

REGO[®]



REGO
10
YEAR
WARRANTY

NH₃-102 Catalog

Anhydrous Ammonia Equipment



Forward 1

Certifications..... 2

NH₃ Bulk Storage Solutions 6

Anhydrous Ammonia Solutions..... 8

Determining the Age of Products..... 9

High Pressure Industrial / Commercial Pounds-to-Pounds Regulators..... 10

Regulator Designs..... 11

“Pop-Action” Pressure Relief Valves 12

Fully Internal “Pop-Action” Pressure Relief Valves for Transports and Delivery Vehicles 12

External “Pop-Action” Pressure Relief Valves for ASME Containers and Bulk Plant Installations 13

External Hydrostatic Relief Valves..... 14

DuoPort® Pressure Relief Valve Manifolds for Small Storage Containers..... 15

Delta Port™ Relief Valve Manifolds..... 16

Multiport® Pressure Relief Valve Manifold Assemblies for Large Storage Containers..... 17

Multiport® Pressure Relief Valve Manifold 18

Quick-Acting Minimum Loss Hose-End Valves for Delivery Trucks and Dispensing Stations..... 19

Quick-Acting Hose-End Valves for Delivery Trucks and Dispensing Stations 20

2” FNPT X 3¼” ACME Low Emission Hose End Valve for loading Transports..... 21

“V”-Ring Seal Globe and Angle Valves..... 22

“V”-Ring Seal Globe and Angle Valves for Bulk Storage Containers, Transports, Plant Piping 23

Flange Seal Globe and Angle Valves for Bulk Storage Containers, Filling Hoses and Plant Piping 24

Flange Seal Liquid Transfer Angle Valves for Bulk Storage Containers..... 25

High Capacity NH₃ Liquid Withdrawal Valve 26

Multipurpose Valve for Filling of NH₃ Containers 27

Multipurpose Valves for Liquid Withdrawal of NH₃ Containers 29

Excess Flow Valves for Liquid or Vapor Line Service..... 30

Excess Flow Valves for Liquid or Vapor 31

Excess Flow Valves for Container Service..... 32

Excess Flow Valves for Vapor or Liquid 33

Excess Flow Valves for Flange Mounting in Container Service 34

Excess Flow Valves for Liquid or Vapor Withdrawal..... 35

Electric Actuators..... 36

1¼” Threaded Internal Valve with Electric Actuator for Small Capacity Pumping Systems and Bobtail Vapor Equalization..... 37

1½” Internal Valve with Electric Actuator 38

2” Internal Valves with Electric Actuator For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks 39

3” Internal Valves with Electric Actuator For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks 40

1¼” Threaded Internal Valve for Small Capacity Pumping Systems and Vapor Equalization 41

1½” Internal Valve..... 42

2” Internal Valves For Delivery Trucks, Transports and Stationary Storage Tanks..... 43

3” Internal Valves For Delivery Trucks, Transports and Stationary Storage Tanks..... 44

3” Flanged Internal Valves for Delivery Trucks, Transports and Large Stationary Storage Containers..... 45

3” Flanged Internal Valves for Delivery Trucks, Transports, and Large Stationary Storage Tanks..... 46

4” Flanged Internal Valve for Transports and Large Stationary Storage Tanks 47

Remote Thermal Release for DOT MC331 Pressure Vessel 49

Flomatic® Internal Valve Operation..... 50

Flomatic® Internal Valves for Delivery Trucks, Transports and Large Stationary Storage Tanks..... 51

¼” Three-Way Quick-Acting Valve..... 52

Electrically Actuated 3 way valve..... 52

Extended Type Hose Couplings for Vapor and Liquid Service 53

Short Type Hose Couplings for Vapor and Liquid Service 53

Caps and Reducers..... 54

1¼” ACME Steel Cap For NH₃..... 54

ACME Adapters 54

1” Rotogage® Assembly for Large Mobile and Stationary Containers 55

Pull-Away Valves for Transfer Operations 57

1¼” Swing-Check ESV for Bulk Plants 58

2” & 3” Swing-Check ESVs for Bulk Plants 59

Flanged Swing-Check ESVs for Bulk Plants 60

Electric Actuator Swing-Check ESVs for Bulk Plants..... 61

Electric Actuator Flanged Swing-Check ESVs for Bulk Plants 62

ESV Pneumatic Controls..... 63

3” Heavy Duty Swing Check with Flow Indicator..... 64

2” Heavy Duty Swing Check with Flow Indicator..... 64

Sight Flow Indicators for Bulk Plants..... 65

Combination Valve for Bulk Storage Containers 66

Pressure Gauges..... 66

Vent Valves..... 67

Fixed Liquid Level Gauges TA3169F 67

General Properties of NH₃ 68

Limited Warranty and Limitation Of Liability 69

Forward

This catalog describes a complete line of equipment available from REGO® for use with Anhydrous ammonia (NH₃). The following points are important to know for proper use of the catalog:

1. Illustrations and drawings of individual products are representative of “product groups” and all products within a product group are similar in construction.
2. Materials used for construction of products in this catalog are suitable for rated service pressure at temperatures of -40° F. to +165° F., unless otherwise specified.
3. Products in this catalog are only intended for use in Anhydrous Ammonia service as follows.
 - a. “A” or “AA” prefix — Products with this prefix are suitable for NH₃ service (i.e., contain no brass parts).
 - b. “AA” prefix on relief valves — These are of partial aluminum materials and are listed by Underwriters Laboratories (UL) for NH₃ service only.
 - c. “SS” prefix—Hydrostatic relief valve with this prefix are suitable for NH₃ (i.e., they have stainless steel materials).
4. We manufacture valves and adapters designed to be used on Anhydrous Ammonia systems, we do not design systems or consult in system design. For this type of information consult a professional Engineer.

Caution

Do not use any product contained in this catalog with any service commodity other than Anhydrous Ammonia NH₃. If you have a need for use of another application, contact REGO®, 100 RegO Drive, Elon, NC 27244, (336) 449-7707 before proceeding.

Proper application, installation and maintenance of products in this catalog are essential. Users of these products should obtain further information if there are any doubts or questions.

Notice

Installation, usage, and maintenance of all REGO® products must be in compliance with all REGO® instructions as well as requirements and provisions of ANSI K61.1 and all applicable federal, state, provincial and local standards, codes, regulations, and laws.

Inspection and maintenance on a periodic basis is essential. Installation and maintenance should be performed only by qualified personnel.

Be sure all instructions are read and understood before installation, operation and service.

Warning

All REGO® products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many REGO® products are manufactured for storage, transport, transfer and use of toxic flammable and dangerous liquids and gases. Such substances should be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures.



CERTIFICATE



This is to certify that

Engineered Controls International, LLC

100 Rego Drive
Elon, NC 27244
United States of America

with the organizational units/sites as listed in the annex

has implemented and maintains a **Quality Management System.**

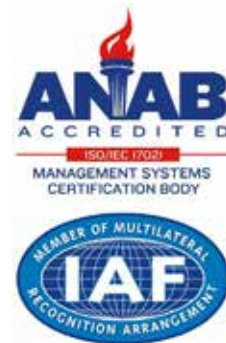
Scope:

The design and manufacture of valves, regulators and fittings for the L.P. Gas, Anhydrous Ammonia, LNG, and Compressed Gas Industries.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 9001 : 2015

Certificate registration no.	10001523 QM15
Date of original certification	1994-10-04
Date of certification	2018-07-20
Valid until	2021-07-19



DQS Inc.

Brad McGuire
Managing Director





**Annex to certificate
Registration No. 10001523 QM15**

Engineered Controls International, LLC

100 Rego Drive
Elon, NC 27244
United States of America



Location

Scope

10003890
Engineered Controls International, LLC
911 Industrial Drive S.W.
Conover, NC 28613
United States of America

The manufacture of regulators for the L.P. Gas, Anhydrous Ammonia, LNG, and Compressed Gas Industries.

Remote Location

Scope

10003889
Engineered Controls International, LLC
3181 Lear Drive
Burlington, NC 27215
United States of America

Shipping and Distribution.

**THE NATIONAL BOARD
OF
BOILER & PRESSURE VESSEL INSPECTORS**

Certificate of Authorization



This is to certify that

Engineered Controls International, LLC

Acceptable Abbrev.: ECII, RegO

100 Rego Drive

Elon, NC 27244

United States

is authorized to use the "NB" mark in accordance with the provisions of NB-501, National Board Certification of Pressure Relief Devices.

The scope of Authorization is limited to National Board Certified devices which have been manufactured, assembled and marked in accordance with the following construction codes:

ASME Section VIII, Division 1: "UV" Stamp

Issue Date: November 3, 2017

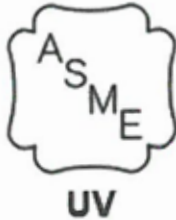
Expiration Date: October 31, 2020

Executive Director

A handwritten signature in black ink, appearing to be 'D. D. ...', written over a horizontal line.

REG





CERTIFICATE OF AUTHORIZATION

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this certification mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

**Engineered Controls International, LLC
100 Rego Drive
Elon, North Carolina 27244**

SCOPE:

**Manufacture of pressure vessel pressure relief valves at the above location only
(This authorization does not cover welding, brazing or fusing)**

AUTHORIZED: **October 24, 2017**

EXPIRES: **October 31, 2020**

CERTIFICATE NUMBER: **24,118**

A handwritten signature in black ink, appearing to read 'Richard R. Stevenson'.

Board Chair, Conformity Assessment

A handwritten signature in black ink, appearing to read 'Joseph Loveland'.

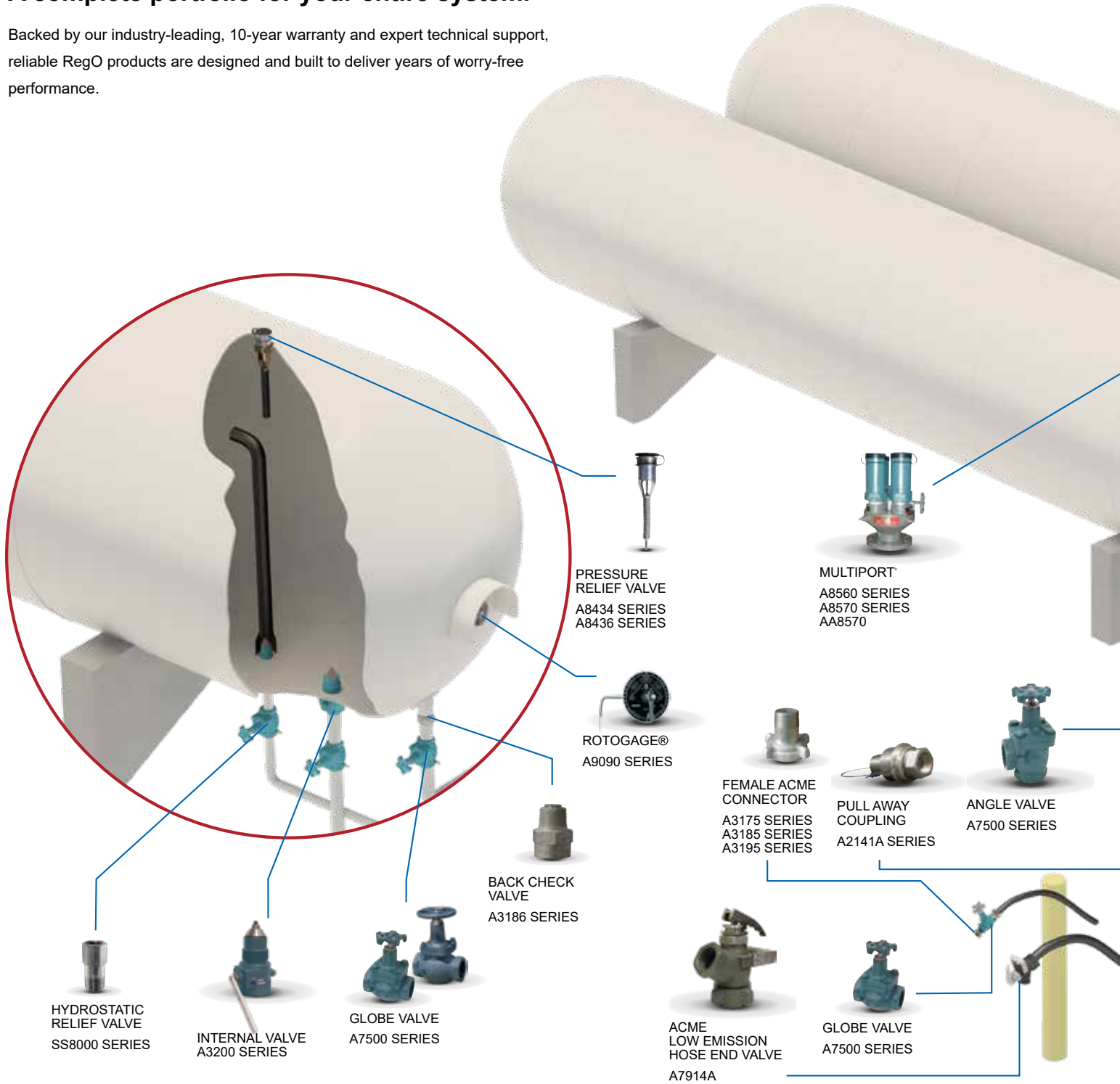
Managing Director, Conformity Assessment

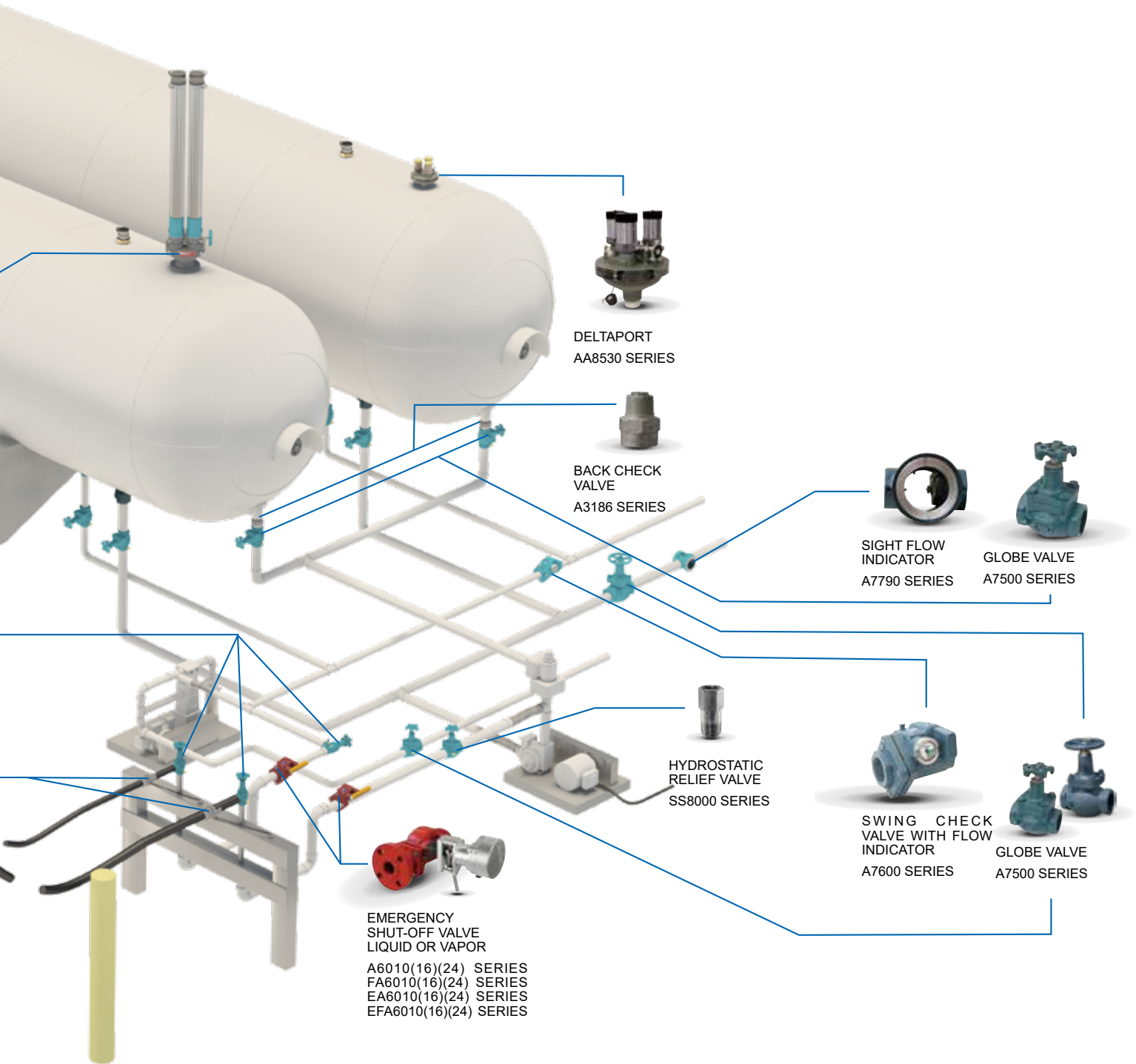


NH₃ Bulk Storage Solutions

A complete portfolio for your entire system.

Backed by our industry-leading, 10-year warranty and expert technical support, reliable RegO products are designed and built to deliver years of worry-free performance.

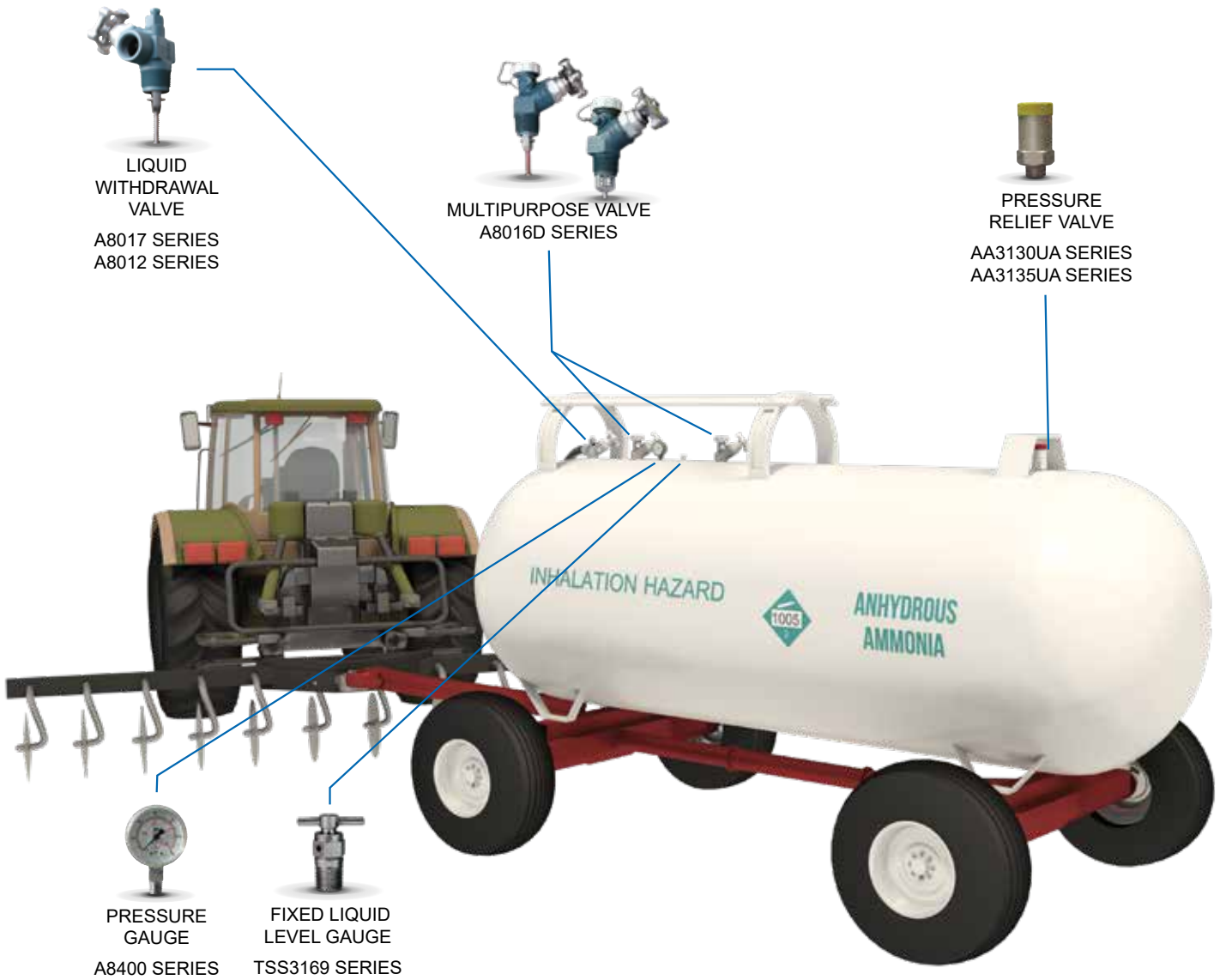




Anhydrous Ammonia Solutions

You can bet the farm on our performance

Demanding applications require products you can trust. RegO offers more NH₃ options, and they are all backed with our industry-leading 10-year warranty to help your customers improve their yields with safe, even applications year after year.



LIQUID
WITHDRAWAL
VALVE
A8017 SERIES
A8012 SERIES

MULTIPURPOSE VALVE
A8016D SERIES

PRESSURE
RELIEF VALVE
AA3130UA SERIES
AA3135UA SERIES

PRESSURE
GAUGE
A8400 SERIES

FIXED LIQUID
LEVEL GAUGE
TSS3169 SERIES

Determining the Age of Products

All REGO® products are mechanical devices that will eventually become inoperative due to wear, contaminants, corrosion and aging of components made of material such as metal and rubber.

The life of a product is determined by the environment in which it "lives." The dealer knows better than anyone what this environment is.

The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential.

Since 1960, most REGO® products are identified with an alphabetical code indicating the month and the year they were manufactured.

Because REGO® products have a long and proven record of quality and service, dealers may forget the hazards that can occur because products are used beyond their safe service life.

Check the product for this code to determine age. If valves or regulators are repainted, take care to keep the date code clear for later identification and inspection.

1960 to 1985 — Two-Letter Date Code

First letter in date code is the month

A — January	G — July
B — February	H — August
C — March	I — September
D — April	J — October
E — May	K — November
F — June	L — December

Relief valves used on ASME tanks carry a numerical code indicating month and year such as 1-75 means January, 1975.

Second letter in date code is the year

R — 1960	A — 1969	J — 1978
S — 1961	B — 1970	K — 1979
T — 1962	C — 1971	L — 1980
U — 1963	D — 1972	M — 1981
V — 1964	E — 1973	N — 1982
W — 1965	F — 1974	O — 1983
X — 1966	G — 1975	P — 1984
Y — 1967	H — 1976	Q — 1985
Z — 1968	I — 1977	

EXAMPLE: DL = April of 1980

From 1985 to 1990 — Digit Date Code

First digit in date code is the month

1 — January	7 — July
2 — February	8 — August
3 — March	9 — September
4 — April	10 — October
5 — May	11 — November
6 — June	12 — December

Second 2 digits in date code are the year

86 — 1986	89 — 1989
87 — 1987	90 — 1990
88 — 1988	

EXAMPLE: 5-87 = May of 1987

After 1990 — Digit-Letter-Digit Date Code

First digit in date code is the month

1 — January	7 — July
2 — February	8 — August
3 — March	9 — September
4 — April	10 — October
5 — May	11 — November
6 — June	12 — December

Letter in date code is the week

A — 1 st week
B — 2 nd week
C — 3 rd week
D — 4 th week
E — 5 th week

Second 2 digits in date code are the year

91 — 1991	97 — 1997
92 — 1992	98 — 1998
93 — 1993	99 — 1999
94 — 1994	00 — 2000
95 — 1995	01 — 2001
96 — 1996	02 — 2002
03 — 2003	etcetera. . .

EXAMPLE: 6A92 = First week of June, 1992

High Pressure Industrial / Commercial Pounds-to-Pounds Regulators AA1580V Series

Application

The AA1580M & AA1580V Series Regulators are specifically designed and precision built to reduce and provide precise control of anhydrous ammonia container pressures between 3 and 125 PSIG.

Features

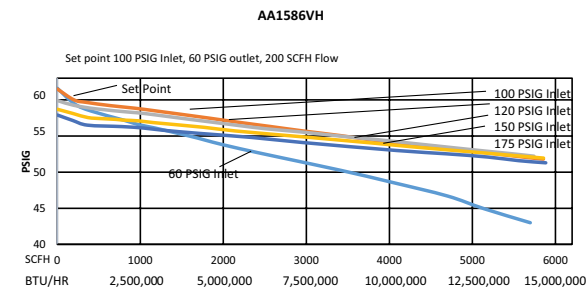
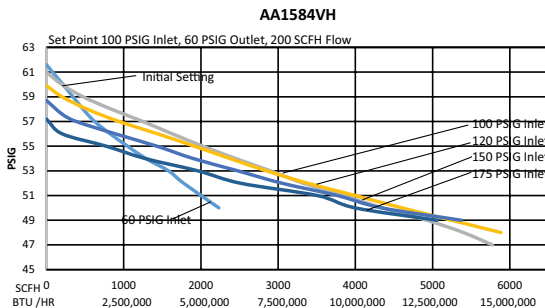
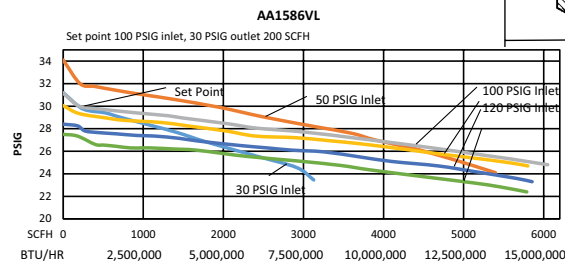
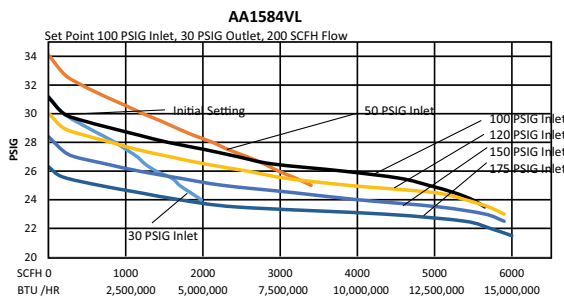
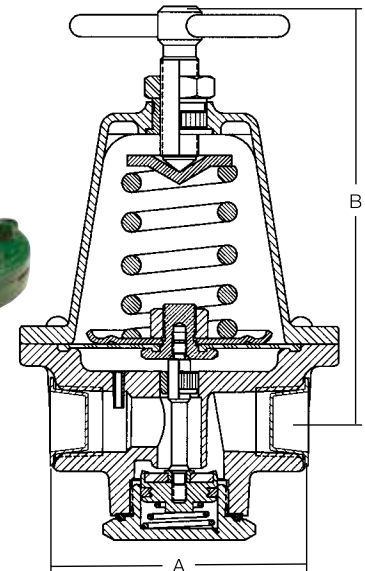
- Large nozzle and straight through flow provides high capacity and resistance to freeze-up.
- O-ring on retainer assembly provides a dampening effect to reduce vibration.
- Suitable for both liquid and vapor service.
- Can be readily fitted with pressure gauge in 1/4" F. NPT port.

