Western Valve

DAN-EX

Dual Expanding Plug Valve

Made in the USA

INTRODUCTION

FACILITY

Located in Bakersfield, California, Western Valve was established in 1991. What started out as a valve repair and machine shop, now features an impressive 50,000 square foot state of the art valve manufacturing facility on five acres.

The facility is separated into four areas: new manufacturing, re-manufacturing, a High Bay testing area, and a CNC automated precision cutting bay.

QUALITY

Western Valve takes great pride in its ability to produce the industries highest quality valve. We continue to upgrade and improve our facilities with state of the art manufacturing equipment. This allows us to continue providing our customers with the best valves on the market, while still providing competitive prices and delivery times.

DAN-EX stands for high quality and superior performance over all other competitive products.

As a testimony to our commitment to a quality product, Western Valve holds an ISO 9001:2000 certification and tests every valve per American Petroleum Institute (API) 6D standards.

FACILITY

Two Toyoda Horizontal Milling Centers
w/20 Pallet Station & RAV

Toyoda CNC Milling Centers [top]
Mazak Quickturn 350 & 450 [bottom]

HISTORY

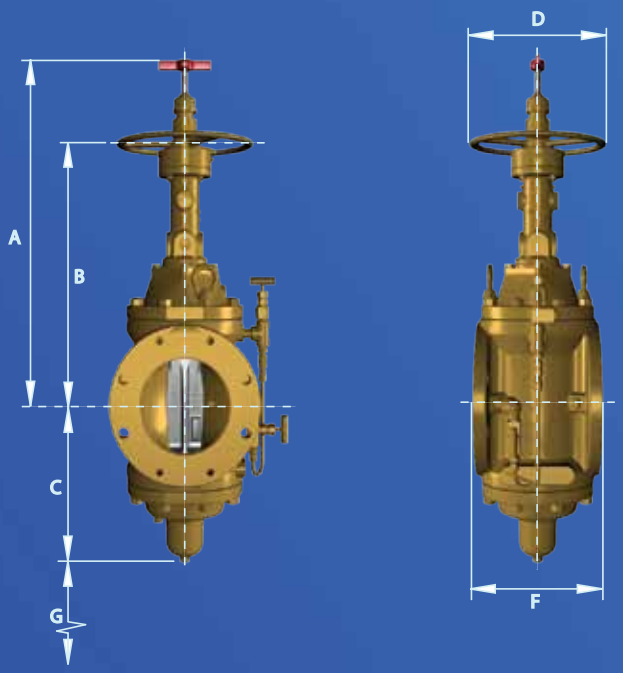
The DAN-EX Dual Expanding Plug Valve line was introduced into the Industrial Valve Market in 1979.

In 2000, Western Valve acquired the DAN-EX line of valves. Today, Western Valve continues to produce the DAN-EX valve line; using the original DAN-EX valve design.

The DAN-EX valve is not a reverse engineered product. The DAN-EX valve design was developed by senior engineers as a superior alternative to the original Double Block & Bleed plug valve.

The DAN-EX valve has a proven record of accomplishment of more than 25 years, and a worldwide installed base that has proven the integrity of the valve.

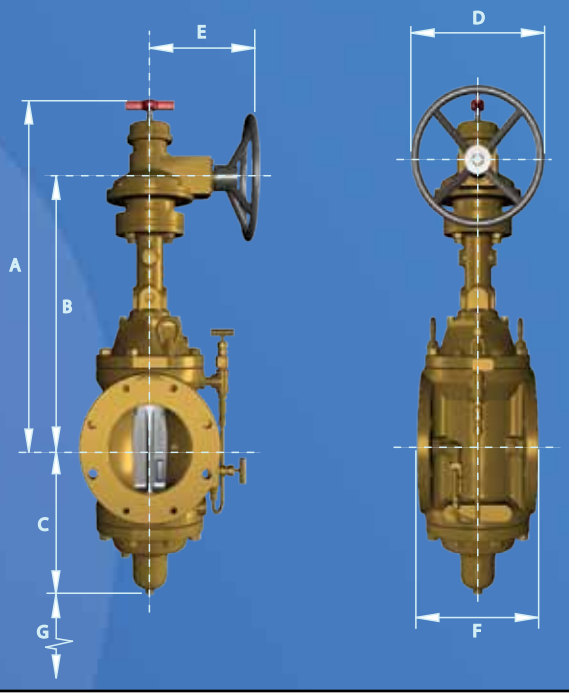
DIMENSIONAL DATA



A. Maximum Overall Height
B. Center Line of Valve to Center Line of Handwheel
C. Center Line of Valve to Lowest Point
D. Handwheel Diameter
E. Center Line of Valve to Outside of Handwheel
F. Face to Face
G. Minimum Clearance to Remove Slip from Bottom

