



**HALE HAMILTON®**

*Excellence in Pressure & Flow Control*

A **CIRCOR** International, Inc. Company

## Gas Turbine Valves



## Gas Turbine Valves

**DV4** Drain Valves

**ASV134** Purge Valves

**DR5 Mk9** Back Pressure Maintaining Valve  
with pressure offset

**FV2 & 3** Fuel Flow Control Valves

We design, machine, build and test all our products on one site in Uxbridge. If you don't see what you want in our standard ranges, contact us and we'll do our best to meet your needs.

Hale Hamilton (Valves) Ltd  
Cowley Road, Uxbridge, UB8 2AF, UK  
Tel: 01895 236 525  
[www.halehamilton.com](http://www.halehamilton.com)





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## Gas Turbine Drain Valve

### Description

These valves were developed for gas turbine control applications but they may be suitable for use in similar harsh environments.

DV4 is used to drain unburnt fuel in case of a failed turbine start or to drain water after washing operations. DV4 is normally open. The actuator is pneumatic with spring return and is integrated into the valve body.

The valves are suitable for use with combinations of particulate fuel combustion products, diesel/paraffin type fuel, de-mineralised water and detergent.

The base model DV4 (Mk0) is rated for 250 C. It has no electrical or visual position indication.

DV4 Mk2, Mk3 and Mk4 have a mechanical visual/tactile indicator and may be supplied with micro switches to indicate fully open only; fully closed only; fully open and fully closed or with no switches.

DV4 Mk3 has a hard (metal) seat.

DV4 Mk4 is designed to hold open at a higher inlet/pilot pressure.



### Options

Please contact us for details

- Position switches: DV4 can be supplied with one or two internal switches to indicate: fully open, fully closed or both.
- The switches are hermetically sealed to MIL 8805 symbol 5
- Certification: units are suitable for Category 3 ATEX service

### Standard Materials

Alternative materials can be supplied

- Body: Stainless Steel
- O rings: Viton (Chemraz on DV4 Mk3 only)
- Seat: PEEK (Copper on DV4 Mk3 only)
- Diaphragm: Viton

### Ordering Information

Please supply the following information when ordering

- Valve type
- Maximum working pressure
- Flow medium
- Port configuration
- Operating and storage temperature ranges
- Certification and QA requirements

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## Gas Turbine Drain Valve

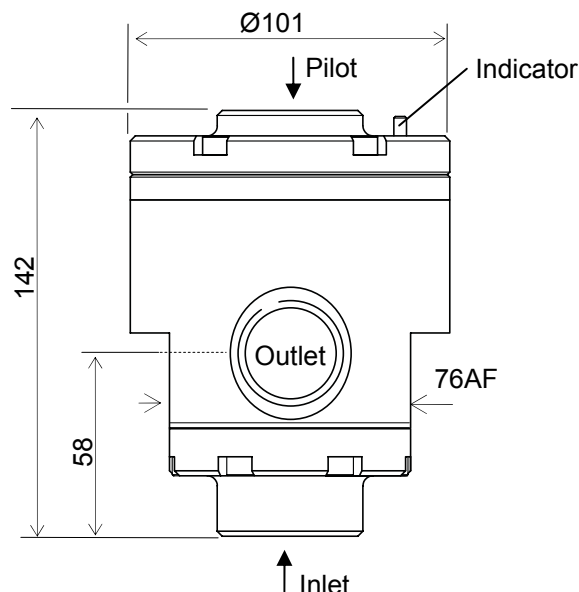
### DV4 Auto Drain Valve

#### Typical Dimensions

in mm except where  
shown otherwise

#### Specification

- Nominal Bore: 24 mm (15/16")
- Inlet pressure: up to 31 bar (450 psi)
- Pilot pressure: 3 to 9 bar (40 to 135 psi)
- Inlet & outlet Ports: 1" NPT female
- Pilot port: 1/4" NPT
- Conduit port: 1/2" NPT (when switches are fitted)
- Weight: approx. 5.5kg
- Medium: combinations of particulate fuel combustion products, diesel/paraffin fuel, de-mineralised water and detergent.
- Operating temperature range: -20 to +204°C (+250°C for DV4 (Mk0) only)



