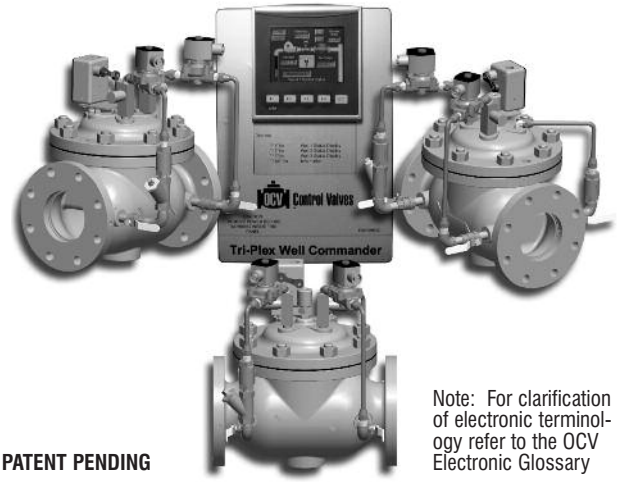


PATENT PENDING

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

The OCV "Well Commander System" provides control of well/aquifer levels to prevent over pumping. The Well Commander System can be as simple as one valve, one well and one electronic multi-stage controller, or as complex as three valves, three wells and one electronic multi-stage controller. The electronic controller operates the valve via line pressure through two solenoids (opening and closing). The traditional hydraulic function works in conjunction with the electronic options to provide digital interfacing, remote operation and more precise control over a larger operation span.

Available models: Well Commander (WC), DuPlex Well Commander (DWC) and TriPlex Well Commander (TWC)

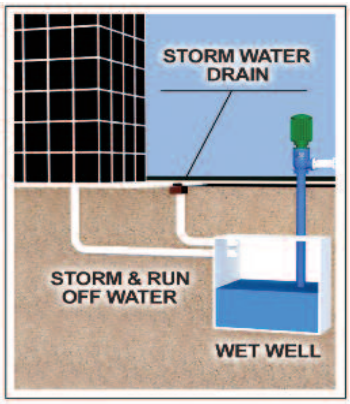
TYPICAL APPLICATIONS

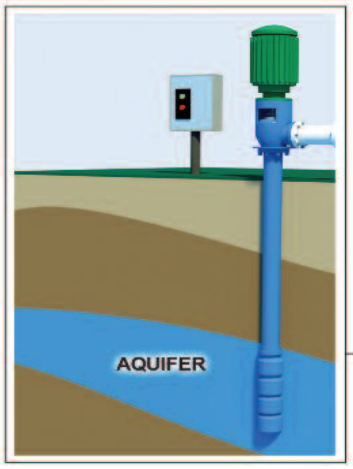
- Storm water management
- Wet well management
- Well/aquifer control and management

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(s) with dual solenoid and 'hydraulic' reverse flow check
- The valve(s) opens slowly on pump start and close slowly prior to pump shutdown
- Scheduling for the control of the valve(s) (time, day of week, flow limiting, process variables)
- Volume totalizer for the valve(s) output sequence (when used with a flow meter)
- Remote operation and monitoring of the valve(s) 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

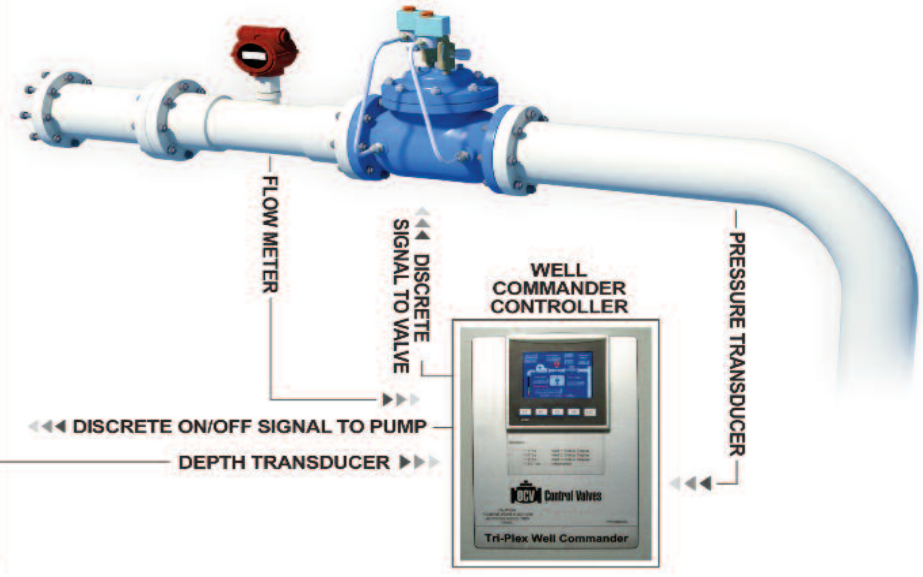
*Only one process variable is in control at any given time but they may all be monitored simultaneously.
*Sensors/transducers are user supplied.





