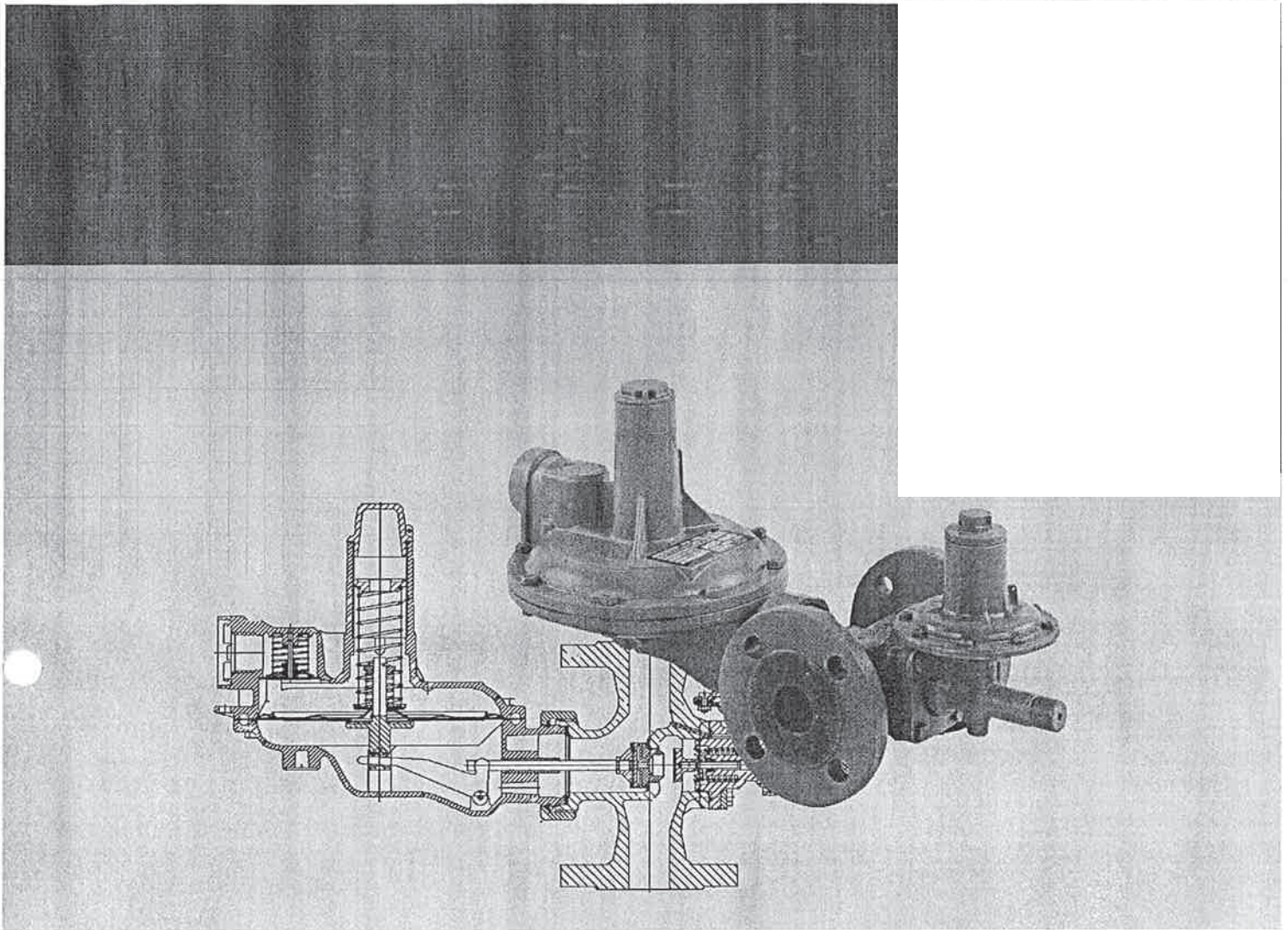




Pressure Control Valve

with SAV and SBV

Typ	233-12-4-72
DN	40
PN	16
Pressure stage	4 bar
Connection SBV	G 1" - female thread
Type of spring	955-200-18 metallic
Operation range	10...21 kPA
Material	GGG 40
<u>Design data</u>	
Inlet pressure pi	100...150 kPA
Outlet pressure pa	15 kPA
Flow rate max.	60 Nm³/h
SAV / OPSP range P	25 kPA
Set point SBV	20 kPA
KKS No.	
Pressure Regulator	6 0HJG01 AA602
SAV	6 0HJG01 AA601
SBV	6 0HJG01 AA603



Gasdruckregler
Gas Pressure Regulator
Régulateur de pression
Регулятор давления газа
Type 133/233 & 244

