SETTIMA®

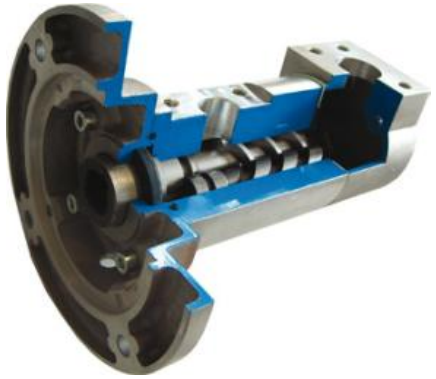
research & innovation, always

PRODUCTS PRESENTATION

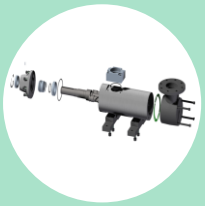
Settima products

Settima designs and manufactures hydraulic 3 screw pumps and helical rotors pumps. *Settima* screw pumps, coupled together with external or immersed motors, run quietly and with no pulsations, they are used in hydraulic applications and systems of many types.

Settima Screw pumps are positive displacement rotary pump with axial flow design. There are only three moving parts. The power rotor is the only driven part that extends outside the case. The idler screws act as sealing parts and are turned hydraulically by the fluid being pumped. There is only a rolling action between the drive screw and the idler ones. **The rolling action eliminates noise and vibration.**



Market proposal

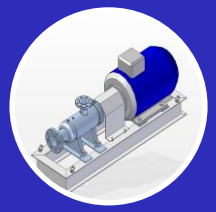


High flow

Low noise

Low pulsations

High pressure



High and low viscosity fluids handling

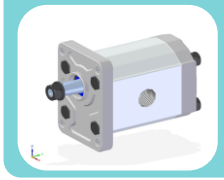
Settima solutions for many requests

Product innovations

Hollow shaft pump

SMT8B short pumps

Customization



Continuum ® pumps

SETTIMA PRODUCT RANGE

3 SCREW PUMPS

2 ROTORS PUMPS

Settima product range

3 Screw Pumps

3 SCREW SERIES	**SMT series** Industrial application up to 80 bar	**FGM series** Industrial application up to 40/80 bar
		HA TM series Industrial application up to 80 bar
	SMT16B series Industrial application up to 40 bar	**SMT16B G HD series** Industrial applications up to 40 bar
	FOTP series Industrial application up to 70 bar	
	SFO series Industrial application up to 20 bar	
	SMT8B series Industrial application up to 15 bar	
	SMAPI series Industrial API676 application up to 60 bar	
	SM series Lift/elevators applications up to 80 bar	**SM EU series** **SMU USA** (USA market)

Settima product range

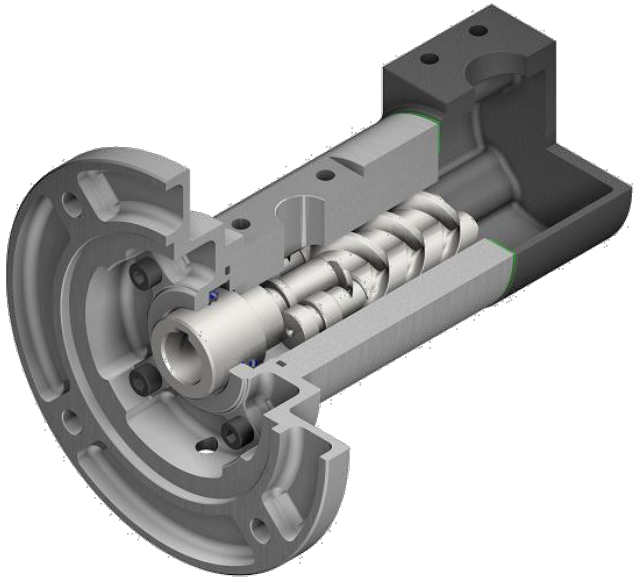
Special gear pump (2 helical rotors pump) – Continuum® Series

Continuum® series	Industrial application up to 280 bar
2VHL Continuum® series	Industrial application up to 25 bar

SMT & SMT16B series

Screw pumps for low & medium pressure
no noise applications

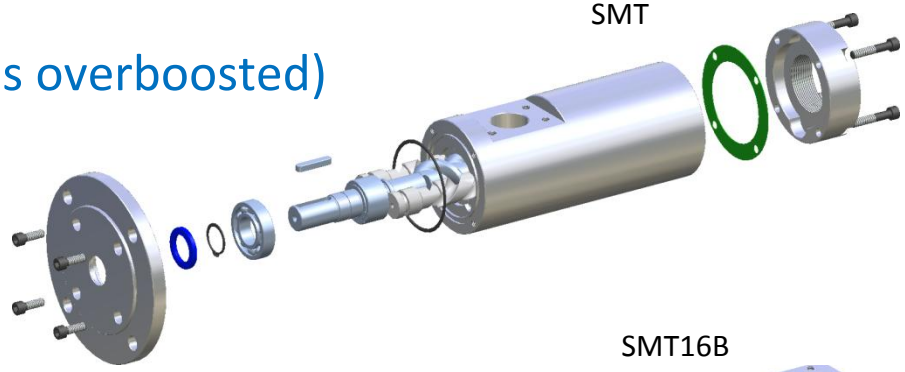
SMT and SMT16B series are 3 screw pump for industrial use up to 80 bar and 40 bar.
Technology and caractheristics are similar between the two series with the only design difference for the SMT16B of shorter screws to be used in application where the space is restricted, and a maximum pressure of 40 bar.



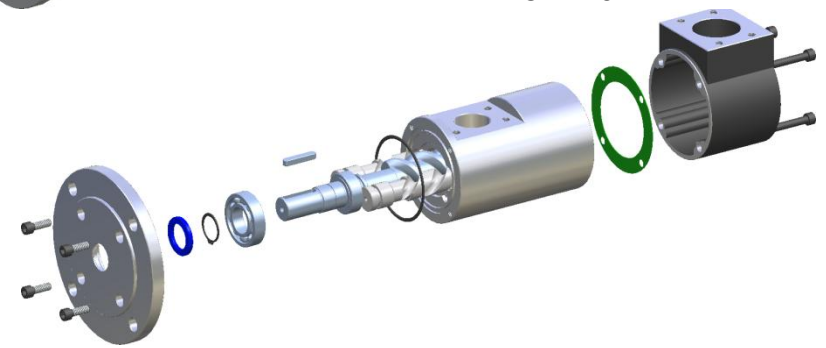
SMT & SMT16B series

- **Characteristics and limits**
  - *Flows*: 4L/min (4 poles) → 3.200L/min (2 poles overboosted)
  - *Viscosity*: 2 → 10.000 cSt
  - *Temperature*: -20° → 60/180°C
  - *Motor speed*: 3.600 rpm max
  - *Pressure*: 40 bar (**SMT16B**) – 80 bar (**SMT**)

SMT



SMT16B



- **Flows**
  - Available pump groups:
    - GR20, GR25, GR32, GR40, GR45, GR55, GR60, GR70, GR80, GR90*, GR110*
  - The nominal flows, reported into the catalogue, are related to the following spec.:
    - 40 bar, oil ISO VG 68
    - NOTE: the pumps are volumetric, but if the viscosity decreases, the flows decrease (at same pressure)

