

## HYDAC INTERNATIONAL



### Piston accumulators Series SK280

#### 1. DESCRIPTION

##### 1.1. FUNCTION

While fluids are practically incompressible, this does not apply to gases. Hydraulic accumulators use these basic laws of physics to store hydraulic energy. Nitrogen is normally used as the compressible medium.

The various types of hydraulic accumulator are categorised on the basis of the separation element that keeps the gas section separate from the fluid section in the pressure vessel. In the case of the piston accumulator, this is a piston made from aluminium or steel with a sealing system that is compatible with the application.

The fluid side of the piston accumulator is connected to the hydraulic circuit so that the piston accumulator draws in fluid when the system pressure increases and the trapped gas is compressed. When the system pressure drops, the compressed gas expands and forces the stored fluid back out into the hydraulic circuit.

HYDAC piston accumulators are available in various designs, see catalogue sections:

- Piston accumulators Standard design  
No. 3.301



- Piston accumulators High pressure  
No. 3.302

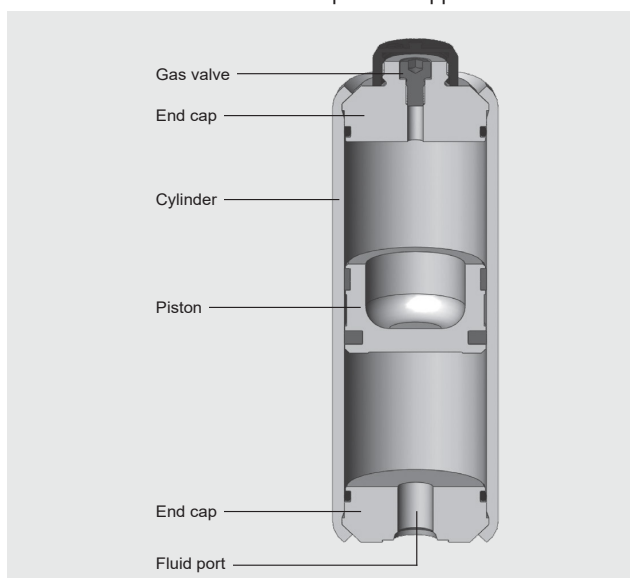


## 1.2. DESIGN

HYDAC piston accumulators consist of the following key individual components:

- Cylinder with a very finely machined internal surface
- Gas side end cap and oil side end cap, both sealed with O-rings
- Steel or aluminium piston
- Sealing system adapted to the particular field of application

The piston floats on guide rings which prevent metal-to-metal contact between the piston and the accumulator wall. Suitable materials are available for low temperature applications.



## 2. GENERAL INFORMATION

### 2.1. MATERIALS, CORROSION PROTECTION

#### 2.1.1 Accumulator shell

The cylinder and the two end caps are manufactured in carbon steel as standard. For use with certain aggressive or corrosive fluids, the parts coming into contact with the fluid can be nickel plated for protection, or made entirely from corrosion-resistant material. When supplied piston accumulators are suitable for short-term storage. Piston accumulators suitable for long-term storage are available on request.

#### 2.1.2 Pistons with a sealing system

- Piston design 3: NBR/PUR

For further information, see catalogue section:

- Piston accumulators Standard design No. 3.301

#### 2.1.3 Maximum temperature range of elastomer materials

See catalogue section:

- Piston accumulators Standard design No. 3.301

### 2.2. INSTALLATION POSITION

HYDAC piston accumulators operate in any position. Vertical installation is preferable with the gas side at the top, to prevent contaminant particles from the fluid settling on the piston seals. For hydraulic accumulators with certain piston position indicators, vertical installation is essential.

## 2.3. TYPE OF INSTALLATION

HYDAC can provide suitable accumulator clamps for the piston accumulator series SK280. The table in section 3 lists the appropriate clamps for each individual diameter. In order to prevent deformation of the cylinder, we recommend that the accumulators are mounted using two clamps, one at each end cap.

