

Attention



Please read carefully before installation and start up and observe all safety measures at all times.

INSTALLATION AND OPERATING INSTRUCTIONS

JUDO AUTOMATIC BACKWASH FILTER

JRSF-A/T DN 125 - 200

JRSF-A/TP DN 125 - 200

VALID FOR EU-COUNTRIES AND SWITZERLAND
LANGUAGE: ENGLISH

Ordering

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Hohreuschstraße 39-41
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Dear Client,

Thank you for making JUDO your brand of choice. In order to ensure a long working life for your unit, please follow all instructions in this manual carefully. This manual contains all necessary instructions for installation, operation and maintenance of your unit.

Trade mark

Trade marks used herein are protected and registered to

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D-71351 Winnenden

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EU Declaration of Conformity

Document-Nr. 166/06.06

Manufacturer: JUDO Wasseraufbereitung GmbH

Address: Hohreuschstr. 39-41
D-71364 Winnenden

We declare that this product

Description of product:
JUDO Automatic Backwash Protective Filter
JRSF-A 1" - DN 200

Conforms to EU guidelines:	Electro-magnetic compatibility (EMC)	89/336/EWG
	Low voltage guidelines	73/23/EWG

and the norm requirements stipulated therein.

Harmonised Norms:	EMC Guidelines	
	Electro-magnetic compatibility:	
	Interference emission	EN 61000-6-2
	Interference resistance	EN 61000-6-3
	Low voltage guidelines	
	Security of transformers, power supplies, etc	EN 61558-1
	Security of electrical household appliances and similar applications	EN 60335-1

Issued by: JUDO Wasseraufbereitung GmbH

City, Date: Winnenden, den 20. Juni 2006

Authorised signature:



 JUDO Wasseraufbereitung GmbH

This declaration is proof of conformity with the above noted norms, does not, however, guarantee any individual properties.

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About this manual

Attention



This manual must be kept at the point of unit operation. The manual is aimed at giving a better understanding of your unit and its correct use and application.

This manual contains important information regarding the economical, safe and correct operation of your unit. It contains information fundamental for the installation, operation and maintenance of this unit. Compliance with these instructions helps avoid dangers, lowers running costs and prolongs the active working life of your unit. These instructions are to be read by all persons working in direct contact with the unit, e.g.:

- Installation
- Operation
- Maintenance (Inspection)

In addition to the instructions given in this manual, all rules, regulations and laws regarding work, health & safety valid in the country of use are to be strictly adhered to. This manual must, therefore, be read by staff carrying out and all work prior to doing so.

Please note the safety symbols!

Symbols used



Indicates possible dangers



Attention electrical current



Additional tips and information

Safety information and the danger of non-compliance

All work should be carried out under strict observance of safety regulations. Failure to comply with these regulations may result in harm or damage to yourself and/or others as well as to the environment and the unit concerned.

1.) Introduction

1.1 Warranty

Warranty can only be accepted under the terms of our general conditions of sale where:

- The unit is used in accordance with the conditions specified in this manual
- The unit has not been opened or used for purposes other than those specified in the manual
- Repairs were made by persons qualified to do so.

1.2 Use of product

The Automatic Backwash Protective Filter described herein is for use in the protection of pipe systems and appliances in mains fed drinking water applications only.

Attention



Other applications will be deemed as non-conform and are not permitted. JUDO accepts no liability for damage resulting from such applications.

1.3 Operator's duties

The operator is responsible for the following in connection with this unit:

- Training of operational staff
- Compliance with maintenance requirements

2.) Product details

2.1 Manufacturer and Model

Manufacturer
 JUDO Wasseraufbereitung GmbH
 Postfach 380
 D-71351 Winnenden

Phone: +49 (0)7195/6 92-0
 Fax: +49 (0)7195/6 92-177
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Model:
 JUDO Automatic Backwash Protective Filter
 JRSF-A/T DN 125 - 200
 JRSF-A/TP DN 125 - 200

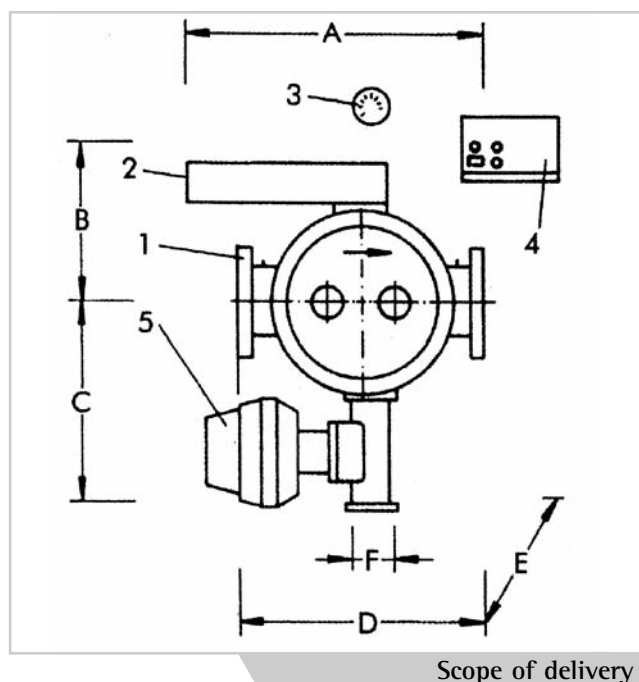
2.2 Version

With time control (T) or time prioritised differential pressure control (TP); sieve size 0.1 mm.