Materials

Body Forged Aluminum
Bonnet Die Cast Aluminum
Spring Steel
Valve Seat Discs Resilient Rubber
Diaphragms Integrated Fabric and Synthetic Rubber



AA1586



Ordering Information

Part Number	Service	Adjustment Method	Inlet & Outlet Connections	Recommended Delivery Pressure Range (PSIG)	A Width	B Height (max.)	Capacity Determined at Set Pressure of PSIG	Capacity*
AA1584VW	NH ₃	Tee Handle	1/2" F. NPT	3-25	2 ¹⁵ / ₁₆ "	4 ⁷ / ₈ "	20	4,500 CFH NH ₃
AA1584VL				25-50			30	4,800 CFH NH ₃
AA1584VH				45-125			60	5,100 CFH NH ₃
AA1586VW	NH ₃		3/4" F. NPT	3-25	3 1/2"	7"	20	7,000 CFH NH ₃
AA1586VL				25-50			30	7,700 CFH NH ₃
AA1586VH				45-125			60	8,900 CFH NH ₃

*Capacity determined at 100 PSIG inlet, set pressure noted on chart at 20% drop.

Regulator Designs

Typical of the AA1580 Series Industrial High Pressure Regulators

The pounds-to-pounds, industrial regulator gives higher delivery pressure as tank pressure decreases, thus permitting full use of the gas in the tank. Most units are field adjustable to meet changing conditions.

Connections

Machined and threaded into the body forging; also includes 1/4" NPT pressure gauge ports.

Seat Disc

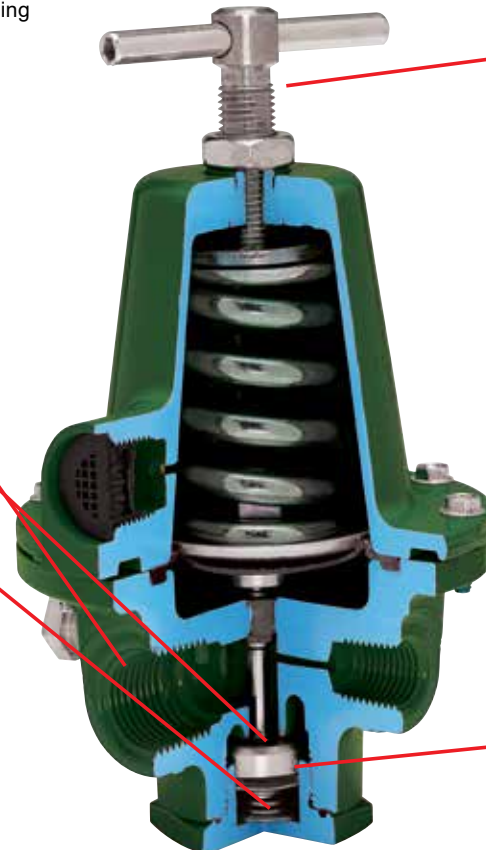
Synthetic rubber assembly attached directly to the diaphragm assembly to ensure proper movement and regulation.

Back Cap Spring

Provides added upward force to help provide a positive lock-up.

Sensitivity

In those cases where there is a choice of delivery pressure ranges, the lowest spring range which will fulfill your requirements is recommended because the sensitivity of a regulator decreases as the range of the adjusting spring increases.



Adjusting Assembly
Large handle with lock-nut release allows easy resetting of delivery pressure.

Integral O-Ring
Minimizes tendency to vibrate or hum under extreme loads.

Relief Valves

Most high pressure regulators are not equipped with integral relief valves. For certain applications where it is desirable to protect equipment downstream of the regulator, relief valves must be installed in the line.



“Pop-Action” Pressure Relief Valves

General Information

The “Pop-Action” design permits the RegO® Pressure Relief Valve to open slightly to relieve moderately excessive pressure in the container. When pressure increases beyond a predetermined point, the valve is designed to “pop” open to its full discharge capacity, reducing excess pressure quickly. This is a distinct advantage over ordinary valves which open gradually over their entire range, allowing excessive pressure to develop before the relief valve is fully open. All RegO® internal, semi internal, and external relief valves incorporate this “Pop-Action” design.

Relief Valves in this catalog are only intended for use in anhydrous ammonia service. Do not use any other service commodity. If you have an application other than anhydrous ammonia service, contact REGO® before proceeding.

Fully Internal “Pop-Action” Pressure Relief Valves for Transports and Delivery Vehicles A8434 and A8436 Series

Application

Designed specifically for use as a primary relief valve on ASME cargo tanks for transportation with 2” and 3” F-NPT couplings.



Features

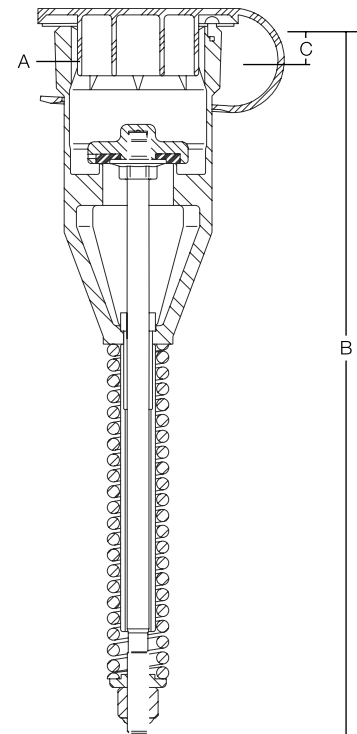
- Low profile design assures maximum protection against sheering or distortion.
- All functioning parts are located below the level of the container connection to reduce the possibility of damage or tampering.
- Longer spring size designed to minimize stress cracking in service.
- Use of two different materials for stem and guide minimizes the possibility of stem seizure which may occur when similar materials are used.
- Internal octagonal wrenching broach assures easy installation and removal.
- Most are UL Listed & ASME rated for use with anhydrous ammonia.

Materials

Body Stainless Steel
 Spring Stainless Steel
 Stem Stainless Steel
 Stem Bushing 17 - 4PH Stainless Steel
 Seat Disc (A8434 & A8436 series) Resilient Synthetic Rubber



A8434-SERIES



Ordering Information

Part Number	Start To Discharge Setting PSIG	A Container Connection	B Overall Height (Approx.)	C Height Above Coupling (Approx.)	UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)	NH3	Protective Cap (Included)
A8434G	250	2" M. NPT	9 1/16"	1/2"	3700	3456	Yes	A8434-11B
A8434N	265					3659		
A8436G	250	3" M. NPT	17 1/8"	3/4"	10210	9598		A8436-11B
A8436N	265					9839		

Appendix D. Area shown is for UL or ASME flow rating—which ever is larger.

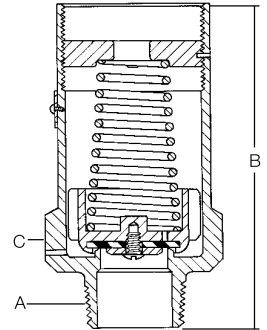
External "Pop-Action" Pressure Relief Valves for ASME Containers and Bulk Plant Installations AA3126, AA3130, AA3135, and A3149 Series

Application

Designed for use as the primary relief valve on stationary Anhydrous Ammonia storage tanks. All working components of these relief valves are located outside the container connection and must be protected from physical damage.

Features

- "Pop-action" design keeps product loss at a minimum.
- Relief valve designed to automatically reseal firmly after discharge.
- Resilient seat disc provides "bubble-tight" seal.
- A3149 relief valves incorporate integral pipeway adapter with break off groove that protects the valve from piping stress damage.
- Optional pipeway adapters have grooves that will break off to protect the relief valve from damage should excess stress be applied to the piping.
- A3149 relief valves include weep hole deflectors, installed to guard against flame impingement on adjacent containers.
- Most are UL Listed & ASME rated for use with anhydrous ammonia.



A3149

AA3135-10



AA3135

Materials

Description	AA3126	AA3130	AA3135	A3149
Body	Aluminum Rod*		Upper Cold Rolled Steel Lower Ductile Iron	
Liner	None		Stainless Steel	
Spring Guide	Aluminum		Stainless Steel	
Spring	Stainless Steel		Stainless Steel or Coated Steel	
Seat Disc	Resilient Synthetic Rubber			



Ordering Information

Part Number	Start To Discharge Setting PSIG	A Container Connection M. NPT	B Overall Height (Approx.)	C Wrench Hex Section	Flow Capacity SCFM/Air (a)		Accessories			
					UL (At 120% of Set Pressure)	ASME (At 120% of Set Pressure)	Protective Cap	Pipeway Adapter		Weep Hole Deflector
								Part Number	Outlet Size	
AA3126L030	30	1/2"	2 3/8"	7/8"	(b)	-	9103-54	AA3126-10	1/2" M. NPT	-
A3149L055	55	2 1/2"	10 1/2"	4 1/8"	2608(c)	-	3149-40	(D)		Included (E)
A3149L200	200				8232 (c)	-				
AA3126L250	250	1/2"	2 3/8"	7/8"	277 (c)	-	9103-54	AA3126-10	1/2" M. NPT	-
AA3130UA250		3/4"	3 7/16"	1 1/4"	2045	1838	11557-110	AA3131-10	1" F. NPT	-
AA3135UA250		1 1/4"	6 13/32"	2 11/16"	6430	6341	AA3135-40PR	AA3135-10	2" F. NPT	-
A3149MG		2 1/2"	10 1/2"	4 1/8"	10390	-	3149-40	(D)		Included (E)
A3149G						9153				
AA3130UA265	265	3/4"	3 7/16"	1 3/4"	2125	1912	11557-110	AA3131-10	1" F. NPT	-
AA3135UA265		1 1/4"	6 13/32"	2 11/16"	6615	6703	AA3135-40PR	AA3135-10	2" F. NPT	3133-11
AA3126L312	312	1/2"	2 3/8"	7/8"	330 (c)	343	9103-54	AA3126-10	1/2" M. NPT	-

(a) Flow rates shown are for bare relief valves. Adapters and pipeways will reduce flow as discussed in forewording information.
 (b) Not UL or ASME rated. .059 square inch effective area.
 (c) Not UL or ASME rated. REGO® rated at 120% of set pressure.
 (d) Outlet 3 1/2-8N (F) thread, will accept 3" M. NPT pipe thread.
 (e) Weep hole deflector is Part No. A3134-11B.

External Hydrostatic Relief Valves SS8001, SS8002, SS8021 and SS8022 Series

Application

Designed especially for the protection of piping and shut-off valves where there is a possibility of trapping liquid anhydrous ammonia. They may be installed in pipelines and hoses located between shut-off valves or in the side boss of RegO® shut-off valves.

Features

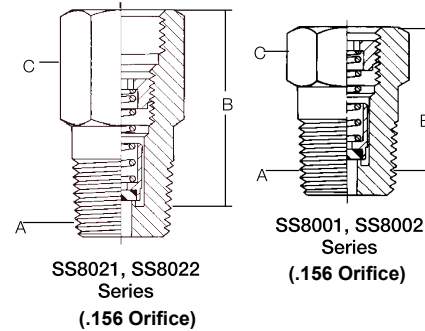
- Relief valve designed to automatically reseal firmly after discharge.
- Resilient seat disc provides a “bubble-tight” seal.
- Stainless steel.
- Available in configurations that permit direct attachment of vent piping when required.

Materials

Body (SS8001, SS8002, SS8021, SS8022)..... Stainless Steel
 Spring Stainless Steel
 Seat Disc Resilient Rubber



SS8022G



Ordering Information

Part Number	Start To Discharge Setting PSIG	Valve Body Material	A Container Connection M. NPT	B Height (Approx.)	C Wrench Hex Section	Accessories			
						Protective Cap	Pipeaway Adapter or Threads		
SS8001G	250	Stainless Steel	1/4"	7/8"	1 1/16"	-	-		
SS8002G			1/2"		7/8"				
SS8021G			1/4"	1 3/8"	1 1/16"				
SS8022G			1/2"		7/8"				
SS8022P	300		1/2"	1 3/8"	7/8"			-	3/8" NPT Thrds
SS8001J	350		1/4"	7/8"	1 1/16"			-	-
SS8002J			1/2"		7/8"				
SS8021J			1/4"	1 3/8"	1 1/16"				
SS8022J			1/2"		7/8"				
SS8001L	400		1/4"	7/8"	1 1/16"			-	-
SS8002L			1/2"		7/8"				
SS8021L			1/4"	1 3/8"	1 1/16"				
SS8022L			1/2"		7/8"				
SS8001U	450		1/4"	7/8"	1 1/16"			-	-
SS8002U			1/2"		7/8"				
SS8021U			1/4"	1"	1 1/16"				
SS8022U		1/2"	7/8"						

* 1/2" F. NPT outlet connection.

DuoPort® Pressure Relief Valve Manifolds for Small Storage Containers 8542 Series

Application

Designed especially for use as a primary relief device on smaller anhydrous ammonia stationary storage containers, with 2" NPT threaded couplings. These manifolds allow servicing or replacement of either of the two relief valves without evacuating the container or loss of service. The operating lever selectively closes off the entrance port to the relief valve being removed while the remaining valve provides protection for the container and its contents. The rating of each manifold is based on actual flow through the manifold and a single pressure relief valve, taking friction loss into account. It is not merely the rating of the relief valve alone.

Features

- Allows for relief valve removal and replacement on a periodic basis without shutting down and evacuating the container.
- Unique seat ring assemblies provide a smooth tubular section to preclude turbulence and assure more efficient flow capacity.
- Operating lever is only locked in the mid-position or in a position to seal either relief valve. Placement of the clapper disc in an intermediate position could restrict flow through one of the relief valves, causing it to chatter and destroy the resilient seat disc.
- A rubber plug with chain is provided to protect manifold outlet threads where the relief valve has been removed.
- "Pop-action" design insures maximum protection with only minimal product loss at moderately excessive pressures.
- Resilient relief valve seat disc provides "bubble-tight" seal.
- Relief valves are UL listed & ASME rated for use with Anhydrous ammonia.

Manifold Materials

Body Ductile Iron
Clapper Disc Stainless Steel
Bleeder Valve Stainless Steel
Seat Disc Teflon
Packing Polyethylene

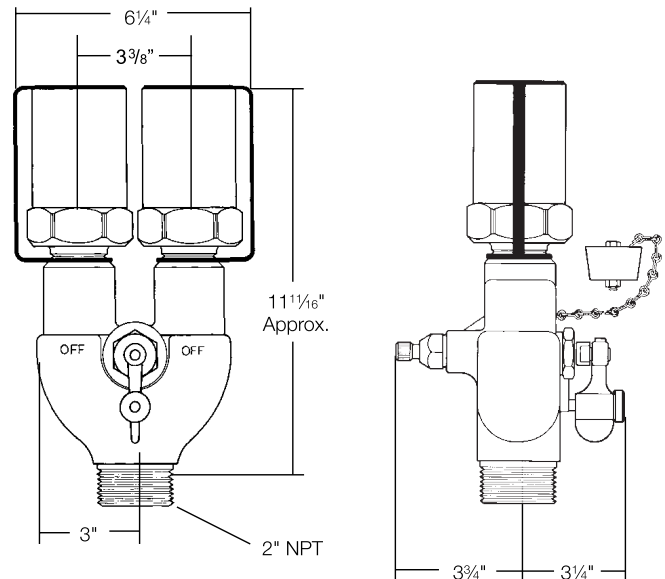
Relief Valve Materials

Body Forged Aluminum*
Spring Guide Aluminum
Spring Coated Steel
Seat Disc Resilient Synthetic Rubber

*A special coating is applied to the inlet threads to minimize the possibility of electrolytic action.



AA8542



Ordering Information

Part Number	Start to Discharge Setting PSIG	Application	Container Connection M. NPT	Relief Valve Included				Flow Capacity SCFM/Air** (at 120% of set pressure)	
				Quantity	Part Number	Inlet Connection M. NPT	Accessory Pipeaway Adaptors	UL Rating (at 120% of set Pressure)	ASME Rating (at 120% of set Pressure)
AA8542UA250 AA8542UA265	250	Yes	2"	2	AA3135MUA250 AA3135MUA265	1 1/4"	AA3135-10*	6430 (1) 6615 (1)	6058 (1) 6404 (1)

* 2" F. NPT outlet connection.

** Flow rating based on number of relief valves indicated in parenthesis (). Flow rates shown are for bare relief valves. Adaptors and pipeaways will reduce flow rates as discussed in forewording information.

Delta Port™ Relief Valve Manifolds AA8530 Series

Application

Designed especially for use as a primary relief device on large stationary pressurized storage containers the base is supplied with a two inch NPT threaded container connection. These manifolds incorporate an additional relief valve, not included in the flow rating, allowing for servicing or replacement of any one of the relief valves without evacuating the container. The hand-wheel on the manifold selectively closes off the entrance port to the relief valve being removed while the remaining relief valves provide protection for the container and its contents. All manifold flow ratings are based on flow through the relief valves after one has been removed for service or replacement.

Materials

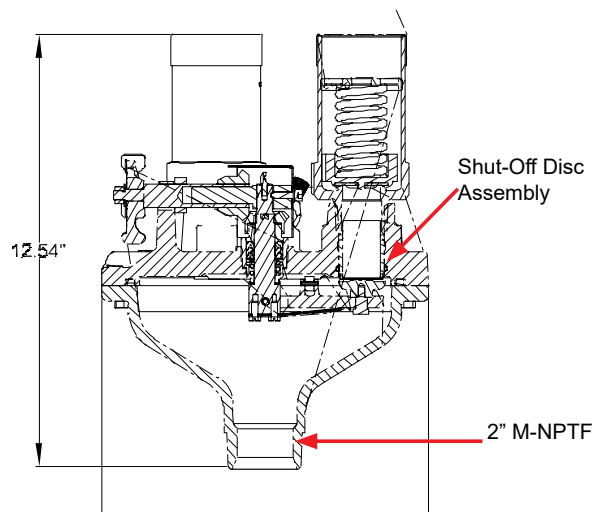
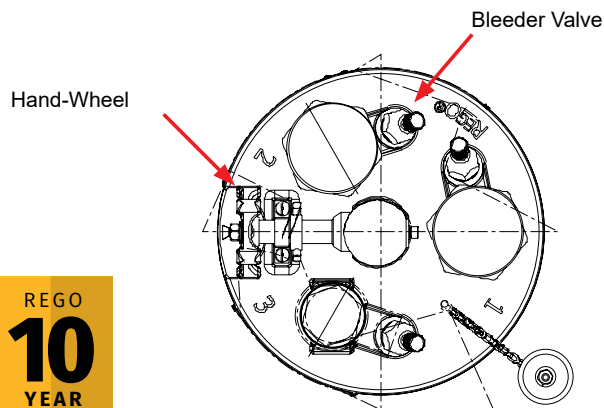
Body Ductile Iron
Resilient Parts Teflon
Clapper Disc Stainless Steel
Bleeder Valve Stainless Steel

Relief Valve Materials

Body (AA3135) Aluminum
Spring Guide (AA3135) Aluminum
Spring (AA3135) Stainless Steel
Seat Disc (AA3135) Resilient Synthetic Rubber



AA8533MA



Ordering Information

Part Number	Start to Discharge Setting PSIG	Application		Qty.	Relief Valve			ASME Flow Rating SCFM (air) @ 120% of Set Pressure *
		NH3	Container Connection M-NPTF		Inlet Connection M-NPT	Accessories Pipe-away Adapter**		
AA8532MA250	250	Yes	2"	2	AA3135MA250	1 1/4"	AA3135-10	6,341 (1)
AA8533MA250				3				12,682 (2)
AA8532MA265				2				6,703 (1)
AA8533MA265	265			3	AA3135MA265			13,406 (2)

* Flow rating based on number of relief valves indicated in parenthesis ().

Flow rates shown are for bare relief valves. Adapters and pipe-always will reduce flow rates as discussed in forwarding information in L-500 catalog.

** 2" F. NPT outlet connection

Multiport® Pressure Relief Valve Manifold Assemblies for Large Storage Containers A8560 and A8570 Series

Application

Designed especially for use as a primary relief device on large stationary pressurized anhydrous ammonia storage containers with flanged openings. These manifolds incorporate an additional relief valve, not included in the flow rating, allowing for servicing or replacement of any one of the relief valves without evacuating the container. The handwheel on the manifold selectively closes off the entrance port to the relief valve being removed while the remaining relief valves provide protection for the container and its contents. All manifold flow ratings are based on flow through the relief valves after one has been removed for service or replacement.

Features

- Allows for relief valve removal and replacement on a periodic basis without shutting down and evacuating the container.
- "Pop-action" design of relief valves insures maximum protection with only minimal product loss at moderately excessive pressures.
- A rubber plug with chain is provided to protect manifold outlet threads where the relief valve has been removed.
- May be mounted directly to a welding neck flange or manhole cover plate. Requires no inlet piping.
- Relief valves designed to automatically reseal firmly after discharge.
- Resilient relief valve seat disc provides "bubble-tight" seal.
- Relief valves are UL listed & ASME rated for use with anhydrous ammonia.

Materials

Body	Ductile Iron
Resilient Parts	Teflon
Clapper Disc	Stainless Steel
Bleeder Valve	Stainless Steel

Bolt Stud and Nut Assemblies

Part Number	Consists of	For Use With:	For Connection To:	Number Required
7560-55	1-Bolt Stud and Nut	RegO Multiport®	Modified 3" - 300# and 4"-ANSI 300# Welding Neck Flange	8
7560-56			Manhole Cover Plate	

Relief Valve Materials

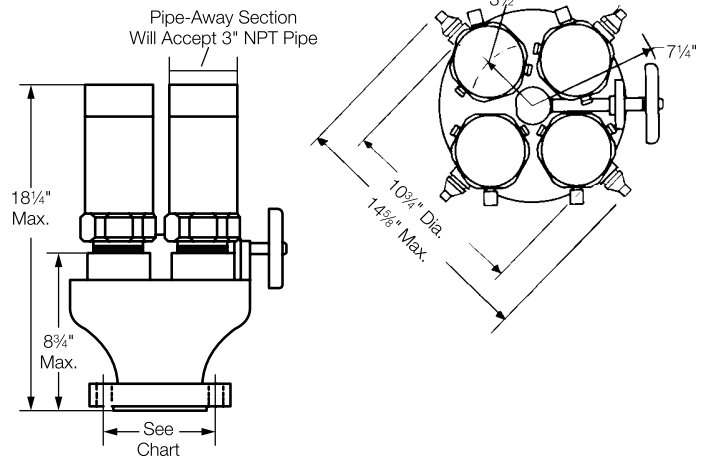
Description	A8563, A8564, A8573, A8574
Body	Upper Cold Rolled Steel Lower Ductile Iron
Liner	Stainless Steel
Spring Guide	Stainless Steel
Spring	Coated Steel
Seat Disc	Resilient Synthetic Rubber

*A special coating is applied to the inlet threads to minimize possibility of electrolytic action.

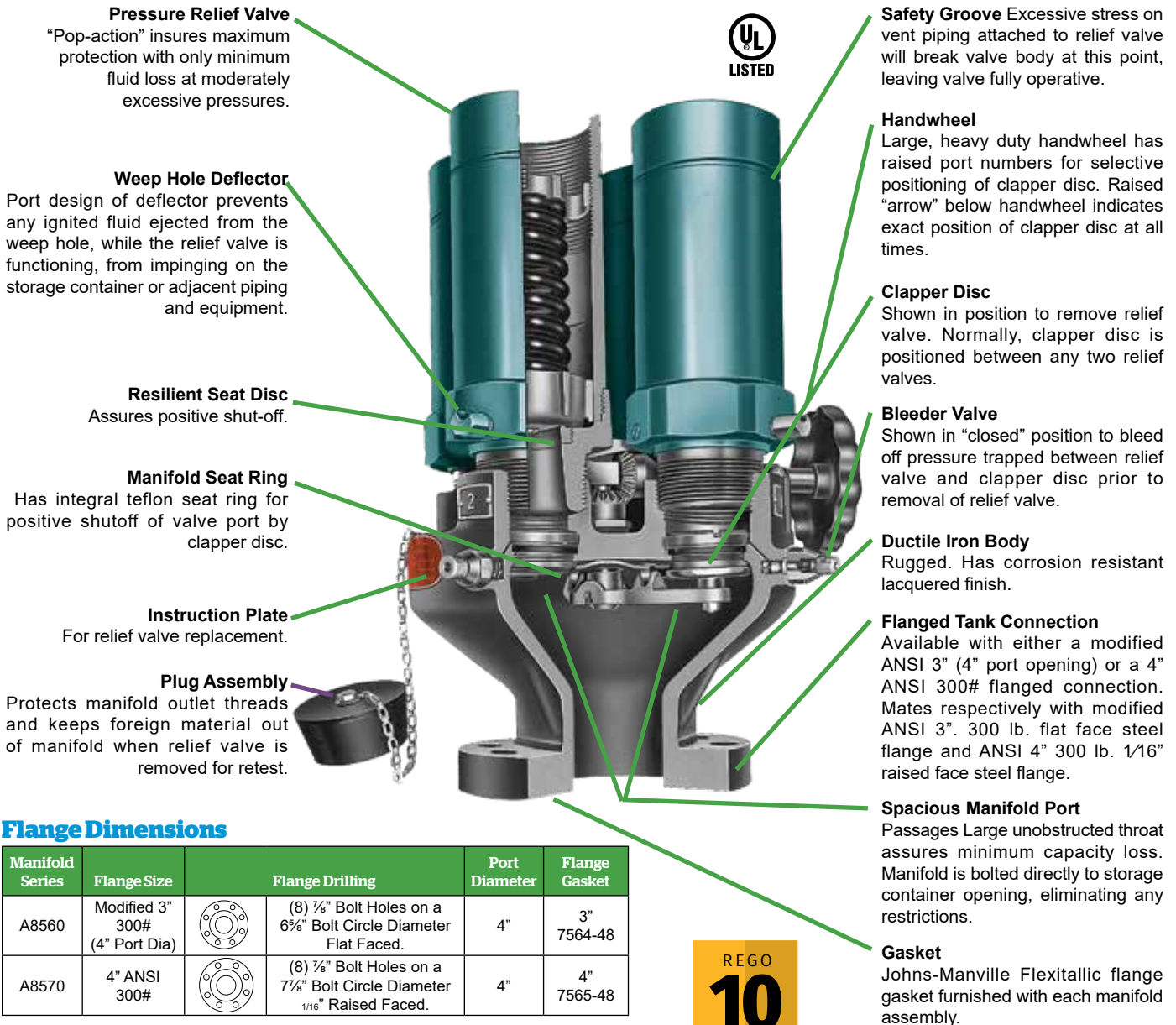


A8560



A8570



Multiport® Pressure Relief Valve Manifold



Flange Dimensions

Manifold Series	Flange Size	Flange Drilling	Port Diameter	Flange Gasket
A8560	Modified 3" 300# (4" Port Dia)	 (8) 7/8" Bolt Holes on a 6 5/8" Bolt Circle Diameter Flat Faced.	4"	3" 7564-48
A8570	4" ANSI 300#	 (8) 7/8" Bolt Holes on a 7 1/8" Bolt Circle Diameter 1/16" Raised Faced.	4"	4" 7565-48



Ordering Information

Part Number	Start To Discharge Setting PSIG	Application		Relief Valve			Flow Capacity SCFM/Air** At 120% of Set Pressure		
		NH3	Container Flange Connection	Quantity	Part Number	Inlet Connection M. NPT	Accessories	UL Rating	ASME Rating
A8563G	250	Yes	3"-300#*	3	A3149MG	2 1/2"	****	18,500 (2)	Not Applicable
A8564G				4				27,750 (3)	
A8573G				3				18,300 (2)	
A8574G				4				27,750 (3)	
A8563AG			4"-300#	3	A3149G			18,300 (2)	
A8564AG				4				27,459 (3)	
A8573AG				3				18,300 (2)	
A8574AG				4				27,459 (3)	

* For use with modified 300# ANSI flange with 4" port.

