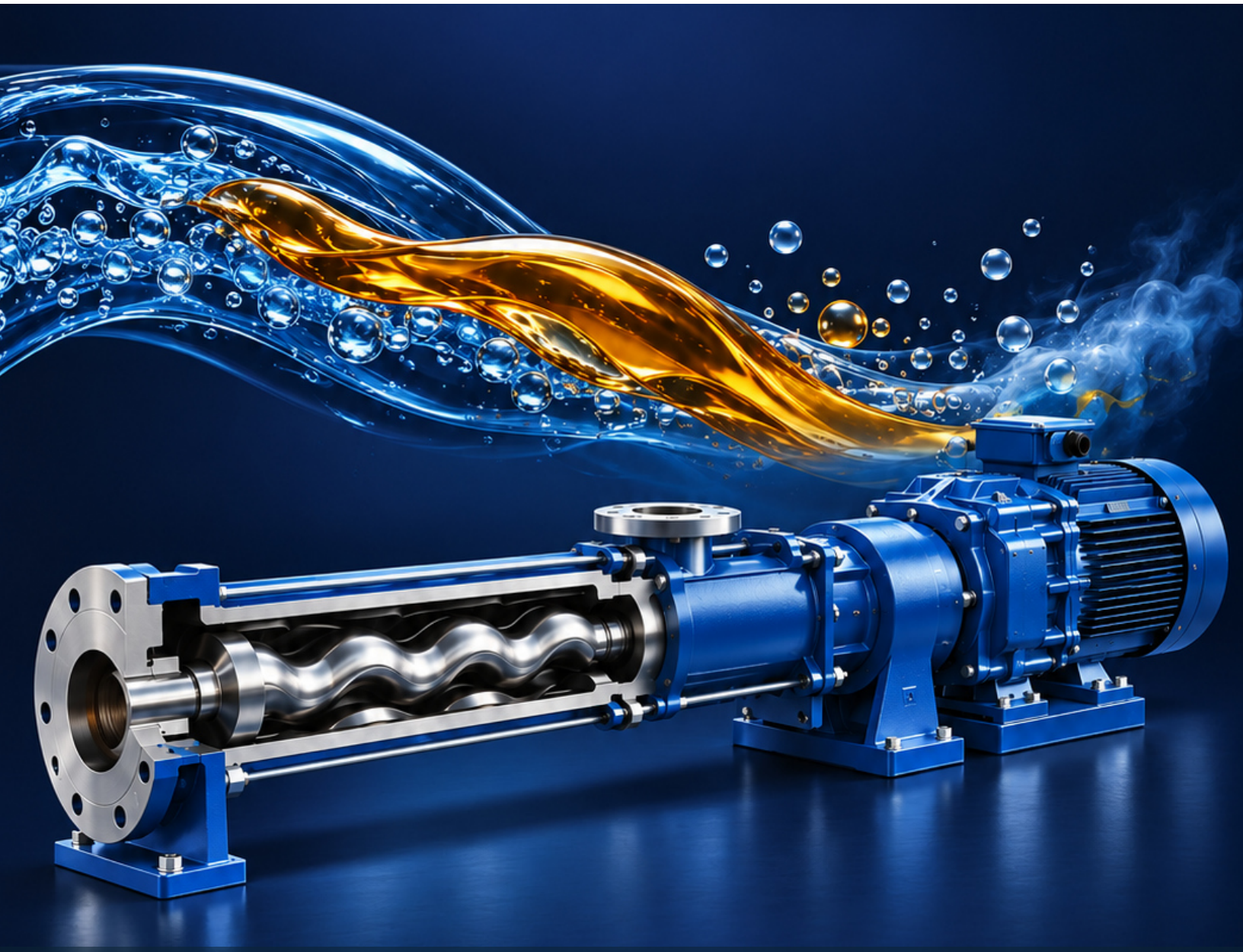
NOVA PETROLEUM
SERVICES

Multiphase Surface Progressive Cavity Pumps

Complete design and supply of multiphase PCP systems for oil, water and gas production.



COMPLETE PRODUCT BROCHURE

Technology, equipment and application

A complete guide to NOVA multiphase surface progressive cavity pump systems.

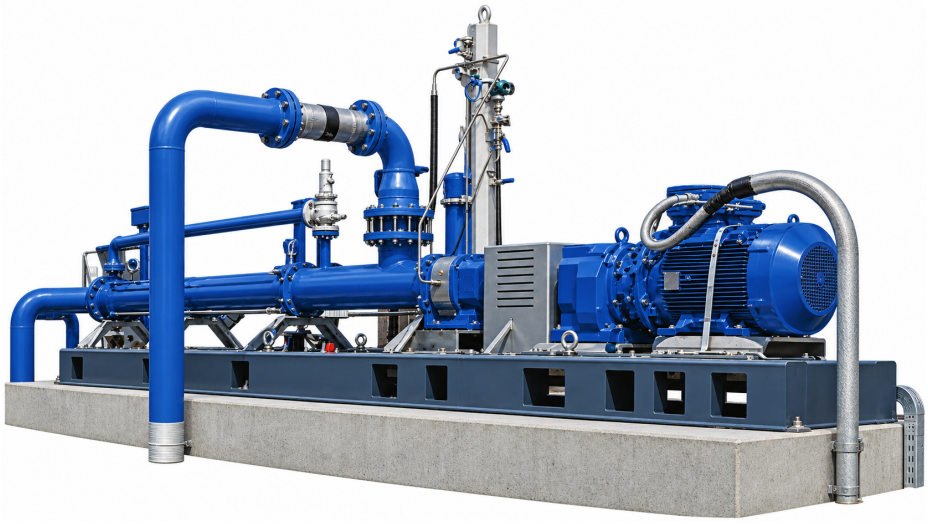
NOVA Petroleum Services supplies application-specific surface PCP packages for oil, water, free gas and solids-bearing production streams. Pump selection combines the production duty, wetted materials, drive train, sealing, protection and site interfaces.

Explore the system	Pages
Multiphase pumping technologies	03
Sectional and exploded assembly drawings	04-05
Well boosting, crude oil transfer and benefits	06
Complete equipment schedule and package components	07-08
Piping, recycle and injection arrangements	09
API 682: seal arrangements, plans and illustrations	10-13
Operating references, protection and testing	14-15
Sour service, material options, wear and viscosity	16-18
VN100-A10 performance curve	19
Data request form and expanded enquiry sheets	20-22
Integration, technical qualifications and contact	23-26

The illustrated configurations and published values support application discussions. The agreed datasheets, drawings and purchase specification define the selected package and its performance commitments.

MULTIPHASE SURFACE PROGRESSIVE CAVITY PUMP

Technologies



Representative complete multiphase surface PCP package.

Multiphase pumping has become a critical component in many production schemes. Far from being a niche technology, it is fast becoming a standard component of the modern oil and gas production system. Multiphase pumps provide cost savings and operational flexibility in applications as diverse as onshore heavy oil and subsea/offshore conventional oil.

