



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Accumulator, Accessories and Spares Catalogue



ENGINEERING YOUR SUCCESS.

Accumulator and Cooler Division Europe

Made in Europe - serving all markets and industries

Parker Wroclaw
(Wroclaw, Poland)

Products:
Coolers (All coolers)
Piston Accumulators (ACP, A, AP)

Market Focus:
Industrial, Mobile, Energy



Parker ACDE Sandycroft
(Chester, UK)

Products:
Bladder Accumulators & Accessories (UK, O&G)
Piston Accumulators (EHP)
Pulsation Dampers, Hydracushions, Compensators

Market Focus:
Oil and Gas, Industrial



Parker ACDE Paris
(Colombes, France)

Products:
Bladder Accumulators & Accessories (EBV, EHV)
Diaphragm Accumulators (DA)
Attenuators

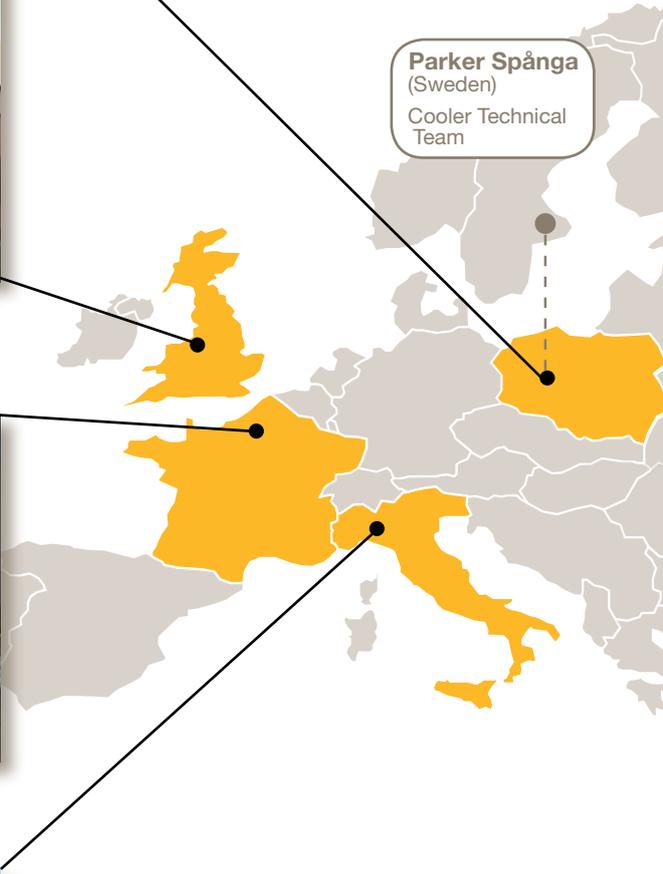
Market Focus:
Wind Power, Industrial, Aerospace, Motor Sport



Parker ACDE Leini
(Turin, Italy)

Products:
Bladder Accumulators & Accessories (EBV, EHV)
Piston Accumulators (EHP)
Gas Bottles, Accumulator Systems

Market Focus:
Oil and Gas, Industrial



Accumulator Products

The complete accumulator range



Bladder Accumulators



Piston Accumulators



Diaphragm Accumulators



Pulsation Dampers



Attenuators



Gas Bottles



Accumulator Systems



Accessories



Services & Support

PARKER SAFETY GUIDE FOR SELECTING AND USING ACCUMULATORS AND RELATED ACCESSORIES

WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or system in the current product catalogue. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its related companies at any time without notice.

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Bladder Accumulators

Typical Market Applications

Low Pressure - EBV Series (0.5 to 575 Litres, 20 to 80 bar)	Energy/ Process/ Marine	17
High Pressure - EHV Series (0.2 to 57 Litres, 70 to 690 bar)	Industrial/ Energy/ Marine/ Mobile	39
Accumulator Regulations and Protections (EBV and EHV)		77
High Pressure - UK Industrial Series (0.16 to 54 Litres, 207 to 420 bar)	UK Industrial	89
High Pressure - O&G Series (0.16 to 54 Litres, 207 to 760 bar)	Oil & Gas	95

