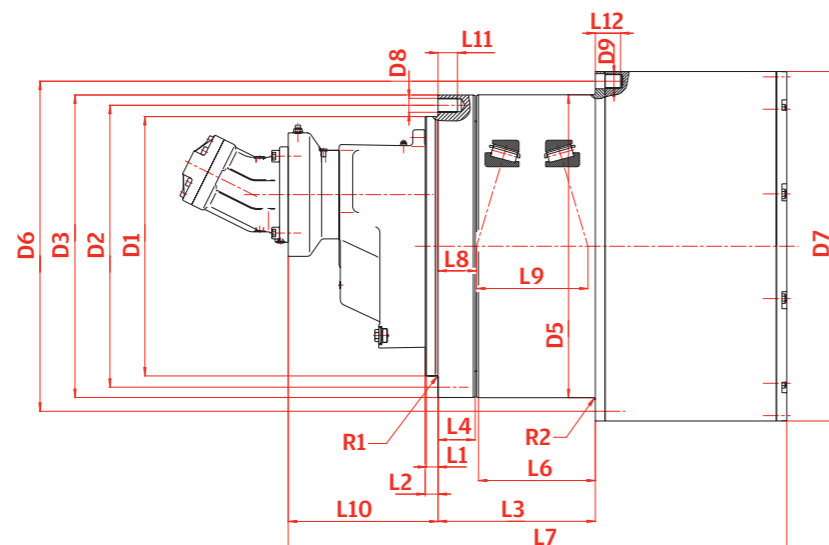
Special executions on request

- › Mechanical disconnect device

Standard input version - ST



Crawler Crane version - CC



		F 620	F 700	F 700A	F 800	F 1100	F 1300	F 1800	F 2200	F 3000	
Output torque ¹	kNm	620	700	700	800	1100	1300	1800	2200	2916	
Ratio ²	i	328 293 249	377	648	283	406	461	656 744	552	699	
VERSION³		ST	CC	CC	CC	ST	ST	ST	CC	ST	
CAPACITY OF BEARING											
C-dynamic	kN	1320	1320	1320	1320	2485	3900	3900	3900	5100	6110
Co-static	kN	3150	3150	3150	3150	5941	7650	7650	7650	11600	11900
Weight ⁴	kg	2897	2897	3350	3350	3764	7220	7400	9000	10736	11500
PARK BRAKE											
Locking torque	Nm	1200	1200	1200	1200	*1000	1750	1750	1200	2300	1700
Release pressure min.	bar	28	28	28	28	*7.8	20	20	28	22	12
HYDRAULIC MOTOR											
fixed	ccm	(2x) 250 (1x) 500	(2x) 200 (2x) 160	(2x) 250		(2x) 250	(2x) 250	(2x) 250	(2x) 250	(2x) 355	
variable	ccm	(2x) 250 (1x) 500	(2x) 160	(2x) 250	(2x) 160	(2x) 250	(2x) 250		(2x) 250	(2x) 355	(3x) 250
DIMENSIONS											
L 1	mm	50	30	30	30	20	57	57	55	60	60
L 2	mm	57.5	33	33	33	25	60	60	60	70	70
L 3	mm	245	405	405	405	229	503	503	478	343	343
L 4	mm	52.5	96	96	96	60	74	74	158	80	80
L 5	mm	53	/	/	/	58	/	/	/	100	100
L 6	mm	75	306	306	306	170	/	/	239	80	80
L 7	mm	1232	1159	1283.5	1372.5	1315	1483	1623	1785.5	1846	2000
L 8	mm	38	99	99	99	161/163	176	176	171	217	217
L 9	mm	287	287	287	287	257/253	368	368	375	376	376
L10	mm	341	352.8	352.8	474.8	713	713	395.5	602.5	591	606
L11	mm	/	50	50	50	/	/	/	50	/	/
L12	mm	/	65	65	65	/	/	/	90	/	/
R 1	mm	4	4	4	4	6	10	10	4	10	10
R 2	mm	/	5	5	5	8	6	6	6	10	10
D 1	mm	730	668	668	668	830	1110	1110	785	1288	1288
D 2	mm	810	726	726	726	980	1230	1230	851	1400	1400
D 3	mm	880	779	779	779	1050	1310	1310	923	1500	1500
D 4	mm	880	/	/	/	916	1116	1116	/	1224	1224
D 5	mm	885	782	780	780	920	-	1100	935	1230	1230
D 6	mm	965	830	850	850	976	1170	1170	1016	1320	1320
D 7	mm	1020	880	900	900	1055	1226	1226	1224	1400	1400
D 8 / D 9	M	30x2	36x1.5 30x1.5	36x1.5	36x1.5	30 x 2	36/30	36/30	42x2	42x3	42x3
Qty. D 8 / D 9		41/48	30/45	30/45	30/45	48/48	48/52	48/52	40/40	50/48	50/48

