

Safety Equipment for Hydraulic Accumulators



1. DESCRIPTION

1.1. GENERAL

Hydraulic accumulators are pressure vessels for the purpose of the PED97/23/EC and as such their manufacture is subject to the statutory pressure equipment directive.

For safety in the workplace, system manufacturers and operators must draw up a risk assessment for the particular site.

These must take into account possible risks at the installation site, particularly in combination with external factors.

Fundamental risks affecting hydraulic accumulators are:

- Excessive pressure and
- Increase in temperature (e.g. in the event of external fire)

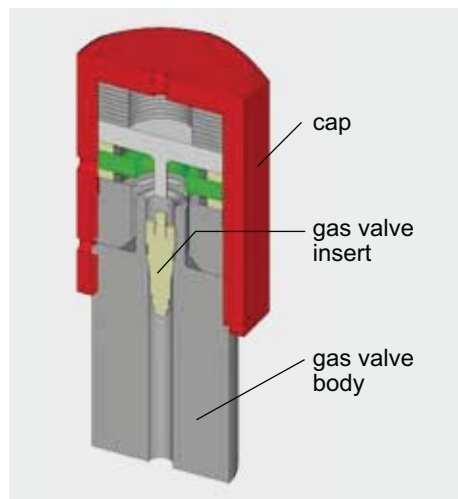
HYDAC provides the appropriate safety equipment to protect accumulators from excessive values on the gas and fluid side; see also catalogue section:

- Accumulators No. 3.000

2. PROTECTION ON THE GAS SIDE

2.1. TEMPERATURE FUSE

2.1.1 Design



2.1.2 Function

Temperature fuses are "devices with a safety function" and are used to release the gas pressure by discharging the nitrogen completely when a rise in temperature reaches unacceptable levels (e.g. in the case of fire).

Permitted operating pressure:

≤ 690 bar

Temperature range:

-10 °C ... +80 °C

Melting point:

approx. +160 °C ... +170 °C

2.1.3 Model

Part no.	Description
363501	Temperature fuse 7/8-14UNF

2.1.4 Installation

Simple to retrofit by replacing the sealing cap with the temperature fuse.



Gas side of the accumulator shown with sealing cap

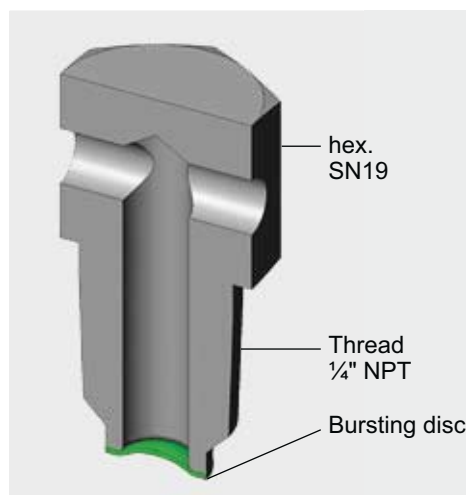


Gas side of the accumulator shown with temperature fuse

2.2. BURSTING DISC

2.2.1 Design

Protection by discharging the nitrogen completely when the pressure exceeds the permitted level.



2.2.2 Function

If the pressure exceeds the permitted level, the bursting disc shatters, permanently opening the port. This reduces the gas pressure by discharging the nitrogen completely.

Bursting discs are designed for different burst pressures and are supplied with a certificate of conformity.

Bursting discs are made either entirely of stainless steel, or from an alloy based on stainless steel and nickel.

