

Appendix C

Shop Drawings of City Supplied Valve



Submittal Data Sheet

Page 2 of 4

Date: 4/7/2010

City of Winnipeg c/o Flo-Crest Equipment
 52-A Caithness Street
 Winnipeg, Manitoba

Cust. P.O. #: NA
Fact Order #: TBD
Fact SO #: TBD
Rev. #: 0

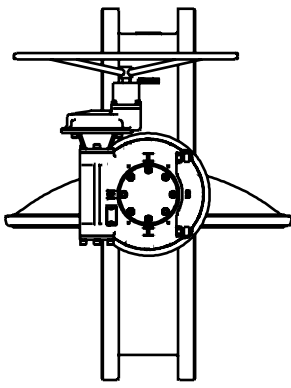
Factory Item	Cust. Item	Qty	Description	Part No.
2	2	1	Crispin/K-Flo 48" AWWA C504 Butterfly Valve w/ Worm Gear Manual Actuator and Hand Wheel	KK4832
Style:	473		AWWA Butterfly Valve 24"-168" - Flanged - 150B	
Size:	48		48 Inch	
End Connection:	Flg - 150		Flanged Drilling; ANSI 125/150	
Body Material:	CI		Cast Iron, ASTM A126 ClassB	
Packing:	Packing		PTFE; Self Adjusting	
Seat Material:	Buna		BUNA - N (nitrile), D2000	
Service Class:	150B		AWWA Class 150B	
Disc:	DI		Ductile Iron with 316 Stainless Steel Edge	
Shaft:	304		Type 304 Stainless Steel, ASTM A276	
Paint:	47		12 mils minimum of Crispin Blue Epoxy Tnemec Series 141 "pota-pox" (NSF Std. 61) on Interior and Exterior	
Act Type:	RTG-IW7R-HW		Rorork Gear IW7R w/ Handwheel	

SPECIAL FEATURES

Flange Bolt Holes to be Spot Faced for Nuts
Interior and Exterior to be Holiday Free (low voltage)
Seat Test to be performed in Vertical Position
City of Winniped to be given 2 week notice prior to testing

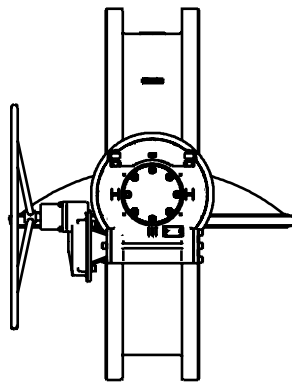
RELATED DOCUMENTS

NSF 61 UL Certification
 Tnemec Series 141 Pota-Pox Specification Data Sheets
 Crispin/K-Flo Standard Terms and Warranty
 Letter of Compliance with AWWA C504



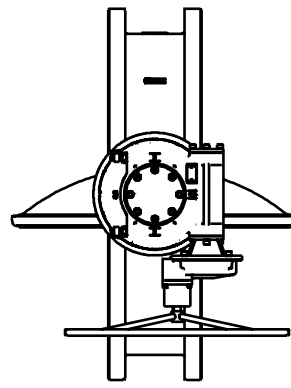
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ASS'Y "B1" (STD. MOUNTING)



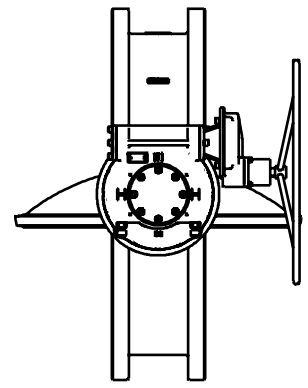
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ASS'Y "B2"



