



ZDY ZLY ZSY

Rigid Cylindrical Gear Reducer



ZDY



ZLY



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Cylindrical Gear Reducer

Introduction

This product is a rigid cylindrical gear reducer manufactured in accordance with JB/T8853-2001.

The product is widely applied in metallurgy, mining, hoisting, transportation, cement, building, chemical, textile, dyeing & printing, pharmaceutical etc.

Its scope of application:

1. Rotation of high-speed shaft $\leq 500\text{rpm}$.

2. Peripheral speed of gear drive $\leq 20\text{m/s}$.

3. Working ambient temperature between $-40\sim 45^{\circ}\text{C}$. Preheat the lubricating oil to above 0°C before start-up when the ambient temperature is below 0°C . The rotation of reducer is available both forwards and backwards.

I. Characteristics

1. The gear employs high-strength low-carbon alloy steel carburized, quenched and ground, with hardness of gear flank of HRC58-62, high precision and good contact.

2. High drive efficiency: single stage $>96.5\%$, two-stage $>93\%$, three-stage $>90\%$.

3. Stable operation, low noise.

4. Compact, light weight, durable lifetime, high carrying capacity.

5. Easy to dismantle, repair and install.

II. Type, Specification and Marking of Reducer

1. The type includes: ZDY single-stage cylindrical gear reducer, ZLY two-stage cylindrical gear reducer, ZSY three-stage cylindrical gear reducer and ZFY four-stage cylindrical gear reducer.

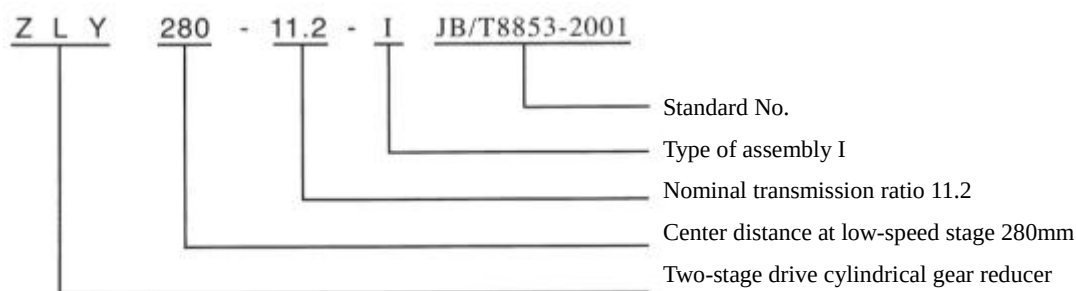
2. The specification includes: single stage: 80, 100, 125, 160, 200, 250, 280, 315, 355, 400, 450, 500, 560;

Two stage: 112, 125, 140, 160, 180, 200, 224, 250, 280, 315, 355, 400, 450, 500, 560, 630, 710;

Three stage: 160, 180, 200, 224, 250, 280, 315, 355, 400, 450, 500, 560, 630, 710;

Four stage: 180, 200, 225, 250, 280, 320, 360, 400, 450, 500, 560, 630, 710, 800.

3. Sample of labels:



D-single stage, L-two stage, S-three stage, F-four stage, Y-rigid gear

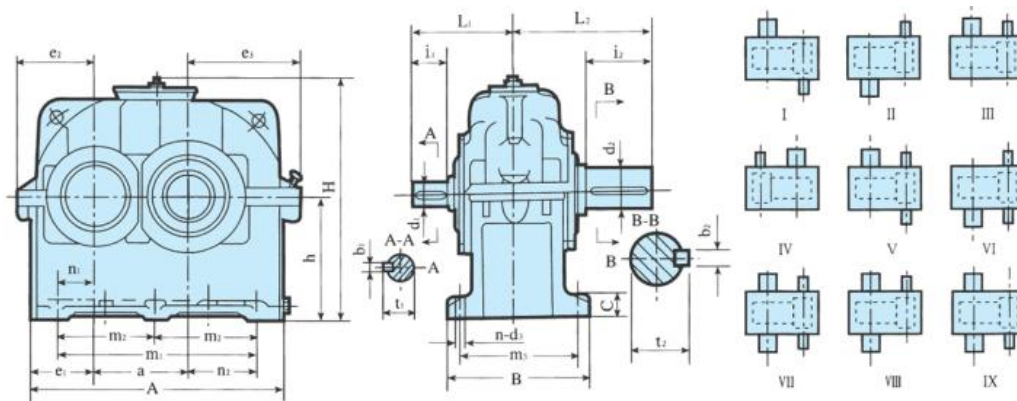
4. Rules on rotary direction: The reducer with back stop shall have only one rotary direction facing to the output shaft. For the output shaft, S—clockwise, N—anticlockwise.

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III. External and Installing Dimensions

ZDY cylindrical gear reducer

Type of assembly



Spec.	A	B	H ≈	a	i=1.25~2.8					i=3.15~4.5					i=5~5.6				
					d (m6)	l_1	L_1	b_1	T_1	d (m6)	l_1	L_1	b_1	T_1	d (m6)	l_1	L_1	b_1	T_1
80	235	150	210	80	28	42	112	8	31	24	36	106	8	27	19	28	98	6	21.5
100	290	175	260	100	42	82	167	12	45	28	42	127	8	31	22	36	121	6	24.5
125	355	195	330	125	48	82	182	14	51.5	38	58	158	10	41	28	42	142	8	31
160	445	245	403	160	65	105	225	18	69	48	82	2	14	51.5	38	58	178	10	41
200	545	310	507	200	80	130	275	22	85	60	105	250	18	64	48	82	227	14	51.5
250	680	370	662	20	100	165	340	28	106	80	130	305	22	85	60	105	280	18	64
280	755	450	722	280	110	165	385	28	116	85	130	350	22	90	65	105	325	18	69
315	840	500	770	315	130	200	445	32	137	95	130	375	25	100	75	105	350	20	79.5
355	930	550	930	355	140	200	470	36	148	100	165	435	28	106	90	130	400	25	95
400	1040	605	982	400	150	200	485	36	158	110	165	450	28	116	95	130	415	25	100
450	1150	645	1090	450	160	240	545	40	169	120	165	470	32	127	100	165	470	28	106
500	1290	710	1270	500	180	240	580	45	190	130	200	540	36	137	120	165	505	32	127
560	1440	780	1360	560	200	280	660	45	210	150	200	580	36	158	130	200	580	32	137

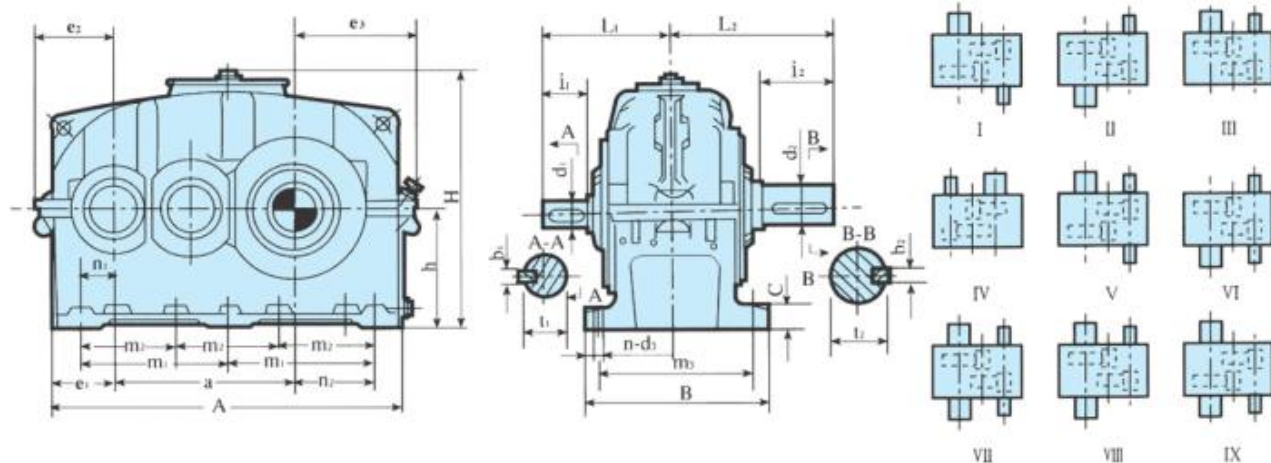
Spec.	d (m6)	l_1	L_1	b_1	t_1	C	m	m	m	n	n_1	e	e	e	h	Foundation hole		Average weight kg	Lubricating oil volume (*)
																d3	n		
80	32	58	128	10	35	18	180	-	120	40	60	67.5	81	101	100	12	4	14	0.9
100	48	82	167	14	51.5	22	225	-	140	52.5	72.5	85	102	122	125	15	4	35	1.6
125	55	82	182	16	59	25	290	-	160	65	100	97.5	119	155	160	15	4	76	3.2
160	70	105	225	20	74.5	32	355	-	200	73	122	118	141	190	200	18.5	4	115	6.5
200	90	130	275	25	95	40	425	-	255	80	145	140	169	235	250	24	4	228	12.5
250	110	165	340	28	116	50	550	275	305	110	190	175	214	295	315	28	6	400	23
280	130	200	420	32	137	50	620	310	380	120	220	187.5	228	328	355	28	6	540	36
315	140	200	445	36	148	63	700	350	420	137.5	247.5	207.5	254	364	400	35	6	800	45
355	150	200	470	36	158	63	770	385	470	142.5	272.5	222.5	269	397	450	35	6	870	70
400	160	240	525	40	169	80	850	425	510	150	300	245	304	454	500	42	6	1640	90
450	170	240	545	40	179	80	950	475	550	165	335	265	331	501	560	42	6	2100	125
500	190	280	620	45	200	100	1080	540	610	190	390	295	418	618	630	42	6	3100	180
560	240	330	790	56	252	100	1200	600	680	205	435	325	432	662	710	48	6	3730	250

*) The volume of lubricating oil foresaid is only a reference value, which must reach the center line of oil leveler.

GUOMAO REDUCER

ZLY cylindrical gear reducer

Type of assembly



Spec.	A	B	H ≈	a	i=6.3~11.2					i=12.5~20					d ₁ (m6)	l ₁	L ₁	b	t ₁
					d ₁ (m6)	l ₁	L ₁	b	t ₁	d ₁ (m6)	l ₁	L ₁	b	t ₁					
112	385	215	265	192	24	36	141	8	27	22	36	141	6	24.5	48	82	192	14	51.5
125	425	235	309	215	28	42	157	8	31	24	36	151	8	27	55	82	197	16	59
140	475	245	335	240	32	58	185	10	35	28	42	167	8	31	65	105	230	18	69
160	540	290	375	272	38	58	198	10	41	32	58	198	10	35	75	105	245	20	79.5
180	600	320	435	305	42	82	232	12	45	32	58	208	10	35	85	130	285	22	90
200	665	355	489	340	48	82	247	14	51.5	38	58	223	10	41	95	130	300	25	100
224	755	390	515	384	48	82	267	14	51.5	42	82	267	12	45	100	165	355	28	106
250	830	450	594	430	60	105	315	18	64	48	82	292	14	51.5	110	165	380	28	116
280	920	500	670	480	65	105	340	18	69	55	82	317	16	59	130	200	440	32	137
315	1030	570	780	539	75	105	365	20	79.5	60	105	365	18	64	140	200	470	36	148
355	1150	600	870	605	85	130	410	22	90	70	105	385	20	74.5	170	240	530	40	179
400	1280	690	968	680	90	130	440	25	95	80	130	440	22	85	180	240	560	45	190
450	1450	750	1065	765	100	165	515	28	106	85	130	480	22	90	220	280	640	50	231
					i=6.3~12.5					i=14~20									
500	1600	830	1190	855	110	165	555	28	116	95	130	520	25	100	240	330	730	56	252
560	1760	910	1320	960	120	165	575	32	127	110	165	575	28	116	280	380	820	63	292
630	1980	1010	1480	1080	140	200	660	36	148	120	165	625	32	127	300	380	870	70	314
710	2220	1110	1653	1210	160	240	740	40	169	140	200	700	36	148	340	450	990	80	355

