

TECHNICAL

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Koła wariatorowe - Lenze

Variable speed pulleys

General information

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Variable speed drive type 11.101/104

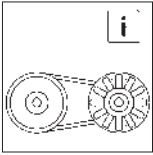
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Variable speed pulleys type 11.213/218

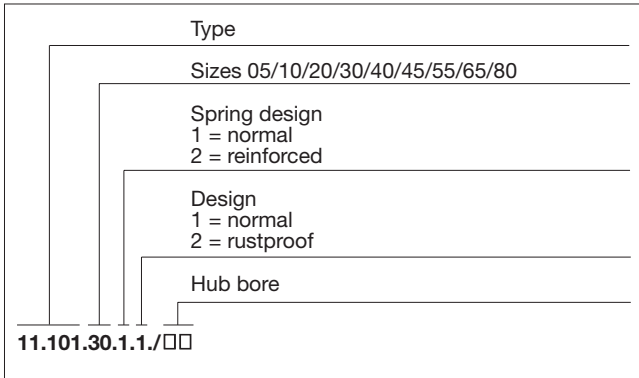
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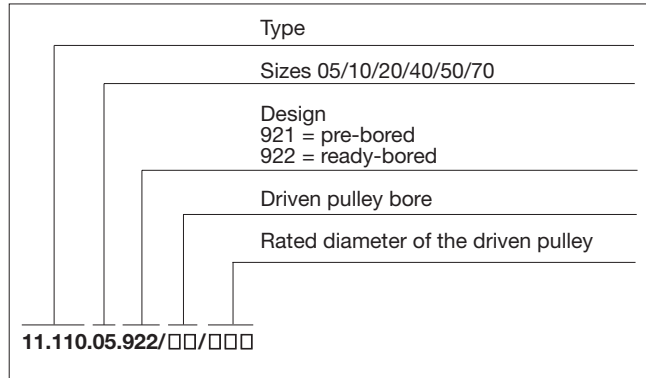
Variable speed pulleys

Product key

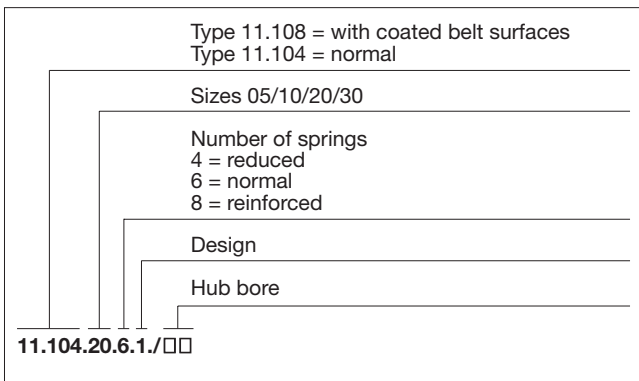
Variable speed pulleys 11.101



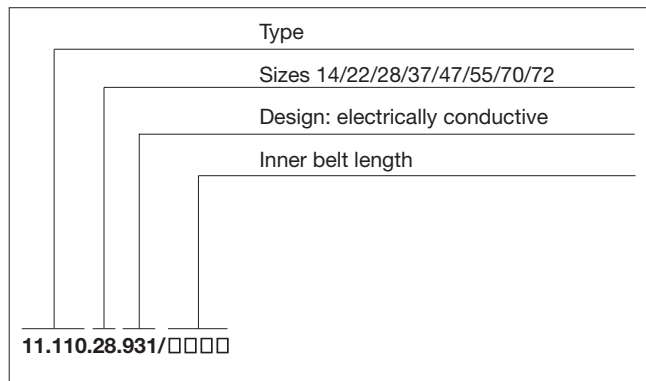
Driven pulleys



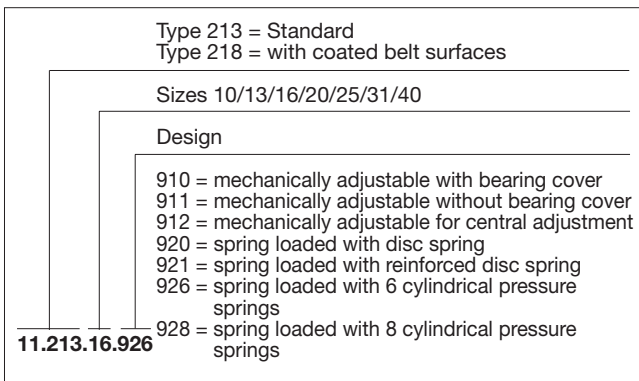
Variable speed pulleys 11.104



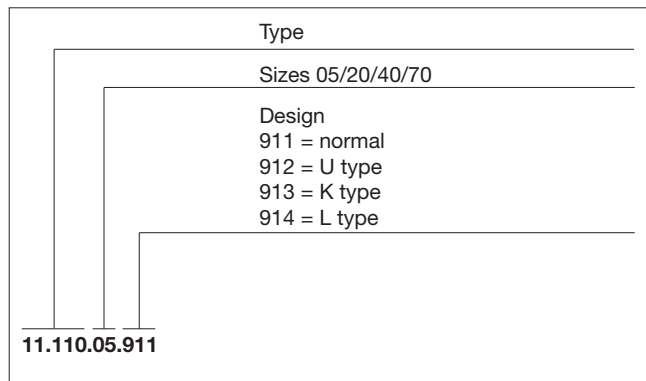
Variable speed belt



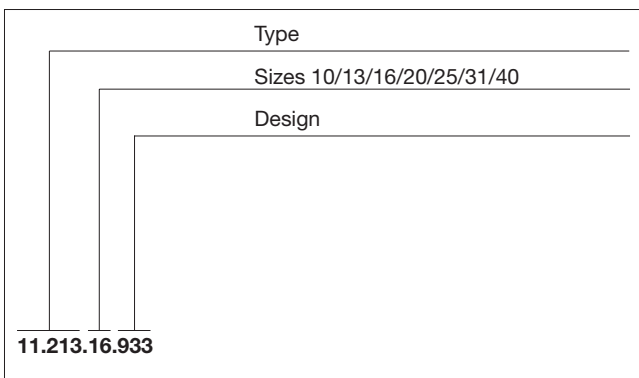
Variable speed pulleys 11.213



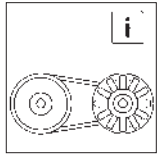
Motor slide



Central adjustment



6



Description

Spring-loaded variable speed pulleys types 11.101 and 11.104 are usually mounted onto the input side of the motor shaft end; the driven pulley is mounted onto the driven shaft. The output speed is determined by the diameter of the driven pulleys. Often additional gearboxes are not necessary.

Speed adjustment

The motor with the variable speed pulley is, for instance, mounted onto an adjustable slide. The variable speed belt is pushed into or pulled out of the spring-loaded variable speed pulley by changing the axis distance between the two shafts. Thus, the effective running diameter of the belt in the variable speed pulley and the speed of the driven pulley are changed. Motor slide, motor rocker and belt tighteners enable adjustment. Fine tuning of the speed is always possible by using a threaded spindle. The output speed range of SIMPLABELT variable speed drives (1 : 3) depends on the effective diameter of the driven pulley. The output speeds possible are indicated on pages 8 and 13. The power to be transmitted of the different pulley sizes at different motor speeds are also indicated on these pages.

For shock loaded operation a higher safety factor must be provided. The use of a larger variable speed pulley can be necessary. In case of doubt, please contact Lenze.

SIMPLABELT has been the name for variable speed belt drives for years and it is well established in national and international engineering.

Well-known machine and system manufacturers have used SIMPLABELT variable speed drives successfully for many years, even under difficult operating conditions.

Simplabelt variable speed pulleys type 11.101

Power range: 0.37–18.5 kW at $n_1=1500 \text{ min}^{-1}$

Thanks to their design – cast iron disc pulleys on both ends – and their high rotating mass, the variable speed pulleys type 11.101 provide good damping features which are advantageous for the use with changing loads, for instance for clock-pulse operating machines.

We recommend to use variable speed pulleys, if harsh operating conditions and exposure to humidity or dust are to be expected.

The pretension required for power transmission is generated by the disc springs which are located on both sides of the disc pulleys.

The forces resulting from the torque transmission are taken up by a well dimensioned serration. By this, the surface pressure is far below the permissible limit and thus the service life is very long.

Variable speed pulleys must be re-lubricated depending on their application.

Simplabelt variable speed pulleys type 11.104

Power range: 0.37–3kW at $n_1=1500 \text{ min}^{-1}$

With this type, the disc pulleys are made of a light-metal alloy especially developed for pulleys. Their main characteristic is a low moment of inertia.

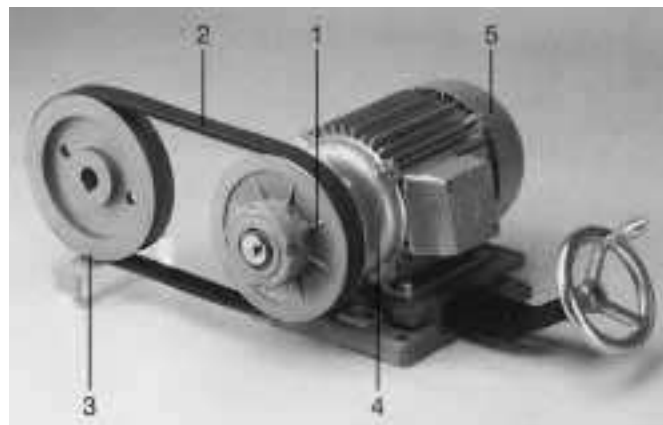
We also offer the economical type 11.104 for operating conditions where a low moment of inertia is favourable because of high switching frequencies or reversing operation.

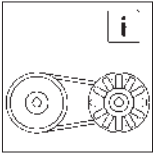
The pretension required for the power transmission is here generated by cylindrical pressure springs which are located rotation-symmetrically on both sides of the disc pulleys.

The variable speed pulleys are life lubricated and do not require further maintenance.

SIMPLABELT variable speed drives, design 1:3

SIMPLABELT variable speed drives, design 1:3 consist of a spring-loaded pulley (1), a variable speed belt with an especially bendable inner toothing (2), driven pulley (3), motor slide (4) and a three-phase AC motor to IEC standards (5).





Variable speed pulleys

Product information

Simplabelt variable speed pulleys type 11.213/218

Operation principle

The main part of variable speed pulleys type 11.213/218 is the slide fit. The coated hub as four-side polygon profile combined with disc pulleys made of aluminium cast iron is well established in mechanical engineering

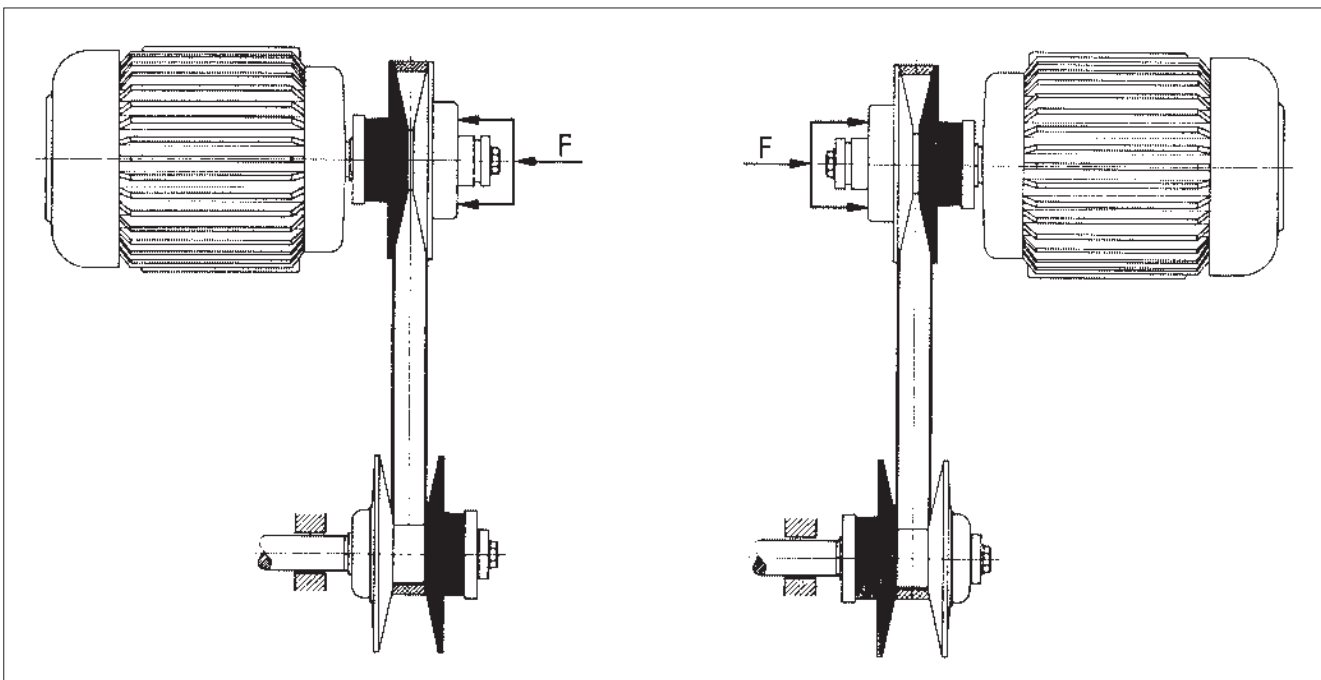
Advantages:

- large torque transmission surfaces, i.e. low surface pressure
- self-centering because of symmetrical backlash compensation, i.e. no toppling of disc pulleys

- even profile edges, i.e. very quiet running
- absolutely maintenance free
- long service life

The pretension required for power transmission is generated by screw springs which are located rotation-symmetrically and can be varied by changing the number of springs. All components are made of corrosion-resistant material and enable application even under difficult environmental conditions.

