



# A world of solutions in piston accumulators



Hydraulic piston accumulators

**2014/68/EU**

**KA**

**ASME**

**GLUAL**

HYDRAULICS



2014/68/EU  
ASME

# KA

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## KA

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 **TÜVRheinland**<sup>®</sup>  
Precisely Right.



PRODUCTS

**top quality**

More than 40 years experience in hydraulic products design, manufacturing and service. Commitment to customer satisfaction, production flexibility to accomplish customer needs.



SOLUTIONS

**Hydraulic units  
Electronic**



**Rotating joints**



**Accumulators**

**HYDRAULIC CYLINDERS**  
ISO



**Servocylinder**

Industrial

High performance

Premier



**Customized**

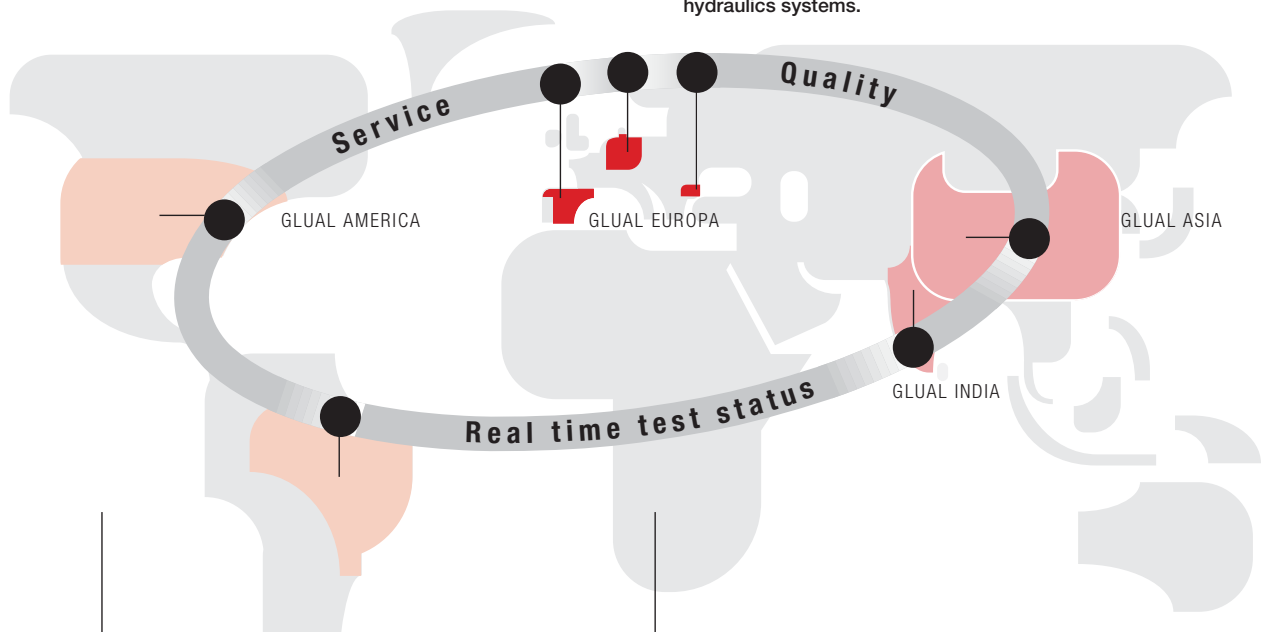
ISO

# Solutions in hydraulics

THE GROUP

## global coverage

As we are present in all the continents, we provide worldwide coverage to anything you may need for hydraulics systems.



### I+D +i

#### TECHNOLOGY

GLUAL has a team of highly qualified and experienced engineers. We work with advanced design tools by graphical simulation of hydraulic drives and 2D/3D design. Our technical department in close collaboration with the technical office develops customer optimal solutions in hydraulic and electronic systems.

We invest every year in different R+D+i projects participating with companies and research centers to different markets and products.

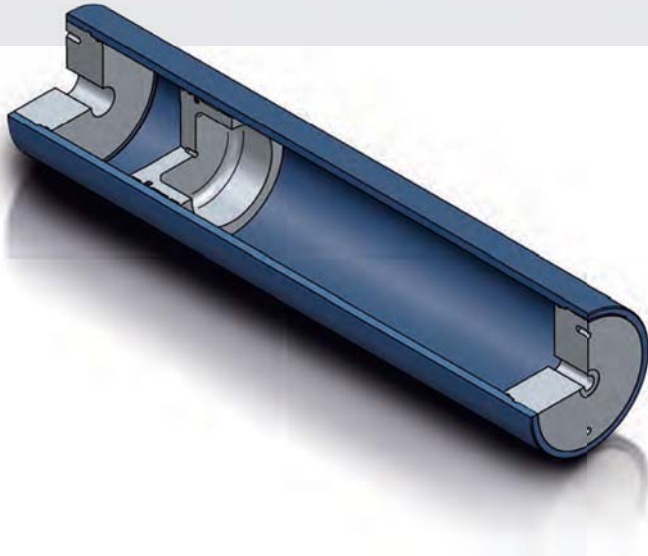
### After-sales service

#### SERVICE

As we are high experienced in hydraulics, we are able to provide any kind of service, from start up of a complete hydraulic system to any individual hydraulic component repair and maintenance service.

# KA

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## Overview

Piston accumulators are hydroneumatic accumulators with a sliding rigid piston to separate gas side (nitrogen) and operation fluid side

Glual piston accumulators operation is based on the considerable difference in compressibility between gas (nitrogen) and operation fluid (liquid). This enables a large quantity of energy to be stored in an extremely compact form.

The piston accumulators can be used in a wide variety of applications, some of which are listed below:

- Energy storage
- Pulsation damping
- Shock absorption
- Stabilize pressure and flow
- Leakage compensation
- ...

The fluid side of the accumulator is connected to the hydraulic circuit and when the circuit pressure increases, the fluid enters in fluid side of accumulator and the gas is compressed. When the circuit pressure drops, the compressed gas expands and the stored fluid is forced into the circuit.

For the right choice of accumulator, is advisable to consider some parameters: operation fluid, pressure range, temperature, speed, response time, mounting orientation...

## Advantages

There are different types of accumulators (piston, bladder, diaphragm ...) and accumulators provide major advantages to hydraulic circuits:

- Reduce pump size
- Reduce installed electrical power
- Energy efficiency
- Increase response time

...

**Piston accumulators have advantages over other types:**

- High compression ratio ( $P_o \div P_{max}$ )
- Horizontal mounting position
- Pressure and position monitoring possible
- Low permeation
- High oil flow rate
- Total discharge is possible
- In failure case, gradual gas loss
- Different sealing solutions (fluids, temperature, pressure, speed...)
- Optimal application solution (changing diameter and length)

## Technical characteristics

### Design pressure

- 250 bar or 375 bar

### Temperature range

- Standard temperature range -20°C to +80°C.
- Low temperature range: -40°C to +80°C.
- Others on request

### Volume

- 2014/68/EU: 0.5 to 500 liters
- ASME: 10 to 500 liters

### Fluids

- Mineral oil DIN51524 (HL, HLP).
- Phosphate ester (HFD-R).
- Other fluids

### Gas load

- For safety reasons, for gas filling use only pure nitrogen 99,9%, class 4.0.
- Never use oxygen (this may lead to an explosion).
- See notes in «Operation and maintenance» manual

### Fluid and gas connection

Different types of connections for oil and gas side are available.

### Operation and maintenance

To avoid injuries and damage to the devices, it is important to read (operation and maintenance manual) before installation of the accumulator in a hydraulic system.