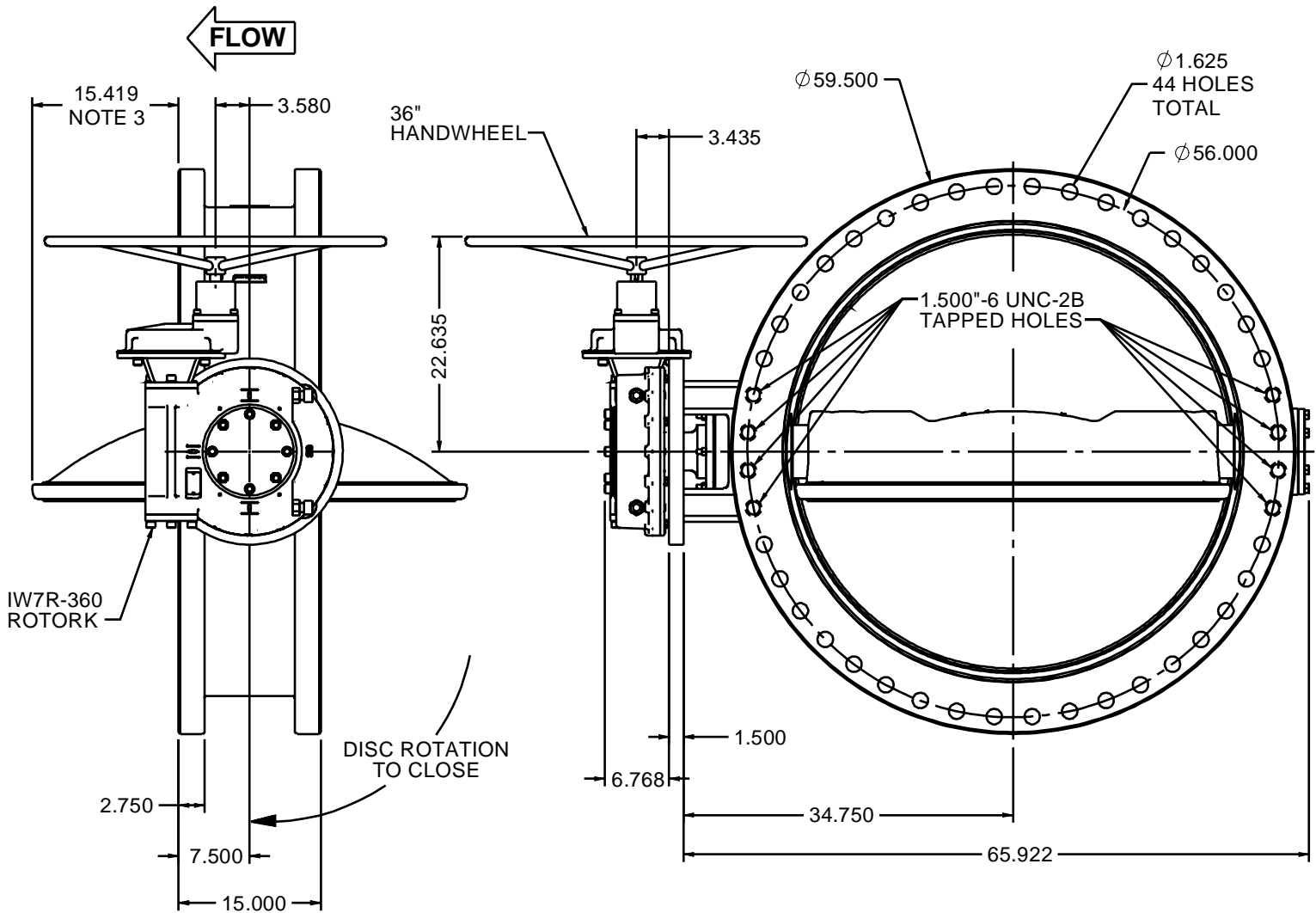
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ASS'Y "B3"



← FLOW

ASS'Y "B4"