1) Stated torques are peak values for short duration

2) Other ratios on demand

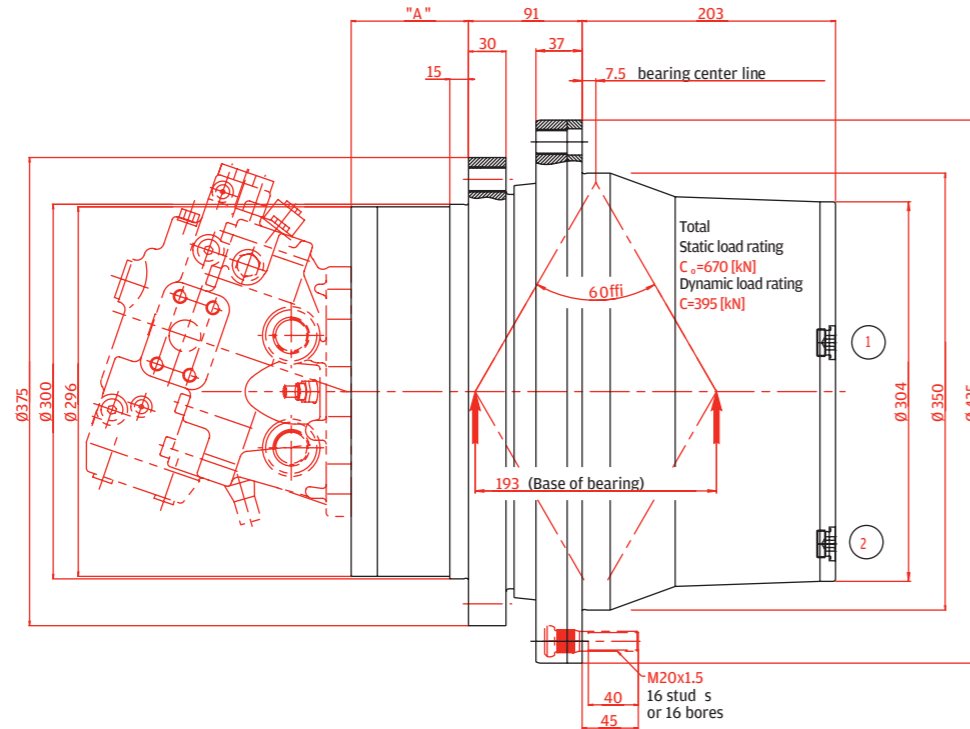
3) ST= Standard CC= Crawler Crane

4) Without hydraulic motor

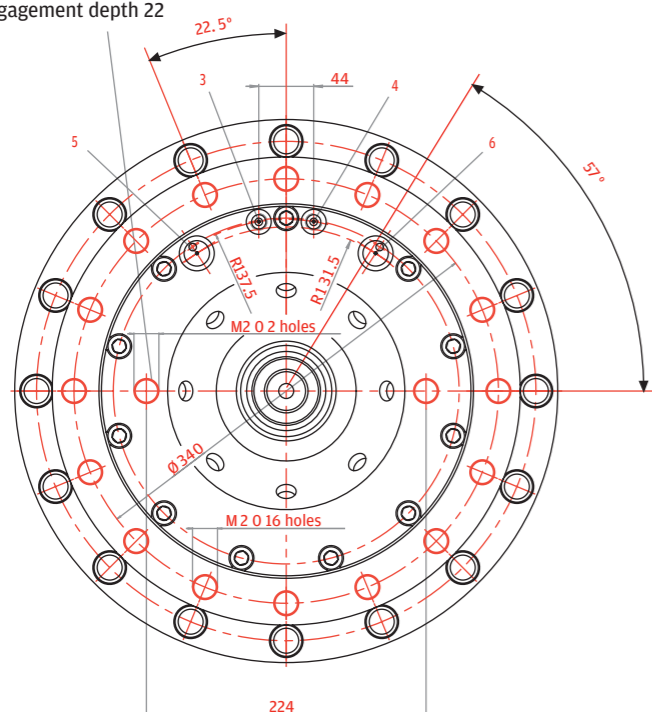
Final Drives 2 – Speed

“A”= 94 for hydraulic motors:
Sauer 51C080 D3
Linde HMV75
Rexroth A6VE80

“A”= 124 for hydraulic motors:
Sauer 51C110
Rexroth A6VE107



Hydraulic motor screw engagement depth 22



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"

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

Project related installation drawings can be available on request.

Dimensions and technical data are subject to change due to continuous product development

Technical data

Output torque max.	Nm	40000
Input speed max.	RPM	3500

Applicable hydraulic motors

Bosch-rexroth	A6VE55 ~ 107 range
Linde	HMV 55 ~ 75 range
Sauer danfoss	51C 060 ~ 080 range

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

Final Drives with Service Brakes

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

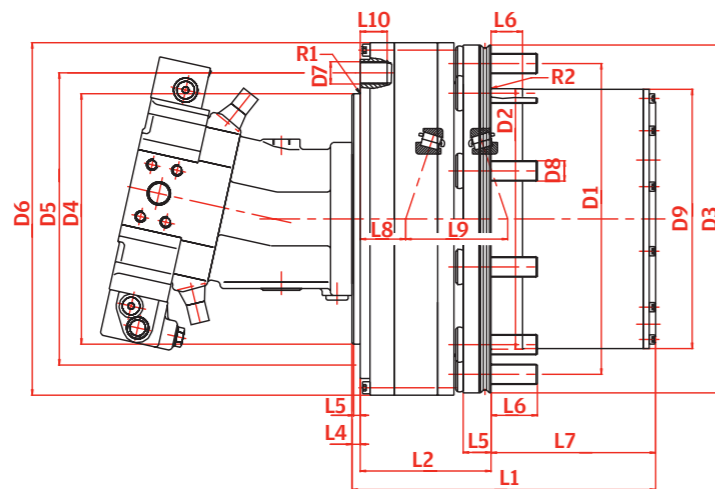
Proven applications

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

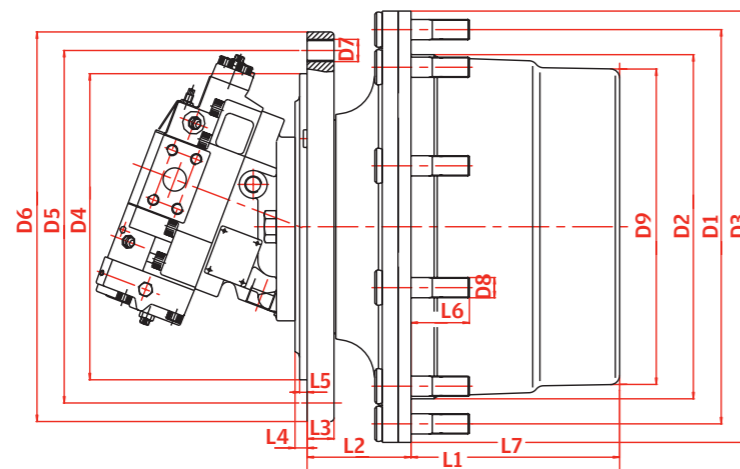
Special executions on request

- › Mechanical disconnect device

Version A



Version B



		FR 20	FR 40	FR 60
Output torque (Max) ¹	kNm	20	40	60
Output torque (Nominal)	kNm	16	23	30
Ratio ²	i	28	30	29
		34	32	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 ⁴	kg	129	173	500
HYDRAULIC MOTOR³				
variable	ccm	80	107	160
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	270f8	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) Stated torques are peak values for short duration

