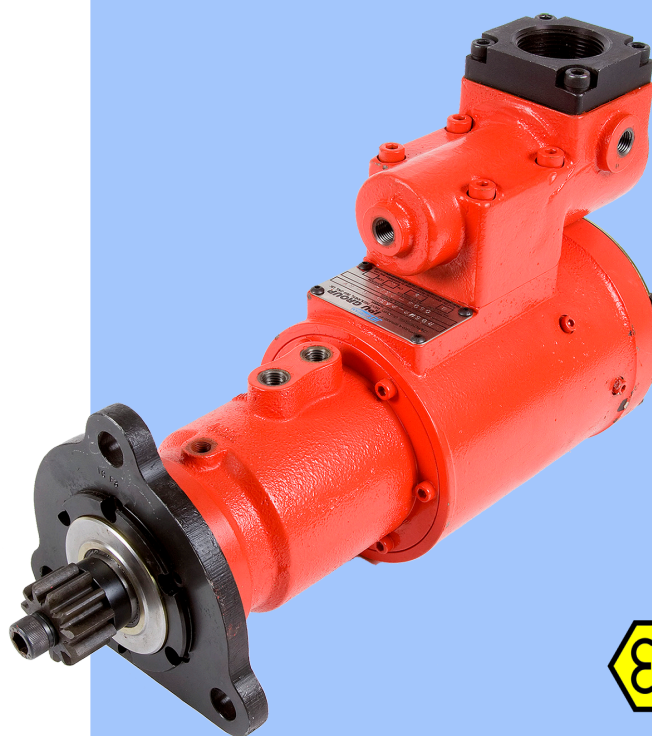


RUGGED AND RELIABLE AIR STARTING SYSTEMS FOR DIESEL AND GAS ENGINES OR GENERATORS



IPU's air starting systems reliably start diesel & gas engines up to 150 litres.

Jetstream air starters are powered by our unique turbine motor which we design and manufacture to be lightweight, powerful and compact. They are resistant to wear and damage making them ideal for marine and offshore applications. Jetstream air starters need no lubrication and are totally maintenance-free.

Available in pre-engaged or inertia drive models, Jetstream are manufactured in two frame sizes with different nozzle configurations developing over 338Nm or 26kW of power at the pinion.

With standard nozzle configurations, Jetstream air starters work at industry standard 100 psi (7 barg). Optional nozzle configurations can work from as low as 3 barg to a maximum of 30 barg.

All Jetstream air starters are sealed for gas use and exhaust options allow gases to be piped away safely.

Tough & Safe

IPU starters are housed in cast iron casings to minimise the explosion and fire risks in underground mines.

Convenient

IPU air starting systems allow you to use your existing air supply.

ATEX-Approved

IPU pre-engaged starter motors are independently ATEX assessed and certified for use in hazardous areas.

Let's talk

+44 (0) 121 511 0400

ATEX APPROVAL IMPROVES SAFETY

IPU's pre-engaged starter motors are independently certified as ATEX compliant. They are suitable for use in explosive environments such as oil platforms, mines, food processing plants and lumber mills.



Safety first

IPU's starter motors are often installed as part of an engine's secondary starting system. Operators rely on them to start fire pumps and generator sets when other systems have failed. They are part of the safety infrastructure that tackles emergency situations in hazardous environments.

They must be both reliable and safe so IPU systems incorporate exclusive features that exceed the most stringent safety standards.

ATEX regulations are designed to ensure equipment being used in hazardous or explosive environments is safe. IPU's pre-engaged air starter motors are ATEX-approved.

Two factors contribute to JetStream starters motors' ATEX compliance. These are safety features not found on the majority of other starter motors.

Cast-iron casing

JetStream starter motors are constructed using cast-iron, not aluminium, casings.

Any external aluminium represents a significant risk in hazardous environments because it could help a thermite reaction develop. In most parts of the world, aluminium has been banned from fiery mines for decades but some still slips into use, causing a severe risk to life.

When aluminium comes into contact with an oxidiser such as iron oxide (rust) and is ignited by heat or by a spark, the thermite reaction that follows produces molten metal at a temperature of around 3000°C - a disaster waiting to happen in explosive atmospheres.

