Hydraulic Power Units

General Info
Standard Power Units
intelligent and tailored-made

ABPAC
Standard Power Unit
intelligent and tailored-made

CytroPac
The radically new
Power Unit

Connected Hydraulics
BEYOND LIMITS
Power Units

Standard Solutions

**CPM-MT - Compact Power Module**
- max. operating pressure 250 bar
- max. electrical power 2.2 kW
- flow rate of oil up to 20 l/min
- tank size from 1 – 20 l
- Configuration and price calculation in CHoose 2.0
- integrated various hydraulic functions

⇒ Cost-efficient, most compact, ready to install

**ABSKG - Smallsize, modular and tailored-made**
- max. operating pressure 315 bar
- max. electrical power 7.5 kW
- flow rate of oil up to 23.2 l/min / 60 l tank
- online configurable
- energy efficient Sytronix Drives

⇒ The right drive concept for flexible smallsize application

**CytroPac - Hydraulic units radically rethought**
- max. operating pressure 240 bar
- max. electrical power 4 kW
- flow rate of oil up to 35 l/min
- integrated watercooling & new filter concept
- integrated frequency converter (FC)
- ready for i4.0 and plug & run

⇒ Everything you need, most compact, fully connected

**ABPAC - Midsize, Intelligent and tailored-made**
- max. operating pressure 350 bar
- max. electrical power 45 kW
- flow rate of oil up to 150 l/min / 400 l tank
- online configurable
- energy efficient Sytronix Drives
- flexible steel construction and tank concept

⇒ The right drive concept for flexible midsize application
Innovations

**Condition Monitoring**

**Benefit:** Cost saving (e.g. optimized maintenance) and increased machine availability (max. lifet.)

**Method:** Monitoring, interpreting, sharing

**Technology:** Elec. Contr., Sensorpackage, Software, Smart device

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**myCro++**

**Benefit:** Mod. Eng. Package to build up HPU’s smaller & cheaper

**Method:** Constr. guidelines, Simulation, Deg. mod. Calculator, ...

**Technology:** Sensor, Controller, Surface cover, degassing module, ...

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**Modular Power Units**

**Benefit:** Savings (cost, del. time, variance,..) through high standardized subassemblies

**Method:** Discrete variation of hydraulic performance

**Technology:** Standard Subassemblies
**Power Units**

**Configurators**

- **ABPAC (link)**
  - Base plates from HSH to 10HSR
  - Selection of intermediate plates and valves
  - ~2000 valves
  - Variation of port location

- **ABAPG (link)**
  - ~240/260 motors (IE2/3)
  - ~20 controls @ variable displacement pumps
  - ~25,000 combinations
  - Colour selectable
  - Entry experts: type key

- **HSR (link)**
  - HPU from RD51013
  - Built-in control AB42-09
  - IE3 motors
  - Complete docu
  - 2D / 3D CAD available

- **ABSKG (link)**
  - Modular system
  - Open Interfaces

- **CHose (link)**
  - Configuration tool for compact hydraulics
  - All catalog inform. and fault check during conf.
  - Available product
  - Groups: HIC, CDV, CPM
Power Units

Intelligence and connectivity

User Experience
- Setup, Configuration
- Usage, Operations
- Maintenance, Service

Additional Sensors:
- Fluid condition
- Pressure
- Temperature

New intelligent Sensor node
"IndraControl FM" (DC)
- Micro PLC
- Web Server
- Inputs / Outputs
- Connectivity (Fieldbus, OCI...)

Industry 4.0 Capability

Open Core Engineering

Visualization by Web App

Decentralized Intelligence with Algorithms for Evaluation

Interface to Big Data Systems (e.g. DAS, ODiN, ...)