2) Other ratios on demand

3) Other hydraulic motors on request

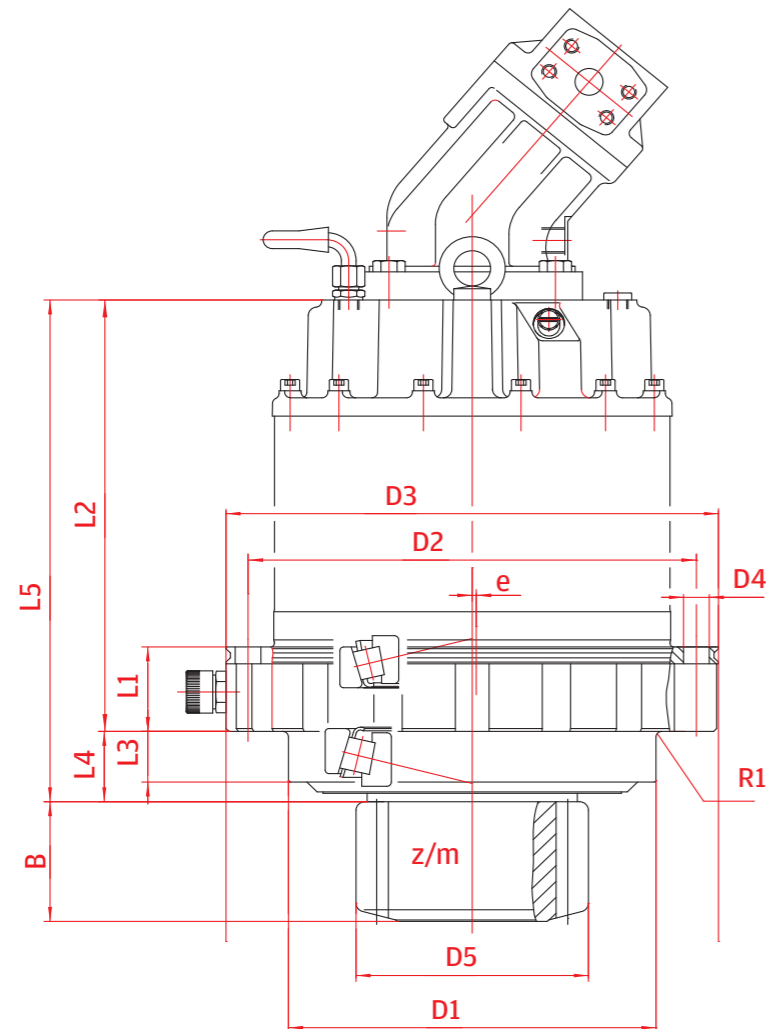
4) Without hydraulic motor

Slew Drives

Slew Drives

Standard features

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



		S 5	S 7	S 10	S 13	S 17	S 30	S 34	S 35	S 54	S 90	S 130
Output torque ¹	kNm	5.5	7	10	13.3	17.5	30	34	35	54	90	130
Ratio ²	i	25 33	23 27 33	24 27 31 36	36	33	45	45	35	48	39	67
Hydraulic motor ³	ccw	28 30 32	45 56 63	45 56 63	80 90 80 90	80 90	125	160	180	180 200	355 500	Electric ⁶

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 ⁴	z/m	10/10	10/11	12/12	10/14	11/14	12/16	12/16	12/18	13/22	16/24	13/30	
	B	95	79	90	99	109	154	154	160	230	182	230	
	D 5	130	141	184	181	198	243	243	274	357	464	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 ⁵ 110 ⁵ 190 ⁵							
		15/6.35 77 112		13/12 110 190	13/12 ⁵ 110 ⁵ 190 ⁵	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

L 1	mm	60	60	60	71	86	332	332	239	610	80	578	
L 2	mm	262	296	306.5	314	340	355	737	785	653	780	730	622
L 3	mm	31	31	36	30(50) ⁵	50.5	33	33	30	40	173	95	
L 4	mm	40	40.5	50	55(75) ⁵	55	65	65	91	87	199	160	
L 5	mm	302	336.5	356.5	364	395(415) ⁵	410	802	808	744	917	929	1012
D 1	mm	175	230	250	275	275	350	350	400	460	500	630	
D 2	mm	260	285	305	335	335	415	415	460	520	640	675	
D 3	mm	288	322	335	370	370	450	450	500	562	690	715	
D 4	mm	12x17.5	12x17.5	18x17.5	20x17.5	20x17.5	24x22	24x22	24x26	24x26	18x30	34x26	
e	mm	–	–	–	1	–	–	–	2	–	–	–	
R 1	mm	6	6	4	4	4	1.6	1.6	10	–	–	–	