Piston Accumulators

Crimped Piston Accumulator 40 to 150mm Bore- ACP Series (0.08 to 8 Litres, up to 275 bar)	Mobile/ Renewable/ Industrial	109
Piston Accumulator 50 to 200mm Bore - A Series (0.05 to 300 Litres, 250 & 350 bar)	Industrial/ Marine/ Mobile/ Construction	121
Piston Accumulators 180 to 360mm Bore - AP Series (6 to 300 Litres, 250 & 350 bar)	Plastic Injection Moulding	131
Die Casting Piston Accumulator 180 & 250mm Bore DC Series 6 to 80 Litres, 250 & 350 bar)	Die Casting/ Plastic Injection Moulding	139
EHP Series (0.1 to 1000 Litres, up to 350 bar)	Energy/ Process	145

Pulsation Damper Accumulators

Silicone Filled Bladder Accumulator - SBV3 Series	Fuel Systems	177
Stainless Steel & Polypropylene APD/ BPD/ CPD/ DPD Series		183

Attenuators - [SH Series](#)

Hydraulic Pump Systems 195

Diaphragm Accumulators - [DA Series](#)

Mobile/Industrial 201

Accessories

Clamps/ Brackets/ Lifting Eye/ Mounting Frames/ Charging Sets/ Safety Block/ Burst Discs	All Markets	219
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Gas Bottles

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Accumulator Stations

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Sizing Questionnaires

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Installing an accumulator can save you time and money



Applications

The Parker ACDE gas loaded accumulator is an essential component for the optimum operation of a hydraulic circuit. In hydraulic circuits, the accumulator enables:

Energy Storage: saves energy without loss and redistributes when required therefore reducing installed power.

Pressure compensation: absorbs pressure spikes from pumps or other components to control pressure and flow-rates in a hydraulic circuit.

Volume Control: absorbs fluid volume variations induced by temperature changes in a closed hydraulic circuit and maintains a rated pressure.

Maintains Fluid Flow Rate: an accumulator can maintain the fluid flow rate in case of pump failure and can also be used as a mobile fluid reserve under pressure.

Emergency Energy Storage: in case of failure of the main energy source, an accumulator can provide sufficient energy to complete an operation or to realize a full hydraulic cycle.

Prevents mixing of fluids: Transfer of energy from a fluid to another fluid without any risk of mixing

Shock absorber: suppresses shocks and vibrations in hydraulic systems of lifting vehicles (e.g. Forklift trucks) and maintains real suspension of the load on a gas spring.

Accumulators - Advantages / Your benefits

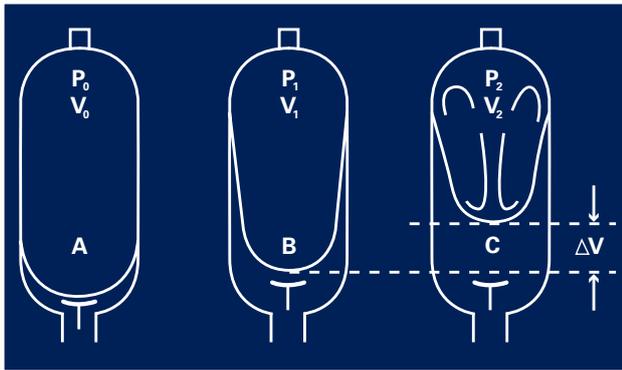
- **Reduction in working costs**
 - Energy reserve
 - Reduces installed electrical power
- **Increases lifetime of equipment**
 - Reduces pulsations
 - Protects against pressure peaks
- **Reduction in maintenance costs**
 - Reduces wear of hydraulic components
 - Requires minimum maintenance
- **Emergency Energy Back-up**
 - Energy reserve



Accumulator Operating Principle

Operation of the gas loaded bladder accumulator is based on the considerable difference in compressibility between a gas and a liquid, enabling a large quantity of energy to be stored in an extremely compact form. This enables a liquid under pressure to be accumulated, stored and recovered at any time.

