



SPECIFICATION // DATA SHEET

# Density Sensitive Valve Fluid Differential Applications

## Introduction

The Density Sensitive Valve was developed for a major oil company to detect the differences in density between two fuels. This version is designed for gravity fed applications, with the Thornton Pilot fitted to our Servo Valves used for pumped applications (see separate Servo Valves datasheet).

Initially used to discriminate between aviation fuels and prevent the wrong grade fuel being used, the product has been designed to detect a density change of up to 1%.

### Key Benefits

- Mechanically operated
- Easy to install
- Low maintenance requirements
- Environmental protection
- Prevents pollution
- Reduces wastage of valuable stock
- Heavy duty for durability
- Customisable to suit application requirements
- Manual test facility
- Rapid response to density change

This allows the valve to be used in a wide range of filling and draining applications for environmental, safety and quality control purposes in Oil & Gas, Aviation, Chemical, Marine, Transportation and many other industries.

Mechanical in operation with only one moving part the Density Sensitive Valve design enables easy installation with low maintenance costs. The hydraulic design is such that it is unaffected by flow but very rapid in response to density change.

The float profile ensures that when the density change occurs, a liquid tight seal is created against the valve seat.

Both the cast and fabricated versions of the valve are supplied with a manual test facility to enable regular checking of the valves operation.



