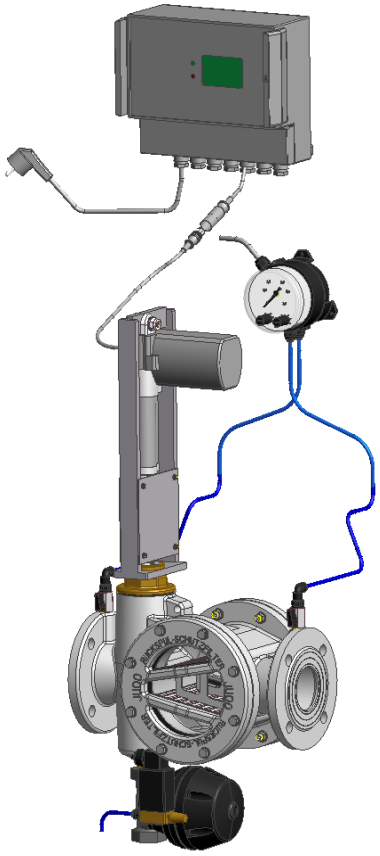
Installation and Operating Instructions

JUDO Backwash Protection Filter
JRSF-HW-A-TP DN 65 - 100



CE

Please transfer to the operator.
Please read carefully before installation and commissioning!
Subject to technical changes.

Parts no.: 1703638

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Operating instructions: JUDO Backwash Protection Filter JRSF-HW-A-TP DN 65 - 100

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Contents

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Wasser-
Aufbereitung

EU Declaration of Conformity

(Translation)

Document no. 166/08.11

Manufacturer: JUDO Wasseraufbereitung GmbH

Address: Hohreuschstraße 39 - 41
D-71364 Winnenden

We declare that our product:

JUDO Automatic Backwashing Protection Filter
JRSF-A/TP 1“ – 2“, DN 65 – DN100, DN125 – DN 200

Is compliant with the EC Directives:

Electromagnetic Compatibility (EMC)	2014/108/EC
Low Voltage Directive	2006/95/EC

and the resulting standard requirements.

Harmonised standards:

EMC Directive

Electromagnetic Compatibility, generic standards for:

Emitted interference	EN 61000-6-2
Immunity to interference	EN 61000-6-3

Low Voltage Directive

Safety of transformers, power supply units and similar	EN 61558-1
Safety of electrical devices for household and similar purposes	EN 60335-1

Issuer: JUDO Wasseraufbereitung GmbH

Town, date: Winnenden, 03 August 2011

Authorised signature

JUDO Wasseraufbereitung GmbH

This declaration confirms compliance with the above Directives, but does not include any guarantee of properties.

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1 Introduction

Dear customer,
Thank you for the confidence you have shown in us by purchasing this device. In order for your device to have a long service life, we kindly ask you to observe the present installation and operating instructions. These installation and operating instructions contain all information for the installation, operation and maintenance of the device described.

We are endeavoured to keep you a satisfied customer and kindly ask you to contact our field service representatives or our factory located in Winnenden for any questions you may have concerning water treatment, e.g. concerning the possible addition of expansion stages of the installed system. If you have any queries, please specify the data that can be found on the type label.

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1.1 Symbols and their meaning

Symbol	Meaning	Symbol	Meaning
	Risk of injuries and accidents!		There is a peculiarity!
	Risk of malfunctions / damage to the device!		Read and understand the operating instructions!
	Mortal danger! Risk of electric shock!		Correct disposal of scrap!
	Warning of hot surfaces!		

Tab. 1: Symbols and their meaning

1.2 Warranty

The warranty shall only be deemed valid in accordance with our general terms of sale and delivery only if

- the device is used in accordance with the information contained in these operating instructions.
- the device is not handled improperly in any other way.
- the electronics of the control unit have not been opened and have not been manipulated.
- the operating conditions correspond to the technical specifications.
- repairs are only carried out by authorised technical personnel.
- only original spare parts are used for repairs.
- safety guards are used and these are not manipulated or removed.
- work is to be carried out only by trained and qualified technical personnel.

