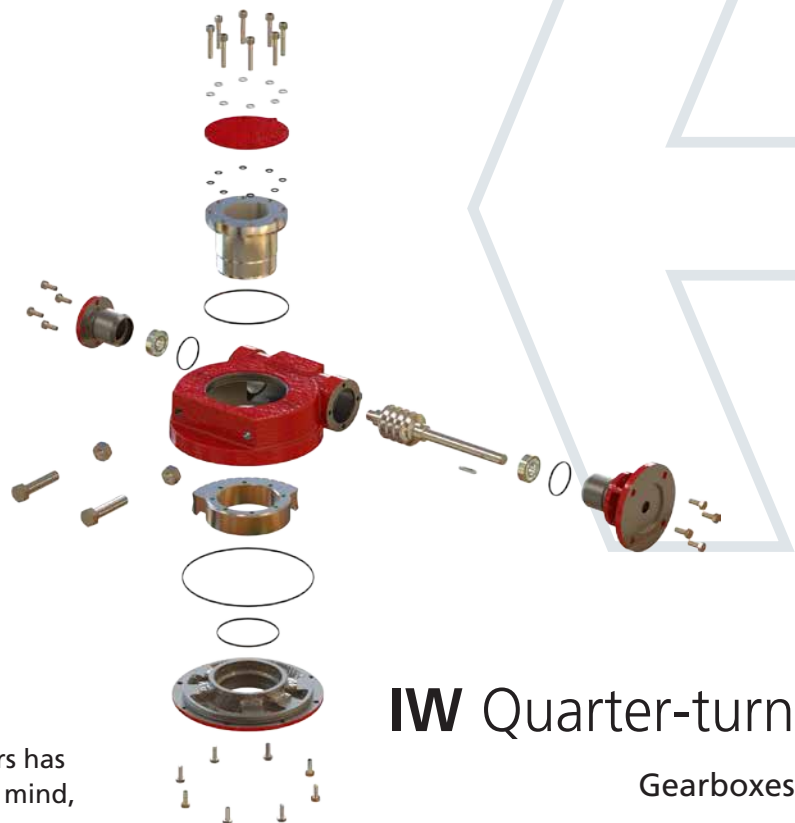


rotork® Gears



IW Quarter-turn Gear Series

The IW series of quadrant worm operators has been designed with customer stocking in mind, and features a removable steel output sleeve to facilitate bore and keyway machining. This separate output sleeve can be positioned through 90° steps on the IW3 & through 45° steps on the IW4 to IW11. The baseplate can be positioned through 45° steps on the IW3 to IW5 and through 22.5° steps on the IW6 to IW12. This facility allows for on or off centre mounting on the valve spool without special machining.

Operating temperature normally ranges from -40 to +120 °C, although other temperature ranges are available on request. Standard input (for actuation purposes) and output flanges are to ISO 5211 standard. However, equivalent standards such as MSS & DIN can be supplied.

Application

Rotork Gears IW series operators are quarter-turn devices intended for the operation of ball, plug and butterfly valves as well as power and process dampers. The gearboxes are suitable for manual and motorised applications.

Features

- Totally enclosed gearing
- Grease filled for life and fully sealed
- Comprehensive gear ratios combined with a selection of auxiliary input spur gear reducers
- Angular contact bearings supporting worm shaft
- Removable output sleeve
- Repositionable baseplate facility
- Adjustable mechanical stops (at 0° and 90° ±5°)