A version with hard-coated belt surfaces is available for application under unfavourable conditions.



6 U type

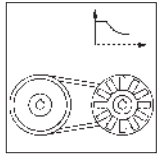
The mechanically adjustable variable speed pulley is mounted onto the driving shaft (motor shaft), the spring-loaded variable speed pulley is mounted onto the shaft to be driven. If the mounting is changed, the performance data of the drive will change. If so, please contact Lenze. All variable speed

Z type

pulleys can be mounted as U or Z type (except size 40). Please observe that the fixed disc pulleys (dark in the figure) must be mounted diagonally. Thus, the belts are aligned in any position. Simplabelt variable speed pulleys can be mounted independently of the mounting position.

Variable speed pulleys

General data



Possible combinations	Variable speed pulley		
	11.101	11.104	11.213/218
Driven pulley 11.110.□□.92□	•	•	
Variable speed belt 11.110.□□.931	•	•	•
Adjustment units			
Motor slide 11.110.□□.91□	•	•	
Central adjustment 11.213.□□.93□			•

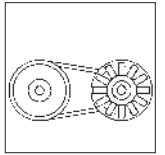
Variable speed pulley	11.101	11.104	11.213/218
Power range at n ₁ =1500 min ⁻¹	0.37-18.5 kW	0.37-3 kW	0.25-45 kW
Speed adjustment	by changing the axis distance		with constant axis distance
Corrosion protection	Option	Standard	Standard
Material f	Disc pulleys	Cast iron	Aluminium
	Hub	C45K	C45K
Tolerances	Bore	Standard: H7 with keyway to DIN	
	Machine shaft required	k6	
Features	High rotational mass damping	Low moment of inertia	
Suitable for	Clock-type operation Shock loaded/rough operation Humidity/dust	High operating frequency (reversing operation)	Clock-pulse operation Shock loaded/rough operation Humidity/dust
Torque transmission	Serration	Polygon	Polygon
Belt pretension by	Disc spring Location: on both sides	Pressure springs Location: on both sides	Pressure or disc springs Location: on one side
Maintenance	Re-lubrication required	Maintenance free	Maintenance free
Ambient temperature	-20 to +40°		
Mechanical efficiency	0.79 ≤ η ≤ 0.85		

Variable speed pulley	11.110.□□.931
Design	Sandwich design
Material	Compound: electrically conductive to ISO 1813

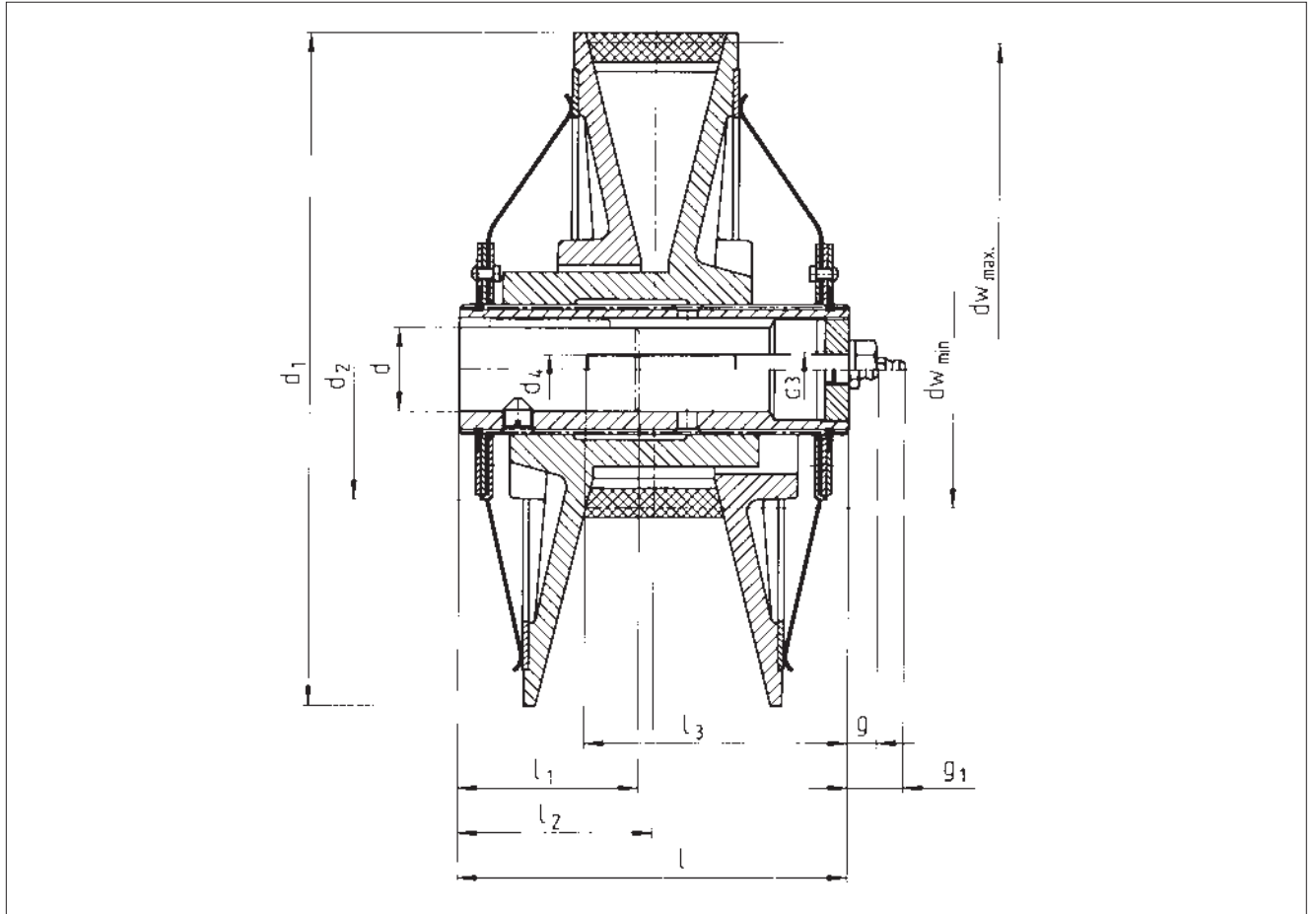
Driven pulley	11.110.□□.92□
Material	Cast iron

Motor slide	11.110.□□.91□	
Material	Housing	Cast iron
	Spindle	9S20K

Central adjustment	11.110.□□.93□	
Material	Housing	Cast iron / aluminium / plastic depending on the size
	Spindle	C45



Dimensions



Type	Belt size	d ^{H7/2})		dw		d ₁	d ₂	d ₃	Clamping screws ⁴⁾		g	g ₁	l	l ₁ min	l ₂	J [kgm ²]	m [kg]
		min.	Standard	min.	max.				Bore	d ₄ x l ₃							
11.100.05.1.1 ¹⁾	22	8	14 ³⁾	40	116	120	44	M10	d<14	M 6x 50	10.5	16.5	72	30	36	0.00044	1.0
11.101.10.1.1	28	14	19	69.5	160.5	165	66	M12	d<15 d>15	M 6x 75 M 6x 70	10.5	16.5	94	35	47	0.00482	2.5
11.101.20.1.1	37	16	24	78	180	185	78	M12	d<19 d>19	M 6x 85 M 8x 75	10.5	18	110	40	55	0.0098	3.5
11.101.30.1.1	47	18	28	92.5	218.5	225	87	M12	d<19 d>19≤24 d>24	M 6x105 M 8x100 M10x 95	10.5	18	130	50	65	0.0313	6
11.101.40.1.1 11.101.45.1.1	47	20	28	105.5	263.5	270	103 96	M16	d>19≤24 d>24	M 8x115 M10x110	-	19.5	148	60	74	0.0875	11
11.101.55.1.1	55	25	38	121	302	310	130	M16 M20	d<28 d>28≤38 d>38	M10x145 M12x130 M16x105	-	19.5 21.5	180	75	90	0.16	19
11.101.65.1.1	70	32	38/42	142	351	360	130	M16 M20	d<38 d>38	M12x130 M16x105	-	19.5	196	80	98	0.287	25.5
11.101.80.1.1	70	38	42/48	162	366	375	130	M16 M20	d<38 d>38	M12x150 M16x120	-	21.5	200	80	98	0.353	33

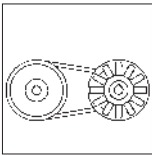
¹⁾ Does not correspond to the figure

²⁾ Keyway to DIN 6885 part 1

³⁾ Keyway to DIN 6885 part 3

⁴⁾ Up to size 30 either with clamping screws or threaded pin

Dimensions in [mm]



Variable speed pulleys

Type 11.101

Distance between axes

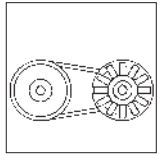
Type 11.100.05.1.1

Driven pulleys		Rated diameter													
		80	90	100	112	125	140	160	180	200	224	250	280	315	
		Smallest axis distance													
Variable speed belt size 22	Inner belt length	610	166	159	151	142									
		650	186	179	171	162	151								
		675	199	191	184	174	164	152							
		700	211	204	196	187	176	164							
		750	236	229	221	212	201	189	173						
		800	261	254	246	237	226	214	198	181					
		850	286	279	271	262	252	241	223	206	188				
		900	311	304	296	287	276	264	248	231	214	192			
		950	336	329	321	312	302	289	273	256	239	218	194		
		1000	361	354	346	337	327	314	298	281	264	243	219		
		1060	391	384	376	367	357	344	328	311	294	273	250	222	
		1120	421	414	406	397	387	374	358	341	324	303	280	253	
		1180	451	444	436	427	417	404	388	371	355	334	311	283	251
		1250	487	479	471	462	452	439	423	407	390	369	346	319	286
		1320	521	514	506	497	487	475	458	442	425	404	381	355	322
1400	562	554	546	537	527	515	498	482	465	445	422	395	363		
1500	612	604	596	587	577	565	548	532	515	495	472	446	414		
1600	662	654	646	637	627	615	598	582	565	545	523	496	465		
Adjustment path		44	44	43	43	42	41	41	40	40	39	38	37	36	

Type 11.101.10.1.1

Driven pulleys		Rated diameter													
		80	100	112	125	140	160	180	200	224	250	280	315	355	
		Smallest axis distance													
Variable speed belt size 28	Inner belt length	650	150	136											
		700	175	161	153										
		750	200	186	178	168									
		800	226	211	203	193	182								
		850	251	237	228	218	207	191	175						
		900	276	262	253	243	232	216	200						
		950	301	287	278	268	257	241	225	209					
		1000	326	312	303	293	282	266	250	234	214				
		1060	356	342	333	323	312	296	280	264	244	222			
		1120	386	372	363	353	342	326	310	294	274	252	225		
		1180	417	402	393	383	372	356	340	324	304	282	256		
		1250	452	437	428	418	407	391	375	359	339	317	291	260	
		1320	487	472	463	453	442	426	410	394	374	352	326	295	
		1400	527	512	503	493	482	466	450	434	414	392	367	336	299
		1500	577	562	553	543	532	516	500	484	464	443	417	386	350
1600	627	612	603	593	582	566	550	534	515	493	467	437	401		
Adjustment path		73	72	72	71	70	69	68	67	65	64	62	60	58	

Values in [mm]



Distance between axes

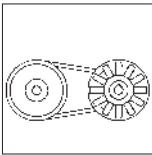
Type 11.101.20.1.1

Driven pulleys		Rated diameter												
		125	140	160	170	180	200	224	250	280	315	355	400	450
		Smallest axis distance												
Variable speed belt size 22	Inner belt length	800	179											
		850	204	193										
		900	229	218	203	195								
		950	254	243	228	220	212							
		1000	279	268	253	245	237	221						
		1060	309	298	283	275	267	251	232					
		1120	339	328	313	305	297	281	262	240				
		1180	369	358	343	335	327	311	292	270	244			
		1250	404	393	378	370	362	346	327	306	279			
		1320	439	428	413	405	397	381	362	340	315	284		
		1400	479	468	453	445	437	421	402	380	355	324	289	
		1500	529	518	503	495	487	471	452	430	405	375	339	
1600	580	568	553	545	537	521	502	480	455	425	390	349		
1700	630	618	603	595	587	571	552	531	505	476	441	400	354	
1800	680	668	653	645	637	621	602	581	556	526	491	451	405	
Adjustment path		80	79	78	78	77	76	75	73	71	69	67	65	62