** 2" F. NPT outlet connection.

** Flow rating based on number of relief valves indicated in parenthesis (). Flow rates shown are for bare relief valves. Adapters and pipeways will reduce flow rates as discussed in forewording information.

**** Outlet 3 1/2-8N (F) thread, will accept 3" M. NPT pipe thread.

Quick-Acting Minimum Loss Hose-End Valves for Delivery Trucks and Dispensing Stations A7793A and A7797A

Application

Designed to vastly reduce the amount of product vented when disconnecting delivery trucks, dispensing systems and anhydrous ammonia nurse tanks.

These valves provide instant, full-on flow at the flip of a handle. Shut-off is instant and the handle locks for added protection. This "top of the line" hose-end valve is a fully contained unit that does not require additional filling adapters or connectors.

Features

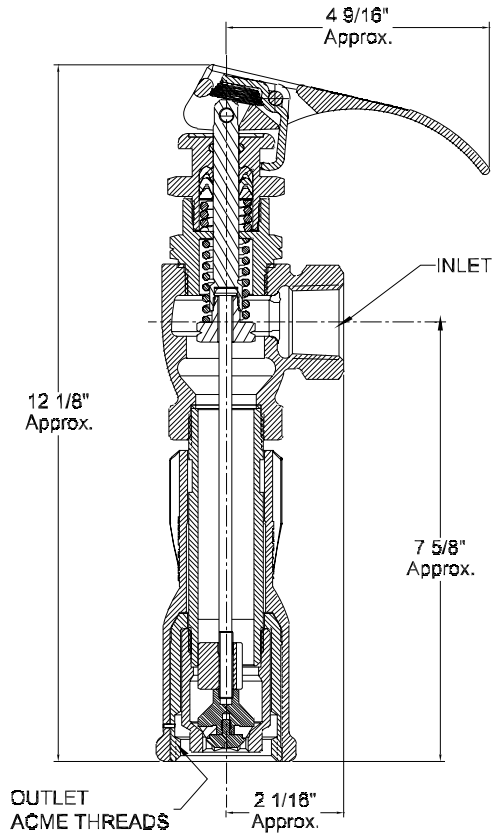
- Minimizes product venting loss, when disconnecting, instantly by housing the seat disc at the bottom of the built-in ACME filling connector.
- Vents less than 2cc of liquid when disconnected.
- "V"-ring spring-loaded pressure seal design provides for dependable, leak-free operation. No packing to retighten or replace.
- Operator friendly. Contoured handle rotates a full 360° and large, easy to grip filling connector make the valve easy to handle.
- Self locking handle is operator opened and closed to prevent against accidental opening of the valve.

Materials

Body	Ductile Iron
"V"-Ring	Teflon
Stem	Stainless Steel
Seat Disc	Synthetic Elastomer
ACME Connector	Aluminum w/Steel Insert
Seal Housing	Stainless Steel
Lever	Stainless Steel
Bonnet	Cadmium Plated Steel



A7793



Ordering Information

Part Number	Inlet Connection (F. NPT)	Outlet Connection (F. ACME)	Locking Handle	Flow at 1 PSIG (Cv) Pressure Drop* (GPM/NH3)
A7793A	3/4"	1 3/4"	Yes	14.4
A7797A	1"			

Quick-Acting Hose-End Valves for Delivery Trucks and Dispensing Stations A7707L and A7708L

Application

Designed especially for safe operator handling of delivery truck, dispensing systems and anhydrous ammonia nurse tank service.

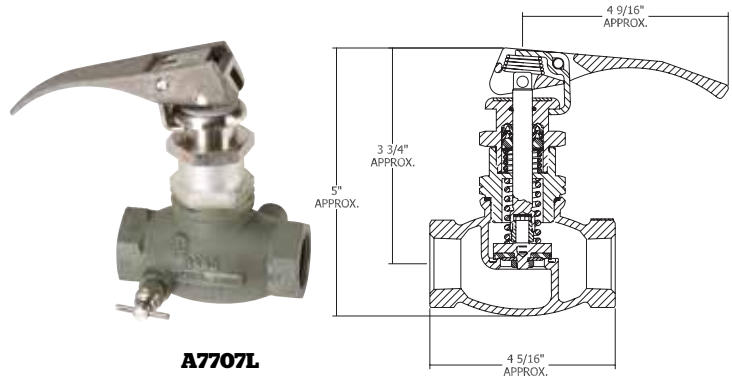
These valves provide instant, full-on flow at the flip of the handle and provide instant positive shut-off with a handle lock for added protection.

Features

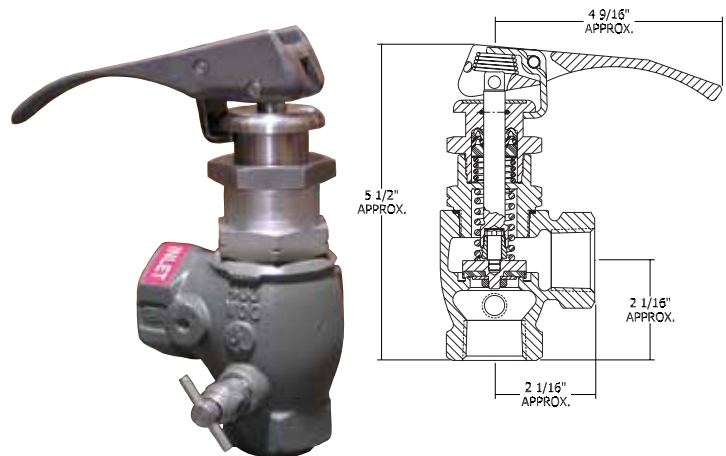
- “V”-ring spring-loaded pressure stem seal provides for leak-proof operation. No packing to retighten or replace.
- Self locking handle is operator opened and closed to prevent against accidental opening of the valve.
- Large, contoured handle provides firm, comfortable grip.
- Full swivel handle rotates 360° so the valve can be operated from any angle.
- Built-in vent valve on the downstream side of the valve permits bleeding of trapped product to assure safe uncoupling.
- Can be used with a variety of RegO® filling adapter connectors.
- Swivel seat disc minimizes grinding on the body seat and assures longer service life.

Materials

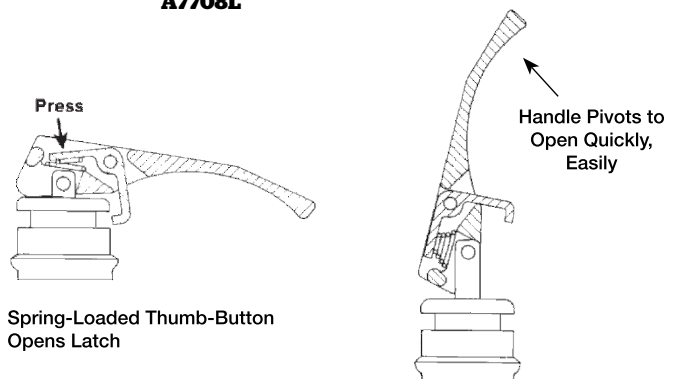
Body	Ductile Iron
“V”-Ring	Teflon
Stem	Stainless Steel
Seat Disc	Synthetic Elastomer
Valve Lever	Stainless Steel
Seal Housing	Stainless Steel
Bonnet	Cadmium Plated Steel



A7707L



A7708L



Spring-Loaded Thumb-Button Opens Latch



Ordering Information

Part Number	Body Design	Inlet & Outlet Connection (F. NPT)	Locking Handle	Flow at 1 PSIG Pressure Drop (Cv) (GPM/NH3)**	Accessories		
					Filling Connectors**		
					Extended	Compact	
					Steel	Brass	Steel
A7707L	Straight	1"	Yes	16.2	A7575L4	3175A	A3175A
A7708L	Angle			19.8			

2" FNPT X 3¼" ACME Low Emission Hose End Valve for loading Transports A7914

Application

The A7914 minimum loss valve is designed to reduce the amount of product vented when disconnecting transport loading hoses. This valve provides a full-on flow when pressing the release trigger and the lifting of an easy grip handle.

Lowering the handle will immediately stop flow and lock the lever in the closed position. This valve can be used with any standard 3¼" Male ACME

connector.

Features

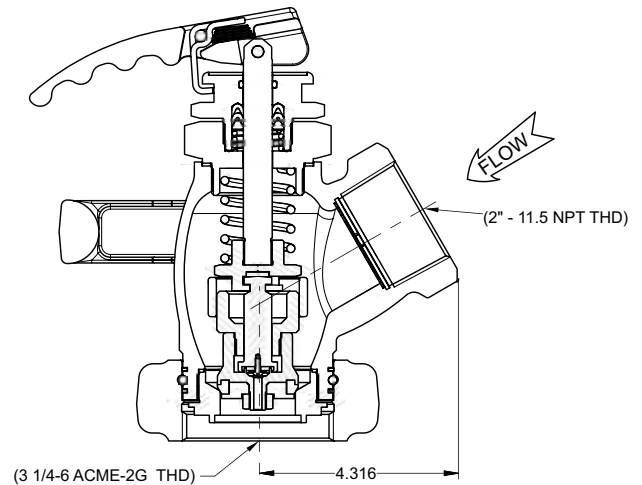
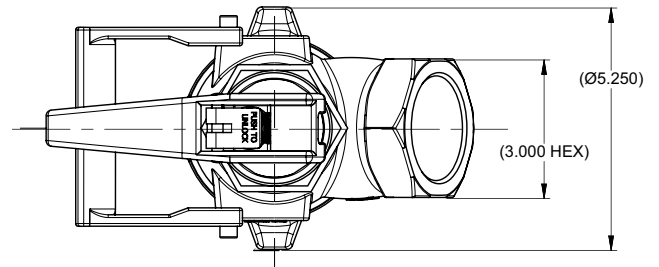
- Minimizes product discharge at disconnect
- Contoured handle rotates 360° large easy to turn ACME swivel connector.
- Self-locking handle is operator opened and closed designed to prevent accidental opening of the valve.
- Bypass mechanism in the seat area allows the upstream pressure to quickly equalize when the handle is partially moved to the open position.
- Spring loaded Teflon "V" packing for bonnet/stem assembly provides long service life.

Materials

Body	Ductile Iron
"V" -Rings.....	Teflon
Stem	Stainless Steel
Acme Connector.....	Cadmium Plated Ductile Iron
Seal Housing	Stainless Steel
Bonnet	Cadmium Plated Steel
Lever.....	Stainless Steel
Seat Disc	Synthetic Rubber



A7914A



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Locking Handle	Flow at (Cv) Pressure Drop* GPM NH3	
				1 PSIG	10 PSIG
A7914A	2" FNPT	3¼" F-ACME	Yes	49.5	156.6

"V"-Ring Seal Globe and Angle Valves

General Information

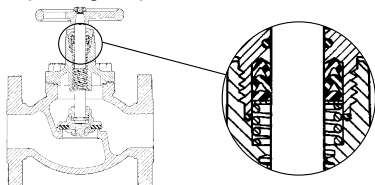
RegO® Globe and Angle Valves are designed and manufactured especially to meet the rigid requirements of the anhydrous ammonia industry. The high quality construction and wide variety of sizes and styles also make them highly suited to many other industries such as chemical and petrochemical.

These ductile iron valves are available in both threaded and flanged connections. Threaded connections are available in 1/2" F. NPT to 3" F. NPT sizes. Flanged connections are available in 1 1/2", 2" and 3" pipe sizes.

The ductile iron used in these valves has a 60,000 PSIG tensile strength which closely approaches that of steel castings. Its yield strength of 45,000 PSIG and elongation of 15% is also comparable to that of steel castings. These material features assure the ability of the valve body to withstand impact, wrenching stresses and thermal shock. This ductile iron conforms to ASTM specification A395.

RegO® globe and angle valves are designed for working pressures up to 400 PSIG WOG and for operating temperatures from -40° F. to +160° F.

"V"-Ring Stem Seal



The "V"-ring spring-loaded pressure seal used in these RegO® globe and angle valves is the most effective stem seal yet developed. It should not be confused with conventional valve stem packing where the seal is obtained by compressing the packing around the stem by means of a packing gland with resultant hard operation and frequent packing replacement.

The wax like surface of the teflon "V"-ring seal and consequent low friction assures leak-tight performance for an indefinite period where periodic retightening of the packing is not required and the seal provides extra long service life.

In the RegO® "V"-ring design, the seal is effected by the pressure expanding the "V"-shape of the seal, forcing it against the stem and bonnet surfaces to prevent leakage. The higher the pressure within the valve, the more effective the seal becomes. A spring loaded washer under the "V"-rings keeps them in an expanded position to assure an effective seal under low pressure conditions. A wiper ring, located above the seal, keeps the seal free from grit, and/or other foreign material that may hamper operation.

Installation and Operation Note

Containers and pipe lines should be thoroughly cleaned before globe and angle valves are installed. Large particles of solid foreign matter can permanently damage the seating surface in the valve body, causing the valve to leak. Use a minimum amount of a suitable pipe dope on the male connecting threads as excess amounts may fall off and be carried into the valve, causing damage to the seat or other operating parts.

It is totally unnecessary to use excess force in opening or closing RegO® valves. The type of seat disc material used and the general design of these valves permits them to be opened and closed easily. Proper valve operation insures unusually long life.

Wrenches must never be used to operate valves equipped with handwheels and designed for hand operation.

Downstream Accessory Boss

These RegO® valves incorporate a plugged 1/4" F. NPT boss on the downstream side of the body for attaching either a hydrostatic relief valve or vent valve. Boss size on the 2" and 3" valves has been increased to allow a 3/4" drilling for accommodation of a standard by-pass valve or jumper lines.

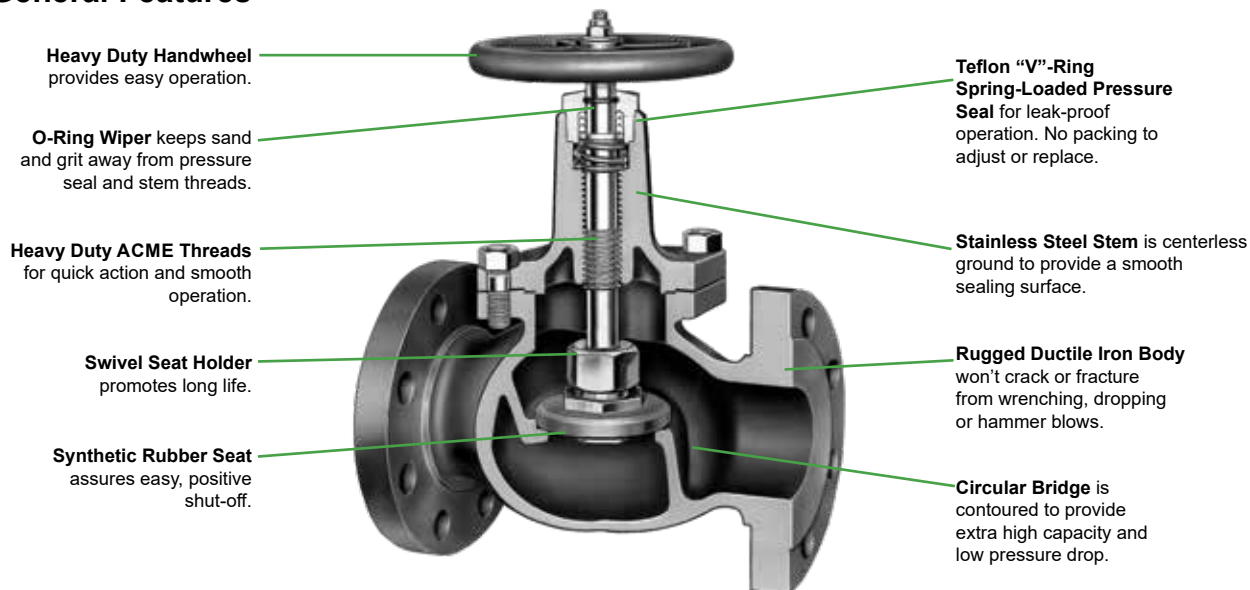
Hydrostatic Relief—When the design of the piping installation is such that liquid may be locked between two shut-off valves, a hydrostatic relief valve should be installed in the lines between the valves. The pressures which can develop due to temperature increase in a liquidfull line are tremendous and can easily damage the valves or piping unless a hydrostatic relief valve is installed.

Vent Valve—If the globe or angle valve is used as a shut-off valve on a loading hose, a vent valve should be installed in the downstream boss to allow liquid trapped beyond the shut-off valve to be vented before disconnecting the hose coupling.

Replace Gate Valves with Flanged Valves

Except for standard flange sizes, RegO® Flanged Globe and Angle Valves are smaller and lighter than contemporary valves, thus reducing price and shipping costs and making them far easier to install. RegO® face to face flange dimensions conform to gate valve dimensions, making replacement of most gate or plug valves with RegO® valves simple and easy.

General Features



"V"-Ring Seal Globe and Angle Valves for Bulk Storage Containers, Transports, Plant Piping A7500 Series and TA7500 Series

Application

Specifically designed to assure positive shut-off and long, maintenance free service life in liquid or vapor service on bulk storage containers, transports, cylinder filling plants and plant piping.

The high quality construction and wide variety of sizes make them highly suited for use with anhydrous ammonia and in the chemical and petrochemical industries.

Features

- "V"-ring spring-loaded pressure stem seal provides for leak-proof operation. No packing to retighten or replace.
- Circular bridge in the globe design and a dropped seat in the angle design achieve greater flow with less pressure drop.
- Swivel seat disc assembly minimizes the seat disc from grinding on the body seat. The seat disc stops rotating as soon as it touches the body seat. This feature provides for good seat alignment and assures long seat life.
- ¼" F. NPT plugged boss on the downstream side of the valve body allows attachment of a hydrostatic relief valve or vent valve.
- "V"-ring stem seal virtually eliminates hard to turn handles frequently encountered with packed type seals.
- Heavy duty rolled ACME stem threads provide quick action and long service life.

Materials

Body	Ductile Iron
Bonnet (7034, 7505-7508).....	Steel
Bonnet (7509-7518).....	Ductile Iron
Valve Stem	Stainless Steel
Wiper Ring.....	Synthetic Rubber
Seat Disc	See Ordering Chart
"V"-Rings	Teflon
Handwheel.....	Ductile Iron
Spring	Stainless Steel



Ordering Information

Part Number				Inlet and Outlet Connection	Port Diameter	Flow at 1 PSIG Pressure Drop (Cv) (GPM/NH3)***		Accessories	
Buna N Seat Discs		Teflon Seat Discs*				Globe	Angle	Hydrostatic Relief Valve	Vent Valve
Globe	Angle	Globe	Angle						
-	-	TA7034P	TA7034LP	½" F. NPT	¾"	9	13.32	SS8001U	TSS3169
A7505AP	A7506AP	TA7505AP	TA7506AP	¾" F. NPT		10.8	15.93		
A7507AP	A7508AP	TA7507AP	-	1" F. NPT	1"	16.2	19.8		
A7509BP	A7510BP	TA7509BP	TA7510BP	1¼" F. NPT	1¼"	32.85	48.6		
A7511AP	A7512AP	TA7511AP	TA7512AP	1½" F. NPT	1½"	38.7	49.95		
A7511FP	-	TA7511FP	-	1½" Flange**		41.4	-		
A7513AP	A7514AP	TA7513AP	-	2" F. NPT	2"	67.5	79.65		
A7513FP	A7514FP	TA7513FP	TA7514FP	2" Flange**		70.2	119.7		
A7517AP	A7518AP	TA7517AP	-	3" F. NPT	3½"	177.3	272.7		
A7517FP	A7518FP	TA7517FP	-	3" Flange**					

* Teflon seat discs on valves built to order.

** 300# ANSI R.F. Flange.

Flange Seal Globe and Angle Valves for Bulk Storage Containers, Filling Hoses and Plant Piping A7704, A7705 and A7706 Series

Application

Designed to assure positive shut-off and long maintenance-free service life in liquid or vapor service. Ideally suited for use on cylinder charging manifolds, truck filling hoses, bulk storage containers and plant piping.

The high quality construction and wide variety of sizes make them highly suited for use with anhydrous ammonia and in the chemical and petrochemical industries.

Features

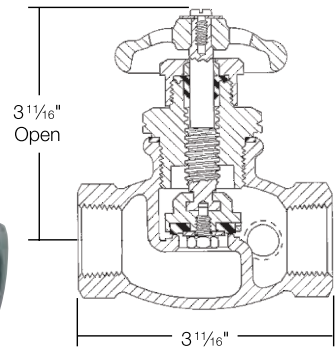
- Steel bonnet and stainless steel stem for combined Anhydrous ammonia service.
- Flange seal stem provides for leak-proof operation. No packing to retighten or replace.
- Metal-to-metal back seat permits replacement of the flange ring with the valve in service.
- Plugged $\frac{1}{4}$ " NPT boss on downstream side of valve accommodates hydrostatic relief valve or vent valve.
- Swivel seat disc minimizes grinding on the body seat and assures longer service life.
- "Dropped seat" body design of the angle valve provides high flow capacity.

Materials

Body Ductile Iron
 Bonnet (A7704, 05, 06) Steel
 Stem (A7704-05-06) Stainless Steel
 Flange Ring Synthetic Rubber
 Seat Disc Synthetic Rubber



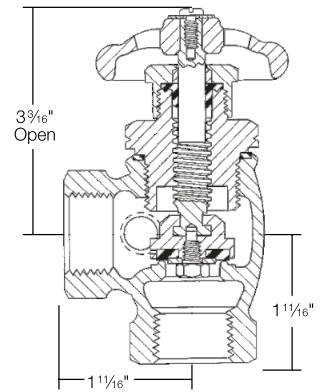
A7704P



**7704 P
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A7706P



**7704 LP
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Ordering Information

Part Number		Inlet & Outlet Connection (F. NPT)	Flow at 1 PSIG Pressure Drop (Cv) (GPM/NH3)*		Accessories	
Globe	Angle		Globe	Angle	Hydrostatic Relief Valve	Vent Valve
A7704P	A7704LP	$\frac{1}{2}$ "	6.57	11.07	SS8001J or SS8001L	TSS3169
A7705P	A7706P	$\frac{3}{4}$ "	10.35	15.93		

Flange Seal Liquid Transfer Angle Valves for Bulk Storage Containers A7550 and A7551 Series

Application

In NH3 applicator tanks they may be used as a vapor bleeder valve or as a liquid withdrawal valve when installed in a coupling with a dip pipe.

When equipped with an integral excess flow valve (A7550PX), the valve should be mounted in a forged steel 3000 lb. half coupling. When mounted in a 1 1/4" x 3/4" NPT reducing coupling, the 3/4" female thread in this coupling must be full length — equivalent to a forged steel 3000 lb. half coupling.

The excess flow valve will not function properly if these specifications are not met. Refer to the Warning Bulletin in the Excess Flow Valve Section of this catalog.

Features

- Flange seal stem design provides for leak-proof operation. No packing to retighten or replace.
- Large, unrestricted interior ports reduce pressure drop through the valve, increasing capacity and preventing cavitation.
- Resilient swivel seat disc assures longer seat life and easy, positive shut-off.
- Plugged 1/4" NPT outlet boss accommodates hydrostatic relief valve or vent valve.

Materials

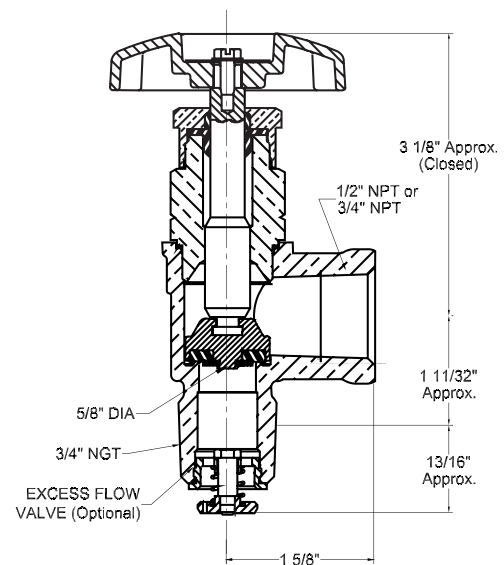
Body (A7550, 51)..... Cadmium Plated Ductile Iron
 Bonnet (A7550, 51) Steel
 Stem (A7550, 51) Stainless Steel
 Flange Ring Synthetic Rubber
 Seat Disc Synthetic Rubber



A7550P



A7550PX



Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Integral Excess Flow	Flow at 1 PSIG (Cv) Pressure Drop* (GPM/NH3)	Excess Flow Approximate Closing Flow** (GPM/NH3)	Accessories	
						Hydrostatic Relief Valve	Vent Valve
A7550P	3/4"	3/4"	No	11.97	-	SS8001J	TSS3169
A7550PX			Yes	-	14.4	SS8001J	TSS3169
A7551P		1/2"	No	8.01	-	SS8001J	TSS3169

High Capacity NH3 Liquid Withdrawal Valve A8012D

Application

The A8012D is designed especially for use as a high capacity liquid withdrawal valve on Anhydrous Ammonia nurse tanks or risers.

This valve incorporates an integral excess flow valve; when the valve is in operation the handwheel must be completely open and back-seated to allow the excess flow valve to function properly as explained in the excess flow section of our L-500 and L-102 catalogs.

Features

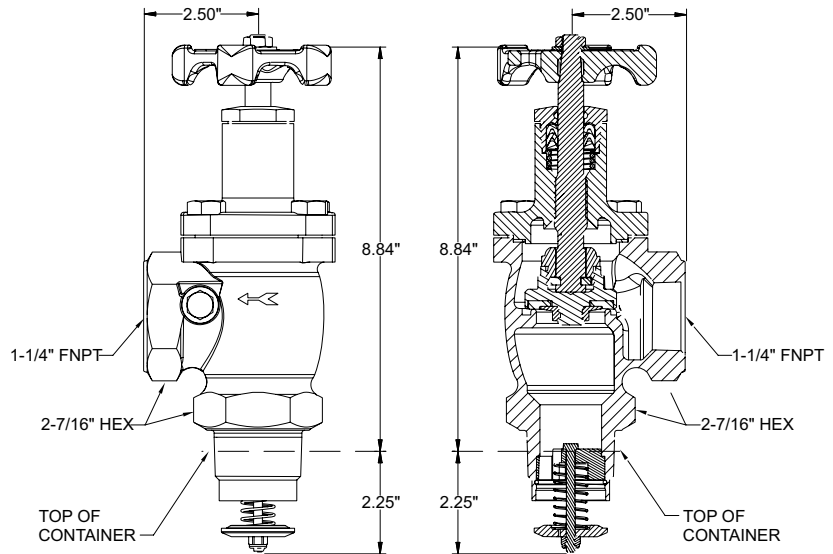
- Excess flow valve designed for high flow and low pressure drop.
- Excess flow seat fully contained in the container coupling for maximum protection in the event of external damage to the valve.
- Resilient disc assembly with swivel seat is fully contained for bubble-tight shut-off and long service life.
- "V"-ring spring loaded stem seal design requires no field adjustment.
- ¼" F-NPT port that accommodates a vent valve or hydrostatic relief valve.
- UL Listed for Anhydrous Ammonia.