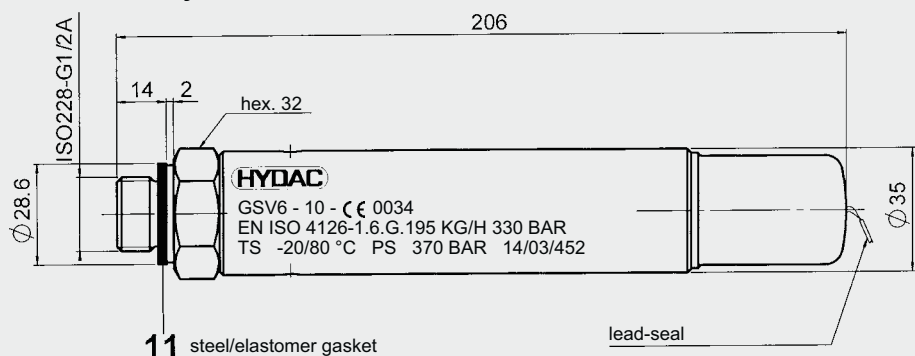
2.2.3 Standard models

Part no. ¹⁾	Description	Burst pressure ± 10% at 50 °C
3156148	Bursting disc plug 1/4" NPT	210 bar
3156152	Bursting disc plug 1/4" NPT	350 bar
3156155	Bursting disc plug 1/4" NPT	450 bar

¹⁾ higher pressures, different threads and burst pressure tolerances on request

2.3. GAS SAFETY VALVE

2.3.1 Assembly and dimensions



2.3.2 Function

The gas safety valve provides protection by reducing the pressure in a controlled way if pressure exceeds the permitted level unexpectedly. It is pre-set on the pressure side and lead-sealed by the authorised representative. It is also supplied with a certificate of conformity and a type approval.

2.3.3 Model code

(also order example)

GSV6-10 - CE0034.ENISO4126-1.6.G. 195. 330

Gas safety valve

Component code

Flow rate Q in kg/h
(see table, Point 2.3.5)

Pressure setting p in bar
(see table, Point 2.3.5)

2.3.4 Technical specifications

Design

PED 97/23/EC, EN ISO4126-1, EN 13445-6, others on request

Module category

IV to PED 97/23/EC
Module B + D (EC type approval)
Module G (EC individual approval) on request

Model

Nominal size 6 mm

Material

Stainless steel, closing element with flexible seat seal

Operating medium

Nitrogen (N₂)
Others on request

Operating pressure range

30 ... 370 bar

Temperature range

-20 °C ... +80 °C

Weight

1.1 kg

2.3.5 Standard models

Q [kg/h]	p [bar] ± 10 %	Part no. ¹⁾
15	30	3123965
20	40	3123966
28	50	3123967
35	60	3124028
40	70	3124029
45	80	3124030
50	90	3124031
58	100	3124032
65	110	3124033
70	120	3124034
75	130	3124035
83	140	3124036
88	150	3124037
95	160	3124038
100	170	3124039
105	180	3124040
110	190	3124041
118	200	3124042
125	210	3124043
130	220	3124044
135	230	3124045
140	240	3124046
148	250	3124047
155	260	3124048
160	270	3124049
165	280	3124050
170	290	3124051
178	300	3124052
185	310	3124053
190	320	3124054
195	330	3124055
200	340	3124056
205	350	3124057
210	360	3153706
216	370	3143015

¹⁾ Others on request.

