Model 22DWC DuPlex Well Commander

Note: For clarification of electronic terminology refer to the OCV Electronic Glossary

PATENT PENDING

The model 22DWC "DuPlex Well Commander System" provides control of well / aquifer levels to prevent over pumping. The system consists of two diaphragm actuated control valves, installed on the discharge of two separate wells, and a single electronic multi-stage controller. Combining the advantages of simplicity and line pressure operation with the features of electronic control, the system is able to monitor and control the variables of each well and constant speed pump via a single controller interface while providing remote access.

THEORY OF OPERATION

DuPlex Well commander with a Model 115-36 Digital Control Valve

Initial setup is performed for each of the wells, which includes user selection of the mode of control desired.

Startup Control Sequence: The controller receives a valid run command. It then checks to make sure well depth is above minimal level (user selection 1) and there is no flow before starting the pump. The controller starts the pump against the closed valve until the start-up delay times out. The controller selected input mode then opens the valve at an adjustable, controlled rate. The controller will then control the selected input by positioning the valve (open or close) by the solenoid pilots (2 and 3) to maintain the user selected set point.

Case 1: Controlling Well Depth:
In this mode the user selects three (3) set points:
1.) WDC - Well depth control
2.) WDA - Well depth alarm (lowest depth)
3.) WDR - Well depth recovery (restart point)

Case 2: Controlling Well Flow:
In this mode the user selects three (3) set points:
1.) WFC - Well flow output control
2.) WDA - Well depth alarm (lowest depth)
3.) WDR - Well depth recovery (restart point)

Case 3: Controlling Valve Outlet Pressure:
In this mode the user selects three (3) set points:
1.) OPC - Valve outlet pressure control
2.) WDA - Well depth alarm (lowest depth)
3.) WDR - Well depth recovery (restart point)

If the well drops below the WDA preset depth during any of the 3 modes of operation, the system will trigger to stop, alarm, or warn user. The DWC will only restart when the WDR depth has been reached or by user intervention (remote or local).**
*****Restart will only happen during a valid run command.***

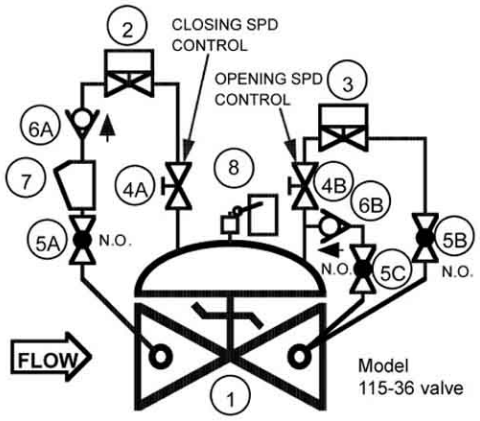
Shut-Down Control Sequence: When the controller run command becomes invalid, the controller will close the valve at an adjustable controlled rate, and after the valve has closed the pump will be shut off.
Hydraulic Reverse Flow Check Feature: Should the pump lose discharge pressure while continuing to run, the "check feature" (6A and 6B) closing will shut off the power to the pump. If power is lost to the system, the "check feature" also closes the valve. The check closing will not be instant, thus there is potential for an amount of reverse flow. The pump should therefore be equipped with a non-reverse ratchet.
Installation: The Duplex Well Commander controller should be centrally located within 2,500 ft. of all transducers in order to accurately control the two Model 115-36 Digital Control Valves. The wiring from the transducers to the controller shall be 20 AWG twisted pair shielded cables in accordance with any local low voltage code requirements. Wiring size to the valve solenoids shall be a minimum of 18 AWG and should follow local electrical codes for voltage level being used.

Consult factory on applications that do not meet the recommended.

FEATURES

- Primary control of well depth via level/depth transducer*
- Secondary control of:
  - Output flow rate via flow meter transducer*
  - Valve discharge pressure via pressure transducer*
- Allows for frequent set point change of control type selected
- The controls for each well can be operated in either manual or automatic mode
- Model 115-36 digital control valve with dual solenoid and 'hydraulic' reverse flow check
- The valve opens slowly on pump start and closes slowly prior to pump shutdown
- User-friendly color touch screen operation
- Scheduling for the control of each valve (time, day of week, flow limiting, process variables)
- Volume totalizer for each valve output (when used with a flow meter)
- Remote operation and monitoring of each valve and discrete pump run conditions
- Remote set point by digital SCADA access
- Extreme stability over wide range of operation
- Wider range of flow control than standard hydraulic systems
- Full function PID controller
- RS232/RS485 communications (CANBUS, MODBUS)
- 100-260Vac 50-60Hz with 24/12 VDC (optional)
- Optional
  - Analog Output (4-20mA)
  - Intranet monitoring control and e-mailing
  - Pump discharge pressure (replaces valve discharge pressure)
  - Manual override of valve operation
  - Valve position transmitter (not required for valve operation)
  - Consult factory for other options and control features as required

*Only one process variable is in control at any given time but they may all be monitored simultaneously. Sensors/transducers are user supplied.



