CIRCOR | DeltaValve

DELAYED COKING

Isolation Valve

INNOVATIVE TECHNOLOGY

World class
products and services
for delayed coking

Leadership and Experience

DeltaValve's extensive experience in designing and building engineered severe-service industrial valves and equipment for delayed coking has made us a world-recognized industry leader. In 2001, DeltaValve designed, engineered, and installed the world's first fully automated, fully enclosed coke drum unheading valve at the Chevron refinery in Salt Lake City, Utah. This new valve technology revolutionized coke drum unheading by replacing traditionally unsafe and unreliable manual or semi-automated unheading equipment, with a fully automated system. The result has been a safer working environment, reduced downtime, and increased productivity.

In 2016, DeltaValve was acquired by CIRCOR and is a key brand within its energy group.

Today DeltaValve continues to develop new and innovative products to address some of the most challenging applications in delayed coking.

DeltaValve offers a full range of delayed coking products including:

- Top and bottom unheading valves
- CenterFeed™ injection devices
- Isolation valves
- Auto-switch boring/cutting tools
- Cutting tool enclosures/blowout diverters
- Aftermarket, spare parts, and field services
- Installation services

At DeltaValve we strive to deliver safe and reliable products at the very best value for our customers. Our goal is to be "Best in Class" in all we do.

Isolation Valves (GV852)

The GV852 is a high-performance isolation gate valve with extended seats which trap process media in the orifice of the gate between the extended seats throughout the full stroke of the valve. This anti-fouling feature allows the valve to modulate in service without the accumulation of process media in the body cavity, making it truly unique as a maintenance-free isolation valve suited for dirty service. Ground and polished self-cleaning, live-loaded seats provide tight shutoff regardless of valve position.

The GV852 is designed to operate with steam purge in the body. The tight seal between the seats and gate provide positive isolation with no cross-valve process leakage. The tight seat-to-gate seal significantly reduces steam consumption, reducing daily steam expense. Steam purge has the added benefit of pressure assisting the seat to gate seal, further reducing steam consumption and preventing process media from entering the body cavity.

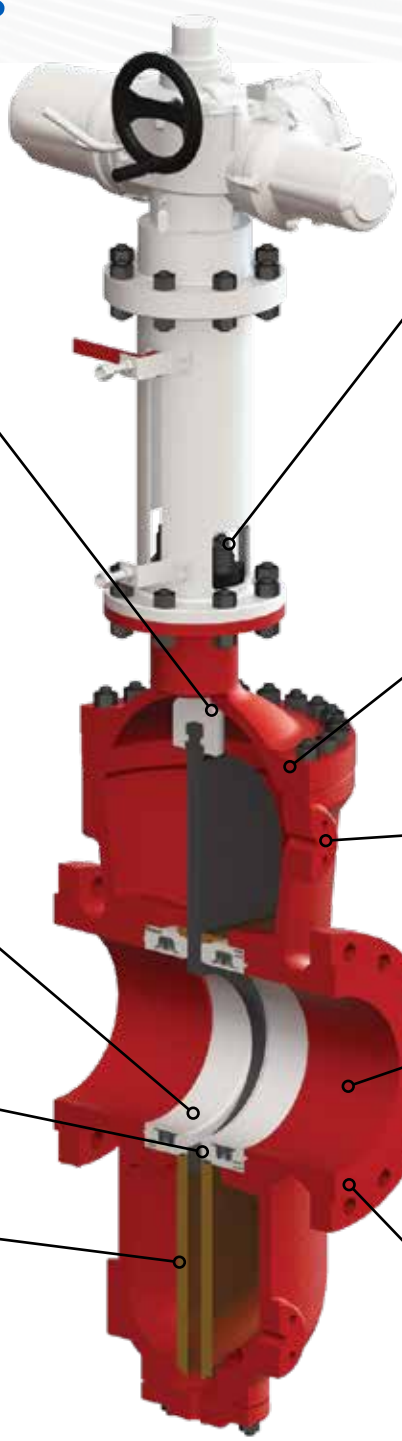
The innovative top entry design of the GV852 allows for maintenance and replacement of parts without removing the valve body from the line. All valve internals can be replaced through the top of the body when the upper bonnet is removed.

