


The PCM logo is displayed in a large, white, sans-serif font. The letters 'P', 'C', and 'M' are connected, with the 'C' being slightly larger and more prominent. The background of the entire image is a photograph of two workers in blue and grey uniforms and white hard hats at an industrial site. One worker is crouching next to a large black pipe with 'PCM Mulmeau' written on it in blue. The other worker is standing next to him. In the background, there are industrial structures, including a yellow crane and a metal platform. The sky is blue with some clouds.

PCM

| Artificial Lift Solutions

PROGRESSIVE CAVITY PUMP SYSTEMS

# Products & Services

keep it moving 





## ABOUT PCM

PCM is a leading provider of Artificial Lift Systems for the Oil & Gas upstream industry, specialized in progressing cavity pump systems and associated services focused on performance management.

PCM offers comprehensive progressing cavity pump (PCP) technologies for Cold Extra Heavy Oil, Cold Heavy Oil, Conventional Medium to Light Oil, Shale & Tight Oil, Thermal EOR SAGD, Thermal EOR CSS and Gas Well Dewatering.

## PCM CORE VALUES GUIDE ALL OUR ACTIVITIES

PCM core values of **RESPECT, ENGAGEMENT AND EXCELLENCE** reflect our identity, our convictions and our promises. They guide all of our activities to meet the customer requirements and ensure his satisfaction.



## PCM ENABLERS



Worldwide customer proximity



Continuous improvement



Operational excellence



People skills & care

## PCM MISSION IN OIL&GAS

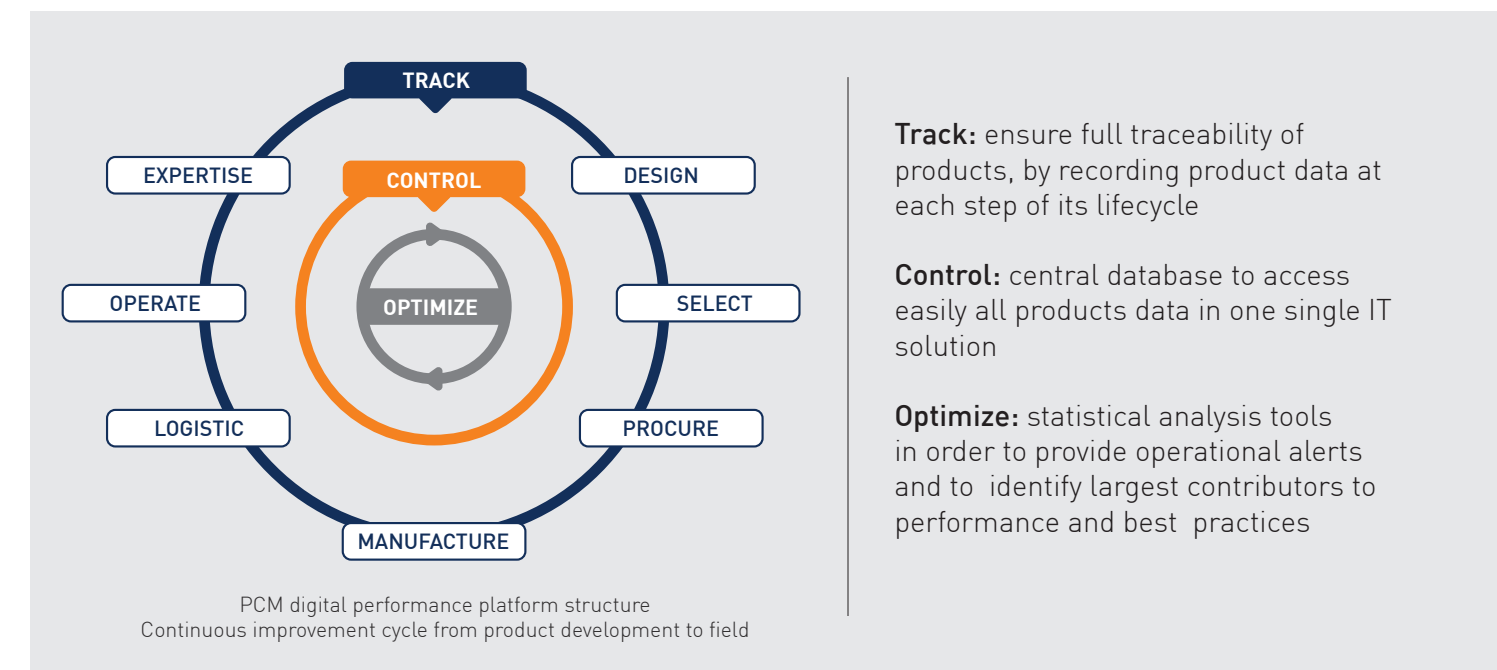
Our mission is to precisely understand our customers demands and expectations, provide them with the best performance control tools and offer them the most appropriate and cost effective innovative solutions.

## PCP OPERATIONS OPTIMIZATION

Commitment to lower costs of operation, higher productivity and environmental responsibility are priorities for Oil & Gas operators. With digital solutions, data records and analysis, PCM can help you manage and optimize your PCP operations.

## PREDICTING PERFORMANCES

Our PCP experts help you measure and evaluate your PCP systems in order to directly translate that knowledge into predictive analysis and improved performance management.



## VALUE-ADDED PARTNERSHIP

Through performance management services our experienced staff delivers the best operational and financial results at each phase of the optimization cycle.

Performance analysis in collaboration with our clients leads naturally to new R & D projects. With a perfect understanding of our customers challenges, PCM can offer the most appropriate and innovative solutions. This is why we constantly push innovative projects through partnering with customers.



# PROGRESSING CAVITY PUMP THEORY

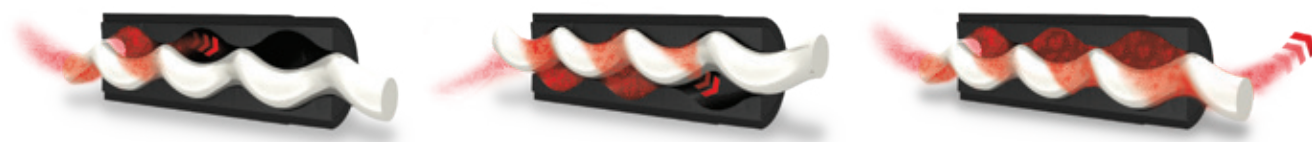
Electric Submersible Pumps (ESP) have been the most recognized means of Artificial Lift System for high flow rates, and Sucker Rod Pumps (SRP) for low flow rates.

Over the last thirty years, new pump technologies have arrived - such as the PCP - bringing improved efficiency and performance to the market.

## PCM MOINEAU™ TECHNOLOGY

### Principle

The Moineau pump consists of a single helical steel rotor turning inside a dual helical stator moulded in elastomer. When the rotor turns inside the stator a double chain of watertight cavities is created and fluid is transferred from the pump intake to the pump discharge without shearing the fluid.

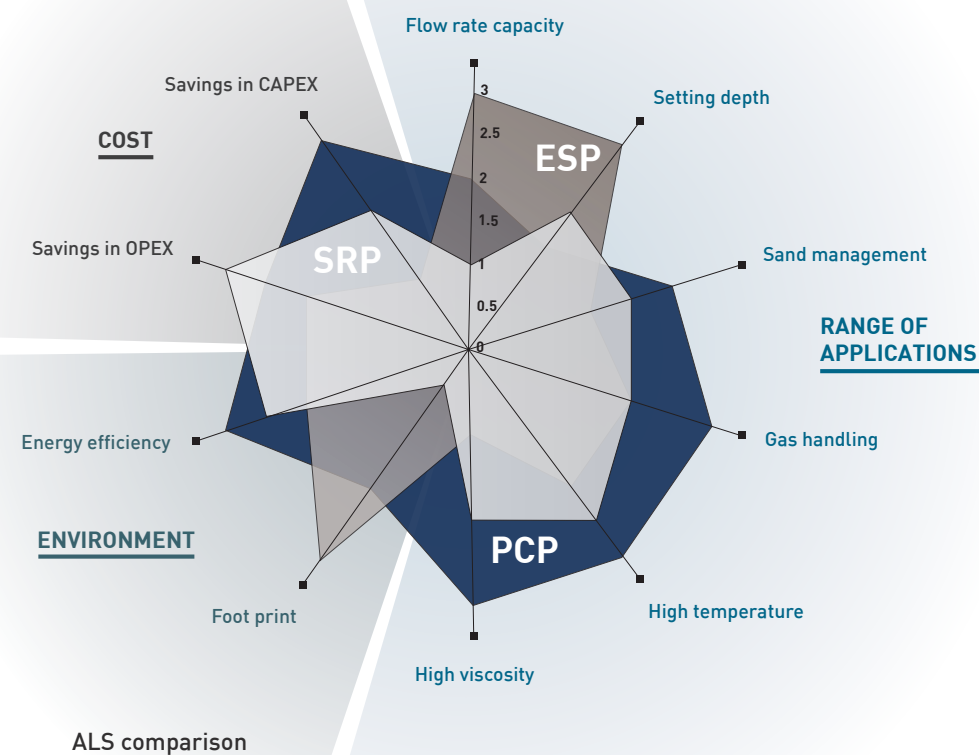


### Easy production optimization

The PCP volumetric technology allows easy adjustment of production according to rotational speed. With a variable speed drive, the same equipment can cover a wide range of production rate.

