

hydroll

THE PISTON ACCUMULATOR COMPANY



THE PISTON
ACCUMULATOR
COMPANY



WHY PISTON ACCUMULATOR

Each type of accumulator technology has its advantages and limitations that must be considered when the accumulator is specified in the hydraulic system. Requirements for response time, system speed, mounting orientation, fluid type, pressure, temperature, diagnostics, maintenance and service intervals as well as costs of down time and servicing effect the selection. Hydroll piston accumulators have been designed to meet these requirements. Let us explain ourselves.

COMPARISON OF ACCUMULATOR TECHNOLOGIES

	PISTON 	BLADDER 	MEMBRANE 
Oil flow rate	High	Low	Medium
Compression ratio (max. pressure to pre-charge pressure)	10:1 ^(20:1)	4:1	6:1
Horizontal mounting position	Yes	No	Yes
Size optimization for system requirements	Yes	No	No
Space requirement	Small	Large	Medium
Sensing (e.g. pressure and piston position monitoring)	Yes	No	No
Temperature tolerance (low)	-45 °C	-20 °C ^(-40 °C)	-20 °C ^(-40 °C)
Extra gas tank connection	Yes	No	No
Dual functionality (dual piston or gas chamber)	Yes	No	No
Gas permeation (loss of pre-charge pressure)	Low	High	High
Service interval	Long	Short	Short
Response time	Medium	Medium	High
Tolerance for dirt	Low	High	High
Pre-charge lost in case of failure	Gradual	Immediate	Immediate
			Better

KEY ADVANTAGES



HIGHEST FLOW RATE

The piston accumulator structure enables the highest flow rates for hydraulic fluid.



OPTIMISATION FOR SYSTEM REQUIREMENTS

Piston accumulators can be short and wide or long and thin. Hydroll has a unique capability for effective mass customization.



LOWEST GAS PERMEATION

Multiple times slower pre-charge gas permeation makes piston the safest and most reliable alternative.



FLEXIBLE MOUNTING POSITION

The piston accumulator can also be mounted horizontally without sacrificing reliability.

The simple, compact, cylindrical design of piston accumulators ensures dependable performance, maximum efficiency, and a long service life. Various mounting positions, high oil flow rate and optimizability really set Hydroll piston accumulators apart from our competitors and competing technologies. **That's why!**



DESIGN FEATURES AND CONSTRUCTION

HOW DOES IT WORK

STRUCTURE AND OPERATING PRINCIPLE

CHARGING VALVE

Gas filling is conducted through the end flange by a dedicated gas valve. M16x2 as standard (arctic and M28x1.5 "bladder" type as an option)

END FLANGE (GAS)

The end flange is connected to the tube by treads or by crimping. The end flange can host sensing, e.g. pressure or piston position monitoring.

SHELL

The piston accumulator shell or tube is a special pressure vessel made of steel. The interior is roller burnished to ensure the highest quality. Before assembly each and every tube is inspected.

PISTON

The piston separates gas and fluid. It should be noted that the piston floats in the cylinder according to pressure changes. There are no radial forces impacting on the piston as in the cylinder, enhancing the piston accumulators durability.

PISTON SEALING SYSTEM

The typical piston sealing system comprises a piston seal and guide rings. The pressure difference over the piston seal is minimal despite enabling high system pressures.

END FLANGE SEALING SYSTEM

Static sealing consist dual sealing system for the highest reliability in the toughest conditions.

END FLANGE (FLUID)

The end flange is connected to the tube by treads or by crimping. The fluid connection is tailored according to customer needs. Also SAE connections are available for high flow rate applications.

A



The accumulator is pre-charged and ready for operation.

B



The hydraulic system is pressurized. The system pressure exceeds precharge pressure, and the fluid flows into the accumulator.

C



The system pressure is at its peak pressure and fluid capacity.

D



The system pressure falls and pressurized gas in the accumulator forces the fluid from the accumulator back into the system.



Cranab CRF 6 C

PISTON ACCUMULATOR

FOR EXTREME USE

Hydroll supplies piston accumulator solutions to customers for a wide range of applications in various industries. The one thing they have in common is the high demands that are set by heavy duty applications as well as remote and extreme operating environments.

Our products and solutions offer efficiency and functionality as well as operational safety and reliability to meet and exceed the needs and expectations of our customers.



MOBILE EQUIPMENT

Safety, ergonomics, reliability, productivity and efficiency are some of the most important features of any mobile equipment in today's mines, construction sites, farmlands or forests.

Originally developed to meet the extreme needs of Finnish forest harvesters, Hydroll mobile equipment accumulator solutions have proven their operations in extreme conditions, from Siberia to Chile and from Australia to North America.

Piston accumulators in mobile equipment improve:

- › Safety
- › Productivity
- › Reliability
- › Energy efficiency
- › Ergonomics

HYDROLL ACCUMULATORS CAN BE EFFECTIVELY CUSTOMISED TO YOUR SYSTEM REQUIREMENTS



ENERGY STORAGE IN HYBRID SYSTEMS

Piston accumulators have been proven to be the superior solution in hybrid systems. Hydroll's groundbreaking piston accumulator technology enables reductions in energy expenditure. In boom lowering motions for example, most of the potential energy is first stored in the accumulators and then recovered in the following lifting motions.



AXLE SUSPENSION

Reliable and smooth suspension for variable loads is built with single or double piston accumulators. Piston accumulators, due to their reliability, ability to withstand higher pressure peaks and freedom of installation are high performance solutions for heavy machinery in the most demanding operating environments.



EMERGENCY BACK-UP

As an emergency back-up, the piston accumulator's function is to store energy, which is available regardless of fluctuations in hydraulic pressure and provides a continued fail-safe application in the event of any loss of hydraulic power.

Piston accumulators are a long-life solution in which the failure mode is gradual, making them superior alternatives to diaphragm and bladder accumulators, that has total failure in case of damage.