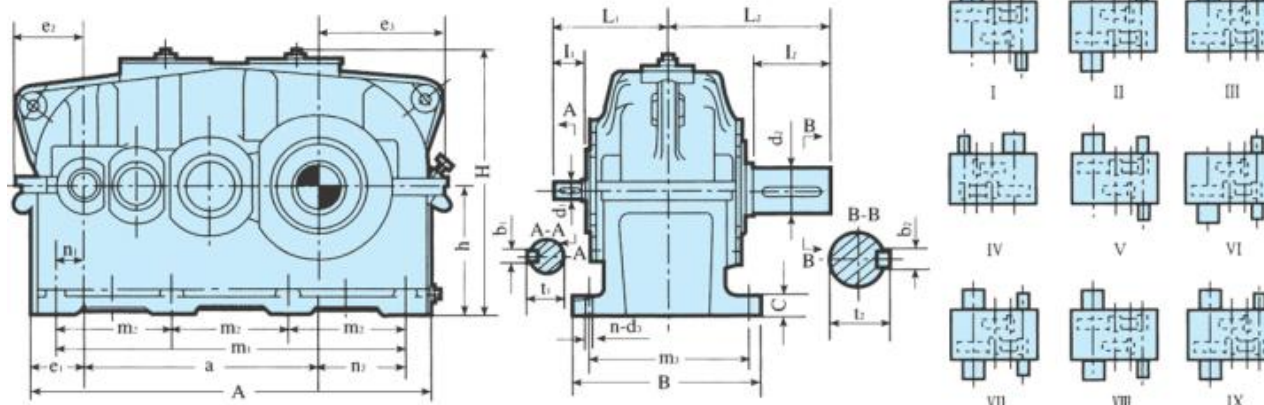
Spec.	C	m	m	m	n	n	e	e	e	h	Foundation hole		Average weight kg	Lubricating oil volume *)
											d	n		
112	22	160	-	180	43	85	75.5	92	134	125	15	6	60	3
125	25	180	-	200	45	100	77.5	98	153	140	15	6	69	4.3
140	25	200	-	210	47.5	112.5	85	106	171	160	15	6	105	6
160	32	225	-	245	58	120	103	126	188	180	18.5	6	155	8.5
180	32	250	-	275	60	135	110	134	209	200	18.5	6	185	11.5
200	40	280	-	300	65	155	117.5	148	238	225	24	6	260	16.5
224	40	310	-	335	70	166	137.5	168	263	250	24	6	370	23
250	50	350	-	380	80	190	145	184	293	280	28	6	527	32
280	50	380	-	430	75	205	155	195	325	315	28	6	700	46
315	63	420	-	490	78	223	173	219	364	355	35	6	940	65
355	63	475	-	520	92.5	252.5	192.5	238	398	400	35	6	1250	90
400	80	520	-	590	95	265	215	275	445	450	42	6	1750	125
450	80	-	400	650	117.5	317.5	242.5	305	505	500	42	8	2650	180
500	100	-	440	710	120	345	262.5	337	557	560	48	8	3400	250
560	100	-	490	790	120	390	265	354	624	630	48	8	4500	350
630	125	-	540	870	115	425	295	384	694	710	56	8	6800	350
710	125	-	610	950	140	480	335	440	780	800	56	8	8509	520

*) The volume of lubricating oil foresaid is only a reference value, which must reach the center line of oil leveler.

GUOMAO REDUCER

ZSY cylindrical gear reducer

Type of assembly



Spec.	A	B	H ≈	a	i=22.4~71					i=80~100					d ₁ (m6)	l ₂	L ₂	b ₂	t ₂
					d ₁ (m6)	l ₁	L ₁	b ₁	t ₁	d ₁ (m6)	l ₁	L ₁	b ₁	t ₁					
160	600	290	375	352	24	36	166	8	27	19	28	158	6	21.5	75	105	245	20	79.5
180	665	320	435	395	28	42	187	8	31	22	36	181	6	24.5	85	130	285	22	90
200	745	355	492	440	32	58	218	10	35	22	36	196	6	24.5	95	130	300	25	100
224	840	390	535	496	38	58	33	10	41	24	36	211	8	27	100	165	355	28	106
250	930	450	589	555	42	82	282	12	45	32	58	258	10	35	110	165	380	28	116
280	1025	500	662	620	48	82	307	14	51.5	38	58	283	10	41	130	200	440	32	137
315	1160	570	749	699	48	82	337	14	51.5	42	82	337	12	45	140	200	470	36	148
					i=22.4~35.5					i=40~90									
355	1280	600	870	785	60	105	380	18	64	48	82	357	14	51.5	170	240	530	40	179
400	1420	690	968	880	65	105	410	18	69	55	82	387	16	59	180	240	560	45	190
450	1610	750	1067	989	70	105	450	20	74.5	60	10	450	18	64	220	280	640	50	231
					i=22.4~45					i=50~90									
500	1790	830	1170	1105	80	130	515	22	85	65	105	490	18	69	240	330	730	56	252
560	2010	910	1320	1240	95	130	530	25	100	75	105	505	20	79.5	280	380	820	63	292
630	2260	1030	1480	1395	110	165	625	28	116	85	130	590	22	90	300	380	880	70	314
710	2540	1160	1655	1565	120	165	685	32	127	90	130	650	25	95	340	450	1010	80	355

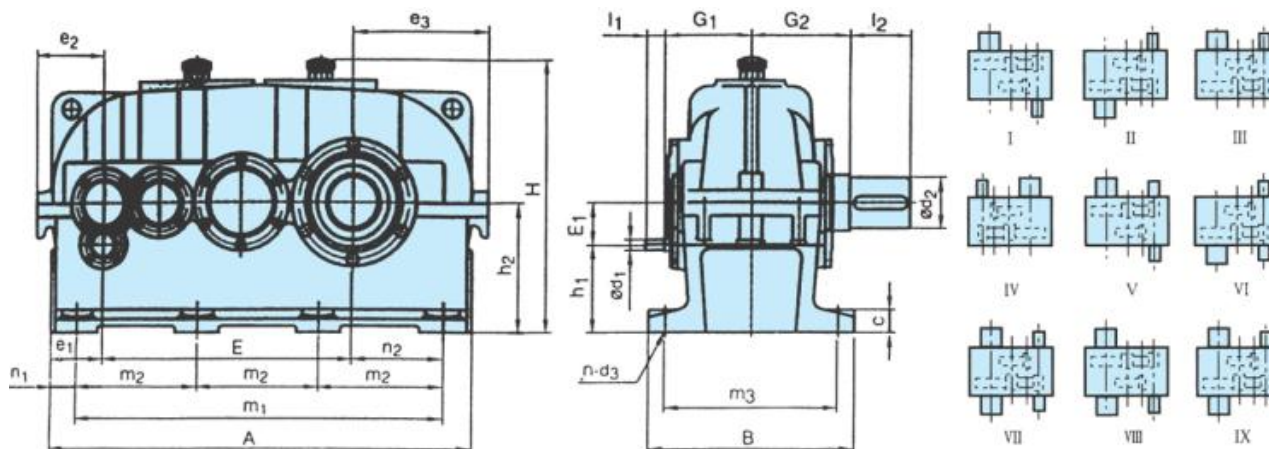
Spec.	C	m	m	m	n	n	e	e	e	h	Foundation bolt hole		Average weight kg	Lubricating oil volume *)
											d ₁	n		
160	32	510	170	245	38	120	83	107	188	180	18.5	8	170	10
180	32	570	190	275	37.5	137.5	85	109	209	200	18.5	8	205	14
200	40	630	210	300	40	150	97.5	128	238	225	24	8	285	19
224	40	705	235	335	43.5	165.5	110.5	141	263	250	24	8	395	26
250	50	810	270	380	60	195	120	158	293	280	28	8	540	36
280	50	855	285	430	35	200	120	160	325	315	28	8	750	53
315	63	960	320	490	40	221	143	189	364	355	35	8	1030	78
355	63	1080	360	520	42.5	252.5	143	188	398	400	35	8	1400	115
400	80	1200	400	590	45	275	155	215	445	450	42	8	1950	160
450	80	1350	450	650	48	313	178	240	505	500	42	8	2636	220
500	100	1500	500	710	59	336	200	277	557	560	48	8	3800	300
560	100	1680	560	790	70	370	235	324	624	630	48	8	5100	450
630	125	1890	630	890	72.5	422.5	255	344	694	710	56	8	7060	520
710	125	2130	710	1000	92.5	472.5	297.5	400	780	800	56	8	9205	820

*) The volume of lubricating oil foresaid is only a reference value, which must reach the center line of oil leveler.

GUOMAO REDUCER

ZFY cylindrical gear reducer

Type of assembly



Spec.	A	B	C	i=112~280 i=315~500						d _k	l ₂	E	E _k	e	e _k	e
				d _k	l ₁	d _k	l ₁	d _k	l ₁							
180	665	320	32	16k6	30	14k6	30	-	-	85r6	140	395	63	85	109	209
200	745	355	40	19k6	35	16k6	30	-	-	90r6	160	440	70	97.5	128	238
225	840	390	40	22k6	35	19k6	35	-	-	100r6	180	497	80	110.5	141	263
250	930	450	50	24k6	40	22k6	35	-	-	110n6	180	555	90	120	158	293
280	1025	500	50	28r6	50	24k6	40	-	-	130n6	210	620	100	120	160	325
320	1160	570	63	32r6	60	28r6	50	-	-	140n6	240	705	112	140	189	364
				i=100~140		i=160~250		i=280~500								
360	1280	600	63	38r6	60	32r6	60	28r6	50	170n6	270	790	125	140	188	398
400	1420	690	80	42r6	70	38r6	60	32r6	60	180n6	310	880	140	155	215	445
450	1610	750	80	48r6	80	42r6	70	38r6	60	210n6	350	995	160	175	240	505
				i=100~160		i=180~250		i=280~500								
500	1790	830	100	48r6	80	42r6	70	38r6	60	240n6	400	1110	180	200	277	557
560	2010	910	100	60r6	105	55r6	90	48r6	80	270n6	450	1240	200	235	324	624
630	2260	1030	125	65r6	105	60r6	105	48r6	80	300n6	500	1400	225	255	344	694
710	2540	1160	125	75r6	120	65r6	105	55r6	90	340n6	550	1570	250	295	400	780
800	2850	1320	160	80r6	140	70r6	120	65r6	105	390n6	650	1760	280	335	448	868

Spec.	G1	G2	h1	h2	H	m	m	m	n	n _k	n-d _k	Average weight kg	Lubricating oil volume *)
180	145	155	137	200	415	570	190	275	47.5	137.5	8-Φ 18	205	16
200	160	170	155	225	462	630	210	300	57.5	50	8-Φ 24	290	21
225	170	190	170	250	511	705	235	335	67.5	165	8-Φ 24	400	29
250	190	215	190	280	570	810	270	380	60	195	8-Φ 28	550	40
280	210	240	215	315	644	855	285	430	85	200	8-Φ 28	760	58
320	230	270	243	355	719	960	320	490	100	215	8-Φ 34	1100	82
360	255	290	275	400	806	1080	360	520	100	250	8-Φ 34	1450	140
400	290	320	310	450	906	1200	400	590	110	275	8-Φ 40	2000	185
450	32	360	340	500	1006	1350	450	650	130	310	8-Φ 40	2700	260
500	355	400	380	560	1121	1500	500	710	145	335	8-Φ 48	3900	360
560	400	440	430	630	1261	1680	560	790	165	370	8-Φ 48	5200	530
630	450	500	485	710	1406	1890	630	890	185	420	8-Φ 54	7300	570
710	500	560	550	800	1581	2130	710	1000	205	470	8-Φ 54	11000	900
800	575	645	620	900	1783	2400	800	1140	225	530	8-Φ 62	14000	1200

*) The volume of lubricating oil foresaid is only a reference value, which must reach the center line of oil leveler.