### PCP unique features

The PCP design is ideal for handling a wide range of viscosities, sand laden fluids and free gas. The PCP volumetric, non pulsating and emulsion free system steadily handles fluctuating well dynamics, viscosities or free gas content.



# PCP APPLICATIONS

PCM provides a complete offer of surface and downhole equipment for each application.



**COLD HEAVY OIL**  
CHOP / CHOPS / Extra Heavy Oil



**LIGHT TO MEDIUM OIL**  
Conventional shales and tight oil



**THERMAL RECOVERY**  
SAGD / CSS / Steam flood



**GAS WELL DEWATERING**  
CSG / CBM



# INDUSTRIAL EXCELLENCE



## PCM IN-HOUSE ELASTOMERS

### ELASTOMER EXPERTISE

PCM owns and operates its elastomer formulations and injection facilities since its creation, over 85 years ago. We are one of the few manufacturers who still produce their own elastomers. Elastomer production is rooted in the history of the Company and is one of our core competencies. We develop formulas in our state-of-the-art laboratory using decades of real world experience.

We capitalize on our unique in-house expertise to provide the best match for your fluids and applications.

### MAIN ELASTOMERS USED IN OIL & GAS APPLICATIONS

NBR	159	<b>NITRILE - "4-wheel drive"</b> Most versatile with its high ACN content, providing top performance across many applications
	194	<b>SOFT NITRILE</b> High resistance to abrasion and top performer for handling solids with varying water cuts
	205	
HNBR	198	<b>HYDROGENATED NITRILE</b> For higher temperature (150°C) applications and H <sub>2</sub> S&CO <sub>2</sub> resistance
FKM	204	<b>FLUORO CARBON</b> Best performer for higher aromatics, and a good choice when nitriles are no longer effective

### SWELLING TEST

To select the most suitable elastomer, PCM performs swelling tests with oil samples from the field. For elastomer fine characterization with volatile fluids, we also propose our patented technology "In situ lab" allowing comparative and selective tests for most demanding applications. PCM's network of testing facilities is worldwide.



### AGILE ALL THE WAY

PCM is a one-stop company and we have full control of our PCP solutions, including R & D, manufacturing, distribution and service. Our scale and industrial strategy ensures that PCM remains agile enough to match most challenging conditions. This unique organization and status sets PCM apart from typical Artificial Lift System providers.

#### Off-Track offer – customized solutions

PCM has a great ability to adapt its solutions for specific client challenges and requests. With our highly skilled engineering team you will get:

- Responsive and relevant solutions when it comes to design and engineered special systems
- Fast-track deployment
- Strong project management expertise to provide the most cost-effective adapted solution.

#### Joint Industry Projects (JIPs) – new solution development

PCM constantly pushes innovative projects through co-development partnerships with customers. We believe that cross-fertilization of minds and the pooling of means (financial resources and expertise), result in a shared and durable success for the venture partners.

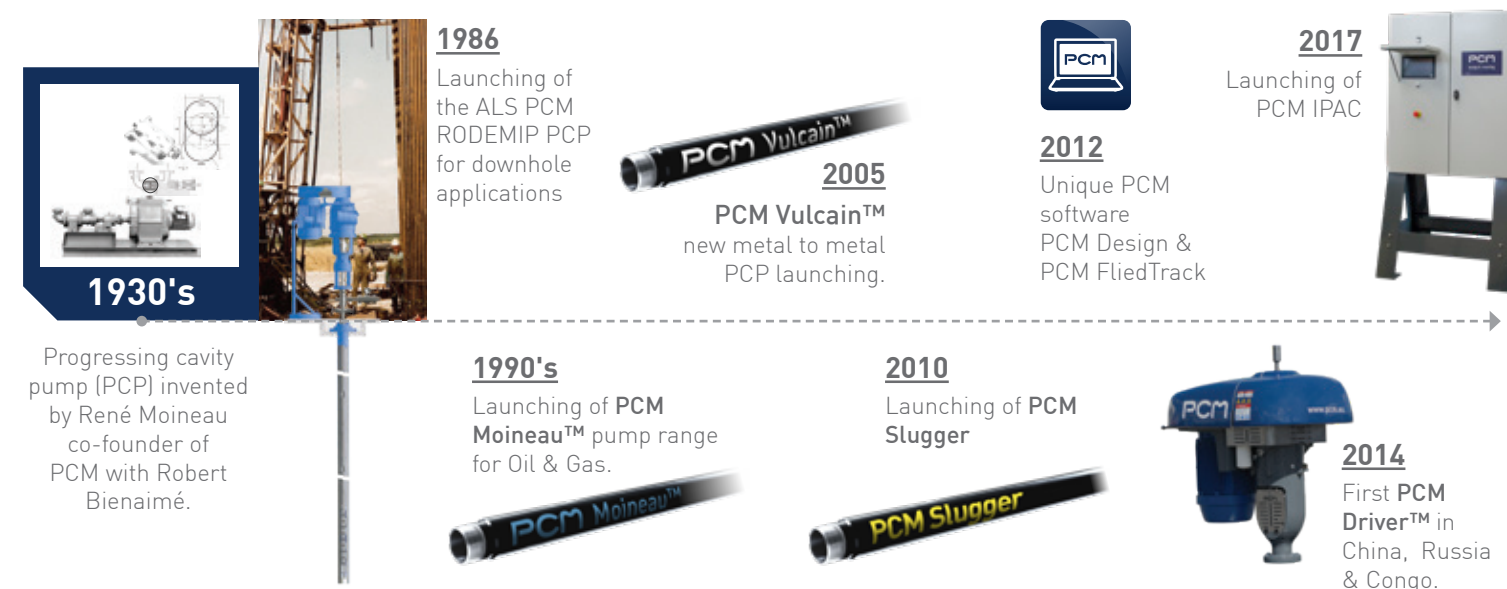
For over twenty years, PCM has been engaged in joint industry projects with some of our longstanding clients and welcomes any new project.

### PCM INNOVATION AT A GLANCE

- Strong DNA inherited from the PCP inventor
- Highly skilled and dedicated R&D entity
- Proven R&D methodology
- Numerical simulation capabilities
- Lab test facilities
- Advanced third party technical network
- 3 University partnerships
- 10 JIPs
- Over 20 patents using PCP





### INNOVATION IS IN OUR DNA

Innovation and creativity have guided PCM's expansion for over 85 years. Backed by a stable shareholder with a long-term approach, PCM has always delivered breakthrough PCP innovations in Artificial Lift.