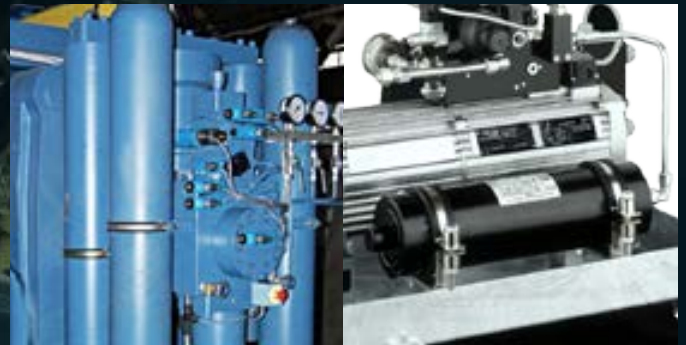


BOOM SUSPENSION

Active or passive boom suspension or soft ride control is a shock absorber for the bucket or boom. While tramming, the material should stay in place. This means a smoother ride for the operator and less stress on the machine.

**PROVEN
RELIABILITY
IN THE MOST
DEMANDING
CONDITIONS**

INDUSTRY AND PROJECTS



In **industrial hydraulics**, accumulators are used in a wide variety of functions. Hydroll's comprehensive accumulator selection can support even the most demanding needs in the markets.

- › Molding machines
- › Press systems
- › Casting systems
- › Hydro power plant

EXAMPLE APPLICATIONS

- › Damping element
- › Energy intensifier
- › Energy storage in a hybrid system
- › Energy storage to support pumps
- › Back up energy storage

MARINE AND OFFSHORE

Hydroll accumulators serve marine and offshore customers in a broad variety of functions. Our accumulators are designed to perform even in the toughest conditions, including arctic waters. The products are tailored to meet your requirements.

- › Approvals on demand (e.g. DNV, Lloyds Register, Bureau Veritas, ABS, GL Group)
- › Special coatings available on demand
- › Arctic packages -40°C and -45°C

EXAMPLE APPLICATION

- › Heave compensation in cranes
- › Brake release in winch systems
- › Emergency back-up for lifeboats
- › Damping elements

HYDROLL IS GEARED TO SUPPORT THE GROWING MARINE AND OFFSHORE INDUSTRY



ENERGY STORAGE OR SAFETY BACK-UP

The piston accumulator is the safest accumulator technology for system back-up. Furthermore its oil flow rates are the highest to provide fast and system function. Hence the piston accumulator is the optimal choice for the demanding needs of the marine and offshore industry.

**OVER 120 000
HYDROLL PISTON
ACCUMULATORS
IN OVER 10 000
WIND TURBINES**



WIND TURBINE HYDRAULIC PITCH CONTROL SYSTEMS AND BRAKES

Hydraulic pitch control constantly adjusts the angle of the blades to the wind to optimize the wind turbine's energy production. Also hydraulic pitch systems act as a main brake in extreme weather or wind conditions protecting the high value turbine.

Piston accumulators have a vital role in hydraulic pitch systems. Typically they perform three functions:

- › Damping pulsations from the pump and the proportional valve
- › During emergency stops accumulators supply extra oil/energy to the cylinders that pitches the blades to a safe position
- › Manual decompression is used during service

The wind turbine industry tends to use either bladder or piston accumulators. However, there are strong factors suggesting the superiority of piston accumulators in wind turbine applications such as:

- › Multiple times lower gas permeation
- › Superior reliability
- › The failure of piston accumulator is not sudden
- › High and low temperature tolerances
- › Ability to withstand centrifugal forces
- › Ease of installing real time pressure monitoring diagnostics

RENEWABLE ENERGY

Our **piston accumulator** solutions are truly proven as in just over a decade Hydroll has gained the position of the leading piston accumulator provider for the wind turbine industry.



SOLAR ENERGY

In concentrated photovoltaic (CPV) systems, tracking the sun all day is key for system efficiency. In remote locations high reliability with minimum maintenance is one of the key demands for hydraulic systems. Proven Hydroll accumulators are built for this purpose.



WAVE AND TIDAL ENERGY PRODUCTION

Hydroll, working closely together with its customers, has developed accumulator solutions to help utilize the huge potential of wave and tidal energy in the ocean. Hydroll accumulators have a crucial role in energy production in wave and tidal energy.



OUR MISSION:

TO REPLACE THE BLADDER

It is our passion to put all our focus and efforts into developing our piston accumulator technology to become even more competitive against bladder and membrane accumulators. We – and most importantly our customers worldwide – believe in the technical superiority of our products.



**WE CAN PROVIDE
THE BENEFITS OF A
PISTON ACCUMULATOR
FOR YOU FOR THE
COST OF BLADDER**

- › **15 YEARS OF EXPERIENCE IN PISTON ACCUMULATOR TECHNOLOGY**
- › **THE ONLY COMPANY IN THE WORLD WITH 100% FOCUS ON PISTON ACCUMULATOR TECHNOLOGY**
- › **STRONG IN-HOUSE R&D IN CLOSE CO-OPERATION WITH CUSTOMERS**
- › **EFFICIENT GLOBAL SUPPLY CHAIN - FAST AND ACCURATE DELIVERIES**
- › **RECOGNIZED FOR HIGH LEVEL AND FLEXIBLE CUSTOMER SERVICE**

UNCOMPROMISING QUALITY AND SAFETY

At Hydroll, we are committed to continuously developing both the piston accumulator technology as well as our products and our own know-how. In everything we do we put safety first. Our committed staff make sure that our production is always precise and the materials and components used are of the highest possible quality. All products are thoroughly tested before they are approved for shipping. Hydroll is ISO9001:2008 quality certified.

HYDROLL - THE STRENGTH OF THE ETOLA GROUP

As a member of the Etola Group, Hydroll has the backing of a Finnish industrial partner operating internationally, with operations in Finland, the Baltics and China. The Etola Group is a family-owned business that consists of approximately 30 specialist companies. The company's main product groups include hydraulics, fasteners, seals, industrial rubber and plastics, tapes and wire products, bearings and power transmission, tools and safety products. The Etola Group has a cumulative annual turnover of approximately €400 million.