1) Stated torques are peak values for short duration

2) Other ratios on demand

3) Other hydraulic motors on request

4) Output Pinion execution acc. to requirement

5) Optional

6) Hydraulic motor connection on demand

Cutter Drives

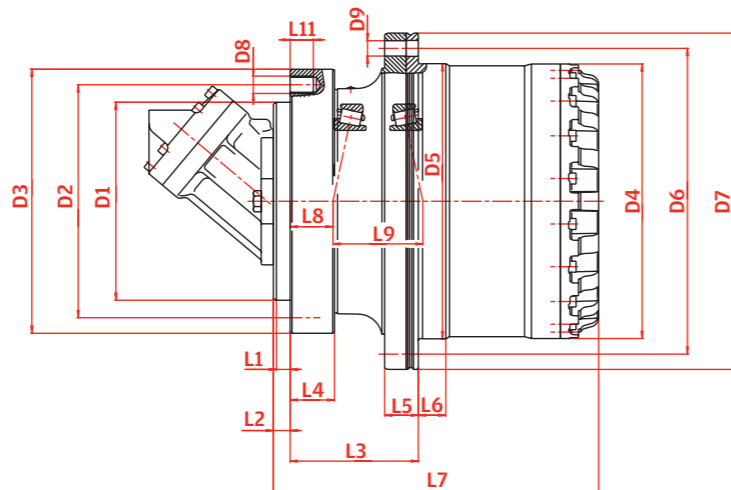
Cutter Drives Medium

Standard features

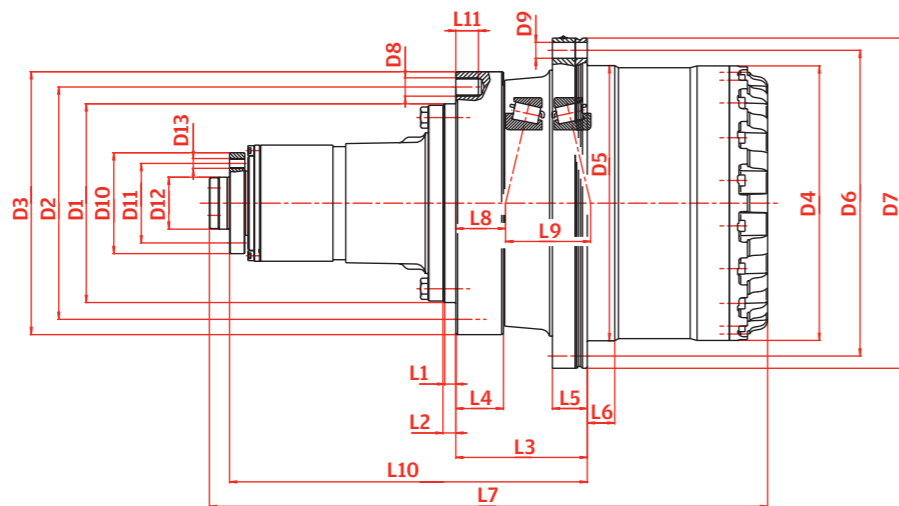
- › Compact structure
- › High performance
- › Notchless ground tooth root
- › Different ratios
- › Suitable for various hydraulic motors
- › High availability by highest teeth and production quality

Special executions on request

Standard Input version - ST



Mechanical Input version - MI



		FA30	FA40	FA55	FA80	FA100
Max. cutting torque	kNm	8.5	12	16	23	32
Input power	kW	80	110	150	220	300
Ratio ¹	i	19	19	16 19 22	19	21 22

VERSION ²		ST	ST	MI	ST	MI	ST	ST	MI
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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 / D9	mm	M16 / Ø 17.5	M20x1.5 / Ø 17.5	M20x1.5 / Ø 17.5	M20x1.5 / Ø 22	M20x1.5 / Ø 22	M24x2 / Ø 25	M24x2 / Ø 26	M20 / Ø 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	/	/	M16	/	M16	/	/	M16
Qty. D13		/	/	6	/	6	/	/	8

1) Other ratios on demand
2) ST - Standard Input / MI - Mechanical Input (Hydraulic Motor)

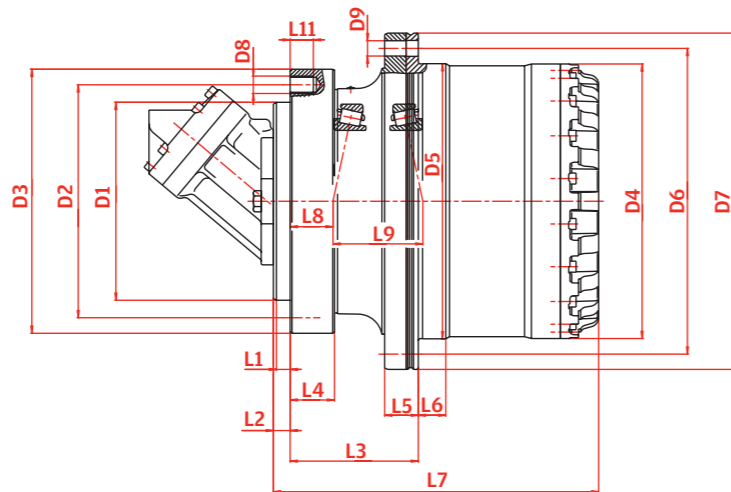
Cutter Drives Large

Standard features

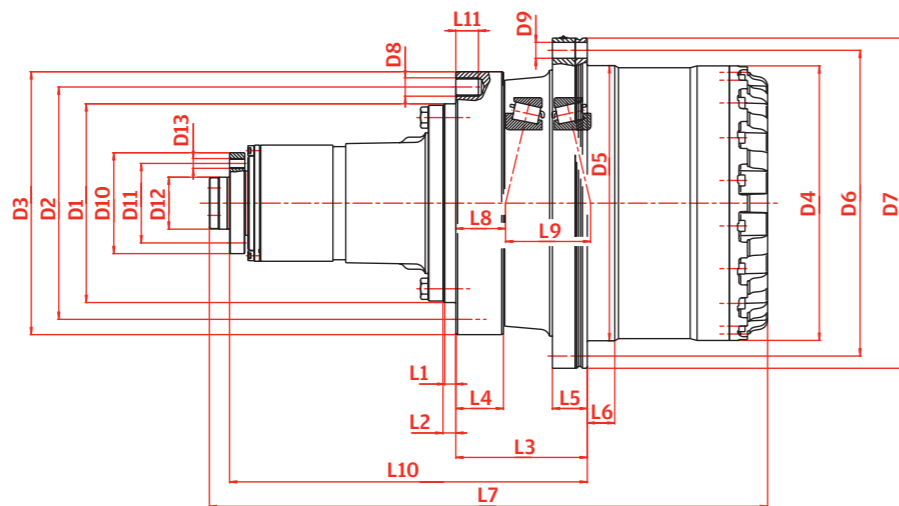
- › Compact structure
- › High performance
- › Notchless ground tooth root
- › Different ratios
- › Suitable for various hydraulic motors
- › High availability by highest teeth and production quality