PROGRESSING CAVITY PUMPS RANGE

MODEL	DISPLACEMENT		HEAD		STATOR					ROTOR					
	m³/d/RPM	bpd/RPM	m	ft	Connection	OD mm	OD inch	LENGTH m	LENGTH ft	Connection	OD mm	OD inch	LENGTH m	LENGTH ft	Slugger
PCM MOINEAU™ 2" 3/8 SERIES															
3E600	0,03	0,2	600	1970	2"3/8 EU	71	2,80	0,90	2,8	3/4"	40,0	1,57	1,40	4,7	
3E1200	0,03	0,2	1200	3940	2"3/8 EU	71	2,80	1,80	5,9	3/4"	40,0	1,57	2,30	7,6	X
3E2400	0,03	0,2	2400	7880	2"3/8 EU	71	2,80	3,60	11,8	3/4"	40,0	1,57	4,10	13,5	X
6E600 	0,05	0,3	600	1970	2"3/8 EU	71	2,80	1,30	4,3	3/4"	38,0	1,50	1,79	5,9	
6E1300 	0,05	0,3	1300	4270	2"3/8 EU	71	2,80	2,61	8,6	3/4"	40,0	1,57	3,09	10,1	X
6E2000 	0,05	0,3	2000	6570	2"3/8 EU	71	2,80	3,91	12,8	3/4"	40,0	1,57	4,44	14,6	X
6E2600 	0,05	0,3	2600	8540	2"3/8 EU	71	2,80	5,22	17,1	3/4"	40,0	1,57	5,71	18,7	X
16E800	0,17	1,1	800	2630	2"3/8 EU	71	2,80	3,60	11,9	3/4"	38,0	1,50	4,10	13,5	
16E1200	0,17	1,1	1200	3940	2"3/8 EU	71	2,80	5,40	17,7	3/4"	38,0	1,50	5,90	19,4	X
16E1600	0,17	1,1	1600	5250	2"3/8 EU	71	2,80	7,21	23,6	3/4"	38,0	1,50	7,71	25,3	X
35E600	0,35	2,26	600	1970	2"3/8 EU	71	2,80	5,64	18,5	3/4"	40	1,57	6,01	19,7	
35E800	0,35	2,26	800	2630	2"3/8 EU	71	2,80	7,44	24,4	3/4"	40	1,57	7,81	25,6	
35E1000	0,35	2,26	1000	3290	2"3/8 EU	71	2,80	9,24	30,3	3/4"	40	1,57	9,62	31,6	

PCM MOINEAU™ 2" 7/8 SERIES															
13E650	0,13	0,8	650	2140	2"7/8 EU	80	3,15	1,74	5,9	7/8"	44,0	1,73	2,22	7,4	
13E1300	0,13	0,8	1300	4270	2"7/8 EU	80	3,15	3,48	11,4	7/8"	44,0	1,73	4,10	13,5	X
13E2000	0,13	0,8	2000	6570	2"7/8 EU	80	3,15	5,22	17,1	1"	50,0	1,97	5,70	18,7	X
13E2600	0,13	0,8	2600	8540	2"7/8 EU	80	3,15	6,97	22,9	1"	50,0	1,97	7,44	24,4	X
13E3300	0,13	0,8	3300	10830	2"7/8 EU	80	3,15	8,71	28,7	1"	50,0	1,97	9,18	30,2	X
22E600	0,22	1,4	600	1970	2"7/8 EU	86	3,39	2,61	8,7	3/4"	43,0	1,69	3,20	10,6	
22E1200	0,22	1,4	1200	3940	2"7/8 EU	86	3,39	5,22	17,1	7/8"	43,0	1,69	5,70	18,7	X
22E1800	0,22	1,4	1800	5910	2"7/8 EU	86	3,39	7,83	25,7	1"	50,0	1,97	8,35	27,4	X
22E2400	0,22	1,4	2400	7880	2"7/8 EU	86	3,39	10,44	34,3	1"	50,0	1,97	11,02	36,2	X
48E600	0,49	3,1	600	1970	2"7/8 EU	86	3,39	5,22	17,1	1"	50,0	1,97	5,70	18,7	
48E900	0,49	3,1	900	2960	2"7/8 EU	86	3,39	7,83	25,7	1"	50,0	1,97	8,35	27,4	
48E1200	0,49	3,1	1200	3940	2"7/8 EU	86	3,39	10,44	34,3	1"	50,0	1,97	11,00	36,2	

PCM MOINEAU™ 3" 1/2 SERIES															
12E1400	0,12	0,8	1400	4600	3"1/2 EU	96	3,78	2,75	9,0	1"	52,0	2,05	3,22	10,7	
12E1800	0,12	0,8	1800	5910	3"1/2 EU	96	3,78	3,65	11,1	1"	52,0	2,05	3,90	13,6	
24E650	0,26	1,6	660	2170	3"1/2 EU	96	3,78	2,03	6,8	1"	51,0	2,01	2,50	8,3	
24E1300	0,26	1,6	1300	4270	3"1/2 EU	96	3,78	4,07	13,4	1"	51,0	2,01	4,54	14,1	X
24E2000	0,26	1,6	2000	6570	3"1/2 EU	96	3,78	6,10	20,0	1"	51,0	2,01	6,57	21,6	X
24E2600	0,26	1,6	2600	8540	3"1/2 EU	96	3,78	8,14	26,7	1"	51,0	2,01	8,61	28,2	X
32E800	0,34	2,1	800	2630	3"1/2 EU	96	3,78	2,75	9,0	1"	51,0	2,01	3,22	10,7	
32E1500	0,34	2,1	1500	4930	3"1/2 EU	96	3,78	5,50	18,1	1"	51,0	2,01	6,00	19,8	X
32E2200	0,34	2,1	2200	7220	3"1/2 EU	96	3,78	8,26	27,1	1"	51,0	2,01	8,80	28,1	X
32E3000	0,34	2,1	3000	9850	3"1/2 EU	96	3,78	11,00	36,2	1"1/8	51,0	2,01	11,55	37,1	X
40E600	0,40	2,5	600	1970	3"1/2 EU	96	3,78	2,75	9,0	1"	51,0	2,01	3,30	10,8	
40E1200	0,40	2,5	1200	3940	3"1/2 EU	96	3,78	5,50	18,0	1"	51,0	2,01	6,00	19,7	X
40E1800	0,40	2,5	1800	5910	3"1/2 EU	96	3,78	8,26	27,1	1"	51,0	2,01	8,80	28,9	X
40E2400	0,40	2,5	2400	7880	3"1/2 EU	96	3,78	11,00	36,2	1"1/8	51,0	2,01	11,55	37,1	X
63E800	0,66	4,2	800	2630	3"1/2 EU	96	3,78	5,50	18,0	1"	51,0	2,01	6,00	19,7	
63E1200	0,66	4,2	1200	3940	3"1/2 EU	96	3,78	8,26	27,1	1"	51,0	2,01	8,80	28,9	
63E1600	0,66	4,2	1600	5250	3"1/2 EU	96	3,78	11,00	36,2	1"1/8	51,0	2,01	11,55	37,1	

MODEL	DISPLACEMENT		HEAD		STATOR				ROTOR					Slugger
	m³/d/RPM	bpd/RPM	m	ft	Connection	OD mm	OD inch	LENGTH m	LENGTH ft	Connection	OD mm	OD inch	LENGTH m	LENGTH ft

PCM MOINEAU™ 4" SERIES															
38E1000	0,38	2,4	1000	3290	4" NU	109	4,29	2,88	9,6	1"1/8	57,5	2,26	3,46	11,4	
38E2000	0,38	2,4	2000	6570	4" NU	109	4,29	5,76	18,1	1"1/8	57,5	2,26	6,29	20,8	X
45E800	0,46	2,9	800	2630	4" NU	109	4,29	2,88	9,6	1"1/8	57,5	2,26	3,46	11,4	X
45E1600	0,46	2,9	1600	5250	4" NU	109	4,29	5,76	18,9	1"1/8	58,0	2,28	6,29	20,6	X
45E2400	0,46	2,9	2400	7880	4" NU	109	4,29	8,64	28,4	1"1/8	58,0	2,28	9,25	30,4	X
45E3200	0,46	2,9	3200	10500	4" NU	109	4,29	11,53	37,1	1"1/8 Mod	57,5	2,26	12,21	40,1	X
60E600	0,61	3,8	600	1970	4" NU	109	1,29	2,88	9,6	1"1/8	57,5	2,26	3,46	11,4	X
60E1200	0,61	3,8	1200	3940	4" NU	109	4,29	5,76	18,9	1"1/8	57,5	2,26	6,29	20,6	X
60E1800	0,61	3,8	1800	5910	4" NU	109	4,29	8,64	28,4	1"1/8	57,5	2,26	9,25	30,4	X
60E2400	0,61	3,8	2400	7880	4" NU	109	4,29	11,53	37,8	1"1/8	57,5	2,26	12,21	40,1	X
80E450	0,81	5,1	450	1480	4" NU	109	4,29	2,88	9,6	1"1/8	57,5	2,26	3,46	11,4	
80E900	0,81	5,1	900	2960	4" NU	109	4,29	5,76	18,9	1"1/8	57,5	2,26	6,29	20,6	
80E1350	0,81	5,1	1350	4430	4" NU	109	4,29	8,64	28,4	1"1/8	57,5	2,26	9,25	30,4	X
80E1800	0,81	5,1	1800	5910	4" NU	109	4,29	11,53	37,8	1"1/8	57,5	2,26	12,21	40,1	X
100E800	0,99	6,2	800	2630	4" NU	109	4,29	5,76	18,9	1"1/8	58,5	2,30	6,29	20,6	
100E1200	0,99	6,2	1200	3940	4" NU	109	4,29	8,64	28,4	1"1/8	58,5	2,30	9,25	30,4	X
100E1600	0,99	6,2	1600	5250	4" NU	109	4,29	11,53	37,8	1"1/8	58,5	2,30	12,21	40,1	X
120E600	1,27	8,0	600	1970	4" NU	109	4,29	5,76	18,9	1"1/8	57,5	2,26	6,29	20,6	
120E900	1,27	8,0	900	2960	4" NU	109	4,29	8,64	28,4	1"1/8	57,5	2,26	9,25	30,4	
120E1200	1,27	8,0	1200	3940	4" NU	109	4,29	11,53	37,8	1"1/8	57,2	2,25	12,21	40,1	X
175E600	1,77	11,2	600	1970	4" NU	109	4,29	8,64	28,4	1"1/8	57,5	2,25	9,25	30,4	
175E800	1,77	11,2	800	2630	4" NU	109	4,29	11,53	37,8	1"1/8	57,2	2,25	12,21	40,1	X

