

**PRESSURE REDUCER  
type R110  
WITH FILTER**

	<b>TECHNICAL PRODUCT DOCUMENTATION</b>	R 110 - DTR
		Page: 2 Pages: 11

## TABLE OF CONTENTS

<b>1. SECURITY INSTRUCTION</b>	<b>3</b>
1.1. Application	3
1.2. Definitions used in description	3
<b>2. CONSTRUCTION AND OPERATION RULES</b>	<b>3</b>
2.1. Construction	3
2.2. Operation rules	5
<b>3. TECHNICAL DATA</b>	<b>5</b>
<b>4. WORKING CONDITIONS</b>	<b>6</b>
<b>5. TRANSPORT INSTRUCTION</b>	<b>6</b>
<b>6. UNPACKING AND STORAGE INSTRUCTION</b>	<b>7</b>
<b>7. INSTALLATION INSTRUCTIONS</b>	<b>7</b>
<b>8. START-UP INSTRUCTION</b>	<b>7</b>
<b>9. OPERATION INSTRUCTION</b>	<b>7</b>
9.1. Output pressure adjustment	7
9.2. Disconnecting from circuit	8
9.3. Removing impurities from tank	8
9.4. Safety requirements	8
<b>10. DAMAGES AND REPAIRS</b>	<b>8</b>
<b>11. SCOPE OF DELIVERY</b>	<b>10</b>

	<b>TECHNICAL PRODUCT DOCUMENTATION</b>	R 110 - DTR
		Page: 3 Pages: 11

## 1. SECURITY INSTRUCTION

### 1.1. Application

Pressure reducer type R110 with filter is designed for adjustment of air pressure, supplying devices of pneumatic automatic adjustment systems, and for cleaning that air from mechanical impurities, oil and water.

### 1.2. Instructions and warnings

Body damage and/or serious material damages might be formed if user doesn't keep of instructions and warnings. Servicing staff have to be instructed and acquaint with whole safety instructions and warnings.

For well and safe reducer's working there has to be assured right transport, storage, assembly, starting and conservation's instruction.

Main attentions of safety in mentioned operation and maintenance manual were marked as pictograms:

	<p style="text-align: center;"><b>This sign means: Pointer.</b></p> <p>„Pointer” indicates on action or any process important for well-working of product. Material damages might be formed if user doesn't keep of instructions.</p>
	<p style="text-align: center;"><b>This sign means: Warning.</b></p> <p>„Warning ” indicates on action or any process, which might be danger for staff or makes material damages if those aren't made correctly.</p>

## 2. CONSTRUCTION AND OPERATION RULES

### 2.1. Construction

Pressure reducer R110 with filter consists of two main functional groups:

- cleaning group
- reducer

Cleaning group consists of valve body, filter, pipe, complete connection screw, release valve – see drawing no. 1.

Valve body has two sockets with St. B. 1/4” thread, used for fixing manometers of input and output pressure, as well as hole with M5 thread, used for bracket fixing. Bracket with spring washer 5.1 and screw M5 x 10-8.8 is delivered separately in plastic bag.

There are arrows on valve body, indicating air flow direction.

Reducer consists of membrane, adjustment valve, ventilation valve, body, adjustment spring, adjustment screw, locking nut.

The whole group is connected with four screws M5 x 14-5.8.

Pressure reducers R110 with filter are produced in the following versions, depending on configuration: without manometer, with one or two manometers, used for measuring input and output pressure.