> 350 bar = additional price for
EC individual approval test

2.3.6 Mounting

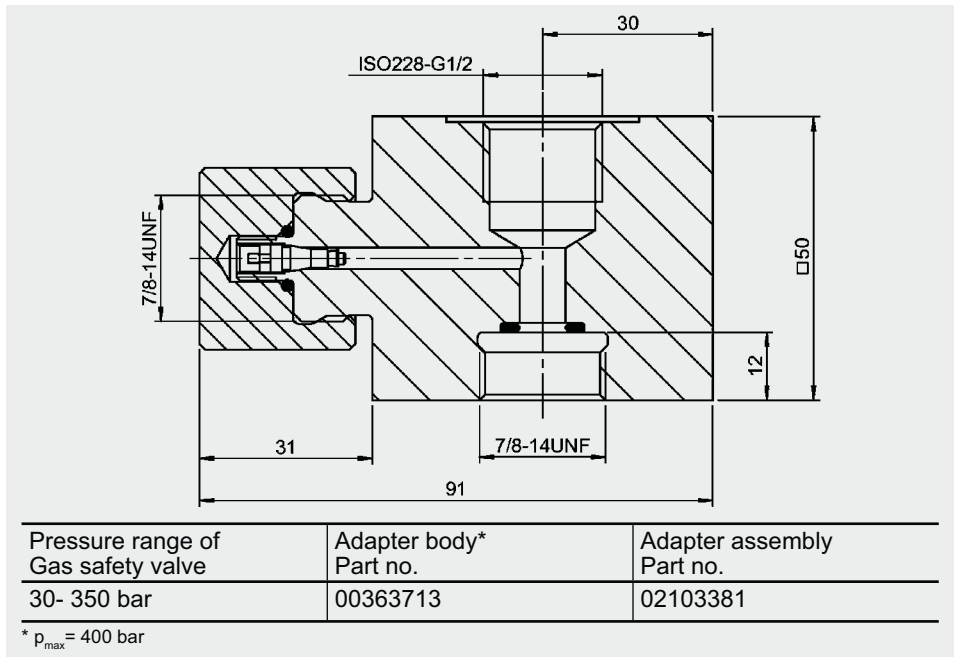
The self-centring gasket means that this valve can be installed simply and securely in any position.

Please read the operating manual!

- GSV6
No. 3.504.CE

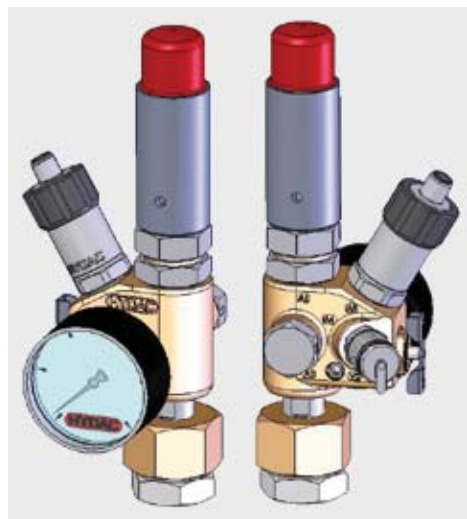
2.3.7 Adapter for gas safety valve GSV6

To protect standard and low pressure bladder accumulators, the adapter shown below must be ordered with the gas safety valve GSV6.



2.4. GAS SAFETY BLOCK

2.4.1 Design



Gas safety block GSB450 consists of a brass block (other materials on request) with integral bleed and shut-off valve and ports for:

- Gas safety valve (GSV6)
- Gas charging valve (e.g. Minimes) series 1620
- Pressure gauge
- Pressure transmitter or pressure switch
- Bursting disc
- Temperature fuse

The connection for the gas safety valve is designed as a check valve. Therefore the valve can be changed, even if the system is pressurized.

2.4.2 Function

The GSB450 is an adapter block, which is mounted on an accumulator on the gas side and which can be fitted with various pressure devices, charging equipment, safety valves and other safety components.

2.4.3 Advantages

- Compact design
- Flexible connection options
- Variable indication options: bar, MPa or psi, analogue or digital (optional)
- Pressure indication according to customer requirement
- Accumulator can be charged with nitrogen without using FPU-1, directly via Minimes valve
- Pre-charge pressure can be checked without using FPU-1

2.4.4 Model code (also order example)

GSB450 - 1 - 1 - 5 - 1 - 1 - **350**

Series

Material

- 1 = standard
- 2 = stainless steel

Accumulator connection

- 1 = connection for SK / SBO
- 2 = connection for SB
- 9 = special connection

Monitoring options

- 0 = no monitoring
- 1 = 0 – 25 bar
- 2 = 0 – 100 bar
- 3 = 0 – 160 bar
- 4 = 0 – 250 bar
- 5 = 0 – 400 bar
- 9 = special pressure gauge

