

FS3 Valves

Solenoid Powered to Open / Spring to Close (failsafe)

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 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.

An electrical signal must be applied continuously to hold the FS3 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 shut down 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 shut down control circuit or fault within the control circuit causing loss of signal output would also result in an engine shut down.

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.

Note. An Ex version of this valve is available. Wyndham Page also supply engine speed switches for incorporation into the emergency shut down control circuit of this type of application. Please contact Wyndham Page or your Wyndham Page supplier for details.

Description and Main Dimensions

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

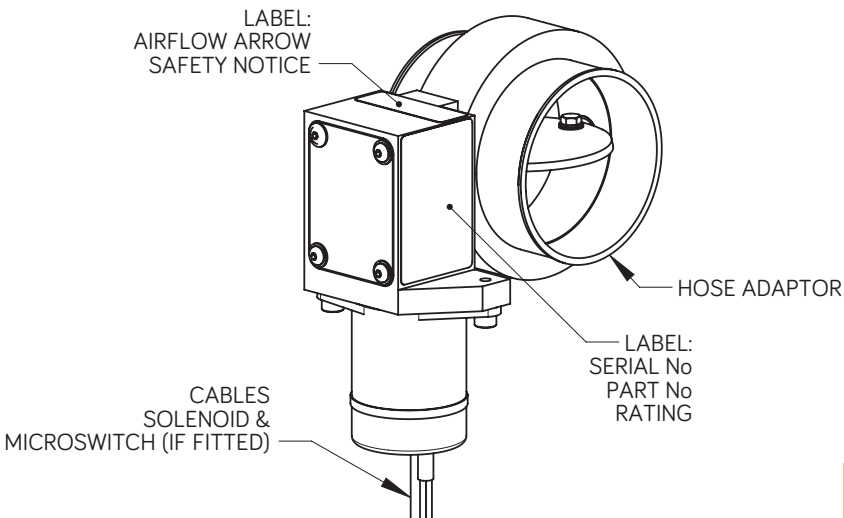
In standard form the FS3 valve is available complete with formed hose adaptors as selected by the customer from a range of standard sizes – see diagram below and data on pages 4 and 5. Where a requirement exists for a non-standard adaptor size or other alternative form of intake pipe connection such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

Optionally the valve can be supplied fitted with an internal microswitch to indicate the open/closed status of the valve.

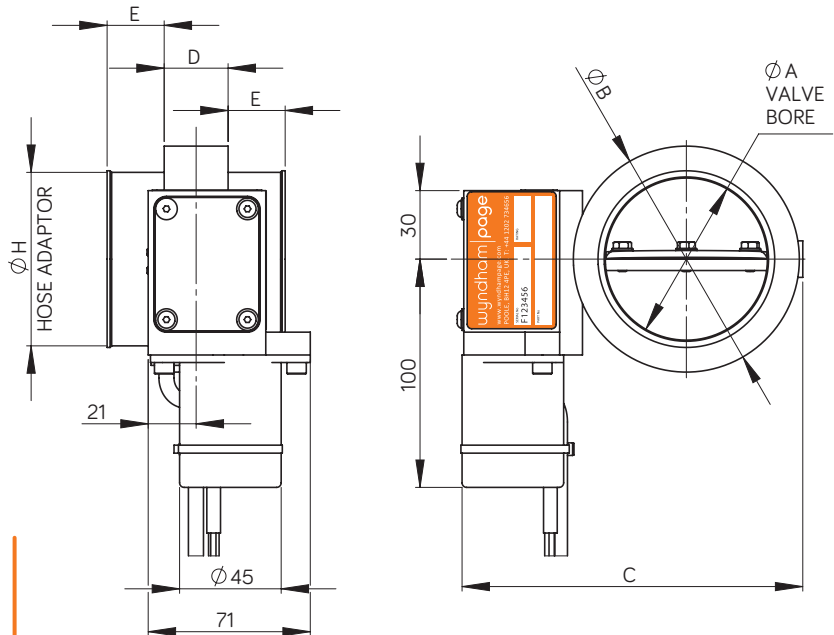
The valve has a metal to metal seal when closed. It is designed for low closing friction and long life of the sealing surfaces. The internal mechanism is configured to withstand high shock loads without malfunction.

The electrical enclosure is to IP66.

The diagram below and the diagrams and data on pages 4 to 6 cover the main features and basic dimensions of the FS3 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	38	57	81	131	50	20	1.47	038
	44						1.47	044
	51						1.47	051
	57						1.46	057
	64						1.46	064
	70						1.51	070
	76	71	99	149	28	25	1.44	076
	83						1.53	083
	89						1.60	089
	95						1.68	095
	102	95	125	175	35	25	1.77	102
	108						1.85	108
	114						1.94	114
	121						2.05	121
	127						2.24	127
	133	120	154	204	42	25	2.34	133
	140						2.47	140
	146						2.58	146
	152						3.04	152
	159	145	185	236	49	25	3.18	159
165	3.30						165	
171	3.44						171	
178	3.61						178	