## 2.4. CHARGING GAS

- Charging gas: Nitrogen
- Specification: min. Class 2.8

If other gases are to be used or if these specifications are deviated from, please contact HYDAC.

## 2.5. HYDRAULIC FLUID

Hydraulic accumulators must only be operated with operating fluids with a minimum cleanliness class of:

- NAS 1638 Class 6 or
- ISO 4406 Class 17/15/12

## 2.6. CERTIFICATES

Hydraulic accumulators that are installed outside of Germany are supplied with the relevant test certificate documentation. The country of installation must be stated at the time of ordering. HYDAC pressure vessels can be supplied with almost any approval classification. The permitted operating pressure may differ from the nominal pressure.

The following table provides some examples of the code in the model code:

Country	Certificate code (CC)
EU member states	U
Australia	F <sup>1)</sup>
Belarus	A6
Canada	S1 <sup>1)</sup>
China	A9
Great Britain	Y
Hong Kong	A9
Iceland	U
Japan	P
Korea (Republic of)	A11
New Zealand	T
Norway	U
Russia	A6
South Africa	S2
Switzerland	U
Turkey	U
Ukraine	A10
USA	S

<sup>1)</sup> Registration required in the individual territories or provinces.

Others on request

## 2.7. FURTHER INFORMATION

- Operating instructions for piston accumulators No. 3.301.BA

### The operating instructions must be observed!

All work on HYDAC piston accumulators must only be carried out by suitably trained staff. Incorrect installation or handling can lead to serious accidents.

Further information such as accumulator sizing, safety information and extracts from the acceptance specifications can be found in our overview catalogue section:

- HYDAC Accumulator Technology No. 3.000

This document and others are available from our Download Center at [www.hydac.com](http://www.hydac.com).

## 3. MODEL CODE

Not all combinations are possible. Order example.  
 For further information, please contact HYDAC.

	SK280	1	3218	U	280	AAD	VB	05	030
<b>Series</b>									
<b>Nominal volume [l]</b>									
<b>Material and piston code (MC)</b> Dependent on operating fluid Standard design = 3218 for mineral oil Others on request									
<b>Piston design</b> (see section 2.1.2)									
<b>Piston material</b> 2 = carbon steel									
<b>Material of cylinder and end cap</b> 1 = carbon steel 2 = carbon steel (low temperature)									
<b>Material of seals including piston seals</b> 8 = NBR/PUR (polyurethane)									
<b>Certification code</b> U = European Pressure Equipment Directive (PED) For others, see section 2.6.									
<b>Permitted operating pressure [bar]</b>									
<b>Fluid port</b> AAD = threaded connection to ISO 228 size G 1/2 AAE = threaded connection to ISO 228 size G 3/4 AAF = threaded connection to ISO 228 size G 1 ACE = threaded connection to SAE J 514 size 9/16-18UNF, SAE #6 ACF = threaded connection to SAE J 514 size 3/4-16UNF, SAE #8 ACH = threaded connection to SAE J 514 size 1 1/16-12UN, SAE #12 ACK = threaded connection to SAE J 514 size 1 5/16-12UN, SAE #16									
<b>Gas-side connection or gas valve</b> VB = gas valve type M28x1.5/M8 integrated into end cap 000 = non-rechargeable version (see drawing, section 4.2.) on request									
<b>Piston diameter</b> 05 = 50 mm									
<b>Pre-charge pressure p<sub>0</sub> [bar] at 20 °C, must be stated clearly, if required!</b>									

## 4. STANDARD ITEMS

### 4.1. TECHNICAL DATA

The piston accumulators described below are manufactured in carbon steel with a design 3 piston in carbon steel and a sealing system made from NBR/PUR (MC = 3218).

The table provides the most important data and dimensions for the following series: SK280

The part numbers provided refer to piston accumulators in accordance with PED (CC = U).

Designs that differ from the standard types described below can be requested from HYDAC.