#### Part Numbers and Spares Kits

Please refer to Service Instruction SI946 available on request

Part Number	Type number	Closed Pressure	Switches	Seat	Spares
NC53026	DV4	0.7 bar	none	PEEK	K872
NB58841/1	DV4 Mk2	1.4 bar	both	PEEK	K1640/1
NB58841/2	DV4 Mk2	1.4 bar	closed	PEEK	K1640/2
NB58841/3	DV4 Mk2	1.4 bar	open	PEEK	K1640/3
NB58841/4	DV4 Mk2	1.4 bar	none	PEEK	K1640/4
NB60117/1	DV4 Mk3	1.4 bar	both	Copper	K1739/1
NB60117/2	DV4 Mk3	1.4 bar	closed	Copper	K1739/2
NB60117/3	DV4 Mk3	1.4 bar	open	Copper	K1739/3
NB60117/4	DV4 Mk3	1.4 bar	none	Copper	K1739/4
N102950/1	DV4 Mk4	3 bar	both	PEEK	K2262/1
N102950/2	DV4 Mk4	3 bar	closed	PEEK	K2262/2
N102950/3	DV4 Mk4	3 bar	open	PEEK	K2262/3
N102950/4	DV4 Mk4	3 bar	none	PEEK	K2262/4

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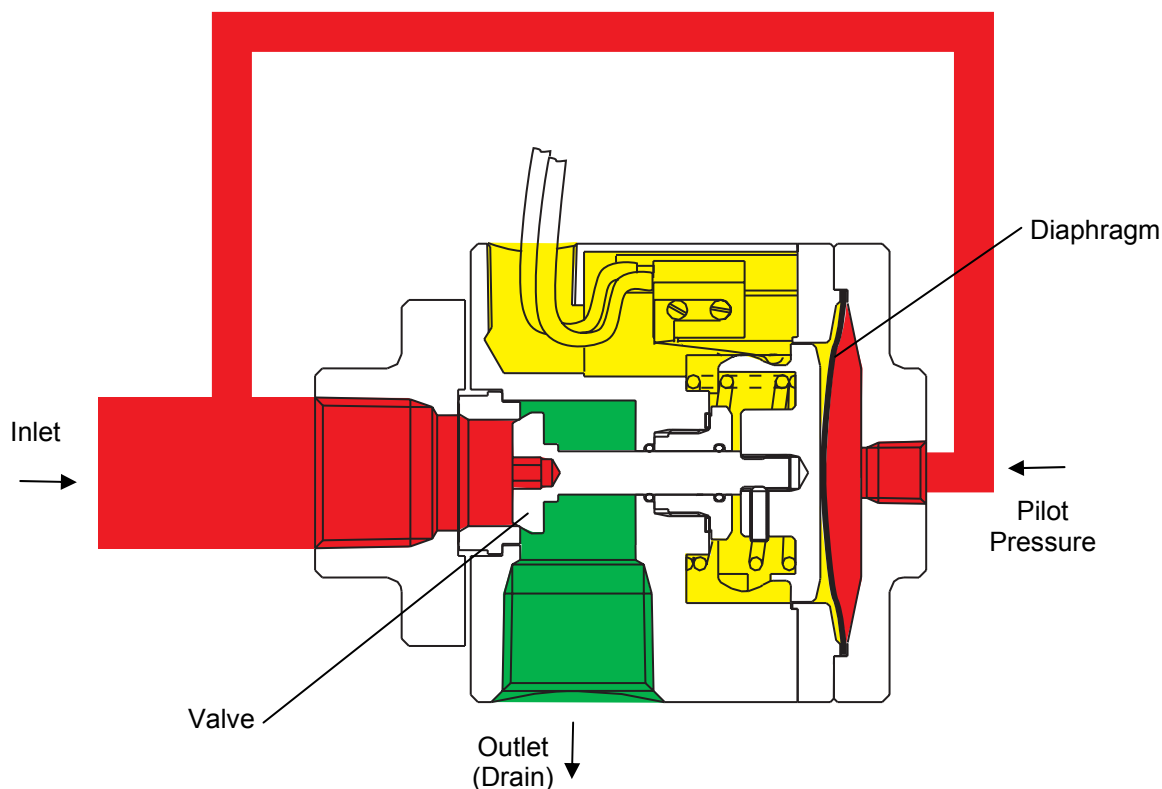
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## Gas Turbine Drain Valve

### How it Works



The valve is held open by a spring and closed when the actuator pilot port is pressurised.