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.)	Basic Valve Assembly	5.)	Isolation Ball Valve
2.)	Two-Way (N.O.) Solenoid Pilot	6.)	Check Valve
3.)	Two-Way (N.C.) Solenoid Pilot	7.)	Y-Strainer
4.)	Needle Valve	8.)	Limit Switch

Model 22DWC DuPlex Well Commander System

TOLL FREE 1.888.628.8258 • **phone:** (918)627.1942 • **fax:** (918)622.8916 • 7400 East 42nd Place, Tulsa, Ok 74145
email: sales@controlvalves.com • **website:** www.controlvalves.com

Model 22DWC DuPlex Well Commander

OCV Control Valves

SIZES: GLOBE/ANGLE
Screwed Ends: 2" - 3"; Grooved Ends: 2" - 6"; Flanged Ends: 2" - 24" (globe); 2" - 12", 16" (angle)
TEMPERATURE RANGE: (Valve Elastomers)
Buna-N -40°F - 180°F, Viton 0°F - 400°F, EPDM 0°F - 300°F
MATERIALS: Consult factory for others.
Body/Bonnet: Ductile Iron (epoxy coated), Carbon Steel (epoxy coated), Stainless Steel, Bronze; Others available (consult factory)
Seat Ring: Bronze, Stainless Steel
Stem: Stainless Steel, Monel
Spring: Stainless Steel
Diaphragm: Nylon Reinforced, Buna-N, Viton, EPDM
Seat Disc: Buna-N, Viton, EPDM
Pilot: Bronze, Stainless Steel; *Other pilot system components:* Bronze/Brass, All Stainless Steel
Tubing & Fittings: Copper/Brass, Stainless Steel
Solenoid: *Enclosure:* Weatherproof NEMA 4X / Explosion Proof NEMA 4X, 6P, 7, 9; *Body*: Brass, Stainless Steel; *Voltages:* 24, 120, 240, 480 VAC / 12, 24 VDC
Note: Working pressures of solenoids vary greatly, consult factory on application of OCV Model 115-36 valves.

CONTROLLER SPECIFICATIONS:
Power Requirements: Standard 100-260 VAC 50-60Hz; Optional 24VDC or 12VDC
Inputs From Transducer: Standard 4-20mA; Optional 0-10VDC or pulse transducer
Outputs To Solenoids: Standard 110-120VAC; Optional 220-240VAC, 12VDC, 24VDC
Model 22DWC Panel Dimensions: 15.50" (394mm) High x 12.00" (305mm) Wide x 8.28" (210mm) Deep
Enclosure: Nema 4X (weather tight, Corrosion resistant)

SIZING

A velocity of 20 ft/sec is the recommended maximum flow rate.

Size	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	24"
GPM	210	300	460	800	1,800	3,100	4,900	7,000	8,450	11,000	25,000
M^3/hr	48	68	105	180	410	700	1,110	1,600	1,920	2,500	5,680

Reduced port valves available. Consult the factory or refer to ValveMaster Premier on the OCV website: www.controlvalves.com

MAX. PRESSURE

Working pressures of solenoids vary greatly, consult factory on application of OCV Model 115-36 valves when pressures exceed those stated in chart.

END CONNECTIONS	DUCTILE IRON	STEEL/STN STL	BRONZE
Threaded	300 psi	300 psi	300 psi
Grooved	300 psi	300 psi	300 psi
150# Flanged	250 psi	285 psi	225 psi
300# Flanged	300 psi	300 psi	300 psi

SPECIFICATIONS (Typical Water Application)

The electronic well commander valve shall operate to monitor and control selected input transducers via discrete electrical signals from the controller.

DESIGN
The electronic well commander valve shall be two single-seated, line pressure operated, diaphragm actuated, pilot controlled <globe, angle> valves. The valve shall seal by means of a corrosion-resistant seat and a resilient, rectangular seat disc. These, and other parts, shall be replaceable without removing the valve from the line. The stem of the main valve shall be guided top and bottom by integral bushings. Alignment of the body, bonnet and diaphragm assembly shall be by precision dowel pins. The diaphragm shall not be used as a seating surface, nor shall pistons be used as an operating means. The pilot system shall be furnished complete and installed on the main valve. It shall include two needle valves, a Y-strainer, two solenoid valves and isolation ball valves. The electronic well commander valve shall be operationally and hydrostatically tested prior to shipment.

MATERIALS OF CONSTRUCTION
The main valve body and bonnet shall be ductile iron per ASTM A536, Grade 65-45-12. All ferrous surfaces shall be coated with 4 mils of epoxy. The main valve seat ring shall be bronze. Elastomers (diaphragms, resilient seats and O-rings) shall be Buna-N. The needle valve and isolation ball valves shall be brass, and control line tubing shall be copper. The solenoid valve shall have brass bodies, weatherproof enclosures and be suitable for operation on **<voltage>**.