A PCP is a positive displacement pump. Its pumping element consists of two components: a single-winding rotor with a round cross-section and a stationary element called the stator. NOVA provides a complete solution for the design and supply of all components for multiphase applications.

We supply all equipment, including the skid-mounted pump, stator and rotor, fixed-speed or variable-speed drive, gearbox, electric motor, junction box, surface electrical equipment and a dedicated control system. We have established alliances with leading manufacturers to produce robust PCP systems at an affordable price compared with other options.

Stator elastomers

We understand that elastomers are a critical component in PCP operating conditions. Our commitment to selecting the best materials for H2S, CO2 and high-temperature conditions is a key factor in ensuring the reliability and longevity of our equipment, giving our customers peace of mind.

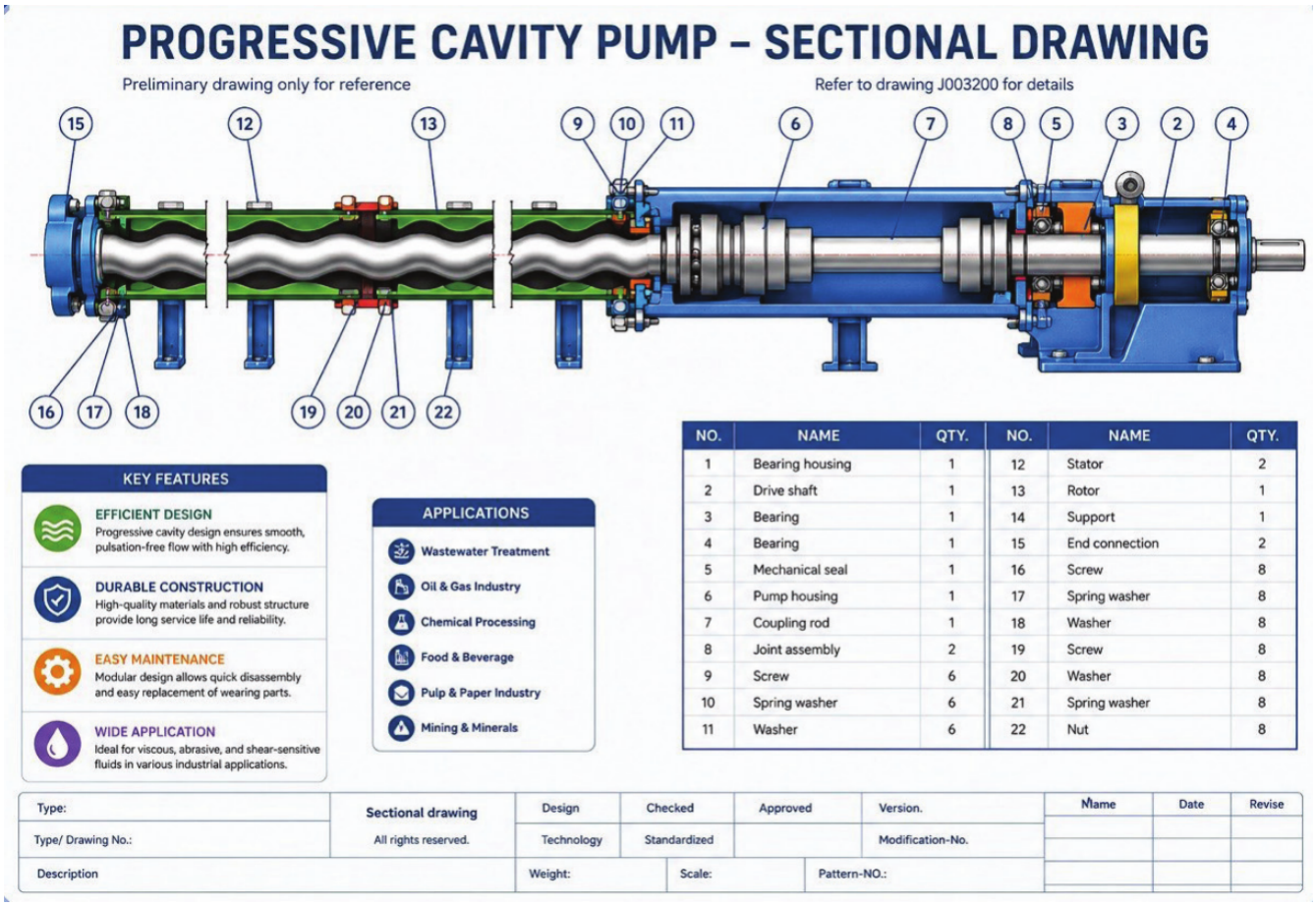
We have developed a series of elastomer formulations for different conditions, demonstrating our adaptability and problem-solving skills in meeting diverse operational challenges.

This brochure addresses surface packages; subsea and other specialised installations require a separate project-specific review.

INSIDE THE PUMP

Sectional drawing

A helical rotor turns eccentrically inside the stator, advancing cavities from inlet to discharge.



Preliminary supplier reference drawing J003200. Component numbers and quantities are specific to the illustrated assembly.

Pumping element

Rotor (13) and stator (12) form progressing cavities. Actual delivery depends on speed, cavity filling, differential pressure, slip, fluid properties and wear.

Power transmission

The drive shaft (2), bearings (3/4), coupling rod (7) and joints (8) transmit rotation. The mechanical seal (5) provides shaft containment.

