

Appendix 4.1

APPENDIX A

EDECO RIG 10







APPENDIX B

BASIC RIG INVENTORY – Rig 10

SKYTOP BREWSTER RR - 850

The Skytop Brewster RR850, is a fully mobile 950 HP rig. The rig is a fully mobile wheeled unit that can be positioned over any well in various configurations to best suit the programme and any other activities on the site

DEPTH RATING

5 in drill pipe (m)	:	10,000 ft (3,000 m)
4-1/2 in drill pipe (m)	:	10,499 ft. (3 200 m)

CARRIER

Manufacturer	:	Skytop Brewster
Type	:	Skytop Brewster 619
Engines	:	Two Detroit Diesel 12V71
Power (HP)	:	950
Transmissions	:	Two Allison CLT-5861S 5-speed (compound)
Air Compressor	:	Two Tru-Flo 1000
Hydraulic system	:	2500 psi x 50 gpm
Levelling Jacks	:	Four (hydraulic)
Front axles	:	Three x 60 000 lb
Rear axles	:	Four x 83 000 lb
Front tyres	:	18:00 x 22.5
Rear tyres	:	11:00 x 20.0

DRAWWORKS

Make	:	Skytop Brewster
Type	:	Skytop DH1-4610A double drum
Rating (HP)	:	950
Depth rating (m)	:	3 660
Drilling line	:	1-1/8 in
Sand line	:	14 000 ft x 9/16 in
Main brake	:	Drum type
Hoisting speeds	:	5
Rotary speeds	:	5
Main drum	:	20 in x 42 in
Sand line drum	:	13 in x 38 in
KEMS System	:	Rig Controls TBM 6000

MAST

Make	:	Skytop Brewster
Type	:	115 - 410XF
Height (ft)	:	115
No of lines	:	10
Capacity (lb)	:	410 000
Fast sheave	:	One x 42 in
Cross sheave	:	Four x 30 in
Deadline sheave	:	One x 30 in
Racking Board Gross Capacity	:	3-1/2 in drill pipe 15,748ft (4800 m)
		4-1/2 in drill pipe 12,133ft (3698m)
Standpipe	:	4 in x 5000 psi
Tong jacks	:	Two hydraulic make up/ break out tong pull jacks

SUBSTRUCTURE

Type : Telescoping type substructure
Clear working height (m) : 4.0

BLOCKS

Type : National 540 G250
Capacity (ton) : 250 (5-sheave)

ROTARY TABLE

Make : Ideco
Model : LR - 275
Opening size (in) : 27.5

MUD PUMP #1 & #2

Make : Bomco
Model : F-1000
Type : Triplex
Number : Two
Drive : CAT 399/3512 diesel engine
Torque Converter : National C-300-100
HP : 1000
Liner size (in) : 5.50 to 6.75
Max pump press rating (psi) : 5000
Max continuous (spm) : 120
Pre-charge pump (in) : 5 x 6
Pre-charge pump (hp) : 50
Pre-charge pump (rpm) : 1750

GENERATORS

MCC Power Generation (Sound Attenuated)

Make : Pro Super Silent
Type : MPG640V
Number : Two
Size : 632Kva, 800 A, 460V @ 60Hz
Engine : Volvo

MUD SYSTEM

Tank volume (bbl)	:	964bbl (three tanks)
Mud mix pump	:	2
Size (in)	:	5 x 6
Power (hp)	:	75hp
Rpm	:	1750
Mix hoppers	:	2 (1 x standard & MI Swaco Hiride 175 mix table)
Shakers	:	2 x MI Swaco Mongoose PT Linear Motion
Atmospheric Degasser	:	42" Poor Boy (PT Patar Tekindo) c/w 20mtr 8" vent line
Mechanical Degasser	:	MI Swaco CD 1400 D-Gasser
Hydroclone Mud Cleaner	:	MI Swaco D-Sander
Hydroclone Mud Cleaner	:	MI Swaco D-Silter
Agitators	:	Seven (7)
Type	:	Nord Gear (Canada)
HP	:	4
PVT System	:	Rig Control Products (RCP) 4-6 Pit monitor

BOP SYSTEM

BOP stack	:	13-5/8" Hydril double gate 5M 13-5/8" Hydril GK 5M annular
Ram blocks	:	To suit tubulars + Blinds
Kill Valves	:	1 x 3 1/8" 5M NRV, Two x 3 1/8" 5M gate valves
Choke Valves	:	One x 4 1/16" 5M gate, 3 1/8" 5M HCR valve
BOP handling details	:	Self-contained trolley on rails Two x 10 MT wire rope lifting slings Two x pad eyes on rotary beam for chain

BOP CLOSING UNIT

Make	:	C.A.D Oilfield
Type	:	T20150-3S
Volume (gals)	:	200
Bottles	:	13 x 10 Gal

CHOKE MANIFOLD

Valves	:	12 off c/w Buffer chamber
Size & Type	:	7 x FMC 4 1/8", 5 x FMC 2 1/16"
Auto adjustable choke	:	MI Swaco 10k super Choke 3 1/8"
Manual Choke	:	2 1/16" 5M (T3 Energy Services)
Manifold Press rating (psi)	:	5M
BOP test unit	:	Hydratron 5k Test pump c/w chart recorder

V-DOOR/CATWALK

Type	:	One unit (V-door folds down on to catwalk)
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HANDLING EQUIPMENT

