

FG3 Valves

Shutdown on Low Control Circuit Pressure /
Manual Reset Butterfly Valves

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



wyndham|page

About Wyndham Page Ltd

Based in the UK Wyndham Page specialise in the design and manufacture of safety equipment for diesel engines.

Our product range of Air Intake Shutdown Valves includes our E Series Automatic Valves and our F Series Butterfly Valves with solenoid, pneumatic or manual actuation options. We offer Speedswitch kits for the F Series valves, a range of G Series Mechanical Engine Safety Products and a range of Spark Arresters designed to prevent the emission of high energy sparks from diesel exhaust systems.

Wyndham Page is headed by Freddy Page-Roberts who brings over 20 years' experience in the diesel safety industry and was previously managing director of Chalwyn Ltd.

All members of the senior management team have considerable experience in organisations specialising in the design and manufacture of hazardous area equipment for diesel engines.

Quality Assurance

Wyndham Page Valves are manufactured and tested under our EN ISO 9001: 2015 quality management system.

Wyndham Page Ltd are certified to supply Ex equipment under Quality Assurance Notification CML ATEXQ11003 in the UK, CML ATEXQ13649 in the EU and IECEx Quality Assurance Report GB/CML/QAR17.0023/01.

- Equipment supplied with an UK Declaration/Assertion of Conformity is CA marked and meets the provision of the UK directive SI 2016No. 1107
- Equipment supplied with an EU Declaration/Assertion of Conformity is CE marked and meets the provision of the ATEX directive 2014/34/EU.

FG3 Valves: Application

The FG3 version of the Wyndham Page F Series engine air intake closure valves is designed to provide an emergency means for rapid shutdown of a diesel engine when low pressure is sensed on the hydro/pneumatic control circuit typically used on engines required to operate without an electrical system.

The control circuit, usually pressurised oil from the engine lube system or an independent pneumatic supply, is vented to sump or atmosphere by a separate safety valve in the event of a fault such as engine overspeed or high coolant temperature. The resulting pressure drop in the control circuit results in closure of the FG3 valve.

Once the FG3 valve has operated to stop the engine, a restart is only possible after manually resetting the valve.

The low intake airflow 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.

New G Series Mechanical Engine Safety Products now available

Wyndham Page also supplies a mechanical speed valve, a fuel control system and a range of temperature sensing valves for incorporation into the emergency shutdown control circuit of this type of application. Details can be found in our “**G Series Mechanical Engine Safety Products**” Handbook available for download on our website. Please contact Wyndham Page or your Wyndham Page supplier for additional details.