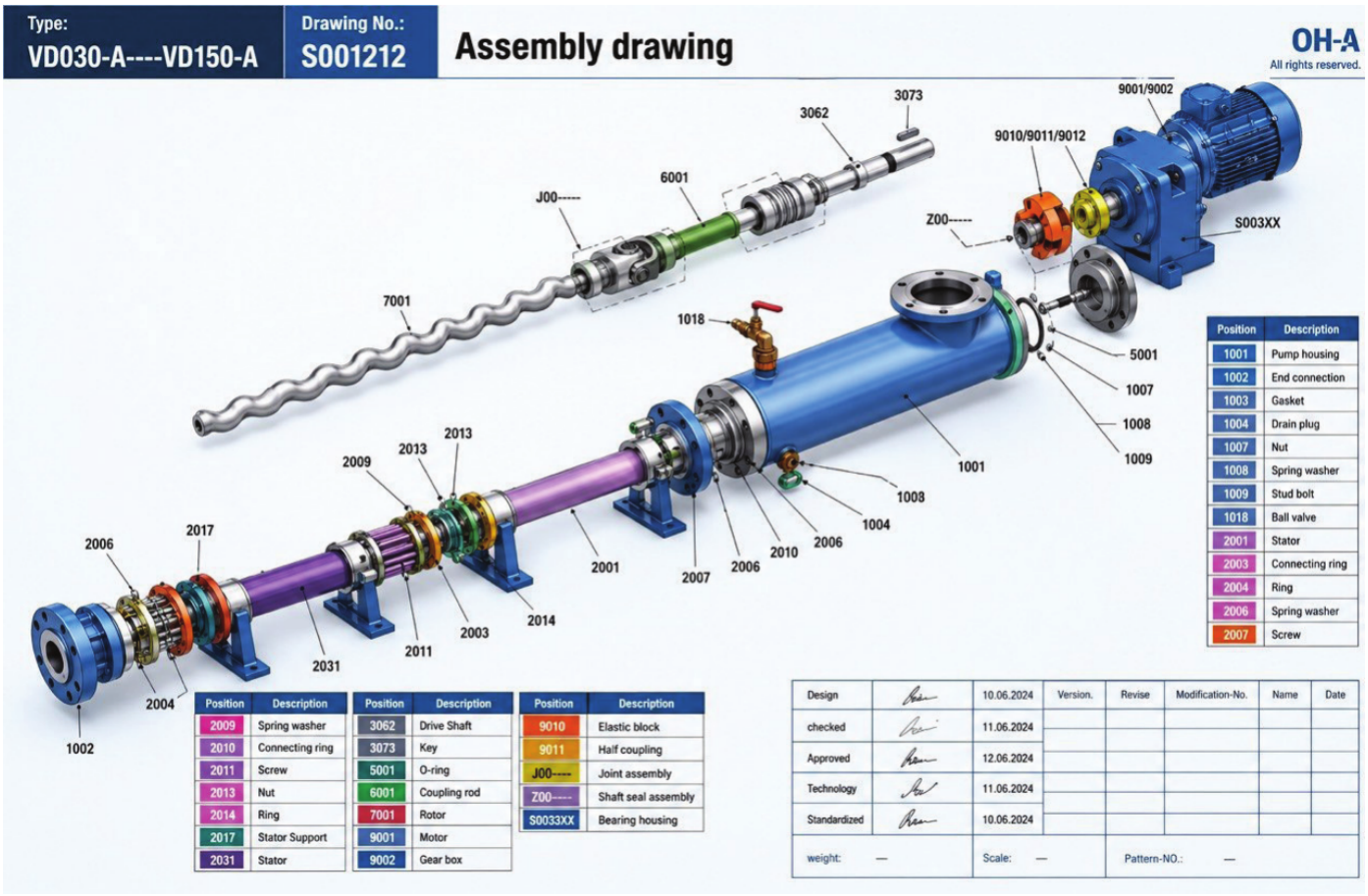
Design features: smooth low-pulsation flow, durable construction and replaceable wear parts. PCP technology serves viscous, abrasive and shear-sensitive fluids across oil and gas, wastewater, chemical processing, food and beverage, pulp and paper, and mining. Material and hygiene requirements differ by application.

The reference illustration is not a certified general arrangement or manufacturing drawing for an offered NOVA package.

COMPONENTS AND MAINTENANCE

Exploded assembly drawing

A detailed reference for the wet end, drive shaft, joints, seal assembly and drive train.



Supplier reference S001212, VD030-A to VD150-A family. Original drawing identifiers retained for traceability.

Wet end and connections

Housing 1001; end connection 1002; gasket 1003; drain plug 1004; ball valve 1018; stators 2001/2031; stator support 2017; rotor 7001.

Drive and containment

Drive shaft 3062; key 3073; O-ring 5001; coupling rod 6001; joint J00; shaft seal Z00; bearing housing S003XX; motor 9001; gearbox 9002.

The figure also retains the complete connecting-ring, washer, fastener and coupling references. Match every replacement part to the actual pump serial number and certified bill of materials; drawing positions alone do not establish interchangeability.

Provide removal space for the rotor and stator, safe lifting points and access to couplings, joints, seals, drains and guards.

APPLICATIONS AND BENEFITS

Boost production. Transfer difficult fluids.

Application-specific equipment for multiphase surface PCP duties, supported by ongoing research and development.



Representative installation from the supplied product literature; image enhanced for clarity.

Boosting wells into high-pressure gathering systems

Surface PCPs can boost low-pressure wellstreams into higher-pressure gathering systems as an alternative to separate vessels and conventional gas compression. Applications include naturally flowing, gas-lifted and ESP wells. Reduced wellhead backpressure can support incremental production, improved efficiency and lower operating cost where the reservoir and facilities permit.

Crude oil transfer and related services

Onshore and offshore duties include multiphase boosting, enhanced oil recovery, oil and gas processing, produced-water treatment and well services. Progressing cavities transfer viscous fluids and emulsions; rotor finish, stator compound and operating speed are selected for erosion and abrasive loading.

Operational advantages

Controlled positive-displacement delivery; a simple pumping element with fewer components; free-gas handling; potential reductions in power consumption, maintenance and total operating cost. Fixed- or variable-speed operation can suit changing production.

Practical operating conditions

The pumping element is valveless, although package piping still needs valves. Backpressure affects slip and torque. High-GVF operation requires adequate liquid and temperature protection. Installation and operation depend on complete site integration.

Remote operation: packages may serve remote sites when a suitable power or prime-mover arrangement is provided. Steady operating demand can simplify energy planning; the pump still requires energy. Factory assembly can simplify site installation and commissioning.

Benefits are application-dependent. Published reference values, including efficiency and low-speed operation, appear on page 14.

COMPLETE PACKAGE SPECIFICATION

Equipment and standards schedule

References are a starting basis for the enquiry; applicability, edition and exceptions are agreed for each purchase.

Item	Component	Reference specification / selection
01	Pump	API 676; materials and construction selected for the application.
02	Mechanical seal	Single or dual cartridge; API 682 Category 1 basis where specified.
03	Seal support system	Selected API seal plan, with cooling as required; Plan 53B is one option.
04	Coupling with spacer	Spacer-type coupling; AGMA 9000 Class 9 reference in the source schedule.
05	Guard	Guard the rotating drive components; geometry and access suit the selected train.
06	Gearbox	Helical reducer; source minimum service factor 1.5; AGMA 6009/6010 basis.
07	Shaft seal	Single or dual mechanical-seal assembly with its matched support system.
08	Stator	Nitrile (NBR), hydrogenated nitrile (HNBR) or fluorocarbon (FKM); compound qualified for duty.
09	Piping	Flanged connections to ASME B16.5 where specified; piping class defined separately.
10	Motor	Safe-area or hazardous-area execution; fixed-speed or VFD duty as required.
11	Vent / drain valves	Ball valves, with flanged ASME B16.5 connections where specified.
12	Baseplate	Long-coupled cold-service arrangement; extended mild-steel base with drip tray; API 676 basis.
13	Surface protection	Coating specification to contract; NORSOK M-501 where required.
14	Optional coupling / spacer	API 671 corrosion-resistant metallic flexible coupling and spacer option.

