

## CPS 730

### Cement pumping skid

#### APPLICATIONS

- Cement slurry mixing and pumping on offshore rigs
- High-pressure or high-rate pumping or both
- High-pressure pumping and testing operations

#### ADVANTAGES

- Improved access and maintenance with modular design
- Reduced NPT because of complete redundancy with two independent power trains and system redundancy
- Increased cement slurry mixing rates
- SlurryAirSeparator\* mechanical cement slurry defoamer on mix tub
- Consistent cement slurry properties and performance through automatic cement density control
- Recirculation and downhole densitometers
- Compliance with American Bureau of Shipping (ABS) certified drilling system (CDS) criteria
- Det Norske Veritas (DNV)-OS-E101 and DNV 2.7-3 certified
- Electric-powered, twin-pump cement unit with combined horsepower of 1,200 bhp
- Full Data Acquisition & Control Systems (DACS) acquisition system
- Fully remote-controlled for all cementing and pressure pumping operations
- Direct drive for low-rate pumping capability
- Torque control for fine pressure control
- Removable spacer between pump and power modules for installation in small spaces
- Two triplex pumps with maximum working pressures of 15,000 psi and 6,667 psi, respectively, and total maximum pump rate of 18.5 bbl/min
- Two 5×6 and one 4×5 centrifugal pump
- Displacement tank agitators
- Optional averaging skid with surge tank
- Spreader bar and slings for offshore lifting

The CPS\* 730 cement pumping skid is a twin-pump offshore cementing unit that provides cementing and pressure pumping capabilities in deepwater environments. Two General Electric® (GE®) motors provide a combined horsepower of 1,200 bhp. The motors drive two triplex pumps that deliver a maximum flow rate of 18.5 bbl/min and maximum pressure of 15,000 psi.

The mixing system allows cement slurries to be mixed at conventional rates. Cement mixing processes are fully automated, with autodensity control for consistent cement slurry properties and performance. Cement mixing and pressure pumping processes are fully remote controlled, with local operation available as backup.

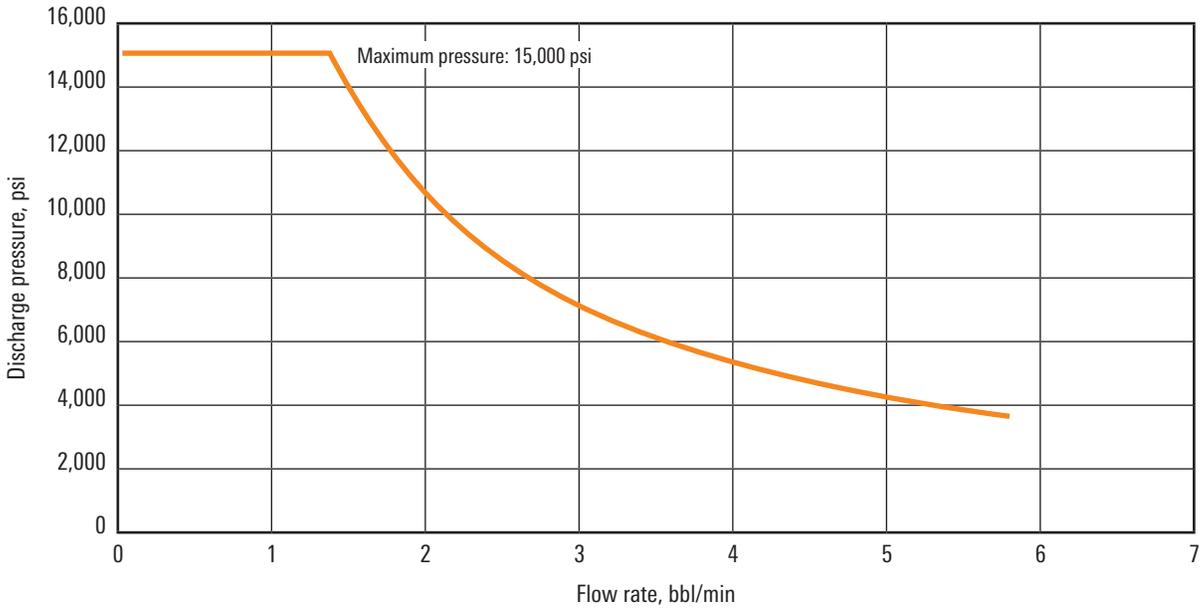
The CPS 730 skid meets DNV-OS-A101 standards for operation in Zone 2 hazardous areas.



