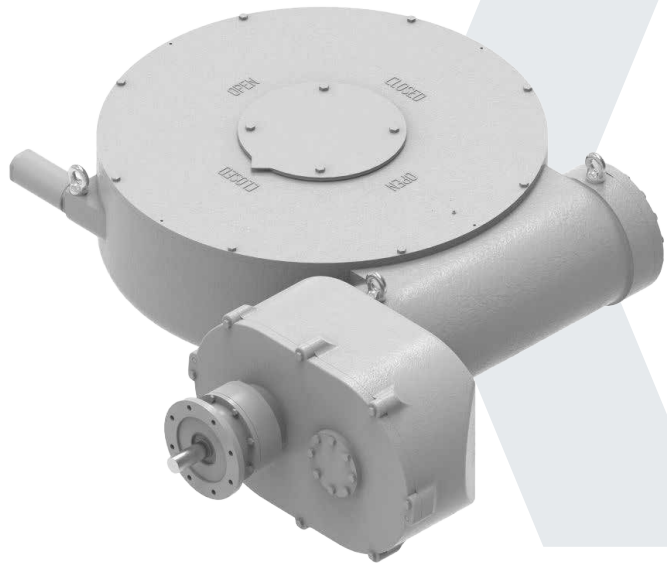




Keeping the World Flowing
for Future Generations

IW Sizes 14-17

Quarter-turn worm gearboxes



The IW14 and above large worm gearbox operators have been designed for very high torques in isolating duty motorised applications with low or no maintenance requirements.

The gearbox input can be from either the left or right side and caters for both clockwise and anti-clockwise valve operating directions. Gearbox input and output flanges are designed with reference to ISO 5211. MSS SP-101 and non-standard options are also available.

Application

The IW series gearboxes are quarter-turn operators intended for the operation of quarter-turn ball, butterfly and plug valves and any other quarter-turn device requiring a reduction for its operation. They are used mainly for motorised applications but can also be used manually or with power tools.

Features

- Heat treated and ground worm gear supported by taper roller bearings. Ground shims used to minimise backlash and improve accuracy in the gear system
- Ductile iron housing
- Grease filled for life and fully sealed with o-rings
- Comprehensive gear ratio with combination spur and planetary gear reducers
- Adjustable mechanical stops at 0° and 90° +/- 5°

Environmental specification

- IP67 enclosure
- -40 to +80 °C (-40 to 176 °F)