1.3 Intended use

The backwash protection filter described here is used to protect piping systems and downstream equipment in accordance with DIN 1988 in areas not at risk of explosion within the scope of the uses specified in these instructions by removing all coarse and fine-grained solid impurities that are larger than the mesh size used for the permanent filter inserts and which as aeration cells cause pitting corrosion.
Intended use also includes the reading of these operating instructions, adherence to all the safety conditions and instructions contained within them and the performance of inspection and maintenance work at the prescribed time intervals.

Attention

Other uses are not compliant with the intended use and not permitted!
JUDO Wasseraufbereitung GmbH will not be responsible for the resulting damage.
All persons who work with or on the device must have previously read and understood the operating instructions, in particular, the safety instructions!

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1.4 Duties of the operator

The operator of the system is responsible for the following:

- Having installation, operation, maintenance and inspection only carried out by authorised and qualified technical personnel.
- Training of the operating personnel.
- Having regular maintenance performed.
- Constant availability of the installation and operating instructions at the place of use.
- Performing regular visual inspection according to the conditions of use and the hazard potential to prevent leaks and damage.
- Regular inspection of the wear parts, if necessary by dismantling the diaphragm valve as well as selecting the cleaning medium and carrying out the cleaning.

1.5 General safety instructions

Warning

Any working methods that might endanger safety must be avoided!
Non-observation of these operating instructions and the safety instructions herein may pose a risk to persons, as well as to the environment and the device itself!

Warning

Danger due to hot surfaces or danger due to scalding!

The safety instructions do not take into account:

- Random happenings and events that may occur during installation, operating and maintenance,
- Location related safety conditions for the observance of which the operator is responsible, even for contract installation personnel.

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Attention

Conversions and modifications of the backwash protection filter and the control unit are prohibited for safety reasons!
Do not perform any changes, make any additions or carry out any conversions that could impair safety without the manufacturer's written approval!
Do not open or manipulate the backwash protection filter or the control unit!
The safety instructions of these operating instructions must be observed without fail!
Additional industry-wide and operational safety instructions remain in force!
Substances with a distinct character, e.g. alcohol, concentrated mineral acids, formic acid, phenol, m-cresol, tetrahydrofuran, pyridine, dimethylformamide as well as mixtures of chloroform and methanol must not be in the water to be filtered because these can cause damage to the plastic and thus result in danger of breaking!
Fault-free operation of the backwash protection filter and of the control unit is only ensured if original spare parts and components are used in the combination described in these operating instructions, otherwise there is a risk of malfunctioning or damage to the device or system components!
During operation, the housing of the backwash protection filter and its components as well as the control unit must be closed!
Only allow authorised technical personnel to carry out repairs!
Loose connections must be tightened immediately and damaged device components immediately replaced!
Never remove safety equipment or deactivate it by making changes to the system!
Without fail, the device must be switched to a voltage-free state, be secured against being switched on again, as well as be depressurised hydraulically and pneumatically for installation, maintenance, inspection and repair work and drained via the diaphragm valve!

Note

The installation and operating instructions must always be available at the place of installation of the backwash protection filter!

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Note

All persons involved in installation, commissioning, operation, maintenance, and servicing of the backwash protection filter must be appropriately qualified and trained and must have carefully read and understood these installation and operating instructions!

Attention

Electrical and electronic scrap must be disposed of in an environmentally friendly way by the designated disposal facility or specialist company!

1.5.1 Safety instructions for electrical systems and operating resources

Warning

Switch off mains voltage prior to intervention or work on voltage-carrying components and secure to prevent switching back on!
If this is ignored severe bodily injuries or even death may result!

Attention

Before opening the housing cover of the control unit, it must be ensured that no splash water is on the housing and can enter into the control unit!