*** only SMT16B**

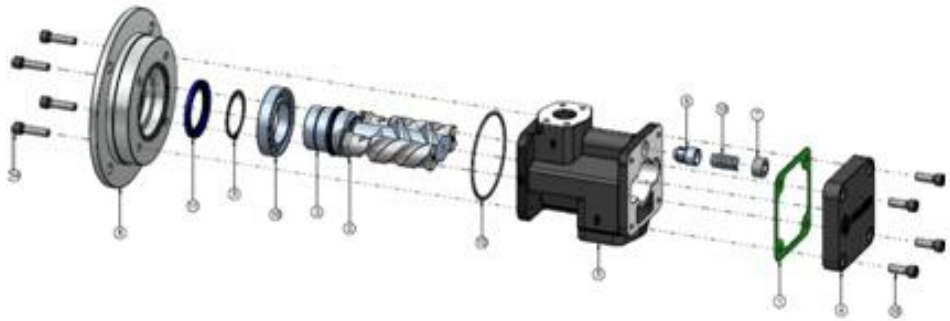
SMT & SMT16B series: FGM pumps

Medium / high pressure transfer pump

Leakage free solution

Magnetic coupling : ultimate concept for total safety and no maintenance

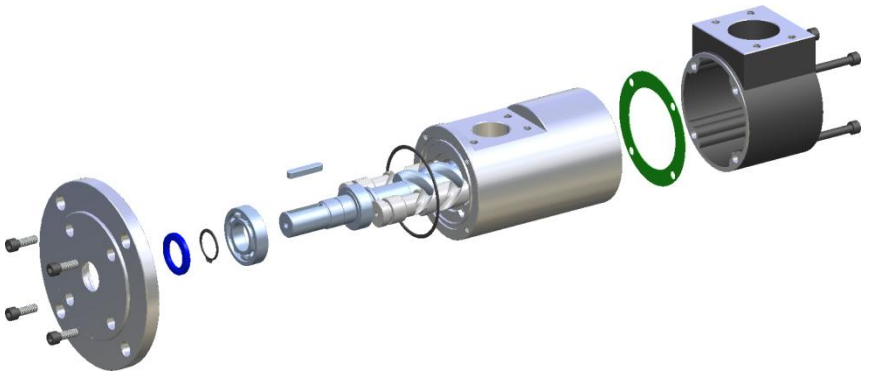
TECHNOLOGY	DETAILED APP.	SIZE	FLOWRATE	MAX PRESSURE
SMT 3 SCREW	Fuel transfer oil, corrosive liquids, high temperatures oil, chemicals and food	GR20 → GR60	8→500L (@2950rpm)	40bar (if SMT16B)



SMT & SMT16B series: SMT16B G HD pumps

Screw pumps for heavy duty filtration applications

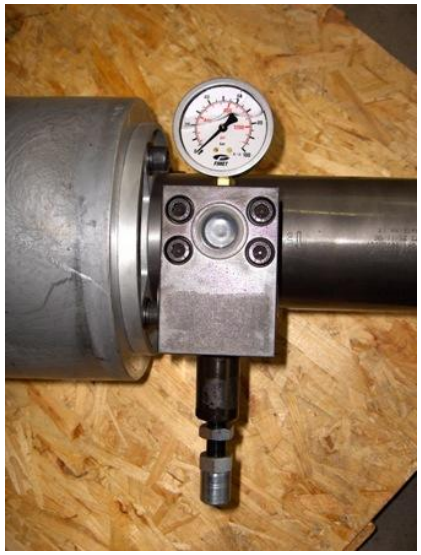
TECHNOLOGY	DETAILED APP.	SIZE	FLOWRATE	MAX PRESSURE	FLOW MEDIA
SMT16B 3 SCREW	Off-line filtration, off-line filtration cart/trolleys, filtration & oil transfer	GR20 → GR110	8→3.200L (@2950rpm)	40bar	Hydraulic oils, water-oil emulsions, water-glycol emulsions, diesel oils

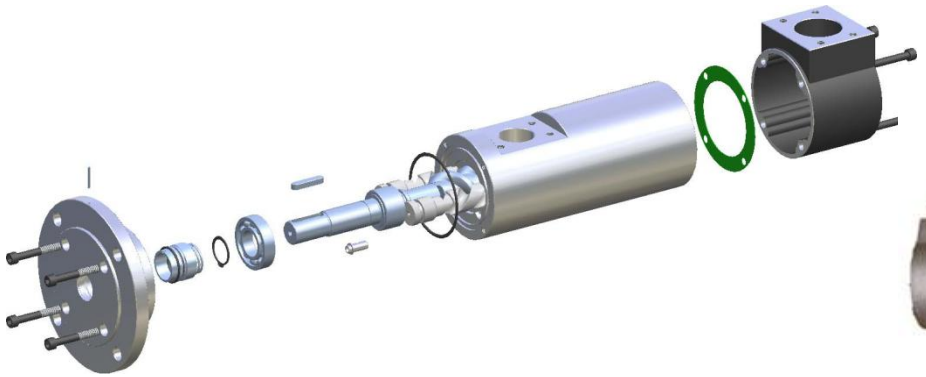


SMT & SMT16B series: SMT HA TM pumps

High pressure coolant, fuel oil handling and filtration applications

TECHNOLOGY	DETAILED APP.	SIZE	FLOWRATE	MAX PRESSURE	FLOW MEDIA
SMT 3 SCREW	Filtration systems, tool cooling, CNC machines, Chip conveyors	GR20 → GR80	4→1.800L (@2950rpm)	80bar	Cutting oils, water-oil emulsions, water-glycol emulsions





SMT & SMT16B series – application sectors

- **Gear Box Lube oil**
  - High viscosity lube
  - Air emulsion
  - Heavy duty application

Wind Energy

- High viscosity lubrication and filtration
- Cooling (gear boxes, transmissions, bearings, shaft)

SMT & SMT16B series – application sectors

Power generation

- Tandem solution for burner boosting systems
- Burners injection (power plants)
- Turbine & compressors lubrication (gear boxes, transmissions, bearing, shaft)
- Seal oil applications
- Jacking oil systems
- Filtration
- Lube service
- Seal oil services
- Oil transfer

SMT & SMT16B series – applications sectors

Industrial

- **Power hydraulics**
  - Presses, machine tools, working machines, rolling mill, dumping equipment, elevators, carriage pitch propellers, hydraulic winches etc. Power unit, mini power packs.

- **Injection moulding machines**
  - Cooling & filtration system
- **High & low pressure filtration systems**
  - Filtration systems, high pressure coolant, tool cooling, CNC machines (grinding machines, machine centers, deep hole drilling machines etc). Chip conveyors, Off-line filtration systems, off-line filtration cart/trolleys, filtration & oil transfer.

- **Hydro power**
  - Turbines & compressor lubrication power
- **Paper industry**
  - Lubrication, filtration

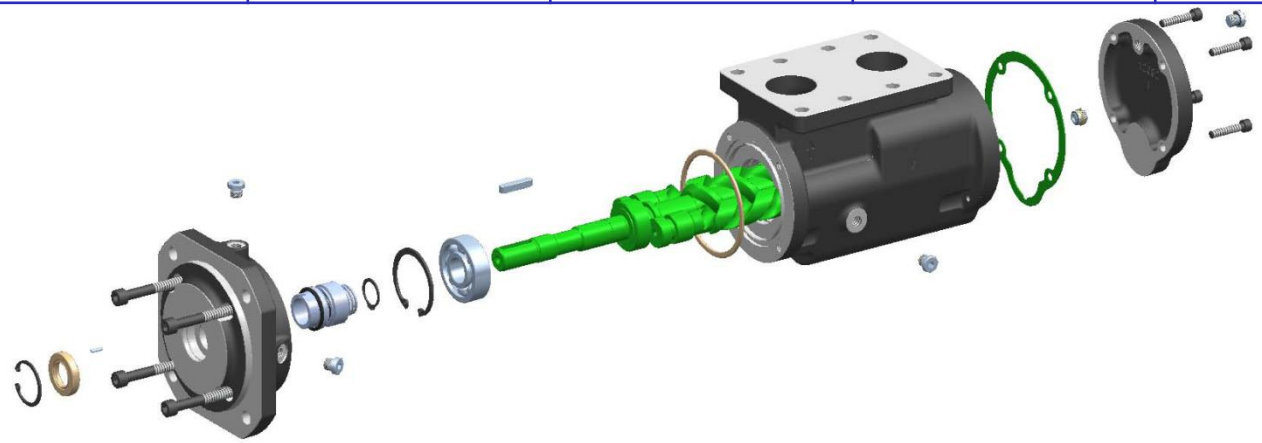
SFO series

Fuel oil handling pump (marine – power generation)

Designed to replace IMO ACE Series

In the SFO pumps the fluid has a uniform axial flow, which drives to a minimum of fluid pulsation and extremely quiet operation.