Special executions on request

Standard Input version - ST



Mechanical Input version - MI



		FA130	FA200	FA360	FA800
Max. cutting torque	kNm	38	47	84	115
Input power	kW	400	500	880	1200
Ratio ¹	i	14 18 24 21 22	20	25	24

VERSION ²	ST	MI	ST	MI	ST	ST
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CAPACITY OF BEARING

C-dynamic	kN	750	750	787	787	1040	4300
Co-static	kN	1290	1290	1650	1650	2450	9650
Weight	kg	490	426	718	710	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	635	635	775	1329
D8 / D9	mm	M30 / Ø 26	M30 / Ø 26	M30x2 / Ø 18	M30x2 / Ø 18	M30 / M30	M30x2 / 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	/	85k6	/	85k6		
D13	mm	/	M16	/	M16		
Qty. D13		/	8	/	8		

1) Other ratios on demand
2) ST - Standard Input / MI - Mechanical Input (Hydraulic Motor)

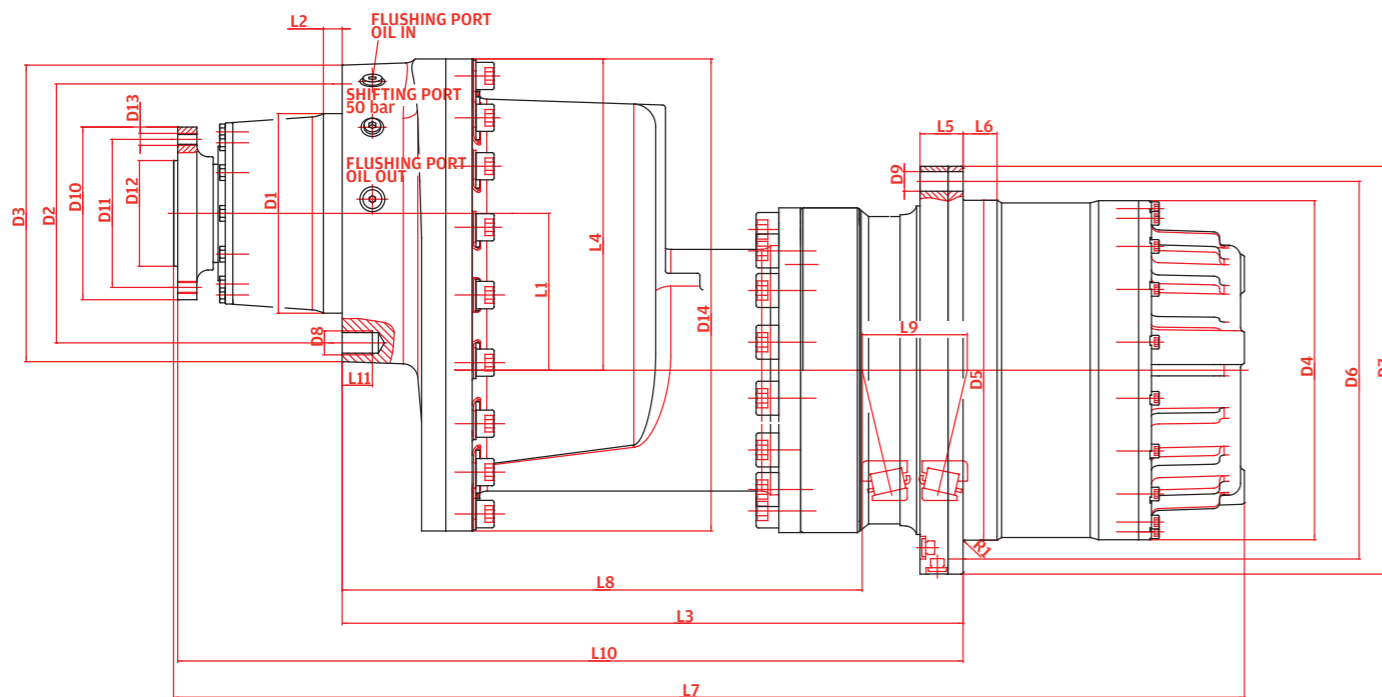
2-Speed Cutter Drives

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



		FA130 - 2S		FA200 - 2S	
Max. cutting torque	kNm	38		47	
Input power	kW	400		540	
VERSION		1	2	1	2
Ratio	i	21	22.235	19.877	21.05
		13.67	18.01	13	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		5/8-11 UNC		5/8-11 UNC	
D13 optional		STUD 5/8-11 UNF		STUD 5/8-11 UNF	
Qty. D13		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 (slewing, 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 (slewing, 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	–	–