## Characteristics

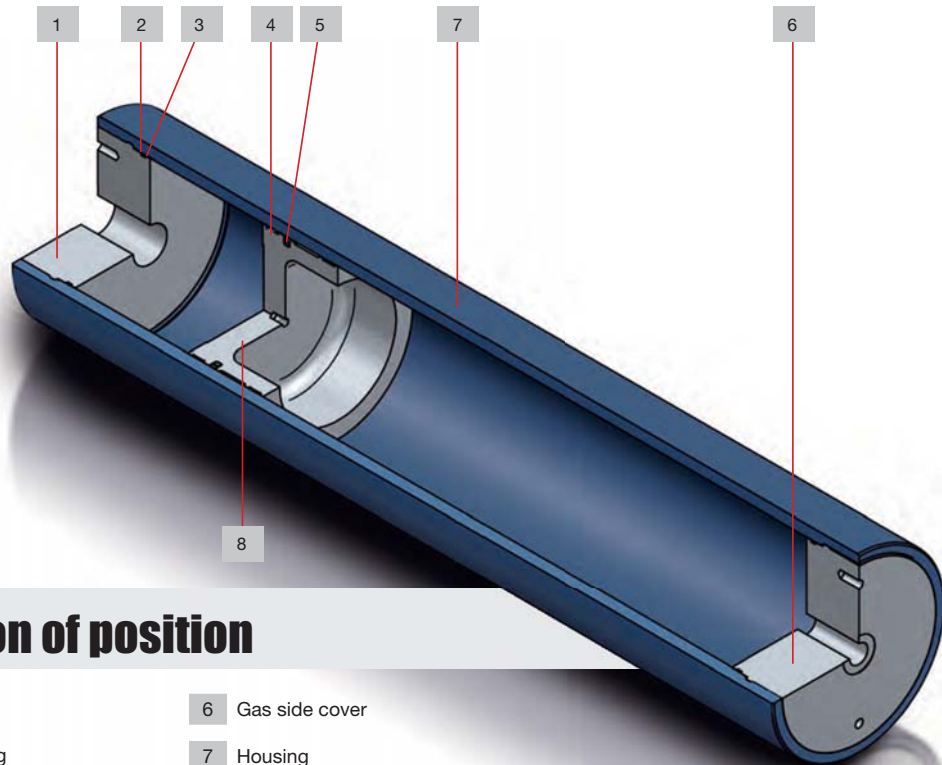
|                                     |          |   |
|-------------------------------------|----------|---|
| <b>Material</b>                     | <b>1</b> | Carbon Steel (Tmin=-20°C)                       |
|                                     | <b>2</b> | Carbon Steel (Tmin=-40°C)                       |
|                                     |          |   |
| <b>Volume (L)</b>                   |          | From 0,5 to 500 Liters                          |
| <b>Maximum working pressure</b>     |          | 250 or 375 Bar according to model               |
| <b>Piston Diameter</b>              |          | Ø60, Ø100, Ø125, Ø180, Ø200, Ø250, Ø300, Ø360   |
| <b>Sealing type</b>                 | <b>1</b> | Standard (mineral oil)                          |
|                                     | <b>2</b> | Viton ( example HFD fluids)                     |
|                                     | <b>3</b> | NBR (for HFC)                                   |
| <b>Connections (oil side)</b>       |          | Threaded ISO 228-1 (G)                          |
|                                     |          | SAE 6000psi -ISO 6162                           |
|                                     |          | Wide range of sizes to be defined on page 9.    |
| <b>Connections (gas side)</b>       |          | There are no GAS bottles, just GAS valve.       |
|                                     |          | Threaded ISO 228-1 (G) (If there is GAS Bottle) |
|                                     |          | SAE 6000psi -ISO 6162 (If there is GAS Bottle)  |
| <b>Position control accessories</b> | <b>0</b> | None  |
|                                     | <b>1</b> | Electric limit switch                           |
|                                     | <b>2</b> | Piston position switch                          |
|                                     | <b>3</b> | Piston position transducer                      |
|                                     | <b>4</b> | Ultrasonic position sensor                      |
| <b>Fluids</b>                       | <b>M</b> | Mineral Oil DIN51524 (HL, HLP)                  |
|                                     | <b>V</b> | Phosphoric Ester                                |
|                                     | <b>O</b> | Other fluids according to customer needs        |
| <b>Acceptance</b>                   |          | CE according to PED 2014/68/EU                  |
|                                     |          | ASME U Stamp                                    |

# KA

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ASME

Parts of the accumulator

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## Description of position

- |                       |                  |
|-----------------------|------------------|
| 1 Oil side cover      | 6 Gas side cover |
| 2 Anti-extrusion ring | 7 Housing        |
| 3 O-ring              | 8 Piston         |
| 4 Guide ring          |                  |
| 5 Piston seal         |                  |

## Spare kit of seals

### Type

|     |            |
|-----|------------|
| KA  | 2014/68/EU |
| KAA | ASME       |

### Piston diameter (mm)

Ø60, Ø100, Ø125, Ø180; Ø200, Ø250, Ø300; Ø360,

# GS - KA - 250 - 60

### Type of seals

|   |                         |
|---|-------------------------|
| S | Standard ( mineral oil) |
| V | Viton ( HFD fluids)     |
| N | NBR ( HFC fluids)       |

### Design pressure (bar)

250 or 375 bar

**Type**

- KA 2014/68/EU
- KAA ASME

**Design pressure ( bar)**

250 or 375 bar

**Volume (L)**

0,5 to 500 liters

**Piston diameter (mm)**

Ø60, Ø100, Ø125, Ø180, Ø200, Ø250, Ø300; Ø360,

**Type of seals**

- S Standard ( mineral oil)
- V Viton ( HFD fluids)
- N NBR ( HFC fluids)

**Material**

- 1 Carbon steel ( Tmin -20°C)
- 2 Carbon steel ( Tmin -40°C)

**KA-250-20-60- S - 1 - 1 - N1 - 1 - 0 - CE**

**Fluid connection**

- 1 Thread -ISO 228-1 (G) \*
- To be defined - Table 1

**Gas connection**

**YES adapted nitrogen bottles**

- 1 Thread -ISO 228-1 (G) \*
- To be defined - Table 1

**NO adapted nitrogen bottles**

- N1 Thread - ISO 228-1 (1/4G)

**Table 1 - Connection**

| N  | Connection                      | Piston Ø ≥     |
|----|---------------------------------|----------------|
| 1  | Thread -ISO 228-1 (G) *         |                |
| 2  | Thread -ISO 228-1 (1/4G)        |                |
| 3  | Thread -ISO 228-1 (1/2G)        |                |
| 4  | Thread -ISO 228-1 (3/4G)        |                |
| 5  | Thread -ISO 228-1 (1G)          | Piston Ø ≥ 100 |
| 6  | Thread -ISO 228-1 (1 1/4G)      | Piston Ø ≥ 125 |
| 7  | Thread -ISO 228-1 (1 1/2G)      | Piston Ø ≥ 125 |
| 8  | SAE-3000 PSI-ISO 6162-1 (1/2)   |                |
| 9  | SAE-3000 PSI-ISO 6162-1 (3/4)   | Piston Ø ≥ 100 |
| 10 | SAE-3000 PSI-ISO 6162-1 (1)     | Piston Ø ≥ 100 |
| 11 | SAE-3000 PSI-ISO 6162-1 (1 1/4) | Piston Ø ≥ 125 |
| 12 | SAE-6000 PSI-ISO 6162-2 (1/2)   |                |
| 13 | SAE-6000 PSI-ISO 6162-2 (3/4)   | Piston Ø ≥ 100 |
| 14 | SAE-6000 PSI-ISO 6162-2 (1)     | Piston Ø ≥ 100 |
| 15 | SAE-6000 PSI-ISO 6162-2 (1 1/4) | Piston Ø ≥ 125 |
| 16 | SAE-6000 PSI-ISO 6162-2 (1 1/2) | Piston Ø ≥ 180 |

\* Standard. According to the catalogue.

**Gas valve**

- 0 None - Standard in case of YES adapted nitrogen bottles.
- 1 M16x2 - Standard in case of No adapted nitrogen bottles.

**Piston position indicators**

- 0 None
- 1 Electric limit switch - Piston Ø >= Ø180
- 2 Piston position switch - Piston Ø >= Ø180
- 3 Piston position transducer - Piston Ø >= Ø180
- 4 Ultrasonic position sensor