Materials

Body	Ductile Iron
Bonnet	Ductile Iron
Stem	Stainless Steel
Seat Disc	Nitrile
"V"-Rings	Teflon
Excess Flow Valve	Stainless Steel
Springs	Stainless Steel



A8012D



Ordering Information

Part Number	Inlet Connection	Outlet Connection	Approximate Closing Flow GPM	Accessories for NH3 Use	
				Hydrostatic Relief Valve	Vent Valve
A8012D	1½" M-NPT	1¼" F-NPT	72 GPM NH3	SS8001J	TSS3169
A8012C			45 GPM NH3		

Multipurpose Valve for Filling of NH3 Containers A8016DBC

Application

Designed specifically for use as a manual filler valve on anhydrous ammonia applicator tanks. This valve incorporates an integral back check valve.

Features

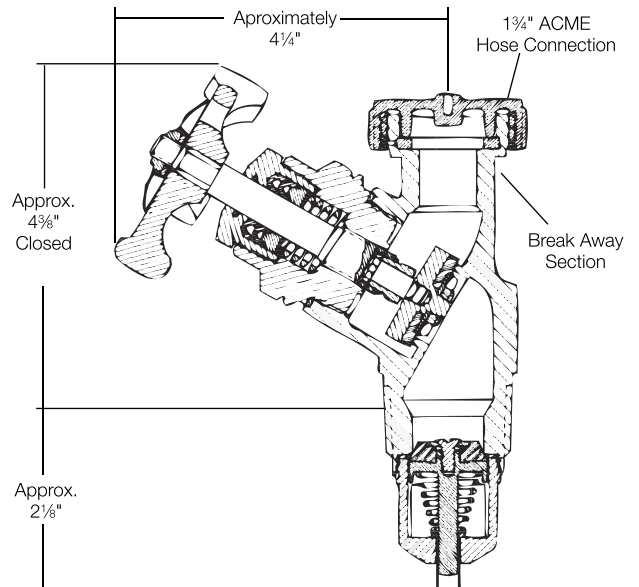
- Positive seating back check valve opens for maximum flow at minimum pressure drop when filling — regardless of the type of coupling in which the valve is installed.
- Back Check seat is fully contained in the tank coupling for maximum protection in the event of external damage to the valve.
- Resilient seat disc assembly is fully contained on three sides for bubble-tight shut-off and long service life.
- "V"-ring spring-loaded stem seal design requires no repacking or field adjustment.
- Specially machined break-away groove beneath ACME threads will shear-off with excessive pull on the hose and leave the valve body intact.
- Plugged 1/4" NPT boss accommodates vent valve or hydrostatic relief valve.

Materials

Body	Ductile Iron
Bonnet	Steel
"V"-Rings	Teflon
Stem	Stainless Steel
Seat Disc	Resilient Synthetic Rubber
Back Check Valve.....	Stainless Steel, Steel and Synthetic Rubber
Springs	Stainless Steel



A8016DBC



Ordering Information

Part Number	Inlet Connection	Filling Connection	Filling Capacity at 20 PSIG Pressure Drop GPM/NH3	Accessories	
				Hydrostatic Relief Valve	Vent Valve
A8016DBC	1 1/4"	1 3/4"	95	SS8001J	TSS3169

Multipurpose Valve for Filling of NH3 Containers A8016DP

Application

Designed specifically for use as a manual valve or vapor equalizing valve on anhydrous ammonia applicator and nurse tanks.

This valve incorporates an integral excess flow valve. When product is required, the valve must be completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow section of this catalog.

Features

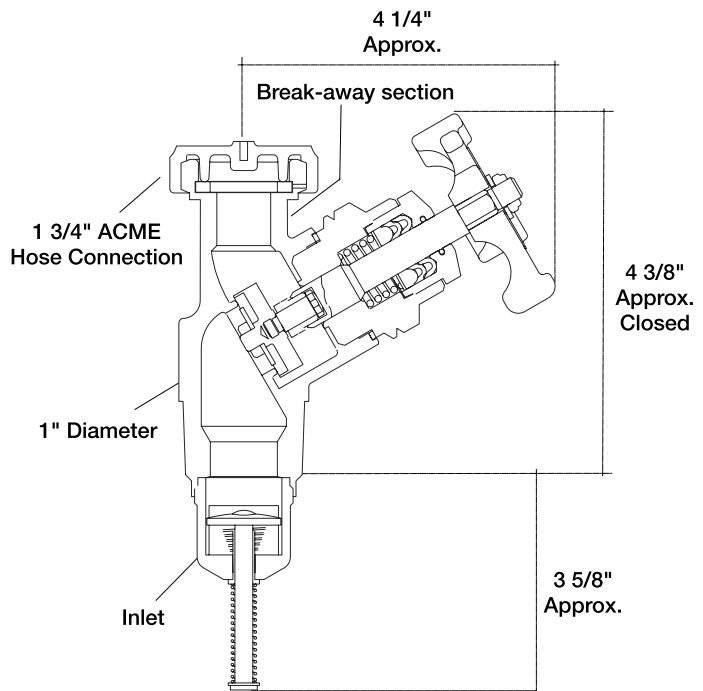
- Positive-acting excess flow valve opens for maximum flow at minimum pressure drop when filling -- regardless of the type of coupling in which the valve is installed.
- Excess flow seat is fully contained in the tank coupling for maximum protection in the event of external damage to the valve.
- Resilient seat disc assembly is fully contained on three sides for bubble-tight shut-off and long service life.
- "V"-ring spring-loaded stem seal design requires no repacking or field adjustment.
- Specially machined break-away groove beneath ACME threads will shear-off with excessive pull on the hose and leave the valve body intact.
- Plugged 1/4" NPT boss accommodates vent valve or hydrostatic relief valve.

Materials

Body	Ductile Iron
Bonnet	Steel
"V"-Rings	Teflon
Stem	Stainless Steel
Seat Disc	Resilient Synthetic Rubber
Excess Flow Valve	Stainless Steel--Steel Body
Springs	Stainless Steel



A8016DP



Ordering Information

Part Number	Inlet Connection (M. NPT)	Filling Connection (M. ACME)	Filling Capacity At 20 PSIG Pressure Drop GPM/NH3*	Approximate Excess Flow Closing Flows		Accessories	
				Liquid* GPM/NH3	Vapor** CFH/NH3	Hydrostatic Relief Valve	Vent Valve
A8016DP	1 1/4"	1 3/4"	95	44	24,000	SS8001J	TSS3169

* Determined at 9.5 to 12 PSIG differential.

** Determined at 100 PSIG inlet.

Multipurpose Valves for Liquid Withdrawal of NH3 Containers A8017D & A8020D

Application

Designed especially for use as a high capacity liquid withdrawal valve on anhydrous ammonia containers.

These valves incorporate an integral excess flow valve. When product is required, the valve must be completely open and backseated to allow the excess flow valve to function properly as explained in the excess flow valve section of this catalog.

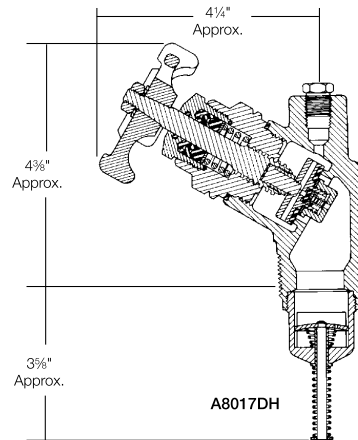
The A8017DH is equipped with a soft seated automatic differential back pressure check valve in the seat disc assembly. This allows any pressure build up in the liquid transfer line in excess of 10-15 psig above the container pressure to flow back into the container. The transfer hose is protected against excessive liquid or vapor pressure entrapment, which adds materially to the useful life of flexible hose. In addition to increasing hose service life, the equalizing valve adds substantially to the operating safety of liquid transfer systems.

Features

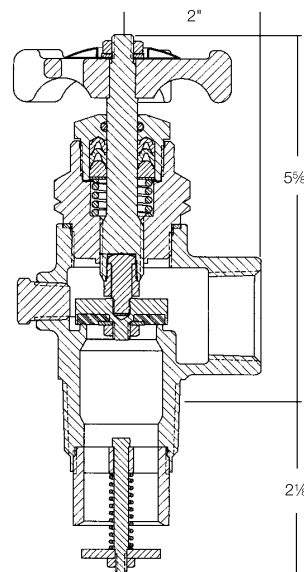
- Positive-acting excess flow valve opens for maximum flow at minimum pressure drop when filling — regardless of the type of coupling in which the valve is installed.
- Excess flow seat is fully contained in the tank coupling for maximum protection in the event of external damage to the valve.
- Resilient seat disc assembly is fully contained on three sides for bubble-tight shut-off and long service life.
- "V"-ring spring loaded stem seal design requires no repacking or field adjustment.
- A8017DH has two plugged 1/4" NPT ports, one on the top and the other on the side, accommodate either a vent valve or hydrostatic relief valve.
- A8020D has a plugged 1/4" NPT port that accommodates vent valve, hydrostatic relief valve, or pressure gauge.
- A8017DH incorporates an automatic back check valve built into the shut-off valve, eliminating the need for a separate hydrostatic relief valve.

Materials

Body	Ductile Iron
Bonnet	Steel
Stem	Stainless Steel
Seat Disc	Resilient Synthetic Rubber
"V"-Rings	Teflon
Excess Flow Valve.....	Stainless Steel - Steel Body
Springs	Stainless Steel



A8017DP



A8020D



Ordering Information

Part Number	Inlet Connection (M. NPT)	Outlet Connection (F. NPT)	Approximate Excess Flow Liquid Closing Flow** (GPM/NH3)	Accessories	
				Hydrostatic Relief Valve	Vent Valve
A8017DH*	1 1/4"	1"	44.1	Not Required	TSS3169
A8017DP			49.5	SS8001J	
A8017DLP		3/4"	41.1	SS8001J	
A8020D	1 1/4"	1"	70.2	SS8001J	TSS3169

* Built-in back pressure check valve incorporated into shut-off valve.

Excess Flow Valves for Liquid or Vapor Line Service A1519 Series

Application

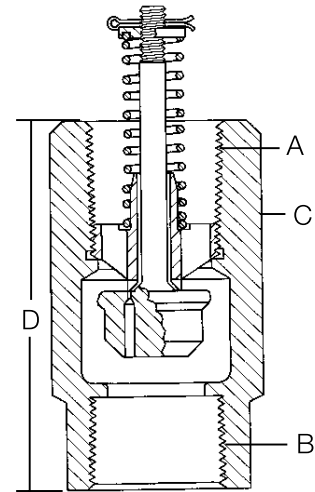
Designed for top installation, in any position, in liquid or vapor service lines. They are intended for long lines or branch piping where tank mounted excess flow valves cannot suffice.

Features

- Precision machined.
- Generous flow channels provide low pressure drop.
- Cotter pin prevents loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.

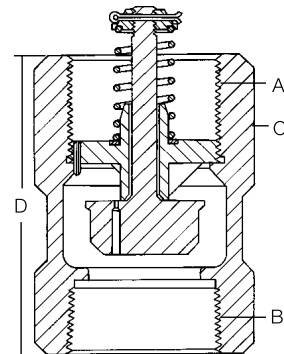
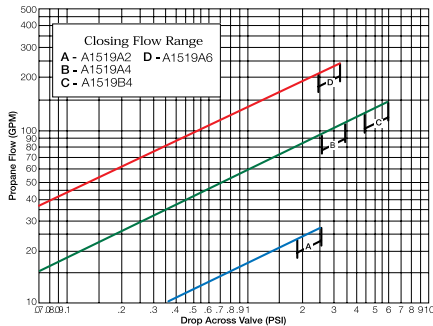
Materials

A1519 Series	
Body	Cadmium Plated Steel
Valve Disc.....	Cadmium Plated Steel
Stem	Stainless Steel
Spring	Stainless Steel
Guide	Ductile Iron

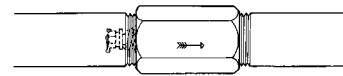


**A1519A2,
A1519A4,
A1519B4**

Performance



A1519A6



Typical Installation

Ordering Information

Part Number	Material	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx)	Approximate Closing Flows*
						Liquid (GPM NH3)
A1519A2	Steel	1"	1"	1 3/4"	3 1/2"	23
A1519A4		2"	2"	3"	4 13/16"	90
A1519B4		2"	2"	3"	4 13/16"	120
A1519A6		3"	3"	4"	6 7/32"	200

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

Excess Flow Valves for Liquid or Vapor A3272 Series, A3282 Series, A3292 Series

Application

Designed for liquid or vapor use for filling, withdrawal and vapor equalizing in container or line applications. They are intended for long lines or branch piping where tank-mounted excess flow valves are inadequate.

Features

- Precision machined.
- Generous flow channels provide low pressure drop.
- Stainless steel spring provides consistent closing flow and long service life.

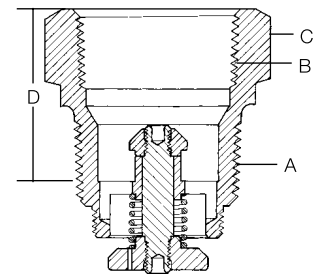
Materials

Series A3272, A3282, A3292

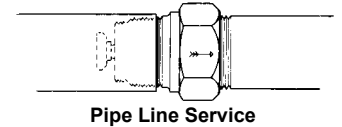
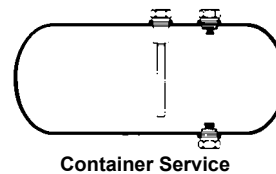
Body	Plated Steel
Seat Disc	Plated Steel
Stem	Plated Steel
Spring	Stainless Steel



A3282C



Typical Installation



Performance



Ordering Information

Part Number	Material	A Inlet Connection (M. NPT)	B Outlet Connection (F. NPT)	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flow*
						Liquid (GPM NH3)
A3272G	Steel	3/4"	3/4"		1 3/8"	18
A3282C		1 1/4"	1 1/4"	2"	1 3/8"	45
A3292A				3"	2"	68
A3292B		2"	2"	3"		90
A3292C						

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

Excess Flow Valves for Container Service

A7537 Series, A7539 Series, A8523 and A8525

Application

Designed for mounting in threaded full or half couplings in container installations. They may be used for filling, withdrawal or vapor equalizing applications. The exceptionally low pressure drop makes them ideal for pump suction lines. If a riser pipe to the vapor space is used with these valves, the minimum inside diameter of the riser pipe must be at least two times the valve thread size in order not to restrict flow to the side inlet ports.

Features

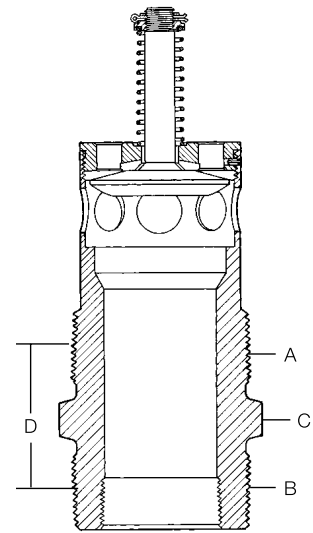
- Precision machined.
- Generous flow channels provide low pressure drop minimizing cavitation in pump suction lines.
- Cotter pin prevents loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.
- Separate models for installation in either half or full couplings.

Materials

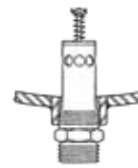
Body	Cadmium Plated Steel
Body (A7539 Series Only)	Ductile Iron
Seat Disc	Cadmium Plated Steel
Stem	Stainless Steel
Spring	Stainless Steel
Guide	Cadmium Plated Steel



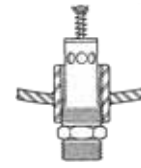
A7537N4



Typical Installation

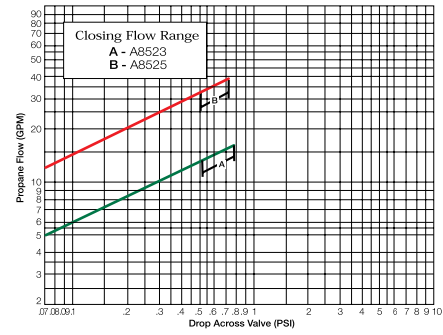
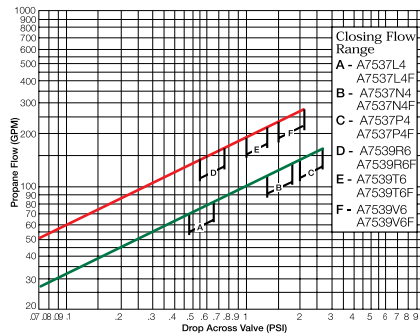


Half Coupling



Full Coupling

Performance



Ordering Information

Part Number	For Use With This Type Coupling	A Inlet Connection M. NPT	B Outlet Connection NPT	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flow*
						Liquid (GPM NH3)
A8523	Half	3/4"	3/4" Male	1 1/8"	1 1/4"	14
A8525	Half	1 1/4"	1 1/4" Male	1 3/4"	2 1/8"	32
A7537L4	Half	2"	2" Male and 1 1/4" Female	2 3/8"	2 1/2"	70
A7537N4	Half					115
A7537N4F	Full					135
A7537P4	Half					180
A7537P4F	Full					225
A7539R6	Half					3"
A7539R6F	Full	32				
A7539T6	Half	70				
A7539T6F	Full	115				
A7539V6	Half	135				
A7539V6F	Full	180				

* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

Excess Flow Valves for Vapor or Liquid A2137 Series

Application

Designed especially for filling, withdrawing or vapor equalizing in half and full coupling installations. Ideal for container service where welded-in dip pipes are not provided. For vapor use, mount in the bottom opening with a threaded dip pipe. For liquid use, mount in the top opening with a threaded dip pipe. These may also be installed in pipe lines provided the connection is made to the male inlet thread and not the female dip pipe connection.

Features

- Precision machined.
- Cotter pin helps prevent loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.
- Generous flow channels provide low pressure drop.

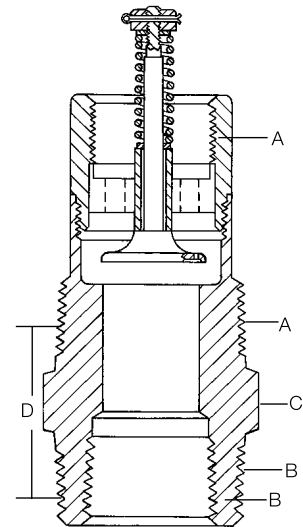
Materials

A2137 Series

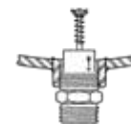
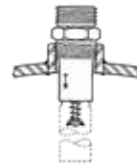
Body	Cadmium Plated Steel
Disc.....	Cadmium Plated Steel
Stem	Stainless Steel
Spring	Stainless Steel
Guide.....	Cadmium Plated Steel



A2137



Typical Installations



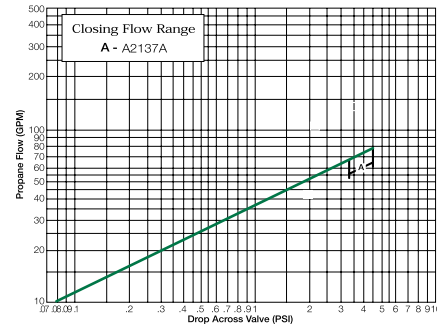
Container Service



Pipe Line Service



Performance



Ordering Information

Part Number	A Inlet Connection NPT	B Outlet Connection F. NPT	C Wrench Hex Flats	D Effective Length (Approx.)	Approximate Closing Flows***
					Liquid (GPM NH3)
A2137	2"	2" Male and 1 1/4" Female*	2 7/16"	1 1/2"	45
A2137A					64

* 1 1/4" F. NPT Dip Pipe Connection

** 2" F. NPT Dip Pipe Connection

*** Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

Excess Flow Valves for Flange Mounting in Container Service

A3500 Series and A4500 Series

Application

Designed for mounting in flanged tank connections with internal threads in the bottom of a container. They may be used in filling, withdrawal or vapor equalizing application. They provide high flow capacity with low pressure drop to minimize pump inlet line cavitation.

If a riser pipe to the vapor space is used with these excess flow valves, the minimum inside diameter of the riser pipe must be at least two times the valve thread size in order not to restrict flow to the side inlet ports.

Flange mounted excess flow valves are readily accessible for servicing and completely enclosed and protected in event of fire. Because there is no direct connection between external piping and the valve, stresses imposed on piping will not affect the excess flow valve.

Features

- Precision machined.
- Generous flow channels provide low pressure drop minimizing cavitation in pump suction lines.
- Cotter pin prevents loss of spring retainer due to vibration in service.
- Stainless steel spring provides consistent closing flow and long service life.

Materials

Body Cadmium Plated Steel
 Seat Disc Cadmium Plated Steel
 Stem Stainless Steel
 Spring Stainless Steel
 Guide Cadmium Plated Steel

Flanged Installation In Container

NOTE: The opening in the tank flange should be machined with a ¼"-45° chamfer at the outer edge. The thread should be tapped one or two turns large as checked by a plug gauge. This and the undersize thread on the valve should permit the valve to be installed so that its outer face is at least flush with the outer edge of the flange.

The valve is screwed into this opening by fitting a ¼" flat metal piece into the slot and turning until hand tight. A lubricant may be used, but a luting compound is not necessary since this joint does not have to be gas tight.

If any difficulty is experienced in "making up" the valve to fit flush, as indicated, the thread in the tank flange can be tapped.

Design and construction of tank and flange must be in accordance with the appropriate section of the ASME Pressure Vessel Code.

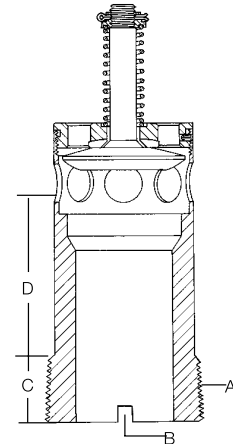
Ordering Information

Part Number	A Inlet Connection NPT	B For Installation	C Effective Thread (Approx.)	D Threaded End To Port	Approximate Closing Flows*
					Liquid (GPM NH3)
A3500L4	2"	Slotted Body	¾"	1 15/16"	70
A3500N4					115
A3500P4					135
A3500R6					180
A3500T6	3"		1"	1 1/8"	225
A3500V6					450
A4500Y8					450

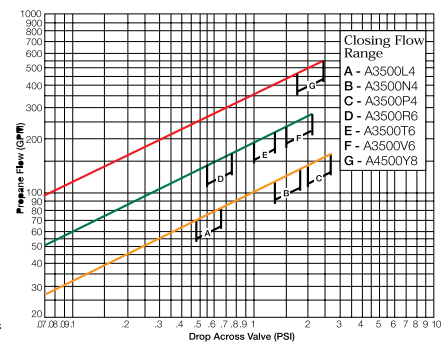
* Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.



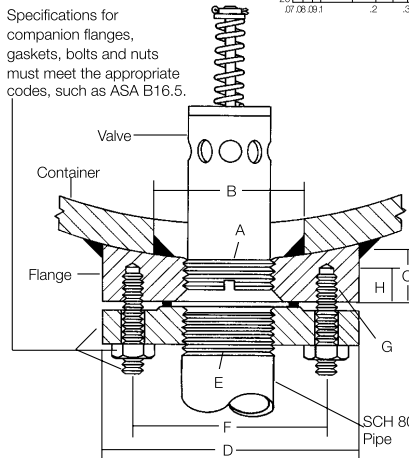
A3500L4



Performance



Specifications for companion flanges, gaskets, bolts and nuts must meet the appropriate codes, such as ASA B16.5.



Key No.	Description	A3400L4, A3500L4, A3500N4, A3500P4	A3400L6, A3500R6, A3500T6, A3500V6	A4500Y8
A	Valve Size (NPT)	2"	3"	4"
B	Tank Opening	3 1/2"	4 1/2"	5 1/2"
C	Thickness (min.)	1"	1 1/4"	1 3/8"
D	Outside Diameter	6 1/2"	8 1/4"	10"
E	Pipe Thread (NPT)	2"	3"	4"
F	Bolt Circle Dia.	5"	6 3/8"	7 1/8"
	Number of Bolt Holes	8	8	8
G	Bolt Hole Thread	5/8" - 11 NC - 2	3/4" - 10 NC - 2	3/4" - 10 NC - 2
H	Bolt Hole Thread (min. eff.)	3/4"	1"	1 1/8"

Excess Flow Valves for Liquid or Vapor Withdrawal

A8013D Series

Application

These valves are designed for bottom mounting in consumer storage tanks for liquid service. They may also be top mounted for vapor service. These valves are designed especially for use with RegO® globe and angle valves.

Features

- A8013D Series features a 2-position floating valve disc for faster, more efficient container filling.
- Precision machined.
- Stainless steel spring provides consistent closing flow and long service life.
- Generous flow channels provide low pressure drop.

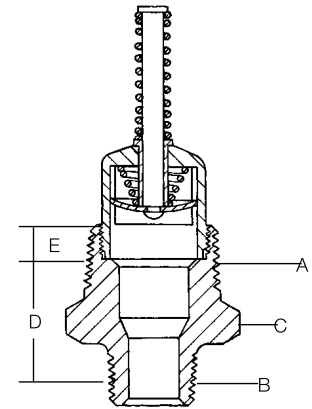
Materials

A8013D Series

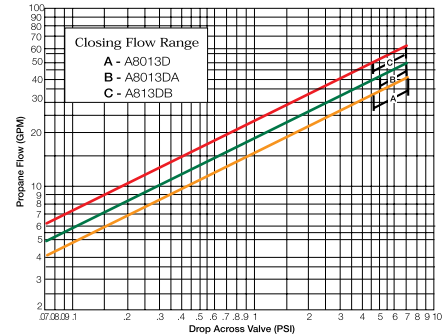
Body	Cadmium Plated Steel
Disc.....	Stainless Steel
Stem	Stainless Steel
Spring	Stainless Steel
Guide.....	Cadmium Plated Steel
Insert.....	Stainless Steel



A8013D



Performance



Ordering Information

Part Number	A. Inlet Connection M. NPT	B. Outlet Connection NPT	C. Wrench Hex Flats	D. Effective Length (Approx.)	E. Threaded End To Port	Approximate Closing Flow**
						Liquid (GPM NH3)
A8013D	1 1/4"	3/4"	1 1/4"	1 3/32"	-	35
A8013DA		1"		1 1/16"		40
A8013DB		1 1/4"		1 1/32"		50

* 3/4" F. NPT Dip Pipe Connection

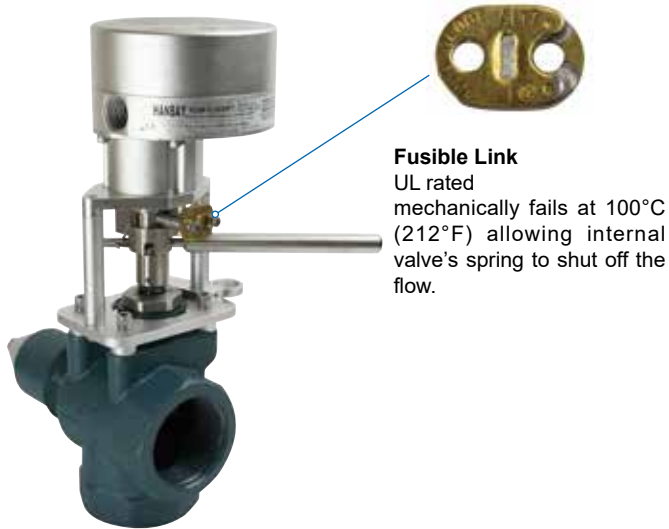
** Based on horizontal installation of excess flow valve. Flows are slightly more when valves are installed with outlet up; slightly less when installed with outlet down.

