Richard Farris

From: Matt Burdette <matt@batemancivilsurvey.com>
Sent: Tuesday, January 6, 2015 9:07 AM
To: Richard Farris
Subject: FW: Bells Crossing lot 41

Please see the email from T & J panel below.

Thanks,

Matt Burdette
Environmental Specialist
Bateman Civil Survey Company, PC
200 North Main Street
Holly Springs, North Carolina 27540
(919) 577-1080 Office
(919) 577-1081 Fax
(919) 422-2827 Cell

From: Brad Johnson [mailto:tj_panel@yahoo.com]
Sent: Monday, January 05, 2015 5:48 PM
To: <matt@batemancivilsurvey.com>
Subject: Re: Bells Crossing lot 41

APPROVED JAN 12 2015
Richard Farris

In reference to:
Lot# 41 in Bells Crossing

We have had much success in soils as deep as 58 inches, as long as the soils meet a standard suitable for an onsite wastewater system. In these circumstances we do modify the system during installation. This would include adding vents that meet the surface to help in obtaining air for breakdown of the effluent. These vents shall be placed on every third panel for the length of trench. As long as these requirements are met; we here at T & J Panel, Inc. are able to endorse the system's functionality.

If any questions arise on the matter, feel free to contact us at anytime.

Brad Johnson

T & J Panel Inc.
(704) 924-8600
(704) 880-7697

On Jan 5, 2015, at 4:53 PM, Matt Burdette <matt@batemancivilsurvey.com> wrote:

> Hey Brad –
>
> I need a letter saying that it is ok to install T & J Panel at a depth of 56-58". It is a repair field so it will not be installed at this time, but feel free to add any requirements that are prudent like air vents at the end of the lines.

Thanks,

Matt Burdette
Environmental Specialist
Bateman Civil Survey Company, PC
200 North Main Street
Holly Springs, North Carolina 27540
(919) 577-1080 Office
(919) 577-1081 Fax
(919) 422-2827 Cell

MODEL 112 Control Panel

Single phase, simplex motor contactor control.

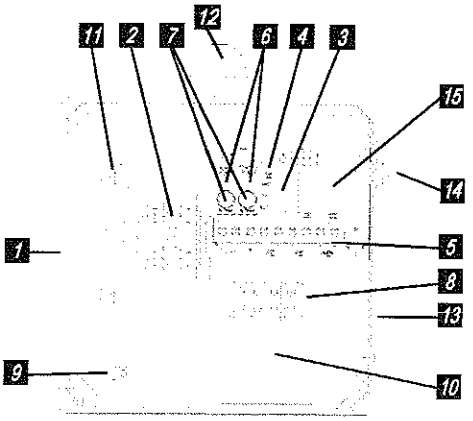
The Model 112 control panel provides a reliable means of controlling one 120, 208, or 240 VAC single phase pump in pump chambers, sump pump basins, irrigation systems and lift stations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs, an additional alarm switch activates the audio/visual alarm system.

PANEL COMPONENTS

1. **Enclosure** measures 8 x 8 x 4 inches (20.32 X 20.32 X 10.16 cm). Choice of NEMA 1 (steel for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic with removable flanges for outdoor or indoor use).

   * Options selected may increase enclosure size and change component layout.

2. **Magnetic Motor Contactor** controls pump by switching electrical lines.
3. **HOA Switch** for manual pump control (mounted on circuit board).
4. **Green Pump Run Indicator Light** (mounted on circuit board).
5. **Float Switch Terminal Block** (mounted on circuit board).
6. **Alarm and Control Fuses** (mounted on circuit board).
7. **Alarm and Control Power Indicators** (mounted on circuit board).
8. **Pump Input Power and Pump Connection Terminal Block**
9. **Ground Lug**
10. **Terminal Block Installation Label**
11. **Circuit Breaker** (optional) provides pump disconnect and branch circuit protection.



Model Shown 1121W914X

STANDARD ALARM PACKAGE

12. **Red Alarm Beacon** provides 360° visual check of alarm condition. **Note:** NEMA 1 style utilizes a door mounted indicator in lieu of a beacon.
13. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating). **Note:** NEMA 1 style utilizes an internally mounted buzzer in lieu of horn.
14. **Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition has been cleared.
15. **Horn Silence Relay** (mounted on circuit board).

NOTE: other options available.

FEATURES

- Entire control system (panel and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes three 20' Sensor Float® control switches
- Complete with step-by-step installation instructions
- Three-year limited warranty

c UL us LISTED

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.

SJE Rhombus® CONTROLS

PO Box 1708, Detroit Lakes, MN 56502
1-888-DIAL-SJE • 1-218-847-1317
1-218-847-4617 Fax
email: sje@sjerhombus.com
www.sjerhombus.com

112	1	W	9	1	4	H	3A, 8A, 8C

MODEL 112

ALARM PACKAGE
- [ ] 0 = select options or no alarm package
- [X] 1 = alarm package (includes test/normal/silence switch, fuse, red light, horn & float)

ENCLOSURE RATING
- [ ] I = Indoor, NEMA 1 (metal)
- [X] W = Weatherproof, NEMA 4X (engineered thermoplastic)

STARTING DEVICE
- [ ] 1 = magnetic motor contactor 120/208/240V
- [X] 9 = magnetic motor contactor 120V only

PUMP FULL LOAD AMPS
- [ ] 0 = 0-7 FLA
- [X] 1 = 7-15 FLA
- [ ] 2 = 15-20 FLA
- [ ] 3 = 20-30 FLA

PUMP DISCONNECTS
- [ ] 0 = no pump disconnect
- [ ] 1 = pull-out with safety deadfront in a 10"x8" enclosure
- [X] 4 = circuit breaker 120V (select STARTING DEVICE option 9 above)
  120/208/240V (select STARTING DEVICE option 1 above)

FLOAT SWITCH APPLICATION
- [X] H or L = pump down or pump up
- [ ] X = no floats

WITH alarm package
WITHOUT alarm package

OPTIONS *Listed below*

★ ENCLOSURE UPSIZE - If you selected 3 or more of the ★ options, or one ★★ option, **a one-time enclosure upsize fee would apply.**

If additional features are required, call the factory for a quote on either a SJE-Rhombus Pro-Line or Engineered Custom control panel.

	CODE	DESCRIPTION
[ ]	1A	Red beacon only / no audio *(must select 1E if floats included)*
[ ]	1C	Horn only / no visual *(must select 1E if floats included)*
[ ]	1E	Alarm float
[X]	3A	Alarm flasher
[ ] ★	3B	Manual alarm reset
[ ] ★	4A	Low level cutout *(select option 4D if floats included)*
[ ] ★	4B	Red low-level indicator & alarm *(must select 4A also)*
[ ]	4D	Low-level float
[ ] ★	5A	Thermal cutout/heat sensor auto reset (for pumps w/thermal switch leads)
[ ] ★★	5E	Seal failure circuit & red indicator (2 wire)
[ ]	6A	Auxiliary alarm contact, form C type
[X] ★	8A	Elapsed time meter
[X] ★	8C	Event (cycle) counter
[ ] ★★	9_A	Pump overload specify amperage after number 9 followed by letter "A". Example: 912A = 12 amp pump.
★★ [ ]		0-25 FLA
★★ [ ]		25-30 FLA
[ ]	10E	Lockable latch - NEMA 4X
[ ]	10E	Lockable latch - NEMA 1
[ ] ★	10F	Lightning arrester
[ ] ★	10K	Anti-condensation heater

	CODE	DESCRIPTION
[ ]	11C	NEMA 1 alarm panel *must select option 6A*
[ ]	11D	NEMA 4X alarm panel *must select option 6A*
[ ] ★★	14B	Main disconnect (rotary style, mounted through door) non-fused
★★ [ ]		0-20 FLA (total of both pumps)
★★ [ ]		20-30 FLA (total of both pumps)
[ ]	15A	Control / alarm circuit breaker *Does not include the circuit board as in standard.*
[ ]	16A	10' cord in lieu of 20' *(per float)*
[ ]	16B	15' cord in lieu of 20' *(per float)*
[ ]	16C	30' cord in lieu of 20' *(per float)*
[ ]	16D	40' cord in lieu of 20' *(per float)*
[ ]	17A	SJE SignalMaster® / mounting strap ● *(per float)*
[ ]	17B	SJE SignalMaster® / externally weighted ● *(per float)*
[ ]	17C	Sensor Float® / internally weighted ▲ *(per float)*
[ ]	17D	Sensor Float® / externally weighted ▲ *(per float)*
[ ]	17E	Sensor Float® Mini / pipe clamp ▲ *(per float)*
[ ]	17F	Sensor Float® Mini / externally weighted ▲ *(per float)*
[ ]	19T	TOA (Test/Off/Automatic) switch and pump run light through door mounted
[ ]	19U	HOA (Hand/Off/Automatic) switch and pump run light through door mounted
[ ]	19X	Door mounted pump run indicator
[ ]	21A	SJE PumpMaster® in lieu of on/off switches ●
[ ]	21B	SJE PumpMaster® Plus in lieu of on/off switches ●
[ ]	21C	Super Single® in lieu of on/off switches ▲
[ ]	21D	Double Float® in lieu of on/off switches ▲

● Mechanically-activated ▲ Mercury-activated

SAMPLE

MODEL	112	1	W	9	1	4	H	3A 8A

Alarm Package
Enclosure Rating
Starting Device
Pump Full Load Amps
Pump Disconnect
Float Switch Application
Options: Flasher, Elapsed Time Meter

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"Quality Pumps Since 1939"

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

ZOELLER PUMP CO.