**Acceptance**

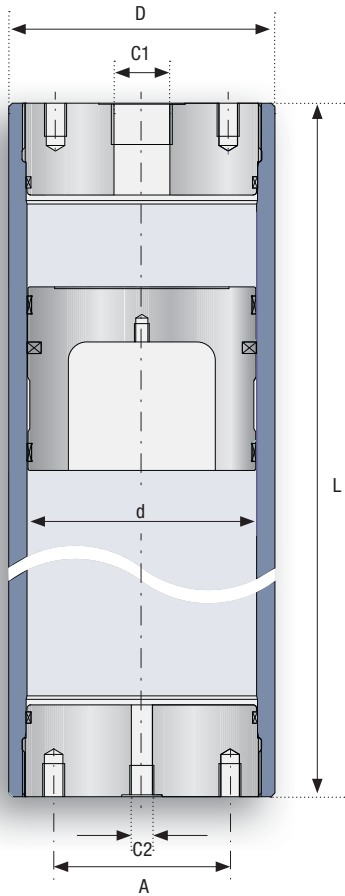
- CE According PED 2014/68/EU
- U ASME

# KA

2014/68/EU

# 250 BAR

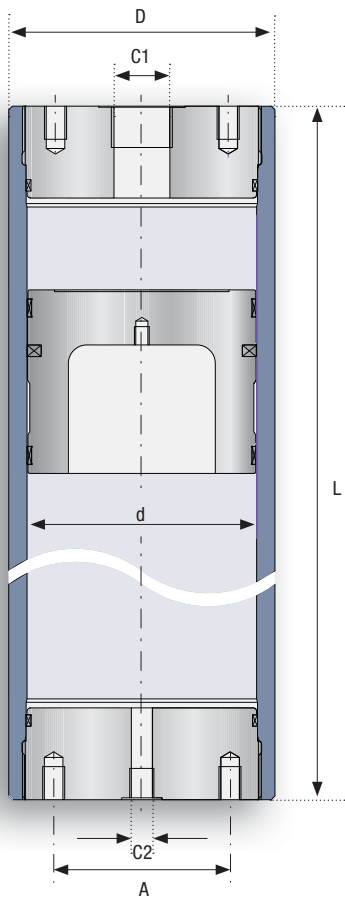
Max working pressure



Design

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| V          | d             | D              | L           | C1             | C2             | A                 | P-V-d             |
|------------|---------------|----------------|-------------|----------------|----------------|-------------------|-------------------|
| Volume (L) | Piston Ø (mm) | Outside Ø (mm) | Length (mm) | Connection OIL | Connection GAS | Fastening         | Weight (Kg) Type  |
| 0.5        | 60            | 72             | 295         | 1/2"G          | 1/4"G          | M8 Ø45            | 5 KA-250-0.5-60   |
| 1          | 60            | 72             | 470         | 1/2"G          | 1/4"G          | M8 Ø45            | 7 KA-250-1-60     |
| 1.5        | 60            | 72             | 650         | 1/2"G          | 1/4"G          | M8 Ø45            | 9 KA-250-1.5-60   |
|            | 100           | 115            | 375         | 3/4"G          | 1/4"G          | M8 Ø80            | 15 KA-250-1.5-100 |
| 2          | 60            | 72             | 825         | 1/2"G          | 1/4"G          | M8 Ø45            | 11 KA-250-2-60    |
|            | 100           | 115            | 435         | 3/4"G          | 1/4"G          | M8 Ø80            | 17 KA-250-2-100   |
| 2.5        | 60            | 72             | 1000        | 1/2"G          | 1/4"G          | M8 Ø45            | 12 KA-250-2.5-60  |
|            | 100           | 115            | 500         | 3/4"G          | 1/4"G          | M8 Ø80            | 18 KA-250-2.5-100 |
| 3          | 60            | 72             | 1180        | 1/2"G          | 1/4"G          | M8 Ø45            | 14 KA-250-3-60    |
|            | 100           | 115            | 565         | 3/4"G          | 1/4"G          | M8 Ø80            | 19 KA-250-3-100   |
|            | 125           | 145            | 445         | 1"G            | 1/4"G          | M12 Ø90           | 27 KA-250-3-125   |
| 4          | 60            | 72             | 1535        | 1/2"G          | 1/4"G          | M8 Ø45            | 18 KA-250-4-60    |
|            | 100           | 115            | 690         | 3/4"G          | 1/4"G          | M8 Ø80            | 22 KA-250-4-100   |
|            | 125           | 145            | 530         | 1"G            | 1/4"G          | M12 Ø90           | 30 KA-250-4-125   |
| 5          | 60            | 72             | 1885        | 1/2"G          | 1/4"G          | M8 Ø45            | 21 KA-250-5-60    |
|            | 100           | 115            | 820         | 3/4"G          | 1/4"G          | M8 Ø80            | 24 KA-250-5-100   |
|            | 125           | 145            | 610         | 1"G            | 1/4"G          | M12 Ø90           | 33 KA-250-5-125   |
| 6          | 100           | 115            | 945         | 3/4"G          | 1/4"G          | M8 Ø80            | 27 KA-250-6-100   |
|            | 125           | 145            | 690         | 1"G            | 1/4"G          | M12 Ø90           | 36 KA-250-6-125   |
| 8          | 100           | 115            | 1200        | 3/4"G          | 1/4"G          | M8 Ø80            | 32 KA-250-8-100   |
|            | 125           | 145            | 855         | 1"G            | 1/4"G          | M12 Ø90           | 41 KA-250-8-125   |
| 10         | 100           | 115            | 1455        | 3/4"G          | 1/4"G          | M8 Ø80            | 37 KA-250-10-100  |
|            | 125           | 145            | 1020        | 1"G            | 1/4"G          | M12 Ø90           | 47 KA-250-10-125  |
| 12         | 100           | 115            | 1710        | 3/4"G          | 1/4"G          | M8 Ø80            | 42 KA-250-12-100  |
|            | 125           | 145            | 1180        | 1"G            | 1/4"G          | M12 Ø90           | 52 KA-250-12-125  |
|            | 180           | 210            | 695         | 1 1/2"G        | 3/4"G          | M12 Ø140          | 77 KA-250-12-180  |
| 15         | 100           | 115            | 2095        | 3/4"G          | 1/4"G          | M8 Ø80            | 50 KA-250-15-100  |
|            | 125           | 145            | 1425        | 1"G            | 1/4"G          | M12 Ø90           | 60 KA-250-15-125  |
|            | 180           | 210            | 810         | 1 1/2"G        | 3/4"G          | M12 Ø140          | 86 KA-250-15-180  |
| 20         | 200           | 230            | 750         | 1 1/2"G        | 3/4"G          | M12 Ø160          | 87 KA-250-15-200  |
|            | 125           | 145            | 1835        | 1"G            | 1/4"G          | M12 Ø90           | 74 KA-250-20-125  |
|            | 180           | 210            | 1010        | 1 1/2"G        | 3/4"G          | M12 Ø140          | 100 KA-250-20-180 |
| 25         | 200           | 230            | 910         | 1 1/2"G        | 3/4"G          | M12 Ø160          | 100 KA-250-20-200 |
|            | 125           | 145            | 2240        | 1"G            | 1/4"G          | M12 Ø90           | 87 KA-250-25-125  |
|            | 180           | 210            | 1205        | 1 1/2"G        | 3/4"G          | M12 Ø140          | 114 KA-250-25-180 |
| 30         | 200           | 230            | 1070        | 1 1/2"G        | 3/4"G          | M12 Ø160          | 113 KA-250-25-200 |
|            | 125           | 145            | 2650        | 1"G            | 1/4"G          | M12 Ø90           | 101 KA-250-30-125 |
|            | 180           | 210            | 1400        | 1 1/2"G        | 3/4"G          | M12 Ø140          | 129 KA-250-30-180 |
| 35         | 200           | 230            | 1230        | 1 1/2"G        | 3/4"G          | M12 Ø160          | 126 KA-250-30-200 |
|            | 250           | 290            | 925         | 1 1/2"G        | 3/4"G          | M12 Ø210          | 197 KA-250-30-250 |
|            | 125           | 145            | 3055        | 1"G            | 1/4"G          | M12 Ø90           | 115 KA-250-35-125 |
| 40         | 180           | 210            | 1600        | 1 1/2"G        | 3/4"G          | M12 Ø140          | 143 KA-250-35-180 |
|            | 200           | 230            | 1385        | 1 1/2"G        | 3/4"G          | M12 Ø160          | 138 KA-250-35-200 |
|            | 250           | 290            | 1025        | 1 1/2"G        | 3/4"G          | M12 Ø210          | 211 KA-250-35-250 |
| 45         | 125           | 145            | 3465        | 1"G            | 1/4"G          | M12 Ø90           | 128 KA-250-40-125 |
|            | 180           | 210            | 1795        | 1 1/2"G        | 3/4"G          | M12 Ø140          | 157 KA-250-40-180 |
|            | 200           | 230            | 1545        | 1 1/2"G        | 3/4"G          | M12 Ø160          | 151 KA-250-40-200 |
| 50         | 250           | 290            | 1130        | 1 1/2"G        | 3/4"G          | M12 Ø210          | 225 KA-250-40-250 |
|            | 180           | 210            | 2000        | 1 1/2"G        | 3/4"G          | M12 Ø140          | 172 KA-250-45-180 |
|            | 200           | 230            | 1705        | 1 1/2"G        | 3/4"G          | M12 Ø160          | 164 KA-250-45-200 |
| 50         | 250           | 290            | 1230        | 1 1/2"G        | 3/4"G          | M12 Ø210          | 238 KA-250-45-250 |
|            | 180           | 210            | 2190        | 1 1/2"G        | 3/4"G          | M12 Ø140          | 186 KA-250-50-180 |
|            | 200           | 230            | 1865        | 1 1/2"G        | 3/4"G          | M12 Ø160          | 177 KA-250-50-200 |
| 250        | 290           | 1330           | 1 1/2"G     | 3/4"G          | M12 Ø210       | 252 KA-250-50-250 |                   |



