Hydraulic Power Units

PAR Series

up to 250 l/min. Flow Rates

w+b offers high-efficient Hydraulic Power Units (HPUs) to furnish the pressurized oil for servohydraulic testing installations.

All our HPU's are designed with the knowledge in servohydraulic testing installation gained in more than 45 years. They are carefully engineered to create a safe, efficient, and reliable oil supply that meets your demands of today and the futures.
Standardized units are available with constant flow rate (displacement) or with variable displacement pump providing demand-dependent flow-rates.

Additionally, we are providing tailored solutions as installations of central hydraulics power packs and distribution system which varies with customer's application, laboratory design and available space. Carefully engineered system design is essential to create a safe, efficient and reliable system that meets your specific demand. Walter+Bai AG provides system design and installation from hydraulic power supply to hydraulic service manifolds, to hard-line installation to high performance digital control system.

PAR-Series

The PAR-range of hydraulic power supplies are designed for use with servo-controlled actuators and / or Testing Machines for Materials, Components, Finished Goods or Structural Testing Applications. Energy consumption has a significant effect on the total operating costs. As a result of rising energy costs efficiency of hydraulic power units including it's cooling system is gaining steadily importance.
The PAR-Series of power packs features high hydraulic and electrical efficiency, minimum water consumption combined with long trouble-free operation.

Power Pack equipped with Parker PV Plus Variable Displacement Pump

PV plus is a heavy-duty piston pump line for demanding industrial applications. It is available in displacements from 16cc/rev to 360cc/rev for operating pressure up to 350 bar.
Energy consumption has a significant effect on the total operating costs. As a result of rising energy costs efficiency of hydraulic power units including its cooling system is gaining steadily importance.
The PAR-Series of power packs features high hydraulic and electrical efficiency, minimum water consumption combined with long trouble-free operation. The motors comply with European Standard IEC 60034-30-1 with Premium Efficiency IE3 level.

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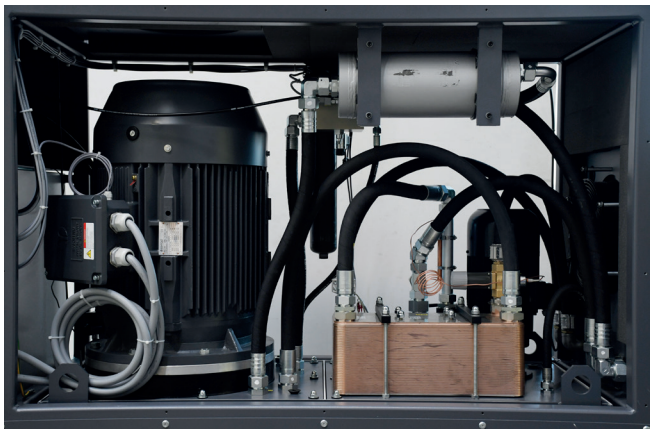
Compensation of Pressure Losses

Our PAR Hydraulic Power Units are available with 280 bar system pressure and 230 bar system pressure. So, they are working on pressure levels above 200 / 250 bar that commonly generates the nominal force of an actuator or servohydraulic test system. That higher pressure fully compensates pressure losses in long hydraulic connections between the Power Pack and test system and hydraulic service manifolds and servovalve blocs. You will have enough pressure on our test station to reach the nominal force even at cyclic loading.



High Efficiency Motor

As part of a concerted effort worldwide to reduce energy As part of a concerted effort worldwide to reduce energy consumption, CO2 emissions and the impact of industrial operations on the environment, various regulatory authorities in many countries have introduced or are planning legislation to encourage the manufacture and use of higher efficiency motors.
Electric motors account for about 70% of electricity consumed by industry. The potential cost saving of high efficiency systems is estimated 20% to 30% and one of major factors in such effective improvement is the use of energy efficient motors. Consequently, all motors used in the PAC & PAR Series of Hydraulic Power Packs comply with the Premium Efficiency IE3 level according to IEC 60034-30-2008

Vertical Design of Motor-Pump Group

The motor-pump group is mounted vertical on the tank so that the pump submerged into the oil. This compact design helps to reduce the noise level and makes removing of the motor/pump assemble in case of service or repair easy. The motor is vertically mounted onto the tank cover and isolated by damping ring.

Integrated In-Line Hydraulic High-Pressure Filters.

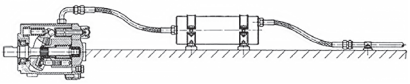
The performance, life and reliability of servo hydraulic test systems is acutely sensitive to the quality of the hydraulic oil. The experience of designers and users of hydraulic oil systems has verified that over 85% of all system failures are a direct result of contamination. Consequently, the PAR & PAR Hydraulic Power Packs are equipped with "In-Line" Hydraulic Pressure Filters with absolute filtration of 3 µm according to Moog recommendation for Servovales. The size of the filters is large in order long service life of the elements are reached.