PCM MOINEAU™ 5" SERIES															
86E2000	0,86	5,4	2000	6570	5" CSG	138	5,43	8,49	27,9	1"1/8	74,0	2,91	9,01	29,6	X
115E1600	1,19	7,5	1600	5250	5" CSG	138	5,43	8,49	27,9	1"1/8	74,0	2,91	9,01	29,6	X
150E1200	1,52	9,6	1200	3940	5" CSG	138	5,43	8,49	27,9	1"1/8	74,0	2,91	9,01	29,6	X
200E860	2,16	13,6	860	2830	5" CSG	138	5,43	8,49	27,9	1"1/8	74,0	2,91	9,01	29,6	
310E800	3,06	19,2	800	2630	5" CSG	138	5,43	11,33	37,2	1"1/8	76,0	3,0	11,86	38,9	

PCM MOINEAU™ 6" 5/8 SERIES															
185E1500	1,94	12,2	1500	4930	6"5/8 BUT	170	6,69	8,49	27,9	1"1/8 Mod	93,0	3,66	9,01	29,6	X

PCM VULCAINT™ 4" SERIES															
80V660	0,80	5,0	660	2170	4" NU	115	4,53	5,88	19,4	1"1/8	57,5	2,26	6,17	20,3	
80V1000	0,80	5,0	1000	3290	4" NU	115	4,53	8,96	29,4	1"1/8	57,5	2,26	9,25	30,4	
80V1350	0,80	5,0	1350	4430	4" NU	115	4,53	11,84	38,9	1"1/8	57,5	2,26	12,00	39,4	
110V500	1,10	6,9	500	1650	4" NU	115	4,53	5,88	19,4	1"1/8	57,5	2,26	6,17	20,3	
110V750	1,10	6,9	750	2470	4" NU	115	4,53	8,96	29,4	1"1/8	57,5	2,26	9,25	30,4	
110V1000	1,10	6,9	1000	3290	4" NU	115	4,53	11,84	38,9	1"1/8	57,5	2,26	12,00	39,4	





## PCM SLUGGER

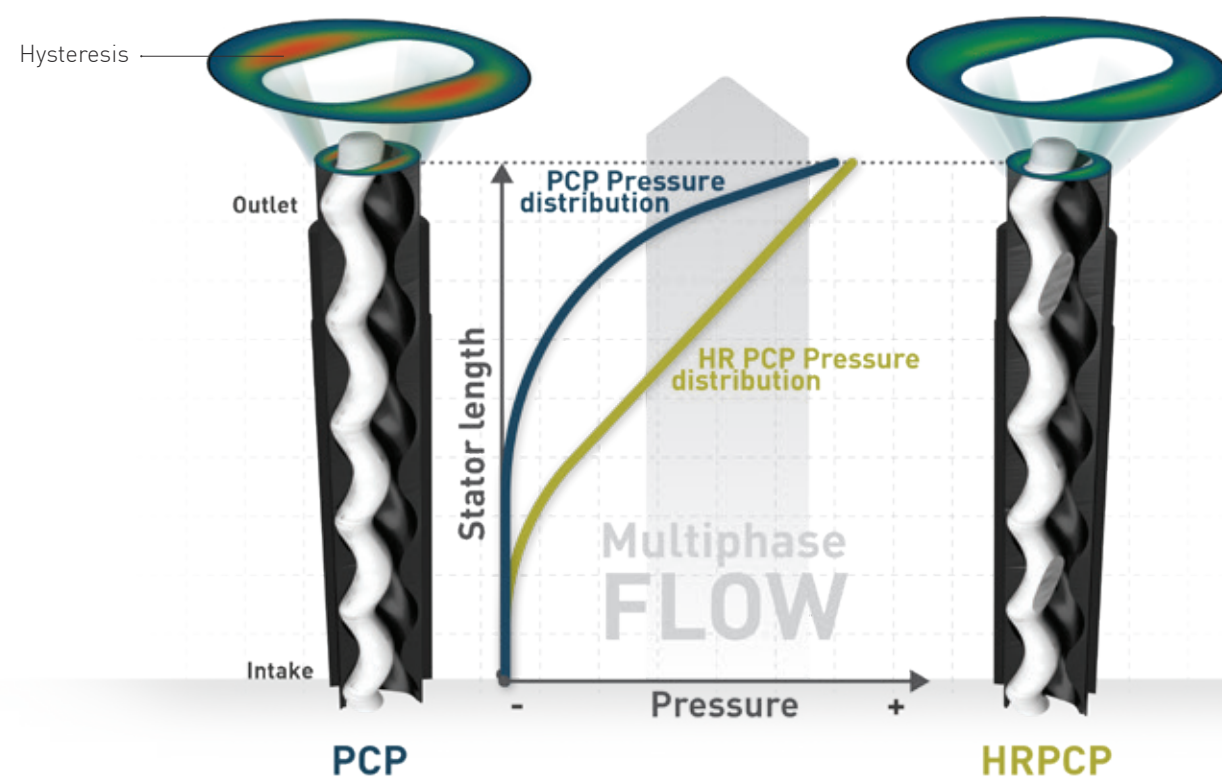
### MULTIPHASE TECHNOLOGY



#### HR PCP TECHNOLOGY FOR GAS MANAGEMENT

The PCM exclusive and patented hydraulically regulated PCP, PCM Slugger pushes the limits of the conventional progressing cavity pumps to handle the highest gas void fraction. This enables you to bring gassy wells that can't be produced using conventional ALS, back on stream..

The hydraulic regulators incorporated in the rotor design make PCM Slugger PCP (HRPCP) a highly versatile choice for variable and changing pumping conditions.



#### Benefits

- Balanced pressure and temperature along the pump
- Optimum production (increase your oil and gas production by operating at lower submergence)
- Longer run life, no gas lock
- Lower power consumption

#### Performances

- Hydraulic regulators incorporated in the rotor
- Pressure: up to 330 bar / 4 800 psi
- Flowrate: up to 570 m<sup>3</sup>/d (3 600 bfpd)
- Range: 37 models
- GVF: 90% of free gas at pump intake

Ideal for mature field revitalization, gassy wells, gas well deliquification or simply to increase productivity of conventional oil recovery.



## PCM VULCAIN™

### HIGH TEMPERATURE TECHNOLOGY



#### ALL METAL PCP TECHNOLOGY DEDICATED TO THERMAL RECOVERY

PCM unique and patented high temperature PCP technology, PCM Vulcain™ boosts usual PCP temperature limitation up to 350°C/660°F.

With a metal stator replacing the elastomer, the PCM Vulcain™ All-Metal PCP (AMPCP) features the same geometry and advantages as a conventional PCP with the elimination of rubber temperature limitations. It runs at low intake pressure; keeps good volumetric efficiency (even when pumping 100% water and steam); and handles very viscous fluid without rod fall issues in the cold production phase. These features make the AMPCP technology highly versatile as it is virtually unaffected by transient periods such as: SAGD warm-up period; beginning or end of the production in CSS; erratic heat front propagation or fluctuation during steam flood production.