The GV852 can be used in on/off, or modulating services with continuous steam purge, and is designed for use in a wide range of delayed coking applications including hydrocarbons near coking temperature, solids ladened hydrocarbon liquids, and dirty hydrocarbon vapor streams.

Suggested applications include:

- Overhead vapor to fractionator
- Overhead vapor to fractionator/ back pressure
- Wax tailings to blowdown
- Coke drum bypass
- Feed isolation
- Main utility header isolation
- Coke condensate
- Utility header isolation
- Drain to coke pad
- Utility steam
- Quench water
- Atmospheric vent
- PSV vapor discharge
- Heater pass outlet

Key Design Features



Back Seat Design
- Prevents accidental blowout of stem

Live-Loaded Packing Gland
- Packing is live-loaded for uniform and consistent packing pressure, resulting in a long lasting, maintenance free seal
- Packing consists of a solid carbon stem guide bushing, and reinforced braided graphite for a durable, consistent seal
- Packing box is available with a lantern ring and side ports for purging and monitoring

Ultra-Tight, Double Live-Loaded Self-Cleaning Seats
- Ground and polished seats and seat extensions provide body isolation from process in the fully open, fully closed, and intermediate positions
- Seats are in constant contact with the valve gate, eliminating the possibility of coke particles being trapped between the gate and seats and causing wear
- With each valve cycle, the gate is wiped clean by the seats
- Seat and gate hard surfacing provides a durable and long lasting seal

Top Entry, In-Line Serviceable
- All internal components can be accessed and replaced with the valve in-line, saving unnecessary downtime and expense. Valve body removal is not required for service or maintenance

Steam Purge Ports
- Convenient ASME B16.5 steam purge connections
- Low steam consumption

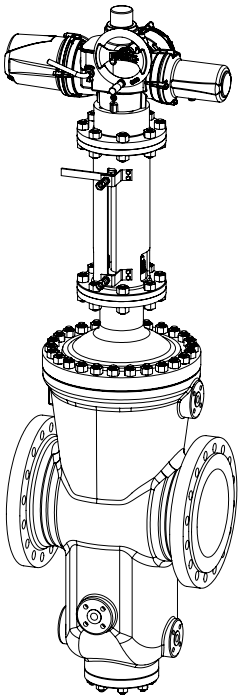
Double Block and Purge
- Ultra-tight dual metal seal using live-loaded seats and a purge system

Bi-Directional Flow Control
- Ultra-tight, double live-loaded seats on both sides of the gate
- This seal design allows for process flow from either direction while maintaining valve seal integrity

Extended Seat Design
- Seats extend into the body to completely isolate process media from the valve body cavity throughout the full valve stroke
- Steam purge pressure can be maintained throughout the valve stroke preventing fouling

Sizes
- ASME B16.10 face-to-face dimensions
- Narrow face-to-face dimensions also available

Ultra-tight seal and
low steam consumption



Technical Data

Size:*	6 inch to 36 inch* [152 mm to 914 mm]
Pressure Class:	CL150, CL300, CL600, CL900, CL1500
Body Material:	ASME SA217 C12, ASME SA217 C5, ASME SA216 WCB
Seat Material:**	ASME SA182 F9 (Nitrided), ASME SA387 Gr 91 CL 2 (Nitrided)
Gate Material:**	ASME SA387 Gr 91 CL 2 (Nitrided)
Stem Material:**	Nitronic 50 ASME A479 GRXM-19
Bolting:	ASME SA193 B16, ASME SA194 Gr7L
Actuation:	Electric, hydraulic, manual, bare stem
Engineering and ASME Standards	
B16.5 / B16.47	Pipe flange and flanged fittings
B16.10	Face-to-face and end-to-end dimensions of valves
B16.34	Pressure / temperature charts per materials
API 598	Valve inspection and testing
API 600	Steel gate valves

