DRILLMEC
DRILLING TECHNOLOGIES

HH SERIES

AUTOMATED
HYDRAULIC RIGS

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The shape of things to come

Drillmec’s hydraulic drilling rigs emerged from the need to meet the demands of today’s E&P companies that require a rig with high performance, lower NPT, lower operational cost, least environmental impact, and high safety.

Drillmec fused all these criteria in the HH Series rigs. This series of hydraulic drilling machines are specially designed for safety, efficiency, and speed as well. This is a masterpiece rig ready to deliver optimal results safely.
The HH Series began in 1993 as simple and regular hydraulic rigs for drilling water wells. It was then modified and improved to meet and surpass the demands of oil and gas drilling with the introduction of automation, transportation, pipe handling and self-elevating rig up system. Over the years, this hydraulic rig machine has worked effectively in difficult good conditions and extreme weather conditions around the world.
The HH Series is a hydraulic drilling machine that is designed for safety, high performance, reduced emissions, and speed with reduced non-productive time.

Drilling Advantages

ADVANCED DIGITALIZATION

The HH Series are fully automatic rigs with a hydraulic hoist system that contributes to high performance and security. This rig design features various hydraulic equipment that is largely automated to support drilling processes and controlled from the drillers' cabin.
The integration of DEEP (Drillmec's Embedded Efficiency Platform) brings to board the use of AI data-driven approach to drilling processes. This enables the use of pattern recognition to produce different operational efficiencies while optimizing drilling operations. The driller and crew enjoy safe and simplified drilling operations while on board.

REDUCED FOOTPRINT

The HH Series is designed with a clear goal of reducing carbon footprint in drilling and production processes. This hydraulic drilling machine features a powerful hydraulic cylinder which is the main hoisting element. It does not have a regular mast structure, drawworks, long wires and travelling equipment as with the conventional rigs. It has a compact design with a reduced height and dropped objects which creates a smaller carbon footprint.
Additionally, it has a reduced rig lifecycle GHG emission of roughly 50%, 35% reduction in drilling activities and manufacturing process, and 50% from rig moves which is a big emission reduction when compared to rigs of that size and power.

FAST MOVING

The HH Series rigs is designed to have a telescopic mast with a single powerful hydraulic system for a quick and fast erection. All the primary components of the rig are mounted on the wheels making it easier, faster and safer to transport between drill sites. It is also easier and safer to rig up and rig down reducing non-productive time.

ENHANCED PERFORMANCE

This hydraulic rig machine is a robust and powerful automated rig offering a high level of safety while delivering outstanding and superlative performance. The advanced automation allows for the central control of most routine drilling operations such as tripping in and out of drill strings with minimal manpower and less time. This ensures proper resource utilization while reducing non-productive time. This hydraulic rig delivers top drive torque range of 13,560 Nm (10,000 lbs/sq.ft.) to 52,230 Nm (38,522 lbs/sq.ft.) and speed of between 120 rpm to 200 rpm. It is available in ratings between 55metric tons (122,000 lbs) to 317 metric tons (700,00 lbs).

Offshore Applications

The HH Series is suitable to cover all drilling, workover, plug & abandonment applications in an offshore oilfield service.

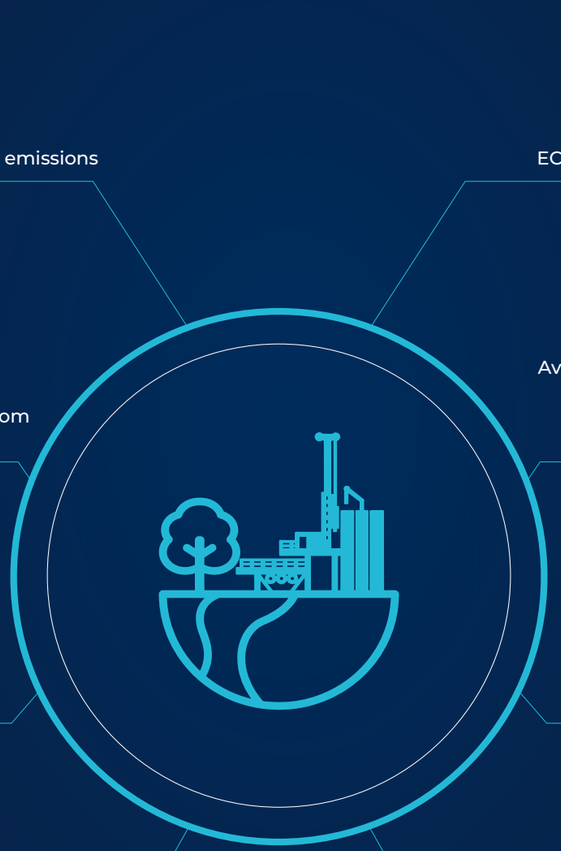
The HH rigs operations processes are largely automated and centrally operated from the driller's cabin. Stuck pipe becomes less of an issue with features that allow automated drilling even with preset WOBs and ROPs or top drive back reaming.