Note

Tests, maintenance and repair work, which must be carried out when the control unit of the backwash protection valve is open and in an electrically live state must only be performed by trained and qualified electricians who are sufficiently familiar with the dangers associated therewith.
All work on electric systems must principally only be carried out by electricians certified according to an approved national scheme!

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1.5.2 Safety instructions for mechanical systems and operating resources

Warning

Before cleaning, maintenance, repair or replacement of parts on the backwash protection filter, it is essential to disconnect it from the power supply, secure it against being switched on again, depressurise it hydraulically and pneumatically and drain it via the diaphragm valve!
Only open the diaphragm valve when it is drained and depressurised!

Note

These activities may only be carried out by JUDO customer service or appropriate specialists who know and understand the entire system of the backwash protection filter and its environment!

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2 Transport/scope of delivery

Transport:

- Transport the device with caution; do not throw!
- Protect the device against the effects of course dust and dirt!

Scope of supply:

- Backwash protection filter made of high-quality grey cast iron, PN 10, with flanges, coated with plastic (Rilsan) for corrosion resistance, two filter chambers incl. ¼" internal threaded connector for differential pressure gauge
- 2x permanent filter inserts, mesh size 0.32 mm (stainless-steel filter and support fabric)
- Linear drive 24 VDC incl. 2.5 m connection cable with 8-pin plug
- JSK V control unit incl. 1.3 m connection cable 3G 0.75 mm² with mains plug
- JUDO differential pressure gauge 0 - 2.5 bar incl. required connection components
- Metal diaphragm valve
- Direct-acting 3/2-way solenoid valve with manual activation incl. silencer
- Installation and Operating Instructions

Note

Using your order, check the supplied components for completeness and sound condition!
The product is supplied fully assembled!
Damage caused by transport must be reported within 24 hours, otherwise no damage claims can be settled for insurance reasons!

Storage:

Attention

Dry, frost-proof storage location with aggressive atmosphere!
Protect the device against the effects of course dust and dirt!
Avoid UV radiation and direct sunshine!
Permissible storage temperature: 4°C to 40°C!

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3 Product information

3.1 Manufacturer and type

Manufacturer:

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Type: JUDO backwash protection filter JRSF-HW-A-TP DN 65 - 100

3.2 Models

Model	Control function	Order no.
JRSF-HW-A-TP DN 65 (0.32 mm MW)	Time and differential pressure controlled	8052505
JRSF-HW-A-TP DN 80 (0.32 mm MW)	Time and differential pressure controlled	8052506
JRSF-HW-A-TP DN 100 (0.32 mm MW)	Time and differential pressure controlled	8052507

Tab. 2: Models

Note

JUDO backwash protection filter JRSF-HW-A-TP DN 65 - 100 with custom mesh size (0.5 mm or 1.0 mm) upon request!
The backwash protection filters described here have been developed and tested according to the requirements of DIN 19632 for mechanical filters and correspond to the technical rules for drinking water installations in accordance with DIN 1988!
The materials and protective coatings used are resistant to the physical, chemical and corrosive loads expected to be encountered in drinking water and fulfil the specifications required by DIN 19632 (Mechanical filters for drinking water installations)!
All materials, protective coatings and auxiliary supplies are hygienically and physiologically harmless!
Plastics and non-metallic materials fulfil the requirements and recommendations of the German Health Authority (KTW recommendations (Recommendations for the Hygienic Assessment of Organic Materials in Contact with Drinking water))!