115-099-2802

Betriebsanleitung

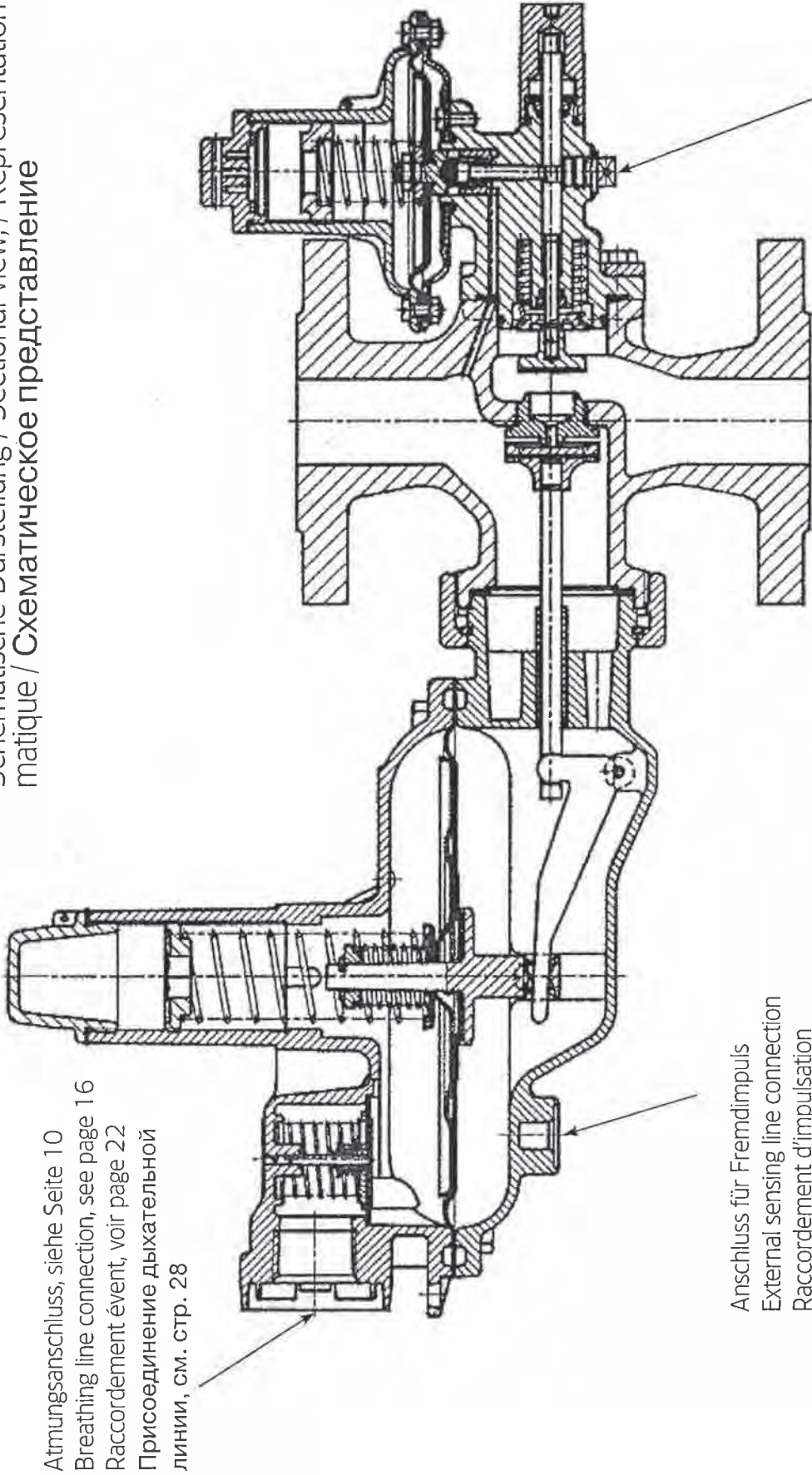
Instruction Manual

Mode d'emploi

Руководство по эксплуатации

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Regler / Regulator / Régulateur / Регулятор 133-72, DN 25
 Schematische Darstellung / Sectional view, / Représentation schématique / Схематическое представление



Atmungsanschluss, siehe Seite 10
 Breathing line connection, see page 16
 Raccordement évent, voir page 22
 Присоединение дыхательной линии, см. стр. 28

Anschluss für Fremdimpuls
 External sensing line connection
 Raccordement d'impulsation
 Присоединение для внешнего импульса

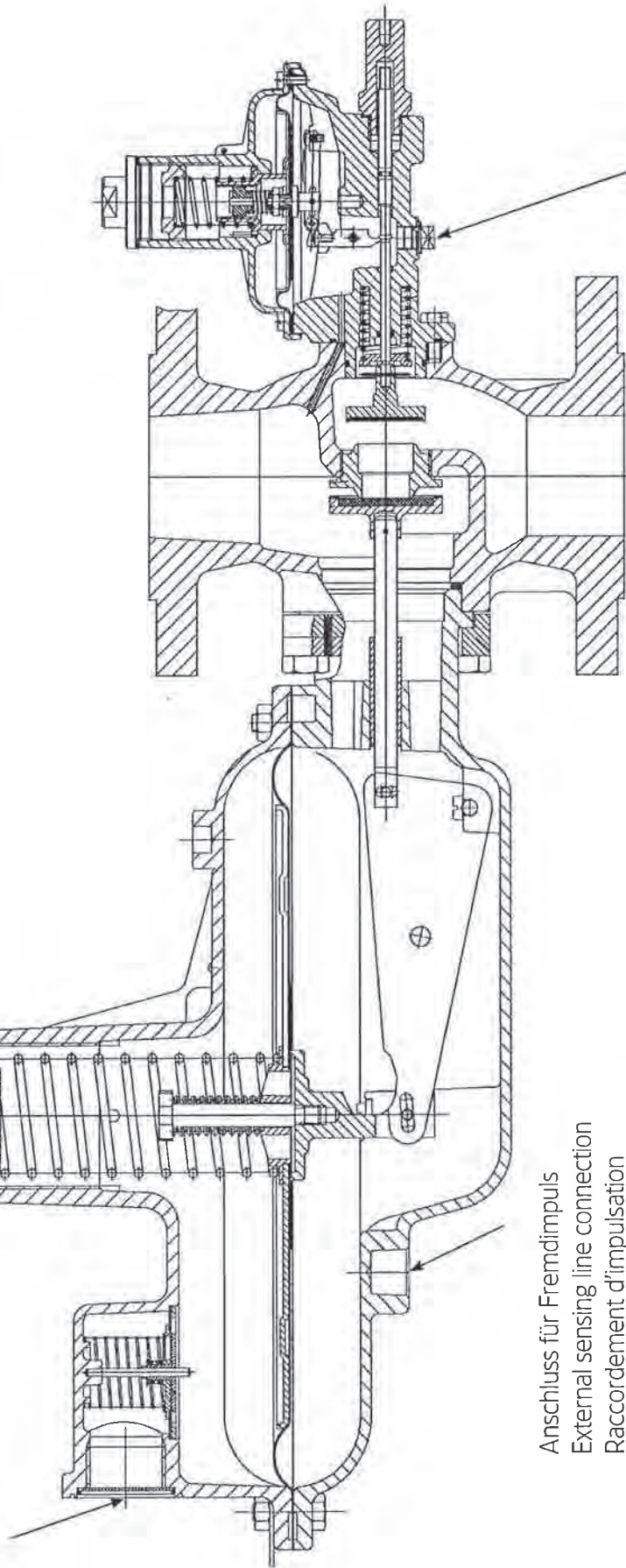
Anschluss für Fremdimpuls
 External sensing line connection
 Raccordement d'impulsation
 Присоединение для внешнего импульса