**ETOLA
GROUP**

ACCUMULATOR SERIES

HPS, HPD, HDC, ACCUMULATOR STATIONS

OFFERINGS

Hydroll has the widest available selection of piston accumulator solutions, products and related services. We offer reliability, durability and supreme functionality for demanding tasks and conditions around the world.

TYPE APPROVALS

Hydroll offers a comprehensive range of CE and SELO approved piston accumulators.


STANDARD DESIGN APPROVALS

- > CE approved to European PED 97/23/EC
- > SELO - Pressure Vessels A1
- > ASME for below 6" or 152 mm internal diameter

OTHER APPROVALS ON DEMAND

- > DNV
- > Lloyds Register
- > Bureau Veritas
- > ABS
- > GL Group





**THIS IS WHAT
MAKES HYDROLL
DIFFERENT -
EFFICIENT MASS
CUSTOMIZATION.**

ENGINEERING SERVICES

Our starting point is always the customer application. The design of an optimal accumulator solution is conducted in three steps to precisely meet the customer application's specific needs.

1

APPLICATION ANALYSES

In-depth analyses of the application's specific requirements. Recommendations for optimized solutions.

2

SIZING THE ACCUMULATOR

Accumulator sizing is carried out together with the customer by simulation and testing.

3

TECHNICAL SUPPORT

Prototype
0-series
Serial production

OFFERING

HPS-SINGLE ACTION ACCUMULATOR

The HPS series is divided into three product lines. HPS 14 is the most cost effective non-repairable crumbed structure. HPS 10 is having one piece end-flange and HPS 11 is designed for larger diameters with 2-piece end-flange.

HPS 14

SPECIFICATIONS

50 mm ID
250 bar max working pressures
0,1-1 L volume

KEY FEATURES

- › Cost-efficient non-repairable accumulator
- › Suitable for heavy duty static and dynamic load applications and harsh weather conditions
- › Excellent gas sealing properties
- › Installation into any position

EXAMPLE APPLICATION:

- › Break system back up
- › Boom suspension
- › Compensator for pump pulsations





HPS 10

SPECIFICATIONS

50–180 mm ID
250, 350, 415, 500, 650 bar max working pressure
0,1–40 L volume

KEY FEATURES

- › Suitable for heavy duty static and dynamic load applications and harsh weather conditions
- › Excellent gas sealing properties
- › Easy to install optional sensors or piston position monitoring equipment
- › Optimized structure
- › Wide range of size and working pressures

EXAMPLE APPLICATION:

- › Wind turbines
- › Solar panels
- › Mobile equipment boom suspension
- › Energy storage
- › Industrial hydraulics



HPS 11

SPECIFICATIONS

180–250 mm ID
250, 350, 415 bar max working pressure
8–80 L volume (enquire for larger volumes)

KEY FEATURES

- › Suitable for heavy duty static and dynamic load applications and harsh weather conditions
- › Excellent gas sealing properties
- › Easy to install optional sensors or piston position monitoring equipment
- › Suitable for large diameters and volumes

EXAMPLE APPLICATION:

- › Energy storage



OFFERING

HPD-DOUBLE ACTION ACCUMULATOR

The HPD series by Hydroll is a patented range of double hydropneumatic piston accumulators. The design of HPD double piston accumulators has combined two accumulators into one product. The double action pistons allow for the suspension of two movements by one accumulator. The HPD double piston accumulator has a fluid connection in both end flanges and the gas is contained between two pistons within the one unit.

HPD 10

SPECIFICATIONS

50–80 mm ID
250 bar max working pressures
0,4–3 L volume

KEY FEATURES

- › Proven and robust design
- › Space-saving structure combining two accumulators into one
- › Excellent dampening features
- › Installation to into any position

EXAMPLE APPLICATION:

- › Boom swing suspensions
- › Forest harvesters heads



HDC-DOUBLE CHAMBER ACCUMULATOR

Hydroll's double chamber structure enables smooth suspension for variable loads. The HDC is an accumulator solution designed for axle and boom suspension. A double gas chamber with a pre-charged pressure difference is the key to smooth suspension for variable payloads. The HDC is based on the proven design and components from the HPS series.

HDC 10

SPECIFICATIONS

80–125 mm ID
250 bar max working pressures
2x1–2x3,5 L volume

KEY FEATURES

- › Smooth suspension for variable payloads
- › Proven and robust design
- › Space saving structure

EXAMPLE APPLICATION:

- › Axle suspension
- › Front loader boom suspension
- › Tele handler boom suspension
- › Tractor front loader suspension





ACCUMULATOR STATIONS

Accumulator stations with frame, piping, plus all necessary valves and safety devices enable our customers to get plug-and-play modules for their assembly process. Hydrill accumulator stations provide easy-to-install solutions tailored to our customer needs.



OPTIONAL EQUIPMENT

› ARCTIC PACKAGE (-40°C AND -45°C)

Hydrill has vast experience in the design and production of accumulators for arctic conditions. Operational temperatures as follows:

- › -25°C to +80°C (Standard)
- › -40°C to +80°C (Arctic package I)
- › -45°C to +80°C (Arctic package II)

› PISTON POSITION MONITORING

Hydrill piston accumulators are available with different systems for piston position monitoring in the accumulator.

- › Wire measuring system
- › Limit switches

› PRESSURE MONITORING

Simple and reliable on-line pre-charge pressure monitoring systems available. Enquire for details.

› SAFETY VALVE

PED certified safety valves and blocks available on request.

› GAS VALVE

Hydrill standard gas valve is named HGV1620. List of alternative arctic and "bladder" type gas valves in table below.



Features of gas valves

Product	Product name	Pressure rating	Connection thread	Low temp.
Standard HYDROLL gas valve, M16x2	M16x2	630 bar	1/4	-25°C
HYDROLL gas valve arctic M16x2	M16x2 arctic	630 bar	1/4	-45°C
M16x1,5 – Stainless steel – Arctic gas valve	M16x1.5 ROS	630 bar	M14x1,5	-45°C
M28x2 type gas valve	M28x1.5 gas valve	630 bar	R½" or integrated	-45°C

ACCESSORIES



CHARGING UNIT

The HPCK charging kit is required to check the pre-charge pressure of an accumulator. The HPCK charging kit can be used with all Hydroll piston accumulators and is compatible with the HGV 1620 gas valve with M16x2 mm thread.