TECHNOLOGY	DETAILED APP.	SIZE	FLOWRATE	MAX PRESSURE	FLOW MEDIA
SMT16B 3 SCREW	Engine fuel filtration and boosting, burner boosting systems burners injection	GR25 GR32 GR40	12→75L (@1450rpm)	20bar (40 bar intermittent)	Mineral oil, synthetic oil, oil water emulsions, fuels, marine distillate fuels, marine residual fuels.



SFO series – applications sectors

Fuel oil Handling – Marine & power generation

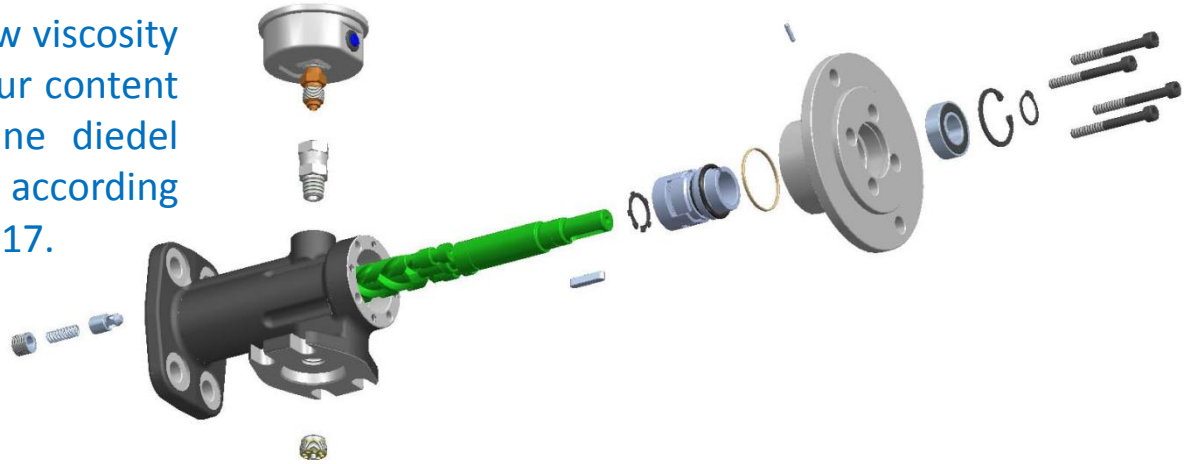
- Engine fuel filtration and boosting (shipyards and power plants)
- Circulation for filtration and cooling
- Engine fuel boosting and filtration
- Burner boosting systems
- Burners injection
- Transfer onboard
- refineries

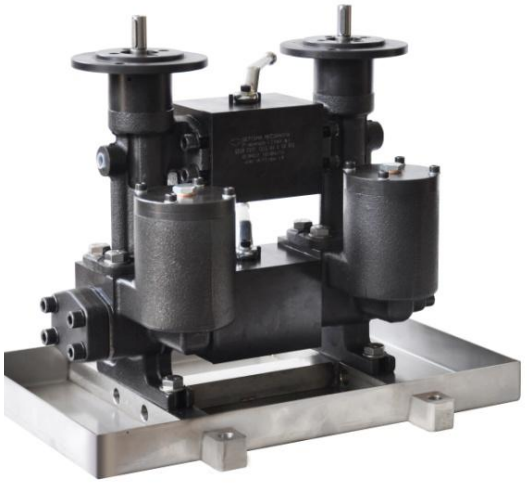
FOTP series

Fuel oil handling pump (marine – power generation)

TECHNOLOGY	DETAILED APP.	SIZE	FLOWRATE	MAX PRESSURE	FLOW MEDIA
SMT 3 SCREW	Burner boosting systems, burners injection.	GR20 GR25	8→30L (@3.000rpm)	70bar	Fuels, marine distillate fuels, marine residual fuels, all fuels according to latest ISO 8217 (DMX, DMA, DMB, DMC, DMZ)

Designed also as solution for low viscosity and low sulphur content for new marine diedel fuels (MDO), according to latest ISO8217.





FOTP series – application sectors

Fuel oil Handling – Marine & power generation

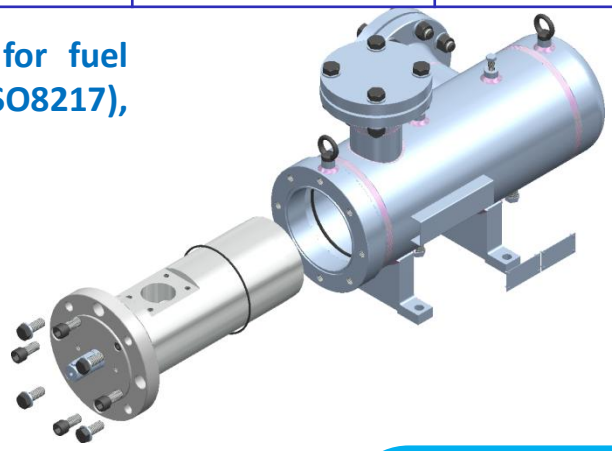
- Burner boosting systems
- Burners injection (shipyards and power plants)
- Feeder and circulation for fuels and lubricants in Marine enviroments
- Feeder, transfer and filling tank systems MDO, MGO, Low sulphur MDO, bunker oil
- Handling DMX (according to latest ISO 8217), DMA DMB, DMC, DMZ

SMAPI series

Oil & gas, power generation, Fuel oil handling pump: **API676 compliant**

TECHNOLOGY	DETAILED APP.	SIZE	FLOWRATE	MAX PRESSURE	FLOW MEDIA
SMT 3 SCREW	Off-shore platform, refineries, petrochemical, turbine & compressor, seal oil applications, jacking oil systems	GR20 → GR110	4→1.800L (@2950rpm) 1.800→3.200 over-busted	60 bar (80 bar intermittent)	Diesel fuel, HFO, MAZUT, bunker oi, furnace oil, engines oil, heating oil d& mineral, oil-in-water emulsions HFA, polyglycol water HFC, hydraulic oils DIN 51524

Smapi series HA designed for fuel compatibility with: SMX (ISO8217), DMA, DMB, DMC, DMZ



SMAPI series – application sectors

Oil & Gas

- Fuel oil pipe line
- Off-shore platform
- Refineries
- Petrochemical industry
- Off-line filters
- Transfer service

ACCORDING TO API 676 REGULATION

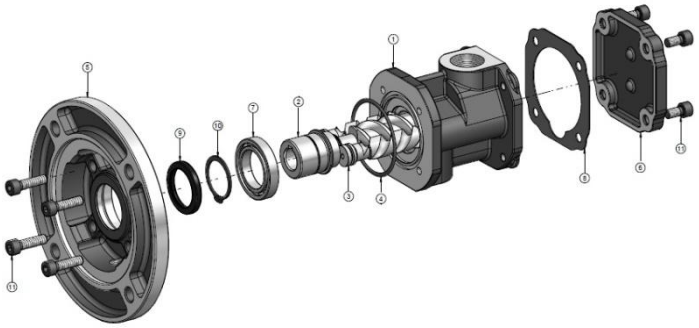
Marine Industry

- High flow & pressure steam boiler ignition
- Burner feeding
- Diesel engines feeding and ignition
- Fuel oil transfer (filtration, loading & unloading)
- Biodiesel applications

