



SOCARE® SLEW DRIVES



SoCare®  
SLEWING DRIVE MANUAL



SOCARE® INTERNATIONAL

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**Slew Drive- what is it? What does it do?**

**Where is it used?**

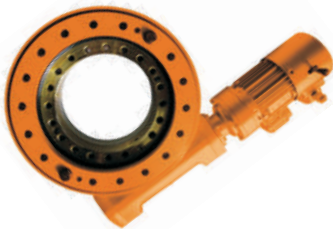
**A complete system,ready to install,consists of**

●A Ball or Roller Slewing Ring to handle simultaneously occurring radial, axial and moment loads

●Hydraulic or electric motor to pitch or rotate the Slewing Ring

●A totally enclosed housing

**Bolt, connect, run... done!**



**Service Contact:**

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**General:**

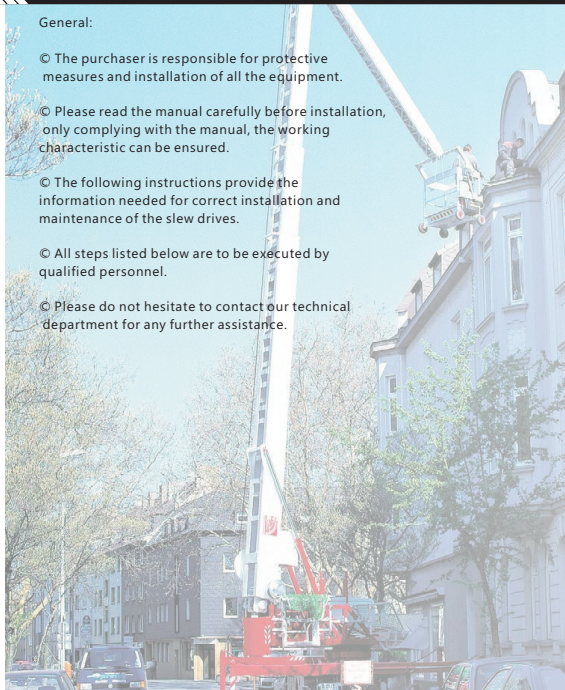
○ The purchaser is responsible for protective measures and installation of all the equipment.

○ Please read the manual carefully before installation, only complying with the manual, the working characteristic can be ensured.

○ The following instructions provide the information needed for correct installation and maintenance of the slew drives.

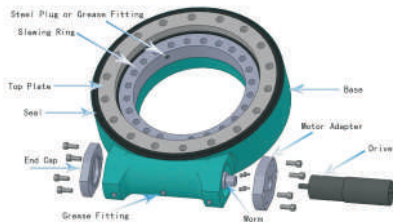
○ All steps listed below are to be executed by qualified personnel.

○ Please do not hesitate to contact our technical department for any further assistance.



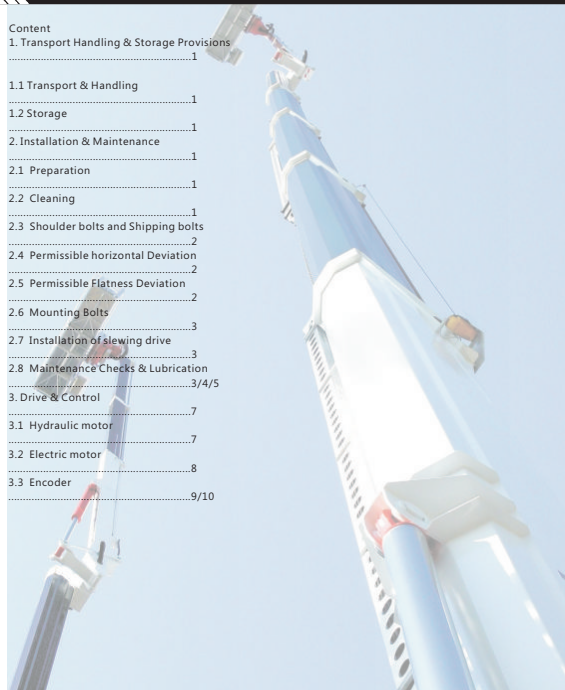


### The Structure Sketch of Slewing Drive



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## Installation & Maintenance Provision

### Notice:

The following text includes special notices and procedures that shall be observed.