#### THERMAL EOR

- SAGD
- CSS
- Steam flood

#### AVAILABLE MODELS

- 80V 660/1000/1350
- 110V 500/750/1000
- 220V 500/750/1000
- 300V 400/600/800



#### Benefits

- More robust than ESP
- Outperforms SRP overall efficiency
- Lower life cycle costs
- Stays efficient with any water cut
- Through stator steaming
- No heavy work over before and after steaming
- Above 4 years life span achieved
- Wide range of viscosities (1-10 000+ cP)

#### Performances

- Max. production flowrate: 5 650 bfpd / 900m<sup>3</sup>/d
- Max. pressure: up to 135 bar / 2 000 psi
- Max. temperature: 350°C / 660°F
- Max. DLS: 14° / 30 m - 14° / 100 ft

Best artificial lift system for unconventional oil production meeting the requirements of all thermal recovery methods.

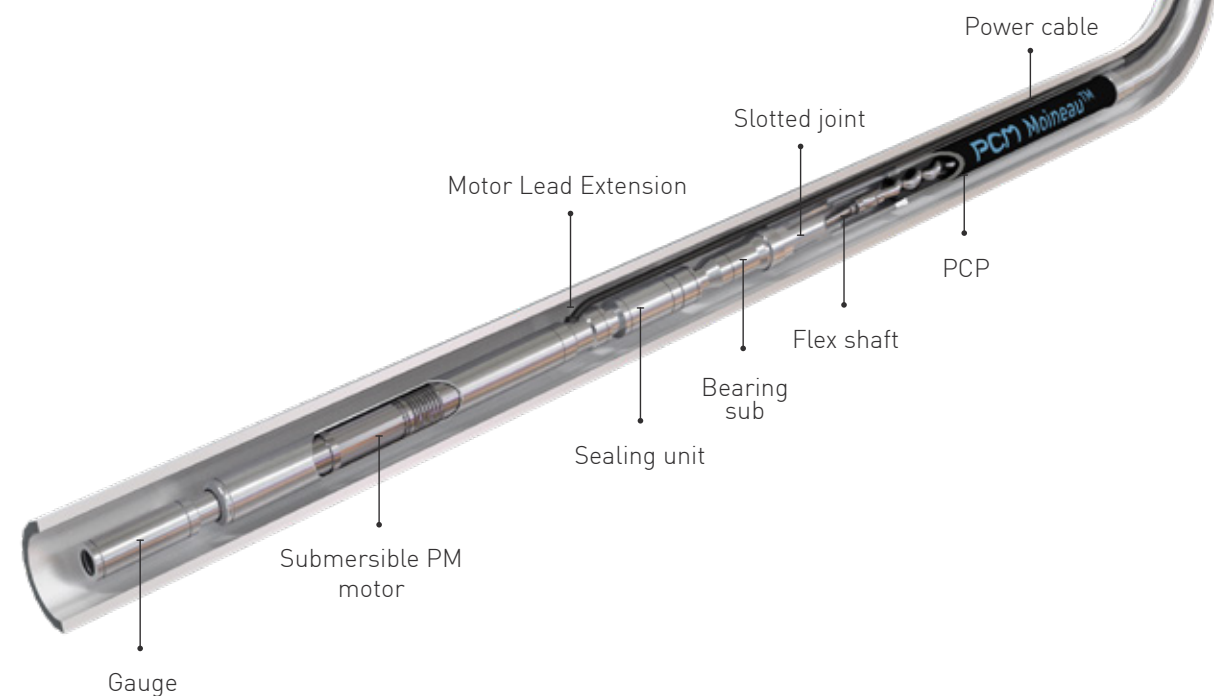


## PCM ESPCP ROD LESS PCP TECHNOLOGY

### THE PCP SOLUTION FOR HIGHLY DEVIATED WELLS AND OFFSHORE OPERATIONS

The Electrical Submersible PCP (ESPCP) is a **ROD FREE SYSTEM** that combines the advantages of ESP downhole motor with the benefits inherent to PCP technology. Removing the rod string and driving the PCP with a downhole motor provides an alternative PCP system to avoid rod pump facing recurrent parted rods and tubing failures in case of high dogleg severity wells. This system also outperforms ESPs, facing early failures (gas lock, sand wear, low efficiency).

PCM offers an energy-saving solution with an ESPCP system that uses a submersible Permanent Magnet Motor (PMM).



#### Benefits

- Higher well performance and reliability
- Improve PCP performance (remove flow area restriction from rod/centralizers)
- No gas lock
- Maintenance free
- Suitable for Offshore

#### Features

- High performance downhole PMM with sensor-less drive control technology
- Constant torque over a wide range of speed 50-500 RPM
- Lower foot print

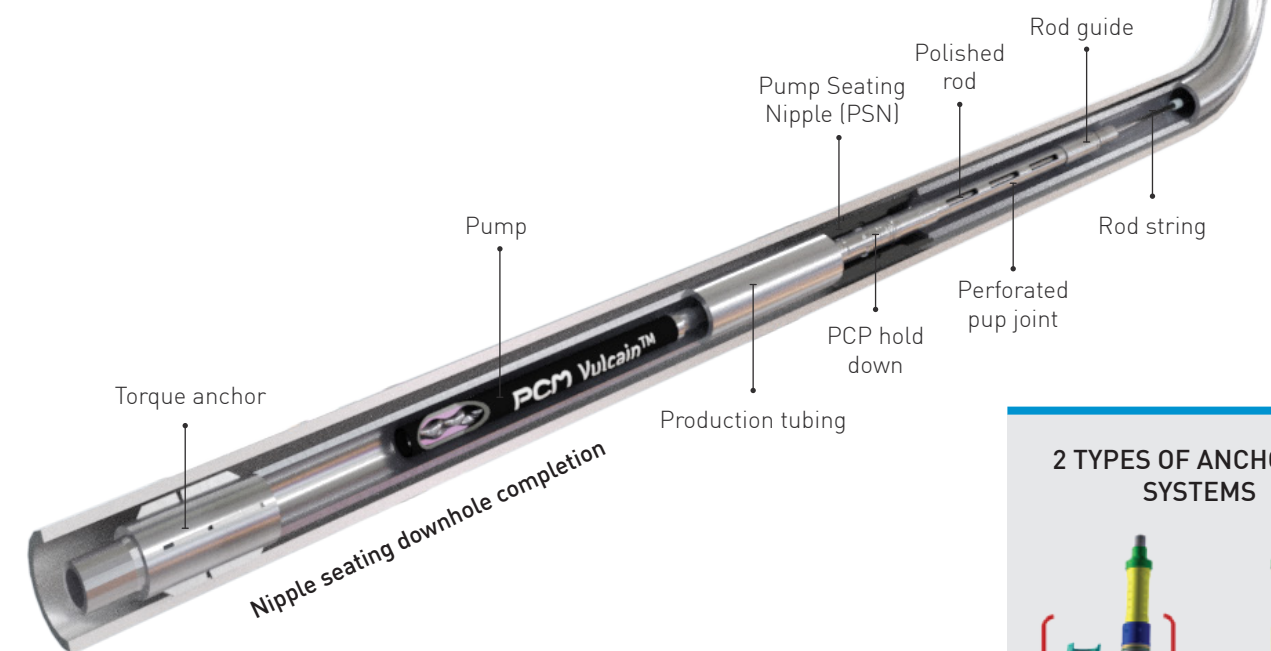
**An attractive artificial lift solution for production wells with high Dog Leg Severity, fields requiring power savings as well as for ESP conversion to offset declining wells.**



## PCM INSERT PCP RIG LESS PCP TECHNOLOGY

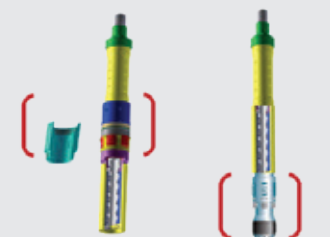
### THE PCP SOLUTION FOR LIGHT WORKOVER OPERATIONS

The Insert PCP is a through tubing retrievable system allowing to run in hole and to pull-out from the well the rotor and stator using only a light pulling unit. Insert PCP helps to significantly reduce your OPEX and downtime costs by eliminating the need for heavy workover rig.