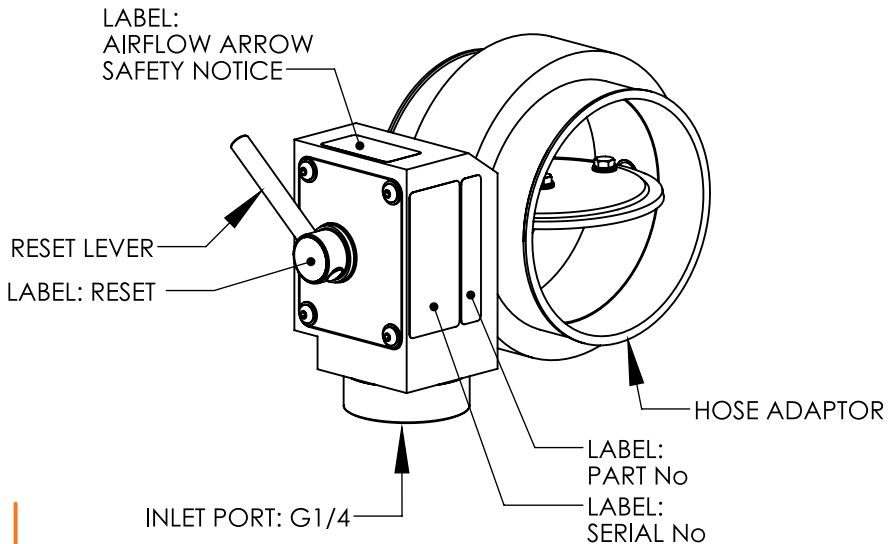
Description and Main Dimensions

The FG3 butterfly valve is held in the open (run) state by pressure in the hydro/ pneumatic control circuit. Low pressure in this control circuit will 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 (start) position. Rising control circuit pressure releases the latch and sets the valve to the run state. Optionally the valve can be supplied with a cable and T handle to enable manual reset from a position remote from the engine.

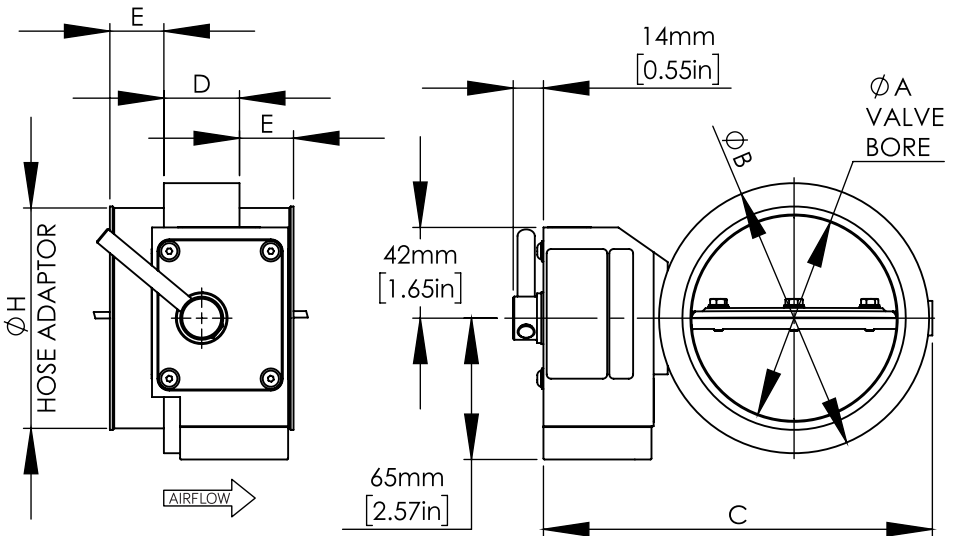
In standard form the FG3 valve is available complete with integrated hose adaptors as selected by the Customer from a range of standard sizes – see diagram below and data on pages 5 and 6. Where a requirement exists for a non-standard adaptor size or other alternative form of pipe connection such as a flanged joint please pass details of your 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 latching / release mechanism is configured to withstand high shock loads without malfunction.

The diagram below and the diagrams and data on pages 5 to 7 cover the main features and basic dimensions of the FG3 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		
FG3	38	57	81	136	50	20	1.33	038
	44						1.32	044
	51						1.32	051
	57						1.32	057
	64						1.33	064
	70	65	91	146	28	25	1.36	070
	70						1.24	70S
	76						1.30	076
	83	71	99	154	28	25	1.38	083
	89						1.45	089
	95						1.53	095
	102	95	125	180	35	25	1.62	102
	108						1.71	108
	114						1.80	114
	121						1.91	121
	127						2.09	127
	133	120	154	209	42	25	2.19	133
	140						2.32	140
	146						2.44	146
	152						2.89	152
159	145	185	241	49	25	3.03	159	
165						3.16	165	
171						3.30	171	
178						3.94	178	
203	171	215	270	56	30	3.94	178	
	192	238	291	65	30	5.34	203	



