Model 3331 shown ▶

The elevated tank, standpipe or storage reservoir is a common and important element found in many water distribution systems- municipal, fire protection, commercial, military and industrial.

The function of the OCV Series 3330 Altitude Control Valve is accurate, automatic level control, without the use of floats or sensors. Pilot controls for the series can accommodate storage facilities up to 230 feet high, maintaining the liquid level to within inches of a predetermined set point.

The series is offered in two basic types. The Model 3331, one-way flow is used for tank fill only. The Model 3333 allows flow both into and out of the tank.

SERIES FEATURES

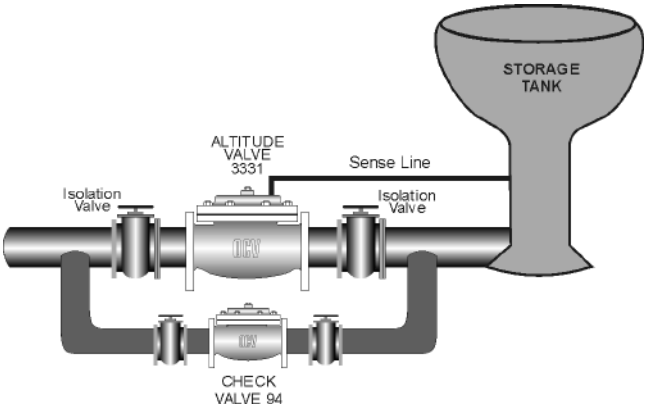
- ▶Consistently maintains water level to within inches of set point in tank/reservoirs from 5 to 230 Ft high.
- ▶Installs at the base of tank.
- ▶Operates hydraulically without need for a tank-mounted float or electrical controls or sensors.

VALVE FEATURES

- ▶Operates automatically off line pressure.
- ▶Heavy-duty, nylon-reinforced diaphragm.
- ▶Rectangular-shaped, soft seat seal provides drip-tight Class VI closure.
- ▶Diaphragm assembly guided top and bottom.
- ▶Throttling seat retainer for flow and pressure stability.
- ▶Easily maintained without removal from the line.
- ▶Replaceable seat ring.
- ▶Alignment pins assure proper reassembly after maintenance.
- ▶Valves are factory tested.
- ▶Valves are serial numbered and registered to facilitate replacement parts and factory support.

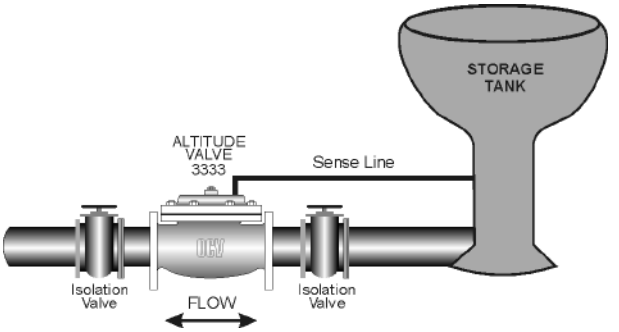
ALTITUDE VALVE / ONE WAY FLOW (TANK FILL)

Provides automatic filling of elevated tanks or reservoirs. When the altitude control senses a drop in level below the predetermined set point, the valve opens to fill tank. When the level again reaches the set point, the valve will close. Discharge of the tank is by a separate line.



ALTITUDE VALVE / TWO WAY FLOW (TANK FILL & DISCHARGE)

Controls both the fill and discharge cycles of a tank or reservoir. When valve inlet (system) pressure falls below tank head pressure, the altitude valve opens to feed the system. When system pressure recovers above tank head, the tank begins to refill. When the high level set point is reached, the valve will close.