Regler / Regulator / Régulateur / Регулятор 233-12-4-66, DN 50

Schematische Darstellung / Sectional view, / Représentation schématique / Схематическое представление

6

Atmungsanschluss, siehe Seite 10
Breathing line connection, see page 16
Raccordement évent, voir page 22
Присоединение дыхательной
линии, см. стр. 28

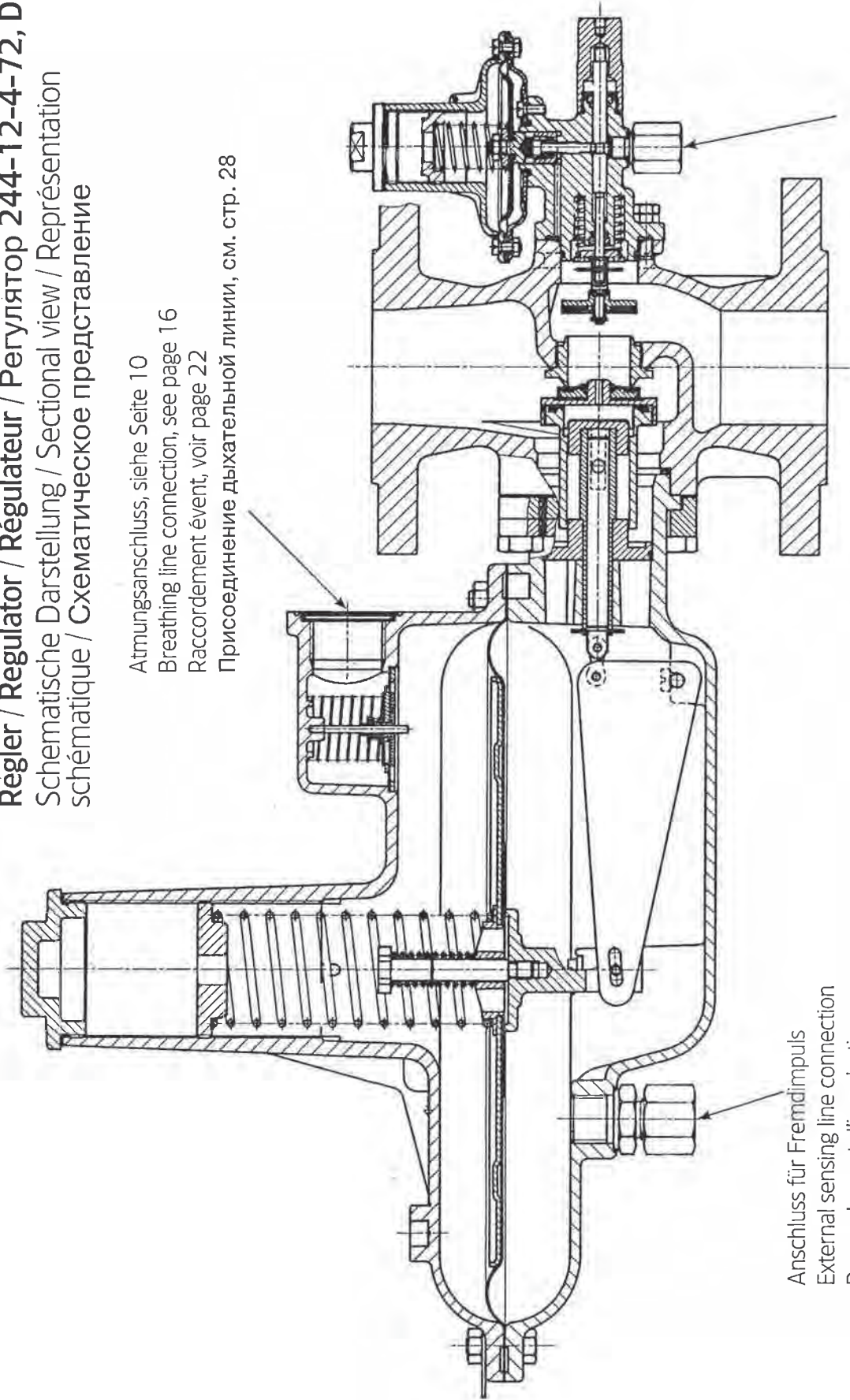


Anschluss für Fremdimpuls
External sensing line connection
Raccordement d'impulsation
Присоединение для внешнего импульса

Anschluss für Fremdimpuls
External sensing line connection
Raccordement d'impulsation
Присоединение для внешнего импульса

Regler / Regulator / Régulateur / Регулятор 244-12-4-72, DN 50
 Schematische Darstellung / Sectional view / Représentation
 schématique / Схематическое представление

Atmungsanschluss, siehe Seite 10
 Breathing line connection, see page 16
 Raccordement évent, voir page 22
 Присоединение дыхательной линии, см. стр. 28



Anschluss für Fremdimpuls
 External sensing line connection
 Raccordement d'impulsion
 Присоединение для внешнего
 импульса

Anschluss für Fremdimpuls
 External sensing line connection
 Raccordement d'impulsion
 Присоединение для внешнего
 импульса