Pre-engaged starting mechanism

IPU's ATEX-certified air starter motors are 'pre-engaged.' The starter motor pinion engages with the engine's ring-gear before rotating and cranking the engine.

This eliminates the risk of sparks being produced on engagement unlike inertia starters where the pinion is rotating at speed when it engages with the stationary ring-gear.

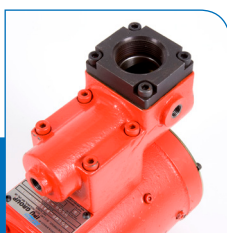
IPU's pre-engaged starter motors conform to ATEX EN1834-1 and 2. They can be used safely in flammable gas atmospheres as well as underground and other environments vulnerable to combustible dust.

For more information on ATEX, please visit: www.ipu.co.uk/atex.



PRODUCT HIGHLIGHTS

Relay valve



JetStream air starter motors feature an integrated relay valve. It is not a separate part.

- Eliminates additional tubing and pipework.
- More economical.
- Easier to install.
- Reduces potential for installation leaks.
- When the starter replaces an alternative brand, the existing remote relay valve can be used.

Parts compatibility



Jetstream pinions, flanges and nosecones are interchangeable across IPU's entire range of air and hydraulic starter motors.

- Fewer spare parts need to be held in stock
- Over 100 types of pinions are available and small volume "specials" will be cut and produced on demand in our own gear-cutting facility.
- As a last resort, flanges and nosecones can be swapped between starter motors.

Flexible installation

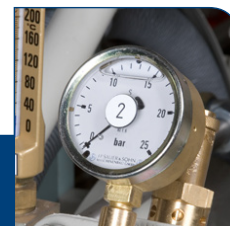


Jetstream air starters are incredibly versatile. They can be oriented to suit the engine and its ancillary equipment.

The flange can be indexed in 60° increments and the body can be oriented independently of the flange or nose cone. This makes for almost infinite installation flexibility.

With the additional option of an "overhung" pinion, Jetstream air starters can be fitted to almost any engine installation.

Accessories



Other Jetstream accessories include:

- Manual start valves for local engine starting.
- Solenoid start valves for remote or automatic engine starting.
- Shuttle valves which allow both manual and solenoid control valves in the same system.
- Pressure regulators to reduce high pressure installations to a suitable working pressure e.g. 350 barg reduced to 7.

RELATED PRODUCTS

Air Systems



IPU designs, manufactures and commissions air starting systems for any brand of starter motor. Bespoke systems meet your space and performance needs.

Hydraulic



IPU's hydraulic starter motors start diesel or gas engines up to 80 litres. They can be connected to an existing hydraulic supply or operate independently.

Spring



Spring (mechanical) starter motors provide a totally independent start system for engines up to 12 litres. They require no external electrical, pneumatic or hydraulic power.

Other Systems



IPU has over 40 years' experience designing, manufacturing and installing hydraulic and nitrogen starting systems to suit the exact needs of complex applications.

OPTIONS

Pre-engaged



Pre-engaged starter motors reduce the risk of sparks by rotating the pinion and cranking the engine after the pinion has fully engaged with the engine's ring-gear.

Inertia



Inertia starter motors are shorter and lighter than a pre-engaged equivalent. A remote relay valve can be used to reduce their size even further.

Pinions



Beryllium-copper pinions can be used to reduce the risk of sparks from inertia starter motors.

Mufflers



A variety of mufflers and exhaust adapters are available to suit the space constraints of every application.

CASE STUDIES



Pearl GTL Plant, Qatar
6 air starting systems were fitted to the CAT 3616 generators used during the plant's construction.