Symbols of individual versions are presented below:

Versions of reducer with filter	Catalogue number
- without manometers	R110-A004
- with one manometer $\phi$ 40 ( on output )	R110-A005
- with two manometers $\phi$ 40	R110-A006
- with one manometer $\phi$ 50 ( on output )	R110-A007
- with two manometers $\phi$ 50	R110-A008
- with one manometer $\phi$ 50 in acid-resistant housing ( on output )	R110-A009
- with two manometers $\phi$ 50 in acid-resistant housing	R110-A010
- acid-resistant without manometers	R110-A011
- acid-resistant with one manometer $\phi$ 40 in acid-resistant housing ( on output )	R110-A012
- acid-resistant with two manometers $\phi$ 40 in acid-resistant housing	R110-A013
- acid-resistant with one manometer $\phi$ 50 in acid-resistant housing ( on output )	R110-A014
- acid-resistant with two manometers $\phi$ 50 in acid-resistant housing	R110-A015

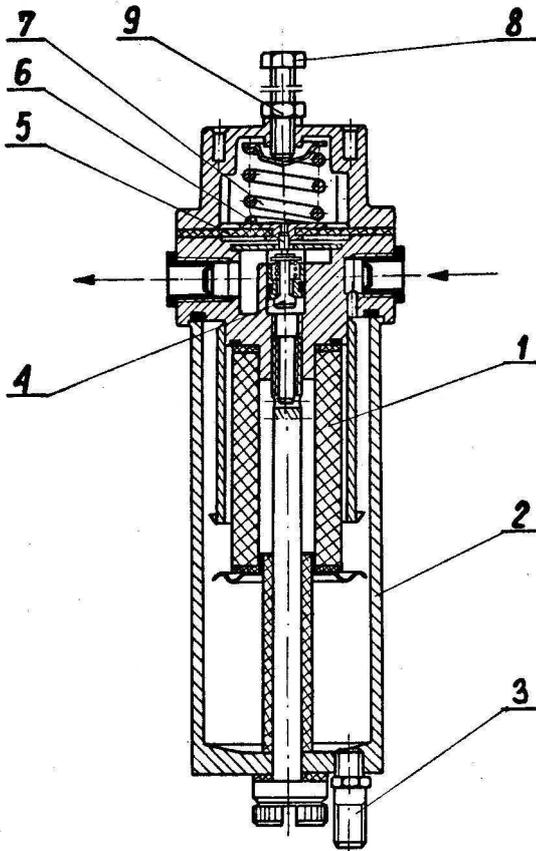
Pressure reducers with filter may be delivered with the following connectors:

Connector name	Designation	Application
Connector $\text{LM}6-1/4''$	R971	for copper pipes $\phi 6 \times 1$
Connector $\text{LM}8-1/4''$	R972	for copper pipes $\phi 8 \times 1$
Connector $\text{LM}6-1/4''$	R973	for polyethylene pipes $\phi 6 \times 1$

Order should include full product name, catalogue number and connector number, e.g.:

Pressure reducer with filter, with one manometer, with connectors for copper pipes  $\phi 6 \times 1$  is designated:

Pressure reducer R110 - A005 (R971) with filter



- 1 - ceramic filter
- 2 - tank
- 3 - release valve
- 4 - adjustment valve
- 5 - membrane
- 6 - ventilation valve
- 7 - adjustment spring
- 8 - adjustment screw
- 9 - locking nut

Drawing no. 1. Reducer functional diagram

## 2.2. Operation rules

Supply air is first directed to cleaning group, where it flows through ceramic filter 1 and leaves there mechanical impurities, water and oil drops – see drawing no. 1.

Condensate is removed through release valve 3, located in lower part of tank 2.

Pressure reducer group operates according to forces balance principle: of adjustment spring 7 and force of output pressure reaction on membrane 5.

When air pressure compensates or exceeds spring force – adjustment valve 4 closes.

When pressure drops, adjustment valve 4 remains opened.

Output pressure is adjusted with adjustment screw 8, protecting it from unscrewing with lock nut 9.

Clockwise rotation of adjustment screw 8 increases output pressure, and anticlockwise rotation decreases it.