SECTION: 2.20.060
FM0659
1299
Supersedes
1297

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347
SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961
(502) 778-2731 • 1 (800) 928-PUMP • FAX (502) 774-3624

visit our web site:
http://www.zoeller.com

COMPARE THESE FEATURES

- Non-clogging vortex impeller design bronze class 88-8-0-4 (180 Series).
- Enclosed impeller design (191 Series).
- Float operated, submersible (NEMA 6) 2-pole mechanical switch.
- Durable cast construction. Cast iron switch case, base, motor and pump housing. No sheet metal parts to rust or corrode.
- Stainless steel screws, bolts, float rod, handle, guard, arm and seal assembly.
- 20' UL-listed 3-wire neoprene cord and plug. Extra cord lengths available in 25-35-50 foot length only.
- Motor - 60 cycle, 3450 RPM, oil-filled, hermetically sealed, automatic reset, thermal overload protected (1 PH only).
- Maximum temperature for effluent or dewatering 130° F. 54° C, WD189 120° F (49° C).
- Variable level control systems available.
- Square Ring & Gasket - Neoprene.
- Shaft Seal - Stainless steel carbon & ceramic rotary.
- Upper sleeve bearing and lower ball bearing running in bath of oil.
- All 180/4180 series pass ¾-inch solids (sphere). Model 191 pump passes ⅝- inch solids (sphere).
- On point 14¾" • Off point 5" (automatic units).
- Major width 12¾" • Height 18 9/16". (Single seal pumps)
- 1½" NPT discharge with 2" or 3" flange available. (Model 191 is not availiable with 3" flange)
- Corrosion resistant powder coated epoxy finish.

MODELS 4185-4186-4188-4189 DOUBLE SEAL PUMPS (Nonauto only)

- Protects motor from seal leaks.
- Improved bearing lubrication.
- Helps eliminate seal and bearing damage from dry runs.
- Major width 12 ¾". Height 20 7/16".

Note: The sizing of effluent systems normally requires variable level float(s) controls and properly sized basins to achieve required pumping cycles.

AUTOMATIC UNITS NOT RECOMMENDED FOR USE IN EFFLUENT SYSTEMS

*NOTE: No UL Listing for 200/208 1 Phase Pumps, Model 186 & 191, or Double Seal Series.
See Back Page for UL & CSA Listings

Nonautomatic Model for variable level systems

185 - 186 - 188 - 189 Single Seal Series
4185 - 4186 - 4188 - 4189 Double Seal Series
191 Single Seal Drip Pump

(For Pump Prefix Identification see News & Views 0052)

HIGH HEAD "FLOW-MATE"

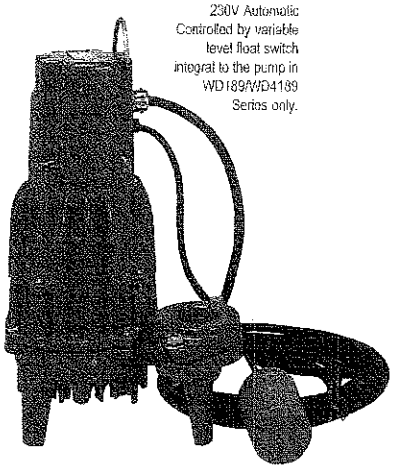
FOR SEPTIC TANK • LOW PRESSURE PIPE (LPP) AND ENHANCED FLOW STEP SYSTEMS

EFFLUENT

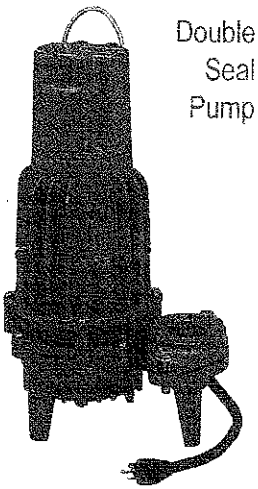
OR DEWATERING PUMP • SUBMERSIBLE

1½" NPT DISCHARGE STANDARD • 2" or 3" FLANGE AVAILABLE

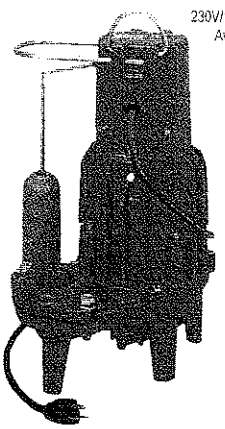
SSPMA MEMBER SUMP AND SEWAGE PUMP MFRS. ASSN.



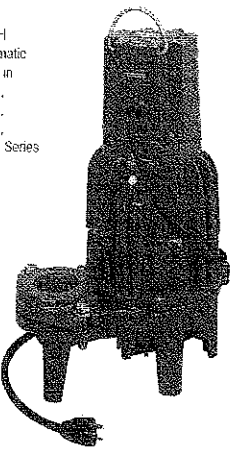
230V Automatic Controlled by variable level float switch integral to the pump in WD189/WD4189 Series only.



Double Seal Pump



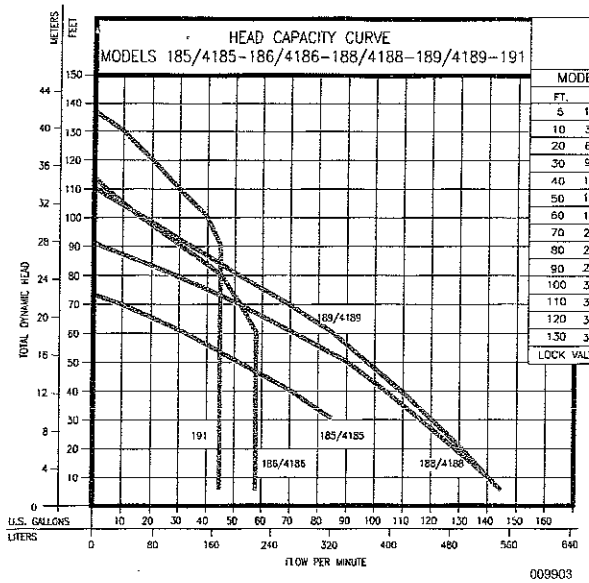
230V/1PH Automatic Available in 185, 186, 188, 189 Series



230V/1PH Nonautomatic Available in 185/4185, 186/4186, 188/4188, 189/4189 Series

POWDER COATED TOUGH™

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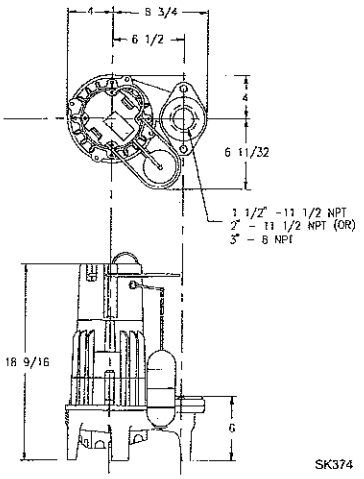


TOTAL DYNAMIC HEAD/ FLOW PER MINUTE EFFLUENT AND DEWATERING

MODEL	185/4185		186/4186		188/4188		189/4189		191	
FT. M.	GAL.	LTRS.	GAL.	LTRS.	GAL.	LTRS.	GAL.	LTRS.	GAL.	LTRS.
5 1.52			58	220	145	549	145	549	45	170
10 3.05			58	220	140	530	140	530	45	170
20 6.10			58	220	128	484	130.5	494	45	170
30 9.14	85	322	58	220	116	439	120	454	45	170
40 12.19	70	265	58	220	103.5	392	109	413	45	170
50 15.24	51	193	58	220	90	341	97	367	45	170
60 18.29	32	121	56	220	71	269	85	322	45	170
70 21.34	9	34	52	197	51	193	69	261	45	170
80 24.38			45	170	28	106	51	193	45	170
90 27.43			30.5	115	2	8	34	129	45	170
100 30.48			16	60			17	64	40	151
110 32.00			4	15					30	114
120 36.58									20	76
130 39.62									10	38
LOCK VALVE:	73'		114'		91'		110'		137'	

WARNING: Model 185 should not be subjected to heads less than 30 feet TDH.