GUOMAO REDUCER

IV. Carrying Capacity of Reducer

1. Nominal input power of ZDY reducer P_1

Nominal transmission ratio i	Nominal rotary speed r/min		Spec.												
			80	100	125	160	200	250	280	315	355	400	450	500	560
	Input n1 **)	Output n2	Nominal input power P_1 (kW *)												
1.25	1500	1200	57	103	205	360	633	1121	-	-	-	-	-	-	-
	1000	800	40	69	140	260	446	807	-	-	-	-	-	-	-
	750	600	31	52	105	190	348	636	-	-	-	-	-	-	-
1.4	1500	1070	53	96	194	326	616	1109	-	-	-	-	-	-	-
	1000	715	37	65	132	240	433	794	-	-	-	-	-	-	-
	750	535	29	48	102	180	337	624	-	-	-	-	-	-	-
1.8	1500	940	49	92	180	310	587	1068	1473	1996	2766	-	-	-	-
	1000	625	34	63	125	217	410	760	1051	1430	1992	-	-	-	-
	750	470	27	50	98	168	319	595	824	1124	1569	-	-	-	-
1.8	1500	835	45	87	173	290	557	1024	1411	1925	2663	-	-	-	-
	1000	555	31	62	120	206	389	726	1002	1372	1906	-	-	-	-
	750	415	24	48	95	160	302	567	784	1074	1497	-	-	-	-
2	1500	750	39	80	158	278	526	970	1339	1827	2536	-	-	-	-
	1000	500	27	55	110	194	367	684	946	1296	1806	2547	3578	4793	-
	750	375	21	43	85	150	284	534	738	1013	1414	1999	2821	3775	5169
2.24	1500	670	36	70	141	264	484	914	1236	1711	2377				
	1000	445	25	49	98	183	337	645	874	1207	1683	2402	3397	4512	
	750	335	19	38	76	142	262	503	682	941	1314	1878	2667	3538	4833
2.5	1500	600	32	64	127	245	447	855	1154	1617	2264				
	1000	400	22	45	88	170	311	601	812	1136	1596	2235	3182	4353	
	750	300	17	35	68	132	241	468	633	884	1243	1742	2492	3406	4645
2.8	1500	535	27	53	115	224	409	789	1063	1489	2068				
	1000	360	19	37	80	155	284	552	746	1048	1456	2049	2945	4000	
	750	270	15	29	62	120	220	429	580	816	1134	1593	2296	3118	4232
3.15	1500	475	23	47	96	203	375	709	990	1359	1924	2658	3790	5036	6666
	1000	315	16	33	67	140	260	496	695	952	1352	1817	2681	3607	4807
	750	235	13	25	52	109	202	385	540	740	1052	1458	2084	2802	3747
3.55	1500	425	20	41	85	179	337	639	898	1210	1730	2410	3407	4460	6119
	1000	280	14	28	59	124	234	446	628	845	1210	1694	2396	3196	4395
	750	210	11	22	46	96	181	346	488	655	940	1312	1856	2483	3419
4	1500	375	17	34	69	155	300	570	774	1095	1555	2146	2981	3985	5651
	1000	250	12	24	48	107	208	396	539	764	1088	1501	2090	2838	4033
	750	187	9	18	37	83	161	307	418	590	844	1160	1618	2199	3128
4.5	1500	335	14	29	55	137	260	495	703	997	1367	1878	2619	3635	4912
	1000	220	9.5	20	38	95	180	344	488	694	953	1311	1832	2582	3485
	750	166	7	15	30	73	139	266	378	536	738	1015	1416	1997	2694
5	1500	300	11	25	48	121	229	451	608	864	1179	1680	2340	3149	4400
	1000	200	8	17	33	84	159	313	422	599	820	1168	1629	2231	3125
	750	150	6	13	26	65	123	242	326	462	633	900	1257	1724	2418
5.6	1500	270	10	20	40	109	211	389	531	779	1031	1564	2038	2791	3778
	1000	180	7	14	27	75	146	270	368	540	716	1088	1417	1969	2670
	750	134	5	11	21	59	113	208	285	416	554	838	1092	1519	2061

) P_1 is a calculated power or power measured from bench test. When select an auxiliary motor, please take working condition factor KA and safety factor SA into consideration. See P14-15.

) n1 is the rotary speed of input shaft.



GUOMAO REDUCER

2. Nominal input power of ZLY reducer P_1

Nominal transmission ratio i	Nominal rotary speed r/min		Spec.																
			112	125	140	160	180	200	224	250	280	315	355	400	450	500	560	630	710
	Input n1	Output n2	Nominal input power P _{1kW} *)																
6.3	1500	240	37.4	54	73	114	157	221	305	424	578	791	1156	1650	2192	3132	4310	-	-
	1000	160	26.4	37.4	50	78	109	153	211	294	400	548	802	1146	1558	2181	3000	4347	6229
	750	120	19.5	28.6	38.5	60	84	119	163	227	308	422	618	884	1213	1685	2320	3357	4884
7.1	1500	210	34	49	66	104	143	201	277	385	525	719	1051	1500	1993	2847	3817	-	-
	1000	140	24	34	45.5	71	99	139	192	267	364	498	729	1042	1416	1983	2731	3952	5663
	750	106	17.7	26	35	54.5	76	108	148	206	280	384	562	804	1103	1532	2109	3052	4440
8	1500	185	32	43	61	94.5	130	181.5	250	347	469	678	932	1309	1869	2489	3520	-	-
	1000	125	21.5	29.5	42.4	64	93	126	173	241	325	470	646	908	1298	1730	2447	3398	5019
	750	94	17	23	33	49	69	97	133	186	251	362	498	700	1000	1333	1887	2619	3881
9	1500	167	29	38.5	56	81	119	165.5	227	315	423	612	841	1182	1689	2248	3183	-	-
	1000	111	20	27	38.5	55	82.5	115	157	218	293	424	583	819	1172	1561	2210	3068	4537
	750	83	15	20.5	30	42	64	88	121	168	226	327	449	631	903	1202	1703	2363	3502
10	1500	150	26	35	50	73	109	149	204	284	383	555	762	1070	1530	2038	2883	-	-
	1000	100	18	24	35	50	75	103	142	197	266	384	528	742	1061	1414	2001	2777	4112
	750	75	14	18.5	26.6	38	58	80	109	152	204	296	407	571	817	1088	1541	2139	3172
11.2	1500	134	23	31.5	45	66	96	133	184	255	346	500	688	966	1381	1839	2604	-	-
	1000	89	16	22	31	45	67	92	127	177	240	347	477	669	957	1275	1806	2506	3711
	750	67	12	17	24	35	51	71	98	136	185	267	367	516	737	982	1391	1930	2862
12.5	1500	120	21	28	40	59	83	116.5	165	229	311	450	618	869	1242	1654	2341	-	-
	1000	80	14	19.5	28	40	57	81	114	159	216	312	428	601	860	1146	1621	2251	3338
	750	60	11	15	21	31	44	63	88	122	166	240	330	463	663	882	1249	1734	2573
14	1500	107	18.5	25	36	52.5	74	105	148	206	279	404	555	779	1115	1485	2162	2918	4318
	1000	71	12.5	17.5	25	36	51	73	102	142	193	280	384	540	772	1028	1455	2020	2996
	750	54	9.8	13	19	27.6	39	56	79	110	149	216	296	416	594	792	1120	1555	2310
16	1500	94	16	22	31	47.5	70.5	98	133	185	251	362	498	700	1000	1333	1887	2619	3879
	1000	62	11	15	21.5	32	49	68	92	128	174	251	345	484	693	923	1306	1812	2690
	750	47	8	11.5	17	25	38	53	71	99	134	193	266	373	533	711	1005	1395	2073
18	1500	83	14	19.5	28	42.5	60.5	86	115	161	225	326	448	629	899	1197	1697	2353	3487
	1000	56	10	13.5	19.6	29	42	59.5	80	111	156	226	310	435	622	829	1175	1628	2417
	750	42	7.5	10.5	15	22	32	46	61	86	120	174	239	335	479	638	905	1252	1861
20	1500	75	13	18	25.5	38	59	77	103	142	205	296	418	587	839	1120	1580	2200	3260
	1000	50	9	12	18	26.5	41	53.5	72	95	142	205	279	392	560	746	1050	1460	2170
	750	38	6.8	9.5	14	20	32	41	55	76	109	158	210	295	420	562	735	1120	1635

) P_1 is a calculated power or power measured from bench test. When select an auxiliary motor, please take working condition factor KA and safety factor SA into consideration. See P14-15.

) n1 is the rotary speed of input shaft.

GUOMAO REDUCER

3. Nominal input power of ZSY reducer P_1

Nominal transmission ratio i	Nominal rotary speed r/min		Spec.													
	Input n_1^{**}	Output n_2	160	180	200	224	250	280	315	355	400	450	500	560	630	710
			Nominal input power $P_1(kW)$													
22.4	1500	67	34	51	68	98	131	182	270	400	530	780	1065	1450	1865	
	1000	44	24	35	48	68	91	128	185	262	355	540	750	1025	1325	1905
	750	33	18	27	37	52	70	97	135	215	275	415	580	800	1030	1485
25	1500	60	32	46	63	96	115	157	240	365	470	705	1020	1405	1865	
	1000	40	22	31	43	66	80	108	163	250	315	465	705	975	1325	1905
	750	30	16	24	33	51	60	84	122	195	240	350	540	750	1030	1485
28	1500	54	29	42	59	86	113	142	220	325	425	625	945	1260	1800	
	1000	36	20	29	41	60	75	98	148	215	280	420	650	870	1245	1760
	750	27	15	22	31	46	56	76	114	160	210	310	500	670	960	1355
31.5	1500	48	26	37	51	79	95	127	197	290	395	560	840	1140	1600	
	1000	32	17	26	35	55	63	86	132	195	270	370	585	790	1110	1565
	750	24	14	20	27	42	49	65	100	145	200	280	450	605	855	1200
35.5	1500	42	23	34	47	70	88	117	178	275	350	510	755	1025	1450	
	1000	28	15	23	32	48	59	80	118	180	235	340	520	710	1000	1410
	750	21	12	18	25	37	44	61	90	140	175	255	405	545	750	1090
40	1500	38	21	30	42	64	79	107	158	235	325	465	675	930	1300	
	1000	25	17	21	29	40	53	71	108	160	210	315	465	640	900	1315
	750	19	11	16	22	31	41	55	80	125	155	235	360	465	680	1015
45	1500	33	17	24	34	46	70	96	142	215	280	410	615	850	1130	
	1000	22	12	16	24	32	47	64	95	145	185	280	425	590	770	1150
	750	17	9	12	18	25	36	50	74	110	140	210	320	450	600	885
50	1500	30	15	22	32	46	63	85	128	195	245	360	540	750	1030	1490
	1000	20	11	15	22	31	43	59	85	130	165	240	370	520	710	1030
	750	15	8	12	17	24	32	43	65	95	125	180	290	400	550	795
56	1500	27	15	21	31	43	56	76	112	170	220	310	480	675	955	1340
	1000	18	10	15	22	30	38	52	77	115	145	210	330	470	660	930
	750	13.4	8	11	17	23	28	40	58	90	110	160	255	360	510	715
63	1500	24	12	17	23	37	45	61	102	145	195	280	425	605	860	1170
	1000	16	8	12	16	25	30	42	70	100	130	190	290	420	600	810
	750	12	6	9	12	20	23	32	52	75	100	140	225	325	460	620
71	1500	21	11	17	23	33	40	56	90	130	185	245	390	540	770	1045
	1000	14	8	11	15	23	27	38	60	90	115	170	270	370	540	725
	750	10.6	6	9	12	18	21	29	45	65	90	125	210	285	410	555
80	1500	18.8	9	13	18	26	36	51	80	115	155	225	340	470	675	960
	1000	12.5	6	9	12	18	24	34	54	80	100	150	240	330	470	665
	750	9.4	4	7	10	14	19	27	42	60	80	110	185	250	360	510
90	1500	16.7	8	12	18	25	33	46	74	105	140	200	305	395	590	765
	1000	11.1	6	8	12	17	22	30	49	70	95	130	200	278	405	530
	750	8.3	4	6	9	13	17	23	37	55	70	100	160	210	300	405
100	1500	15	8	11	16	4	30	43	60							
	1000	10	5	7	11	16	21	29	40							
	750	7.5	4	6	8	13	16	22	30							

) P_1 is a calculated power or power measured from bench test. When select an auxiliary motor, please take working condition factor K_A and safety factor S_A into consideration. See P14-15.

) n_1 is the rotary speed of input shaft.