IW Quarter-turn Gearboxes

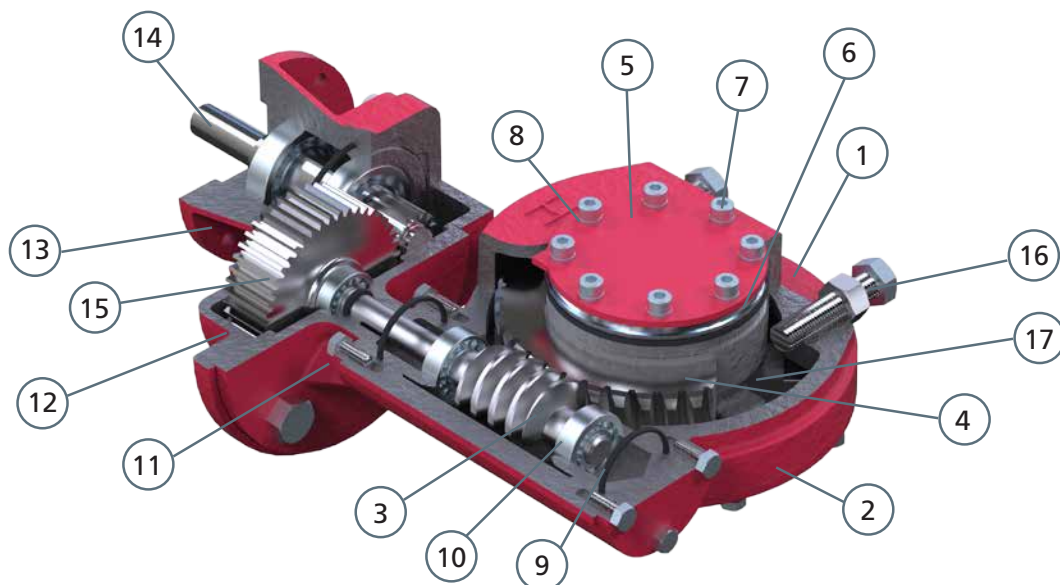
Environmental Specification

- Enclosure: IP67 standard suitable for submerged duty up to a depth of 1 metre for 30 minutes
- Temperature: -40 to +120 °C (-40 to +250 °F)

Options

- Ductile Iron
- IP68
- AWWA, ATEX, Nuclear
- All types of environment
- High temperature range -20 to +150 °C (-4 to +302 °F)
- Extra high temperature range -20 to +200 °C (-4 to +392 °F)
- Low temperature range -60 to +120 °C (-76 to +250 °F)
- Padlockable handwheels
- Limit switches
- Lever arms
- Travelling nut for applications requiring less than 90° travel and more than 90°
- Modulating and multi-turn
- Input flanges for motorisation
- Flexible extensions
- Firesafe to ISO 10497
- Interlock safety system
- Enclosure IP68 suitable for submerged duty up to a depth of 15 metres for 72 hours
- CS type suitable for continuous submerged duty up to a maximum depth of 15 metres

IW Quarter-turn Gearboxes



Material Specification for Rotork Gear IW Series of Quarter-turn Valve Operators

No.	Description	Material	UK Standard	USA Standard	DIN Standard
1	Gearcase	SG Iron	BS1563 EN-GJS-450-10 BS1563 EN-GJS-400-15	ASTM A536 65-45-12	GGG40
2	Baseplate	Cast Iron or SG Iron	BS1561 EN-GJL-250 BS1563 EN-GJS-400-15	ASTM A48 35B/40B ASTM A536 65-45-12	GG25 GGG40
3	Worm Shaft	Steel	BS970 045M10 or 605M36T	AISI/SAE 1010 or 4340	C 10 or 42 MnMo 7
4	Quadrant	SG Iron	BS1563 EN-GJS-700-2	ASTM A536 100-70-03	GGG70
5	Position Indicator	Protected Steel	BS970 070M20	AISI/SAE 1023	C 22
6	Output Sleeve	Steel	BS970 070M20 or BS970 080M40 or BS970 070M55	AISI/SAE 1023 or AISI/SAE 1040 or AISI/SAE 1055	C 22 C 40 C 55
7	Drive Screws	Protected Carbon Steel	BS4168		
7a	Drive Screws O-ring	Nitrile Rubber			
8	Nordlock Washers	Protected Steel			
9	Seal	Nitrile Rubber			
10	Bearing	Angular Contact Ball Bearings			
11	Adaptor	Cast Iron	BS1561 EN-GJL-250	ASTM A48 35B/40B	GG25
12	Reducer Gearcase	Cast Iron	BS1561 EN-GJL-250	ASTM A48 35B/40B	GG25
13	Input Flange	Cast Iron or SG Iron	BS1561 EN-GJL-250 BS1563 EN-GJS-400-15	ASTM A48 35B/40B ASTM A536 60-40-18	GG25 GGG40
14	Input Shaft	Steel	BS970 605M36T	AISI/SAE 4340	42 MnMo 7
15	Spur Gear	Steel	BS970 817M40T	AISI/SAE 4340	40 NiCrMo 8 - 4
16	Fasteners	Protected Steel	BS3692		
17	Grease	Renolit CLX2			

Note: Because of the company's policy of continuous improvement, Rotork Gears reserves the right to change specification details without prior notice.