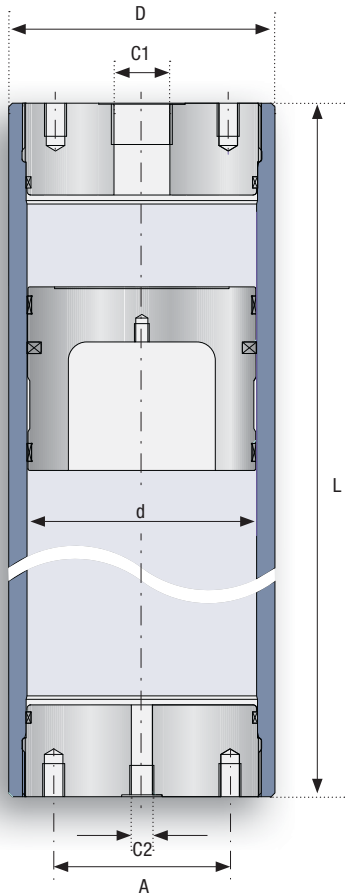
| V          | d             | D              | L           | C1             | C2             | A         | P-V-d       |                |
|------------|---------------|----------------|-------------|----------------|----------------|-----------|-------------|----------------|
| Volume (L) | Piston Ø (mm) | Outside Ø (mm) | Length (mm) | Connection OIL | Connection GAS | Fastening | Weight (KG) | Type           |
| 60         | 180           | 210            | 2580        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 214         | KA-250-60-180  |
|            | 200           | 230            | 2185        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 202         | KA-250-60-200  |
|            | 250           | 290            | 1535        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 279         | KA-250-60-250  |
| 70         | 180           | 210            | 2975        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 243         | KA-250-70-180  |
|            | 200           | 230            | 2500        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 227         | KA-250-70-200  |
|            | 250           | 290            | 1740        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 306         | KA-250-70-250  |
| 80         | 300           | 350            | 1345        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 371         | KA-250-70-300  |
|            | 180           | 210            | 3370        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 271         | KA-250-80-180  |
|            | 200           | 230            | 2820        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 253         | KA-250-80-200  |
| 90         | 250           | 290            | 1845        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 334         | KA-250-80-250  |
|            | 300           | 350            | 1485        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 400         | KA-250-80-300  |
|            | 180           | 210            | 3760        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 299         | KA-250-90-180  |
| 100        | 200           | 230            | 3140        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 278         | KA-250-90-200  |
|            | 250           | 290            | 2145        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 361         | KA-250-90-250  |
|            | 300           | 350            | 1625        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 428         | KA-250-90-300  |
| 120        | 200           | 230            | 3455        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 303         | KA-250-100-200 |
|            | 250           | 290            | 2350        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 388         | KA-250-100-250 |
|            | 300           | 350            | 1770        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 457         | KA-250-100-300 |
| 140        | 360           | 425            | 1365        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 603         | KA-250-100-360 |
|            | 200           | 230            | 4095        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 355         | KA-250-120-200 |
|            | 250           | 290            | 2760        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 443         | KA-250-120-250 |
| 150        | 300           | 350            | 2050        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 513         | KA-250-120-300 |
|            | 360           | 425            | 1560        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 665         | KA-250-120-360 |
|            | 250           | 290            | 3165        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 497         | KA-250-140-250 |
| 160        | 300           | 350            | 2335        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 571         | KA-250-140-300 |
|            | 360           | 425            | 1760        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 728         | KA-250-140-360 |
|            | 250           | 290            | 3370        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 524         | KA-250-150-250 |
| 180        | 300           | 350            | 2475        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 599         | KA-250-150-300 |
|            | 360           | 425            | 1855        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 758         | KA-250-150-360 |
|            | 250           | 290            | 3575        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 552         | KA-250-160-250 |
| 200        | 300           | 350            | 2615        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 627         | KA-250-160-300 |
|            | 360           | 425            | 1955        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 790         | KA-250-160-360 |
|            | 250           | 290            | 3980        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 606         | KA-250-180-250 |
| 225        | 300           | 350            | 2900        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 684         | KA-250-180-300 |
|            | 360           | 425            | 2150        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 851         | KA-250-180-360 |
|            | 300           | 350            | 3185        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 742         | KA-250-200-300 |
| 250        | 360           | 425            | 2350        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 915         | KA-250-200-360 |
|            | 300           | 350            | 3535        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 812         | KA-250-225-300 |
|            | 360           | 425            | 2595        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 992         | KA-250-225-360 |
| 275        | 300           | 350            | 3890        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 883         | KA-250-250-300 |
|            | 360           | 425            | 2840        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1069        | KA-250-250-360 |
|            | 300           | 350            | 4245        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 955         | KA-250-275-300 |
| 300        | 360           | 425            | 3085        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1147        | KA-250-275-360 |
|            | 300           | 350            | 4600        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1026        | KA-250-300-300 |
|            | 360           | 425            | 3330        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1224        | KA-250-300-360 |
| 325        | 300           | 350            | 4955        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1098        | KA-250-325-300 |
|            | 360           | 425            | 3575        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1301        | KA-250-325-360 |
|            | 300           | 350            | 5305        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1168        | KA-250-350-300 |
| 350        | 360           | 425            | 3825        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1380        | KA-250-350-360 |
|            | 300           | 350            | 5660        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1239        | KA-250-375-300 |
|            | 360           | 425            | 4070        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1458        | KA-250-375-360 |
| 400        | 360           | 425            | 4315        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1535        | KA-250-400-360 |
|            | 425           | 360            | 425         | 4560           | 1 1/2"G        | 3/4"G     | 1612        | KA-250-425-360 |
|            | 450           | 360            | 425         | 4805           | 1 1/2"G        | 3/4"G     | 1690        | KA-250-450-360 |
| 475        | 360           | 425            | 5050        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1767        | KA-250-475-360 |
|            | 500           | 360            | 425         | 5295           | 1 1/2"G        | 3/4"G     | 1845        | KA-250-500-360 |
|            | 525           | 360            | 425         | 5540           | 1 1/2"G        | 3/4"G     | 1922        | KA-250-525-360 |
| 550        | 360           | 425            | 5785        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1999        | KA-250-550-360 |
|            | 575           | 360            | 425         | 6035           | 1 1/2"G        | 3/4"G     | 2078        | KA-250-575-360 |
|            | 600           | 360            | 425         | 6280           | 1 1/2"G        | 3/4"G     | 2156        | KA-250-600-360 |