Electric Actuators

Electric Actuators are a simple, safe and reliable solution with accurate and smooth motion control. There is no need for a compressed air source and no concern of moisture freezing shutting a system down. Remote emergency-shut-down locations can be easily installed and easily maintained. The electric actuators come installed on the valve and are tested for proper operation at the factory. All electric actuators are rated CSA UL Class 1 Div 1 Explosion proof enclosures.

Electric actuators are available to retrofit existing RegO valves and are easy to install. Positional indication and operation, can be remoted to a truck cab or control panel (or PLC) to indicate valve position. Manual override handle also indicates position and can be used for Lock-Out. An internal heater is installed to ensure reliability. A thermal fuse is incorporated to ensure no over temp.

Safety Features



Fusible Link
UL rated mechanically fails at 100°C (212°F) allowing internal valve's spring to shut off the flow.

Electronic Thermal Cut-Off

Internal component cuts power line at 89°C (208°F). Actuator closes when power is lost.

General Specifications

Model	Torque Range (in-lbs)	Speed Range (time to open)
RDM	44 .. 95	2 sec .. 10 sec

- Enclosure: NEMA 6 / IP67 IP67 / 40°C (104°F)
 - Enclosure: Class 1, Div 1 Groups D, C, D /T6
 - Temperature Range: -40°C/F .. 70°C (185°F) Internal heater standard
 - Finish: Anodized white, Stainless
 - Stall Protection: By current sense and motion detection
 - Feedback: Limit switches
 - Life Expectance: 250,000 cycles or equivalent under specified conditions
 - Motor: BLDC brushless DC motor
 - Voltages: 12/24 VDC
 - Positioning precision: +/- 3 deg
 - Range Setting: Set according to valve
 - Speed setting: Set according to valve
 - End of travel detection: By current sense and motion detection
 - Power setting: Set according to valve
 - Motor control: Internal micro controller
 - Mechanical shock: 1 m drop test no damage to function Random SAE J1211, Chassis, Exterior
 - Mechanical vibration: Random SAE J1211, Chassis, Exterior
-
- Housing: All housing parts anodized aluminum
 - Bearings: Oiled for life porous bronze bearings
 - External Fasteners: Stainless Steel
 - Manual Override: Mounted Directly on the valve stem
 - Control: 12/24 VDC TTL
 - Limit Switches: Switches are triggered at fully closed, and fully open position. (independent I/O)

1 1/4" Threaded Internal Valve with Electric Actuator for Small Capacity Pumping Systems and Bobtail Vapor Equalization EA3209E Series

Application

Designed primarily for use with anhydrous ammonia as a main valve on small capacity pumping systems, NH3 nurse tanks and in-line installations. It may also be installed in the vapor equalizing opening on bobtail delivery trucks. Installation is quick and easy, and it fits in both full and half couplings, as well as, in-line applications.



Features

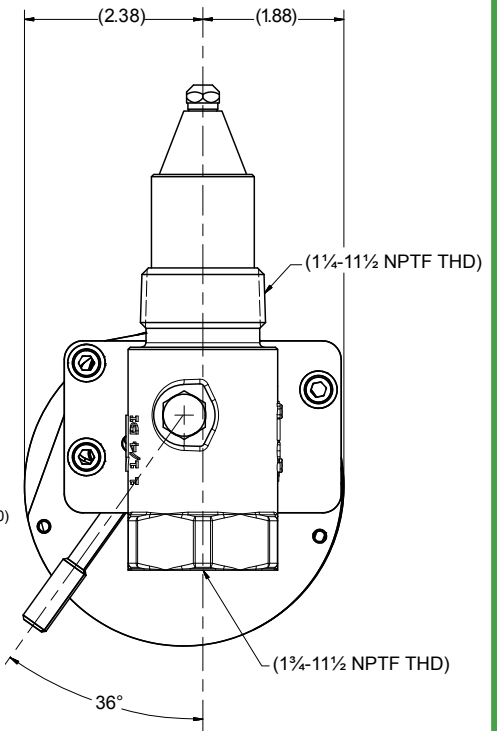
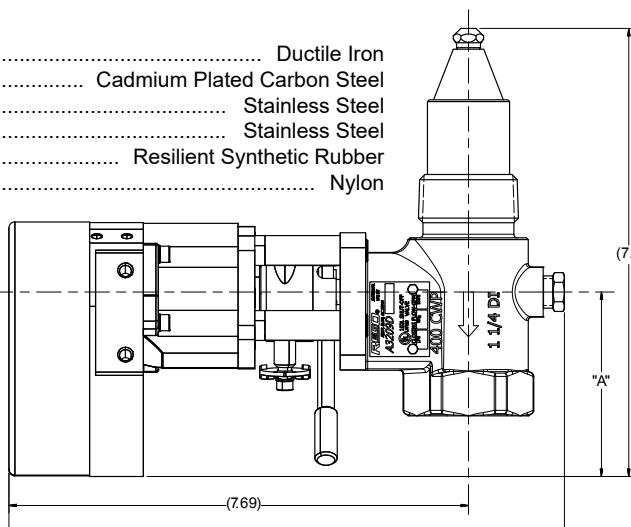
- One piece body construction.
- Spring loaded V-packing with heavy duty wiper ring on operating shaft for dependable leak-free construction.
- Nylon bearing supported operating shaft provides smooth, easy operation.
- Excess flow valve feature
- Return spring forces the valve lever to the closed position when the power is de-energized.
- All critical operating components are located in the valve body and inside the container coupling for maximum protection against damage.
- Midway stem position (rapid bleed) allows for quick pressure equalization.
- Equipped with 212° F, UL listed fuse link for thermal protection.
- Provides a convenient means of electrically opening and closing the valve from a remote location.
- CSA/UL rated Explosion Proof Enclosure on the actuator.
- Class I, Div 1 Groups B, C, D, / T6
- 12-24VDC
- Internal Valve is UL Listed and TPED Certified
- Electric Actuator is ATEX Certified



EA3209D Series

Materials

Body	Ductile Iron
Operating Lever	Cadmium Plated Carbon Steel
Stem	Stainless Steel
Springs	Stainless Steel
Seat Disc	Resilient Synthetic Rubber
Shaft Bearing	Nylon



Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Voltages	Closing Flow NH3
EA3209D050	1 1/4"	1 1/4"	12/24 VDC	45
EA3209D080	1 1/4"	1 1/4"		72
EA3209DT050*	1 1/4"	1 1/4"		45
EA3209DT080*	1 1/4"	1 1/4"		72

* T-Body Design

1½" Internal Valve with Electric Actuator EA3211D Series

Application

Designed primarily for use with anhydrous ammonia as a main valve on pumping systems, and in-line installations. Installation is quick and easy and it fits in both full and half couplings, as well as, in-line applications.

Features

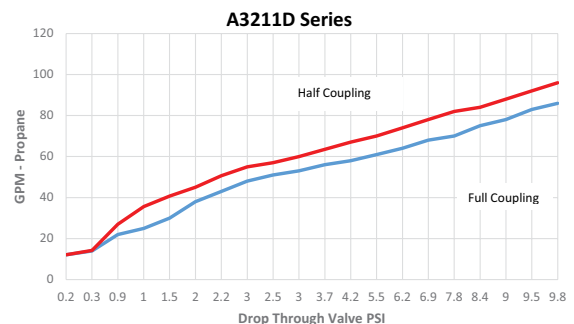
- One piece body construction.
- Spring loaded V-packing with heavy duty wiper ring on operating shaft for dependable leak-free construction.
- Nylon bearing supported operating shaft provides smooth, easy operation.
- Excess flow valve feature
- Return spring forces the valve lever to the closed position when the power is de-energized.
- All critical operating components are located in the valve body and inside the container coupling for maximum protection against damage.
- Midway stem position (rapid bleed) allows for quick pressure equalization.
- Equipped with 212° F, UL listed fuse link for thermal protection.
- Provides a convenient means of electrically opening and closing the valve from a remote location.
- CSA/UL rated Explosion Proof Enclosure on the actuator.
- Class I, Div 1 Groups B, C, D, / T6
- 12-24VDC
- Internal Valve is UL Listed and TPED Certified
- Electric Actuator is ATEX Certified



EA3211D Series

Materials

Body Ductile Iron
 Operating Lever..... Cadmium Plated Carbon Steel
 Stem Stainless Steel
 Springs Stainless Steel
 Shaft Bearing..... Nylon
 Seat Disc Synthetic Rubber



Ordering Information

Part Number	Inlet M.NPT	Outlet FNPT	Voltages	Closing Flow GPM	
				Half Coupling	Full Coupling
EA3211D080	1½"	1½"	12/24 VDC	72	67
EA3211D110	1½"	1½"		99	76

2" Internal Valves with Electric Actuator For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks EA3212 Series

Application

Designed primarily for use with anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of bobtail delivery trucks, transports, stationary storage tanks, and in-line installations.

Features

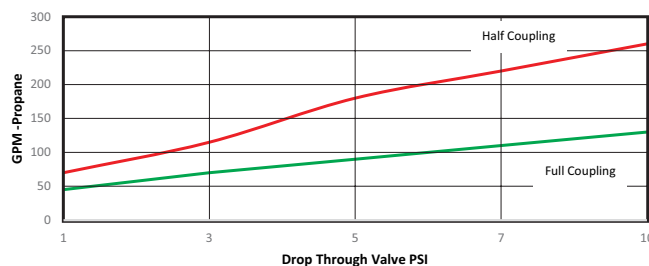
- One piece body construction.
- Spring loaded V-packing with heavy duty wiper ring on operating shaft for dependable leak-free construction.
- Nylon bearing supported operating shaft provides smooth, easy operation.
- Excess flow valve feature
- Return spring forces the valve lever to the closed position when the power is de-energized.
- All critical operating components are located in the valve body and inside the container coupling for maximum protection against damage.
- Midway stem position (rapid bleed) allows for quick pressure equalization.
- Equipped with 212° F, UL listed fuse link for thermal protection.
- Provides a convenient means of electrically opening and closing the valve from a remote location.
- CSA/UL rated Explosion Proof Enclosure on the actuator.
- Class I, Div 1 Groups B, C, D, / T6
- 12-24VDC
- Internal Valve is UL Listed and TPED Certified
- Electric Actuator is ATEX Certified



EA3212R Series

Materials

Body Ductile Iron
 Operating Lever..... Cadmium Plated Steel
 Stem Stainless Steel
 Springs Stainless Steel
 Seat Disc Resilient Synthetic Rubber
 Shaft Bearing..... Nylon



Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Voltages	Closing Flow (GPM) Half Coupling	Closing Flow (GPM) Full Coupling
EA3212R105	2"	2"	12/24 VDC	95	59
EA3212RT105		2" T-body			
EA3212R175		2"		158	90
EA3212RT175		2" T-body			
EA3212R250		2"			
EA3212RT250		2" T-body			

3" Internal Valves with Electric Actuator For Bobtail Delivery Trucks, Transports and Stationary Storage Tanks EA3213D Series

Application

Designed primarily for use with anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of bobtail delivery trucks, transports, stationary storage tanks, and in-line installations.



Features

- One piece body construction.
- Spring loaded V-packing with heavy duty wiper ring on operating shaft for dependable leak-free construction.
- Nylon bearing supported operating shaft provides smooth, easy operation.
- Excess flow valve feature
- Return spring forces the valve lever to the closed position when the power is de-energized.
- All critical operating components are located in the valve body and inside the container coupling for maximum protection against damage.
- Midway stem position (rapid bleed) allows for quick pressure equalization.
- Equipped with 212° F, UL listed fuse link for thermal protection.
- Provides a convenient means of electrically opening and closing the valve from a remote location.
- CSA/UL rated Explosion Proof Enclosure on the actuator.
- Class I, Div 1 Groups B, C, D, / T6
- 12-24VDC
- Internal Valve is UL Listed and TPED Certified
- Electric Actuator is ATEX Certified



Materials

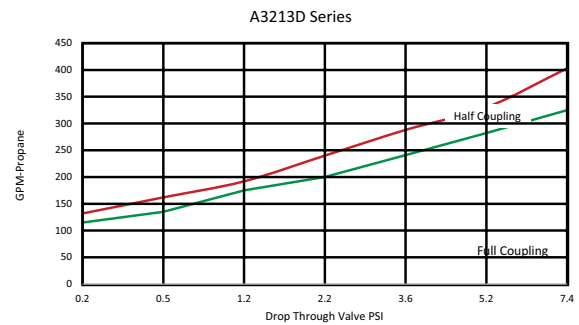
Body Ductile Iron
 Operating Lever..... Cadmium Plated Steel
 Stem Stainless Steel
 Springs Stainless Steel
 Seat Disc Resilient Synthetic Rubber
 Shaft Bearing..... Nylon



Ordering Information

Part Number	Inlet Connection M.NPT	Outlet Connections F.NPT	Voltages	Closing Flow Half Coupling (GPM)	Closing Flow Full Coupling (GPM)
EA3213D150	3"	3"	12/24 VDC	135	113
EA3213D200				180	144
EA3213D300				270	225
EA3213D400				360	293
EA3213DT150*				135	113
EA3213DT200*				180	144
EA3213DT300*				250	225
EA3213DT400*				325	293

* T-body design



1/4" Threaded Internal Valve for Small Capacity Pumping Systems and Vapor Equalization A3209D & A3209DT Series

Application

Designed primarily for use with anhydrous ammonia as a main valve on small capacity pumping systems, NH3 nurse tanks and in-line installations. It may also be installed in the vapor equalizing opening on delivery trucks. Installation is quick and easy, and it fits in both full and half couplings, as well as, in-line applications. The valve may be actuated manually by hand or cable.

Features

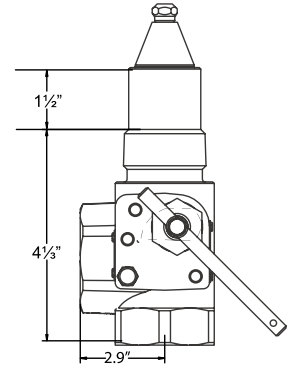
- Valve is compact, with one piece body construction.
- Spring loaded V-packing with heavy duty wiper ring on operating shaft for dependable leak-free construction.
- Nylon bearing supported operating shaft provides smooth, easy operation.
- Simple operating lever allows for easy connection of cable controls.
- Built in excess flow valve
- Return spring forces the valve to the closed position when the lever is released.
- All critical operating components are located in the valve body and inside the container coupling for maximum protection against damage.
- Midway stem position allows for quick pressure equalization.
- Equipped with 212° F, UL listed fuse link for thermal protection.

Materials

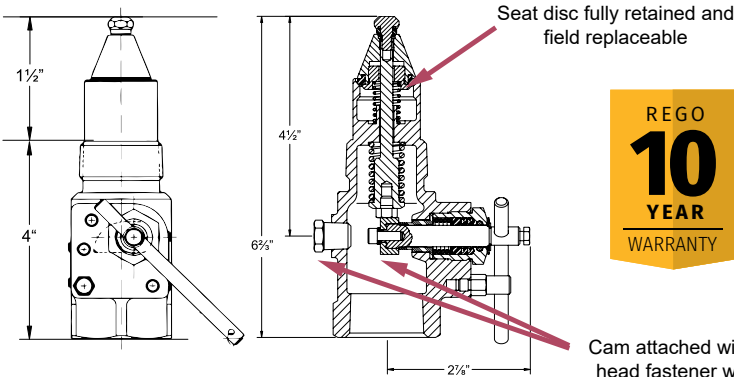
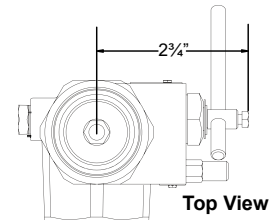
Body Ductile Iron
 Operating Lever..... Cadmium Plated Carbon Steel
 Stem Stainless Steel
 Springs Stainless Steel
 Seat Disc Resilient Synthetic Rubber
 Shaft Bearing..... Nylon



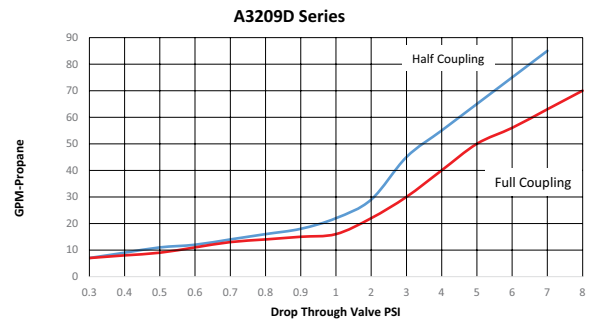
A3209DT



A3209D



Cam attached with Allen head fastener which is accessed from the 1/4" pipe plug on side of the body



Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Closing Flow NH3	Accessories	
				Thermal Latch	Pneumatic Actuators
A3209D050	1/4"	1/4"	45	A3209TL	A3209PA
A3209D080	1/4"	1/4"	72		
A3209DT050	1/4"	1/4"	45		
A3209DT080	1/4"	1/4"	72		

1½" Internal Valve A3211D Series

Application

Designed primarily for use with anhydrous ammonia as a main valve on pumping systems, and in-line installations. Installation is quick and easy, and it fits in both full and half couplings, as well as, in-line applications. The valve may be opened manually by hand or pneumatic actuator.

Features

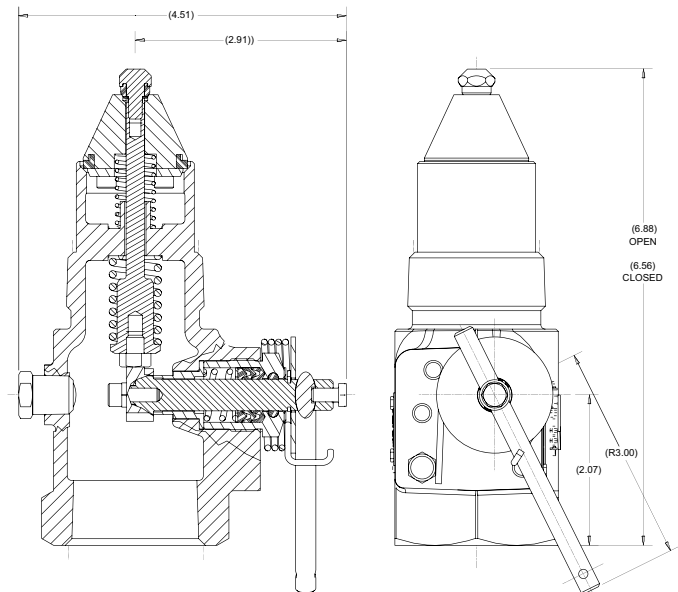
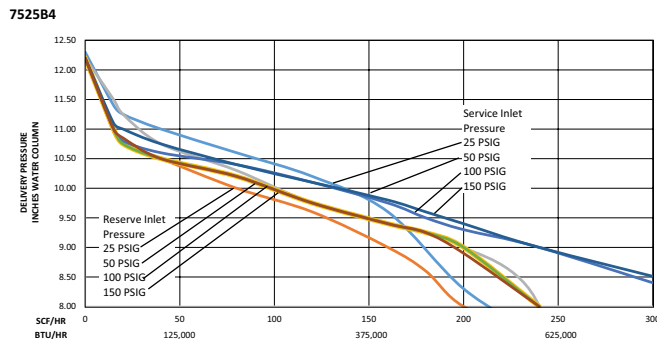
- Valve is compact, with one piece body construction.
- Spring loaded V-packing with heavy duty wiper ring on operating shaft for dependable leak-free construction.
- Nylon bearing supported operating shaft provides smooth, easy operation.
- Simple operating lever allows for easy connection of cable controls.
- Built in excess flow valve
- Return spring forces the valve to the closed position when the lever is released.
- All critical operating components are located in the valve body and inside the container coupling for maximum protection against damage.
- Midway stem position allows for quick pressure equalization.
- Equipped with 212° F, UL listed fuse link for thermal protection.



A3211D

Materials

Body Ductile Iron
 Operating Lever..... Cadmium Plated Carbon Steel
 Stem Stainless Steel
 Springs Stainless Steel
 Shaft Bearing..... Nylon
 Seat Disc Synthetic Rubber



Ordering Information

Part Number	Inlet M-NPT	Outlet F-NPT	Closing Flow GPM		Accessories
			Half Coupling	Full Coupling	Thermal Latch
			NH3	NH3	
A3211D080	1½"	1½"	72	67	A3209TL
A3211D110	1½"	1½"	99	76	

2" Internal Valves For Delivery Trucks, Transports and Stationary Storage Tanks A3212 Series

Application

Designed primarily for use with anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of delivery trucks, transports, stationary storage tanks, and in-line installations. The valve may be operated manually by cable or pneumatically.



Features

- May be installed in full and half couplings.
- Nylon bearing supported operating shaft provides smooth, easy operation.
- Simple operating lever facilitates easy adaptation of all cable controls.
- Midway stem position allows for quicker pressure equalization.
- All critical operating components are located in the valve body inside the container coupling for maximum protection against physical damage.
- Built in excess flow valve.
- Return spring returns the valve to the closed position when the handle is released.
- Specify RegO® Internal Valves on your next new tank body or when your tank is rebuilt.
- A3213PA pneumatic actuator provides a convenient means of opening and closing the valve from a remote location, using either air or nitrogen for both the A3212R & A3213A service valves.

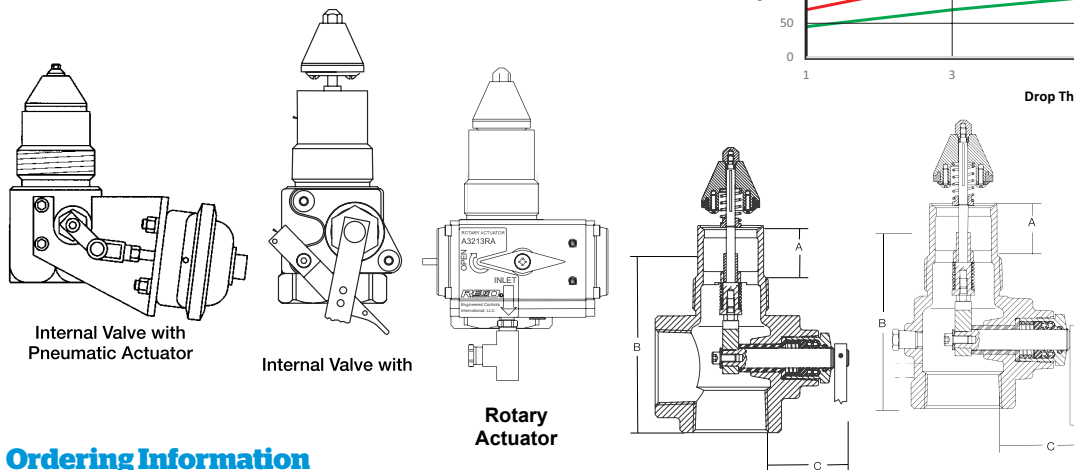
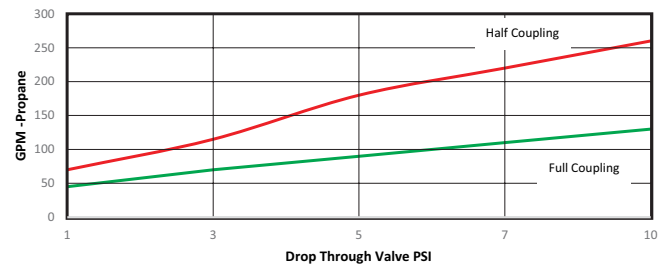


A3212R Series

Materials

Body Ductile Iron
 Operating Lever..... Cadmium Plated Steel
 Stem Stainless Steel
 Springs Stainless Steel
 Seat Disc Resilient Synthetic Rubber
 Shaft Bearing..... Nylon

A3212R Series



Ordering Information

Part Number	Inlet Connection M. NPT	Outlet Connection F. NPT	Closing Flow (GPM)		A	B	C	Accessories	
			Half Coupling NH3	Full Coupling NH3				Thermal Latch	Pneumatic Actuator
A3212R105	2"	2"	95	59	1 ⁹ / ₁₆ "	4 ¹¹ / ₁₆ "	3 ⁴⁵ / ₆₄ "	A3213TL	A3213PA
A3212RT105		2" T-body							
A3212R175		2"	158	90		4 ¹¹ / ₁₆ "			
A3212RT175		2" T-body							
A3212R250		2"	225	117		4 ¹¹ / ₁₆ "			
A3212RT250		2" T-body							

3" Internal Valves For Delivery Trucks, Transports and Stationary Storage Tanks A3213D Series

Application

Designed primarily for use with anhydrous ammonia for liquid withdrawal; vapor transfer or vapor equalization of delivery trucks, transports, stationary storage tanks, and in-line installations. The valve may be operated manually by cable or pneumatically.

Features

- May be installed in full and half couplings.
- Nylon bearing supported operating shaft provides smooth, easy operation.
- Simple operating lever facilitates easy adaptation of all cable controls.
- Midway stem position allows for quicker pressure equalization.
- All critical operating components are located in the valve body inside the container coupling for maximum protection against physical damage.
- Built in excess flow valve.
- Return spring returns the valve to the closed position when the handle is released.
- Specify RegO® Internal Valves on your next new tank body or when your tank is rebuilt.
- A3213PA pneumatic actuator provides a convenient means of opening and closing the valve from a remote location, using either air or nitrogen for A3213D service valves.

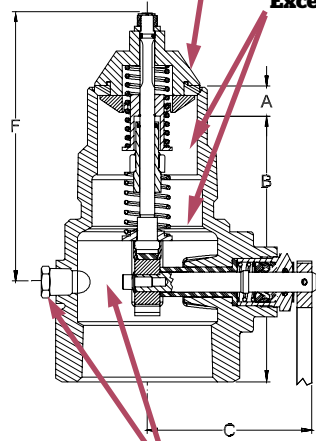
Materials

Body Ductile Iron
 Operating Lever..... Cadmium Plated Steel
 Stem Stainless Steel
 Springs Stainless Steel
 Seat Disc Resilient Synthetic Rubber
 Shaft Bearing..... Nylon



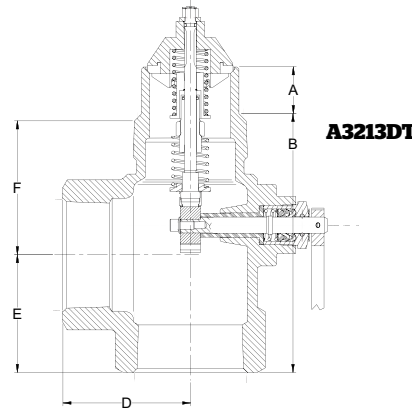
Seat disc fully retained and field replaceable.