Tubing 3" 1/2	3E / 6E / 16E / 35E	600 bdp @ 1 000 m (3 300 ft) 100 bdp @ 2 000 m (6 600 ft)
	3E / 6E / 16E / 35E	
Tubing 4" 1/2	13E / 22E / 48E	1 000 bdp @ 1 500 m (4 900 ft) 600 bdp @ 2 000 m (6 600 ft)
	12E / 24E / 32E / 40E / 63E	

#### 2 TYPES OF ANCHORING SYSTEMS



Nipple Seating

Nipple less

#### Benefits

- Reduce work over intervention time and cost
- Stator replacement by pulling out only the rod string
- Possibility to flush by the pump to circulate fluid
- Suitable for deviated wellbores and sour applications
- Ideal for limited rig access and rig availability

#### Features

- Rotor/stator pre-assembly prior running in hole
- Anchoring systems options: nipple installation on the tubing string or innovative packer system

**Cost effective solution to reduce downtime and rig costs. Easy run for a secondary ALS completion.**



## TUBING STRING

The tubing string completion is adapted to well conditions to ensure the best operational efficiency

### THE BASICS



#### › CROSS OVER - Connect any bottom hole items

- BOX/BOX or BOX/PIN or PIN/BOX
- All types of thread connections as per API 5CT
- From 2"3/8 to 6"5/8



#### › PUP JOINT - Allow free motion of rotor head

- Permit easy lift of the stator assembly during the installation
- Allow rotor head eccentric motion while in operation
- Available in 2"7/8, 3"1/2, 4"1/2, 5", 6"5/8 in 4,6 or 8 ft length



#### › TAG BAR - Landing spot for rotor spacing out

- Provide a stand-off length to anticipate rods elongation
- Several sizes available with option for short, XL or slotted configurations
- Top bushing option upon request (product not available for Canada and USA)



#### › TORQUE ANCHOR - Prevent tubing back-off

- Handle high torque, reliable and robust design
- For casing 4"1/2 to 9"5/8 with connection 2"3/8 to 5"1/2
- Repair Kit available for anchor blocks

### THE ADVANCES [optional]



#### › FLUSH VALVE - Avoid solids accumulation above the pump

- Automatic sliding sleeve activated by hydrostatic pressure
- Tubing fluid column is directly flushed to the annulus
- Minimize backspin



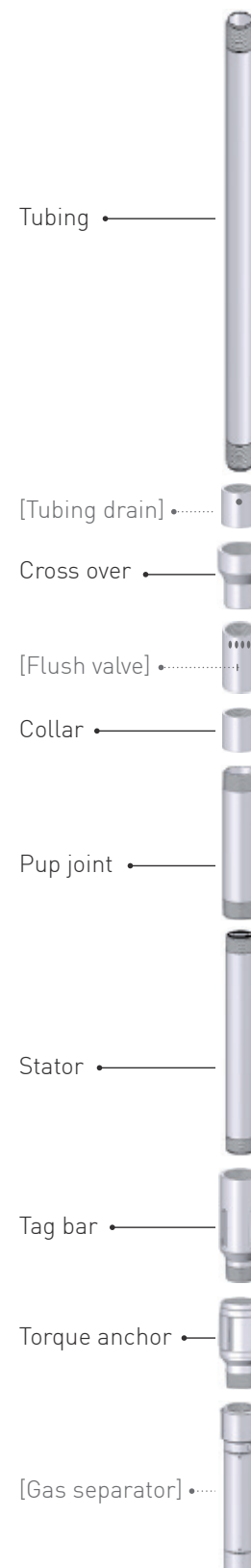
#### › TUBING DRAIN - Release tubing fluid column prior POOH

- Shear pin activated by tubing pressure
- Easy workover after parted rods



#### › GAS SEPARATOR - Limit free gas intake

- Installed below the Torque Anchor
- Free gas directly vented to the casing



## ROD STRING

Rod string completion is carefully designed to suit your project, well profile, torque requirements and service tools available on site.

### THE BASICS



#### › POLISHED ROD - Ensure an appropriate sealing

- 11 to 44 ft length
- 1"1/4, 1"1/2 and other size available on request



#### › SUCKER RODS - Rod string

- Size adapted to torque requirements and tubing size.
- Grad D or high strength available
- 3/4", 7/8", 1", 1"1/8, 1"1/4, 1"1/2



#### › PONY RODS - Adjust rod string length

- Available in 2,4,6,8,10,12 ft
- Any SR size available



#### › COUPLINGS - Connect rod string elements

- Polished rod to sucker rod
- Sucker rod to sucker rod or to centralizers

#### › CENTRALIZERS - Prevent tubing wear

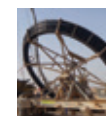
- Non-rotating centralizers
- Spindle/sleeve type
- Available for high temperature (metallic sleeve)

### ALTERNATIVE OPTIONS [optional]



#### › HOLLOW RODS - Possibility to inject through rod string

- Coming from seamless pipes
- Flush joint to reduce tubing wear



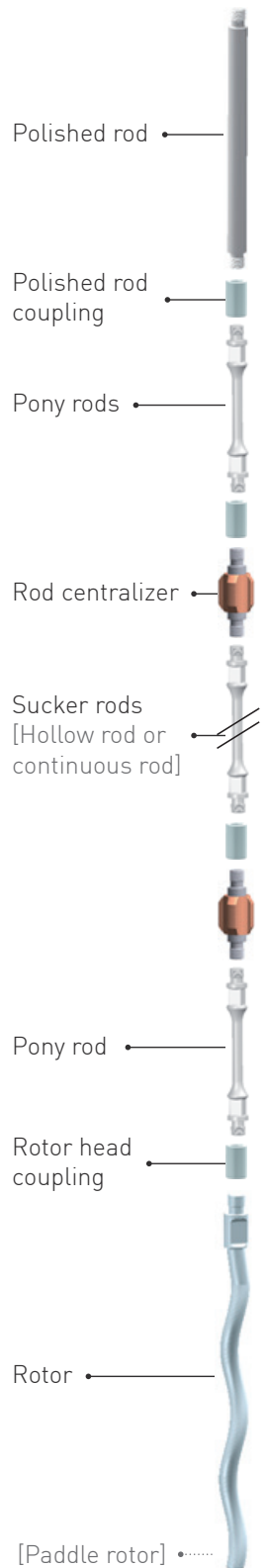
#### › CONTINUOUS RODS - Highly deviated well, faster RIH

- High torque capabilities
- Continuous design to reduce tubing wear



#### › PADDLE ROTOR - Avoid solid plugging

- 2ft extra length flattened rotor
- Break solids accumulation at stator suction







## SURFACE DRIVES

PCM Drivers are safe and reliable surface PCP driveheads. They drive the rotation of the rotor, control backspin rotation, support the weight of the rod string and seal around the polished rod.



### PCM DRIVER™ BELTS DRIVEHEAD

**B50 :** 50HP / 9,5T / 1 440Nm  
**B100 :** 100HP / 13,7T / 2 440Nm

- Safe & reliable - ISO15 136-2 & 2 006/42/CE compliant
- User friendly - Sliding light cover
- Smart maintenance - Easy access to wear parts



### PCM PM-100 DIRECT DRIVEHEAD PMM

- Highly efficient Permanent Magnet Motor with hollow shaft
- Failsafe resistive braking system through VFD
- Low maintenance and easy installation



### PCM G-75H HYDRAULIC DRIVEHEAD

- 75HP Gear Driven
- Integrated pressurized Stuffing Box with oil circulation
- Power pack available with several options

## SEALING UNIT OPTIONS - Environment friendly sealing system



**Stuffing box**  
 Sealing is ensured by packing set and bronze bushings.



**No leak**  
 Sealing is ensured by dynamic seals on a tungsten carbide coated shaft and special filtration packing set.



**Pressurized SB**  
 Sealing is ensured by hydraulically pressurized packing set around a tungsten carbide coated shaft.