Rotary tongs	:	One set Type tongs c/w jaws 2 7/8 in to 7 in
	:	One set type 'DB' tongs c/w jaws 3 1/2 in to 9 5/8 in
Casing slips	:	slips to suit each of the following sizes 7 in, 9-5/8 in and 13 3/8 in
Casing & single joint elevators	:	One set of elevators to suit each of the following sizes 7 in (150ton), 9-5/8 in (150ton) and 13 3/8 in (250ton)
Drill Pipe/Drill Collar Slips	:	To Suit Tubular Inventory (includes safety clamp)
Drill Pipe/Drill Collar Elevators	:	To Suit Tubular Inventory
Bit Breakers	:	17 1/2", 12 1/4", 8 1/2"
Bit Gauge Rings	:	17 1/2", 12 1/4", 8 1/2"

DOWNHOLE EQUIPMENT

Drill Pipe	:	3000 meters of 5" OD 19.50 lb/ft Premium Class, grade G-105, premium class, 19.5 lbs/ft, with 5"XH connections and Arnco 300XT hard-banding and internal plastic coating
Pup Joints	:	5ft, 10ft, 15ft.
Heavy Weight Drill Pipes	:	12 Joints of 5" OD X 50 lb/ft heavy weight drill pipe with 5" XH connections and Arnco 300XT hard banding.
Drill Collars	:	All drill collars have API stress relief grooves on pins & bore back in boxes with thread protectors. Twelve (12) 8 1/4", spiral grooved type drill collars, with 6-5/8" Reg connections Eighteen (12) 6-3/4" spiral grooved type drill collars, with 4-1/2" IF connections

FUEL TANK

Capacity (l)	:	22,000 ltr double skin tank
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WATER TANK

Water tank capacity (m ³)	:	40 (250 bbl)
Water pumps size (in)	:	2 x 3

WINCHES

Tugger winch	:	2 x 4 tonne hydraulic winches
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SAFETY EQUIPMENT

Stretcher	:	Collapsible steel framed
First Aid kit	:	One fully stocked kit
Eye wash station	:	Two eye wash stations
Fire extinguishers	:	Eight 9 kg dry powder One 50 kg wheeled type dry powder
Other	:	One escape buggy One derrick man rider One fall arrester

BUILDINGS

Combination building	:	Combination building housing tool room, water tank, fuel tank
Doghhouse	:	Doghhouse lowers into water tank for moving

SUBS INVENTOTY	:	Set of crossovers with spares for principal Crossover from drill pipe to drill collars and Saver subs.
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FISHING TOOLS	:	Basic fishing tool package to fish Contractor Drill string. (Full inventory available)
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WELDING MACHINE	:	Basic electric welding plant
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SUPPORT EQUIPMENT

Fork Lift	:	7-ton all terrain with pallet forks and pipe handling device for safe handling of tubulars
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ADDITIONAL EQUIPMENT AVAILABLE : (ADDITIONAL TO BASIC DAY RATE)

TOP DRIVE

Type	:	Tesco HMI
Model	:	250 HMI 475
HP	:	475
Capacity (ton)	:	250
Torque – High	:	10,500 ftlb
Torque – Low	:	21,000 ftlb
Prime Mover	:	60 Series Detroit Diesel – 475HP

MUD PUMP (Optional 3rd Pump)

Make	:	Emsco
Model	:	F-800
Type	:	Triplex
Number	:	Two
Drive	:	CAT 398 diesel engine
Transmission	:	Allison 8000 series (5 speed)
HP	:	800
Liner size (in)	:	5.50 to 6.75

Max pump press rating (psi) : 5000
Max continuous (spm) : 120
Pre-charge pump (in) : 5 x 6
Pre-charge pump (hp) : 50
Pre-charge pump (rpm) : 1750

STORAGE/MIX TANK

Water tank volume (bbl) : 250bbl
Water pump size (in) : 2 x 3
Various Mix/Storage Tanks : 250bbl to 700bbl unit

Appendix 4.2



BRITISH DRILLING AND
FREEZING COMPANY LIMITED

RIG 28 - IDECO BIR 5625

Rig 28, a five axle self propelled Back in Rambler (BIR), purchased in 1991, is ideally suited for drilling wells to depths of 2250 metres, re-entry and workover operations.

Major rig features include:

- IDECO H37 (500 H.P) double drum drawworks, with DETROIT 12 V 71 power.
- IDECO KM 108 270 KH telescopic mast with an API static hookload of 270,000 lbs and 108ft clear height to permit mousehole connections.
- IDECO substructure with 12ft clear working height enabling use of 13⁵/₈" double ram and annular B.O.P.S.
- IDECO 20¹/₂" rotary table.
- 2 No triplex mud pumps - 500HP, 600HP and 800HP pumps available.
- High specification ancillary equipment.
- All electrical equipment conforms to the latest I.P. Code of Practice and BASEEFA approval.
- Compact modular design of components ensures minimum site area is required and maximises efficiency of rig moves.
- Extensive acoustic enclosures to all prime movers ensures the rig can operate in environmentally sensitive locations.

RIG 28 - IDECO BIR 5625



RIG 28 – IDECO BIR 5625



RIG ENGINE ACOUSTIC ENCLOSURE



TRIPLEX MUD PUMP



SUBSTRUCTURE



DRILLER'S CONSOLE



BRITISH DRILLING AND
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Appendix 4.3