HANDWHEEL OPERATED - REDUCED PORT											
CLASS	SIZE	FIGURE	OPERATOR	A	B	C	D	E	F	G	WEIGHT (lbs.)
ANSI 150	2"	271A	5KL	17 7/8	10 21/32	3 1/4	10	5	7	N/A	56
	3"	271	10KL	27	17 3/4	8 3/32	13	6 1/2	8	11 1/2	92
	4"	271	10KL	27	17 3/4	8 3/32	13	6 1/2	9	11 1/2	156
	6"	271A	10KL	29 15/32	20 3/16	10 5/32	13	6 1/2	10 1/2	16	325
	8"	271A	10KL	31 3/4	22 17/32	14 1/2	13	6 1/2	11 1/2	22	355
ANSI 300	2"	273	5KL	17 7/8	10 17/32	6 7/16	10	5	8 1/2	8 1/2	85
	3"	273	10KL	27	17 3/4	8 1/32	13	6 1/2	11 1/8	11 1/2	98
	4"	273	10KL	27	17 3/4	8 1/32	13	6 1/2	12	11 1/2	198
ANSI 600	2"	275	5KL	17 7/8	10 17/32	6 13/32	13	6 1/2	11 1/2	8 3/8	95
	3"	275	10KL	27 13/32	18 7/32	8 5/16	13	6 1/2	14	11 7/8	300
	4"	275	10KL	27 13/32	18 1/4	8 11/32	13	6 1/2	17	11 7/8	335

DIMENSIONAL DATA



GEAR OPERATED - REDUCED PORT											
CLASS	SIZE	FIGURE	OPERATOR	A	B	C	D	E	F	G	WEIGHT (lbs.)
ANSI 150	3"	271	10KL	29 1/2	20 5/16	8 3/32	12	10 15/32	8	11 1/2	130
	4"	271	10KL	29 1/2	20 5/16	8 3/32	12	10 15/32	9	11 1/2	193
	6"	271A	10KL	31 31/32	22 3/4	10 5/32	12	10 15/32	10 1/2	16	380
	8"	271A	10KL	34 1/4	25 1/8	14 1/2	12	10 15/32	11 1/2	22	400
	10"	271	50KL2	43 5/8	33 17/32	16 23/32	18	11 7/8	13	25 5/8	790
	12"	271	50KL2	44 13/32	34 11/32	17 17/32	24	11 7/8	14	27 1/4	880
	14"	271	50KL2	44 3/8	34 11/32	17 17/32	24	11 7/8	15	27 1/4	970
	16"	271	50KL2	48 3/16	37 21/32	22 13/32	24	11 7/8	16	34	1467
	18"	271	50KL2	48 3/16	37 21/32	22 13/32	24	11 7/8	17	34	1592
	20"	291	100KS2	48 19/32	40 5/32	19 9/16	36	18 1/16	40	29 1/2	2800
ANSI 300	3"	273	10KL	29 1/2	20 5/16	8 1/32	12	10 15/32	11 1/8	11 1/2	153
	4"	273	10KL	29 1/2	20 5/16	8 1/32	12	10 15/32	12	11 1/2	253
	6"	273	50KL2	41 7/8	31 7/8	14 1/2	18	11 7/8	15 7/8	22	675
	8"	273	50KL2	41 7/8	31 7/8	14 1/2	18	11 7/8	16 1/2	22	720
	10"	273	50KL2	43 5/8	33 17/32	16 23/32	24	11 7/8	18	25 5/8	1105
	12"	273	50KL2	44 3/8	34 11/32	17 17/32	30	25 5/16	19 3/4	27 1/4	1180
	14"	273	50KL2	44 3/8	34 11/32	17 17/32	30	25 5/16	30	27 1/4	1305
	16"	273	100KS2	48 5/32	39 25/32	22 13/32	30	17 7/16	33	34	2280
ANSI 600	3"	275	10KL	29 29/32	20 13/16	8 11/32	12	10 15/32	14	11 7/8	300
	4"	275	10KL	29 29/32	20 13/16	8 11/32	12	10 15/32	17	11 7/8	415
	6"	275	50KL2	40 1/16	30 1/32	13 17/32	24	11 7/8	22	19 1/4	810
	8"	275	50KL2	41 7/8	31 13/16	15 9/32	24	11 7/8	26	19 1/4	1275
ANSI 900	4"	276	10KL	29 29/32	20 13/16	8 11/32	18	11 7/8	18	11 7/8	445
	6"	276	50KL2	40 1/16	30 1/32	13 17/32	36	14 15/16	24	19 1/4	880
	8"	276	50KL2	41 7/8	31 13/16	15 9/32	36	14 15/16	29	19 1/4	1940
ANSI 150 FULL PORT	16"	201	100KS2	48 19/32	40 5/32	19 9/16	36	18 1/16	35	29 1/2	2600