Gas charging connection

- 0 = no charging connection
- 1 = standard Minimes series 1620
- 2 = Minimes gas charging valve series 1615
- 9 = special

Safety equipment

- 0 = no safety device
- 1 = GSV
- 2 = bursting disc
- 3 = temperature fuse

Pressure range of the safety equipment

2.4.5 Technical data

Medium

Nitrogen (N₂)

Permitted operating temperature

-20 °C ... +80 °C

Max. operating pressure

400 bar / 5800 psi

Accumulator connection

Bladder accumulator

7/8-14UNF with adapter

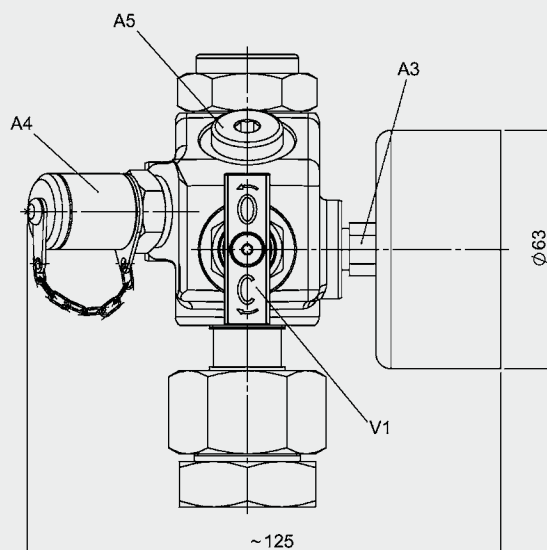
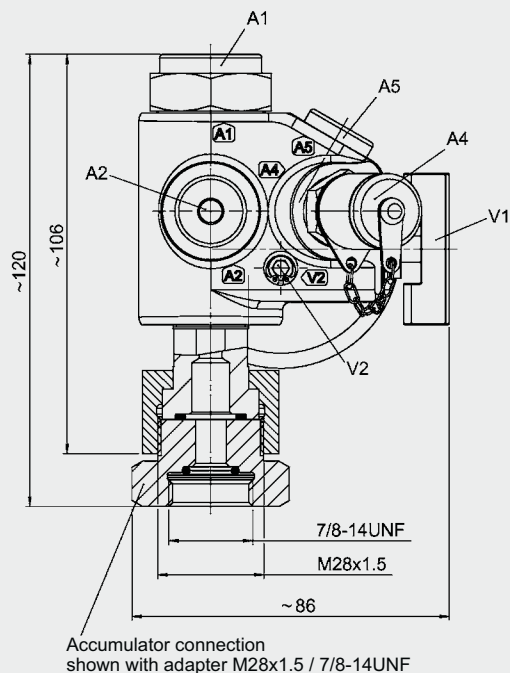
For bladder accumulators, the appropriate adapter is supplied. All other connections are sealed with blanking plugs.

Piston and diaphragm accumulators:

M28x1.5

For piston and diaphragm accumulators the connection is a M28x1.5 thread as standard.

2.4.6 Models



Basic model

In the basic version, the GSB450 is supplied with shut-off valve, air bleed valve, pressure gauge (0 - 400 bar, $\varnothing 63$ mm) and gas charging connection in Minimes screw coupling series 1620 (M16x2).