## SURFACE EQUIPMENT

User friendly PCP interface / Settable alarms / Internal data storage / Easy data transmission



### PCM IPAC - VSD with Intelligent Pump Automation Controller

#### Benefits

- Integrated Variable Frequency Drive
- PLC/HMI with PCP interface

#### Performances

- Power supply: 380-480 / 535-690 VAC
- Frequency: 50 or 60 hz
- DANFOSS VSD: 11 to 90kW (15 to 120HP)  
     FC202 – 110% overload  
     FC302 – 160% overload
- Enclosure: IP55 or Nema 3R
- Environment: -10°/ +50°C (+14 / +120°F)  
     option: -40°C/-40°F  
     95% Humidity

**Note:** provided by default with its stand



### PCM IPAC MINI - Intelligent Pump Automation Controller

#### Benefits

- Plug-and-play with most of existing VSD brand (ABB, Siemens, Leroy Somer, Danfoss, Schneider, ...)
- PLC/HMI with PCP interface

#### Performances

- Power supply: 230 / 380-480 / 535-690 VAC
- Frequency: 50 or 60 hz
- Enclosure: IP65 or Nema 4
- Environment: -10°/ +50°C (+14 / +120°F)  
     95% Humidity

**Note:** light stand available as an option



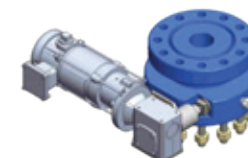
### ELECTRIC MOTOR - Asynchronous motor adapted for PCP operations

- High efficiency motor
- IEC Exna, IEC ExD, NEMA explosion proof or GOST standard
- From 11 kW to 90kW, 4 Poles or 6 poles motor
- Feet or flange mounted type



### IBOP - Integrated blow out preventer for safe PCP oilfield operation

- Standard or High Temperature available
- Top and bottom connections available in studded, flanged or threaded
- Single or Dual Ram: blind, sealing 1"¼, 1"½, 0 to 1"½ or rod clamping



### TUBING ROTATOR - Extend tubing string life in deviated well

- Manual drive or electric drive to rotate the tubing string
- Downhole clutch swivel
- Several sizes available 11", 9", 7"1/16 in 2 000, 3 000 or 5 000 PSI



## SERVICE OFFER



EXPERT



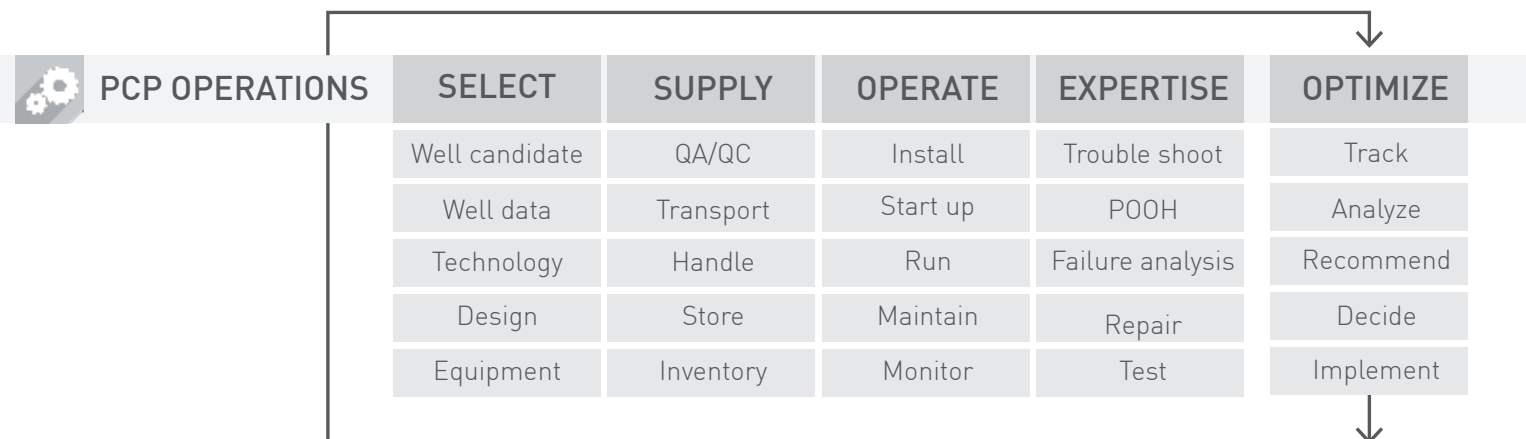
REACTIVE & FLEXIBLE



EFFICIENT

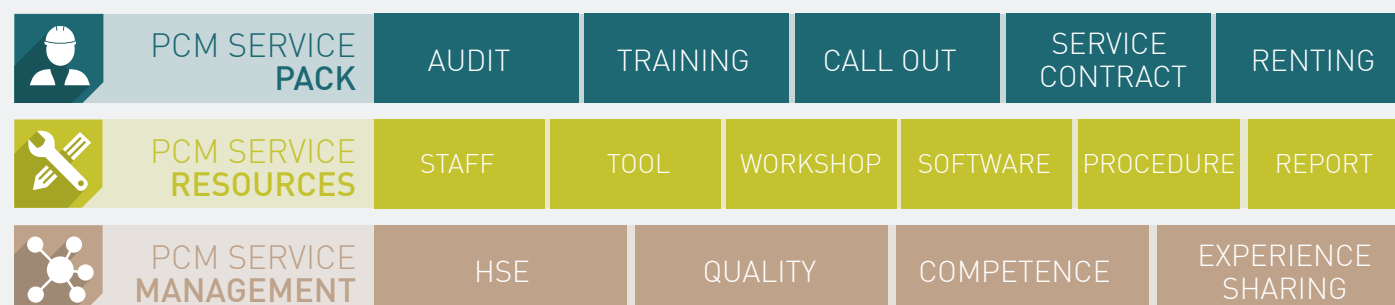
### YOUR OPERATION

By service, we mean understanding the operational needs of a client and offering him adapted support, with reliable options for decision to optimize his assets. PCP operations include a variety of actions, some of which you can decide to enhance:



### OUR OFFER

Once you have decided on the PCP operation you want to optimize, you can identify the level of needed support through the different PCM Service Packs. To ensure the same level of service to all our customers, we deploy the adapted service resources and operate following the PCM's established and field proven processes.



## PCM SERVICE PACK AUDIT

PCM offers a unique and efficient methodology to identify quick wins and priorities for PCP operation optimization.

### WORKFLOW, ANALYSIS & REPORTING

We collect breadth of information through office interview, data collection, field visit and failure analysis. Based on PCP operation questionnaire, well completion and monitoring sheet as well as failure analysis procedure, we conduct a four-axis PCP performance analysis:



#### AXIS #1

##### Client KPI & challenges

Identify client KPI and main challenges and focus PCM analysis and recommendation on those challenges.



#### AXIS #2

##### PCP operations process evaluation

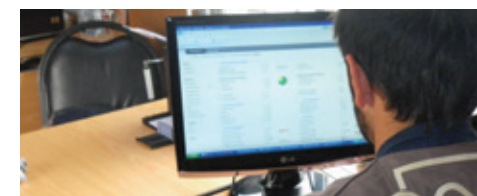
Attend and evaluate each PCP operation to identify (if any): performance bottle necks, risks, quick wins or major opportunities for improvements.



#### AXIS #3

##### Failure analysis

Identify and develop understanding of repetitive/recurrent POOH, failed equipment, failure root cause through in depth analysis.



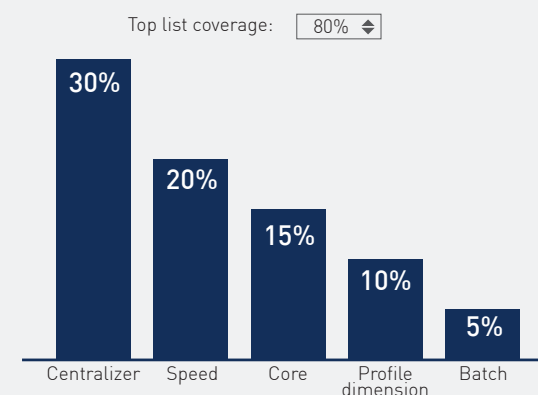
#### AXIS #4

##### Statistical analysis of PCP performance

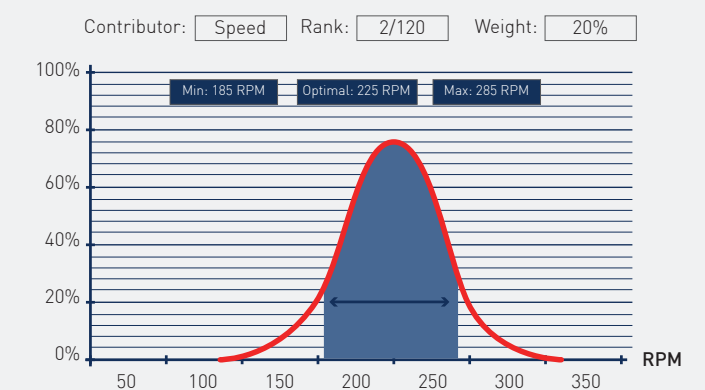
Using Minitab© software and the Kaplan Meier method, PCM has developed an efficient and unique statistical methodology to evaluate and identify the key contributors to PCP system performance and/or failures.

### EXAMPLE OF AUDIT STATISTICAL ANALYSIS

#### TOP 80% CONTRIBUTORS ON KPI



#### BEST PRACTICES RECOMMENDATION







## PCM SERVICE RESOURCES STAFF

PCM has extensive field experience and knowledge covering a broad range of activities.