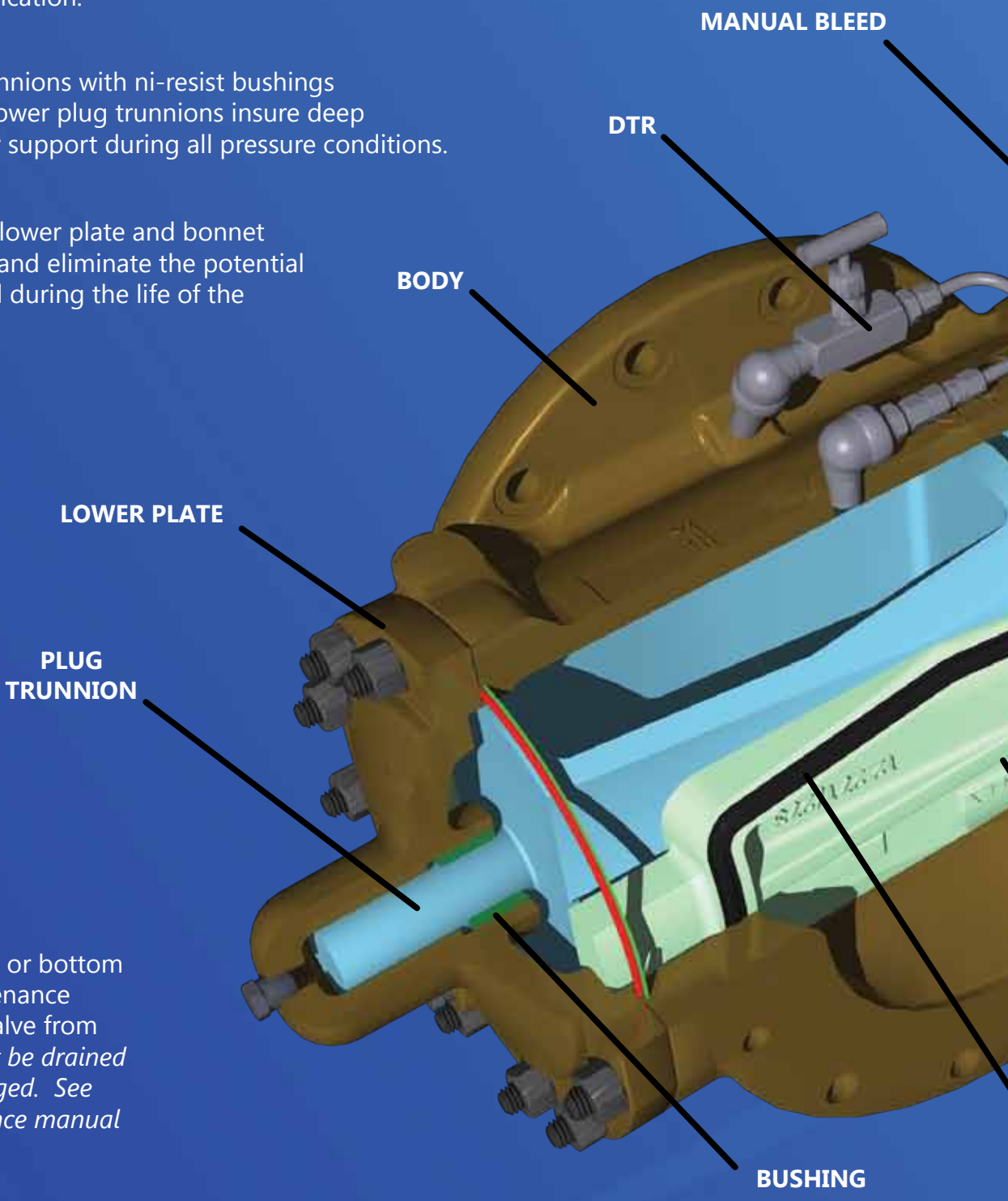
SECTIONAL VIEW & FEATURES - DAN-EX VALVE

Operator Assembly
Lift turn mechanical operator assembly, incorporating solid one piece cam shaft and large "bearing type" cam followers.

