

## 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 via a hose 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.

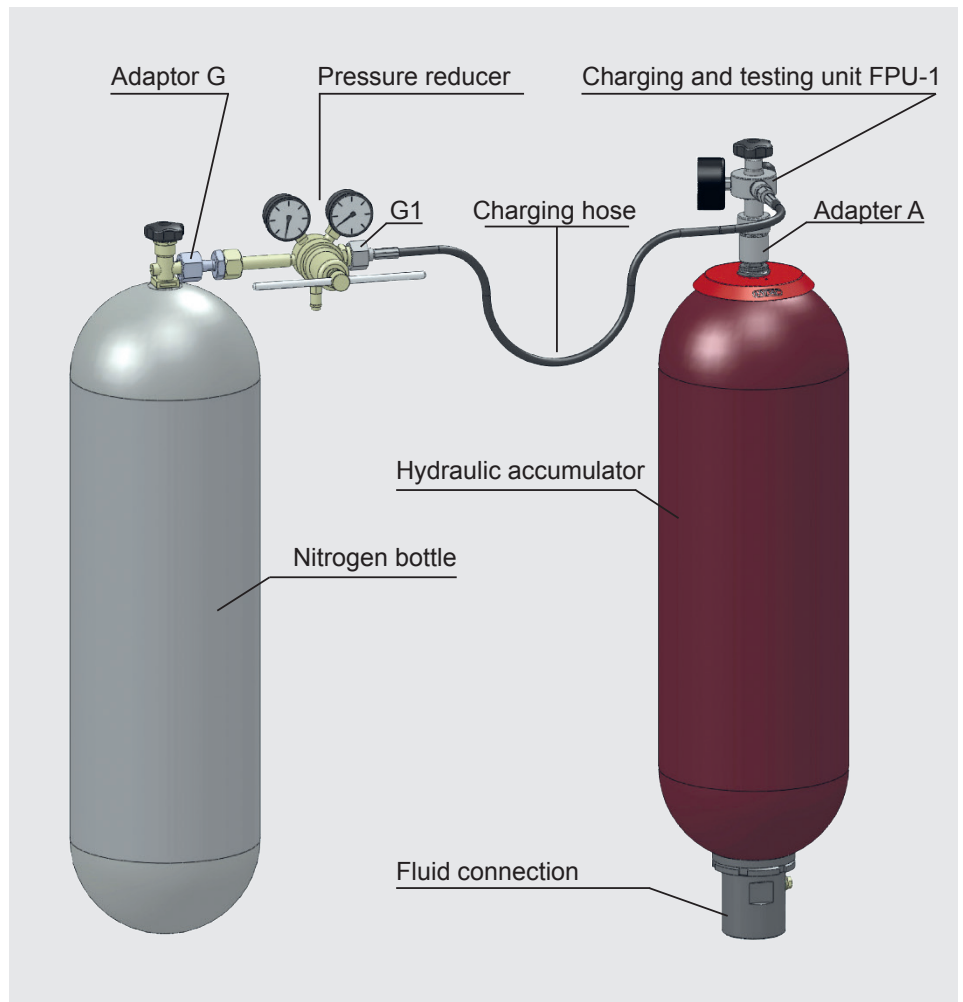
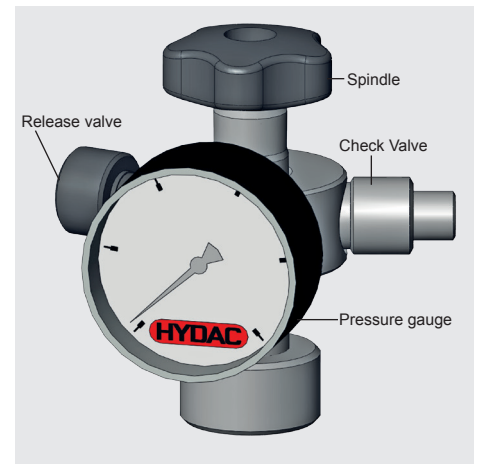
Information on how to check the pre-charge pressure, on testing intervals and other instructions relating to operation can be found in the Operating Manual.

