

## Actual Installation

The installation shown is a 6" x 3" decoking valve at a refinery in South America.



# DECOKING CONTROL VALVES

[www.elwood.com](http://www.elwood.com)



ISO 9001:2000  
CERTIFIED COMPANY



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10/11 - Brochure 2214  
Rev. B

## Long Legacy of Service to the Refining Industry

In 1803, less than a decade after Joseph Bramah ushered in the era of modern hydraulics by patenting the first hydrostatic press, the R.D. Wood & Griffin Pipe Companies were established, manufacturing water valves and pipes. In 1851 the Charles Elmes Engineering Works was established and later became the Elmes Press & Valve Company to manufacture water valves, systems, and presses. These two companies existed independently until the early 1960's when they were purchased by the Nordberg Heavy Machinery Group of Milwaukee. In 1972 Rex Chainbelt bought the Nordberg Heavy Machinery Group changing the name of the company to Rexnord. In 1983 Elwood purchased the Hydraulic Products division of Rexnord and formed the Fluid Power Group of Elwood.

The R.D. Wood and Nordberg decoking product lines that came with this purchase from Rexnord has a long history of service to the Refining Industry that dates back to 1938 with the sale of the first decoking unit to Shell Petroleum Corporation in Wood River, Illinois. Since that time the list has grown to include a worldwide base of customers.

COMPANIES		COUNTRIES
Ameriven	Koch Refining	Argentina
Asiatic Petroleum	Magnolia Petroleum	Brazil
Atlantic Richfield	Marathon Oil	Canada
Bongaigaon	Mitsubishi Kasei	Chile
Canadian Natural Resources Ltd.	Mobil Oil	China
Chevron Oil	Motiva Enterprises	Germany
Chevron Texaco	Numaligarh	India
Citgo	Ohio Oil Company	Indonesia
Cities Service	Pasadena Refining	Japan
Clark Oil and Refining	Pertamina	Russia
Coastal States Petrochemical	Petrobras	South Korea
Conoco Phillips	Pure Oil	Spain
Continental Oil	Shell Compania	United States
Crown Central Petroleum	Shell Petroleum	Venezuela
Exxon	Sinclair Refining	
Frontier Refining	Skelly Oil	
Gelsenberg Benzine, AG	Socony Vacuum Oil	
General Petroleum	Standard Oil	
Gulf Oil	Suncor	
Hyundai Oilbank	Union Oil	
Imperial Oil	Union Pacific	
	Valero	

## Technical Data

	HIGH PRESSURE VALVE
Maximum Operating Pressure	6248 PSI (430.9 bar)
Maximum Water Temperature	80° C
Main Sealing Material	Stainless Steel
Bypass Sealing Material	Soft
Internal Material (High Pressure Area)	Stainless Steel
Body Material	Stainless Steel (Std)*
Encoder	1024 with explosion proof enclosure
Main Flange	2500 lb. Ring Type Joint
Bypass Flange	300 lb. Raised Face
Largest Diameter Size Particulate to Pass	5mm
Max Flow Rate	2000 GPM (7571 LPM)

\*Consult Factory for other Material

## Ordering Data - Decoking Control Valve

Valve Style		MOTOR SPECIFICATIONS		
CDS	Cam Driven Spindle	Voltage	Frequency	Certification
CPM	Cartridge Pump-Mounted	400	50Hz	ATEX
CFS	Cartridge Free-Standing	575	60Hz	CSA
		480	60Hz	UL

VALVE SIZE		
	Main	Bypass
4M2B	4"	2"
6M3B	6"	3"
8M4B	8"	4"

*Consult Factory for other Sizes*

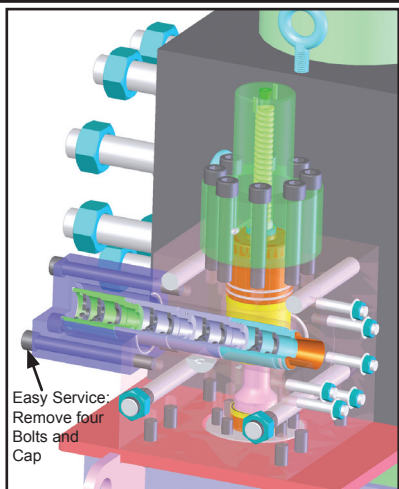
BODY MATERIAL	
F	Forged
SS	Stainless Steel