**CAST VERSION**

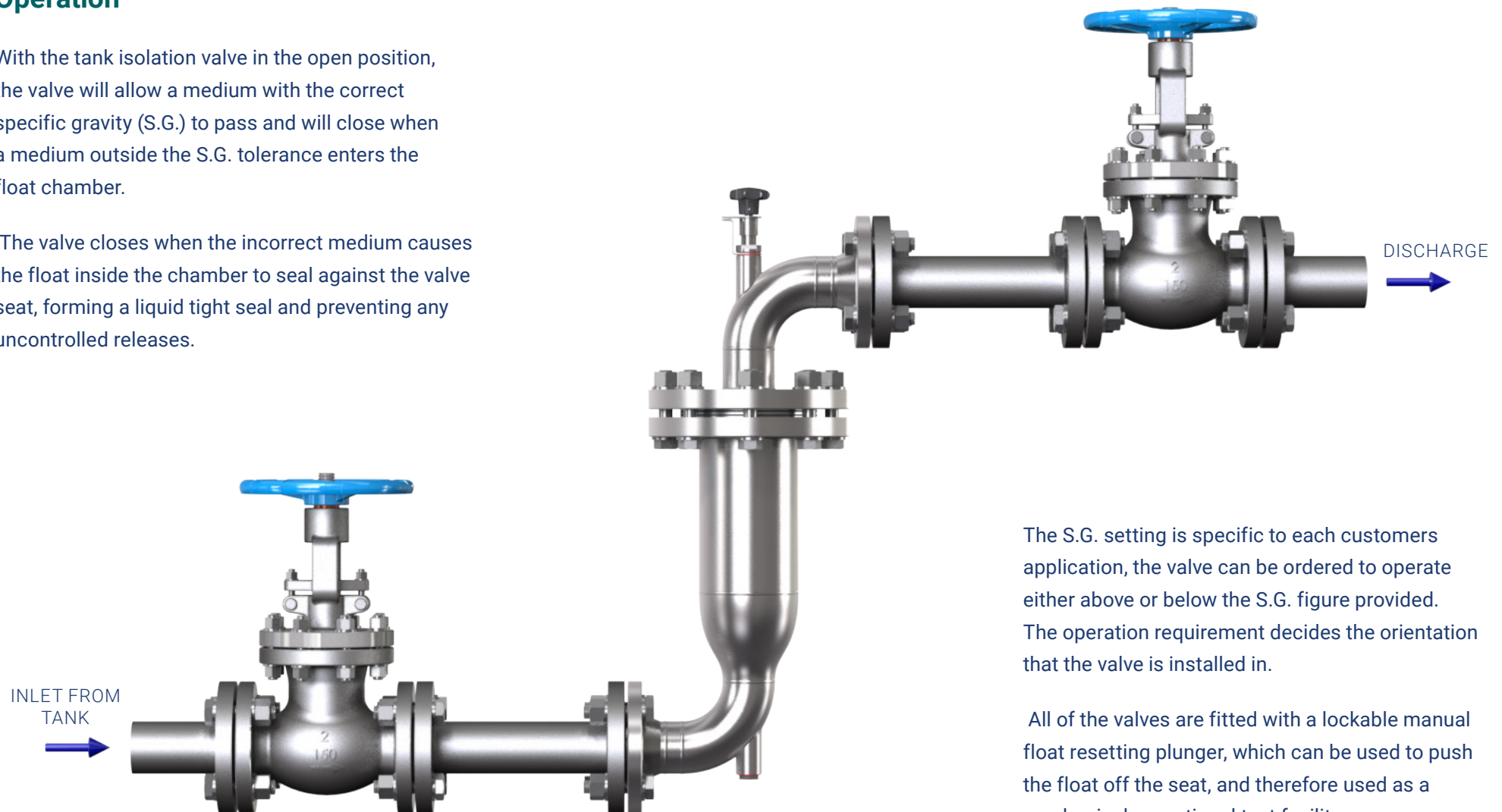


**FABRICATED VERSION**

## Operation

With the tank isolation valve in the open position, the valve will allow a medium with the correct specific gravity (S.G.) to pass and will close when a medium outside the S.G. tolerance enters the float chamber.

The valve closes when the incorrect medium causes the float inside the chamber to seal against the valve seat, forming a liquid tight seal and preventing any uncontrolled releases.



The S.G. setting is specific to each customer's application, the valve can be ordered to operate either above or below the S.G. figure provided. The operation requirement decides the orientation that the valve is installed in.

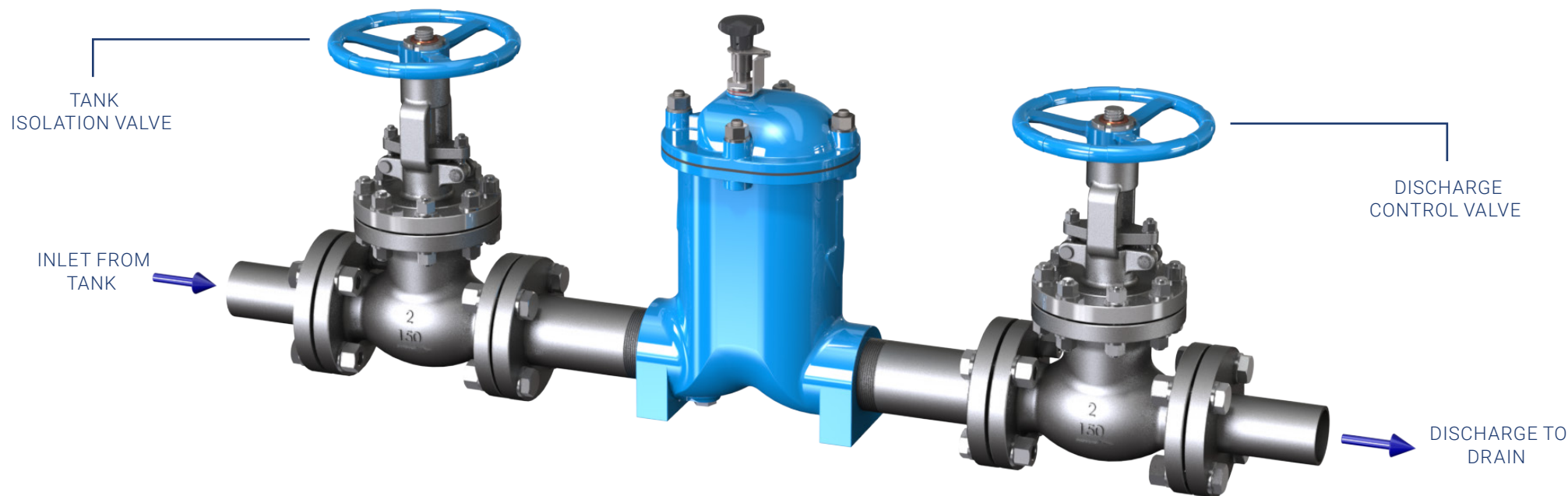
All of the valves are fitted with a lockable manual float resetting plunger, which can be used to push the float off the seat, and therefore used as a mechanical operational test facility.

