

FS3-ATEX Valves

Solenoid Powered to Open / Spring to Close (failsafe)
ATEX / IECEx certified

Part of the F Series of easily installed, compact, air intake valves for diesel engine emergency shut down.



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Application

The FS3-ATEX version of the Wyndham Page F Series of shut down valves is designed to be installed in the air intake system of a diesel engine to provide an emergency means of rapid shut down.

The valve is fitted with a solenoid approved for operation in T4, Zone 1, Gas Group IIC and Zone 21, Conductive Dust Group IIIC hazardous areas.

An electrical signal must be applied continuously to hold the FS3-ATEX valve in the open state to enable the engine to be started and run. Loss of this electrical signal results in closure of the valve thereby bringing the running engine to a stop within a few seconds.

An electrical shutdown control system is required to interrupt the electrical signal to the valve automatically on engine overspeed or any other selected fault condition. Additionally a manual emergency stop button to enable the electrical signal to the valve to be switched off should be incorporated.

Any loss of power supply to the shutdown control circuit or fault within the control circuit causing loss of signal output would also result in an engine shutdown.

The low intake air flow restriction through the open valve makes it generally compatible with the requirements of low emission diesel engines.

Corrosion resistant materials are used where applicable in the construction of the valve. This lightweight and compact valve design together with the availability of factory fitted hose adaptors selected from a wide range of optional sizes assists in easy installation.

The valve may be fitted to either turbocharged or naturally aspirated engines. In the case of turbocharged engines temperature limitations may restrict the position in which the valve may be installed in the intake system.

Description and Main Dimensions

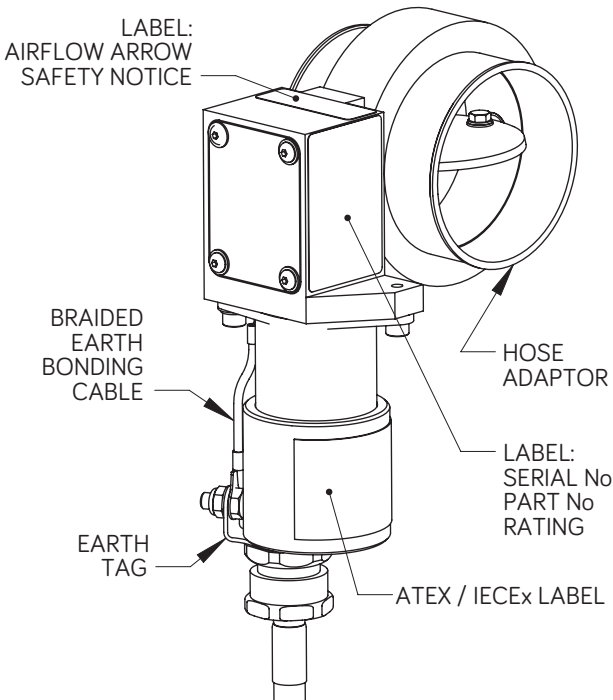
Versions of the FS3-ATEX valve can be selected to operate by either a 12 volt or 24 volt run signal.

In standard form the FS3-ATEX valve is available complete with formed hose adaptors as selected by the customer from a range of standard sizes – see diagram below and data on pages 4 and 5. Where a requirement exists for a non-standard adaptor size or other alternative form of intake pipe connection such as bolted joint, please pass details of requirement to Wyndham Page or your Wyndham Page supplier for investigation.