### 1. Transport, Handling & Storage Provisions

1.1 Please keep the slewing drive in prescribed position and avoid any collision. Wear work gloves and when handling the slewing drives.

Use the holes of the rings in the slewing drives to fix bolts for safe hoisting, handling and placement.

1.2 Store only in a prescribed position & in an enclosed room, Store in a dry environment. Surface corrosion protection will hold for 5 months in factory packaging. For extended storage periods, additional surface treatment is recommended.

### 2.Installation & maintenance

#### 2.1 Preparation

- © Check the slewing drive for physical damage.
- © Clean the slewing drive and the mounting structure, see Cleaning
- © Remove extraneous materials from supporting surfaces

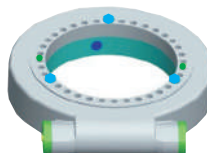
#### 2.2 Cleaning

- © Clean the exterior of the mounting surfaces using cold solvent (e.g. diesel oil) that will not damage the rubber seals.

© Applicable provisions for cleaning media are observed (e.g. manufacturer provisions, protection of workers, environment protection).

### 2.3 Shoulder bolts & Shipping bolts

When mounting the Slewing drive, the shoulder bolts can not be removed .The shipping bolts should be removed.



 Shipping Bolts

 Shoulder Bolts

### 2.4 Permissible horizontal Deviation of the mounting surface

Size of Slew Drives	3"	5"	7"	9"	12"	14"	17"	21"	25"
Permissible Perpendicularity Deviation in length (mm)	0.07	0.09	0.11	0.16	0.23	0.26	0.32	0.42	0.49
Permissible Perpendicularity Deviation in Angle Dimension (Degrees)	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09

Table 1

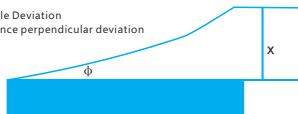
### 2.5 Permissible Flatness Deviation of the mounting surface

Size of Slew Drives	3"	5"	7"	9"	12"	14"	17"	21"	25"
Flatness Deviation	0.04	0.10	0.10	0.12	0.15	0.15	0.15	0.20	0.20

Table 2



$\phi$  - Angle Deviation  
 x- Distance perpendicular deviation



The form must resemble a sine curve that gradually rises and falls.

## 2.6 Mounting Bolts

As the gearbox manufacturer, we do not supply warrant or recommend the mounting fasteners used.

Ⓢ Please select required hardware grade for your application to attach our slew drive to your equipment.

Ⓢ Prescribed sizes, number and quality grades shall be used.

Ⓢ Grip ratio (grip length to diameter of bolt) shall be observed, from minimum  $\geq 2$  to maximum  $\leq 10$ .

Slewing drive function, lifespan, and durability of the bolt connection are affected in case of non-compliance.

Ⓢ Use flat washers of appropriate size and strength choice of tightening torques, so that the permissible interface pressure is not exceeded.

Ⓢ When mounting the Slewing drive, please remove the shipment bolts.

## 2.6.1 Tightening Torques

Ⓢ Use of split rings, split washers, etc. not permissible.

Ⓢ Tightening torques and initial preloads for mounting bolts. Information of this table is for guidance only.

Mounting Bolt Dimension	Metric Bolts			
	Tightening Torque (N m)			
M8	11±1	26±4	33±3	45±6
M10	22±2	52±7	72±6	90±10
M12	40±4	90±12	120±10	150±20
M16	100±10	225±35	305±25	380±50
M18	135±15	310±45	415±35	521±70
M20	190±20	410±50	600±50	750±100

Table 3

## 2.7 Installation of Slewing Drive

Ⓢ Clean the mounting structure, e.g. from welding, galvanizing, residues, dirt, etc.

Ⓢ Lift the slewing drive with eye bolts.

Ⓢ The slewing drive shall be mounted in unloaded condition.

2.7.1 The following procedure shall be followed in order to avoid deviations between bolt tightening forces.

Ⓢ Apply thread lock liquid to threads.