Larchford Limited

Specifications & Description of Major Rig Equipment for Drillmaster 1



<u>Model</u>	Trailer mounted hydraulic rotary drilling rig, DRILLMEC model HH-220, driven by AC motors and designed for drilling, work over and servicing of oil and gas wells.
<u>Manufacturer</u>	Manufactured in Italy by Drillmec Drilling Technologies in December 2006.
<u>Total Installed Power</u>	1,340 HP
<u>Static Hook Load Capacity</u>	440,000 lbs.
<u>Pull Down Capacity</u>	44,000 lbs
<u>Maximum Top Drive Speed</u>	3 ft/sec with 100% efficiency.
<u>Working Stroke</u>	52 ft 6 in, longest string pick-up is 47 ft
<u>Main Hydraulic Power Unit</u>	Independent HPU assembled in soundproof container and located on driller's side, complete with oil tank 794 gallon capacity and two hydraulic power trains.
<u>Telescopic Mast</u>	The HH-220 hoisting system is based on a telescopic mast operating as a hydraulic hoist to perform the functions of a traditional draw works. It is designed to allow handling of API Range 3 drill pipes, 30 ft drill collars and API Range 3 casing. Four drilling lines (1-11/32" rope diameter) with minimum breaking strength of 255,200 lbs each are pinned directly to the top drive cradle, without any travelling block. The mast is raised and lowered by two hydraulic jacks.
<u>Crown Block</u>	The crown block is fixed to the mast telescopic section and includes 8-sheaves with hardened grooves for 1-11/32" wire rope. The crown block is also equipped with two additional sheaves for wire line services.
<u>Auxiliary Jib Crane</u>	Hydraulic jib crane installed on the side of bottom mast section and is operated from the drill floor complete with hydraulic winch, capacity 8,800 lbs, for rig floor services.



<u>Top Drive HTD 220</u>	<p>One top drive system driven by four top head hydraulic motors installed on heavy duty power swivel body. The top drive is equipped with a static brake operated from the main control panel and includes a shock absorber air operated system.</p> <ul style="list-style-type: none">• Torque range from 0 to 26,000 ft/lbs• Variable speed from 0 to 200 rpm• Maximum power is 397 HP• Hoisting capacity is 440,000 lbs• ID full passage is 3 in• Stroke is 52 ft 6 in• Maximum working pressure is 5,000 psi
<u>Top Drive Dolly</u>	<p>One dolly to allow tripping operations with device to move the complete top drive between well centre and mouse hole.</p>
<u>Torque Wrench</u>	<p>One hydraulic torque wrench mounted underneath the power swivel to be used during tripping operations to make-up and break-out drill pipe.</p> <ul style="list-style-type: none">• Max. make up torque is 36,200 ft/lbs• Max. break-out torque is 50,700 ft/lbs• Hydraulic jacks stroke is 2 ft 7 in
<u>Casing Make-Up Device</u>	<p>One casing make-up device to handle 13-5/8" + 9-5/8" + 7" casing sizes One casing make-up device to handle 5" + 4-1/2" casing sizes</p>
<u>Rotary Table</u>	<p>One back-up type rotary table driven by two hydraulic motors, with 27-1/2" full opening. Rotary table can be easily and quickly removed to leave 47-1/4" free passage through sub-structure.</p> <ul style="list-style-type: none">• Max. torque is 7,527 ft/lbs• Max. speed is 60 rpm• Max. full opening is 27-1/2"
<u>Automatic Power Slips</u>	<p>One hydraulically operated automatic power slips assembly using conventional API drill pipe slips.</p>



<u>Power Tongs</u>	Operated from main control panel to make-up and break-out DP and DC from 3-1/2” to 11” tubular OD. <ul style="list-style-type: none">• Max. torque is 118,000 ft/lbs• Max. tubular diameter ID is 11 in• Min. tubular diameter is 3-1/2 in
<u>Mouse Hole Hydraulic Clamp</u>	One mouse hole hydraulic clamp located beneath the drill floor. Clamp controlled from main control panel with adjustable clamping force.
<u>Substructure and Drill Floor</u>	The substructure frame and drill floor are directly connected to the rig trailer. The height from ground level is 25 ft to provide 23 ft clearance underneath the rotary beams.
<u>Hydraulic Outriggers</u>	Four independent hydraulic stabilisers for raising trailer and sub-structure, with 88,000 lbs lifting capacity each. Provided with safety mechanical locking system and controlled by side control panel.
<u>Trailer Frame</u>	Includes hydraulic and pneumatic system with regulation and distribution components. The main frame is a specially designed multi-axle trailer equipped with walkways and servicing stairs.
<u>Automatic Driller/ WOB Controller</u>	The hydraulic hoisting system is equipped with a pressure balanced feeding device with “automatic driller/WOB controller”. It senses the down feed speed at any depth and adjusts the feed automatically and instantly keeping WOB constant while drilling.
<u>Pneumatic System</u>	One pneumatic system to service the rig air operated equipment. Air compressor and vessels installed in separate container.
<u>Driller’s Control Cabin (Doghouse)</u>	The driller’s control cabin is installed on a support steel frame attached to the rotary beams. The access platform to drill floor is flush without steps or stairs. It is designed to include adjustable driller’s chair and main controls, Martin Decker weight indicator, computer screens and visualisation screens.



<u>Main Control Panel</u>	<p>Mounted inside driller's control cabin with all controls for drilling operations.</p> <p>Visual instruments for WOB, top drive torque, top drive rpm, power tong clamp force, power tong torque, pull down, stand pipe pressure, rotary table torque etc.</p>
<u>Vertical Racking System Bins</u>	<p>Quantity 17 racking bins and fingers to vertically rack 272 lengths 5" DP Range 3 (approx. 12,000 ft)</p>
<u>Fully Automatic Pipe Handling System</u>	<p>Comprising of:</p> <ul style="list-style-type: none">• Central pivoting mast on bearing slewing ring• Power unit and control panel• Arm and clamp for drill pipe handling• Arm for drill pipe stabilisation in vertical position• Hydraulic jib crane inserted in the mast top head, complete with hydraulic winch for site service, 37,400 lbs lifting capacity. <p>By means of the pivoting mast, the system automatically moves the pipe from the vertical bin to the mouse hole. Each pipe is kept at the right height by means of a hydraulic clamp installed in the mouse hole.</p> <p>Controlled by the driller, the top drive scopes out from the well centre and positions itself on the mouse hole centre. The driller lowers the top drive to pick up the pipe in the mouse hole and moves back to well centre to add it to the drill string. Meanwhile the pipe handler will position another pipe in the mouse hole in readiness for the next connection.</p>
<u>Mud Pump No.1 complete with charging pump</u>	<p>Drillmec 9T1000 skid mounted triplex single acting piston pump. The piston diameter is 7" and the piston stroke is 9"</p> <ul style="list-style-type: none">• Power is 1,000 HP• 750 kW 600 V DC motor• Max. working pressure is 5,000 psi• Pulsation damper is Hydril K20 – 5,000 psi• Jib crane mounted on frame SWL 1,100 lbs• Pressure indication visual gauge M/D Totco• Pump safeguard, type shear pin• Supercharging centrifugal pump Baker 8X6X14



