DEPURECO · II 1/2D EX H IIIC T160°C DA/DB

Depureco ECOBULL M DEX 1/2D INERT

The ECOBULL M DEX 1/2D INERT is the stricter EPL Da variant of the ECOBULL M INERT range, designed for areas where a dust-explosive atmosphere may be present *continuously or for long periods* (Zone 20) inside the machine, and *occasionally* (Zone 21) around it. It is the go-to choice for reactive metal powder capture in dedicated process rooms -- aluminium polishing, titanium grinding cells, lithium battery blending stations -- where the risk of an explosive dust cloud inside the collector chamber itself is permanent, not just during operation. The ATEX class II 1/2D Ex h IIIC T160°C Da/Db, together with the N2-flushed inerting container, safety hydrogen vent and lockable lid, is the highest protection level Depureco offers on the dust side. The motor is uprated to 2.2 kW (from 1.8 kW in the 1/3D variant) to ensure stable operation within the T160°C surface temperature limit even under fault scenarios in the stricter Da class, which is a requirement in ATEX product standards EN 1127-1 and EN 13463-1. Air performance is identical to the 1/3D model: 240 m³/h and 180 mbar -- the extra capacity goes to safety, not to pulling power.

APPLICATIONS

- Battery-electrode manufacturing in Zone 21 with reactive lithium powder and single-phase installation
- Aluminium grinding cell classified Zone 21 (frequent fine-dust presence)
- Pharmaceutical pilot plant with reactive excipients and Zone 20/21 zoning
- Titanium machining in defense industry, smaller workshops without 400V supply
- Zinc-powder handling in laboratories and research pilot production
- Magnesium grinding in small scale, shooting ranges with reactive projectile powder

Technical specifications

ATEX marking	II 1/2D Ex h IIIC T160°C Da/Db
Internal / external zone	20 / 21
Motor type	2D ATEX-certificeret sidekanalblæser, 2,2 kW 1-faset 230V 50/60 Hz
Airflow	240 m³/h
Vacuum	180 mbar (1836 mmH_2O)
Container	100 L
Sound pressure	72 dB(A)
Filter class	H class
Filter type	Cartridge-primaerfilter antistatisk polyester HEPA13 (EN 60335-2-69 klasse H)
Primary filter	Cartridge antistatisk polyester klasse HEPA13
Cleaning system	Manuel filterrens (bagudtryk)
Collection system	Detachable container + INERT neutralisation bath
Material	Lakeret staalkonstruktion, AISI 304 stoevbeholder med N2-fluxet inerting-indsats
IP class	IP55
Power	2.2 kW
Voltage	230 V / 50-60 Hz
Venturi units	0 pcs
Inlet	Diameter 50 mm
Dimensions (L x W x H)	660 x 800 x 1630 mm
Weight	95 kg

Questions and answers

Why is the motor uprated from 1.8 to 2.2 kW in the 1/2D version?

The difference is not suction -- flow and vacuum are identical to the 1/3D variant -- it is thermal margin. EPL Da class (which applies to internal Zone 20) requires that the safety level is maintained even under *two-fault scenarios* (per EN 1127-1 Table 1 and EN 13463-1). This means the motor must handle, for example, simultaneous bearing wear and airflow blockage without the surface temperature rising above T160°C. By using a 2.2 kW motor instead of 1.8 kW, the motor runs well below its nominal load during normal operation -- longer power margin = less heat production = a safe distance from T160°C even under fault scenarios. It is a classic ATEX design principle: let the motor sweat so safety does not have to.

If I already have a 1/3D INERT, when should I upgrade to 1/2D?

Short answer: when your ATEX zone classification requires it. In practice, this means -- when the collector's internal chamber is in Zone 20 (a dust-explosive atmosphere is present continuously, for long periods or frequently in operation) and not Zone 22 (only briefly under abnormal operation). Three concrete scenarios: (1) a battery blending station where the chamber is always filled with active-material dust -- Zone 20; (2) an aluminium polishing cell with continuous dust production and limited ventilation -- Zone 20; (3) a grinding workshop that kicks up dust twice a week -- Zone 22, 1/3D is sufficient. If you are in doubt, your employer's ATEX zone assessment (the Explosion Protection Document per directive 1999/92/EC article 8) should provide the answer. We cannot make that decision for you over the phone -- but we can help with the right model selection once the document is available.

Is the hydrogen vent a physical safety device or a sensor?

Physical safety device. The safety hydrogen vent is a calibrated membrane valve (with constant flow characteristic) installed at the top of the inerting container's N2 chamber, and releases hydrogen gas under control if lithium or aluminium dust reacts with small amounts of moisture and generates H2 inside the chamber. The design is based on EN 14460 principles for flame-arresting devices, but sized so hydrogen escapes before reaching the explosive limit (4 volume percent in air). The vent is passive -- no electronics, no power supply, no battery. It is the single most important safety function on the ECOBULL 1/2D INERT for lithium battery powder capture, and uses the same principle as the safety vents on lithium battery cells themselves.

What is the difference between this and an ATEX Zone 20 Ex-d explosion-proof vacuum?

They are two entirely different protection philosophies. Ex-d (flameproof enclosure, EN 60079-1) encloses the motor in a pressure-tested metal housing so any internal explosion cannot escape -- heavy, expensive, and limited to the motor compartment. The ECOBULL 1/2D INERT is based on 'Ex h' (non-electrical, constructional safety per EN ISO 80079-36/37) combined with pure mechanical inerting: inside the chamber the atmosphere is filled with N2 until the O2 level is below 8 volume percent -- the limit below which most metal-powder explosions cannot propagate. In practice, the INERT philosophy is cheaper, lighter and more universal (works for all conductive metals, not just electrically connected ones), but requires an N2 supply -- typically 50 L/cycle consumption at a 10-bar regulator. See also CENELEC TR 50404 for a short overview of constructional safety versus flameproof enclosure in dust applications.

Contact and advisory

PARTICULAIR

Particulair
Højtoften 12
2690 Karlslunde, Denmark
CVR: 34129894
Phone: (+45) 70 23 12 03
E-mail: sales@particulair.com
Web: particulair.eu
Product page: particulair.eu/ex-vac/en/atex-dust/ecobull-m-dex-1-2d-inert/

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