PAT-Drill 301

Modular Drilling Rig

The oldest PAT model and still in constant production – and has many design refinements through its 25 years.

With a 'stand alone' mast unit it can be simply transported and man handled onto drill sites – some with tight access.

Rig is powered by a stand alone power pack with a heavy duty Diesel engine or lightweight Petrol engine option.

Ideal application sedimentary mud drilled holes to 100 m depth 100 - 200 mm diameter.

Product Description :

In its modular format it remains one of the lightest drilling packages in its depth capacity in the world and can meet many specialist needs – manhandled up mountains for horizontal well drilling, compact air cargo movement where road transport is not an option or local mounting on hydraulic excavator arms and similar configurations.

TECHNICAL DATA & SPECIFICATION

RECOMMENDED HOLE RANGE
Soft formations, rotary mud drilling operation:
(Needs a seperated mud pump)
4" - 8" (100-200 mm) borehole diameter.

TOP ROTATION HEAD
Single reduction gearbox, hydraulic motor driven, and variable rotation speed. Able to swing-a-side for easy casing installation. Swivel spindle 40 mm inside diameter, sub joint 2 3/8 API Reg Mod

Gear box ratio:	3.875 : 1
Speed:	0 – 50 rpm
Max. torque:	1320 Nm

MAST
All steel work, 3.15 metres high, break-out table to open 200 mm. diameter.
2 - wheel axle aids erecting the mast to a vertical positon for drilling and aids moving the unit around site or loading / unloading the unit from a vehicle.

FEED SYSTEM
Rotation head is raised and lowered by a hydraulic cylinder and heavy- duty transmission chain.

Head travelling stroke:	2.25 metres
Pull up - Capacity:	2300 kg
Max. speed:	9.5 metres/min
Pull down - Capacity:	3480 kg
Max. speed:	14.5 metres/min

OPERATION CONTROL PANEL
the control panel is mounted on the mast, and is equipped with:
4 levers controlling rotation head, pull and feed
2 regulators for rotation speed and pull/feed weight
3 system pressure gauges

HYDRAULIC POWER PACK
Engine: 14 hp (10.4 kW) KUBOTA diesel engine
13 hp (9.7kW) HONDA petrol engine

Hydraulic system: VANE pump type, system pressure 250 bar max, 75-litres tank capacity.

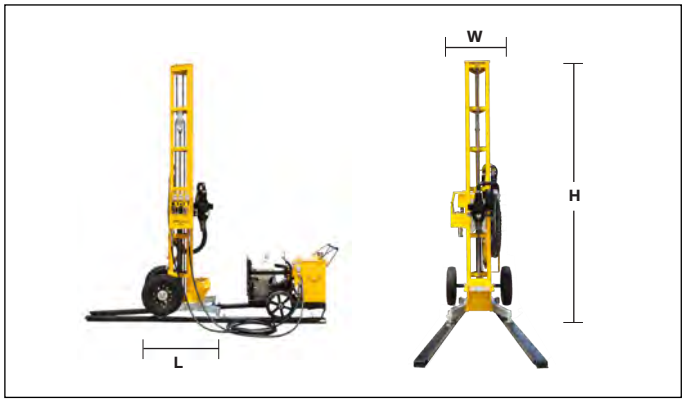
Hydraulic hose line: 2 pieces supply & return. 6 m long with quick release self-sealing type couplings to connect power pack to rig.

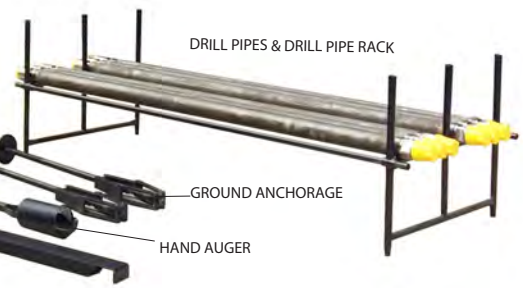
DRILL PIPE

Drill pipe length:	2 metres
Drill pipe diameter: *(Option)*	60/76 mm.