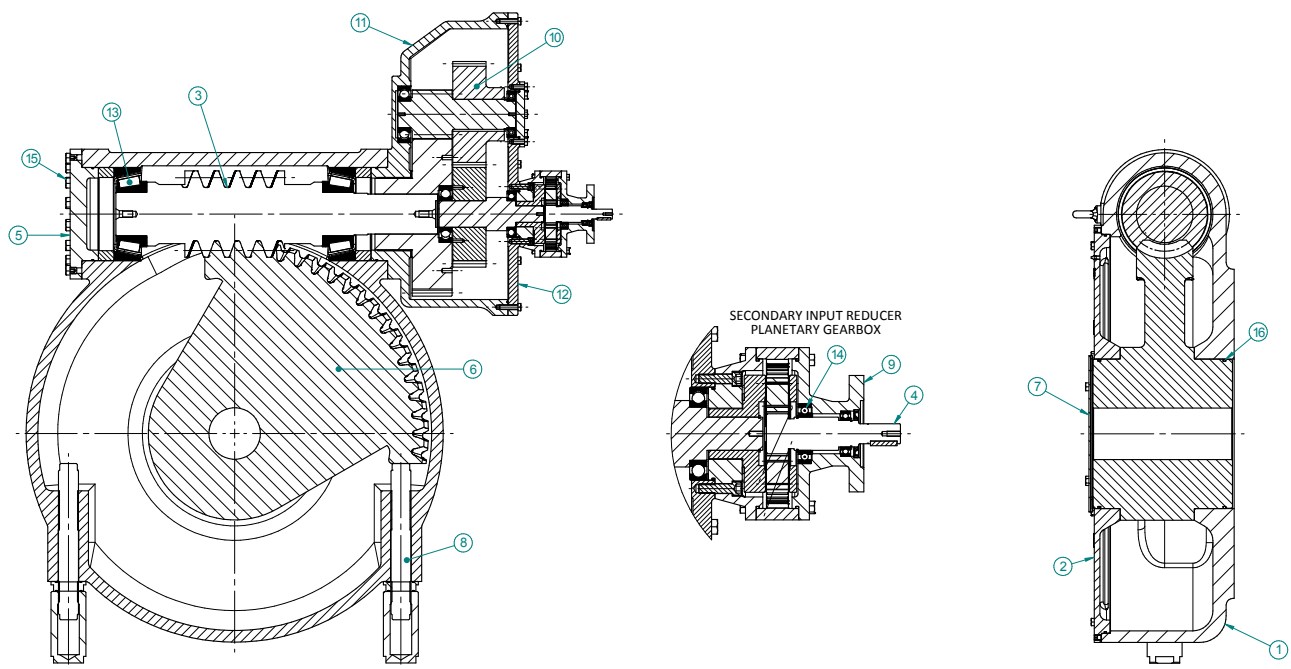
Options

- IP68 enclosure (1.1 metres for 40 minutes)
- High and low temperature
- Padlockable kits
- Limit switches
- All types of environments
- Flexible extensions
- Stainless steel fasteners

Material Specification

No.	Component	Material	UK Standard	USA Standard	DIN Standard	ISO / EN Standard
1	Body	SG Iron	BS1563 EN-GJS-400-15	ASTM A536 65-45-12	GGG40	ISO 1083 JS 400-15
2	Cover Plate	SG Iron	BS1563 EN-GJS-400-15	ASTM A536 65-45-12	GGG40	ISO 1083 JS 400-15
3	Worm Shaft	Alloy Steel	BS970 815M17	AISI 4317	17CrNiMo6	EN10084 17NiCrMo6-4
4	Input Shaft	Alloy Steel	BS970 605M36T	AISI 9840	1.651	39NiCrMo3 (1.6510)
		Carbon Steel	BS970 080M46	AISI 1045	C45	ISO 683 C45 E4
5	End Cap	SG Iron	BS1563 EN-GJS-400-15	ASTM A536 65-45-12	GGG40	ISO 1083 JS 400-15
			BS1563 EN-GJS-500-7	ASTM A536 70-50-05	GGG50	ISO 1083 JS 500-7
6	Quadrant	SG Iron	BS1563 EN-GJS-600-3	ASTM A536 80-60-03	GGG60	ISO 1083 JS 600-3
7	Position Indicator	Mild Steel	BS4360 43A(B)	ASTM A529	ST44-2	EN 1.0044 S275JR
8	Stop Bolts	Carbon Steel	BS970 080M46	AISI 1045	C45	ISO 683 C45 E4
9	Input Flange	Carbon Steel	BS970 080M46	AISI 1045	C45	ISO 683 C45 E4
		SG Iron	BS1563 EN-GJS-450-10	ASTM A536 65-45-12	GGG40	ISO 1083 JS 450-10
			BS1563 EN-GJS-400-15	ASTM A536 65-45-12	GGG40	ISO 1083 JS 400-15
10	Reducer Gearing	Carbon Steel	BS970 080M46	AISI 1045	C45	ISO 683 C45 E4
		Alloy Steel	BS970 605M36T	AISI 9840	1.651	39NiCrMo3 (1.6510)
11	Reducer Gearcase	SG Iron	BS1563 EN-GJS-400-15	ASTM A536 65-45-12	GGG40	ISO 1083 JS 400-15
12	Reducer Cover	SG Iron	BS1563 EN-GJS-400-15	ASTM A536 65-45-12	GGG40	ISO 1083 JS 400-15
13	Tapered Roller Bearings	-	-	-	-	-
14	Radial Ball Bearings	-	-	-	-	-
15	Fasteners	Protected Steel				
16	Seals	Nitrile Rubber	-	-	-	-
17	Grease	Renolit CLX2	-	-	-	-