#### 4.1.1 Permitted operating temperature

As standard, a piston accumulator can be operated in the following temperature range:

-20 °C ... +80 °C

Extended temperature range:

-40 °C ... +100 °C

#### 4.1.2 Permitted operating pressure

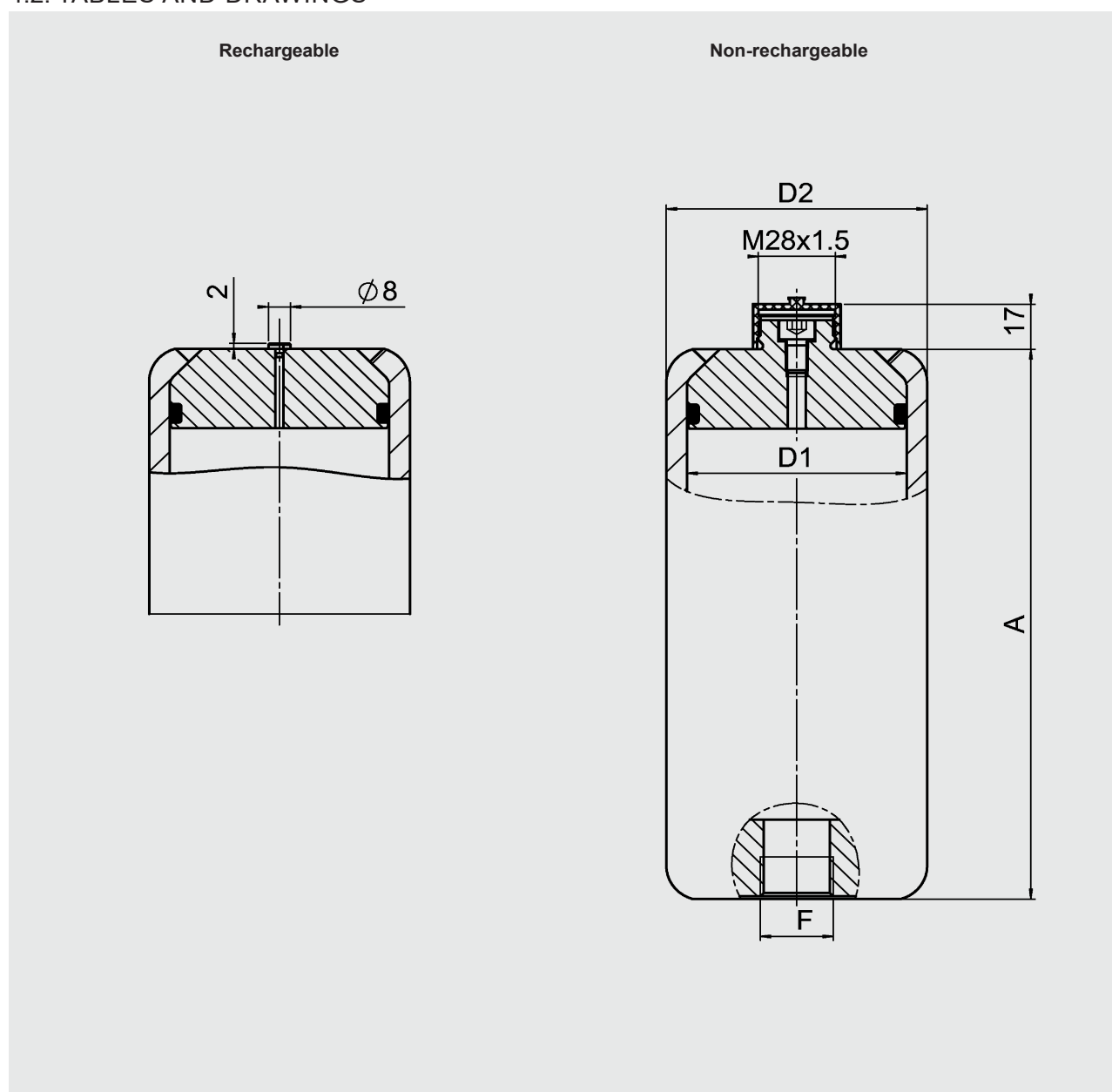
The permitted operating pressure may differ from the nominal pressure in the case of other certifications. The table in section 4.2. shows the permitted operating pressure in accordance with the European Pressure Equipment Directive.