SMT8B series

Product range

- *Operating pressure*: 0-15 bar
- *Delivery flow range*: 15-80 L/min



			Standard hollow shaft availability				
Size	Type	LPM @1450rpm	AC14	AC19	AC24	AC28	AC38
GR32	26L	13	X*	X	X		
	30L	15					
	35L	17					
	45L	22					
GR40	60L	30		X	X	X	
	80L	40					
GR45	80L	40			X*	X	X
	12L	60					
	155L	77					

Technology: SMT 3 screws

*GR32 – AC14, GR45 – AC24 available on request

SMT8B series – application sectors

Wind energy

- Low pressure cooling
- Low pressure recirculation (pitch control)

Industrial

- Low pressure cooling
- Off-line compact cooling systems
- Powerpacks cooling
- Chillers

Mobile

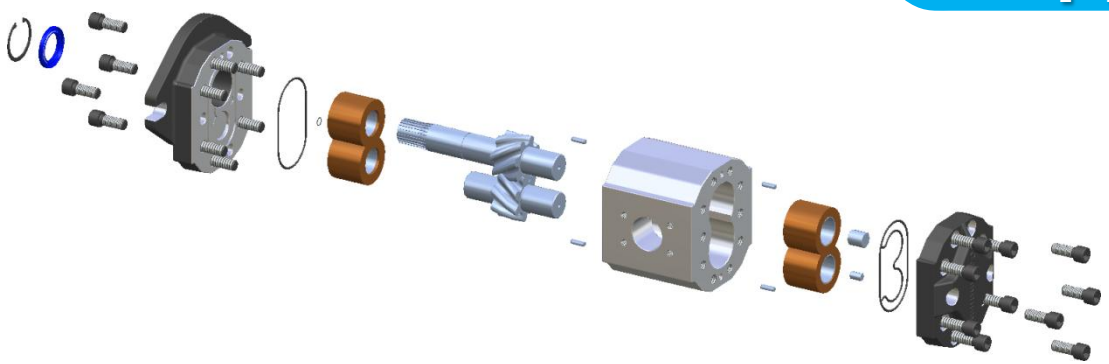
- Mobile machines cooling
- Filtration
- Low pressure recirculation

Settima product range

2 Helical Rotors Pumps – Continuum® Series

Continuum® series	Industrial application up to 280 bar
2VHL Continuum® series	Industrial application up to 25 bar

Continuum® series



Product description

*GR92, GR106 available soon

TECHNOLOGY	DETAILED APP.	SIZE	CC	FLOWRATE (@1450rpm)	MAX PRESSURE	FLOW MEDIA
Continuum® helical rotors	Marine power Hydraulic, Yacht building industry, Elevator, Lift, Hydraulics tyres lift, Power hydraulics, Injection moulding machines, Hydro power, Paper industry, Power units, Steering units, Forklift, Mobile compactors	GR28 GR33 GR38 GR47 GR55 GR72 GR92* GR106*	4→13 10→18 16→28 28→50 50→90 94→220	6→18,6L 14,5→26,1 22,8→40,7 40,3→72,4 72,7→130,9 136→290	280bar (Please contact Settima for single pressure data for each cc)	Mineral oils , Synthetic oils

*Available soon

Continuum ® pumps

Helical rotor pumps for high pressure low noise applications
Patents Approved in EU, US , China and Canada

GO SILENTLY

One of the most important request from the industrial world is to create a better working environment, which is synonymous of better efficiency, production lower cost and better life quality of workers. The reduction of function noise goes with no doubt into that direction.
Hydraulic pumps, above all those for high pressure, entail noise and/or vibration level that are unacceptable for certain new applications. This is the main reason why *Settima* has designed a new gear pumps generation capable to eliminate acoustic emissions.
Parameters influencing emissions of hydraulic noise are:

- cavitation
- pressure peaks arising from trapping fluid between gear teeth
- ripple or flow pulsation

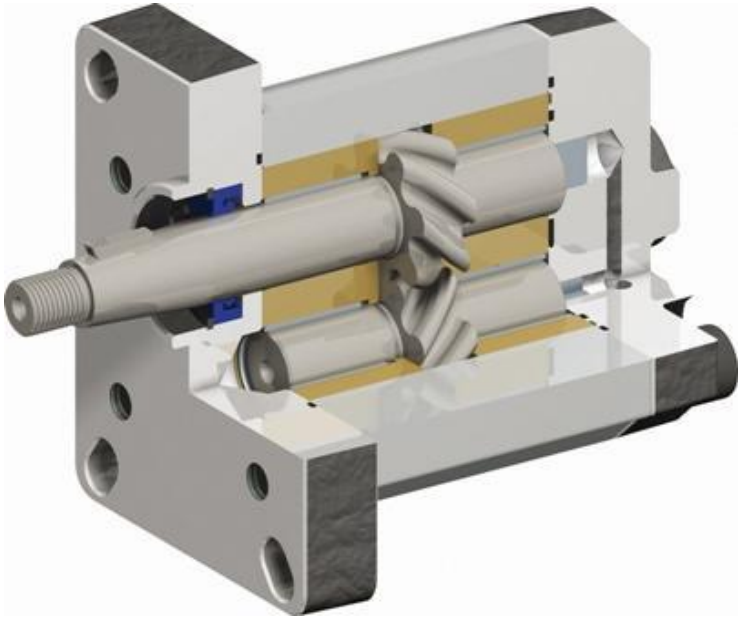
Continuum® is capable to eliminate those parameters causing noise.

Thinking beyond traditional process design

No noise *Continuum®* concept

Internationally patented:

- the **rotors profile**
- the **screw step**
- the inner **force balancing**



Main *Continuum®* advantages

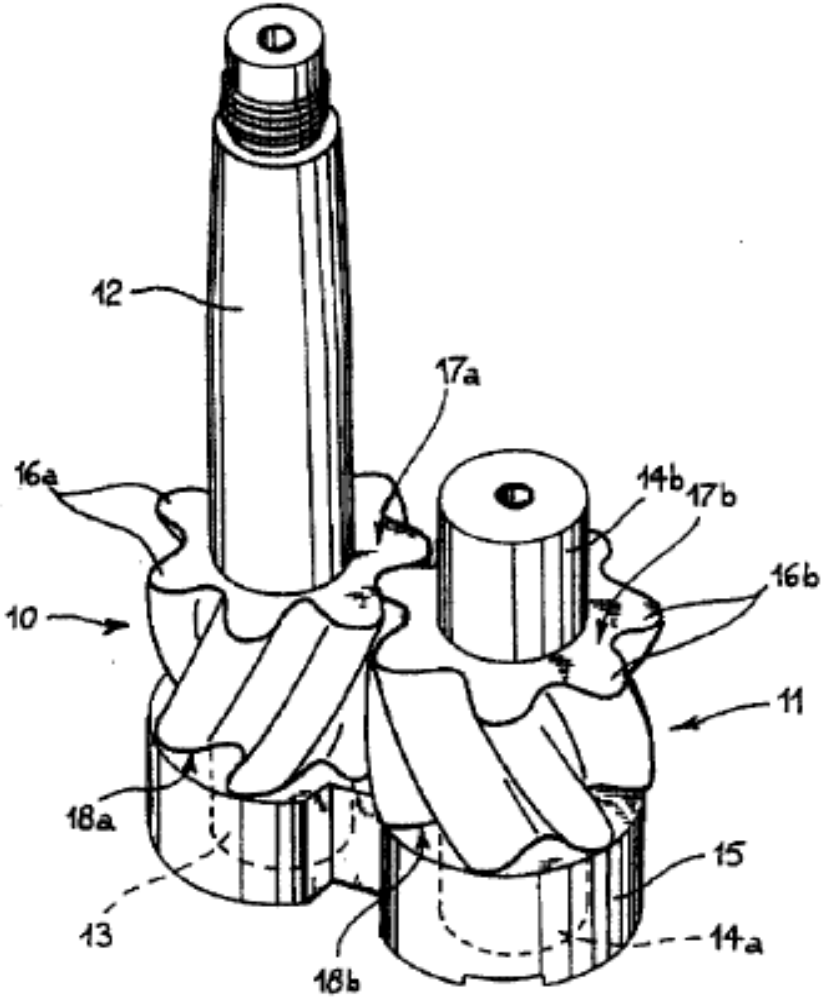
- **average 15 db(A) less noise than standard external gear pump**
- **reduced noise level for the machine operator and the surroundings**
- **cost saving by eliminating second noise reduction measures**
- **easy to replace thanks to compatibility with all the external gear pumps**
- **helps meet legal noise limit requirements**