IMPERIAL TABLE		DIMENSIONS (INCHES)					WEIGHT LB	ORDER CODE
MODEL	H TO SUIT HOSE BORE	BORE A	B	C	D	E		
FG3	1.50	2.2	3.18	5.33	1.97	0.79	2.93	038
	1.73						2.91	044
	2.01						2.91	051
	2.24						2.91	057
	2.52						2.93	064
	2.76						3.00	070
	2.76	2.56	3.58	5.75	1.10	0.98	2.73	70S
	2.99	2.80	3.90	6.06	1.10	0.98	2.87	076
	3.27						3.04	083
	3.50						3.20	089
	3.74						3.37	095
	4.02						3.57	102
	4.25	3.74	4.92	7.09	1.38	0.98	3.77	108
	4.49						3.97	114
	4.76						4.21	121
	5.00						4.61	127
	5.24	4.72	6.06	8.23	1.65	0.98	4.83	133
	5.51						5.12	140
	5.75						5.38	146
	5.98						6.37	152
6.26	5.71	7.28	9.49	1.93	0.98	6.68	159	
6.50						6.97	165	
6.73						7.28	171	
7.01						6.73	8.46	10.63
7.99	7.56	9.37	11.46	2.56	1.57	11.77	203	

Valve Selection

To enable Wyndham Page to select the most suitable version of the FG3 valve for the Customers application the following data is required:

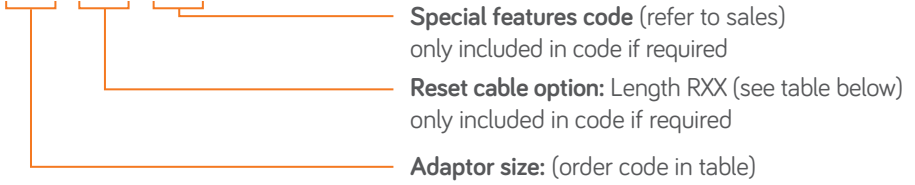
- [1]. Bore size of the intake hose into which the intake valve is to be fitted:
refer to section headed "Installation [mechanical]".

The following additional options are available

- [2]. A remote manual reset (see page 7):
select suitable cable length - see range on page 7.

Order Coding

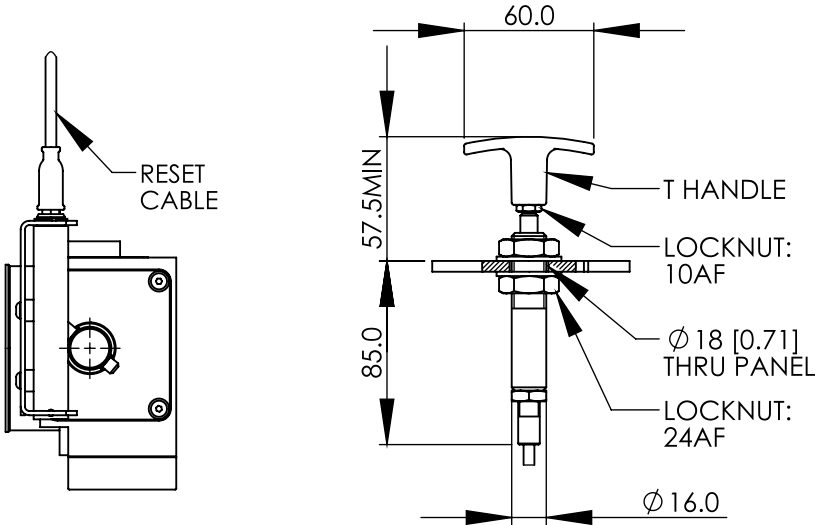
FG3 - XXX - RXX - S00



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.