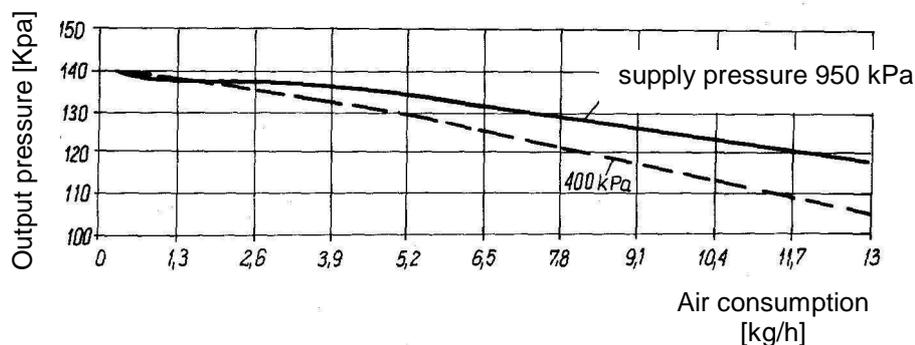
Pressure reducer ventilation is performed through ventilation valve 6 and hole in valve body side wall.

## 3. TECHNICAL DATA

Supply pressure	max. 1.6 MPa
Output pressure adjustment range	0.01.....0.6 MPa
Air consumption	max. 80 g/h ( at supply pressure 0.5 MPa )
Supply pressure manometer range	0....2.5 MPa
Output pressure manometer range	0.....0.6 MPa
Flow rate at output pressure drop 5 kPa	4.6.....6.5 kg/h (depending on supply pressure )
Maximum air expenditure for outflow to atmosphere	16.9 kg/h for supply pressure 0.4 MPa 31.2 kg/h for supply pressure 0.8 MPa 45.5 kg/h for supply pressure 1.2 MPa 58.5 kg/h for supply pressure 1.6 MPa

Relation of output pressure drop and air intake

– acc. to chart



	<b>TECHNICAL PRODUCT DOCUMENTATION</b>	R 110 - DTR
		Page: 6 Pages: 11

Materials:	aluminium alloys, stainless steel, carbon steel
Membrane	oil-resistant rubber with textile spacer,
ceramic filter	ceramic sinter,
coating	zinc coating
Filtration efficiency:	solid particles: > 2,5 µm-100%
	1.4..3 µm-99,98%
	0.5..1.4 µm-99,66%
	0.3..0.5 µm-99,6%
	water particles: 0.5..1.4 µm-86%
Pressure connectors	threaded holes St.B1/4"
Mass:	version R110-A004 – 0.860 kg
	version R110-A005 – 1.015 kg
	version R110-A006 – 1.170 kg
	version R110-A007 – 1.073 kg
	version R110-A008 – 1.286 kg
	version R110-A009 – 1.073 kg
	version R110-A010 – 1.286 kg
	version R110-A011 – 1.430 kg
	version R110-A012 – 1.585 kg
	version R110-A013 – 1.740 kg
	version R110-A014 – 1.643 kg
	version R110-A015 – 1.856 kg

Dimensions of pressure reducer with filter are shown in enclosure 1 and 2.

#### 4. WORKING CONDITIONS

Pressure reducer with filter is designed for operation in the following conditions:

- a / working medium: air without impurities, which react chemically and cause corrosion of steel, copper alloys, aluminium, and influencing oil-resistant rubber
- b / operation temperature: -25..+70°C
- c / allowable vibrations: 10..60 Hz, amplitude <0.35 mm, 60...500 Hz, acceleration 5g (acc. to PN-EN 60654-3:2000; class VH6)
- d / working position: vertical, tank down.

#### 5. TRANSPORT INSTRUCTION

Pressure reducer with filter, together with declaration of conformity and hygroscopic agent bag is located in tight plastic bag, and with tight plastic bag, containing separately delivered parts is put into carton box, filled with shock absorbing insert.

For transportation purposes reducers in above package are located in the box, protecting them from damages and weather conditions.

Temperature during transport should not exceed range -25°C...+70°C.

