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With over 200 years experience in mooring floating structures, Griffin-Woodhouse Limited is globally acknowledged as a market leader in consultation, design, manufacture and supply of 'Offshore Mooring Systems'

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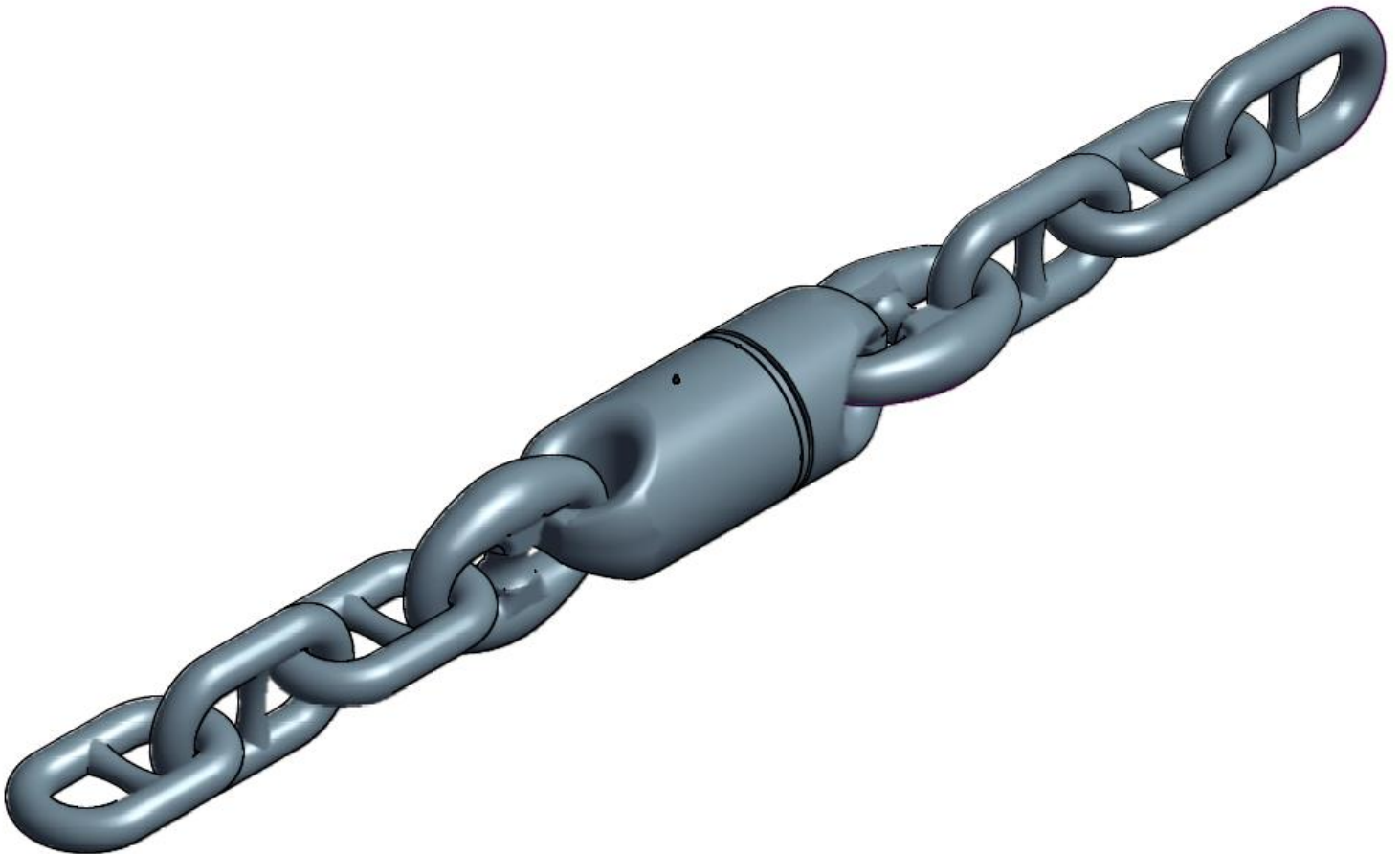


Registered No. 852771 England

# Operation Manual

Griffin-Woodhouse Limited  
Totally Enclosed Grease Packed Swivel designated -

## GPS



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## 1. Introduction

GPS is designed to facilitate easy assembly of the swivel directly into mooring lines via one of the following connecting links - Kenter Shackle (KS), Detachable Chain Connecting Link (DCCL) or Detachable Anchor Connecting Link (DAACL).