The specified values are maximum values and must not be considered as referring to a permanent load. The tolerable pressure ratio is influenced by the geometry, temperature, fluid and flow rate as well as any gas losses due to physical properties.

#### 4.1.3 Nominal volume

HYDAC piston accumulators are available with set nominal volumes, as described in the table in section 4.2.

### 4.2. TABLES AND DRAWINGS



Nominal volume	D1	D2	A ±3	Perm. operating pressure 280 bar (PED)				Weight	Mounting clamps <sup>2)</sup>
				to ISO 228		to SAE J 514			
				F	Part no. <sup>1)</sup>	F	Part no. <sup>1)</sup>		
[l]	[mm]	[mm]	[mm]					[kg]	
0.16	50	60	160	G 1/2	3200525	9/16-18UNF	—	2	3018442 HRGKSM 0 R 58-61/62 ST
0.32			240		3200521		—	2.5	
0.5			335		3200528	3/4-16UNF	—	3.1	
0.75			460		3200522		—	4	
1			590		3200523		—	4.8	
0.32	60	75	205	G 1/2	3200524	3/4-16UNF	—	4	444912 HRGKSM 0 R 73-76/76 ST
0.5			265		3200546		—	4.7	
0.75			355		3200547		—	5.8	
1			445		3200548		—	6.9	
1.5			620		3200549		—	9.1	
2			800		3200550		—	11.4	
2.5			975		3200551		—	13.6	
0.5	80	95	210	G 3/4	3200552	1 1/16-12UN	—	6.5	444995 HRGKSM 0 R 92-95/96 ST
0.75			260		3200553		—	7.2	
1			310		3200554		—	8	
1.5			410		3200557		—	9.5	
2			510		3200558		—	11.5	
2.5			605		3200559		—	13	
3			705		3200560		—	14.5	
3.5			805		3200561		—	16	
4			905		3200562		—	17.5	
0.75	100	120	235	G 1	3200563	1 5/16-12UN	3984528	11.7	444505 HRGKSM 1 R 119-127/124 ST
1			265		3200564		3984529	12.5	
1.5			330		3200565		3984530	14.3	
2			395		3200566		3984531	16	
2.5			460		3984479		3984533	18	
3			520		3200568		3984534	19.5	
3.5			585		3984478		3984555	21.5	
4			650		3200569		3984556	23	
5			775		3200570		3984557	26.3	
6			900		3200571		3984558	30	
4	125	150	445	G 1	4092344	1 5/16-12UN	4092420	29	444321 HRGKSM 1 R 146-154/151 ST
5			528		4092395		4092421	32.5	
6			609		4092396		4092422	36	
7			691		4092397		4092423	39.5	
8			772		4092398		4092424	43	
9			854		4092399		4092445	46.5	
10			935		4092400		4092446	50	
6	150	175	467	G 1	4289054	1 5/16-12UN	—	39.4	444402 HRGKSM 2 R 172-180/178 ST
8			581		4289105		—	45.1	
10			695		4289106		—	50.8	
12			809		4289108		—	56.5	
15			980		4289109		—	65.1	