Packed reducers should be protected from direct influence of rain and snow.

	<b>TECHNICAL PRODUCT DOCUMENTATION</b>	R 110 - DTR
		Page: 7 Pages: 11

## 6. UNPACKING AND STORAGE INSTRUCTION

Customer should inspect boxes state after receiving.

After taking reducer out of box, without opening plastic bag, inspect it visually for damages.

Before removing plastic bag keep reducer in room, where it is unpacked, until it reaches environment temperature.

Reducers should be stored in original boxes in closed rooms.

Air in storage area should not contain aggressive vapours and gases.

## 7. INSTALLATION INSTRUCTION

In order to install pressure reducer with filter one should be done:

- fix reducer to installation plate with screws M4 or M8 (2 pcs.). Adjust screws length to installation plate thickness. Fixing screws should be protected from corrosion.
- connect pneumatic hoses, supplying input and output pressure to fixed reducer, after removing plugs from connectors.



**ATTENTION: Clean hoses with dry air before connecting to dry them and remove impurities.**

## 8. START-UP INSTRUCTION

Unscrew adjustment screw to release spring tension.

Turn on supply pressure. Rotate reducer adjustment screw according to arrows on body, until reaching required value of output pressure. Protect adjustment screw from unscrewing with locking nut.

## 9. OPERATION INSTRUCTION

### 9.1. Output pressure adjustment

Output pressure of pressure reducer with filter is adjusted by rotation of adjustment screw.

Output pressure is increased by rotating adjustment screw according to arrows on body, and decreased by rotating it in the opposite direction.



**ATTENTION: After reaching maximum output pressure (0,6 MPa), further rotating of adjustment screw in order to increase it may damage the product.**

	<b>TECHNICAL PRODUCT DOCUMENTATION</b>	R 110 - DTR
		Page: 8 Pages: 11

### **9.2. Disconnecting from circuit**

Lower output pressure to 0 MPa by unscrewing adjustment screw after loosening locking nut, and turn off supply pressure.

Disconnect supply and return hoses from tanks, unscrew fixing screws, unscrew connectors, plug supply and output holes.

### **9.3. Removing impurities from tank**

Place container under pressure reducer and press pin, protruding from release valve, until contaminated condensate flows out to the container.

It is recommended to use container, which allows for removing contaminated condensate by pressing release valve with its bottom.