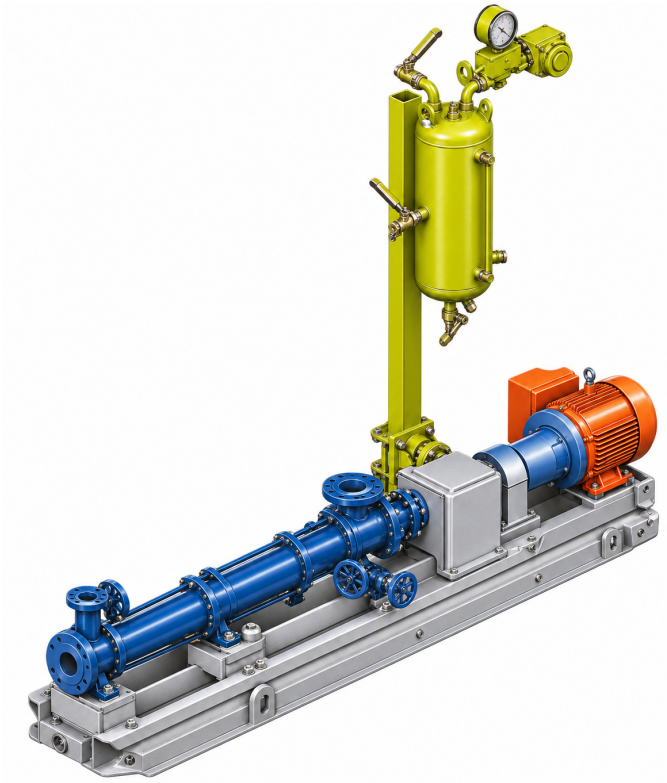
The source repeats mechanical seal and shaft seal as separate entries; both are retained to make the package scope explicit. Bearing, gear and coupling references must be assigned to the correct component. See engineering qualifications on page 24.

A listed standard is not blanket certification. Final compliance is established by the accepted technical specification and documentation.

PACKAGE ARCHITECTURE

Complete surface PCP package

The component callouts below retain the scope of the original annotated package illustration.



Seal support system

Plan and cooling arrangement selected for the process and mechanical seal.

Motor and gearbox

Safe or hazardous area motor; helical gearbox with the agreed AGMA basis.

Mechanical seal

Single or dual; API 682 Category 1 basis when specified.

Pump

API 676 basis; materials of construction matched to the application.

Coupling

Spacer type; alignment, torque rating, balance and guard coordinated.

Vent and drain valves

Ball valves; specified flanges and safe discharge or collection routes.

Baseplate

Long- or close-coupled arrangement, extended steel base and drip tray.

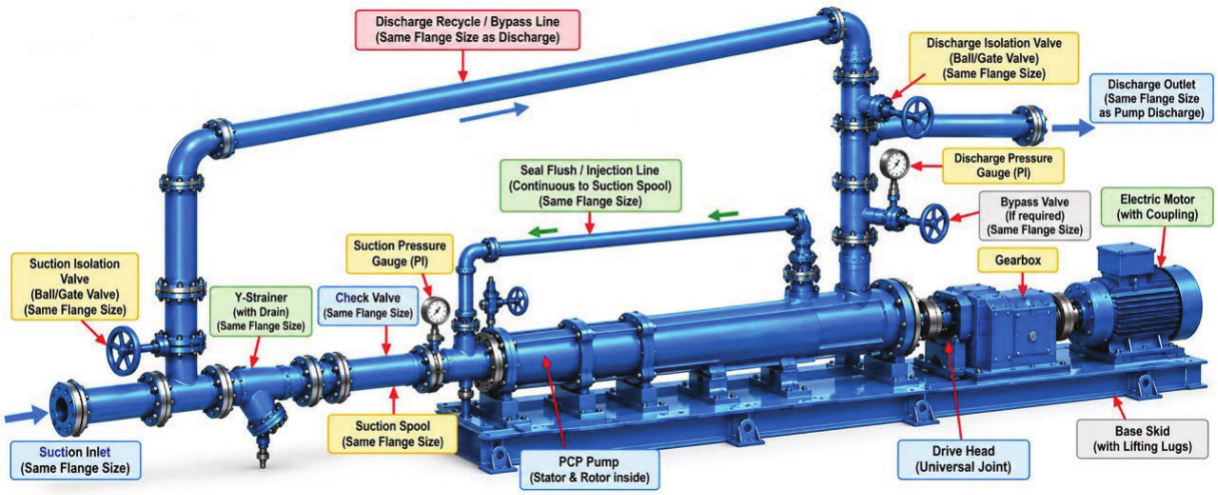
Additional supply interfaces	Define in the quotation
Electrical and controls	Starter/VFD, junction boxes, local panel, instruments, remote signals and control system.
Utilities and boundaries	Seal fluid, liquid injection/recycle, cooling, foundations, piping, cabling and commissioning.

Representative package illustration. Final dimensions, connections and maintenance clearances follow the approved drawings.

PROCESS INTERFACES

Piping, recycle and injection

Coordinate the pump with the inlet, discharge, auxiliary liquid and protective systems.



Illustrative arrangement from the supplied literature. It is not a project P&ID; connections, ratings and routing require confirmation.

System	Function and design considerations
Suction	Inlet isolation, strainer with drain where appropriate, pressure measurement and suction spool. Check inlet losses, fouling and available NPSH.
Discharge	Outlet isolation, pressure monitoring and non-return function where required. Provide engineered overpressure protection and a safe relief route.
Recycle / bypass	Controlled return or bypass path where needed for the operating strategy; assess heat accumulation and the effect on net delivered flow.
Flush / liquid injection	A defined compatible liquid supply may support seal operation or high-GVF duty. Confirm injection point, rate, pressure, quality and availability.
Skid integration	Coordinate drive head, joints, gearbox, motor, coupling, lifting provisions and maintenance access with the installed piping.

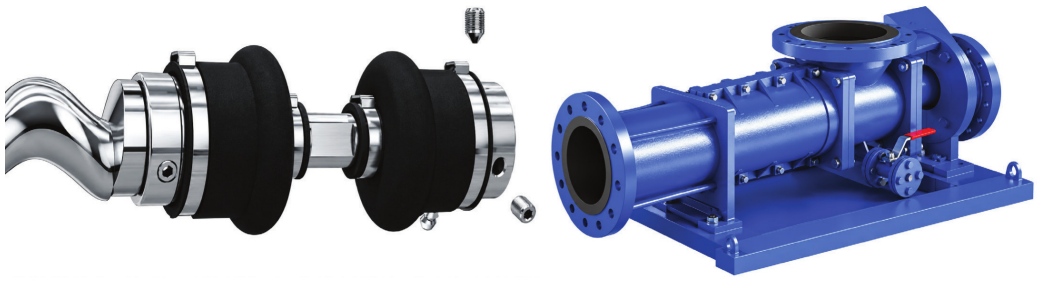
Gas and liquid management: define continuous and transient inlet GVF, liquid slugs, gas slugs and minimum liquid availability. Gas compression and friction add heat. Confirm temperature trips, auxiliary-liquid needs and the response to loss of liquid or blocked discharge.

GVF is based on actual inlet volumes. Standard gas rate and GOR need an agreed pressure, temperature and PVT conversion basis.

MECHANICAL SHAFT SEALING

API 682: scope and selection

Mechanical seals and their support systems are selected together to control process-fluid leakage and improve reliability.



Representative rotor/shaft components and pump assembly.