## Installation

The Density Sensitive Valve should be installed after a isolation valve and before a control valve. There is no minimum distance required between the isolation and control valve and the Density Sensitive Valve inlet and outlet; however AMS-IAC would recommend a distance of at least 200mm.

The orientation of the valve is dependent on the application. The diagram shows an installation which allows lower density mediums to pass through and will close when a higher density medium enters the valve. To achieve the opposite, the valve body should simply be installed in the inverted position.

**Note:** The DSV's are designed for use in gravity fed system and do not operate on a pump fed system, for density shut off on pump fed systems please refer to the AMS-IAC fuel grade monitoring valve.



**SUGGESTED INSTALLATION FOR THE CAST DENSITY SENSITIVE VALVE WITH SCREWED CONNECTION  
(OPTIONAL FLANGED VERSION ALSO AVAILABLE)**

## Specification

	Cast Versions	2" Fabricated Version	4" Fabricated Version
<b>Part No:</b>	DSV-SV2050/DSV-SV2056	DSV-SV2107	DSV-SV596
<b>Body Material:</b>	Aluminium Alloy or 316 Stainless Steel	316L Stainless Steel/ Carbon Steel	316L Stainless Steel/ Carbon Steel
<b>Float Material:</b>	Polypropylene	Polypropylene	Polypropylene
<b>Seal Materials:</b>	Viton/Klingsill	Viton/Klingsill	Viton/Klingsill
<b>Std Process Connections:</b>	Screwed connections 2.5" BSPP or 2" NPT Flanged Connections 2" or 3" ANSI/ASME 150lb or 300lb*	Flanged 2" ANSI/ASME 150lb. RF	Flanged 4" ANSI/ASME 150lb. RF
<b>Max Flow Rate:</b>	300 Ltrs/Min	300 Ltrs/Min	1250 Ltrs/Min
<b>Max Line Pressure:</b>	10 Bar	10 Bar	15 Bar
<b>Temperature Rating:</b>	-18 to 200°C	-18 to 200°C	-18 to 200°C
<b>Weight:</b>	10 Kgs	35 Kgs	70 Kgs

\*Other flange sizes/ratings available on request.

Density range (S.G.) can be from 0.68 to 1.2. Dependant on user requirements the float can be set to either shut off above or below the required density value.

If the line medium freezes the valve will return to operation once the medium has thawed. Although Viton seals have a brittle point of -45°C and can operate satisfactorily at temperatures approaching this, it is recommended that they are replaced if subjected to temperatures below -18°C before the valve returns to operation.

AMS-IAC specialise in custom made instrumentation & valve products and as such offer a wide range of documentation options and where possible, will amend standard features to meet customer specific requirements.