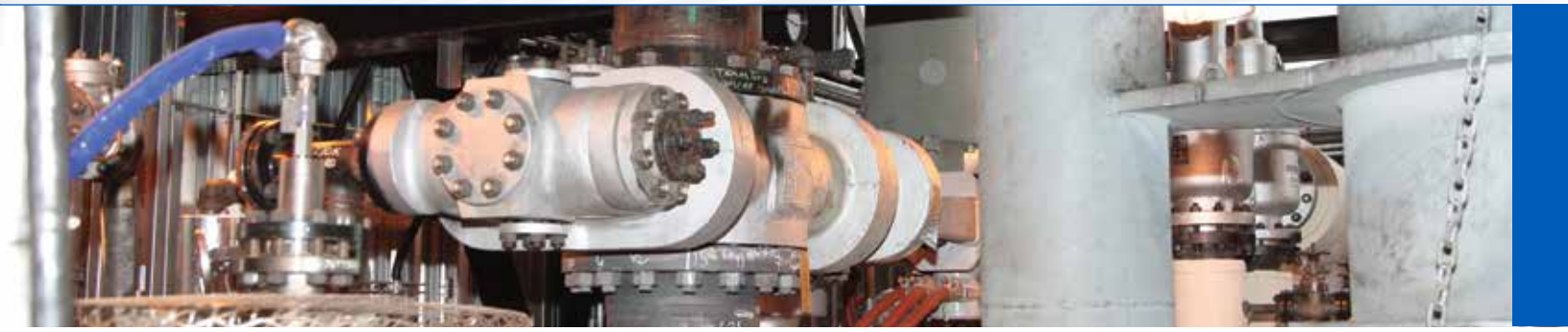
Envelope Dimensions – Class 300††

Valve Size*	B16.10 F/F	Envelope Dimensions			Weight
	A	B	C	D	
in [mm]	in [mm]	in [mm]	in [mm]	in [mm]	lb [kg]
6 [150]	15.88 [403]	52.1 [1323]	16.7 [423]	13.3 [338]	650 [295]
8 [200]	19.75 [502]	73.8 [1874]	20.2 [513]	16.0 [406]	1200 [344]
10 [250]	22.38 [568]	74.7 [1847]	23.0 [583]	18.7 [475]	1500 [681]
12 [300]	25.5 [648]	83.4 [2118]	26.4 [670]	22.3 [566]	2100 [953]
14 [350]	30.0 [762]	87.0 [2210]	29.3 [743]	23.6 [599]	3961 [1797]
16 [400]	33.0 [838]	82.1 [2085]	32.4 [823]	26.8 [681]	3800 [1725]
18 [450]	36.0 [914]	94.5 [2400]	36.0 [913]	29.5 [749]	5100 [2315]
20 [500]	39.0 [991]	123.6 [3140]	38.4 [975]	30.8 [782]	5464 [2478]
24 [600]	45.0 [1143]	117.3 [2979]	46.6 [1184]	36.0 [914]	9500 [4312]
30 [750]	55.0 [1397]	126.4 [3210]	56.3 [1429]	44.0 [1118]	14500 [6582]
36 [900]	68.0 [1727]	146.7 [3726]	65.9 [1674]	52.0 [1321]	22000 [9986]

(Refer to Figure 2 on next page)

*Other valve sizes and custom face-to-face dimensions available upon request.
Chart dimensions assume electric actuation.
Dimensions and weights are subject to change.

**Other material options available. Consult with DeltaValve for additional details.
††Dimensions for CL 150, 600, 900 and 1500 available upon request.