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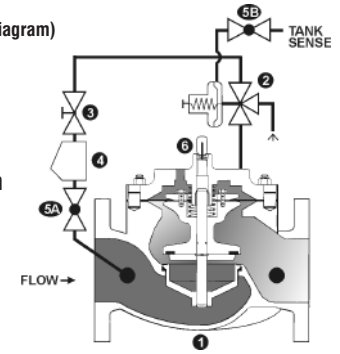
email: sales@controlvalves.com ● **website:** www.controlvalves.com

Altitude Control Valve Series 3330

VALVE OPERATION

3331 (2-8" diagram)



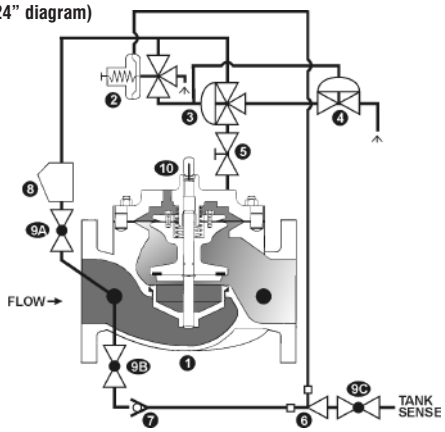
Model 3331 One-way Flow

The 3331 is designed to only fill the tank. Tank head (pressure) is sensed under the diaphragm of the 3300 altitude pilot (2). When the tank head falls below the set point , the pilot shifts to vent water from diaphragm chamber of the main valve (1) to drain. This allows the valve to open and fill the tank. When the tank level again reaches the set point, the altitude pilot shifts to apply full inlet pressure to the diaphragm of the main valve, forcing the valve fully closed.

The 3331 consists of the following components, arranged as shown on the schematic diagram:

1. Model 65 Basic Valve Assembly
2. Model 3300 Altitude Pilot
3. Model 141-2 Needle Valve
4. Model 159 Y-Strainer
5. Two Model 141-4 Ball Valves
6. Model 155 Visual Indicator

3333 (10-24" diagram)



Two-Way Altitude Valve

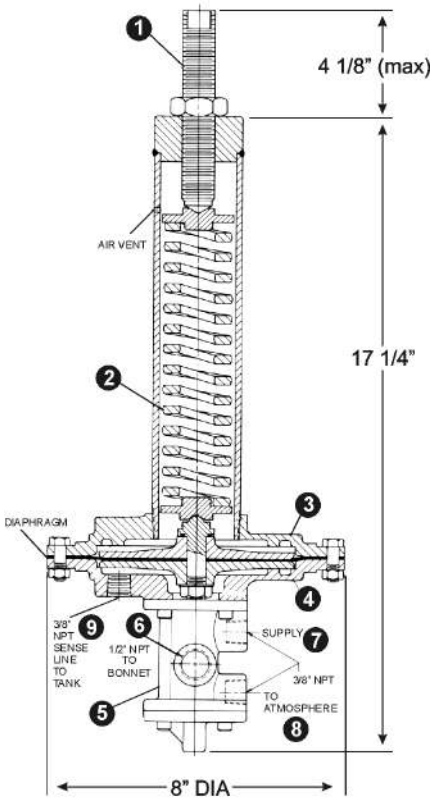
The 3333 is designed to drain and fill the tank. When the inlet (system) pressure falls below the set point of the altitude pilot (2), the pilot shifts to vent water from diaphragm chamber of the main valve (1) to drain. This allows the valve to open and let the tank feed the system. When system pressure recovers to a point higher than tank head, the tank will begin refilling. When the tank level again reaches the set point, the altitude pilot shifts to apply full inlet pressure to the diaphragm of the main valve, forcing the valve fully closed.