# KA

2014/68/EU

# 375 BAR

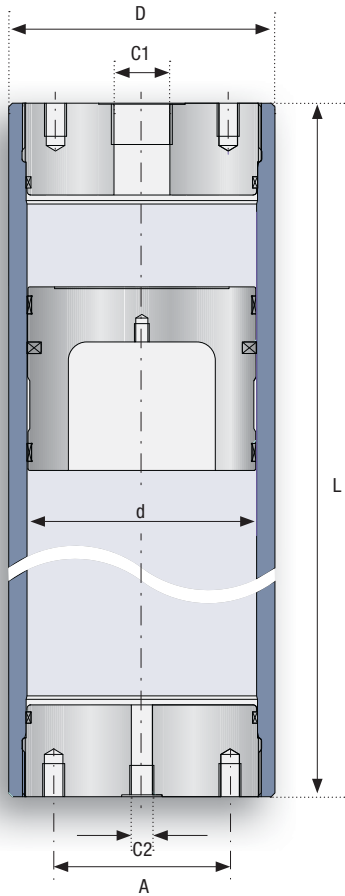
Max working pressure



Design

**GLUAL**  
HYDRAULICS

| V          | d             | D              | L           | C1             | C2             | A         | P-V-d         |                |
|------------|---------------|----------------|-------------|----------------|----------------|-----------|---------------|----------------|
| Volume (L) | Piston Ø (mm) | Outside Ø (mm) | Length (mm) | Connection OIL | Connection GAS | Fastening | Weight (Kg)   | Type           |
| 0.5        | 60            | 76             | 340         | 1/2"G          | 1/4"G          | M8 Ø45    | 7             | KA-375-0.5-60  |
| 1          | 60            | 76             | 515         | 1/2"G          | 1/4"G          | M8 Ø45    | 10            | KA-375-1-60    |
| 1.5        | 60            | 76             | 695         | 1/2"G          | 1/4"G          | M8 Ø45    | 12            | KA-375-1.5-60  |
|            | 100           | 120            | 405         | 3/4"G          | 1/4"G          | M8 Ø80    | 20            | KA-375-1.5-100 |
| 2          | 60            | 76             | 870         | 1/2"G          | 1/4"G          | M8 Ø45    | 15            | KA-375-2-60    |
|            | 100           | 120            | 465         | 3/4"G          | 1/4"G          | M8 Ø80    | 22            | KA-375-2-100   |
| 2.5        | 60            | 76             | 1045        | 1/2"G          | 1/4"G          | M8 Ø45    | 17            | KA-375-2.5-60  |
|            | 100           | 120            | 530         | 3/4"G          | 1/4"G          | M8 Ø80    | 24            | KA-375-2.5-100 |
| 3          | 60            | 76             | 1225        | 1/2"G          | 1/4"G          | M8 Ø45    | 19            | KA-375-3-60    |
|            | 100           | 120            | 595         | 3/4"G          | 1/4"G          | M8 Ø80    | 26            | KA-375-3-100   |
|            | 125           | 150            | 465         | 1"G            | 1/4"G          | M12 Ø90   | 34            | KA-375-3-125   |
| 4          | 60            | 76             | 1580        | 1/2"G          | 1/4"G          | M8 Ø45    | 24            | KA-375-4-60    |
|            | 100           | 120            | 720         | 3/4"G          | 1/4"G          | M8 Ø80    | 29            | KA-375-4-100   |
|            | 125           | 150            | 550         | 1"G            | 1/4"G          | M12 Ø90   | 38            | KA-375-4-125   |
| 5          | 60            | 76             | 1930        | 1/2"G          | 1/4"G          | M8 Ø45    | 29            | KA-375-5-60    |
|            | 100           | 120            | 850         | 3/4"G          | 1/4"G          | M8 Ø80    | 33            | KA-375-5-100   |
|            | 125           | 150            | 630         | 1"G            | 1/4"G          | M12 Ø90   | 42            | KA-375-5-125   |
| 6          | 100           | 120            | 975         | 3/4"G          | 1/4"G          | M8 Ø80    | 36            | KA-375-6-100   |
|            | 125           | 150            | 710         | 1"G            | 1/4"G          | M12 Ø90   | 45            | KA-375-6-125   |
| 8          | 100           | 120            | 1230        | 3/4"G          | 1/4"G          | M8 Ø80    | 43            | KA-375-8-100   |
|            | 125           | 150            | 875         | 1"G            | 1/4"G          | M12 Ø90   | 52            | KA-375-8-125   |
| 10         | 100           | 120            | 1485        | 3/4"G          | 1/4"G          | M8 Ø80    | 50            | KA-375-10-100  |
|            | 125           | 150            | 1040        | 1"G            | 1/4"G          | M12 Ø90   | 59            | KA-375-10-125  |
|            | 180           | 222            | 670         | 1 1/2"G        | 3/4"G          | M12 Ø140  | 104           | KA-375-10-180  |
| 12         | 100           | 120            | 1740        | 3/4"G          | 1/4"G          | M8 Ø80    | 57            | KA-375-12-100  |
|            | 125           | 150            | 1200        | 1"G            | 1/4"G          | M12 Ø90   | 66            | KA-375-12-125  |
|            | 180           | 222            | 735         | 1 1/2"G        | 3/4"G          | M12 Ø140  | 111           | KA-375-12-180  |
| 15         | 100           | 120            | 2125        | 3/4"G          | 1/4"G          | M8 Ø80    | 67            | KA-375-15-100  |
|            | 125           | 150            | 1445        | 1"G            | 1/4"G          | M12 Ø90   | 76            | KA-375-15-125  |
|            | 180           | 222            | 850         | 1 1/2"G        | 3/4"G          | M12 Ø140  | 123           | KA-375-15-180  |
| 20         | 200           | 240            | 790         | 1 1/2"G        | 3/4"G          | M12 Ø160  | 121           | KA-375-15-200  |
|            | 125           | 150            | 1855        | 1"G            | 1/4"G          | M12 Ø90   | 94            | KA-375-20-125  |
|            | 180           | 222            | 1050        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 144           | KA-375-20-180  |
| 25         | 200           | 240            | 950         | 1 1/2"G        | 3/4"G          | M12 Ø160  | 139           | KA-375-20-200  |
|            | 125           | 150            | 2260        | 1"G            | 1/4"G          | M12 Ø90   | 111           | KA-375-25-125  |
|            | 180           | 222            | 1245        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 165           | KA-375-25-180  |
| 30         | 200           | 240            | 1110        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 156           | KA-375-25-200  |
|            | 125           | 150            | 2670        | 1"G            | 1/4"G          | M12 Ø90   | 128           | KA-375-30-125  |
|            | 180           | 222            | 1440        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 185           | KA-375-30-180  |
| 35         | 200           | 240            | 1270        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 174           | KA-375-30-200  |
|            | 250           | 300            | 985         | 1 1/2"G        | 3/4"G          | M12 Ø210  | 264           | KA-375-30-250  |
|            | 125           | 150            | 3075        | 1"G            | 1/4"G          | M12 Ø90   | 146           | KA-375-35-125  |
| 40         | 180           | 222            | 1640        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 206           | KA-375-35-180  |
|            | 200           | 240            | 1425        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 191           | KA-375-35-200  |
|            | 250           | 300            | 1085        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 282           | KA-375-35-250  |
| 45         | 125           | 150            | 3485        | 1"G            | 1/4"G          | M12 Ø90   | 163           | KA-375-40-125  |
|            | 180           | 222            | 1835        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 226           | KA-375-40-180  |
|            | 200           | 240            | 1585        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 208           | KA-375-40-200  |
| 50         | 250           | 300            | 1190        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 299           | KA-375-40-250  |
|            | 180           | 222            | 2030        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 247           | KA-375-45-180  |
|            | 200           | 240            | 1745        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 226           | KA-375-45-200  |
| 50         | 250           | 300            | 1290        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 316           | KA-375-45-250  |
|            | 180           | 222            | 2230        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 268           | KA-375-50-180  |
|            | 200           | 240            | 1905        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 243           | KA-375-50-200  |
| 250        | 300           | 1390           | 1 1/2"G     | 3/4"G          | M12 Ø210       | 333       | KA-375-50-250 |                |



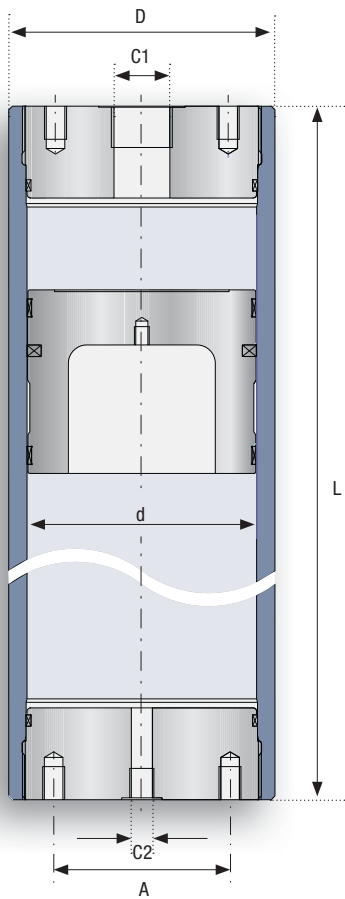
| V          | d             | D              | L           | C1             | C2             | A         | P-V-d       |                |
|------------|---------------|----------------|-------------|----------------|----------------|-----------|-------------|----------------|
| Volume (L) | Piston Ø (mm) | Outside Ø (mm) | Length (mm) | Connection OIL | Connection GAS | Fastening | Weight (Kg) | Type           |
| 60         | 180           | 222            | 2620        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 308         | KA-375-60-180  |
|            | 200           | 240            | 2225        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 278         | KA-375-60-200  |
|            | 250           | 300            | 1595        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 368         | KA-375-60-250  |
| 70         | 180           | 222            | 3015        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 350         | KA-375-70-180  |
|            | 200           | 240            | 2540        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 312         | KA-375-70-200  |
|            | 250           | 300            | 1800        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 403         | KA-375-70-250  |
| 80         | 300           | 360            | 1415        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 515         | KA-375-70-300  |
|            | 180           | 222            | 3410        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 391         | KA-375-80-180  |
|            | 200           | 240            | 2860        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 347         | KA-375-80-200  |
| 80         | 250           | 300            | 2005        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 438         | KA-375-80-250  |
|            | 300           | 360            | 1545        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 547         | KA-375-80-300  |
|            | 180           | 222            | 3800        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 432         | KA-375-90-180  |
| 90         | 200           | 240            | 3180        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 382         | KA-375-90-200  |
|            | 250           | 300            | 2205        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 472         | KA-375-90-250  |
|            | 300           | 360            | 1695        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 584         | KA-375-90-300  |
| 100        | 200           | 240            | 3495        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 418         | KA-375-100-200 |
|            | 250           | 300            | 2410        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 507         | KA-375-100-250 |
|            | 300           | 360            | 1840        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 620         | KA-375-100-300 |
| 100        | 380           | 455            | 1445        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 804         | KA-375-100-360 |
|            | 200           | 240            | 4135        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 486         | KA-375-120-200 |
|            | 250           | 300            | 2820        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 577         | KA-375-120-250 |
| 120        | 300           | 360            | 2120        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 688         | KA-375-120-300 |
|            | 360           | 455            | 1640        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 898         | KA-375-120-360 |
|            | 250           | 300            | 3225        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 646         | KA-375-140-250 |
| 140        | 300           | 360            | 2405        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 758         | KA-375-140-300 |
|            | 360           | 455            | 1840        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 994         | KA-375-140-360 |
|            | 250           | 300            | 3430        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 681         | KA-375-150-250 |
| 150        | 300           | 360            | 2545        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 792         | KA-375-150-300 |
|            | 360           | 455            | 1935        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1039        | KA-375-150-360 |
|            | 250           | 300            | 3635        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 716         | KA-375-160-250 |
| 160        | 300           | 360            | 2685        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 827         | KA-375-160-300 |
|            | 360           | 455            | 2035        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1087        | KA-375-160-360 |
|            | 250           | 300            | 4040        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 784         | KA-375-180-250 |
| 180        | 300           | 360            | 2970        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 897         | KA-375-180-300 |
|            | 360           | 455            | 2230        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1181        | KA-375-180-360 |
|            | 300           | 360            | 3255        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 966         | KA-375-200-300 |
| 200        | 360           | 455            | 2430        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1276        | KA-375-200-360 |
|            | 300           | 360            | 3605        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1052        | KA-375-225-300 |
|            | 360           | 455            | 2675        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1394        | KA-375-225-360 |
| 250        | 300           | 360            | 3960        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1139        | KA-375-250-300 |
|            | 360           | 455            | 2920        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1511        | KA-375-250-360 |
|            | 300           | 360            | 4315        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1226        | KA-375-275-300 |
| 275        | 360           | 455            | 3165        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1629        | KA-375-275-360 |
|            | 300           | 360            | 4670        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1313        | KA-375-300-300 |
|            | 360           | 455            | 3410        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1746        | KA-375-300-360 |
| 325        | 300           | 360            | 5025        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1400        | KA-375-325-300 |
|            | 360           | 455            | 3655        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1863        | KA-375-325-360 |
|            | 300           | 360            | 5375        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1486        | KA-375-350-300 |
| 350        | 360           | 455            | 3905        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1983        | KA-375-350-360 |
|            | 300           | 360            | 5730        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1573        | KA-375-375-300 |
|            | 360           | 455            | 4150        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2101        | KA-375-375-360 |
| 400        | 360           | 455            | 4395        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2218        | KA-375-400-360 |
| 425        | 360           | 455            | 4640        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2335        | KA-375-425-360 |
| 450        | 360           | 455            | 4885        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2453        | KA-375-450-360 |
| 475        | 360           | 455            | 5130        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2570        | KA-375-475-360 |
| 500        | 360           | 455            | 5375        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2688        | KA-375-500-360 |
| 525        | 360           | 455            | 5620        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2805        | KA-375-525-360 |
| 550        | 360           | 455            | 5865        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2922        | KA-375-550-360 |
| 575        | 360           | 455            | 6110        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 3042        | KA-375-575-360 |
| 600        | 360           | 455            | 6360        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 3160        | KA-375-600-360 |

