



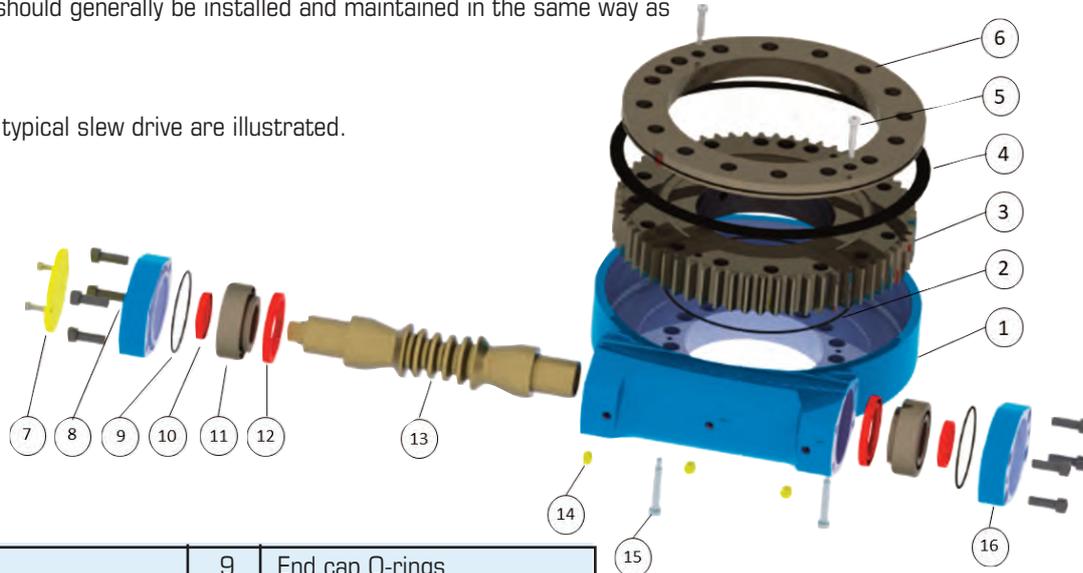
Slewing Drive
Installation &
Maintenance



SLEWING DRIVE INSTALLATION DATA

Slewing drives consist of a slewing ring bearing with an associate worm shaft and support bearings in an open or enclosed housing. The slewing ring should generally be installed and maintained in the same way as QCB slewing rings.

The constituent parts of a typical slew drive are illustrated.



1	Enclosed housing	9	End cap O-rings
2	Large O-ring	10	Outer oil seals
3	Slewing ring	11	Taper roller bearing
4	Top plate seal	12	Inner oil seals
5	Upper positioning bolts	13	Worm shaft
6	Top plate	14	Grease nipples
7	Non-drive end cover	15	Lower positioning bolts
8	End cap and bolts	16	Drive end adapter cap

Slew Drive Part Number Breakdown

Example WGSE 14A-85 BT-25H- 2R

WGSE 14 A	Model code ; Raceway diameter in inches; Design revision	
85	Reduction ratio	
B	Imperial threads	
	Option [Omitted]	Metric threads
T	Mounting hole style	Inner ring through holes/ Outer ring blind tapped holes
	Option [C]	Inner and outer ring threaded holes through
	Option [Omitted]	Inner and outer ring blind tapped holes
25	Input shaft size	
	Options	12 / 14 / 16 / 20 / 32 mm; 1" and SAE 68 spline
H	Hex head on non drive end ;	
	Option [E]	Encoder
2	Number of worm shafts ;	
	Option [Omitted]	Single shaft units
R	Motor position Right	
	Option [L]	Left

Support Structure

Under load, flatness defects must not exceed the values tabulated below to avoid tight spots or seizure; both of which will reduce the life of the ring. The tabulated values are for 'long waves' around the circumference. Shorter wave defects between 2 bolts must not exceed 1/4 of these values.



Basic Drive dia.	3"	5"	7"	9"	12"
Flatness deviation (mm)	0.04	0.10	0.10	0.12	0.15
Basic Drive dia.	14"	17"	19"	21"	25"
Flatness deviation (mm)	0.15	0.15	0.17	0.20	0.20

Fastening Bolts

QCB recommends use of Grade 10.9 Hex head bolts or Grade 12.9 Cap Screw bolts.

Lubrication WGR Rotation Drives

After 100 hours of operation, grease in the WGR Rotation Drives should be refreshed. Grease should be injected into one grease port, while old grease is purged from the other.

Size	Grease qty (grammes)
WGR 72	350 - 400
WGR 110	1200 - 1300
WGR 114	1700 - 1800

Lubrication Slewing Drives

QCB Slewing Drives are factory lubricated and ready for installation, but the most frequent cause of slewing drive failure is inadequate relubrication. It is recommended that lubricant is applied to the slewing ring, the worm gearing and worm shaft support bearings on a regular maintenance schedule.