Gearbox IW Series Sizes 14 - 17



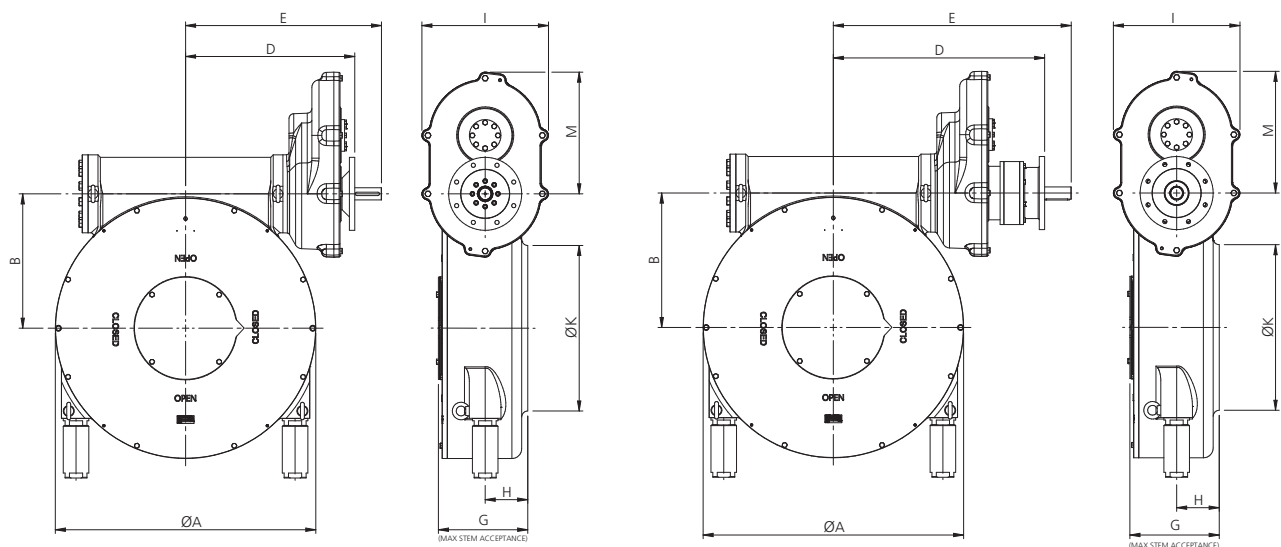
Standard Input/Output Options

Gearbox Model	Ratio :1	Input Mounting Details					Output Mounting Details					
		Shaft Diameter					Min Bore Rectangle key BS 4235	Max Bore Rectangle key BS 4235	Min Square Bore A/F	Max Square Bore A/F	ISO Flange Standard Baseplate	Max Thread Depth
		F10 / FA10	F14 / FA14	F16 / FA16	F25 / FA25	F30 / FA30						
IW14	320 to 1280	-	30	40	50	-	145	350	130	247	F/FA 48 - 60	54
IW14 R1	2400 to 9600	20	30	40	-	-						
IW14 R2	1536 to 6144	20	30	40	-	-						
IW14 R3	1600 to 6400	-	30	40	50	-						
IW15	272 to 1088	-	30	40	50	-	155	350	130	247	F/FA 48 - 60	54
IW15 R1	2040 to 8160	20	30	40	-	-						
IW15 R2	1306 to 5222	20	30	40	-	-						
IW15 R3	1360 to 5440	-	30	40	50	-						
IW16	248 to 992	-	-	-	50	60	185	380	160	268	F/FA60 or Larger	54 (F/FA60), 52 (F/FA80)
IW16 R1	1860 to 7440	20	30	40	-	-						
IW16 R2	1190 to 4762	20	30	40	-	-						
IW16 R3	1240 to 4960	-	30	40	50	-						
IW17	220 to 880	-	-	-	50	60	185	380	160	268	F/FA60 or Larger	54 (F/FA60), 52 (F/FA80)
IW17 R1	1650 to 6600	20	30	40	-	-						
IW17 R2	1056 to 4224	20	30	40	-	-						
IW17 R3	1100 to 4400	-	30	40	50	-						