Type 11.101.30.1.1

Driven pulleys		Rated diameter													
		140	160	180	200	208	224	250	280	315	355	400	450	500	
		Smallest axis distance													
Variable speed belt size 28	Inner belt length	950	217	202											
		1000	242	227	212										
		1060	272	257	242	227									
		1120	302	287	272	257	251								
		1180	332	317	302	287	281	268				247			
		1250	367	352	337	322	316	303			282				
		1320	402	388	372	357	351	338	317	293					
		1400	442	428	412	397	391	378	357	333	303				
		1500	493	478	462	447	441	428	407	383	353	319			
		1600	543	528	513	497	491	478	457	433	404	369	329		
		1700	593	578	563	547	541	528	507	483	454	420	380		
		1800	643	628	613	597	591	578	557	533	504	470	431	386	
2000	743	728	713	697	691	678	658	633	604	570	532	487	441		
2240	863	848	833	817	811	798	778	753	725	691	652	609	564		
Adjustment path		99	98	97	96	96	95	93	92	89	88	86	82	79	

Values in [mm]



Variable speed pulleys

Type 11.101

Distance between axes

Type 11.101.40/45.1.1

Driven pulleys		Rated diameter												
		140	160	180	200	208	224	250	280	315	355	400	450	500
		Smallest axis distance												
Variable speed belt size 47	Inner belt length	1120	263	249										
		1180	293	279	265									
		1250	329	315	300	286	280	268						
		1320	364	350	335	321	315	303	283					
		1400	404	390	375	361	355	343	323	299				
		1500	455	440	426	411	405	393	373	349	320			
		1600	505	490	476	461	455	443	423	399	370	337		
		1700	555	541	526	511	505	493	473	449	421	387	349	
		1800	605	591	576	561	555	543	523	499	471	438	399	
		2000	706	691	676	661	655	643	623	599	571	538	500	457
	2240	826	811	796	781	775	763	743	719	691	658	620	577	533
Adjustment path		127	125	124	123	122	121	119	117	114	112	109	106	102

Type 11.101.55.1.1

Driven pulleys		Rated diameter									
		200	224	250	280	315	355	400	450	500	560
		Smallest axis distance									
Variable speed belt size 55	Inner belt length	1250	259								
		1320	294	277							
		1400	334	317	298						
		1500	385	367	348	325					
		1600	435	417	398	375	347				
		1700	485	467	448	425	397	365			
		1800	535	517	498	475	447	415	377		
		2000	635	617	598	575	547	515	478	435	
		2240	754	738	718	695	667	635	598	556	513
Adjustment path		144	140	138	136	133	130	127	123	119	114

Type 11.101.65.1.1

Driven pulleys		Rated diameter										
		280	315	355	400	450	500	560	630	7100	800	
		Smallest axis distance										
Variable speed belt size 70	Inner belt length	1700	389	362								
		1800	439	412	381							
		2000	539	512	481	445						
		2240	659	632	601	565	524	482				
		2500	789	762	731	695	654	613	561			
		2800	939	913	881	845	805	763	712	651	579	
		3150	1115	1088	1056	1020	980	939	888	828	757	675
		3210	1145	1118	1086	1050	1010	969	918	858	787	705
		3520	1300	1273	1241	1205	1165	1124	1074	1014	943	863
	Adjustment path		161	159	157	155	152	149	145	141	137	131

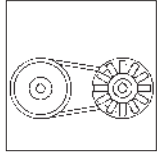
Type 11.101.80.1.1

Driven pulleys		Rated diameter										
		280	315	355	400	450	500	560	630	710	800	
		Smallest axis distance										
Variable speed belt size 70	Inner belt length	1700	377									
		1800	427	400								
		2000	527	500	469	434						
		2240	647	620	589	554	513	471				
		2500	777	751	719	684	643	602	551			
		2800	927	901	869	834	793	752	701	641	569	
		3150	1102	1076	1044	1009	969	927	877	817	747	665
		3210	1132	1106	1074	1039	999	958	907	847	777	695
		3520	1288	1261	1229	1194	1154	1113	1063	1003	933	853
	Adjustment path		158	156	155	152	149	146	143	139	135	129

Values in [mm]

Variable speed pulleys

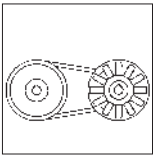
Type 11.104



Selection tables

Type	Motor speed [min ⁻¹]	Power [kW]	Inner counter pulley diameter [mm]								
			80	90	100	112	125	140	160	170	180
11.104.05.6.1	2810	0.55	3961- 1591	3535- 1420	3192- 1282	2859- 1148	2569- 1032	2299- 924	2017- 810		1797-722
	1380	0.37	1945- 781	1736- 697	1568- 630	1404- 564	1261- 507	1129- 454	991- 398		882-354
	910	0.25	1283- 515	1145- 460	1034- 415	926- 372	832- 334	745- 299	653- 262		582-234
	675	0.18	952- 382	849- 341	767- 308	687- 276	617- 248	552- 222	485- 195		432-173
11.104.10.6.1	2820	1.1	5069- 1880		4094- 1518	3671- 1361	3301- 1224	2957- 1097	2596- 963		2314-858
	1400	0.75	2517- 933		2033- 754	1822- 676	1639- 608	1468- 544	1289- 478		1149-426
	920	0.55	1654- 613		1336- 495	1198- 444	1077- 399	965- 358	874- 314		755-280
	670	0.37	1204- 447		973- 361	872- 323	784- 291	703- 261	617- 229		550-204
11.104.20.6.1	2835	2.2					3868- 1407	3465- 1260	3042- 1106		2712-986
	1410	1.5					1924- 700	1723- 627	1513- 520		1349-490
	910	1.1					1242- 451	1112- 404	977- 355		870-317
	670	0.55					914- 332	819- 298	719- 261		641-233
11.104.30.6.1	2880	4						4270- 1430	3753- 1257	3538- 1185	3347-1121
	1410	3						2091- 700	1837- 615	1732- 580	1639-549
	950	1.5						1409- 472	1238- 415	1167- 391	1104-370
	690	1.1						1023- 343	899- 301	848- 284	802-269

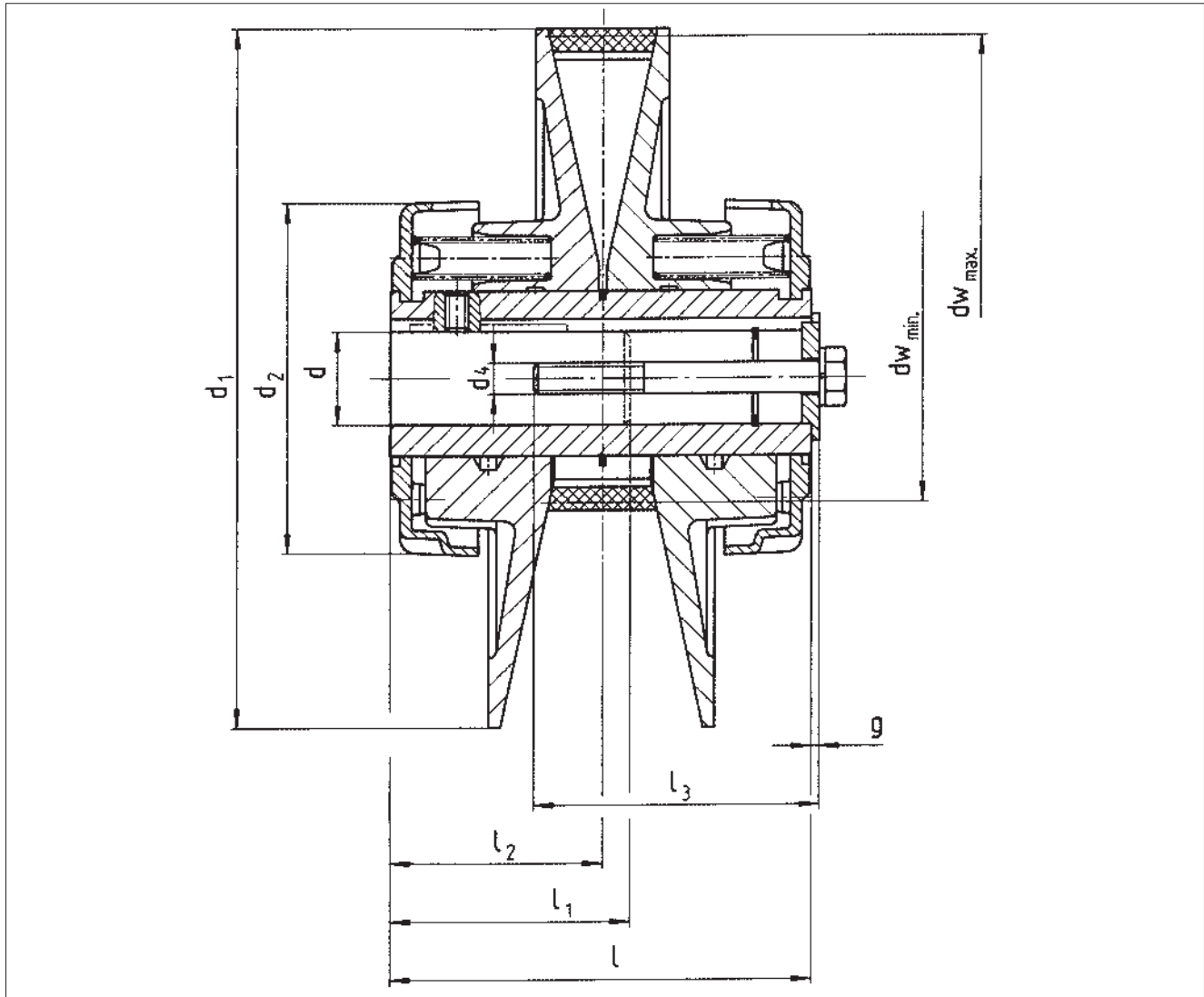
Type	Motor speed [min ⁻¹]	Power [kW]	Inner counter pulley diameter [mm]								
			200	224	250	280	315	355	400	450	500
11.104.05.6.1	2810	0.55	1620- 651	1448- 582	1299- 522	1162- 467	1034- 415				
	1380	0.37	795- 320	711- 286	638- 256	571- 229	508- 204				
	910	0.25	524- 211	469- 188	421- 169	376- 151	335- 134				
	675	0.18	389- 157	348- 140	312- 125	279- 112	248- 100				
11.104.10.6.1	2820	1.1	2087- 774	1868- 693	1676- 622	1499- 556	1335- 495	1186- 440			
	1400	0.75	1036- 384	927- 344	832- 309	744- 276	663- 246	589- 218			
	920	0.55	681- 253	609- 226	547- 203	489- 181	435- 162	387- 144			
	670	0.37	496- 184	444- 165	398- 148	356- 132	317- 118	282- 105			
11.104.20.6.1	2835	2.2	2446- 889	2188- 796	1964- 713	1757- 639	1564- 569	1390- 505	1235- 449	1099- 400	
	1410	1.5	1216- 442	1088- 396	977- 355	874- 318	778- 283	691- 251	614- 223	547- 199	
	910	1.1	784- 285	702- 255	631- 229	564- 205	502- 183	446- 162	396- 144	353- 128	
	670	0.55	578- 210	517- 188	464- 169	415- 151	370- 134	328- 119	292- 106	260- 94	
11.104.30.6.1	2880	4	3020- 1016	2704- 906	2428- 813	2173- 728	1935- 648	1720 576	1720- 512	1361- 456	1226-411
	1410	3	1479- 495	1324- 443	1189- 398	1064- 356	947- 317	842- 282	749- 251	666- 223	600-201
	950	1.5	996- 334	892- 299	801- 268	717- 240	638- 214	567- 190	504- 169	449- 150	404-135
	690	1.1	724- 242	648- 217	582- 195	521- 174	464- 155	412- 138	366- 123	326- 109	294- 98



Variable speed pulleys

Type 11.104

Dimensions



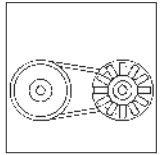
6

Type	Belt size	d ^{H7} 1)		d _w		d ₁	d ₂	Clamping screw ²⁾		g	l	l ₁ min.	l ₂	J [kg m ²]	m [kg]
		min.	Stand	min.	max.			Bore	d ₄ x l ₃						
11.104.05.6.1	22	11	14/19	47	117	120	68	d < 14 d > 14	M 6 x 55 M 6 x 50	1.5	72	30	36	0.00062	0.77
11.104.10.6.1	28	14	19/24	56	151	155	80	d < 19 d > 19	M 6 x 70 M 8 x 65	2	94	35	47	0.0022	1.4
11.104.20.6.1	28	19	24/28	64	176	180	90	d < 24 d > 24	M 8 x 75 M 10 x 70	2	108	40	54	0.0038	2
11.104.30.6.1	37	24	28	72	215	220	104	d < 24 d > 24	M 8 x 100 M 10 x 95	2	130	50	65	0.0093	3.2

