



## Universal Charging and Testing Unit FPU-1 for Bladder, Piston and Diaphragm Accumulators

### 1. DESCRIPTION

#### 1.1. FUNCTION

The HYDAC charging and testing unit FPU-1 is used to charge accumulators with nitrogen or to check or to change the existing pre-charge pressure in accumulators.

For this purpose the charging and testing unit is screwed onto the gas valve of the hydraulic accumulator and connected to a commercial nitrogen bottle.

If the nitrogen pressure is only to be checked or reduced, the charging hose does not need to be connected. The unit has a screw-type fitting with a built-in gauge, check valve and a spindle for opening the accumulator gas valve to control the pressure

HYDAC piston and diaphragm accumulators can be charged and checked without the need for adapters. Bladder accumulators, however, require an A3 adapter.

The FPU-1 must only be used for its intended purpose.

#### 1.2. TESTING INTERVALS

On the whole, nitrogen losses on HYDAC hydraulic accumulators are very low. However, a regular check of the gas pre-charge pressure is recommended to prevent the piston from hitting the end cap, or the bladder or diaphragm from becoming too deformed if there is a drop in the pressure  $p_0$ .

The pre-charge pressure  $p_0$  as shown on the label or the accumulator body, must be re-set after every new installation or repair and then checked at least once during the following week. If no nitrogen loss is detected, a further check should be made after approx. 4 months. If after this period no change in the pressure is found, a yearly check should be sufficient.

**Please read the operating manual!  
No. 3.501.CE**

#### 1.3. CONSTRUCTION

The HYDAC charging and testing unit for bladder, piston and diaphragm accumulators consists of:

- Valve body
- Spindle
- Check valve
- Release valve
- Gauge
- Charging hose
- A3 adapter for bladder accumulators

## 2. TECHNICAL SPECIFICATIONS

### 2.1. MODEL CODE

(also order example)

FPU-1 -250 F 2.5 G2 A1 K

#### Universal charging and testing unit

$p_{max} = 350 \text{ bar}$

#### Gauge indication range

0 - 10 bar	0 - 145 psi	10
0 - 25 bar	0 - 363 psi	25
0 - 100 bar	0 - 1450 psi	100
0 - 250 bar	0 - 3625 psi	250
0 - 400 bar	0 - 5800 psi	400

#### Charging hose

- F = for 200 bar nitrogen bottle with connection W24.32x1/14 (DIN 477, Part 1)
- FM = for 300 bar nitrogen bottle with connection M30x1.5 (DIN 477, Part 5 up to April 2002)
- FW = for 300 bar nitrogen bottle with connection W30x2 (DIN 477, Part 5 from April 2002)

#### Length of charging hose

- 2.5 = 2.5 m
- 4.0 = 4 m
- Special lengths on request

#### Adapter G for nitrogen bottles

See table, Point 3.6.

#### Adapter A

- A1 = M16x1.5
  - A2 = 5/8 - 18 UNF
  - A3 = 7/8 - 14 UNF
  - A4 = 7/8 - 14 UNF
  - A5 = M8x1
  - A6 = G 3/4 A
  - A7 = G 1/4
  - A8 = G 3/4
  - A9 = Vg 8
  - A10 = 7/8 - 14 UNF
  - A11 = M16x2
  - D4 = 5/8 - 18 UNF
- (Part no. 366374)  
other adapters on request
- (A3 is supplied as standard)

#### Protective case

Accessories - please give full details when ordering (see Point 4.)