## 2. Instructions for Use

### 2.1 Intended Application

The GW Deep Water Mooring Swivel is designed to solve the problem of torque build up in offshore mooring lines, thus allowing their safe operation, deployment and recovery. This is achieved by -

- Having a crush proof bearing with a low coefficient of friction, thus being able to swivel at high loads
- Being rated as a minimum to the same grade requirements of the mooring chain
- Capable of being connected directly into any mooring line
- Being compact, streamlined and able to withstand a high bending moment, thus being able to run a fairlead or stern roller without risk of failure or snagging
- Having a minimum fatigue capability equivalent to that of the mooring chain
- Being robust enough to withstand heavy handling without the need for regular maintenance, thus long life

The GW Swivel is designed for deployment in the following vessel class'

#### 2.1.1 MODUs (Mobile Offshore Drilling Units)

- Deep Water Mooring Lines - at the interface of chain, wire rope socket or other suitable equipment within the mooring line
- Temporary, Towing and Mobile Moorings

#### 2.1.2 AHVs (Anchor Handling Vessels)

- Anchor Handling Lines - at the interface of chain, wire rope socket or other suitable equipment within the chaser line

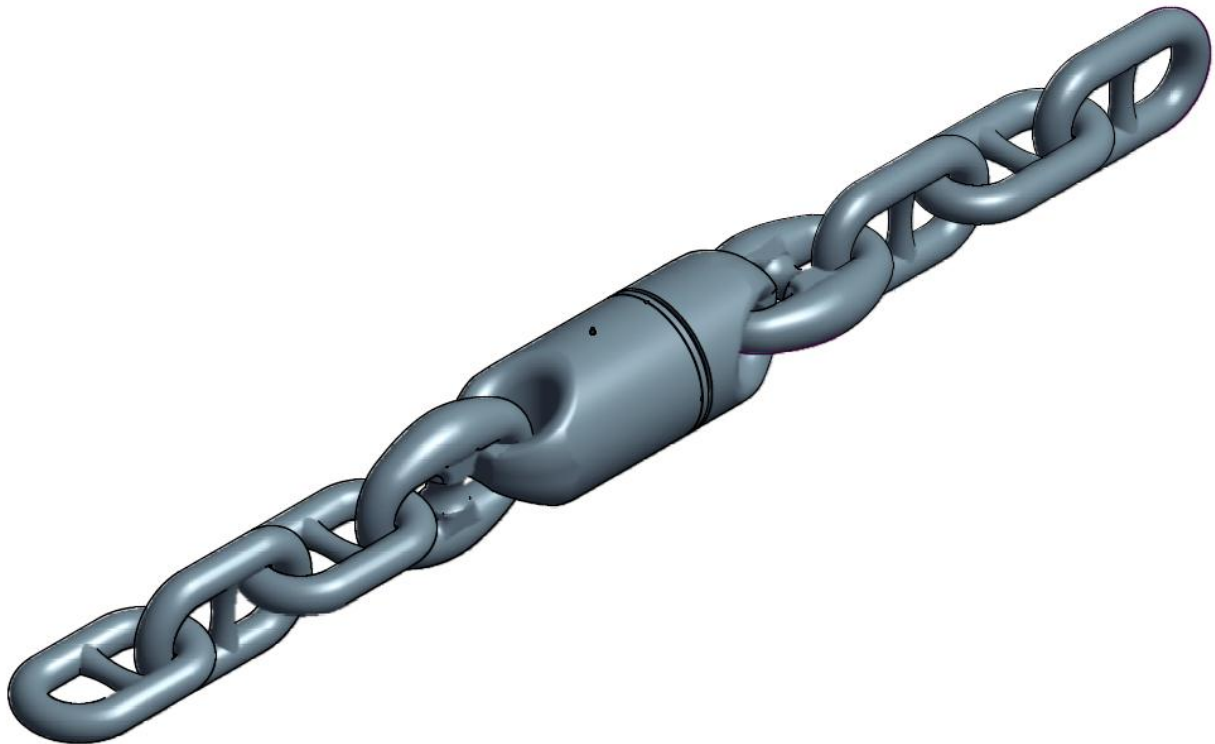
## 2.2 Correct Use

GPS is specifically designed to connect directly to the appropriate size of KS, DCCL or DACL. Connecting to equipment intended for a larger diameter than detailed in Table 1 below is not recommended as it may affect the loading profile of the eye, which in turn will impact the function, performance, later use and ultimate life of the product.

## 2.3 Table 1 - Product Data to suit Grade R4

Nominal Diameter		Product Code	MBL		Max. Proving Load		Max. Load Over Sheaves*	
mm	Inch		kN	Ton(S)	kN	Ton(S)	kN	Ton(S)
70	2¾	GPS 70	5160	569	4060	448	1893	209
76	3	GPS 76	6000	661	4730	521	1992	220
84	3¼	GPS 84	7210	795	5680	626	2640	291
90	3½	GPS 90	8170	901	6440	710	2989	329
95	3¾	GPS 95	9030	995	7090	782	3150	347

\*Note - When the swivel passes over a pulley or sheave, the maximum loading must be restricted to that shown above and angle of entry to the pulley must be no less than 30° to the vertical.