Additional Options:



RESET CABLE OPTION: ORDER CODE RXX

Valve Installation [mechanical]

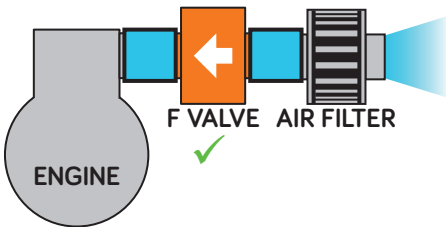
Select a position for the valve which meets the requirements below. The valve may be fitted in any attitude from horizontal to vertical but not in a position where it is subjected to temperatures, internal or external, outside of the range -40°C to $+120^{\circ}\text{C}$. When planning and checking installation always ensure that:

- There is safe access to operate the Reset Lever and a suitable run for the control circuit piping and the manual reset cable (if fitted).
- The direction of airflow is in compliance with the arrow marked on the body of the valve.
- An **Air Filter Element** must always be fitted in the engine air intake system **upstream** of the Valve.
- Valve location in the Air Intake System (refer to schematics below):

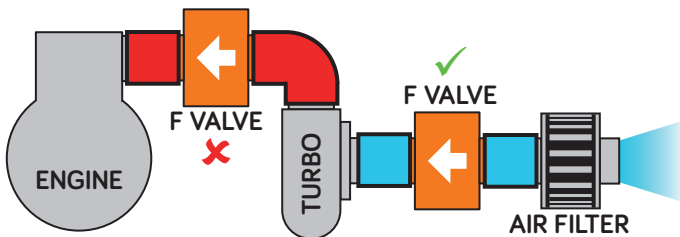
Yes ✓ No ✗

In all cases the Valve must be located where both ambient and intake air temperature does not exceed 120°C .

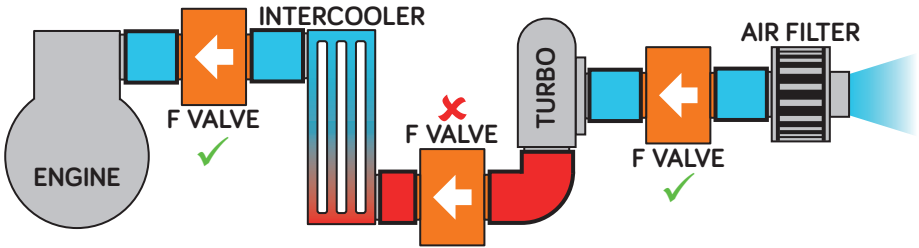
- Normally Aspirated Engines (no turbocharger):** fit the valve between the engine and the air filter (see schematic below).



- Turbocharged Engines:** fit the valve upstream [air filter side] of the turbocharger. **Do not** fit the valve between turbocharger and engine (see schematic below).



- **Turbocharged Engines with Intercooler:** fit the valve upstream (air filter side) of the turbocharger or downstream of the intercooler. **Do not** fit the valve between turbocharger and intercooler (see schematic below).