Model	Order number
JRSF-A/T DN 125	8303035
JRSF-A/T DN 150	8303036
JRSF-A/T DN 200	8303037
JRSF-A/TP DN 125	8503035
JRSF-A/TP DN 150	8503036
JRSF-A/TP DN 200	8503037

Also available in a hot water version on request.

2.3 Scope of delivery



1. Casing with multiway valve, viewing glasses and 2 filter chambers each with filter sieve.
2. Servomotor
3. Differential pressure manometer (TP control) with mini taps (2 pcs.) 1/2" connections and pressured tubing (ca. 1.5.m)
4. Electronic control board type JSK V (T+TP versions)
5. Membrane valve with electromagnetic valves (no electrical connection). Compressed air to be provided

on site

6. Installation and operations manual

Accessoires:

- JUDO filter sieve replacements (various sizes) on request

										Dimensions	
Model	A	mm	B	mm	C	mm	D	mm	E	mm	F
JRSF-A/T(TP) DN125	570		290		470		440		425		G 2
JRSF-A/T(TP) DN 150	600		325		510		500		475		DN 65
JRSF-A/T(TP) DN 200	660		370		580		620		620		DN 80

Control unit H x B x T
ca. 245 x 290 x 150 mm

										2.4 Operational data		
Max. flow rate *					m ³ /h *	75	110	170				
Pressure loss at backwash					bar	0,1	0,1	0,1				
Operating pressure min./max.					bar	1,5 / 10	1,5 / 10	1,5 / 10				
Backwash volumes					ca. l/s	10	15	25				
Volumes per total backwash cycle					ca. l	200	300	500				
Max. water temperature					°C	30	30	30				
Sieve size **					mm	0,1	0,1	0,1				
Flange connection DIN 2633					DN	125	150	200				
Electrical connections for control unit					V/Hz	230/50	230/50	230/50				
Control medium						Comp. air	Comp. air	Comp. air				
Control pressure					ca. bar	4 - 6	4,5 - 7	5,5 - 7				
Max consumption					W	60	60	60				
Protection category for control unit (cover closed)					IP	54	54	54				
Weight					kg	75	115	165				
Model JRSF-A/T(TP)						DN 125	DN 150	DN 200				

* Approx. half flow rate during backwash

** Also available in the following sieve sizes 0,03/0,05/0,32/0,5/1,00/2,00 mm

2.5 Place of use

The JUDO Backwash Protective Filter removes all particulate in the cold and warm water supply which can lead to pitting in the system. These can lead to malfunctions in taps, control units, regulators and other equipment.

2.6 Function

The multiway valve used to regulate operation and backwashing on a JUDO Automatic Backwash Filter DN 125 – 200 is servomotor operated. The run-off is operated using a combination of electro-magnetic valve and a membrane valve (compressed air). Backwash is controlled electronically.

The JRSF-A/T(TP) unit is operated using:

Time and differential pressure controls using a timer switch and differential pressure manometers allowing max 1 bar pressure differential.

Particles filtered out of the incoming water supply are retained on the sieve surface. This results in a rise in pressure differential between the entry and exit points within the filter. The manometer monitors the actual difference in pressure here. Once the pressure differential has reached a pre-set level, a backwash is automatically started. During times of low consumption, backwashing is started using a timer function in order to stop dirt build-up on the sieve.

As running water is a pre-requisite for the build-up of differential pressure, the TP-function will only be active during operation. The TP function is of special interest for use in applications with varying water consumption and dirt inflow levels.

3.) Safety

3.1 Safety notes and tips

For the meanings of symbols used, please see the „table of contents“ page.

3.2 Correct application

JUDO Automatic Backwash Protective Filters JRSF A/T(TP) have been designed, engineered and tested to meet with the requirements for mechanical filters in drinking water applications.

Information



Particles retained on the filter surface are removed using abrasion. All materials used in this unit conform to German standards pertaining to expected levels of physical, chemical & corrosive loads as stipulated in DIN 19632. Materials used conform to physiological and Hygiene requirements. PVC-based and metallic parts conform to the requirements of the German Ministry of Health.

Attention



Water containing substances with high polarisation properties such as alcohols, concentrated mineral acids, formic acid, carboic acids, cresylic acids, tetrahydrofuran, pyridines, dimethyl-formamid & mixes containing chloroform & methanol may not be used in connection with this unit. These will cause damage to PVC-based materials and may lead to breakage. The test marks printed on the unit are valid only in connection with original, JUDO parts! Instructions regarding operation, maintenance and repairs contained in this manual must be strictly adhered to! For safety reasons, unauthorized changes or alterations to this unit are under no circumstances what so ever to be effected.

Warning



Electrical work is only permitted when the unit has been disconnected from the power supply.

3.3 Sources of danger

Attention



Before opening the control unit covers, please make sure that no splash water can enter the unit. Water which may already be on the cover must be removed before opening. The locking system must be closed once the cover has been replaced (see chapter 6.2). The cover of the servomotor must be correctly in place before the unit is put into operation (see chapter 2.3)! As the unit is under voltage when operational, all electrical work, e.g. maintenance work, installation, part and fuse replacement, connection to potential-free input and output contacts is to be performed by persons suitably qualified under local regulations to do so!