Product	Product name
HPCK Charging kit with 5meter hose	HPCK
Gas connector (for std. Gas bottle)	
For special connectors, ask for more information.	

SEAL KITS

Seal kits should be selected according to the accumulator type. A seal kit includes:

- > Piston seal
- > Piston guide ring
- > O-ring seals
- > Support rings

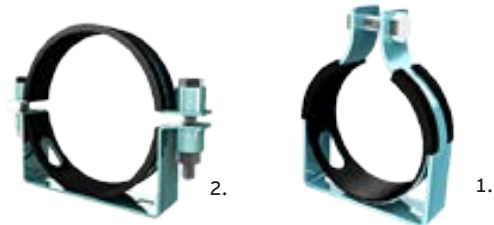


Product	Suitability for type
Sealkit HPS 50	HPS Ø 50
Sealkit HPD 50	HPD Ø 50
Sealkit HPS 80	HPS Ø 80
Sealkit HPD 80	HPD Ø 80
Sealkit HPS 100	HPS Ø 100
Sealkit HPS 125	HPS Ø 125
Sealkit HPS 140	HPS Ø 140
Sealkit HPS 150	HPS Ø 150
Sealkit HPS 160	HPS Ø 160
Sealkit HPS 180	HPS Ø 180
Sealkit HPS 200	HPS Ø 200
Sealkit HPS 250	HPS Ø 250

CLAMPS

Hydroll clamps are used to mount all types of accumulators safely and simply into position. A suitable clamp has been designed for every accumulator type.

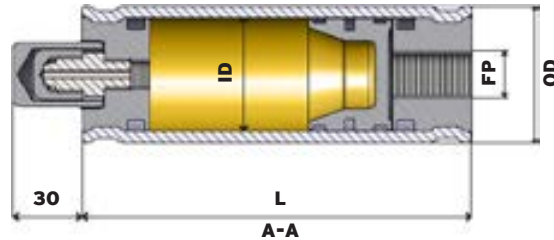
- > To keep the accumulator in position
- > To carry the weight of the accumulator



Product name	Suitability for cylinder diameters	Weight / kg	H / mm	Material thickness	W / mm	Model number *
HP Clamp 60	58 mm-62 mm	0.3	100	3 mm	80	1
HP Clamp 90	85 mm-92 mm	0.45	140	3 mm	110	1
HP Clamp 95	92 mm-98 mm	0.45	140	3 mm	110	1
HP Clamp 95-2	90 mm-100 mm	0.8	120	3 mm	170	2
HP Clamp 120	110 mm-125 mm	0.9	145	3 mm	200	2
HP Clamp 120 Heavy	110 mm-125 mm	1.1	145	5 mm		2
HP Clamp 165	155 mm-165 mm	1.2	205	3 mm	245	2
HP Clamp 185	170 mm-185 mm	1	220	3 mm	255	2
HP Clamp 185 Heavy	170 mm-185 mm	1.3	220	5 mm	270	2
HP Clamp 205	195 mm-205 mm	1.5	230	3 mm	291	2
HP Clamp 205 Heavy	195 mm-205 mm	2	230	5 mm	295	2
HP Clamp 230	220 mm-230 mm	1.8	270	3 mm	310	2
HP Clamp 300	280 mm-300 mm	2	325	3 mm	365	2

SPECIFICATIONS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------



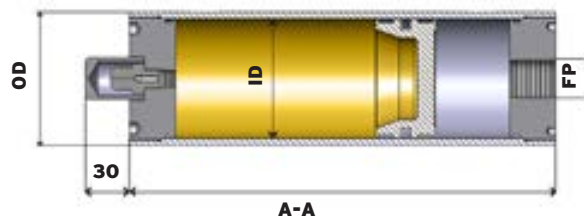
HPS 14 PISTON ACCUMULATORS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 50

PED / SELO / ASME *					
HPS14-250-050-0001	250	0,1	50/60/136	R½"	1.9
HPS14-250-050-0002	250	0,2	50/60/187	R½"	2.2
HPS14-250-050-0003	250	0,3	50/60/238	R½"	2.6
HPS14-250-050-0004	250	0,4	50/60/289	R½"	2.9
HPS14-250-050-0005	250	0,5	50/60/340	R½"	3.3
HPS14-250-050-0007	250	0,7	50/60/442	R½"	4.0
HPS14-250-050-0010	250	1	50/60/594	R½"	5.0

* Pressure vessels that internal diameter is less than 152 mm (6") are not considered into scope of the ASME DIVISION 1



HPS 10 PISTON ACCUMULATORS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 50

PED / SELO / ASME *					
HPS10-350-050-0001	350	0.1	50/60/130	R¾"	1.9
HPS10-350-050-0002	350	0.2	50/60/181	R¾"	2.2
HPS10-350-050-0003	350	0.3	50/60/232	R¾"	2.6
HPS10-350-050-0004	350	0.4	50/60/283	R¾"	3.0
HPS10-350-050-0005	350	0.5	50/60/334	R¾"	3.3
HPS10-350-050-0007	350	0.7	50/60/435	R¾"	4.0
HPS10-350-050-0010	350	1	50/60/588	R¾"	5.0

SPECIFICATIONS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 60

PED / SELO / ASME *					
HPS10-350-060-0001	350	0.1	60/70/121	R¾"	2.7
HPS10-350-060-0002	350	0.2	60/70/156	R¾"	3.0
HPS10-350-060-0003	350	0.3	60/70/192	R¾"	3.3
HPS10-350-060-0004	350	0.4	60/70/227	R¾"	3.6
HPS10-350-060-0005	350	0.5	60/70/263	R¾"	3.9
HPS10-350-060-0007	350	0.7	60/70/333	R¾"	4.4
HPS10-350-060-0010	350	1	60/70/439	R¾"	5.3