Bladder Accumulator

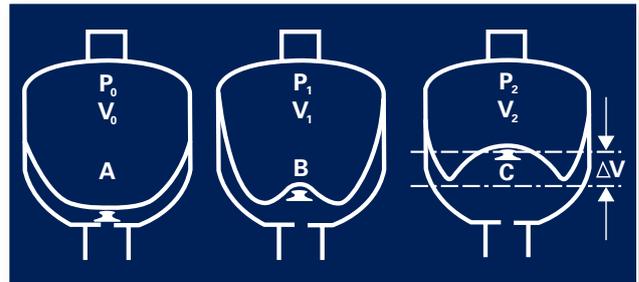


A - Bladder in the Pre-charge position, which means that the accumulator only contains nitrogen. The anti-extrusion system closes the hydraulic orifice which prevents the destruction of the bladder. In low pressure accumulators the bladder rests against the grid. Maximum pressure differential (P_2/P_0): 4:1

B - Position at the minimum operating pressure. There must be a certain amount of fluid between the bladder and the hydraulic orifice, such that the anti-extrusion system does not close the hydraulic orifice.

C - Position at the maximum operating pressure. The volume difference between the minimum and maximum positions of the operating pressures represents the working fluid quantity.

Diaphragm Accumulator

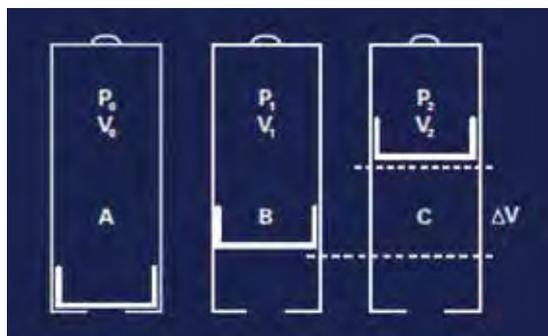


A - The diaphragm is in the Pre-charge position, which means that it is only filled with nitrogen. The knob closes the hydraulic orifice and prevents the destruction of the diaphragm.

B - Position at the minimum operating pressure : there must be a certain amount of fluid between the diaphragm and the hydraulic orifice, such that the knob does not close the hydraulic orifice. Thus, P_0 must always be $< P_1$.

C - Position at the maximum operating pressure: the volume change ΔV between the minimum and maximum positions of the operating pressures represents the fluid quantity stored.

Piston Accumulator



When fluid under pressure enters the fluid side of the accumulator, the piston is pushed towards the gas side and the Nitrogen gas is compressed.

Key:-

V0 = Capacity in nitrogen of the accumulator

V1 = Gas volume at the minimum hydraulic pressure

V2 = Gas volume at the maximum hydraulic pressure

ΔV = Returned and/or stored volume of working fluid between P_1 and P_2

P0 = Initial preload of the accumulator

P1 = Gas pressure at the minimum hydraulic pressure

P2 = Gas pressure at the maximum hydraulic pressure

Experts in accumulator technologies

With over 50 years experience we have worked with customers from a diverse range of markets and applications which has enabled us to gain **extensive knowledge** and **expertise in accumulator technologies**.

We often work closely with our customers to provide solutions for hydraulic systems helping customers to enhance the longevity of their parts and systems whilst also improving **efficiency** and **output**.

Offering a comprehensive range of bladder, piston and diaphragm accumulators, regulations and approvals, we can supply accumulators to suit **any requirement** and for **any geographic location**.



Our History



Olaer, pioneer of high pressure equipment, was founded in 1938 by Jean Mercier. Using his experience, passion for research and extensive knowledge of hydraulics in the demanding field of aeronautics, Mr. Mercier engineered the first gas loaded bladder accumulator. This has

lead to Olaer becoming the indisputable international leader in this field.

In 1987 Fawcett Engineering and Christie Hydraulics (both in the UK) became part of the Olaer Group and merged to become Fawcett Christie Engineering.



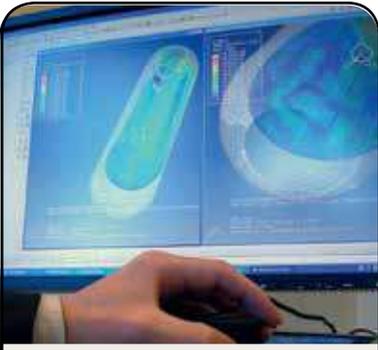
The Olaer Group continued to expand over the next 25 years and established a worldwide manufacturing and supply network.