OPERATING CONDITIONS
The electronic well commander valves shall be suitable for pressures of **<X to X>** psi, controlling flow rates up to **<X>** gpm.

ACCEPTABLE PRODUCTS
The electronic well commander valves shall be a **<size, size>** Model 22DWC **<globe pattern, angle pattern>**, with **<150# flanged, 300# flanged, threaded, grooved>** end connections, as manufactured by OCV Control Valves, Tulsa, Oklahoma, USA.

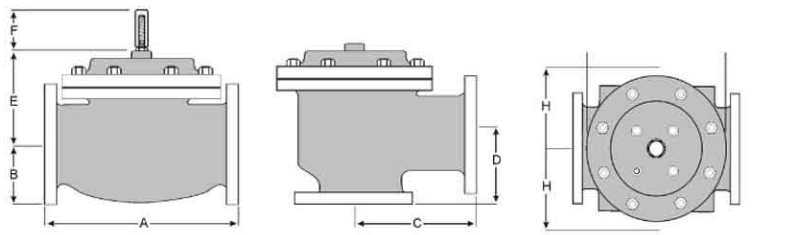
U.S. DIMENSIONS - INCHES

DIM	END CONN.	2	2 1/2	3	4	6	8	10	12	14	16	24
A	SCREWED	9 7/8	10 1/2	13	--	--	--	--	--	--	--	--
	GROOVED	9 7/8	10 1/2	13	15 1/4	20	--	--	--	--	--	--
	150# FLGD	9 3/8	10 1/2	12	15	17 3/4	25 3/8	29 3/4	34	39	40 3/8	62
	300# FLGD	9 7/8	11 1/8	12 3/4	15 5/8	18 5/8	26 3/8	31 1/8	35 1/2	40 1/2	42	63 3/4
B	SCREWED	1 11/16	1 7/8	2 1/4	--	--	--	--	--	--	--	--
	GROOVED	1 3/16	1 7/16	1 3/4	2 1/4	3 5/16	--	--	--	--	--	--
	150# FLGD	3	3 1/2	3 3/4	4 1/2	5 1/2	6 3/4	8	9 1/2	10 5/8	11 3/4	16
	300# FLGD	3 1/4	3 3/4	4 1/8	5	6 1/4	7 1/2	8 3/4	10 1/4	11 1/2	12 3/4	18
C ANGLE	SCREWED	4 3/4	6	6 1/2	--	--	--	--	--	--	--	--
	GROOVED	4 3/4	6	6 1/2	7 5/8	--	--	--	--	--	--	--
	150# FLGD	4 3/4	6	6	7 1/2	10	12 11/16	14 7/8	17	--	20 13/16	--
	300# FLGD	5	6 3/8	6 3/8	7 13/16	10 1/2	13 3/16	15 9/16	17 3/4	--	21 5/8	--
D ANGLE	SCREWED	3 7/8	4	4 1/2	--	--	--	--	--	--	--	--
	GROOVED	3 7/8	4	4 1/2	5 5/8	--	--	--	--	--	--	--
	150# FLGD	3 7/8	4	4	5 1/2	6	8	11 3/8	11	--	15 11/16	--
	300# FLGD	4 1/8	4 3/8	4 3/8	5 13/16	6 1/2	8 1/2	12 1/16	11 3/4	--	16 1/2	--
E	ALL	6	7	6 1/2	8	10	11 7/8	15 3/8	17	18	19	27
F	ALL	5	5	5	5	5	7	7	7	7	7	8
H	ALL	11	11	11	12	13	14	17	18	20	20	28 1/2

*GROOVED END NOT AVAILABLE IN 1 1/4"

For maximum efficiency, the OCV control valve should be mounted in a piping system so that the valve bonnet (cover) is in the top position. Other positions are acceptable but may not allow the valve to function to its fullest and safest potential. In particular, please consult the factory before installing 8" and larger valves, or any valves with a limit switch, in positions other than described. Space should be taken into consideration when mounting valves and their pilot systems.
A routine inspection & maintenance program should be established and conducted yearly by a qualified technician. Consult our factory @ **1-888-628-8258** for parts and service.

How to order your 22DWC valve
When Ordering please provide:
- Fluid to be controlled - Model Number - Size - Globe or Angle - End Connection - Body Material - Trim Material - Solenoid & Controller Voltages - Flow, Pressure and Depth Transducer Output/Flow Range - Power failure mode: Close (standard) - Solenoid enclosure Weatherproof or Explosion Proof - Solenoid exhaust to downstream or atmosphere - Controller Options - Special Requirements / Installation Requirements



Represented by:

QUALITY SYSTEM REGISTERED TO ISO 9001

TOLL FREE 1.888.628.8258 • **phone:** (918)627.1942 • **fax:** (918)622.8916 • 7400 East 42nd Place, Tulsa, Oklahoma 74145
email: sales@controlvalves.com • **website:** www.controlvalves.com

Global performance. Personal touch.