ID Ø 80

PED / SELO / ASME *					
HPS10-250-080-0004	250	0.4	80/90/166	R¾"	4.7
HPS10-250-080-0005	250	0.5	80/90/186	R¾"	4.9
HPS10-250-080-00075	250	0.75	80/90/236	R¾"	5.5
HPS10-250-080-0010	250	1	80/90/286	R¾"	6.0
HPS10-250-080-0015	250	1.5	80/90/385	R¾"	7.0
HPS10-250-080-0020	250	2	80/90/485	R¾"	8.1
HPS10-250-080-0030	250	3	80/90/684	R¾"	10.2
HPS10-250-080-0040	250	4	80/90/883	R¾"	12.2

PED / SELO / ASME *					
HPS10-350-080-0004	250	0.4	80/95/166	R¾"	5.7
HPS10-350-080-0005	250	0.5	80/95/186	R¾"	6.0
HPS10-350-080-00075	250	0.75	80/95/236	R¾"	6.8
HPS10-350-080-0010	250	1	80/95/286	R¾"	7.6
HPS10-350-080-0015	250	1.5	80/95/385	R¾"	9.2
HPS10-350-080-0020	250	2	80/95/485	R¾"	10.8
HPS10-350-080-0030	250	3	80/95/684	R¾"	14.1
HPS10-350-080-0040	250	4	80/95/883	R¾"	17.3

PED / SELO / ASME *					
HPS10-500-080-0004	500	0.4	80/95/173	R¾"	6.1
HPS10-500-080-0005	500	0.5	80/95/193	R¾"	6.4
HPS10-500-080-00075	500	0.75	80/95/243	R¾"	7.2
HPS10-500-080-0010	500	1	80/95/292	R¾"	8.1
HPS10-500-080-0015	500	1.5	80/95/392	R¾"	9.6
HPS10-500-080-0020	500	2	80/95/491	R¾"	11.3
HPS10-500-080-0030	500	3	80/95/670	R¾"	14.5
HPS10-500-080-0040	500	4	80/95/889	R¾"	17.7



Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 100

PED / SELO / ASME *					
HPS10-350-100-0020	350	2	100/115/381	R1"	14.8
HPS10-350-100-0030	350	3	100/115/509	R1"	17.4
HPS10-350-100-0040	350	4	100/115/636	R1"	19.9
HPS10-350-100-0060	350	6	100/115/891	R1"	24.9
HPS10-350-100-0080	350	8	100/115/1146	R1"	30.0
HPS10-350-100-0100	350	10	100/115/1400	R1"	35.1

PED / SELO / ASME *					
HPS10-500-100-0020	500	2	100/120/381	R1"	17.4
HPS10-500-100-0030	500	3	100/120/509	R1"	20.9
HPS10-500-100-0040	500	4	100/120/636	R1"	24.4
HPS10-500-100-0060	500	6	100/120/891	R1"	31.3
HPS10-500-100-0080	500	8	100/120/1146	R1"	38.2
HPS10-500-100-0100	500	10	100/120/1400	R1"	45.1

ID Ø 125

PED / SELO / ASME *					
HPS10-250-125-0040	250	4	125/140/441	R1"	26.1
HPS10-250-125-0050	250	5	125/140/522	R1"	28.8
HPS10-250-125-0060	250	6	125/140/604	R1"	31.6
HPS10-250-125-0080	250	8	125/140/767	R1"	37.0
HPS10-250-125-0100	250	10	125/140/930	R1"	42.5
HPS10-250-125-0120	250	12	125/140/1093	R1"	47.9
HPS10-250-125-0150	250	15	125/140/1337	R1"	56.0
HPS10-250-125-0200	250	20	125/140/1745	R1"	69.6

PED / SELO / ASME *					
HPS10-350-125-0040	350	4	125/140/457	R1"	28.2
HPS10-350-125-0050	350	5	125/140/538	R1"	30.9
HPS10-350-125-0060	350	6	125/140/620	R1"	33.7
HPS10-350-125-0080	350	8	125/140/783	R1"	39.1
HPS10-350-125-0100	350	10	125/140/946	R1"	44.5
HPS10-350-125-0120	350	12	125/140/1109	R1"	49.9
HPS10-350-125-0150	350	15	125/140/1353	R1"	58.1
HPS10-350-125-0200	350	20	125/140/1761	R1"	71.7

SPECIFICATIONS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
PED / SELO / ASME *					
HPS10-415-125-0040	415	4	125/145/471	R1"	30.1
HPS10-415-125-0050	415	5	125/145/552	R1"	32.8
HPS10-415-125-0060	415	6	125/145/634	R1"	35.5
HPS10-415-125-0080	415	8	125/145/797	R1"	40.9
HPS10-415-125-0100	415	10	125/145/960	R1"	46.3
HPS10-415-125-0120	415	12	125/145/1123	R1"	51.8
HPS10-415-125-0150	415	15	125/145/1367	R1"	59.9
HPS10-415-125-0200	415	20	125/145/1775	R1"	73.5

ID Ø 140

PED / SELO / ASME *					
HPS10-250-140-0040	250	4	140/160/394	R 1 ½"	28.9
HPS10-250-140-0050	250	5	140/160/459	R 1 ½"	31.3
HPS10-250-140-0060	250	6	140/160/524	R 1 ½"	33.7
HPS10-250-140-0100	250	10	140/160/808	R 1 ½"	44.3
HPS10-250-140-0120	250	12	140/160/914	R 1 ½"	48.2
HPS10-250-140-0150	250	15	140/160/1109	R 1 ½"	55.4
HPS10-250-140-0200	250	20	140/160/1434	R 1 ½"	67.4
HPS10-250-140-0250	250	25	140/160/1759	R 1 ½"	79.4

PED / SELO / ASME *					
HPS10-350-140-0040	350	4	140/160/418	R 1 ½"	33.3
HPS10-350-140-0050	350	5	140/160/483	R 1 ½"	35.7
HPS10-350-140-0060	350	6	140/160/548	R 1 ½"	38.1
HPS10-350-140-0100	350	10	140/160/808	R 1 ½"	47.7
HPS10-350-140-0120	350	12	140/160/938	R 1 ½"	52.5
HPS10-350-140-0150	350	15	140/160/1133	R 1 ½"	59.7
HPS10-350-140-0200	350	20	140/160/1458	R 1 ½"	71.7
HPS10-350-140-0250	350	25	140/160/1783	R 1 ½"	83.7