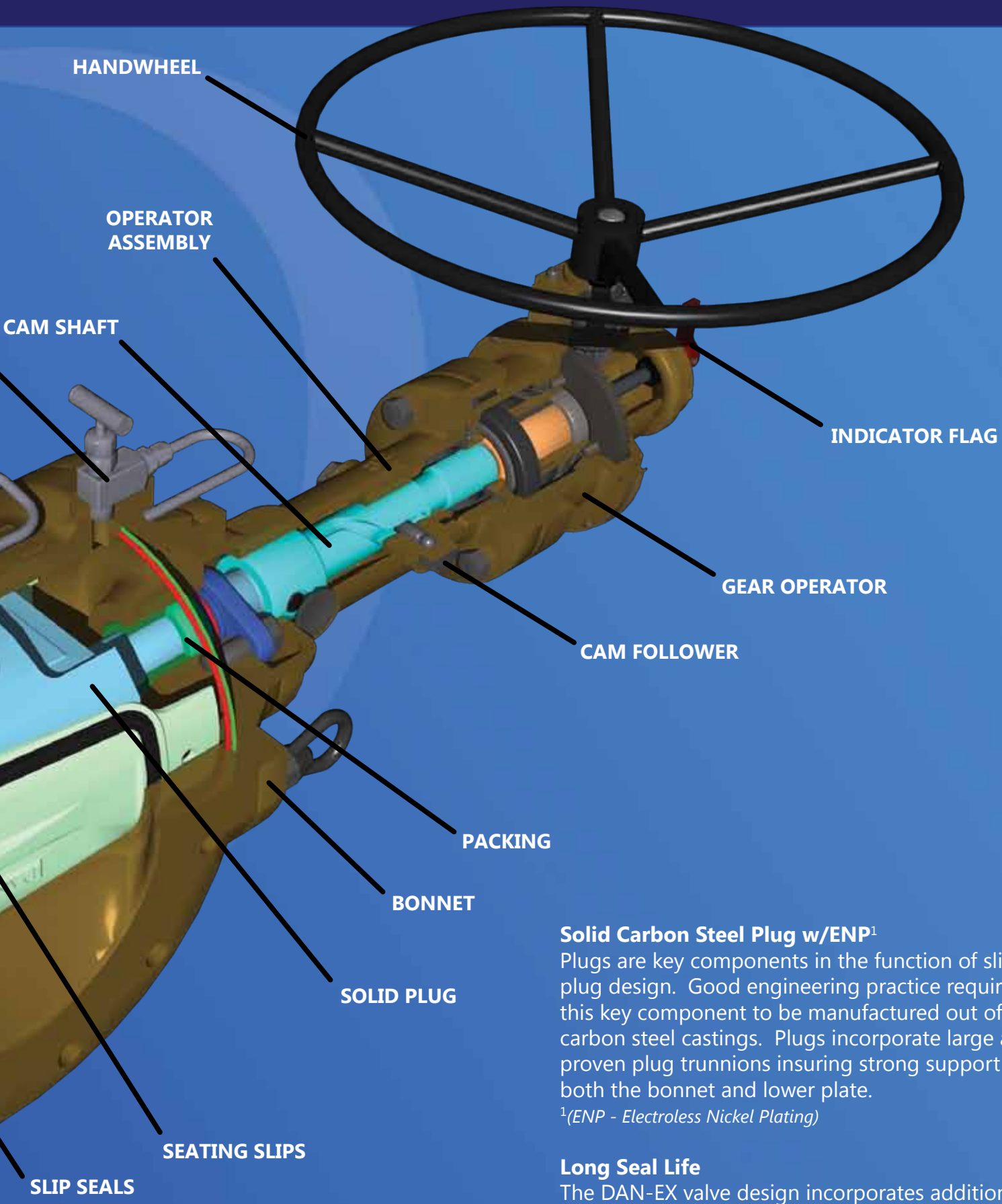
Differential Thermal Relief
DTR with manual body bleed valve. This system automatically protects the body cavity from thermal expansion and provides a manual body bleed valve for seal verification.

Plug Trunnions
Large diameter plug trunnions with ni-resist bushings for superior strength. Lower plug trunnions insure deep penetration required for support during all pressure conditions.

Bushings
Ni-resist bushing in the lower plate and bonnet support plug trunnions and eliminate the potential of steel rubbing on steel during the life of the valve.