The silent way to replace gears pumps

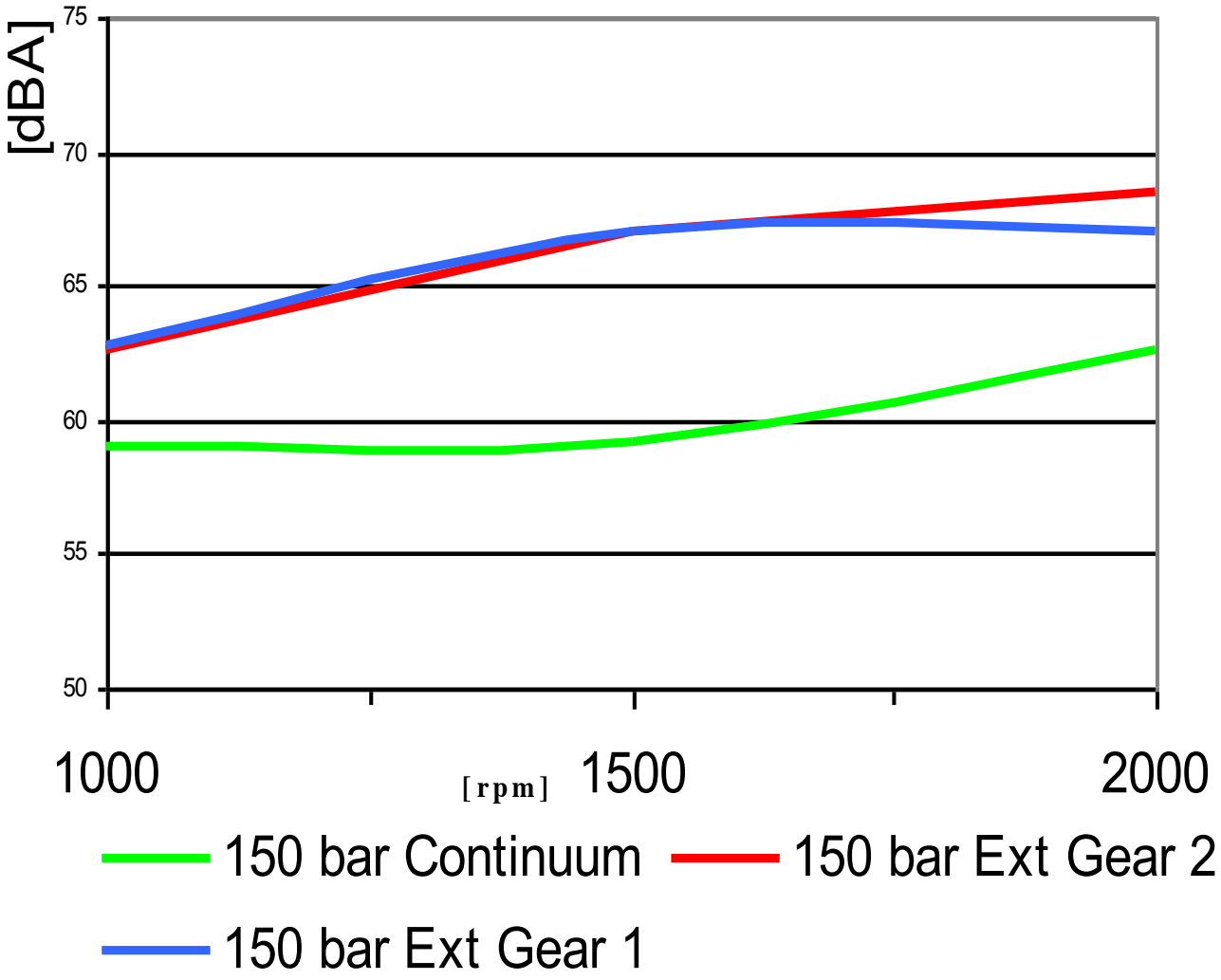
The innovation behind

KNOCK DOWN THE NOISE:

The especially studied rotor profile does not trap any fluid volume (no encapsulation chambers).
The helical course (there is just a single point of contact between rotors) of the Continuum rotor profile makes a gentle transmission of movement and minimization of the any pulsation. Internal hydrostatic mechanisms are put in place in order to avoid trade-off with efficiency.