Parker Hannifin acquired the Olaer Group in 2012 and the Accumulator and Cooler Division Europe was established.

Now part of one of the world's leading manufacturing companies the Accumulator and Cooler Division Europe continues to develop new products and services and offers a comprehensive accumulator product range suitable for any market or application.



Services - easy to do business with



Technical Support & Product Innovation



Parker Tracking System (PTS)



Regulations & Approvals Portal



Accumulator Sizing Software



Online Support



Recertification Centres & Distribution Network

How to size an accumulator

Accumulator Sizing Software

www.parker.com/acde

Parker Olaer has developed very sophisticated simulation software to optimise accumulator sizing recommendations.

Calculations are based on the real gas equation and real gases. The software allows for temperature and flow characteristics and has an intuitive Windows format that is easy to use!

The behaviour of accumulators used in applications such as pulsation dampening, surge arrestor, thermal expansion and energy storage can be simulated.

The latest version of the sizing software can be downloaded from our website.



Sizing Questionnaires

Customers can complete a sizing questionnaire and send this to the local Parker Sales Office so that the most efficient accumulator can be sized for your application.

You can download the sizing questionnaires from our website www.parker.com/acde or click on the links below if you are viewing a digital version of this document.

There are 4 questionnaires to select from:-

1. **Energy Storage - LINK**
2. **Thermal Expansion in a closed circuit - LINK**
3. **Surge Arrestor / Waterhammer - LINK**
4. **Pulsation Damper - LINK**

DATA SHEET Application : ENERGY STORAGE

Date:

Company Name:	Contact Name:
Market Segment: <small>expl. O&G, Distribution, Marine, Industrial, Offshore, Service</small>	E-mail:
Address:	Telephone:
Website:	

SIZING DATA

Describe application: Please attached system scheme			
Fluid Type:			
Volume of Fluid to be restored:			Ltr.
Dual Time (Charge-Stabilisation-Discharge):			Sec
Maximum Working Pressure (P2):			Bar
Minimum Working Pressure (P1):			Bar
Fluid Temperature during Operation:	Min. °C		Max. °C
Certification:			

TECHNICAL SPECIFICATION OR SPECIAL REQUIREMENTS HAVE TO BE FILLED IN

- Material options :
- Special Port Connections and adaptors :
- Special Coatings :
- End user country :

If there is no special requirement, we will offer standard connection and material according to the fluid and PED 97/23/EC (**)

Parker Tracking System (PTS)

The PTS service for accumulators is designed to reduce equipment and machinery downtime by increasing the speed of acquiring replacements. All relevant product documentation can also be accessed via the PTS service including precharge, maintenance, approvals and recertification information.

The Parker Tracking System is available via an app which can be downloaded to your computer or portable device making it easy to access.

Available for:-

- Desktops
- Laptops
- Tablets
- Smart-phones



www.parker.com/pts

Faster, easier and more accurate spare parts replacement



PTS Mobile

PTS is available wherever you go via the PTS Mobile app. This free app from Parker makes it faster, easier and more accurate than ever before to get the replacement components you need.

Technical Support & Product Innovation

Technical Support

We are able to offer an unrivalled depth of experience and expertise in the hydraulics industry. A continuous programme of research and development and strict quality controls help us to maintain our leading position in the market.

Design Facilities

A dedicated technical team uses the latest 3D SolidWorks and Autodesk Inventor software driven by calculation programs (linked to EN14359, PD5500 and ASME VIII) to reduce design times and provide technical customer support.

Hydraulic Testing

In order to develop new and improved products we provide testing facilities for specific applications and accumulator technologies. These test facilities help us to gain in-depth knowledge on product performance, material durability and the expected lifetime of our units in different operational environments.

Qualification Tests

We can offer qualification tests on all of our new accumulators if required. These tests include

- **Long duration pressure hold tests**
- **External pressure tests**



Product Innovation

As part of our product development programme we seek new ways to innovate, collaborate and partner with our customers to address engineering challenges and solve problems.

COMING SOON!