**Please read the Operating Manual!  
No. 3.501.CE**

#### 1.2. DESIGN

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

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



The photo top left shows one possible order option, including accessories.

## 2. TECHNICAL SPECIFICATIONS

### 2.1. MODEL CODE

(also order example)

FPU-1 - 250 F 2.5 G2 A1 K

#### Universal charging and testing unit

$p_{max} = 350$  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 3.4.

#### Adapter A

A3 = 7/8-14UNF, supplied as standard for others, see table at Point 3.3.

#### Protective case

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

### 2.2. STANDARD TYPES

#### Models without protective case

Designation	Part no.
FPU-1-010F2.5A3	2114486
FPU-1-010F4A3	2115056
FPU-1-025F2.5A3	2114481
FPU-1-025F4A3	2116876
FPU-1-100F2.5A3	2114310
FPU-1-100F4A3	2115657
FPU-1-250F2.5A3	2114306
FPU-1-250F4A3	2114311
FPU-1-400F2.5A3	2115646
FPU-1-400F4A3	2119673

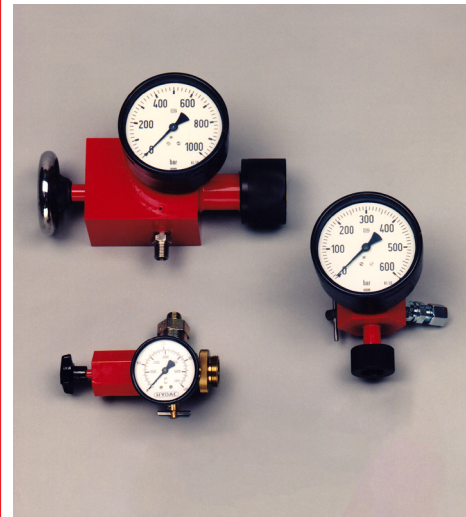
#### Models with protective case

Designation	Part no.
FPU-1-010F2.5A3K	2115365
FPU-1-010F4A3K	3013690
FPU-1-025F2.5A3K	2114305
FPU-1-025F4A3K	2116738
FPU-1-100F2.5A3K	2115314
FPU-1-100F4A3K	2114842
FPU-1-250F2.5A3K	2114302
FPU-1-250F4A3K	2114303
FPU-1-400F2.5A3K	2114307
FPU-1-400F4A3K	2114304

#### Models with protective case and adapter G

Designation	Part no.
FPU-1-250F2.5G2A3K	2114309
FPU-1-250F2.5G3A3K	2114308
FPU-1-250F2.5G4A3K	2103046
FPU-1-250F2.5G5A3K	2117038
FPU-1-250F2.5G6A3K	2115420
FPU-1-250F2.5G7A3K	2120010
FPU-1-250F2.5G8A3K	2115216
FPU-1-250F2.5G9A3K	2115833
FPU-1-250F2.5G10A3K	2115403
FPU-1-250F2.5G11A3K	3104265
FPU-1-250F2.5G12A3K	3738731
FPU-1-250F2.5G13A3K	3820014

