

CP System

CONSTANT PRESSURE BARRIER FLUID SEALING TECHNOLOGY

PUMP OVERVIEW

The ClydeUnion Pumps CP System is a constant differential pressure barrier fluid sealing system. All units comply with and exceed API 682 53C requirements.

The patented CP System improves safety, reliability and eliminates fugitive emissions by providing a simple means of pressurising double, back-to-back and dual pressurised mechanical seals.

The CP System ensures zero leakage to atmosphere and achieved this without the need for external power or a nitrogen gas source.

The unit maintains a constant differential pressure to 2 Bar across the inboard seal, regardless of fluctuations in suction or discharge pressure.

Designed per ASME Section VIII, Division 1

Meets requirements of the European Pressure Equipment Directive 97/23/EC. Available with either ANSI 600 lb or 900 lb flange pressure ratings. Offers a proven history in improving seal life, particularly under varying suction pressures.

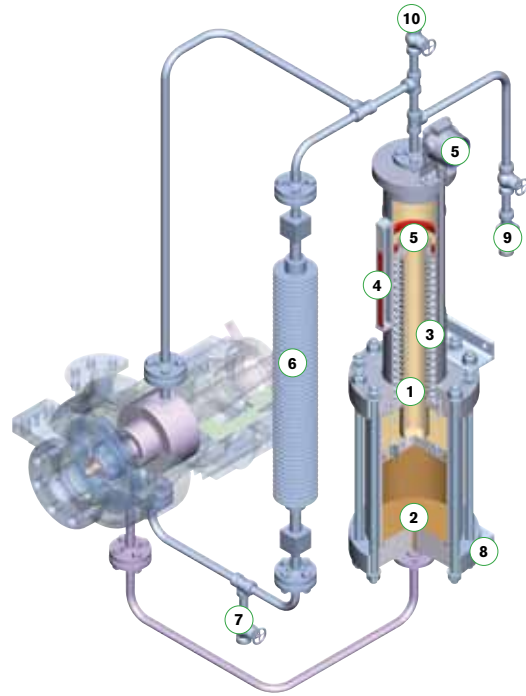
TYPICAL APPLICATIONS

- Can be supplied for new pumps or retrofitted to existing pumps from any pump manufacturer
- Offers a proven history in improving seal life, particularly under varying suction pressures
- Provides an excellent mechanical sealing environment in the most demanding process conditions



FEATURES + BENEFITS

- 1 **Stroke limiting valve**
Prevents accidental overfilling of barrier fluid avoiding over pressurising of the mechanical seals. Provides a thermal pressure relief facility
- 2 **Bottom cylinder**
10 litres / 2.64 US gallons working capacity maximises period between refills
- 3 **Double coil spring**
Differential pressure is generated entirely by spring action. No need for any external supply of instrument air or nitrogen. No need for any circulating pumps
- 4 **Piston position indicator**
Magnetically coupled sight gauge provides local visual indicator of barrier fluid level
- 5 **Piston position switch / transmitter**
Magnetically coupled switch or transmitter provides an alarm and / or trip signal when barrier fluid is low
- 6 **Barrier fluid cooler**
Naturally air cooled single, double or triple length of finned pipe as standard. Shell / tube water cooled and fin / fan cooled options
- 7 **System drain valve**
- 8 **Universal mount**
Flexibility to mount the CP System remotely from the pump
- 9 **Fill connection**
A separate line with a quick connect coupling, check valve and isolation valve
- 10 **System vent valve**



Using a dual pressurised or double, back-to-back seal: CP System versus dual unpressurised seal with API Plan 52 system

DESIGN FEATURE	BENEFIT	API PLAN 52	CP SYSTEM
Barrier fluid is at a higher pressure than pumpage	Zero fugitive emissions	✘	✔
Primary mechanical seal interface film is barrier fluid, not product	Increased mechanical seal life, especially on light hydrocarbon pumpages	✘	✔
Barrier fluid remains uncontaminated by pumpage throughout its life	Increased mechanical seal life, especially the secondary seal faces	✘	✔
No need for the seal system to be connected to the plant flare system	Reduced load on plant vapour recovery system	✘	✔
Requires only one channel of instrumentation	Reduced installation and maintenance costs	✘	✔
Barrier fluid can be refilled with the system pressurised and the pump running	Reduces pump shutdown time and enables a pump with a leaking seal to continue running	✘	✔
Barrier fluid reservoir can be mounted off pump baseplate	Flexibility when retro-fitting to existing pump assembly	✘	✔
Non-penetrating magnetic instrumentation	Able to service / replace instrumentation with the system full of barrier fluid and pump operating	✘	✔

Using a dual pressurised or double, back-to-back seal: CP System versus various API Plan 53 systems

DESIGN FEATURE	API PLAN 53A	API PLAN 53B	API PLAN 53C	CP SYSTEM
Inter-seal barrier fluid pressure automatically changes with varying pumpage pressure	✘ (Fixed pressure seal)	✘ (Fixed pressure seal)	✔	✔
Differential pressure between seal barrier fluid and pumpage fixed	✘	✘	Partial ⁽¹⁾	✔ ⁽²⁾
Suitable for use with low suction pressures	✔	✔	✘	✔
Nitrogen gas free operation	✘	✘	✔	✔
No nitrogen absorption into barrier fluid	✘	✔	✔	✔
Requires only one channel of instrumentation	✘	✘	✘	✔
No external relief valves	✔	✔	✘	✔
Large volume of unsealable seal barrier fluid	✔	✘	✘	✔
System can be refilled while pressurised	Not usual	✔	✔	✔
Non-penetrating magnetic instrumentation	✘	✘	Partial	✔

⁽¹⁾ Differential pressure between seal barrier fluid and pumpage varies within range of pre-fixed pressure multiplier device ⁽²⁾ CP System is a pressure addition device maintaining barrier fluid pressure 15 to 30 psi (1 to 2 Bar) above pumpage pressure **COMPLIES TO AND EXCEEDS API 682 PLAN 53C REQUIREMENTS**



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