WORM GEARBOX WITH INPUT REDUCING UNIT FOR ALL RATIOS OTHER THAN BASIC OR GEARBOXES REQUIRING IR3 UNITS OR BEVEL UNITS

BASIC RATIOS: 40:1, 60:1 & 70:1

IR3, IR35 or IR4 INPUT REDUCING UNIT
FITTED TO:
IW9 960:1 TO 3000:1
IW10 180:1 TO 3000:1
IW11 180:1 TO 3000:1
IW115 360:1 TO 900:1
IW12 & IW13 240:1 TO 960:1

STANDARD BASEPLATE

FILLED BASEPLATE

WAFER / ENHANCED BASEPLATE

IW115*, IW12 & IW13 WITH 2ND SPUR AUXILIARY GEARBOX

*IW115 cannot be mounted East for Position A or mounted West for Position B.

Gearbox	Ratio	Input Shaft Diameter (mm)					
		MAN	F10	F14	F16	F25	F30
IW3	40 TO 70	15	15*				
IW4	40 TO 70	17	17*				
IW4	80 TO 420	20	20	20			
IW5, IW52	40 TO 70	25	20	25			
IW5, IW52	80 TO 420	20	20	20			
IW6, IW62	70	30	20	30	30		
IW6, IW62	140 TO 420	20	20	20			
IW63	70	30	20	30	30		
IW63	140 TO 420	-	20	20			
IW7, IW72	60	30	20	30	30	30	
IW7, IW72	120 TO 720	50	20	30			
IW8, IW82	60	40	-	-	40	40	
IW8, IW82	120 TO 720	50	20	30	40	50	
IW9	60	-	-	-	40	50	
IW9	180 TO 3000	50	20	30	40	50	
IW10	60	-	-	-	-	50	50
IW10	180 TO 3000	50	20	30	40	50	
IW11, IW115	60	-	-	-	-	50	50
IW11	180 TO 3000	50	20	30	40	50	
IW115	360 TO 900	50	-	30	40	50	
IW12, IW13	60	-	-	-	-	75	75
IW12, IW13	240 TO 960	-	-	30	40	50	
IW115, IW12 & IW13 WITH 2ND SPUR AUXILIARY							
IW115	1190 TO 5390	30	20	30	30		
IW12, IW13	1290, 1210 TO 5760	30	20	30	30		

*20 MM SHAFT ADAPTOR AVAILABLE ON REQUEST SHAFT TOLERANCE -0.05 (-0.002)

IW Quarter-turn Gearboxes

Dimensions and Weights

Gearbox	Ratio	ØA	B	C	D	E	F	G	H	ØI	Weight (kg)
IW3	40, 70	172	76		118	158	91	74	49		11
IW4	40, 70	218	102		142	182	102	85	50		22
IW4	80, 120, 140, 160, 210, 280	218	102	64	269	320	104	85	50	190	30
IW4	200, 240, 350, 420	218	102	96	291	342	104	85	50	248	35
IW5 / IW52	40, 70 / 40	285	136		186	236	132	114	69		45
IW5	80, 120, 140, 160, 210, 280	285	136	64	313	364	132	114	69	190	53
IW5	200, 240, 350, 420	285	136	96	335	386	132	114	69	248	58
IW52	80, 120, 160	285	136	64	313	364	132	114	69	190	53
IW52	200, 240	285	136	96	335	386	132	114	69	248	58
IW6, IW62, IW63	70	375	178		186	236	139	113	70		68
					196 for F10, FA10						
IW6, IW62, IW63	140 - 280	375	178	64	313	364	139	113	70	190	79
IW6, IW62, IW63	350 - 420	375	178	96	342	393	139	113	70	248	84
IW7, IW72	60	450	210		270	329	171	140	86		120
IW7, IW72	120 - 360	450	210	119	460	521	171	140	86	290	152
IW7, IW72	480 - 720	450	210	179	469	530	171	140	86	408	162
IW8, IW82	60	520	246		306	365	192	160	99		180
IW8, IW82	120 - 360	520	246	119	496	557	192	160	99	290	212
IW8, IW82	480 - 720	520	246	179	505	566	192	160	99	408	222
IW9	60	596	279		371	481	200	168	99		220
IW9	180 - 720	596	279	179	568	631	200	168	99	408	262
IW9	960 - 3000	596	279	59	605	666	200	168	99	382	290
IW10	60	735	343		397	507	216	180	110		330
IW10	180 - 3000	735	343	59	631	692	216	180	110	382	408
IW11 / IW11BB	60	795	381		414	524	247	200	120		520
IW11 / IW11BB	180 - 3000	795	381	59	648	709	247	200	120	382	570
IW115 / IW115BB	60	795	381		414	524	247	200	120		520
IW115 / IW115BB	360 - 900	795	381	59	648	709	247	200	120	382	540
IW115 WITH 2ND SPUR AUXILIARY	1190 - 5390	795	381	240	787	837	247	200	120	382	570
IW12, IW13	60	972	450		460	610	260	251	166		1000
IW12, IW13	240 - 960	972	450	240	851	910	260	251	166	520	1150
IW12 WITH 2ND SPUR AUXILIARY	1290 - 5760	972	450	204	989	1039	260	251	166	520	1170
IW13 WITH 2ND SPUR AUXILIARY	1210 - 5760	972	450	305	1001	1051	260	251	166	520	1180