The 3333 consists of the following components, arranged as shown on the schematic diagram:

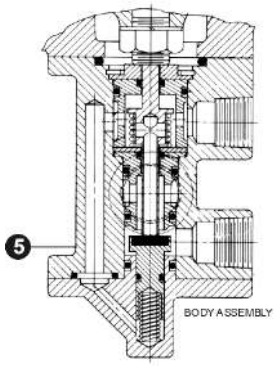
1. Model 65 Basic Valve Assembly
2. Model 3300 Altitude Pilot
3. Model 3600 Three-Way Auxiliary Pilot (10-24" only)
4. Model 6401 Two-Way Auxiliary Pilot (10-24" only)
5. Model 141-2 Needle Valve
6. Model 126 Ejector
7. Model 141-1 Check Valve
8. Model 159 Y-Strainer
9. Three Model 141-4 Ball Valves
10. Model 155 Visual Indicator

PILOT
3330

▶3300 Altitude Pilot



Spring Ranges in feet
5-30
20-50
40-80
70-140
130-230



Installation Requirements

The altitude valve is furnished fully factory assembled except for the tank sense line. In areas where freezing temperatures are possible, the valve should be located in a vault below the frost line.
After the main valve is installed, the tank sense line must be connected at the altitude pilot. The proper installation of this sense line is critical to the efficient operation of the altitude valve. The following guidelines apply.

1. It is essential that the sense line be connected as close to the tank as possible in order to accurately sense the tank head, within 40 diameters of the tank wall or riser.
2. Minimum recommended size for the sense line is ½" OD tubing or 3/8" pipe.
3. In order to prevent air accumulation, the sense line should slope slightly upwards from the valve to the tank.

The altitude valve vents its diaphragm chamber to atmosphere, the volume varying according to valve size, as shown below. Provision should be made to drain off or otherwise dispose of this water.

1 ¼"	0.02 gal.	8"	1.0 gal.
1 ½"	0.02 gal.	10"	2.5 gal.
2"	0.05 gal.	12"	4.0 gal.
2 ½"	0.06 gal.	14"	6.5 gal.
3"	0.1 gal.	16"	9.6 gal.
4"	0.2 gal.	24"	28.0 gal.
6"	0.6 gal.		

MODEL 3330 Altitude Control Valve Series
1. Adjusting Screw
2. Spring
3. Upper Diaphragm Chamber
4. Lower Diaphragm Chamber
5. Pilot Valve Body
6. To Bonnet
7. To Supply
8. To Atmosphere
9. Tank Pressure Sense Line

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SIZING CONSIDERATIONS

For the most comprehensive procedure in sizing Series 3330 control valves, it is best to use our ValveMaster software or the guidelines shown here in conjunction with the Performance Charts in the Engineering Section of the OCV catalog.

With rare exceptions, altitude valves are line sized. This being said, the following criteria may be applied.

The valve flow rate may be verified from the equation:

$$Q = C_v\sqrt{dp}$$

where: Q = flow rate, gallons per minute
Cv = valve flow coefficient from chart, below
dp = available pressure drop
Tank Fill - (system pressure minus tank head in psi)
Flow Out of Tank - (tank head in psi minus system pressure)

In no case should the flow velocity exceed 25 ft/sec (see chart). If a greater flow is required, use a larger valve.

In some cases, in may be necessary to limit the flow, particularly for flow into the tank. In such cases, consider using either a smaller valve or a line size valve with a pressure sustaining feature (Model 3331-3 or 3333-3).

BASIC VALVE FLOW CHARACTERISTICS

Valve Size	Globe Valves Cv	Angle Valves Cv	Flow for 25ft/sec GPM
1-1/4	23	30	115
1-1/2	27	35	115
2”	47	65	260
2-1/2”	68	87	370
3”	120	160	570
4”	200	270	1,000
6”	450	550	2,250
8”	760	1,000	3,900
10”	1,250	1,600	6,150
12”	1,940	2,400	8,700
14”	2,200	-----	10,500
16”	2,850	4,000	13,800
24”	6,900	-----	31,300

VALVE SELECTION GUIDE

By combining various control pilots, multiple valve functions can be performed on a single Series 3330 Altitude Control Valve. To find the combination function valve, select the desired features and then the model number.
This chart shows only a sample of those most often specified valves. Consult the factory for specific data on the model you selected.

