

# FPSO's FSO's & EWT's: SMS External Turret



## All Weather External Turret and Mooring

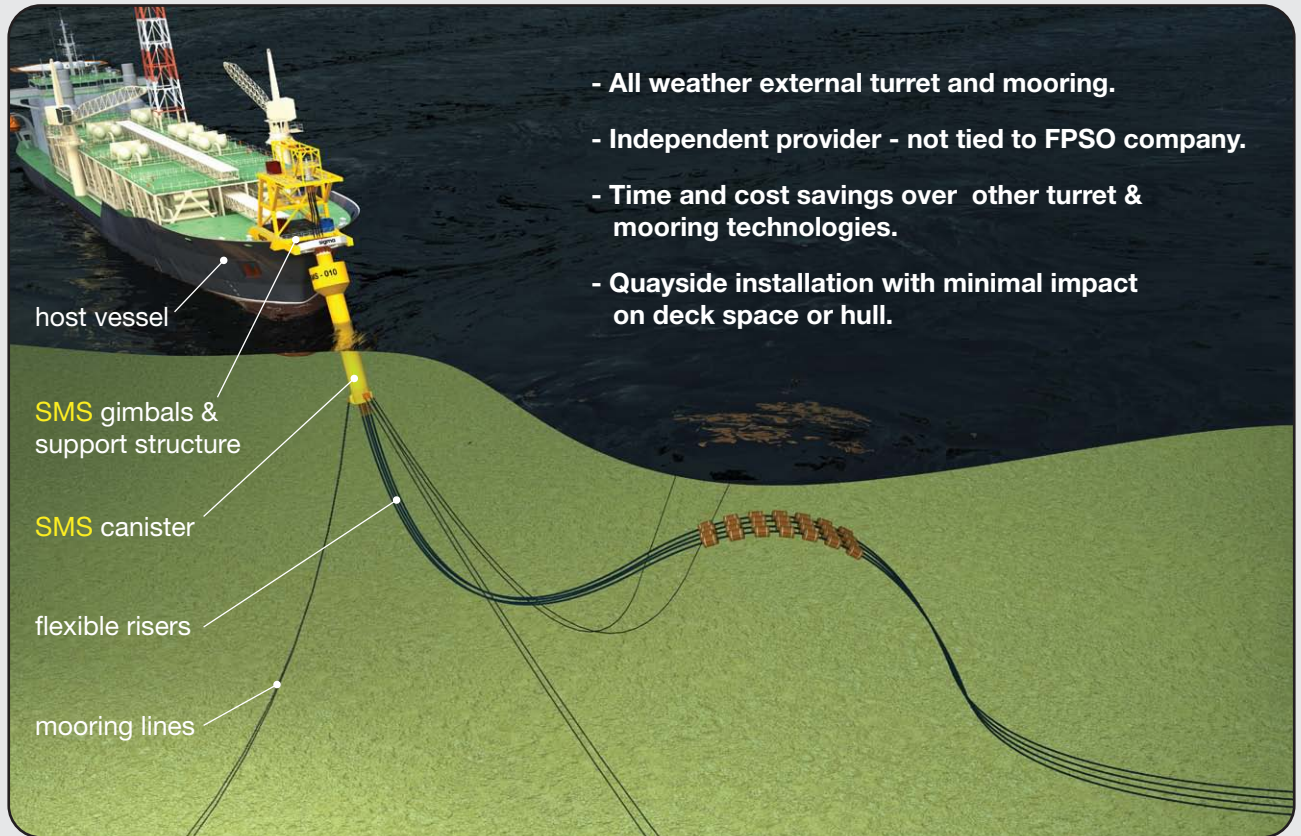
Our cost-effective External Turret is built from proven components and can be installed on FPSO, FSO and EWT vessels without major hull modifications.

Discover more at [www.sigmaoffshore.com](http://www.sigmaoffshore.com)