1) Keyway to DIN 6885 part 1

2) Either with clamping screw or threaded pin

Dimensions in [mm]



Distance between axes

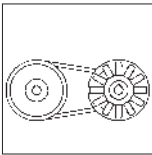
Type 11.104.05.6.1

Driven pulleys		Rated diameter															
		80	90	100	112	125	140	160	180	200	224	250	280	315			
		Smallest axis distance															
Variable speed belt size 37	Inner belt length	610	161	154	146	137											
		650	181	174	166	157	147										
		675	194	186	179	169	159	147									
		700	206	199	191	182	172	159									
		750	231	224	216	207	197	185	168								
		800	256	249	241	232	222	210	193	176							
		850	281	274	266	257	247	235	218	201	184						
		900	306	299	291	282	272	260	243	226	209	187					
		950	331	324	316	307	297	285	268	251	234	213	189				
		1000	356	349	341	332	322	310	293	276	259	238	215				
		1060	387	379	371	362	352	340	323	307	289	268	245	217			
		1120	417	409	401	392	382	370	353	337	320	299	276	248			
		1180	447	439	431	422	412	400	383	367	350	329	306	277	246		
		1250	482	474	466	457	447	435	418	402	385	364	341	314	282		
		1320	517	509	501	492	482	470	453	437	420	400	377	350	318		
1400	557	549	541	532	522	510	494	477	460	440	417	390	358				
1500	607	599	591	582	572	560	544	527	510	490	468	441	409				
1600	657	649	641	632	622	610	594	577	561	540	518	492	460				
Adjustment path		55	54	53	53	52	51	50	49	48	46	45	44	43			

Type 11.104.10.6.1

Driven pulleys		Rated diameter														
		80	100	112	125	140	160	180	200	224	250	280	315	355		
		Smallest axis distance														
Variable speed belt size 47	Inner belt length	650	156	142												
		700	181	167	158											
		750	206	192	183	173										
		800	231	217	208	198	187									
		850	257	242	233	223	212	196	180							
		900	282	267	258	248	237	221	205							
		950	307	292	283	274	262	246	230	213						
		1000	332	317	308	299	287	271	255	239	218					
		1060	362	347	338	329	317	301	285	269	248	226				
		1120	392	377	368	359	347	331	315	299	278	256	229			
		1180	422	407	398	389	377	361	345	329	309	286	260			
		1250	457	443	433	424	412	396	380	364	344	322	295	267		
		1320	492	478	469	459	447	431	415	399	379	357	331	299		
		1400	533	518	509	499	487	471	455	439	419	397	371	340	303	
		1500	583	568	559	549	537	521	505	489	469	447	421	390	354	
1600	633	618	609	599	587	571	555	539	519	497	472	441	405			
Adjustment path		76	75	73	72	71	70	68	67	65	64	62	60	59		

Values in [mm]



Variable speed pulleys

Type 11.104

Distance between axes

Type 11.104.20.6.1

Driven pulleys		Rated diameter												
		125	140	160	180	200	224	250	280	315	355	400	450	500
		Smallest axis distance												
Variable speed belt size 47	Inner belt length	800	178											
		850	203	192										
		900	228	217	202									
		950	253	242	227	211								
		1000	278	267	252	236	220							
		1060	308	297	282	266	250	230						
		1120	338	327	312	296	280	260	238					
		1180	368	357	342	326	310	290	269	243				
		1250	403	392	377	361	345	325	304	278				
		1320	438	427	412	396	380	360	339	313	282			
		1400	478	467	452	436	420	400	379	353	323	287		
		1500	528	517	502	486	470	451	429	404	373	338		
1600	578	567	552	536	520	501	479	454	424	388	347			
1700	628	617	602	586	570	551	529	504	474	439	398	352		
1800	679	667	652	636	620	601	579	554	524	489	449	402		
Adjustment path		87	86	84	82	81	79	77	75	74	71	70	67	

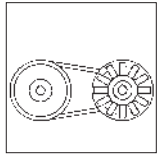
Type 11.104.30.6.1

Driven pulleys		Rated diameter												
		140	160	170	180	200	224	250	280	315	355	400	450	500
		Smallest axis distance												
Variable speed belt size 47	Inner belt length	950	213	199										
		1000	239	224	217	209								
		1060	269	254	247	239	224							
		1120	299	284	277	269	254							
		1180	329	314	307	299	284	265					244	
		1250	364	349	342	334	319	300						279
		1320	399	384	377	369	354	335	314	289				
		1400	439	424	417	409	394	375	354	329	300			
		1500	489	474	467	459	444	425	404	379	350	315		
		1600	539	524	517	509	494	475	454	430	400	366	326	
		1700	590	575	567	559	544	525	504	480	450	416	377	
		1800	640	625	617	609	594	575	554	530	501	466	427	382
2000	740	725	717	709	694	675	654	630	601	567	528	484	438	
2240	860	845	837	829	814	795	774	750	721	688	649	605	560	
Adjustment path		112	110	108	108	106	105	102	100	98	96	93	90	88

Values in [mm]

Variable speed pulleys

Calculation of axis distance



The tables on pages 6-8 to 6-10 and 6-13 to 6-14 list the smallest axis distance for different inner diameters of the driven wheel depending on different inner belt lengths.

Use the following equations for the calculation.

$$A \text{ or } A_1 = \frac{1}{2} \left[L_w - 1.57 (D_w + d_w) - \frac{(D_w - d_w)^2}{L_w} \right]$$

$$s = A_1 - A$$

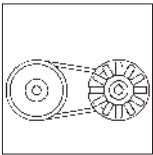
$$L_w = 2 A + 1.57 (D_w + d_w) + \frac{(D_w - d_w)^2}{4 A}$$

$$L_w = L_i + x$$

Variable speed belt size	22	28	37	47	55	70
X in mm	28	38	47	61	75	85

- A = smallest axis distance for largest variable speed pulley diameter (max. output speed)
- A₁ = largest axis distance for smallest variable speed pulley diameter (min. output speed)
- s = adjustment path, roughly applicable: large adjustment path for small driven pulleys, small adjustment path for large driven pulleys. The tables on pages 6-8 to 6-10 and 6-13 to 6-14 give the values for the adjustment path.
- D_w = effective diameter of larger pulley (can be largest effective diameter of variable speed pulley or effective diameter of driven pulleys).

- d_w = effective diameter of smaller pulley (can be smallest effective diameter of variable speed pulley or effective diameter of driven pulleys). For d_w values see tables on pages 6-7, 6-12 and 6-19.
- L_w = effective length of variable speed belt
- L_i = inner length of variable speed belt



Variable speed pulleys

Motor slide

Simplabelt motor slides are rugged and very flat. The surface is very strong and ensures smooth running of the variable speed pulleys. The adjustment range is limited by two stops. 4 slide sizes in 4 designs are available.

Normal design

The spindle with belt wheel is bent by 30° to the top.

U design

Like normal design but the spindle is bent to the bottom.

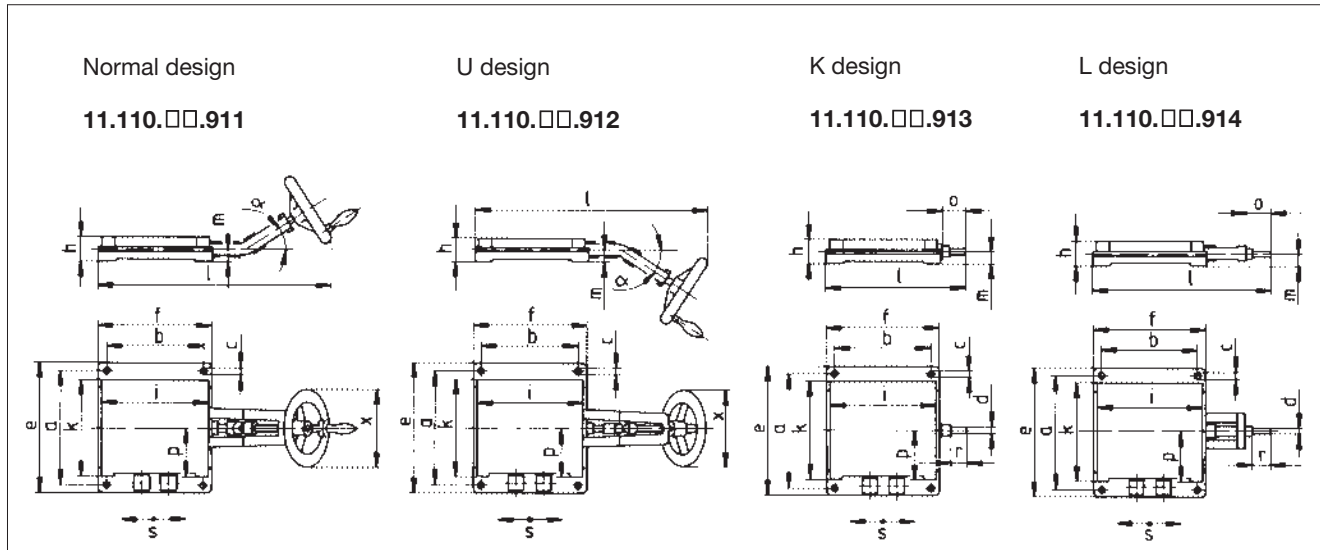
K design

Short spindle

This design is necessary to extend the spindle.

L design

Long spindle – for chain and bevel wheel adjustment.

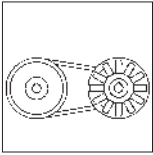


Size	Type	a	b	c	d k ₆	e	f	h	i	k	l	m	o	p	r	s*	x	α°	m kg
05	11.110.05.911	160	170	9	-	180	195	47	150	150	305	25	-	75	-	67	80	30	5
	11.110.05.912				205						13		-						
	11.110.05.913				260						23		-						
	11.110.05.914				260						23		-						
20	11.110.20.911	210	180	13	-	240	210	44	235	215	418	25.5	-	90	-	97	142	33	11
	11.110.20.912				418						-		142		33				
	11.110.20.913				258						48		-		-				
	11.110.20.914				328						46		-		-				
40	11.110.40.911	235	255	13.5	-	270	290	60	290	235	521	32	-	100	-	142	140	30	18.5
	11.110.40.912				521						-		140		30				
	11.110.40.913				354						62		-		-				
	11.110.40.914				430						47		-		-				
70	11.110.70.911	255	435	14	-	290	470	60	400	360	706	28	-	180	-	180	180	30	38
	11.110.70.912				706						-		180		30				
	11.110.70.913				525						53		-		-				
	11.110.70.914				625						22		-		-				

s* indicates the max. adjustment path. The adjustment path required is calculated according to the equation on page 6-15.

Roughly applicable: Large adjustment path for small driven pulleys, small adjustment path for large driven pulleys

Dimensions in [mm]



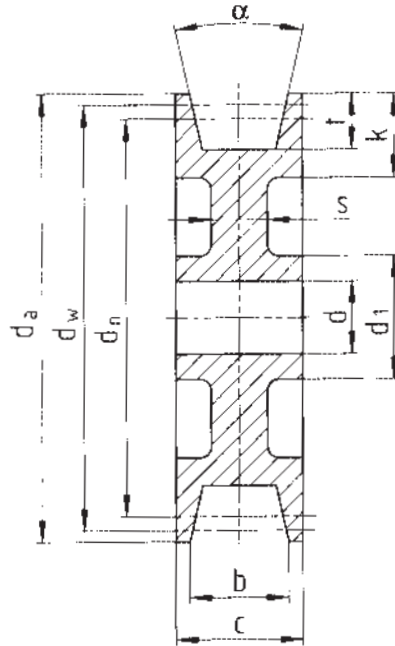
Variable speed pulleys

Driven pulleys

Simplabelt driven pulleys are made of cast iron and are statically balanced. The running grooves match the dimensions of the Simplabelt variable speed belts. The size designation refers to the corresponding spring-loaded variable speed pulley type 101 or 104.

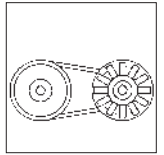
The ready-bored driven pulleys are delivered with keyway to DIN 6885 sheet 1 and ISO fit H 7. Therefore the shaft fit should be ISO-k 6. Please indicate in your order designation, rated diameter and bore.

The driven pulley is mounted onto the machine shaft to be driven or the input shaft of a reducing gearbox.