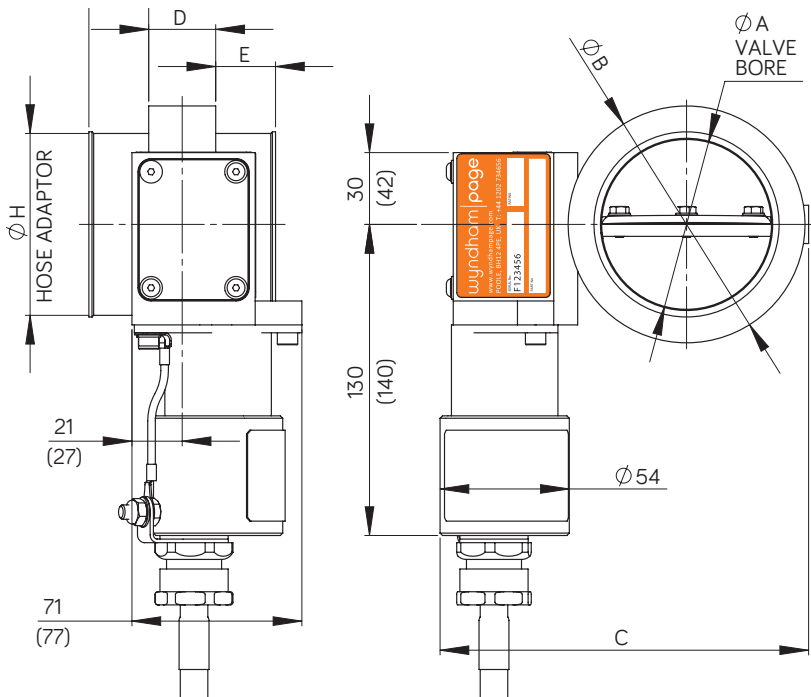
The valve has a metal to metal seal when closed. It is designed for low closing friction and long life of the sealing surfaces. The internal mechanism is configured to withstand high shock loads without malfunction.

The electrical enclosure is to IP66.

The diagram below and the diagrams and data on pages 4 to 5 cover the main features and basic dimensions of the FS3-ATEX range including selection of options and order coding.



METRIC TABLE		DIMENSIONS (MM)					WEIGHT KG	ORDER CODE					
MODEL	H TO SUIT HOSE BORE	BORE A	B	C	D	E							
FS3- ATEX	38	57	81	131	50	20	1.72	038					
	44						1.72	044					
	51						1.72	051					
	57						1.72	057					
	64						1.72	064					
	70	71	99	149	28	25	1.75	070					
	76						1.69	076					
	83						1.77	083					
	89						1.84	089					
	95						2.03	095					
	102	95	125	175	35	25	2.01	102					
	108						2.1	108					
	114						2.19	114					
	121						2.46	121					
	127						2.48	127					
	133	120	154	204	42	25	2.58	133					
	140						2.71	140					
	146						3.03	146					
	152						145	185	236	49	25	3.28	152
	159											3.42	159
165	3.55	165											
171	3.69	171											
178	4.19	178											
203	192	238	291	65	40	5.95	203						



IMPERIAL TABLE		DIMENSIONS (INCHES)					WEIGHT LB	ORDER CODE
MODEL	H TO SUIT HOSE BORE	BORE A	B	C	D	E		
FS3- ATEX	1.50	2.2	3.18	5.14	1.97	0.79	3.79	038
	1.73						3.79	044
	2.01						3.79	051
	2.24						3.79	057
	2.52						3.79	064
	2.76						3.86	070
	2.99	2.80	3.90	5.87	1.10	0.98	3.73	076
	3.27						3.90	083
	3.50						4.06	089
	3.74						4.48	095
	4.02	3.74	4.92	6.89	1.38	0.98	4.43	102
	4.25						4.63	108
	4.49						4.83	114
	4.76						5.42	121
	5.00	4.72	6.06	8.03	1.65	0.98	5.47	127
	5.24						5.69	133
	5.51						5.98	140
	5.75						6.68	146
	5.98						7.23	152
	6.26	5.71	7.28	9.29	1.93	0.98	7.54	159
6.50	7.83						165	
6.73	8.14						171	
7.01	9.24						178	
7.99	7.56	9.37	11.46	2.56	1.57	13.12	203	

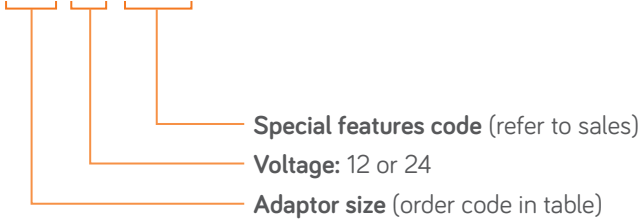
Valve Selection

To enable Wyndham Page to select the most suitable version of the FS3-ATEX valve for the Customers application the following data is required:

- [1]. Bore size of the intake hose into which the intake valve is to be fitted - refer to section headed "Description and Main Dimensions".
- [2]. Whether a 12 volt or 24 volt shut down signal is to be used.

Order Coding

FS3 - XXX - XX - S000 - ATEX



Special Features:
By arrangement with Wyndham Page.