API 682 addresses mechanical shaft sealing systems for centrifugal and rotary pumps in petroleum, natural gas and chemical services. It sets a framework for selection, design, qualification, testing and documentation. It is commonly associated with API 610 centrifugal pumps; that association does not make a PCP an API 610 pump.

Arrangement	Operating concept
Single seal	One sealing arrangement; process-side flush or cooling and outboard collection/quench may be required.
Dual unpressurised	A buffer-fluid system below seal-chamber pressure supports leakage containment and monitoring.
Dual pressurised	Barrier fluid is maintained above seal-chamber pressure; pressure and heat-removal reliability are central to selection.

What the specification covers

Seal design and arrangement; support piping plans; materials; instruments; testing; qualification; documentation; and operating requirements.

What selection must establish

Seal-chamber pressure and temperature, fluid properties, solids, vaporisation risk, emissions and toxicity limits, operating transients, utilities and leakage handling.

Common support families include Plans 11, 13, 21, 23, 32, 52, 53A/53B/53C, 54, 62, 65, 72, 75 and 76. The following pages retain the full plan comparison and source equipment illustrations, with corrected plan terminology.

API 682 scope and plan terminology: references R1-R2 on page 25. Agree category, arrangement, applicable requirements and exceptions.

SEAL SUPPORT PLAN REFERENCE

Flush, buffer, barrier and leakage plans

A plan describes a support circuit; suitability depends on the seal arrangement and actual operating conditions.

Plan	Purpose / circuit
11	Pump-discharge recirculation to the seal chamber through a flow restriction.
13	Seal-chamber recirculation to pump suction through a flow restriction.
21	Discharge recirculation through a cooler to the seal chamber.
23	Seal-chamber fluid circulates through a cooler and back to the chamber.
32	External clean-fluid flush supplied to the seal chamber.
52	Unpressurised buffer-fluid reservoir for a dual unpressurised seal.
53A	Pressurised barrier reservoir with direct gas contact above the liquid.
53B	Pressurised barrier circuit using a bladder accumulator.
53C	Pressurised barrier circuit using a piston accumulator that tracks process pressure.
54	Externally supplied pressurised barrier-fluid circulation.
62	External quench to the atmospheric side of the seal.
65A / 65B	Liquid leakage detection / collection arrangements on the atmospheric side.
72	Low-pressure buffer-gas supply for a containment seal system.
75	Collection of condensing process leakage in a containment system.
76	Routing and monitoring of non-condensing leakage from a containment seal.

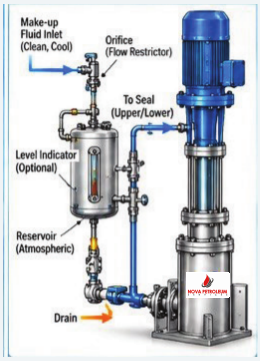
Confirm fluid compatibility, pressure margin, cooling load, circulation method, alarms, isolation, safe vent/drain destinations and loss-of-utility response. A vessel photograph alone cannot identify a complete compliant API plan.

Condensed plan reference; use the applicable standard, seal supplier drawings and project specifications for detailed design [R1-R2].

SEAL SUPPORT ILLUSTRATIONS

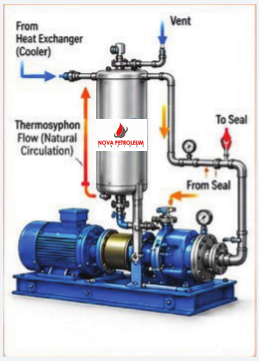
Five support-system concepts

Original equipment illustrations retained; headings describe the function shown without repeating inconsistent source labels.



External clean-fluid flush

External fluid enters the seal area. Plan 32 applies to an engineered external-flush circuit; Plan 13 is return to suction.



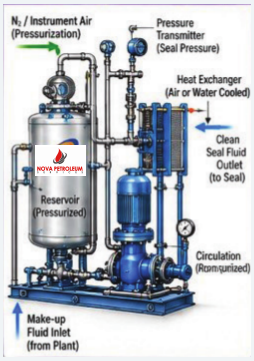
Cooling and circulation

A reservoir and heat-removal loop are shown. Confirm the complete seal arrangement and circulation method.



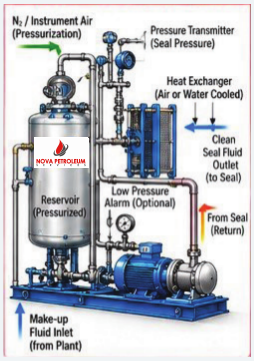
Leakage collection

Collect and monitor seal leakage; define alarms and a safe drain/vent route. Plan 65-family concepts.



Pressurised reservoir

A gas-pressurised fluid reservoir is illustrated. Plan 53A uses direct gas/liquid contact in the barrier reservoir.



External fluid circulation

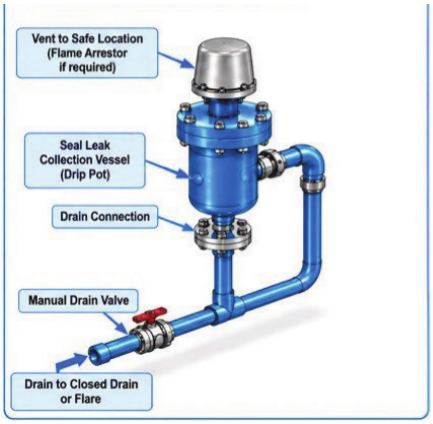
Pump-driven circulation, heat exchange and instruments are shown. A Plan 54 circuit uses an external pressurised barrier supply.

Illustrations are functional concepts, not validated P&IDs.; A circulation pump does not by itself define a Plan 53B system.

SEAL SUPPORT ILLUSTRATIONS

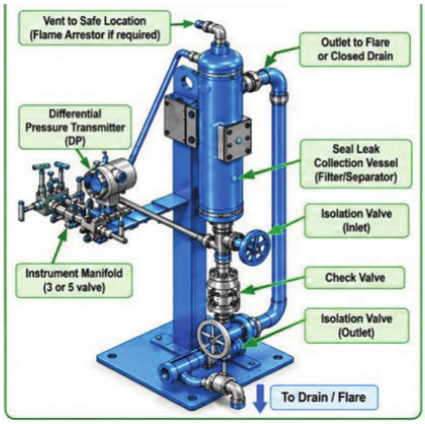
Collection, monitoring and circulation

Detailed equipment views retained from the source, with the support function stated separately from API plan selection.



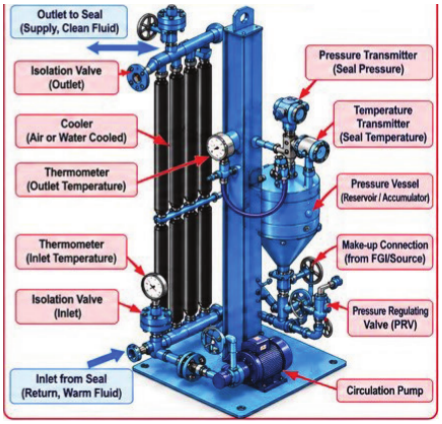
Leakage collection

The collection vessel, vent connection, manual drain valve and closed-drain connection are shown. Confirm fluid phase, monitoring, vessel design and the safe disposal route. A vent or flare connection must follow the approved process design.