The most noteworthy feature are the compact footprint and the rig's vertical pipe handling system, although different pipe handling system configurations can also be implemented on HH rigs.
Fully automated tripping systems have been already deployed and installed on HH rigs. The top drive is fully integrated with the vertical pipe rack through an automated pipe handler that rotates within the system and is equipped with a torque wrench for making up drill strings and has a horizontal displacement capability for moving pipes between the center hole and mouse hole. The high automation level reduces the rig drilling crew, enhancing safety on board.

On top of this, HH Series are designed to reduce environmental impact by decreasing noise emissions, waste production and with a limited power requirement.

Green Philosophy

Long before Green Economy was a trend, we designed the **HH Series** with two main objectives: **performance** and **sustainability**. Throughout our history, we have always striven to **improve rig performance** in a **conscious way**. We implemented our vision to hit and exceed stringent environmental and technical requirements by developing the **HH Series rigs**: **top tier technology** in an **environmentally-friendly rig**.



50%
Reduced rig life-cycle ghg emissions

EPM
ECO POWER MANAGEMENT

35%
Reduced ghg emissions from drilling activities

DRY LOCATION
Avoiding spills from rig floor, mud tanks, generators and any other equipment handling fluids

50%
Reduced ghg emissions from rig moving & rig up/down operations

50%
FOOTPRINT REDUCTION

35%
Reduced ghg emissions from production of raw materials, rig manufacturing process and end-of-life recycling activities

30%
REDUCED HEIGHT

PERCENTAGE COMPARISON WITH A CONVENTIONAL DRILLING RIG OF EQUIVALENT CAPACITY

PANORAMIC VIEW

Rig features & options

DRILLING CONTROL SYSTEMS

DEEP (Drillmec's Embedded Efficiency Platform) incorporates machine learning and artificial intelligence to fulfill new requirements for system integration of the whole drilling package, data touch points and processes, leading to advanced data analyses that facilitate improvements in drilling performance, equipment reliability and maintenance and safety.
DRILLER'S CYBER CHAIR: our control cabins are specifically designed for each individual drill floor. The Driller's Cyber Chair is an advanced workstation for controlling, managing and monitoring all rig features and parameters. The cyber chair will be rotating and fully adjustable to ensure perfect operability to the driller, reducing fatigue and strain.
PCR (power control rooms) includes all the required power, electronic and automation controls to run all drilling processes such as: VFDs, MCC, power management including generators control and PLC control systems.
HPU (Hydraulic Power Unit): an independent HPU assembled in a soundproof container. The HH-Series HPU and hydraulic systems are fully tested in many years of activities in several extreme job-sites worldwide, including first class components made by primary suppliers assembled according to Drillmec's experience. Strict internal testing procedures assure to reach the maximum result in terms of safety and reliability of the rigs.