All dimensions in millimetres.

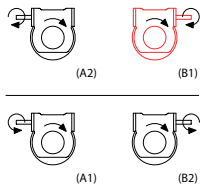
Mounting Options

Gearbox	Max Bore Rectangle Key BS4235	Max Square Bore AF	ISO Flange Standard Baseplate	ISO Flange Filled Baseplate	ISO Flange Enhanced Baseplate	Filled Baseplate Thickness	Enhanced Baseplate Thickness
IW3	45	36	F10 - F12	-	F14 - F16	-	22
IW4	64	51	F10-F12- F14	-	F16	-	25
IW5, IW52	76	62	F14 - F16	F25	F25	6	32
IW6, IW62, IW63	102	83.3	F16 - F25	F16 - F25 - F30	F30	0	23
IW7, IW72	136	108.8	F25 - F30	F30	F35	10	31
IW8, IW82	157	122.9	F25 - F30 - F35 - F40	F25 - F30 - F35	F40 - F48	0	38
IW9	178	132.1	F30 - F35 - F40	F30 - F35 - F40	F40 - F48	0	27
IW10	203	152.6	F35 - F40 - F48	F48	F60	0	32
IW11, IW115	203	152.6	F35 - F40 - F48	F60	-	0	-
IW11BB, IW115BB	270	190	F40 - F48	F60	-	0	-
IW12, IW13	272	180	F35 - F40 - F48	-	-	-	-
IW12, IW13	305	229	F48 - F60	-	-	-	-