GUOMAO REDUCER

4. Nominal input power of ZFY reducer P_1

Nominal transmission ratio i	Nominal rotary speed r/min		Spec.													
	Input n_1^{**}	Output n_2	180	200	225	250	280	320	360	400	450	500	560	630	710	800
			Nominal input power $P_1(kW)$													
100	1500	15	-	-	-	-	-	-	99	130	190	290	400	540	780	1100
	1000	10	-	-	-	-	-	-	66	87	125	195	265	360	520	750
	750	7.5	-	-	-	-	-	-	50	65	95	145	205	270	400	560
112	1500	13.4	9.2	15	21	29	40	59	88	115	170	255	360	480	690	990
	1000	8.9	6.1	10	14	20	27	40	59	78	115	170	240	320	470	670
	750	6.7	4.6	7.5	11	15	20	29	44	59	85	130	185	245	355	510
125	1500	12	9.2	12	18.5	26	36	52	81	105	150	230	320	430	610	890
	1000	8	6.1	8	12.5	17.5	24	35	54	70	100	155	215	285	410	590
	750	6	4.6	6	9.3	13	18	26.5	41	53	75	115	165	215	310	440
140	1500	10.7	8.4	11	16.5	23	32	46	72	92	135	205	290	380	550	800
	1000	7.1	5.6	7.3	11	16	21.5	31	48	61	90	135	195	255	370	530
	750	5.4	4.2	5.5	8.3	12	16	23	36	46	68	105	145	190	288	400
160	1500	9.4	7.5	9.6	14.5	20	28	41	64	81	120	180	255	340	490	710
	1000	6.3	5	6.4	9.7	14	18.5	27.5	43	54	80	120	170	225	330	470
	750	4.7	3.8	4.8	7.6	10	14	21	32	41	60	92	130	170	250	360
180	1500	8.3	6.6	8.4	13	19	25	37	57	70	105	160	225	300	440	630
	1000	5.6	4.4	5.6	8.7	12.5	17	25	38	47	70	105	150	200	295	420
	750	4.2	3.3	4.2	6.5	9.5	13	18.5	29	35	53	82	115	155	220	320
200	1500	7.5	5.6	7.5	12	15.5	22	33	51	64	95	145	205	270	390	560
	1000	5	3.7	5	8	10.5	14.5	22	34	43	63	97	135	180	260	370
	750	3.8	2.8	3.8	6	8	11.5	17	26	32	48	73	105	135	200	280
224	1500	6.7	4.8	6.7	10.5	14	20	29	45	57	83	130	185	240	360	510
	1000	4.5	3.2	4.5	7	9.3	13.5	20	30	38	55	87	125	160	240	340
	750	3.3	2.4	3.4	5.3	7	10.5	15	23	28.5	42	66	94	120	180	255
250	1500	6	4.5	6.1	9.5	12.5	17.5	26	41	51	73	115	165	215	320	450
	1000	4	3	4.1	6.3	8.5	12	17.5	27.5	34	49	77	110	145	215	300
	750	3	2.3	3.1	4.8	6.5	9	13	20.5	25.5	37	58	83	110	160	225
280	1500	5.4	3.9	5.3	8.2	11	15.5	23	37	46	66	100	145	195	280	400
	1000	3.6	2.6	3.5	5.6	7.5	10.5	15.5	24.5	31	44	67	97	130	185	265
	750	2.7	2	2.7	4.2	5.6	8	12	19	23	34	51	73	96	140	200
315	1500	4.8	3.5	4.7	7.5	9.5	13.5	21	32	42	59	92	130	175	250	360
	1000	3.2	2.3	3.1	5.1	6.5	9	14	21.5	28	39	61	87	115	165	240
	750	2.4	1.8	2.4	3.8	5	7	10.5	16.5	21	30	47	66	88	125	180
355	1500	4.2	2.9	4	6.5	8.5	12	18	29	37	52	83	115	155	225	320
	1000	2.8	1.9	2.7	4.5	6	8.5	12	19.5	24.5	35	55	77	105	150	215
	750	2.1	1.5	2	3.3	4.5	6.5	9.5	14.5	18.5	26.5	42	59	78	115	160
400	1500	3.8	2.6	3.6	6	8	11	16.5	26	33	46	72	100	135	195	270
	1000	2.5	1.7	2.4	4	5.3	7.5	11	17.5	22	31	48	68	90	130	180
	750	1.9	1.3	1.8	3	4	6.5	8.3	13.5	16.5	23.5	37	52	68	99	135
450	1500	3.3	2.3	3.2	5	7	10	13.5	21.5	29	40	65	93	125	175	250
	1000	2.2	1.5	2.1	3.5	4.7	6.6	9	14.5	19.5	26.5	44	62	83	115	170
	750	1.7	1.2	1.6	2.6	3.5	5.1	6.8	11	14.5	20	33	47	63	89	125
500	1500	3	2.1	2.9	4.2	6	9.1	12	19.5	26	36	59	82	110	155	225
	1000	2	1.4	1.9	2.8	4	6.1	8	13	17.5	24	39	55	73	105	150
	750	1.5	1.1	1.5	2.1	3	4.6	6	9.6	13	18	30	42	55	79	115

) P_1 is a calculated power or power measured from bench test. When select an auxiliary motor, please take working condition factor K_A and safety factor S_A into consideration. See P14-15.

) n_1 is the rotary speed of input shaft.

V. Lubrication of Reducer Gear

1. The reducer gears usually employ oil bath lubrication and natural cooling.

If the carrying power of reducer exceeds thermal power P_{G1} , the circulating lubrication or the oil bath lubrication with cooling coil may be applied. If the reducer with circulating lubrication is restarted with full load after 24h stop, the gears and bearings shall be fully lubricated before start-up.

The trademark (viscosity) of lubricating oil is selected according to the peripheral speed of high-speed gear v or the lubricating method:

When $V < 2.5\text{m/s}$ or ambient temperature between 35-50 , please select the heavy load EP gear oil L-CKD320 (or VC320, Mo-bil632).

When $V > 2.5\text{m/s}$ or circulating lubrication is applied please select the heavy load EP gear oil L-CKD220 (or VC220, Mobil630).

2. Bearing lubrication

The bearing usually employs splash lubrication with lubricating oil in the same quality with gear oil.

3. For large reducer (center distance of last stage $a \geq 400$), the forced lubrication is recommended, see Appendix D.

The bearing usually employs splash lubrication with lubricating oil in the same quality with gear oil.

VI. Installation, Operation and Maintenance

1 The axial lines of input shaft and output shaft shall be coaxial with that of connecting part, with the deviation no more than the allowed value of the coupling used. If a triangle belt is used to input the drive, the triangle belt wheel shall be cut and processed to minimize the unbalance mass. The high-strength narrow belt is an ideal option to reduce vibrating noise and increase lifetime of bearing.

2. After installation, fill the tank with lubricating oil to the designated level of oil leveler (between the upper limit and lower limit).

3. Before normal operation, turn the reducer by hand, make sure it rotates freely and run it without load for at least 2h. Its operation shall be stable and free of impact, vibration, noise or oil leak. Solve any problem incurred as soon as possible.

4. For new reducer put into service for the first time, the oil shall be changed after 20-day operation. After that, the oil quality shall be checked at regular intervals. Change any oil that is mixed with impurities or aged. Regularly check the oil level and refill the oil when it is below the lowest level allowed (center line of oil leveler). Generally, for the reducer continuously working for long time, the oil shall be changed every three months. For the reducer working no more than 8h per day, the oil may be changed every 6 months.

If the oil heats up quickly with a temperature rise over 70 or to over 100 , or deteriorates or any exceptional noise occurs, stop the machine to find the cause. If it is due to binding problem of tooth flank, solve the cause and replace the lubricating oil before restart.

VII. Accessories

1. Thermal power of reducer

(1) ZDY reducer, see Table A1 for the nominal thermal power $P_{G1} \cdot P_{G2}$ calculated as per the max. allowed balance temperature of lubricating oil.

(2) ZLY reducer, see Table A1 for the nominal thermal power $P_{G1} \cdot P_{G2}$ calculated as per the max. allowed balance temperature of lubricating oil.

(3) ZSY reducer, see Table A1 for the nominal thermal power $P_{G1} \cdot P_{G2}$ calculated as per the max. allowed balance temperature of lubricating oil.

(4) The values of thermal power in the table are calculated when the max. oil temperature $t_{\text{max}}=95$ and ambient temperature $t_{\text{a}}=20$.

GUOMAO REDUCER

Table A1 Thermal Power of ZDY Reducer P_{G1} P_{G2}

Cooling conditions			Spec.												
Without cooling devices	Environmental conditions	Ambient air flow rate w m/s	80	100	125	160	200	250	280	315	356	400	450	500	560
			P_{G1} KW												
	Small room and workshop	≥ 0.5	13	20	31	48	77	115	145	182	228	286	365	440	542
	Large room and workshop	≥ 1.4	18	29	43	68	110	160	210	270	320	415	515	620	770
	Open air	≥ 3.7	24	38	58	92	145	220	275	360	425	550	690	840	1020
Coil cooling	Environmental conditions	Inner dia. of pipe d dm	0.08	0.08	0.08	0.12	0.12	0.15	0.15	0.20	0.20	0.20	0.20	0.20	0.20
		Ambient air flow rate w m/s	P_{G2} KW												
	Small room and workshop	≥ 0.5	-	-	-	73	108	156	192	235	307	376	463	540	660
	Large room and workshop	≥ 1.4	-	-	-	93	141	201	257	323	400	505	613	730	890
	Open air	≥ 3.7	-	-	-	117	176	261	322	413	504	590	788	950	1140

Note: When the circulating lubrication is desired, please contact us.

Table A2 Thermal Power of ZLY Reducer P_{G1} P_{G2}

Cooling conditions			Spec.																
Without cooling devices	Environmental conditions	Ambient air flow rate w m/s	112	125	140	160	180	200	224	250	280	315	355	400	450	500	560	630	710
			P _{G1} kW																
	Small room and workshop	≥ 0.5	16	20	24	30	38	48	60	74	92	115	145	181	22	6276	345	430	540
	Large room and workshop	≥ 1.4	20	28	35	43	54	67	87	105	130	165	210	255	320	405	485	620	760
	Open air	≥ 3.7	30	38	47	57	73	88	115	140	175	220	275	345	420	530	650	810	1000
Coil cooling	Environmental conditions	Inner dia. of pipe d dm	0.08	0.08	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.20	0.20	0.20	0.20	0.20	0.20	0.20
		Ambient air flow rate w m/s	P _{G2} kW																
	Small room and workshop	≥ 0.5	-	-	-	45	56	68	83	99	120	148	196	237	291	347	423	520	640
	Large room and workshop	≥ 1.4	-	-	-	58	72	87	110	130	158	198	251	311	385	476	563	710	860
	Open air	≥ 3.7	-	-	-	72	91	108	148	165	203	253	326	400	485	600	730	900	1100

Note: When the circulating lubrication is desired, please contact us.

GUOMAO REDUCER

Table A3 Thermal Power of ZSY Reducer P_{G1} P_{G2}

Cooling conditions			Spec.													
Without cooling devices	Environmental conditions	Ambient air flow rate w m/s	160	180	200	224	250	280	315	355	400	450	500	560	630	710
			P_{G1} kW													
	Small room and workshop	≥ 0.5	24	30	37	45	56	69	86	110	135	165	208	258	322	400
	Large room and workshop	≥ 1.4	34	42	52	64	80	98	116	155	190	235	300	365	450	570
	Open air	≥ 3.7	46	57	69	87	108	132	162	205	250	310	400	475	600	760
Coil cooling	Environmental conditions	Inner dia. of pipe d dm	0.15	0.15	0.15	0.15	0.15	0.1	0.15	0.20	0.20	0.20	0.20	0.20	0.20	0.20
		Ambient air flow rate w m/s	P_{G2} kW													
	Small room and workshop	≥ 0.5	34	42	50	60	73	88	98	144	172	208	255	310	380	470
	Large room and workshop	≥ 1.4	44	54	65	79	97	117	138	189	227	278	347	417	510	640
	Open air	≥ 3.7	56	69	82	102	125	151	184	239	287	353	447	529	660	830

Note: When the circulating lubrication is desired, please contact us.

2. Selection of reducer

The carrying capacity of reducer depends on both its mechanical strength and allowable power of thermal equilibrium. Therefore, the reducer shall be selected in terms of these two tables of power and the radial load of input and output shaft extensions shall also be checked.

(1) Selection factors of reducer

- a. factor of working condition K_A (Table 1) b. safety factor S_A (Table 2) c. factor of ambient temperature f_1 (Table 3)
d. factor of load rate f_2 (Table 4) e. utilization factor of nominal power f_3 (Table 5)

Table 1 Factor of Working Condition K_A

Prime mover	Daily working hour h	K_A		
		Light impact (uniform) load	Medium impact load	Heavy impact load
Motor	~3	0.8	1	1.5
Steam turbine	>3~10	1	1.25	1.75
Hydraulic engine	>10	1.25	1.5	2
4~6-cylinder piston engine	~3	1	1.25	1.75
	>3~10	1.25	1.5	2.25
	>10	1.5	1.75	2.5
1-3-cylinder piston engine	~3	1.25	1.5	2
	>3~10	1.5	1.75	2.25
	>10	1.75	2	2.5

Note: The loads in table belong to the service machine, as listed in Appendix A.

GUOMAO REDUCER

Table 2 Safety Factor S_A

Consequences arising from reducer failure	General loss	Significant loss	Severe loss
	Stop of single machine, breakdown of main equipment etc.	Stop of whole production line, equipment damaged etc.	Personal injury or death, power failure of factory, stop of steel ladle, failure of hoisting device etc.
Safety Factor K_s	1.1~1.3	1.3~1.5	1.5~1.7

Table 3 Factor of Ambient Temperature f_1

Ambient temperature t°C f1 Cooling condition	10	20	30	40	50
	Without cooling	0.9	1	1.15	1.35
Cooling pipe	0.9	1	1.1	1.2	1.3

Table 4 Factor of Load Rate f_2

Load rate per hour	100%	80%	60%	40%	20%
Factor of load rate f_2	1	0.94	0.86	0.74	0.56

Table 5 Utilization Factor of Nominal Power f_3

P_2/P_1 100%	40%	50%	60%	70%	80%~100%
f_3	1.25	1.15	1.1	1.05	1

Note:

P_1 -nominal power

P_2 -load power

GUOMAO REDUCER

(2) Selection of reducer

The carrying capacity of reducer depends on both its mechanical strength and allowable power of thermal equilibrium. Therefore, the reducer shall be selected in terms of these two tables of power.