Single Seal-4180 Series Automatic Design Weight 82-89 lbs.



185 MODELS	4185 MODELS	Standard all models - 20 ft. cord - 1 H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts -	Ph	Mode	Amps	Simplex	Duplex	CSA	UL
D185	—	230	1	Auto	9.8	1 or 1 & 8		Y	Y
E185	E4185	230	1	Non	9.8	2 or 2 & 7	3 or 5 & 6	Y(2)	Y
* H185	—	200-208	1	Auto	11.5	1 & 8		N	N
* I185	* I4185	200-208	1	Non	11.5	2 & 7	3 or 5 & 6	N	N
* F185	* F4185	230	3	Non	7.4	4 & 6	3 & 4 or 5 & 6	Y	Y
* J185	* J4185	200-208	3	Non	7.5	4 & 6	3 & 4 or 5 & 6	Y	Y
* G185	* G4185	460	3	Non	3.7	4 & 6	3 & 4 or 5 & 6	Y	Y
* BA185	—	575	3	Non	3.3	4 & 6	3 & 4 or 5 & 6	Y	N

186 MODELS	4186 MODELS	Standard all models - 20 ft. cord - 1½ H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts -	Ph	Mode	Amps	Simplex	Duplex	CSA	UL
D186	—	230	1	Auto	13.7	1 or 1 & 8		N	N
E186	E4186	230	1	Non	13.7	2 or 2 & 7	3 or 5 & 6	N	N
* F186	* F4186	230	3	Non	9.2	4 & 6	3 & 4 or 5 & 6	N	N
* G186	* G4186	460	3	Non	4.6	4 & 6	3 & 4 or 5 & 6	N	N

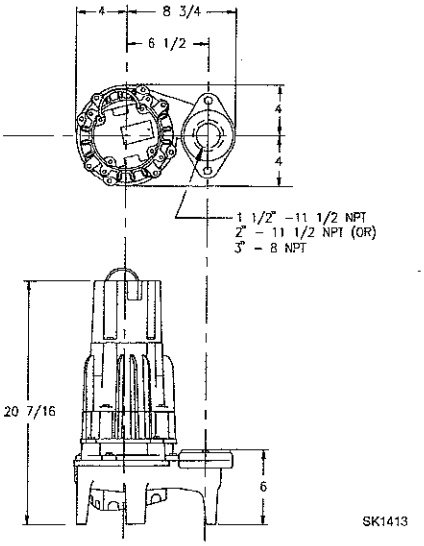
188 MODELS	4188 MODELS	Standard all models - 20 ft. cord - 1½ H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts -	Ph	Mode	Amps	Simplex	Duplex	CSA	UL
D188	—	230	1	Auto	13.3	1 or 1 & 8		N	Y(1)
E188	E4188	230	1	Non	13.3	2 or 2 & 7	3 or 5 & 6	Y(2)	Y(1)
* H188	—	200-208	1	Auto	16.8	1 & 8		N	N
* I188	* I4188	200-208	1	Non	16.8	2 & 7	3 or 5 & 6	N	N
* F188	* F4188	230	3	Non	8.9	4 & 6	3 & 4 or 5 & 6	Y	Y
* J188	* J4188	200-208	3	Non	10.3	4 & 6	3 & 4 or 5 & 6	Y	Y
* G188	* G4188	460	3	Non	4.6	4 & 6	3 & 4 or 5 & 6	Y	Y
* BA188	—	575	3	Non	3.5	4 & 6	3 & 4 or 5 & 6	Y	N

189 MODELS	4189 MODELS	Standard all models - 20 ft. cord - 2 H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts -	Ph	Mode	Amps	Simplex	Duplex	CSA	UL
③ D189	—	230	1	Auto	17.1	1 or 1 & 8		N	Y(1)
③ E189	③ E4189	230	1	Non	17.1	2 & 7	3 or 5 & 6	Y(2)	Y(1)
* H189	—	200-208	1	Auto	20.5	1 & 8		N	N
* I189	* I4189	200-208	1	Non	20.5	2 & 7	3 or 5 & 6	N	N
* F189	* F4189	230	3	Non	11.2	4 & 6	3 & 4 or 5 & 6	Y	Y
* J189	* J4189	200-208	3	Non	13.2	4 & 6	3 & 4 or 5 & 6	Y	Y
* G189	* G4189	460	3	Non	6.0	4 & 6	3 & 4 or 5 & 6	Y	Y
* BA189	—	575	3	Non	5.8	4 & 6	3 & 4 or 5 & 6	Y	N
③ WD189	* WD4189	230	1	Auto	17.1	2 or 2 & 8		N	N

191 MODEL		Standard all models - 20 ft. cord - 2 H.P.				Control Selection		Listings	
SiSingle Seal	Double Seal	Volts -	Ph	Mode	Amps	Simplex	Duplex	CSA	UL
E191	---	230	1	Non	14.5	2 or 2 & 7	3 or 5 & 6	N	N

* No Molded Plug
(1) UL Listed unit available with 20 Amp Plug.
(2) CSA Approval without plug cap.
(3) 20 Amp Outlet, P/N 10-0060 must be used.

Double Seal-4180 Series / Weight 89-94 lbs.



SELECTION GUIDE

1. Integral float operated 2-pole mechanical switch, no external control required.
2. Single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
3. Mechanical alternator M-Pak 10-0072 or 10-0075. Refer to FM0495
4. Simplex three phase control panel. Refer to FM1228.
5. See FM0712 for correct model of Electrical Alternator.
6. Variable level control switch 10-0225 used as control activator, specify simplex (3) float or duplex (3) or (4) float system.

⚠ CAUTION

All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electric Code (NEC) and the Occupational Safety and Health Act (OSHA).

For information on additional Zoeller products refer to catalog on Piggyback Variable Level Float Switches, FM0477; Electrical Alternator, FM0486; Mechanical Alternator, FM0495; Sump/Sewage Basins, FM0487; Simplex Pump Control, FM1596; Alarm Systems, FM0732; and Disconnect/Rail Systems, FM0787.

RESERVE POWERED DESIGN

For unusual conditions a reserve safety factor is engineered into the design of every Zoeller pump.

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"Quality Pumps Since 1939"

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

ZOELLER PUMP CO.

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347
SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961
(502) 778-2731 • 1 (800) 928-PUMP • FAX (502) 774-3624

SECTION: 3.20.065
FM1775
1101
Supersedes
0501

visit our web site:
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ZOELLER ON-SITE WASTEWATER PRODUCTS

INTRODUCING ZOELLER SEPTIC SYSTEM FILTERS

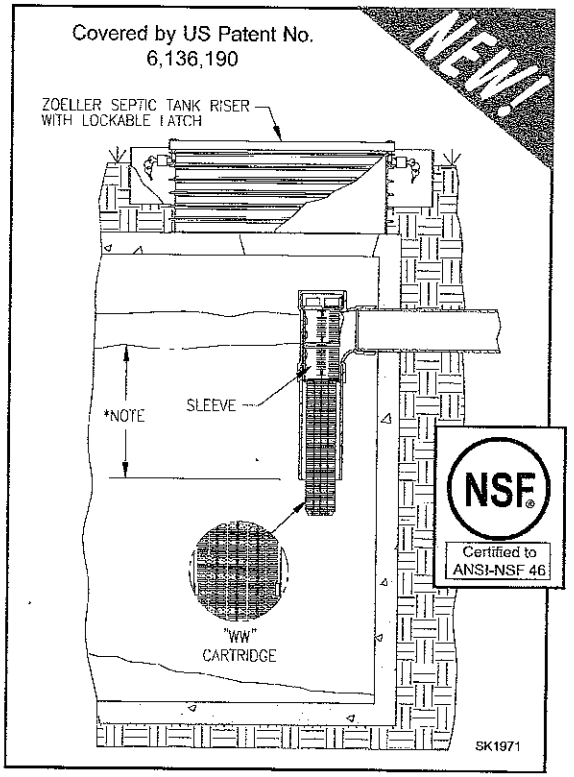
QUALITY MADE BY U.S. CRAFTSMEN

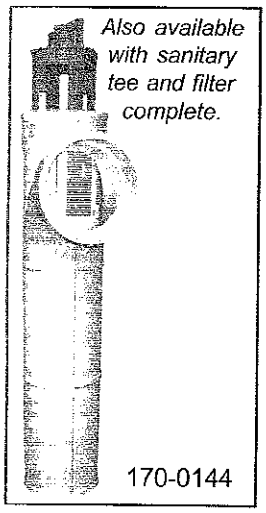
Zoeller "WW" Residential Effluent Filter P/N 170-0078

The Zoeller "WW" residential filter gives your septic system protection like no other. Zoeller Company's patented design keeps your lateral fields safe with twice the filtration area of most residential filters. All of the filtration area is submerged, making the filter 100% effective. The best feature of the WW filter is that the sleeve section of the filter remains in the outlet tee when the main filter is removed for servicing. This will guarantee no solids larger than 1/16" reach the lateral fields during servicing. The Zoeller "WW" filter is ultimate protection.