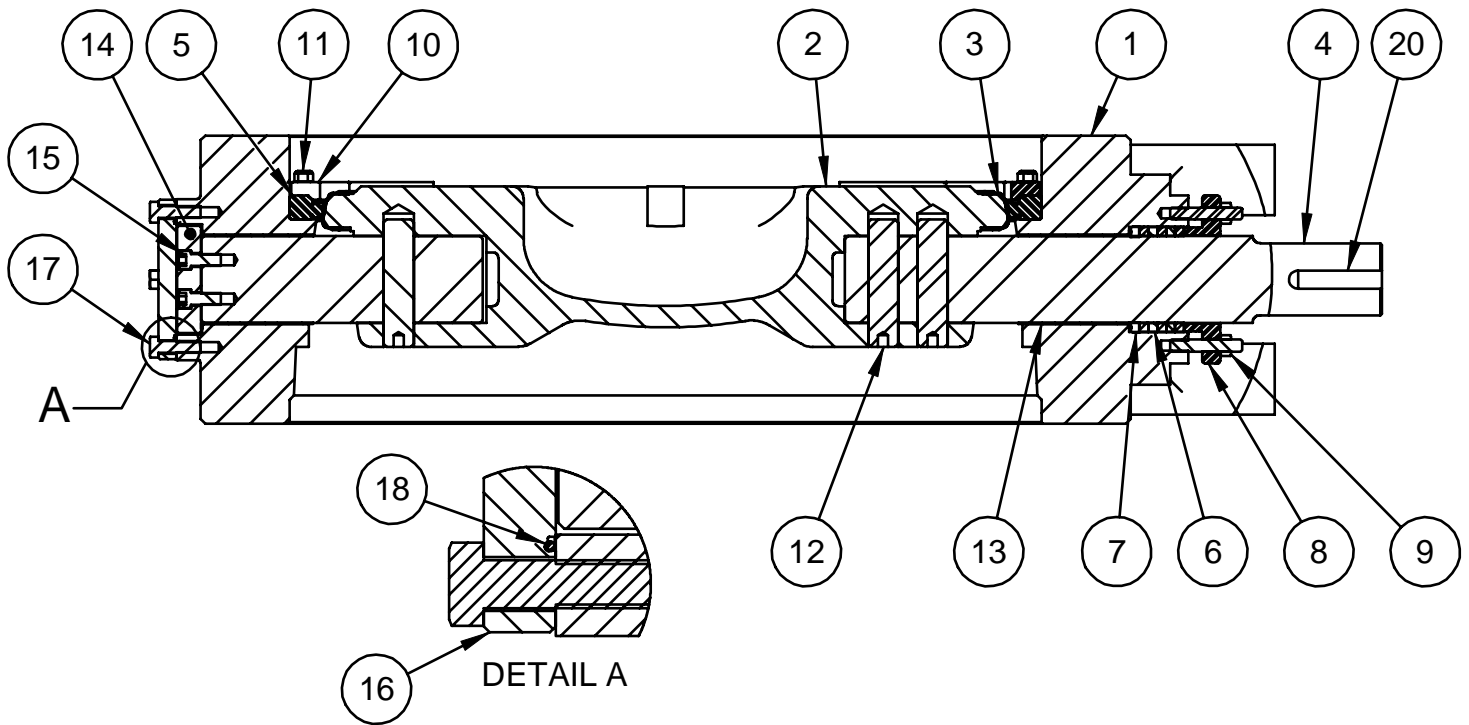
NOTES:

1. 150 PSIG MAXIMUM WORKING PRESSURE.
2. THIS VALVE CONFORMS TO AWWA C504.
3. "Q" IS THE MINIMUM ALLOWABLE PIPE OR FLANGE INSIDE DIAMETER AT THE CENTERED BODY FACE TO PROTECT THE DISC SEALING EDGE FROM DAMAGE WHEN OPENING THE VALVE.
4. FLOW RECOMMENDED IN DIRECTION SHOWN.
5. VALVE MAY BE INSTALLED WITH SHAFT IN EITHER HORIZONTAL OR VERTICAL POSITION.
6. ROTATE HANDWHEEL CLOCKWISE TO CLOSE VALVE.
7. ALL DIMENSIONS ARE IN INCHES.


K-FLO			
BUTTERFLY VALVES			
BY			
CRISPIN VALVES			
800-247-VALVE			
WWW.CRISPINVALVE.COM			
48"-150B FLANGED BUTTERFLY VALVE WITH ROTORK IW7-360 AND 36" HANDWHEEL			