Technical Features / Typ Designation Regulator 133 / 233 and 244

Sizes		DN 25 ¹⁾ , DN 40, DN 50
Connection	Flange:	PN 16 / DIN 2633
	Threads:	G 3/4, G 1, G1 1/2 ²⁾ , ISO 228/1, Rp 3/4 DIN 2999; 3/4-, 1" - & 1 1/2 ²⁾ -NPT;-BSPT, Male thread for pipe connection, conform with DIN 2993: G1 1/2 ¹⁾ , ISO 228/1, Single pipe connection DIN 3376/2 ¹⁾ , with Nut UB 25: DN 25 (R2", Type B)
Pressure Rate	PN 1	133-..., 133E-..., 233/244 -8 /-12-...
	PN 4 (5), 6 & 8	133-...-..., 233 -8 /-12-...
	PN 4	244 -8-.../-12-...-...
Inlet pressure	PN 1	pu = 0,05 - 1,0 bar
	PN 4 (5), 6 & 8	pu = 0,35 - 4,0 (5,0; 6,0; 8,0 ^{3,4)}) bar
Outlet pressure range		wd = 0,01 - 0,7 bar
Operating temperature		-20 - +60°C
Ambient temperature		-30 - +60°C
Flowrate Vn		approx. 60 (133) / 400 (233) Nm ³ /h Natural Gas
Type designation		133-/133E-... 133-4(5)-... 133-6 233-12/8- 233-12/8-4(5)-... 233-12/8-6... 244-12/8-... 244-12/8-4-...
• SSV f. over-pressure shutoff (OPSO ≥ 400mbar)		-61 -61 -
• SSV for over-pressure shutoff and SRV (OPSO ≥ 400mbar)		-62 -62 -
• SSV for over & under pressure shutoff		-64 - -
• SSV for over & under pressure shutoff & SRV		-66 -66 - 66
• SSV for over-pressure shutoff and Safety diaphragm (OPSO ≥ 400mbar) PN 1		-630 - -
• SSV for over & under pressure shutoff and Safety diaphragm (OPSO ≥ 400mbar) PN 1		-650 - -
• SSV f. over-pressure shutoff (OPSO ≤ 450mbar)		-71 -71 -
• SSV for over-pressure shutoff and SRV (OPSO ≤ 450mbar)		-72 -72 -
• SSV for over-pressure shutoff and Safety diaphragm (OPSO ≤ 450mbar) PN 1		-730 - -

SSV-Type:

-6.. = SAV I, II

-7.. = SAV 033

1) Regulator Type 133 only

2) Regulator Type 233 only

3) >PN 4 with external pulse

4) Please note max. Orifice-diameter!

Outlet pressure range

Regulator Type	Spring range (Wds)	Spring code	Wire-Ø	Spring color
133 with Gas loss protection	9-15 mbar	955-200-08	1,6 mm	red
	14-20 mbar	955-200-09	1,8	blue
	18-26 mbar	955-201-06	2,25	silver
	24-40 mbar	955-202-98	2,5	yellow
	38-53 mbar	955-200-11	2,4	orange
133	8-16 mbar	955-200-08	1,6 mm	red
	12-20 mbar	955-200-09	1,8	blue
	15-35 mbar	955-200-10	2,0	green
	30-70 mbar	955-200-11	2,4	orange
	50-140 mbar	955-200-12	3,0	black-white
	100-210 mbar	955-200-83	3,4	silver
133 HP	140 – 420 mbar	955-200-84	4,5 mm	black
233-12 / 244-12	8-16 mbar	955-200-13	2,8	red
	12-20 mbar	955-200-14	3,2	blue
	15-35 mbar	955-200-15	3,6	green
	30-70 mbar	955-200-16	4,5	orange
	70-140 mbar	955-200-17	5,6	black
	100-210 mbar	955-200-18	6,3	metallic
233-8 / 244-8	30-70 mbar	955-200-15	3,6 mm	green
	70-140 mbar	955-200-16	4,5	orange
	140-300 mbar	955-200-17	5,6	black-white
	210-450 mbar	955-200-18	6,3	metallic
233-8 HP	420-700 mbar	955-200-69+	4,0 mm	silver
		955-200-18	6,3	metallic

Spring range of SSV 033, OPSO

Function	Spring range (Wdso)	Spring code	Wire-Ø	Spring color
OPSO (Pdso)	40-70 mbar	955-200-22	1,4 mm	red
	50-150 mbar	955-200-23	1,6	blue
	140-450 mbar	955-200-24	2,6	green

Spring range of SSV I and II, OPSO and UPSO

Function	Spring range (Wdso & Wdsu)	Spring code	Wire-Ø	Spring color
OPSO (Pdso)	20-60 mbar	955-200-22	1,4 mm	red
	50-120 mbar	955-200-23	1,6	blue
	100-400 mbar	955-200-24	2,6	green
	300-600 mbar	955-200-52	2,8	brown
	400-1000 mbar	955-202-42	3,2	silver
UPSO (Pdsu)	8-50 mbar	955-200-32	0,9 mm	red

Attention: Δp between pds and pdso **max 150 mbar!**

Accuracy class AC / Lock-up pressure SG:

Outlet pressure	AC	SG
8 - 20 mbar	20	30
>20 - 40 mbar	10	20
>40 - 700 mbar	5	10

Accuracy group (SSV):

OPSO	AG
20 - 400 mbar	10
0,4 - 1,0 bar	5
UPSO	AG
8 - 20 mbar	30
20 - 50 mbar	10

Installation

- Check that the maximum inlet pressure is not higher than the design pressure of the regulator.
- Regulator should be lifted only with belts around the body.
- Arrange enough room for the serving of the regulator.

Before installing the pressure regulator in the piping, the following must be checked:

- The upstream and downstream flanges must be parallel so as to install the regulator without undue stress.
- The upstream piping must be cleaned from all impurities (sand, welding slag, etc.)
- The pressure regulator must not be visibly damaged.
- The inlet and outlet chambers of the pressure regulator must be perfectly clean.
- Make sure that the direction of gas flow corresponds to the arrow on the pressure regulator body.

Installation position

- The installation position is freely selectable.

Sensing line

- The sensing line isn't necessary of internal pulse (< 4.0 bar)
- For external pulse (> 4,0 bar), the sensing line must be connected to a section reasonably free from turbulences, preferably in a straight section of the downstream piping (approx. 5D).
- Connection: G1/2"/EO-12 (Regulator)
- Connection: G1/4"/EO-6 (SSV)
- Recommended pipe:
Ermeto-pipe EO-12 / -6, Steel, zinc protected

Breathing line

- Breathing connection 133 **G 3/4"**
- Breathing connection 233/ 243/ 244: **G 1"**
- To realize fast load changes of the regulator, the following cross section of breathing line is to observe:
- Up to 3 m breathing line, min. size **DN 20**;
- Longer than 3 m breathing line, size **DN 25** or larger.