Lower Plate & Bonnet
3" through 20" have top or bottom access for in-line maintenance without removing the valve from the line. *Note: line must be drained prior to slips being changed. See Operations & Maintenance manual for instructions.*

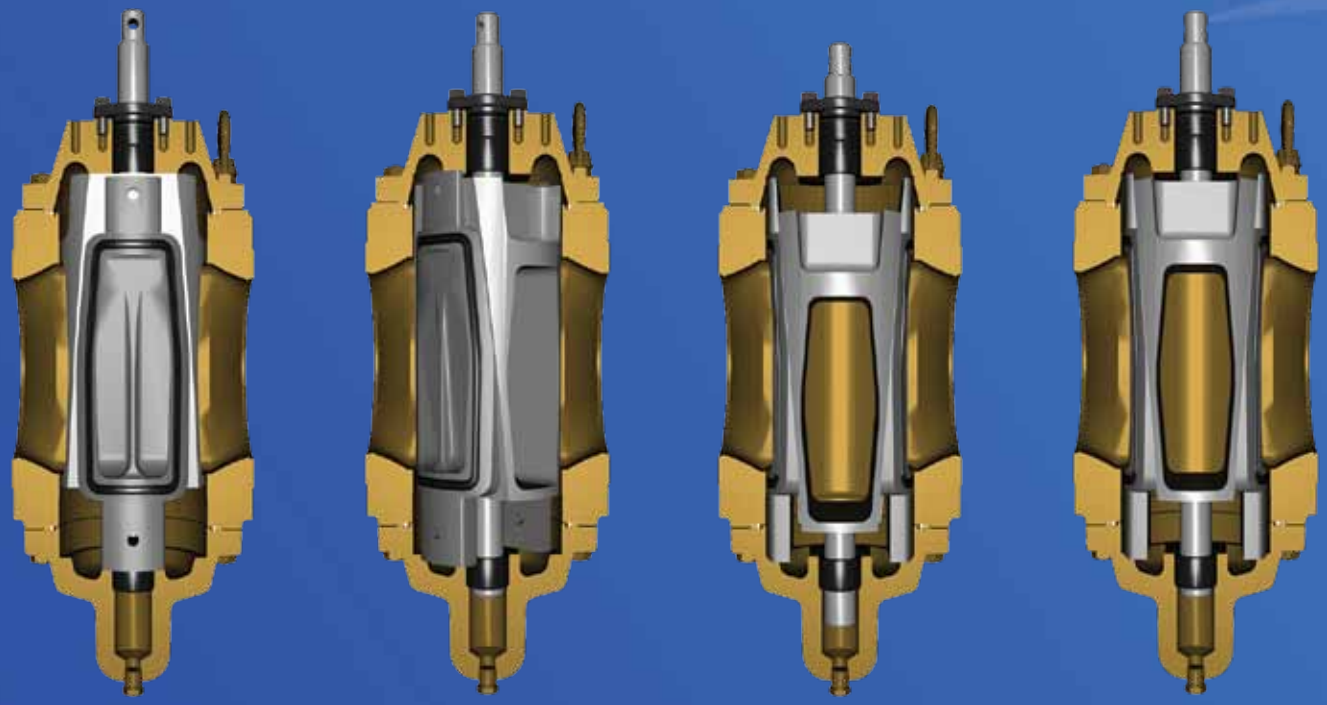


Solid Carbon Steel Plug w/ENP[1]
Plugs are key components in the function of slip/plug design. Good engineering practice requires this key component to be manufactured out of solid carbon steel castings. Plugs incorporate large and proven plug trunnions insuring strong support in both the bonnet and lower plate.

[1]*(ENP - Electroless Nickel Plating)*

Long Seal Life
The DAN-EX valve design incorporates additional clearance/travel over traditional slip/plug designs. This equates to longer seal life.

HOW THE DAN-EX DUAL EXPANDING PLUG VALVE WORKS



Open View

In the open position, the slips are retracted away from the body and protected from the flow.

Rotating View

Turning the handwheel clockwise, the slip/plug assembly begins to rotate, maintaining clearance between the seals and body. This clearance is achieved by the tapered plug in the fully open position and dovetails holding the slips to the plug. The slip/plug assembly maintains a critical center position by substantial plug trunnions, bonnet and lower plate bushings.

Closed View

A clockwise rotation of the handwheel rotates the plug 90 degrees while moving downward. As the plug moves down, the taper plug forces the slips against the body until the seals have been compressed to the fully seated position. Primary slip seals are backed up by a metal to metal seal for fire safe capabilities. Solid plug trunnions, substantial lower plate penetration and bushings are resisting flow pressure tendencies to push the slip/plug assembly off center. Proof of double block and bleed is obtained by opening the manual body bleed valve.

Retracting View

Rotating the handwheel counter clockwise, the plug begins to move up, starting the process of retracting the slips. As the tapered plug moves up, the slips begin to retract. When the slips are fully retracted, the slip/plug assembly begins to rotate to the open position. It is important to note that going from closed to open, slip/plug designed valves are potentially exposed to substantial flow, high differentials and pressures. In order to overcome these forces, solid plug trunnions, strong dovetails, and bushings have been proven to play a key role in keeping the slip/plug on center to allow for complete slip retraction prior to rotation.