### 2.3. SPECIAL MODELS

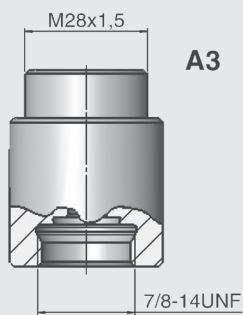
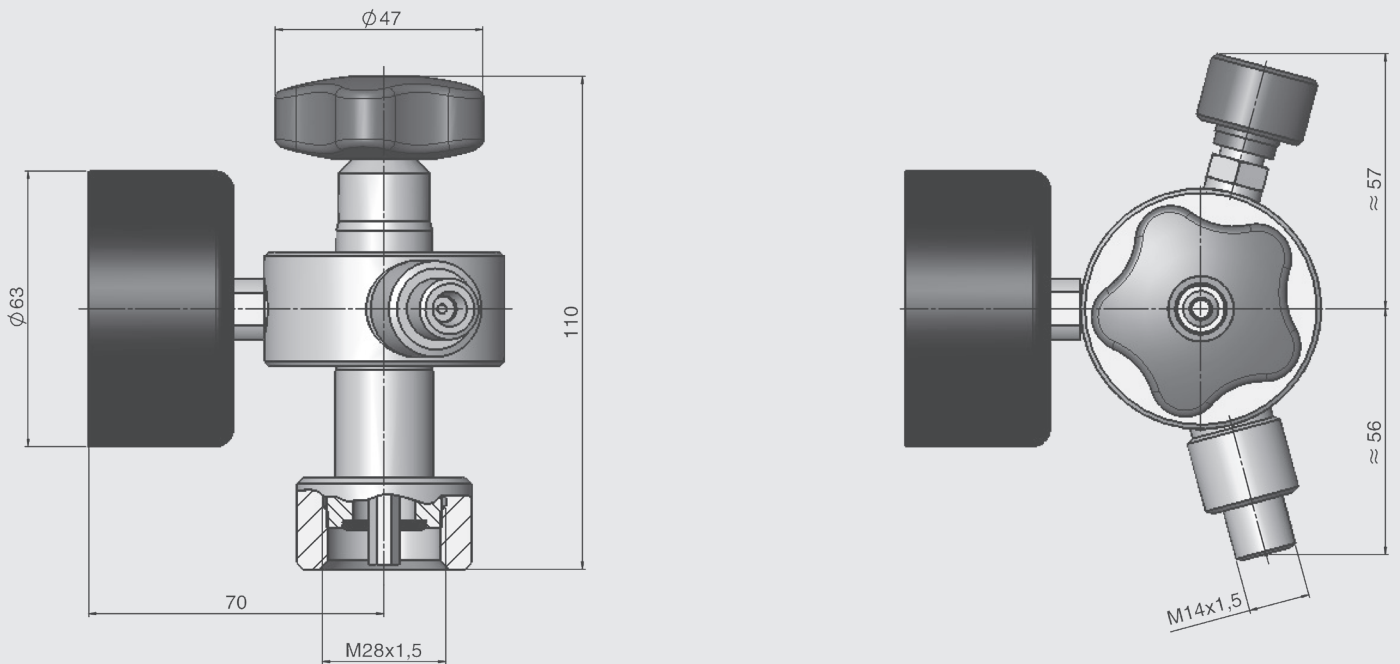


For higher pressures, the following special models are available:

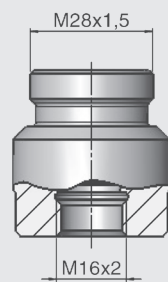
- FPS 600 for bladder accumulators up to 600 bar max. pre-charge pressure.
- FPK 600 for piston, diaphragm and SB800-1.5 accumulators up to 600 bar max. pre-charge pressure.
- FPH 800 for high pressure bladder accumulators up to 800 bar max. pre-charge pressure.

### 3. DIMENSIONS

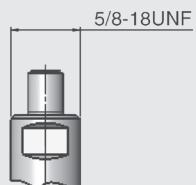
#### 3.1. GAS-SIDE CONNECTION OF THE CHARGING AND TESTING UNIT FPU-1 USING ADAPTERS FOR HYDAC ACCUMULATORS