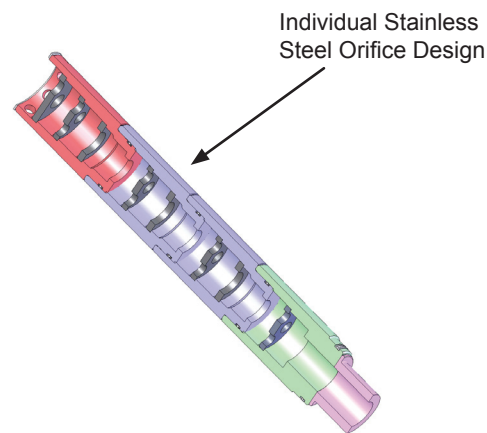
Code No. Example: **DC-CDS - 6M3B - SS - 400 - 50 - ATEX**

• Denotes standard features.

## Integrated Orifice Design



Easy Service: Remove four Bolts and Cap

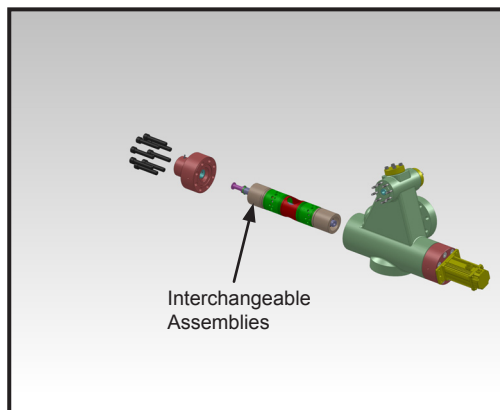


Individual Stainless Steel Orifice Design

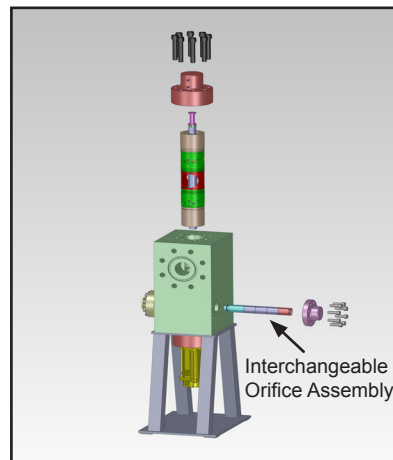
The integrated orifice design provides a compact and easy to maintain reliable pressure reducing element in the decoking valve product. The single sleeved design provides superior performance over the stacked plate designs by eliminating multiple sealing areas. Advantages of this orifice design include:

- Easily serviced by removing 4 bolts and cap located on the bypass valve
- Non-clogging design
- High reliability
- With optional differential pressure transducer wear on orifice pack can be monitored to allow servicing during a planned maintenance.

## Interchangeable Cartridge Assemblies



Interchangeable Assemblies



Interchangeable Orifice Assembly

Now you can completely service the unit without removing the unit from service. Simply remove old cartridge and instal new cartridge. All dynamic Parts are hardened, chrome-plated and replaceable in the field.

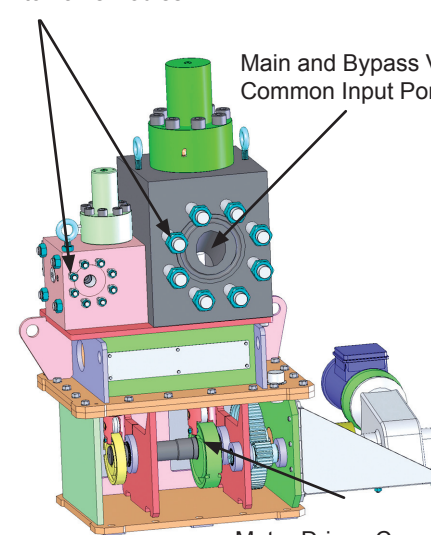
- Minimize down time
- Reduce maintnance cost

## Innovative Product Enhancements

The original R.D. Wood and later Nordberg Decoking Valve was specifically designed and built to meet the demanding requirements of the refining industry. Although the product line has a long reliable history of service to this industry, enhancements have been made based on inputs received from our customers.