The valve is designed to be operated with the pilot pressure supplied from the inlet.

When the force applied by the pilot pressure acting on the area of the diaphragm is higher than the spring force, the valve starts to close. The pressure at which the valve is fully closed is different for each type and is listed in the table.

For instructions on adjusting the set pressure or on servicing the valve please contact Hale Hamilton Valves Ltd.

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## Gas Turbine Purge Valve

### Description

These valves were developed for gas turbine control applications but they may be suitable for use in similar harsh environments.

ASV134 is used in gas turbine systems to purge the fuel nozzle. In the normal position (actuator un-pressurised) the inlet is blocked and the outlet is connected to the vent. When the actuator is pressurised, the inlet is connected to the outlet and the vent is blocked. All ports are momentarily connected together during changeover.

The actuator is pneumatic with spring return and is integrated into the valve body.



### Options

Please contact us for details

- Position switches: ASV134 can be fitted with one external switch to indicate the energised position. This increases overall height to 208mm.

### Standard Materials

Alternative materials can be supplied

- Body: Stainless Steel
- O rings: Viton
- Seats: PEEK
- Diaphragm: Viton

### Ordering Information

Please supply the following information when ordering

- Valve type
- Maximum working pressure
- Flow medium
- Port configuration
- Operating and storage temperature ranges
- Certification and QA requirements

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## Gas Turbine Purge Valve

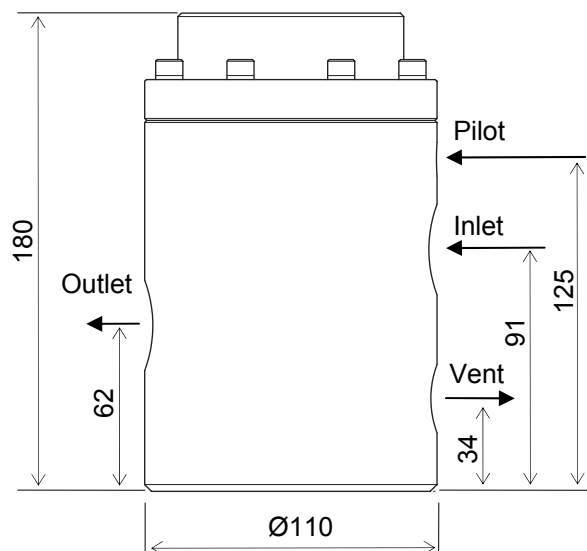
### ASV134 Fuel Nozzle Purge Valve

#### Typical Dimensions

in mm except where  
shown otherwise

#### Specification

- Nominal Bore: 19 mm (3/4")
- Inlet pressure: up to 15 bar (220 psi)
- Pilot pressure: 3 to 9 bar (40 to 135 psi)
- Inlet & outlet Ports: 3/4" NPT female
- Vent port: 1/2" NPT
- Pilot port: 1/8" NPT
- Weight: approx. 10.5kg
- Medium: Air
- Maximum operating temperature: 232°C (when switch is fitted valve must not exceed 180°C and actuator must not exceed 150°C)
- Maximum pilot air temperature: 38°C
- Ambient temperature range: -29 to +149°C



#### Part Numbers and Spares Kits

Please refer to Service Instruction SI1070 available on request

Part Number	Type number	Switch	Spares
NB54950	ASV134	no	K1372
NB56102	ASV134 mk1	yes	K1372