REDRAWN:	
CHECKED:	
DRAWN: C. GEARY	12/18/05

SIZE	DWG. NO.	REV
C	48-150B IW7 HW	0



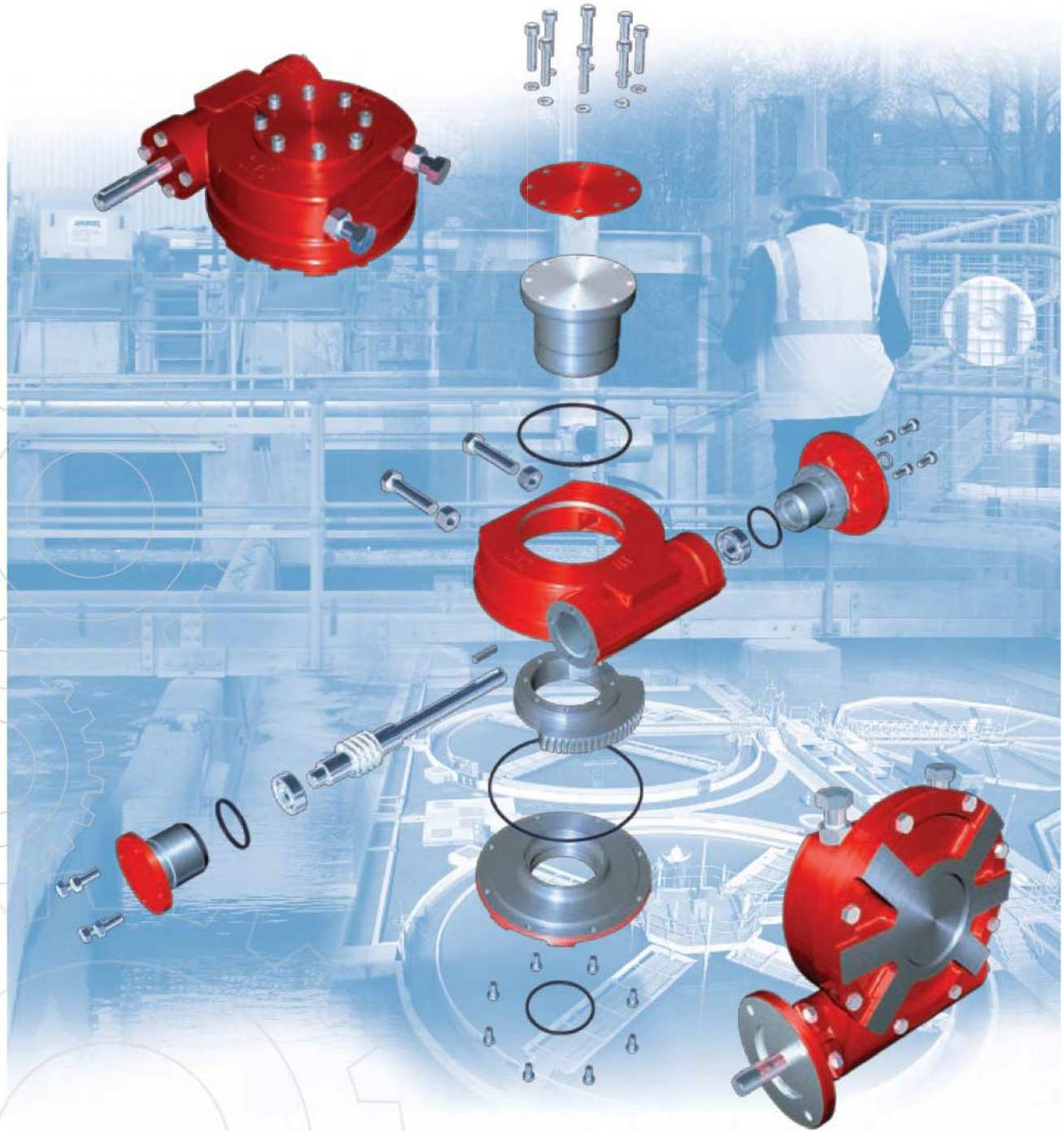
ITEM	DESCRIPTION	MATERIAL	REMARKS
1	BODY	CAST IRON	ASTM A126 CLASS B
2	DISC	DUCTILE IRON	ASTM A536 GR. 65-45-12
3	DISC EDGE	316 STAINLESS STEEL	ASTM A240 TYPE 316
4	UPPER & LOWER SHAFT	304 STAINLESS STEEL	ASTM A276 TYPE 304
5	SEAT	BUNA-N	ASTM D2000
6	PACKING	TEFLON COMPOSITE FIBER	PALMETTO NO. 1392-H OR EQUIV.
7	V-TYPE COMPRESS PACKING	BUNA-N	ASTM D2000
8	GLAND PLATE	RED BRASS	ASTM B62 UNS C83600
9	STUDS & NUTS (GLAND)	304 STAINLESS STEEL	ASTM A276 TYPE 304
10	RETAINING RING SEGMENTS	316 STAINLESS STEEL	ASTM A743 GRADE CF8M
11	STUDS & NUTS (RING)	304 STAINLESS STEEL	ASTM A276 TYPE 304
12	SHAFT PIN	410 STAINLESS STEEL	ASTM A276 TYPE 410
13	BEARING	TFE - 316 STAINLESS STEEL BACKING	TFE/ASTM A240 TYPE 316
14	THRUST COLLAR	304 STAINLESS STEEL	ASTM A240 TYPE 304
15	SCREWS (THRUST COLLAR)	304 STAINLESS STEEL	ASTM F594 GRADE 1
16	COVER PLATE (BOTTOM)	410 STAINLESS STEEL	ASTM A240 TYPE 410
17	SCREW (COVER PLATE)	304 STAINLESS STEEL	ASTM A193 GRADE B8
18	SEAL O-RING	BUNA-N	ASTM D2000
20	KEY	CARBON STEEL	ASTM A108 UNS G10180