Storm Water Collection Point
The Well Commander System can assist in compliance with regulations regarding pumping into the city storm water system. The Well Commander System can measure the wet well depth, limit the volume and control the rate the water is pumped into the city storm water system, all without the need of personnel standing by to monitor or control the system. Options may also be added to email/text messages regarding when the system is pumping, how much is being pumped and at what volume.

Well Control
The Well Commander System can act as a critical tool to keep applications compliant with limitations regulating pumping from wells. Once the pump is started, the valve can control depth, flow, pressure or any combination thereof, until a user selected set point, usually a maximum volume. A restart set point can be set to allow an automatic restart (during a valid run condition) until the stop condition is again valid. The Well Commander System may also be programmed to set off alarms, automatically stop or send an email/text warning when the allowed conditions have been exceeded.



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

The Well Commander System Series

THEORY OF OPERATION

The Well Commander with a Model 115-36 Digital Control Valve
Initial setup has been performed for the well(s), 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 allowed 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 allowed 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 allowed depth)
3) WDR - Well Depth Recovery (restart point)

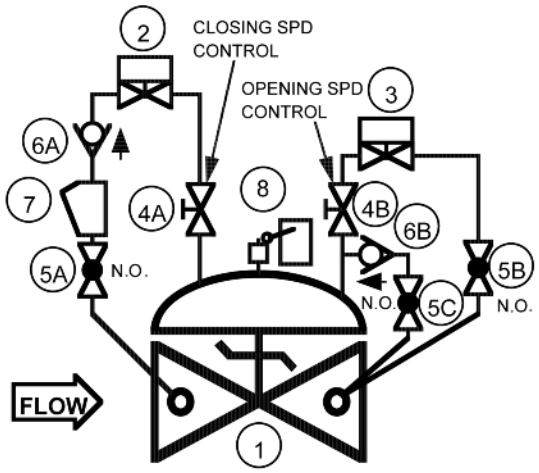
If during any of the 3 modes of operation above the well drops below the WDA preset depth, the system will trigger to stop, alarm, or warn the user (user selectable). The Well Commander will only restart when the WDR depth has been reached or by user intervention (remote or local).**
Restart will only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

Shut-Down Control Sequence: When the controller run command becomes invalid, the controller will close the valve(s) at an adjustable, controlled rate, and after the valve(s) has closed, the pump will 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(s). The check closing will not be instant, thus there is potential for a minimum amount of reverse flow. The pump should be equipped with a non-reverse ratchet.

Installation: The Well Commander controller should be located within 2,500 ft. of all transducers in order to accurately control the Model 115-36 Digital Control Valve(s). The wiring from the transducers to the controller shall be 20 AWG twisted pair shielded cable 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.



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

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

CONTROLLER

The commander screen is a touch command screen so touching a display button pulls up additional menus for informational display or button call out descriptions.

Well Commander Controller Features

- User-friendly color touch screen operation
- 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 outlet pressure)
  - Manual Override of valve operation
  - Valve position transmitter (not required for valve operation)
  - Consult factory for other options and control features as required

Pump Status and Control- allows manual on/off operation of pump. When button is grayed out, pump on/off is disabled in automatic mode. When button is blue, pump on/off may be controlled in manual mode. Depressing button will start or stop the pump

Pump Indicator- displays pump status. Gray pump is off. Green pump is on

Well Depth Indicator- measured well depth in feet (other units available)