BODY BLEED & THERMAL RELIEF VALVE OPTIONS

DTR

Differential Thermal Relief (DTR)

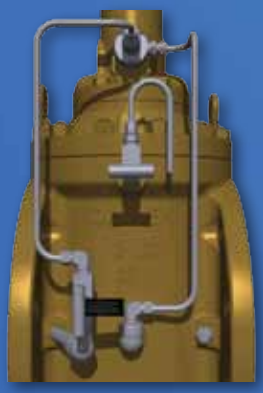
Solution to dangerous pressure build up due to thermal expansion in liquid service.

The DAN-EX Dual Expanding Plug Valve is designed to provide zero leakage. Therefore, in the closed position, the center cavity of the valve is subject to extreme pressures caused by solar or ambient temperature fluctuations. In a liquid application, it is critical to protect the DAN-EX valve from this overpressure buildup prior to opening the valve. The Differential Thermal Relief system (DTR) accomplishes this task and is operational when the valve is in the closed position only.

The standard relief is set to check at 25 PSI and will automatically relieve the body cavity pressure back to the upstream throat of the valve. The isolation valve located in the upstream throat is to be left in the open position for the system to function. This valve is closed only when the check valve needs to be replaced. Other check pressures are available upon request.

In addition, a manual body bleed valve is provided to check the seal integrity of the DAN-EX valve when closed. The manual body bleed valve should be goose necked to the highest point to eliminate extended product draining during seal verification. This is especially important in a heavy crude service. The manual body bleed valve must be closed prior to opening the DAN-EX valve.

This system is to be considered standard in all applications both in manual and automated valves.



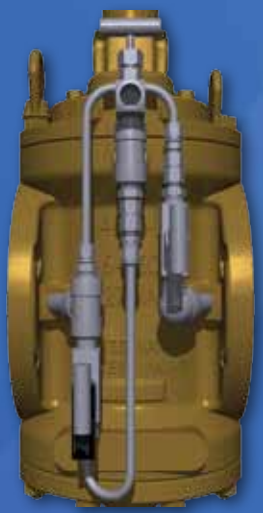
ABBV

Automatic Body Bleed Valve (ABBV)

Solution to automatic verification of seal integrity in a liquid service.

This system automatically provides a seal integrity check when the DAN-EX valve is closed. In addition, thermal pressure buildups in the cavity are relieved.

A plunger actuated check valve is opened by the cam as the DAN-EX valve is closed. When the DAN-EX valve is opened, the ABBV is automatically closed. Typical application includes installation of a sight glass between the discharge piping and sump. *Note: discharge piping and sight glass is provided by others.*



LR/DTR

Line Relieving Differential Thermal Relief (LR/DTR)

Solution to piping over pressurization in a liquid service.

This system performs the same function as the DTR system as well as protecting the piping system. When the DAN-EX valve is closed, piping is subject to thermal pressure buildups. A standard 25 PSI check valve relieves the downstream pressure through the downstream throat tap and relieves any pressure buildup back upstream. An extra isolation valve is included (to remain open) in the event a portion of the system requires replacement.

While this system is available and functional, Western Valve strongly recommends traditional thermal protection to relieve pipeline pressures around valves whenever possible.

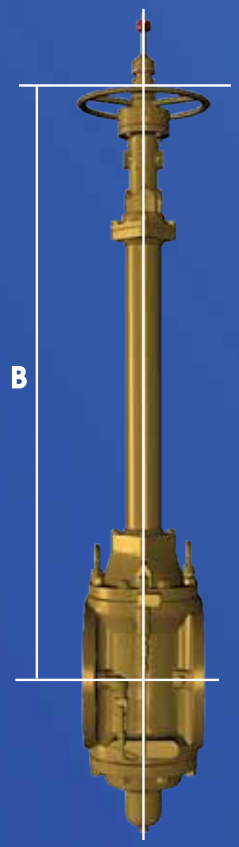
DTR with Gauge

Differential Thermal Relief (DTR) with Gauge

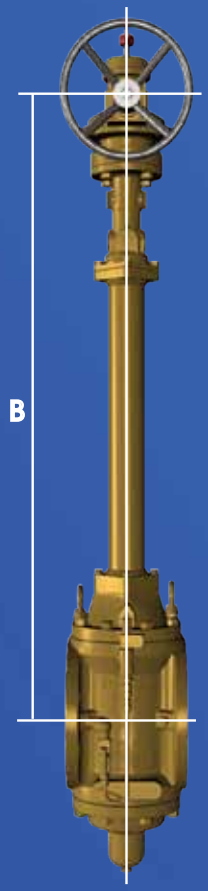
Solution to seal verification without emission exposure to the atmosphere in a liquid service.