Mud Pump No.2 complete with charging pump

Drillmec 9T1000 skid mounted triplex single acting piston pump. The piston diameter is 7” and the piston stroke is 9”

- Power is 1,000 HP
- 750 kW 600 V DC motor
- Max. working pressure is 5,000 psi
- Pulsation damper is Hydril K20 – 5,000 psi
- Jib crane mounted on frame SWL 1,100 lbs
- Pressure indication visual gauge M/D Totco
- Pump safeguard, type shear pin
- Supercharging centrifugal pump Baker 8X6X14

Liners Carried on Rig

<u>Liner Size</u>	<u>Maximum Pressure</u>	<u>Maximum Flow rate</u>
7”	2,200 psi	585 gpm @ 130 spm
6”	3,100 psi	430 gpm @ 130 spm
5”	4,400 psi	298 gpm @ 130 spm

Bentec PCR System

DC Drive System with 3 generator supplies installed in one 40 ft container

- 600 V main switchboard
- Generator control panel
- DC drive system
- Driller’s control console
- Motor control centre
- Auxiliary power distribution 400/230 V
- Plug panel for power distribution

Rig Power System
Max. total installed power
4.5 MW

The main rig power is supplied by 3 No(s) diesel engine/generator sets each comprising:

- Cummins 4-cycle, 60 deg Vee 16-cylinder diesel engine
- Model KTA50-G3
- Displacement is 50.30 litre
- Number of cylinders is 16
- Turbocharged and after-cooled
- Exhaust silencer system
- Average fuel consumption is 41.6 US gal/hr
- Housed in acoustically clad 40 ft container



<u>Standby Generator</u>	Cummins diesel generator <ul style="list-style-type: none">• Super silent generator mounted on fuel tank base• Model C100• Output 113 kVA prime, 400/220 V 60Hz
<u>Rig Air System</u>	Two HPC rotary screw air compressors and dryer. <ul style="list-style-type: none">• 400 V 60 Hz 8.0 bar• 80 – 100 cu.ft/min. each compressor• HPC AO-025F pre-filter, particle removal down to 1 micron• 2,000 litre mild steel air receiver
<u>Mud System Tank No.1</u>	Pill tank, active tank, degasser and shaker tank <ul style="list-style-type: none">• Flygt submersible mud agitators• Mud hopper and mud gun• Total capacity 460 bbls.
<u>Mud System Tank No.2</u>	Reserve tank and mix tank <ul style="list-style-type: none">• Flygt submersible mud agitators• Mud hopper and mud gun• Total capacity 300 bbls.
<u>Trip Tank</u>	Capacity 50 bbl
<u>Mud Return</u>	Bell nipple and flow line
<u>Dual Shale Shakers</u>	Model 503 Derrick high-speed shakers
<u>Annular BOP</u>	Shaffer style annular preventer 13 5/8" 5,000 psi
<u>Ram Type BOP</u>	Cameron double U ram preventer 5,000 psi with: <ul style="list-style-type: none">• 2 7/8" – 5" variable top pipe rams• Bottom blind rams
<u>BOP Accumulator</u>	Oilco 132 gallon, 6 station hydraulic accumulator: <ul style="list-style-type: none">• 1 No. Triplex hydraulic pump• 2 No. 8 1/2", 40:1 pneumatic hydraulic pumps• Max. pressure 4,000 psi• Pumps will produce 12 gpm @ 1,500 psi total with 125 psi air supply at 80 scfm• Atex certified PLC touch screen remote panel

Larchford Limited

Specifications & Description of Major Rig Equipment for Drillmaster 1



<u>Choke Manifold</u>	<ul style="list-style-type: none">• 1 No. 3 1/8" 5,000 psi manual adjustable choke• 1 No. 3 1/8" 10,000 psi Swaco auto choke
<u>Kill Line</u>	<ul style="list-style-type: none">• 2 in X 5000 psi• 2 No. 2 1/8" 5000 psi manual valves
<u>BOP Testing Equipment</u>	High pressure 10,000 psi portable test unit with built-in chart recorder
<u>Mechanical Degasser</u>	Compact vacuum degasser <ul style="list-style-type: none">• Tri-Flo model 800• Skid mounted• 3 HP 230.460 V AC 3PH 60 Hz 1,800 RPM explosion-proof motor• Manual starter with heavy-duty vacuum pump• UL/CSA approved electrical system• United rated at 800 gpm
<u>Wireline Survey Unit</u>	Type "lil-drawworks" 12 in c/w <ul style="list-style-type: none">• 15,000 ft 0.092" API 9 carbon line• 7 5/8" and 6 5/8" totco rings <i>No survey barrel or surveying tools carried by rig</i>
<u>Choke Line</u>	<ul style="list-style-type: none">• 3 No(s). 3" X 15,000 psi chiksan loops• 1 No. 3-1/8" X 5,000 psi HCR pressure operated gate valve• 1 No. 3-1/8" manual choke valve
<u>Rig Tongs</u>	2 No(s). type HT55 rig tongs c/w jaws for: <ul style="list-style-type: none">• 13-3/8", 9-5/8", 7" casing• 9-1/2" to 4-3/4" drill collars
<u>Drilling Spools & DSA's</u>	<ul style="list-style-type: none">• 1 No. 13-5/8" 5M mud cross height 24"• 1 No. 13-5/8" 5M spacer spool height 26"• 1 No. 13-5/8" 5M by 3M DSA• 1 No. 9" 5M by 3M DSA
<u>Safety Valves</u>	<ul style="list-style-type: none">• 1 No. 4-1/2" IF FOSV• 1 No. 4-1/2" IF Gray Valve• 1 No. 3-1/2" IF FOSV• 1 No. 3-1/2" IF Gray Valve