3.3 Dimensions

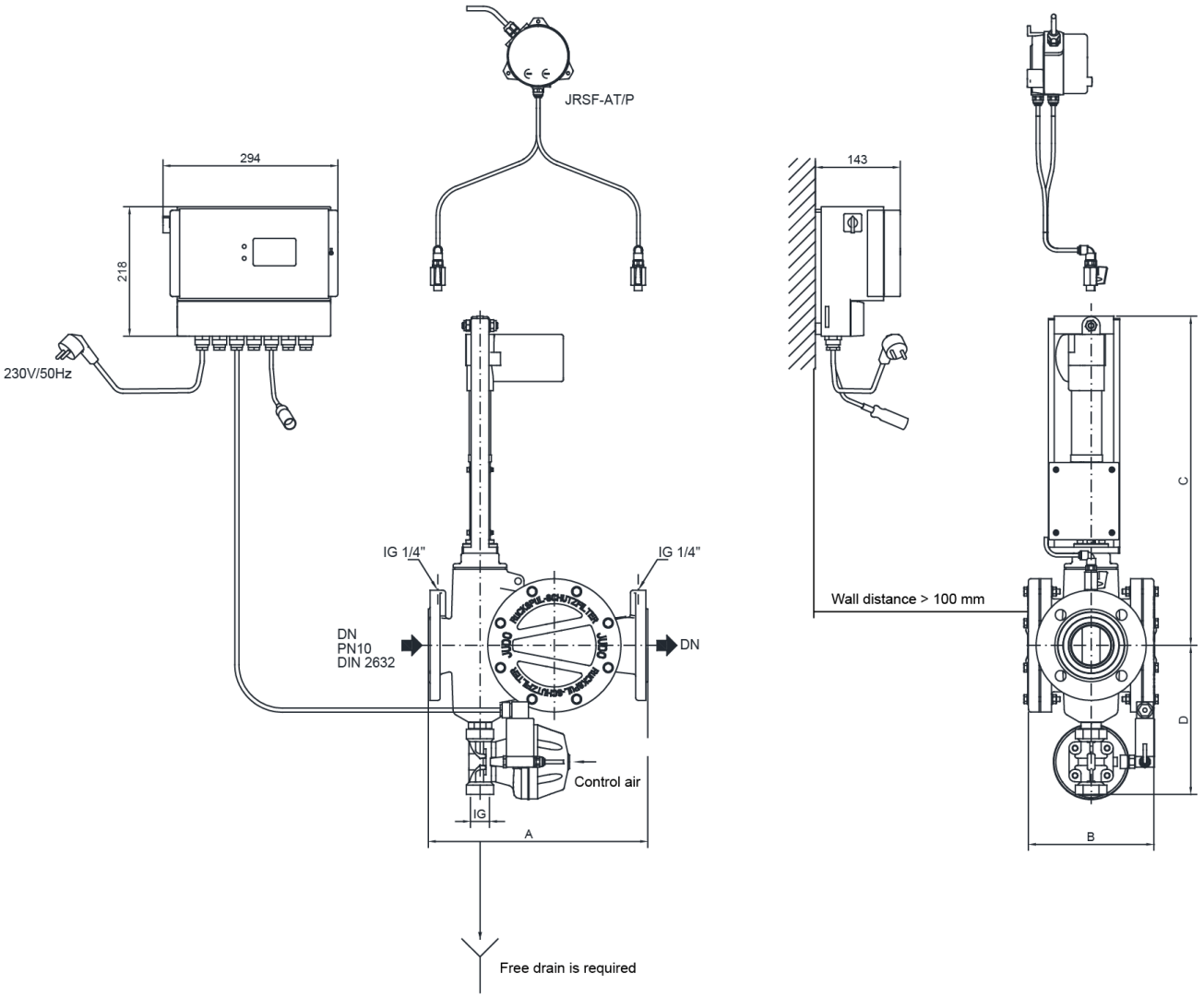

Fig. 1: Dimensions in mm

Model	A	B	C	D	Inlet/outlet	Internal thread
JRSF-HW-A-TP DN 65	370	211	554	251	DN 65	1“
JRSF-HW-A-TP DN 80	370	211	554	251	DN 80	1“
JRSF-HW-A-TP DN 100	414	240	576	287	DN 100	1¼“