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

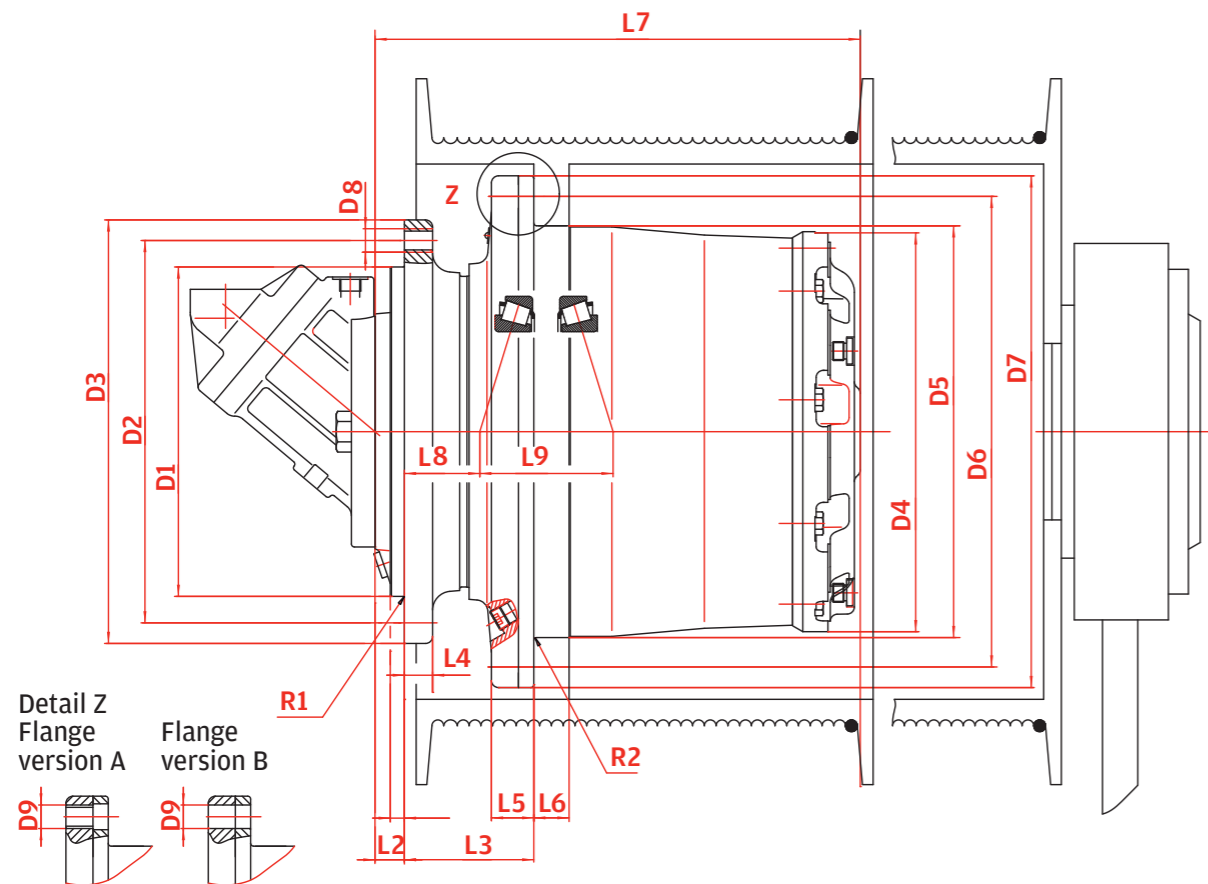
i: drive ratio

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

Winch Drives

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



WINCH DRIVES

		FW 10	FW 13	FW 30	FW 30K
Nominal torque T_{Nom} (M5 / T5 / L2)	kNm	5.4	7.25	17.6	17.6
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 90 101 114 121 137 171 228 305

CAPACITY OF BEARING

C-dynamic	kN	132	132	132/194	132/194
Co-static	kN	255	255	255/325	255/325
Weight ²	kg	45	50	94	94

MULTI-DISK BRAKE

Locking torque version ³	Nm	200	200	300 / 400	300 / 400
Release pressure min.	bar	17	17	16 / 22	16 / 22

HYDRAULIC MOTOR

plug in fixed	ccm	28	28	40	28
		30	30	45	30
		32	32	56 60 63	32
plug in variable	ccm	28	28	55	28
		45	45	60	

DIMENSIONS

L 1	mm	10	10	13	13
L 2	mm	30	30	25	22
L 3	mm	72	72	75	75
L 4	mm	13.5	13.5	15	15
L 5	mm	15	15	29	29
L 6	mm	16	16	25	25
L 7	mm	230	255	323	320
L 8	mm	28	28	28.5	28.5
L 9	mm	79	79	89	89
R 1	mm	0.6	0.6	2.5	2.5
R 2	mm	0.6	0.6	2.5	2.5
D 1	mm	190	190	240	240
D 2	mm	230	230	275	275
D 3	mm	256	256	304	304
D 4	mm	216	216	269	269
D 5	mm	220	220	270	270
D 6	mm	260	260	305	305
D 7	mm	290	290	335	335
D 8	M	16	16	16	16
D 9 Version A	M	16	16	16	16
D 9 Version B	mm	17	17	17	17
Qty. D 8 / D 9		12/8	12/8	18/18	18/18