Start up- Instructions

- To start-up the regulator after installation properly, proceed as follows:
- Check that the upstream- and downstream valves are closed;
- Open the upstream valve slowly;
- Reset the shut-off valve (see also page 17);
- Check that the downstream pressure is rising slowly on the downstream side manometer, the downstream pressure should stop at the closing pressure;
- Open the downstream valves slowly to control the even flow.

Regulator- and SSV-set point

- The regulator is delivered according to the specifications, specified in the purchase order. If the adjusted outlet- / SSV shut off- pressure is to be changed, proceed as follows:
- **Increasing the outlet- / shut-off pressure:**
The adjusting screw is to turn clockwise;
- **Decreasing the outlet- / shut-off pressure:**
The adjusting screw is to turn anti-clockwise.

Service and repair

- All work on the regulator is to carry out only in the **pressure-free** condition. The safety regulations, in particular the UVV's, as well as the DVGW papers G 490, G 491 and G 495 are to be considered:
- Valves on the upstream- and downstream side are to be closed.
- The pressure must be reduced by the relief valve on the outlet side, up to zero level



Caution:

When disassembling the regulator, the loading spring is to release before!

Adjusting tool and Orifice-key

Adjusting tool:

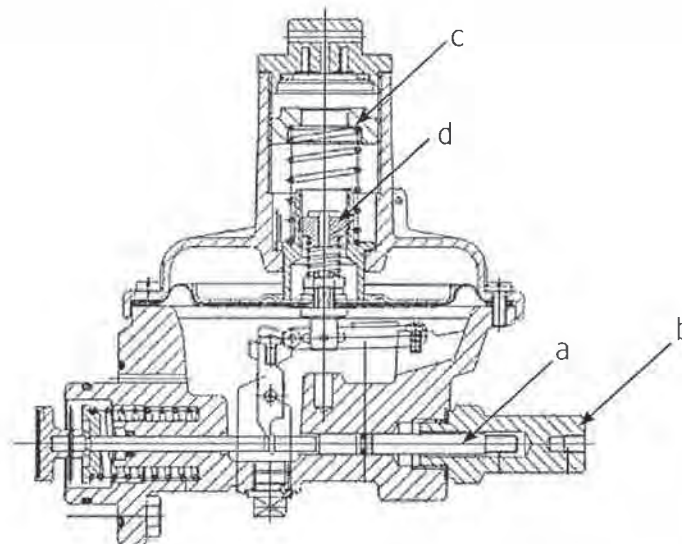
Regulator 133	→ Adjusting tool a/f 13 (Hexagon)
Regulator 233/244	→ Adjusting tool a/f 1/2" Square
SSV 033	→ Adjusting tool a/f 13 (Hexagon)
SSV-I	→ Adjusting tool a/f 13 (Hexagon)
SSV-II	→ Adjusting tool a/f 13 (Hexagon) and Screw driver, N° 2 (Pos. c and d)

Key to change the orifice (Hexagon):

Regulator 133	→ Key a/f 25 mm
Regulator 233/244*)	→ Key a/f 41 mm

*) the Regulator Type 244 is working only with one Orifice-diameter (27,5 mm) !

Commissioning SSV-II (upper and lower shut-off)



Cover cap (b) unscrew and onto valve rod (a) screw. Valve rod slowly pull out, until outlet pressure adjusts itself in the controller and the lever system of the SSV's engages and the valve rod in open position remains. **It's only possible, if the outlet pressure p_d of the regulator smaller then the shut-off pressure p_{dso} and bigger than the shut-off pressure p_{dsu} !**

Be sure to screw on cap (b).

Commissioning SSV 033 / SSV-I (upper shut-off)

Cover cap (b) unscrew and onto valve rod (a) screw. Valve rod slowly pull out, until outlet pressure adjusts itself in the controller and the lever system of the SSV's engages and the valve rod in open position remains. **It's only possible, if the outlet pressure p_d of the regulator smaller then the shut-off-pressure p_{dso} .**

Be sure to screw on cap (b).

Safety Instructions and CE Certificate of Conformity:

- This "Instruction manual" has to be kept on the place, which can be easy reached.
- The regulator has to be used only for dry and clean gases. Never use with oxygen: risk of explosion.
- The national norms and standards about installation, start-up and maintenance of the devices and gas installations have to be strictly respected.
- The handling with the device has to be done carefully, specially by the installation works. The pick up has to be made by using the stretcher eyes or belts.
- The device should be examined before the installation for possible transport damages and be mounted only if it is in perfect state. Possible lacquer damage should be improved. The sealing surfaces of the threaded connections or flanges must be damage-free and clean.
- For reading off the device and its serving are sufficiently space to designate.
- For the protection of the device is recommendable to install a filter.
- The device is to be installed in such a way that it is not impaired in its function by other installation components.
- The regulator has to be mounted in the pipe line without any tension.
- The mentioned below torque's values for screws (property class 5.6) must be respected by tighten of the flanged connections:

	Thread female 3/4" / 1" / 1 1/2" DIN 2999/ISO 7	Thread male 1 1/2" DIN 2993	Flange DN 25	Flange DN 40	Flange DN 50
PN16 PS = 8 bar	80 / 110 / 140 Nm	140 Nm	35 Nm (M12)	85 Nm (M16)	85 Nm (M16)
ANSI150 PS = 8 bar	80 / 110 / 140 Nm	140 Nm	55 Nm (M14)	55 Nm (M14)	85 Nm (M16)