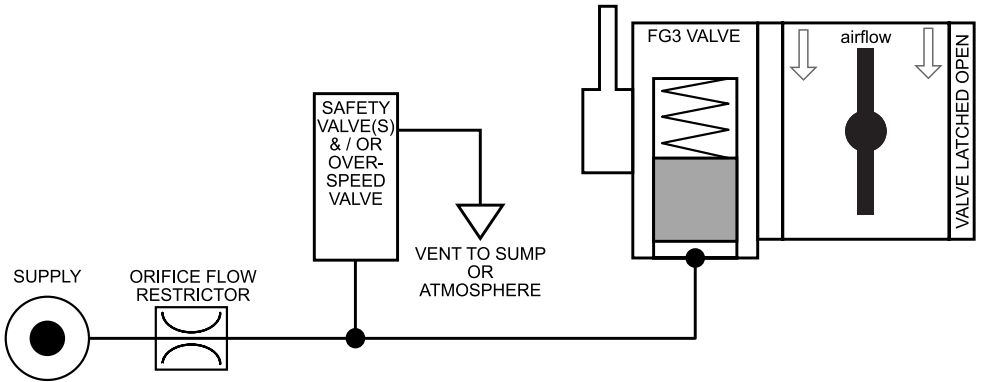


- In all cases where an **Intake Flametrap** is also fitted, the valve must be installed **upstream** of the flametrap.
- The hose into which the valve is fitted should be adequate to fully support the valve whilst not permitting excessive vibration of the valve. For the heavier valves in the range a support bracket for the valve may be necessary. Generally ensure that there is sufficient flexibility in the finalised intake system installation to allow for the relative movement between the system components over the full range of engine operating conditions thereby avoiding excessive mechanical stresses.
- Any engine **Crankcase Breather** arrangement venting directly into the intake ports or into the air intake system downstream of the Wyndham Page valve must be sealed and replaced by an external breather system connected to the intake system upstream of the valve or [if permitted at the operating site] vented to atmosphere.
- When installing valves fitted with the manual cable RXX option ensure that the bend radius of the Cable does not restrict the mechanism from pulling the T Handle back into the run position. If it is found that the T Handle is not being pulled fully in then a straighter run for the reset cable must be used.

Important Note. Retain the standard fuel shutdown stop fitted to the engine. The Wyndham Page FG3 air intake valve is designed for emergency stop only.

Valve Installation [control circuit connection]

Connect the control circuit feed to the valve via the G1/4 port using fittings appropriate to the control circuit type. The detailed design of the control circuit is not within the scope of this handbook however the simplified schematic below shows the basic operating principle. Note the requirement for a flow restrictor to ensure the control pressure drops sufficiently to trip the FG3 valve to the closed position when the safety valve opens.



FG3 Valve: General Specification

GENERAL DESCRIPTION:	
A slim solenoid operated butterfly valve designed for emergency shutoff of the engine air intake.	
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
OPERATING SPECIFICATION:	
Manually latched open, rising control pressure sets to run, valve closes on falling control pressure.	
Control circuit: Engine lubrication oil or compressed air	
Operating pressures:	Run: 15 PSI (1 Bar) Minimum Rising Closes: 10 PSI (0.7 Bar) Falling Max: 116 PSI (8 Bar)

Operation

For Engine Lube oil control systems:

- Before starting the engine the valve must be latched open by rotating the reset lever fully clockwise by approximately 80° as indicated on the reset label until the back stop position is reached, or if fitted, by pulling the T Handle until the backstop position is reached.
- Start the engine, when the control system oil pressure rises above the minimum run pressure (see spec table) the latch is released and the valve is now in the fail-safe run mode.
- Should the control system oil pressure fall below the close pressure (see spec table) due to an engine fault condition the valve will snap shut and stop the engine.

Note: After a normal engine stop via the standard fuel shutoff the valve will close when the engine oil pressure drops below the close pressure. In situations where this causes operational problems a check valve can be fitted in the control circuit to maintain system pressure and keep the valve open.

For Pneumatic control systems:

- Before starting the engine the valve must be latched open by rotating the reset lever fully clockwise by approximately 80° as indicated on the reset label until the back stop position is reached, or if fitted, by pulling the T Handle until the backstop position is reached.
- The compressed air can now be applied to the control circuit to set the valve to the fail-safe run mode. Do not apply the air to the control circuit before opening the valve. It is not possible to open the valve with the air pressure applied.
- Should the control system air pressure fall below the close pressure (see spec table) due to an engine fault condition the valve will snap shut and stop the engine.

Note: The valve will remain open until the air supply to the control circuit is cut off. It is not possible manually close the valve using the reset lever, once latched open the valve can only be closed by applying then removing pressure at the control circuit port.

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 FG3 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.] Check the control circuit pipework is secure and leak free.
- [3.] Where the valve has been fitted with a Reset Cable RXX option inspect and if required clean off any contamination from the reset lever, reset mechanism slide and T Handle shaft and spray with a suitable light cleaner/lubricant. Check that the Reset mechanism pulls the T Handle fully back into the run position.
- [4.] Start engine. Carry out a shutdown by tripping 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 FG3 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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Unit 1c Chalwyn Industrial Estate, Parkstone, Poole,
Dorset BH12 4PE United Kingdom

Tel: +44 (0)1202 734 656

Email: sales@wyndhampage.com

www.wyndhampage.com