Manual Input Options are also available

*All dimensions are in mm

Dimensional Drawings



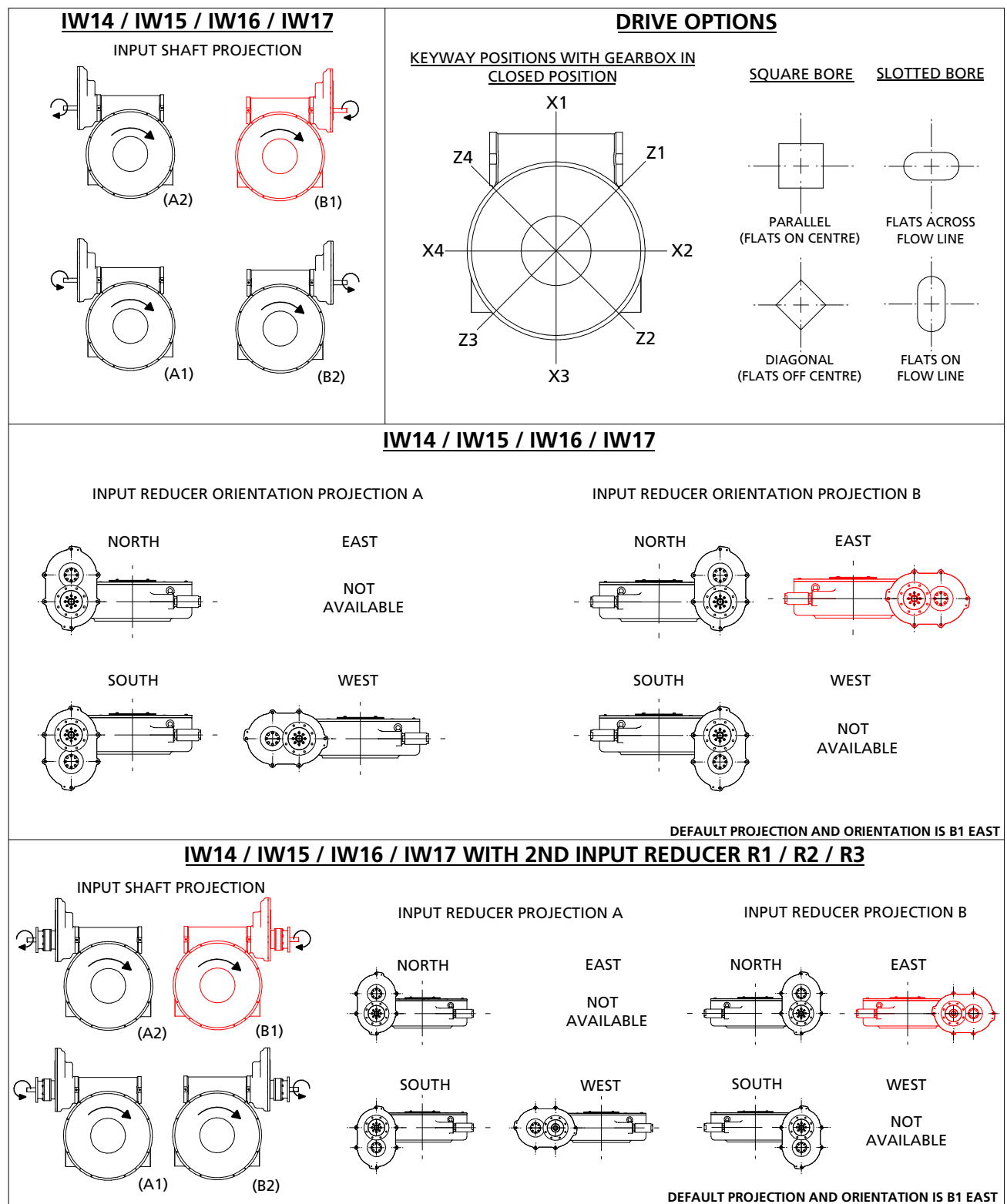
IW Sizes 14 - 17 Quarter-turn Worm Gearboxes