Long Oil Change & Filter Intervals

Our HPU's are equipped with large sized In-Line pressure filters and oil tank with high volume, resulting in longer oil and filter change intervals that reduces the system downtime.

Integrated Vibration and structure-borne sound dampers

After the Variable Displacement Pump a vibration and structure-borne sound damper is installed. In industrial application cases too, severe consequential damage or cost-intensive downtimes are possible should machines or units be impaired or interrupted in their function as a result of unimpeded vibrations. Normally these are positive displacement pumps, such as gear-type pumps, vane-type delivery pumps and reciprocating pumps, which deliver the oil as a pulsating flow thus causing unwanted vibrations. The vibration and structure-borne sound dampers help to prevent the development of such vibrations.



Schematic Illustration

The pulsating oil flow delivered by the pump is routed through the vibration and structure-borne sound dampers and thus split up into multiple partial flows. These cause a counterflow to a degree and thus trigger a turbulence in the oil flow. In doing so the vibration energy is successively exhausted, i.e. the amplitudes of the vibrations are reduced to practically zero and flattened off so that vibration and structureborne sound dampers then emit a low-level pulsating oil flow. The conversion of the vibration energy takes place almost without any losses. The flow resistance lies at less than 1 bar.

Integrated High Performance Heat Exchanger (Oil-Water Plate Cooler)

The integrated heat-exchanger plate coolers are unique and maintenance-free oil-water plate cooler with high cooling capacity. It consists of corrugated channel plates enclosed by a back and front cover plate. The channel plates are pressed and vacuum-welded in an automatic procedure subject to very strict quality controls. The unique plate design provides highly turbulent flow conditions throughout the cooler, the key to efficient cooling. Turbulences prevent deposits from forming to such an extent, that the cooler is virtually maintenance free.
The resistance to 30 bar pressure allows a wide range of cooling applications and guarantees long lifetime. The needed cooling water supply and return line must be provided by the laboratory and can easily be connected to the water supply and return ports on the power pack.

Thermostatically Operated Water Valve

The cooling water flow of the PAR Hydraulic Power Units are proportional regulated. The valve controls the cooling water flow in dependence of the used energy and keeps the oil temperature on a constant level. The constant oil-temperature ensures the oil-viscosity does not change much to keep the servohydraulic installation in stable conditions.

Designed for Safety

Our hydraulic power units are protected with interlocks against inadvertent damage against high system pressure, high fluid temperature, high motor temperature, high motor power and low fluid level. Further the lowest allowed system pressure can be set for safety mode in case of failure of a hose, pipe etc. An additional adjustable fluid level sensor can be set just below the pendulum volume and will switch-off the power pack in case of oil leak.

Designed for Serviceability

Special attention was paid to the serviceability of the PAR Hydraulic Power Units.
The hydraulic pumps extend into the hydraulic oil of the tank. This reduces the noise level. The motor is vertically mounted onto the tank cover and isolated by damping ring. For pump repairs the complete pump unit can be convenient vertically lifted without opening or removing the tank cover. The filter elements are accessible positioned for easy filter-element change.

Anti-Vibration Dampers

The hydraulic power pack is isolated to the laboratory building through anti-vibration dampers. Each individual pump unit with motor is isolated to the oil-tank through damping ring top separate of structure-borne noise between drive unit and tank.

Operating and Visualisation Panel at the Power Pack

Front Panel with visualisation elements of oil-temperature, system pressure and emergency bottom.
To lower the power consumption and to safe operating expenses the power pack includes in the front panel a pressure control valve which al- lows to lower the system pressure (if the maximum force is not needed). Therefore, the power consumption will be less. A pressure manometer will indicate the adjusted pressure.

PLC (Programmable Logic Controller) with Remote Operation Panel

The hydraulic power pack is managed by PLC with touchscreen.
It enables to operate the power pack (start and stop of pump, activate flushing mode) through touch-screen operation. Further it visualizes the operating status and error message as system pressure low, oil-level low, over-temperature, motor-overloaded etc.
Remote Control through Testing Software is provided for each individual Pump/Motor system from the related Testing Machine.

Painting

The units are pended with impact-resistant RAL two-component industrial pint. A primer is applied before the two-component painting. The primer serves to protect the power pack with a first layer and at the same time to improve the adhesion conditions for the two-component coating. The inside-surface of the oil reservoir is painted with hydraulic fluid resistant coat.