K-FLO AWWA BUTTERFLY VALVES FROM CRISPIN VALVES		TITLE: CROSS-SECTION & MATERIAL LIST FOR 24" TO 72", FLANGED BUTTERFLY VALVE FIGURE 473	
DWN. BY: BJL	DATE: 2005 8-11		DWG. NO. 101473-ML
DATE:	APPD. BY:		REV. 1
REV.		SIZE: A	
DATE		SHEET 1 OF 1	
BY			
APPD			
REVISION			

1	2009 06-18	CTG		REVISED PARTS LIST AND MATERIALS
REV.	DATE	BY	APPD	REVISION

IW Quarter-turn Gearbox Series

rotork[®]
Gears



Cast Iron Housing Gearboxes - IW Quarter-turn Gear Series

IW Gearbox Series

IW Quarter-turn Gearbox Series

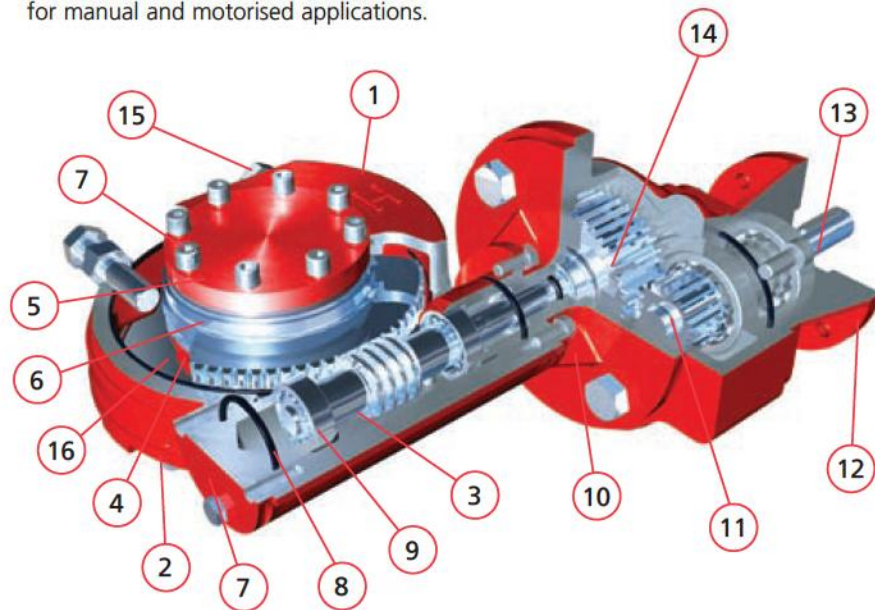
Description

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 stool without special machining.

Operating temperature normally ranges from -40 °F to +250 °F, although other temperature ranges are available on request. Standard input (for actuation purposes) and output flanges are to MSS standard. However, equivalent standards such as ISO & 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 & 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°)

Environmental specification

- Enclosure: IP67 standard
- Temperature: -40 °F to +250 °F (-40 °C to +120 °C)

Options

- Ductile Iron
- IP68
- AWWA
- ATEX
- Nuclear
- All types of environment
- High & low temperatures
- Padlockable handwheels
- Limit switches
- Lever arms
- Travelling nut for applications requiring less than 90° travel and more than 90°
- Modulating & multi-turn
- Input flanges for motorisation