Dimension Table

Gearbox Model	Ratio :1	ØA	B	Input										G	H	I	ØK	M	Weight (kg)	
				F10 / FA10		F14 / FA14		F16 / FA16		F25 / FA25		F30 / FA30								
				D	E	D	E	D	E	D	E	D	E							
IW14	320, 480, 640, 809, 960, 1280	1070	552	-	-	749	809	749	809	749	809	-	-	355	175	520	680	500	1920	
	All other IW14 ratios								695	805										
IW14 R1	2400 to 9600			825	879	825	879	841	930	-	-									1940
IW14 R2	1536 to 6144																			
IW14 R3	1600 to 6400			-	-	862	917	862	951	868	977									
IW15	272, 408, 544, 688, 816, 983, 1088	1070	552	-	-	749	809	749	809	749	809	-	-	355	175	520	680	500	1920	
	All other IW15 ratios								695	805										
IW15 R1	2040 to 8160			825	879	825	879	841	930	-	-									1940
IW15 R2	1306 to 5222																			
IW15 R3	1360 to 5440			-	-	862	917	862	951	868	977									
IW16	248 to 992	1255	660	-	-	-	-	-	-	935	1044	1002	1125	425	209	610	750	605	3000	
IW16 R1	1860 to 7440			1081	1135	1081	1135	1098	1186	-	-	-	-						3180	
IW16 R2	1190 to 4762							1081	1170	1086	1195									3200
IW16 R3	1240 to 4960			-	-															
IW17	220 to 880	1255	660	-	-	-	-	-	-	935	1044	1002	1125	425	209	610	750	605	3000	
IW17 R1	1650 to 6600			1081	1135	1081	1135	1098	1186	-	-	-	-						3180	
IW17 R2	1056 to 4224							1081	1170	1086	1195									3200
IW17 R3	1100 to 4400			-	-															

*All dimensions are in mm

Drive and Orientation Options



A1 = Anticlockwise in, clockwise out A2 = Clockwise in, clockwise out B1= Clockwise in, clockwise out B2= Anticlockwise in, clockwise out

IW Sizes 14 - 17 Quarter-turn Worm Gearboxes

Sizing Chart - Ratios

Gearbox	Ratio :1																			Rated Output Torque	
																				7000 Cycles (Nm)	1000 Cycles (Nm)
IW14	320	342	366	391	418	448	480	515	553	594	640	691	747	809	880	960	1051	1157	1280	250,000	300,000
IW14 R1	2400	2566	2743	2933	3138	3360	3600	3861	4145	4457	4800	5179	5600	6071	6600	7200	7886	8677	9600	250,000	300,000
IW14 R2	1536	1642	1755	1877	2009	2150	2304	2471	2653	2853	3072	3315	3584	3885	4224	4608	5047	5553	6144	250,000	300,000
IW14 R3	1600	1710	1829	1956	2092	2240	2400	2574	2764	2971	3200	3453	3733	4047	4400	4800	5257	5785	6400	250,000	300,000
IW15	272	291	311	332	356	381	408	438	470	505	544	587	635	688	748	816	894	983	1088	300,000	360,000
IW15 R1	2040	2181	2331	2493	2668	2856	3060	3282	3524	3789	4080	4402	4760	5160	5610	6120	6703	7375	8160	300,000	360,000
IW15 R2	1306	1396	1492	1596	1707	1828	1958	2100	2255	2425	2611	2817	3046	3302	3590	3917	4290	4720	5222	300,000	360,000
IW15 R3	1360	1454	1554	1662	1778	1904	2040	2188	2349	2526	2720	2935	3173	3440	3740	4080	4469	4917	5440	300,000	360,000
IW16	248	265	283	303	324	347	372	399	428	461	496	535	579	627	682	744	815	897	992	500,000	600,000
IW16 R1	1860	1988	2126	2273	2432	2604	2790	2992	3213	3454	3720	4014	4340	4705	5115	5580	6111	6725	7440	500,000	600,000
IW16 R2	1190	1272	1360	1455	1557	1667	1786	1915	2056	2211	2381	2569	2778	3011	3274	3571	3911	4304	4762	500,000	600,000
IW16 R3	1240	1326	1417	1516	1622	1736	1860	1995	2142	2303	2480	2676	2893	3136	3410	3720	4074	4483	4960	500,000	600,000
IW17	220	235	251	269	288	308	330	354	380	409	440	475	513	556	605	660	723	795	880	750,000	850,000
IW17 R1	1650	1764	1886	2017	2158	2310	2475	2654	2850	3064	3300	3561	3850	4174	4538	4950	5421	5965	6600	750,000	850,000
IW17 R2	1056	1129	1207	1291	1381	1478	1584	1699	1824	1961	2112	2279	2464	2671	2904	3168	3470	3818	4224	750,000	850,000
IW17 R3	1100	1176	1257	1344	1438	1540	1650	1770	1900	2043	2200	2374	2567	2782	3025	3300	3614	3977	4400	750,000	850,000