	3331	3331-1	3331-2	3331-3	3331-4	3331-13	3331-14	3331-23	3331-24	3331-34	3331-C	3333	3333-1	3333-2	3333-3	3333-5	3333-13	3333-15	3333-23	3333-25	3333-35	Definition
One-Way Flow	X	X	X	X	X	X	X	X	X	X	X											Fills elevated tank or resevoir
Two-Way Flow												X	X	X	X	X	X	X	X	X	X	Fills elevated tank and opens for return flow
Pressure Sustaining				X		X		X		X					X		X		X		X	Maintains minimum valve inlet pressure
Lift Check											X											Internal assembly closes valve on pressure reversal
Solenoid-Energized to Enable		X				X	X						X				X	X				Solenoid energized to allow valve to open
Solenoid-Energized to Close			X					X	X					X					X	X		Solenoid energized to close valve
Delayed Drawdown					X		X		X	X												Valve opening delayed until tank level reaches set point
Delayed Opening For Return Flow																X		X		X	X	Valve opening for return flow is delayed

ABOUT YOUR VALVE

OCV Control Valves was founded more than 60 years ago with a vision and commitment to quality and reliability. From modest beginnings, the company has grown to be a global leader just a half century later. In fact, OCV Valves can be found in some capacity in nearly every country around the world from fire protection systems in Malaysia to aircraft fueling systems in Africa and from oil refineries in Russia to water supply systems in the USA and Canada. You will also find our valves in irrigation systems in Europe, South America and the Middle East.

The original foundation on which the company was built allows our team of professionals to not only provide the service required to be a worldwide supplier, but more importantly the opportunity to afford the personal touch necessary to be each of our customers' best partner. Simply stated, we take pride in all that we do.

Committed to the work they do, our employees average over 15 years of service. This wealth of knowledge allows us to provide quality engineering, expert support, exacting control and the know-how to create valves known for their long life.

Being ISO 9001 certified means we are committed to a quality assurance program. Our policy is to supply each customer with consistent quality products and ensure that the process is right every time. Our valves meet and exceed industry standards around the world. Including approvals by:

Check individual models for availability.

CLASSIFIED UL WATER QUALITY VALVE MH61756 ANSI/NSF 61-G & 372 · UL · FM APPROVED · CE · NSF NSF-ISR Registered to ISO 9001 · ABS TYPE APPROVED PRODUCT

All valves are not created equal. OCV Control Valves proves that day in and day out.
We stand behind our valves and are ready to serve your needs.

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SPECIFICATIONS

NOTE: ALL waterworks valves meet the Low-Lead laws of the United States, including individual state laws, as of March 2014.
**Valves 1-1/4" through 24" are certified to NSF/ANSI 372. Valves 4" through 24" are also certified to NSF/ANSI 61-G.*