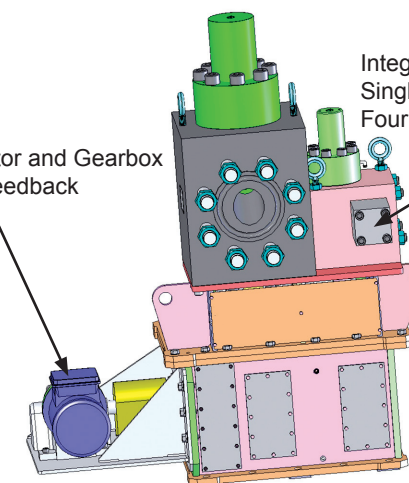
### Spindle Descale

Flange Connections Integrated into Valve Bodies



Main and Bypass Valves have Common Input Port

Heavy Duty Motor and Gearbox with Encoder Feedback



Integrated Orifice Pack with Single Sleeve Design. Remove Four (4) Bolts for Easy Servicing.

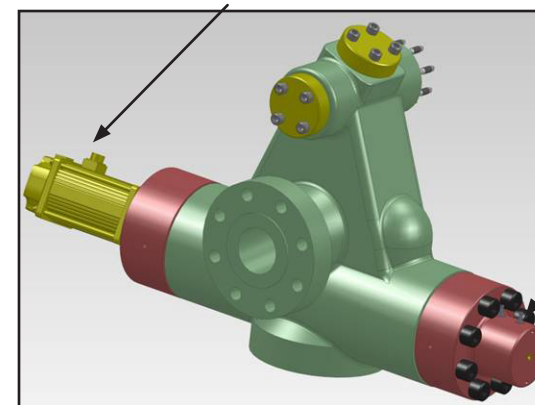
**Other Innovations:**

- Safety Interlock
- Improved Spindle Design with Hard Seat

Motor Driven Cams Mechanically Linked to Spindle

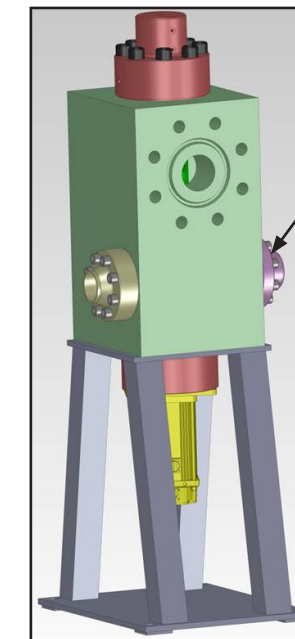
### Cartridge Design

Linear Actuator and Servo Motor With Encoder



Pump-Mounted

Proximity Sensors For Cutting & By-Pass Positions



Interchangeable Orifice Assembly

Free-Standing

## Characteristics

At the heart of the decoking valve is the balanced spindle technology used to control the flow of fluid. This design has a proven track record with over 100 worldwide installations going back to the first decoking valve shipped in 1938. Although enhancements have been made in this design many of these products remain in service today.