Variable speed pulleys

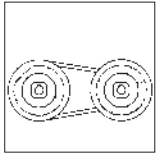
Driven pulleys



Type	Variable speed pulley type 11.101 11.104 Size		Variable speed belt size	b	c	k	s	t	§°
11.110.05.921 11.110.05.922	05	05	22	22	26	25	13	17	25
11.110.10.921 11.110.10.922	10	10/20	28	28	32	28	13	18	25
11.110.20.921 11.110.20.922	20	30	37	37	43	39	13	20	28
11.110.40.921 11.110.40.922	30/40/45	-	47	47	52	32	13	22	28
11.110.50.921 11.110.50.922	55	-	55	55	70	40	14	28	28
11.110.70.921 11.110.70.922	65/80	-	70	70	85	49	15	37	28

Type	dn	Inner diameter of driven pulleys																							
		80	90	100	112	125	140	160	170	180	200	208	224	250	280	315	355	400	450	500	560	630	710	800	
11.110.05.921	d1)						10		10	10		10	10	10											
	d max.	28	28	28	28	30	30	30	30	30		35	35	35	40										
11.110.05.922	d 1				45	50	50	50		55	55		55	55	65										
	da	86	96	106	118	131	145	166		186	206		230	256	286	321									
11.110.10.921	dw	83	93	103	115	128	143	163		183	203		227	253	283	318									
	d1)						10	10		10	10		10	10	12	12	12	12	12						
11.110.10.922	d max.	30		30	35	35	28*	40		40	40		40	40	45	45	45	50	50						
	d 1						44	65		65	65		65	65	70	70	70	70	70						
11.110.20.921	da	88		108	120	133	148	168		188	208		232	258	288	323	363	408	458						
	dw	84		104	116	129	144	164		184	204		228	254	284	319	359	404	454						
11.110.20.922	d1)					12	12	14	14	14		14	14	14	14	14	14	14	14	14					
	d max.					40	28*	40	30*	40	30*		45	45	45	45	50	50	50	50					
11.110.40.921	d 1						48	65	48	65	50		70	70	70	70	80	80	80	80					
	da					135	150	170	180	190	210		234	260	290	325	365	410	460	510					
11.110.40.922	dw					130	145	165	175	185	205		229	255	285	320	360	405	455	505					
	d1)						14	16		16	16	16	16	16	18	18	18	18	18	18					
11.110.50.921	d max.						40	40		40	50	50	50	50	50	40	55	60	60	65					
	d 1							75	75	85	85	85	85	85	85	64	95	95	95	105					
11.110.50.922	da						153	173		193	213	221	237	263	293	328	368	413	463	513					
	dw						146.5	166.5		186.5	206.5	214.5	230.5	256.5	286.5	321.5	361.5	406.5	456.5	506.5					
11.110.70.921	d1)											18		18	18	20	20	20	20	22	22	22	22		
	d max.											55		55	55	60	60	60	60	70	70	70	70		
11.110.70.922	d 1											90		90	90	95	95	95	95	110	110	110	110		
	da											216		240	266	296	331	371	416	466	516	576			
11.110.70.922	dw											208		232	258	288	323	363	408	458	508	568			
	d1)															22	22	22	22	22	22	25	25		
11.110.70.922	d max.															60	60	60	70	70	70	75	75		
	d 1															95	95	95	110	110	110	120	120		
11.110.70.922	da															298	333	373	418	468	518	578	648		
	dw															289	324	364	409	459	509	569	639		
		Full pulleys						Full ground						Spoke design											

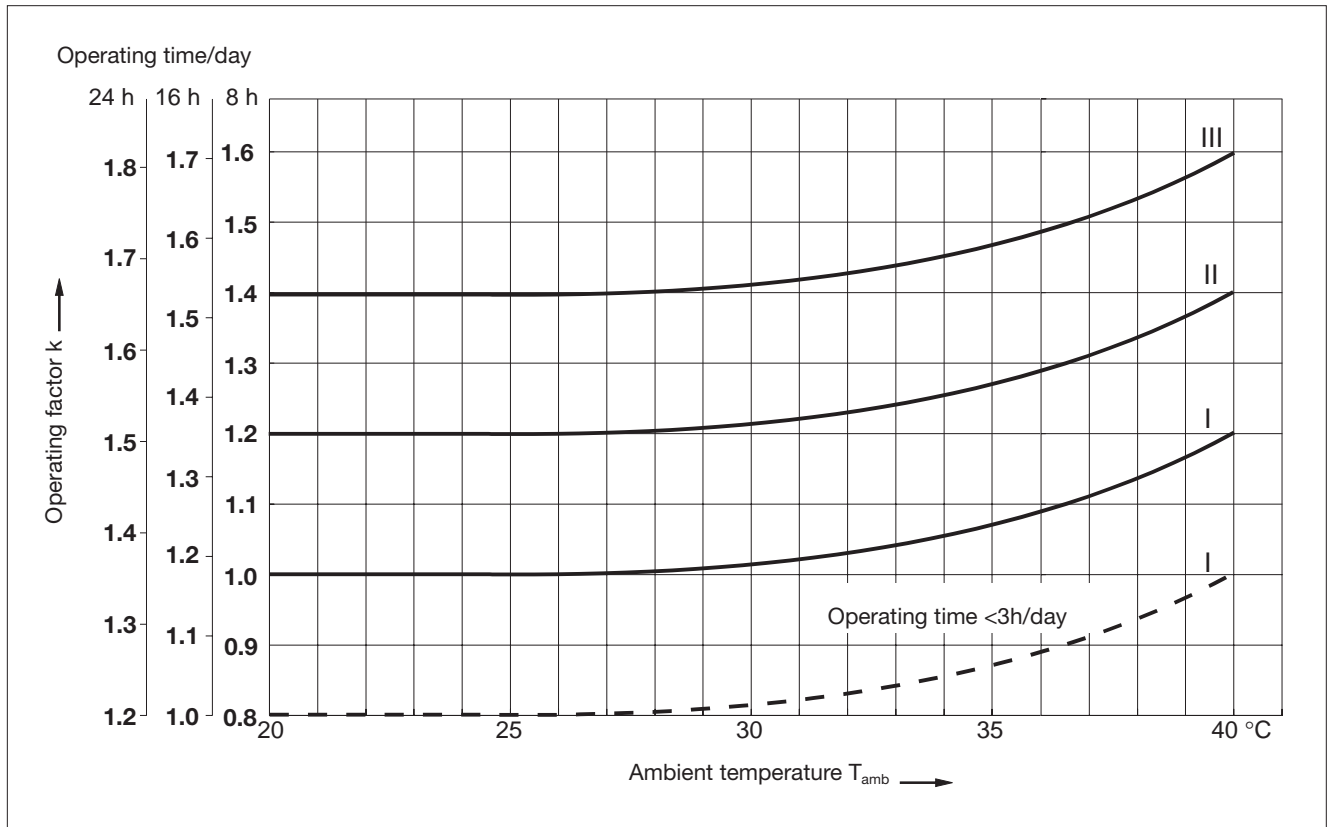
1) Pre-bored hole
 * Spoke design only in position 2
 Values in [mm]

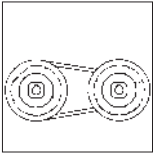


Selection

Simplabelt variable speed pulleys are selected according to the power P_2 and output speeds n_2 required. It is important to consider that the power and torque required for the machine to be driven might be different for max. and min. speeds. The power to be transmitted can be obtained from

the corresponding power characteristic of the variable speed pulleys. The power data given in these characteristics refer to an operating time of 8h/day and 100 % duty time and shock-free operation. For other operating conditions, please see the operating factors in the diagram.





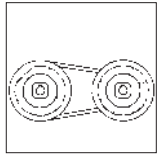
Variable speed pulleys

Type 11.213/11.218

Selection table

Three-phase AC motor			Variable speed pulleys		
Power kW	Size	Load speed min ⁻¹	Output speed min ⁻¹	Transm. power kW	Size
Variable speed pulleys 11.213/218					
0.37/0.25 0.25/0.18 0.18/0.12	71	1380 910 680	3320-600 2190-400 1635-300	0.35-0.2 0.22-0.15 0.18-0.1	10 SEF-920
1.5/1.1/0.75 1.1/0.75/0.55 /0.55/0.37	90/80	1400 920 675	3285-620 2160-410 1585-305	1.3-0.5 0.95-0.4 0.65-0.3	13 SEF-926
3/2.2/1.5 2.2/1.5/1.1 1.1/0.55	100/90	1410 920 710	3540-580 2310-380 1780-290	2.6-1.1 1.7-0.7 1.3-0.5	16 SEF-926
5.5 ¹⁾ /4/3 3/2.2/1.5 1.5/1.1	112/100	1420 940 700	3675-565 2435-375 1800-280	4.7-1.7 3.0-1.1 2.3-0.8	20 SEF-926
11/9.2/7.5 7.5/5.5/4 4/2.2	160/132	1440 960 710	3725-570 2485-380 1840-280	9.4-3.5 6.2-1.8 4.6-1.4	25 SEF-928
11/9.2/7.5 7.5/5.5 5.5/4	160/132	1460 965 720	3780-570 2500-380 1865-285	11-5 6.6-3 4.8-2.2	31 SEF-920
18.5/15 15/11 11/7.5	180/160	1460 965 720	3780-570 2500-380 1865-285	18.5-7.1 15-5.7 11-3.8	31 SEF-921
45/37/30/22 30/22/15 22/15/11	225/200/180	1460 954 720	2740-485 1810-320 1350-240	40-12 26-8 19-6	40 SEF-926

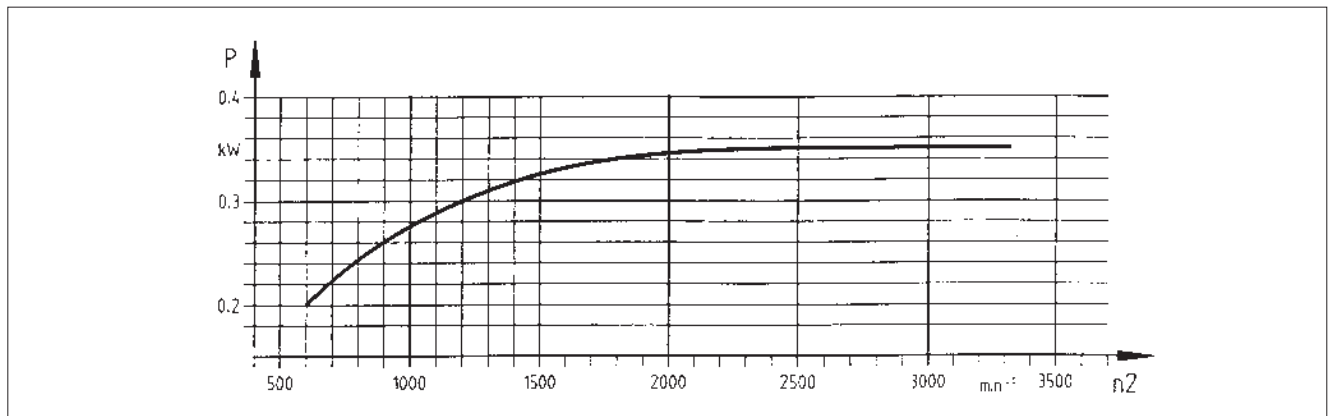
¹⁾ Motor with shaft like size 112



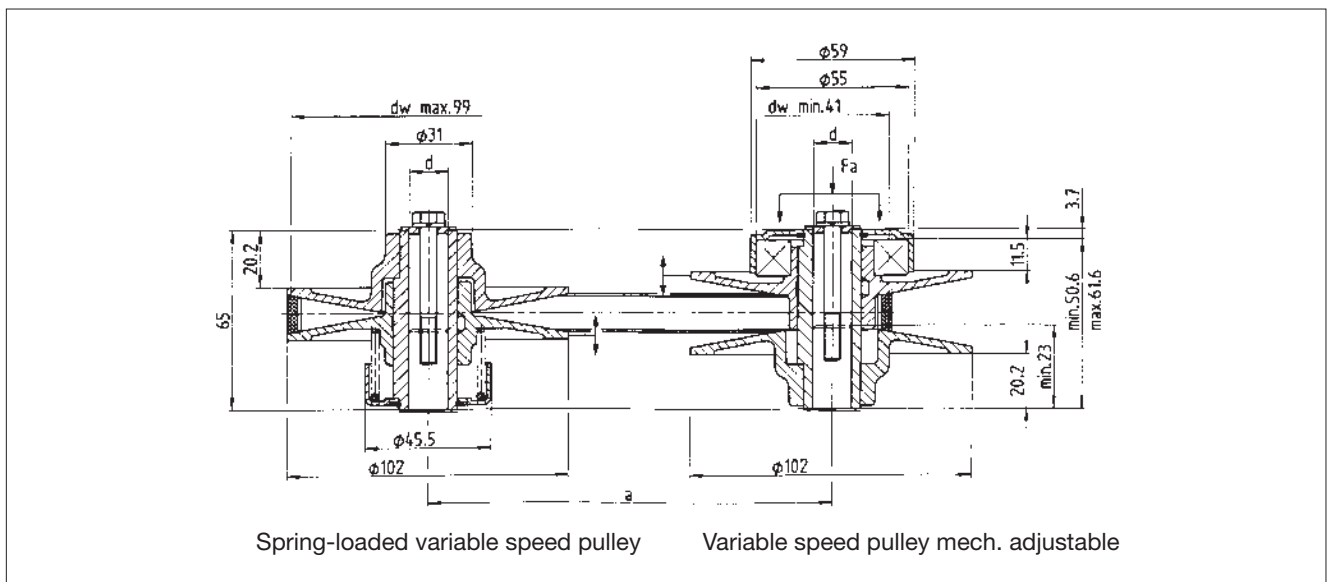
Technical data

$P_1 = 0.25/0.37 \text{ kW}$			
Adjustment range	R:	5.8	
Variable speed belt	:	14x5mm	
Mass	m:	0.46 kg 0.35 kg	(...910/911/912) (...920)
Moment of inertia	J:	0.00025 kgm ² 0.00023 kgm ²	(...910/911/912) (...920)
Bores of ISO H7/keyway	min: standard: max:	10 mm 14 mm 14 mm	DIN 6885/1 DIN 6885/1 DIN 6885/1
Adjustment force	Fa max:	300 N	
Belt tension	Fr max:	120 N	