Excess flow spring is independent from return spring operation

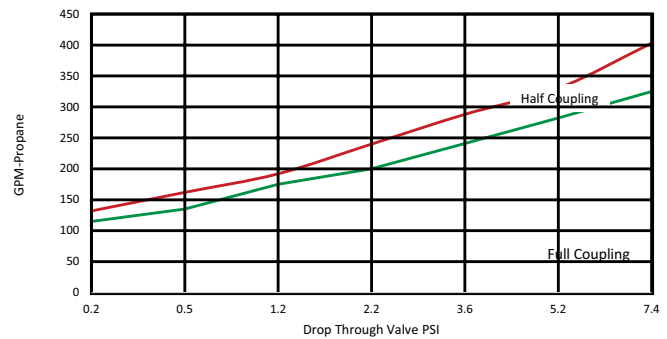


Cam attached with Allen head fastener which is accessed from the 1/4" pipe plug on side of the body

A3213D Series



A3213D Series



Ordering Information

Part Number	Inlet Connection M-NPT	Outlet Connections F-NPT	Closing Flow Half Coupling (GPM) NH3	Closing Flow Full Coupling (GPM) NH3	Accessories	
					Pneumatic Actuator	Thermal Latch
A3213D150	3"	3"	135	113	A3213PA	A3213TL
A3213D200			180	144		
A3213D300			270	225		
A3213D400			360	293		
A3213DT150			135	113		
A3213DT200			180	144		
A3213DT300			250	225		
A3213DT400			325	293		

3" Flanged Internal Valves for Delivery Trucks, Transports and Large Stationary Storage Containers A3217A & A3217DA

Application

Designed primarily for anhydrous ammonia filling and/or withdrawal on MC331 delivery trucks, transports and stationary storage tanks with flanged pumps or piping. Installation is quick and easy, and the valve may be operated manually by cable or pneumatically. Lever available on right or left side to allow for installation without the use of an extra pulley.

Features

Provides More Efficient Operation

- Flow passages designed to allow substantially higher flow without cavitation or loss of efficiency--saving time and money.
- Simple operating lever facilitates easy adaptation of all cable controls.
- Lever available on right or left side to allow for installation without the use of an extra pulley.
- Nylon bearing supported operating shaft provides smooth, easy operation.

Less Frequent-Easier Maintenance

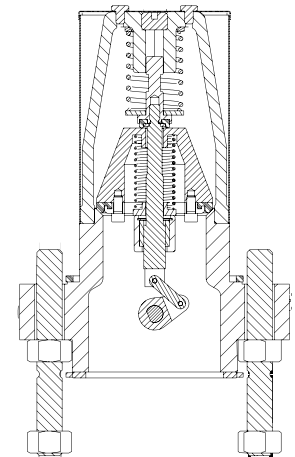
- Stainless steel screws resist rusting and are easily removed during valve disassembly.
- Heavy duty rod wiper helps minimize dirt and foreign material from entering operating shaft and hampering operation.

Durable Construction

- Cadmium plating helps resist corrosion during storage and use.
- All ferrous materials with a temperature range of -40° F. to +165° F. and a pressure rating of 400 psi.
- Sturdy retaining ring secures operating cam to provide for more durable, slack-free operation.
- Built-in excess flow valve.
- Specify RegO® Internal Valves on your next new tank or when your truck is rebuilt.



A3217AR



Ordering Information

Part Number	Operating Lever Position	Inlet Connection	Outlet Connection	Closing Flow GPM		Accessories	
				NH3	Pneumatic Actuator	Right Operation	Left Operation
Single Flange							
A3217AR160	A3217AL160	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	145	A3217ARPA	A3217ALPA	
A3217AR210	A3217AL210			190			
A3217AR260	A3217AL260			236			
A3217AR410	A3217AL410			372			
A3217AR510	A3217AL510			461			
Double Flange							
A3217DAR160	A3217DAL160	3" 300# ANSI RF Modified Flange*	3" 300# ANSI RF Flange	145	A3217ARPA	A3217ALPA	
A3217DAR210	A3217DAL210			190			
A3217DAR260	A3217DAL260			236			
A3217DAR410	A3217DAL410			372			
A3217DAR510	A3217DAL510			461			

Furnished with mounting studs and nuts

**Modified bore=4% diameter with 5% diameter raised face.

3" Flanged Internal Valves for Delivery Trucks, Transports, and Large Stationary Storage Tanks

Application

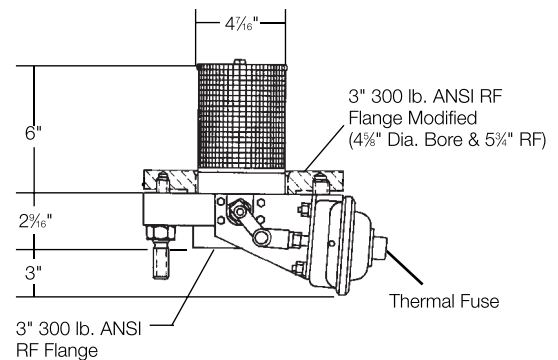
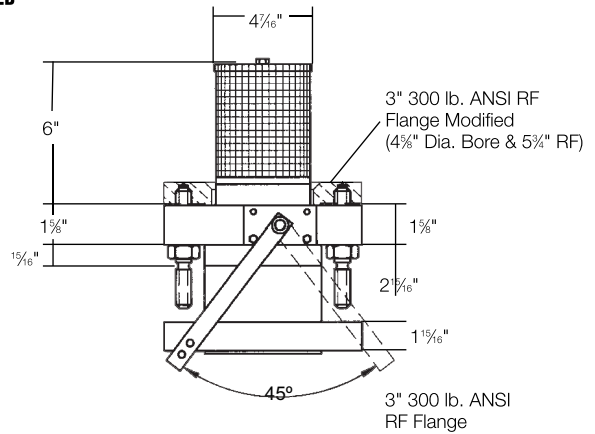
A3217FPA and A3217FLPA Pneumatic Actuators
 These Pneumatic Actuators are designed specifically for use with the A3217 Series 3" Internal Valves. The diaphragm design provides a convenient means of opening and closing the valve from a remote location, using either air or nitrogen.

Features

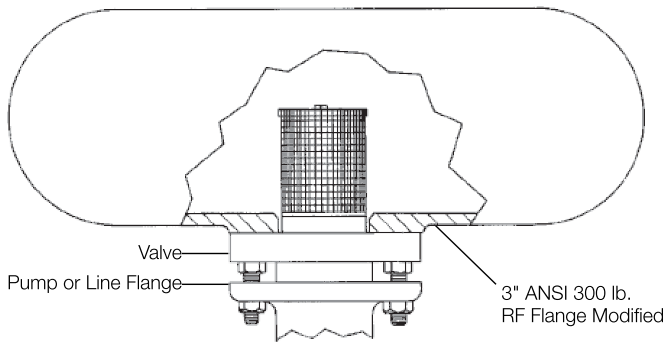
- Diaphragm type—no seals to leak.
- Easily installed on internal valve "in-line."
- Utilizes standard air brake chamber with proven performance over many years of heavy-duty truck/trailer applications.
- Compatible with existing air interlock systems.
- Operates with pressures of 50-150 psig.
- Thermal Fuse installed complies with DOT thermal protection requirements.

Materials

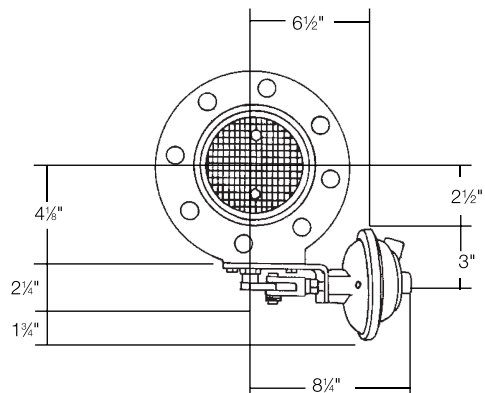
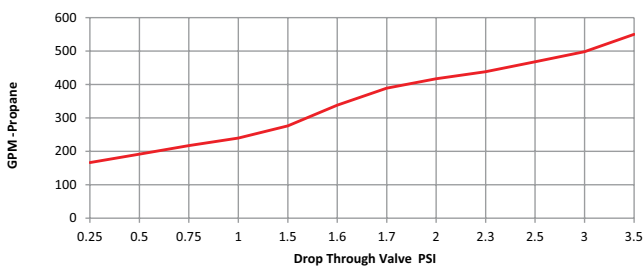
Body and Valve Cage	Cadmium Plated Ductile Iron
Seat	Nickel Chrome Plated Steel
Strainer	Stainless Steel
Shaft	Stainless Steel
Pilot Valve Stem	Stainless Steel
Springs	Stainless Steel
Actuator Cam	Stainless Steel
Lever	Cadmium Plated Carbon Steel
Seat Disc	Resilient Synthetic Rubber



Typical Valve Installation



A3217A & FA Series



4" Flanged Internal Valve for Transports and Large Stationary Storage Tanks A3219 Series

Application

Designed primarily for anhydrous ammonia service on MC331 transport pressure vessels and large stationary storage tanks. Installation is quick and easy, and it fits in most existing tank flanges. The valve may be actuated manually or pneumatically.

Use of the A3219RT Remote Thermal Release with this valve is suggested to provide a remote means of mechanical closure along with thermal protection, as required by DOT.

Features

Provides More Efficient Operation

- Flow passages designed to allow higher pumping rates without cavitation or loss of efficiency—saves time and money.
- One piece, stainless steel pilot valve provides more accurate alignment for dependable operation.
- Remote release lever allows cables to run directly to opposite ends of vessel without pulleys or tubing.

Protects Your Pump

- Main disc retaining screws are installed from the top down to help minimize loose screws from entering and damaging the pump.
- Back-up cotter pin is designed to minimize the chance of a loosened actuator nut and washer from entering and damaging the pump.

Less Frequent-Easier Maintenance

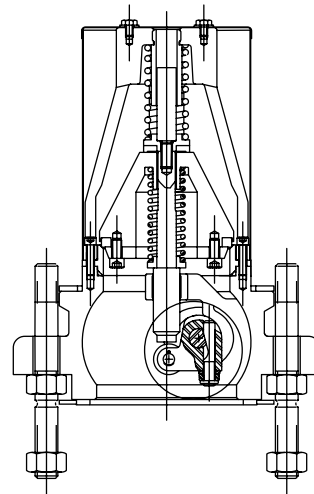
- Easily replaceable chrome plated seat insert eliminates need for expensive remachining of valve body when overhauled.
- Stainless steel screws resist rusting and are easily removed during valve disassembly.
- Strainer completely covers the top of the valve to help keep out sediment and foreign material.
- Strainer seats at the top flange of the valve's seat insert, making removal of the valve easier.

Durable Construction

- Cadmium plating helps resist corrosion during storage and use.
- Taper pin lock secures the operating shaft to provide for more precise, trouble-free actuation.
- Built-in excess flow valve and thermal protection.
- Specify RegO® Internal Valves on your next new tank body or rebuild.



A3219FA



Materials

Body and Valve Cage	Cadmium Plated Ductile Iron
Handle	Cadmium Plated Ductile Iron
Seat	Nickel Chrome Plated Steel
Strainer	Stainless Steel
Stem	Stainless Steel
Pilot Valve Plug	Stainless Steel
Springs	Stainless Steel
Roller Actuator	Cadmium Plated Carbon Steel
Lever Assembly	Cadmium Plated Carbon Steel
Seat Disc	Resilient Synthetic Rubber

Ordering Information

Part Number*	Inlet Connection	Outlet Connection	Closing Flow GPM***	Accessories	
			NH3	Pneumatic Actuator	Remote Thermal Release
A3219FA400L	4" 300# ANSI RF Modified Flange**	4" 300# ANSI RF Flange	400	A3219FPA	A3219RT (2)
A3219FA600L			600		

* Valve supplied with 16 nuts and 8 studs for mounting.
 ** Modified bore = 5 7/8" diameter with 7" diameter raised face.
 *** Other closing flows available

4" Flanged Internal Valves for Transports and Large Stationary Storage Tanks

Application

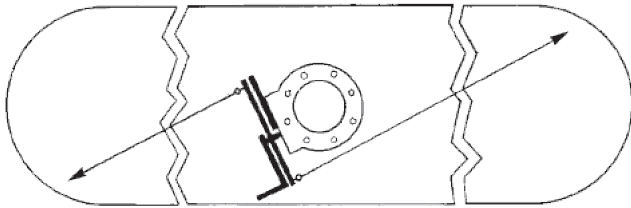
A3219FPA Pneumatic Actuator

The A3219FPA Pneumatic Actuator is designed especially for use with the A3219FA Series Flanged Internal Valves. The diaphragm type A3219FPA provides a convenient means of opening and closing the valve from a remote location, using either air or nitrogen, on NH3 transport trailers and stationary tanks.

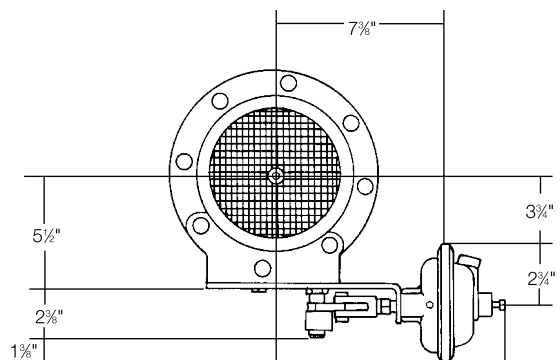
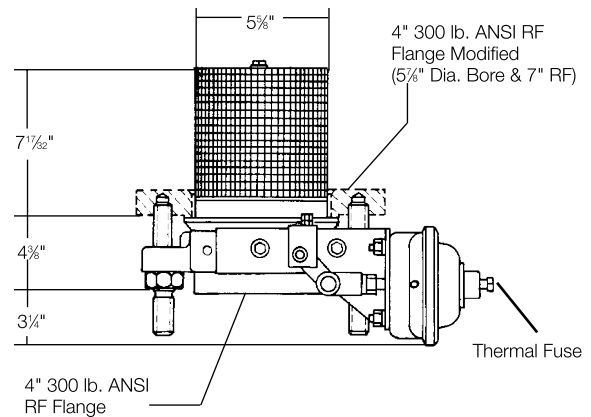
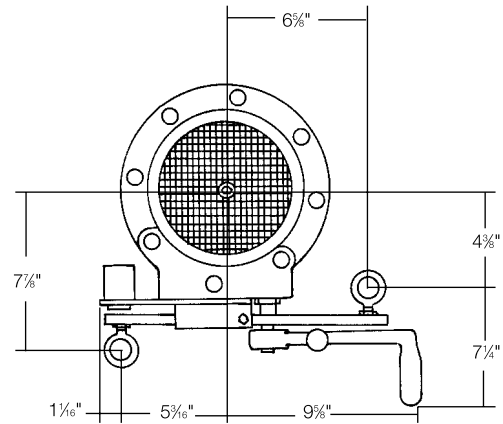
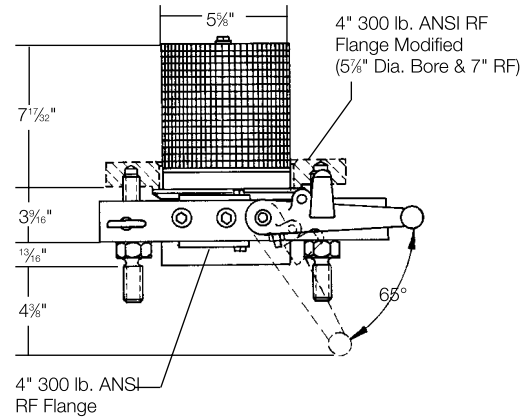
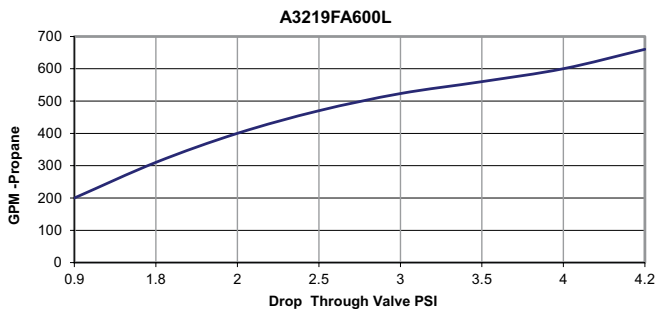
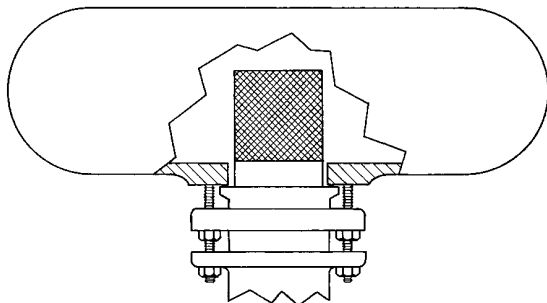
Features

- Diaphragm type—no seals to leak.
- Easily installed on internal valve "in-line,"
- Utilizes standard brake actuator with time proven performance in heavy-duty truck/trailer applications.
- Compatible with existing air interlock systems.
- Operate with pressures of 50-150 psig.
- Thermal fuse installed in actuator complies with DOT thermal protection requirements.

Typical Valve Positioning



Typical Valve Installation



Remote Thermal Release for DOT MC331 Pressure Vessel A3219RT

Application

Designed especially for use with Internal Valves installed in DOT MC331 pressure vessels. The A3219RT provides a remote means of mechanical closure along with thermal protection, as required by DOT MC331.

The A3219RT is connected by cable to the internal valve(s) on the vessel. In the event of extreme heat (over 212° F.), the fuse link will melt, causing the spring to contract and pull the cable. When properly installed the cable will trip the internal valve release lever(s) allowing the connected handle(s) to move to the closed position.

Materials

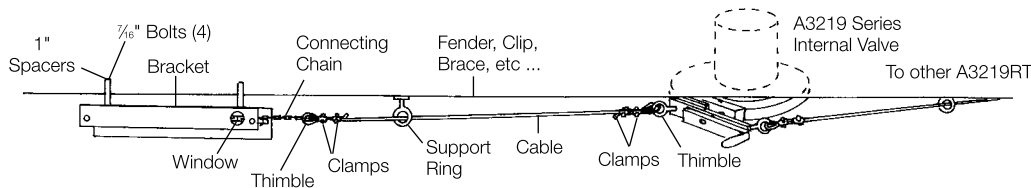
Body Galvanized Steel
Springs Stainless Steel



Ordering Information

Part Number	For Use With	Release Temperature	Spring Load		Minimum Number Required By MC331
			Fully Extended	After 4" Travel	
A3219RT	Internal Valves	212° F.	≈100 lbs.	≈50 lbs.	2

Typical Mounting Side View

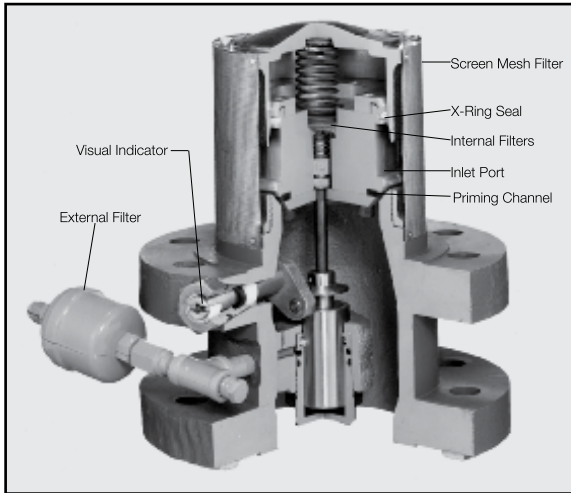


A3219RT

Features

- Meets DOT MC331 requirements.
- Easily installed, rugged formed steel bracket has open bottom to minimize dirt and water build-up.
- Heavy, shouldered pins lock into position.
- Stainless steel spring provides dependable performance with 100 lb. load.
- Heavy-duty chain adapts easily to standard cable and fittings.
- Fuse link has 212° F. release temperature.
- Adapts easily to standard cables and fittings.

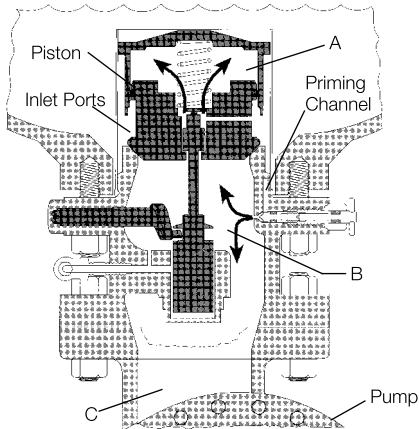
Flomatic® Internal Valve Operation



1. Normally Closed

When the valve is closed, liquid flows into the INLET PORTS, through a channel in the PISTON, and into area A. It also flows down through the PRIMING CHANNEL in the valve body, into area B beneath the valve seat, and into area C to prime the PUMP.

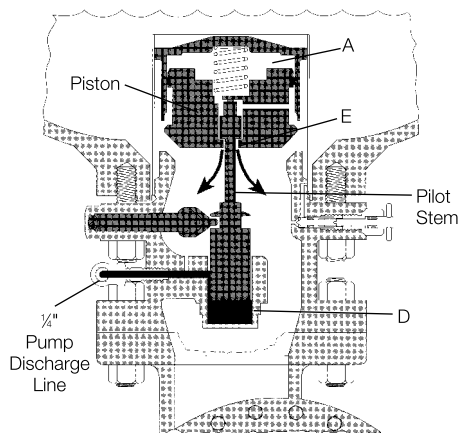
1



2. Pump On – Valve Opening

When the pump is started, differential pressure transmits through the 1/4" piping into chamber D. lifting the PILOT STEM. This opens the seat between the stem and piston at E. Pump suction then evacuates the tank pressure in area A, which becomes equal to the pump suction pressure.

2



General Information

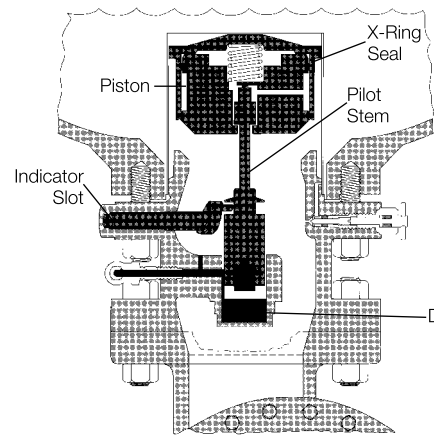
RegO® piston type Flomatic® Internal Valves are normally closed and use pressure differential to provide completely automatic service. Mounted directly between the tank body and pump, the Flomatic® uses the pressure differential developed by the pump to open the valve and it closes automatically when the differential no longer exists.

This means the RegO® Flomatic® opens when the pump is on and closes when the pump is shut off – fully automatic.

3. Pump On – Valve Open

The force below the pilot stem forces the piston up to open the valve; rotating the INDICATOR SLOT to its vertical (valve open) position. Pump differential pressure in area D holds the PILOT STEM and PISTON open. Approximately 20 psig pump differential pressure is required to open the valve; approximately 8 psig differential pressure will hold the valve open.

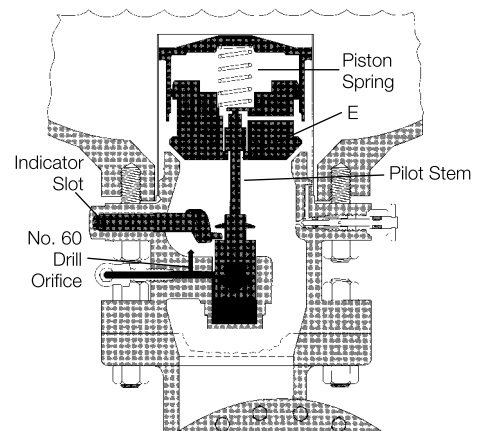
3



4. Pump Off – Valve Closes

With the pump shut off, the pressure in area D which holds the valve open, bleeds out through the #60 DRILL ORIFICE. This loss of pressure permits the SPRING to push the PILOT STEM down to reseat at point E. Since pressures are equal above and below the PISTON, with no sustaining pressure in area D, the SPRING forces the valve closed. The INDICATOR SLOT rotates to the horizontal (valve closed) position.

4



Flomatic® Internal Valves for Delivery Trucks, Transports and Large Stationary Storage Tanks A7883FK and A7884FK

Application

Designed primarily for anhydrous ammonia liquid withdrawal on MC331 delivery trucks, transports and large stationary storage containers with flanged connections. The valve is fully automatic, opening and closing as the pump is turned on or off.

Features

Fully Automatic

- Operates on pressure differential from the pump to open and close.
- Automatically closes should downstream line rupture causing loss of pump differential pressure required to keep the valve open.
- Problems of improperly sized excess flow valves slugging shut during liquid transfer are eliminated.

Faster Unloading

- Straight through flow design provides minimum pressure drop and large flow capacity to the pump, resulting in higher flow rates and greater pump efficiency.
- Unloading is quicker and turn-around faster to provide more profitable operation.

Greater Protection

- Fully automatic operation virtually eliminates operator errors such as forgetting to close the valve after product transfer.
- Fully internal design reduces possibility of spillage that may result from a collision.
- Built-in visual indicator lets the operator know whether the valve seat is in the open or closed position.
- Never a cable problem. These valves must NEVER be held open by wire or any other means as the valve will not close as expected when the pump is shut-off.

Less Maintenance

- Easily replaceable, high efficiency external filter removes contaminant's as small as 20 microns. Filter virtually eliminates orifice clogging, excessive internal filter maintenance and service downtime.
- No need to check or replace air lines, cables or cable connections.

Economical

- Completely equipped with mounting bolts, flange gaskets, quick acting valve and filter - all in one purchase price.
- No need to purchase additional mounting equipment or actuating accessories.
- Specify RegO® Internal Valves on your next new tank body or when your tank is rebuilt.

Materials

Body	Cast Steel
Valve Stem	Stainless Steel
Operating Stem	Stainless Steel
Piston.....	Aluminum
Cylinder	Stainless Steel
Screen	Stainless Steel
Seats	Resilient Synthetic Rubber

Ordering Information

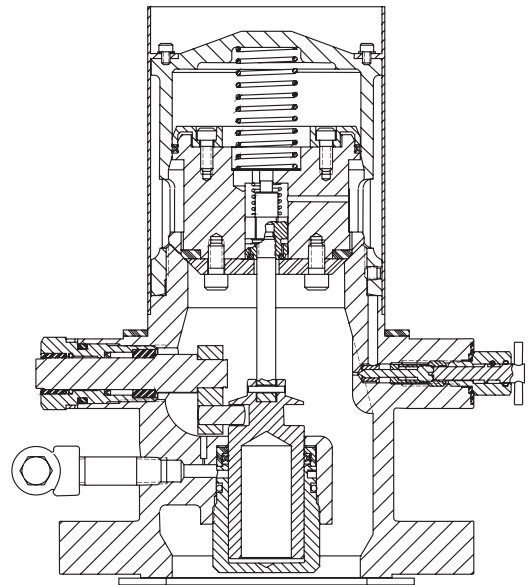
Part Number	Inlet Connection ANSI Flange	Outlet Connection ANSI Flange	Strainer Width	Base Width	Overall Height (Approx.)	Height from Indicator to Base	Accessories (included with Flomatic®)	
							Filter	3-Way Valve
A7883FK*	3"-300#**	3"-300#	4¾"	8¼"	10¾"	4 ¹³ / ₁₆ "	A7884-201	A7853A

*Supplied with A7853A 3-way valve, A7884-201 filter, studs, nuts and gaskets.