<u>Inside BOP valve (IBOP)</u>	Hydraulically operated from main control panel. Maximum working pressure 10,000 psi
<u>Drill Pipe</u>	<ul style="list-style-type: none">• 10,500 ft 5" Range 3 drill pipe G-105 19.50 ppf• 4,500 ft 3-1/2" Range 3 drill pipe G-105 13.30 ppf
<u>Drill Collars</u>	<ul style="list-style-type: none">• 6 No(s). 9-1/2" drill collars 7-5/8" reg• 12 No(s). 8-1/4" drill collars 6-5/8" reg• 8 No(s). 6-1/2" drill collars 4-1/2" IF• 12 No(s). 4-3/4" drill collars 3-1/2" IF
<u>Cross-Overs & Subs</u>	Cross-overs and bit subs to furnish all items in Rig's drill string inventory
<u>Circulating Swedges</u>	<ul style="list-style-type: none">• 1 No. 4-1/2" IF box X 1502 circulating swedge• 1 No. 4-1/2" IF pin X 1502 circulating swedge• 1 No. 3-1/2" IF pin X 1502 circulating swedge <p><i>Rig does not carry any pup joints for 5" or 3-1/2" drill pipe or drill string floats</i></p>
<u>Circulating Equipment</u>	<ul style="list-style-type: none">• 1 No. 2" X 30 ft 5,000 psi flexible circulating hose• 2 No(s). 2" X 5,000 psi chiksan loops• 2 No(s). 2" X 5,000 psi lo-torq valves• 2 No(s). 2" X 5,000 psi style 50 chiksan swivels
<u>Handling Equipment</u>	<ul style="list-style-type: none">• 1 set 250 Ton 5" drill pipe elevators• 1 set 250 Ton 3-1/2" drill pipe elevators• 1 set 5" drill pipe slips• 1 set 3-1/2" drill pipe slips• Drill collar slips for 9-1/2", 8", 6-1/2", 4-3/4" DC• 1 set of 96" 250 ton bail arms
<u>Forklift Truck</u>	Merlo rough terrain telescopic fork lift truck: <ul style="list-style-type: none">• 7 ton capacity, 10 metre reach• Pipe grabs• Safety lifting hook• Personnel basket



<u>Welding Equipment</u>	Kemppi Mastertig 2500 MLS & welding accessories
<u>Oxyacetylene Equipment</u>	Torch and gas bottles for cutting operations
<u>Storage and Accommodation Units</u>	<ul style="list-style-type: none">• 2 No(s) 10 ft container storage units• 1 No. 40 ft- half height storage unit• 1 No. 20 ft sub storage unit• 1 No. 40 ft mechanic's office, store and workshop• 1 No. 20 ft toolpusher's office• 1 No. 20 ft change and locker room• 1 No. 20 ft mess room and kitchen• 1 No. 20 ft toilet and shower block• 1 No. Pipe handler Unit (PHU) container• 1 No. Koomey Unit
<u>Fuel Oil Tank</u>	1 No. 50,000 litre oil storage tank : <ul style="list-style-type: none">• Enclosed bunded rectangular steel tank with four lifting lugs• Cabinet to house 40mm suction outlet & angle check valve and lever isolation valve• 55 litre per minute pump, flow meter and delivery hose with automatic shut-off nozzle
<u>Water Tank & Compressor Unit</u>	1 No. 40 ft purpose-built unit to separately house water tank, compressor system and parts storage: <ul style="list-style-type: none">• Max 5,975 gal water capacity• Compressor and air receiver installation• Spare parts storage room
<u>Pipe Racks & Catwalk</u>	8 No(s) pipe racks and catwalk
<u>First Aid Equipment</u>	Stretcher and first-aid boxes
<u>Fire Fighting Equipment</u>	Fire extinguishers at all principle locations: <ul style="list-style-type: none">• Doghouse• PCR unit• Mud pumps• Generator units• Offices• Laundry• Camp accommodation



Camp Accommodation

For the welfare of Larchford's personnel:

- 8 No(s) twin-bedded rooms & TV's
- 4 No(s) bathroom c/w toilet, shower & wash basin
- 1 No. twin-bedded room c/w toilet, shower & wash basin
- 1 No. mess room/kitchen
- 1 No. camp generator 415/240 V 3 PH 50 Hz housed in 20 ft acoustic container
- 1 No. fuel oil tank
- 1 No. water storage tank

Appendix 4.4

With the development of the Clean Enclosed Burner (CEB®) Bekaert CEB Technologies Canada Ltd. offers an environmentally safe alternative for the conventional industrial flares. A solution for reducing emissions from petroleum refinery operations, oil & gas processing plants and the chemical industry, is now ready to be deployed!

What about 'Flaring'?

Flaring is a high-temperature oxidation process used to burn waste gases from industrial operations, mostly hydrocarbons. Flares are used extensively to dispose of (1) purged and wasted products from refineries, (2) unrecoverable gases emerged with oil from oil wells, (3) vented gases from blast furnaces and (4) gaseous wastes from chemical industries.

Why is flaring an issue within the industry?