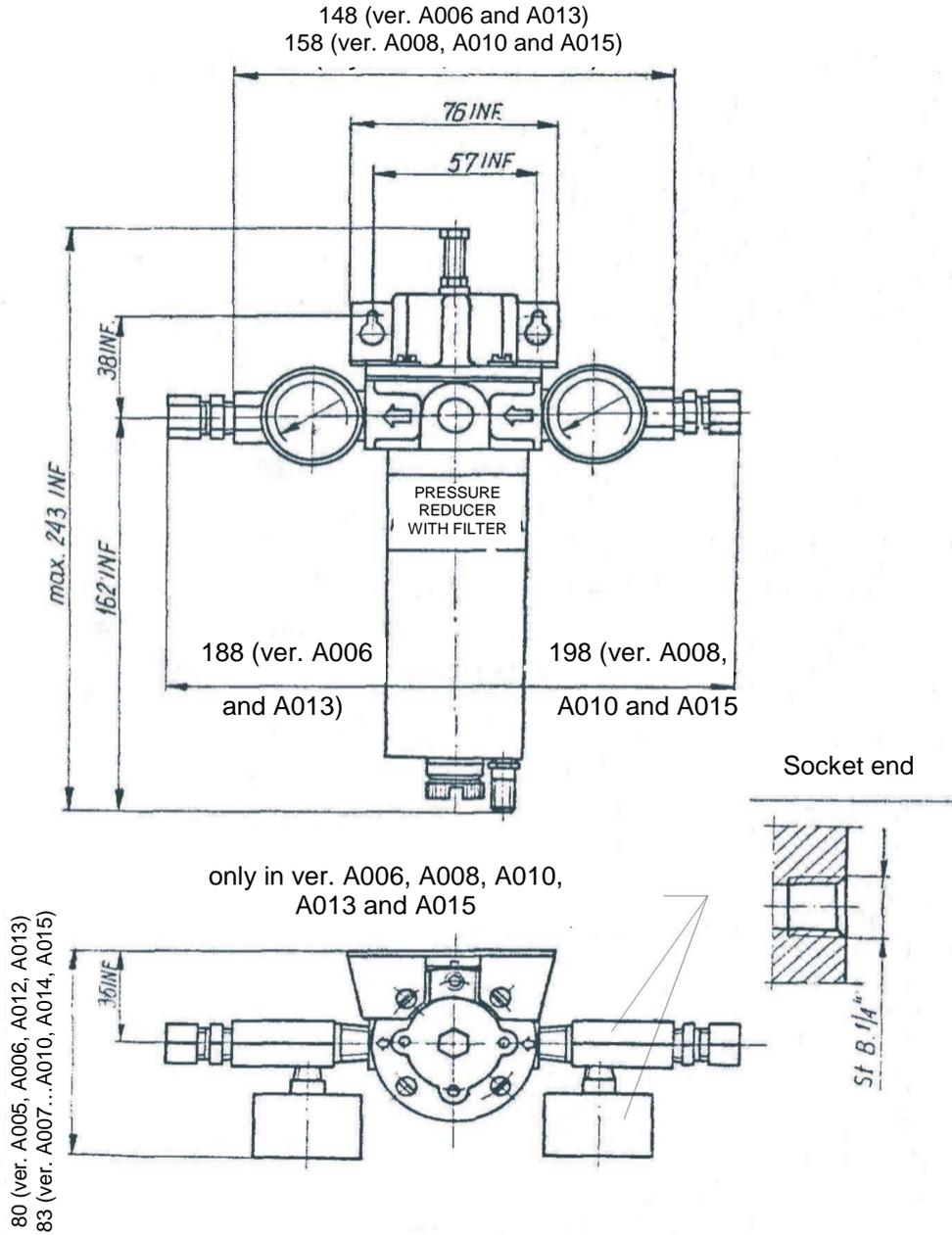
### **9.4. Safety requirements**

Personnel installing pressure reducers with filters in objects should have general knowledge of safety requirements and this documentation.

## **10. DAMAGES AND REPAIRS**

No.	Damage	Damage reason	Repair method
1.	2.	3.	4.
1.	Output pressure can not be set at 10 kPa	Contaminated adjustment valve pin Broken pressure spring	Remove and clean adjustment valve pin Replace pressure spring
2.	Output pressure is equal to 10 kPa and does not raise with rotations of adjustment screw	No supply pressure Broken adjustment spring Stripped thread of adjustment screw	Turn on supply pressure Replace adjustment spring Replace adjustment screw
3.	Large drops of output pressure	Supply pressure lower than lower range limit Contaminated filtration cartridge Too high expenditure of output pressure	Increase supply pressure Clean or replace filtration cartridge Lower expenditure of output pressure to normal value
4.	Too high air own consumption	Untight or broken membrane Blocking of adjustment valve pin	Seal or replace membrane Remove pin, clean it and install in proper position
5.	Release valve releases air	Damage seal of air-chamber valve insert	Replace air-chamber valve insert