## 3. In-Service Inspection

### 3.1 Recommended Schedule

Detailed visual inspection of all areas of GPS and basic operational checks should be conducted on an annual basis with additional crack detection every third year. Fully traceable records of all inspections carried out, together with comprehensive details of any suspect areas found, results of further examinations and copies of relevant certification should be maintained, appropriately stored and accessible.

### 3.2 Visual Inspection Details

Visual inspections should pay particularly attention to, but not exclusively -

- Cracks or other visible defects, which should be further examined by crack detection or similar if necessary
- Signs of damage that could affect the operation of GPS
- Signs of excessive wear, particularly at or near to the bearing point of the eye. Excessive wear is considered to have taken place when any dimension is reduced by 5%
- Ensuring both Grease Nipples remain correctly installed
- Ensuring all marks remain legible

### 3.3 Operational Inspection Details

A simple operational inspection can be conducted manually by undertaking the following action -

- Suspend GPS with one eye held such that it cannot rotate and, using a suitable tommy bar through the other eye, ensure the Main Body rotates freely



## 4. Servicing

The following basic servicing may be conducted on-board MOU or AHV. All service and refurbishment procedures other than those detailed herein **MUST** be carried out by Griffin-Woodhouse Limited otherwise product warranty is invalidated -

### 4.1 Greasing the Bearing

Remove one grease nipple, pump grease into the other until grease escapes from the hole from which the first nipple was removed. Leave for 30 minutes, allowing excess grease to escape and pressures equalise, then replace the first nipple.

**IMPORTANT** - Pressurisation of the bearing due to overfilling will prevent GPS from swivelling. If GPS remains seized please contact Griffin-Woodhouse Limited as detailed in Section 5 Further Information, Pg. 7

**IMPORTANT** - Castrol Spheerol SX2 lubricant (see Appendix 1, Pg. 8) should be used and is available as part of GPS Service pack detailed below.

### 4.2 GPS Service Pack

For a complete service pack please contact Griffin-Woodhouse Limited as detailed in Section 5 Further Information, Pg. 7. Each contains -

- 2 x Grease Nipples
- 1 x Tub Castrol Spheerol SX2 Lubricant

## 5. Further Information

For further information please contact us -

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## Appendix 1 - Spheerol SX2 Data Sheet

# Product &

## Spheerol SX2

# Technical Data

### INTRODUCTION

Improved Castrol Spheerol SX2 is a true multipurpose ships machinery lubricant specifically developed to provide enhanced lubrication and protection for bearings, wire ropes and open gears.

It is a complex calcium sulphonate grease providing superior performance benefits in the highly aggressive conditions experienced in the marine environment.

### FEATURES AND BENEFITS

Castrol Spheerol SX2 is proven to offer:

- { Long term stability with no premature hardening.
- { High drop point
- { Excellent protection against corrosion.
- { High resistance to sea water wash off.
- { Strong adhesion to surfaces
- { A lubricant which is solvent free containing no heavy metals or harmful constituents.

Spheerol SX2 can also be used to lubricate ball and roller bearings in both engine room and deck applications, and has been successfully tested at shaft speeds of 6000 RPM and at a temperature of 140°C.

In addition to the excellent protection provided for wire ropes and open gears, Castrol Spheerol SX2 is also suitable for use on a wide range of deck equipment where it will protect and lubricate hinges, tumblers, screws and fair leads etc.

Extensive evaluation in adverse climatic conditions has confirmed the outstanding qualities of Spheerol SX2 as a true multipurpose ships machinery lubricant. Service intervals between re-lubrication are extended, compared with conventional lubricants, reducing the time spent on preventative maintenance.

When applying Spheerol SX2, when used for multipurpose applications a grease gun may be used. Whilst the traditional methods should be applied when used as a wire rope and open gear lubricant.

### TECHNICAL DATA

#### Typical Characteristics

Colour  
NLGI Rating  
Base  
Flash Point, °C  
Penetration, Unworked (0.1mm)  
Penetration, Worked (0.1mm)  
Drop Point, °C  
Operating Temperature Range, °C  
Base Oil Viscosity at 40°C, cSt  
Timken OK Load, lbs  
4-ball EP Weld Point, kg  
4-ball EP Wear (MWSD) @ 60kg load, mm  
Salt Spray Corrosion Test Rating, (1-6), ASTM B117  
Resistance to Water Spray, ASTM D4049, % loss  
Emcor Bearing Corrosion Test (Salt Water), IP 220

#### Spheerol SX2

Pale Brown  
2  
Complex Calcium  
Sulphonate  
>250  
262  
285  
>300  
-25 to +175  
180  
65  
540  
0.688  
1  
11  
0