IMPERIAL TABLE		DIMENSIONS (INCHES)					WEIGHT LB	ORDER CODE
MODEL	H TO SUIT HOSE BORE	BORE A	B	C	D	E		
FS3	1.50	2.2	3.18	5.14	1.97	0.79	3.24	038
	1.73						3.24	044
	2.01						3.24	051
	2.24						3.22	057
	2.52						3.22	064
	2.76						3.33	070
	2.99	2.80	3.90	5.87	1.10	0.98	3.18	076
	3.27						3.37	083
	3.50						3.53	089
	3.74						3.70	095
	4.02	3.74	4.92	6.89	1.38	0.98	3.90	102
	4.25						4.08	108
	4.49						4.28	114
	4.76						4.52	121
	5.00	4.72	6.06	8.03	1.65	0.98	4.94	127
	5.24						5.16	133
	5.51						5.45	140
	5.75						5.69	146
	5.98						6.70	152
	6.26	5.71	7.28	9.29	1.93	0.98	7.01	159
6.50	7.28						165	
6.73	7.59						171	
7.01	7.96						178	

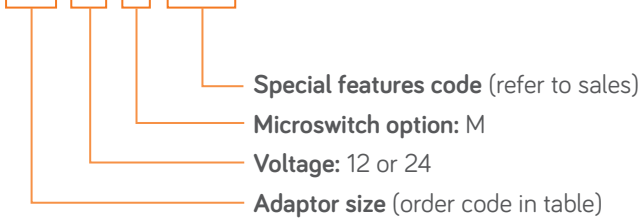
Valve Selection

To enable Wyndham Page to select the most suitable version of the FS3 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 "Installation [mechanical]".
- [2]. Whether a 12 volt or 24 volt shut down signal is to be used.
- [3]. Whether a built in microswitch is required.

Order Coding

FS3 - XXX - XX - M - S000



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 cables. Ensure direction of the engine intake airflow complies with that marked on the valve.

The valve may be fitted in any attitude from horizontal to vertical but not in a position where it is subjected to temperatures , internal or external, outside of the range -40C to +120C.

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 not exceeding the +120C limit. **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.

Any existing crankcase breather arrangement venting directly into the engine intake ports or into the intake system downstream of the FS3 valve, must be sealed and replaced by a crankcase breather arrangement connected into the intake system upstream of the FS3 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 air intake valve is designed for emergency stop only.

Installation [electrical]

The wiring diagrams show the connections for the valve solenoid and, where applicable, the optional microswitch.

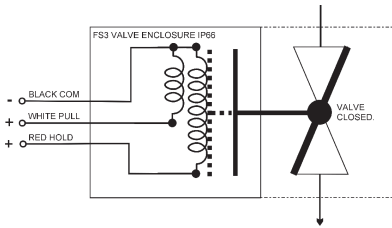
The electrical data for the solenoid and microswitch is tabulated on page 9.

It is recommended that a manual switch for emergency stop is **always** incorporated into the control shut down control circuit to switch off the electrical signal to the FS3. This manual switch should be a type that requires reset to the run status after operation.

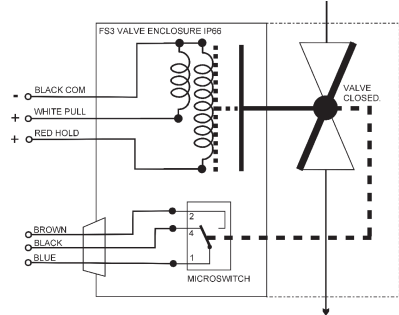
Important notes.

Design of the electrical shut down system must take into account the limitations applicable in terms of applying power to the solenoid [see solenoid electrical specification on page 9].

FS3 VALVE SCHEMATIC:



FS3 VALVE SCHEMATIC: Microswitch Version



General and Electrical Specification

GENERAL DESCRIPTION:	
A slim solenoid operated butterfly valve designed for emergency shutoff of the engine air intake.	
Operating mode: Spring closed, energise to open.	
Duel coil solenoid.	
GENERAL SPECIFICATION:	
Temperature:	Max ambient: 120°C Max intake air temp: 120°C
Construction:	Body and disk: Hard anodized aluminium Other main components: Stainless steel, aluminium Hose adaptors: Aluminium
ELECTRICAL SPECIFICATION:	
Energise pull coil to open, energise hold coil to hold valve in open position for engine start & run.	
12 or 24 volt option specified when ordering	
Solenoid rating:	12 Volt: Pull Coil - 46A, Hold Coil - 1.1A 24 Volt: Pull Coil - 25A, Hold Coil - 0.5A
Pull coil max single pulse:	1.5 seconds
Max 4 cycles in one minute	
Recommended engine controller setting:	1 second pull
MICROSWITCH OPTION:	
S.P.D.T - 24V, 10A Max	
MICROSWITCH CABLE:	
SIHF silicone insulated multicore cable: Standard length 3m	

Operation

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

Normal engine shut down 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 shut down control system to break the 12 volt or 24 volt supply to the FS3 valve.

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

Where fitted the valves internal microswitch permits an indication of the valves open / closed status.

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 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 shut down using the stop signal from the shut down control system. Check that the valve snaps shut and brings the engine to a stop within a few seconds.

SIX MONTHLY:

Remove the FS3 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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