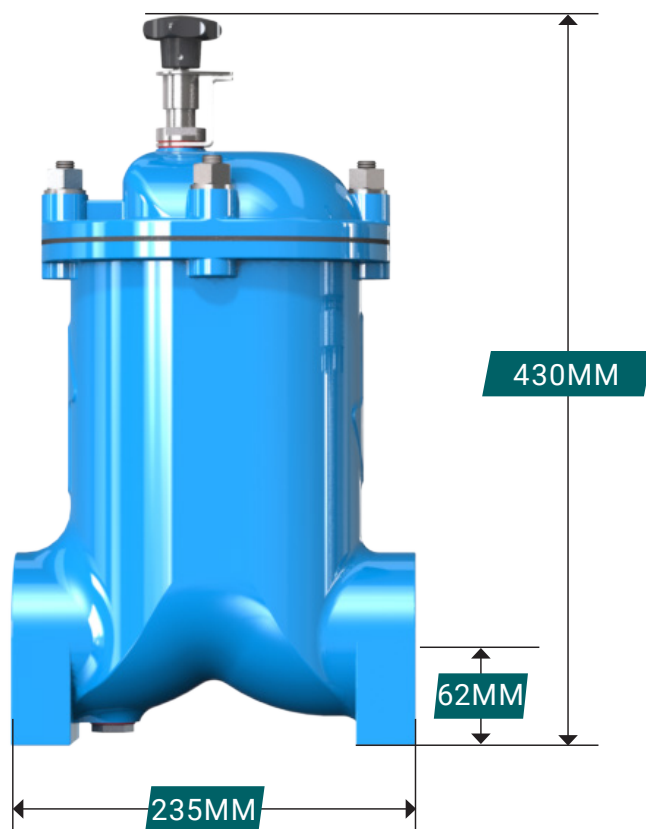
A version of this valve has been created specifically for draining water in hydrocarbon storage tanks, see our Density Sensitive Valve for Water Drain Applications for more information.

### Key Benefits

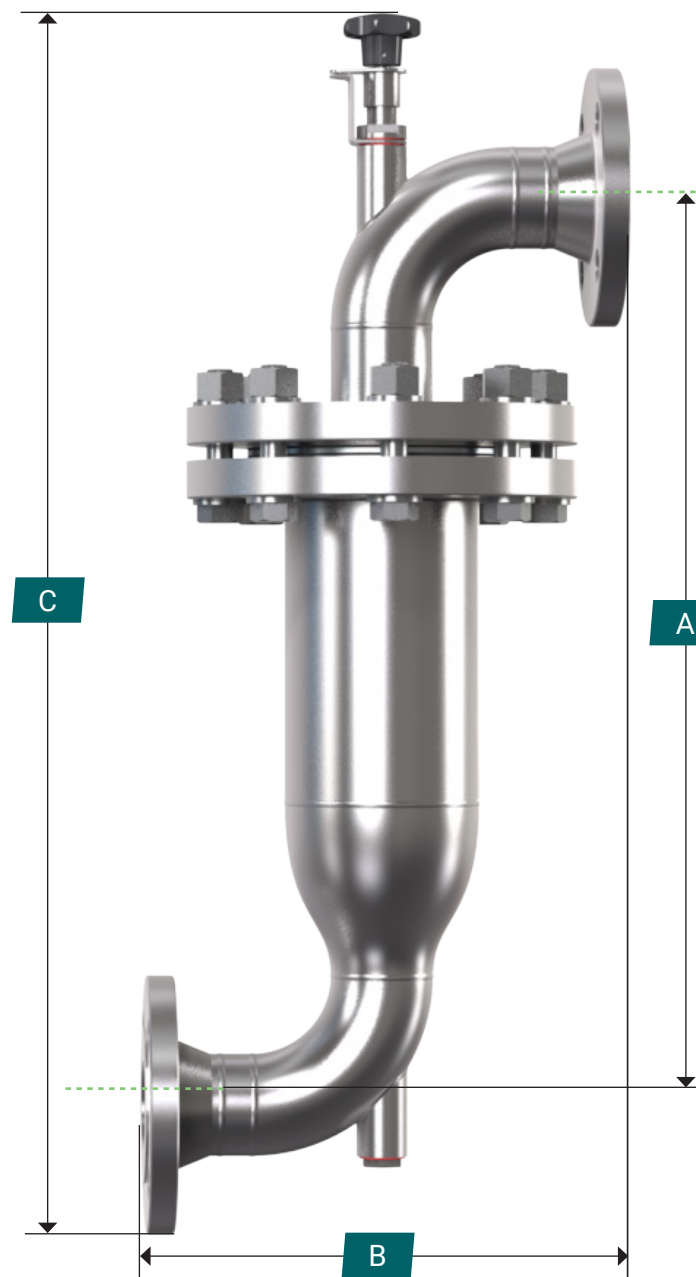
- Oil/water separator outlets
- Aviation gasoline quality control to prevent engine failure
- Forecourt fuel grade monitoring
- Wastewater package drain lines in marine and transport applications
- Filtration packages
- Water/Condensate drain on storage tanks
- Chemical drain and quality applications (PVDF Version)