DIMENSIONS

Overall length *(L)* :		1.10 m
Overall width *(W)* :		0.85 m
Overall height *(H)* :		3.20 m
Weight :	Drilling Unit	450 kg
	Power pack diesel	250 kg
	Power pack petrol	200 kg





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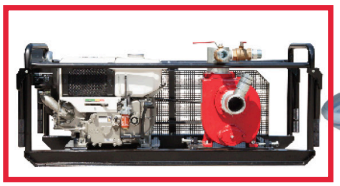
MUD PUMPS



MUD PUMPS TYPE	KATO MUD PUMP	TAKI HEAVY DUTY MUD PUMP	TAKI TRAILER MUD PUMP	8x12 DUPLEX PISTON MUD PUMP
ENGINE TYPE	9 HP Kubota Diesel engine (6.7 kW) 13 HP Honda Petrol engine (9.7 kW)	KUBOTA Diesel engine (10.4 kW)	36 HP YANMAR Diesel engine (26.8 kW)	83 HP YANMAR Diesel engine (61.0 kW)
MUD PUMP TYPE	Single stage centrifugal, KATO model *Typical Capacity: 1500 Litres/ min (330 gals/min) at 10 m head (15psi) Max pressure: 2 bar (30psi)	Double Stage centrifugal, TAKI model: 65-33/2 *Typical Capacity: 1000 Litres/ min (220gals/min) at 70 m head (100psi) Max pressure: 4 bar (60psi)	Double Stage centrifugal, TAKI model: 65-33/2 *Typical Capacity: 1170 Litres/ min (260gals/min) at 80 m head (115psi) Max pressure: 6 bar (100psi)	High pressure mud pump, 8x12 Duplex piston pump *Typical Capacity: 800 Litres/ min(212gals/min) at 150 m head (150psi) Max pressure: 24 bar (350psi)
**Maxium Diameter & depth recommended				
76mm drill pipe	165mm bit x 80m depth 200mm bit x 60m depth	165mm x 120m depth 200mm x 100m depth 250mm bit x 20m depth	165mm x 140 m depth 200mm x 150m depth 250mm bit x 50m depth	
90mm 'open throat' drill pipe	165mm x 120m depth 200mm x 100m depth	165mm x 150m depth 200mm x 120m depth 250mm bit x 40m depth	165mm x 200 m depth 200mm x 200m depth 250mm bit x 100m depth	200mm x 300 m depth 250mm x 300m depth 300mm bit x 2-300m depth
WATER HOSES (with PAT Quick Couplings fitted)	Suction Hose: 75mm/3 inch x 4 m long with suction strainer/foot valve Pressure Hose: 40mm , 1 1/2 inch x 6 m long Mixing/gunline: 40mm, 1 1/2 inch x 4 m long Hand priming pump on suction inlet	Suction Hose: 75mm/ 3 inch x 4 m long with suction strainer/foot valve Pressure Hose: 50mm, 2 inch x 6 m long Mixing/gunline: 40mm, 1 1/2 inch x 4 m long Hand priming pump on suction inlet	Suction Hose: 75mm/3 inch x 6 m long with suction strainer/foot valve Pressure Hose: 50mm, 2 inch x 6 m long Mixing/gunline: 40mm, 1 1/2 inch x 4 m long Hand priming pump on suction inlet	Suction Hose: 100mm/4 inch x 6 m long with suction strainer/ foot valve Pressure Hose: 50mm, 2 inch x 6 m long
MOUNTED	Steel skid frame	Steel skid with 2 wheel	Road Trailer with sprung axle and overrun brakes.	Road Trailer with sprung axle and overrun brakes.
WEIGHT	150 kg	260 Kg	770 Kg	2100 Kg
Dimension	58 x 120 x 65 cm.	83 x 128 x 83 cm.	172 x 326 x144 cm.	192x442x190 cm.
NOTES*	All centrifugal pumps reduce output flow as output pressure rises. When mud drilling, The biggest cause of increased pump outlet pressure is caused by pressure lost to friction inside the drill pipe.			Piston pump - fixed displaced constant flow - through drill
NOTES**	Final depth that can be reached depends on the exact nature of formation being drilled, the type & mix of drill mud and the condition of the mud pump			

TYPICAL ACCESSORIES	
	Mud viscosity measiuring 'Marsh Funnel & Cup' Mud Density - Mud Balance PH Meter Polymer Drill Mud Bentonite - For drilling Soda Ash to raise PH for drilling muds Mud Pump Spares sets - to replace worn seals, shafts, impellors *(centrifugal only)* piston, seal, liners, seat valve *(Piston pump only)* Bare Pump' to replace complete pumping unit worn through use *(centrifugal only)*

Borehole Development Compressor

PAT release new 'Borehole Development Compressor unit', powered by monocycle diesel engine 10 HP, heavy duty type, high torque, and very save fuel consumption,

We design new handle, easily to move. The unit is 205 kg weight.

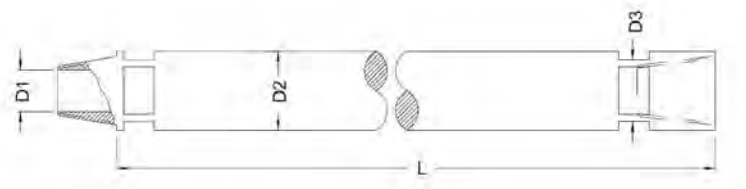
We also release new '2 inch PVC Eductor pipe', 2 or 3 m long.