Conventionally, combustion is done using an open pipe in combination with a pilot-flame on top. The flame is completely atmospheric and may, on full capacity, reach lengths up to 75 meters and more. The quality of this combustion is very poor. The emission contains several percentages of un-burned Methane, Hydro-carbons and CO due to incomplete combustion. Because of the long flame length there's time enough to form a lot of NO_x, which causes acid rain (next to SO_x and NH₃). There's also a huge amount of emitted radiation in terms of heat and light. Steam injection, used to reduce black smoke and thermal radiation from elevated flares, creates irritating high-frequency jet-like whines and low-frequency rumbles.



CEB test unit at NAM test location. Both flares in operation !

Why is the CEB a better alternative?

The Clean Enclosed Burner is a better alternative due to a complete combustion process, which has the following important benefits:

1. A complete combustion transforms the Methane for 100% into CO₂ and water. Considering the greenhouse effect, the Global Warming Potential (GWP) of Methane is 21 times higher than the GWP of CO₂. So, the more complete the combustion process, the less influence it has on global warming.
2. Hydrocarbons (NM-VOS) and CO formed by incomplete combustion create the condition of producing ozone directly at ground levels which is the prior cause of smog. Also, CO itself is very toxic.
3. A clean combustion hardly produces any NO_x. Next to SO_x and NH₃, NO_x causes acid rain. NO_x also causes the production of toxic ozone (as mentioned at point 2).
4. An enclosed combustion prevents the environment being exposed to IR radiant, heat and light.
5. A combustion in the CEB, with a controlled flame length, offers the possibility to recover heat and energy. With an optional heat exchanger, the system is capable of producing low pressure steam, which can be transferred for instance back into the plant for re-use.

How does the CEB work?

The CEB combustion process is based on surface combustion. This is a gas burning technique where premixed gas and air burns on a surface layer of a permeable medium. The CEB combustion occurs in the blue flame mode: blue flames hover above the surface and release the major part of the energy in a convective way.

Additional features

Beside the recovery of heat and energy, the Clean Enclosed Burner offers another advantage. The off-gases can be permanently monitored, both on quality and quantity. In terms of environmental protection the CEB produces extremely low NO_x quantities. Also the CO production is second to none compared to any existing flare system. As the CEB does not produce any visible flame, any radiation, smoke or soot it is a fact that the CEB can be placed at a very small area. In other words, we do not need any large areas anymore and therefore the existing areas that are now solely being reserved for flaring activities can be minimised: less than 10% of the traditional area will be occupied by CEB units.



Three CEB Units in operation ¹(10.5 Million Scuff /day)

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[product portfolio](#)
 Show contact persons

Products/Services

- CEB Technology Description
- General specifications
- CEB 100
- CEB 350
- CEB 500
- CEB 4500**
- CEB Modular HP
- CEB Modular LP
- CEB Services

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**Bekaert Flaring
CEB 4500**