# CAA

ASME

## 250 BAR

Max working pressure

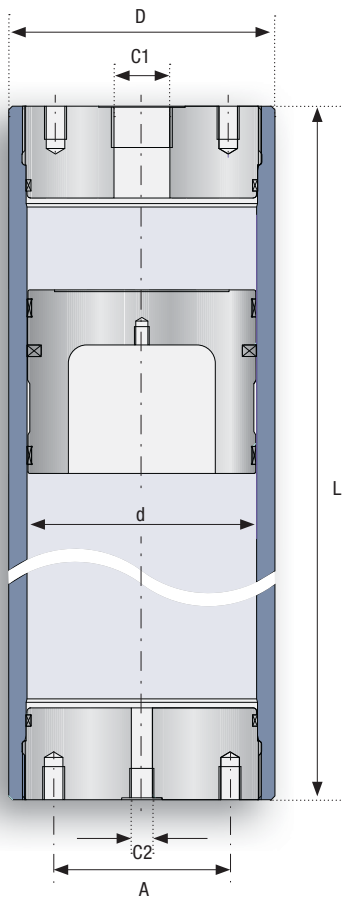


According to the Code, ASME acceptance is not necessary when the piston diameter is smaller than 150mm. For  $\varnothing \leq 150\text{mm}$ , Glual KA 2014/98/EU accumulators are available.

Design

**GLUAL**  
HYDRAULICS

| V          | d             | D              | L           | C1             | C2             | A         | P-V-d               |
|------------|---------------|----------------|-------------|----------------|----------------|-----------|---------------------|
| Volume (L) | Piston Ø (mm) | Outside Ø (mm) | Length (mm) | Connection OIL | Connection GAS | Fastening | Weight (Kg) Type    |
| 12         | 180           | 210            | 895         | 1 1/2"G        | 3/4"G          | M12 Ø140  | 77 KAA-250-12-180   |
|            | 180           | 210            | 810         | 1 1/2"G        | 3/4"G          | M12 Ø140  | 86 KAA-250-15-180   |
| 15         | 200           | 230            | 750         | 1 1/2"G        | 3/4"G          | M12 Ø160  | 87 KAA-250-15-200   |
|            | 180           | 210            | 1010        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 100 KAA-250-20-180  |
| 20         | 200           | 230            | 910         | 1 1/2"G        | 3/4"G          | M12 Ø160  | 100 KAA-250-20-200  |
|            | 180           | 210            | 1205        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 114 KAA-250-25-180  |
| 25         | 200           | 230            | 1070        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 113 KAA-250-25-200  |
|            | 180           | 210            | 1400        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 129 KAA-250-30-180  |
| 30         | 200           | 230            | 1230        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 126 KAA-250-30-200  |
|            | 250           | 290            | 925         | 1 1/2"G        | 3/4"G          | M12 Ø210  | 197 KAA-250-30-250  |
| 35         | 180           | 210            | 1600        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 143 KAA-250-35-180  |
|            | 200           | 230            | 1385        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 138 KAA-250-35-200  |
| 40         | 250           | 290            | 1025        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 211 KAA-250-35-250  |
|            | 180           | 210            | 1795        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 157 KAA-250-40-180  |
| 45         | 200           | 230            | 1545        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 151 KAA-250-40-200  |
|            | 250           | 290            | 1130        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 225 KAA-250-40-250  |
| 50         | 180           | 210            | 2000        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 172 KAA-250-45-180  |
|            | 200           | 230            | 1705        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 164 KAA-250-45-200  |
| 55         | 250           | 290            | 1230        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 238 KAA-250-45-250  |
|            | 180           | 210            | 2190        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 186 KAA-250-50-180  |
| 60         | 200           | 230            | 1865        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 177 KAA-250-50-200  |
|            | 250           | 290            | 1330        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 252 KAA-250-50-250  |
| 65         | 180           | 210            | 2580        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 214 KAA-250-60-180  |
|            | 200           | 230            | 2185        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 202 KAA-250-60-200  |
| 70         | 250           | 290            | 1535        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 279 KAA-250-60-250  |
|            | 180           | 210            | 2975        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 243 KAA-250-70-180  |
| 75         | 200           | 230            | 2500        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 227 KAA-250-70-200  |
|            | 250           | 290            | 1740        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 306 KAA-250-70-250  |
| 80         | 300           | 350            | 1345        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 371 KAA-250-70-300  |
|            | 180           | 210            | 3370        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 271 KAA-250-80-180  |
| 85         | 200           | 230            | 2820        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 253 KAA-250-80-200  |
|            | 250           | 290            | 1945        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 334 KAA-250-80-250  |
| 90         | 300           | 350            | 1485        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 400 KAA-250-80-300  |
|            | 180           | 210            | 3760        | 1 1/2"G        | 3/4"G          | M12 Ø140  | 299 KAA-250-90-180  |
| 95         | 200           | 230            | 3140        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 278 KAA-250-90-200  |
|            | 250           | 290            | 2145        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 361 KAA-250-90-250  |
| 100        | 300           | 350            | 1625        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 428 KAA-250-90-300  |
|            | 200           | 230            | 3455        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 303 KAA-250-100-200 |
| 105        | 250           | 290            | 2350        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 388 KAA-250-100-250 |
|            | 300           | 350            | 1770        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 457 KAA-250-100-300 |
| 110        | 360           | 425            | 1365        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 603 KAA-250-100-360 |