Sizing Chart - Maximum Input Torques (7000 cycles)

Gearbox	Max. Input Torque (Nm)																			Rated Output Torque (Nm)
IW14	2340	2189	2047	1914	1789	1671	1560	1454	1355	1260	1170	1084	1003	925	851	780	712	647	585	250,000
IW14 R1	328	307	287	269	251	235	219	204	190	177	164	152	141	130	119	109	100	91	82	250,000
IW14 R2	513	480	449	420	392	367	342	319	297	276	257	238	220	203	187	171	156	142	128	250,000
IW14 R3	493	461	431	403	377	352	328	306	285	265	246	228	211	195	179	164	150	136	123	250,000
IW15	3134	2931	2742	2564	2396	2238	2089	1948	1814	1687	1567	1452	1343	1239	1139	1045	954	867	783	300,000
IW15 R1	440	411	385	360	336	314	293	273	255	237	220	204	188	174	160	147	134	122	110	300,000
IW15 R2	687	643	601	562	525	491	458	427	398	370	344	318	294	272	250	229	209	190	172	300,000
IW15 R3	660	617	577	540	504	471	440	410	382	355	330	306	283	261	240	220	201	182	165	300,000
IW16	5585	5225	4887	4569	4271	3989	3723	3472	3233	3007	2792	2588	2394	2208	2031	1862	1700	1545	1396	500,000
IW16 R1	784	733	686	641	599	560	522	487	454	422	392	363	336	310	285	261	239	217	196	500,000
IW16 R2	1225	1146	1071	1002	936	875	816	761	709	659	612	567	525	484	445	408	373	339	306	500,000
IW16 R3	1176	1100	1029	962	899	840	784	731	681	633	588	545	504	465	427	392	358	325	294	500,000
IW17	9213	8619	8061	7538	7045	6581	6142	5727	5334	4961	4607	4270	3948	3642	3350	3071	2804	2548	2303	750,000
IW17 R1	1287	1204	1126	1053	984	919	858	800	745	693	644	596	552	509	468	429	392	356	322	750,000
IW17 R2	2011	1881	1760	1645	1538	1436	1341	1250	1164	1083	1005	932	862	795	731	670	612	556	503	750,000
IW17 R3	1931	1806	1689	1580	1476	1379	1287	1200	1118	1040	965	895	827	763	702	644	588	534	483	750,000

IW Sizes 14 - 17 Quarter-turn Worm Gearboxes

Sizing Chart - Maximum Input Torques (1000 cycles)