Installation [mechanical]

Select a position for the valve which meets the requirements below and also permits a suitable run for the connected electrical cable. Ensure direction of the engine intake airflow complies with that marked on the valve. If an engine air intake system flametrap is also fitted, the valve must be installed upstream (air cleaner side) of the flametrap.

The valve may be fitted in any attitude from horizontal to vertical but not in a position where it is subjected to internal airflow temperatures outside of the range -40°C to $+120^{\circ}\text{C}$ and an effective ambient at the solenoid assembly outside the range -40°C to $+50^{\circ}\text{C}$ (see page 8).

Additionally in the case of naturally aspirated engines fit the valve as close as possible to the intake manifold.

For turbocharged engines fit the valve upstream of the turbocharger except where an air charge cooler is fitted in which case it may be fitted downstream of the charge cooler subject to compliance with the temperature limits stated herein. Do not fit valve between the turbocharger and charge cooler.

The hose and associated intake system into which the valve is installed should be adequate to fully support the valve whilst not permitting excessive vibration of the valve. Generally ensure that there is sufficient flexibility in the finalised intake system to allow for the necessary relative movement between the intake system components over the full range of engine operating conditions to avoid excessive mechanical stresses. Ensure the quality and length of the sections of flexible intake pipe are such that when the intake valve closes with the engine at full rating hose collapse is avoided.

Any existing crankcase breather arrangement venting directly into the engine intake ports or into the intake system downstream of the FS3-ATEX valve, must be sealed and replaced by a crankcase breather arrangement connected into the intake system upstream of the FS3-ATEX valve or, if permitted at the operating site, vented to atmosphere.

Important Note. Retain the standard fuel shut down stop fitted to the engine. The Wyndham Page FS3-ATEX air intake valve is designed for emergency stop only.

Installation and Operation of B1126X Solenoid Unit

The FS3-ATEX valve is fitted with an ATEX / IECEx certified solenoid marked as shown below according to the voltage selected.

WYNDHAM PAGE BH12 4PE UK ⊕ II 2 G D IP66 Ta -40°C to +50°C Ex eb IIC T4 Gb Ex tb IIIC T135°C Db TYPE B1126X12X SN 123456 / YY CML 17ATEX3233X IECEx CML 17.0131X 12Vdc (13.5Vdc MAX) HOLD 1.1A PULL 46A CE 2503	WYNDHAM PAGE BH12 4PE UK ⊕ II 2 G D IP66 Ta -40°C to +50°C Ex eb IIC T4 Gb Ex tb IIIC T135°C Db TYPE B1126X24X SN 123456 / YY CML 17ATEX3233X IECEx CML 17.0131X 24Vdc (27Vdc MAX) HOLD 0.5A PULL 25A CE 2503
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- The solenoid should be connected as shown in the connection schematic on page 10.
- The solenoid may be earthed using the cable gland earth tag. The braided earth bonding cable must be reconnected to the earth tag when connecting an earth cable.
- The outer braiding of the supply cable **MUST** be earthed at the supply end.
- The length of the supply cable should not be increased from that supplied.
- A suitable cable gland must be used at the supply end of the cable.
- The solenoid power supply cable must be adequately secured along its length to avoid excessive mechanical stress at the connection to the solenoid or any other physical damage under all normal operating conditions and during equipment servicing.

It is recommended that a manual switch for emergency stop is **always** incorporated into the shutdown control circuit to switch off the electrical signal to the solenoid. This manual switch should be a type that requires reset to the run status after operation.

Important installation notes.

- The valve must be installed so that the solenoid is not exposed to temperatures outside of those shown in the table on page 10.
- The design of the electrical shutdown system must take into account the limitations applicable in terms of applying power to the solenoid pull coil as shown in the table on page 10. A suitable timer circuit should be fitted to achieve this. The starting instructions should clearly state that the key switch should not be returned to the solenoid de-energised position between starting attempts. If this requirement cannot be complied with, or the engine is an unattended unit with auto start, then the control system must be designed to restrict the number of times the pull coil is energised to that shown in the table on page 10.
- The control system must include a backup safety device such as a thermal overcurrent circuit breaker which will de-energise the pull coil if it is energised for more than 8 seconds continuously due to a fault in the control system.
- Epoxy adhesive and an elastomeric cable gland sealing ring are used in the construction of these solenoids. The performance of these materials with respect to chemicals that may be present in the hazardous area shall be taken into account when installing and using the product.