Ⓢ Preload the bolts including washers, if required, crosswise. See the general pattern in sketch below of how bolts get torqued in crosswise sequence. Start with either inner or outer ring. The crosswise torque of all bolts to 30% of tightening torque is first applied. Then repeat crosswise.





torque to 50% of tightening torque. Finally crosswise torque to 100% of the tightening torque.  
First completely torque inner or outer ring, then do the other ring.

Once the screw is tightened, please make a permanent mark on the position of the screw head to that of the stationary structure. This will be used later during inspection to be sure the screw head has not loosened.



Figure 2.7.1

## 2.8 Maintenance Checks & Lubrication

### 2.8.1 Mounting Bolts and Checks

To compensate for possible settling, it is necessary to re-tighten the bolts to the prescribed torque. This shall be done after no more than 100 hours of operation and without external load applied to the bolt connection. This inspection shall be repeated annually.

The inspection frequency may be reduced under special operating conditions. In case of loose bolts, replace all bolts and washers with new ones.

### 2.8.2 Lubrication and Mounting Bolts

There are three places which need to be lubricated, they are slewing ring raceway, worm thread and taper roller bearings. Slewing drives are supplied fully lubricated. A suitable grease type for normal cases is shown on the follow table 4.

Parts needed to be lubricated	Roller Bearing, Ring raceway, Worm gear thread
Recommended grease	Mobile Shell Ep2 Grease
Applicable temp. range in °C	-40 to +200
Color	White
Four-ball test	3500N welding load
Viscosity(-40°C, 10 s-1) Pas	653
Dropping point °C	316
Penetration, worked 0.1mm	67

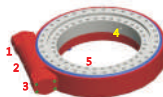
Note: This kind of ecological friendly grease is harmless to human and circumstance

Table 5

Parts needed to be lubricated	Quantity of grease-filled (unit:g)								
	3"	5"	7"	9"	12"	14"	17"	21"	25"
Ring Raceway	/	10-15	15-20	30-35	45-50	55-60	70-75	120-130	140-150
Worm Gear Thread	330-350	50-60	55-65	90-100	100-110	100-110	110-120	130-140	130-140
Taper Bearing	7±0.5	7±0.5	7±0.5	10±0.5	10±0.5	10±0.5	10±0.5	10±0.5	10±0.5

Manufacturer provisions about handling the respective lubricants must be observed.

While rotating the slewing drive, inject grease into all the cleaned grease nipples consecutively, the quantity of grease-filled need to according to the Table 6.



1. Roller Bearing Lubricate Point
2. Worm Thread Lubricate Point
3. Roller Bearing Lubricate Point
4. Ball Slewing Bearing Lubricate Point
5. Ball Slewing Bearing Lubricate Point

Recommended re-lubrication every 3 years by filling each cavity completely with new grease.

Work conditions	Grease-filled slewing drive lubrication intervals
Dry and clean workshop, industrial positioners (turntables/ robots, etc.)	Every 500 hours of operation or once every 1 year.
Difficult conditions in open grounds (crane/ bulldozer, etc.) wind turbine, solar, m an-lift	Once every year
A aggressive clim atic conditions sea/ desert/ Arctic clim atic/ very dirty surrounding/ more than 70 continuous operating hours per week	Every 150 hours of operation or once Every 4 months
Extrem e conditions (tunneling machines, steel mills, oil field)	Every 50 operating hours, at least, how ever every 2 months

- © The specified values are valid for the following conditions
- © Operating temperature on slewing drive -30°C ~ +60°C
- © Driver rotational speed < 2 rpm (maximum speed varies depending on torque load applied during the same time)
- © Low to medium loads (Table 7)



Table 7

Size	3"	5"	7"	9"	12"	14"	17"	21"	25"
Rated Torque (KN.M)	0.20	0.30	1	8	9	11	14	17	20

© The most frequent cause of failure of slewing drives is insufficient lubrication.

© Cleaning a slewing drive with steam jet or high-pressure cleaner is not permissible.