## 2.2. SPECIAL MODELS

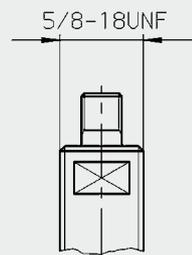
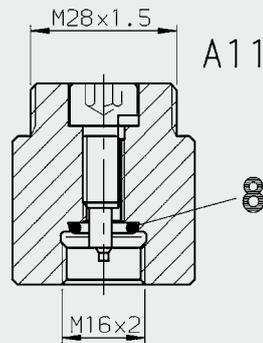
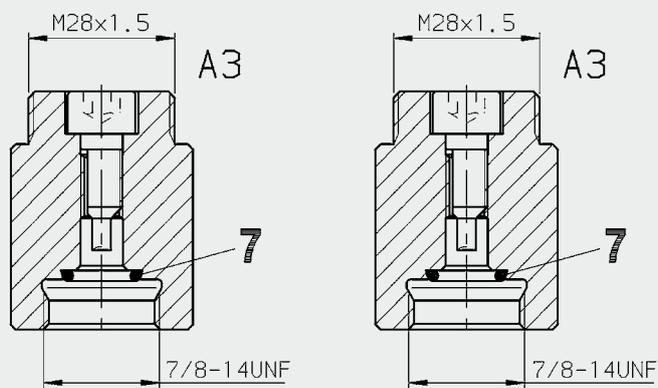
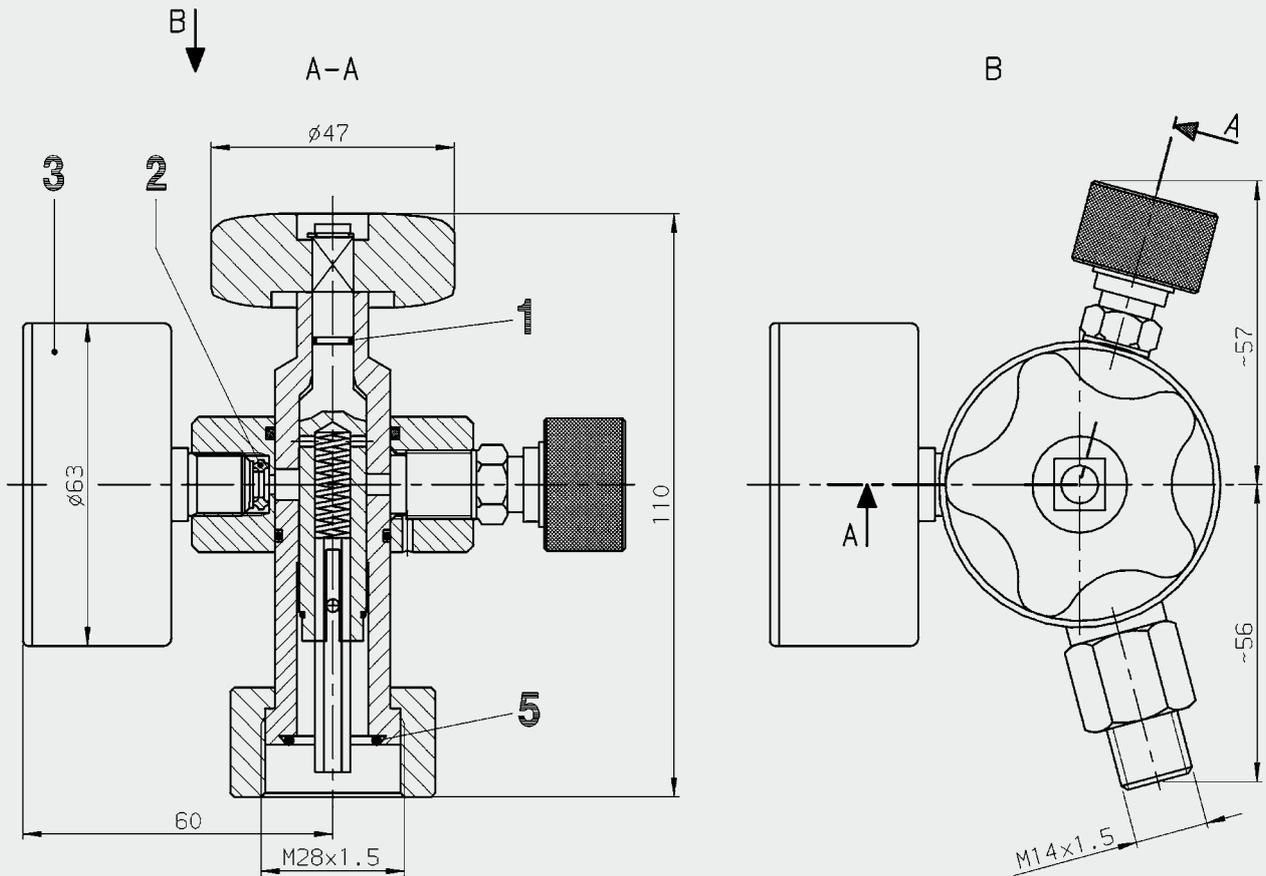


For higher pressures, the following special models are available:

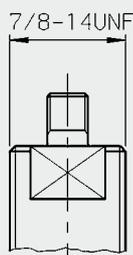
- **FPS 600**  
for bladder accumulators up to 600 bar max. pre-charge pressure (see technical information 293715).
- **FPK 600**  
for piston, diaphragm and SB800-1.5 bladder accumulators up to 600 bar max. pre-charge pressure (see technical information 297248).
- **FPH 800**  
for high pressure bladder accumulators up to 800 bar max. pre-charge pressure (see technical information 242948).