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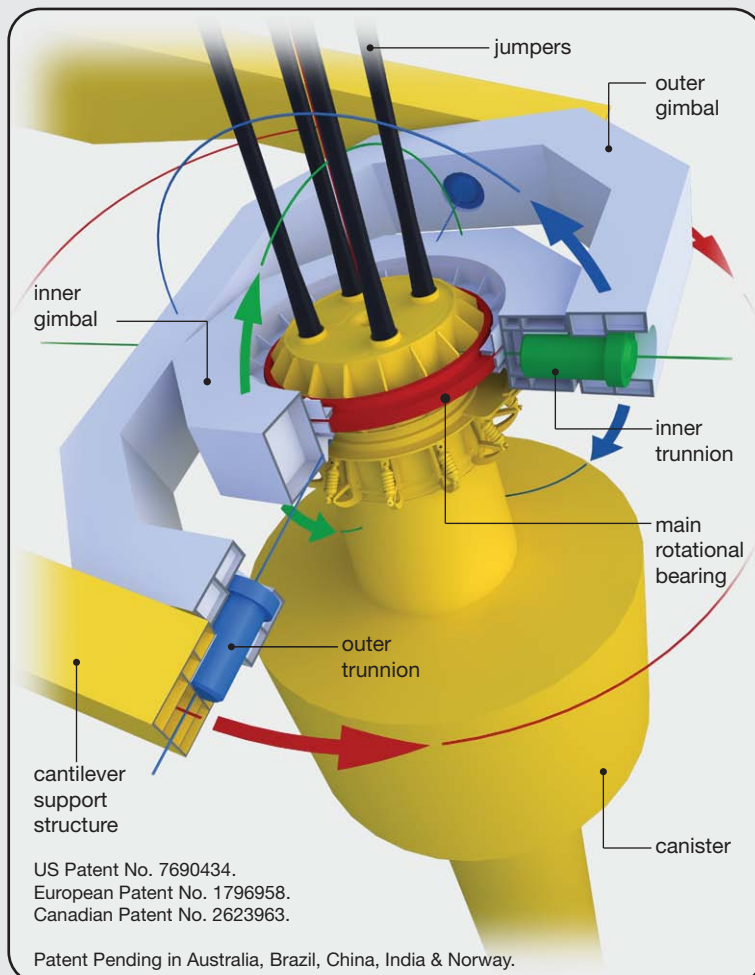
Independent providers of external turrets, moorings and engineering services

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



- All weather external turret and mooring.
- Independent provider - not tied to FPSO company.
- Time and cost savings over other turret & mooring technologies.
- Quayside installation with minimal impact on deck space or hull.

### Patented Design >



Approved in principle by DNV following successful tank testing, our proprietary SMS is the product of 10 years continual development and offers clients a cost effective and flexible Mooring and Fluid Transfer Solution suitable for FPSO's, FSO's, EWT's & similar applications. The tanker bow location of the SMS cantilever support structure and gimbal minimize deck space impact, avoid hull modifications, allow unlimited weathervaning of the vessel, reduce cost and modification to the ship's equipment and save time, thanks to a unique and patented design. Mooring components are below the canister eliminating splash zone corrosion.

-  outer trunnion allows vessel to pitch and surge; bending moments are minimized.
-  main rotational bearing allows vessel to rotate about canister enabling unlimited weathervaning.
-  inner trunnion allows vessel to roll; bending moments in structure and riser are minimized

## Smart Mooring System SMS Product Family >

### QCDC SMS >

This SMS product family variant is the most complex being both multipath and emergency disconnectable. Suitable for relatively short-term early-production system deployments and for FPSOs and FSOs in tropical cyclone areas vulnerable to hurricanes and typhoons; the vessel propulsion and navigation systems are in commission, there is a marine crew on board, and the SMS is quickly disconnectable. Flow shut-in (via a multipath QCDC) and canister drop can be triggered from the bridge and the dropped canister is designed to float at or below the water surface with the mooring lines and risers suspended from it pending vessel return and pickup. A QCDC SMS can also be used when the vessel itself is also used to export oil.



### All Weather SMS >

For long term deployments where the need for regular or emergency disconnect is not envisaged, the cost of maintaining the ship in commission and providing a marine crew can be dispensed with. All the SMS components are designed for extreme storms and mooring line failure is designed for in accordance with the DNV POSMOOR ALS case. Although the facilities for regular or emergency disconnect are omitted, the canister is nevertheless connected with the aid of a hydraulically retracted latch mechanism so that planned disconnection is possible. This enables the vessel to be towed to port for modifications if necessary.



### Single Riser SMS >

The single flowpath SMS is the simplest product family variant and is ideally suited to extended well test deployment where relatively frequent mooring and disconnection, for example for relocation, is envisaged. The single riser SMS is used with a shuttle tanker.



**Our SMS solution for your needs. Please contact us to discuss your requirements.**

## About us >

Sigma Offshore provide bespoke mooring and fluid transfer systems, including the Smart Mooring System, and also provide consultancy services in structural engineering, naval architecture and geotechnics.

Our roots go back to the mid 1990s and our mooring systems have been evolving since those days.

We have a special interest in devising economical solutions for FPSO/FSO Mooring and Fluid Transfer Systems and in providing solutions to problems posed in deepwater projects.

Our consultancy services are focused on marine structures, principally ships and FPSOs, but also includes renewable energy systems.

Sigma Offshore Limited is owned by :

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### Sigma Offshore Ltd

ISO 9001 : 2008	✓
ISO 14001 : 2004	
OHSAS 18001 : 2007	
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