The following border values are valid for the connection of the potential-free contact on a JUDO Automatic Backwash Protective Filter JRSF-A/T(TP):

- max. load current 1 A
- max. switching voltage 24 V

Attention



potential-free contacts only are to be used on the optional in- & output contacts (see chapter potential-free contacts).

Under no circumstances are these contacts to be connected to an external power supply!

The potential-free contacts are to be connected using a 2-core cable, max. diameter 4.5 – 10 mm. The sheathing may be removed to max. 3 cm.

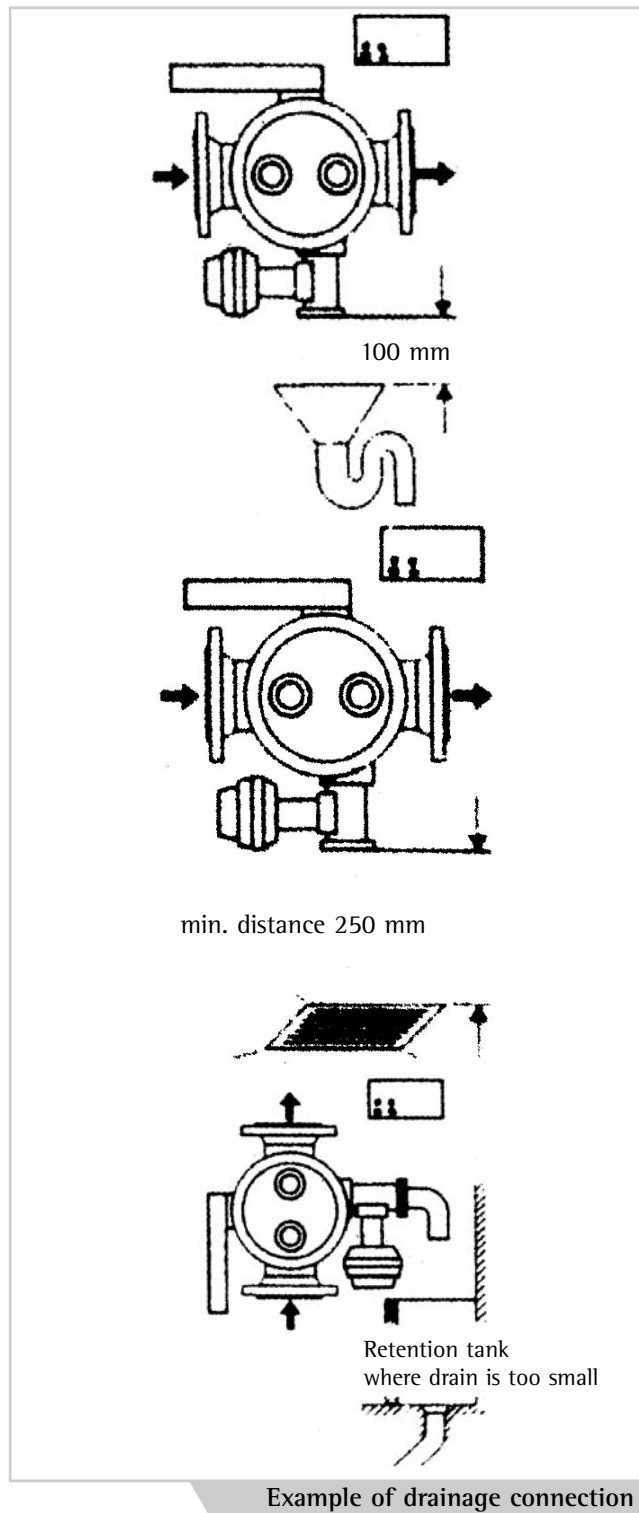
4.) Installation

4.1 Requirements on site

This JUDO Automatic Backwash Protective Filter is to be installed in a dry and frost-protected location. A drainage connection (e.g. floor drain) in accordance with local plumbing codes is required to feed off backwash water. Connections for compressed air are also required on site. The filter should be installed close to a power supply (230V/50Hz). Connection to the power supply should be performed by a person qualified for this task and in accordance with local electrical codes. Please take note of the example installation herein. Access to the power supply must be available at all times.