**With 4¾" diameter bore.

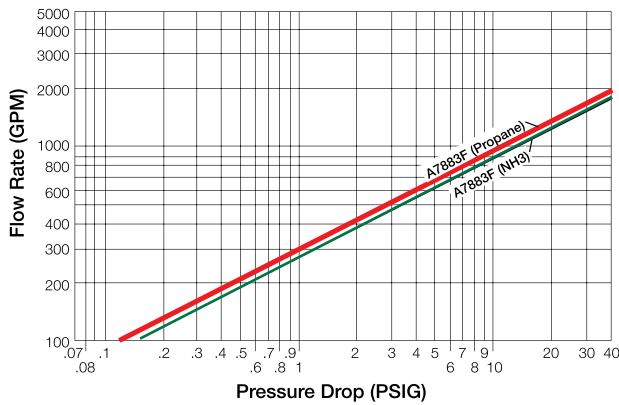


A7883FK



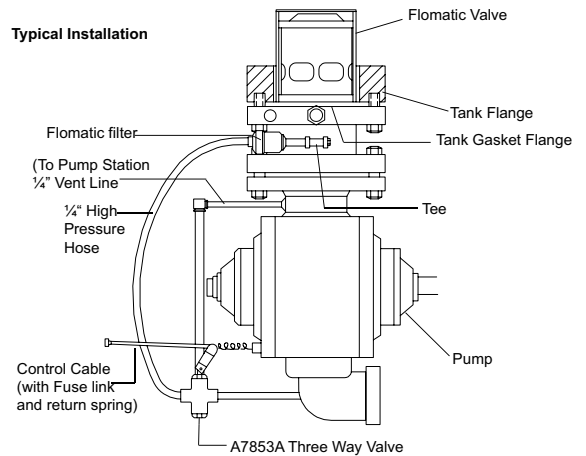
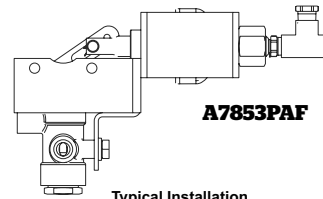
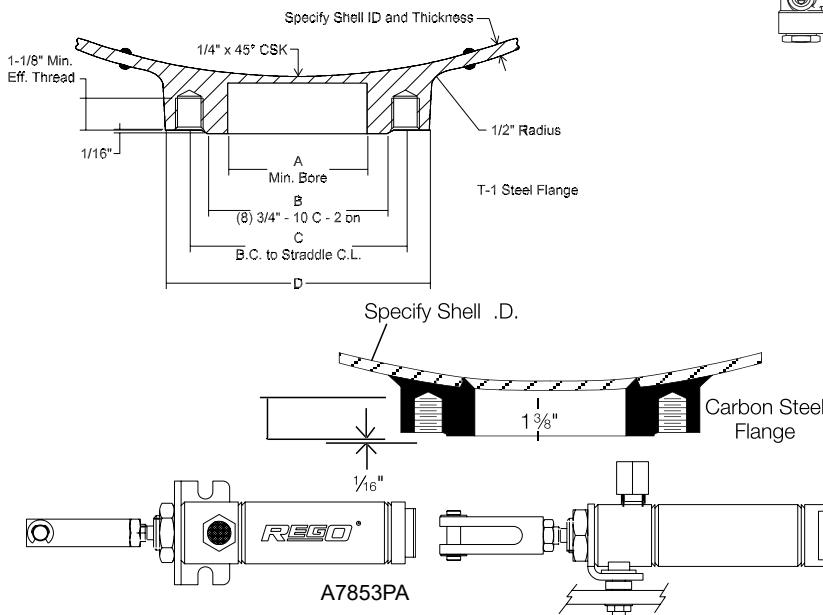
1/4" Three-Way Quick-Acting Valve A7853A

Flow Characteristics



A7853A
1/4" Three-Way
Quick-Acting Valve

Flange Dimensions



Ordering Information

Part Number	Flange Type	A	B	C	D	Accessories	
						Pneumatic Actuator	3-Way Valve
A7883FK*	T-1 Steel Carbon Steel	4 13/16"	5 3/4"	6 5/8"	8 1/4"	A7853PAF	A7853PA

*Supplied with A7853A 3-way valve, A7884-201 filter, studs, nuts and gaskets.

Electrically Actuated 3 way valve EA7853A

The EA7853A 3-way quick acting valve controls the fluid exchange between three separate transfer lines. For better control, the 3-way valve is paired with an electric actuator which provides a safe, easy way to open and close the valve from a remote location.



EA7853A

Ordering Information

Part Number	Flange Type	Voltages
EA7853A*	T-1 Steel Carbon Steel	12/24 VDC

*Supplied with A7853A 3-way valve, A7884-201 filter, studs, nuts and gaskets.

Extended Type Hose Couplings for Vapor and Liquid Service A7571 and A7575 Series

Application

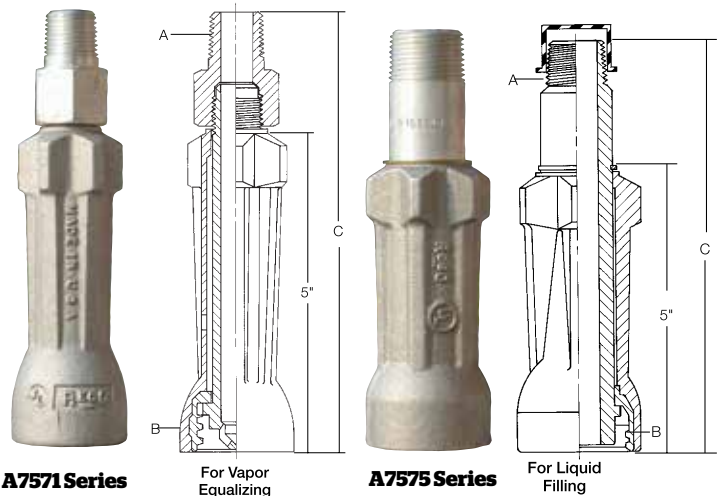
Designed especially for liquid filling and vapor equalization of anhydrous ammonia. The limited travel of the handle on the tailpiece minimizes spin-off, encouraging cautious removal to properly bleed off trapped product to assure closure of the filler valve and hose end valve. The ACME threads are machined on a rugged steel insert which is permanently cast in the aluminum handle, providing for durability under repeated use.

Features

- Lightweight aluminum handle is contoured and ribbed for added comfort, easy handling allows for easy make-up.
- Free swivel action between tailpiece and handle allows for easy make-up.
- Simplified design eliminates an extra joint and provides smooth, uninterrupted flow.

Materials

Handle Aluminium
 ACME Threads Steel Inlet
 Restraining Ring Stainless Steel



Ordering Information

Part Number	Type of Service	A. Hose Connection (M. NPT)	B. Coupling Connection (F. ACME)	C. Approx. Length
A7575L2*	Liquid	1/2"	1 1/4"	7"
A7575L3		3/4"		
A7575L4		1"		
A7575L5**		1 1/4"		
A7571LA	Vapor	1/2"	1 1/4"	
A7571LB	3/4"			

* Includes 7199-33 adapter, shipped loose.
 ** Includes A7575L5-1 adapter, shipped loose.

Short Type Hose Couplings for Vapor and Liquid Service A3175, A3185 and A3195 Series



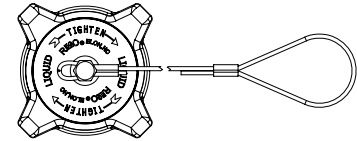
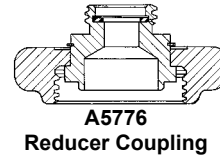
Ordering Information

Part Number	Material	Style	A. Hose Connection (M. NPT)	B. Coupling Connection (F. ACME)	C. Tailpiece Bore	D. Hose End To Nut	E. Overall Length
A3175	Steel	A	3/4"	1 1/4"	3/4"	2"	2 1/8"
A3175A			1"		7/8"	2 1/4"	3 1/8"
A3185		B	1 1/4"	2 1/4"	1 1/4"	2 1/8"	3 3/16"
A3195			2"	3/4"	1 7/8"	2 1/4"	3 5/8"

Caps and Reducers

Ordering Information

Cap With Chain & Ring				
Part Number	Ring Fits Pipe Size Up To:	Cap Only Part Number	Material	Thread Connection
A8016-93	1¼"	A8016-9P	Nylon	1¼" F. ACME
A3184-90	-	-	Steel	2¼" F. ACME
A3194-90				3¼" F. ACME
A3194-91L				Adjustable Cable
A3194-91S				
A3194-91V				
-	-	A5776		



1¼" ACME Steel Cap For NH3 A3175P

Application

The A3175P is a 1¼" ACME cap for use with 1¼" ACME connections for Anhydrous Ammonia service.

Materials

Body Steel 1¼" F. ACME
Chain & Ring Plated Steel



A3175P Series



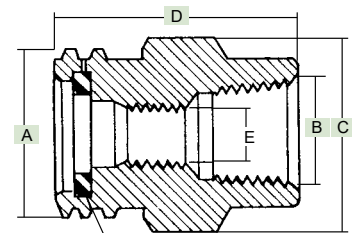
Ordering Information

Part Number	Thread Connection	Outside Diameter	Height	Material
A3175P	1¼" ACME	2"	15/16"	Steel

ACME Adapters

Ordering Information

Part Number	Material	A M. ACME	B FNPT	C Hex	D Overall Length	E Diameter	For Spare Gasket Order Part No.
A5764D	Steel	1¼"	¾"	1¼"	2 ³ / ₁₆ "	7/8"	A2697-20R
A5764E			1"				
A5768H			3/4"				

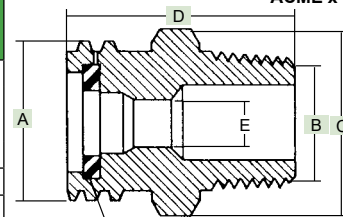


Gasket (Furnished with adapter)

ACME x Female NPT

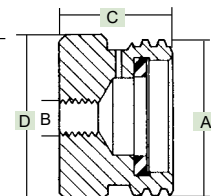
Ordering Information

Part Number	Material	A M. ACME	B M. NPT	C Hex	D Overall Length	E Diameter	For Spare Gasket Order Part No.
A5765C	Steel	1¼"	½"	1¼"	2 ³ / ₁₆ "	17/32"	A2697-20R
A5765D			¾"			11/16"	
A5765E			1"			57/64"	
A5765F			1¼"				
A5767F			2¼"			1¼"	
A5769H	3¼"	2"	3¼"	2 ⁷ / ₈ "	1 ¹⁵ / ₁₆ "	A3194-8R	
A5769K		3"	4"	3 ¹³ / ₁₆ "			



Gasket (Furnished with adapter)

ACME x Male NPT



ACME x Miscellaneous
(Recommended for securing hose-end valve when not in use.)

Ordering Information

Part Number	Material	A M. ACME	B F. NPT	C Overall Length	D Diameter	For Spare Gasket Order Part No.
A5764W	Steel	1¼"	¾"	1¼"	1¼"	2697-20

* 3/8" -16 UNC Thread.

1" Rotogage® Assembly for Large Mobile and Stationary Containers A9090 Series

Application

Rotogage® assemblies are designed to provide an accurate determination of anhydrous ammonia container contents. They mount in a standard 1" NPT coupling on large mobile or stationary containers.

To operate the Rotogage® assembly, the vent valve is opened and the dip tube rotated slowly from the container vapor space to the liquid space. The difference in appearance of the discharge indicates when the liquid level is reached. Dial readings then indicate the percentage of product in the container.

Features

- Supported design (TS Models) eliminates whipping and the need for internal support hangers.
- Resistance-free nylon bearing inserts reduce friction and promote operating ease.
- Dial face is dual calibrated to provide greater accuracy in reading contents in containers which are not level.

Materials

Body	Steel
Stem	Steel
Dip Tube	Seamless Steel
Indicator.....	Malleable Iron
Dial Plate	Aluminium
Vent Stem	Stainless Steel



Rotogage® Assembly

Tubes for use with A9090 Series Roto Gauges
Cut to length required.

Service	Part Number
Up to 48"	A9091-M24.0
Up to 72"	A9091-M36.0
Up to 96"	A9091-M48.0
Up to 120"	A9091-M60.0
Up to 144"	A9091-M72.0



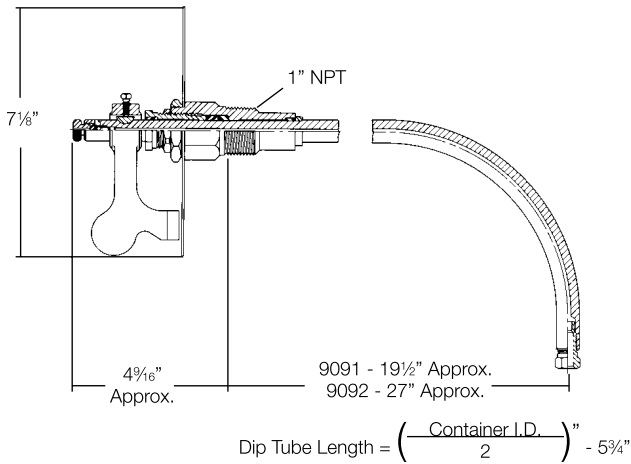
Rotogage® Dials

Ordering Information

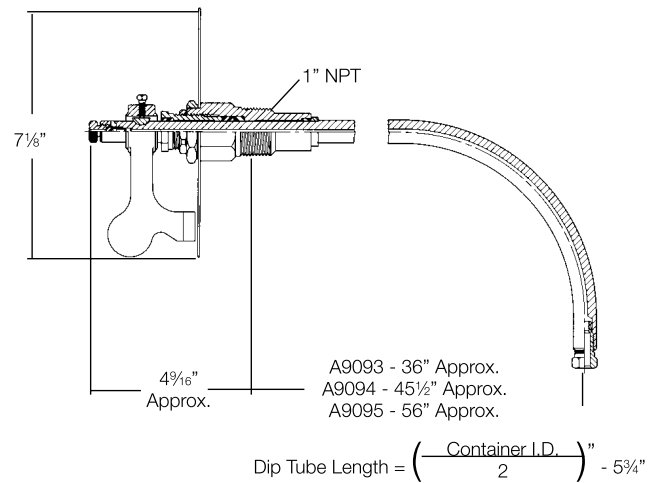
Part Number	Service	Container Size
A9091-18N	NH3	All Sizes

1" Rotogage® Assemblies for Large Mobile and Stationary Containers

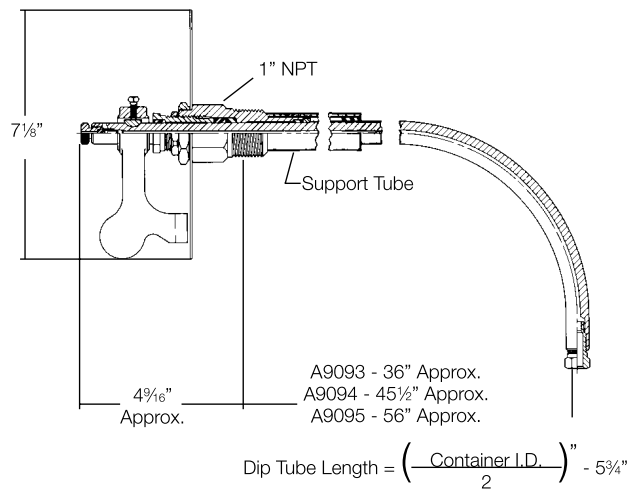
For Small Mobile or Stationary Containers
A9091R and A9092R Series



For Large Stationary Containers
9093RS, 9094RS and 9095RS Series



For Large Mobile or Stationary Containers
A9093TS, A9094TS and A9095TS Series



Ordering Information

Part Number		For Container Inside Diameter			
		Ellipsoidal Heads		Hemispherical Heads	
For Mobile or Stationary Containers	For Stationary Containers Only	Side Mounted	End Mounted	Side Mounted	End Mounted
A9091R	-	30" - 45"	30" - 75"	30" - 45"	30" - 45"
A9092R	-	46" - 61"	76" - 108"	46" - 61"	46" - 61"
A9093TS*	A9093RS	62" - 79"	109" - 147"	62" - 79"	62" - 79"
A9094TS*	A9094RS	80" - 99"	-	80" - 99"	80" - 99"
A9095TS*	A9095RS	100" - 147"	-	100" - 147"	100" - 147"

* Supported Design
NOTE: The dip tube must be cut to the required length (1/2 of container inside diameter minus 5 3/4").

Pull-Away Valves for Transfer Operations

A2141 Series

Application

Designed especially to provide pull-away protection for anhydrous ammonia transfer operations including transport and delivery truck loading and unloading, engine fuel container filling and miscellaneous cylinder filling operations. When properly fastened to the inlet end of the discharge hose, the valve is designed to stop gas escape from both upstream and downstream lines in the event of a pull-away. An excessive tension pull causes the valve to automatically separate, closing two internal back pressure checks. Only a few cubic centimeters of gas escape at the instant of separation.

It is recommended that a convenient means be provided to safely remove the pressure from the line upstream of each coupling half to enable reassembly of the valve. To reassemble, simply push the male half firmly into the female half until the retaining balls slip into the retaining groove. Check for leaks after reassembly.

NOTE: It is recommended that pull-away valves be maintained and safety tested periodically to confirm that they will separate properly in the event of a pull-away. Lubrication every six months is essential to the pull-away's operation. Dry nitrogen or other inert gas is suggested as a source of pressure for pull-away tests.

If the A2141 pull-away valve is going to be stored for a period of time, A2141 Series such as in seasonal applications, it is recommended that it be sprayed with a good grade of rust-preventive machine oil, and covered to protect it from moisture.



A2141A6



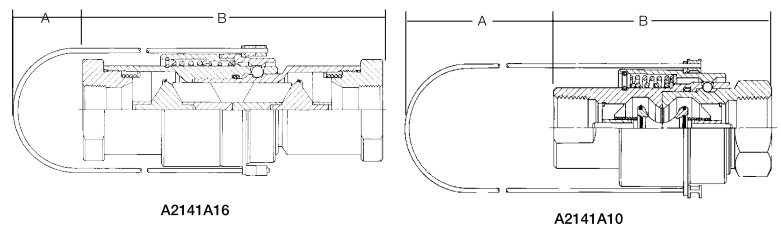
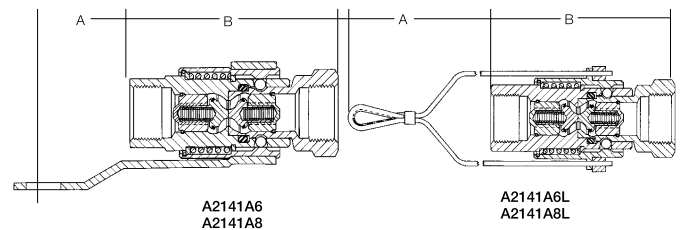
A2141A10

Features

- Heavy-duty construction for long service life.
- A "true" pull-away type valve which simply reconnects by snapping together without unnecessary downtime or need for new parts.
- Buna-N seals provide leak tight operation.
- 400 PSIG operating pressure.

Materials

Body (3/4", 1")..... Cadmium Plated Steel
 Body (1 1/4", 2")..... Cadmium Plated Steel
 Seals..... Buna-N Rubber
 Cables Nylon Coated, Galvanized Steel



Ordering Information

Part Number	Inlet/Outlet Connections NPT F.	Disconnect Force Approx-lbs	Reconnect Force Approx-lbs	Length Of Valve	NH3 Flow Capacity at Various Differential Pressures (GPM)*			
					5 PSIG	10 PSIG	25 PSIG	50 PSIG
A2141A6	3/4"	130	80	3 3/8"	9.9	14.4	22.5	32.4
A2141A6L**								
A2141A8	1"	75	50	4 9/16"	18.9	27	42.3	60.3
A2141A8L**								
A2141A10	1 1/4"	160	25	5 5/8"	46.8	67.5	108	153
A2141A16	2"	300	50	14 9/16"	225	315	495	675

1¼" Swing-Check ESV for Bulk Plants VA6010 and A6010

Application

Designed for installation in liquid or vapor transfer lines at Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.

Features

Meets NFPA 58 and UL requirements

- Fusible Element is located in the thermal fuse assembly, which acts at the latch open and close trigger. When exposed to fire, the element melts at 212 degrees F. allowing the shaft to return to the closed position.
- Valve can be opened by use of operating lever. If a pneumatic actuator is used it will open with the actuator.
- Valve can be closed by remote cable or pneumatic actuator.
- Valve can be closed by simply pushing the operating lever down; it is not necessary to trip the close trigger.

Sturdy Rugged Construction

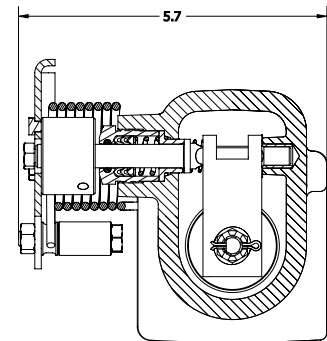
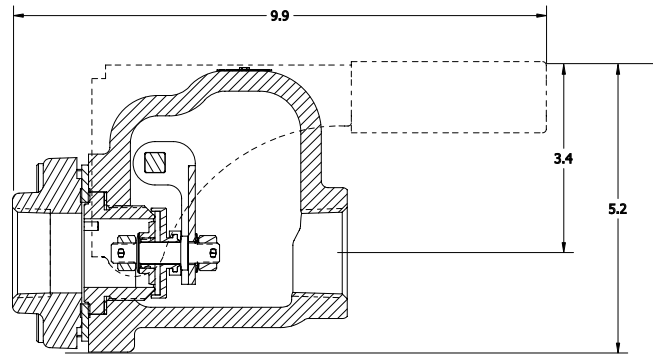
- Will withstand hydraulic shock of sudden closings, piping strains, and temperature variations.
- Valve has only two moving parts, stem and close/thermal trigger.
- **A6010** is UL listed for use as an emergency and operating shut-off valve.
- Stem seals are spring loaded for leak free performance at low temperatures/pressures.
- Seat Disc is retained by a metal seat to minimize leakage in case of direct fire impingement.
- Quick closing regardless if the pump is running or not.

Materials

Body	Ductile Iron Clad Plated
Stem	Stainless Steel
Seat	Stainless Steel
Seat Disc	Synthetic Rubber
Springs	Stainless Steel
Gaskets	Teflon



A6010



6016-60D



6016-60C



Ordering Information

Part Number	Seat	Inlet and Outlet Connections	Accessories		Liquid Flow Capacity @ 10 PSIG Pressure Drop (GPM)
			Remote Pneumatic Close	Remote Pneumatic Open/Close	
A6010	Buna-N	1¼" F. NPT	6016-60D	6016-60C	233

2" & 3" Swing-Check ESVs for Bulk Plants A6016 Series and A6024 Series

Application

Designed for installation in liquid transfer lines at Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.

Features

- Fusible Element is located in the thermal fuse assembly which acts at the latch open and close trigger. When exposed to fire, the element melts at 212° F allowing the shaft to return to the closed position.
- Valve can be opened by use of operating lever, if a pneumatic actuator is used it will open with the actuator.
- Valve can be closed by remote cable or pneumatic actuator.
- Valve can be closed by simply pushing the operating lever down, it is not necessary to trip the close trigger.
- Seat Disc is retained by a metal seat to minimize leakage in case of direct fire impingement.
- Quick closing regardless if the pump is running or not.

Sturdy Rugged Construction

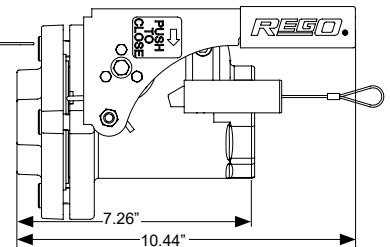
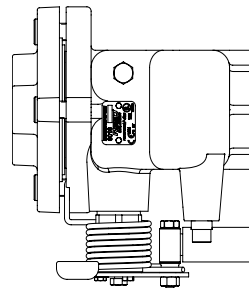
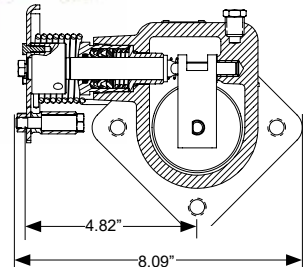
- Will withstand hydraulic shock of sudden closings, piping strains, and temperature variations.
- Valve has only two moving parts, stem and close/thermal trigger.
- A6016 is UL listed for use as an emergency and operating shut-off valve.
- Stem seals are spring loaded for leak free performance at low temperatures/pressures.

Materials

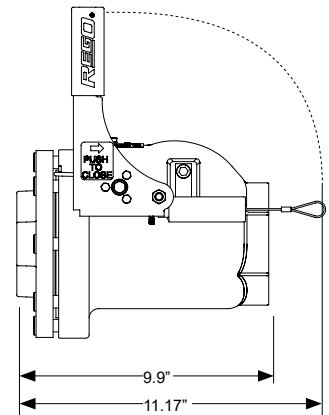
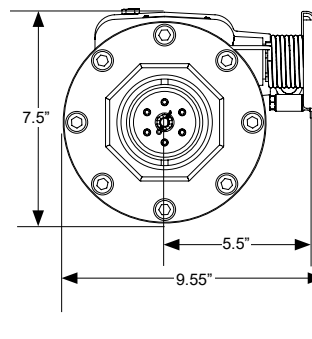
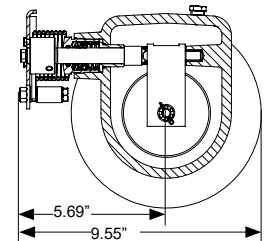
Body	Ductile Iron Cad Plated
Stem	Stainless Steel
Seat	Stainless Steel
Seat Disc (A6016/A6024)	Nitrite
Springs	Stainless Steel
Gaskets	Teflon



A6016



A6024



Ordering Information

Part Number	Seat	Inlet and Outlet Connections	Liquid Flow Capacity at 10 PSIG Drop (GPM)	Accessories	
				Remote Close Pneumatic	Remote Open/Close Pneumatic
A6016	Buna-N	2" F.NPT	640	6016--60D	6016-60C
A6024		3" F.NPT	1173		

Flanged Swing-Check ESVs for Bulk Plants

FA6010, FA6016 and FA6024

Application

Designed for installation in liquid transfer lines at Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.

Features

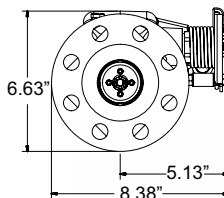
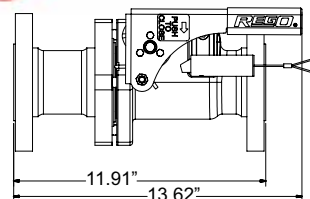
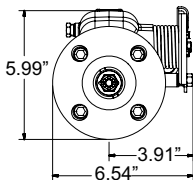
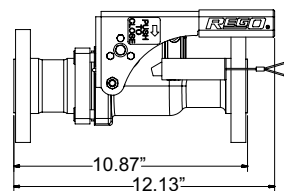
- Fusible Element is located in the thermal fuse assembly which acts at the latch open and close trigger. When exposed to fire, the element melts at 212° F allowing the shaft to return to the closed position.
- Valve can be opened by use of operating lever, if a pneumatic actuator is used it will open with the actuator.
- Valve can be closed by remote cable or pneumatic actuator.
- Valve can be closed by simply pushing the operating lever down. It is not necessary to trip the close trigger.
- Seat Disc is retained by a metal seat to minimize leakage in case of direct fire impingement.
- Quick closing regardless if the pump is running or not.