- **These torque's values are mentioned per screw and are valid for metal soft material gaskets (specified as k0xKD=45bD und k1=2,2bD). Other gaskets can require another torque's values.**
- The screws used for the flange connection must be according to the flange size and must be adapted to the temperature range of the regulator. Please tighten the screws crosswise.
- After the installation works are completed, the tightness of the connections (threaded or flanged) must be checked with appropriate means.
- The operating conditions indicated on the name plates must be respected; if necessary appropriate safety devices have to be designated.
- Repairs of the device are allowed to be made only by trained or qualified personal. Afterwards a tightness test with 1.1 X PS must be performed. When changing pressure containing parts their compliance with PED must be assured. After guarantee only with repair by Actaris.
- The device has to be regularly examined for corrosion danger in the interior and external area and be taken from use if noticeable corrosion is discovered.
- The internal chamber volume on the inlet side of regulator 233-8/-12, DN 40/50 is **1,0 litres**. The chamber volume on the outlet side of regulator 233-8, DN 40/50 is **2,5 litres** and of the regulator 233-12, DN 40/50 **4,8 litres**.
- The cleaning of the devices has to be done without using any alcohol containing solvent or cleaning agents.
- The device is not appropriate for floods and loads by earthquakes.
- The pressure has to be completely discharged before to take the device from the pipe line. The rest of gas can withdraw; therefore the required ventilation has to be insured.
- The appropriate measures for noise reduction have to be seized depending on the installation place and work conditions.

Remarks for use in potentially explosive atmospheres (ATEX):

- If film of rust is possible (flying rust in the immediate product surroundings), all outer aluminium parts have to be protected accordingly (e.g. by varnish).
- The product must be electrically connected to adequately earthed installation.
- For installation, removing or repair of the product on site, only tools allowed for the corresponding explosion area can be used.
- The product shall not be exposed to: flames, ionised radiation and ultrasound.

CE Certificate of Conformity

Actaris Gaszählerbau GmbH
76161 Karlsruhe

We declare, that the product

Gas pressure regulator 133-..., 233-... and 244-...

is in conformity with the following directives:

1. 97/23/EG module A category I Pressure Equipment Directive (PED)
(only controller concerns 233 and 244).

The module A1 is supervised by Notified Body TÜV Süddeutschland,
Bau und Betrieb GmbH (CE 0036) Durmersheimerstraße 145, 76189 Karlsruhe.

EC Certificate N°: **BB-NDD-KAR-01/08/4648676/001**

2. 90/396/EEC (Gas Appliances Directive) together with DIN 3380 with EC type-examination certificate:
DVGW **CE-0085AQ1090 / 1091 (133-...)**
DVGW **CE-0085AQ1092 / 1093 (233-...)** and
DVGW **CE-0085AQ1094 (244-..)**.

3. 94/9/EG (ATEX) module A+ (Annex VIII), with marking
Ref. 11501 Ⓜ II 2 G EEx c IIC T5.

The technical documentation has been communicated to the Notified Body L.C.I.E (0081)
33, av. du Général Leclerc, 92266 Fontenay-aux-Roses France
(Acknowledgment N° LCIE 03 AR 012)

4. *For electrical additional devices only:*

89/336/EEC-89 (electromagnetic compatibility) with modifications under consideration
of the norms EN50081-2/1993 and EN50082-2/1995

Karlsruhe, March 25, 2004

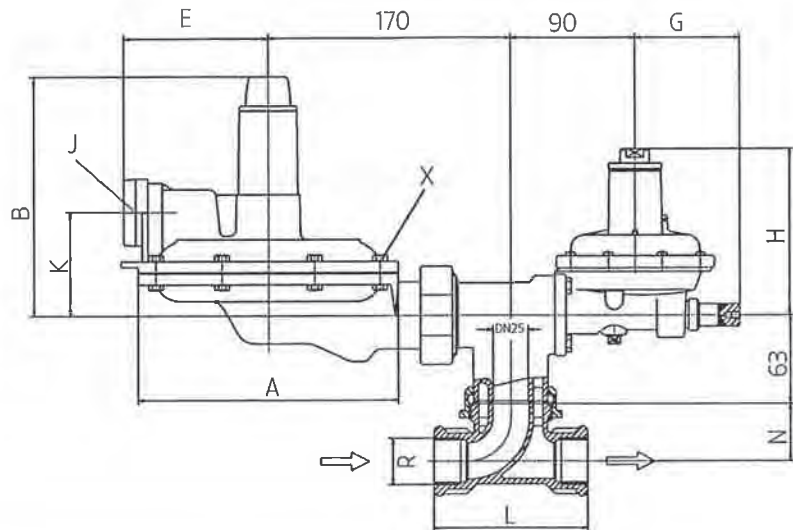


Stefan Feller
Head of Production

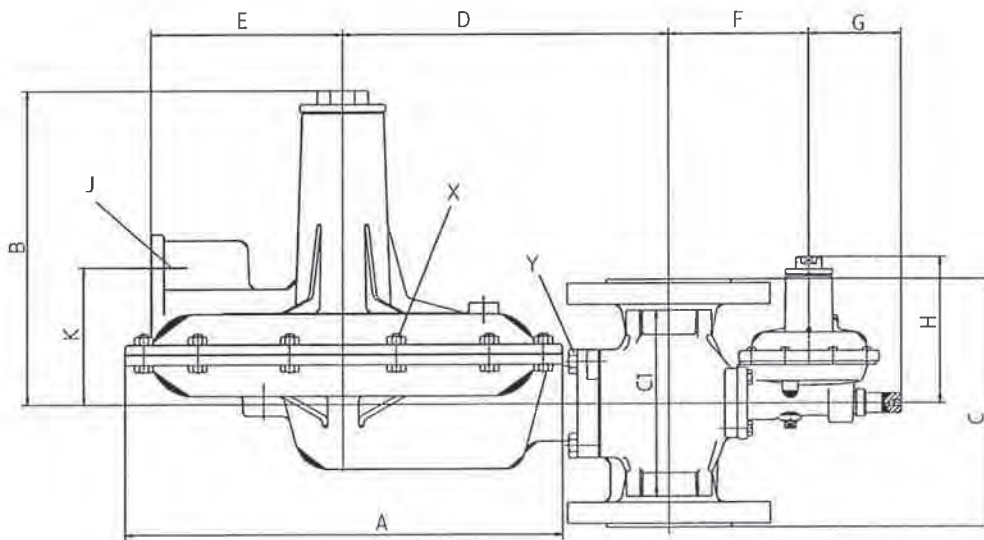
Einbaumaße / Dimension

Type 133-E

Tabelle für Anstusstück / Table of Connection piece		
R	L	N
Rp 1	110	41
Rp 1 1/2	140	50