Output power at $n_1 = 1450 \text{ min}^{-1}$

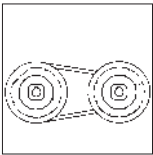


Dimensions



Axis distance a	133	136	149	162	174	204	224	250	275	300	325	350	375	400
Inner belt length	468	475	500	525	550	600	650	700	750	800	850	900	950	1000

Dimensions in [mm]



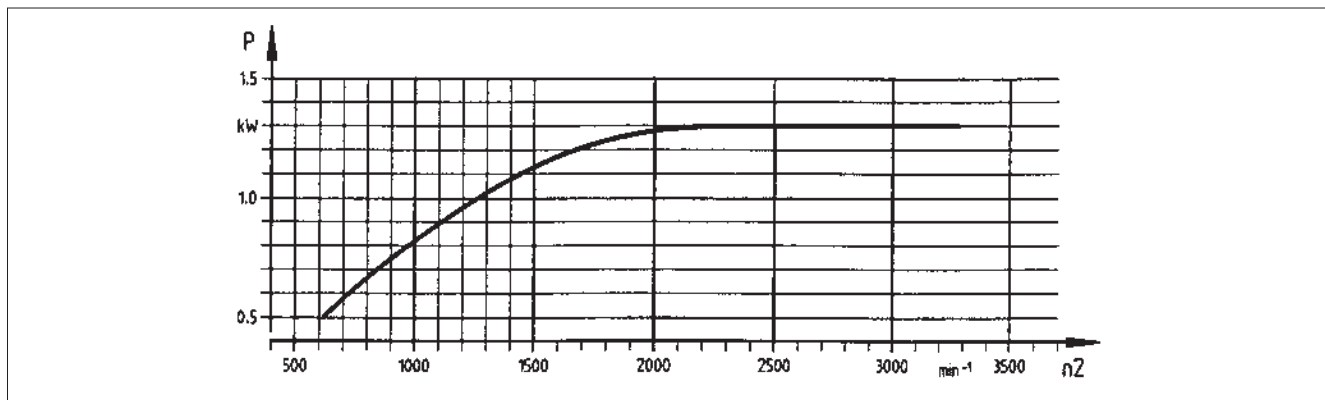
Variable speed pulleys

Type 11.213.13/11.218.13

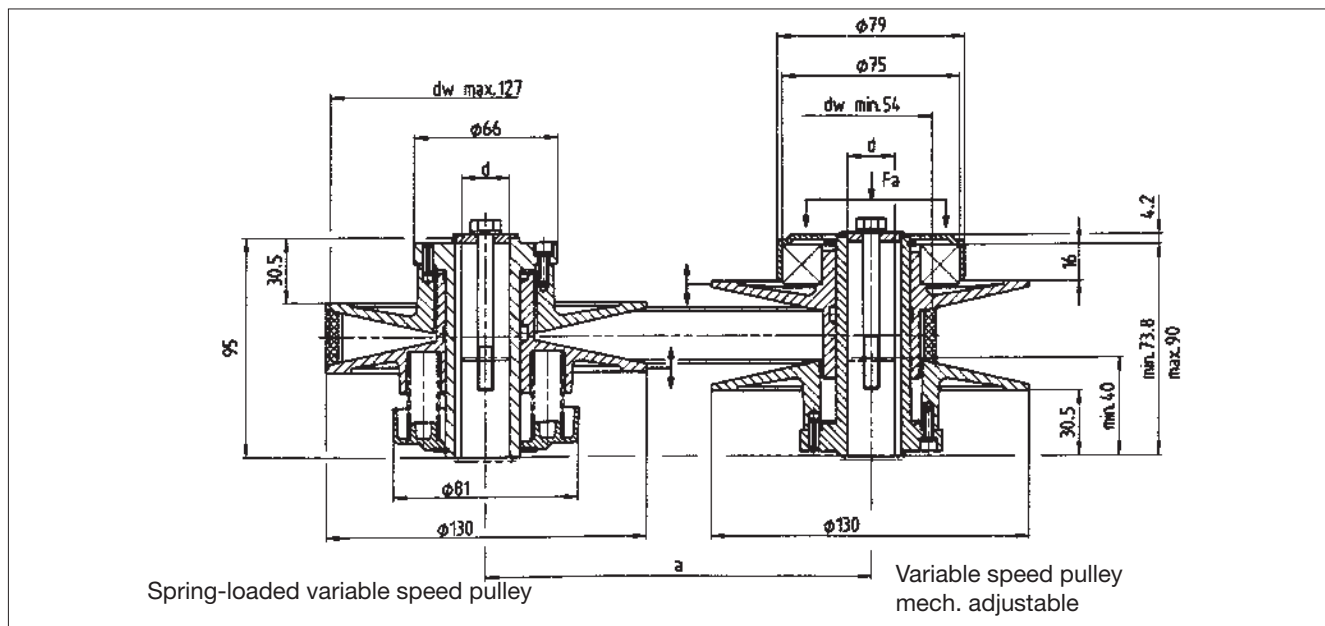
Technical data

$P_1 = 0.55/0.75/1.1/1.5 \text{ kW}$			
Adjustment range	R:	5.5	
Variable speed belt	:	22x6mm	
Mass	m:	1.4 kg 1.2 kg	(...910/911/912) (...926)
Moment of inertia	J:	0.00020 kgm ² 0.00018 kgm ²	(...910/911/912) (...926)
Bores of ISO H7/keyway	min: standard: max:	14mm 14; 19; (24) mm 24 mm	DIN 6885/1 DIN 6885/1 (/3) DIN 6885/3
Adjustment force	Fa max:	500 N	
Belt tension	Fr max:	250 N	

Output power at $n_1 = 1450 \text{ min}^{-1}$



Dimensions

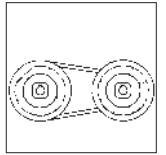


Axis distance a	142	173	193	218	244	269	294	319	344	369	400	430	460
Inner belt length	550	600	650	700	750	800	850	900	950	1000	1060	1120	1180

Dimensions in [mm]

Variable speed pulleys

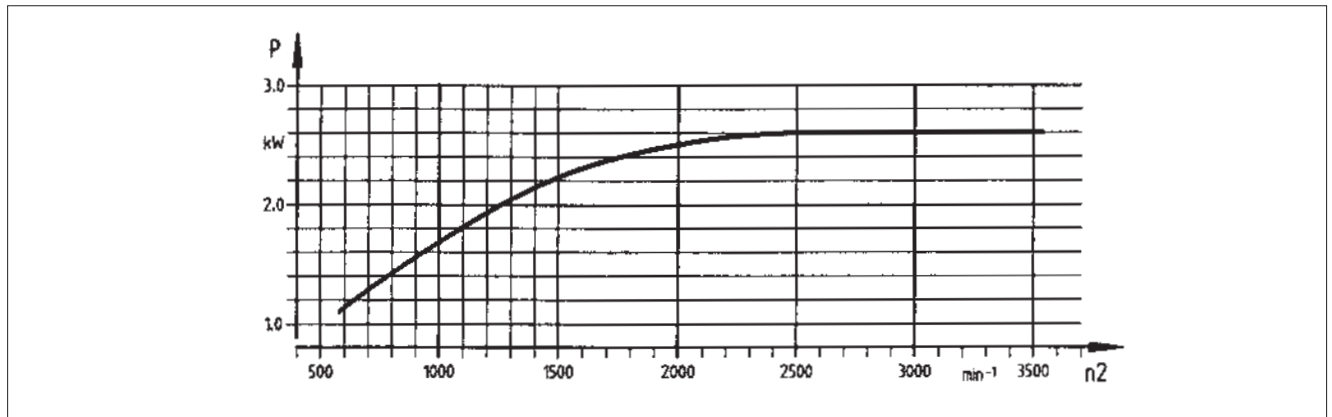
Type 11.213.16/11.218.16



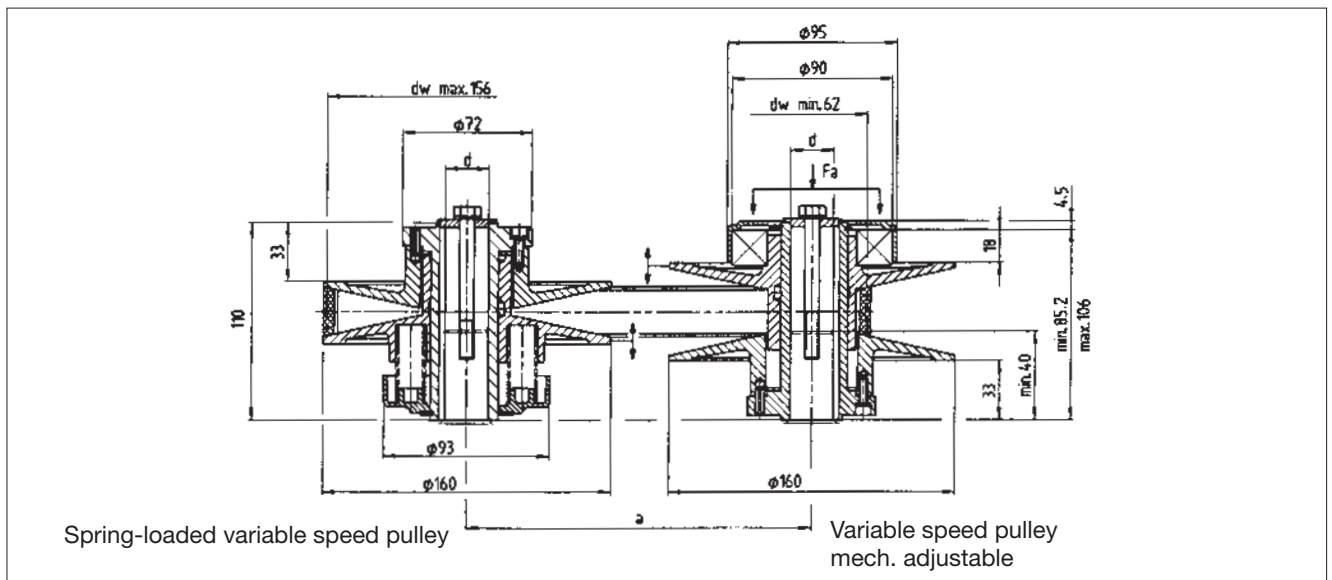
Technical data

$P_1 = 2.2/3 \text{ kW}$			
Adjustment range	R:	6.3	
Variable speed belt	:	28x8mm	
Mass	m:	2.2 kg 1.8 kg	(...910/911/912) (...926)
Moment of inertia	J:	0.0032 kgm ² 0.0032 kgm ²	(...910/911/912) (...926)
Bores of ISO H7/keyway _t	min: standard: max:	18mm 19; 24 (28) mm 28 mm	DIN 6885/1 DIN 6885/1 (/3) DIN 6885/3
Adjustment force	Fa max:	800 N	
Belt tension	Fr max:	380 N	

Output power at $n_1 = 1450 \text{ min}^{-1}$



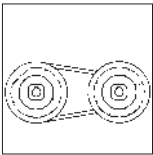
Dimensions



6

Axis distance a	166	192	217	242	268	293	318	343	373	404	434	469	504	544
Inner belt length	650	700	750	800	850	900	950	1000	1060	1120	1180	1250	1320	1400

Dimensions in [mm]