## Dimensions

A	B	C
516mm	280mm	668mm
810mm	458mm	1089mm



**CAST VERSION**



**FABRICATED VERSION**

## Ordering Information

### Part Number Selection

DENSITY SENSITIVE VALVE	DSV-	XXXX-	XX-	X-	X-	XX
Base Model						
4" Fabricated Version		SV596				
2" Fabricated Version		SV2107				
2" Npt Cast Version		SV2056				
2" Bspg Cast Version		SV2050				
<b>BODY MATERIAL</b>						
Aluminium Alloy (Cast) Grade: Lm 25M			Ac			
Stainless Steel (Cast) Grade: BS3100 316 C16			Sc			
Stainless Steel (Fabricated) Grade: 316Ss			Sf			
Carbon Steel (Fabricated) Grade: ASTM A106 (Body) / ASTM A234 (Elbows & Reducers)			Cf			
<b>FLANGE MATERIAL</b>						
316 Stainless Steel Grade: Astm A182 F316				S		
Carbon Steel Grade: Astm A105				C		
No Flange				0		
<b>FLANGE SIZE</b>						
2"					2	
3"					3	
4"					4	
Others (Special)					X	
<b>FLANGE RATING</b>						
150Lb ANSI/ASME B16.5						15
300Lb ANSI/ASME B16.5						30
Others (Special)						X

### Paint Specification

The Cast Aluminium and Fabricated Carbon Steel Density Sensitive Valves are supplied painted with Amercoat 385 Multi-Purpose Epoxy (+120 Deg C Max), AMS-IAC Blue Colour (RAL 5005) as standard. AMS-IAC can supply the Density Sensitive Valves painted to suit individual customer paint requirements, please specify at time of enquiry.

### Spares

<b>DSV-MSK-SV596</b>	Maintenance Spares Kit for WDV/DSV596, includes 1x gasket for body/cover, 1x SV384 Plunger Assembly
<b>DSV-SV2107</b>	Maintenance Spares Kit for WDV/DSV2107, includes 2x gasket for body/cover, 1x SV471 Plunger Assembly
<b>DSV-MSK-SV2056</b>	Maintenance Spares Kit for WDV/DSV2056, includes 1x gasket for body/cover, 1x SV364 Plunger Assembly
<b>DSV-MSK-SV2050</b>	Maintenance Spares Kit for WDV/DSV2050, includes 1x gasket for body/cover, 1x SV364 Plunger Assembly
<b>SV399</b>	Float Guide Assembly (WDV/DSV596)
<b>SV2070</b>	Float Guide Assembly (WDV/DSV2107)
<b>SV273</b>	Float Guide Assembly (WDV/DSV2050/WDV/DSV2056)

## Documentation and Testing

AMS-IAC can supply the Density Sensitive Valves with documentation to suit individual customer requirements, these documents include but not limited to:

- Material Certification EN 10204-3.1
- Hydrostatic Pressure Test Certificates
- Weld Procedures
- Welder Qualifications
- Certificate of Conformity
- PED
- Installation, Operation and Maintenance Manual etc.
- Non-destructive Testing
- Material Analysis
- Special Tagging
- Inspection and Test Plans

In addition to the above AMS-IAC can also provide:

- **Accessories:**

AMS-IAC offer a range of accessories for use in conjunction with the Valves, such as Gaskets, nuts/bolts and fittings.

- **Instrumentation:**

AMS-IAC offer a range of process instrumentation and valves to cover a wide variety of process measurement applications.





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