FLUID SYSTEMS

MUD PUMPS: we manufacture a complete range of triplex mud pumps, delivering power from 300 hp to 2,200 hp, 5000 or 7500 psi. The quick replacement of wearable parts, such as valves, pistons and liners, allows the operator to keep the pump on line longer. With a variety of drive packages on the displacement and pressure sides, our mud pumps have it all in one package. Mud pump controls are rigorously tested before and after installation and quality is guaranteed before deployment to your drill site.
HoD® Prearranged: the HH-Series rigs are prearranged for integration with Drillmec HoD® (Heart of Drilling), the continuous circulation system developed by Drillmec which facilitate improvements in drilling performances (limited NPT, higher ROP; reduced formation stresses/damages and improved wellbore stability; reduced tripping time and circulation time prior POOH).

ROTATION EQUIPMENT

TOP DRIVES: a full range of top drives can be fitted to any HH-Series rig model in order to increase the performance in directional or horizontal drilling. They are hydraulically or electrically powered. In the HH Series Rigs, the top drive has a horizontal displacement capability that allows it to move the pipes from the center hole to the mouse hole and vice versa. The hydraulic top drive allows automatic drilling with a constant WOB or constant RPM that is selected by the driller on the control console. Predetermined values of over-pull can also be set. Such features coupled with the back-reaming allowed by the top drive while tripping out considerably reduce the risk of stuck pipes.
CASING MAKE UP DEVICE: casing make-up device is designed to handle 4 ½" - 20" casing sizes. The device is located underneath the top drive's double hook, hydraulically operated from the main control panel. It allows the casing rotation with adjustable torque and fluid circulation during the running of the casing. Drillmec partners with Volant to offer its customers CRTs as standard or optional equipment. It enables automated casing running using the automated pipe handling systems which are integral to Drillmec's automated hydraulic rigs. In addition to the casing running operations, the Volant CRT helps to improve the efficiency of the HH Series Rigs in casing drilling applications, which can be performed in an advanced semi-automated mode.

DRILLING STRUCTURES

RIG SEMITRAILER: major rig components are permanently mounted to semi-trailers for fast rig-up or down for transportation between drill sites.
SUBSTRUCTURE: drilling floor frame made of high-grade steel, directly connected to rig trailer. Due to its specific design, this type of substructure can be easily set also over large existing cellars and the ample space under the substructure floor facilitates the BOP installation.
SOUNDPROOFING: high soundproofing level enclosures for generator sets, PCR, HPU, VFD, air unit.
RIG WINTERIZATION solutions allow HH-series operations at a wider working temperature range up to arctic conditions. Winterization is available for the entire rig package (substructure zone, drilling floor, pipe racks, rig's semitrailer) and can be integrated with a heating system.
BOP HANDLING SYSTEM: handling device for easy moving of BOP assembly. The BOP handling device is remotely controlled by a local control panel and consists of two hydraulic lifting cylinders and related control panel with suitable capacity for the BOP stack. The system can be completed with BOP CART: a special dolly moved by motorized wheels, which allows the transport of entire BOP Stack in horizontal position and raising in vertical by two cylinders, making BOP stack installation easier, faster and safer.

HOISTING EQUIPMENT

HOISTING SYSTEM: the HH Series Rigs do not have a conventional mast structure, nor drawworks, long wires or travelling equipment; these are replaced by a powerful hydraulic cylinder, which is the main hoisting element of the rig.
TELESCOPIC MAST: it is a self-standing telescopic mast with reduced height and reduced dropped objects. The telescopic mast is designed to allow handling of API Range 3 drill pipes (up to 13.7 m), 30' drill collars and API Range 3 casings (up to 14.6 m). It is composed by two independent sections: a bottom section is fixed to the trailer frame and a telescopic section is running up and down.