Instrumented collection

The illustrated system includes differential-pressure measurement, an instrument manifold, isolation and check valves. Establish what is being measured, alarm settings, maintenance isolation and the correct collection or separation duty.



Circulating barrier-fluid system

The view includes a cooler, temperature and pressure instruments, reservoir, circulation pump, make-up connection and seal supply/return. A Plan 53B specifically requires a bladder accumulator; identify the actual plan from the approved circuit.

Equipment drawings are illustrative. Instrument settings, pressure ratings, relief and vent/drain routing must follow the final engineering design.

PUBLISHED OPERATING REFERENCES

Define the operating envelope

The supplied literature contains different capacity references. They are retained separately and require model-specific confirmation.

Parameter	Published reference	Engineering basis
Flow reference A	75,000 bfpd	≈ 2,188 US gpm / 497 m³/h; source rounded to 2,200 US gpm.
Flow reference B	225 m³/h	≈ 991 US gpm / 33,966 bbl/day. Separate configuration reference.
Differential pressure	48 bar and 750 psi	48 bar ≈ 696 psi; 750 psi ≈ 51.7 bar. These are not equivalent.
Motor power	200 hp / 150 kW	200 mechanical hp ≈ 149 kW; offered drive rating governs.
Fluid temperature	265°F / 130°C	265°F ≈ 129.4°C; 130°C = 266°F. Confirm continuous limit.
Gas volume fraction	Up to 90% GVF	At actual inlet conditions; liquid availability and heat control matter.
Viscosity	Up to 1,000,000 cP	Verify rheology, temperature, inlet filling, speed and starting torque.
System efficiency	55-70%	Source range; definition and operating point are not specified.
Low-speed operation	As low as 50 rpm	Configuration-dependent; confirm torque, slip and drive cooling.

Determine actual inlet volumes

GVF = Qgas / (Qgas + Qliquid) at the same inlet pressure and temperature. Convert standard gas flow or GOR using suitable PVT data.

Check the complete load range

Review cold starts, gas and liquid slugs, changing viscosity, differential pressure, NPSH, low-speed cooling and available power.

Values are independent references, not simultaneous maximums or guaranteed ratings. The VN100-A10 curve has its own test basis on page 19.

PROTECTION, STANDARDS AND VERIFICATION

API 676 and package protection

Rotary positive-displacement pump requirements, protective functions and testing are defined in the project specification.

The American Petroleum Institute publishes equipment standards for petroleum-industry service. API 676 addresses rotary positive-displacement pumps. The source brochure cites the third edition; the applicable edition, supplied configuration and exceptions must be agreed in the purchase documents.

Function	Retained package provision / requirement
Overpressure protection	Pressure relief valves with API 520/526 references where applicable. Establish set pressure, capacity and safe return/disposal routing; instrument trips complement the mechanical relief design.
Dry-run protection	PT100 stator-temperature sensor with control relay. An intrinsically safe (IS) barrier is provided where required by the hazardous-area design. Confirm trip response and restart conditions.
Pressure measurement	Pressure transmitter for monitoring and overpressure trip logic; hazardous-area execution when required.
Surface protection	High-build two-pack epoxy system. The source cites ISO 12944 C5-M and NORSOK M-501; specify the required environment, coating system, preparation and inspection by contract.
Inspection and testing	Mechanical run and performance testing; noise and vibration; NPSH testing where specified; hydraulic pressure testing; material certification and contract hold/witness points.

Document acceptance

State test fluid, speed, pressure, flow, power, tolerances, instrument calibration, required certificates and agreed deviations.

Verify the installed package

Check alignment, lubrication, utilities, instruments, guards, relief routing, rotation and protective functions before operation.

Standard references describe the design basis; compliance and test scope must be demonstrated for the actual equipment supplied.

MATERIALS AND CORROSION

H2S and CO2 in the production stream

Evaluate cracking, corrosion and elastomer compatibility as separate but related selection issues.

Hydrogen sulfide: H2S

Mechanism	Why it matters
Sulfide stress cracking (SSC)	Susceptible metals under tensile stress can crack in an H2S-containing environment; strength, hardness, material condition and environment matter.
Hydrogen embrittlement	Hydrogen uptake associated with sour corrosion can reduce ductility and promote cracking.
Elastomer degradation	H2S exposure can affect stator and seal compounds. Qualify swelling, mechanical-property changes and gas decompression behaviour.

Carbon dioxide: CO2

CO2 dissolved in water forms carbonic acid and can cause metal loss. Localised corrosion, pitting and crevice attack depend on water chemistry, chlorides, temperature, flow conditions and the selected material. Gas composition alone does not establish the corrosion rate.

Chemical protection strategies

H2S scavengers such as triazine and amine-based CO2 corrosion inhibitors are cited in the source literature. Selection needs process chemistry, compatibility, dosing, monitoring and downstream-impact review.

Material qualification

ISO 15156 / NACE MR0175 addresses defined cracking mechanisms in H2S-containing oil and gas production environments. Establish H2S partial pressure, pH, temperature, chlorides and material condition; assess general corrosion separately.

Use the whole environment

Provide fluid composition, aqueous phase, chemical treatments, pressure and temperature range, cycling and decompression conditions. Chemical treatment does not replace qualified materials or verified operating limits.

Candidate materials appear on page 17. Source concentration bands are retained with their limitations on page 24 [R3].

MATERIAL OPTIONS

Candidates by component

The complete set of source material families is retained below. Each named option requires qualification for the actual service.

Component	Candidate materials from the source
Body and housing	Carbon steel (API 5L X52 cited in the source); 13Cr; duplex stainless steel S31803; superduplex S32750; nickel alloy 625 (Inconel 625).
Rotor	Coated AISI 4140; duplex S31803; alloy 625 with tungsten-carbide coating. Chrome and carbide coatings require application-specific specification.
Stator lining	NBR; HNBR; FKM; FFKM where an appropriate compound and construction are available.
Seals and O-rings	NBR; HNBR; FKM; FFKM, including suitable Kalrez® compounds.
Tubing and drive shaft	Carbon steel; 13Cr stainless steel; duplex stainless steel; alloy 625. Tubing and shaft product forms require separate specifications.

Elastomer selection and the HNBR example

NOVA develops and selects elastomer formulations for differing operating conditions. For oil and gas duty with moderate sand, a fluid temperature around 60°C and fluctuating gas content, the source identifies hydrogenated nitrile butadiene rubber (HNBR) as a candidate for its oil and abrasion resistance. Confirm the actual compound against aromatics, H2S, CO2, temperature, solids and decompression exposure.

Review basic steel options

The source flags AISI 1020/1045 carbon steels and 304/316 stainless steels for corrosion or sour-service review. This is not a blanket ban: acceptability depends on the defined environment and material condition.