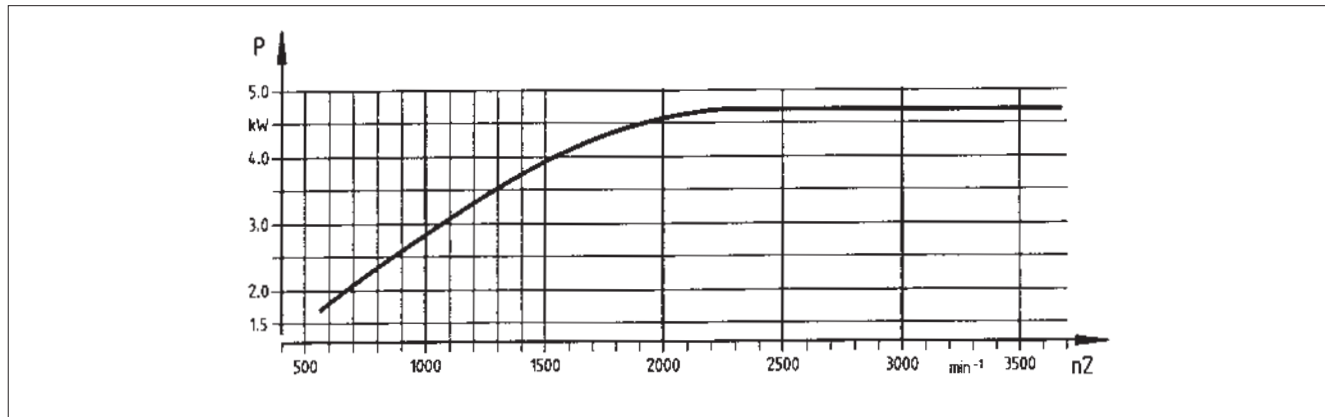
Variable speed pulleys

11.213.20/11.218.20

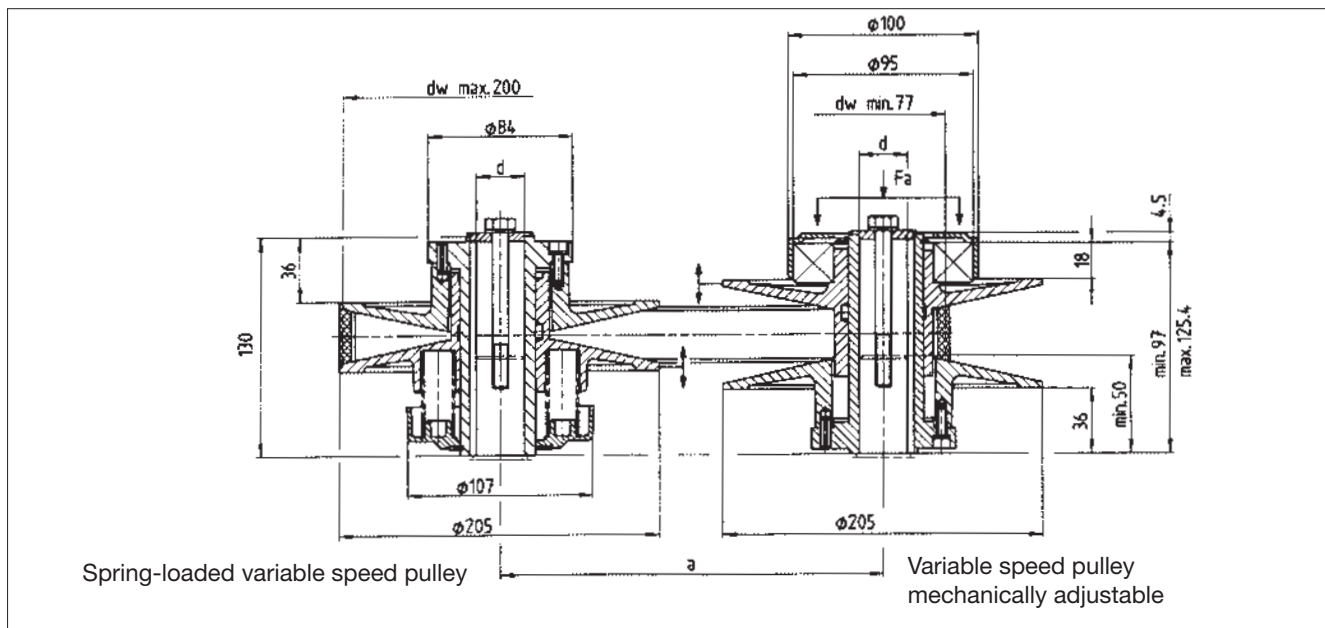
Technical data

$P_1 = 4/5.5 \text{ kW}$			
Adjustment range	R:	6.7	
Variable speed belt	:	37x10 mm	
Mass	m:	3.4 kg 3.3 kg	(...910/911/912) (...926)
Moment of inertia	J:	0.0071 kgm ² 0.0092 kgm ²	(...910/911/912) (...926)
Bores of ISO H7/keyway	min: standard: max:	19mm 24; 28; (24) mm 28 mm	DIN 6885/1 DIN 6885/1 DIN 6885/1
Adjustment force	Fa max:	1400 N	
Belt tension	Fr max:	600 N	

Output power at $n_1 = 1450 \text{ min}^{-1}$



Dimensions

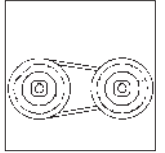


Axis distance a	223	248	274	299	329	360	390	425	461	501	551	602	652
Inner belt length	850	900	950	1000	1060	1120	1180	1250	1320	1400	1500	1600	1700

Dimensions in [mm]

Variable speed pulleys

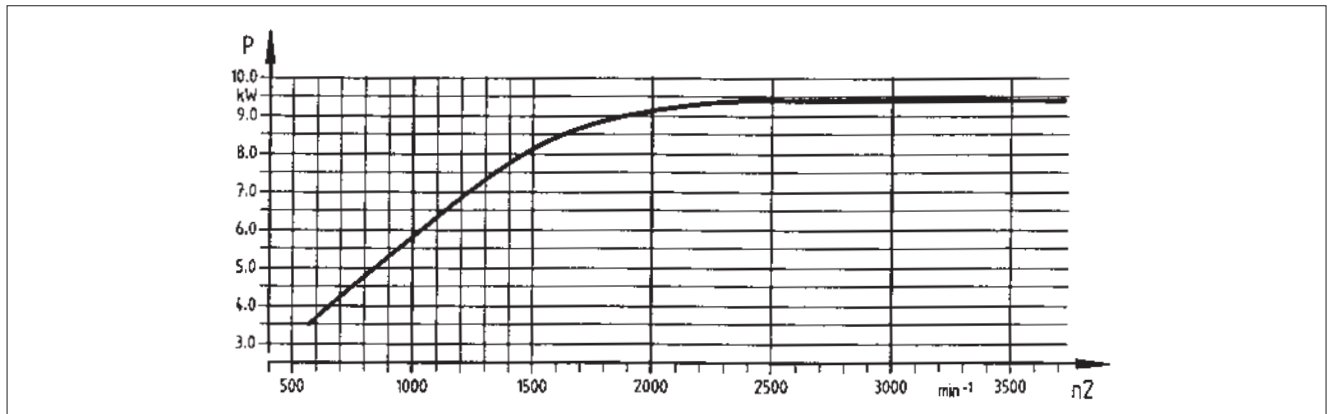
Type 11.213.25/11.218.25



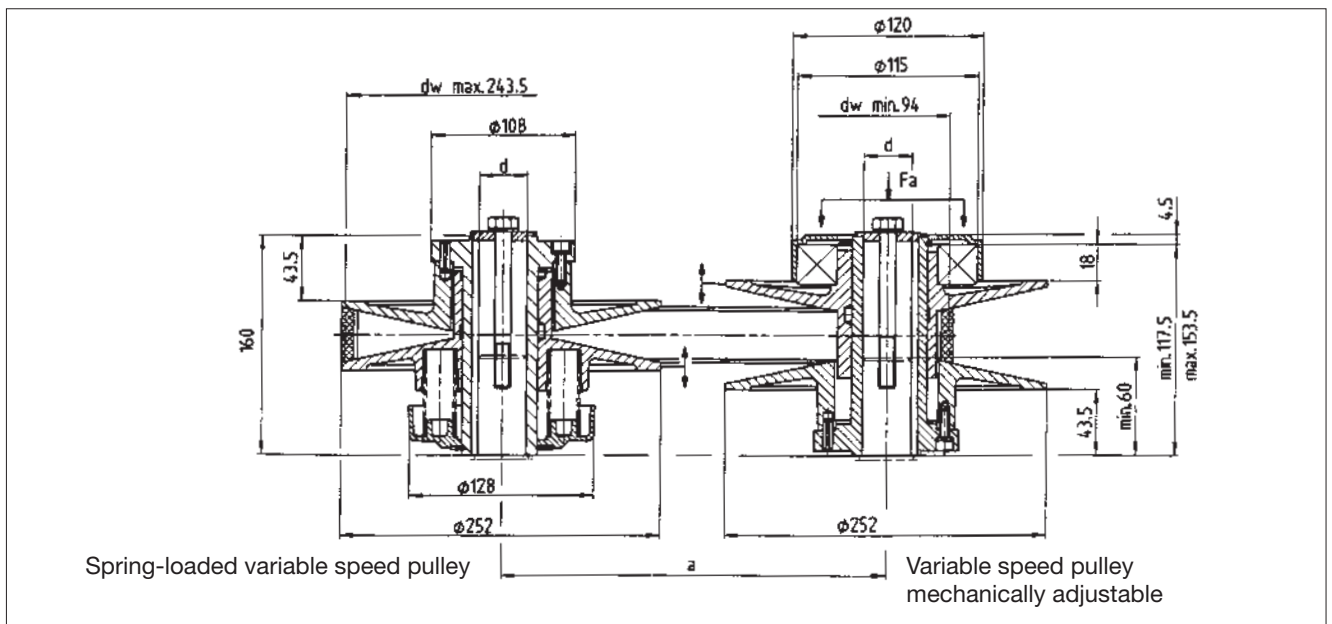
Technical data

$P_1 = 7.5/9.2/11 \text{ kW}$			
Adjustment range	R:	6.7	
Variable speed drive	:	47x13 mm	
Mass	m:	6.6 kg 5.8 kg	(...910/911/912) (...928)
Moment of inertia	J:	0.020 kgm ² 0.026 kgm ²	(...910/911/912) (...928)
Bores of ISO H7/keyway	min: standard: max:	25 mm 28; 38; 42 mm 42 mm	DIN 6885/1 DIN 6885/1 DIN 6885/1
Adjustment force	Fa max:	2000 N	
Belt tension	Fr max:	900 N	

Output power at $n_1 = 1450 \text{ min}^{-1}$

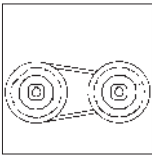


Dimensions



Axis distance a	286	316	347	382	418	458	509	559	609
Inner belt length	1060	1120	1180	1250	1320	1400	1500	1600	1700

Dimensions in [mm]