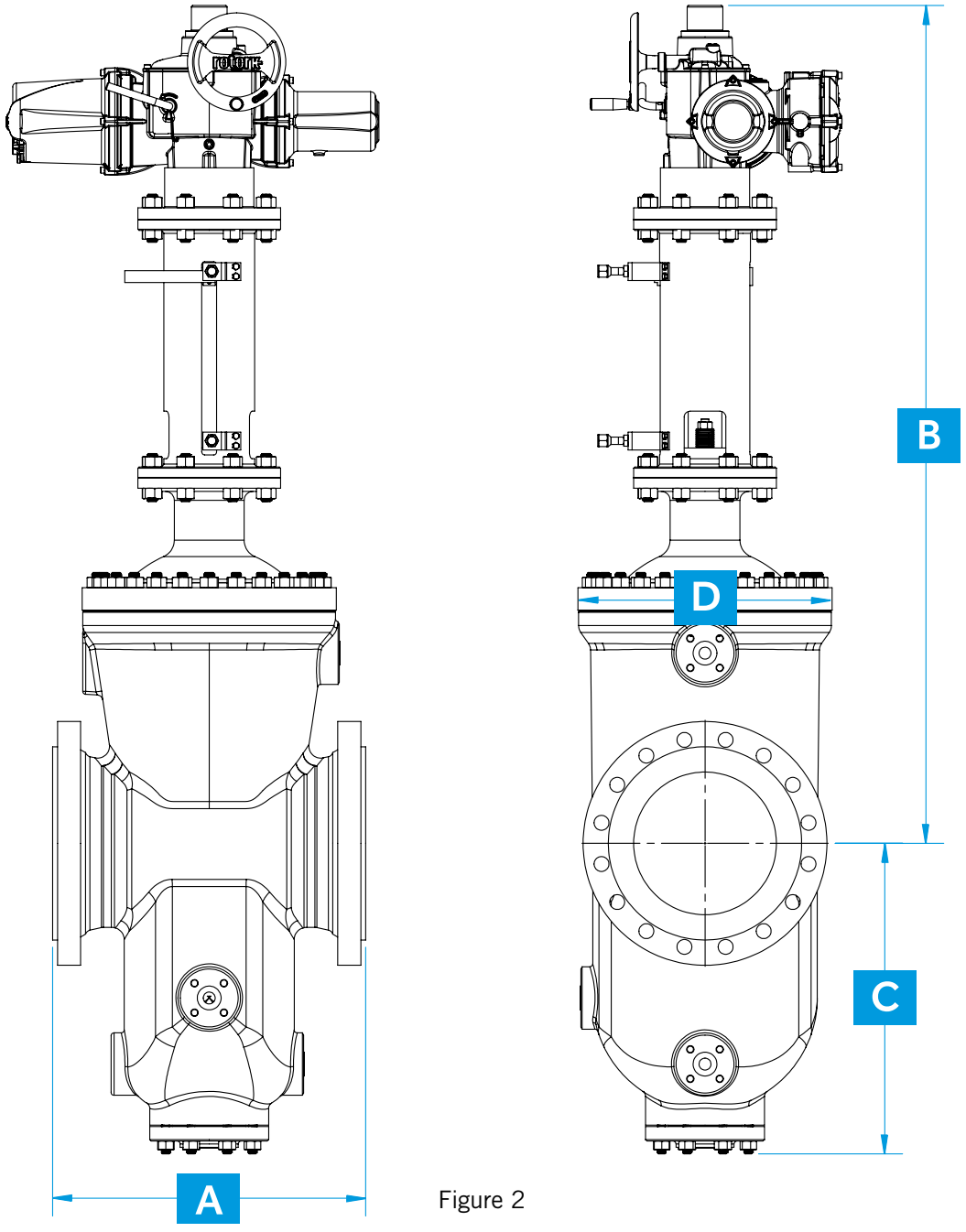
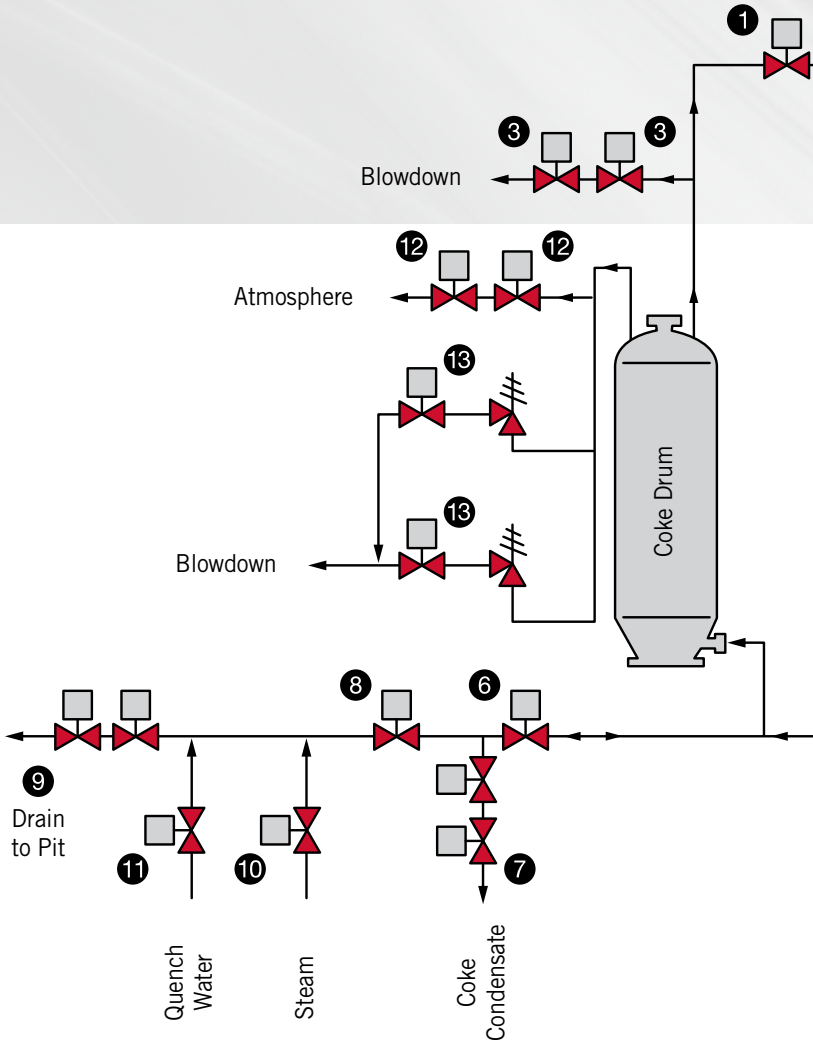