Specify more than a family name

Control metallurgy, hardness, heat treatment, pressure rating, corrosion allowance, coating finish and rotor/stator interference. API 5L X52 is a line-pipe grade, not a universal pump-housing specification.

Do not assign alloy or elastomer suitability solely from an H2S ppm band. See page 24 for the retained source bands and their limitations.

APPLICATION ENGINEERING

Wear, abrasion and viscosity

Select speed, stage loading, rotor finish and elastomer together for the actual fluid and solids.

Wear and abrasive service

Speed influences wear; lower speed can help reduce abrasive damage. Describe particle size, hardness, concentration and intermittent loading. Derate stage loading as needed to control slip and wear.

Rotor and stator options

Abrasion-resistant stator compounds, suitable softer elastomers, hard-chrome rotor finishes and tungsten-carbide coatings are source options. Rotor oversizing is a fit decision, not a universal life-extension rule.

Viscosity and cavity filling

As viscosity increases, a lower speed may be needed to allow fluid to enter the cavities. Available inlet pressure, line losses and rheology also govern filling. At lower speeds, slip can reduce volumetric efficiency; the pump must be selected using the actual speed, differential pressure and fluid properties. Starting torque and cold-fluid conditions can govern the drive.

Illustrative fluid	Source viscosity reference (cP)
Water	1
Motor oil SAE 40	200
Glycerin	1,400
Honey	10,000
Ketchup	50,000

These are approximate comparisons from the supplied literature. Temperature and shear conditions were not specified; oils and non-Newtonian fluids can vary widely. Obtain measured viscosity or a rheology curve at the expected operating temperatures.

Confirm pressure per stage and interference

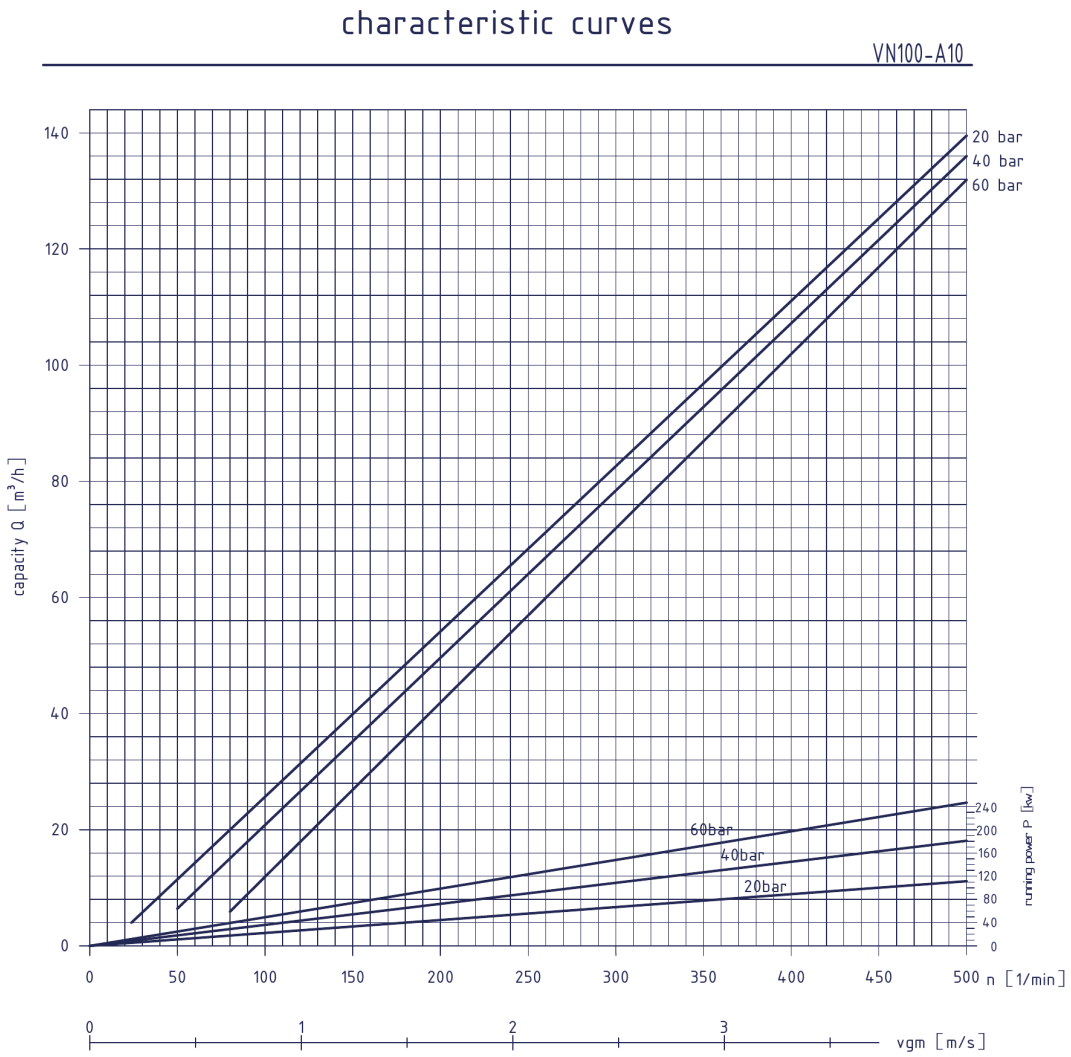
The source quotes 6 bar per stage without abrasion and 3 bar per stage for heavy abrasion. Retain these as discussion references only; the selected model, compound, fluid, speed and temperature determine permissible loading and fit.

Abrasion, temperature and viscosity are central selection inputs. The source pressure-versus-flow rule is addressed on page 24.

PERFORMANCE REFERENCE

VN100-A10 characteristic curve

Capacity and running power at 20, 40 and 60 bar differential pressure.



Test basis: water, 1 cP at 20°C (68°F; source printed 70°F). **Starting torque:** 4,900 Nm.
Running torque: 20 bar: 2,144-2,160 Nm; 40 bar: 3,340-3,424 Nm; 60 bar: 4,608-4,688 Nm.

Theoretical flow is proportional to speed for a given geometry. Actual delivery also depends on filling, slip, viscosity, gas fraction and wear. This original water curve is not a multiphase guarantee; request duty-specific curves and a power/torque assessment.

Original model-specific curve preserved. Source tolerance: VDMA 24284 (+10% / -5%); confirm the contract acceptance basis.

APPLICATION FORM - AT SURFACE CONDITIONS

Multiphase PCP data request

Complete this single-page form, then add the expanded process and site details on pages 21-22.