### 3. DIMENSIONS

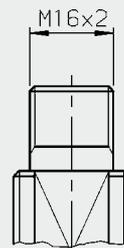
#### 3.1. CHARGING AND TESTING UNIT FPU-1 WITH ADAPTER FOR HYDAC ACCUMULATORS



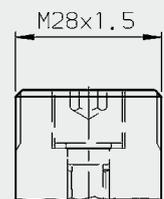
Bladder accumulator  
330-0.5 / 400-0.5



Bladder accumulator  
 $\geq 1l$



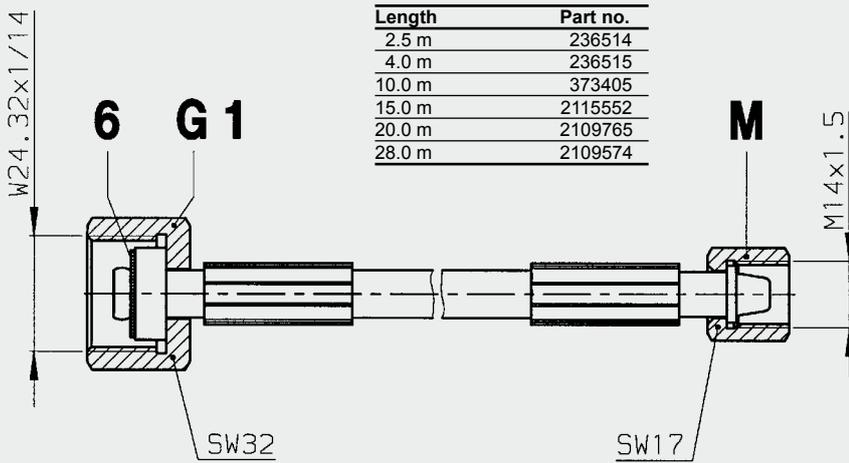
Gas valve  
to ISO 10945



Piston and diaphragm  
accumulator

### 3.2. CHARGING HOSE F

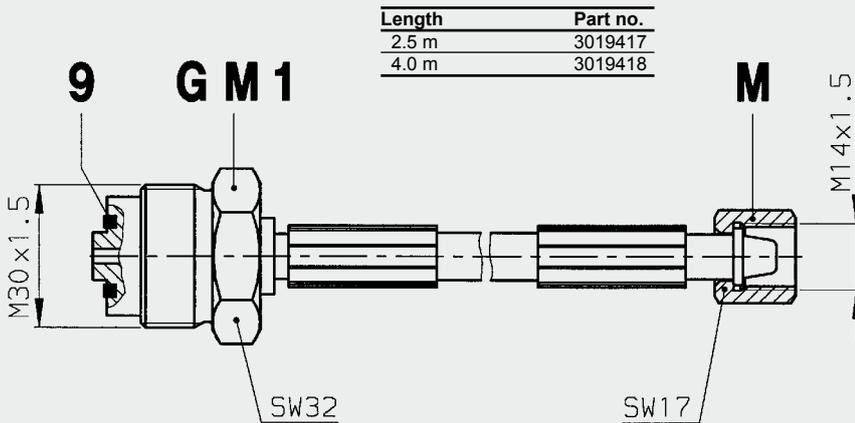
(200 bar nitrogen bottle - connection to DIN 477, Part 1)



Charging hoses are suitable for the relevant published maximum permitted operating pressures and 10,000 charging processes. (HYDAC charging hoses comply with the EC machine directive and with DIN EN 982 and DIN EN 853 to 857)

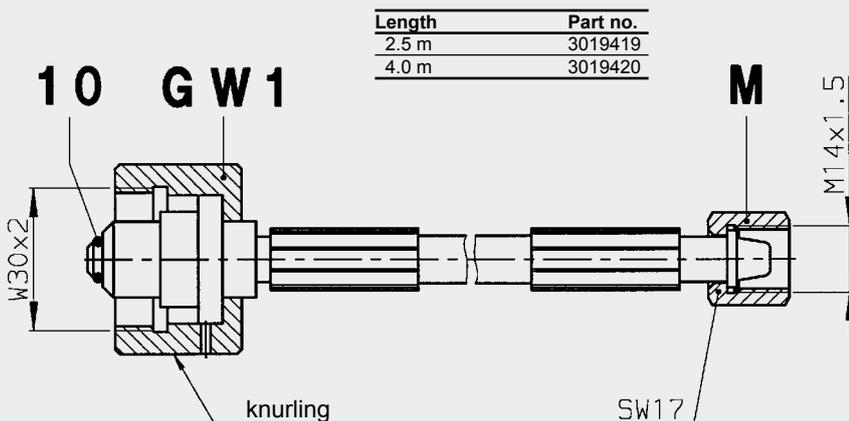
### 3.3. CHARGING HOSE FM

(300 bar nitrogen bottle - connection to DIN 477, Part 5 up to April 2002)



