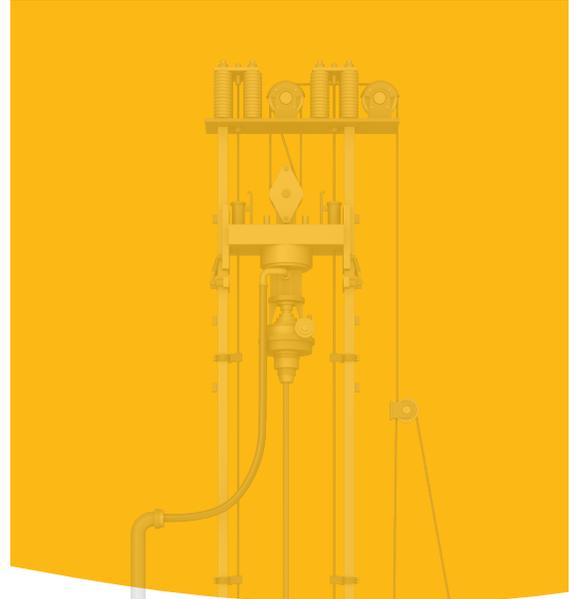




Hydraulic Decoking Systems

Tool Enclosure and Stem Guide

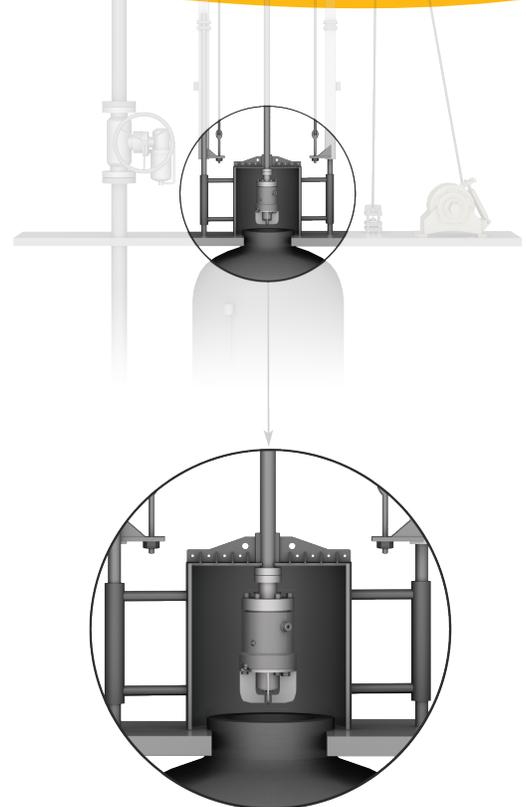
Under its Worthington®, Pacific® and IDP® heritage names, Flowserve hydraulic decoking systems are installed in more than 200 refineries worldwide.



Drill Enclosure and Stem Guide

The drill enclosure and stem guide serves a dual role in the Flowserve Hydraulic Decoking System. It acts as a guide for the drill string during cutting operations and, in the unlikely event a pressurized cutting tool is retracted from the coke drum, it diverts the high pressure water stream upwards and downwards, thus providing operator protection.

- Enclosed shroud fully surrounds the cutting tool in 9.5 mm (0.375 in) thick carbon steel.
- Vented top allows steam and gas to escape in the event of a hot spot blowout.
- Optional vented design will direct gases away from the cutting deck.
- Bolt-down or lifting design that accommodates up to 254 mm (10 in) of lateral misalignment
- Easy installation without field welding or unit shutdown
- Custom fit to the customer's top head device including all available automatic unheading valves
- Proprietary cooling system keeps the cutting tool cool when drum is coking.



Experience In Motion

Rugged Design

The unit is built of carbon steel that is capable of withstanding the pressure of a fully energized cutting tool. An integral drill stem guide includes a non-sparking radial bearing. The two halves of the enclosure can be separated for installation or removal. The enclosure will accommodate any size cutting tool, including Flowserve heritage tools and the AutoShift™ combination tool.



Ease of Use

Two styles of enclosures are available: a *lifting design* and a *bolt-down design*. Both provide full operator protection in the event a live tool is extracted from the drum. The enclosures do not interfere with the normal operation of automatic unheading valves, and no manual intervention is required during normal operations.

Lifting Design

The lifting design encloses the cutting tool at all times except during tool maintenance. During hydraulic decoking operation, the enclosure latches to the drum and a guide bearing on the enclosure's top plate provides radial support for the drill stem. When the drum is in coking operation, two vertical guides allow the enclosure to be raised by the drill stem and autolocking latches stow the enclosure above the cutting deck. The stowed enclosure provides complete access to the cutting tool and unheading valve without disassembling the enclosure.

Bolt-Down Design

The bolt-down design is a permanent installation attached to the top unheading valve. Its self-cooling design keeps the cutting tool well below the drum temperature during coking operations. Like the lifting design, a guide bearing on the enclosure's top plate provides radial support to the rotating drill stem. The design allows for easy opening for maintenance of the cutting tool by removing the enclosure's top and bearing plates.

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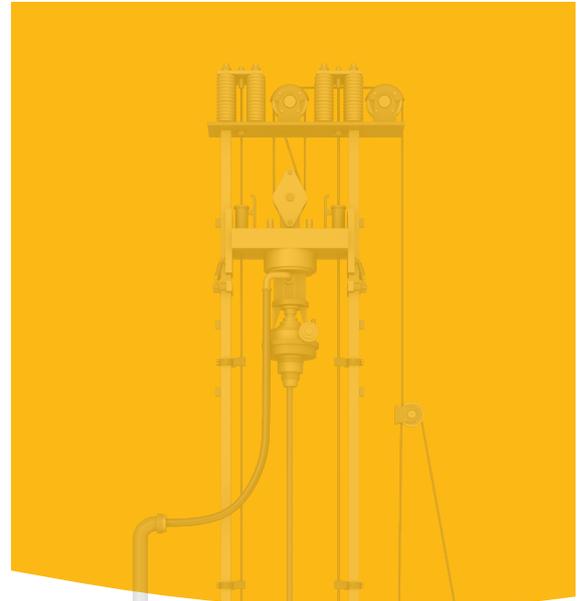
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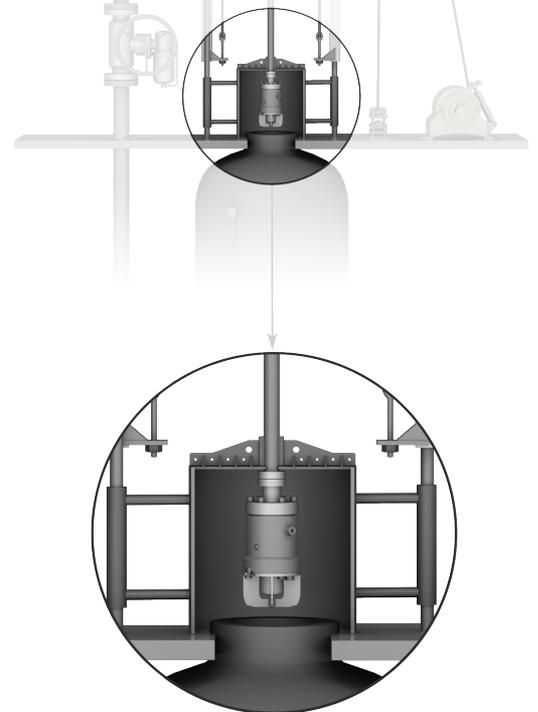
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