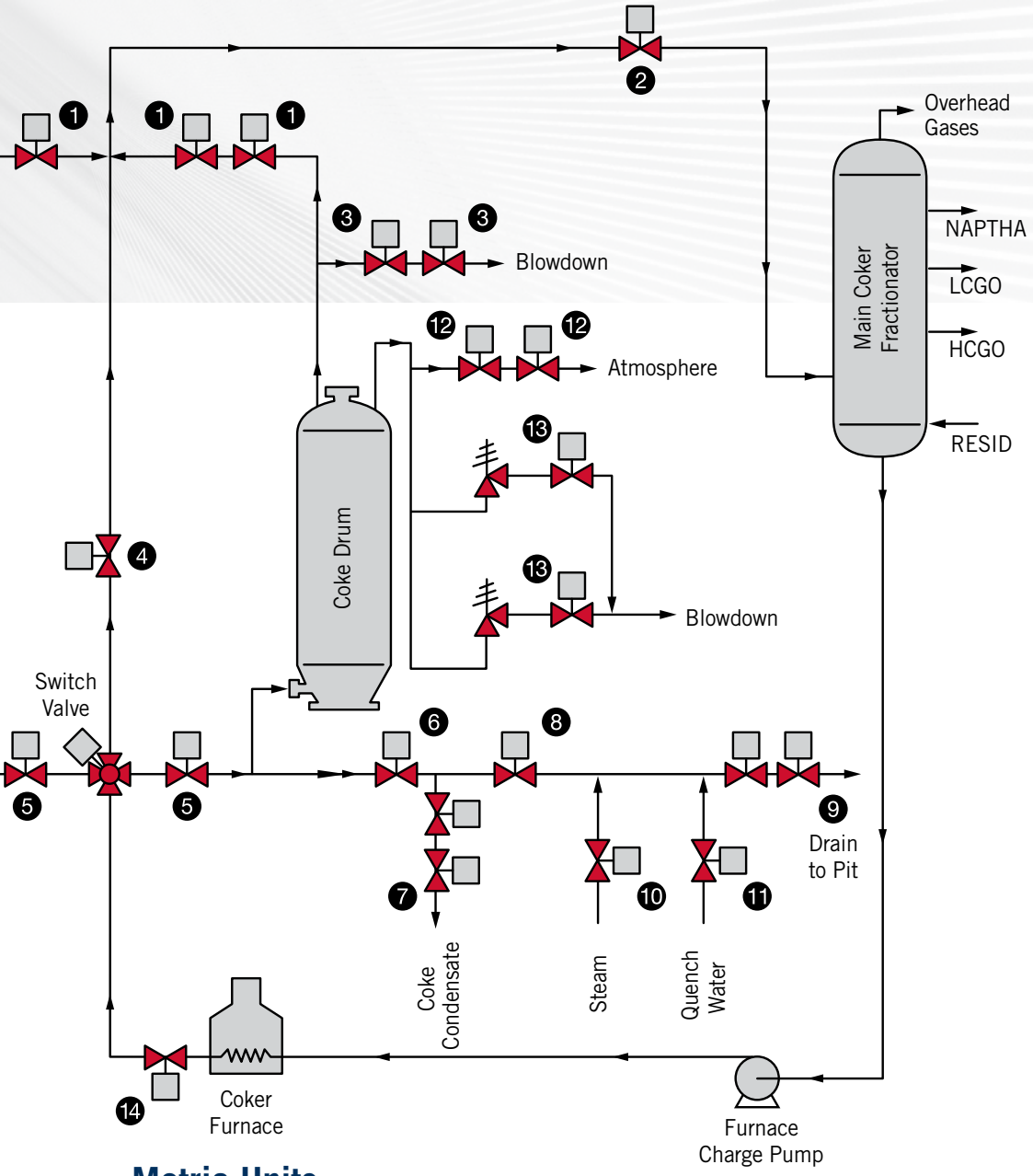