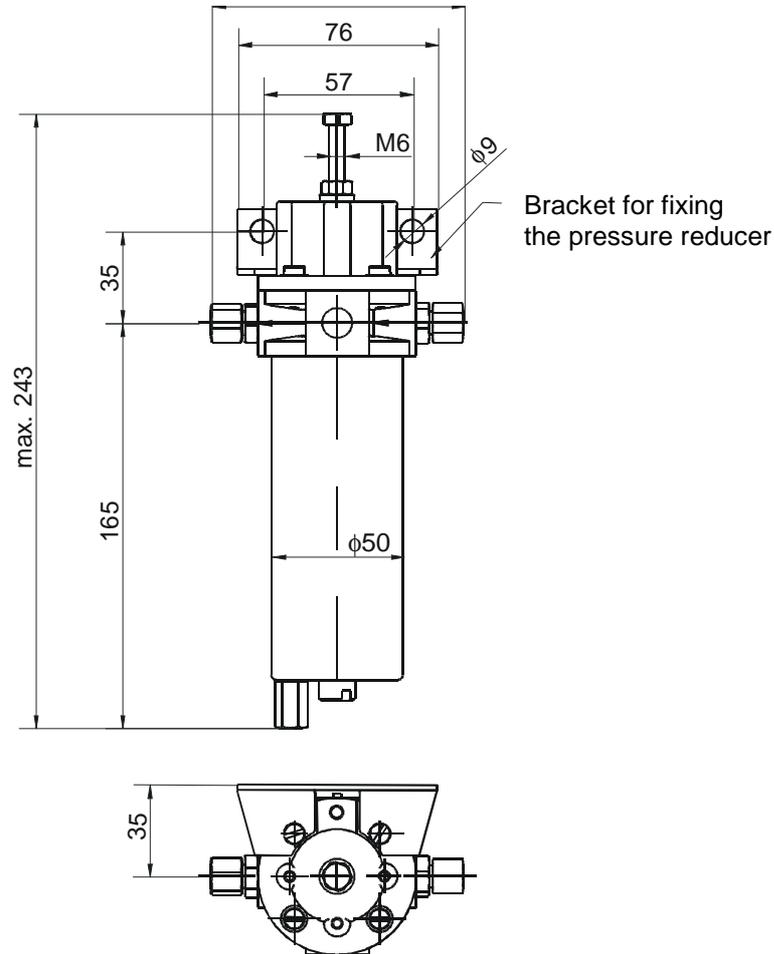
**Enclosure no. 1**



Overall dimensions of reducer type R110 with filter (version with manometers)

**Enclosure no. 2**

115-(ver.A004) 160-(ver.A005)  
205-(ver.A006) 215-(ver.A008)



Overall dimensions of reducer with filter (version without manometers)



**ATTENTION: All repairs should be performed by producer or authorized service company. In case of repairs performed by unauthorized persons producer bears no responsibility for safety and proper product operation.**

**11. SCOPE OF DELIVERY**

- Pressure reducer with filter
- Technical Product Documentation
- Commissioning Certificate
- Package

	<b>TECHNICAL PRODUCT DOCUMENTATION</b>	R 110 - DTR
		Page: 11 Pages: 11



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Ostrów Wielkopolski, 24 październik 2008r.

## OŚWIADCZENIE PRODUCENTA

Oświadczamy, że wyroby R110 spełniają wymagania dyrektywy „Urządzenia Ciśnieniowe” 97/23/WE. Według art. 3 ust. 3 powyższej dyrektywy są wykonane zgodnie z uznaną praktyką inżynierską i nie podlegają oznaczeniu CE.

KIEROWNIK  
DEPARTAMENTU TECHNICZNEGO  
  
mgr inż. Krzysztof Idzior

PREZES ZARZĄDU  
  
Sebastian Moch

## ENGLISH VERSION

Ostrów Wielkopolski, on 24<sup>th</sup> October 2008

### PRODUCER'S DECLARATION

We declare that the products type R110, meet the requirements of the EU Directive „Pressure-type Equipment” no. 97/23/WE.

According to Article 3, section 3 of mentioned directive, these products are made with the acknowledged engineering practice and are not subject to the CE marking.

**Signed by:**  
**Technical Dept. Manager**  
(-) illegible signature  
mgr inż. Krzysztof Idzior

**Signed by:**  
**President of the Board**  
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Sebastian Moch

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