4.2 Installation tips

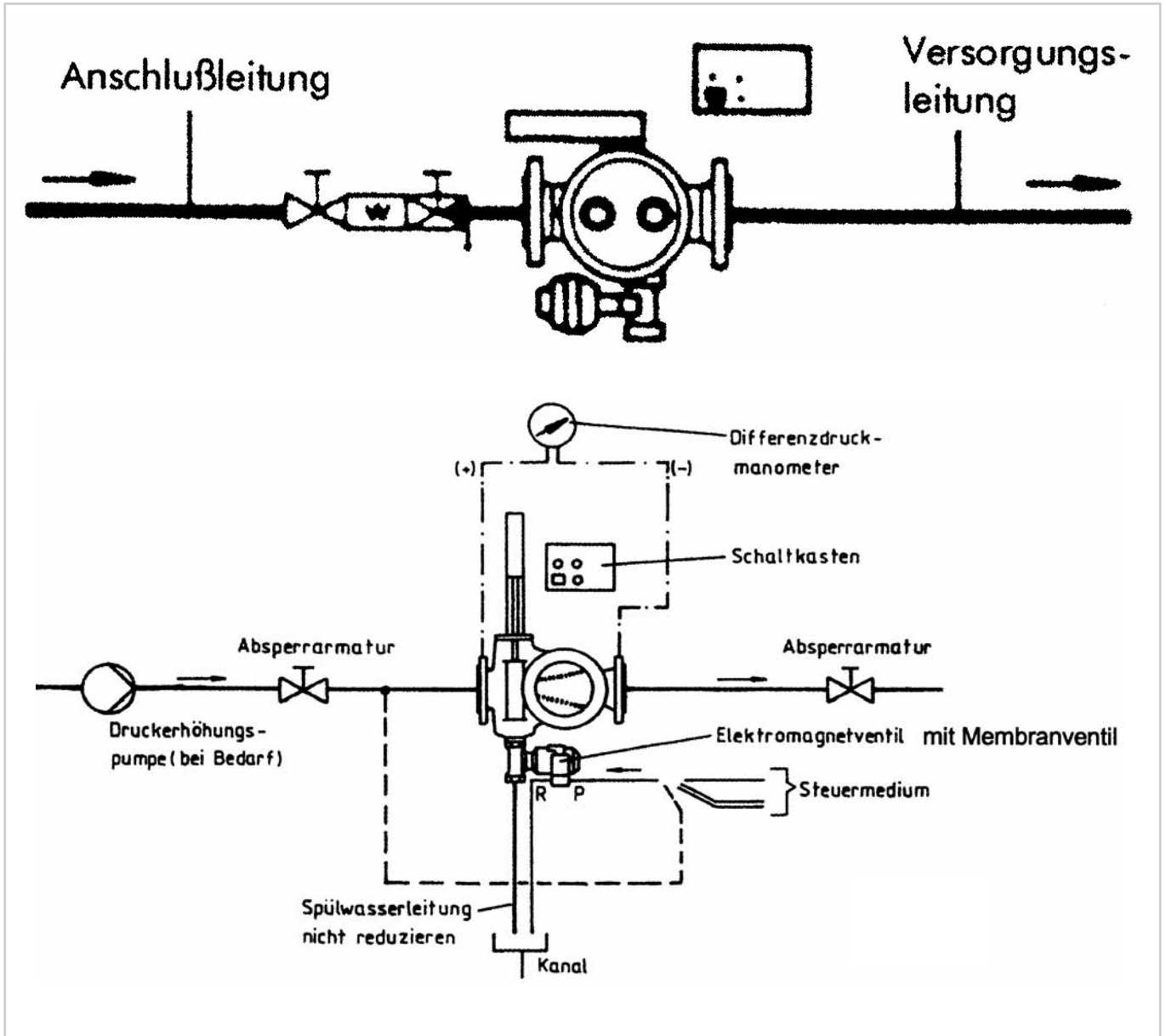
- The filter may be installed in horizontally or vertically running steel or PVC-based pipes. It may not be installed in a suction line.
- It may be connected to the water supply using standard fittings.
- Water pressure at point of installation should not exceed the nominal 10 bar for which this unit is approved.
- In order to facilitate operation and maintenance, the unit should be installed at a point offering ease of access.
- For ease of sieve changes, a min. distance of 250 mm should be left between the filter cover and the wall.
- Drainage provided should be scaled one size larger than the pipes used in order to allow backwash water to flow freely without backing up.
- When installed in vertically running pipes, the installation of a U-bend at the backwash water outlet will facilitate the downward flow of backwash water.
- Where installation directly above a drain is not possible, a tube of the same size as the pipes can be installed leading to the nearest drain in a steady downward grade.
- In order to ensure high levels of screen cleaning, a volume of approx. 50 % of the max flow rate is required for efficient backwashing. At the same time, the minimum pressure of 1.5 bar required should not be undercut. Where these values cannot be met, a decrease in backwash efficiency will occur.
- The shut-off valves placed in front of and behind the unit are to be mounted in such a way that they remain operative even when the unit is being installed or disassembled.
- Where compressed air is used as a control medium, this is to be provided on site.
- Filters should be installed free from distortion
- Pressure differential max. 2 bar.
- Installation in front of a water meter only where this is legally permitted.
- Where backwash water is to be collected in a pump well, then the pump must be sized to cope with the volumes from several backwashes in a row and offer an overflow alarm feature.
- Always observe the general regulations on plumbing, electrical work and health & safety valid in your region or country!
- The distance between the electronic control unit and the filter may not exceed 2 m. The control unit is to be positioned hanging vertically on a wall and fixed using round or cylinder head screws (5 mm diameter) leaving a distance of 5mm to the wall itself. The control unit is then hung onto the screw by means of the hole fixture on the reverse side of the unit. The control unit is then fixed with 2 further screws (right and left under the cover cap).
- A cable duct or similar should be used to ensure that wiring is fitted free of tension.
- Connections for the servomotor, differential pressure manometer and magnetic valve can be found in the wiring diagram (see chapter 8).
- Compressed air/water must be provided on site.



4.3 Installation example

Installation example for a JUDO Automatic Backwash Protective Filter based on German installation standards. Please consult local regulations before installing as these may vary. Installation follows after the water meter and back-flow protection unit. The differential pressure

manometer with mini-tap is fixed using the fitting provided to the inflow side of the unit and the remaining mini-tap with fixture is fitted to the outflow side. Make sure both connections are tight!