Company

Site name / location

Request date

AT SURFACE CONDITIONS - DATA	VALUE / UNITS / BASIS
Suction pressure (psig / bar)	
Discharge pressure (psig / bar)	
Suction temperature (°F / °C)	
Oil flow rate (bbl/day / m³/day / US gpm)	
Gas flow rate (MMscf/day)	
Water flow rate (bbl/day / m³/day)	
Gas specific gravity	
Water specific gravity	
Temperature (°F / °C)	
Oil API gravity	
Gas-oil ratio (GOR)	
Crude viscosity (cP)	
Available site voltage (V; e.g. 420 / 380)	
Frequency (Hz)	
Indoor / outdoor	
Sand	
H2S	
CO2	
Offshore / onshore	

State whether pressure is gauge or absolute and give the gas reference conditions. Attach a separate sheet for minimum, normal and maximum operating cases.

Fillable data request form. All original page-14 fields are retained; labels and units have been clarified.

APPLICATION DATA - PROCESS

Multiphase PCP enquiry sheet

State units and the measurement basis. Supply minimum, normal and maximum conditions at the pump suction.

Company / project: _____

Site name / location: _____

Contact / request date: _____

Process information	Min.	Normal	Max. / units / basis
Suction pressure (psig / bar; gauge or absolute)			
Discharge pressure / differential pressure			
Suction temperature (°C / °F)			
Other fluid / design temperature (°C / °F)			
Oil flow (bbl/day / m³/day / US gpm)			
Water flow (bbl/day / m³/day / US gpm)			
Gas flow (MMscf/day; reference conditions)			
Gas specific gravity / composition			
Water specific gravity / chemistry			
Oil API gravity / reference temperature			
Gas-oil ratio (GOR) / PVT data reference			
Crude viscosity (cP) / temperature / shear basis			
Actual inlet GVF / gas and liquid slug duration			
Sand concentration / size / hardness			
H2S content / units / sampling basis			
CO2 content / units / sampling basis			

Attach composition, fluid analysis, PVT data, rheology and expected future operating conditions. Identify provisional values and unresolved data.

Process sheet 1 of 2. Complete the site and package sheet on page 22 and send both to info@novapservices.com.

APPLICATION DATA - SITE AND PACKAGE

Site and supply requirements

Define the available utilities, installation environment and required package boundaries.

Site / package information	Customer entry / requirements
Project / site reference	
Available voltage (V; e.g. 380 / 420)	
Supply frequency (Hz) / available power	
Fixed-speed / VFD / alternate prime mover	
Hazardous-area classification / certification	
Indoor / outdoor installation	
Onshore / offshore location	
Ambient temperature / altitude / exposure	
Duty / standby quantity and operating hours	
Cooling water / seal fluid / instrument gas	
Liquid injection / recycle availability	
Suction and discharge piping / flange class	
Relief / vent / drain destination and limits	
Controls / local panel / remote interface	
Foundation / lifting / space / removal access	
Coating / corrosion / noise requirements	
Standards editions / client specifications	
Testing / witness points / documentation	
Commissioning / training / spares scope	
Delivery requirement / project notes	

Attach the site layout and P&ID; where available. Include any restrictions on shutdowns, transport, lifting, utility consumption and maintenance access.

Site sheet 2 of 2. Send the completed enquiry and supporting documents to info@novapservices.com.

INTEGRATION AND LIFECYCLE

From package definition to field support

Coordinate the equipment with the site, then establish a clear commissioning and service baseline.



Representative multiple-pump installation; quantity, auxiliary equipment and redundancy are project-specific.

01 Define the duty

Gather process data, operating scenarios and the required supply boundaries.

02 Coordinate the interfaces

Review the P&ID;, layout, utilities, tie-ins, relief route and control-system interfaces.

03 Verify and commission

Agree acceptance tests, site checks, protective-function tests and operator training.

04 Plan service and spares

Confirm rotor/stator removal space, lifting, wear parts, seal kits and long-lead components.

Handover package: approved drawings, equipment datasheets, inspection and test records, operating and maintenance manuals, control narrative, preservation requirements and recommended spares.

Installation, operation and maintenance follow the OEM manuals and approved site procedures.

ENGINEERING QUALIFICATIONS

Interpret reference values correctly

The original technical topics and selection references are retained, with ambiguities resolved or clearly identified.

Capacity and pressure references

The literature gives both 75,000 bfpd and 225 m³/h without a common configuration basis. It also equates 48 bar with 750 psi. Page 14 keeps both capacity references and corrects unit conversions; neither establishes a combined guaranteed envelope.

Sour-service concentration bands

The source uses 0.05, 50 and 500 ppm H2S thresholds for non-sour, low, moderate and high categories; the upper category contains an inequality error. Its component table uses <50 / 50-500 / >500 ppm H2S with <0.5 / 0.5-30 / >30 psi CO2. The concentration/partial-pressure basis is incompletely defined. These bands are not ISO 15156 acceptance criteria and must not determine material selection alone.

Stage pressure and rotor fit

Source values of 6 bar per stage for non-abrasive duty and 3 bar for heavy abrasion are application references, not universal limits. Increasing rotor interference can raise friction, heat and starting torque. Any oversizing requires supplier approval for the specific compound, temperature and fluid.

Pressure, flow and performance

The source rule “psi > gpm” compares different physical quantities and changes with units; it is not a valid selection criterion. Select using displacement, speed, differential pressure, torque, inlet filling, gas fraction and wear. Free-gas capability does not imply unlimited dry running or constant flow at all backpressures.

Standards and coating references

The legacy schedule cites API 676 third edition and ISO 12944 C5-M. Specify the agreed edition and exposure/coating requirements. “NORSOK M50” is treated as the M-501 surface-preparation/coating reference. API 610 and AGMA references in the guard row are ambiguous; apply gear, bearing, coupling and guard requirements to their actual components.

Seal illustration terminology

Source headings “Plan 13” for external flush and “Plan 53B” for a pump-driven circulation illustration are inconsistent with standard plan definitions. Pages 11-13 preserve the equipment concepts and describe the correct plan distinctions. A drawing or reservoir photograph alone does not demonstrate conformity.

Use the quoted datasheets, certified drawings and accepted engineering calculations to establish project-specific operating limits.

NOVA PETROLEUM SERVICES

Let’s define your next pumping package.

Bring the process requirement, equipment scope and site interfaces into one coordinated discussion.

Start with the application

Send the completed data request form and enquiry sheets on pages 20-22, fluid composition and PVT information, existing equipment references, and the site layout or P&ID.; NOVA can then clarify the proposed configuration, supporting data and quotation basis.

Talk to NOVA

info@novapservices.com

www.novapservices.com

Discuss your requirements →

Application and reference notes

Equipment images are representative. The agreed quotation, datasheets, drawings and purchase specification define the supply and performance commitments. This edition combines the supplied NOVA and manufacturer product literature and retains the detailed technical sections. Product and cover imagery has been enhanced for presentation; original technical diagrams and performance data are retained.

R1 John Crane - API 682 seal piping plans

R2 API - Standard 682 scope

R3 ISO - ISO 15156-1 general principles

NOVA-SPCP-BR-2026-04 | November 2026 | Complete product brochure



Engineered for real production

Integrated multiphase pumping, drive, sealing and control packages.

info@novapservices.com | novapservices.com

NOVA PETROLEUM
SERVICES

PCP technology illustration. Equipment configuration follows the approved project specification.