Type 133/233/244



Ausführung/ Version Type	Gewinde- Größe/ Thread- Dimension	Flansch/ Flange	ØA	B	C1 (1)	C (2)	D	E	F	G	H	J Atmungs- Anschluss/ Breathing- Connection	K	ca. kg	
														(1)	(2)
133-	3/4" / 1"	DN 25	190	170	100	160	170	100	100	60	120	Rp 3/4"	74	4	6
233-12	1 1/2"	DN 40	350	250	150	200	260	155	110	60	120	Rp 1"	110	11	15
233/244-12	-	DN 50	350	250	-	200	260	155	110	60	120	Rp 1"	110	-	16
233-8	1 1/2"	DN 40	260	250	150	200	220	125	110	60	120	Rp 1"	105	9	13
233/244-8	-	DN 50	260	250	-	200	220	125	110	60	120	Rp 1"	105	-	14

(1) Gehäuse mit Gewindeanschluss / Body with thread connection

(2) Gehäuse mit Flanschanschluss / Body with flange connection

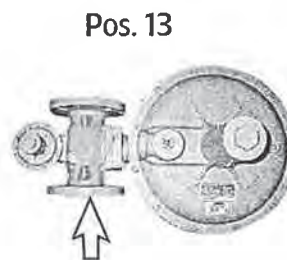
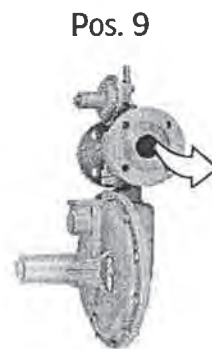
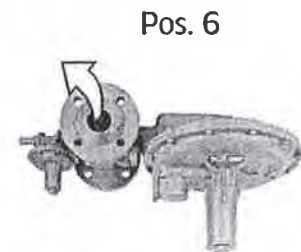
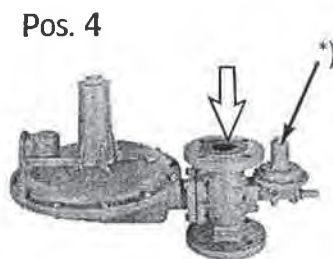
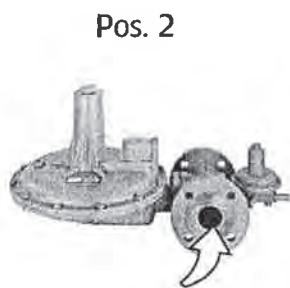
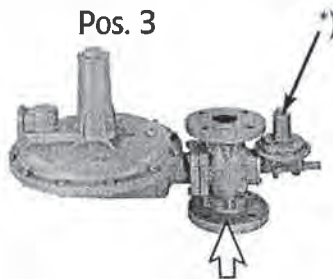
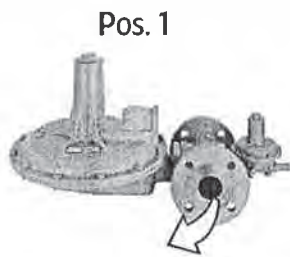
Max. Anzugsmomente / Torque of fastening

x) Schrauben am Membrangehäuse / Screws of diaphragm housing : **max 10 Nm**

y) Schrauben am Verbindungsflansch, Membrangehäuse zu Ventilkörper /

Screws of the connection flange, diaphragm housing to body : **max 13 Nm.**

Beispiele für Montage-Positionen
 Example for Assembly position
 Exemples pour positions de montage
 Примеры монтажных положений



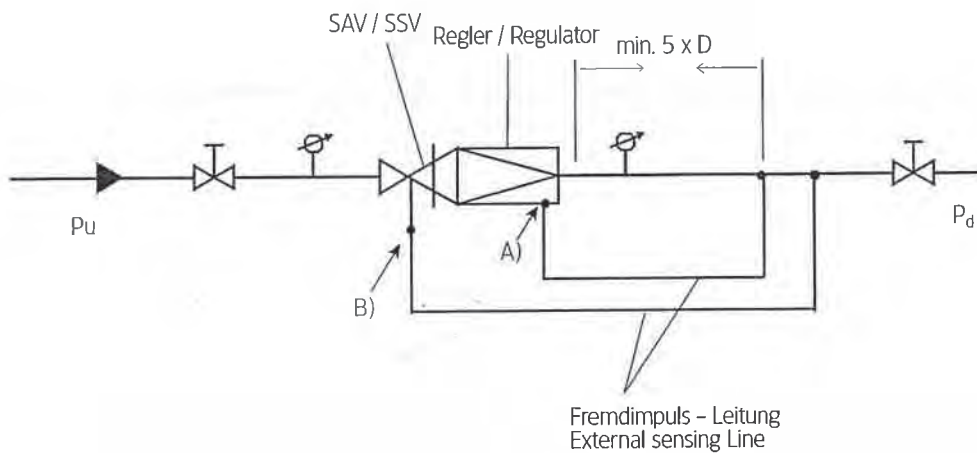
*dargestellte SAV-Anordnung nicht für Ausführungen 233/244-8(-12)-71/-72/-730, **DN 50**

*represented SAV-arrangement isn't possible for Type 233/244-8(-12)-71/-72/-730, **DN 50**

*Disposition de la vanne de sécurité représentée non valable pour les versions 233/244-8(-12)-71/-72/-730, **DN 50**