Installation example

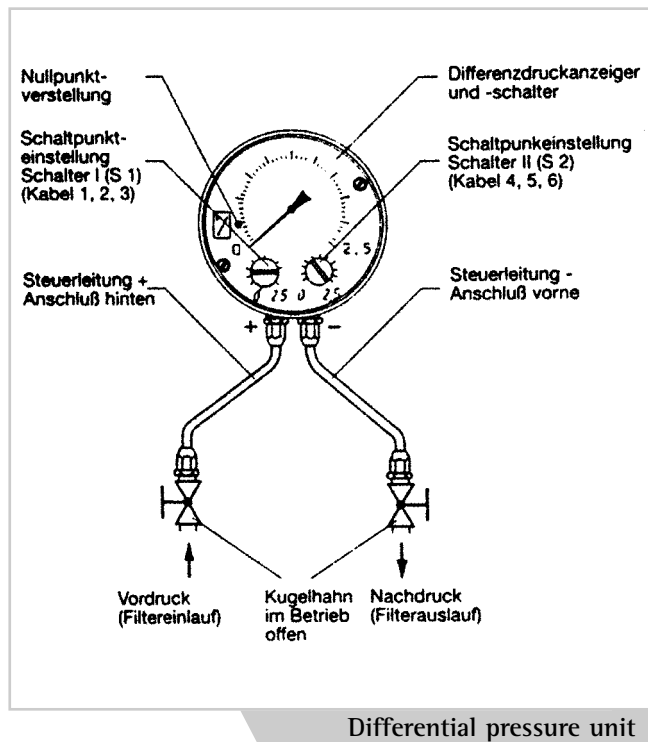
4.4 Installation of differential pressure unit

A differential pressure control forms part of the scope of delivery on TP controlled filters. T controlled units may also be retrofitted.

The pressure resistant control lines on a JRSF-A/T(TP) are installed directly into the filter casing.; line (+) at the filter inlet and line (-) at the filter outlet. The build up of particles on the sieve surface leads to a gradual drop in pressure within the unit. This drop in pressure is registered by the differential pressure manometer. Once a preset level has been reached, a backwash is started up automatically. The differential pressure control has priority over the timer and has a factory setting of approx. 1 bar.

Venting the control line (-):

1. Close ball valve
2. Loosen nut on manometer
3. Remove tube
4. Carefully open ball valve partially to vent
5. Replace tube and tighten connection
6. Open ball valve fully



5.) Commissioning

Information



Installation should be completed only by persons with the skills and training required to do so.

5.1 Control types

Time control "T":

Backwash is controlled on a timer base only and needs merely be programmed on site.

Differential pressure control "TP":

Particles filtered from the incoming water supply are retained on the sieve surface. This results in an increase in pressure loss between the filter inlet and filter outlet. The manometer registers the difference in pressure on an ongoing basis within the unit. Once a preset pressure differential has been reached and held for more than 20 seconds, a backwash starts automatically. If the differential pressure has not been reduced following backwash, further backwashes automatically follow. Where the differential pressure has not been brought back under the preset level after 5 minutes or 10 backwashes, the unit runs a final cleaning cycle, goes into alarm and shuts down. The filter goes returns to operative mode once the error has been cancelled and the differential pressure monitored is below the preset level. In order to prevent the sieves from blocking during longer periods out of use, a timer controlled backwash is also incorporated into the unit. As differential pressure only occurs where water is flowing, the TP function is only activated when the filter is in use. TP control is advisable for applications involving varying levels of water consumption and fluctuations in the rates of incoming impurities.

5.2 Manometer

Particle build-up on the sieve surface leads to a drop in pressure within the filter. This drop is monitored by the differential pressure manometer on the filter unit. A backwash is started automatically when a preset differential is reached. The differential pressure manometer is to be installed directly into the filter unit. All parts required are included in the scope of supply for the unit. Installation and connection see installation example. Connect manometer control line (+) to the filter inlet and line (-) to the filter outlet. Electrical connections: see wiring diagram.

5.3 Setting differential pressure

Setting zero point:

The needle on the manometer should be showing zero when no water is flowing through the unit and the ball valves on each control line are fully open. If this is not the case, the needle can be re-positioned by opening the manometer cover and adjusting by means of the screws provided.

Setting backwash, switch 1:

Values at which backwashes are automatically started up are set here. Remove the plug in the clear cover cap and turn the switch point indicator to the setting required (0.1 - 2.5 bar possible). Settings should be set between 1 and max. 2 bar (do not set at less than 0.5 bar). Setting accuracy +/-5%. Close cover cap. (factory setting 0,1 bar). Setting required depends heavily on the volumes of impurities contained in the incoming water supply. Too high a setting may result in sieve blockage, too low may lead to increased backwash water consumption.

Setting backwash switch 2:

Switch 2 can be used for the connection of an external alarm unit monitoring the differential pressure within the unit and to be set off when values programmed here are reached. As this is an additional safety feature, please ensure that values programmed here are at least 0.5 bar higher than for switch 1.