Improve the performance of your septic system: The number one reason that septic systems fail is because the lateral field becomes clogged. By preventing solids larger than 1/16" from exiting to your drain field, the lifetime of your system can be greatly increased.

Allows only the clearest effluent to leave the tank: Located in the sanitary tee, this filter extends beneath the scum layer, above the sludge layer, and withdraws effluent from the clear water zone of the tank.





Lowers maintenance costs: The filter must be serviced on a periodic basis to maintain peak performance. Under normal circumstances, the filter requires servicing when the septic tank is pumped. However, site specific circumstances may require more frequent service. A Zoeller Riser & Lid will make septic tank and filter maintenance an easy task.

***NOTE:** State and local plumbing codes may require a specific liquid penetration. For example, 25% - 45% into the liquid depth or 9" off the tank bottom.

Allows any responsible management entity to monitor the condition of the tank: During routine maintenance, the tank should be inspected to be sure unnecessary particulate is not getting into your tank (i.e. fruit peelings, cigarette filters, feminine hygiene materials, etc.). Check your local plumbing codes to determine how often your tank should be pumped. If sludge buildup becomes apparent on the bottom of your tank, then a more frequent pumping interval is suggested.

P/N 013244

Distributed by: ZOELLER PUMP CO.

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Zoeller Residential Septic Tank Effluent Filter Specifications

Application: Single family homes.

Filter Area: 122 Linear Feet of 1/16" filtration.

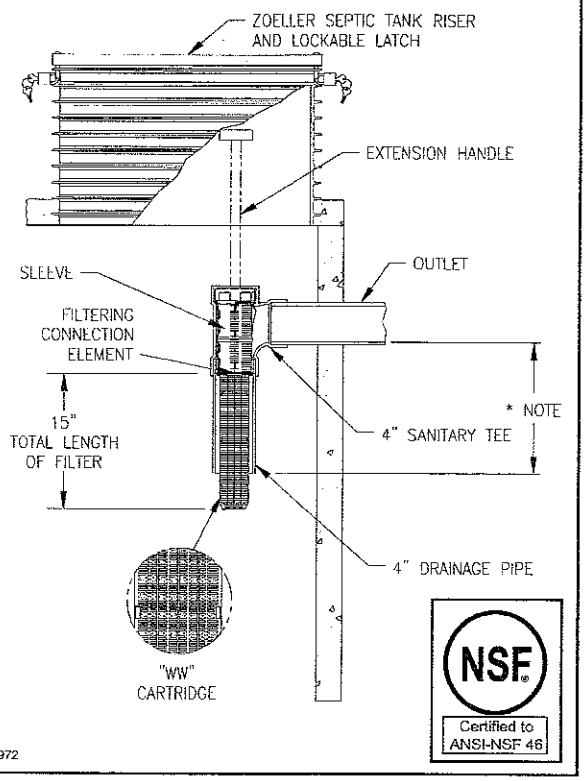
Flow Rate: 1000 gpd.

Material: All materials are noncorrosive in the septic tank environment. Sleeve is PVC, primary filter is polypropylene, and filter connection element is neoprene.

Easy to install or retrofit: The Zoeller Septic System Filter fits inside any 4" sanitary tee. Slide the filter cartridge into the filter sleeve. Lock the cartridge and sleeve together by holding the sleeve stationary and rotating the cartridge clockwise. Slide the assembled cartridge and sleeve into the sanitary tee at the tank's outlet. Ensure the sleeve latch is pointing toward the outlet of the septic tank before filter placement into the tee. The drain field is now protected from solids greater than 1/16".

Adding an extension handle: Zoeller's effluent filter can be easily retrofitted with an extension handle. Attach a 1/2" PVC pipe to the top of the filter with properly installed stainless steel screws. Cut off to appropriate length below the lid. A 1/2" PVC Tee can be added to the pipe for added leverage and control.

Covered by US Patent No. 6,136,190



Easy to maintain: The filter cartridge can be maintained by rotating the cartridge counterclockwise and removing for cleaning. The sleeve should remain in the sanitary tee while cleaning the cartridge. To clean the cartridge, hold cartridge over septic tank opening and thoroughly rinse with hose until clean, washing filtered trash back into septic tank. After cleaning the cartridge, it is imperative that the sleeve be cleaned inside and out, by reinserting the cartridge; turning it clock wise in the sleeve and removing the sleeve from the sanitary tee. The Zoeller filter should be cleaned each time the septic tank is pumped or when the need is indicated by slow flows from the house. More frequent cleanings will not hurt the filter and could even improve the performance of your septic tank. For installations that exceed the design flow rate of the filter, more frequent cleanings may be required or manifold more than one sanitary tee to accept more than one filter.

Trouble shooting, repair, and replacement: Follow the install and maintenance instructions above. For replacement components, call 1-800-928-PUMP.

Lifetime Warranty: Every Zoeller filter is guaranteed to be free from defects in materials and workmanship for the lifetime of the homeowner/ purchaser. Free repair or replacement, excluding labor, will be made on return of the filter prepaid to the factory. This warranty is limited to product proven to be free from abuse or improper installation.

***NOTE:** State and local plumbing codes may require a specific liquid penetration. For example, 25% - 45% into the liquid depth or 9" off the tank bottom.

ALL ZOELLER ON-SITE WASTEWATER PRODUCTS MUST BE INSTALLED IN ACCORDANCE WITH LOCAL AND/OR STATE PLUMBING AND/OR HEALTH DEPARTMENT CODES.

http://www.zoeller.com

ZOELLER PUMP CO.

MAIL TO: P.O. BOX 16347
Louisville, KY 40256-0347
SHIP TO: 3649 Cane Run Road
Louisville, KY 40211-1961
(502) 778-2731 • 1 (800) 928-PUMP
FAX (502) 774-3624

Manufacturers of . .
"Quality Pumps Since 1939"

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AIR RELEASE / VACUUM RELIEF VALVES

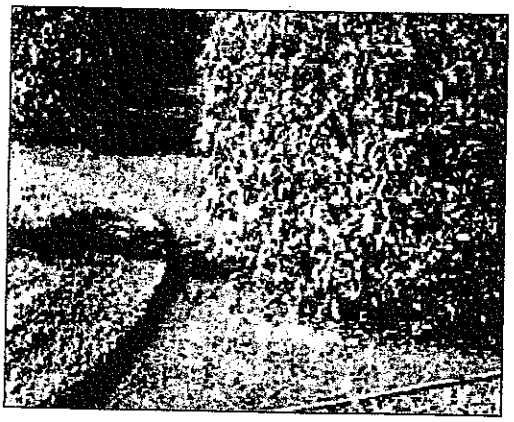
DURABLE **RELIABLE** **PROVEN** **TRUSTED**

Applications

Agriculture

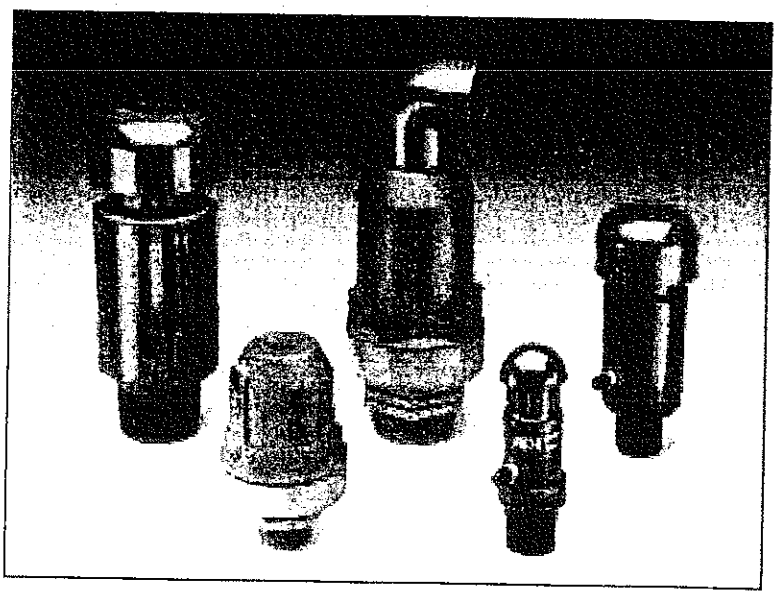


Landscape



Greenhouse/Nursery





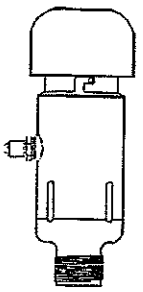
Product Features

Air Release / Vacuum Relief Valves provide vital protection to pipe line systems by preventing: air restrictions, water hammer, and collapsed pipes due to a vacuum.