No.	Description	Material	UK Standard	USA Standard	DIN Standard
1	Gearcase (W3 to IW8)	Cast Iron	BS1561 EN-GJL-250	ASTM A48 35B/40B	GG25
	Gearcase (IW9 to IW12)	SG Iron	BS1563 EN-GJS-450-10	ASTM A536 65-45-12	GGG40
2	Baseplate	Cast Iron	BS1561 EN-GJL-250	ASTM A48 35B/40B	GG25
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	Steel	BS970 070M20	ASIS/SAE 1023	C 22
6	Output Sleeve	Steel	BS970 070M20 or BS970 080M40 or BS970 070M55 or	ASIS/SAE 1023 or ASIS/SAE 1040 or ASIS/SAE 1055 or	C 22 C 40 C 55
7	Drive Screws	Carbon Steel	BS4168		
8	Seal	Nitrile Rubber			
9	Bearing	Angular Contact Ball Bearings			
10	Adaptor	Cast Iron	BS1561 EN-GJL-250	ASTM A48 35B/40B	GG25
11	Reducer Gearcase	Cast Iron	BS1561 EN-GJL-250	ASTM A48 35B/40B	GG25
12	Input Housing	Cast Iron	BS1561 EN-GJL-250	ASTM A48 35B/40B	GG25
13	Input Shaft	Steel	BS970 605M36T	AISI/SAE 4340	42 MnMo 7
14	Spur Gear	Steel	BS970 817M40T	AISI/SAE 4340	40 NiCrMo 8 - 4
15	Fasteners	Steel	BS3692		
16	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.

Gearbox IW Series

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

IR3 INPUT REDUCING UNIT FITTED TO:
 IW9 960:1 TO 3000:1
 IW10 180:1 TO 3000:1
 IW11 180:1 TO 3000:1

(MAX. STEM ACCEPTANCE)

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

STANDARD BASEPLATE FILLED BASEPLATE WAFER / ENHANCED BASEPLATE

IW115 & IW12 WORM GEARBOX WITH REDUCING SPUR & BEVEL

* 7.87 FOR IW115 & IW12
1440:1 & 1920:1

Gearbox	Ratio	Shaft Diameter (inches)					
		MAN	FA10	FA14	FA16	FA25	FA30
IW3	40 TO 70	0.591	0.591				
IW4	40 TO 70	0.669	0.669				
IW4	80 TO 420	0.787	0.787	0.787			
IW5, IW52	40 TO 70	0.984	0.787	0.984			
IW5, IW52	80 TO 420	0.787	0.787	0.787			
IW6, IW62	70	1.181	0.787	1.181	1.181		
IW6, IW62	140 TO 420	0.787	0.787	0.787			
IW63	140 TO 420	-	0.787	0.787			
IW7, IW72	60	1.181	0.787	1.181	1.181		
IW7, IW72	120 TO 720	1.969	0.787	1.181			
IW8, IW82	60	1.575	-	-	1.575	1.575	
IW8, IW82	120 TO 720	1.969	0.787	1.181	1.575	1.969	
IW9	60	-	-	-	1.575	1.969	
IW9	180 TO 3000	1.969	0.787	1.181	1.575	1.969	
IW10	60	-	-	-	-	1.969	1.969
IW10	180 TO 3000	1.969	0.787	1.181	1.575	1.969	
IW11, IW115	60	-	-	-	-	1.969	1.969
IW11	180 TO 3000	1.969	0.787	1.181	1.575	1.969	
IW115	480 TO 900	1.969	0.787	1.181	1.575	1.969	
IW12, IW13	60	-	-	-	-	2.953	2.953
IW12, IW13	480 TO 900	-	-	1.181	1.575	1.969	
IW115, IW12 & IW13 WITH DOUBLE REDUCING UNITS							
IW115	960 TO 5400	1.969	0.787	1.181	1.575		
IW12, IW13	1920 TO 5400	1.969	0.787	1.181	1.575		