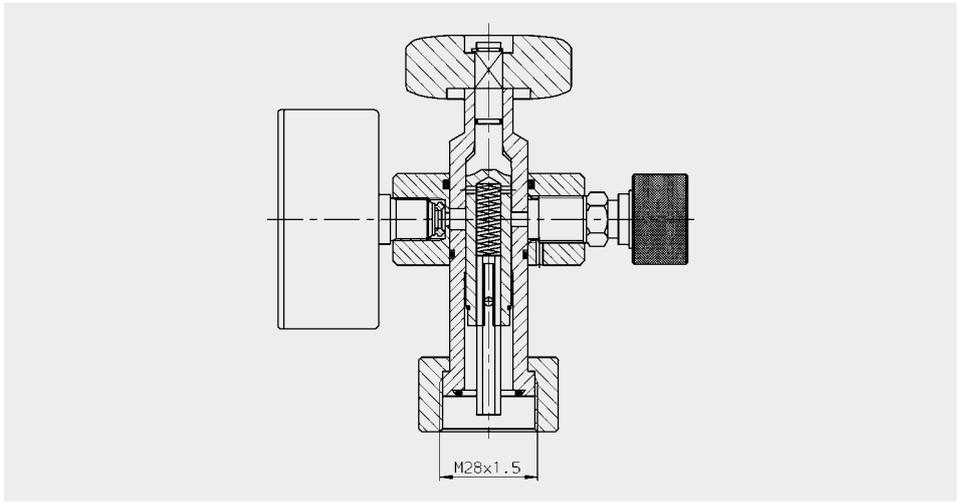
### 3.4. CHARGING HOSE FW

(300 bar nitrogen bottle - connection to DIN 477, Part 5 from April 2002)

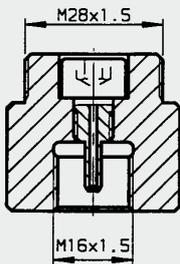


### 3.5. ADAPTERS A1 TO A12

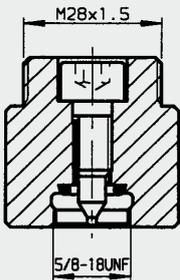
The universality of the FPU-1 is guaranteed because as well as HYDAC piston and diaphragm accumulators, bladder accumulators can also be charged and tested using the A3 adapter. By using additional adapters other makes of accumulator can also be charged and tested.