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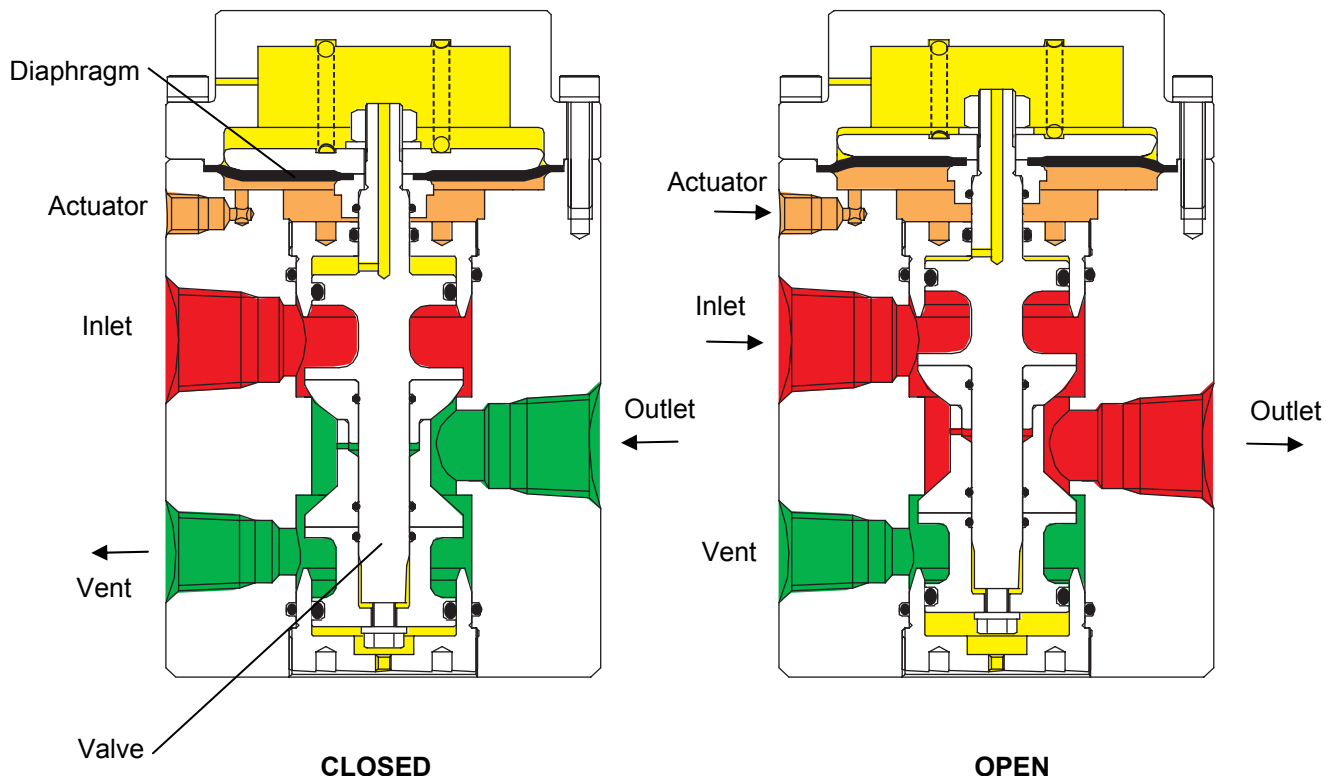
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## Gas Turbine Purge Valve

### How it Works



The valve is held closed by a spring and opened when the actuator port is pressurised.

In the normal position (actuator un-pressurised) the inlet is blocked and the outlet is connected to the vent. When the actuator is pressurised, the inlet is connected to the outlet and the vent is blocked. All ports are momentarily connected together during changeover.

The valve is pressure balanced to reduce the load on the actuator.

ASV134 Mk1 has a microswitch to indicate valve position. The switch is closed when the valve is open (actuator pressurised).

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## Back Pressure Maintaining Valve (with pressure offset)

### Description

Back pressure maintaining valves (BPMV) control the inlet pressure by venting pressure to the outlet if the inlet pressure exceeds the set value.

DR5 Mk 9 is a dome-loaded, back pressure maintaining valve with a spring loaded offset.

The valve remains closed until the pressure in the upper dome exceeds the pressure in the lower dome by more than 1bar (the spring offset). The valve then opens and allows flow from inlet to outlet. The valve is balanced to improve sensitivity.

