FS1-203 Valve

Solenoid Powered to Close / Manual Reset Butterfly Valve

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

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Application

The FS1-203 valve is designed for diesel engine applications where the bore of the air intake pipe is 203mm (8 inches). For FS1 valves suitable for smaller bore air intake pipes see handbook FS1 Valves: 38mm to 178mm.

The FS1 version of the Wyndham Page F Series of engine air intake closure valves is designed to provide an emergency means for rapid shut down of a diesel engine when triggered by a 12 or 24 volt signal. This signal may be generated automatically by engine overspeed or any other selected fault conditions or via a manually operated electrical engine stop button. Optionally for additional safety the valve can also be supplied with a mechanical emergency engine stop button either directly mounted on the valve or remotely mounted for operation via a mechanical cable.

Once the FS1 valve has operated to stop the engine, a restart is only possible after manually resetting the valve to the run position. 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. Wyndham Page also supply 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

The FS1 butterfly valve is a latched open type. Either operation of the manual engine shut down button [where fitted] or applying a 12 volt or 24 volt signal is required to trip the valve to the closed [engine stop] position. Following valve closure the manual reset lever on the valve is used to reset to the latched open position. Optionally the valve can be supplied with a cable and lever arrangement to permit manual reset from a position remote from the engine.

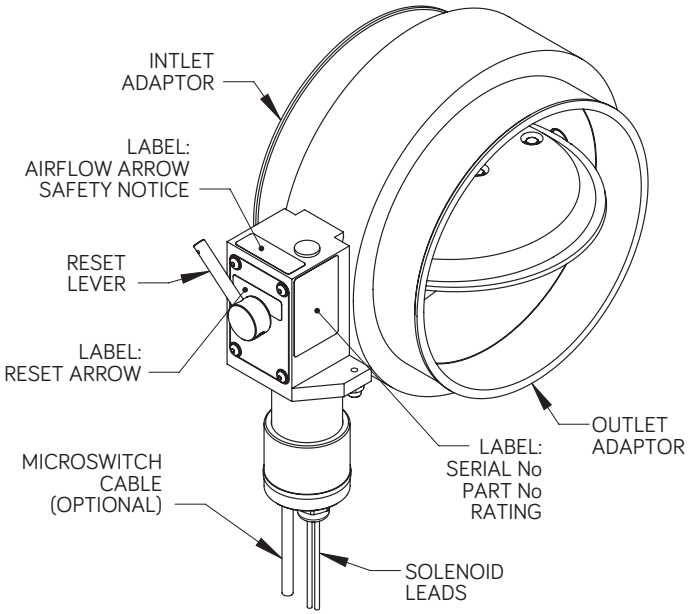
In standard form the FS1-203 valve is supplied complete with hose adaptors suitable for 203mm (8inch) bore hose – see diagram below and on page 4. Where a requirement exists for a non-standard adaptor size or other alternative form of pipe connection such as a bolted joint please pass details of requirement to Wyndham Page or your Wyndham Page supplier for investigation.

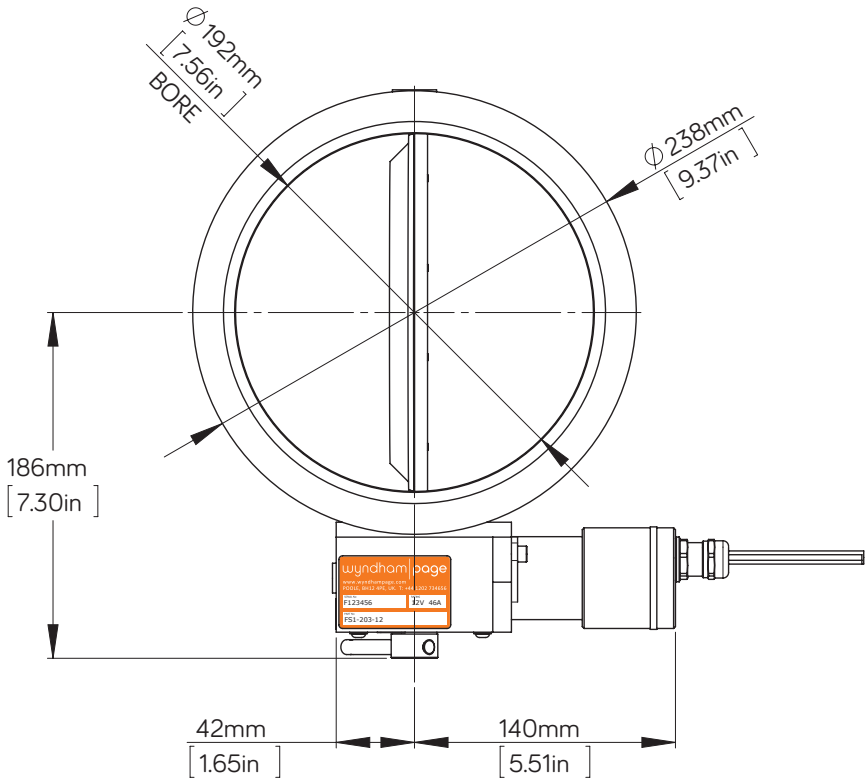
Optionally the valve can be supplied fitted with an internal microswitch to indicate the open/closed status of the valve.