First, the reducer is selected according to mechanical strength and nominal allowable power P_1 . If one of the rotary speeds under the three columns (1500, 1000, 750) specified in the table of practical input speed and carrying capacity has a relative error below 4%, the reducer may be selected according to the nominal power under such column; if the relative error is above 4%, the nominal power shall be converted as per the actual rotary speed when selecting the reducer. After that, the allowable power of thermal equilibrium shall be checked.

For instance: the reducer for belt conveyor carrying large piece of materials, motor driven, intermediate speed reduction, input speed $n_1=1200\text{r/min}$, transmission ratio $i=4.5$, load power $P_2=380\text{KW}$, pure torque applied to shaft extension, 24h working per day, max. ambient temperature $t=38^\circ\text{C}$, large factory building, natural ventilation cooling, bath lubrication. The reducer of No.1 type of assembly shall be chosen.

Step 1, select as per the table of mechanical strength while take the factor of working condition K_A and safety factor into consideration S_A .

According to Appendix A, the load of belt conveyer is medium impact, which means that the failure of reducer may result in the stop of whole production line. Refer to Table 1 and 2:

$K_A=1.5$, $S_A=1.5$, the calculated power of mechanical strength P_{2m} is:

$$P_{2m} = P_2 \times K_A \times S_A = 380 \times 1.5 \times 1.5 = 855\text{kW}$$

If $P_{2m} \leq P_1$

As $i=4.5$ and $n_1=1200\text{r/min}$ which is close to nominal speed 1000r/min , refer to the table:

ZDY355, $i=4.5$, $n_1=1000\text{r/min}$, $P_1=953\text{kW}$. When $n_1=1200\text{r/min}$, the nominal power is converted;

$$P_1 = 953 \times 1200 / 1000 = 1143.6\text{kW}$$

$P_{2m} = 855\text{kW} \leq P_1 = 1143.6\text{kW}$, ZDY355 reducer is chosen.

Step 2, check whether the thermal power P_{2t} is qualified. If to reckon in factors f_1 , f_2 and f_3 , it shall be:

$$P_{2t} = P_2 \times f_1 \times f_2 \times f_3 \leq P_{G1}$$

Refer to Table 3, 4 and 5:

$f_1=1.31$

$f_2=1$ (24h working every day)

$f_3=1.25$ ($P_2/P_1=380/1143.6=0.33=33\% \leq 40\%$)

$$P_{2t} = 380 \times 1.31 \times 1.25 = 622.3\text{kW}$$

Refer to A1: ZDY355, $P_{G1}=320\text{KW}$. $P_{G1} < P_{2t}$.

Only when the coil cooling is applied, $P_{G2}=400\text{kW}$. $P_{G2} < P_{2t}$, so it can inferred:

ZDY355-4.5-I reducer, with forced lubrication and cooler.

If no forced lubrication and cooler are applied a larger reducer shall be used. After recalculation as per the steps above, the ZDY500-4.5-I reducer is chosen.

The allowable instantaneous peak load of reducer $P_{2max} \leq 1.8P_1$. The instantaneous peak load during operation is not given in the above example, so it needs not be checked.

GUOMAO REDUCER

3. Allowable radial load of middle part of shaft extension

Stages of reducer	Input shaft	Output shaft
Single stage	$\leq 125\sqrt{T_1}$	$125\sqrt{T_2}$
Two/three-stage	$\sqrt{T_1}$	$\sqrt{T_2}$

Note: (1) T1: for allowable input torque N•m, see Appendix C.

T2: for allowable output torque N•m, see Appendix C.

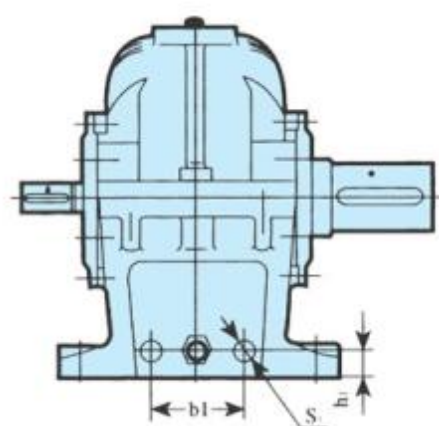
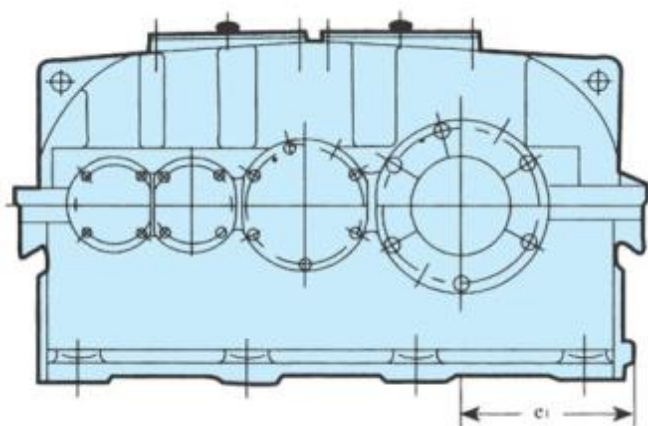
(2) If the input torque and output torque are applied through belt pulley, chain wheel and gear, the user shall check the position and value of radial force. If such force exceeds the values specified in the table, please contact our technology department when making an order.

4. Connecting dimension of cooling coil of reducer

Except the standard design, the coil cooling inside tank and the forced lubrication system with separate circulating cooling may be mounted.

The installing dimensions of coil cooling see the following chart.

The forced lubrication system is to be customized according to the actual operating conditions.



Size of cooling coil (mm)									
ZDY	S ₁	e ₁	h ₁	b ₁	L Z Y S	S ₁	e ₁	h ₁	b ₁
160	KG1/2"	199	33	60	160	KG1/2"	197	33	80
200		237	37	70	180		217	33	90
250		287	60	90	200		240	37	110
280		320	60	110	224		265	54	110
315		350	62	110	250		287	60	140
355	KG3/4"	392	72	130	280	KG3/4"	317	60	140
400		435	80	150	315		350	62	140
450		475	82	170	355		392	72	200
500		538	84	180	400		425	80	200
560		595	84	210	450		283	82	260
					500		525	84	260
					560		575	84	260

Note: (1) The nozzles of water inlet and outlet pipes are optional; (2) Flow rate of cooling water 5-8dm/s.

Appendix A Type of Loads of Reducer

Equipment	Type of load	Equipment	Type of load
Fan		Crane	
Fan (axial and radial)	U	Slewing hoist gear assembly	M
Fan of cooling tower	M	Gear assembly of winch	U
Draught fan	M	Derricking gear assembly	U
Spiral piston blower	M	Steering gear assembly	M
Turbo fan	U	Traveling gear assembly	H
Constructional machinery		Dredge	
Concrete mixer	M	Roller conveyor	H
Winch	M	Roller-type steering wheel	H
Road construction machinery	M	Dredge head	H
Chemical		Mobile windlass	M
Mixer (liquid)	U	Pump	M
Mixer (semi-liquid)	M	Steering gear assembly	M
Centrifugal unit (heavy)	M	Traveling gear assembly (caterpillar)	H
Centrifugal unit (light)	U	Traveling gear assembly (track)	M
Cooling drum*	M	Food machinery	
Drying drum*	M	Filling and packing machines	U
Mixer	M	Sugar cane press	M
Compressor		Sugar cane cutter*	M
Piston compressor	H	Sugar cane crusher	H
Turbo compressor	M	Mixer	M
Transfer conveyor		Paste bucket	M
Apron conveyor	M	Packing machine	U
Counterbalance elevator	M	Sugar beet cutter	M
Trough conveyor	M	Sugar beet cleaner	M
Belt conveyor (large piece)	M	Engine and converter	
Belt conveyor	H	Frequency converter	H
Roller-type flour conveyor (bulk)	U	Engine	H
Chain conveyor	M	Welding engine	H
Ring conveyor	M	Washing machine	
Freight elevator	M	Drum	M
Winch*	H	Washing machine	M
Tilt winch*	H	Metal roll machine (1)	
Rod conveyor	M	Billet shearing machine*	H
Passenger elevator	M	Chain conveyer*	M
Screw conveyor	M	Cold mill*	H
Steel band conveyor	M	Whole-set continuous casting machine*	H
Troughed chain conveyor	M	Cold bed*	M
Windlass transport	M	Material cutter head*	H

GUOMAO REDUCER

Equipment	Type of load	Equipment	Type of load
Cross curve conveyor	M	Suction roller press	H
Deruster*	H	Absorbent paper roller press*	H
Medium and heavy plate mill	H	Willow	H
Bar blooming mill	H	Pumps	
Bar conveying machine*	H	Centrifugal pump (thin liquid)	U
Bar pusher*	H	Centrifugal pump (semi-liquid)	M
Pushing machine*	H	Piston pump	H
Metal roll machine (2)		Plunger pump*	H
Plate shear*	H	Force pump*	H
Plate swinging elevating platform*	M	Plastic industry	
Roller adjusting device*	M	Glazing press*	M
Roller straightener*	M	Extrusion press*	M
Roller way of rolling mill (heavy)*	H	Spiral extruding machine*	M
Roller way of rolling mill (light)*	M	Mixing machine*	M
Sheet mill*	H	Rubber machines	
Trimming shearer*	M	Glazing press*	M
Pipe welder	H	Extrusion press*	H
Pipe welder (bands and wires)	M	Mixing blender	M
Wire drawbench	M	Kneading machine*	H
Metalworking machine tool		Roller press*	H
Line shaft	U	Stone and porcelain clay processing machine tools	
Forging machine	H	Spherical plug machine*	H
Forging hammer	H	Extrusion crusher*	H
Machine tool and auxiliary device	U	Crusher*	H
Machine tool and main gearing	M	Brick press*	H
Metal planer	H	Hammer mill*	H
Plate straightening machine	H	Converter*	H
Punch	H	Cylinder mill*	H
Machine tool of punch	H	Textile machine tools	
Shearing machine	M	Feeder	M
Sheet bending machine	M	Loom	M
Petroleum machinery		Printing and dyeing machine	M
Pump of oil pipeline*	M	Fine bucket	M
Rotor drilling equipment	H	Willow	M
Paper machine		Water treatment	
Glazing press*	H	Blower*	M
Multilayer board machine*	H	Screw pump	M
Drying drum*	H	Timber processing machine	
Glazing drum*	H	Barker	H
Pulp blender*	H	Planer	M
Pulp crusher*	H	Saw bench*	H
Suction roll*	H	Timber processing machine	U
Note: 1. U—steady load, M—medium load, H—heavy load. 2. * only applies to 24h working day.			

