



## ATEX-approved hydraulic starting systems



Safe starting without compromise

### Starting critical engines for mining

- Pre-engaged mechanism reduces spark risk
- Cast-iron casing prevents dangerous thermite reaction
- Approved to ATEX, BS EN 1834 and BS EN 13463 standards
- Optional beryllium copper non-spark pinions for ultimate safety

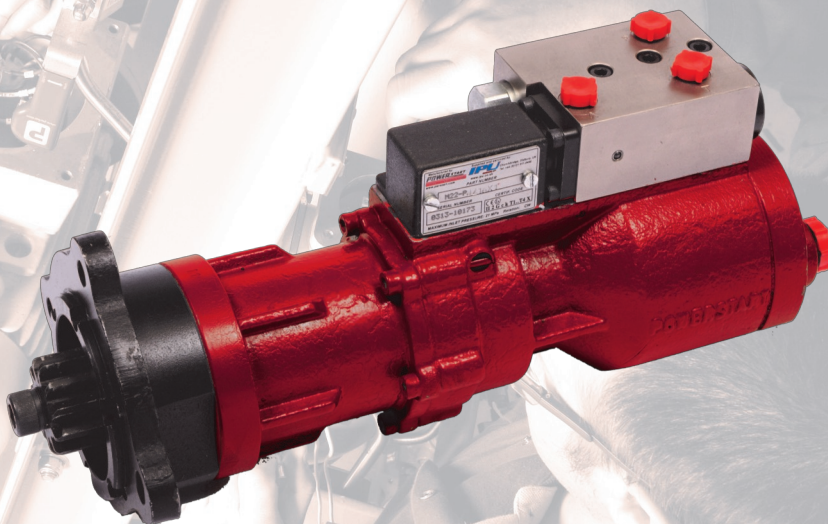
Call IPU's Engine Starting Division on 0121 511 0400

[www.ipu.co.uk/atex](http://www.ipu.co.uk/atex)



Safety systems have to start every time:

- no questions
- no compromises
- no excuses



## IPU's pre-engaged hydraulic starters: flexible ▶ powerful ▶ reliable

IPU's M22 and M28 pre-engaged hydraulic starters are bursting with features that make them perfect for the mining industry.

Safety is never optional

The ATEX-approved M22 and M28 use a pre-engaged starting sequence: the high-speed cranking process does not begin until the starter's pinion has engaged with the engine's ring gear.

IPU's starters are fully cast iron and contain no aluminium that could cause a catastrophic thermite reaction, which may lead to an ignition source underground.

Non-spark beryllium-copper pinions can be specified to resist even the slightest chance of sparking.

Low-cost installation and maintenance

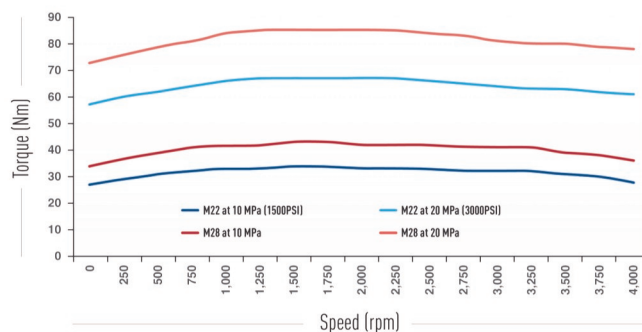
The M22 and M28 can be oriented to fit any engine with the standard adjustable flanges or a custom flange. After a starting sequence, they can recharge using existing hydraulic systems or a dedicated pump.

IPU starters can be supplied as kits, bare motors, self-contained mini-packs or custom packages.

### Specifications

Weight	12kg
Construction	Cast-iron
Maximum working pressure	21 MPa (3000 PSI)
Fluid media	Mineral oil
Viscosity range	ISO 32 to 46 (SUS 140-230)
Temperature range	-30°C to +100°C (-22°F to +212°F)
Speed range	0-4000 rpm
Rotation	Clockwise (Counter-Clockwise option)
Duty cycle	Intermittent
Overall volumetric efficiency	92% (Minimum)
Displacement	M22: 22.1 cc; M28: 28 cc
Maximum torque at 210 MPa	M22: 66 Nm (49 lbf.ft.); M28: 84Nm
Maximum power at 3500 rpm	M22: 24 kW (32 HP); M28: 31kW

M22 & M28 Power Curves



### IPU Group Engine Starting

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