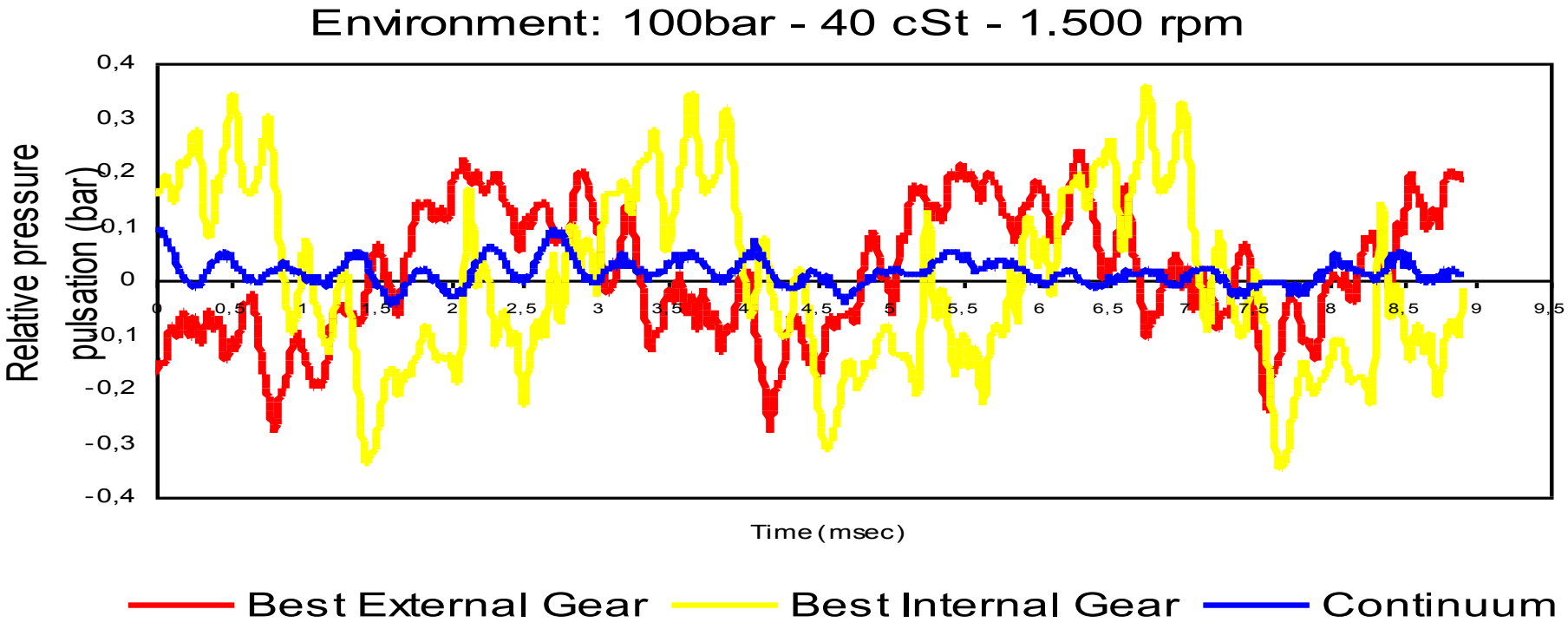


Sustainable power



Pulsation is harmful

- In Hose and Pipe design is paramount pressure pulsation; in fact pressure pulsation affects the hydraulic system lifetime;
- Noise not only is generated by the pumps but in most cases the systems generated noise by amplifying the ripple. Consequent pressure drops are a noticeable energy consumption and reducing overall efficiency.



The innovation behind

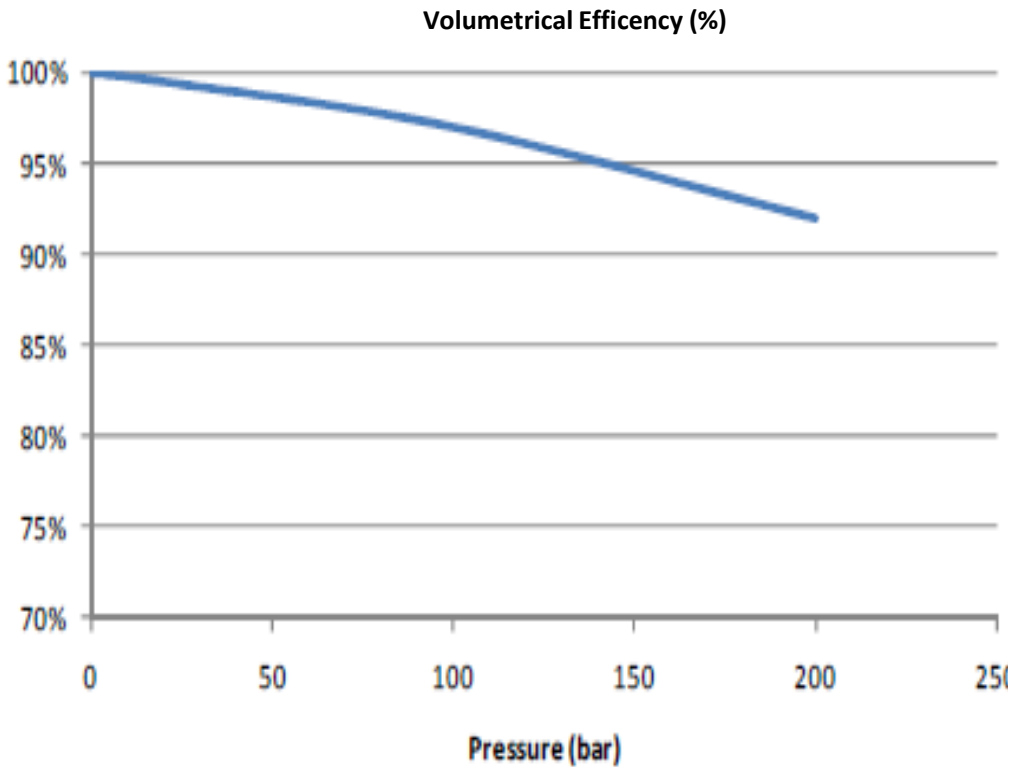
Continuum® Main characteristics

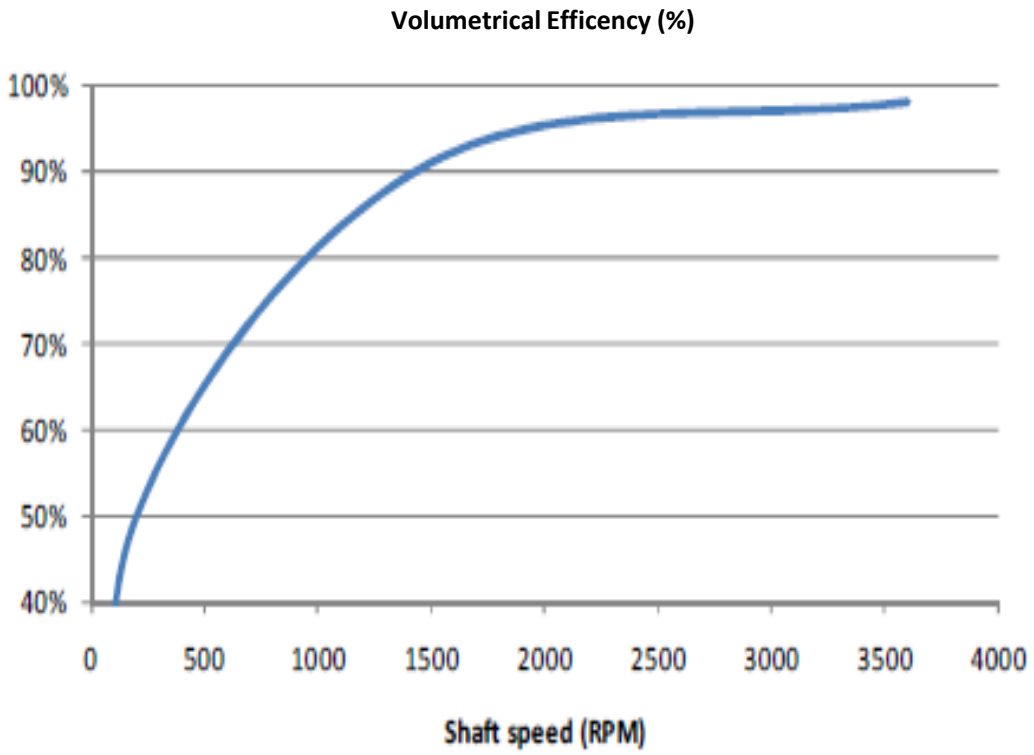
- Reduced energy requirement
- Lower noise levels
- High speed of operations: up to 6500rpm (only some models at special applications)
- Continuously variable flow rate: 0% to 100%
- Unidirectional pump to bi-directional pump/motor
- Intermittent operation at high pressure and low speed with no net flow is possible
- Driven by servo-motors and/or a variety of asynchronous motors
- Pressure up to 280 bar
- Can operate for some short time as reversible pump
- Fast reverse rpm is allowed: CCW max < 400 rpm
- Response time < 100ms due to very small internal mechanical inertia

The innovation behind

Continuum® volumetric efficiency

The volumetric efficiency of Continuum® pumps is depending on both pressure and speed. Continuum® pumps achieve high volumetric efficiencies.