Features:

- Oil tank with vertical mounted motor-pump group
- High Energy Efficient motors comply with European Standard IEC 60034-30-1 with Premium Efficiency IE3 level
- High pressure inline filter with clogged filter indication
- Additional circulating pump
- Pump protected against over-pressure through pressure limiter valves
  One fixed to protect system over-pressure
  One adjustable
- Oil-Tank with cleaning cover for easy servicing
- Damping ring between motor and pump top separate of structure-borne noise between drive unit and tank
- Totally enclosed and noise-isolated version
- Air fan on the rear side of the power pack to avoid high air temperature inside the power pack
- Electric pressure indicator for safety mode in case of failure of a hose, pipe etc.
- Max. oil temp. protection (shut down of the system)
- Adjustable minimum oil level indication (shut down of system)
- Oil pressure manometer on front panel
- Oil temperature indication on front panel
- Motor power indication with electrical safety mode
- Hour meter
- Filter and Fluid level gage
- Remote turn on/off control of hydraulic through testing software
- To lower the power consumption and to safe operating expenses the power pack includes a pressure control valve which allows to lower the system pressure (if the maximum force is not needed). Therefore, the power consumption will be less. A pressure manometer will indicate the adjusted pressure.
- Including oil water heat exchanger (cooler) to be connected to the cooling water supply (alternative re-cooler/chiller)
- Meets ISO 4413:10 (Hydraulic fluid power - General rules and safety requirements for systems and their components and the European directive 2006/42/EC for machinery safety

PAR Series with System Pressure up to 280 bar

Type PAR 280 bar Series		PAR-90	PAR-140	PAR-200	PAR-250
Nominal flowrate	l/min.	90	135	200	250
System Pressure adjustable up to	bar	280			
Oil reservoir max. volume	litre	500		1000	
High-pressure filter, absolute (ISO 16889)	µm	3			
Nominal flow high-pressure filter	litre	450	450	900	900
Motor output at 280 bar	kW	47	70	108	130
Electrical supply*	V	400V (+/-10%) 3 Phases, N, E, 50 Hz (60 Hz on request)			
Hydraulic connection for		Parker Ermeto Original 24° cone end fittings to ISO 8434-1, DIN 2353			
P (Pressure)	Inch	30-S		38-S	
R (return)	Inch	35-L		42-L	
L (leak oil)	Inch	18-L		18-L	
Cooling Water connection for		Internal Thread			
Inlet	Inch	1"		2"	
Outlet	Inch	1"		2"	
Hydraulic Fluid	ISO-VG	46 / 68			
Dimensions					
Width	nm	810		1200	
Depth	mm	2150		3150	
Height	mm	1950		2220	
Approx. Weight with oil	Kg	1950	1980	5420	5500
Noise level **	dB(A)	72	73	73	74
Environmental Temperature	°C	15°C to 40°C			

*Others as 60 Hz on request

** Sound pressure level (noise level), measured in a free hemispherical field at a distance of 1 m from the machine and 1.5 meters from the ground, per ISO 3746

PAR Series with System Pressure up to 230 bar

Type PAR 230 bar Series		PAR-90	PAR-140	PAR-200 (210)	PAR-250 (280)
Nominal flowrate	l/min.	90	135	200	250
System Pressure adjustable up to	bar	280			
Oil reservoir max. volume	litre	500		1000	
High-pressure filter, absolute (ISO 16889)	µm	3			
Nominal flow high-pressure filter	litre	450	450	900	900
Motor output at 280 bar	kW	37	60	86	109
Electrical supply*	V	400V (+/-10%) 3 Phases, N, E, 50 Hz (60 Hz on request)			
Hydraulic connection for		Parker Ermeto Original 24° cone end fittings to ISO 8434-1, DIN 2353			
P (Pressure)	Inch	30-S		38-S	
R (return)	Inch	35-L		42-L	
L (leak oil)	Inch	18-L		18-L	
Cooling Water connection for		Internal Thread			
Inlet	Inch	1"		2"	
Outlet	Inch	1"		2"	
Hydraulic Fluid	ISO-VG	46 / 68			
Dimensions					
Width	nm	810		1200	
Depth	mm	2150		3150	
Height	mm	1950		2220	
Approx. Weight with oil	Kg	1950	1980	5420	5500
Noise level **	dB(A)	71	72	72	73
Environmental Temperature	°C	15°C to 40°C			

*Others as 60 Hz on request

** Sound pressure level (noise level), measured in a free hemispherical field at a distance of 1 m from the machine and 1.5 meters from the ground, per ISO 3746

System Cooling
There are different power pack cooling choices available.