GUOMAO REDUCER

Appendix B

Actual Transmission Ratio of Reducer

B1: See Table B1 for the nominal transmission ratio i and actual transmission ratio i' of ZDY reducer Table B1

Spec.	Nominal transmission ratio i													
	1.25	1.4	1.6	1.8	2	2.24	2.5	2.8	3.15	3.55	4	4.5	5	5.6
	Actual transmission ratio i'													
80	1.235	1.375	1.621	1.815	2.04	2.304	2.455	2.8	3.222	3.471	3.905	4.425	5.059	5.5
100	1.235	1.375	1.621	1.815	2.04	2.304	2.455	2.84	3.174	3.511	4.053	4.647	5.063	5.5
125	1.257	1.394	1.633	1.821	2.038	2.292	2.478	2.762	3.158	3.571	4.053	4.647	5.1	5.667
160	1.235	1.375	1.621	1.815	2.04	2.222	2.48	2.783	3.143	3.579	4.059	4.421	5.059	5.438
00	1.235	1.375	1.621	1.815	2.04	2.296	2.542	2.864	3.174	3.571	4.053	4.588	5.111	5.471
250	1.257	1.394	1.633	1.821	2.038	2.2	2.478	2.810	3.174	3.571	4.053	4.389	4.944	5.625
280	-	-	1.621	1.815	2.04	2.269	2.56	2.870	3.091	3.5	3.909	4.45	5.056	5.750
315	-	-	1.586	1.778	2.04	2.304	2.455	2.783	3.143	3.517	4.050	4.368	4.941	5.722
355	-	-	1.586	1.815	2.04	2.261	2.455	2.864	3.095	3.526	3.95	4.44	5.053	5.765
400	-	-	-	-	1.966	2.269	2.542	2.864	3.095	3.571	4.053	4.5	5.111	5.471
450	-	-	-	-	1.966	2.185	2.44	2.739	3.095	3.526	4.053	4.45	5.056	5.75
500	-	-	-	-	2.038	2.292	2.478	2.762	3.158	3.571	4.053	4.450	4.944	5.688
560	-	-	-	-	2.040	2.304	2.455	2.800	3.238	3.500	3.940	4.450	5.060	5.750

B2: See Table B2 for the nominal transmission ratio i and actual transmission ratio i' of ZLY reducer Table B2

Spec.	Nominal transmission ratio i										
	6.3	7.1	8	9	10	11.2	12.5	14	16	18	20
	Actual transmission ratio i'										
112	6.312	7.138	8.126	8.656	9.874	11.363	12.238	13.769	15.849	17.944	19.453
125	6.313	7.218	8.163	8.714	9.783	11.054	12.594	14.496	16.449	18.333	20.690
140	6.612	7.462	8.065	8.591	9.940	11.109	12.500	14.184	16.076	18.377	20.020
160	6.155	7.009	7.911	9.04	10.35	11.118	12.563	14.313	16.474	17.854	20.520
180	6.455	7.227	8.125	8.787	9.792	11.196	12.662	14.368	16.008	18.237	20.912
200	6.475	7.286	8.201	9.143	10.248	11.565	12.500	14.123	16.026	18.034	20.418
224	6.31	7.194	7.836	8.745	9.812	11.083	12.620	14.313	15.590	17.839	20.502
250	6.475	7.286	7.804	8.714	9.783	11.310	12.662	14.107	16.071	18.233	20.690
280	6.305	7.14	7.925	8.871	9.936	11.194	12.407	13.961	15.842	17.936	19.980
315	6.177	7.043	7.960	8.85	9.88	11.093	12.535	14.282	16.413	18.023	20.475
355	6.310	7.188	8.052	8.690	9.789	11.098	12.537	14.107	16.008	17.336	19.531
400	6.314	7.286	8.267	9.306	10.375	11.629	12.526	14.184	15.842	18.034	20.488
450	6.314	7.194	8.267	9.339	9.947	11.277	12.737	14.504	16.413	17.704	20.025
500	6.442	7.286	8.267	9.162	9.947	11.605	12.544	14.291	16.008	18.012	20.476
560	6.365	6.879	7.753	8.951	10.025	11.295	12.209	14.087	15.985	17.75	20.160
630	6.084	6.931	7.978	8.869	9.904	11.118	12.563	14.313	16.449	18.062	20.52
710	6.31	7.081	7.95	8.938	9.665	10.771	12.316	13.929	15.805	17.355	19.283

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B3: See Table B3 for the nominal transmission ratio i and actual transmission ratio i' of ZSY reducer

Table B3

Spec.	Nominal transmission ratio i													
	22.4	25	28	31.5	35.5	40	45	50	56	63	71	80	90	100
	Actual transmission ratio i'													
160	22.416	25.538	27.203	31.032	35.711	38.484	43.275	49.81	56.722	64.222	72.833	83.339	90.345	103.805
180	22.381	25.311	27.595	30.487	35.006	39.881	45.903	52.088	58.319	65.000	72.417	81.725	93.712	102.846
200	22.683	25.598	27.267	31.549	35.258	39.674	45.019	50.866	57.237	64.408	73.086	83.806	90.199	98.263
224	21.667	24.673	26.903	30.343	34.288	39.063	44.962	50.991	58.093	62.976	72.375	83.158	90.580	103.647
250	23.033	25.788	27.888	31.080	35.536	40.189	43.604	50.808	57.171	65.557	74.390	81.640	93.008	101.225
280	22.527	25.349	28.260	31.677	35.745	38.636	43.654	49.536	56.092	63.12	70.497	75.875	85.903	95.693
315	21.618	24.628	27.485	30.839	34.831	39.664	44.983	51.697	58.870	64.124	72.563	83.031	91.173	103.579
355	22.832	25.692	27.520	30.729	34.497	39.881	44.651	50.668	56.449	61.133	69.645	78.461	89.014	99.790
400	22.519	25.50	28.365	31.77	35.795	39.674	44.643	49.861	56.579	64.408	72.92	82.843	92.284	104.718
450	21.793	24.806	27.578	30.794	34.569	39.036	44.503	50.361	57.878	62.428	68.55	77.537	88.089	101.236
500	22.534	25.627	27.707	31.211	35.383	39.927	44.979	50.383	57.171	64.327	69.665	79.198	89.223	101.245
560	22.100	25.5	28.704	32.00	35.87	38.636	43.75	49.645	55.447	61.568	70.088	79.606	90.438	101.923
630	22.266	25.367	28.654	30.522	34.601	39.081	44.504	51.146	57.878	63.553	68.55	77.878	88.089	101.391
710	22.378	25.308	28.048	30.451	35.526	38.4	43.748	49.642	55.606	61.059	68.702	76.335	86.781	97.432



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Appendix C

Nominal input and output torques of ZDY reducer

Nominal transmission ratio	Nominal rotary speed r/min		Nominal input torque T1, nominal output torque T2 (N.M)*																												
			ZDY80		ZDY100		ZDY125		ZDY160		ZDY200		ZDY250		ZDY280		ZDY315		ZDY355		ZDY400		ZDY450		ZDY500		ZDY560				
	Input n1	Output n2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	P1	T1	T2	T1	T2	P1	T1	T2	T1	T2	T1	T2			
1.25	1500	1200	363	454	656	820	1305	1631	2292	2865	4030	5038	7137	8921	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
	1000	800	382	478	659	824	1337	1671	2483	3104	4259	5324	7707	9634	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
	750	600	395	493	662	828	1337	1671	2419	3024	4431	5539	8098	10123	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
1.4	1500	1070	337	472	611	856	1235	1729	2076	2906	3922	5491	7061	9885	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
	1000	715	353	495	621	869	1261	1765	2292	3209	4135	5789	7586	10616	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
	750	535	369	517	611	856	1299	1818	2292	3209	4291	6008	7946	11124	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
1.6	1500	940	312	499	586	937	1146	1834	1974	3158	3737	5980	6800	10879	9378	15005	1996	12708	20333	17610	28176	--	--	--	--	--	--	--			
	1000	625	325	520	602	963	1194	1910	2072	3316	3916	6265	7258	11613	10037	16059	1430	13657	21850	19024	30438	--	--	--	--	--	--	--			
	750	470	344	550	637	1019	1248	1997	2139	3423	4062	6499	7576	12122	10492	16788	1124	14312	22900	19979	31966	--	--	--	--	--	--	--			
1.8	1500	835	287	516	554	997	1101	1983	1846	3323	3546	6383	6519	11735	8983	16170	1925	12256	22061	16954	30518	--	--	--	--	--	--	--			
	1000	555	296	553	592	1066	1146	2063	1967	3541	3715	6687	6933	12480	9569	17224	1372	13103	23585	18202	32764	--	--	--	--	--	--	--			
	750	415	306	550	611	1100	1210	2177	2037	3667	3845	6922	7220	12996	9983	17969	1074	13676	24616	19062	34311	--	--	--	--	--	--	--			
2	1500	750	248	497	509	1006	1006	2012	1770	3540	3349	6698	6176	12351	8525	17050	1827	11632	23264	16082	32164	--	--	--	--	--	--	--			
	1000	500	258	516	525	1051	1051	2101	1853	3705	3505	7010	6532	13064	9034	18069	1296	12377	24754	17247	34495	24324	48648	3578	34170	68340	45773	91546			
	750	375	267	535	548	1095	1082	2165	1910	3820	3616	7233	6800	13599	9397	18794	1013	12899	25798	18005	36010	25454	50908	2821	35921	71841	48068	96137	65819	131637	
2.24	1500	670	229	513	446	998	898	2011	1681	3765	3081	6902	5819	13035	7869	17627	1711	10893	24401	15134	33899	--	--	--	--	--	--	--			
	1000	445	239	535	468	1048	936	2096	1748	3915	3218	7209	6160	13798	8347	18697	1207	11527	25820	16073	36003	22939	51384	3397	32441	72669	43090	96521	--	--	
	750	335	242	542	484	1084	868	2168	1808	4050	3336	7473	6405	14347	8694	19452	941	11982	26840	16732	37479	23913	53566	2667	33960	76070	45051	100913	61540	137850	
2.5	1500	600	204	509	407	1019	809	2021	1560	3900	2846	7115	5444	13609	7347	18368	1617	10295	25737	14414	36035	--	--	--	--	--	--	--			
	1000	400	210	525	430	1074	840	2101	1624	4059	2970	7425	5740	14349	7755	19387	1136	10849	27122	15242	38105	21344	53361	3182	30388	75970	41571	103928	--	--	
	750	300	216	541	446	1114	866	2165	1681	4202	3069	7672	5959	14898	8060	20151	844	11256	28141	15828	39569	22181	55454	2492	31731	79329	43370	108424	59146	147866	
2.8	1500	535	172	481	337	945	732	2050	1426	3993	2604	7291	5023	14065	6768	18950	1489	9480	26544	13166	36866	--	--	--	--	--	--	--			
	1000	360	181	508	353	989	764	2139	1480	4145	2712	7594	5272	14760	7124	19948	1048	10008	28024	13905	38933	19568	54790	2945	28125	78749	38200	106960	--	--	
	750	270	191	535	369	1034	789	2211	1528	4278	2801	7844	5463	15295	7385	20679	816	10390	29093	14440	40431	20284	56796	2296	29236	81860	39703	111167	53887	150885	
3.15	1500	475	146	461	299	943	611	1925	1292	4071	2388	7521	4514	14219	6303	19854	1359	8652	27255	12249	38586	16923	53306	3790	24130	76008	32063	100997	42440	133687	
	1000	315	153	481	315	993	640	2016	1337	4212	2483	7821	4737	14921	6637	20907	952	9092	28639	12912	40672	17352	54660	2681	25604	80651	34447	108508	45907	144607	
	750	235	166	521	318	1003	662	2086	1388	4372	2572	8102	4902	15422	6876	21659	740	9423	29681	13395	42196	18565	58480	2084	26536	83589	35679	112388	47712	150292	
3.55	1500	425	127	452	261	927	541	1921	1140	4046	2146	7617	4068	14442	5717	20296	1210	7704	27348	11014	39101	15344	54470	3407	21691	77004	28395	100803	38958	138300	
	1000	280	134	475	267	949	563	2000	1184	4204	2235	7933	4259	15121	5997	21291	845	8070	28648	11556	41022	16178	57431	2396	22882	81230	30522	108352	41972	149001	
	750	210	140	497	280	994	586	2079	1222	4340	2305	8182	4406	15640	6214	22059	655	8340	29608	11969	42491	16706	59307	1856	23633	83897	31617	112240	43535	154550	
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	1000	250	115	458	229	917	458	1834	1022	4087	1986	7946	2782	15127	5147	20590	764	7296	29185	10390	41562	14335	57338	2090	19960	79838	27103	108412	38515	154061	
	750	187	115	458	229	917	471	1885	1057	4227	2050	8200	3909	15637	5353	21290	590	7513	30051	10747	42988	14771	59083	1618	20603	82410	28001	112002	39830	159319	
4.5	1500	335	89	401	185	831	350	1576	872	3925	1655	7449	3152	14182	4476	20141	997	6348	28564	8703	39165	11957	83805	2619	16674	75034	23143	104143	31273	140729	
	1000	220	91	408	191	860	363	1633	907	4083	1719	7736	3285	14783	4660	20972	694	6628	29825	9101	40955	12520	56340	1832	17496	78730	24658	110961	33282	149768	
	750	166	89	401	191	860	382	1719	930	4183	1770	7965	3387	15242	4813	21659	536	6825	30713	9397	42287	12924	58160	1416	18030	81137	25428	114428	34304	154366	
5	1500	300	70	350	159	796	306	1528	770	3852	1458	7290	2871	14357	3871	19355	864	5501	27504	7506	37532	10696	53480	2340	14898	74490	20049	100243	28013	140067	
	1000	200	76	382	162	812	315	1576	802	4011	1518	7592	2989	14946	4030	20151	599	5720	28602	7831	39155	11154	55772	1629	15557	77785	221306	106530	29844	149219	
	750	150	76	382	166	828	331	1655	828	4138	1566	7831	3081	15407	4151	20755	462	5883	29414	8060	40301	11460	57300	1257	16006	80029	21952	109761	30789	153946	
5.6	1500	270	64	357	127	713	255	1426	694	3886	1343	7523	2477	13869	3381	18932	779	4960	27774	6564	36759	9957	55762	2038	12975	72661	17769	99508	24053	134698	
	1000	180	67	374	134	749	258	1444	716	4011	1394	7808	2579	14440	3514	19681	540	5157	28879	6838	38292	10390	58186	1417	13532	75781	18804	105302	25499	142792	
	750	134	64	357	140	784	267	1497	751	4207	1439	8058	2649	14832	3629	20322	416	5297	29664	7054	39504	10671	59755	1092	13905	77867	1934	108315	26243	146963	