We can mobilize worldwide, 7 different levels of PCP competencies:

- PCP Operation Manager
- PCP Application Engineer
- PCP Service Manager
- PCP Service Workshop Manager
- PCP Field Engineer
- PCP Field Technician
- PCP Field Worker



## PCM SERVICE RESOURCES SOFTWARE

PCM provides high standard innovative PCP solutions for Artificial Lift with unique in-house software.



### PCM DESIGN

PCM Design is a user-friendly web based software for selection, completion design, evaluation and optimization of PCP Artificial Lift Systems with suitable reporting.

#### Online

- Stay connected anytime, anywhere
- Automatic updates to the latest version

#### Simple

- Intuitive, easy to understand and simple to use
- Minimized data input time

#### Expert

- Optimize and support your PCP system throughout its lifecycle
- Understand in-field behavior



field track

### PCM FIELD TRACK

PCM Field Track software is an online application to support service activities and provide adapted reporting to our clients. It measures PCP system performance all along its life from storage to tear down.

#### PCP operations management tool

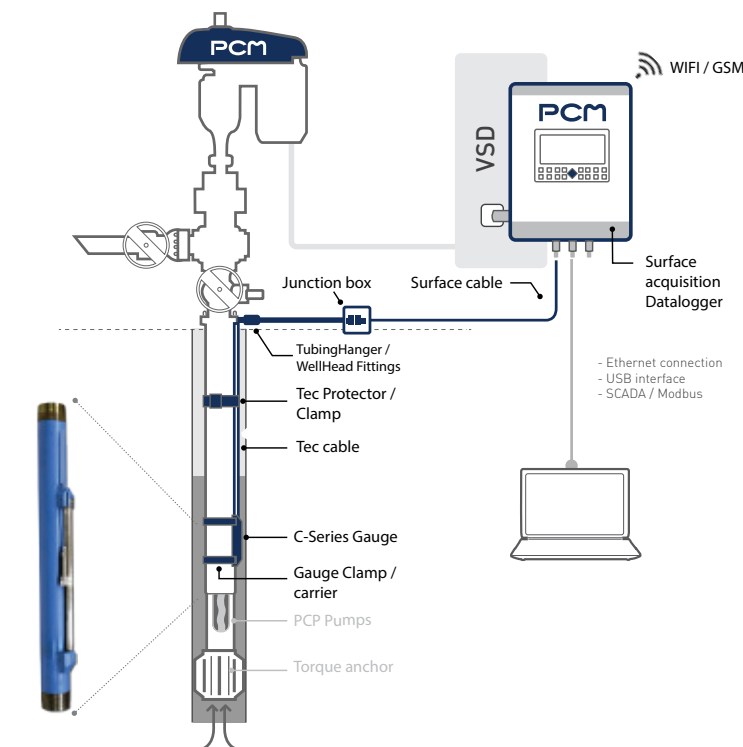
- Inventory Management
- Data & Event Recording
- Failure Analysis Tracking
- Key Performance Indicators

## PCM SERVICE RESOURCES MONITORING

PCM provides monitoring tools dedicated to PCP wells in order to improve production well performance.

### DOWNHOLE GAUGES

Our permanent downhole Capacitance gauges provide real time downhole monitoring with reliable information, in order to protect PCP equipment and optimize production.



#### Benefits

- Improve MTBF and reduce work over
- Automatic alarms and safe trips
- Prevent dry running of your PCP's
- Possibility to setup PID regulation from VSD to maintain a constant dynamic level
- Real-time view of your well and PCP conditions
- History in case of PCP's failure

#### Specifications

- Single P/T + option on Vibration
- Dual P/T + option on Vibration
- Rated 1 500/5 000PSI & 150°C
- Downhole cable = bare cable or TEC
- Surface panel= Gauge signal interface in Data logger or integrated in PCM IPAC

### SURFACE WELL ANALYZER

The echometer is a computerized instrument for acquiring liquid level data and acoustic pressure transient data, in order to protect your PCP and optimize production.



#### MANUAL

Mobil unit for well-to-well monitoring by field technician



#### AUTOMATIC

Permanently installed on well head. Record and automatically transmit fluid level at regular time intervals.



## PCM SERVICE RESOURCES » TESTING



PCM provides a more comprehensive solution to its customers by offering local services with appropriate testing tools.

### » PCP TEST BENCH

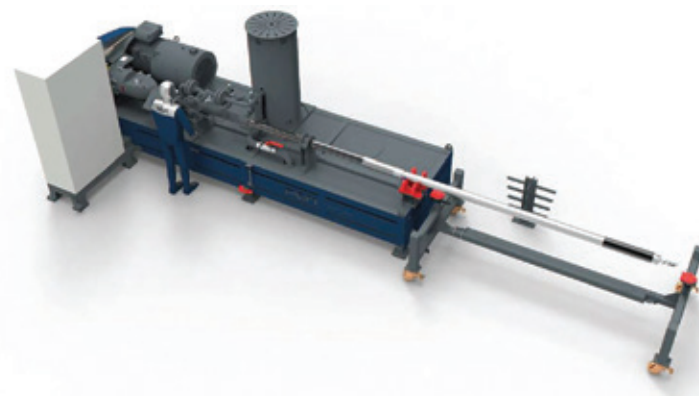
In remote areas, maximize equipment uptime, and ROI, with a simple and limited maintenance test bench design.

#### Benefits

- ISO15136 Compliant
- Test all ranges of PCPs technologies: PCM Moineau™, PCM Moineau™ HR, PCM Vulcain™
- Test all PCP manufacturer pumps
- Electronic flow meters or manual reading
- Automatic or manual driven pump support
- Quick connectors at intake & discharge

#### Performances

- Up to 6" 5/8 connections
- Up to 12m long pump
- 50 to 200 HP drive equipment
- Up to 960 m³/d
- Up to 260 bars



### » ELASTOMER COMPATIBILITY LABORATORY

The elastomer compatibility test is part of the PCM PCP Service workshop. PCM's network of testing facilities is available worldwide.

#### Input

- Oil gravity
- Temperature
- Pressure

#### Records (before / after)

- Weight
- Volume
- Hardness

#### Test Duration

- 2 weeks

### » PCM ELASTOMER IN SITU LAB

- Swelling test in real well conditions
- Elastomer basket run in the well below stator suction
- Patented technology



## PCM SERVICE RESOURCES » FAILURE ANALYSIS TOOLS

PCM has adapted workshop tools and procedures to identify and record POOH reasons, failed equipment, failure root cause through in depth analysis.



**CLEAN**  
High pressure washer



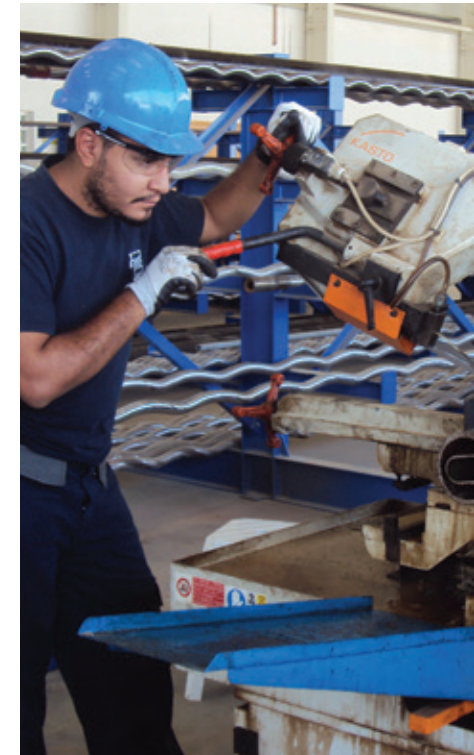
**CONTROL**  
Intertest & durometer



**INSPECT**  
Borescope



**CUT**  
Band saw



## PCM SERVICE RESOURCES » INSTALLATION TOOLS

We provide a full range of dedicated tools that will help you save time and money and minimize the risk of installation issues.



Sucker rod elevator



Sucker rod wrench



Polished rod bullet



Polished rod safety clamp





### ABOUT PCM



Founded in 1932 by René Moineau, the inventor of the Progressing Cavity Pump, and Robert Bienaimé, from Gévelot Group, **PCM is today one of the world's leading manufacturers of positive displacement pumps and fluid-handling equipment.**

To meet demand around the globe while adapting to specific considerations in the different regions in which we operate, **PCM has established a strategy of localized organisations designed to promote commercial and industrial proximity to customers and enhance operational efficiency.** Today, PCM is divided into four clusters and has 27 entities worldwide, gathering employees from 38 different nationalities.