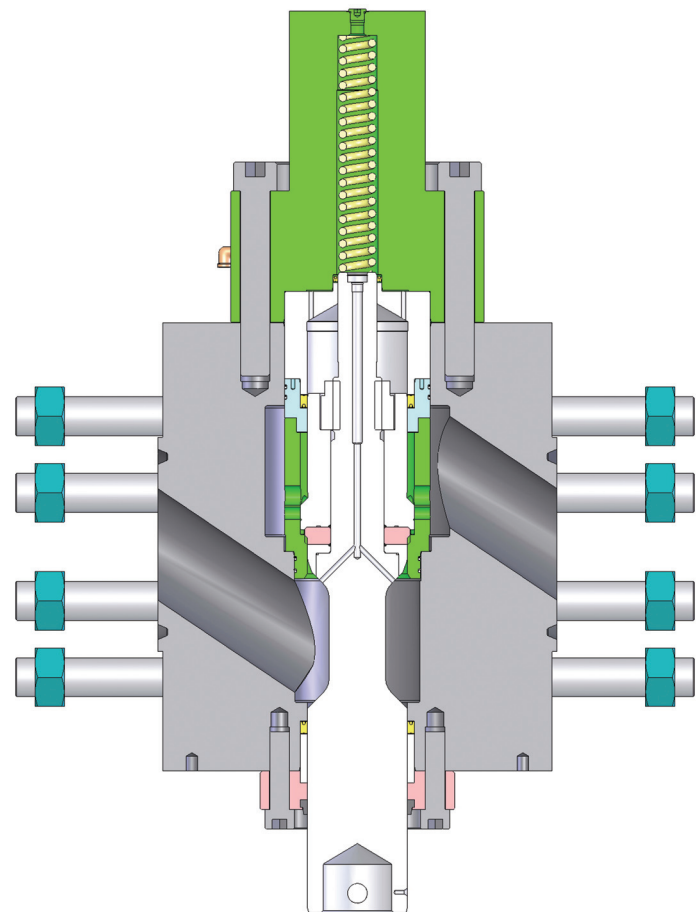
Over the years we have responded to the needs of our customers to increase the pressure and flow requirements of the decoking valve. These requirements have been the catalyst for several innovations and enhancements to the basic spindle design.

### V-Notch Technology

Our V-Notch Technology allows precise control of fluid flow that eliminates harmful shock or water hammer to the system. This control is achieved by the use of specially designed orifices machined into the annulus area located above the seat and precise contours on the spindle. When the spindle is first opened, fluid flow passes through a series of small control orifices. As the spindle continues to open, the area of flow expands, providing precise metering of the fluid.

### Shield Seat Design

The contour of the spindle above and below the composite disc is used to meter fluid flow controlling the effects of high fluid velocities. When the spindle is opening, the gap between the seat and the disc accelerates faster than the gap between the spindle and bores, minimizing the effects of high velocity fluids acting on the seat and disc. This innovation provides superior valve life.