SensoNODE™ for Accumulators

Long Range Wireless Sensor for Measuring Accumulator Pre-Charge

Parker SensoNODE™ for Accumulators Bluetooth-powered sensors are specifically designed for accumulators. Compact, energy-efficient, and wireless, they are designed to provide simple and easy solutions for measuring gas pre-charge on bladder and piston style accumulators.

These sensors allow for hands off pre-charge pressure and temperature measurement to prevent the damage and/or downtime associated with pre-charge loss.



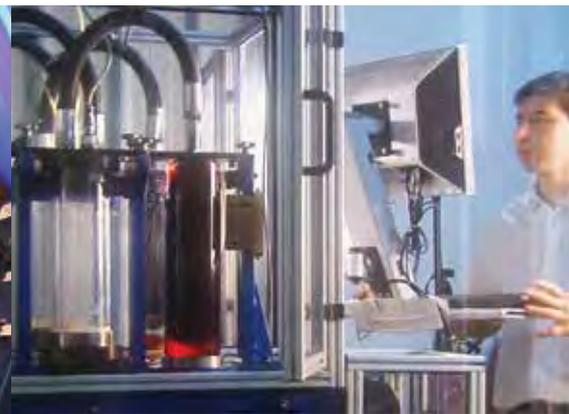
SensoNODE™



Accumulator test bench for wind turbine application.



Piston accumulator hydraulic test facility.



Bladder accumulator test bench - Patented technology

Materials

Parker can offer a wide range of options for the 3 key accumulator technologies (bladder, piston and diaphragm) depending on the application where the product is used. The most important parameters for selecting an accumulator are:

- 1. The application**
- 2. The minimum and maximum operating temperature of the system.**
- 3. The fluid type in the system**
- 4. Working Pressure.**

Shell material options include standard carbon steel, alloyed steel, stainless steel, aluminium, titanium and composites. The main requirement is that the material is suitable and approved for use in pressure vessels.

The elastomers used are the key working components, and also where we have focused resources selecting the correct type and material.

Depending on the customer application, our engineers will

choose the most optimum solution.

Taking into account the different needs of various applications Parker proposes different corrosion protections external or internal: bare metal, electroless nickel plating, standard primer, epoxy paint and Rilsan.



Service Centre & Distribution Network

Europe, Middle East & Africa

Parker Hannifin has developed a network of trained competent persons within Authorized Recertification/Service Centres in most EMEA countries.

The service centres have specialized equipment ready for works which can be provided in-house, on-site or in the field* (location).

*services available at some service centres.

Services include:-

- **Preparation of Written Schemes of Examination**
- **Accumulator maintenance, testing and repair**
- **Hydraulic system troubleshooting**
- **Stock of spare parts**

Parker Authorized Recertification Centres are fully trained and offer a wealth of experience in the Parker accumulator product range.

We have established a fully trained and certified accumulator service network in most European countries



Helping our customers:-

- **Minimise system down-time**
- **Increase efficiency**
- **Reduce the complexity of documentation.**

Regulations & Approvals

Parker designs and manufactures gas loaded accumulators for use in all countries, as well as other industry specific approvals including Oil & Gas, Naval and Nuclear. The main regulations in force are PED for European market, ASME for US market and SELO for Chinese market.

As a service, Parker Olaer can recommend the appropriate regulations applicable if customers know the country where the accumulator will be installed. When operating in dangerous and explosive environments, Parker

has developed high-tech solutions. Some of these regulations call for the use of safety devices to protect the accumulator against over pressure. Solutions may include hydraulic safety blocks, relief valves or gas side safety devices such as burst discs and fuse plugs. Parker has designed and proposed a complete range of safety devices suitable for the applicable regulations.

To meet the needs of our customers, Parker can supply accumulators with multiple approvals. With regard to

environmental concerns Parker's product range complies with REACH regulations. Each accumulator is delivered with the certificate of conformity. Documents can be accessed at any time and from any location.



www.parkerace-certificatesportal.com

Do you need multi-international certification?

The Global Bladder Accumulator Series

Multi-international certification

In April 2017 Parker launched the first global accumulator offering multi-international certification (SELO, ASME & CE) as well as improved technology and design.

Only 11 countries in the world are not covered by this multi-international certification.

All regulations have been combined which has significantly reduced the amount of part numbers and complexity of documentation therefore providing a significant reduction of cost and resources for your design and logistic departments.