1) Other ratios on demand

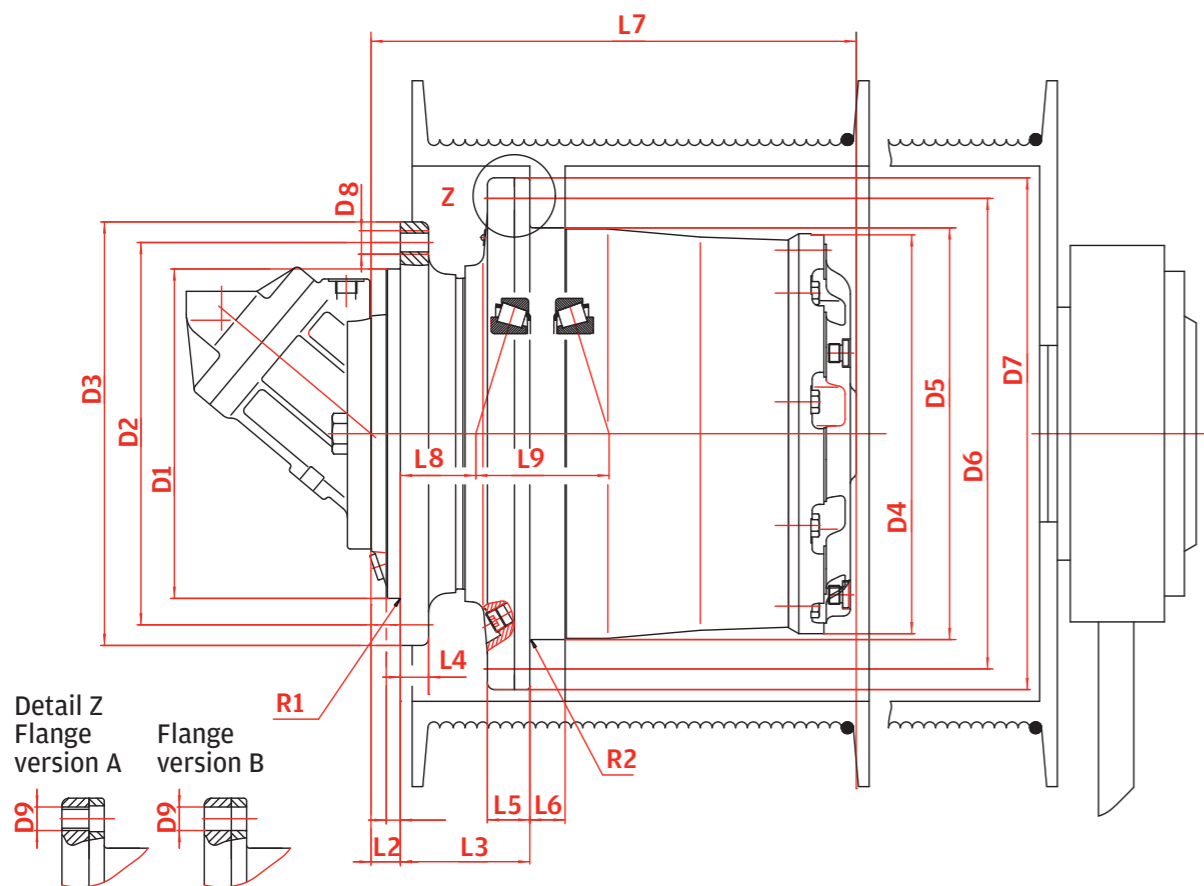
2) Without Hydraulic motor

3) Optional brake torques on demand

Winch Drives

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



		FW 40	FW 40A	FW 55	FW 55A	FW 55B	FW 80	FW 80A	FW 80B
Nominal torque T_{Nom} (M5 / T5 / L2)	kNm	20	20	25.4	25.4	25.4	42.8	42.8	42.8
Ratio ¹	i	61	61	63	63	63	61	61	61
		66	66	68	68	68	81	81	81
		81	81	87	87	87	101	101	101
		85	85	94	94	94	114	114	114
		101	101	117	117	117	121	121	121
		110	110	124	124	124	137	137	137
		117	117	137	137	137	147	147	147
		124	124	148	148	148	171	171	171
		142	142	185	185	185	187	187	187
		181	181				206	206	206

CAPACITY OF BEARING

C-dynamic	kN	224	224	224	224	224	300	300	300
Co-static	kN	405	405	405	405	405	570	570	570
Weight ²	kg	115	123	165	177	181	215	227	228

MULTI-DISK BRAKE

Locking torque version ³	Nm	420	420	420 / 500	420 / 500	420 / 500	600 / 1000	600 / 1000	600 / 1000
Release pressure min.	bar	18	18	15 / 21	15 / 21	15 / 21	18 / 28	18 / 28	18 / 28

HYDRAULIC MOTOR

plug in fixed	ccm	40	80	80	40		107	80	160
		45	90	90	45		110	90	180
		56			56		125		
		60			60				
		63			63				
plug in variable	ccm	55	80	80	55	107	107	80	160
		60			60	110	110		

DIMENSIONS

L 1	mm	16	13	12	20	12	20	20	20
L 2	mm	16	35	25	30	37	35	35	35
L 3	mm	91	91	110	91	110	90	90	90
L 4	mm	21	21	24	24	24	22	22	22
L 5	mm	34	34	36	36	36	37	37	37
L 6	mm	26	26	30	30	30	24	24	24
L 7	mm	338	357	413	399	425	415	415	415
L 8	mm	38	38	64	45	64	34	34	34
L 9	mm	100	100	113	113	113	123	123	123
R 1	mm	2.5	2.5	1	4	1	4	4	4
R 2	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
D 1	mm	240	270	280	240	290	330	330	330
D 2	mm	285	310	325	285	335	370	370	370
D 3	mm	320	345	360	320	370	410	410	410
D 4	mm	294	294	340	340	340	374	374	374
D 5	mm	295	295	350	350	350	400	400	400
D 6	mm	335	335	400	400	400	450	450	450
D 7	mm	370	370	435	435	435	490	490	490
D 8	M	16x1.5	16x1.5	20x1.5	20x1.5	20x1.5	24x2	24x2	24x2
D 9 Version A	M	16x1.5	16x1.5	20x1.5	20x1.5	20x1.5	24x2	24x2	24x2
D 9 Version B	mm	17.5	17.5	22	22	22	26	26	26
Qty. D 8 / D 9		20/20	16/20	24/20	20/20	20/20	20/20	20/20	20/20