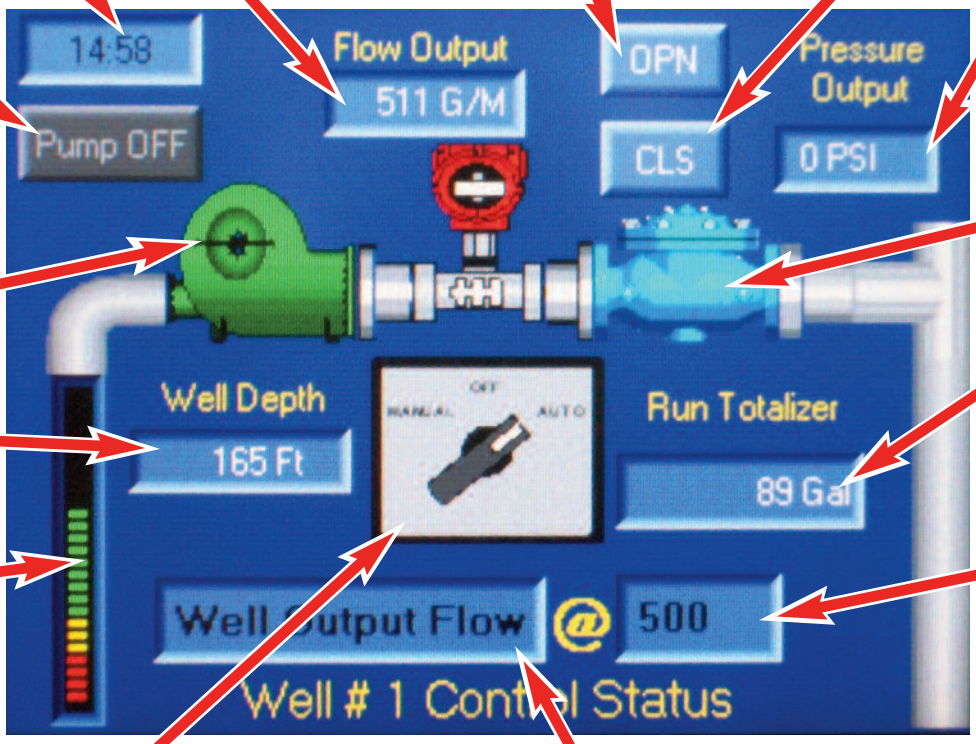
Well Depth Indicator- bar graph displaying well depth status. Green-0-80% of scaling. Yellow-80-90% of scaling. Red is 90-100% of scaling

Internal Real Time Clock- displays real time

Flow Meter Output- displays flow meter output (GPM; other units available)

Open Solenoid Announcerator- displays opening solenoid status. Yellow indicates solenoid is open

Close Solenoid Announcerator- displays closing solenoid status. Yellow indicated solenoid is open



Output Pressure- displays valve outlet pressure (PSI other units available)

Valve Display Status- displays valve status. Gray-valve is closed. Blue-valve is open. Red-valve is open greater than 90%

System Totalizer- displays the amount of water (Gallons, other units available) flowing through the system

Controlled Set Point- displays user selected depth, pressure, flow. By touching button, user can temporarily switch set point

Mode of Operation- shows current system operational control mode. Button will display system control by Manual, Off or Automatic. For automatic mode, see F4 functions listed below. Manual mode allows touch screen operation of pump and valve solenoids

Controller Operational Status Window- displays quick overview of current system status, including normal automatic operations, normal manual operations, and detected errors display (red wording)

Well 1 Status Display - applies to all (WC, DWC, TWC)

Well 2 Status Display - DWC andTWC only

Well 3 Status Display - TWC only

ESC - general OCV company contact information and firmware version number

Combining F buttons displays additional menus. F4 is the primary button and must be depressed while depressing secondary button. Common are listed below, other control functions are covered in the O&M manual.

F4+F1- well 1 program page-set up automatic mode of operation for well commander (depth, flow or pressure mode). Also alarm modes (all wells)
F4+F2- (DWC and TWC only) well 2 program page-set up automatic mode of operation for well commander (depth, flow or pressure mode). Also alarm
F4+F3-(TWC only) well 3 program page-set up automatic mode of operation for well commander (depth, flow or pressure mode). Also alarm

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

The Well Commander System Series

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
Well Commander 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.

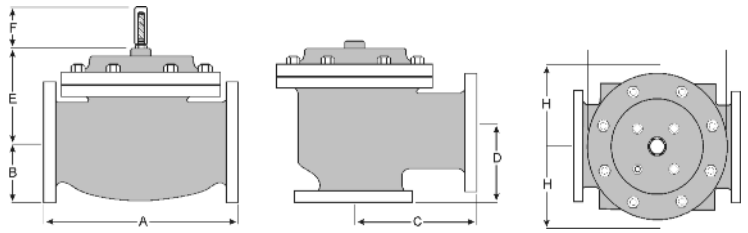
Size	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	24"
GPM	210	300	460	800	1,800	3,100	4,900	7,000	8,450	11,000	25,000
M^3/hr	48	68	105	180	410	700	1,110	1,600	1,920	2,500	5,680

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



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

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.

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

REVISED 12/03/09