Customer Drive and Orientation Options

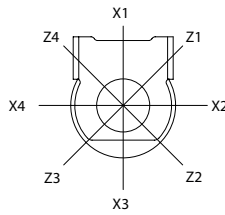
IW3 TO IW13 40:1 TO 70:1

INPUT SHAFT PROJECTION
WITHOUT INPUT REDUCER

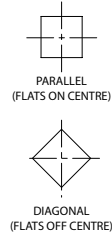


DRIVE OPTIONS

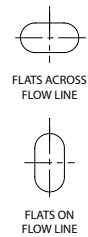
KEYWAY POSITIONS WITH GEARBOX IN CLOSED POSITION



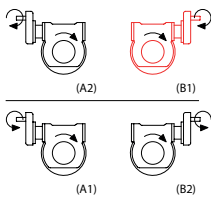
SQUARE BORE



SLOTTED BORE



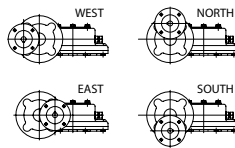
INPUT SHAFT PROJECTION



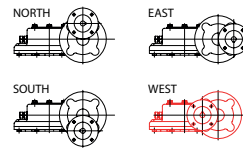
IW4 TO IW9 UP TO 720:1

IW12 & IW13 RATIOS 240:1 TO 960:1

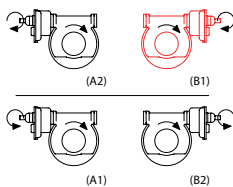
INPUT REDUCER ORIENTATION POS. A



INPUT REDUCER ORIENTATION POS. B



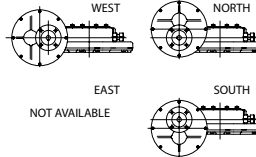
INPUT SHAFT PROJECTION



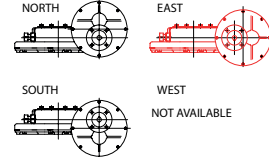
IW9 960:1 TO 3000:1

IW10 & IW11 180:1 TO 3000:1

IR3 INPUT REDUCER ORIENTATION POS. A

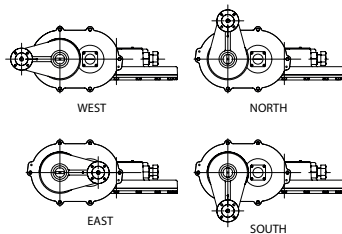


IR3 INPUT REDUCER ORIENTATION POS. B

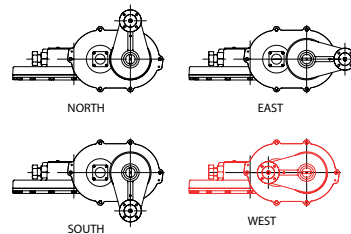


IW115, IW12 & IW13 WITH 2ND SPUR AUXILIARY GEARBOX

2ND AUXILIARY GEARBOX ORIENTATION POS. A
WITH 1ST AUXILIARY SHOWN IN EAST
DEFAULT ORIENTATION EAST/EAST



2ND AUXILIARY GEARBOX ORIENTATION POS. B
WITH 1ST AUXILIARY SHOWN IN WEST
DEFAULT ORIENTATION WEST/WEST



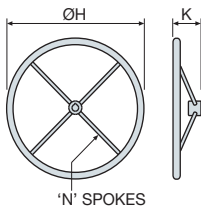
*IW115 1ST AUXILIARY SPUR CANNOT BE MOUNTED EAST FOR POSITION A OR MOUNTED WEST FOR POSITION B, DEFAULT ORIENTATION POS. B EAST/WEST.

A1 = Anticlockwise in, clockwise out.

A2 = Clockwise in, clockwise out.

B1 = Clockwise in, clockwise out.

B2 = Anticlockwise in, clockwise out.

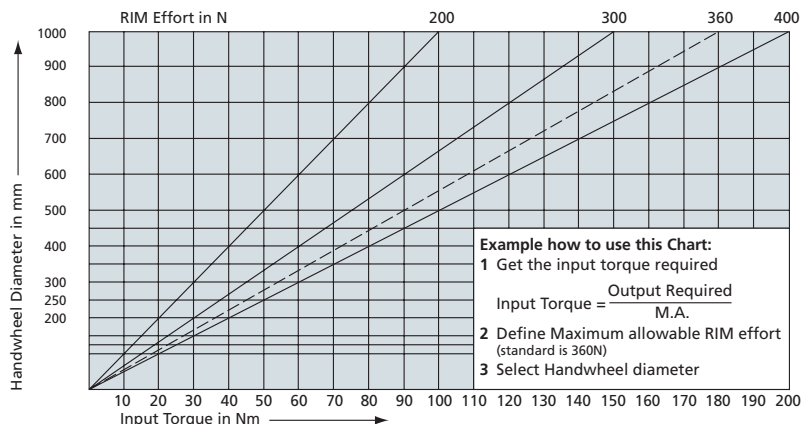


'N' SPOKES

Dimensions

Type	ØH	K	N
F200	200	75.5	3
F300	300	100.5	3
F400	400	100.5	4
F500	500	100.5	4
F600	600	100.5	4
F700	700	100.5	6
F800	800	100.5	6
F900	900	100.5	6
F1000	1000	100.5	6
F1100	1100	100.5	6
F1200	1200	100.5	8