CLASSIFIED UL WATER QUALITY VALVE MH61756 ANSI/NSF 61-G & 372

VALVE BODY & BONNET	DUCTILE IRON		CAST STEEL		STAINLESS STEEL	
Material Specification	ASTM A536/65-45-12 (epoxy coated)		ASTM A216/WCB (epoxy coated)		ALL GRADES	
END CONNECTIONS						
Flange Standard (also available in metric)	ANSI B16.42		ANSI B16.5		ANSI B16.5	
Flange Class	150#	300#	150#	300#	150#	300#
Flange Face	Flat	Raised	Raised	Raised	Raised	Raised
Maximum Working Pressure	250 psi	640 psi	285 psi	740 psi	285 psi	740 psi
Screwed Working Pressure: ANSI B1.20.1 640 psi			Grooved End Working Pressure: 300 psi			
INTERNALS						
Stem	STAINLESS STEEL					
Spring	STAINLESS STEEL					
Spool	DUCTILE IRON (epoxy coated) / OPTIONAL - STN. STL.				STAINLESS STEEL	
Seat Disc Retainer	DUCTILE IRON (epoxy coated) (10" & LARGER) STN. STL. (8" & SMALLER / OPTIONAL - ALL SIZES)				STAINLESS STEEL	
Diaphragm Plate	DUCTILE IRON (epoxy coated) / OPTIONAL - STN. STL.				STAINLESS STEEL	
Seat Ring (Trim)	LOW-LEAD BRONZE OR STN. STL.				STN. STL.	
Upper Stem Bushing	BRONZE OR TEFLON®				TEFLON®	
Lower Stem Bushing	NOT APPLICABLE FOR LOW-LEAD BROZE SEAT RINGS / TEFLON FOR FOR STN. STL. SEAT RINGS					
ELASTOMER PARTS (Rubber)						
Diaphragm/Seat Disc/O-Rings	EPDM					
Operating Temperature* *Consult factory when temperatures approach low or high temperature allowance.	32°F to 230°F					
COATINGS	NSF-61 EPOXY COATING					
ELECTRICAL SOLENOIDS						
Bodies	BRASS / OPTIONAL - STAINLESS STEEL					
Enclosures	WATER TIGHT, NEMA 1, 3, 4, & 4X					
Power	AC, 60HZ - 24, 120, 240, 480 VOLTS	AC, 50HZ - In 110 VOLT MULTIPLES	DC, 6 12, 24, 240 VOLTS			
Operation	ENERGIZE TO OPEN (NORMALLY CLOSED)	DE-ENERGIZE TO OPEN (NORMALLY OPEN)				

CONTROL PILOTS		
Bodies	LOW-LEAD BRONZE	STN. STL.
Internal	STAINLESS STEEL	STAINLESS STEEL
Tubing	COPPER	STAINLESS STEEL
Fittings	LOW-LEAD BRASS	STAINLESS STEEL

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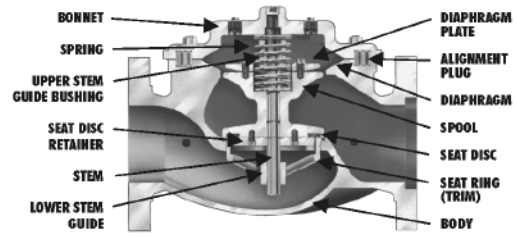

Globe Flanged Sizes

1.25"	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"*	20"*	24"
32mm	40mm	50mm	65mm	80mm	100mm	150mm	200mm	250mm	300mm	350mm	400mm	450mm*	500mm*	600mm

*CONSULT FACTORY

Angle Flanged Sizes

1.25"	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	16"
32mm	40mm	50mm	65mm	80mm	100mm	150mm	200mm	250mm	300mm	400mm