Multi Ethernet and optional Wifi

platform independent WebApp
Hydraulical Design HD
System Engineer role

- Identify customer requirements and transform them into a system solution.
- Calculate and verify feasibility of design.
- Create BOM lists.
- Draw hydraulic schematic.
- Being a speaking partner to customers, sales colleagues and manufacturing units.
- Standardizing (common denominator/s in design and choice of components)
- Claims, procedures
Mechanical Design MD
Mechanical Engineer role

- Identify customer requirements and create CAD drafts based on system solution.
- Evaluate feasibility of design.
- Support in creation of BOM lists.
- Create mechanical parts/assemblies and drawings.
- Being a speaking partner to customers, sales colleagues and manufacturing units when comes to customized design solutions.
- Standardizing (common denominator/s in design and choice of components)
- Work according to “Step by Step” build method to secure design
System Order Coordinator SOC

SOC role

- The SOC is part of the whole sales process covering following responsibilities:
  - To identify long lead items, LLI.
  - To allocate and secure production capacity.
  - To identify critical components.
  - Actively monitor, follow and support the process from “Order to Delivery”.
  - Responsible for placing orders.
  - Providing status information to project parties
  - To communicate changes in the project scope.
  - Secure that proper product documentation is delivered with the product to the customer.
Technical Support Project & System HPU group, TS HPU
Simplified process overview

Pre Quote
- Dialogue between customer and Bosch Rexroth sales person.

Other participants
- System Engineer
- Mechanical Engineer
- SOC (LLI, Prod Capacity etc)
- Technical specialist (HYD system in general)

Order
- SOC provides quote to sales person.
- SOC places order on accepted customer quote.
- System & Mech engineers finalizes design according to quote.
- SOC provide progress info to concerned parties

Delivery
- SOC confirms delivery date, place and chosen transport.
- SOC secures that documentation is compiled and sent to customer.
- Lessons learned (all involved, when applicable)
Hydraulic power units

ABPAC
Standard Power Unit intelligent and tailored-made

CytroPac
The radically new Power Unit

Connected Hydraulics
BEYOND LIMITS
The intelligent standard power pack: ABPAC

- Configurable
- Linked up
- Energy efficient
ABPAC – Development goals
Simple, fast and individual configuration & short delivery times

- Development goals:
  - Configurable online
  - Customized configuration
  - Very short delivery time
  - Drives from the Sytronix modular system
  - Adjustments provided outside configuration
  - Predictive Maintenance
ABPAC – Technical characteristics
The right drive concept for every application

- **Features:**
  - Available pumps:
    - Fixed pumps: PGF, PGH
    - Variable pumps: A10VSO/31 and 32; A4VSO
    - Additional pumps in preparation
  - Motor powers from 4.0 to 110 kW
  - Flow rates from 25 to 250 l/min
  - Maximum pressure up to 315 bar

- **Your benefit:**
  - Current motor standards (IE3 as standard)
  - More compact design with the same power spectrum
ABPAC – Technical characteristics
Energy efficient – powerful – cost-reducing

- **Features:**
  - Use of energy-efficient drives from the Sytronix modular system:
    - FcP 5020; FcP 7020
    - SvP 7020

- **Your benefit:**
  - Energy savings up to 80%
  - Lower noise level
ABPAC – Technical characteristics
Condition Monitoring

- **Features:**
  - Universally usable sensor package for detecting the relevant system conditions
  - Sensor node IP65 protected
  - Oil quality
  - Pressure
  - Temperatures
  - Level
  - Efficiency
  - Filter clogging

- **Your benefit:**
  - For every situation the right sensor concept
  - Monitoring of the component states
  - Predictive Maintenance
  - Interface and visualization of smart device
ABPAC – Technical characteristics
Compact – interface to all hydraulic control modules

- **Features:**
- **Functions:**
  - Pressure filtration
  - Start-up circuit
  - Depressurized circulation
  - Maximum pressure limitation
  - Port for accumulator and measuring ports
  - Bypass for FCP and SvP applications
  - Hydraulic heater circuit
- Standardized interface for customer's control system

- **Your benefit:**
  - Integrated standard basic functions, only as large as necessary
  - Reduced piping
  - Optionally hydraulic control on ABPAC or in the machine
ABPAC – Technical characteristics
Flexible steel construction and tank concept