PED / SELO / ASME *					
HPS10-415-140-0040	415	4	140/160/434	R 1 ½"	36.1
HPS10-415-140-0050	415	5	140/160/499	R 1 ½"	38.5
HPS10-415-140-0060	415	6	140/160/564	R 1 ½"	40.9
HPS10-415-140-0100	415	10	140/160/824	R 1 ½"	50.5
HPS10-415-140-0120	415	12	140/160/954	R 1 ½"	55.3
HPS10-415-140-0150	415	15	140/160/1149	R 1 ½"	62.5
HPS10-415-140-0200	415	20	140/160/1474	R 1 ½"	74.5
HPS10-415-140-0250	415	25	140/160/1799	R 1 ½"	86.6



Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 150

PED / SELO / ASME *					
HPS10-250-150-0050	250	5	150/170/419	R 1 ½"	34.3
HPS10-250-150-0060	250	6	150/170/476	R 1 ½"	36.6
HPS10-250-150-0100	250	10	150/170/702	R 1 ½"	45.5
HPS10-250-150-0120	250	12	150/170/815	R 1 ½"	50.0
HPS10-250-150-0150	250	15	150/170/985	R 1 ½"	56.7
HPS10-250-150-0200	250	20	150/170/1268	R 1 ½"	67.9
HPS10-250-150-0250	250	25	150/170/1551	R 1 ½"	79.1
HPS10-250-150-0300	250	30	150/170/1734	R 1 ½"	90,5

PED / SELO / ASME *					
HPS10-350-150-0050	350	5	150/170/445	R 1 ½"	39.0
HPS10-350-150-0060	350	6	150/170/502	R 1 ½"	41.3
HPS10-350-150-0100	350	10	150/170/728	R 1 ½"	50.2
HPS10-350-150-0120	350	12	150/170/841	R 1 ½"	54.6
HPS10-350-150-0150	350	15	150/170/1011	R 1 ½"	61.3
HPS10-350-150-0200	350	20	150/170/1294	R 1 ½"	72.5
HPS10-350-150-0250	350	25	150/170/1577	R 1 ½"	83.6
HPS10-350-150-0300	350	30	150/170/1860	R 1 ½"	94.8

PED / SELO / ASME *					
HPS10-415-150-0050	415	5	150/175/441	R 1 ½"	42.9
HPS10-415-150-0060	415	6	150/175/498	R 1 ½"	45.8
HPS10-415-150-0100	415	10	150/175/724	R 1 ½"	57.1
HPS10-415-150-0120	415	12	150/175/837	R 1 ½"	62.7
HPS10-415-150-0150	415	15	150/175/1007	R 1 ½"	71.3
HPS10-415-150-0200	415	20	150/175/1290	R 1 ½"	85.4
HPS10-415-150-0250	415	25	150/175/1573	R 1 ½"	99.6
HPS10-415-150-0300	415	30	150/175/1856	R 1 ½"	113.8

* Pressure vessels that internal diameter is less than 152 mm (6") are not considered into scope of the ASME DIVISION 1

SPECIFICATIONS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 160

PED / SELO					
HPS10-250-160-0060	250	6	160/180/452	R 1 ½"	41.3
HPS10-250-160-0080	250	8	160/180/551	R 1 ½"	45.5
HPS10-250-160-0100	250	10	160/180/651	R 1 ½"	49.7
HPS10-250-160-0150	250	15	160/180/899	R 1 ½"	60.1
HPS10-250-160-0200	250	20	160/180/1148	R 1 ½"	70.5
HPS10-250-160-0250	250	25	160/180/1397	R 1 ½"	80.9
HPS10-250-160-0300	250	30	160/180/1646	R 1 ½"	91.4

PED / SELO					
HPS10-415-160-0060	350	6	160/180/490	R 1 ½"	48.9
HPS10-350-160-0080	350	8	160/180/589	R 1 ½"	53.1
HPS10-350-160-0100	350	10	160/180/689	R 1 ½"	57.3
HPS10-350-160-0150	350	15	160/180/937	R 1 ½"	67.6
HPS10-350-160-0200	350	20	160/180/1186	R 1 ½"	78.1
HPS10-350-160-0250	350	25	160/180/1435	R 1 ½"	88.5
HPS10-350-160-0300	350	30	160/180/1684	R 1 ½"	99.0

PED / SELO					
HPS10-415-160-0060	415	6	160/185/480	R 1 ½"	52.3
HPS10-415-160-0080	415	8	160/185/579	R 1 ½"	57.6
HPS10-415-160-0100	415	10	160/185/679	R 1 ½"	62.9
HPS10-415-160-0150	415	15	160/185/927	R 1 ½"	76.1
HPS10-415-160-0200	415	20	160/185/1176	R 1 ½"	89.4
HPS10-415-160-0250	415	25	160/185/1425	R 1 ½"	102.6
HPS10-415-160-0300	415	30	160/185/1674	R 1 ½"	115.9



Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 180

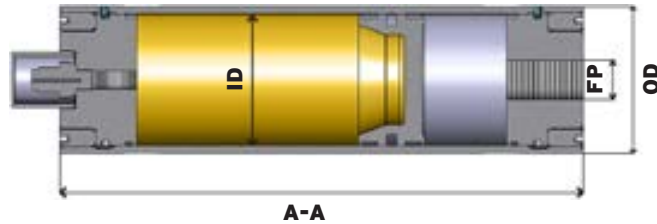
PED / SELO					
HPS10-250-180-0080	250	8	180/200/484	R 1 ½"	59.2
HPS10-250-180-0100	250	10	180/200/563	R 1 ½"	63.0
HPS10-250-180-0120	250	12	180/200/641	R 1 ½"	66.6
HPS10-250-180-0150	250	15	180/200/759	R 1 ½"	72.1
HPS10-250-180-0200	250	20	180/200/956	R 1 ½"	81.4
HPS10-250-180-0250	250	25	180/200/1152	R 1 ½"	90.6
HPS10-250-180-0300	250	30	180/200/1349	R 1 ½"	99.8
HPS10-250-180-0350	250	35	180/200/1545	R 1 ½"	109.0
HPS10-250-180-0400	250	40	180/200/1742	R 1 ½"	118.2