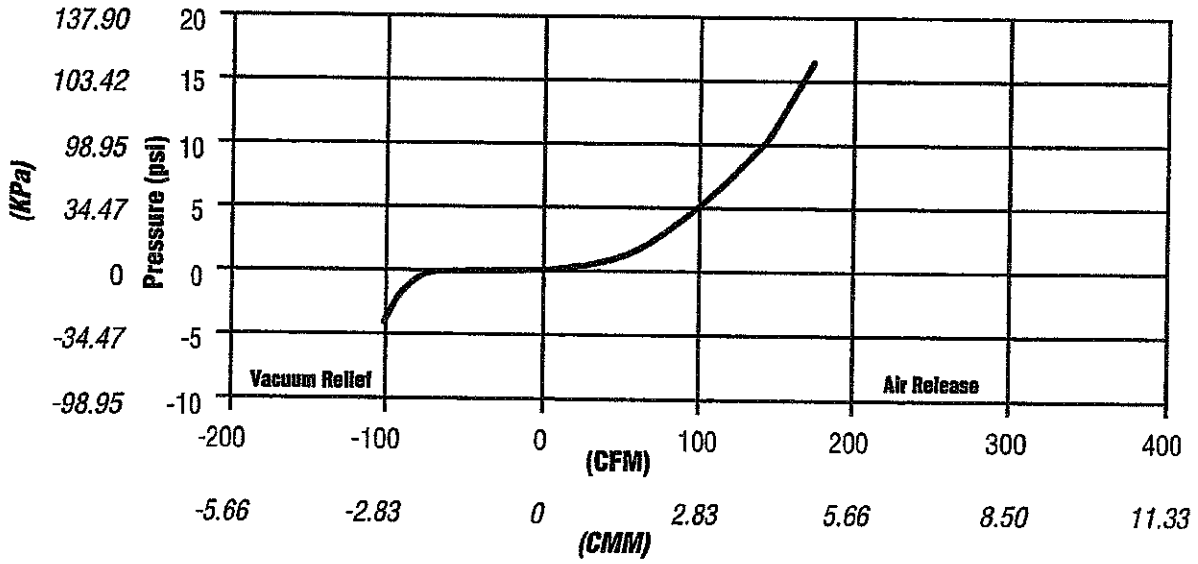
- Available in dual, continuous and combination models
- Instant and continuous vacuum relief
- Durable, weather resistant and non-corrosive material
- Removable top for seal maintenance
- Protects irrigation systems and components
- Bright color allows easy visibility
- Slam resistant models available
- Easy to install
- Performance data tested and verified at C.I.T.

APV-Series Dual Acting Air Release / Vacuum Relief Valve
APV-1, 1¼ and APVV-1, 1¼

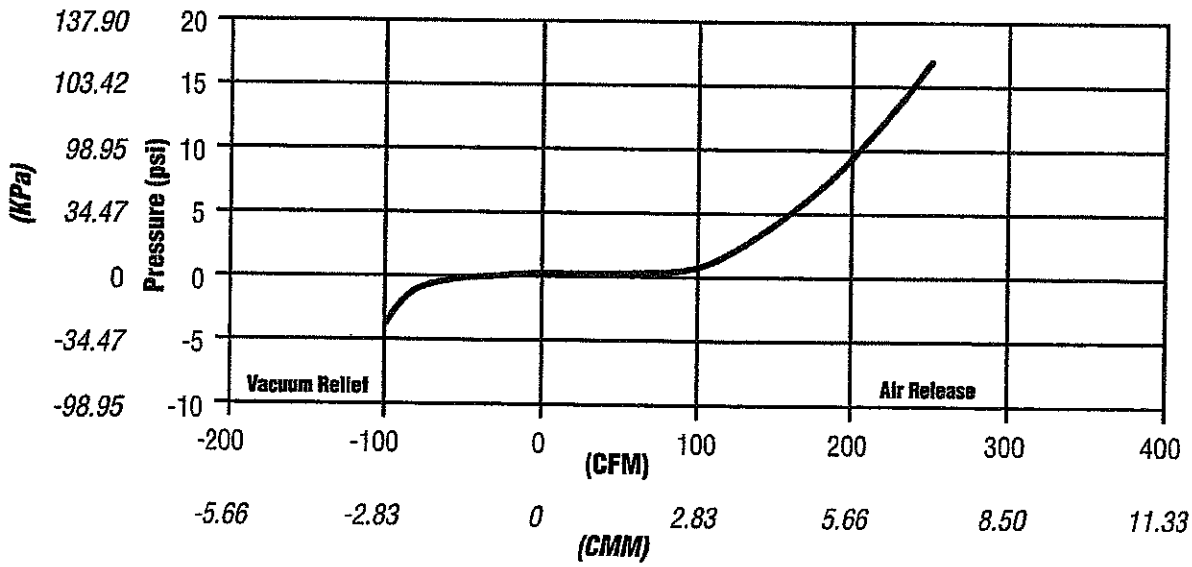
- Innovative slam resistant design allows only water to close valve
- 150 psi working pressure
- Inlet 1" and 1¼" NPT or BSP
- Seals at 1 psi
- Clear open diameter is 0.775"
- Optional Schrader valve to check system pressure