Borehole Development compressor with 80m Hose Reel - Both ex stock availability.

Air development compressor required the 3/4" hose to be insert in 2" Eductor pipe to base of borehole.

DRILL PIPE:

Strong and hard wearing drill pipe is an essential attribute to a drilling machine. PAT endeavour to make the strongest and durable - sourcing the best quality high tensile steels, machining on CNC automated machining centres - all processed within the PAT Factory.



Part number	Reference	Description	L meter	D1 (mm)	D2 (mm)	D3 (mm)	Weight Kg
30 5 1000	301, option	DRILL PIPE 60 MM, 2.0 M LONG	2.0	28	60	50	12.4
40 5 1000	301, 301T, 421	DRILL PIPE 76 MM, 2.0 M LONG, 2 3/8 REG MOD	2.0	40	76	60	18.2
42 5 1000	421	DRILL PIPE 89 MM, 2.0 M LONG, 2 7/8 REG MOD	2.0	46	89	70	19.9
50 5 1000	431, 431T	DRILL PIPE 76 MM, 3.0 M LONG, 2 3/8 REG MOD	3.0	40	76	60	26.6
60 5 1000	431T, 501, 601	DRILL PIPE 89 MM, 3.0 M LONG, 2 7/8 REG MOD	3.0	42	89	70	32.4
61 5 1000	option	DRILL PIPE 89 MM, 3.0 M LONG, 2 7/8 IF MOD	3.0	44	89	70	34.2
80 5 2000	701, 801	DRILL PIPE 100 MM, 6.0 M LONG, 3 REG MOD	6.0	50	106.6	80	95.4

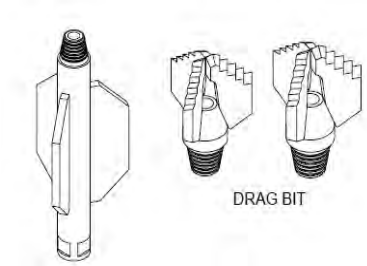
Drill pipe tube is a seamless drawn grade ST52-3 and tool joints are machined from SCM 440 grade. Tooljoints. Tool joints are fuse welded to the drill tube by CNC controlled inertia welding process.

PAT-Drill

DRAG BITS AND REAMER-STABILIZERS

PAT Factory manufactures in house a full range of high-grade tungsten toothed drag blade drill bits and reamers.
See table below for common sizes stocked.

Steel blades are CNC profile cut and then machined with sunken pockets into which the tungsten tips are brazed by a temperature by a controlled induction coil.
Please request factory for any non-standard sizes or blade profiles required.



Part number	Reference	Description	Thread, remark	Weight Kg
30 6 1400-3s	all models	DRAG BIT 4" (100mm), 3-wings step	2 3/8 API REG MOD. PIN.	3.5
30 6 1412-3s	all models	DRAG BIT 4 1/2" (115mm), 3-wings step	2 3/8 API REG MOD. PIN.	3.8
30 6 1500-3s	all models	DRAG BIT 5" (127mm), 3-wings step	2 3/8 API REG MOD. PIN.	4.2
30 6 1512-3s	all models	DRAG BIT 5 1/2" (140mm), 3-wings step	2 3/8 API REG MOD. PIN.	4.5
30 6 1578-3s	all models	DRAG BIT 5 7/8" (150mm), 3-wings step	2 3/8 API REG MOD. PIN.	4.6
30 6 1600-3s	all models	DRAG BIT 6" (152mm), 3-wings step	2 3/8 API REG MOD. PIN.	5.1
30 6 1612-3s	all models	DRAG BIT 6 1/2" (165mm), 3-wings step	2 3/8 API REG MOD. PIN.	5.4
30 6 1700-3s	all models	DRAG BIT 7" (178mm), 3-wings step	2 3/8 API REG MOD. PIN.	6.4
30 6 1800-3s	all models	DRAG BIT 8" (200mm), 3-wings step	2 3/8 API REG MOD. PIN.	7.4
30 6 1900-3s	all models	DRAG BIT 9" (230mm), 3-wings step	2 3/8 API REG MOD. PIN.	8.3
30 6 1900-4s	all models	DRAG BIT 9" (230mm), 4-wings step	2 3/8 API REG MOD. PIN.	10.9
30 6 1000-4s	all models	DRAG BIT 10" (250mm), 4-wings step	2 3/8 API REG MOD. PIN.	12.5
30 6 1200-4s	all models	DRAG BIT 12" (300mm), 4-wings step	2 3/8 API REG MOD. PIN.	12.1
40 5 2500	all models	REAMER-STABILIZER 5" (127 MM)	2 3/8 API REG MOD. BOX-PIN	9.2
40 5 2512	all models	REAMER-STABILIZER 6" (150 MM)	2 3/8 API REG MOD. BOX-PIN	10.5
40 5 2600	all models	REAMER-STABILIZER 6 1/2" (165 MM)	2 3/8 API REG MOD. BOX-PIN	11.1
40 5 2700	all models	REAMER-STABILIZER 7" (178 MM)	2 3/8 API REG MOD. BOX-PIN	11.6
40 5 2800	all models	REAMER-STABILIZER 8" (200 MM)	2 3/8 API REG MOD. BOX-PIN	12.7
40 5 2900	all models	REAMER-STABILIZER 9" (230 MM)	2 3/8 API REG MOD. BOX-PIN	13.7
40 5 2100	all models	REAMER-STABILIZER 10" (250 MM)	2 3/8 API REG MOD. BOX-PIN	17.9
40 5 2200	all models	REAMER-STABILIZER 12" (300 MM)	2 3/8 API REG MOD. BOX-PIN	20.9