5.4 Electro-magnetic valve

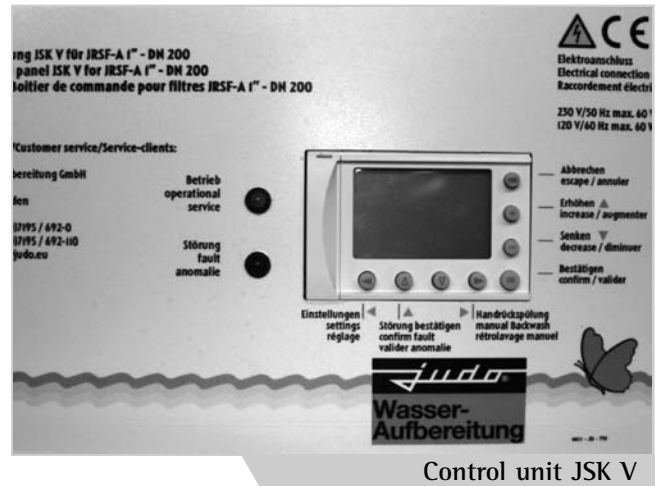
The electromagnetic valve (pilot valve) is delivered pre-installed in the unit. It serves as a pilot for the main membrane valve. The power supply is connected at point 'P'. When using air as a control medium, connection 'R' is to remain open. When using water, connect the drainage hose here. All connections are pipe threading type R 1/4". See wiring diagram for electrical connections. The electro-magnetic valve can also be manually activated. Press in and turn clockwise to stop.

Warning



Do not carry out any electrical work until the unit has been disconnected from the power supply!

6.) Setting the controls



Control unit JSK V

Information



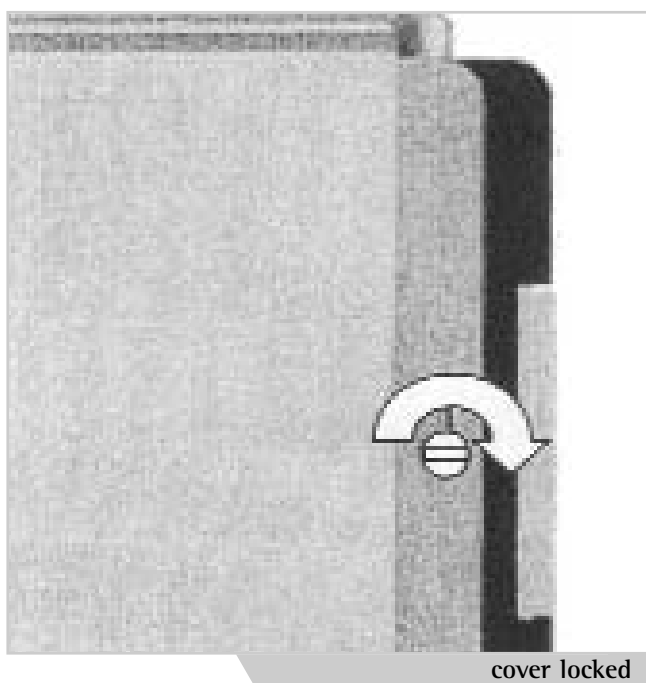
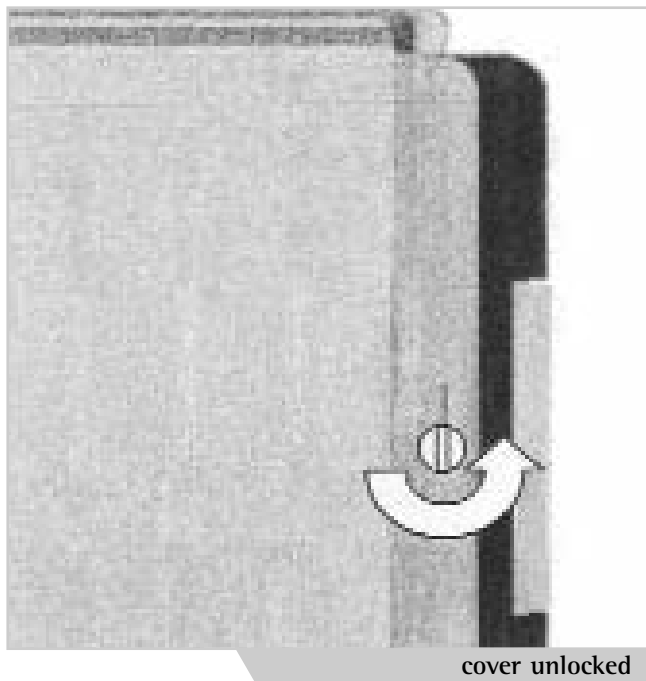
Settings to this unit must be carried out in accordance with the instructions herein only. Any variations will lead to damage of the unit. Dip switches contained within the unit are for maintenance purposes only. Altering these can result in total damage to the unit and a complete loss of warranty coverage.

6.1 Control unit

The JSK V unit is a programmable SPC control which can be adapted for individual requirements.

6.2 Opening and closing the control unit cover

The control unit cover is opened and closed using a screw driver.



6.3 For your information

Information



Menus and values can be selected using the arrow keys ◀ ▶ ▲ ▼ (lower line).

The +/- keys are then used to activate values set (selection blinks).

The +/- Tasten can also be used to alter values up or down.

Value are stored using the OK key.

An action can be broken off using the ESC key.

In the following text, signs shown in the display are marked in „cursive“ and key indicators in „bold“.

Time limits

Each new entry must be completed within a 1 min. time frame and confirmed by pressing the OK button. If this is not the case, the display return automatically to operational mode and original parameters remain unchanged.

6.4 Manual backwash

A manual backwash can be started by holding the arrow key ▶ pressed (approx. 5 secs.). The unit then performs the preset number of backwashes and returns to operational mode. During this process the word „backwash“ appears on the display.

6.5 Settings

Menus are opened using the arrow key ◀ (settings). A new menu point each opened with each push. Menus can be closed by a further push once the end of the menu has been reached. Menus cannot be interrupted and must be run through completely.