Figure 2



Standard Units

Valve Number	Valve Description	Temperature Range	Pressure Range	Isolation Valve	Recommended Model		Steam Purged Valve Body
		°F	psig	Inches	GV851	GV852	TYPICALLY
1	Overhead vapor to fractionator	70 - 850	10 - 80	20 - 42	-	X	Y
2	Overhead vapor to fractionator/back pressure	750 - 850	10 - 80	20 - 42	-	X	Y
3	Wax tailings to blowdown	70 - 850	10 - 80	20 - 42	-	X	Y
4	Coke drum bypass	350 - 950	30 - 800	10 - 16	-	X	Y
5	Feed isolation	350 - 950	200 - 800	12 - 20	-	X	Y
6	Main utility header isolation	70 - 950	100 - 300	12 - 20	-	X	Y
7	Coke condensate	200 - 750	100 - 300	8 - 14	-	X	Y
8	Utility header isolation	200 - 750	100 - 300	8 - 14	X	-	Y
9	Drain to coke pad	200 - 750	40 - 300	8 - 14	X	-	Y
10	Utility steam	200 - 750	100 - 300	8 - 12	X	-	N
11	Quench water	550 - 900	100 - 300	8 - 12	X	-	N
12	Atmospheric vent	70 - 850	10 - 80	12 - 16	X	-	Y
13	PSV vapor discharge	350 - 850	10 - 80	8 - 14	X	-	Y
14	Heater pass outlet	850 - 950	80 - 800	4 - 8	-	X	Y



Metric Units

Valve Number	Valve Description	Temperature Range	Pressure Range	Isolation Valve	Recommended Model		Steam Purged Valve Body
		°C	bar g	mm	GV851	GV852	TYPICALLY
1	Overhead vapor to fractionator	20 - 450	1 - 5	500 - 1070	-	X	Y
2	Overhead vapor to fractionator/back pressure	400 - 450	1 - 5	500 - 1070	-	X	Y
3	Wax tailings to blowdown	20 - 450	1 - 5	500 - 1070	-	X	Y
4	Coke drum bypass	180 - 400	2 - 60	250 - 400	-	X	Y
5	Feed isolation	180 - 510	15 - 60	300 - 500	-	X	Y
6	Main utility header isolation	20 - 510	7 - 20	300 - 500	-	X	Y
7	Coke condensate	90 - 400	7 - 20	200 - 350	-	X	Y
8	Utility header isolation	90 - 400	7 - 20	200 - 350	X	-	Y
9	Drain to coke pad	90 - 400	7 - 20	200 - 350	X	-	Y
10	Utility steam	90 - 400	3 - 20	200 - 300	X	-	N
11	Quench water	90 - 400	7 - 20	200 - 300	X	-	N
12	Atmospheric vent	20 - 450	1 - 5	300 - 400	X	-	Y
13	PSV vapor discharge	180 - 450	1 - 5	200 - 350	X	-	Y
14	Heater pass outlet	454 - 510	5.5 - 55	102 - 203	-	X	Y

Additional DCU Equipment

CenterFeed™ Injection Device

DeltaValve's innovative CenterFeed™ injection device addresses the issues of uneven thermal distribution and severe thermal transients experienced when using single or dual side feed configurations. The CenterFeed accomplishes this by simply returning feed streams to the center of the coke drum, resulting in more consistent operation during feed, steam strip, and quench cycles, all of which can contribute to reduced drum stresses and longer drum life. The CenterFeed can be configured with electric, electro-hydraulic, or hydraulic actuation, and can be integrated with any safety interlock system.