TUBULAR HANDLING SYSTEMS

AUTOMATED VERTICAL PIPE HANDLER: the automatic pipe handler rotates inside a unique vertical pipe rack that surrounds the rig floor. The pipe handler's arms are installed on a vertical rotating tower; they have two clamps that take the drill pipes from any container of the vertical pipe rack and transfer them to the mouse hole or vice versa, depending on an electronic pre-set order.
AUTOMATED HORIZONTAL PIPE HANDLER: the HH-Series rigs can be also equipped by horizontal automated pipe handler for the transferring of DP, Tubing and DC from horizontal pipe racks to the drill floor. The pipe handling machine is available in different configurations with power catwalk or HTV (Horizontal to Vertical) pipe handler.
PIPE RACK: the pipe rack is made of a number of mobile bins, whose number varies with the size and the HH Series Rig. The semicircular pipe rack is assembled around the rig floor and contributes to quick rig-up and rig-down. In addition, the pipe racks can be transported fully loaded with pipe reducing pipe handing procedures and optimizing the moving operations. Trailerized pipe bins are also available for a faster mobilization. For the smaller HH-Series Rigs, a horizontal pipe rack is available as alternative to the standard vertical pipe racking system.
AUTOMATIC TRIPPING SYSTEM: the HH Series Rigs with automatic pipe handler is capable to perform automatic tripping operations through the new DATS software (Drillmec Automatic Tripping System), once more improving safety and performance.
AUTOMATIC CASING HANDLING: once the casing is on the horizontal rack, a special power catwalk carries it through an opening in the middle of the pipe bins carrousel directly to the center hole, where also the connection is completely automatic and unmanned.
OFFLINE STAND BUILDING: the HH-series vertical pipe-handling system, in combination with power catwalk allows offline stand building of drill pipes and casing while drilling operations are ongoing.

Services

Purchasing a Drillmec product entails choosing a brand that will be by your side throughout the life cycle of the rig package or drilling equipment provided.
The worldwide presence of experienced and skillful team of field technicians, together with our 24/7 diagnostic center and our spare parts warehouses strategically located around the globe guarantee a superior quality assistance.
On top of this, our world class IWCF/IADC certified training center is available for in person or remote training for your drilling crew through cutting-edge simulators, with safety and performance in mind.

HH SERIES		HH 55	HH 75	HH 102	HH 150	HH 220	HH 300	HH 350
Input Power	kw	328	403	429	720	1,000	1,150	1,150
	hp	440	540	575	965	1,542	1,542	1,542
Pull Up	m ton	55	75	100	150	200	272	317
	lbs	122,000	165,000	220,000	330,000	440,000	600,000	700,000
Pull Down	m ton	10	10	20	20	20	30	30
	lbs	22,000	22,000	44,000	44,000	44,000	66,000	66,000
Rated	m ton	55	75	100	136	200	272	317
	lbs	122,000	165,000	220,000	300,000	440,000	600,000	700,000
Top Drive Torque	Nm	13,560	13,560	32,300	32,300	35,840	49,080	52,230
	lbs*ft	10,000	10,000	23,824	23,824	26,435	36,200	38,522
Top Drive Speed	rpm	120	120	120	120	158	158	200
Rotary Table	mm	698	698	698	698	698	952.5	952.5
	in	27.5	27.5	27.5	27.5	27.5	37.5	37.5
Vertical Pipe Rack Capacity – DP 3 1/2”	m	1,025	1,025	2,900	4,600	4,600	4,624	4,624
	ft	3,360	3,360	9,500	15,000	15,000	15,170	15,170
Vertical Pipe Rack Capacity – DP 5”	m	730	730	1,800	3,600	3,600	3,670	3,670
	ft	2,395	2,395	5,900	11,800	11,800	12,040	12,040
Vertical Pipe Rack Capacity – DC	m	110	110	110	192	192	192	192
	ft	360	360	360	630	630	630	630

MUD PUMPS		7T450	7TS600	9T1000	9T1300	12T1600	12T1600GD
Liner Size	mm	114 - 140	102 - 178	114 - 178	114 - 178	114 - 184	114 - 184
	in	4 1/2 - 5 1/2	4 - 7	4 1/2 - 7	4 1/2 - 7	4 1/2 - 7 1/4	4 1/2 - 7 1/4
Stroke	mm	178	178	228	228	305	305
	in	7	7	9	9	12	12
Max Pressure	bar	207	345	345	345	345 / 517	517
	psi	3,000	5,000	5,000	5,000	5,000 / 7,500	7,500
Max Delivery	gpm	323	524	674	674	674 / 771	771
	l/min	1,226	1,986	2,554	2,554	2,554 / 2,922	2,922
Rated	kW	336	447	745	970	1,194	1,194
	hp	450	600	1,000	1,370	1,600	1,600

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