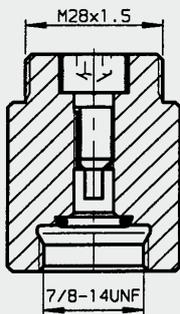
**A1 (Part no. 361619)**



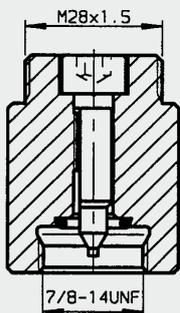
**A2 (Part no. 361605)**



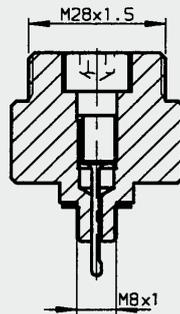
**A3 (Part no. 291533)**



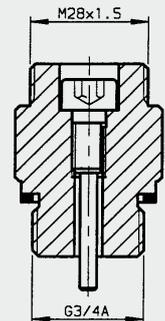
**A4 (Part no. 291536)**



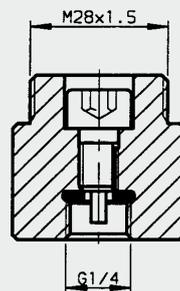
**A5 (Part no. 291531)**



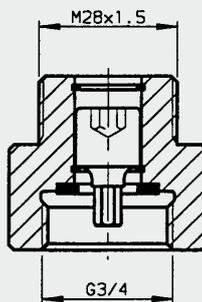
**A6 (Part no. 2108819)**



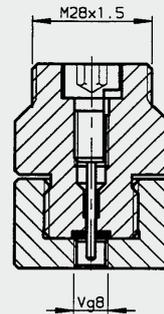
**A7 (Part no. 2110629)**



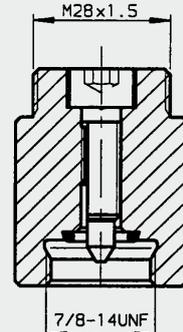
**A8 (Part no. 2124524)**



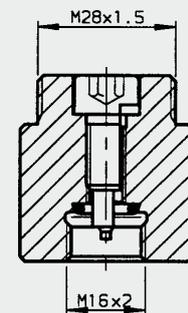
**A9 (Part no. 2128638)**



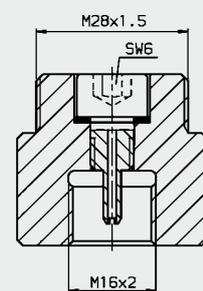
**A10 (Part no. 2128849)**



**A11 (Part no. 3018210)**

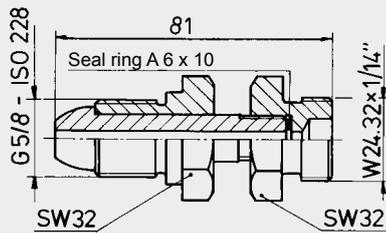


**A12 (Part no. 3203185)**

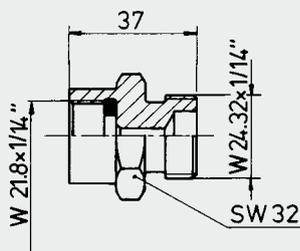


### 3.6. ADAPTERS G2 TO G12

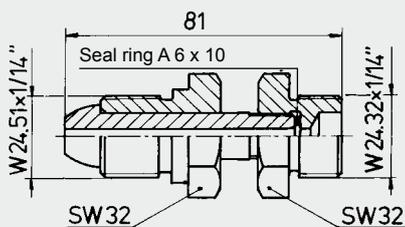
**G 2 (Part no. 236376)**



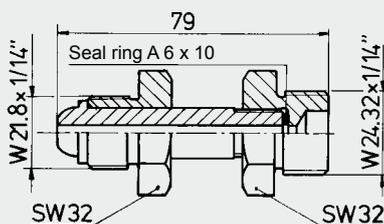
**G 3 (Part no. 2103421)**



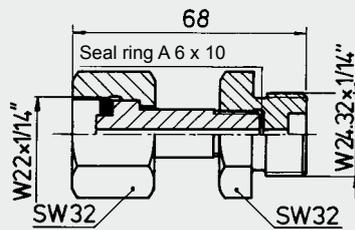
**G 4 (Part no. 236374)**



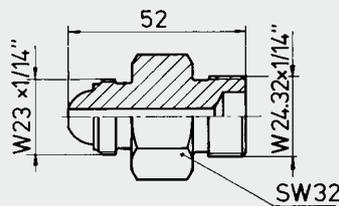
**G 5 (Part no. 236373)**



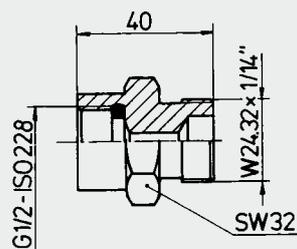
**G 6 (Part no. 2103423)**



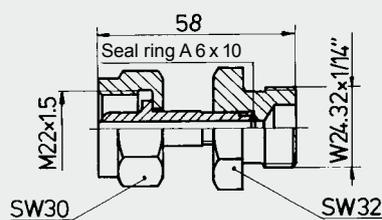
**G 7 (Part no. 236377)**



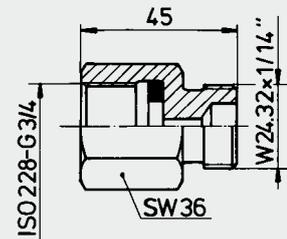
**G 8 (Part no. 2103425)**



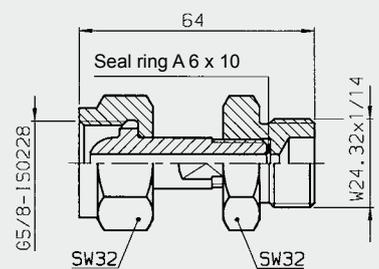
**G 9 (Part no. 241168)**



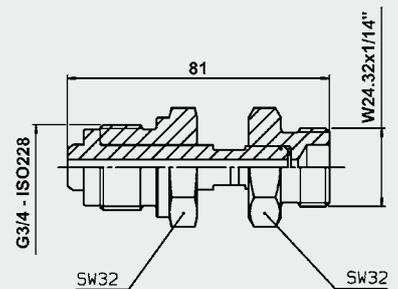
**G 10 (Part no. 2103427)**



**G 11 (Part no. 3018678)**



**G 12 (Part no. 3195556)**



### 3.6.1 Schedule of countries

G Adapters for nitrogen bottles from different countries.

Country	Type / Material no.											
	G1 <sup>1)</sup>	G2 236376	G3 2103421	G4 236374	G5 236373	G6 2103423	G7 236377	G8 2103425	G9 241168	G10 2103427	G11 3018678	G12 3195556
Albania												
Algeria			•									
Argentina		•										
Australia												•
Austria	•											
Bahamas		•										
Bahrain			•									
Bangladesh		•										
Barbados		•										
Belgium	•											
Bolivia								•				
Botswana		•										
Brazil				•								
Bulgaria			•									
Burma		•										
Canada				•								
Chile								•				
China											•	
Columbia								•				
Costa Rica		•										
Cyprus		•										
Czech Republic	•											
Denmark	•											