Globe/Angle Screwed Sizes

1.25"	1.5"	2"	2.5"	3"
32mm	40mm	50mm	65mm	80mm

Globe/Angle Grooved Sizes

1.5"	2"	2.5"	3"	4"	6"*
32mm	50mm	65mm	80mm	100mm	150mm*

*GLOBE ONLY

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DIMENSIONS

U.S. DIMENSIONS - INCHES

DIM	END CONN.	1 1/4-1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	24
	SCREWED	8 3/4	9 7/8	10 1/2	13	--	--	--	--	--	--	--	--
A	GROOVED	8 3/4	9 7/8	10 1/2	13	15 1/4	20	--	--	--	--	--	--
	150# FLGD	8 1/2	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	8 3/4	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
	SCREWED	1 7/16	1 11/16	1 7/8	2 1/4	--	--	--	--	--	--	--	--
B	GROOVED	1*	1 3/16	1 7/16	1 3/4	2 1/4	3 5/16	--	--	--	--	--	--
	150# FLGD	2 5/16-2 1/2	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	2 5/8-3 1/16	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
	SCREWED	4 3/8	4 3/4	6	6 1/2	--	--	--	--	--	--	--	--
C	GROOVED	4 3/8*	4 3/4	6	6 1/2	7 5/8	--	--	--	--	--	--	--
ANGLE	150# FLGD	4 1/4	4 3/4	6	6	7 1/2	10	12 11/16	14 7/8	17	--	20 13/16	--
	300# FLGD	4 3/8	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	--
	SCREWED	3 1/8	3 7/8	4	4 1/2	--	--	--	--	--	--	--	--
D	GROOVED	3 1/8*	3 7/8	4	4 1/2	5 5/8	--	--	--	--	--	--	--
ANGLE	150# FLGD	3	3 7/8	4	4	5 1/2	6	8	11 3/8	11	--	15 11/16	--
	300# FLGD	3 1/8	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	6	7	6 1/2	8	10	11 7/8	15 3/8	17	18	19	27
F	ALL	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	6 3/8	6 3/8	6 3/8	6 3/8	6 3/8	8
G	ALL	6	6 3/4	7 11/16	8 3/4	11 3/4	14	21	24 1/2	28	31 1/4	34 1/2	52
H	ALL	10	11	11	11	12	13	14	17	18	20	20	28 1/2

*GROOVED END NOT AVAILABLE IN 1 1/4"

METRIC DIMENSIONS - M.M.

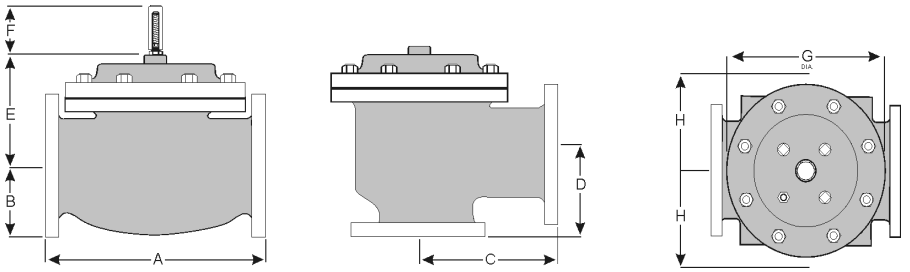
DIM	END CONN.	DN32-DN40	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN600
	SCREWED	222	251	267	330	--	--	--	--	--	--	--	--
A	GROOVED	222	251	267	330	387	508	--	--	--	--	--	--
	150# FLGD	216	238	267	305	381	451	645	756	864	991	1026	1575
	300# FLGD	222	251	283	324	397	473	670	791	902	1029	1067	1619
	SCREWED	37	43	48	57	--	--	--	--	--	--	--	--
B	GROOVED	25*	30	37	44	57	84	--	--	--	--	--	--
	150# FLGD	59-64	76	89	95	114	140	171	203	241	270	298	406
	300# FLGD	67-78	83	95	105	127	159	191	222	260	292	324	457
	SCREWED	111	121	152	165	--	--	--	--	--	--	--	--
C	GROOVED	111*	121	152	165	194	--	--	--	--	--	--	--
ANGLE	150# FLGD	108	121	152	152	191	254	322	378	432	--	529	--
	300# FLGD	111	127	162	162	198	267	335	395	451	--	549	--
	SCREWED	79	98	102	114	--	--	--	--	--	--	--	--
D	GROOVED	79*	98	102	114	143	--	--	--	--	--	--	--
ANGLE	150# FLGD	76	98	102	102	140	152	203	289	279	--	398	--
	300# FLGD	79	105	111	111	148	165	216	306	298	--	419	--
E	ALL	152	152	178	165	203	254	302	391	432	457	483	686
F	ALL	98	98	98	98	98	98	162	162	162	162	162	203
G	ALL	152	171	195	222	298	356	533	622	711	794	876	1321
H	ALL	254	279	279	279	305	330	356	432	457	508	508	724

*GROOVED END NOT AVAILABLE IN DN32

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 valve
When Ordering please provide:
Series Number - Valve size - Globe or Angle - Pressure Class - Screwed, Flanged, Grooved - Trim Material - Adjustment Range - Pilot Options - Special needs / or installation requirements.



Represented by:

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