A11



D4 Adapter



7/8-18UNF

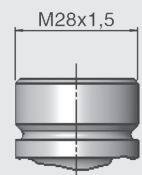


Bladder accumulators  
330-0.5 / 400-0.5

Bladder accumulators  
 $\geq 1l$



Gas valve  
to ISO 10945



Piston and  
diaphragm  
accumulators

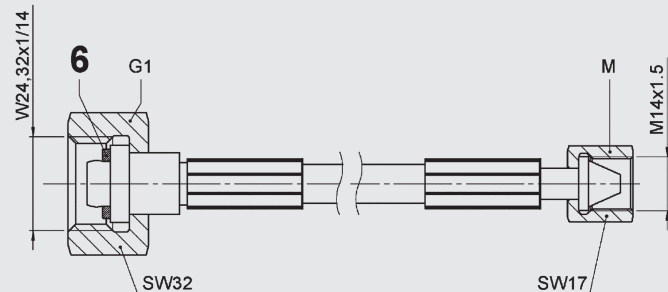
## 3.2. CHARGING HOSES

Charging hoses are designed for the particular maximum permitted operating pressure marked on them and 10,000 charging processes.  
(HYDAC charging hoses comply with DIN EN ISO 4413 and DIN EN 853 to 857)

### 3.2.1 Charging hose for nitrogen bottles up to 200 bar

Charging hose **F**

Connection to DIN 477, Part 1

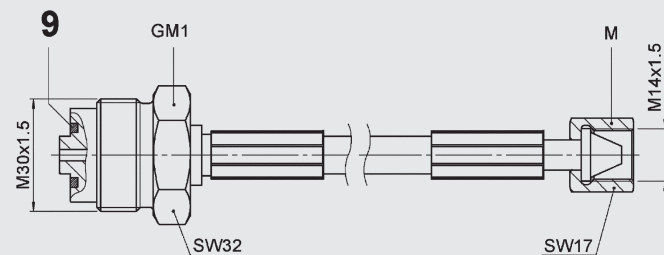


Type	Length [m]	Part no.
Charging hose <b>F</b>	2.5	236514
	4	236515
	10	373405
	15	2115552
	20	2109765
	28	2109574

### 3.2.2 Charging hose for nitrogen bottles up to 300 bar

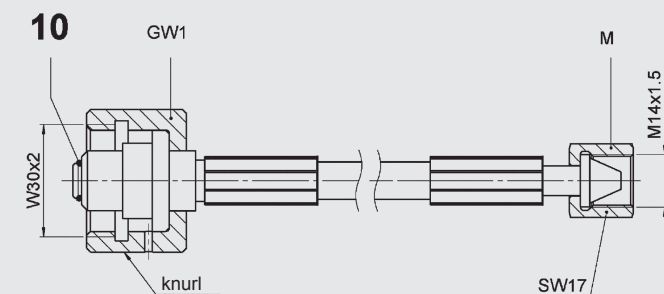
Charging hose **FM**

Connection to DIN 477, Part 5 up to April 2002



Charging hose **FW**

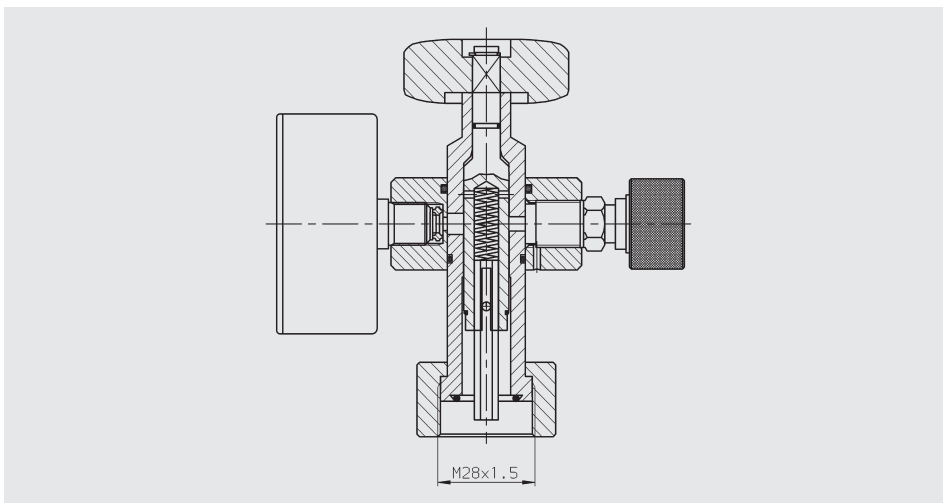
Connection to DIN 477, Part 5 from April 2002