SHAFT TOLERANCE
-0.002

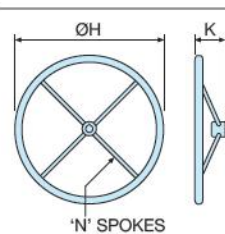
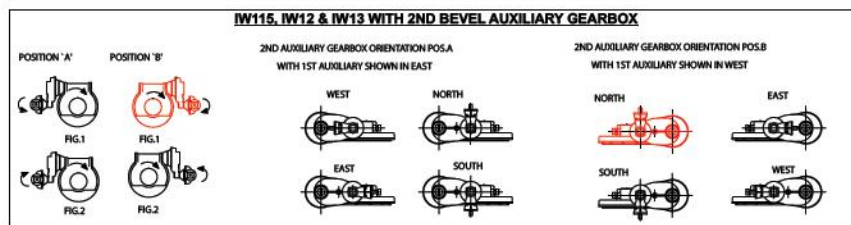
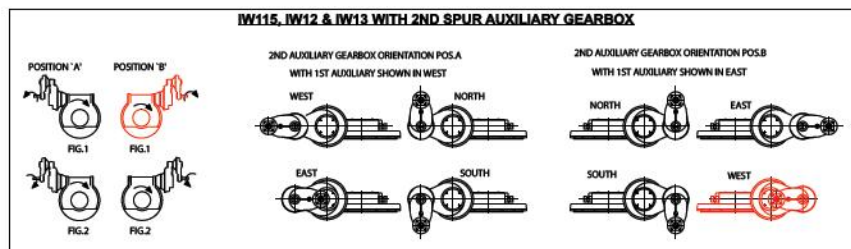
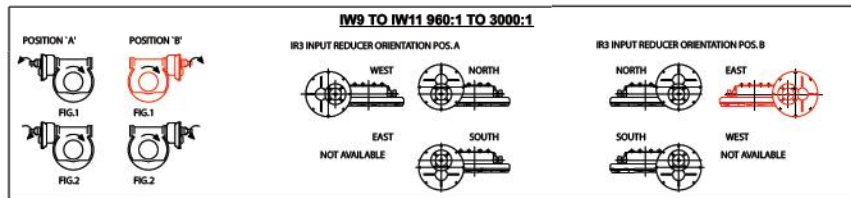
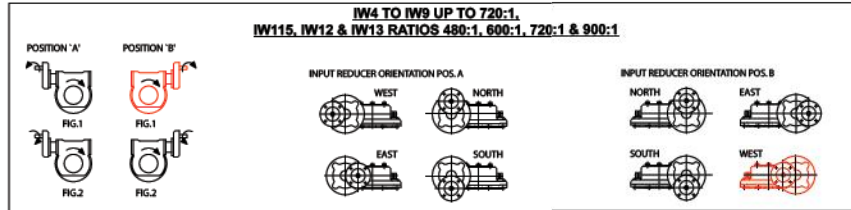
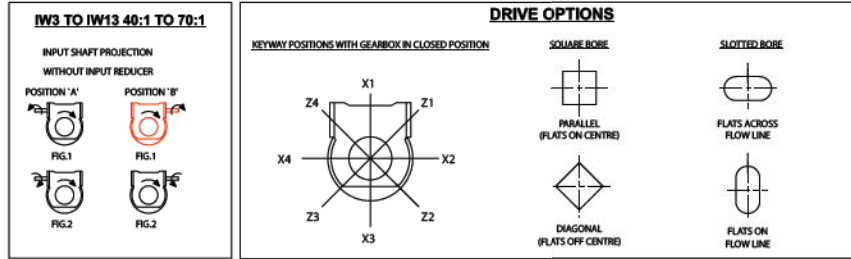
Dimensions and Weights