### 3 Drive & Control

#### 3.1 Hydraulic motor

- a:7/16"-20 UNF(DEPTH:12MM)  
 b:7/8"-14 UNF(DEPTH:17MM)  
 c:7/8"-14 UNF(DEPTH:17MM)  
 d:Two mounting holes

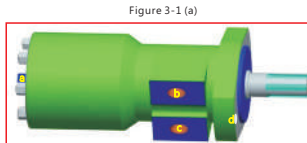


Figure 3-1 (a)

Cleaning mounting surface see **cleaning**  
 Check mounting position



Check motor rotation

See Figure 3.1(a), from output shaft, input Port b and out put Port c, Rotation is CW; to the contrary, input Port c and output Port b, Rotation is CCW.

Check mounting bolts tightening torque see Figure 2.7.1  
 Connect Hydraulic supply to motor.

Connect Hydraulic supply to motor.

Rotate the motor under no load, confirm it rotates smoothly. Once it does not rotate, please check the oil system or current system; please check the joint Slewing drive & worm etc; Checking there is enough grease in running location.

After the test under no load successfully, then add the rated load.

#### Notice:

For other type Hydraulic motor, need to read the specification attached with product!

#### 3.2 Electric motor

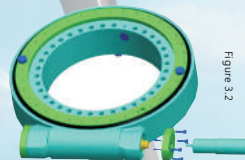


Figure 3.2

For standard 24VDC motor

Cleaning mounting surface see cleaning

Join the adapter and tightening screws to the motor;  
 Mount the motor and tightening screws to the base;  
 Connect the DC power to the motor, check the rotation.  
 If not in desired direction of rotation, exchange the LINE (L) and NEUTRAL (N).

Rotate the motor under no load, confirm it rotates smoothly. If it does not rotate, please check the current system; Please check the mating area of ring gear and worm to ensure proper lubrication on mating surface. After the test under no load successfully, then add the rated load.

**Notice:**

For other motor, such as 110VDC motor, brushless DC motor, AC motor etc. need to read the specification attached with product!

**3.3 Hall Sensor****3.3.1 Standard Magnetic pulse generator**

Model	M 2-V	M2-N
Output type	voltage output	Open Collector(NPN)
Pull-up resistor	yes	no
Output signal	2 square wave signals, phase quadrature	
Impulses per revolution	ppr	2,channels A and B
Operating voltage	VDC	$U_N=12$ (5 ..... 24)
Operating current	mA	max. 12 ( $U=12V$ )
Deviation of pulse width		max. 15°C
Deviation of phase shift		max. 15°C
Output voltage(low level)	VDC	max. 0.4 (20mA)
Operating temperature	°C	-40 -- +85

Connection: For DC motor



Electric Connection:

- Pin 1: Motor, 0V (MOTOR INPUT), (Black thick wire inside)
- Pin 2: Motor, +24V (MOTOR INPUT), (Red thick wire inside)
- Pin 3: Hall, 0V (HALL INPUT), (Black thin wire inside)
- Pin 4: Hall, +12V(5-24) (HALL INPUT), (Red thin wire inside)
- Pin 5: Hall, Signal A (HALL OUTPUT, square wave signal)  
(Green thin wire inside)
- Pin 6: Hall, Signal B (HALL OUTPUT, square wave signal)  
(Yellow thin wire inside)
- Pin 7: GROUND (G)

**3.3.2 Photoelectric Encoder**

Incremental encoder

Spec:

Resolution	100/ 360/ 500/ 600/ 1000/ 1024
Output signal	3(A,B,Z)
Operating voltage	5/ 28 VDC
Electric characteristic	Push-pull/ NPN OC/ long drive
Transmission frequency	115 kHz
Rotate speed	Max6000 rpm
IP grade	IP54
Cable output	2m radial output
Crust material	plastic
Shaft size	6x 15mm stainless steel
Operating temperature	-10...70 degree
Bearing	2XPBQ 626 ZZ
Polarity protection	Yes



SoCare® ACCEPTS NO LIABILITY FOR:

- ⊗ Failure to pass the manual to the related third party
- ⊗ Non-compliance with Installation and Maintenance Instructions
- ⊗ Any omissions or errors in following the manual