Performance Graph for the APV-1

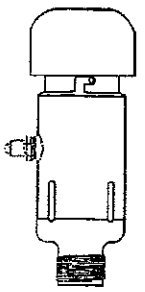


Performance Graph for the APV-1¼

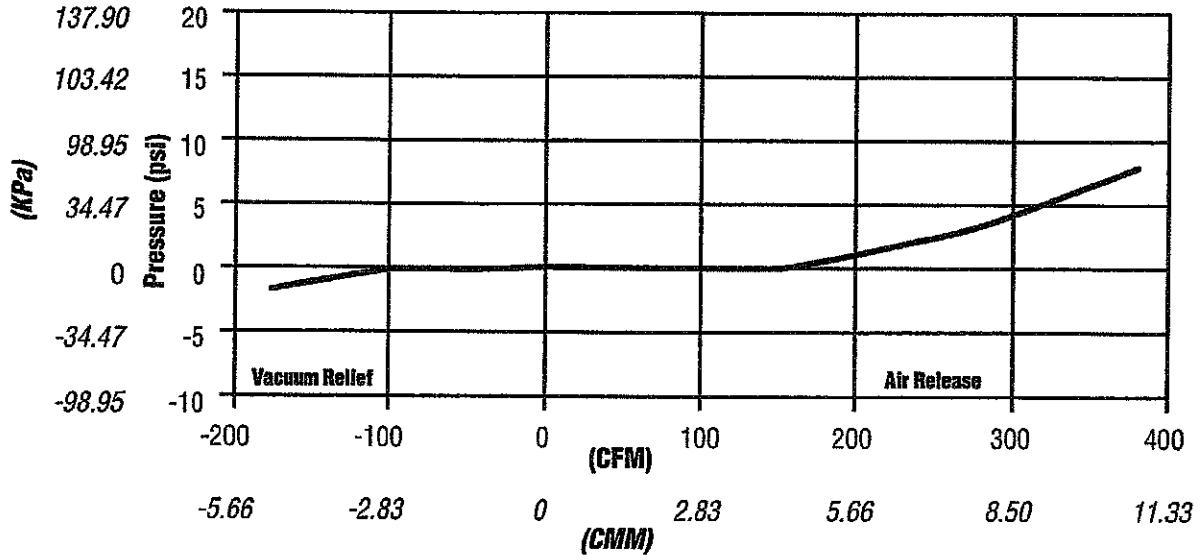


APV-Series Dual Acting Air Release / Vacuum Relief Valve
APV-1½, 2, APVV-1½, 2

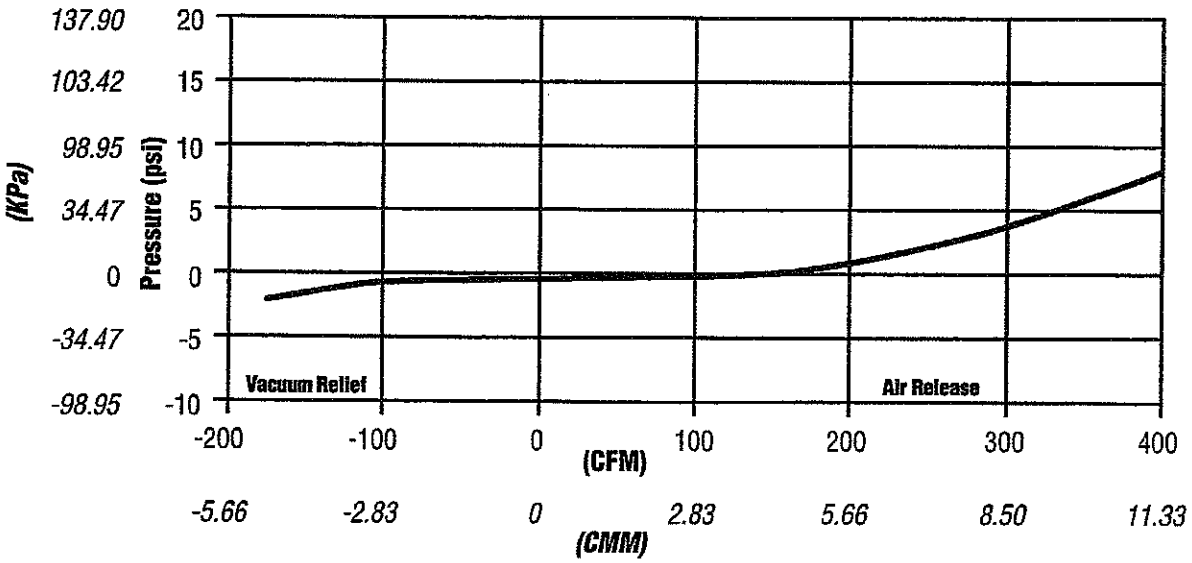
- Innovative slam resistant design allows only water to close valve
- 150 psi working pressure
- Inlet 1½" and 2" NPT or BSP
- Seals at 1 psi
- Clear open diameter is 1.140"
- Optional Schrader valve to check system pressure



Performance Graph for the APV-1½

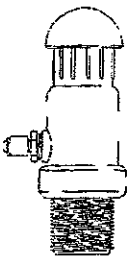


Performance Graph for the APV-2

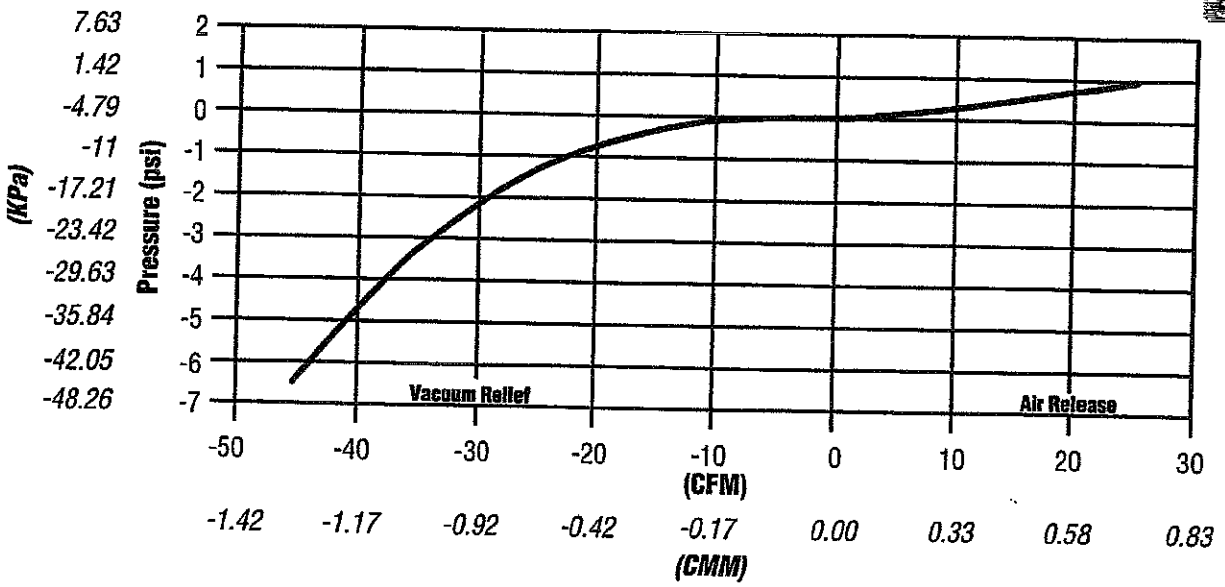


VBK-Series Dual Acting Air Release / Vacuum Relief Valve
VBK-1, VBKV-1

- 80 psi working pressure
- Inlet 1" NPT or BSP
- Seals at 5 psi
- Clear open diameter is 0.610"
- Optional Schrader valve to check system pressure

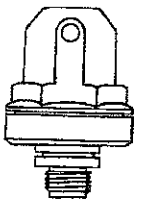


Performance Graph for the VBK-1, VBKV-1

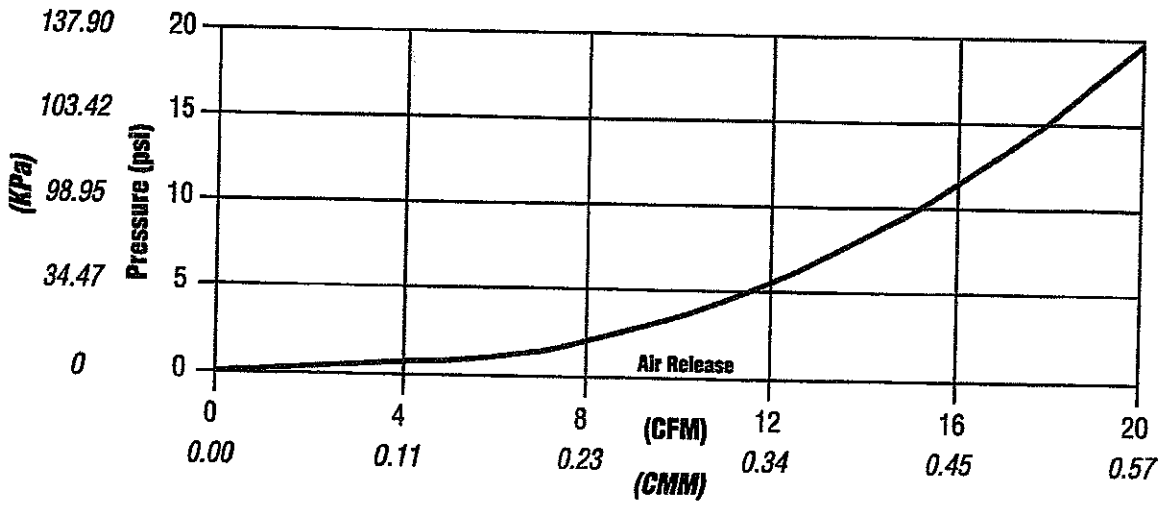


ARV-1 Continuous Air Release

- 170 psi working pressure
- Inlet 1" NPT or BSP
- Simple design
- Easy maintenance

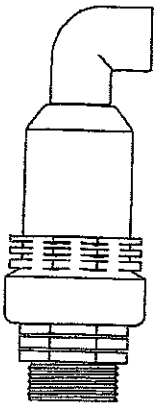


Performance Graph for the ARV-1

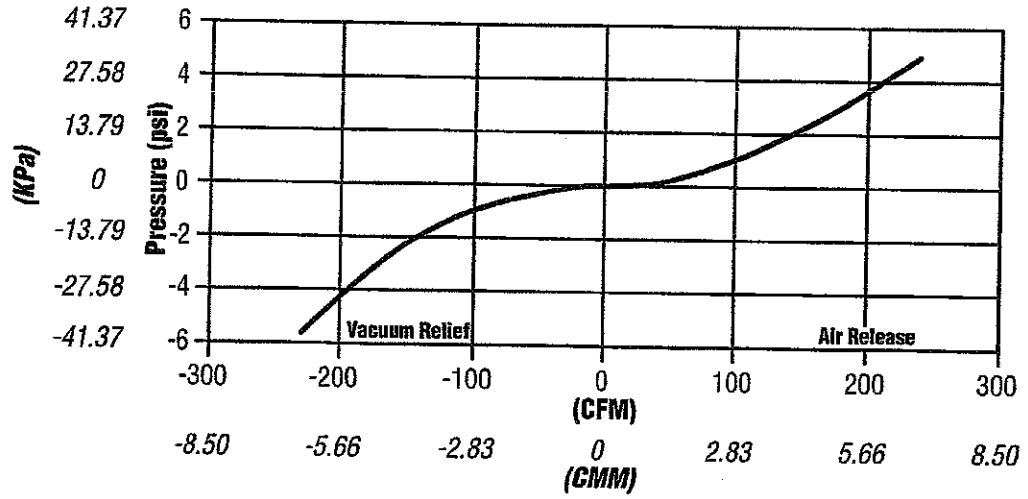


ARV-2 Combination Air Release / Vacuum Relief and Continuous Air Release Valve

- 200 psi working pressure
- Inlet 2" NPT or 2" BSP
- Outlet 1 ¼" socket PVC ell
- Seals at 1 psi
- Clear open diameter is 1.290"