PED / SELO					
HPS10-350-180-0080	350	8	180/205/496	R 1 ½"	68.3
HPS10-350-180-0100	350	10	180/205/574	R 1 ½"	73.0
HPS10-350-180-0120	350	12	180/205/653	R 1 ½"	77.6
HPS10-350-180-0150	350	15	180/205/771	R 1 ½"	84.6
HPS10-350-180-0200	350	20	180/205/968	R 1 ½"	96.3
HPS10-350-180-0250	350	25	180/205/1164	R 1 ½"	107.9
HPS10-350-180-0300	350	30	180/205/1361	R 1 ½"	119.6
HPS10-350-180-0350	350	35	180/205/1557	R 1 ½"	131.3
HPS10-350-180-0400	350	40	180/205/1754	R 1 ½"	143.0

PED / SELO					
HPS10-415-180-0080	415	8	180/205/520	R 1 ½"	74.5
HPS10-415-180-0100	415	10	180/205/598	R 1 ½"	79.2
HPS10-415-180-0120	415	12	180/205/677	R 1 ½"	83.8
HPS10-415-180-0150	415	15	180/205/795	R 1 ½"	90.8
HPS10-415-180-0200	415	20	180/205/992	R 1 ½"	102.5
HPS10-415-180-0250	415	25	180/205/1188	R 1 ½"	114.2
HPS10-415-180-0300	415	30	180/205/1385	R 1 ½"	125.8
HPS10-415-180-0350	415	35	180/205/1581	R 1 ½"	137.5
HPS10-415-180-0400	415	40	180/205/1778	R 1 ½"	149.2

SPECIFICATIONS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------



HPS 11 PISTON ACCUMULATORS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 180

PED / SELO					
HPS11-250-180-0080	250	8	180/200/498	R 1 ½"	63.1
HPS11-250-180-0100	250	10	180/200/577	R 1 ½"	66.8
HPS11-250-180-0120	250	12	180/200/656	R 1 ½"	70.5
HPS11-250-180-0150	250	15	180/200/774	R 1 ½"	76.0
HPS11-250-180-0200	250	20	180/200/971	R 1 ½"	85.3
HPS11-250-180-0250	250	25	180/200/1167	R 1 ½"	94.5
HPS11-250-180-0300	250	30	180/200/1364	R 1 ½"	103.7
HPS11-250-180-0350	250	35	180/200/1561	R 1 ½"	112.9
HPS11-250-180-0400	250	40	180/200/1758	R 1 ½"	122.3

ID Ø 200

PED / SELO					
HPS11-250-200-0080	250	8	200/220/469	R2"	79.8
HPS11-250-200-0100	250	10	200/220/533	R2"	83.1
HPS11-250-200-0150	250	15	200/220/692	R2"	91.4
HPS11-250-200-0200	250	20	200/220/851	R2"	99.6
HPS11-250-200-0250	250	25	200/220/1010	R2"	107.9
HPS11-250-200-0300	250	30	200/220/1169	R2"	116.1
HPS11-250-200-0450	250	45	200/220/1647	R2"	140.9
HPS11-250-200-0500	250	50	200/220/1806	R2"	149.1



Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

PED / SELO					
HPS11-350-200-0080	350	8	200/230/479	R2"	97.9
HPS11-350-200-0100	350	10	200/230/543	R2"	105
HPS11-350-200-0150	350	15	200/230/702	R2"	117.8
HPS11-350-200-0200	350	20	200/230/861	R2"	130.3
HPS11-350-200-0250	350	25	200/230/1020	R2"	143.0
HPS11-350-200-0300	350	30	200/230/1179	R2"	155.7
HPS11-350-200-0450	350	45	200/230/1657	R2"	193.7
HPS11-350-200-0500	350	50	200/230/1816	R2"	206.3

PED / SELO					
HPS11-415-200-0080	415	8	200/230/489	R2"	103.3
HPS11-415-200-0100	415	10	200/230/553	R2"	108.4
HPS11-415-200-0150	415	15	200/230/712	R2"	121.1
HPS11-415-200-0200	415	20	200/230/871	R2"	133.7
HPS11-415-200-0250	415	25	200/230/1030	R2"	146.4
HPS11-415-200-0300	415	30	200/230/1189	R2"	159.1
HPS11-415-200-0450	415	45	200/230/1667	R2"	197.1
HPS11-415-200-0500	415	50	200/230/1826	R2"	209.7

ID Ø 250

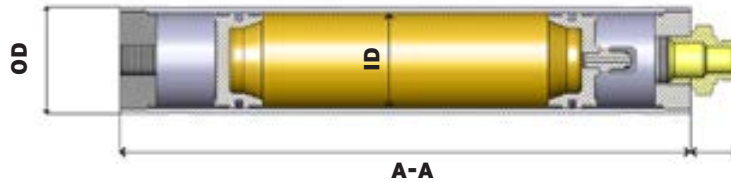
PED / SELO					
HPS11-250-250-0400	250	40	250/300/1038	R2"	274.5
HPS11-250-250-0500	250	50	250/300/1242	R2"	309.0
HPS11-250-250-0600	250	60	250/300/1446	R2"	343.0
HPS11-250-250-0700	250	70	250/300/1649	R2"	378.0
HPS11-250-250-0800	250	80	250/300/1853	R2"	412.0

PED / SELO					
HPS11-350-250-0400	350	40	250/300/1068	R2"	293.0
HPS11-350-250-0500	350	50	250/300/1272	R2"	328.0
HPS11-350-250-0600	350	60	250/300/1476	R2"	362.0
HPS11-350-250-0700	350	70	250/300/1679	R2"	397.0
HPS11-350-250-0800	350	80	250/300/1883	R2"	431.0