Tab. 3: Dimensions in mm

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3.4 Technical data

Model JRSF-HW-A-TP	DN 65	DN 80	DN 100
Rated flow* [m³/h] at 0.2/0.5 bar pressure loss	30/40	33/48	51/72
Max. permissible operating pressure [bar]	10	10	10
Min. required flow pressure [bar]	1.5	1.5	1.5
Pressure loss after backwashing * [bar]	0.2	0.2	0.2
Max. permissible differential pressure [bar]	0.5	0.5	0.5
Required backwash water flow rate [l/s]	approx. 4.2	approx. 4.6	approx. 7.1
Backwash water volume per complete backwash [l]	approx. 84	approx. 92	approx. 142
Maximum permissible medium temperature [°C]	85	85	85
Permanent filter insert mesh size [mm]	0.32	0.32	0.32
Pipe connection inlet/outlet flange (DIN 2632)	DN 65	DN 80	DN 100
Flushing water connection, diaphragm valve	R 1“ internal thread	R 1“ internal thread	R 1¼“ internal thread
Control medium required on site	Control air	Control air	Control air
Required control pressure [bar]	5.5 - 7.0	5.5 - 7.0	5.5 - 7.0
Electrical connection (via mains socket) [VAC/Hz]	230/50	230/50	230/50
Max. on-site back-up fuse, control unit [A]	10	10	10
Internal device fuse, primary/secondary [A]	0.63T/2.5T	0.63T/2.5T	0.63T/2.5T
Max. power consumption, control unit [W]	60	60	60
Max. load, potential-free relay contacts [VAC/A]	250/2	250/2	250/2
Control unit, degree of protection (in the case of closed housing cover)	IP 54	IP 54	IP 54
Electrical connection, linear drive [VDC/A]	24/5	24/5	24/5
Max. push/pull force, linear drive [N]	6000/4000	6000/4000	6000/4000
Power consumption, 3/2-way solenoid valve [W]	8	8	8
Switching times, 3/2-way solenoid valve [ms]	8 - 15	8 - 15	8 - 15
3/2-way solenoid valve connection [“]	¼ int. thread	¼ int. thread	¼ int. thread
3/2-way solenoid valve sealing material	NBR	NBR	NBR
Degree of protection, 3/2-way solenoid valve (with the unit plug fitted)	IP 65	IP 65	IP 65
Diaphragm material, diaphragm valve	EPDM	EPDM	EPDM
Volume, diaphragm valve [l]	0.15	0.15	0.35
Empty weight (incl. diaphragm valve) [kg]	48	49	62

Tab. 4: Technical data

* Related to drinking water with a clean filter, technical advice is required for process water or heavily contaminated water!

Note

To obtain an effective backwashing outcome, a flow pressure downstream of the backwash protection filter of at least 1.5 bar as well as a backwash water flow that corresponds to approx. half of the rated flow are required!
This can be achieved by means of a site-provided pump upstream of the filter or by a site-provided shut-off valve for regulation of the filter outlet for example!

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3.5 Application

The backwash protection filter removes all coarse and fine solid impurities, that are bigger than the mesh size of the permanent filter inserts used and which as aeration cells cause pitting corrosion and consequently can result in malfunctions of valves, control and regulating devices as well as sensitive devices.
The two alternatively switching filter chambers enable backwashing with filtered water without interruption of operation. Hence this backwashing system enables cleaning of the permanent filter inserts, without unfiltered water simultaneously being able to reach the pure water side and consequently the downstream building installation.

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4 Function description

The functional sequence of a backwash takes place automatically (time or differential pressure controlled) by the electrical control unit of the JUDO backwash protection filter. Here, the linear drive controls the filter flap to the "operation" and "backwash" position based on the pulses from the Hall effect sensor. These are factory-set to the size of the JUDO backwash protection filter. Via the control of the 3/2-way solenoid valve, the diaphragm valve is opened by means of control air provided by the customer and the backwash water is discharged into the sewer.