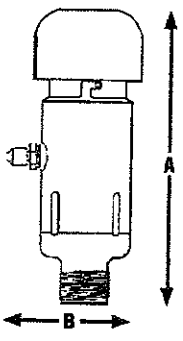


Performance Graph for the ARV-2

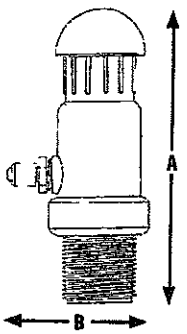


For detailed sizing information and placement see Agricultural Product's Technical Manual, *Guide to the use of Air Release / Vacuum Relief and Continuous Acting Air Vents*

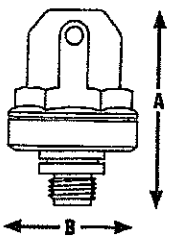
DIMENSIONS & WEIGHTS								
Description	**Nominal / Metric**		**Height (A)**		**Width (B)**		**Weight**	
	In.	**cm**	**In.**	**cm**	**In.**	**cm**	**Lbs.**	**gr.**
APV - 1" & 1¼"	1 & 1¼	2.54 & 3.17	9	22.84	3.43	8.71	0.67	32.5
APV - 1½" & 2"	1½ & 2	3.81 & 5.08	9	22.84	3.43	8.71	1.80	80
ARV - 1	1	2.54	5.25	13.32	3.180	8.07	0.63	31.5
ARV - 2	2	5.08	10.75	27.28	3.98	10.10	6.62	81.5
VBK - 1	1	2.54	5.5	13.96	1.810	4.59	0.24	12



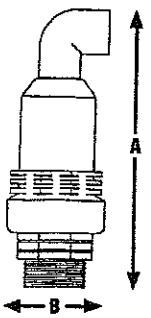
APV-1*



VBK-1*



ARV-1



ARV-2

*Shown with optional Schrader valve

Metric Conversion Tables

Metric Conversion Table for APV-Series Release Valves

	Air Action		Pressure							
	(CFM)	(CMM)	(psi) 2"	(KPa) 2"	(psi) 1 ½"	KPa) 1 ½"	(psi) 1 ¼"	(KPa) 1 ¼"	(psi) 1"	(KPa) 1"
Vacuum Relief	-175	-4.955	-1.623	-11.192	-1.86	-12.823	–	–	–	–
	-150	-4.248	-1.171	-8.077	-1.33	-9.172	–	–	–	–
	-125	-3.54	-0.778	-5.367	-0.878	-6.054	–	–	–	–
	-100	-2.832	-0.444	-3.062	-0.503	-3.469	-3.965	-27.336	-4.17	-28.749
	-75	-2.124	-0.169	-1.163	-0.205	-1.416	-0.909	-6.266	-0.419	-2.889
	0	0	0	0	0	0	0	0	0	0
Air Release	25	0.708	0	0	0	0	0.006	0.041	0.33	2.275
	50	1.416	0.001	0.007	0	0.001	0.05	0.345	1	6.895
	75	2.124	0.003	0.021	0.001	0.006	0.1	0.689	2.5	17.237
	100	2.832	0.03	0.207	0.005	0.034	0.604	4.161	4.9	33.784
	125	3.54	0.148	1.019	0.009	0.062	2.085	14.377	7.75	53.434
	150	4.248	0.192	1.321	0.035	0.241	4.043	27.873	11	75.842
	175	4.955	0.611	4.212	0.562	3.873	6.476	44.647	16.25	112.04
	200	5.663	1.11	7.654	1.178	8.124	9.384	64.701	–	–
	225	6.371	1.689	11.646	1.888	13.017	12.768	88.034	–	–
	250	7.079	2.348	16.19	2.691	18.551	16.628	114.647	–	–
	275	7.787	3.087	21.284	3.586	24.725	–	–	–	–
	300	8.495	3.906	26.928	4.575	31.542	–	–	–	–
	325	9.203	4.804	33.124	5.656	38.999	–	–	–	–
	350	9.911	5.783	39.87	6.831	47.097	–	–	–	–
	375	10.619	6.841	47.167	8.098	55.837	–	–	–	–
	400	11.327	7.979	55.014	–	–	–	–	–	–

Metric Conversion Table for the ARV-2

Air Action		Pressure	
(CFM)	(CMM)	(psi)	(KPa)
-230	-6.513	-5.56	-38.335
-220	-6.230	-5.06	-34.887
-210	-5.947	-4.59	-31.647
-200	-5.663	-4.14	-28.544
-190	-5.380	-3.72	-25.648
-180	-5.097	-3.32	-22.891
-170	-4.814	-2.95	-20.340
-160	-4.531	-2.59	-17.857
-150	-4.248	-2.27	-15.651
-140	-3.964	-1.96	-13.514
-130	-3.681	-1.68	-11.583
-120	-3.398	-1.42	-9.791
-110	-3.115	-1.18	-8.136
-100	-2.832	-0.97	-6.688
-90	-2.549	-0.78	-5.378
-80	-2.265	-0.61	-4.206
-70	-1.982	-0.46	-3.172
-60	1.699	-0.33	-2.275
-50	-1.416	-0.23	-1.586
-40	-1.133	-0.14	-0.965
-30	0.850	-0.08	-0.552
-20	-0.566	-0.03	-0.207
-10	-0.283	-0.01	-0.069
0	0.000	0	0.000
10	0.283	0.01	0.069
20	0.566	0.03	0.207
30	0.850	0.05	0.345
40	1.133	0.08	0.552
50	1.416	0.06	1.103
60	1.699	0.3	2.068
70	1.982	0.45	3.103
80	2.265	0.61	4.206
90	2.549	0.79	5.447
100	2.832	0.97	6.688
110	3.115	1.17	8.067
120	3.398	1.38	9.515
130	3.681	1.6	11.032
140	3.964	1.83	12.617
150	4.248	2.08	14.341
160	4.531	2.34	16.134
170	4.814	2.61	17.995
180	5.097	2.89	19.925
190	5.380	3.18	21.925
200	5.663	3.49	24.063
210	5.947	3.8	26.200
220	6.230	4.13	28.475
230	6.513	4.48	30.889
240	6.796	4.83	33.302

Metric Conversion Table for the VBK-1

Air Action		Pressure	
(CFM)	(CMM)	(psi)	(KPa)
-45	-1.274	-6.56	-45.23
-40	-1.133	-4.81	-33.164
-35	-0.991	-3.39	-23.373
-30	-0.85	-2.26	-15.582
-25	-0.708	-1.4	-9.653
-20	-0.566	-0.78	-5.378
-15	-0.425	-0.37	-2.551
-10	-0.283	-0.13	-0.896
-5	-0.142	-0.02	-0.138
0	0	0	0
5	.0142	0.04	0.276
10	0.283	0.18	1.241
15	0.425	0.38	2.62
20	0.566	0.65	4.482
25	0.708	0.88	6.067

Metric Conversion Table for the ARV-1

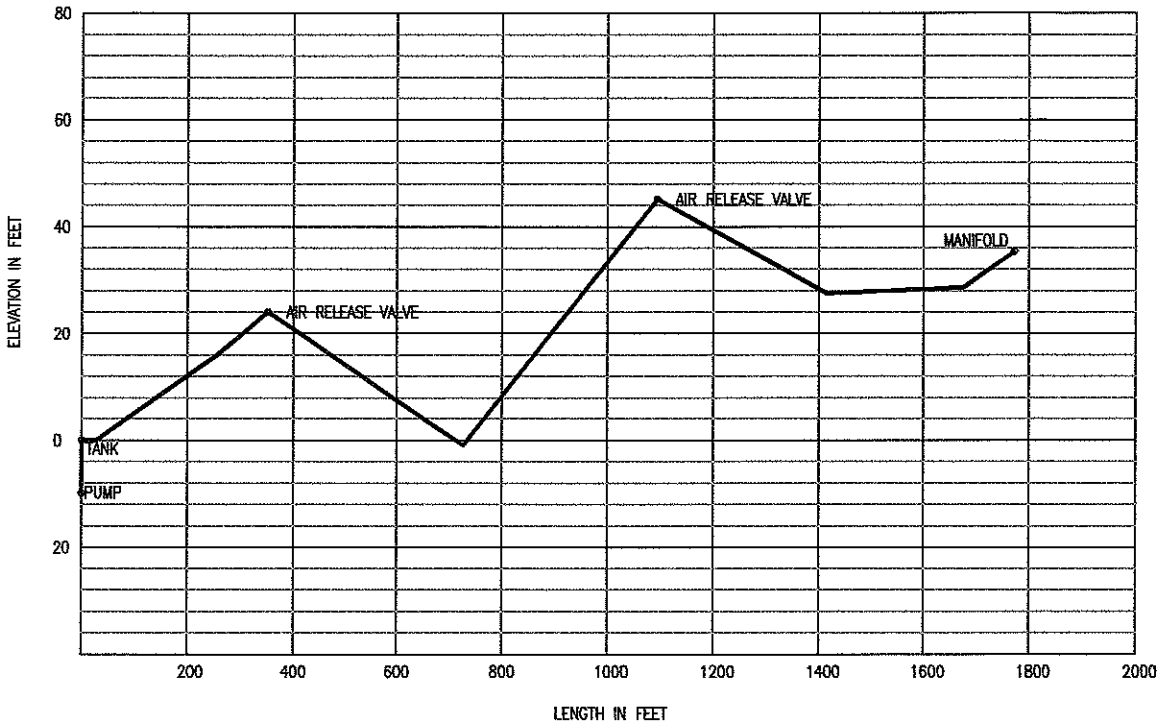
Air Action		Pressure	
(CFM)	(CMM)	(psi)	(KPa)
0	0	0	0
2	0.057	0.3	2.068
4	0.113	0.599	4.13
6	0.17	1.0375	7.153
8	0.227	2.0287	13.988
10	0.283	3.5728	24.634
12	0.34	5.6698	39.092
14	0.369	8.3195	57.361
16	0.453	11.522	79.442
18	0.51	15.278	105.335
20	0.566	19.586	135.039