DR5 Mk 9 is intended for use in maintaining back pressure in gas turbine lubrication applications. The spring offset ensures that some back pressure is maintained if control pressure is lost.

This valve was developed for gas turbine control applications but it may be suitable for use in similar harsh environments.



### Standard Specification

See next page for specification of individual types

- Temperature range: -20 to +70°C (extended temperature range versions can be supplied)

### Standard Materials

Alternative materials can be supplied

- Body: Aluminium Alloy
- Internal parts: Stainless Steel
- Valve Seat: PEEK
- O rings and Diaphragm: Viton

### Options

Please contact us for details

- Materials: suitable combinations of materials can be supplied for various applications.

### Ordering Information

Please supply the following information when ordering

- Maximum inlet pressure
- Set pressure
- Flow medium
- Operating and storage temperature ranges
- Certification and QA requirements

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## Back Pressure Maintaining Valve (with pressure offset)

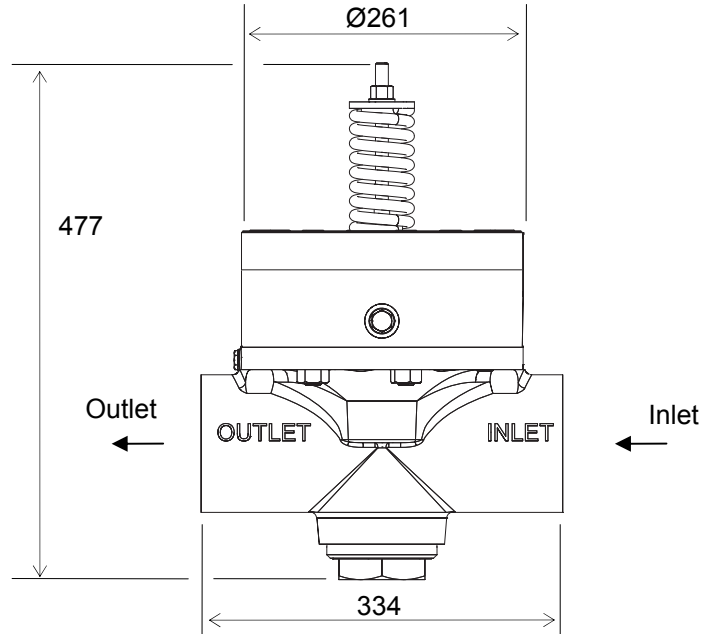
### DR5 Mk9

#### Typical Dimensions

in mm except where shown otherwise

#### Specification

- Inlet pressure: 4.5bar
- Nominal set pressure: 3bar
- Offset pressure: 1bar
- Nominal bore: 63.5mm (2 1/2")
- Inlet & Outlet ports: G3
- Upper dome ports: G3/4 (gauge port), G1/4 (remote sensing port)
- Lower dome ports: G3/8 (gauge port), G1/4 (control port)
- Weight: approx. 27.6 kg



