

ATLAS COPCO BLASTHOLE DRILLS DM-M3 SERIES

Rotary Drilling and Multi-pass
Hole diameter 9 $\frac{3}{8}$ in – 12 $\frac{1}{4}$ in (251 – 311 mm)
Maximum hole depth 240 ft (73.2 m)

Atlas Copco



Heavy duty concept

for deep drilling of overburden

The Atlas Copco DM-M3 is a crawler mounted, hydraulic tophead drive, multi-pass rotary drilling rig primarily designed for deep drilling of overburden for cast blasting in large coal mines. The heavy and durable DM-M3 was launched at MINExpo 1992 and is used at several of the largest coal mines in the world.

The Atlas Copco DM-M3 has an on-board depth capability of 200 ft (61 m) using 10 3/4 in diameter drill pipe and up to 240 ft (73 m) using 8 5/8 in diameter drill pipe with a 5-rod carousel. The standard drill pipe length is 40 ft (12.2 m) and the hole diameter ranges from 9 7/8 in - 12 1/4 in (251 – 311 mm). Weight on bit is rated at 90,000 lbf (400 kN) using a patented hydrostatic, closed-loop system acting through twin, double-rod hydraulic cylinders and cable. The DM-M3 has a rotary head torque of up to 10,183 lbf-ft (13.8 kNm) and a rotation speed from 0 - 200 RPM.

Tower and pipe handling

The tower can be raised or lowered in seconds with a full complement of drill pipe in the carousel and under the rotary head. Tower pinning and pipe changing is performed remotely from the operator's cab. Drill pipe handling on the DM-M3 is accomplished through the rotary head, a hydraulically positioned carousel-type pipe changer, hydraulic breakout, and an auxiliary hoist and boom. A standard hydraulically operated rod support arm helps to align the drill pipe during rod changing and when the angle drilling option is in use. An exclusive "key lock" securely locks in the drill pipes at the bottom and the top of the carousel. A No-Bump drill pipe change limits the feed force of the rotary head, while the carousel moves completely out. This prevents the carousel from operation unless the rotary head is at the top of the tower. Drill pipes can be handled by the standard auxiliary hoist/winch located at the top of the tower.

Rotary multi pass drilling

The DM-M3 is designed to handle drill pipe from 7 5/8 in (194 mm) up to 10 3/4 in (273 mm). This drill rig is only available in the low pressure version where 110 psi (7.6 bar) is used for rotary drilling of blast-holes up to 12 1/4 in (311 mm) in diameter. Bit rotation on the DM-M3 is provided by a hydraulic tophead drive assembly consisting of two variable displacement, axial piston motors driving a two stage spur gear reduction enclosed in a heavy steel casting. The use of variable displacement pumps and motors allows the operator an infinite selection of rotation speed at variable torque values. The DM-M3 in-line drive train consists of a diesel engine (or optional electric motor) directly coupled to a compressor on one end and a three-hole hydraulic pump drive gearbox on the other end. The power pack assembly is mounted on its own sub base, which in turn is "shock" or "float" mounted to the rig main frame. This configuration maximizes mechanical efficiency. The power pack comes complete with filters, air intake, and exhaust.

Compressor

Low pressure rotary	2,600 cfm @ 110 psi / 73.6 m ³ /min @ 7.6 bar
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Operator comfort

All operational functions are controlled from the drillers console in the cab. The operator has excellent visibility with an unobstructed view of the drill table. The wrap-around drilling console places the heavy-duty electric-over-hydraulic controllers within easy reach. The cab is thermally insulated, pressurized, equipped with double safety glass, and has an ergonomic seat with seat belt. The FOPS certified cab, which can be entered through two hinged and lockable doors, has an integrated air conditioning system and a sound abatement tested at 80 dBA. A full 360 degree walkway extends around the entire machine, including the cab.



Patented feed system

The heart of the feed system on the DM-M3 is the patented hydrostatic closed-loop hydraulic system. This allows single lever control of the speed and the directional movement of the rotary head, while at the same time operating more efficiently than conventional systems due to lower flows and reduced pressure drop. The fast feed and retract speeds permitted by this system reduce the non-drilling time significantly. The utilization of the double-rod hydraulic cylinders further extends the uniqueness of the system. Conventional feed systems use single rod cylinders, while the DM-M3 uses two separate rods and pistons within a common barrel.