Djibouti			•									
Dominican Republic								•				
Ecuador								•				
Egypt			•									
Ethiopia		•										
Fiji		•										
Finland	•											
France			•									
Gabon			•									
Gambia		•										
Germany	•											
Ghana		•										
Great Britain		•										
Greece		•										
Guatemala								•				
Guinea			•									
Guyana								•				
Honduras								•				
Hong Kong		•										
Hungary			•									
India		•										
Indonesia		•										
Iran			•									
Iraq			•									
Ireland		•										
Israel			•									
Italy					•							
Ivory Coast			•									
Jamaica		•										
Japan						•						
Jordan			•									
Kenya		•										
Korea												
Kuwait			•									
Lebanon			•									
Libya			•									
Malawi		•										
Malaysia		•										
Malta		•										
Mauritius			•									
Mexico			•									
Morocco			•									
Mozambique			•									
Netherlands	•											
New Zealand		•										
Nigeria			•									
Norway	•											
Oman			•									
Pakistan		•										
Paraguay								•				
Peru								•				
Philippines		•										
Poland	•											
Portugal		•										
Puerto Rico				•								
Qatar			•									
Romania			•									
Russia										•		
Saudi Arabia			•									
Singapore		•										
South Africa		•										
Spain		•	•									
Sri Lanka		•										
Sudan		•										
Surinam		•										
Swaziland		•										
Sweden	•											
Switzerland	•											
Syria			•									
Taiwan									•			
Tanzania		•										
Thailand		•										
Trinidad/Tobago										•		
Tunisia			•									
Turkey		•										
United Arab Emirates			•									
Uruguay								•				
USA				•								
Venezuela										•		
Vietnam		•										
Yugoslavia 2)										•		
Zambia		•										

• = suggestion

<sup>1)</sup> = already fitted to hose

<sup>2)</sup> = Bosnia, Herzegovina, Croatia, Macedonia, Slovenia

## 4. ACCESSORIES

### 4.1. PROTECTIVE CASE

for storing the charging and testing unit and adapters.

**Different types of case are available, depending on customer requirement.**

FPU-1, standard model, without case: approx. 1.4 kg

FPU-1, standard model, with case: approx. 3.0 kg

### 4.2. GAS SAFETY VALVE

Provides protection by reducing the pressure in a controlled way if pressure exceeds the permitted level unexpectedly, see catalogue section:

- Safety Equipment for Hydraulic Accumulators No. 3.552

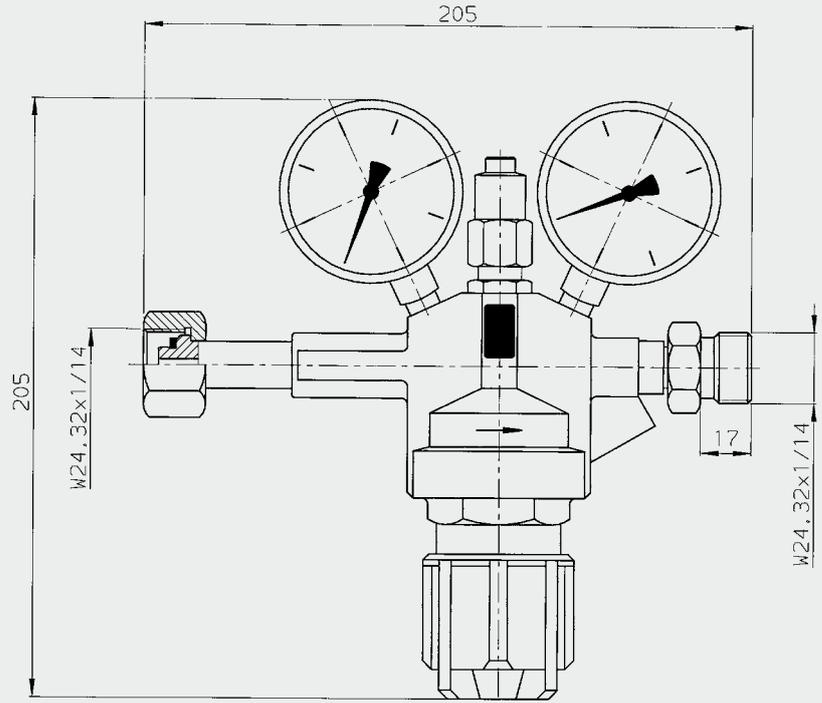
### 4.3. ADAPTER D4

For screw connector D on bladder accumulators < 1 l (see Point 3.)

### 4.4. PRESSURE REDUCER

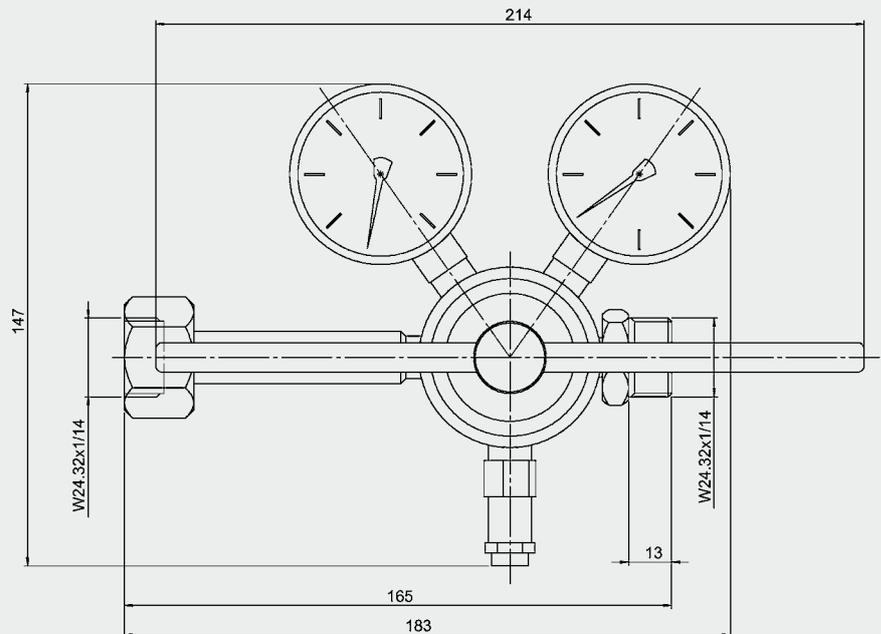
For adjusting the required pre-charge pressure between the nitrogen bottle and the accumulator.

#### 4.4.1 Pressure reducer for 200 bar nitrogen bottles (Connection W24.32x1/14 - DIN 477, Part 1)



Bottle pressure [bar]	Reduces pressure to between [bar]	Part no.
200	0 – 20	635409