This system functions as a standard DTR system with the addition of a gauge installed prior to the manual body bleed valve. In a liquid service, the gauge will indicate a drop in pressure due to slip expansion when closed which will prove seal integrity. Seal verification is achieved without bleeding media to the atmosphere or the need to discharge product into a sump system.

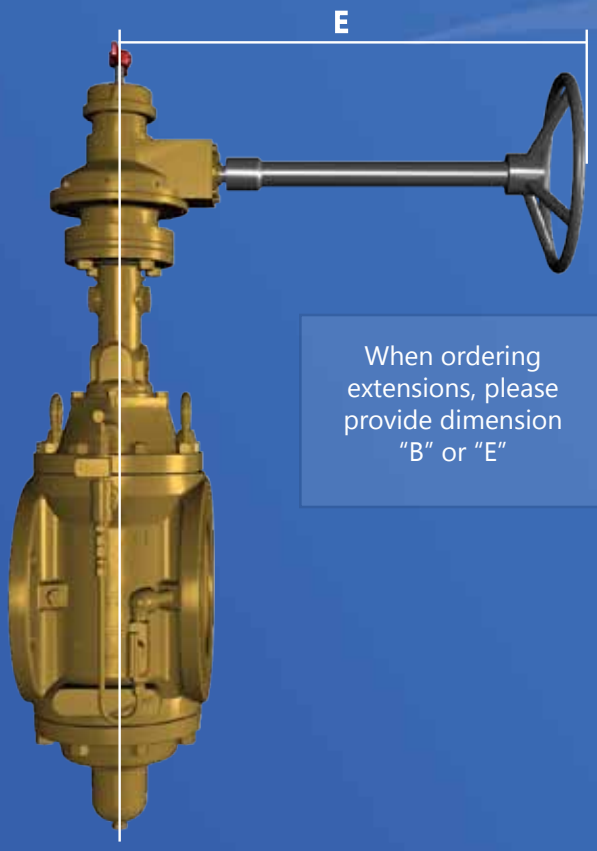
EXTENSIONS



Handwheel Operated
Extension Type “B”



Gear Operated
Extension Type “B”



Gear Operated
Extension Type “E”

When ordering extensions, please provide dimension “B” or “E”

ACTUATION

Direct Mounted

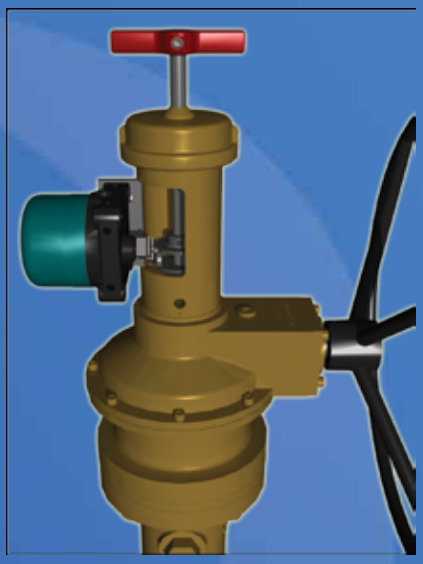
Side Mounted

DAN-EX valves provide you with two options:

Direct mounted to operator or Side mounted through bevel gear for the majority of electric motor operators.

Direct mounted actuation allows you to have faster closing speeds with lower RPM electric motor operators.

LIMIT SWITCHES



Limit Switches provide open/closed valve position indication.