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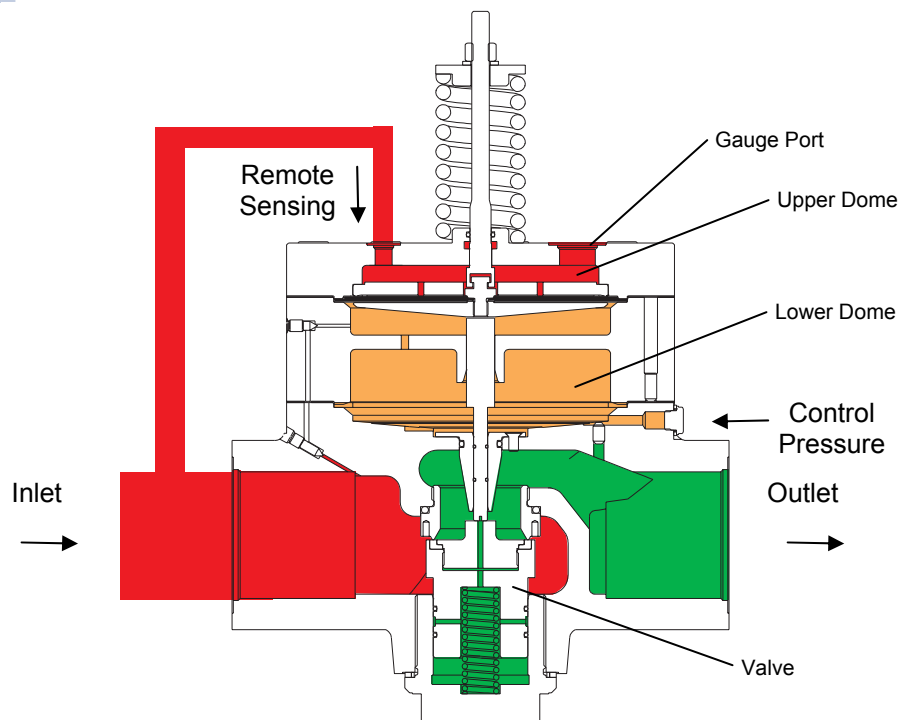
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## **Back Pressure Maintaining Valve (with pressure offset)**

### **How it Works**



The lower dome of the valve contains pressurised gas at a set pressure. This acts as a spring pushing on the diaphragm to allow the valve to close. The upper dome on the other side of the diaphragm is connected to the remote sensing pressure. An external spring pulls the diaphragm upward and also acts against the pressure in the upper dome. The valve is closed while the remote sensing pressure is lower than the combination of the set pressure and the external spring.

The diaphragm moves down when the remote sensing pressure becomes higher than the sum of set pressure and the equivalent pressure from the spring. This opens the valve and allows flow from inlet to outlet.

To use the valve as a back pressure maintaining valve, the remote sensing port must be externally connected to the inlet. There is no internal connection to the upper dome.

The pressure in the lower dome may be supplied from an external source of gas. In this case the inlet pressure is maintained at 1bar higher than the control pressure.

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## Gas Turbine Control Valves

### Description

These valves were developed for gas turbine control applications but they may be suitable for use in similar harsh environments.

FV2 is for the control of gaseous fuel flow. It consists of a valve cartridge and an electrical, rotary actuator.

FV3 is for the control of liquid fuel flow. It consists of a valve cartridge with an electrical, rotary actuator; a relief valve and a pressure maintaining valve.

In both FV2 and FV3 the effective orifice of the valve is controlled by the angle of the spool within the cartridge. The spool is rotated to the required angle by the actuator.

The valve cartridge is available in various flow ranges and can be removed and replaced without disturbing the valve.

The actuator is flameproof and is available in two variants: LA16 includes a stepper motor and a position sensor but no electronic drive system; LA17 has an electronic drive system and is slightly larger.

The actuator can be removed and replaced without disturbing the valve.

Either actuator can be fitted on either valve.



### Options

Please contact us for details

- Actuator: available with or without electronic drive controller
- Flow cartridge: various flow rate ranges are available
- Relief valve: FV3 may be supplied with or without a relief valve
- Certification: units are suitable for Category 2 ATEX service

### Standard Materials

Alternative materials can be supplied

- Body: Stainless Steel
- O rings: Viton

### Ordering Information

Please supply the following information when ordering

- Valve type
- Flow rate range
- Maximum working pressure
- Relief valve setting (FV3 only)
- Pressure maintaining valve setting (FV3 only)
- Flow medium
- Port configuration
- Operating and storage temperature ranges
- Certification and QA requirements

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## Gas Turbine Control Valves