NOTE: Cost effective drilling - particularly where a range of drilling diameter are required use one size of drag blade drill bit and then run larger diameter reamers behind it. As an example by 6" (152mm) drag blade to use on all sedimentary/top-hole drilling and then use a 7" 8" 9" 10" or 12" reamer when large hole diameters are required. It is normal for the majority of bit wear to be taken at the centre of the bit in this example case the 6" Drag - blade and this the lightest and cheapest to replace - the larger reamers have large cutter area and will outlast a drag blade. So the advice is to buy one common size drag blade and adjust the required borehole diameter by having a selection of different reamers.

PDC Drill Bits (Polycrystalline Diamond Compact Bit)

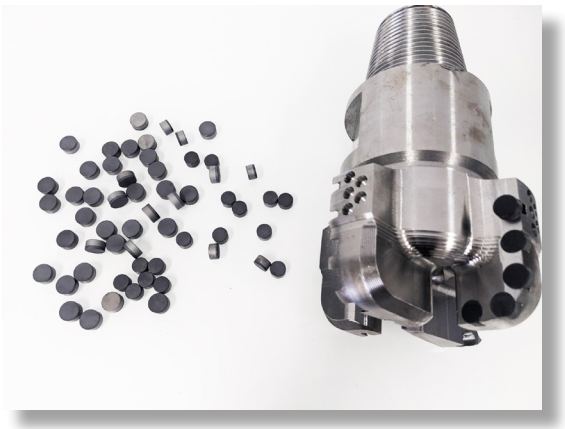
A PDC insert is a tough man-made material that equals the hardness of a natural diamond and is three times the hardness of tungsten carbide. This allows it to maintain a durable, sharp edge that, when rotating and pushed into a rock formation with modest weight on drill bits - particularly when compared to tricone rock roller bits, the PDC will continually scrape at the surface to cut material

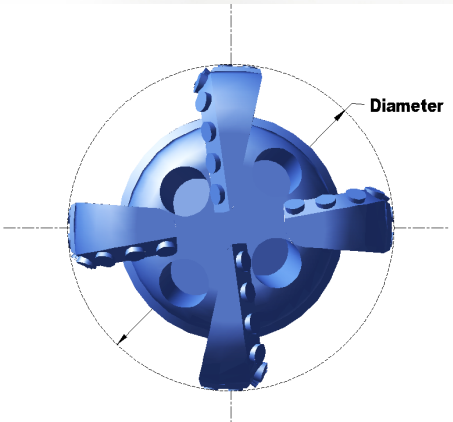
It is an ideal drill bit to use in sandstones limestones and in the transition from heavily weathered crystalline rocks into the consolidated fresh underlying rock to drill pockets to set surface casing to allow drilling to switch to compressed air and DTH down The Hole hammer and percussive button bit.

PDC bits can be used with drill mud circulation in unstable water saturated formations on with compressed air if the formation is stable

Drill Bits diameter		PDC 1308 inserts		Gauge pins		Blade wings	Weight
mm	Inch	mm	Qty.	mm	Qty.	Qty.	Kg.
150	5 7/8	13.3	25	8	20	4	12.7
200	7 7/8	13.3	31	8	28	4	32.8
225	8 7/8	13.3	36	8	24	4	41.5
250	9 7/8	13.3	41	8	28	4	47.7
300	11 7/8	13.3	50	8	36	6	77

- Manufactured from a single piece of metal. seamless welding
- PDC blade 1308 inserts are made of artificial diamonds.
- 4 water outlet holes, size 25 mm (6 holes for size 300 mm)
- Thread end to male drill rod, standard size 3 1/2” API REG





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