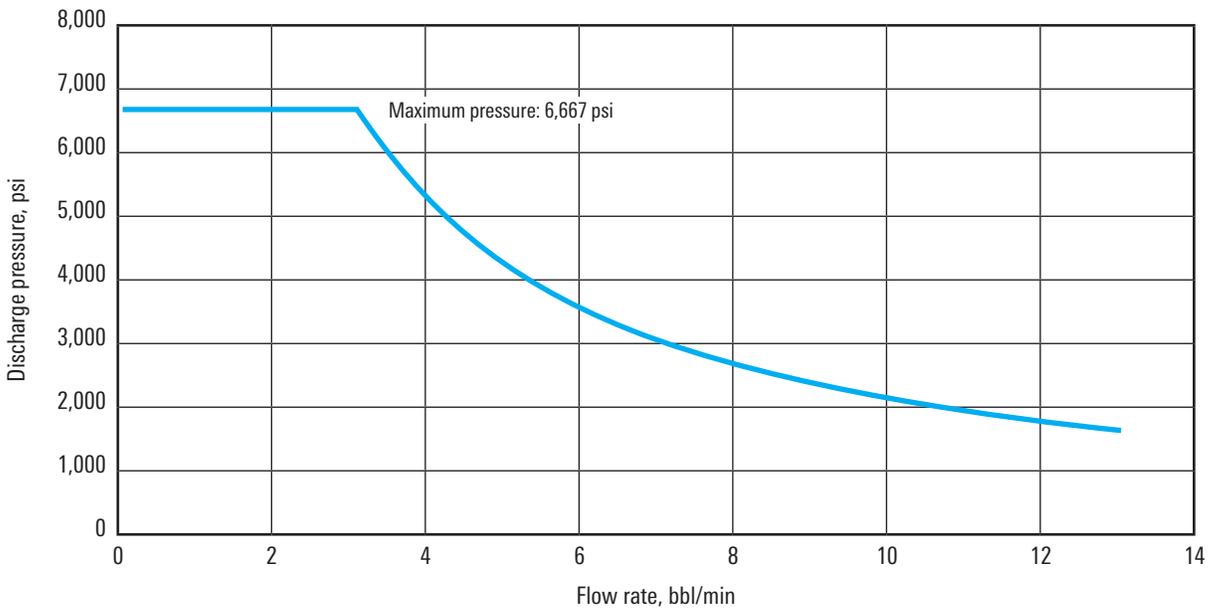
*CPS 730 cement pumping skid.<sup>†</sup>*

<sup>†</sup>The photograph may not be exactly representative of current production; be sure to review the specifications.

# CPS 730



Performance curve for SPM® TWS 600S HD triplex pump with 3-in plunger.



Performance curve for SPM TWS 600S HD triplex pump with 4.5-in plunger.

# CPS 730

## CPS 730 Skid Specifications

### General

|                     |   |
|---------------------|---|
| Motors              | Two General Electric 5GEB-22E1 AC drilling motors rated 690 V |
| Capability          | Maximum 1,150 hp [858 kW] <sup>†</sup> /motor                 |
| Centrifugal pumps   | Two 5×6 and one 4×5   |
| Length              | 362.2 in [9.2 m]  |
| Width (narrow)      | 141.2 in [3.6 m]  |
| Height              | 189 in [4.8 m]  |
| Ambient temperature | 32 to 104 degF [0 to 40 degC]                                 |

### Certifications

|             |  |
|-------------|--|
| ABS-CDS     |  |
| DNV-OS-E101 |  |
| DNV 2.7-3   |  |

### Triplex Pumps

|                   |                                      |  |  |
|-------------------|--------------------------------------|--|--|
| Front pump        | SPM TWS 600S HD                      |  |  |
| Plunger diameter  | 3.0 in [76 mm]                       |  |  |
| Maximum pressure  | 15,000 psi [103 MPa]                 |  |  |
| Maximum pump rate | 5.7 bbl/min [55 m <sup>3</sup> /h]   |  |  |
| Rear pump         | SPM TWS 600S HD                      |  |  |
| Plunger diameter  | 4.5 in [114 mm]                      |  |  |
| Maximum pressure  | 6,667 psi [46 MPa]                   |  |  |
| Maximum pump rate | 12.8 bbl/min [124 m <sup>3</sup> /h] |  |  |