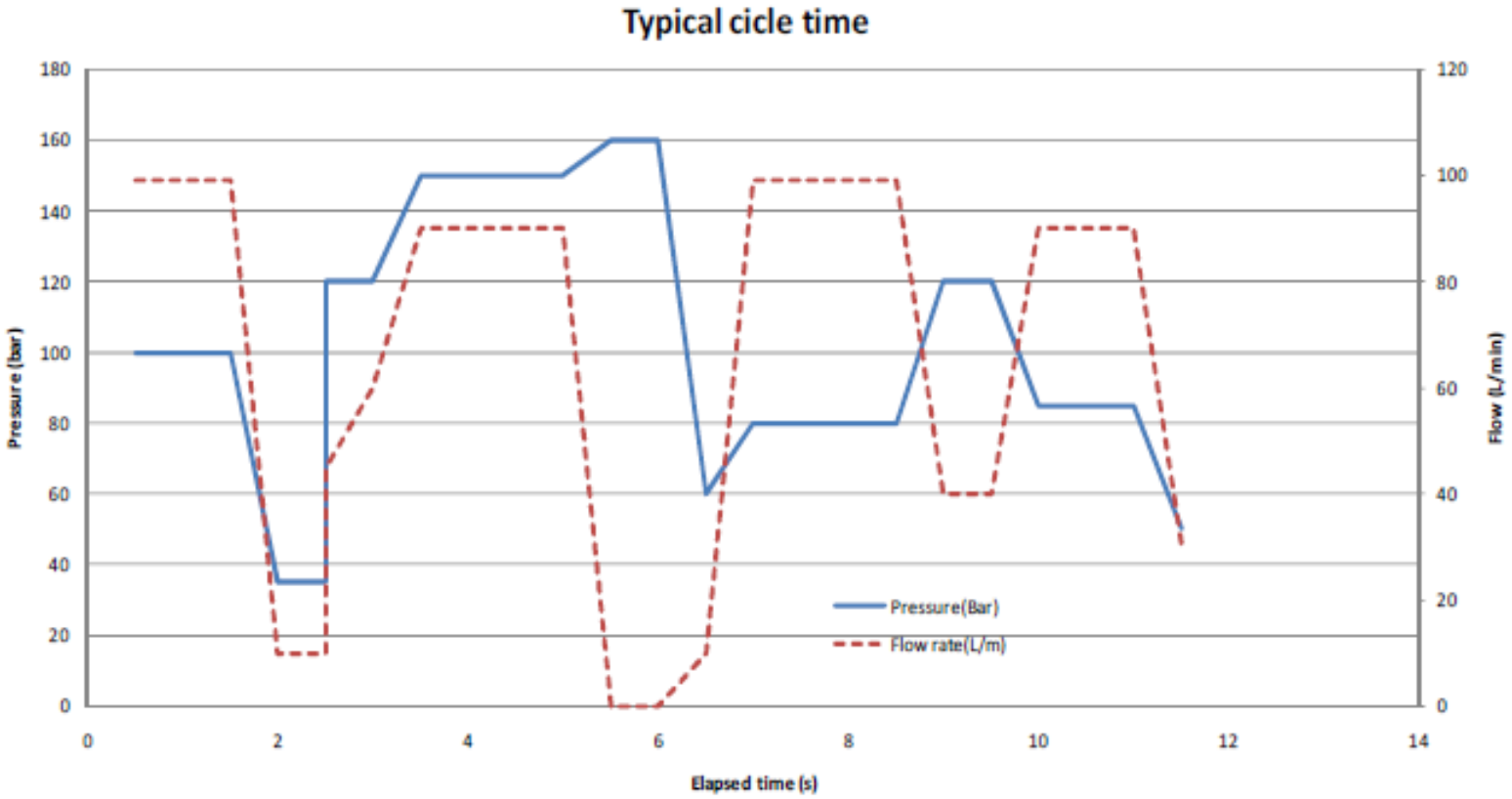




The innovation behind

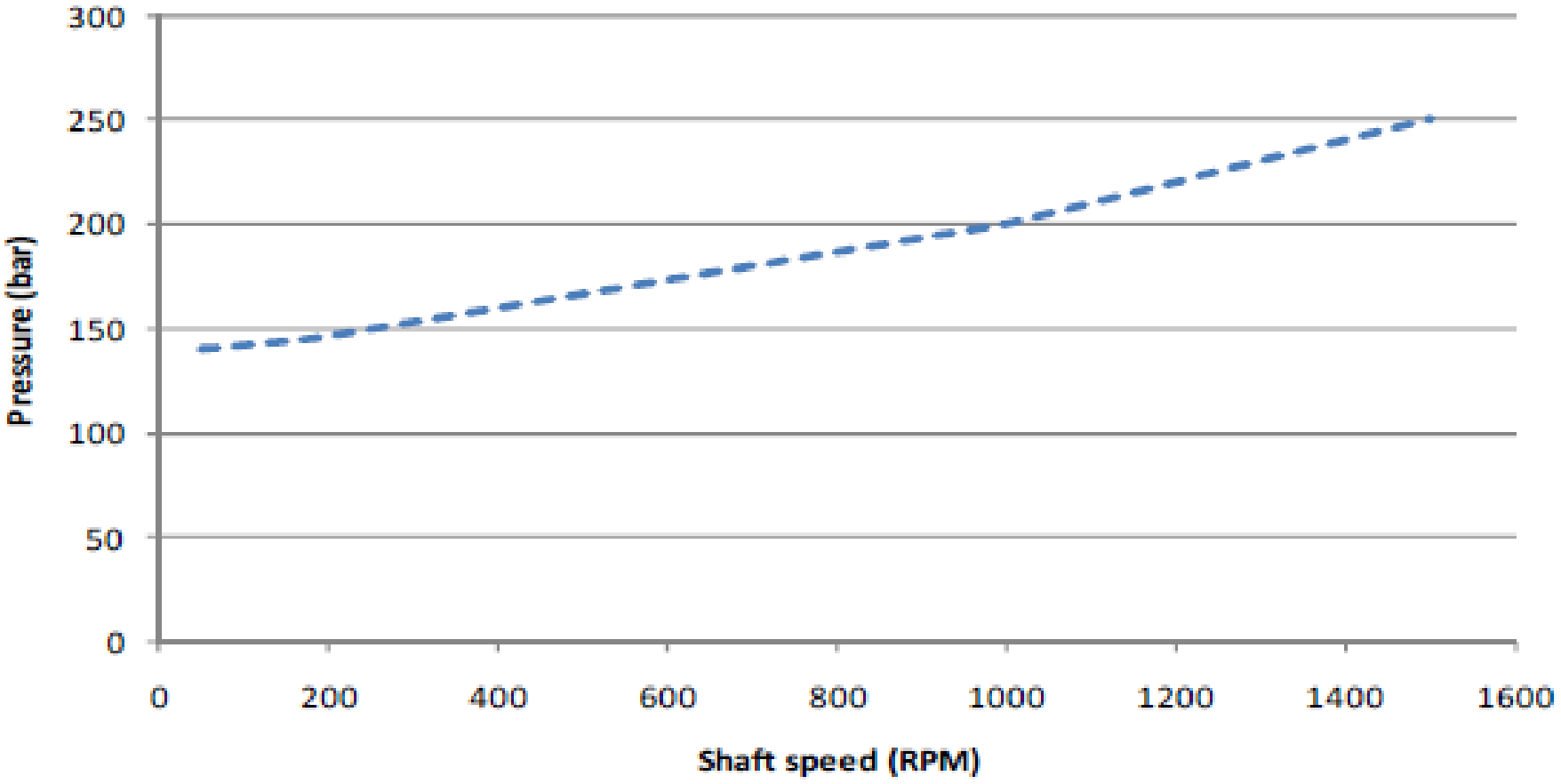
Example of press machinery load cycle for a Continuum® pump with variable speed drive

Maximum time for pressure holding duty (Q=0 l/min) is depending on pressure, duty cycle and pump type.