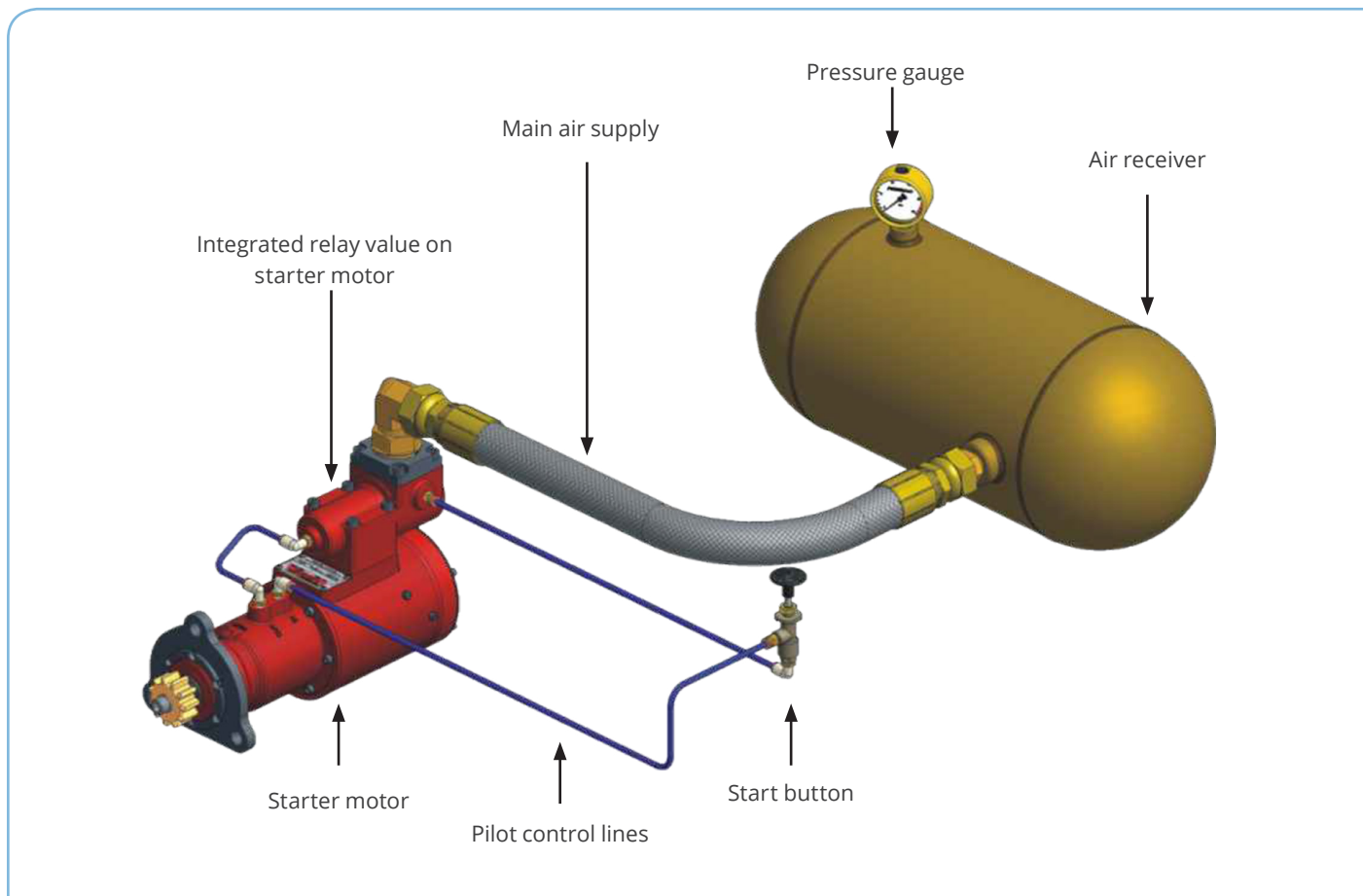
www.ipu.co.uk/case1003



Sakhalin Island LNG Plant

The CAT 3612 emergency generator operated in a Zone 2 hazardous area at temperatures as low as -36°C.

www.ipu.co.uk/case1004



Installation

Installing a Jetstream starter motor is quick and easy thanks to its integrated relay valve.

Just mount the starter, connect the air and you're ready to go - the amount of time and skill needed to fit a Jetstream is often much less than starter motors from other manufacturers.

If connected to nitrogen or gas, the Jetstream exhaust adaptor can be threaded to allow the exhaust gases to be piped away safely.