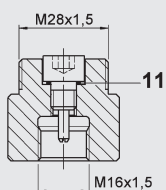
Type	Length [m]	Part no.
Charging hose <b>FM</b>	2.5	3019417
	4	3019418
Charging hose <b>FW</b>	2.5	3019419
	4	3019420

### 3.3. ADAPTERS A1 TO A12

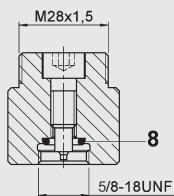
The universality of the FPU-1 is guaranteed because as well as HYDAC piston and diaphragm accumulators, bladder accumulators can also be charged and tested using the A3 adapter. Additional adapters can be used to charge and test other brands of accumulator.



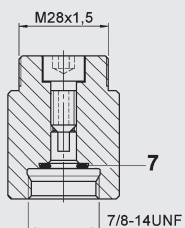
**A1 (Part no. 361619)**



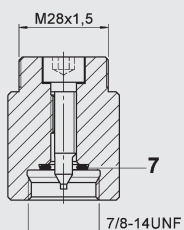
**A2 (Part no. 361605)**



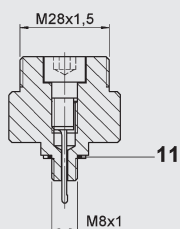
**A3 (Part no. 291533)**



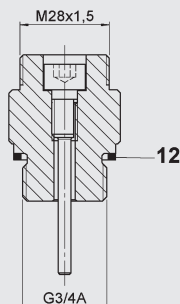
**A4 (Part no. 291536)**



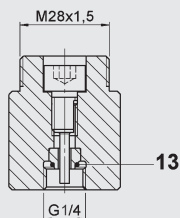
**A5 (Part no. 291531)**



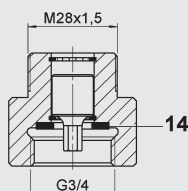
**A6 (Part no. 2108819)**



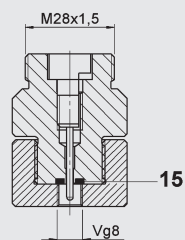
**A7 (Part no. 2110629)**



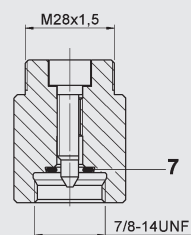
**A8 (Part no. 2124524)**



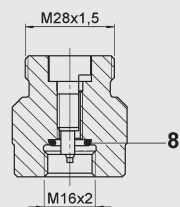
**A9 (Part no. 2128638)**



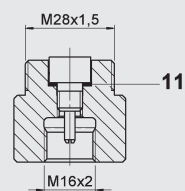
**A10 (Part no. 2128849)**



**A11 (Part no. 3018210)**

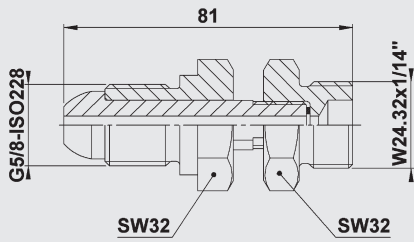


**A12 (Part no. 3203185)**

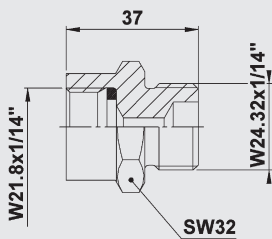


### 3.4. ADAPTERS G2 TO G12

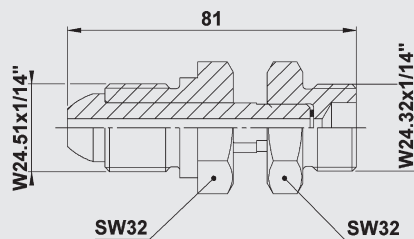
G 2 (Part no. 236376)