6.6 Backwash cycles

The number of backwashes per cycle can be adjusted to meet with actual requirements on site. Normally 3 backwashes should be adequate. Should the sieves still not be fully clean, however, this number can be altered. Between 1 and 10 backwashes per cycle can be programmed.

- Press arrow key ◀ once to display 'backwash' menu.
- Activate using +/- keys (display blinks)
- Select number of backwashes required using +/- keys. Confirm with the OK key.

The values set are now stored.

6.7 Setting the opening times for the magnetic valves

Use the **arrow key** ◀ to reach the menu „magnetic valve opening times“. Use the +/- keys to set the hour and then move using the **arrow key** to set the minutes (display blinks). Press key again to display upper value.

- pushing the **arrow key** ◀ will move you to the next menu point.
- The lower value is set here: e.g. display shows “MV 10s down”
- Set seconds required using +/- keys and confirm with OK.

6.8 Setting the weekly timer

Weekly timer settings are fixed in the next menu point. The display shows the current timer status (TS#01) in the upper right hand corner followed by the weeks as in numbers (12345) below that and then the days activated (SMDMDFSa). The lowest line contains the On and off times (HH:MM). Day and weeks appear in bold script when activated.

- Pressing the **arrow key** ◀ activates a menu displaying „select switch T1 –T3“
- Press **arrow key** ◀ Display shows ‘T1 on’
- Set using +/- keys (time display blinks) The on-time for weekly timer 1 is now set.
- Confirm with OK
The display now shows the following series (example):

	B049:TS	#01	
Weeks	12345	1.	
Day	SMDMDFSa		Sunday, ...
Time	10:00	→ EIN	

- The cursor can be moved in the lower 3 lines using the **arrow keys** ◀ ▲ ▼ ▶
- The week line is used to select the week in which backwash should take place (1 = each first week in the month, 2 = each second, etc. 12345 = every week).
- Use the +/- keys to activate or deactivate the week required. If a week is deactivated, it will be replaced in the display with a (-).
- The same method is used to select weekdays. Again if a day is deactivated the display shows (-).
- The bottom line is for time settings. Use the +/- keys to set hours and minutes individually.
- Once all data has been entered, press OK to store. The word „write“ appears in the display. The menu is then moved on using the **arrow key** ◀ . „T1 off“ appears on the display.

The display now shows the following series (example):

	B049:TS	#02	
Weeks	12345	1.	
Day	SMDMDFSa		Sunday, ...
Time	10:01	→ AUS	

Programing in #02 runs analog to timer on function. Please note that values for Week and day must be identical in #01 and #02.

The values shown in time time line for #02 must be 1 minute after values in #01. in this example a backwash is run every week (weeks 1–5 are active), every weekday (all days are active) and at 10:00 hrs.

- Confirm using OK. Values are now stored
- Move to next menu point using **arrow key** ◀

The next menu point offers two further timer options and can be used for additional backwashing. If this feature is not required, then it must be switched off by cancelling either every week or every day on the display.

Information



The SPC control requires two sets of input per backwash:
Backwash on and, 1 minute later, backwash off.
These are, for example Timer #01 (on) and #02 (off).

6.9 Setting backwash interval

Use arrow key ◀ to move to next menu point. Display shows either „interval on“ or „interval off“ depending on current status.

- Confirm with OK
Display now reads as follows (standard interval off mode):

OK=Ein/Aus
Interval.Aus

- Press OK to alter.
- Use arrow key ◀ to move to next menu point.

Intervall:
1000 min

Interval times of between 30 mins and 1,080 mins. (7 days) can be set here.

- Intervals may now be set using the +/- keys
- Confirm with OK
- Press arrow key ◀ twice to return to start screen

6.10 Time and date settings

Time and date can be entered as follows:

- Press ESC and OK down together
- Keep pressing the arrow key ▼ or ▲ until menu „set clock“ appears on the display.
- Press OK twice to confirm
- Set values using the +/- keys.
- Press OK to store and leave the menu.
- Press ESC twice until the display return to operational mode.

7.1 Spare parts list

Order number	Description	Quantity
1510162	Control unit JSK V	1
1510149	Fuse 630 mA 250 VAC for control JSK V (primary)	1
1500382	Fuse 2,5 A 250 VAC for control JSK V (primary)	1
1510165	Linear drive ECOMAG 24 VDC	1
1610011	Differential pressure manometer 0 - 2,5 bar	1
1510022	Magnetic valve 230 VAC/50 Hz, 8 W, 0 - 10 bar, G 1/4"	1
1200347	Membrane (EPDM) for metallic membrane valver (for DN 125)	1
1200348	Membrane (EPDM) for metallic membrane valver (for DN 150)	1
1200349	Membrane (EPDM) for metallic membrane valver (for DN 200)	1
1610010	Mini ball valve G 1/4"	2
2635108	Viewing glass	4
1635102	Seal d=130x105x2 (for DN 125)	2
1636102	Seal d=155x130x2 (for DN 150)	2
1637102	Seal d=180x160x2 (for DN 200)	2
1637135	Seal d=122x70x4 (for DN 150)	1
1200042	Seal d=138x80x4 (for DN 200)	1
1635117	Permatite seal	1
2635104	Profile seal 780 mm (for DN 125)	2
2636104	Profile seal 930 mm (for DN 150)	2
2637104	Profile seal 1.220 mm (for DN 200)	2
1635107	O-Ring 60x5	4
1635115	O-Ring 20x2	2
2635126	Elliptical rubber seal (for DN 125)	2
2636126	Elliptical rubber seal (for DN 150)	2
2637126	Elliptical rubber seal (for DN 200)	2
1100018	Tubing, blue 80 °C	2 m
2748110	* Sieve inserts 0,10 mm (for DN 125)	2
2748111	* Sieve inserts 0,10 mm (for DN 150)	2
2748112	* Sieve inserts 0,10 mm (for DN 200)	2

