

Anaesthetic Gas Scavenging Plant

Duplex • 24 V a.c. Controls • 50/60 Hz

Description

Anaesthetic Gas Scavenging (AGS) Plants are intended to provide a continuous low level vacuum supply to pipeline systems in healthcare facilities for the removal of waste anaesthetic gases captured from patient breathing circuits via AGS receivers. The plant shall be a duplex configuration such that the vacuum supply is maintained in single fault condition. The stated volumetric flow rate shall be delivered with one blower on standby. AGS Plants shall comply with BS EN ISO 7396-2 and United Kingdom Department of Health (DoH) publications HTM 02-01, HTM 2022 and NHS Model Engineering Specification C11.

The entire AGS Plant shall be skid mounted, fully assembled and factory tested as a complete system. A test certificate shall be provided showing the results of all tests, which shall include the free-air flow rate obtained with the system delivering a working pressure of -125 mbar gauge. Type testing or testing in component form is not acceptable.

Penlon Medical Gas Solutions Anaesthetic Gas Scavenging Plant is CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (Lloyds). Under this directive, Anaesthetic Gas Scavenging Plant is classified as Class IIa Medical Devices.

Regenerative Blowers

Two equally sized regenerative blowers shall be provided. Blowers shall be oil-less, air cooled side channel regenerative type, suitable for both continuous operation and frequent start/stop. The motor shall be directly coupled to a fully enclosed impeller with contact free operation. All bearings shall be sealed and greased for life, requiring no further lubrication in service.

Each pump shall be provided with a 'Mode Select' switch incorporated into the plant control unit to enable the pump to be run continuously (in hand operation) or automatically as and when required by the plant control unit. Each motor shall also be afforded protection by means of a thermal overload relay with a manually reset function.



Plant Control Unit

The plant control unit shall incorporate a transformer to provide a nominal 24 V a.c. electrical supply to all internal controls and remote start switches and an interlock isolator shall be integrated into control panel door.

The plant control unit shall be provided with neon indicator lights for the following operating and fault conditions:

- Power On (Green)
- Standby Run (Amber)
- Pump Failed (Red)

The plant control panel shall include a switch to enable manual selection of the duty pump; the other thereby being designated as standby.



Pressure at the pipeline interface shall be continuously monitored by a pressure switch with diaphragm sensing element and shall be adjustable between -25 and -100 mbar gauge pressure and shall be factory set to -65 mbar gauge pressure. If the duty blower fails or is unable to cope with the system demand, the standby blower shall be called to operate and a

'Standby Run/Duty Failed' indication shall illuminate on the plant control panel and each remote start switch. If both blowers fail or the system is otherwise unable to maintain a pipeline vacuum level above the pressure switch set point, a 'System Failed' indication shall be initiated.

The vacuum level at the plant inlet shall be displayed on 63 mm nominal diameter pressure gauge mounted on the plant control unit. The pressure gauge shall have a scale range of 0 to -400 mbar gauge pressure and have an accuracy of +/-2% or better across the middle half of the scale range.

Swing type check valves shall be installed in the pipes connected to the blower inlet ports. At the pump outlets, each exhaust pipe shall be provided with a polymer coated autoclavable Pyrex drain flask at the lowest point.

Vacuum Regulation

The pipeline vacuum level shall be regulated by a vacuum relief valve fitted to close to the interface with the pipeline system. The valve shall incorporate a wire mesh filter to prevent ingress of large particulates, thereby protecting the impeller and housing. By regulating the vacuum level and adjusting terminal unit orifices to suit, the system will be able to provide flow rates at each terminal unit required by any of the commonly used standards as shown in the following table:

Standard	Δp (kPa)*	Flow (l/min)
BS 6834:1987	1	130 max.
	4	80 min.
BS EN ISO 7296-2	1	80 max.
	2	50 min.
BS EN ISO 7296-2	1	50 max.
	2	25 min.

*Resistance to flow upstream of terminal unit under test.

Remote Start Switches

Remote start switches shall be connected in parallel such that the plant can be operated from any switch and the plant will continuously operate until all switches are turned off.

Building Management System Contacts

Means shall be provided to enable plant status indications to be relayed to a building management system (BMS) via an optional BMS relay module (supplied separately on request) with both normally open and normally closed volt-free contacts.



Duplex Anaesthetic Gas Scavenging Plant Specifications

400V 3-phase 50 Hz and 380V 3-phase 60 Hz Electrical Supplies – Oil-Less Side Channel Blowers

Part Number	Model Ref.	Free Air Aspired (l/min) ⁽¹⁾	Nominal Motor Power per Blower (kW)	Electrical Supply	Starting Method	Motor Start Current (A)	Full Load Current per Compressor	Motor Rated Supply per Blower (A)	Configuration	Service Connection (mm OD Cu Tube)	Sound Pressure Level/Blower dB(A) ⁽²⁾	No. AGSS Outlets Served (HTM 2022/BS 6834:1987)	Length x Width x Height (m) ⁽³⁾	Plant Weight (kg)
3265154-24V	AGS-520D 50Hz	520	0.75	400 V 3~ 50 Hz	DOL	9	1.8	16	Duplex	54 mm	60	4	0.9 x 0.55 x 1.15	-
3265157-24V	AGS-1560D 50Hz	1560	1.5	400 V 3~ 50 Hz	DOL	23	3.3	16	Duplex	54 mm	64	11	0.9 x 0.55 x 1.15	-
3265159-24V	AGS-2860D 50Hz	2860	3	400 V 3~ 50 Hz	DOL	48	7.2	16	Duplex	54 mm	74	22	0.9 x 0.55 x 1.15	-
3265154-60	AGS-650D 60Hz	650	0.9	380 V 3~ 60 Hz	DOL	10	1.8	16	Duplex	54 mm	64	5	0.9 x 0.55 x 1.15	-
3265157-60	AGS-2210D 60Hz	2210	1.8	380 V 3~ 60 Hz	DOL	23	3.3	16	Duplex	54 mm	69	10	0.9 x 0.55 x 1.15	-
3265159-60	AGS-3770D 60Hz	3770	3.6	380 V 3~ 60 Hz	DOL	48	7.2	16	Duplex	54 mm	70	16	0.9 x 0.55 x 1.15	-

1. System flow with one blower on standby and with an air intake at 1000 mbar at 20°C. Flow rates stated are subject to a tolerance of +/- 5%.
2. These are typical figures and may vary with the specific motor used. Consult the motor nameplate for exact figures.
3. Dimensions do not include clearance for access and servicing.