How a Jetstream starter motor works

Compressed air enters the unit and is directed by inlet nozzles to strike a primary turbine wheel. The air flow is transferred to the wheel, rotating it at high speed.

This effect is repeated as the air exits the first wheel and passes over each subsequent wheel, finally rotating the drive shaft at 25-40,000rpm. This velocity is reduced by about 10:1 inside a planetary gearbox sitting just in front of the turbine mechanism.

Your benefits

- **Dependability:** guaranteed to start any diesel or gas engine up to 150 litres, IPU's air starters operate at pressures from 3 to 30 barg. They are flexible enough to suit any application and have the option of using an existing air supply.
- **Performance in all conditions:** a cast iron casing and aluminium components means IPU's air starter motors are highly resistant to corrosion. This makes them ideal for marine and offshore applications.
- **Low maintenance:** developed as an easy to install, fit-and-forget solution, Jetstream starter motors are resistant to wear and damage. They need no lubrication and are totally maintenance-free.
- **Safe in hazardous areas:** IPU's pre-engaged starters meet ATEX regulations for both gas and dust environments such as offshore, marine and mining.

SPECIFICATIONS

		Jetstream 4			Jetstream 5								
PERFORMANCE													
Nozzles		1	5		6			10			14		
Inlet pressure	bar	30	8.0	5.5	10.0	8.0	6.0	10.0	8.0	6.0	8.0	6.0	3.0
	psi	435	116	80	145	116	87	145	116	87	116	87	44
Breakaway torque	Nm	78	95	63	180	147	103	300	233	194	338	160	120
	lb. ft	57	70	46	132	108	76	221	171	143	249	191	88
Max. power	kW	7.8	12.0	7.5	17.0	12.5	8.2	30.8	23.7	16.5	26.4	19.6	8.4
	HP	10.5	16.1	10.1	22.8	16.8	11.0	41.3	31.8	22.1	35.4	26.3	11.3
Max. consumption	m³/sec	0.37	0.29	0.20	0.35	0.27	0.19	0.54	0.42	0.33	0.55	0.43	0.22
	scfs	13.1	10.3	7.1	12.5	9.6	6.6	19.0	15.0	11.5	19.4	15.2	7.8

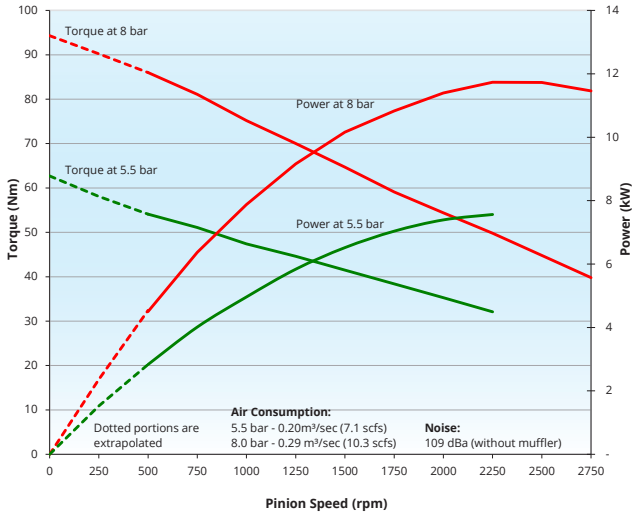
		Jetstream 4 Inertia		Jetstream 4 Pre-Engaged		Jetstream 5 Pre-Engaged Overhung		Jetstream 5 Pre-Engaged Outboard	
PHYSICAL									
Length¹	mm	331		324		398		372	
	in	13.0		12.8		15.7		14.6	
Weight¹	kg	10.0		17.0		16.0			
	lb	22.0		37.4		35.2			