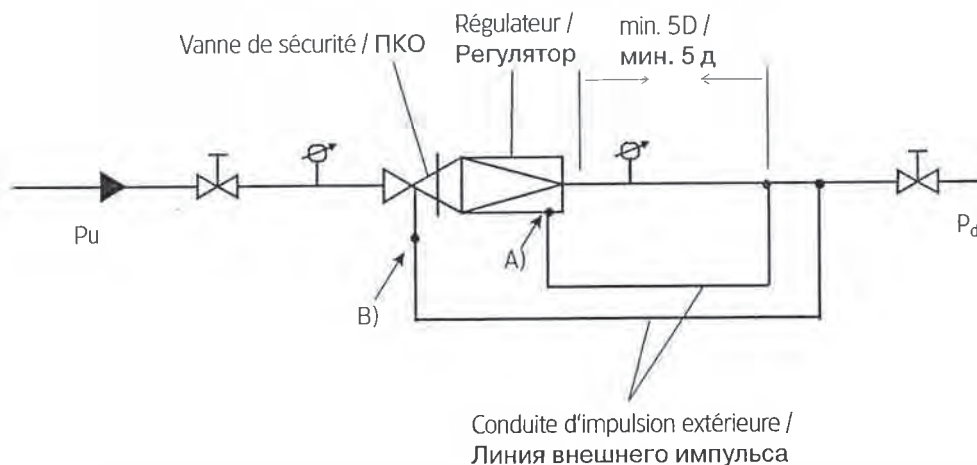
*изображенное расположение ПКО не для исполнений 233/244-8(-12)-71/-72/-730, **DN 50**

Installationsbeispiel Gasdruckregelgerät Typ 133/233 mit Fremdimpuls / Example for installation of Type 133/233 with external pulse



- A) Impuls-Anschluss Regelgerät: G 1/2" ISO 228/1 mit Ermeto GE-PLR 1/2 (EO-12)
Sensing line connection of regulator: ' G 1/2"ISO 228/1 with Ermeto GE-PLR 1/2 (EO-12)
- B) Impuls-Anschluss SAV, G 1/8" ISO 228/1 mit Ermeto GE-PLR 1/8 (EO-6)
Sensing line connection of SAV: ' G 1/8" ISO 228/1 with Ermeto GE-PLR 1/8 (EO-6)

**Exemple d'installation régulateur de pression type 133/233 avec impulsion extérieure /
Пример инсталляции регулятора типа 133/233 с внешним импульсом**



- A) Raccordement impulsion pour régulateur : G 1/2" ISO 228/1 avec Ermeto GE-PLR 1/2 (EO-12)
Присоединение импульса к УРДГ: ' G 1/2"ISO 228/1 с Ermeto GE-PLR 1/2 (EO-12)
- B) Raccordement impulsion pour vanne de sécurité, G 1/8" ISO 228/1 avec Ermeto GE-PLR 1/8 (EO-6)
Присоединение импульса к ПКО: ' G 1/8" ISO 228/1 с Ermeto GE-PLR 1/8 (EO-6)

Remarks for use in potentially explosive atmospheres (ATEX):

- If film of rust is possible (flying rust in the immediate product surroundings), all outer aluminium parts have to be protected accordingly (e.g. by varnish).
- The product must be electrically connected to adequately earthed installation.
- For installation, removing or repair of the product on site, only tools allowed for the corresponding explosion area can be used.
- The product shall not be exposed to: flames, ionised radiation and ultrasound.

CE Certificate of Conformity

Actaris Gaszählerbau GmbH
76161 Karlsruhe

We declare, that the product

Gas pressure regulator 133-..., 233-... and 244-...

is in conformity with the following directives:

1. 97/23/EG module A category I Pressure Equipment Directive (PED)
(only controller concerns 233 and 244).

The module A1 is supervised by Notified Body TÜV Süddeutschland,
Bau und Betrieb GmbH (CE 0036) Durmersheimerstraße 145, 76189 Karlsruhe.

EC Certificate N°: **BB-NDD-KAR-01/08/4648676/001**

2. 90/396/EEC (Gas Appliances Directive) together with DIN 3380 with EC type-examination certificate:
DVGW **CE-0085AQ1090 / 1091 (133-...)**
DVGW **CE-0085AQ1092 / 1093 (233-...)** and
DVGW **CE-0085AQ1094 (244-..)**.

3. 94/9/EG (ATEX) module A+ (Annex VIII), with marking
Ref. 11501 Ⓜ II 2 G EEx c IIC T5.

The technical documentation has been communicated to the Notified Body L.C.I.E (0081)
33, av. du Général Leclerc, 92266 Fontenay-aux-Roses France
(Acknowledgment N° LCIE 03 AR 012)

4. *For electrical additional devices only:*

89/336/EEC-89 (electromagnetic compatibility) with modifications under consideration
of the norms EN50081-2/1993 and EN50082-2/1995

Karlsruhe, March 25, 2004



Stefan Feller
Head of Production

Supplier:		Kühme		Proj./Com.-Nr.:		B114103		
Sales branch:		Valves		Project:		MEDUPI Unit 6		
Lubrication Instructions								
KKS-No.	Designation	Manufacturer	Type	Lubricating point designation	Time intervals (o.h.)	Legend	Fill Quantity	
6 0HJG01 AA601 6 0HJG01 AA602 6 0HJG01 AA603	Pressure control valve with SAV and SAB	ACTARIS	233-12-4-72	Lubrication not necessary	---	---	---	
Legend: 1 Lubricator nipple 2 Oil filling 3 Grease filling 4 Grease refill 5 Spray lubrication								
Maintenance instruction								
KKS-No.	Designation	Manufacturer	Type	Maintenance activity	Maintenance intervall	Component condition		
6 0HJG01 AA601 6 0HJG01 AA602 6 0HJG01 AA603	Pressure control valve with SAV and SAB	ACTARIS	233-12-4-72	inspection for wear and shut down	5000h *)	---		
Remark:	*)The denoted maintenance intervals are only recommendations and may vary dependent on the operating conditions. Therefore the specific intervals may be changed by the assessment of the system operator. See also general maintenance strategy in the documentation of the valve station						Rev.:	AA
						Date:	15.07.2013	
						Sheet:	1 of 1	