A mobile and stable platform

The DM-M3 utilizes an excavator-type undercarriage, built to Atlas Copco specifications. Tracks are driven by a planetary gear system and two hydraulic motors rated at 188 hp (140 kW) each. Both tracks are individually controlled and act as an independent unit. The tracks are hydraulically adjustable with a spring recoil system and equipped with replaceable triple bar grouser pads. The Atlas Copco designed DM-M3 main frame is a weld fabrication of ASTM A572 Grade 50, 24 in. x 146 lb/ft (61 cm x 217 kg/m) high strength, low alloy "I" beam. A "walking beam" oscillation yoke allows the rig to propel over uneven ground, while reducing torsional stresses on the main frame.



Standard Equipment

- Insulated, pressurized FOPS cab with heater
- Rotary screw 2600 CFM @ 110 psi air compressor
- Caterpillar C32 diesel engine (950 HP at 1800 rpm)
- Six-light, 70 watt quartz-halogen night lighting system
- Cab and ladder access lights plus dust curtain light
- Cooling package
- Remote hydraulic tower pinning
- Auxiliary hoist of 8,000 lb (3,600 kg) capacity with lifting bail
- Hydraulically-actuated, drill pipe carousel internal to tower for 4 drill pipe or 5 for 8-5/8 in. diameter 40 ft.
- Hydraulic sliding fork chuck breakout with auxiliary hydraulic wrench
- 650 U.S. gallon (2,460 L) fuel capacity
- Wide flange structural steel "I" beam main frame with oscillation yoke mounting
- Separate three-stage air intake filters for engine and compressor
- Rotary head tachometer
- Three hydraulic leveling jacks and "jacks-up" indicator in cab
- Hydraulically actuated rod support arm to align drill pipe during rod changing operations and when using the angle drill option
- Full walkways and railings
- 35.5 in (900 mm) wide, triple bar replaceable grouser pads

A selection of features on DM-M3 Series

For a more comprehensive options list, please contact your local Atlas Copco Customer Center.



Angle drilling package

The optional angle drilling package allows the tower to be positioned from 0° to 30° from the vertical position, in 5° increments. The package includes a drill rod support and an angle drill tie bar. All controls are located at the operator's control console inside the cab.

Dust control

There are four different dust control options for the DM-M3 series; three dust collector sizes and a water injection system. Each includes rectangular split dust curtains and a hydraulically retractable front curtain.

Cold weather package

Several cold weather options are available to enable trouble free operations and a pleasant operator's environment. Fully utilizing these options allow the drill rigs to operate in arctic conditions at temperatures around -55°C

Fast service system

The DM-M3 has an optional fast service system with ground level, quick connect fittings for fill and evacuation of fuel, hydraulic oil, engine coolant, receiver and crankcase oil.

Technical data DM-M3

Drilling Method	Rotary - Multi pass	
Hole Diameter	9 7/8 in - 12 1/4 in	251 mm - 311 mm
Hydraulic Pulldown	90,000 lbf	400 kN
Weight on bit	90,000 lb	40,800 kg
Hydraulic Pullback	41,500 lbf	185 kN
Single pass depth	37 ft	11.3 m
Maximum hole depth	200 - 240 ft	61 - 73.2 m
Feed speed	144 ft/min	0.7 m/s
Rotary head, torque	10,183 lbf-ft	13.8 kNm
Estimated weight	230,000 lb	104 tonnes

Dimensions tower up

Length	40 ft 5 in	12.3 m
Height	67 ft	20.4 m
Width	18 ft 11 in	5.8 m

Dimensions tower down

Length	66 ft 6 in	20.3 m
Height	23 ft 9 in	7.2 m

Compressor

Low pressure rotary	2600 cfm@110 psi / 73.6 m ³ /min@7.6 Bar
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Engine (Tier II)

Caterpillar	C32	950HP / 709 kW@1800RPM (LP 2600)
Cummins	QST30	950HP / 709 kW@1800RPM (LP 2600)
Weg motor	6811	900HP / 671 kW@ 50 or 60Hz (LP 2600)

Drill Pipe specification

Standard 40 ft tower, 12.2 m long pipes		
7 5/8 in (194 mm)	9 7/8" - 10 5/8"	5 1/4" BECO
8 5/8" (219 mm)	10 5/8" - 11"	6" BECO
9 1/4" (235 mm)	11" - 12 1/4"	6" BECO
10 3/4" (273 mm)	12 1/4"	8" BECO

Sustainable Productivity

We stand by our responsibilities towards our customers, towards the environment and the people around us.

We make performance stand the test of time.

This is what we call – Sustainable Productivity

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