- **Features:**
  - Standardized basic tank without welded elements
  - Folded side frames
  - Screwed cover plate
  - Nominal tank sizes from 100 to 1,000
  - Optimization of the ratio of hydraulic power to tank volume

- **Your benefit:**
  - Low variance in the tank thanks to screwed cover and screw-on Rexroth basic mechanical elements
  - Variance in the assembly, not in the steel construction, so reduced delivery time is possible
  - Depending on the application, smaller, more specific tank volume possible (L/KW)
ABPAC – Technical characteristics
Flexible and customer-specific

- **Features:**
  - Individually mountable on each side of the tank
  - Dimensions variable
  - Variance in the assembly process

- **Your benefit:**
  - High degree of flexibility
  - Customer-specific attachments possible
ABPAC – configurator

Customer – specific unit – tailored to the application

- Guided configuration:
  - Start with input of the hydraulic performance data
  - Project planning proposals
  - Deviating assignment selectable
  - Technical data for selected input
ABPAC – configurator
Quick selection of relevant data and options

- Guided configuration:
- Quick selection:
  - Pressure limitation
  - Tank
  - Cooling
  - Accumulator
  - Hydraulic control
ABPAC Workshop

- **Säljargument**
  - Enkelt & snabbt att konfigurera en standardlösning
  - Flexibelt. Kan anpassa från standard
  - Bra documentation
  - Snabbt till offert

- **Säljhinder**
  - Kundstandarder (fabrikat)
  - Begränsat i storlekar
  - Rostfritt?

- **Applikationer**
  - Alla
  - Icke komplexa lösningar
ABPAC Configurator

- Configuration result and documentation:
  - Technical description
  - Bill of material
  - Drawing
  - Circuit diagram
  - Price after unlocking
  - 3D model
  - Material number after unlocking

- Complete documentation package and material number available immediately – including Pro/E compatible 3D model.
CytroPac
The radically new Power Unit
CytroPac
CytroPac – Saves space, energy and time

- **Compact**
  - Space saving and low noise design concept
  - Ideal for machine tools

- **Highly Efficient**
  - Variable speed pump drive for demand-based power
  - Reduces energy consumption and CO2 emissions and meets the requirements of the European EcoDesign Directive 2009/125/EC
  - Use of the latest heat pipe technology

- **Connected**
  - Completely wired frequency converter with Multi-Ethernet interface
  - Comprehensive sensor technology for preventive real-time condition monitoring
CytroPac
The features

- Compact micro power unit, particularly for tooling machines and assembly lines with limited installation space
- Variable speed pump drive Sytronix for demand-driven performance
- Efficient heat-pipe technology enables simplified water cooling
- Integrated frequency inverter with I/O connectivity (Multi-Ethernet, e.g. sercos, Profinet)
- Condition Monitoring via fluid level, a temperature, a pressure as well as a filter clogging sensor
- The flow is measured via the motor speed
- Designed for the integration into Industry 4.0 concepts
CytroPac
Technical features

- Pressure up to 240 bar
- Hydraulic power up to 4.0 kW
- Flow rate up to 25 l/min
- Oil volume up to 20 liter
- Integrated frequency converter with I/O connectivity
- Integrated sensors for condition monitoring
- Innovative cooling concept
- Degassing system for optimized tank
CytroPac
Technical features

Performance class

- 1,5 kW
- 2,2 kW
- 3,0 kW
- 4,0 kW

- 4 ccm
- 6 ccm
- 8 ccm
- 11 ccm
- 14 ccm

Equipment packages

Performance cooling oil

- 700 W
- 1,400 W
- 2,000 W

Sensors & control

<table>
<thead>
<tr>
<th>Basic</th>
<th>Level, Temperature, Filter contamination only shutdown. Wiring and evaluation through machine-tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced</td>
<td>In addition, preliminary warning and disconnect; wiring and evaluation in the HPU; Signal via LED bar (green, yellow, red)</td>
</tr>
<tr>
<td>Premium</td>
<td>Additionally Multi-Ethernet or Profibus interface</td>
</tr>
</tbody>
</table>
CytroPac