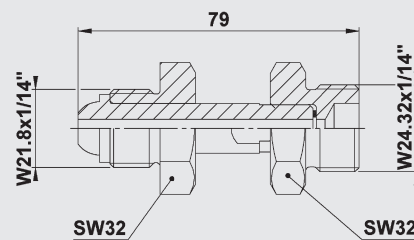
G 3 (Part no. 2103421)



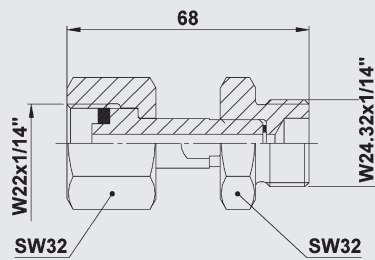
G 4 (Part no. 236374)



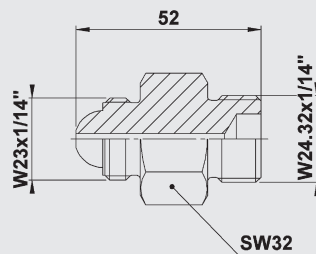
G 5 (Part no. 236373)



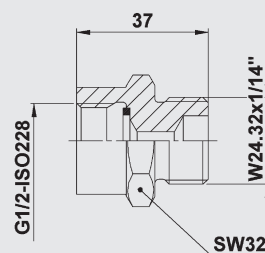
G 6 (Part no. 2103423)



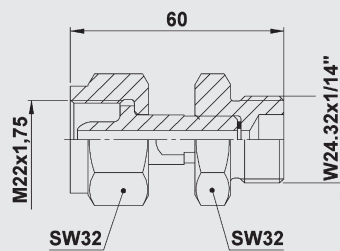
G 7 (Part no. 236377)



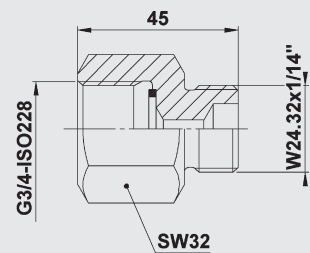
G 8 (Part no. 2103425)



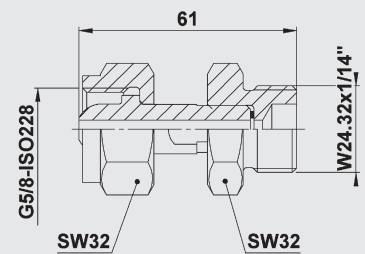
G 9 (Part no. 241168)



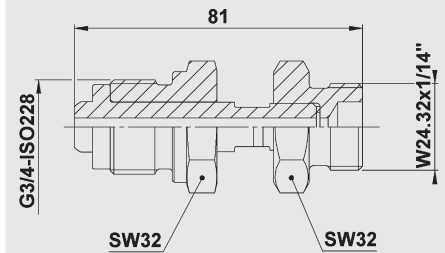
G 10 (Part no. 2103427)



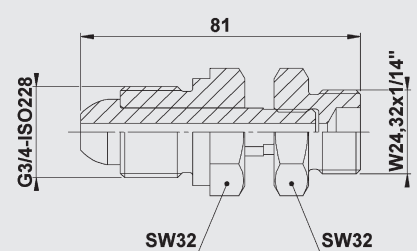
G 11 (Part no. 3018678)



G 12 (Part no. 3195556)



G 13 (Part no. 3787884)



### 3.4.1 Schedule of countries

G adapters for nitrogen bottles from different countries.