Water Cooling
Water-cooled systems use "cold" water to remove heat, with hot and cold fluids separated inside the heat exchanger. This option is one of the most common ways to cool the oil-fluid. Compared to air-cooled systems of equivalent capacity, water-cooled system has lower up-front costs. They are also quiet, compact and do not halter the surrounding ambient temperature. Variations in air temperature have little or no effect on cooling capacity, which allows for greater consistency. Meanwhile, the system's heated water can be used for other on-site purposes.
Although water-cooled coolers cost less, they generally require relatively clean water. Continuously running water can be expensive, leading to higher operating costs. To reduce the water consumption to its minimum the thermostatically operated water valve is installed in our power packs. The cooling water flow of our hydraulic power units are proportional regulated. The valve controls the cooling water flow in dependence of the used energy and keeps the oil temperature on a constant level. The constant oil-temperature ensures the oil-viscosity does not change much to keep the servohydraulic installation in stable conditions.

Air Cooling
Air-cooled systems dissipate heat with flowing air. It operates by forcing "cold" air over warmer fluid inside the air-cooler. This energy-saving cooling system run with low cost and simple maintenance. Further it eliminates water-contamination problem and minimize corrosion. As the cooling capacity depends on the outside temperature the air-cooler size will be calculated according to the maximum air-temperature. This cooling system can be a good choice in moderate climates.
The air-cooler shall be installed inside or in a sheltered outside installation.

Oil Chiller Unit
A hydraulic oil chiller / refrigeration system will maintain the cooling water within a narrow temperature range regardless of the ambient temperature. The chillers can be connected direct to our HPU's with its integrated heat exchanger.

Closed Loop Water Re-Cooler Series WRC
This re-cooler (recirculating chiller) is compact, ready-to-install unit for cooling the hydraulic oil of power packs within a circuit. The cooling liquid is water with or without additives. The heat exchanger (oil-water cooler) is part of the hydraulic power pack where the cooling water with water tank is part of the chiller.

The water pump circulates the cooling water in a closed loop circuit with the oil-water cooler. This method largely uses ambient air. The heat exchanger in the chiller is therefore a water/air heat exchanger.
The nature of the process means that the temperature of the cooling medium cannot be cooled below the temperature of the air.
In an active cooling unit the heat exchanger in the chiller is a refrigerant condenser.
One feature applies for all cooling options, namely that, when matched with the hydraulic components, they represent a ready-to-install and fully equipped cooling unit. A cooling circuit is thus created without any loss of cooling medium (water). Apart from the fact that it conserves water resources, the main advantage of a recirculating chiller lies in the fact that constant conditions (temperature, pressure, etc.) are always present for the hydraulic power pack to be cooled and there is no gradual impairment of the cooling properties by the permanent precipitation of minerals from fresh water. So no cooling water is wasted.
Supply includes connections between hydraulic power pack and Re-cooler unit.

Features:
- Single-circuit system including tank open to atmosphere
- Refrigeration circuit: Complete with charging port, liquid receiver, drier filter, thermostatic valve, high- and low-pressure pressure switch
- Compressor: Hermetic compressor, cooled by the refrigerant, complete with thermal cut-out
- Evaporator: Brazed stainless-steel plate model
- Air-cooled cooling machine
- MANAGEMENT AND CONTROL: Control unit manages the operation of the chiller and provides complete operator alarm diagnostics. An on-off contact allows the machine to be switched on remotely. Illuminated control selector. Possibility of remote display for machine regulation.
- Air Condenser: Microchannel condensing coil, complete with safety grille
- Tank with water level indicator
- Electronic microprocessor-controlled thermostat with digital display
- Error messages displayed as individual codes by controller
- Control cabinet with main switch
- Built-in pump
- High- and low-pressure manometer
- High- and low-pressure switch
- Fan controlled by static pressure
- Manometer displaying coolant outlet pressure
- Housing powder-coated, color RAL 7035 (light grey)

Hydraulic Service Manifolds

Hydraulic Service Manifolds output module to isolate the servo actuators form the hydraulic power pack. Our manifolds provide independent control of the hydraulic pressure and flow applied to individual testing machine from a hydraulic oil supply. These units provide switched modes: Off/Low/High with ramping between pressure levels with smooth pressure transition between the high- and low-pressure modes and additional adjustable low-oil-flow that reduce the maximum piston speed during set-up mode.

The Service Manifold Control Module for the **PCS8000** digital controller operated the HSM direct from the **PCS8000** controller. Thanks to this function, no additional electrical control board or SPC is needed. This module simplifies the installation, offers a maximum of flexibility in the future in extending and minimizing interference-prone cable connections.
In case of an emergency stop an electrical security connection between Controller and Service Manifold takes part scope of supply.

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