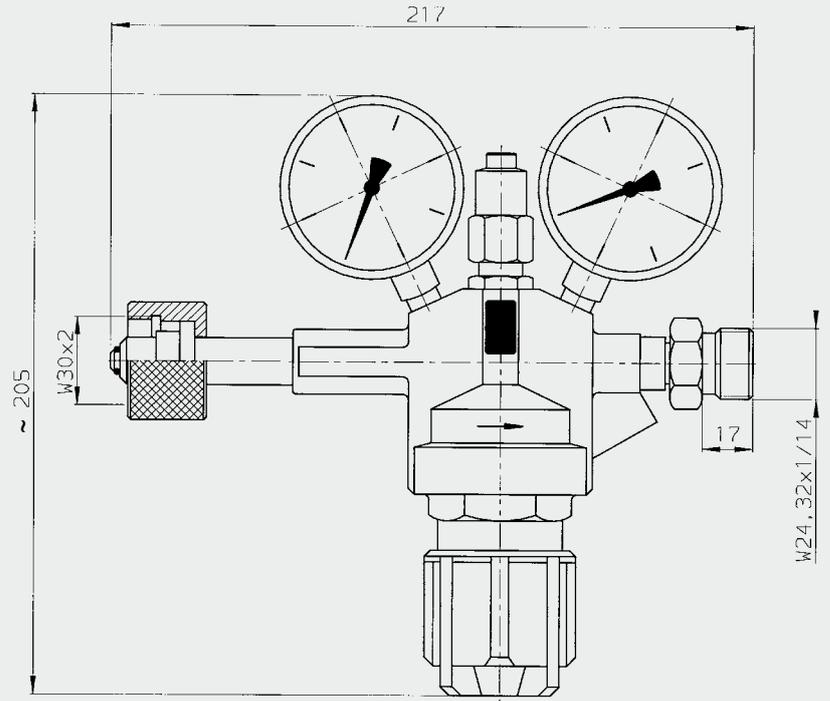
Weight: 1.5 kg



Bottle pressure [bar]	Reduces pressure to between [bar]	Part no.
200	0 – 100	635411
200	0 – 200	635412

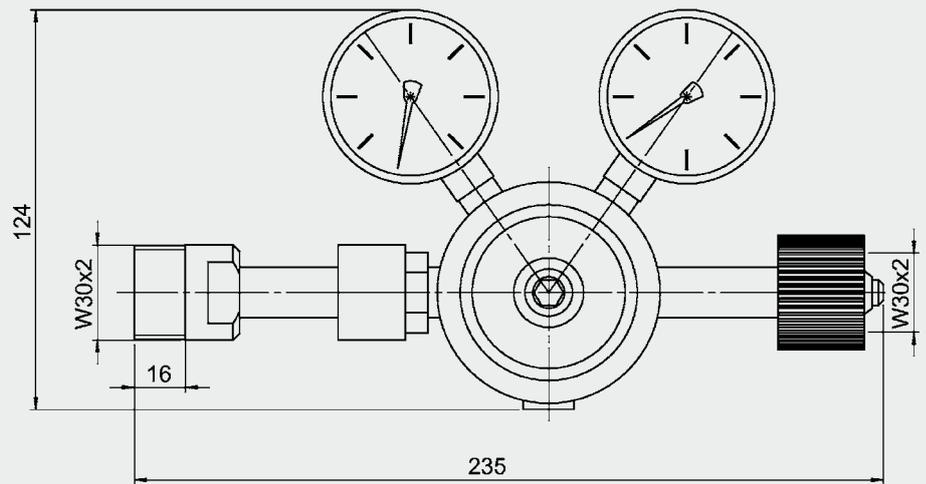
Weight: 2 kg

4.4.2. Pressure reducer for 300 bar nitrogen bottles  
(Connection W30x2 - DIN 477, Part 5 from April 2002)



Bottle pressure [bar]	Reduces pressure to between [bar]	Part no.
300	0 – 20	6004020
300	0 – 100	6004021
300	0 – 200	6004022

Weight: 2.3 kg



Bottle pressure [bar]	Reduces pressure to between [bar]	Part no.
300	0 – 250	6004023

Weight: 3.5 kg

## 5. SPARE PARTS, ADAPTERS AND TOOLS

### 5.1. SPARE PARTS

CHARGING AND TESTING UNIT FPU-1				
Item	Quantity	Description		Part no.
1	1	O-ring 6x1		601 032
2	1	Seal ring		612 730
3	1	Gauge	0 - 10 bar	635 139
			0 - 25 bar	635 140
			0 - 100 bar	635 141
			0 - 250 bar	635 142
			0 - 400 bar	635 143
5	1	O-ring 15x2		601 049
6	1	Seal ring		601 456
7	1	O-ring 11x2		601 043
8	1	O-ring 9x2		601 040
9	1	O-ring 11x2.5		603 681
10	1	O-ring 5.7x1.9		6004009
		Seal kit FPU-1		2117669

### 5.2. ADAPTERS

Description	Part no.
Seal kit for adapters A1-12	3269153

### 5.3. TOOLS

Part no.	Part no.
Wrench 14x15	1011065
Allen key SW6	1005164
Torque wrench	3136470
Valve tool for gas valve	616 886

## 6. 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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