All of the global accumulators will have a unique code so that you can benefit from the Parker Tracking System (PTS).

**SELO,
ASME & CE**



Online Support

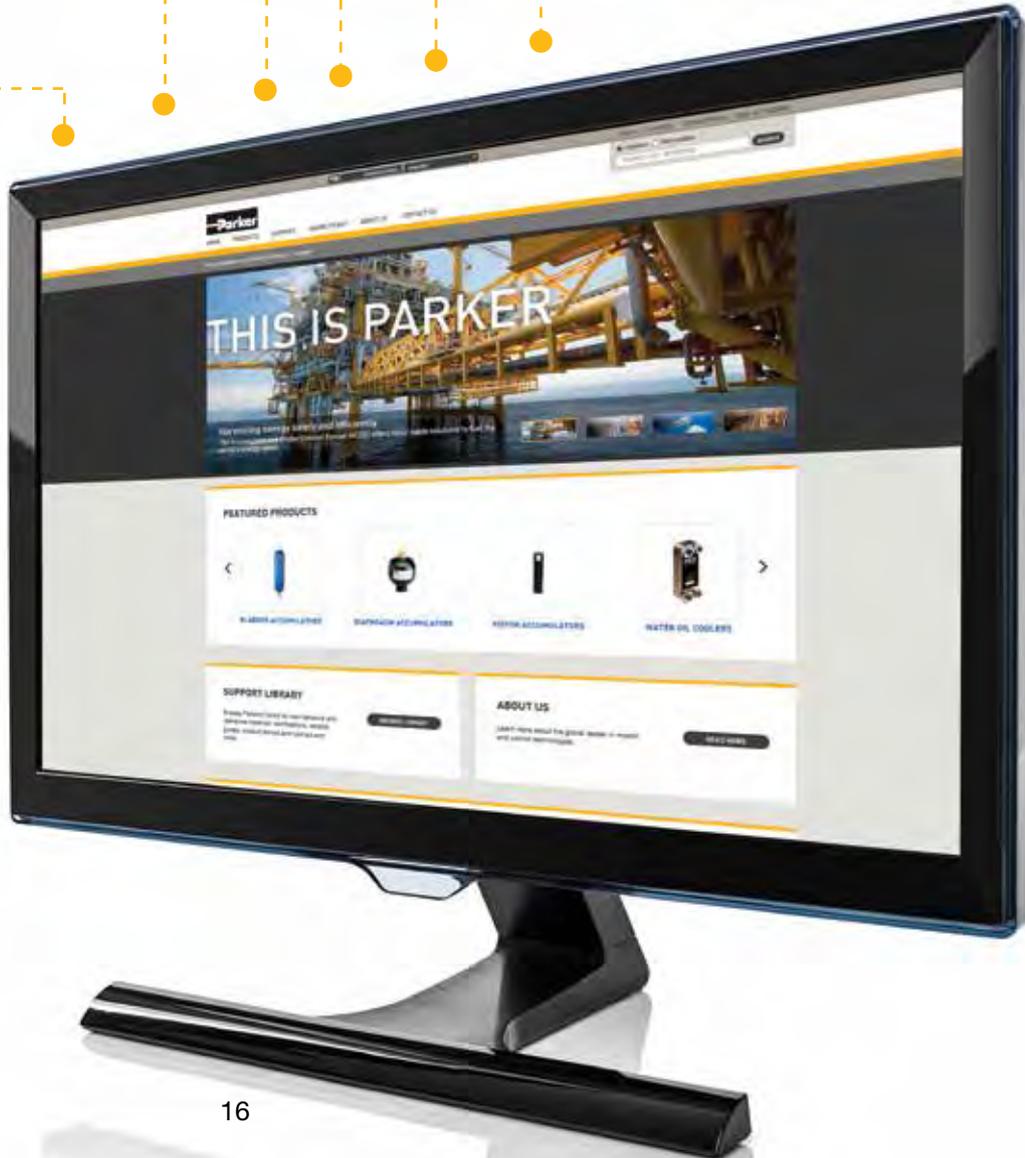
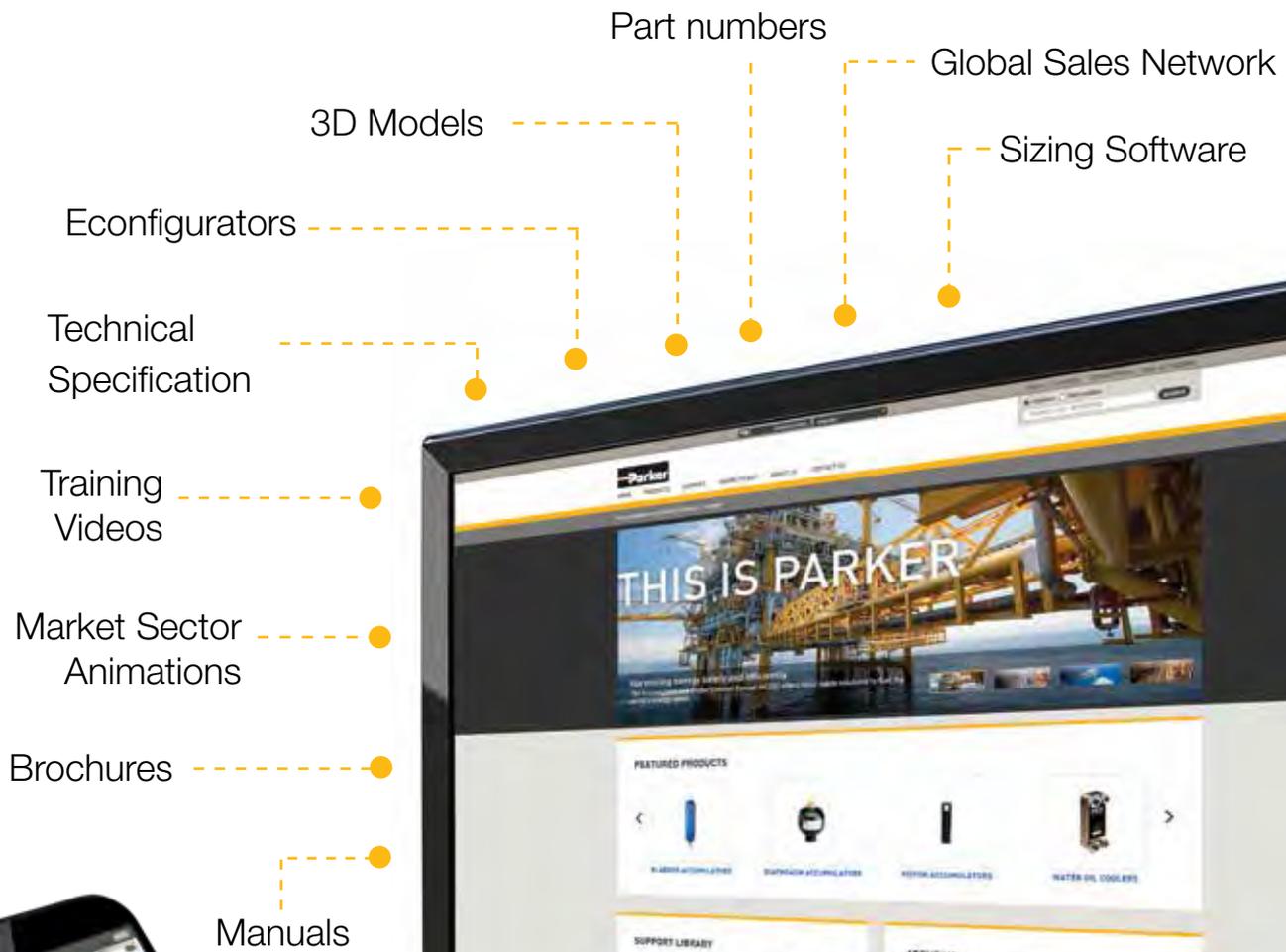
www.parker.com/acde

You can find the latest product information on the Parker website, parker.com/acde.

Designed to be accessible via desktops, tablets and smart phones you can download sizing software, e-configurators, manuals and 3D models.

You will also find all of our latest brochures and catalogues on the website.

In addition to our hydraulic accumulators and accessories we also provide a range of air oil and water oil coolers and accessories.



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