### Systems

|                      |   |  |  |
|----------------------|---|--|--|
| Slurry mixing system |   |  |  |
| Model                | Mixing system with Mark III SLURRY CHIEF* cement mixing equipment |  |  |
| Maximum mixing rate  | 60 sacks dry cement/min [2,560 kg/min]                            |  |  |
| Volume capacity      | 6-bbl mixing tub and 20-bbl averaging tank                        |  |  |

### Slurry mixing rate capabilities<sup>‡</sup>

|                           |                                      |                                      |                                       |
|---------------------------|--------------------------------------|--------------------------------------|---------------------------------------|
| Slurry density            | 22 lbm/galUS [2.64 relative density] | 19 lbm/galUS [2.28 relative density] | 17 lbm/galUS [2.04 relative density]  |
| Bulk cement delivery rate | 2,328 lbm/min [1,056 kg/min]         | 5,223 lbm/min [2,369 kg/min]         | 5,805 lbm/min [2,633 kg/min]          |
| Slurry rate               | 3 bbl/min [0.48 m <sup>3</sup> /min] | 8 bbl/min [1.27 m <sup>3</sup> /min] | 11 bbl/min [1.75 m <sup>3</sup> /min] |

|                                |   |
|--------------------------------|---|
| Cooling System                 | Seawater closed-loop cooling system         |
| DACS acquisition system (full) | Allows control and data acquisition on unit |

### Other

|                    |   |
|--------------------|---|
| Discharge manifold | 15,000-psi [103-MPa] maximum working pressure |
| Displacement tanks | 2 × 10 bbl [2 × 1.59 m <sup>3</sup> ]         |
| SlurryAirSeparator | mechanical cement slurry defoamer on mix tub  |

### Options

|                                |  |
|--------------------------------|--|
| Removable spacer               | Can be removed to allow installation of power and pump modules in small spaces |
| Averaging skid with surge tank |  |

<sup>†</sup>Limited to 600 bhp [447 kW] due to triplex pump rating.

<sup>‡</sup>Slurry mixing rate capability depends on slurry type and bulk cement delivery rate to mixer.

# CPS 730

## Module Specifications

### Power Module

|                             |                        |
|-----------------------------|------------------------|
| Length                      | 84.8 in [2.2 m]        |
| Width (without spacer)      | 121.5 in [3.1 m]       |
| Width (with spacer)         | 141.2 in [3.6 m]       |
| Height                      | 155 in [3.9 m]         |
| Service Weight <sup>†</sup> | 34,171 lbm [15,500 kg] |

### Pump Module

|                             |                       |
|-----------------------------|-----------------------|
| Length                      | 91.1 in [2.3 m]       |
| Width (without spacer)      | 130.7 in [3.3 m]      |
| Width (with spacer)         | 150 in [3.8 m]        |
| Height                      | 120.6 in [3.1 m]      |
| Service Weight <sup>†</sup> | 19,357 lbm [8,780 kg] |

### Mixing Module

|                             |                        |
|-----------------------------|------------------------|
| Length                      | 128 in [3.3 m]         |
| Width                       | 155.2 in [3.9 m]       |
| Height                      | 159.2 in [4 m]         |
| Unladen weight              | 19,842 lbm [9,000 kg]  |
| Service weight <sup>†</sup> | 31,526 lbm [14,300 kg] |

### Averaging Module

|                             |                        |
|-----------------------------|------------------------|
| Length                      | 83.3 in [2.1 m]        |
| Width                       | 151.1 in [3.8 m]       |
| Height                      | 192.3 in [4.8 m]       |
| Unladen weight              | 11,839 lbm [5,370 kg]  |
| Service weight <sup>†</sup> | 33,885 lbm [15,370 kg] |

<sup>†</sup>Service weights are calculated with 18.4-lbm/galUS [2,200-kg/m<sup>3</sup>] mud for 6 bbl of fluid in the mixing tank, 20 bbl of fluid in the averaging tank, and 20 bbl of fluid (water) in the displacement tanks.

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