Gearbox	Max. Input Torque (Nm)																				Rated Output Torque (Nm)
IW14	2808	2626	2457	2297	2147	2005	1872	1745	1625	1512	1404	1301	1203	1110	1021	936	854	777	702	300,000	
IW14 R1	394	369	345	322	301	281	263	245	228	212	197	183	169	156	143	131	120	109	99	300,000	
IW14 R2	616	576	539	504	471	440	411	383	356	332	308	285	264	243	224	205	187	170	154	300,000	
IW14 R3	591	553	517	484	452	422	394	367	342	318	296	274	253	234	215	197	180	164	148	300,000	
IW15	3134	2931	2742	2564	2396	2238	2089	1948	1814	1687	1567	1452	1343	1239	1139	1045	954	867	783	360,000	
IW15 R1	528	494	462	432	404	377	352	328	305	284	264	245	226	209	192	176	161	146	132	360,000	
IW15 R2	824	771	721	675	630	589	550	513	477	444	412	382	353	326	300	275	251	228	206	360,000	
IW15 R3	791	740	693	648	605	565	528	492	458	426	396	367	339	313	288	264	241	219	198	360,000	
IW16	6702	6269	5864	5483	5125	4787	4468	4166	3880	3609	3351	3106	2872	2650	2437	2234	2040	1854	1675	600,000	
IW16 R1	940	880	823	769	719	672	627	585	544	506	470	436	403	372	342	313	286	260	235	600,000	
IW16 R2	1469	1375	1286	1202	1124	1050	980	913	851	791	735	681	630	581	534	490	447	406	367	600,000	
IW16 R3	1411	1320	1234	1154	1079	1008	940	877	817	760	705	654	605	558	513	470	429	390	353	600,000	
IW17	10442	9768	9136	8543	7985	7458	6961	6491	6045	5622	5221	4839	4475	4128	3797	3481	3178	2888	2610	850,000	
IW17 R1	1459	1364	1276	1193	1115	1042	972	907	844	785	729	676	625	577	530	486	444	403	365	850,000	
IW17 R2	2279	2132	1994	1865	1743	1628	1519	1417	1319	1227	1140	1056	977	901	829	760	694	630	570	850,000	
IW17 R3	2188	2047	1914	1790	1673	1563	1459	1360	1267	1178	1094	1014	938	865	796	729	666	605	547	850,000	

Sizing Chart - Mechanical Advantages

Gearbox	Mechanical Advantage ±10%*																			
IW14	107	114	122	131	140	150	160	172	185	198	214	231	249	270	294	321	351	386	427	
IW14 R1	761	814	870	930	995	1066	1142	1225	1315	1414	1523	1643	1776	1926	2093	2284	2501	2752	3045	
IW14 R2	487	521	557	595	637	682	731	784	842	905	974	1051	1137	1232	1340	1462	1601	1761	1949	
IW14 R3	508	543	580	620	664	711	761	816	877	943	1015	1095	1184	1284	1396	1523	1667	1835	2030	
IW15	96	102	109	117	125	134	144	154	165	178	191	207	223	242	263	287	315	346	383	
IW15 R1	682	729	780	834	892	955	1023	1098	1178	1267	1365	1472	1592	1726	1876	2047	2242	2467	2729	
IW15 R2	437	467	499	534	571	611	655	702	754	811	873	942	1019	1104	1201	1310	1435	1579	1747	
IW15 R3	455	486	520	556	595	637	682	732	786	845	910	981	1061	1150	1251	1365	1494	1644	1819	
IW16	90	96	102	109	117	125	134	144	155	166	179	193	209	226	246	269	294	324	358	
IW16 R1	638	682	729	780	834	893	957	1026	1102	1185	1276	1377	1489	1614	1755	1914	2096	2307	2552	
IW16 R2	408	436	467	499	534	572	612	657	705	758	817	881	953	1033	1123	1225	1342	1476	1633	
IW16 R3	425	455	486	520	556	595	638	684	735	790	851	918	992	1076	1170	1276	1398	1538	1701	
IW17	81	87	93	99	106	114	122	131	141	151	163	176	190	206	224	244	267	294	326	
IW17 R1	583	623	666	712	762	816	874	937	1007	1082	1166	1258	1360	1474	1603	1748	1915	2107	2331	
IW17 R2	373	399	426	456	488	522	559	600	644	693	746	805	870	943	1026	1119	1225	1348	1492	
IW17 R3	389	415	444	475	508	544	583	625	671	722	777	838	907	983	1068	1166	1277	1405	1554	

* The Published M.A. is achieved after a few cycles.

IW Sizes 14-17

Quarter-turn worm gearboxes

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