The amount of grease required is tabulated below:-

Basic size	3"	5"	7"	9"	12"
Raceway	-	15	20	35	50
Worm gear	35	60	65	100	110
Taper brgs	7	7	7	10	10
Basic Size	14"	17"	19"	21"	25"
Raceway	60	75	105	130	150
Worm gear	110	120	130	140	150
Taper brgs	10	10	10	10	10

The regreasing interval is determined by the environment. In aggressive environments, grease can be used as a barrier to contaminant entry.

Suitable lubricants include:-

Environmental conditions	Recommended relubrication interval
Dry, clean workshop	- 1000 hours use or 12 months
Outside & exposed	- 500 hours use or 6 months
Aggressive outdoors	- 150 hours use or 3 months
Extreme conditions	- 50 hours or 2 months

Brand	Grease
QCB	YP 7014-1
Kluber	Isoplex NBU 15
Mobil	Mobiltemp SHC 100

Mobiltemp SHC 100 is available in 380gr cartridges or in GreaseMax Autolubricators (lubricant code F239) from QCB.

Tracking Accuracy & Backlash

The tracking accuracy of all QCB slewing drives is tested and recorded during assembly. The difference between tracking accuracy and backlash is illustrated below.

Tracking accuracy is catalogued

- Input (worm shaft) is locked in place
- The worm wheel rotates $< 0.2^\circ$



Backlash is measured

- Worm wheel is locked in place
- Worm shaft can move axially by $\text{Gear PCD}/2 \times \tan(\text{tracking precision})$



e.g. WGSE 7 73 – worm shaft can move axially by $229.95/2 \times \tan 0.2 = 0.401\text{mm}$

Backlash is calculated

- Worm wheel is locked in place
- Worm shaft can rotate $0.2 \times \text{reduction ratio}$



e.g. WGSE 7 73 – worm shaft can rotate $0.2 \times 73 = 14.6^\circ$

High precision slewing drives are imported to order, and only after full technical evaluation with the factory engineering team. These can include an encoder on the non-drive side of the worm shaft.



Hydraulic Motors

The table illustrates the largest motor using typical system pressures and flow rates to make use of the full capacity of QCB slew drives. Other options are available such as braked motors, geared reducers. Overcenter valves for load control are recommended.

Should you do your own calculations remember to take into account the low efficiency of the worm gear systems (30-40% maximum).

QCB Reference	Output torque	Ratio	Max Speed	Motor		Motor ref	Pressure	Flow Rate
	KNm		rpm	Torque	Speed		bar	lpm
WGSE 3C 62 16 R ##1	0.4	62:1	2	21	124	AMM 50 P	32	7
WGSE 5A 62 16 R ##1	1	62:1	2	32	124	AMM 50 P	50	7
WGSE 7 73 16 H R##1	1.5	73:1	3	44	219	AMM 50 P	70	12
WGSE 9 61 25 H R	7	61:1	3	266	183	MSA 125 2 M	150	26
WGSE 12 78 25 H R	7.5	78:1	3	240	234	MSA 125 2 M	140	32
WGSE 14 85 25 H R	8	85:1	3	235	255	MSA 125 2 M	140	34
WGSE 17 102 25 H R	10	102:1	3	245	306	MSA 125 2 M	140	40
WGSE 21 125 25 H R	15	125:1	3	300	375	MSA 150 2 M	130	64
WGSE 25 150 25 H R	18	150:1	3	300	450	MSA 150 2 M	140	75

##1 modification = 3 bolt fixing and 16mm input shaft for AMM Series motors

QCB Reference	Output torque	Ratio	Max Speed	Motor		Motor ref	Pressure	Flow Rate
	KNm		rpm	Torque	Speed		bar	lpm
WGWEA 9 62 25 H R	8	62:1	2.5	323	155	MSA 150 2 M	150	22
WGWEA 12 79 25 H R	10	79:1	3	316	198	MSA 150 2 M	140	33
WGWEA 14 86 25 H R	10.8	86:1	2.5	314	215	MSA 150 2 M	150	36
WGWEA 17 104 25 H R	13	105:1	3	309	263	MSA 200 2 M	110	65
WGWEA 19B 94 25 H R	18.5	94:1	2.5	492	235	MSA 300 2 M	100	75
WGWEA 21 90 R MTAP	29	90:1	3	797	225	MTAP 300P	165	75
WGWEA 25 104 R MTAP	34.2	104:1	2.5	822	260	MTAP 300P	180	95

MTAP modification = 4 bolt fixing and 32mm input shaft to achieve maximum load torque

QCB Reference	Output torque	Ratio	Max Speed	Motor		Motor ref	Pressure	Flow Rate
	KNm		rpm	Torque	Speed		bar	lpm
WGR 72	0.9	63:1	8	48	500	MSA 75 2 M	35	40
WGR 114	3	44:1	8	214	350	MSA 150 2 M	100	68

Note: The flow rates & pressures tabulated are calculated at maximum torque & speed.





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