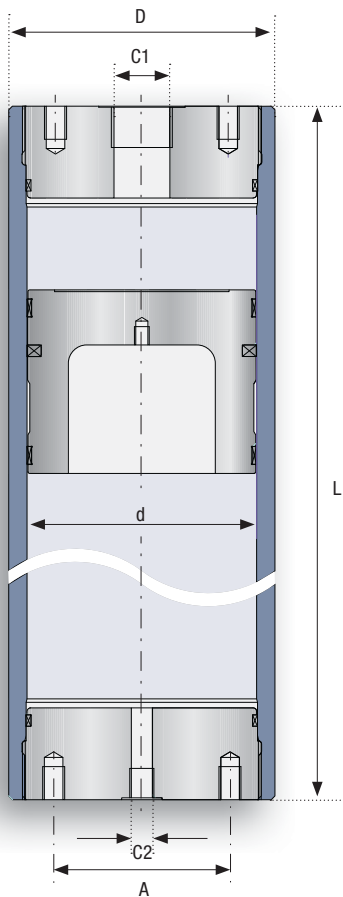
| V          | d             | D              | L           | C1             | C2             | A         | P-V-d       |                 |
|------------|---------------|----------------|-------------|----------------|----------------|-----------|-------------|-----------------|
| Volume (L) | Piston Ø (mm) | Outside Ø (mm) | Length (mm) | Connection OIL | Connection GAS | Fastening | Weight (Kg) | Type            |
| 120        | 200           | 230            | 4095        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 355         | CAA-250-120-200 |
|            | 250           | 290            | 2760        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 443         | CAA-250-120-250 |
|            | 300           | 350            | 2050        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 513         | CAA-250-120-300 |
|            | 360           | 425            | 1560        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 665         | CAA-250-120-360 |
| 140        | 250           | 290            | 3165        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 497         | CAA-250-140-250 |
|            | 300           | 350            | 2335        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 571         | CAA-250-140-300 |
|            | 360           | 425            | 1760        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 728         | CAA-250-140-360 |
| 150        | 250           | 290            | 3370        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 524         | CAA-250-150-250 |
|            | 300           | 350            | 2475        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 599         | CAA-250-150-300 |
| 160        | 360           | 425            | 1855        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 758         | CAA-250-150-360 |
|            | 250           | 290            | 3575        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 552         | CAA-250-160-250 |
| 160        | 300           | 350            | 2615        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 627         | CAA-250-160-300 |
|            | 360           | 425            | 1955        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 790         | CAA-250-160-360 |
| 180        | 250           | 290            | 3980        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 606         | CAA-250-180-250 |
|            | 300           | 350            | 2900        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 684         | CAA-250-180-300 |
| 180        | 360           | 425            | 2150        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 851         | CAA-250-180-360 |
|            | 300           | 350            | 3185        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 742         | CAA-250-200-300 |
| 200        | 360           | 425            | 2350        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 915         | CAA-250-200-360 |
|            | 300           | 350            | 3535        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 812         | CAA-250-225-300 |
| 225        | 360           | 425            | 2595        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 992         | CAA-250-225-360 |
|            | 300           | 350            | 3890        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 883         | CAA-250-250-300 |
| 250        | 360           | 425            | 2840        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1069        | CAA-250-250-360 |
|            | 300           | 350            | 4245        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 955         | CAA-250-275-300 |
| 275        | 360           | 425            | 3085        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1147        | CAA-250-275-360 |
|            | 300           | 350            | 4600        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1026        | CAA-250-300-300 |
| 300        | 360           | 425            | 3330        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1224        | CAA-250-300-360 |
|            | 300           | 350            | 4955        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1098        | CAA-250-325-300 |
| 325        | 360           | 425            | 3575        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1301        | CAA-250-325-360 |
|            | 300           | 350            | 5305        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1168        | CAA-250-350-300 |
| 350        | 360           | 425            | 3825        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1380        | CAA-250-350-360 |
|            | 300           | 350            | 5660        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1239        | CAA-250-375-300 |
| 375        | 360           | 425            | 4070        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1458        | CAA-250-375-360 |
|            | 360           | 425            | 4315        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1535        | CAA-250-400-360 |
| 400        | 360           | 425            | 4560        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1612        | CAA-250-425-360 |
| 425        | 360           | 425            | 4805        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1690        | CAA-250-450-360 |
| 450        | 360           | 425            | 5050        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1767        | CAA-250-475-360 |
| 475        | 360           | 425            | 5295        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1845        | CAA-250-500-360 |
| 500        | 360           | 425            | 5540        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1922        | CAA-250-525-360 |
| 525        | 360           | 425            | 5785        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1999        | CAA-250-550-360 |
| 550        | 360           | 425            | 6035        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2078        | CAA-250-575-360 |
| 575        | 360           | 425            | 6280        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2156        | CAA-250-600-360 |
| 600        | 360           | 425            |             |                |                |           |             |                 |

# KAA

ASME

## 375 BAR

Max working pressure

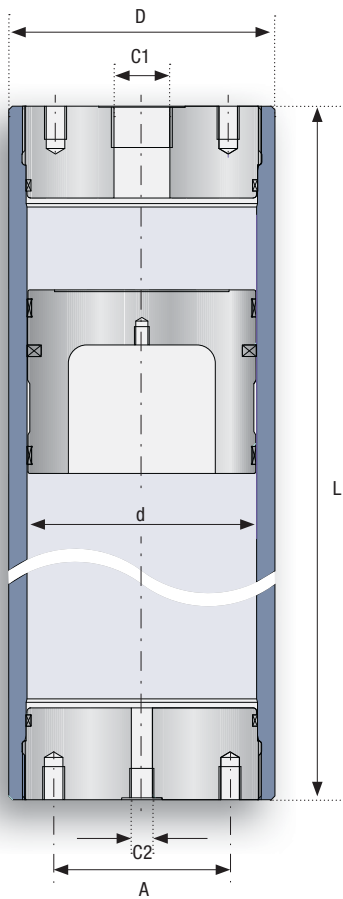


According to the Code, ASME acceptance is not necessary when the piston diameter is smaller than 150mm. For  $\varnothing \leq 150\text{mm}$ , Glual KA 2014/98/EU accumulators are available.

Design

**GLUAL**  
HYDRAULICS

| V          | d                         | D                          | L           | C1             | C2                    | A                     | P-V-d           |                 |
|------------|---------------------------|----------------------------|-------------|----------------|-----------------------|-----------------------|-----------------|-----------------|
| Volume (L) | Piston $\varnothing$ (mm) | Outside $\varnothing$ (mm) | Length (mm) | Connection OIL | Connection GAS        | Fastening             | Weight (Kg)     | Type            |
| 10         | 180                       | 222                        | 670         | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 104             | KAA-375-10-180  |
| 12         | 180                       | 222                        | 735         | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 111             | KAA-375-12-180  |
| 15         | 180                       | 222                        | 850         | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 123             | KAA-375-15-180  |
|            | 200                       | 240                        | 790         | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 121             | KAA-375-15-200  |
| 20         | 180                       | 222                        | 1050        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 144             | KAA-375-20-180  |
|            | 200                       | 240                        | 950         | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 139             | KAA-375-20-200  |
| 25         | 180                       | 222                        | 1245        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 165             | KAA-375-25-180  |
|            | 200                       | 240                        | 1110        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 156             | KAA-375-25-200  |
| 30         | 180                       | 222                        | 1440        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 185             | KAA-375-30-180  |
|            | 200                       | 240                        | 1270        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 174             | KAA-375-30-200  |
|            | 250                       | 300                        | 985         | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 284             | KAA-375-30-250  |
| 35         | 180                       | 222                        | 1640        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 206             | KAA-375-35-180  |
|            | 200                       | 240                        | 1425        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 191             | KAA-375-35-200  |
|            | 250                       | 300                        | 1085        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 282             | KAA-375-35-250  |
| 40         | 180                       | 222                        | 1835        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 226             | KAA-375-40-180  |
|            | 200                       | 240                        | 1585        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 208             | KAA-375-40-200  |
|            | 250                       | 300                        | 1190        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 299             | KAA-375-40-250  |
| 45         | 180                       | 222                        | 2030        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 247             | KAA-375-45-180  |
|            | 200                       | 240                        | 1745        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 228             | KAA-375-45-200  |
|            | 250                       | 300                        | 1290        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 316             | KAA-375-45-250  |
| 50         | 180                       | 222                        | 2230        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 268             | KAA-375-50-180  |
|            | 200                       | 240                        | 1905        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 243             | KAA-375-50-200  |
|            | 250                       | 300                        | 1390        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 333             | KAA-375-50-250  |
| 60         | 180                       | 222                        | 2620        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 308             | KAA-375-60-180  |
|            | 200                       | 240                        | 2225        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 278             | KAA-375-60-200  |
|            | 250                       | 300                        | 1585        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 368             | KAA-375-60-250  |
| 70         | 180                       | 222                        | 3015        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 350             | KAA-375-70-180  |
|            | 200                       | 240                        | 2540        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 312             | KAA-375-70-200  |
|            | 250                       | 300                        | 1800        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 403             | KAA-375-70-250  |
| 80         | 300                       | 360                        | 1415        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 240 | 515             | KAA-375-70-300  |
|            | 180                       | 222                        | 3410        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 391             | KAA-375-80-180  |
|            | 200                       | 240                        | 2860        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 347             | KAA-375-80-200  |
| 90         | 250                       | 300                        | 2005        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 438             | KAA-375-80-250  |
|            | 300                       | 360                        | 1545        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 240 | 547             | KAA-375-80-300  |
|            | 180                       | 222                        | 3800        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 140 | 432             | KAA-375-90-180  |
| 100        | 200                       | 240                        | 3180        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 382             | KAA-375-90-200  |
|            | 250                       | 300                        | 2205        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 472             | KAA-375-90-250  |
|            | 300                       | 360                        | 1695        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 240 | 584             | KAA-375-90-300  |
| 100        | 200                       | 240                        | 3495        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 160 | 416             | KAA-375-100-200 |
|            | 250                       | 300                        | 2410        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 210 | 507             | KAA-375-100-250 |
|            | 300                       | 360                        | 1840        | 1 1/2"G        | 3/4"G                 | M12 $\varnothing$ 240 | 620             | KAA-375-100-300 |
| 360        | 455                       | 1445                       | 1 1/2"G     | 3/4"G          | M12 $\varnothing$ 300 | 804                   | KAA-375-100-360 |                 |