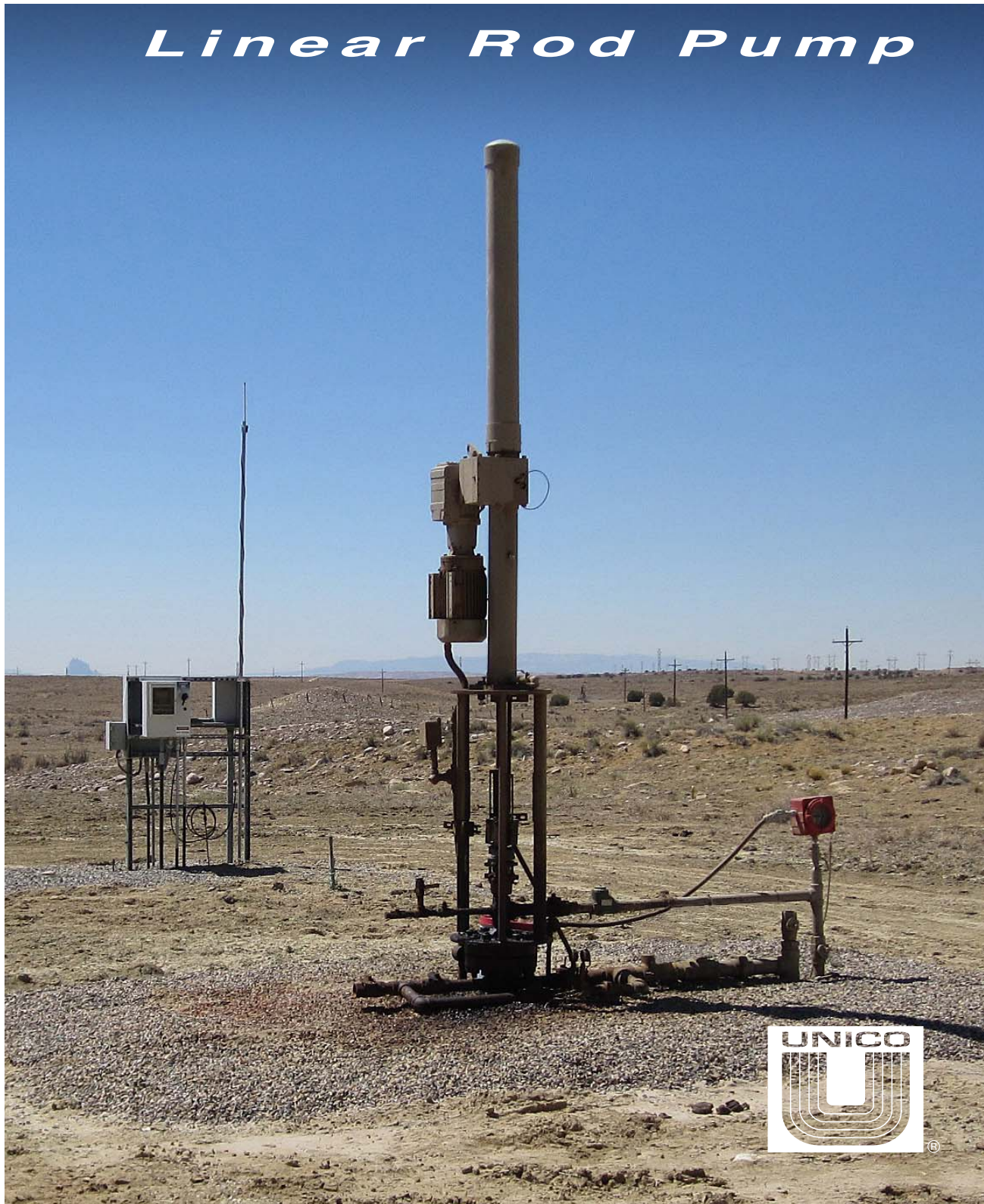

Capacity*	100 000 Nm ³ /day	3.5 MM SCFD
Power	45 MW	153 mmBtu/h
Minimum turndown ratio**	1/10	
Footprint and Height	3 x 2,6 x 6,2 m	10' x 8'5" x 20' ft
Weight	7 500 kg	16,000 lbs
Inlet pressure	25 mbarg - 8 barg	10"WC - 116 psig
Electrical power consumption	5 kW	
Battery limit	3" ANSI 150 lbs RF	
Operating Temperature	1100 - 1200°C	2,000 - 2,200 °F
Ground Temperature	Ambient during operation	

* Capacity is based on natural gas with gross heating value of 39,82 MJ/Nm³.
 ** Turndown ratio can be increased for specific projects with customized units.
 *** Electrical power consumption for high pressure unit. With low pressure systems, power consumption is determined case per case.

Appendix 4.5

L R P®

Linear Rod Pump



*A revolutionary
sucker-rod
artificial lift
system*



LRP® LINEAR

A revolutionary concept in sucker-rod artificial lift systems

*Variable-speed control, simple mechanics,
and industry-leading control software
in a compact, lightweight, unobtrusive
solution with significant cost and
performance advantages over
traditional approaches.*



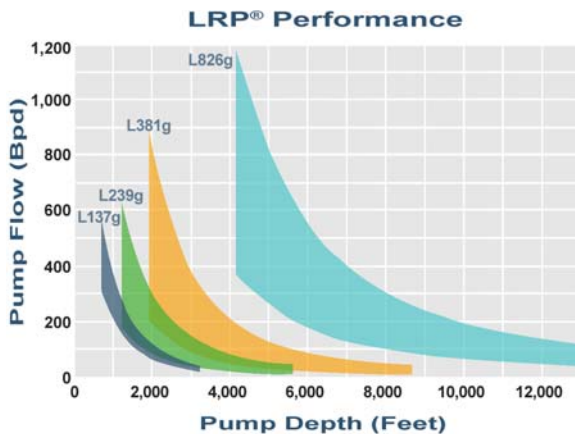
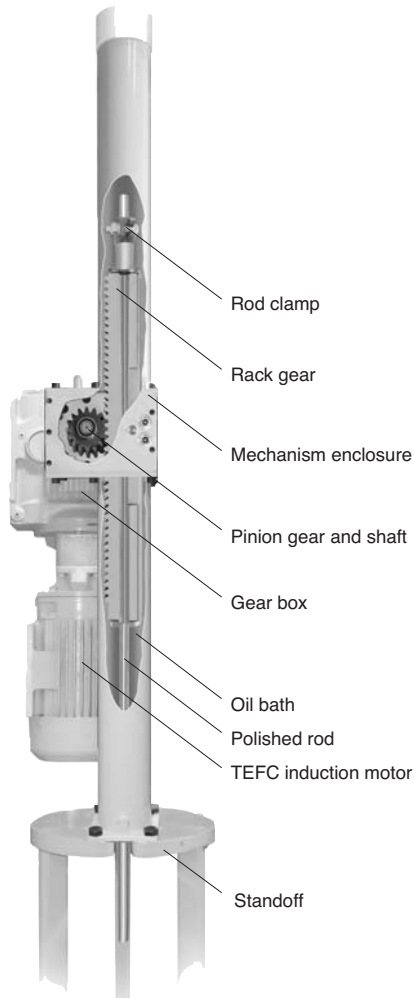
Direct Drive

The LRP® system takes advantage of the motor reversing and servo positioning capabilities of a flux vector variable-speed drive to directly control the sucker rod using a simple rack-and-pinion mechanism. Direct control provides numerous benefits by eliminating the cumbersome, high-inertia mechanics of other systems. Compared to hydraulic reversing systems, the LRP® solution

is much more elegant and capable, thanks to electronic control.

Simple Design

The LRP® pumping unit mounts directly to the wellhead. The polished rod runs through a channel inside the rack and is suspended from the top by a conventional rod clamp. The rod is allowed to float inside the rack should the pump or rod stick. An induction motor, coupled to



LRP® capacity for several models. Analysis is based on plunger diameters from 1.25 to 3.75 inches and associated API 76 tapered rod designs. Maximum pump flows and depths are associated with maximum and minimum plunger diameters, respectively. The vertical span of each region is based on the range of available motor sizes for each model.

R O D P U M P

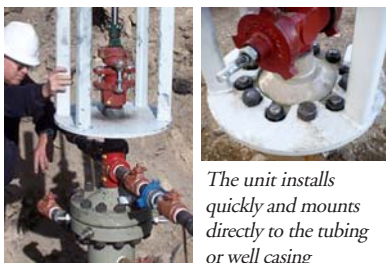
the rack-and-pinion mechanism through a gear box, cycles the rack up and down to reciprocate the rod. The rack is lubricated with each stroke by submersion into a fully contained oil bath. A high-performance motor and line-regenerative drive can be used to achieve relatively high system efficiency, even on deep wells, without resorting to the massive counterweights used in conventional pumping systems.