'F' Type handwheel



Gearbox Selection Chart

Gearbox	Ratio								Manual Output Torque (Nm)	Motorised Output Torque (Nm)	Maximum Motorised Input Torque (Nm)								Mechanical Advantage $\pm 10\%$ *							
IW3	70								1060	813	35								23							
IW3	40								1630	1085	72								15							
IW4	70								2650	2034	88								23							
IW4	140								2850	2190	50								44							
IW4	210	280	350	420					2950	2264	34	26	21	17					66	88	110	132				
IW4	40	80							3660	2440	163	84							15	29						
IW4	120	160	200						3930	2617	61	46	37						43	57	71					
IW4	240								4070	2712	32								86							
IW5	70								4410	3390	147								23							
IW5	140	210	280	350	420				4820	3701	84	56	42	34	28				44	66	88	110	132			
IW5	40								6100	4067	239								17							
IW5	80	120	160	200	240				6670	4447	139	93	68	55	46				32	48	65	81	97			
IW52	40								7300	4867	286								17							
IW52	80	120	160	200	240				8000	5334	167	111	82	66	55				32	48	65	81	97			
IW6	70								10580	8135	354								23							
IW6	140	210							12060	9274	211	141							44	66						
IW6	280	350	420						13000	9924	113	90	75						88	110	132					
IW62	70								12540	NA	NA								23							
IW62	140	210							14300	NA	NA								44	66						
IW62	280	350	420						15300	NA	NA								88	110	132					
IW63	70								NA	9650	420								23							
IW63	140	210	280	350	420				NA	11000	250	167	125	100	83				44	66	88	110	132			
IW7	60	120	180						17630	13558	542	282	191						25	48	71					
IW7	240	360	480	540	720				20000	15253	161	107	81	71	54				95	142	189	214	285			
IW72	60	120	180	240	360	480	540	720	26000	20000	800	417	282	211	141	106	93	70	25	48	71	95	142	189	214	285
IW8	60								31730	24404	976								25							
IW8	120	180	240	360	480	540	720		34000	26031	542	367	274	183	138	122	91		48	71	95	142	189	214	285	
IW82	60								45000	34600	1385								25							
IW82	120	180	240	360	480	540	720		48100	37000	771	521	389	261	196	173	130		48	71	95	142	189	214	285	
IW9	60	180	240	360	480	540	720		63500	48809	1952	687	514	344	258	228	171		25	71	95	142	189	214	285	
IW9	960	1080	1440	2160	2520	3000			67900	52171	137	122	92	61	52	44			380	428	570	855	998	1188		
IW10	60	180	240	360	540	720			84600	65078	2603	917	685	458	304	228			25	71	95	142	214	285		
IW10	960	1080	1440	2160	2520	3000			88130	67790	178	158	119	79	68	57			380	428	570	855	998	1188		
IW11 / IW11BB	60	180	240	360	540	720			141000	108464	4339	1528	1142	764	507	381			25	71	95	142	214	285		
	960	1080	1440	2160	2520	3000					285	253	190	127	109	91			380	428	570	855	998	1188		
IW115 / IW115BB	60	360	490	560	650	760			170000	130000	5200	963	710	619	489	459			25	135	183	210	242	283		
	900	1190	1370	1600	1910	2290					386	327	283	242	203	168			337	398	460	538	640	773		
	2650	3100	3680	4530	5390						146	124	105	85	71				893	1045	1243	1529	1820			
IW12	60	240	360	480	610	720			180000	137000	5480	1522	1015	757	601	506			25	90	135	181	228	271		
	960	1290	1530	1820	2040	2490					380	316	267	222	200	163			361	434	514	616	686	842		
	2880	3640	3940	4320	5760						141	111	103	94	70				975	1233	1332	1462	1949			
IW13	60	240	360	480	610	720			264000	203000	8120	2256	1504	1122	890	749			25	90	135	181	228	271		
	960	1210	1440	1820	1920	2430					562	494	417	330	312	247			361	411	487	616	650	822		
	2880	3640	3840	4860	5760						208	165	156	123	104				975	1233	1300	1644	1949			

For manual torque the static safety factor is 1.5. For motorised torque the static safety factor is 2.

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

A full listing of the Rotork sales and service network is available on our website.

Controls

Electric Actuators and Control Systems

Fluid Systems

Fluid Power Actuators and Control Systems

Gears

Gearboxes and Gear Operators

Instruments

Precision Control and Indication

Site Services

Projects, Services and Retrofit