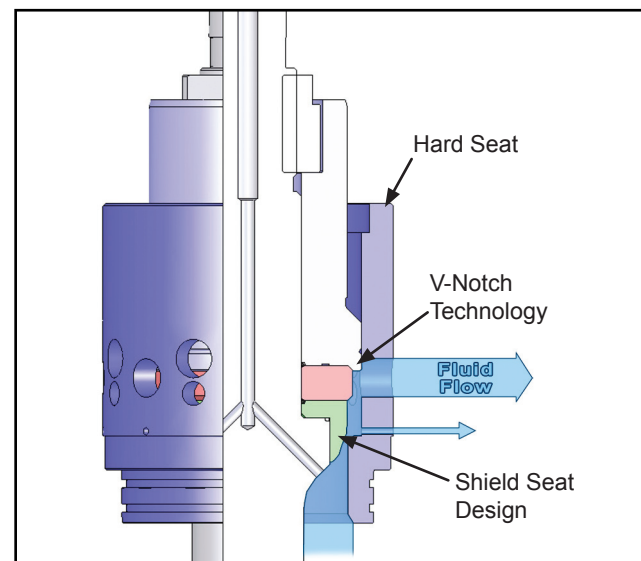


### Hard Seating Material

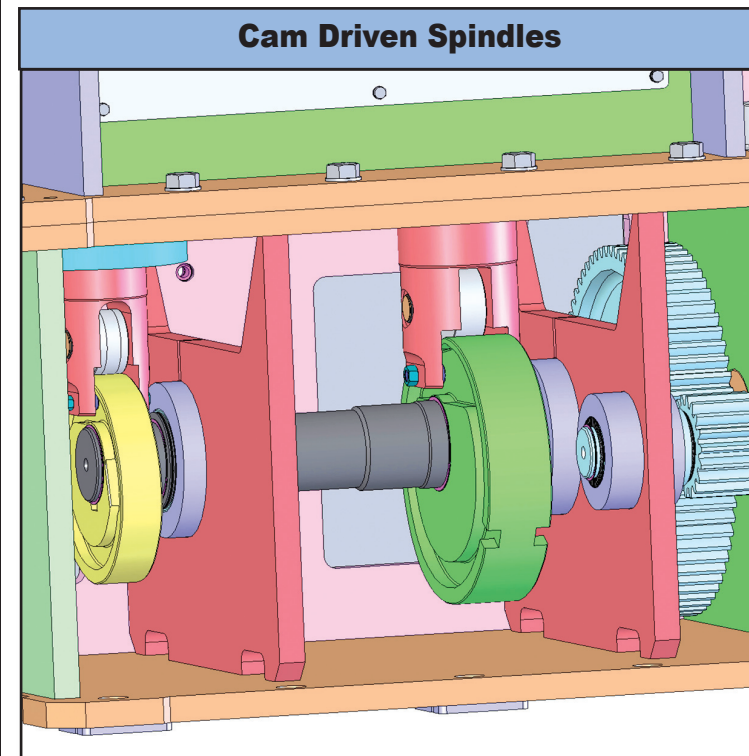
Higher pressure decoking units have hard seating materials to insure drop tight sealing with long life.

### Maintenance

Spindle design consists of 5 components that can be easily serviced without moving valve unit or disconnecting piping.

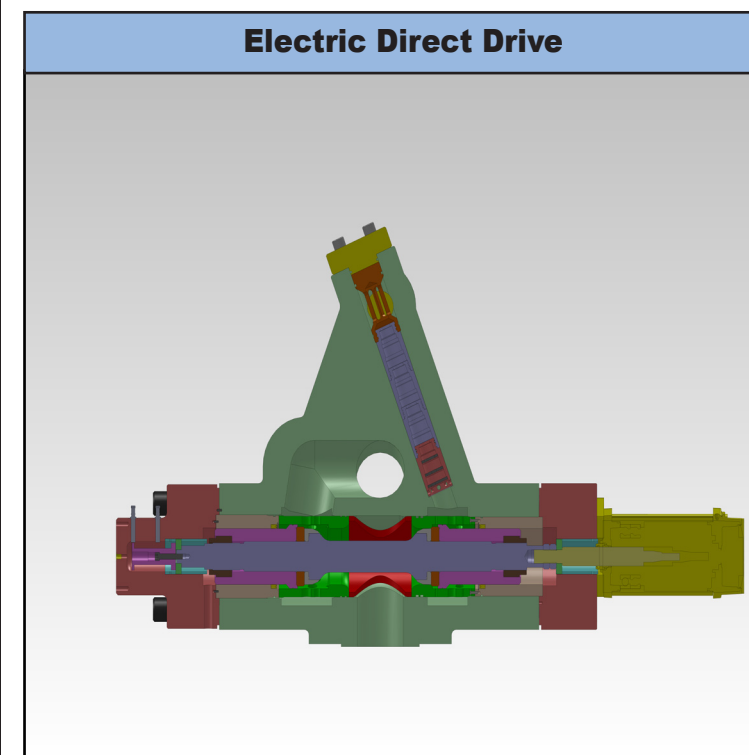


## Precise Valve Control



The valve spindles are mechanically linked to the cams providing precise, accurate position control of both the main and bypass valves in the forward and reverse directions. Other decoking valves only estimate the valve position. Other advantages of directly linking the cams and spindle include:

- Elimination of valve chatter during operation
- No external pilot valves required
- No external air supply required to operate air cylinders
- Positive pre-fill positioning
- Direct coupling to motor and gearbox provides capability to reverse valve direction from pre-fill back to bypass.



Linear Actuators provide for the ability to completely control the valve performance characteristics, opening speed, pre-fill position, closing speed and flow profile.

- Spindle is hydraulically balanced to minimize the linear actuator size.
- The complete gear drive system is replaced with a linear actuator (electric motor, reducer unit, and Elwood gearbox assembly).
- \* Linear actuator provides for speed and position control of the valve spindle.
- \* Linear actuator features built-in encoder