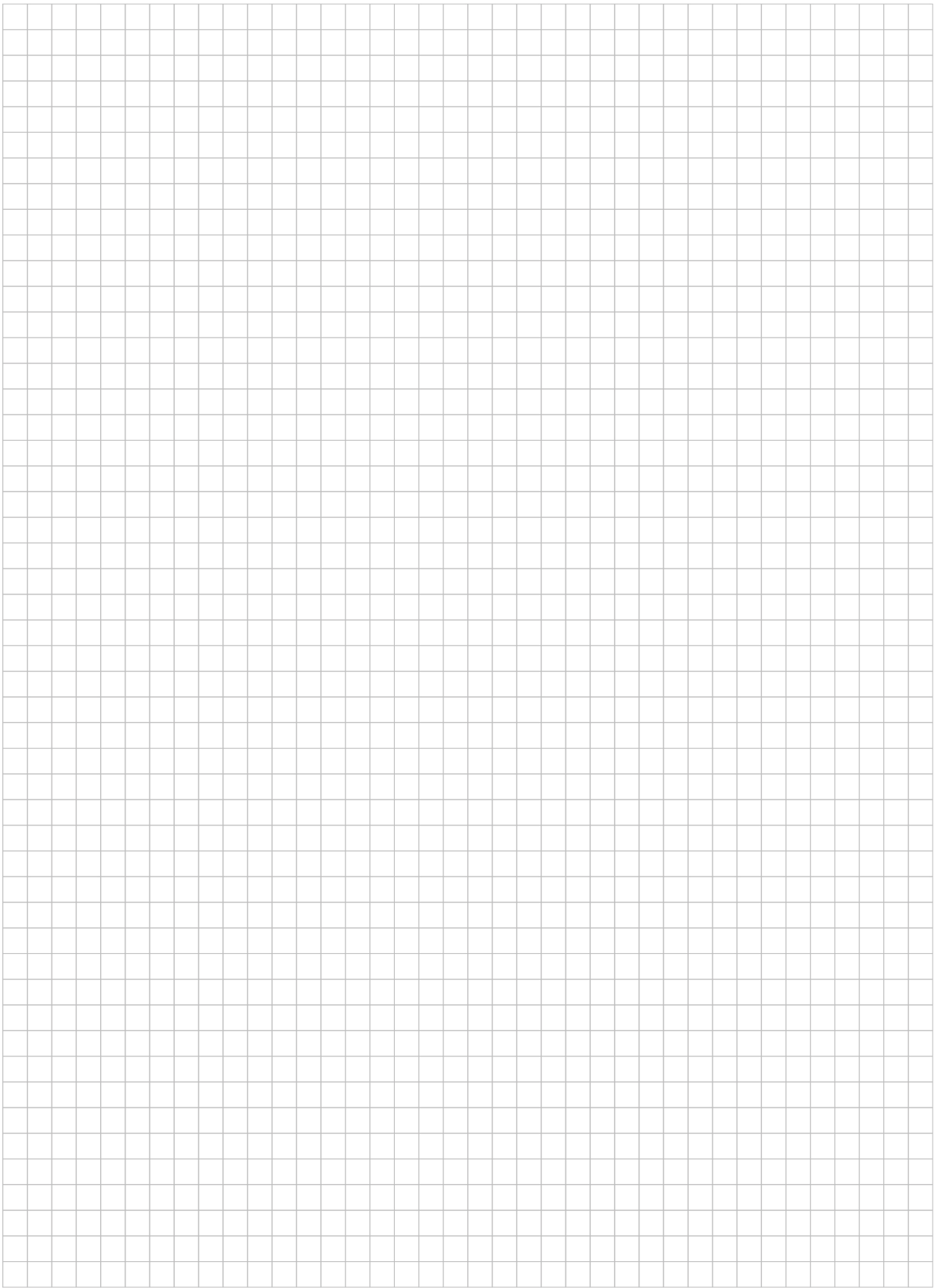
<sup>1)</sup> Preferred models, others on request

<sup>2)</sup> Clamps must be mounted near the end caps in order to prevent deformation of the cylinder; for further information see the following catalogue section:

■ Mounting elements for hydraulic accumulators  
No. 3.502

## 5. NOTE

The information in this brochure relates to the operating conditions and fields of application described. For applications and/or operating conditions not described, please contact the relevant technical department.  
Subject to technical modifications.



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