* Other sizes available on request

7.) Operation

7.2 Control

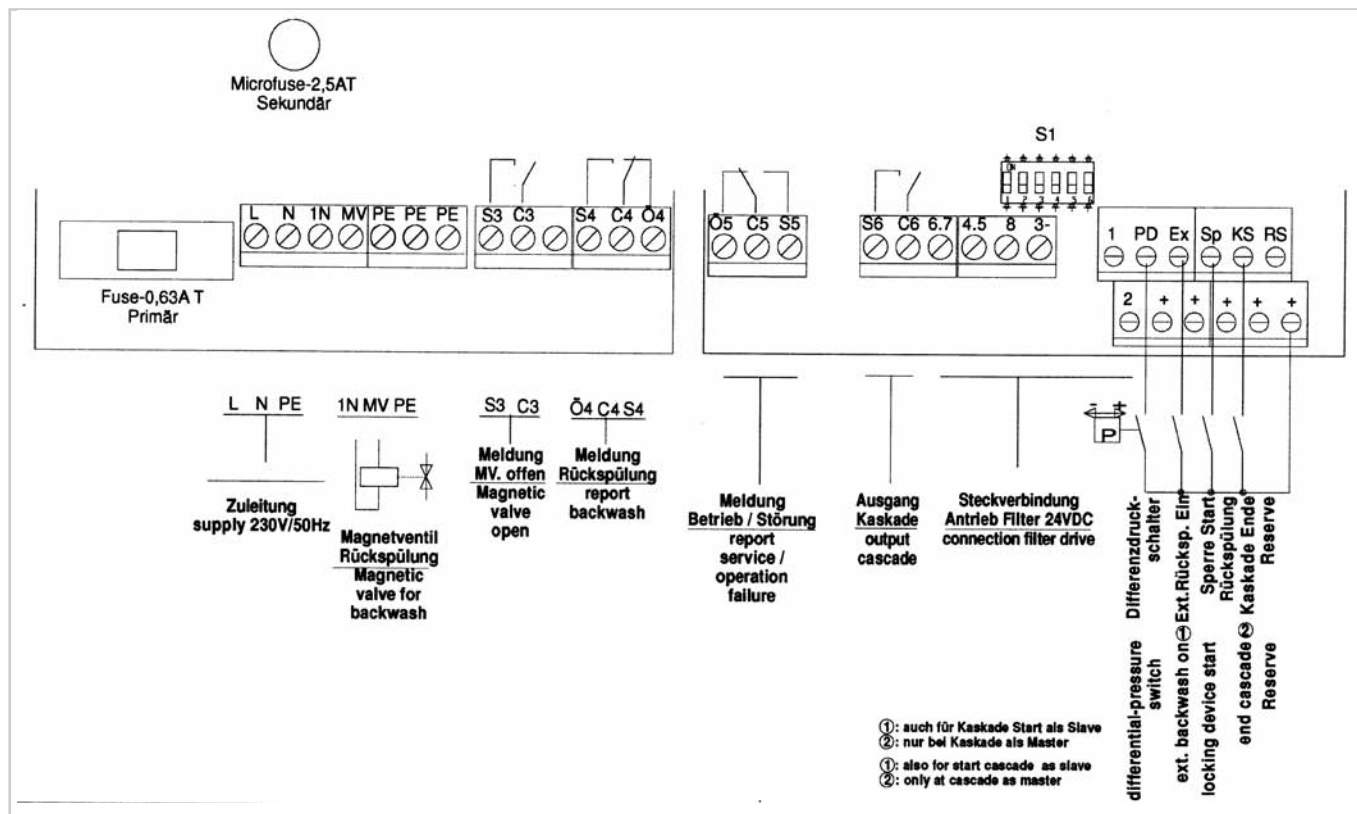
A thorough optical examination of the unit should be made at regular intervals depending on the application used. Use the viewing glass to inspect the level of build-up on the filter sieve and start a backwash manually where required.

7.3 Maintenance

Your JUDO Backwash Protective filter represents a major investment in the quality of your installation. In order to ensure maximum operating efficiency of this unit, JUDO strongly recommend regular maintenance to be carried out by trained personell or by a maintenance company qualified to do so.

7.4 Tips for error reports

Error	Alert in Display:	Cause:	Solution:
Automatic backwash does not start		no power	Check power supply Check fuses
Automatic backwash stops unexpectedly	„Störung Hall“	Hall sensor connection is interrupted	Check connections to control and call customer service
Heavily load build-up on sieves		High dirt inflow level	Start manual backwash and check differential pressure settings.
Differential pressure ramins high Backwash Signal is on for too long	„Störung- - Diff.druck/Extern- -“	Water pressure to low resulting in blocked sieves.	Increase flow pressure
Etternal start up signal active for too long	„Störung- - Diff.druck/Extern- -“	Should not run without interruption for more than 5 mins. Or the time required for 10 backwashes.	Terminate signal



8. Wiring diagram



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