Gearbox	Ratio	ØA	B	C	D	E	F	G	H	ØI	Weight (lb)
IW3	40, 70	6.69	2.99		4.65	6.22	3.19	2.56	1.77		24
IW4	40, 70	8.58	4.02		5.59	7.17	4.02	3.35	1.97		49
IW4	80, 120, 140, 160, 210, 280	8.58	4.02	2.52	10.59	12.60	4.02	3.35	1.97	7.48	66
IW4	200, 240, 350, 420	8.58	4.02	3.78	11.46	13.46	4.02	3.35	1.97	9.76	77
IW5, IW52	40, 70	11.22	5.35		7.32	9.29	4.96	4.33	2.56		99
IW5, IW52	80, 120, 140, 160, 210, 280	11.22	5.35	2.52	12.32	14.33	4.96	4.33	2.56	7.48	117
IW5, IW52	200, 240, 350, 420	11.22	5.35	3.78	13.19	15.20	4.96	4.33	2.56	9.76	128
IW6, IW62, IW63	70	14.76	7.01		7.32	9.29	5.20	4.33	2.76		150
					7.72 for IW6 F10, FA10						
IW6, IW62, IW63	140 - 280	14.76	7.01	2.52	12.32	14.33	5.20	4.33	2.76	7.48	174
IW6, IW62, IW63	350 - 420	14.76	7.01	3.78	13.46	15.47	5.20	4.33	2.76	9.76	185
IW7, IW72	60	17.72	8.27		10.63	12.95	6.65	5.51	3.43		265
IW7, IW72	120 - 360	17.72	8.27	4.69	18.11	20.51	6.65	5.51	3.43	11.42	335
IW7, IW72	480 - 720	17.72	8.27	7.05	18.46	20.87	6.65	5.51	3.43	16.06	357
IW8, IW82	60	20.47	9.69		12.05	14.37	7.28	6.10	3.74		397
IW8, IW82	120 - 360	20.47	9.69	4.69	19.53	21.93	7.28	6.10	3.74	11.42	467
IW8, IW82	480 - 720	20.47	9.69	7.05	19.88	22.28	7.28	6.10	3.74	16.06	489
IW9	60	23.46	10.98		14.61	18.94	7.80	6.50	3.94		485
IW9	180 - 720	23.46	10.98	7.05	22.36	24.84	7.80	6.50	3.94	16.06	578
IW9	960 - 3000	23.46	10.98	2.32	23.82	26.22	7.80	6.50	3.94	15.04	639
IW10	60	28.94	13.50		15.63	19.96	8.27	7.09	4.33		728
IW10	180 - 3000	28.94	13.50	2.32	24.84	27.24	8.27	7.09	4.33	15.04	899
IW11	60	31.30	15.00		16.30	20.63	9.65	7.87	4.72		1146
IW11	180 - 3000	31.30	15.00	2.32	25.51	27.91	9.65	7.87	4.72	15.04	1257
IW115	60	31.30	15.00		16.30	20.63	9.65	7.87	4.72		1060
IW115	480, 600, 720 & 900	31.30	15.00	16.02	31.14	33.50	9.65	7.87	4.72	20.47	1698
IW115 WITH SPUR & BEVEL REDUCING UNIT	1440, 1800, 1920, 2160, 2400, 2700, 2880, 3600, 4320 & 5400	31.30	15.00	16.02	34.06	-	9.65	7.87	4.72	20.47	1742
					35.16 for IW115 1440:1 & 1920:1						
IW12, IW13	60	38.27	17.72		18.11	24.02	10.24	9.88	6.54		2205
IW12, IW13	480, 600, 720 & 900	38.27	17.72	16.02	32.95	35.28	10.24	9.88	6.54	20.47	2646
IW12 WITH SPUR & BEVEL REDUCING UNIT	1440, 1800, 1920, 2160, 2400, 2700, 2880, 3600, 4320 & 5400	38.27	17.72	16.02	35.87	-	10.24	9.88	6.54	20.47	2690
					36.97 for IW12 1440:1 & 1920:1						
IW13 WITH SPUR & BEVEL REDUCING UNIT	1440, 1800, 1920, 2160, 2400, 2700, 2880, 3600, 4320 & 5400	38.27	17.72	16.02	36.97	-	10.24	9.88	6.54	20.47	2690

All dimensions in inches.

Mounting Options

Gearbox	Max Bore ANSI B17.1 Key		Max Square Bore AF	MSS Flange Standard Baseplate	MSS Flange Filled Baseplate	MSS Flange Wafer Baseplate	Filled Baseplate Thickness	Wafer Baseplate Thickness
	Square	Rectangular						
IW3	1.75	1.75	1.375	FA10 - FA12	FA14	FA16	0.47	1.02
IW4	2.25	2.5	2	FA12- FA14	---	FA16	---	0.98
IW5, IW52	2.75	3	2.375	FA14 - FA16	FA25	FA25	0.39	1.42
IW6, IW62, IW63	3.75	3.875	3.25	FA16 - FA25	FA30	FA30	0	0.91
IW7, IW72	4.875	5.25	4.25	FA25 - FA30	FA25 - FA30	FA35	0.39	1.22
IW8, IW82	5.625	6	4.75	FA25 - FA35	---	FA40 - FA48	---	1.65
IW9	6.5	6.5	5.125	FA30 - FA35 - FA40	FA30 - FA35 - FA40	FA48	0	1.06
IW10	7.375	7.625	6	FA35 - FA40	FA35 - FA40 - FA48	FA60	0	1.26
IW11, IW115	7.375	7.625	5.5	FA35 - FA40 - FA48	FA60	---	0	---
IW12, IW13	9.5	10.25	7	FA40	---	---	---	---
IW12, IW13	11.75	12	9	FA48 - FA60	---	---	---	---



'F' Type handwheel

Dimensions

Type	øH	K	N
F200	8	2.97	3
F300	12	3.96	3
F400	16	3.96	4
F500	20	3.96	4
F600	24	3.96	4
F700	28	3.96	6
F800	32	3.96	6
F900	36	3.96	6
F1000	40	3.96	6
F1100	44	3.96	6
F1200	48	3.96	8