General and Electrical Specification

Ambient temperatures	Max: +50°C
	Min: -40°C
Solenoid ratings	12Vdc: Max 13.5Vdc, Pull Coil 46A, Hold Coil 1.1A
	24Vdc: Max 27.0Vdc, Pull Coil 25A, Hold Coil 0.5A
Pull coil on time	1 second max / maximum 5 cycles per 30 minutes max followed by cool down to ambient.
Fault protection	Pull coil to be de-energised after 8 seconds in fault situation.
Special conditions for safe use	i. The Pull and Hold Coils or the 12V valve shall not be supplied at more than 13.5Vdc. The Pull and Hold coils of the 24V valve shall not be supplied at more than 27.0Vdc.
	ii. The Pull Coil shall not be operated for more than 5 seconds every 30 minutes.
	iii. The maximum on time of the Pull Coil in fault conditions must not exceed 8 seconds followed by a cool down to ambient.
Standards used for compliance	EN 60079-0:2012 +A11:2013, EN 60079-7:2015, EN 60079-31:2014 IEC 60079-0:2011 Ed 6.0, IEC 60079-7:2015 Ed 5.0, IEC 60079-31:2013 Ed 2.0

GENERAL DESCRIPTION:

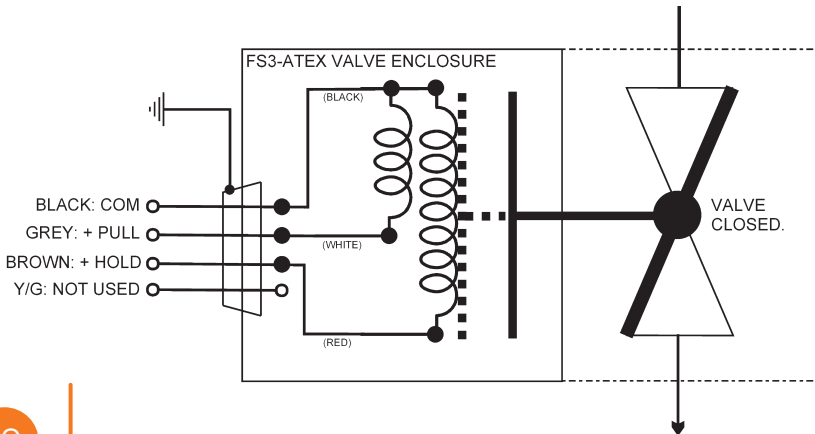
A slim solenoid operated butterfly valve designed for emergency shutoff of the engine air intake.

Operating mode: Spring closed, energise to open.

Dual coil solenoid.

GENERAL SPECIFICATION:

Temperature	Refer to solenoid section
Construction	Body and disk: Hard anodized Aluminium
	Other main components: Stainless steel, Aluminium
	Hose adaptors: Aluminium



Operation

Arrange the shutdown control circuit system such that the 12 volt or 24 volt run signal as applicable is applied to the FS3-ATEX valve when engine start up is required.

Normal engine shutdown should always be via the standard fuel shut down.

Should the engine standard fuel shut down fail to stop the engine operate the manual emergency stop in the shutdown control system to break the 12 volt or 24 volt supply to the FS3-ATEX valve.

The FS3-ATEX valve has no manual reset facility. It can only be operated by the application or removal of an electrical signal at the appropriate voltage.

Maintenance

The following maintenance schedule should be undertaken. Subject to experience of local operating conditions the frequency of the maintenance schedule may be varied. Carry out the proposed maintenance work when the equipment is in a safe area and record details of the work carried out. Rectify any problems identified before returning the diesel powered equipment back into service.

FOLLOWING INITIAL INSTALLATION AND THEREAFTER AT WEEKLY INTERVALS:

- [1]. Check all intake pipework between the FS3-ATEX valve and engine intake manifold to ensure all pipe fittings and any support brackets are properly fitted and secure and that the engine intake is leak free and shows no sign of significant deterioration or damage.
- [2]. Start engine. Carry out a shutdown using the stop signal from the shutdown control system. Check that the valve snaps shut and brings the engine to a stop within a few seconds.

SIX MONTHLY:

Remove the FS3-ATEX valve. Wipe clean as necessary and visually inspect for damage or excessive wear. Bench test valve function. Refit and complete the "Weekly" maintenance as listed above.

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