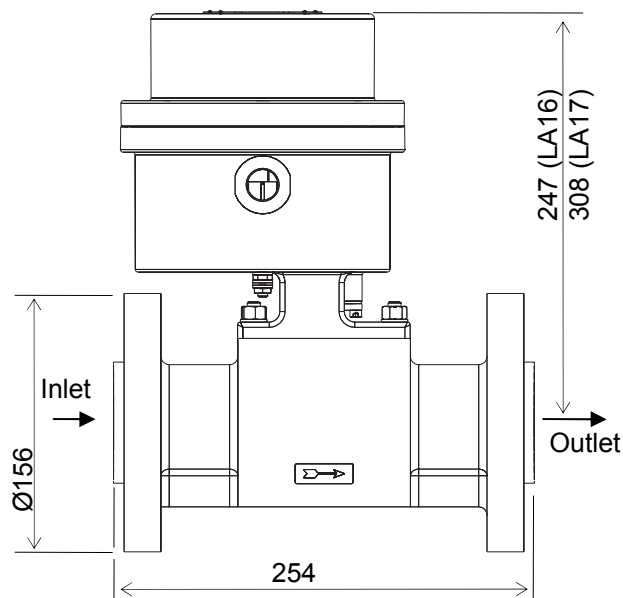
### FV2 Gas Fuel Valve

#### Specification

- Nominal Bore: 38 mm (1 1/2")
- Inlet pressure: up to 41 bar (600 psi)
- Maximum Flow (largest orifice): 0.7 kg/s of natural gas - pressure ratio 1.1:1
- Inlet & outlet Ports: 1 1/2" ANSI 600 flange
- Weight: approx. 28.5kg (with LA16 actuator); 29.5kg (with LA17 actuator)
- Medium: gaseous fuel
- Operating temperature range: -40 to +70°C

#### Typical Dimensions

in mm except where shown otherwise



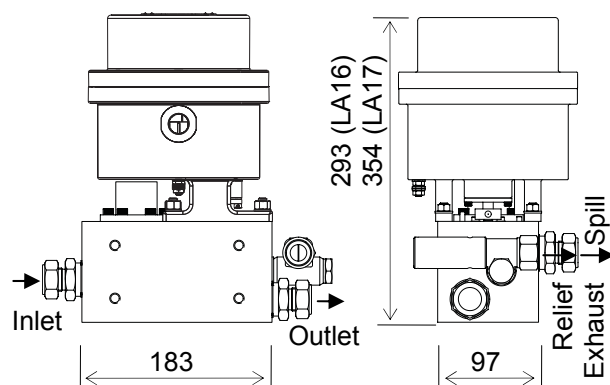
### FV3 Liquid Fuel Valve

#### Specification

- Nominal Bore: 19 mm (3/4")
- Inlet pressure: up to 120 bar (1750 psi)
- Outlet flow range: 3.6 to 58 l/min of Diesel
- Inlet, outlet & spill ports: fittings for 20mm or 3/4" tube
- Relief valve exhaust port: G3/4
- Weight: approx. 26kg (with LA16 actuator); 27kg (with LA17 actuator)
- Medium: Diesel
- Operating temperature range: -40 to +80°C

#### Typical Dimensions

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## Gas Turbine Control Valves

### LA16, LA17 Actuator

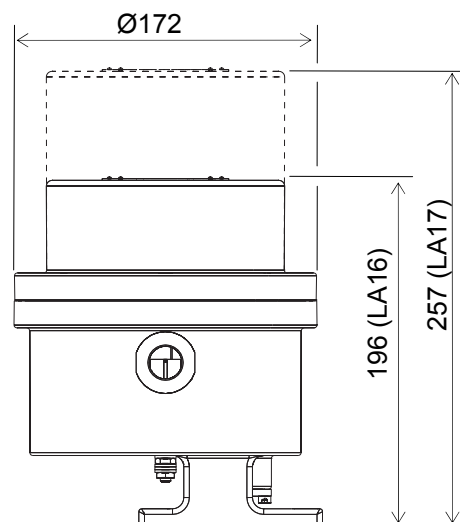
#### Typical Dimensions

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shown otherwise

#### Specification

	LA16	LA17
Control Input	Direct access to stepper motor	4 to 20 mA
Position Indication	4 to 20 mA (direct from inductive sensor)	4 to 20 mA
Power Supply	N/A	24V dc
Other functions	N/A	Motor lock; fault relay; fail closed or open as required
Operating temperature range	-40 to +90°C	-40 to +80°C
Weight approx	12.5 kg	13.5 kg

- Earth stud: M6
- Cable ports: 2 x M20 - 1.5



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