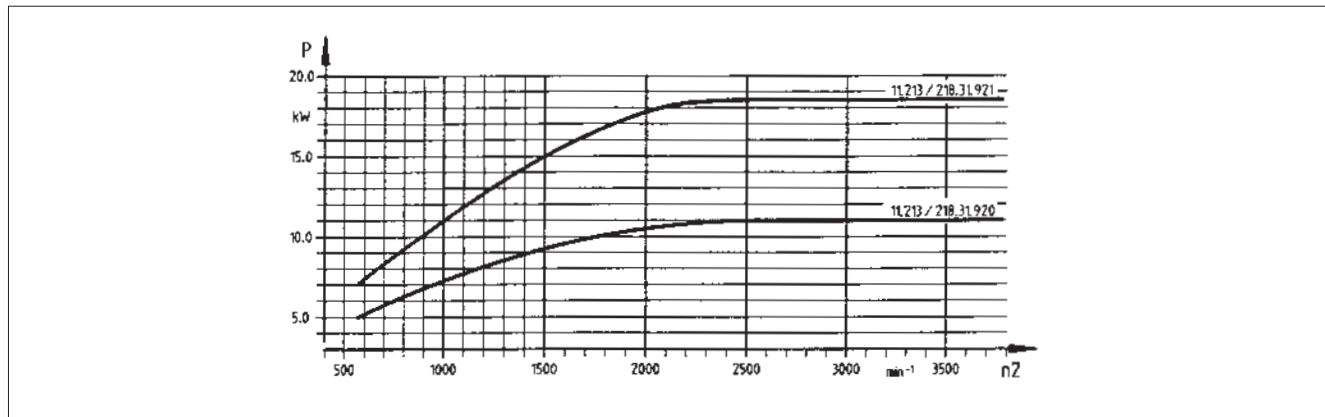
Variable speed pulleys

Type 11.213.31/11.218.31

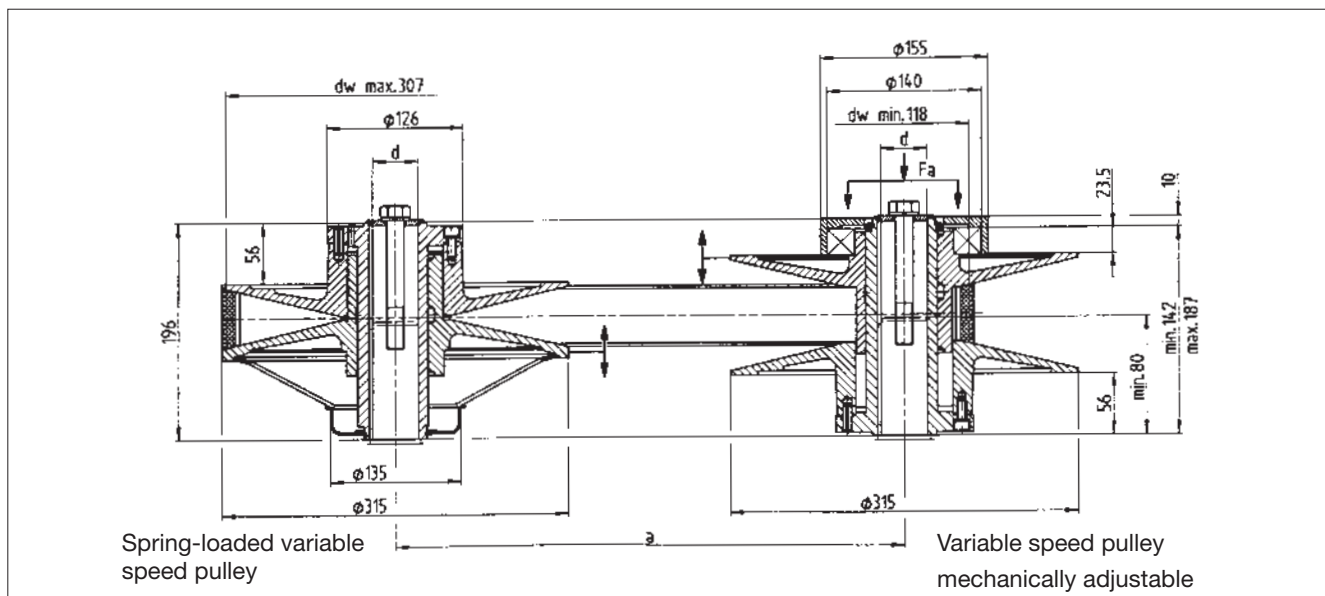
Technical data

$P_1 = 15/18.5 \text{ kW}$		
Adjustment range	R:	6.7
Variable speed belt	:	55x16 mm
Mass	m:	12 kg (...910/911/912) 12 kg (...920/921)
Moment of inertia	J:	0.073 kgm ² (...910/911/912) 0.073 kgm ² (...920/921)
Bores of ISO H7/keyway	min: standard: max:	28 mm 38; 42 mm; (48) 48 mm DIN 6885/1 DIN 6885/1 (/3) DIN 6885/3
Adjustment force	Fa max:	3000 N
Belt tension	Fr max:	1250 N

Output power at $n_1 = 1450 \text{ min}^{-1}$



Dimensions

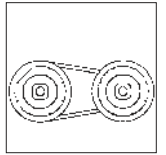


Axis distance a	351	392	443	493	544	595	695	816	947
Inner belt length	1320	1400	1500	1600	1700	1800	2000	2240	2500

Dimensions in [mm]

Variable speed pulleys

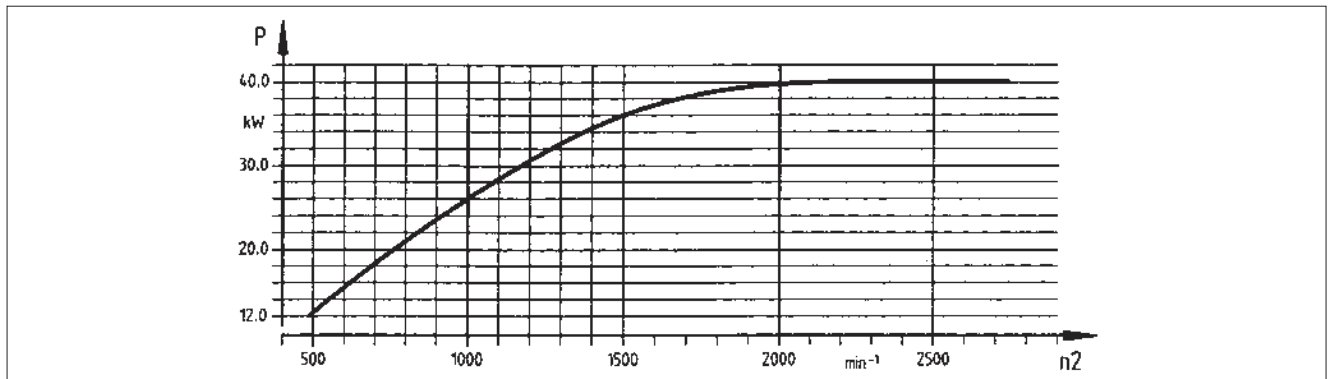
Type 11.213.40/11.218.40



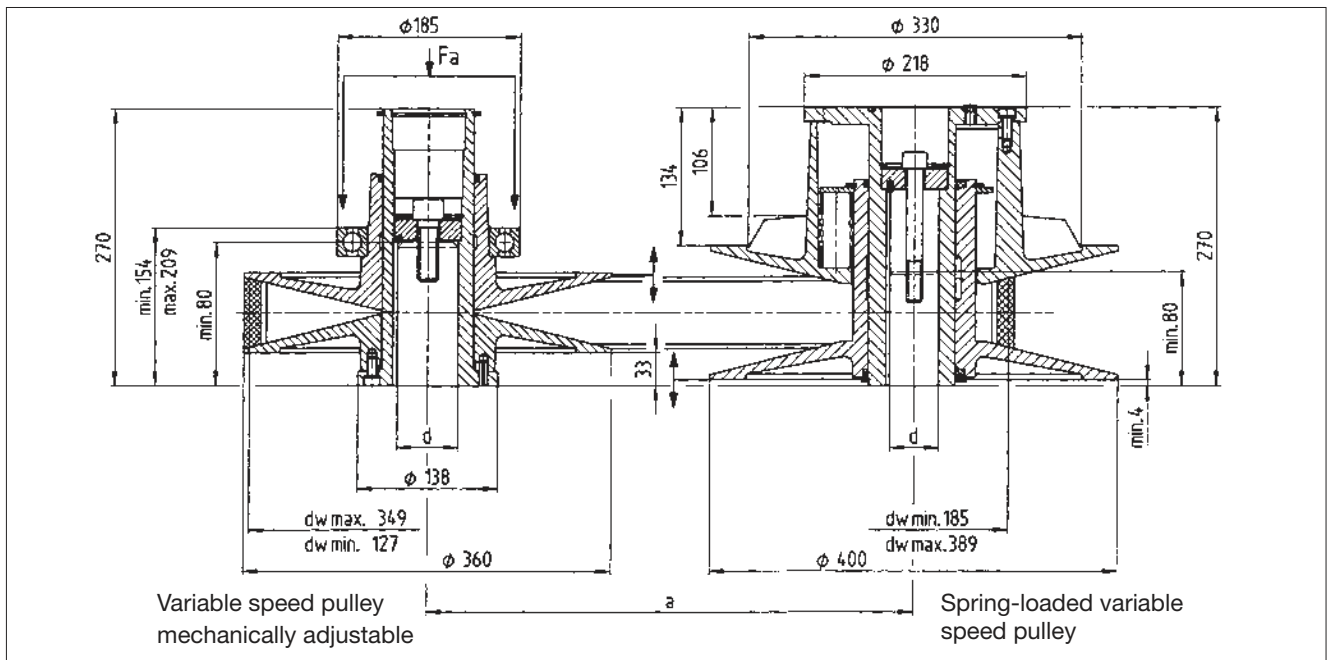
Technical data

$P_1 = 22/30/37/45 \text{ kW}$			
Adjustment range	R:	5.7	
Variable speed belt	:	72x22 mm	
Mass	m:	20.5 kg	(...912)
		28.4 kg	(...926)
Moment of inertia	J:	0.122 kgm ²	(...912)
		0.227 kgm ²	(...926)
Bores of ISO H7/keyway	min:	38 mm	DIN 6885/1
	standard:	38; 42; 48; 55; 60 mm	DIN 6885/1
	max:	60 mm	DIN 6885/1
Adjustment force	Fa max:	4300 N	
Belt tension	Fr max:	1900 N	

Output power at $n_1 = 1450 \text{ min}^{-1}$

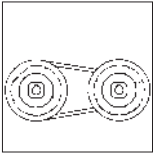


Dimensions



Axis distance a	425	476	500	526	626	747	878	1028	1204	1334	1389
Inner belt length	1600	1700	1750	1800	2000	2240	2500	2800	3150	3210	3520

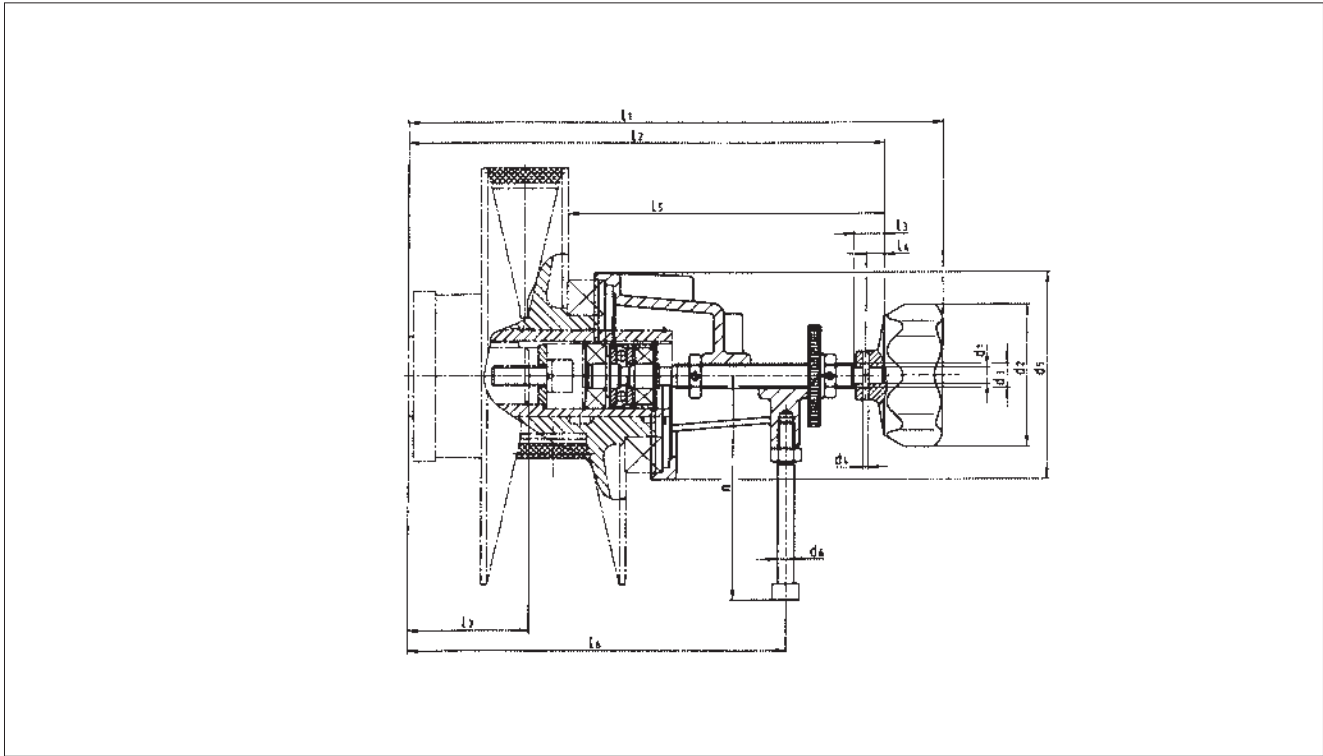
Dimensions in [mm]



Variable speed pulleys

Type 11.213/218

Central adjustment Dimensions



Central adjustment	For variable speed pulleys																	
Type	Type	d ₁	d ₂	d ₃	d ₄	d ₅	d ₆	l ₁	l ₂	l ₃	l ₄	l ₅		l ₆		l ₇	n	m
												max	min	max	min	max		kg
11.213.10.932	11.213/218.10.912	12	80	14x1.5	3	70	M 6	165	152	16	11	113	102	126	115	30	80	1.0
11.213.13.933	11.213/218.13.912	8	70	12x2	3	80	M 6	208	179	15	9	122	106	131	115	48 ²⁾	78	0.5
11.213.16.933	11.213/218.16.912	8	70	12x2	3	102	M 8	244	215	15	9	148	127	163	142	52 ³⁾	110	1.0
11.213.20.933	11.213/218.20.912	8	70	12x2	3	102	M 8	264	235	15	9	156	128	185	157	63	110	1.0
11.213.25.933	11.213/218.25.912	12	105	16x2	3	150	M10	331	298	24	17	199	163	235	199	83	130	2.8
11.213.31.933	11.213/218.31.912	12	105	20x2	3	150	M10	370	337	24	17	219	173.5	277	231.5	113	160	3.0
11.213.40.933	11.213/218.40.912	20	200	24x2	6	192	M12	442	422	25	15	311	256	359	304	142	190	6.0