Top Unheading Valve

The DeltaValve top unheading valve mounts directly to the drum to create a permanent top head connection. Just like the bottom unheading valve, the top unheading valve uses patented dynamic seating technology that is tight-sealing, robust, and reliable.

Cutting Tool Enclosure

The cutting tool enclosure mounts directly to the top unheading valve and is designed to protect personnel and equipment by containing the cutting tool when not in the drum, and also diverting coke, steam, and water away from the cutting deck in the event of a drum eruption. The built-in drill stem guide controls and stabilizes the drill stem during coke boring and cutting.

Auto-Switch Boring/Cutting Tool

DeltaValve's auto-switch boring/cutting tool provides a high level of safety and reliability during de-coking operations by allowing the tool to remain in the drum when switching between boring/cutting modes. Contact with the tool is not required to switch between boring/cutting modes.

Isolation Valves and Controls

DeltaValve's line of isolation valves are designed for on/off as well as continuous operation in the partially open (throttling) position, while isolating body internals from the process. These valves are available with a complete suite of electric and hydraulic actuator options and complete PLC-based control systems with safety interlocks and sequence controls. This design provides for quick and efficient in-line removal or replacement of all internal components.

World-class
customer service

Installation Services

By managing the engineering, procurement, and construction work associated with the installation of our unheading valves and other equipment, we provide strategic value added services to our clients.

DeltaValve partners with engineering and construction companies who specialize in coker revamps. Together we have successfully managed numerous projects. Please contact us for references.

We offer the following:

- Project management
- Detailed engineering management
- Installation engineering management
- Procurement management
- Construction management
- Commissioning supervision
- Training

OEM Parts and Service

DeltaValve offers a full line of OEM spare parts for its entire product line. Additionally, DeltaValve's service technicians are available to respond to our customers' needs in a timely and efficient manner. Our network of technicians are highly trained to evaluate, troubleshoot, and resolves issues. They are backed by our engineering group allowing for quick access to technical expertise, drawings, bills of materials, and other relevant data to expedite practical and reliable solutions.

Core services provided by the DeltaValve service team are:

- DeltaValve equipment installations
- Site acceptance tests
- Commissioning supervision
- Site audits
- Turnaround service
- Maintenance and repair
- Equipment rebuilds
- Equipment storage
- Hydraulic flush services
- Electrical loop checks
- On-site training
- Bolt tensioning/torquing
- Valve/equipment maintenance and service

DeltaValve's network of global facilities offer support and technical assistance to our large and growing base of worldwide customers.

Quality control,
quality assurance

Quality

DeltaValve complies with all aspects of the ISO 9001:2015 certified quality management system, and provides customers with the highest level of quality.

DeltaValve Design Standards

Unheading valves
- ASME and BPVC, Section VIII Div. I and II

Isolation valves
- ASME B16.34, API 598 and API 600

Center feed devices
- ASME B31.3

DeltaValve maintains the following stamps and design certifications:
- ASME
- "U" Stamp, Division I
- "R" Stamp
- National Board Registration
- Pressure Equipment Directive (PED) (2014/68/EU)

DeltaValve manufactures to the following certifications per international requirements:
- Canadian Registration Number (CRN)
- TR CU (formerly GOST-R)
- KHK
- Others as required

DeltaValve has experience installing equipment in flameproof/explosion proof, non-incendiary, intrinsically-safe hazardous areas utilizing the following standards:
- IECEx
- PESO
- ATEX
- JIS
- InMetro
- UL
- KOSHA
- TR CU
- NEMA
- TIIS
- CSA
- NEPSI

DeltaValve complies with international certifications and standards, and has unheading valves installed in over 100 refineries and in more than 20 countries around the world.

Quality Assurance Documentation

- ISO 9001:2015 certificate
- Quality assurance manual
- Additional international certifications as required.

Final Assembly and Testing

Our equipment is assembled and tested at our facilities in Houston, Texas, Salt Lake City, Utah, and Coimbatore, India. As part of our quality control protocol, each critical component is inspected and reviewed before installation for proper functionality and product quality.

NOTES:

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