Easy to Install

The LRP® unit is small, lightweight, and easy to transport. No specialized or heavy equipment is required, which saves on installation costs. It can be carried in a light-duty truck and installed with a 1-ton rig or small picker. Installation is quick and easy and can be handled by two people. Units can be installed and fully operational within a couple of hours.



Compact LRP® units are easy to transport



The unit installs quickly and mounts directly to the tubing or well casing

Portable

Since it's easy to transport and commission, the LRP® system can easily be moved from well to well for temporary installations or to prove reserves.

Efficient

The low-inertia design of the LRP® system allows it to use a much smaller motor and gear box than a conventional jack pump. Jack pumps are often oversized to provide the necessary capability. Programmable motion profiles give the LRP® system the effective stroke of a much larger unit. Therefore, a much smaller LRP® unit will provide the same or better production at less cost.

Economical

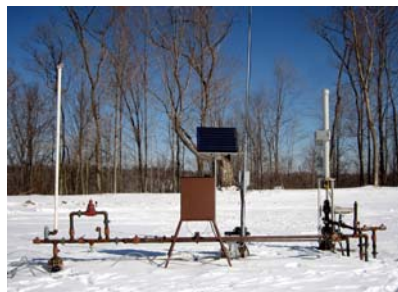
The LRP® system is a smart investment that quickly pays for itself in reduced installation, operation, and maintenance costs. The system can be purchased for a fraction of what a comparable pump jack without any controls would cost. Installation is significantly less expensive because the unit is so easy to transport and set up. Since the unit bolts directly to the wellhead, concrete and gravel pads and other expensive site preparations are no longer needed. Increased production increases revenue and reduced downtime lowers operational costs, making the the LRP® system a truly economical solution.

Environmentally Friendly

The LRP® system is the ideal choice for environmentally sensitive installations. It is quiet, unobtrusive, and does not require site grading, mounting pads, or other well site disruptions. Its low profile and small footprint allow it to blend in where other units would be offensive or prohibited by regulation.



The LRP® system blends into its environment



Coal-bed methane installation

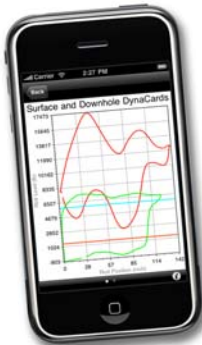


Model Number	Rod Stroke (in)	Rod Force (lb)	Rod Speed (fpm)	Pump Speed (spm)
L073g-mmmm-020	20	4,000	10-250	0.5-25.0
L073g-mmmm-032	32	4,000	10-250	0.5-25.0
L137g-mmmm-032	32	7,000	10-250	0.5-25.0
L239g-mmmm-032	32	12,000	10-250	0.5-25.0
L381g-mmmm-044	44	20,000	10-250	0.5-25.0
L381g-mmmm-056	56	20,000	10-250	0.5-21.4
L381g-mmmm-064	64	20,000	10-250	0.5-18.8
L381g-mmmm-086	86	20,000	10-250	0.5-14.0
L826g-mmmm-086	86	30,000	10-375	0.5-21.0
L826g-mmmm-100	100	30,000	10-375	0.5-18.0
L826g-mmmm-120	120	30,000	10-375	0.5-15.0
L826g-mmmm-144	144	30,000	10-375	0.5-12.5

By combining a few different rack lengths, gear boxes (g), motors (mmmm), and drives, the LRP® system provides maximum application flexibility with minimal spare parts.

C O N T R O L

Advanced Control



Well data, including surface and downhole dynamometer plots, is readily available

The LRP® system incorporates Unico's patented SRP sucker-rod pump control software to optimize production while protecting the pumping system. Sophisticated variable-speed control achieves motion profiles that are impossible through mechanical means.

Pump fill is optimally regulated by independently adjusting upstroke and downstroke speeds. Soft landing speed control minimizes fluid impact. An automated valve check determines standing and traveling valve leakage. The control also provides well data reporting, surface and downhole dynamometer plotting, remote access capability, embedded PLC, automatic fault restarting, and more.



Sophisticated controls are protected inside rugged enclosures designed to withstand the environment

Variable Pump Stroke/Position

Pump stroke length and spacing can easily be adjusted through software. Upper and lower pump positions are set independently, allowing maximum pump compression by minimizing pump clearance volume when in the full downward position.

Superior Pump Speed Control

Downhole pump speed can be more precisely controlled due to the low inertia of the LRP® mechanism and the constant relationship between motor and rod speed. Pump speed, for example, is quickly reduced prior to fluid impact, attenuating the damaging effects of shock loads on the pump and rod during fluid pound. After fluid impact, speed is quickly increased to maximize production potential.

Low-Speed Operation

The LRP® system can operate at speeds as low as 1 spm, as compared to pump jacks without gear box wipers, which are typically limited to 4 to 5 spm.

Remote Power

Unico's GPL® gas-powered generator can operate the LRP® system using wellhead natural gas for remote installations where electrical service is unavailable or cost prohibitive.



Global Monitoring

Unico's GMC® Global Monitoring and Control service provides comprehensive Web-based monitoring and reporting capabilities. It is an efficient, cost-effective way to stay connected to daily operations. The service provides real-time monitoring of production and performance data, historical data for analysis, automated well reports, as well as email notification of alarms and other conditions. Operators can view data for all fields, a single field, or an individual well.



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Protected by United States patent 7,168,924. Other patents are pending.

All trade designations are provided without reference to the rights of their respective owners.

Specifications subject to change without notice.