Country	Type / Part 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	G13 3787884
Africa <sup>3)</sup>													
Albania													
Algeria													
Argentina													
Australia													
Austria													
Bahamas													
Bahrain													
Bangladesh													
Barbados													
Belgium													
Bolivia													
Brazil													
Bulgaria													
Burma													
Canada													
Chile													
China													
Colombia													
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													
Netherlands													
New Zealand													
Nigeria													
Norway													
Oman													
Pakistan													
Paraguay													
Peru													
Philippines													
Poland													
Portugal													
Puerto Rico													
Qatar													
Romania													
Russia													
Saudi Arabia													
Singapore													
Spain													
Sri Lanka													
Sudan													
Surinam													
Swaziland													
Sweden													
Switzerland													
Syria													
Taiwan													
Tanzania													
Thailand													
Trinidad/Tobago													
Tunisia													
Turkey													
Ukraine													
United Arab Emirates													
Uruguay													
USA													
Venezuela													
Vietnam													
Yugoslavia <sup>2)</sup>													
Zambia													

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

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

<sup>3)</sup> = Angola, Botswana, Lesotho, Mozambique, Namibia, Somalia, South Africa, Zimbabwe

## 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 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

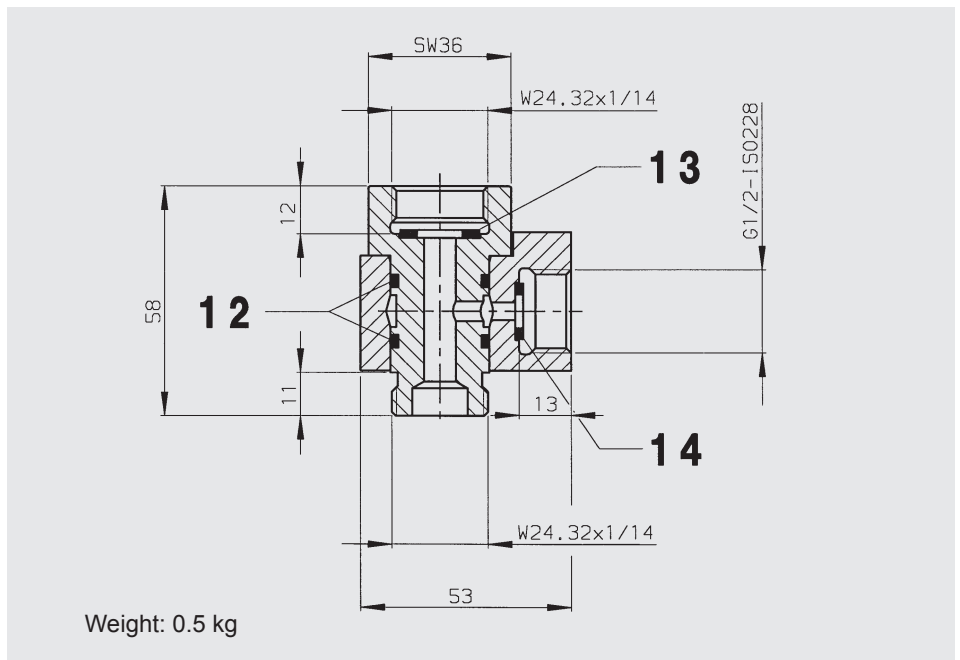
### 4.3. ADAPTER D4

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

D4 = 5/8-18UNF (Part no. 366374)

### 4.4. INTERMEDIATE PIECE GSV6-10-CE

Intermediate piece for installing the gas safety valve GSV 6 between the 200 bar nitrogen bottle and the Charging and Testing Unit FPU-1.



Description	Quantity	Item	Part no.
<b>Intermediate piece GSV6-10-CE</b>	-	-	242558
<b>Seal kit for intermediate piece</b>	-	-	2117287
consisting of:			
O-ring 20x2.5x2	2	12	-
Seal ring 20x11.5x2	1	13	-
Seal ring 14x8.5x2	1	14	-

### 4.5. PRESSURE REDUCER

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

#### 4.5.1 Pressure reducer for 200 bar nitrogen bottles

Inlet: connection W24.32x1/14-DIN477, Part 1

Outlet: male thread W24.32x1/14-DIN477, Part 1

Bottle pressure [bar]	Pressure after reducer [bar]	Part no.
200	20	635409
	100	635411
	200	635412