Options

The GSB450 can be supplied with the following options:

- Pressure gauge with various different display ranges (in $\varnothing 63$ mm - no additional cost) and different unit indication: bar, MPa or psi; analogue or digital
- Pressure gauges of various accuracy classes and glycerin-filled pressure gauges
- Minimes gas charging valve series 1615 (M16x1.5) in stainless steel version
- Version for lower and higher temperatures
- Version where all steel parts are stainless steel (A4)
- Gas safety valve GSV6
- Safety devices (burst disc, temperature fuse)
- Pressure transmitter (e.g. HDA)
- Pressure switch (e.g. EDS)

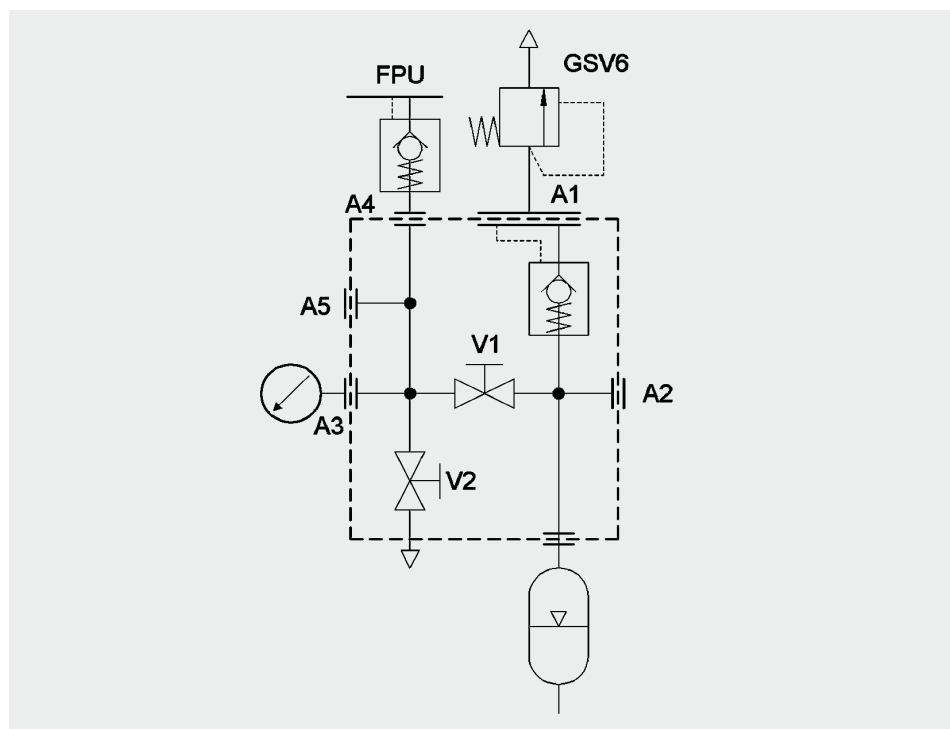
* on request and must be ordered separately and at additional cost

2.4.7 Block connections

Connections	Size	Description	Options available as accessories
A1	G 1/2-ISO228	GSV6 connection, incl. pilot-operated check valve	Blanking plug
A2	G1/4-ISO228	Connection for charging and safety devices	Charging connection for remote charging Bursting disc, Temperature fuse
A3		Connection for pressure gauge	Pressure gauge in various models and various different indication ranges (0 - 400 bar, 0 - 5714 PSI)
A4		Gas charging connection	Minimes M16x2; M16x1.5 gas-tight
A5		General connections	Pressure transmitter e.g. HYDAC HDA, EDS

2.4.8 Valves

Type	Description
V1	Shut-off valve
V2	Bleed valve (int. hex. SW4)



3. PROTECTION ON THE FLUID SIDE

3.1. GENERAL

The fluid side must be protected against pressures which exceed the permitted operating pressures by fitting approved and appropriate safety valves.

HYDAC offers pressure relief valves (DB12) which has a pressure setting of up to 400 bar (set by HYDAC). The valve carries the CE mark and is built into Safety and Shut-off Blocks in the series DSV10 and SAF in nominal sizes DN10 and DN50 and is lead-sealed.

Further information is available from the following catalogue section:

- Safety and Shut-off Block SAF/DSV No. 3.551

4. NOTE

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

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