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Appendix C

Nominal input and output torques of ZLY reducer

Nominal transmission ratio	Nominal rotary speed r/min		Nominal input torque T1, nominal output torque T2 (N.M)*																																	
			ZLY112		ZLY125		ZLY140		ZLY160		ZLY180		ZLY200		ZLY224		ZLY250		ZLY280		ZLY315		ZLY355		ZLY400		ZLY450		ZLY500		ZLY560		ZLY630		ZLY710	
	Input n1	Output n2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2		
6.3	1500	240	238	1500	344	2166	465	2928	726	4573	1000	6297	1407	8864	1942	12234	2699	17007	3680	23184	5036	31727	7360	46367	10505	66182	13956	87921	19940	125625	27440	172874	--	--	--	--
	1000	160	252	1588	357	2250	478	3008	745	4693	1041	6558	1461	9205	2015	12695	2808	17689	3820	24066	5233	32970	7659	48252	10944	68949	14879	93737	20829	131220	28650	180495	41514	261537	59487	374768
	750	120	248	1564	364	2294	490	3088	764	4813	1070	6738	1515	9546	2076	13076	2890	18210	3922	24708	5373	33853	7869	49576	11256	70914	15446	97307	21456	135171	29541	186110	42746	269299	62190	391794
7.1	1500	210	216	1537	312	2215	420	2983	662	4701	910	6464	1280	9086	1764	12521	2451	17403	3343	23732	4578	32501	6691	57509	9550	67805	12689	90090	18126	128694	24302	172541	--	--	--	--
	1000	140	229	1627	325	2305	435	3085	678	4814	945	6713	1327	9425	1834	13019	2550	18104	3476	24681	4756	33767	6962	49430	9951	70653	13523	96012	18938	134457	26081	185175	37742	267965	54082	383980
	750	106	225	1600	331	2351	446	6164	694	4927	968	6871	1375	9764	1885	13380	2623	18624	3565	25314	4890	34716	7156	50809	10238	72687	14045	99719	19507	138503	26855	190668	38862	275921	56536	401406
8	1500	185	204	2630	274	2190	388	3107	602	4813	828	6621	1156	9244	1592	12733	2209	17674	2986	23888	4317	34533	5934	47470	8334	66672	11899	95194	15847	126773	22411	179285	--	--	--	--
	1000	125	205	1643	282	2254	405	3239	611	4890	888	7105	1203	9626	1652	13217	2302	18412	3104	24830	4489	35908	6169	49354	8671	69371	12396	99167	16522	132172	23369	186951	32451	259607	47931	383452
	750	94	216	1732	293	2343	420	3362	624	4991	879	7029	1235	9881	1694	13548	2368	18947	3196	25565	4609	36876	6341	50730	8913	71307	12733	101867	16974	135788	24028	192222	33349	266789	49418	395345
9	1500	167	185	1162	245	2206	357	3209	516	4641	758	6819	1054	9483	1445	13007	2006	18050	2693	24238	3896	35068	5354	48189	7525	67729	10753	96780	14312	128810	20265	182386	--	--	--	--
	1000	111	191	1719	258	2321	368	3309	525	4727	788	7091	1098	9884	1499	13494	2082	18737	2798	25183	4049	36443	5568	50109	7821	70393	11193	100733	14908	134168	21106	189950	29299	263695	43328	389955
	750	83	191	1719	261	2349	382	3438	535	4813	815	7334	1121	10085	1541	13867	2139	19253	2878	25900	4164	37474	5717	51455	8035	72313	11498	103484	15305	137749	21685	195164	30089	270800	44592	401329
10	1500	150	166	1655	223	2228	318	3183	465	4648	694	6940	949	9486	1299	12988	1808	18081	2438	24384	3534	35335	4851	48514	6812	68123	9741	97410	12975	129753	18355	183551	--	--	--	--
	1000	100	172	1719	229	2292	334	3343	478	4775	716	7163	984	9837	1356	13561	1881	18814	2540	25403	3667	36672	5042	50424	7086	70861	10133	101326	13504	135037	19110	191096	26520	265204	39270	392696
	750	75	178	1783	236	2356	339	3387	484	4839	739	7385	1019	10187	1388	13875	1935	19355	2598	25976	3769	37691	5182	51825	7271	72707	10403	104031	13854	138539	19622	196221	27237	272366	40390	403901
11.2	1500	134	146	1640	201	2246	287	3209	420	4706	611	6845	847	9484	1171	13120	1624	18183	2203	24672	3183	35653	4380	49059	6150	68882	8792	98475	11708	131133	16579	185683	--	--	--	--
	1000	89	153	1711	210	2353	296	3316	430	4813	640	7166	879	9840	1213	13584	1690	18932	2292	25670	3314	37115	4555	51020	6389	71556	9139	102361	12176	136374	17247	193170	23932	268042	35440	396929
	750	67	153	1711	216	2424	306	3423	446	4991	649	7273	904	10126	1248	13976	1732	19395	2356	26383	3400	38078	4673	52339	6570	73588	9384	105106	12504	140046	17712	198375	24575	275244	36443	408159
12.5	1500	120	134	1671	178	2228	255	3183	376	4695	528	6605	742	9271	1051	13131	1458	18225	1980	24750	2865	35813	3935	49183	5533	69158	7907	98843	10530	131631	14904	186305	--	--	--	--
	1000	80	134	1671	186	2328	267	3343	382	4775	544	6804	774	9669	1089	13605	1518	18981	2063	25785	2980	37245	4087	51093	5740	71744	8213	102663	10944	136804	15481	196507	21497	268713	31878	398474
	750	60	140	1751	191	2388	267	334	395	4934	560	7003	802	10028	1121	14007	1553	19418	2114	26422	3056	38200	4202	52525	5896	73694	8442	105528	11231	140385	15904	198795	22080	275995	32763	409536
14	1500	107	118	1649	159	2228	229	3209	334	4680	471	6596	669	9359	942	13192	1312	18361	1776	24868	2572	36010	3534	49469	4960	69435	7099	99384	9455	132363	13765	192706	18578	260091	27491	384878
	1000	71	119	1671	167	2340	239	3343	344	4813	487	6819	697	9760	974	13637	1356	18985	1843	25804	2674	37436	3667	51341	5157	72198	7373	103216	9817	137444	13895	194534	19291	270074	28612	400565
	750	54	125	1747	166	2317	242	3387	351	4920	497	6952	713	9983	1006	14083	1401	19609	1897	26562	2750	38506	3769	52767	5297	74159	7564	105890	10085	141187	14261	199659	19800	277205	29414	411796
16	1500	94	102	1630	140	2241	197	3158	302	4839	449	7182	624	9983	847	13548	1478	18845	1598	25565	2305	36876	3171	50730	4457	71307	6367	101867	8487	135788	12014	192222	16674	266789	24696	395141
	1000	62	105	1681	143	2292	205	3285	306	4890	468	7487	649	10390	879	14058	1222	19558	1662	26587	2397	38353	3295	52716	4622	73955	6618	105890	8815	141034	12472	199557	17305	276874	25690	411032
	750	47	102	1630	146	2343	216	3463	318	5093	484	7742	675	10798	904	14465	1261	20170	1706	27300	2458	39321	3387	54193	4750	75993	6787	108590	9053	144854	12797	204752	17763	284208	26396	422339
18	1500	83	89	1604	124	2235	178	3209	271	4871	385	6933	548	9856	732	13179	1025	18451	1433	25785	2076	37360	2852	51341	4005	72083	5724	103025	7621	137176	10804	194476	14981	269654	22201	399610
	1000	56	96	1719	129	2321	187	3369	277	4985	401	7220	568	10228	764	13752	1060	19081	1490	26816	2158	38849	2961	53289	4154	74777	5940	106922	7917	142505	11221	201983	15547	279853	23082	415482
	750	42	96	1719	134	2407	191	3438	280	5042	407	7334	586	10543	777	13981	1095	19711	1528	27504	2216	39881	3043	54779	4266	76782	6099	109787	8124	146230	11524	207426	15942	286958	23697	426541
20	1500	75	83	1655	115	2292	162	3247	242	4839	376	7513	490	9805	656	13115	904	18081	1305	26103	1885	37691	2661	53225	3737	74745	5342	106833	7131	142613	10059	201187	14007	280133	20755	415107
	1000	50	86	1719	115	2292	172	3438	253	5062	392	7831	511	10219	688	13752	907	18145	1356	27122	1958	39155	2664	53289	3744	74872	5348	106960	7124	142486	10028	20				

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Appendix C

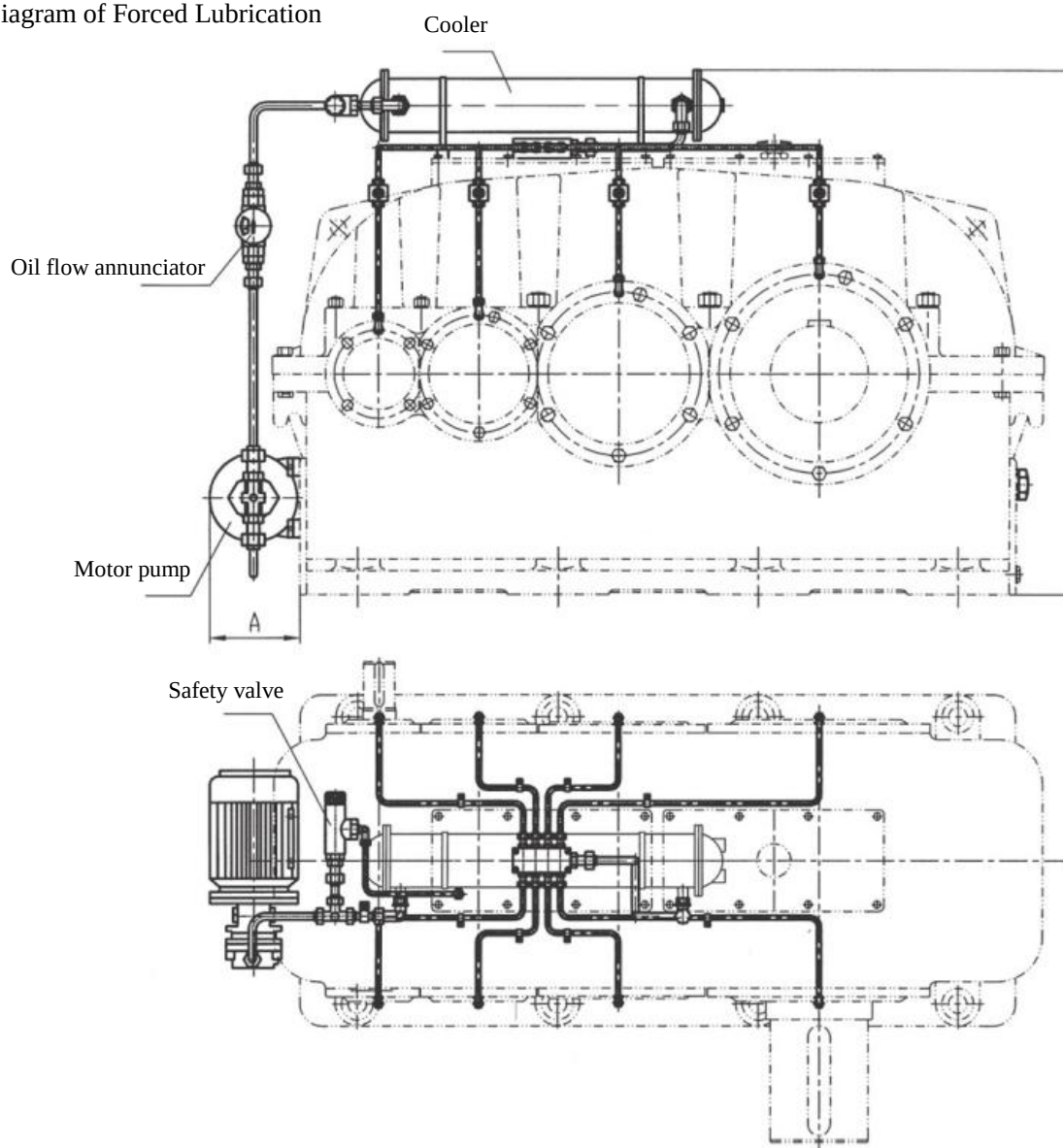
Nominal input and output torques of ZSY reducer