Notes

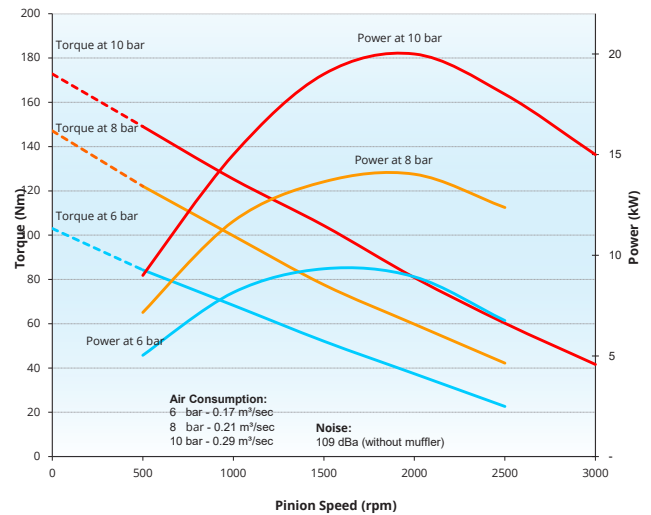
1 Dimensions and weights exclude relay valves, exhaust adapters and exhaust mufflers.

SPECIFICATIONS

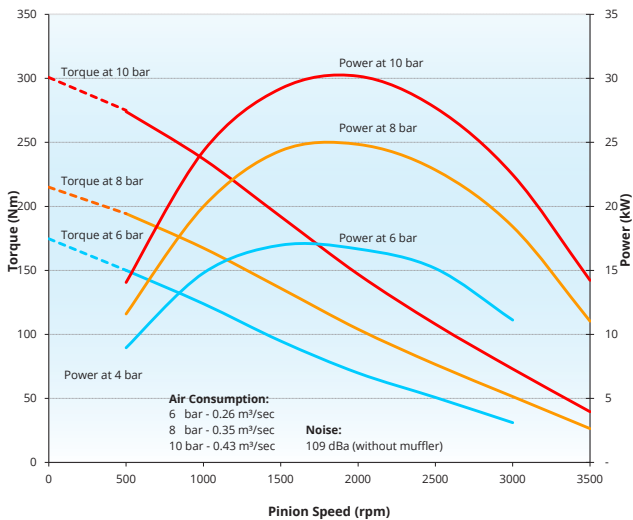
Jetstream 4 power & torque curves
Medium pressure (L05M) with exhaust guard



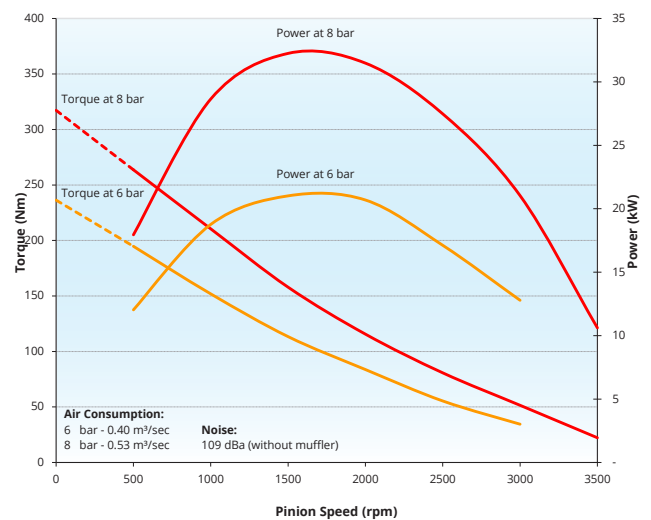
Jetstream 5 power & torque curves
Medium Pressure 6 Nozzle (R06M) with exhaust guard



Jetstream 5 power & torque curves
Medium Pressure 10 Nozzle (R10M) with exhaust guard



Jetstream 5 power & torque curves
Medium Pressure 14 Nozzle (R14M) with exhaust guard



Notes

All charts represent performance without a muffler or valve.



THE COMPANY YOU WANT TO DO BUSINESS WITH

IPU helps businesses reach the profitability and efficiency they seek.

For nearly sixty years, we have delivered the expert assistance and customer service that lets our domestic and international customers excel in their industries.

We support businesses in sectors including power-generation, oil & gas, marine, IT & telecoms, manufacturing and government.

Our industry experience, competitive pricing and superb support let us evolve from a regular supplier to become the company our customers *want* to do business with.



For further details, please visit: IPU.CO.UK/STARTING For more information, please contact: +44 (0) 121 511 0400