The innovation behind

Minimum speeds as a function of pressure



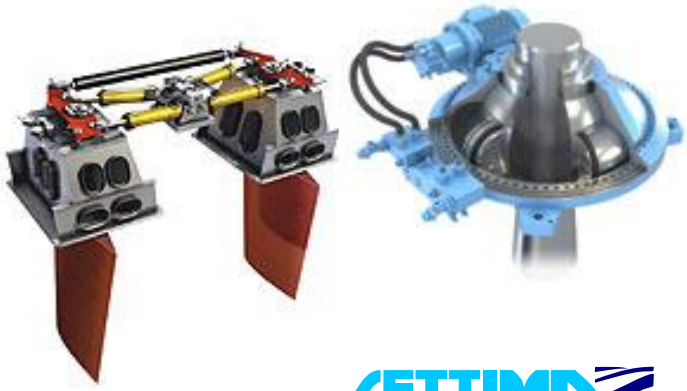
Continuum® series – application sectors

Marine

- Marine power hydraulics
- Rudder actuators (tandem systems)
- Propeller pitch control
- Propeller drive (power transmissions from engine)
- Minipowerpacks (Dock operation, door control)
- Diesel pump
- Yacht building industry (Lifting systems: fly bridge cranes, tenderlift, elevators, walkways, transformers, automatic swimming ladders, side boarding ladders, pitch controls and operations)

Building industry

- Elevator
- Lift
- Scissor lift
- Hydraulic tyres lift



Continuum® series – application sectors

Industrial

- Power hydraulics
- Injection moulding machines: servo drive systems, power
- Filtration-cooling
- Hydro power
- Energy, Steel, Paper industry
- Dosing/metering
- Presses, leather cutting syst.

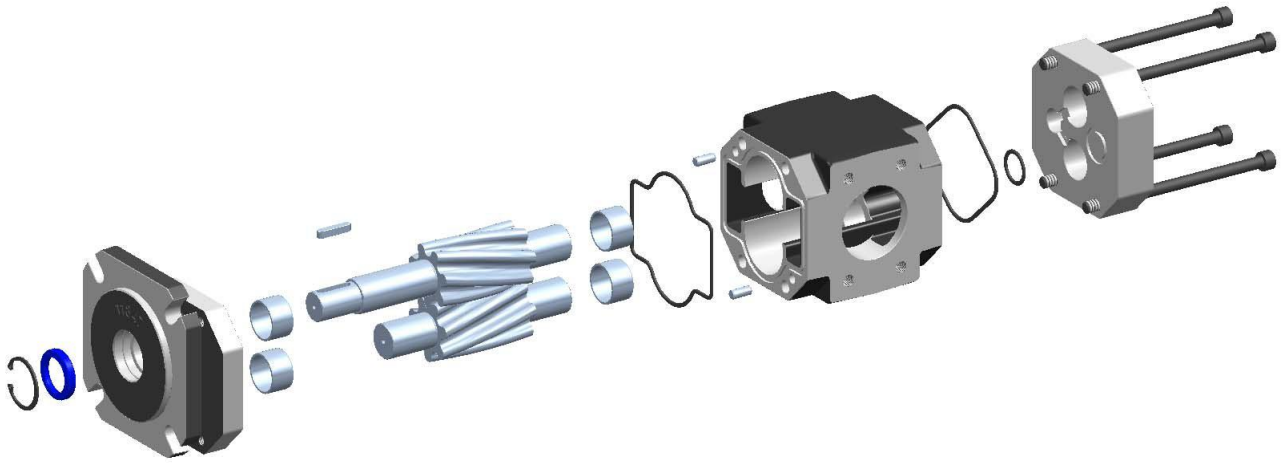
Mobile

- Power Units
- Forklift
- Mobile compactors
- Steering units
- Parking systems
- Truck, Tractors

2VHL Continuum® series

Product description

TECHNOLOGY	DETAILED APP.	SIZE	CC	FLOWRATE	MAX PRESSURE	FLOW MEDIA
Continuum® helical rotors	Turbine & compressors (gear boxes, transmissions, bearings, shaft) Filtration Cooling Recirculation	GR47 GR55	28→63 75→160	40→90 L/min (@1450rpm) 100→230 L/min (@1750RPM)	25 bar (peak 40 bar)	Hydraulic fluids (mineral & synthetic), thermal oils, emulsions, polyglycol oil, heavy oil, other fluids upon request



2VHL Continuum® series – application sectors

Power generation

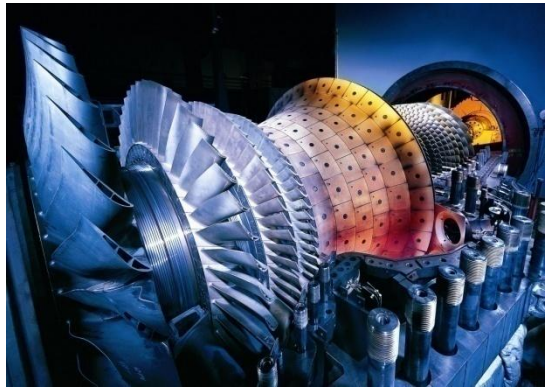
- Oil filtration and cooling for turbine & compressors
- Turbine and compressors lubrication
- Filtration and cooling (gear boxes, transmissions, bearings, shafts)

Marine

- Oil filtration
- Cooling
- Recirculation
- Transfer

Wind energy

- Lubrication
- Filtration
- Cooling (gear boxes, transmissions, bearings, shafts)



Industrial

- Filtration & cooling

Pump technology comparison

Information reported below is as basic scheme – for more information ask Settima

Pump type	Flow	Noise	Pressure / Flow pulsation	Pressure	Efficency	Energy saving	Dirty particles insensitiveness
Screw	1	1	1	3	4	4	1
Continuum	2	1	1	4	2	1	2
External gear	4	5	5	4	2	3	3
Internal gear	4	3	4	5	1	2	4
Vane	2	3	4	3	3	4	5
Piston	3	4	5	1	1	4	5
Vane - variable displacement	2	3	4	3	3	2	5
Piston - variable displacement	3	4	5	1	1	1	5

Application summary

Information reported below is as basic scheme
for more information ask Settima

	Basic	SM	SMT	SMT	SMT	SMT	SMT	SMT8B	SMT16B	SMT16B	SMT16B	SMT16B	SMAPI	Continuum®
	Options			SN	G	G HA	K HA			S1, S2...S4	G	K HA		
Cooling									X					
Cooling (water & glycole)											X			
Cooling systems - compact								X						
Diesel boilers injection						X								
Diesel oil high pressure						X								
Elevators		X												
Filtration systems											X	X		
Filtration systems - offline/portable														
Lube services										X				
Lube services - Bearing				X						X			X	
Lube services - Bearing jacking, high pressure														X
Lube services - gear boxes / air emulsions				X										
Lube services - power generation/oil & gas industry				X									X	
Lube services - Turbines				X									X	
Lube services (wide viscosity range)				X										
Marine control - propeller drive, picth control, actuators														X
Mobile hydraulics - forklift														X
Mobile hydraulics - steering systems														X
Oil transfer / Fluid transfer									X					
Parking systems		X												X
Power Hydraulics			X		X									X
Power packs									X					X
Power packs - minipower packs														X
Presses / Compactors			X											X
Tool machines - Coolant fluid transfer											X			
Tool machines - Coolant systems												X		
Tool machines - Coolant systems - high pressure							X							
Tool machines - rotary joint jacking														X
Tool machines - tool handling / axis control & movements														X

Product certification

- **ISO 9001 – DNV**
  - All the products of Settima are manufactured according to this standard
- Additional certification (free of charge under request)
  - **ATEX**: area CE eX II 2 GD ck T3
  - Material certification: **EN10204 3.1b**
- Marine certifications
  - **ABS, BV, DNV, LLOYD, RINA, CCS, RS, GL, KR, NK**

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research & innovation, always

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