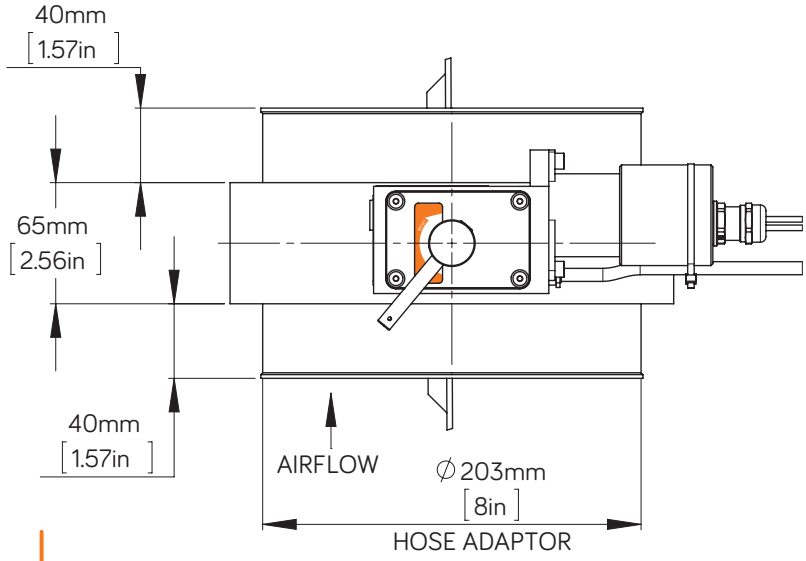
The valve has a metal to metal seal when closed. It is designed for low closing friction and long life of the sealing surfaces. The latching / release mechanism is configured to withstand high shock loads without malfunction.

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 FS1-203 including selection of options and order coding.




∅192mm
[7.56in]
BORE
∅238mm
[9.37in]
186mm
[7.30in]
42mm
[1.65in]
140mm
[5.51in]


40mm
[1.57in]
65mm
[2.56in]
40mm
[1.57in]
AIRFLOW
∅203mm
[8in]
HOSE ADAPTOR

Valve Selection

To enable Wyndham Page to select the most suitable version of the FS1-203 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.

[3]. Whether a built in microswitch is required.

[4]. Whether a local or remote mechanical emergency stop is required.

[5]. Whether a reset cable is required.

Order Coding

FS1-203 - XX - M - RXX - EXX - S000

Special features code (refer to sales)

Manual stop option: E or EXX for cable length (see table below)

Reset cable option: Length RXX (see table below)

Microswitch option: M

Voltage: 12 or 24

STANDARD CABLE LENGTHS	
CABLE XX CODE	LENGTH (M)
05	0.5
10	1.0
15	1.5
20	2.0
25	2.5
30	3.0

Special Features:
By arrangement with Wyndham Page.

Installation [mechanical]

Select a position for the valve which enables safe access to operate the reset lever and also permits a suitable run for the connected electrical cables and, when applicable, mechanical manual stop and / or reset cables. Ensure that the direction of the engine intake airflow complies with that marked on the valve. If an engine air intake 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 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 a 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 FS1 valve, must be sealed and replaced by a crankcase breather arrangement connected into the intake system upstream of the FS1 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 FS1 air intake valve is designed for emergency stop only.

Installation [electrical]

The wiring diagram overleaf shows the connections for the valve solenoid and optional microswitch.

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

It is recommended that either a manually operated electrical engine stop button or a remotely operated mechanical engine stop button is always incorporated.