| V          | d             | D              | L           | C1             | C2             | A         | P-V-d                |
|------------|---------------|----------------|-------------|----------------|----------------|-----------|----------------------|
| Volume (L) | Piston Ø (mm) | Outside Ø (mm) | Length (mm) | Connection OIL | Connection GAS | Fastening | Weight (Kg) Type     |
| 120        | 200           | 240            | 4135        | 1 1/2"G        | 3/4"G          | M12 Ø160  | 486 KAA-375-120-200  |
|            | 250           | 300            | 2820        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 577 KAA-375-120-250  |
|            | 300           | 360            | 2120        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 688 KAA-375-120-300  |
|            | 360           | 455            | 1640        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 898 KAA-375-120-360  |
| 140        | 250           | 300            | 3225        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 646 KAA-375-140-250  |
|            | 300           | 360            | 2405        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 758 KAA-375-140-300  |
|            | 360           | 455            | 1840        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 994 KAA-375-140-360  |
| 150        | 250           | 300            | 3430        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 681 KAA-375-150-250  |
|            | 300           | 360            | 2545        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 792 KAA-375-150-300  |
|            | 360           | 455            | 1935        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1039 KAA-375-150-360 |
| 160        | 250           | 300            | 3635        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 716 KAA-375-160-250  |
|            | 300           | 360            | 2685        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 827 KAA-375-160-300  |
| 180        | 360           | 455            | 2035        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1087 KAA-375-160-360 |
|            | 250           | 300            | 4040        | 1 1/2"G        | 3/4"G          | M12 Ø210  | 784 KAA-375-180-250  |
| 180        | 300           | 360            | 2970        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 897 KAA-375-180-300  |
|            | 360           | 455            | 2230        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1181 KAA-375-180-360 |
| 200        | 300           | 360            | 3265        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 966 KAA-375-200-300  |
|            | 360           | 455            | 2430        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1278 KAA-375-200-360 |
| 225        | 300           | 360            | 3605        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1052 KAA-375-225-300 |
|            | 360           | 455            | 2675        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1394 KAA-375-225-360 |
| 250        | 300           | 360            | 3980        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1138 KAA-375-250-300 |
|            | 360           | 455            | 2920        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1511 KAA-375-250-360 |
| 275        | 300           | 360            | 4315        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1226 KAA-375-275-300 |
|            | 360           | 455            | 3165        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1629 KAA-375-275-360 |
| 300        | 300           | 360            | 4670        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1313 KAA-375-300-300 |
|            | 360           | 455            | 3410        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1746 KAA-375-300-360 |
| 325        | 300           | 360            | 5025        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1400 KAA-375-325-300 |
|            | 360           | 455            | 3655        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1863 KAA-375-325-360 |
| 350        | 300           | 360            | 5375        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1486 KAA-375-350-300 |
|            | 360           | 455            | 3905        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 1983 KAA-375-350-360 |
| 375        | 300           | 360            | 5730        | 1 1/2"G        | 3/4"G          | M12 Ø240  | 1573 KAA-375-375-300 |
|            | 360           | 455            | 4150        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2101 KAA-375-375-360 |
| 400        | 360           | 455            | 4395        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2218 KAA-375-400-360 |
| 425        | 360           | 455            | 4640        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2335 KAA-375-425-360 |
| 450        | 360           | 455            | 4885        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2453 KAA-375-450-360 |
| 475        | 360           | 455            | 5130        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2570 KAA-375-475-360 |
| 500        | 360           | 455            | 5375        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2688 KAA-375-500-360 |
| 525        | 360           | 455            | 5620        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2805 KAA-375-525-360 |
| 550        | 360           | 455            | 5865        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 2922 KAA-375-550-360 |
| 575        | 360           | 455            | 6115        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 3042 KAA-375-575-360 |
| 600        | 360           | 455            | 6360        | 1 1/2"G        | 3/4"G          | M12 Ø300  | 3160 KAA-375-600-360 |

# KA

2014/68/EU  
ASME

Optional

**GLUAL**  
HYDRAULICS

## Optional

Electrical  
limit  
switching  
device



### Electric limit switch

The system consists in a N/C and N/O switch.

When the piston reaches the up switch position, the switch (N/C) is activated. When the oil pressure falls and the piston reaches down switch position, the switch (N/O) is activated.

The switch is reset by a spring and it allows any mounting position, but a vertical mounting is preferable.

In the limit switch stroke, the maximum piston speed should not exceed 0,5 m/s.

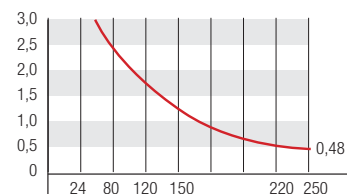
#### Electric switch characteristics:

- Compliance with the Directives
- Approval: USA/CAN
- Ambient conditions:
  - Ambient temperature
    - Min. environmental temperature -25 °C
    - Max. environmental temperature +75 °C
- Protection class IP67 to IEC/EN 60529

#### Electrical data

- Switching voltage max. 250 VAC/DC
- Switching current max. 3 A
- Switching capacity max. 120 VA / W

#### Characteristic curve:



#### Detection range:

The assembly is supplied with one limit switch possible to be adjusted and detect piston while oil volume between 85-100%.

### Piston position switch

The system consists in a magnet element that is moved with the piston.

The device is mounted on the gas side of the accumulator and according the piston reaches the switches position, the correspondent switch is activated. Depending the piston direction (up or down) the switches works as breaker or closing contact.

When the piston reaches the switch position, the switch is activated. Several switched could be mounted and the total stroke could be controlled.

The accumulator must only be installed vertically and gas side on top.

In the controlled stroke, the maximum piston speed should not exceed 0,5 m/s.

#### Electric switch characteristics:

- Compliance with the Directives
- Approval: USA/CAN

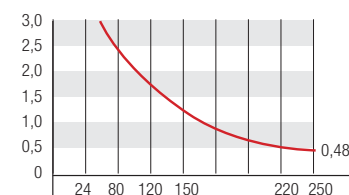
#### Ambient conditions:

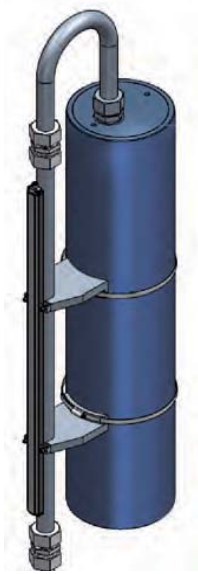
- Ambient temperature
  - Min. environmental temperature -25 °C
  - Max. environmental temperature +75 °C
- Protection class IP67 to IEC/EN 60529

#### Electrical data

- Switching voltage max. 250 VAC/DC
- Switching current max. 3 A
- Switching capacity max. 120 VA / W

#### Characteristic curve:





## Piston position transducer

The system consists in a magnet element that is moved with the piston.

The device is mounted on the gas side of the accumulator and according the piston is moved, the analogical output signal of the transducer can be displayed.

The accumulator must only be installed vertically and gas side on top (the casing is pressurised)

The total piston stroke could be controlled.

In the controlled stroke, the maximum piston speed should not exceed 0,5 m/s.

### Position transducer characteristics:

- Compliance with the Directives **CE**
- Approval: USA/CAN **UL US**

### Ambient conditions:

- Ambient temperature Ta min. -25 °C
- Ambient temperature Ta max. 70 °C
- Storage temperature min. -40 °C
- Storage temperature max. 100 °C

### Electrical data

- Ripple 0.5 Vpp
- Current consumption (at 24 V DC) ≤ 150 mA
- Inrush current ≤ 3 A / 0.5 ms
- Overvoltage protected Up to 36 V
- Voltage-proof (GND – housing) 500 V DC
- Galvanic isolation No
- Output signal adjustable Via programming inputs
- Error signal output 1 10.5 V
- Programming inputs 10 ... 30 V DC, High-active

Output signal . 0-10 v or 4-20 Ma

Electrical connection: 8-pin, M12 plug

## ADDITIONAL DETECTION SYSTEMS ON REQUEST:

- Internal cable pull Position sensor.
- External visual position device.
- Multiple system assembling.

## Ultrasonic position sensor

The system consists in ultrasonic sensor. The sensors recognize the piston position by means of ultrasonic.

The sensors sound through the wall of the accumulator, so the installation is possible without process interruption.

Ultrasound is produced by an electrical impulse and is reflected at the rear wall of the accumulator and evaluated afterwards

Several switched could be mounted and the total piston stroke could be controlled.

The accumulator could be installed in any position.

### Ambient conditions for sensors:

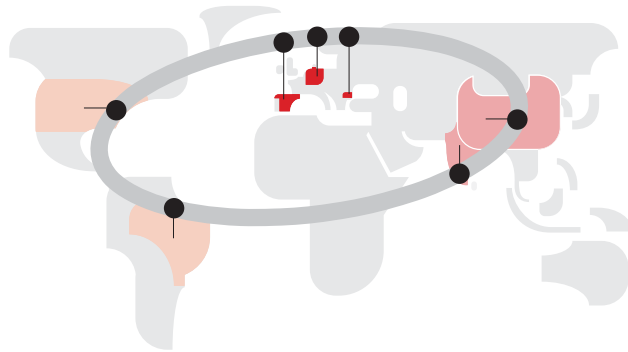
- Temperature of accumulator: -20 ... +80 °C
- Ambient temperature: -20 ... +60 °C
- Storage temperature: -40 ... +85 °C
- Attention: The range of working temperature is further restricted by the absolute viscosity.

### Electrical data:

- Protection class: IP 67, oil resistant
- Hydraulic fluid Mineral oil (HL, HLP), HFA, (HFB), HFC, HFD
- Max. absolute viscosity 100 cSt
- Out signal: NPN or PNP
- Power supply 18 ... 30 VDC, max. 80 mA, ripple 10 %
  - low voltage identification
  - inverse-polarity protection
- CE Conformity Ingress protection:
  - DIN EN 60529:1991 + A1:2000
  - EMC active: DIN EN 61326-1:2006
  - EMC passive: IEC61000-4-2, -3, -4, -5, -6



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