PED / SELO					
HPS11-415-250-0400	415	40	250/300/1068	R2"	294.0
HPS11-415-250-0500	415	50	250/300/1272	R2"	328.0
HPS11-415-250-0600	415	60	250/300/1476	R2"	363.0
HPS11-415-250-0700	415	70	250/300/1679	R2"	397.0
HPS11-415-250-0800	415	80	250/300/1883	R2"	432.0

SPECIFICATIONS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------



HPD DOUBLE PISTON ACCUMULATORS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 50

PED / SELO / ASME *	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
HPD10-250-050-0004	250	0.4	50/60/330	R¾"	4.8
HPD10-250-050-0005	250	0.5	50/60/381	R¾"	5.1
HPD10-250-050-0007	250	0.65	50/60/457	R¾"	5.6
HPD10-250-050-0010	250	1	50/60/635	R¾"	6.8

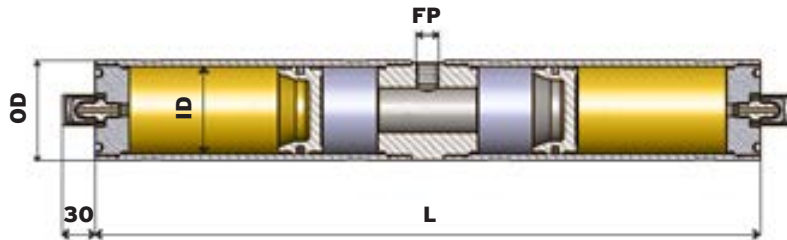
ID Ø 80

PED / SELO / ASME *	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
HPD10-250-080-0004	250	0.4	80/90/191	R¾"	6.0
HPD10-250-080-0005	250	0.5	80/90/211	R¾"	6.2
HPD10-250-080-0008	250	0.75	80/90/261	R¾"	6.7
HPD10-250-080-0010	250	1	80/90/311	R¾"	7.3
HPD10-250-080-0020	250	2	80/90/510	R¾"	9.4
HPD10-250-080-0030	250	3	80/90/709	R¾"	11.5

* Pressure vessels that internal diameter is less than 152 mm (6") are not considered into scope of the ASME DIVISION 1



Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------



HDC DOUBLE CHAMBER PISTON ACCUMULATORS

Product name	Max Allowable Pressure / bar	Capacity / litre	Dimensions ID / OD / L	Standard Fluid Port	Weight / kg
--------------	------------------------------	------------------	------------------------	---------------------	-------------

ID Ø 80

PED / SELO / ASME *					
HDC10-250-080-0010x2	250	2 x 1 ltr	80/90/602	R $\frac{1}{2}$ "	12.5
HDC10-250-080-0015x2	250	2 x 1,5 ltr	80/90/800	R $\frac{1}{2}$ "	14.5
HDC10-250-080-0020x2	250	2 x 2 ltr	80/90/1000	R $\frac{1}{2}$ "	16.7
HDC10-250-080-0025x2	250	2 x 2,5 ltr	80/90/1228	R $\frac{1}{2}$ "	18.6

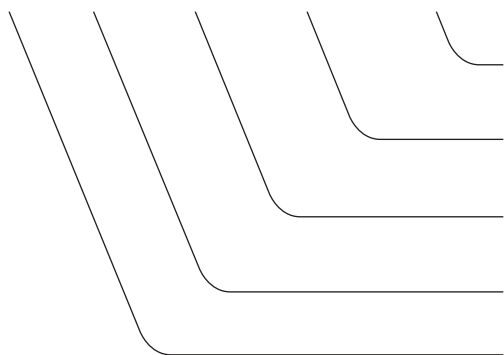
ID Ø 125

PED / SELO / ASME *					
HDC10-250-125-0020x2	250	2 x 2 ltr	125/140/594	R $\frac{3}{4}$ "	44.8
HDC10-250-125-0025x2	250	2 x 2,5 ltr	125/140/676	R $\frac{3}{4}$ "	47.3
HDC10-250-125-0030x2	250	2 x 3 ltr	125/140/758	R $\frac{3}{4}$ "	49.8
HDC10-250-125-0035x2	250	2 x 3,5 ltr	125/140/838	R $\frac{3}{4}$ "	52.3

* Pressure vessels that internal diameter is less than 152 mm (6") are not considered into scope of the ASME DIVISION 1

HOW TO READ PRODUCT NAME

HPS10-350-140-0150



CAPACITY [DECILITRE]

0001-1000 < 0,1-100 liter

PISTON DIAMETER [mm]

50, 60, 80, 100, 125, 140, 150, 160, 180, 200, 250

MAX WORKING PRESSURE [BAR]

250, 350, 415, 500

END FLANGE STRUCTURE TYPE

10, 11, 14

ACCUMULATOR TYPE

HPS, HPD, HDC

SALES PARTNERS

FINLAND

NESTEPAINE OY
(member of ETOLA group)
Mäkituvantie 11
01510 Vantaa
Finland

Tel: +358 (0) 207 65 7460
Mob: +400 (0) 210 905
Fax: +358 (0) 207 65 7666

www.nestepaine.fi

SWEDEN

TUBE CONTROL AB
Storsätragränd 10
Box 292,
127 25 Skärholmen
Sverige

Tel: +46 (0) 8 555 921 00
Fax: +46 (0) 8 555 921 50
Email: order@tubecontrol.se
Email: info@tubecontrol.se

www.tubecontrol.se

DENMARK

FRITZ SCHUR TEKNIK A/S
Roskildevej 8-10
DK-2620 Albertslund
Denmark

Tel: +45 70 20 16 16
Fax: +45 70 20 16 15
Email: contact@fst.dk

www.fst.dk

CHINA

ETOLA INDUSTRIAL
PRODUCTS (Tianjin) Co., Ltd.
Workshop 7, 249 Huang Hai Road,
TEDA, Tianjin 300457

Tel: +86 22 25761933
Fax: +86 22 25764191
Email: info@etola.cn

www.etola.cn

hydroll
THE PISTON ACCUMULATOR COMPANY

PL 12 Lohkarekuja 6
FIN-62101
Lapua, Finland

Tel: +358 (0) 20 765 7900
Fax: +358 (0) 20 765 7901
Email: info@hydroll.com