1) Other ratios on demand

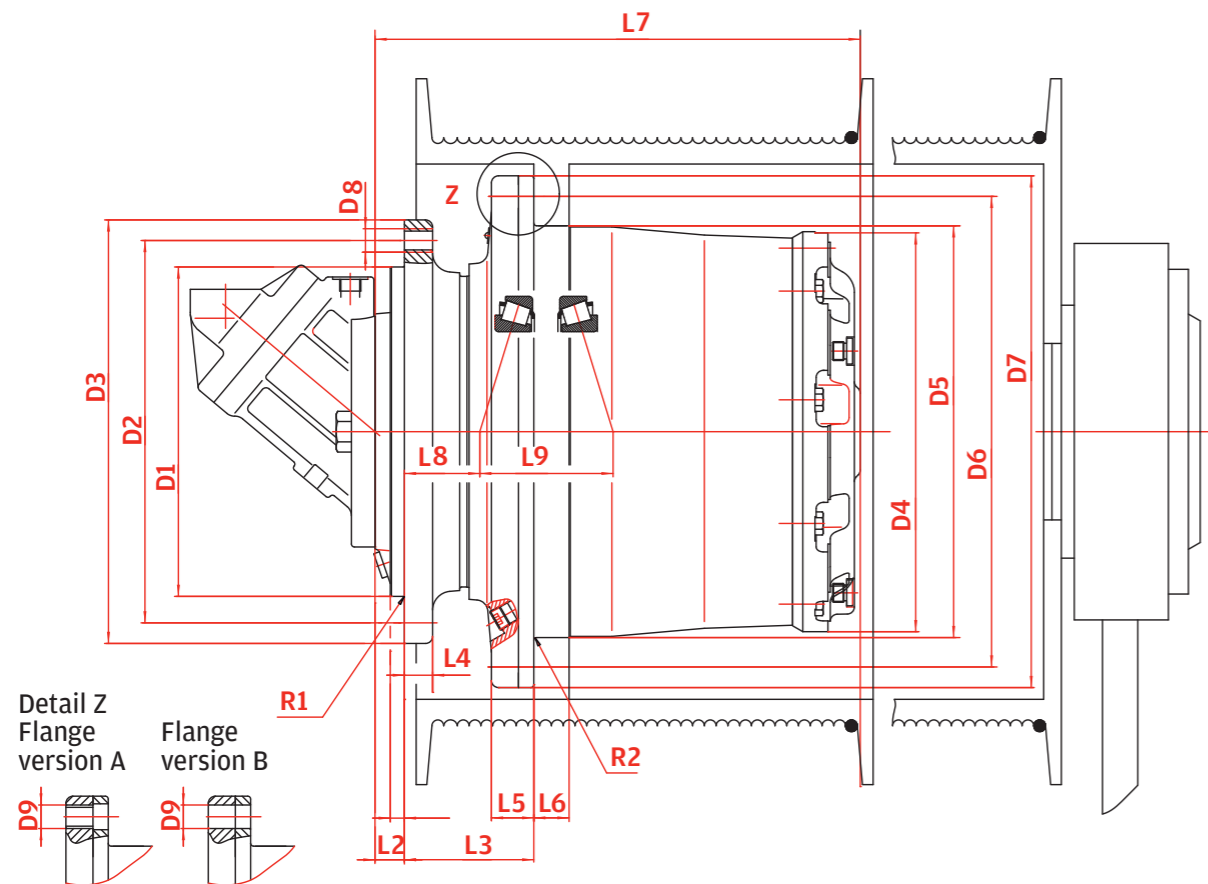
2) Without Hydraulic motor

3) Optional brake torques on demand

Winch Drives

Standard features

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		FW 100	FW 100B	FW 130	FW 180	FW 220	FW 260	FW 360
Nominal torque T_{Nom} (M5 / T5 / L2)	kNm	53.5	53.5	78.5	112.5	140	175	210
Ratio ¹	i	77 84 95 121 142 175 192 226	77 84 95 121 142 175 192 226	81 85 115 159 167 180 206	206 281	97 119 190 248 290 345	69 97 245 345	94 128 223 257 490

CAPACITY OF BEARING

C-dynamic	kN	498	498	523	787	765	750	1 040
Co-static	kN	1010	1010	980	1650	1660	1560	2450
Weight ²	kg	325	338	452	636	740	865	1080

MULTI-DISK BRAKE

Locking torque version ³	Nm	600 / 900	600 / 900	750	1200	1200	1000	1700
Release pressure min.	bar	13	13	17	35	15	15	12

HYDRAULIC MOTOR

plug in fixed	ccm	107 125	160 180	107 125 160 180	180	107 180		355
plug in variable	ccm	107 110	160	107 160		160 200 250	355 250	355

DIMENSIONS

L 1	mm	35	37	45	30	18	21	100
L 2	mm	35	37	45	30	52	45	100
L 3	mm	165	165	190	168	166.5	170	130
L 4	mm	28	28	35	40	40	40	40
L 5	mm	53	53	58	56	61	48	60
L 6	mm	43	43	45	21.5	35	60	80
L 7	mm	461	463	530	534.5	580.5	579	658
L 8	mm	32	32	50.5	50.3	16	18.5	-25
L 9	mm	139	139	147	141.4	187.5	189.5	215
R 1	mm	10/60	12/60	25	4	35°/16/16	2	18°/100/16
R 2	mm	5	5	4	3	4	/	10
D 1	mm	390	390	390	450	460	460	580
D 2	mm	460	460	500	510	600	520	680
D 3	mm	500	500	550	560	650	570	735
D 4	mm	407	407	449	528	540	608	649
D 5	mm	408	408	450	535	542	610	650
D 6	mm	460	460	500	600	600	680	720
D 7	mm	500	500	550	650	650	735	775
D 8	M	24x2	24x2	24x2	24x2	24x2	30x2	30
D 9 Version A	M	24x2	24x2	24x2	24x2	24x2	30x2	30
D 9 Version B	mm	26	26	26	26	26	32	32
Qty. D 8 / D 9		30/24	30/24	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

The Power Transmission Excellence is our Passion

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Project related installation drawings
can be made available on request as dimensions
and technical data are subject to change
due to continuous development.



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