Weatherproof and Explosion proof

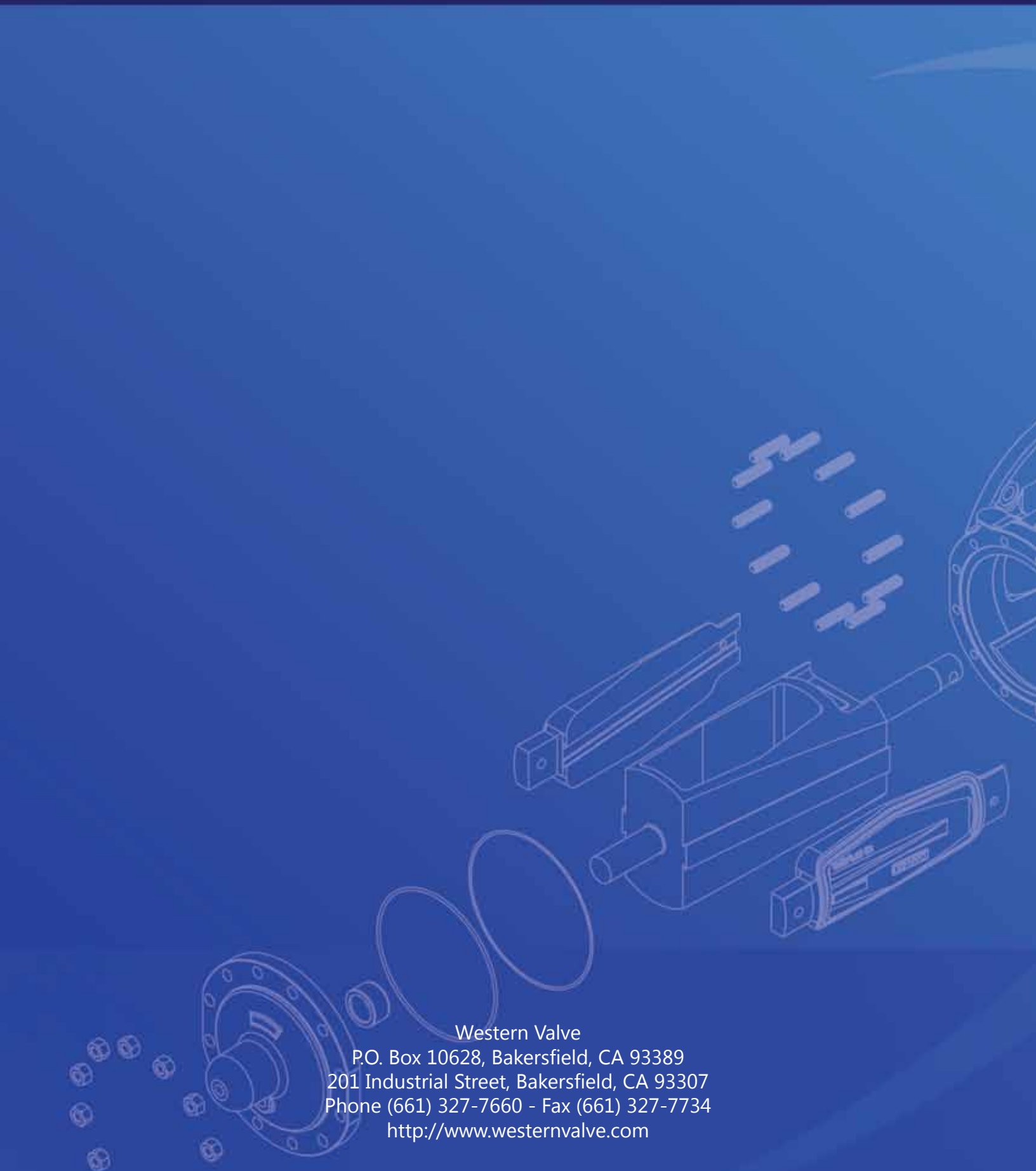
Single Pole Double Throw (SPDT)

Double Pole Double Throw (DPDT)

DAN-EX STANDARD MATERIALS OF CONSTRUCTION

Body:	ASTM A-216 WCC Chrome Plated Seat Area
Bonnet:	ASTM A-216 WCC/ ASTM A-36 Plate
Lower Plate:	ASTM A-216 WCC/ ASTM A-36 Plate
Plug:	ASTM A-216 WCC Electroless Nickel Plated
Slip/Seal:	Ductile Iron 80-55-06/Viton®
Trunnion Bushings:	Type 1 NI-Resist
O-Rings:	Viton®
Packing Gland:	ASTM A-582 Stainless Steel/ ASTM A-487 CA6NM
Stem Packing:	Grafoil Rings
Studs:	ASTM 193 B.7
Nuts:	ASTM 194 2H
Bleed System:	Differential Thermal Relief/ Manual Body Bleed
Gaskets:	Grafoil

Fluoro Elastomers Slip Seal Materials		
VIT	Viton® (FKM)	Standard Material
V90	Viton® 90 Durometer	Standard High Differential Pressure
VGF	Viton® GF	Viton® with Enhanced Chemical Resistance
VTF	Fiber Reinforced Viton®	Optional High Differential Pressure
Nitrile Elastomers Slip Seal Materials		
NBR	Nitrile	
NBR (Low Temp)	Low Temp Nitrile	
HNBR	Hydrogenated Nitrile	Low Temp Nitrile
STS	Modified Nitrile	Reformulated Gasoline Seal Material
Specialty Slip Seal Materials		
ECH	Epichlorohydrin	Low Temp Material
EPDM	Ethylene Propylene	Ammonia but not Hydrocarbon



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