Agricultural Products, Inc.
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P.O. Box 3546 - Haines City, FL 33845 - 800.848.8153 - Fax: 800.533.6421
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SUPPLY LINE
HYDRAULIC PROFILE

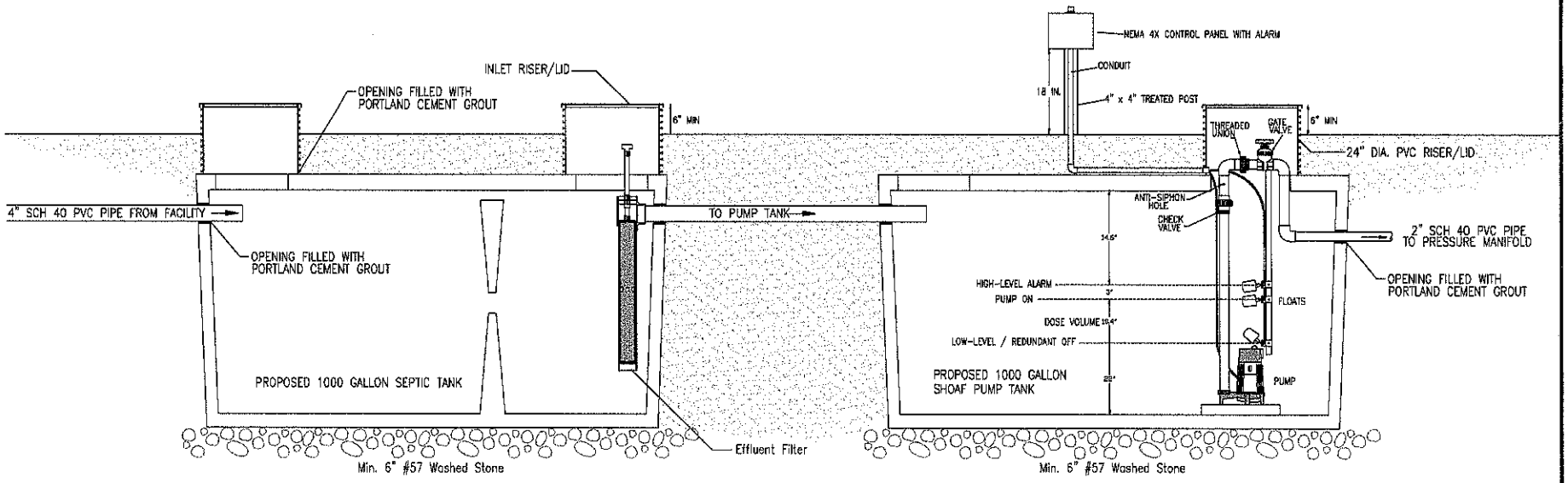


Bateman Civil Survey Company
Engineers • Surveyors • Planners
200 N. Main Street, Holly Springs, NC 27540 Ph: 919.577.1080 Fax: 919.577.1081
www.batemancivilsurvey.com info@batemancivilsurvey.com
NCBELS Firm No. C-2378

MeritageHomes

LOT 41

BELLS CROSSING SUBDIVISION
MOORESVILLE, NC IREDELL COUNTY
DATE: 12/08/14
DRAWN BY: TMB CHECKED BY: TMB



NOTES:

1. **CONTROL PANEL SHALL HAVE A VISUAL AND AUDIO ALARM**
2. **FINAL GRADE SHOULD SHED WATER AWAY FROM TANKS**
3. **TANKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STATE RULE 15A NCAC 18A .1953**

TANK DETAILS - LOT 41

FOR

MeritageHomes

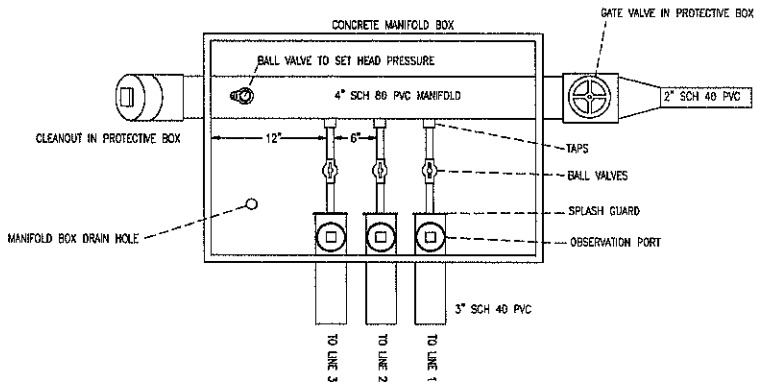
Bateman Civil Survey Company
Engineers • Surveyors Planners
200 N. Main Street, Holly Springs, NC 27540 Ph: 919.577.1080 Fax: 919.577.1081
www.batemancivilsurvey.com info@batemancivilsurvey.com
NCBELS Firm No. C-3378

BELLS CROSSING SUBDIVISION LOT 41
MOORESVILLE, NC
IREDELL COUNTY

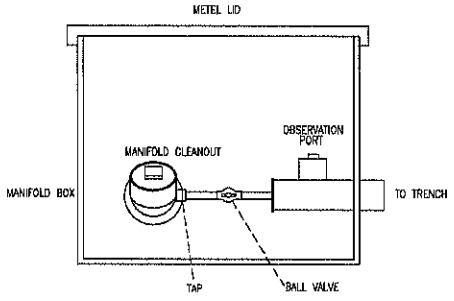
DATE: 12/08/14 DRAWN BY: TMB CHECKED BY: TMB

SCALE: AS SHOWN

PRESSURE MANIFOLD DETAILS
TOP VIEW

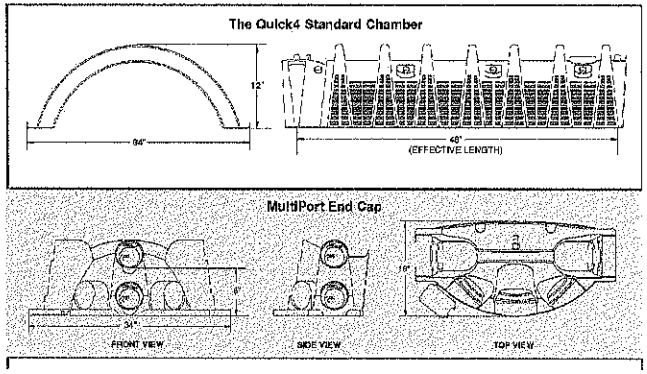


PRESSURE MANIFOLD DETAILS
END VIEW



TAP SCHEDULE	
LINE #	TAP
1	¾" SCH 40
2	¾" SCH 40
3	¾" SCH 40

The
Quick4® Standard
Chamber



CHAMBER DETAILS

MANIFOLD DETAILS - LOT 41
FOR
MeritageHomes

Bateman Civil Survey Company
Engineers • Surveyors • Planners
200 N. Main Street, Holly Springs, NC 27540 Ph: 919.577.1080 Fax: 919.577.1081
www.batemancivilsurvey.com info@batemancivilsurvey.com
NCBELS Firm No. C-2378

BELLS CROSSING SUBDIVISION LOT 41
MOORESVILLE, NC
IREDELL COUNTY
DATE: 12/08/14 DRAWN BY: TMB CHECKED BY: TMB
SCALE: AS SHOWN