#### 4.5.2 Pressure reducer for 300 bar nitrogen bottles

Inlet: connection W30x2-DIN477, Part 5

Outlet: male thread W24.32x1/14-DIN477, Part 5

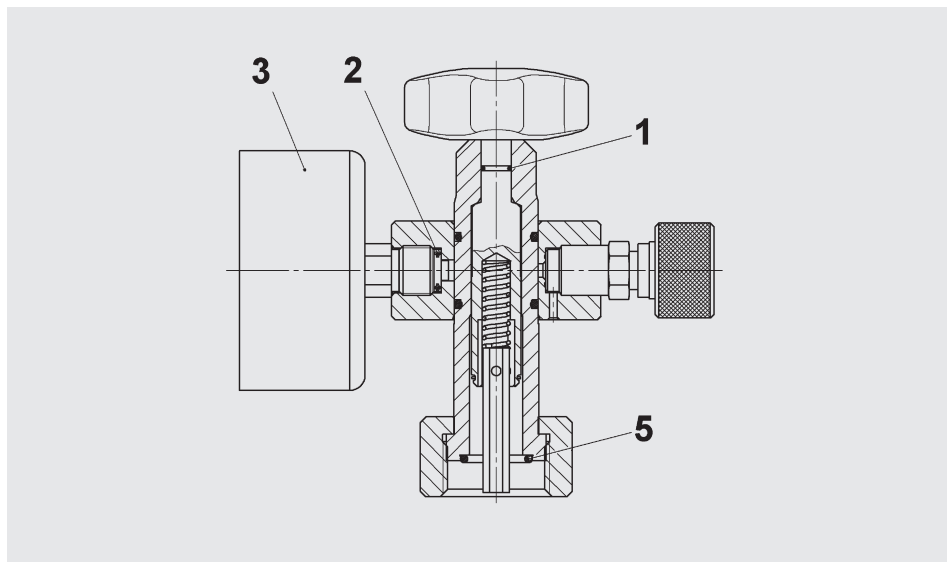
Bottle pressure [bar]	Pressure after reducer [bar]	Part no.
300	20	6004020
	100	6004021
	200	6004022
	270*	6004023

\* for pressures after reducer > 200 bar, the outlet has a male thread W30x2-DIN 477, Part 5



## 5. SPARE PARTS, ADAPTERS AND TOOLS

### 5.1. SPARE PARTS FOR FPU-1



Description	Quantity	Item	Part no.
<b>Seal kit for FPU-1</b>	1	-	2117669
consisting of:			
O-ring 6x1	1	1	-
Seal ring	1	2	-
O-ring 15x2	1	5	-
Seal ring	1	6	-
O-ring 11x2	1	7	-
O-ring 9x2	1	8	-
O-ring 11x2.5	1	9	-
O-ring 5.7x1.9	1	10	-
<b>Pressure gauge</b>			
0 - 10 bar			635139
0 - 25 bar			635140
0 - 100 bar	1	3	635141
0 - 250 bar			635142
0 - 400 bar			635143

### 5.2. ADAPTERS

Description	Quantity	Item	Part no.
<b>Seal kit for adapters A1-12</b>	1	-	3269153
consisting of:			
O-ring 11x2	3	7	-
O-ring 9x2	2	8	-
Seal ring 9.3x13.3x1	1	11	-
Seal ring 27x32x2	1	12	-
O-ring 6x1.2	1	13	-
O-ring 19x2	1	14	-
Seal ring for adapter A9	1	15	-
Seal ring 6x13x2	1	50*	-

\* only suitable for adapters A7 up to May 2006

### 5.3. TOOLS

Description	Part no.
Wrench 14x15	1011065
Allen key SW6	1005164
Torque wrench	3136470
Valve tool for gas valve	616886

## 6. NOTE

The information in this brochure relates to the operating conditions and applications described.

For applications and/or operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

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