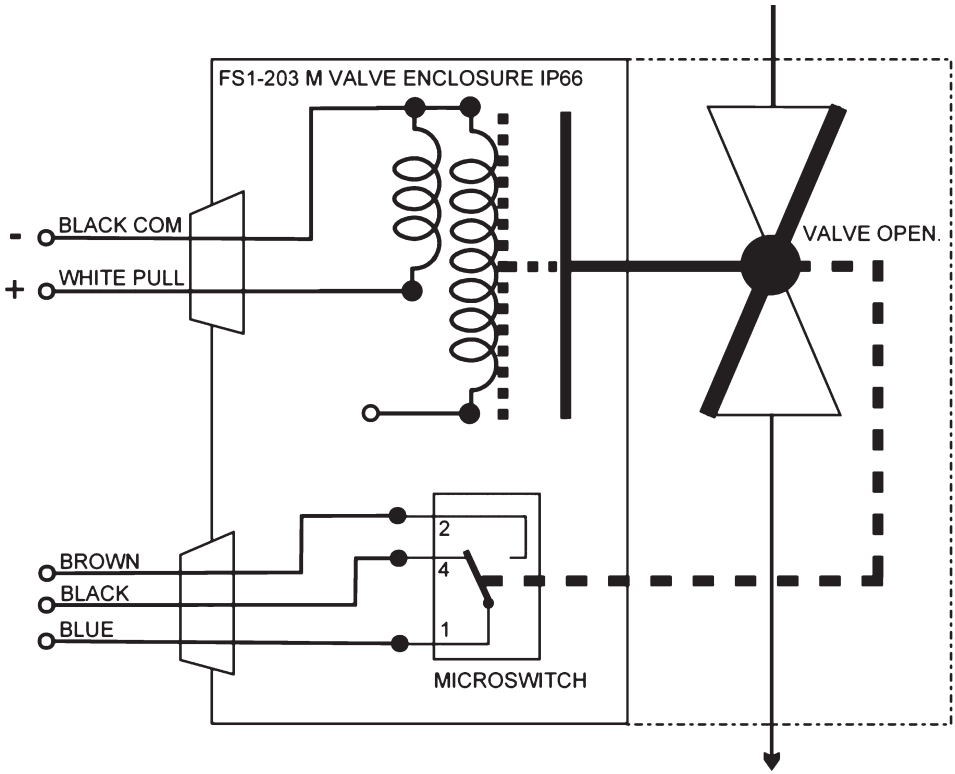
The solenoid power supply cable must be adequately secured along its length to avoid excessive mechanical stress at the connection to the solenoid or any other physical damage under all normal operating conditions and during equipment servicing.

Important notes.

[1]. The electrical system must include means to restrict the maximum time the closure signal may be applied to the solenoid to within the limits stated on page 9. This restriction must also be applied where a manually operated electrical engine stop button is also incorporated in the electrical shut down circuit.

[2]. It is recommended that for additional safety when a manually operated electrical engine stop button is incorporated it should be directly supplied by the required voltage from source and not via the shutdown control circuit.

FS1-203 Valve Schematic



General and Electrical Specification

GENERAL DESCRIPTION:	
A slim butterfly valve designed for emergency shutoff of the engine air intake.	
Mechanically latched open, energise to close, manual reset by rotation of reset knob.	
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
Weight:	6KG (13.2LB)
ELECTRICAL SPECIFICATION:	
Solenoid energise to close operation	
12 or 24 volt option specified when ordering	
Solenoid rating:	12 VOLT, 46A 24 VOLT, 25A
Max single pulse @20°C:	1.5 seconds
Max 4 cycles in one minute	
Recommended engine controller setting:	1 second
MICROSWITCH OPTION:	
S.P.D.T - 24V, 10A Max	
MICROSWITCH CABLE:	
SIHF silicone insulated multicore cable: Standard length 3m	

Operation

The valve closure disc is sprung towards the engine stop [closed] position. It is latched in the engine run [open] position by rotating the reset latch as indicated on the valve body, or, where a remote manual reset is fitted, by pulling the reset 'T' handle. During engine operation the valve remains open until the 12 or 24 volt shut down signal is applied or the manual emergency stop button is operated. This releases the valve disc from the run position to the stop position thereby shutting down the engine.

Note. Unless released to the closed position by an electrical signal or the manual emergency stop button the valve disc will continue to remain in the latched open state and therefore following a normal engine stop by fuel shut down it will not require reset.

Where fitted the 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 FS1 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]. Inspect the power supply and microswitch cables for damage.

[3]. 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.

[4]. Repeat step [3] by operating the mechanical stop (where fitted) and again check that the valve snaps shut and brings the engine to a stop within a few seconds.

SIX MONTHLY:

Remove the FS1 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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