Nominal transmission ratio	Nominal rotary speed		Nominal input torque T1, nominal output torque T2 (N.M)*																											
	Input n1	Output n2	ZSY160		ZSY180		ZSY200		ZSY224		ZSY250		ZSY280		ZSY315		ZSY355		ZSY400		ZSY450		ZSY500		ZSY560		ZSY630		ZSY710	
			T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
22.4	1500	67	216	4849	325	7273	433	9698	624	13976	834	18682	1159	25956	1719	38506	2547	57045	3374	75585	4966	111238	6781	151883	9232	206789	11874	265974		
	1000	44	229	5134	334	7487	458	10268	649	14547	869	19467	1222	27382	1767	39575	2502	56047	3390	75942	5157	11517	7163	160440	9789	219268	12654	283444	18193	407518
	750	33	229	5134	344	7701	471	10553	662	14832	891	19966	1235	27667	1719	38506	2738	61324	3592	78437	5284	118369	7385	165431	10187	228181	13115	293783	18909	423562
25	1500	60	204	5093	293	7322	401	10028	611	15280	732	18304	1000	24989	1528	38200	2324	58096	2992	74808	4489	112213	6494	162350	8945	223629	11874	296846		
	1000	40	210	5253	296	7401	411	10266	630	15758	764	19100	1031	25785	1557	38916	2388	59688	3008	75206	4441	111019	6733	168319	9311	232781	12654	316344	18193	454819
	750	30	204	5093	306	7640	420	10505	649	16235	764	19100	1070	26740	1553	38837	2483	62075	3056	76400	4457	111417	6876	171900	9550	238750	13115	327883	18909	472725
28	1500	54	185	5170	267	7487	376	10518	548	15331	719	20144	904	25314	1401	39219	2069	57937	2706	75763	3979	111417	6017	168462	8022	224616	11460	320880		
	1000	36	191	5348	277	7755	392	10963	573	16044	716	20055	936	26205	141	39575	2053	57491	2674	74872	4011	112308	6208	173810	8309	232638	11890	332913	16808	470624
	750	27	191	5348	280	7844	395	11053	586	16401	713	19966	968	27097	1452	40645	2037	57045	2674	74872	3947	110525	6367	178267	8531	238877	12224	342272	17254	483103
31.5	1500	48	166	5214	236	7420	325	10228	503	15843	605	19052	809	25470	1254	39508	1846	58160	2515	79217	3565	112308	5348	168462	7258	228627	10187	320880		
	1000	32	162	5114	248	7821	334	10529	525	16545	602	18952	821	25871	1261	39709	1862	58661	2579	81223	3534	111305	5587	175983	7545	237652	10601	333916	14946	470791
	750	24	178	5615	255	8022	344	10830	535	16846	624	19654	828	26072	1273	40110	1846	58160	2547	80220	3565	112308	5730	180495	7704	242666	10887	342941	15280	481320
35.5	1500	42	146	5198	216	7685	299	10623	446	15821	560	19889	745	26444	1133	40231	1751	62155	2228	79106	3247	115269	4807	170643	6526	231667	9232	327724		
	1000	28	143	5085	220	7798	306	10849	458	16273	563	20002	764	27122	1127	40005	1719	61025	2244	79671	3247	115269	4966	176293	6781	240708	9550	339025	13466	478025
	750	21	153	5424	229	8137	318	11301	471	16725	560	19889	777	27574	1146	40683	1783	63285	2228	79106	3247	115269	5157	183074	6940	246358	9550	339025	13879	492716
40	1500	38	134	5348	191	7640	267	10696	407	16299	503	20119	681	27249	1006	40237	1496	59847	2069	82767	2961	118420	4298	171900	5921	236840	8277	331067		
	1000	25	138	5539	201	8022	277	11078	382	15280	506	20246	678	27122	1031	41256	1528	61120	2006	80220	3008	120330	4364	174574	6112	244480	8595	343800	12558	502330
	750	19	140	5603	204	8149	280	11205	395	15789	522	20883	700	28013	1019	40747	1592	63667	1974	78947	2992	119693	4584	183360	5921	236840	8659	346347	12924	516973
45	1500	33	108	4871	153	6876	216	9741	293	13179	446	20055	611	27504	904	40683	1369	61598	1783	80220	2610	117465	3916	176198	5412	243525	7194	323745		
	1000	22	115	5157	153	6876	229	10314	306	13752	449	20198	611	27504	907	40826	1385	62314	1767	79504	2674	120330	4059	182644	5635	253553	7354	330908	10983	494213
	750	17	115	5157	153	6876	229	10314	318	1435	458	20628	637	28650	942	42402	1401	63030	1783	80220	2674	120330	4075	183360	5730	257850	7640	343800	11269	507105
50	1500	30	96	4775	140	7003	204	10187	293	14643	401	20055	541	27058	815	40747	1242	62075	1560	77992	2292	114600	3438	171900	4775	238750	6558	327883	9486	474317
	1000	20	105	5253	143	7163	210	10505	296	14803	411	20533	563	28173	812	40588	142	62075	1576	78788	2292	114600	3534	176675	4966	248300	6781	339025	9837	491825
	750	15	102	5093	153	7640	216	10823	306	15280	407	20373	548	27377	828	41383	1210	60483	1592	79583	2292	114600	3693	184633	5093	254677	7003	350167	10123	506150
56	1500	27	96	5348	134	7487	197	11053	274	15331	357	19966	484	27097	713	39932	1082	60611	1401	78437	1974	110525	3056	171136	4298	240660	6080	340489	8531	477755
	1000	18	96	5348	143	8022	210	11766	287	6044	363	20322	497	27810	735	41180	1098	61502	1385	77546	2006	112308	3152	176484	4489	251356	6303	352968	8882	497364
	750	13.4	102	5705	140	7844	216	12122	293	16401	357	19966	509	28523	739	41358	1146	64176	1401	78437	2037	114091	3247	181832	4584	256704	6494	363664	9104	509843
63	1500	24	76	4813	108	6819	146	9225	236	14841	287	18050	388	24467	649	40912	923	58160	1242	78215	1783	112308	2706	170468	3852	242666	5475	344946	7449	469287
	1000	16	76	4813	115	7220	153	9626	239	15041	287	18050	401	25269	669	42116	955	60165	1242	78215	1815	114314	2770	174479	4011	252693	5730	360990	7736	487337
	750	12	76	4813	115	7220	153	9626	255	16044	293	18451	407	25670	662	41714	955	60165	1273	80220	1783	112308	2865	180495	4138	260715	5857	369012	7895	497364
71	1500	21	70	4972	108	7685	146	10397	210	14917	255	18081	357	25314	573	40683	828	58764	1178	83626	1560	110748	483	176293	3438	244098	4902	348066	6653	472375
	1000	14	76	5424	105	7459	143	10171	220	15595	258	18307	363	25766	573	40683	860	61025	1098	77976	1624	115269	2579	183074	3534	250879	5157	36647	6924	491586
	750	10.6	76	5424	115	8137	153	10849	229	16273	267	18985	369	26218	573	40683	828	58764	1146	81366	1592	113008	2674	189854	3629	257659	5221	370667	7067	501757
80	1500	18.8	57	4584	83	6621	115	9168	166	13243	229	18336	325	25976	509	40747	732	58573	987	78947	1433	114600	2165	173173	2992	239387	4295	343800	6112	488960
	1000	12.5	57	4584	86	6876	115	9168	172	13752	229	18336	325	25976	516	41256	764	61120	955	76400	1433	114600	2292	183360	3152	252120	4489	359080	6351	508060
	750	9.4	51	4075	89	7131	127	10187	178	14261	242	19355	344	27504	535	42784	764	61120	1019	81493	1401	112053	2356	188453	3183	254667	4584	366720	6494	519520
90	1500	16.7	51	4584	76	6876	115	10314	159	14325	210	18909	293	26358	471	42402	669	60165	891	80220	1273	114600	1942	174765	5215	226335	3756	338070	4871	438345
	1000	11.1	57	5157	76	6876	115	10314	162	14612	210	18909	287	25785	468	42116	669	60165	907	81653	1242	111735	1910	171900	2655	238941	3868	348098	5062	455535
	750	8.3	51	4584	76	6876	115	10314</																						

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Appendix D

Diagram of Forced Lubrication



	A	H		A	H		A	H
ZDY315	155	930	ZLY315	155	900	ZSY315	155	900
ZDY355	155	1080	ZLY355	155	1000	ZSY355	155	1000
ZDY400	155	1130	ZLY400	155	1150	ZSY400	155	1100
ZDY450	155	1330	ZLY450	155	1250	ZSY450	205	1185
ZDY500	155	1450	ZLY500	205	1450	ZSY500	205	1400
ZDY560	205	1580	ZLY560	205	1550	ZSY560	205	1520
			ZLY630	20	1650	ZSY630	205	1600
			ZLY710	205	1780	ZSY710	205	1720

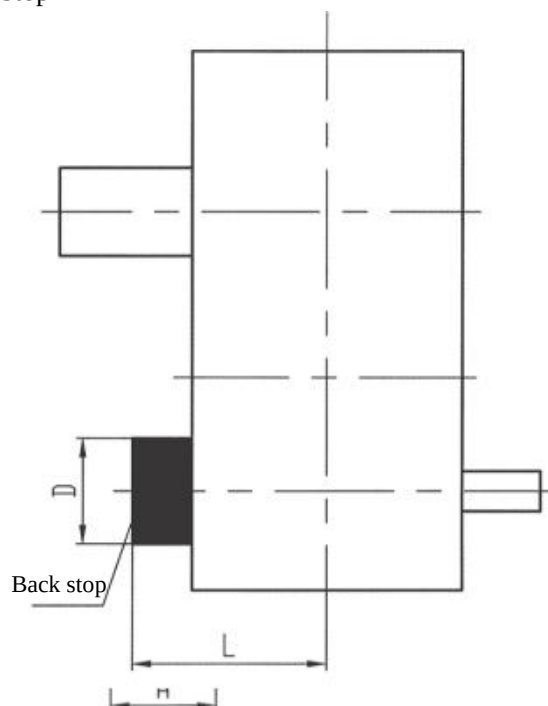
Note:

1. For large reducer (center distance of last stage $a_1 \geq 400$), the forced lubrication is recommended.
2. Oil cooler is recommended for ZDY and ZLY reducers. No cooler is required when the transmission ratio of ZSY reducer is >40 .
3. Oil flow annunciator and safety valve may be provided in the lubrication system for important workplace.
4. Oil cooler, oil flow annunciator and safety valve are not within the scope of supply. Please prescribe in the order if required.

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Appendix E

Installing Dimensions of Back Stop



	i	D	L			i	D	L
ZLY112		Φ 90	155		ZSY160	22.4-71	Φ 90	173
ZLY125	6.3-11.2	Φ 100	180		ZSY180	80-100	Φ 68	168
	12.5-20	Φ 90	173			22.4-71	Φ 100	193
ZLY140	6.3-11.2	Φ 110	189		ZSY200	80-100	Φ 90	186
	12.5-20	Φ 100	182			22.4-71	Φ 110	213
ZLY160	6.3-11.2	Φ 125	193		ZSY224	80-100	Φ 90	199
	12.5-20	Φ 100	193			22.4-71	Φ 125	219
ZLY180	6.3-11.2	Φ 130	196		ZSY250	80-100	Φ 100	215
	12.5-20	Φ 110	203			22.4-71	Φ 130	236
ZLY200	6.3-11.2	Φ 150	221		ZSY280	80-100	Φ 110	243
	12.5-20	Φ 125	213			22.4-71	Φ 150	269
ZLY224	6.3-11.2	Φ 160	236		ZSY315	80-100	Φ 110	269
	12.5-20	Φ 130	226			22.4-71	Φ 150	286
ZLY250	6.3-11.2	Φ 175	272		ZSY355	80-100	Φ 125	282
	12.5-20	Φ 160	249			22.4-71	Φ 190	342
ZLY280	6.3-11.2	Φ 190	298		ZSY400	80-100	Φ 150	314
	12.5-20	Φ 175	299			22.4-71	Φ 190	368
ZLY315	6.3-11.2	Φ 210	333		ZSY450	80-100	Φ 160	345
	12.5-20	Φ 175	319			22.4-71	Φ 190	403
						80-100	Φ 175	403

Note:

1. When the back stop is equipped, the operating direction of output shaft shall be stated.
2. If the type of assembly is V, VI and VII, the back stop is installed on shaft II, and please contact us then.