Sturdy Rugged Construction

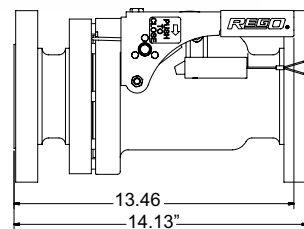
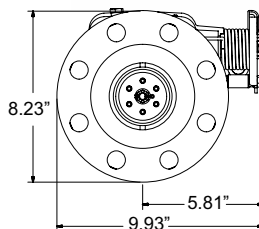
- Will withstand hydraulic shock of sudden closings, piping strains, and temperature variations.
- Valve has only two moving parts, stem and close/thermal trigger.
- UL listed for use as an emergency and operating shut-off valve.
- Stem seals are spring loaded for leak free performance at low temperatures/pressures.

Materials

Body Ductile Iron Cad Plated
 Stem Stainless Steel
 Seat Stainless Steel
 Seat Disc (FA6010/16/24) Nitrile
 Springs Stainless Steel
 Stem Seals Teflon



FA6024



Ordering Information

Part Number	Seat	Inlet and Outlet Connections	Liquid Flow Capacity at 10 PSIG Drop (GPM)	Accessories	
				Remote Close Pneumatic	Remote Open/Close Pneumatic
FA6010	Buna-N	1 1/4" - 300# ANSI RF Flange	233	FA6016-60D	*
FA6016		2" - 300# ANSI RF Flange	640		6016-60C
FA6024		3" - 300# ANSI RF Flange	1173		

* Not Available

Electric Actuator Swing-Check ESVs for Bulk Plants EA6010, EA6016 and EA 6024

Application

Designed for installation in liquid transfer lines at Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.

Features

- Fusible Element is located in the thermal fuse assembly which acts at the latch open and close trigger. When exposed to fire, the element melts at 212 degrees F. allowing the shaft to return to the closed position.
- The EA6010, EA6016 and EA6024 provide a convenient means of electrically opening and closing the valve from a remote location.
- Seat Disc is retained by a metal seat to minimize leakage in case of direct fire impingement.
- Quick closing regardless if the pump is running or not.
- CSA/UL rated Explosion Proof Enclosure on the actuator.
- Class I, Div 1 Groups B, C, D, / T6
- 12-24VDC
- ESVs and Electric Actuators are UL Listed

Sturdy Rugged Construction

- Will withstand hydraulic shock of sudden closings, piping strains, and temperature variations.
- Valve has only two moving parts, stem and close/thermal trigger.
- EA6016 is UL listed for use as an emergency and operating shut-off valve.
- Stem seals are spring loaded for leak free performance at low temperatures/pressures.

Materials

Body Ductile Iron Cad Plated
 Stem Stainless Steel
 Seat Stainless Steel
 Seat Disc (EA6010/16/24) Nitrile
 Springs Stainless Steel
 Stem Seals Teflon



Ordering Information

Part Number	Seat	Inlet and Outlet Connections	Voltages	Liquid Flow Capacity at 10 PSIG Drop (GPM) NH ₃
EA6010	Buna-N	1 1/4" F.NPT	12/24 VDC	233
EA6016		2" F.NPT		640
EA6024		3" F.NPT		1173

Electric Actuator Flanged Swing-Check ESVs for Bulk Plants EFA6010, EFA6016 and EFA6024

Application

Designed for installation in liquid transfer lines at Anhydrous Ammonia bulk plants to provide for quick shut-off of liquid or vapor flow in the event of an accidental pull-away, line break, or hose rupture.

Features

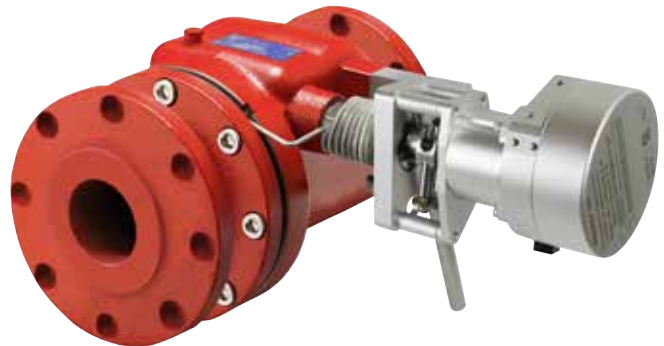
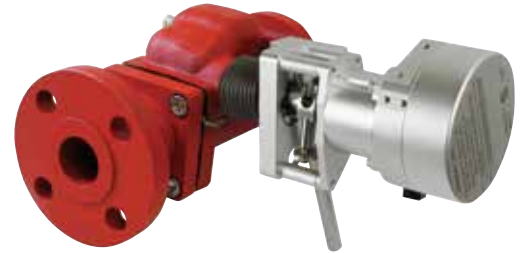
- Fusible Element is located in the thermal fuse assembly which acts at the latch open and close trigger. When exposed to fire, the element melts at 212° F allowing the shaft to return to the closed position.
- The EFA6010, EFA6016 and EFA6024 provide a convenient means of electrically opening and closing the valve from a remote location.
- Seat Disc is retained by a metal seat to minimize leakage in case of direct fire impingement.
- Quick closing regardless if the pump is running or not.
- CSA/UL rated Explosion Proof Enclosure on the actuator.
- Class I, Div 1 Groups B, C, D, / T6
- 12-24VDC
- ESVs and Electric Actuators are UL Listed

Sturdy Rugged Construction

- Will withstand hydraulic shock of sudden closings, piping strains, and temperature variations.
- Valve has only two moving parts, stem and close/thermal trigger.
- UL listed for use as an emergency and operating shut-off valve.
- Stem seals are spring loaded for leak free performance at low temperatures/pressures.

Materials

Body Ductile Iron Cad Plated
 Stem Stainless Steel
 Seat Stainless Steel
 Seat Disc (EA6010/16/24)..... Nitrile
 Springs Stainless Steel
 Stem Seals Teflon



Ordering Information

Part Number	Seat*	Inlet and Outlet Connections	Voltages	Liquid Flow Capacity at 10 PSIG Drop (GPM) NH ₃
EFA6010	Buna-N	1¼" - 300# ANSI RF Flange	12/24 VDC	233
EFA6016		2" - 300# ANSI RF Flange		640
EFA6024		3" - 300# ANSI RF Flange		1173

ESV Pneumatic Controls

Application

RegO® Emergency Shut-Off Valves modified for remote pneumatic shutdown operation retain all the operating features of the standard valves.

Once equipped with pneumatic cylinders and then pressurized, the pneumatic cylinder piston rod disengages from a striker plate, allowing the ESV to be manually opened and the striker plate to act as a latch and hold the valve open. Release of the control system pressure for any reason closes the ESV for fail-safe operation.

Features

Convenience

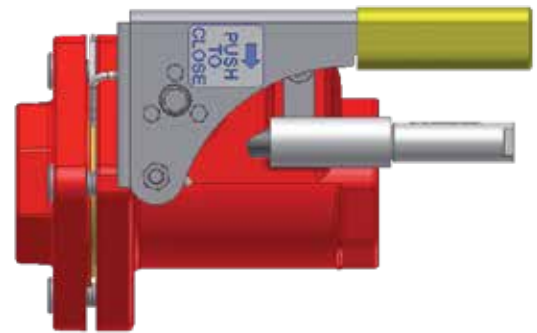
- Closes the liquid and vapor ESV from a convenient remote location.
- Independent closed loop system allows the ESV to be pneumatically charged, but opened or closed manually or with cable controls to conserve pressurized gas.

Reliability

- Independent closed loop system will continue to hold pressure and close ESV in an emergency - even if supply pressure is cut off.

Security

- Any loss of pressure from the control line, such as accidents or the line melting from fire, automatically shuts down the liquid and vapor ESV.
- ESV must be reset after automatic shutdown.



A6016 with 6016-60D Remote Close Actuator



6016PN-50 Pneumatic Remote Control Kit

Control kit with components for connecting and charging the pneumatic controls from a source of compressed gas (air or nitrogen) to a RegO® liquid or vapor ESV. Includes charging valves with low pressure indicator, operating valves, 100 feet of ¼" plastic tubing and tube fittings.



Ordering Information

Part Number	Description
6016-60D	Cylinder assembly kit to convert 6016 ESVs to pneumatic shutdown.
6016PN-50	Pneumatic Remote Control Kit.
7605APN-8A	Extra shutdown valve assembly.
7605A-BT	100' roll of ¼" pneumatic tubing.
7605AP-16	¼" tubing tee, with nuts.
7605AP-15	⅜" NPT x ¼" tubing, straight connector.

3" Heavy Duty Swing Check with Flow Indicator A7624

Application

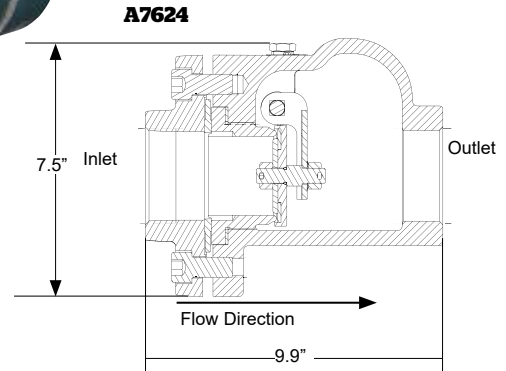
This back check valve is designed to provide required back flow protection for the unloading riser in the bulk plant's transfer area. It is designed specifically for pipeline installation and is suitable for anhydrous ammonia service. Product flow moves the swing check to the open position, when flow stops the spring loaded swing check closes.

Features

- Easy to read flow indicator
- Heavy duty spring loaded swing check design
- Resilient synthetic rubber seat disc
- High flow rates with low pressure drop
- May be installed either horizontally or vertically
- ¼" F-NPT plugged boss on top of body

Materials

Body Ductile Iron
 Stem Stainless Steel
 Seat Stainless Steel
 Seat Disc Resilient synthetic rubber
 Return Spring Stainless Steel



Ordering Information

Part Number	For Use With:	Inlet & Outlet Connections	Liquid Capacity at 10 PSIG Drop GPM
A7624	NH3	3" F-NPT	1173-GPM(NH3)

2" Heavy Duty Swing Check with Flow Indicator A7616

Application

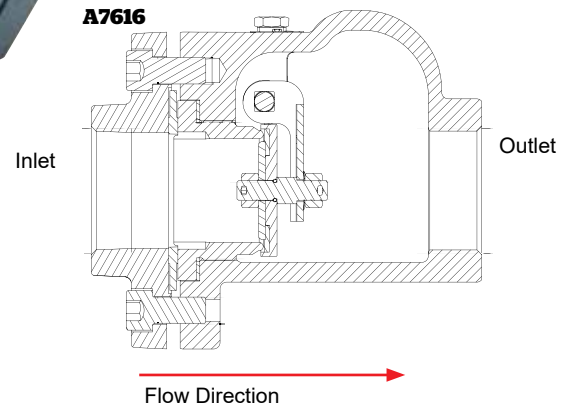
This back check valve is designed to provide required back flow protection for the unloading riser in the bulk plant's transfer area. It is designed specifically for pipeline installation and is suitable for anhydrous ammonia service. Product flow moves the swing check to the open position, when flow stops the spring loaded swing check closes.

Features

- Easy to read flow indicator
- Heavy duty spring loaded swing check design
- Resilient synthetic rubber seat disc
- High flow rates with low pressure drop
- May be installed either horizontally or vertically
- ¼" F-NPT plugged boss on top of body

Materials

Body Ductile Iron
 Stem Stainless Steel
 Seat Stainless Steel
 Seat Disc Synthetic Rubber
 Return Spring Stainless Steel



Ordering Information

Part Number	For Use With:	Inlet & Outlet Connections	Liquid Capacity at 10 PSIG Drop GPM
A7616	NH3	2" F-NPT	640-GPM(NH3)

Sight Flow Indicators for Bulk Plants A7794 and A7796

Application

Designed to promote maximum pump efficiency, these indicators enable bulk plant operators to visually inspect liquid flow conditions. With glass on both sides of the indicator, flow can be observed from either side, even under some poor light conditions. The integral swing check also serves as a back-check valve to prevent reverse flow and product loss if the hose fails in a loading operation.

By installing an indicator on the upstream side of the plant pump, suction conditions can be observed and the pump speed adjusted to obtain the maximum possible flow rate without cavitation. Additionally, if an indicator is installed in the piping at the loading rack, just ahead of the loading hose, the operator can maintain a constant check on pump conditions.

Both installations are designed to allow for observation to provide maximum pump efficiency and assure safe plant pump operation.

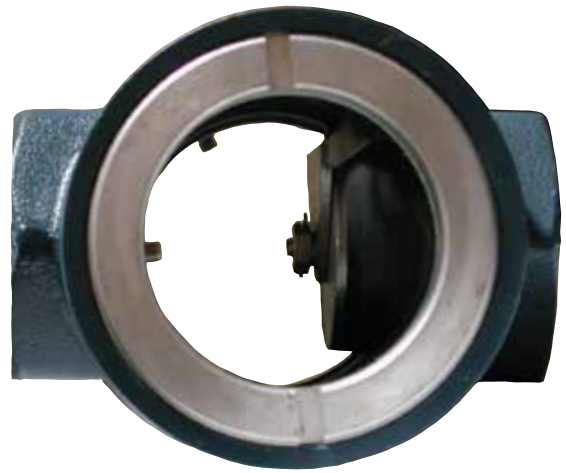
In compressor operations a sight flow indicator installed in the liquid line will give a visual indication when the tank car or transport is emptied. Compressor operation can then be immediately reversed to start recovery of the vapor

Features

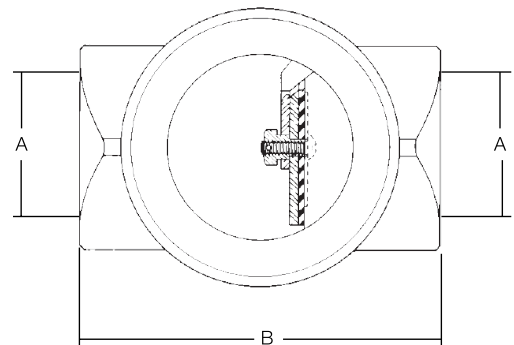
- Durable ductile iron body assures long, trouble-free operation with design working pressure of 400 PSIG.
- Glass is polished, ground and tempered after fabrication for maximum strength up to 2,500 PSIG.
- Set screws minimize loosening of glass retainer rings.
- O-ring glass seals provide for leak-tight operation.

Materials

Body Ductile Iron
 Swing Check..... Stainless Steel
 Check Seat Disc..... Resilient Synthetic Rubber
 Glass Polished, Ground and Tempered
 Tested to 2,500 PSIG.



A7794



Ordering Information

Part Number	A Inlet/Outlet Connections	B Length
A7794	2" F. NPT	5 1/4"
A7796	3" F. NPT	7 3/8"

Combination Valve for Bulk Storage Containers A2805C

Application

Designed for installation on bulk storage containers, this valve combines a pressure gauge mounting and provision for a fixed tube liquid level gauge.

The shut-off valve prevents the pressure gauge from being subjected to constant pressure, thereby prolonging its life and accuracy. The valve may be closed, and the vent valve opened to vent pressure from the gauge to permit replacement.

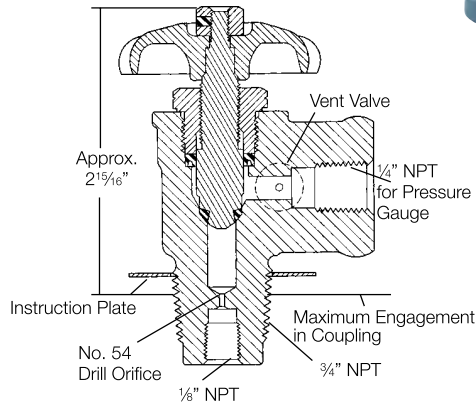
For fixed liquid level gauging, the valve can be mounted at the maximum permitted filling level. When equipped with a dip tube threaded 1/8" M.NPT, it can be installed at any convenient level.

Materials

Body A2805C.....	Ductile Iron
Bonnet.....	Steel
Valve Stem.....	Stainless Steel
Vent Stem.....	Stainless Steel
Valve Stem Seal.....	Resilient Synthetic Rubber
Vent Seal.....	Resilient Synthetic Rubber
Valve Seat.....	Nylon



A2805C



Ordering Information

Part Number	Container Connection	Service Connection	Liquid Level Vent
A2805C	3/4" M. NPT	1/4" F. NPT for Gauge Mounting	Tee Handle

* Has 1/8" F. NPT opening for installing separate dip tube.

Pressure Gauges

Application

Especially designed in a variety of sizes and construction for the Anhydrous ammonia industry.

All RegO® pressure gauges have a 1/4" M. NPT connection unless otherwise noted.

Materials

Body (TSS3169).....	Stainless Steel
Seat Disc (3165).....	Resilient Synthetic Rubber
Seat Disc (3169).....	Teflon



A8400



Ordering Information

Part Number	Service	Case Material	Maximum Pressure	Case Size	Increment Divisions
A8060	NH ₃	Steel	60 PSIG	2 1/2"	5 lb.
A8150			150 PSIG		
A8400			400 PSIG		

Vent Valves TSS3169

Application

Especially designed to bleed off liquid or vapor pressures trapped in transfer lines. When installed in the downstream boss of RegO® globe and angle valves used at the end of a liquid transfer hose, the bleeder valve allows for the controlled venting of the product and indicates to the operator that the valves are closed and he can disconnect the coupling. They may also be used as a fixed liquid level gauge where the dip tube is part of the container.

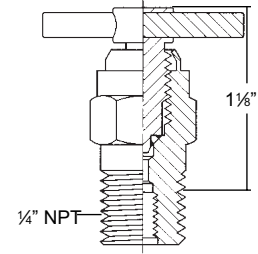
An optional instruction plate with "Stop Filling When Liquid Appears" may be ordered for use with these valves.

Materials

Body (TSS3169)..... Stainless Steel
 Seat Disc (3169)..... Teflon



TSS3169



Ordering Information

Part Number	Service	Connection	Actuation	Accessories
				Warning Plate Kit
TSS3169	NH ₃	1/4" M. NPT	Tee Handle	2550-40P

Fixed Liquid Level Gauges TA3169F

Application

Especially designed to provide a visible warning when containers are filled to the maximum permitted filling level. At the start of the filling operation, with the vent stem opened, the valve discharges vapor. When the maximum permitted filling level is reached, the valve discharges liquid. The TA3169F12.0 incorporates a No 54 drill orifice; they all are normally furnished with a 12" 3/16" OD dip tube.

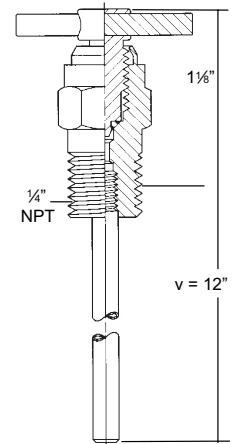
An optional instruction plate with "Stop Filling When Liquid Appears" may be ordered for use with these valves.

Materials

Body (TA3169)..... Stainless Steel
 Seat Disc (TA3169)..... Teflon



TA3169F12.0



TA3169F12.0



Ordering Information

Part Number	Service	Connection	Actuation	Dip Tube Length	Accessories
					Warning Plate Kit
TA3169F12.0	NH ₃	1/4" M. NPT	Tee Handle	12"	2550-40P

General Properties of NH3

There's nothing like ammonia. Anyone who has smelled it, even in small concentrations, will know ammonia when he encounters it again. The odor of this colorless gas is characteristically sharp ...pungent ...biting.

Ammonia is one of the most water soluble of all gases. Under atmospheric pressure and at a temperature of 32° F., one volume of water will dissolve 1,150 volumes of ammonia. Such a saturated aqueous solution contains 47.3% ammonia by weight.

"Dry ammonia", which contains no water, is called anhydrous ammonia (NH3).

Ammonia vapor is lighter than air. Considering the specific gravity of air to be 1.0, the specific gravity of ammonia is 0.589. Under atmospheric pressure, ammonia has a vapor density of 0.0556 pound per cubic foot at its boiling point.

For most industrial purposes, ammonia is shipped and stored as a liquid. Ammonia gas liquefies easily, and in its liquid state is a colorless, mobile fluid. At atmospheric pressure, liquid ammonia boils at -28° F. As the temperature rises, the vapor pressure of ammonia increases rapidly. Liquid ammonia has a density under atmospheric pressure of 42.6 pounds per cubic foot, approximately two-thirds that of water.

Flammability of ammonia vapor in air is limited—the heat of combustion is insufficient to maintain a flame. But the flammability increases with the degree of concentration. At a concentration range of 16% to 27% ammonia by volume with air, the mixture can be ignited by a source of ignition at about 1,200° F. If the vapor is contaminated with oil, the ignition temperature would be lower. In an atmosphere of pure oxygen, ammonia burns vigorously producing nitrogen, water, a small proportion of ammonium nitrate, and a trace of nitrous oxide.

Many metals are not affected by dry ammonia. Moist ammonia will not corrode iron, steel or aluminum, but will react rapidly with copper, silver, zinc and their alloys. Mercury should never be used with ammonia, since explosive chemical compounds may be formed. For this reason, mercury should not be used as the liquid in a manometer in measuring rates of flow of ammonia. Refer to ANSI Standard K61.1, Safety Requirements for the Storage and Handling of Anhydrous Ammonia, as well as state and local codes

Temperature F°	Approximate Pressure (PSIG)
-28	0
-20	3
-10	9
0	15
10	23
20	33
30	45
40	58
50	74
60	92
70	114
80	138
90	165
100	197
110	232
120	271
130	315

NH3 Safety Commandments*

1. ALWAYS have ample water available.
2. ALWAYS stay clear of hose and valve openings.
3. ALWAYS wear gloves and goggles when transferring NH3.
4. ALWAYS close valves and disconnect hoses when plant is unattended.
5. ALWAYS be sure pressure is relieved before disconnecting hoses or parts.
6. NEVER fill a tank over 85% of capacity.
7. NEVER leave transfer operations unattended.
8. NEVER tamper with relief valves or safety devices.
9. NEVER try to "get by"—use only approved NH3 equipment.
10. NEVER tow a trailer without secure connecting parts and safety chains.

*Courtesy of Operational Safety Manual for Anhydrous Ammonia, Agricultural Ammonia Institute.

Chart — Minimum Required Rate of Discharge for Anhydrous Ammonia Pressure Relief Valves Used on ASME Containers

From ANSI K61.1-1981, Appendix A (1981). Minimum required rate of discharge in cubic feet per minute of air at 120% of the maximum permitted start-to-discharge pressure for pressure relief valves to be used on containers other than those constructed in accordance with United States Department of Transportation cylinder specifications.

Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air	Surface Area Sq. Ft.	Flow Rate SCFM Air
20	258	95	925	170	1500	290	2320	600	4200	1350	8160	2100	11720
25	310	100	965	175	1530	300	2380	650	4480	1400	8410	2150	11950
30	360	105	1010	180	1570	310	2450	700	4760	1450	8650	2200	12180
35	408	110	1050	185	1600	320	2510	750	5040	1500	8900	2250	12400
40	455	115	1090	190	1640	330	2570	800	5300	1550	9140	2300	12630
45	501	120	1120	195	1670	340	2640	850	5590	1600	9380	2350	12850
50	547	125	1160	200	1710	350	2700	900	5850	1650	9620	2400	13080
55	591	130	1200	210	1780	360	2760	950	6120	1700	9860	2450	13300
60	635	135	1240	220	1850	370	2830	1000	6380	1750	10090	2500	13520
65	678	140	1280	230	1920	380	2890	1050	6640	1800	10330		
70	720	145	1310	240	1980	390	2950	1100	6900	1850	10560		
75	762	150	1350	250	2050	400	3010	1150	7160	1900	10800		
80	804	155	1390	260	2120	450	3320	1200	7410	1950	11030		
85	845	160	1420	270	2180	500	3620	1250	7660	2000	11260		
90	885	165	1460	280	2250	550	3910	1300	7910	2050	11490		

Surface area = Total outside surface area of container in square feet.

When the surface area is not stamped on the name plate or when the marking is not legible, the area can be calculated by using one of the following formulas:

1. Cylindrical container with hemispherical heads. Area (in sq. ft.) = overall length (ft.) x outside diameter (ft.) x 3.1416.
2. Cylindrical container with other than hemispherical heads. Area (in sq. ft.) = overall length (ft.) + .3 outside diameter (ft.) x outside diameter (ft.) x 3.1416.
3. Spherical container. Area (in sq. ft.) = outside diameter (ft.) squared x 3.1416.

Flow Rate SCFM Air = Required flow capacity in cubic feet per minute of air at standard conditions, 60°F. and atmospheric pressure (14.7 psia).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with total outside surface area greater than 2,500 square feet, the required flow rate can be calculated using the formula, Flow Rate—SCFM Air = 22.11 A^{0.82} where A = outside surface area of the container in square feet.

Conversion Factor

$$\begin{aligned} \text{ft}^2 & \times 0.092903 & = \text{m}^2 \\ \text{SCFM} & \times 0.028317 & = \text{m}^3/\text{min} \\ \text{ft} & \times 0.3048 & = \text{m} \end{aligned}$$

Limited Warranty and Limitation Of Liability

LIMITED 10 YEAR WARRANTY

REGO® warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships the product to REGO® at 100 Rego Drive, Elon, NC 27244, REGO®, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by REGO® to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used continuously after installation in accordance with REGO®'s printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain, or neglect, nor does it extend to any product or part which has been modified, altered, disassembled, or repaired in the field. This warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

Except as expressly set forth above, and subject to the limitation of liability below, REGO® MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, with respect to its products and parts, whether used alone or in combination with others. REGO® disclaims all warranties not stated herein.



LIMITATION OF LIABILITY

REGO®'s total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such cause be based on theories of contract, negligence, strict liability, tort or otherwise.

REGO® shall not be liable for incidental, consequential or punitive damages or other losses. REGO® shall not be liable for, and buyer assumes any liability for, all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask REGO® for technical advice based upon limited facts disclosed to REGO®. If REGO® furnishes technical advice to buyer, whether or not at buyer's request, with respect to application, further manufacture or other use of the products and parts, REGO® shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from State to State. The portions of this limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the first purchasers of REGO® products. Since most users have purchased these products from REGO® distributors, the user must within thirty (30) days after the user's discovery of what user believes is a defect, notify in writing and return the product to the distributor from whom he purchased the product/part. The distributor may or may not at the distributor's option choose to submit the product/parts to REGO®, pursuant to this Limited Warranty. Failure by buyer to give such written notice within thirty (30) days shall be deemed an absolute and unconditional waiver of buyer's claim for such defects. Acceptance of any alleged defective product/parts by REGO®'s distributor for replacement or repairs under the terms of REGO®'s Limited Warranty in no way determines REGO®'s obligations under this Limited Warranty.

Because of a policy of continuous product improvement, REGO® reserves the right to change designs, materials or specifications without notice.



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