Technical features

- Mechanical connections
  - Return line G1”
  - Return line G1/2” (to filter)
  - Return line G1”
  - Cooling water G1/2”
  - Pressure port G1/2”
CytroPac
Technical features
CytroPac
Technical features

New filter concept
- Flow through from the inside out
- No filter housing required
- Simple change of the filter element

Spare element:
R928035258 35.0035CP H10XL-R00-0-M
CytroPac

Comparison with state of the art HPU

Floor space

State of the Art
2.400 cm²

CytroPac
1.200 cm²

-50 %

Installation space

State of the Art
150 Liter

CytroPac
60 Liter

-60 %
CytroPac
Energy efficient with variable-speed pump drive

- Reduced energy consumption between 30 and 80 percent
- Reducing CO2 emission
- Lower noise emission
- Compact machine design
- Easier installation and reduced commissioning expenses
- According to EU Eco design Directive 2009/125/EC
CytroPac

CytroPac – Ready for I4.0

- Easy connection to higher-level systems
- Support of open standards
- Intelligent onboard controller for decentral drives
- Ready for online life time management
CytroPac
Selection Guide

Small power units
CytroPac

- Component series 1X
- Tank size 20 l
- Maximum operating pressure 240 bar
- Maximum flow 35 l/min
- Power 1.5 ... 4 kW

Additional information
- Data sheet
- Downloads
- Spare parts & repair

Features
CytroPac Selection Guide

Hydraulic power unit CytroPac

The CytroPac features an integrated frequency converter, offering a power range from 1.6 to 6.0 kW with identical frame size and interfaces. The Power unit is suitable for S1 operation (continuous operation). It reports early warning signals in case of faults regarding oil level, temperature, return flow filter and frequency converter, is directly ready to use “Plug and Run” (electrical connection via plug-in connection), integrates cooling for motor and frequency converter, and is designed in a noise-reduced way. It includes an integrated oil drain facility, as well as an integrated return flow filter and allows a reduced volume due to degassing-optimized tank. Further, the CytroPac with its compact design provides a Prestart Control to reduce the collapse of pressure and a Sleep function to reduce the power consumption, e.g., during accumulator charging operation.

Component series
- Component series 12...240

Tank size
- 39 liters

Drive
- Asynchronous motor with frequency converter

Performance class
- 1.6 kW

Pump
- Size 4

Maximum operating pressure
- 240 bar

Sensor technology
- Basic

Cooling technology / maximum cooling power fluid
- Without"
CytroPac
Selection Guide

Component series
Component series 10 ... 19

Tank size
20 liters

Drive
Asynchronous motor with frequency converter

Performance class
2.2 kW

Pump
Size 5

Maximum operating pressure
240 bar

Sensor technology
Basic

You have successfully finished your selection.
Material number: R901500085

Documentation
Typecode: CYTROPAC-1X26/AF2A/5052/AWB/17035

Material number: R901500078

The following data were configured by customer.

Component series
1X Component series 10 ... 19

Tank size
20 liters

Drive
AF Asynchronous motor with frequency converter

Performance class
2 2.2 kW

Pump
A505 Size 5

Maximum operating pressure
2 240 bar

Sensor technology
A Advanced

Cooling type / maximum cooling power fluid
WB 700 Watt

Filling
1 Return flow filter

Coloring
7035 RAL 7035
**CytroPac Workshop**

### Säljargument
- Kompakt
- Kan användas för Retrofit av gamla maskiner
- Ljudnivå
- Eco direktivet
- Energibesparing (Sytronix)
- Uppkopplad vid behov
- Design
- Färdigt koncept

### Säljhinder
- Reservdelar?
- Service?
- Renovering?
- Saknar ventilfunktioner
- Liten målgrupp?
- OEM-product
- Trycknivån (Max 240Bar)
- Ej anpassningsbar

### Applikationer
- Små förbrukare
- Verktygsmaskiner
- Fixturer