

THE UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

SCHEDULE 13G

Under the Securities Exchange Act of 1934

(Amendment No. 2 )\*

Infusystem Holdings, Inc.  
(Name of Issuer)

Common Stock, Par Value \$.0001  
(Title of Class of Securities)

45685K102  
(CUSIP Number)

December 31, 2014  
(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this  
Schedule 13G is filed:

- Rule 13d-1(b)  
 Rule 13d-1(c)  
 Rule 13d-1(d)

\*The remainder of this cover page shall be filled out for a reporting  
person's initial filing on this form with respect to the subject class  
of securities, and for any subsequent amendment containing information  
which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not  
be deemed to be filed for the purpose of Section 18 of the  
Securities Exchange Act of 1934 (Act) or otherwise subject to the  
liabilities of that section of the Act but shall be subject to all  
other provisions of the Act (however, see the Notes).

CUSIP No. 45685K102

(1) Names of Reporting Persons. I.R.S. Identification Nos. of  
Above Persons (entities only):

AWM Investment Company, Inc.

(2) Check the Appropriate Box if a Member of a Group (See  
Instructions) (a)\_\_\_ b)\_\_\_

(3) SEC Use Only

(4) Citizenship or Place of Organization: Delaware, United States

Number of Shares Beneficially  
Owned by Each Reporting Person  
With

(5) Sole Voting Power:  
1,173,102\*\*

(6) Shared Voting Power: 0\*\*

(7) Sole Dispositive Power:  
1,173,102\*\*

(8) Shared Dispositive Power: 0\*\*

(9) Aggregate Amount Beneficially Owned by Each Reporting

Person: 1,173,102\*\*

(10) Check if the Aggregate Amount in Row (9) Excludes Certain Shares  
(See Instructions):

(11) Percent of Class Represented by Amount in Row (9): 5.3%\*\*

(12) Type of Reporting Person (See Instructions): IA

\*\*AWM Investment Company, Inc., a Delaware corporation (?AWM?), is the investment adviser to Special Situations Life Sciences Fund, L.P. (?SSLS?) (SSLS will hereafter be referred to as the ?Fund?). As the investment adviser to the Fund, AWM holds sole voting and investment power over 1,173,102 shares of Common Stock of the Issuer (the ?Shares?) held by SSLS. Austin W. Marxe (?Marxe?), David M. Greenhouse (?Greenhouse?) and Adam C. Stettner (?Stettner?) previously reported the Shares held by the Funds on Schedule 13G. Accordingly, reference should be made to Marxe, Greenhouse and Stettner (CIK #0001044321) for any prior filings with the Securities and Exchange Commission relating to the Shares held by each of the Funds. See Items 2 and 4 of this Schedule for additional information.

Item 1(a). Name Of Issuer: Infusystem Holdings, Inc.

Item 1(b). Address of Issuer's Principal Executive Offices:

31700 Research Park Drive  
Madison Heights, Michigan 48071

Item 2(a). Name of Person Filing:

The person filing this report is AWM Investment Company, Inc., a Delaware corporation (?AWM?), which is the investment adviser to Special Situations Life Sciences Fund, L.P. a Delaware limited partnership (?SSLS?), (SSLS, will hereafter be referred to as the ?Fund?). The principal business of each Fund is to invest in equity and equity-related securities and other securities of any kind or nature.

Austin W. Marxe (?Marxe?), David M. Greenhouse (?Greenhouse?) and Adam C. Stettner (?Stettner?) are members of: LS Advisers, L.L.C., a New York limited liability company (?LS?),. Marxe, Greenhouse and Stettner are also controlling principals of AWM.

Item 2(b). Address of Principal Business Office or, if None, Residence:

The principal business address for AWM is c/o Special Situations Funds, 527 Madison Avenue, Suite 2600, New York, NY 10022.

Item 2(c). Citizenship: AWM is a Delaware Corporation.

Item 2(d). Title of Class of Securities: Common Stock, Par Value \$.0001

Item 2(e). CUSIP No.: 45685K102

Item 3. If This Statement Is Filed Pursuant to ??240.13d-1(b) or 240.13d-2(b) or (c), check whether the Person Filing is a:  
Not Applicable.

Item 4. Ownership

(a) Amount Beneficially Owned: 1,173,102\*\*

(b) Percent of Class: 5.3%\*\*

(c) Number of Shares as to which the person has:

(i) sole power to vote or to direct the vote: 1,173,102\*\*

(ii) shared power to vote or to direct the vote: 0\*\*

(iii) sole power to dispose or to direct the disposition of:  
1,173,102\*\*

(iv) shared power to dispose or to direct the disposition  
of: 0\*\*

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\*\* AWM is the investment adviser to each of the Funds. As the investment adviser to the Funds, AWM holds sole voting and investment power over 1,173,102 shares of Common Stock of the Issuer (the ?Shares?) held by SSLs. Marxe, Greenhouse and Stettner are members of: LS, the general partner of SSLs. Marxe, Greenhouse and Stettner are also controlling principals of AWM. Marxe, Greenhouse and Stettner previously reported the Shares held by the Funds on Schedule 13G. Accordingly, reference should be made to Marxe, Greenhouse and Stettner (CIK #0001044321) for any prior filings with the Securities and Exchange Commission relating to the Shares held by each of the Funds.

Item 5. Ownership of Five Percent or Less of a Class

If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following. \_\_\_

Item 6. Ownership of More Than Five Percent on Behalf of Another Person

Not Applicable.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on by the Parent Holding Company or Control Person

Not Applicable.

Item 8. Identification and Classification of Members of the Group

Not Applicable.

Item 9. Notice of Dissolution of Group

Not Applicable.

Item 10. Certification

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect.

SIGNATURE

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Dated: January 20, 2015

*AWM INVESTMENT COMPANY, INC.*

*By:*

*Name: David M. Greenhouse*

*Title: Executive Vice President*

*Attention: Intentional misstatements or omissions of fact constitute  
Federal criminal violations (See 18 U.S.C. 1001)*

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