Operation:
If the filter flap controlled via the linear drive is in the operating position, the raw water to be filtered flows through both filter chambers, whereby all impurities that are larger than the mesh size of the backwash protection filter used are retained on the permanent filter inserts. When doing so, the diaphragm valve is closed.

Backwash of the filter chambers:
If the filter flap is brought into the backwash position for filter chamber 1 via the linear drive and the diaphragm valve is opened by means of on-site control air via the 3/2-way solenoid valve, the impurities on the permanent filter insert of the 1st filter chamber are flushed out via the diaphragm valve. At the same time, the 2nd filter chamber remains operating so that filtered water can continue to be withdrawn.
If the linear drive switches the filter flap to flush the 2nd filter chamber, the impurities on the permanent filter insert of the 2nd filter chamber are flushed out via the diaphragm valve. At the same time, filtered water can be withdrawn via the 1st filter chamber. After completion of the backwash, the linear drive switches the filter flap to the operating position and the diaphragm valve is closed by the 3/2-way solenoid valve.

Note

To obtain an effective backwashing outcome, a flow pressure downstream of the backwash protection filter of at least 1.5 bar as well as a backwash water flow that corresponds to approx. half of the rated flow are required (observe Chap. 3.4)!
If these values are undershot, for example, if there is a free outlet downstream of the backwash protection filter or if open circuits exist (cooling circuit), then adequate backwashing results are no longer guaranteed!

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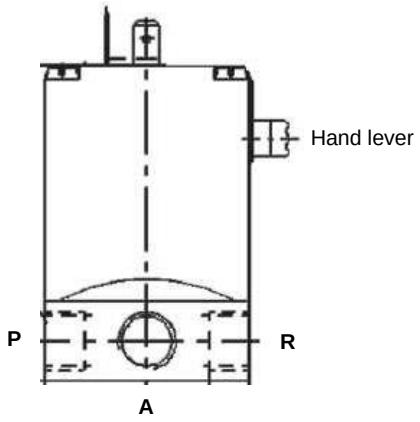
Dependent on the degree of soiling of the permanent filter inserts of the backwash protection filter, multiple backwashing processes may also be necessary!

4.1 3/2-way solenoid valve



Pin assignment:
A = Diaphragm valve (observe chap. 4.2)
P = Control air (on site)
R = JUDO silencer

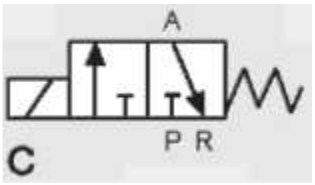


Fig. 2: 3/2-way solenoid valve

Note

Use PTFE tape for the connections on the 3/2-way solenoid valve!

The valve used is designed as a direct-acting 3/2 folding armature solenoid valve, pre-assembled at the factory and serves as a pilot valve for the diaphragm valve. The magnet system and the medium chamber are separated from each other by a separating diaphragm system. Output A is discharged in the de-energised state. The valve has a long service life even when running dry and is suitable for neutral, abrasive and slightly contaminated media (e.g. water, compressed air, city gas, hydraulic oil, oils and greases without additives). The nominal operating mode is designed for continuous operation 100 % ED. The hand lever can be locked after pressing it by turning it clockwise. As soon as the linear drive has reached its end position for backwashing the respective filter chamber, the 3/2-way solenoid valve opens for the time programmed under parameter "MV Top" or "MV Bottom".

4.2 Diaphragm valve

The diaphragm valve is opened by the 3/2-way solenoid valve by means of control air when the backwash protection filter is backwashed and discards the resulting backwash water into the sewer. After the backwash process, it is closed again by the 3/2-way solenoid valve. Actuation takes place via a low-maintenance diaphragm drive.

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The diaphragm valve is insensitive to media containing particles and is suitable for neutral, gaseous and liquid media that do not negatively affect the physical and chemical properties of the housing and diaphragm material.

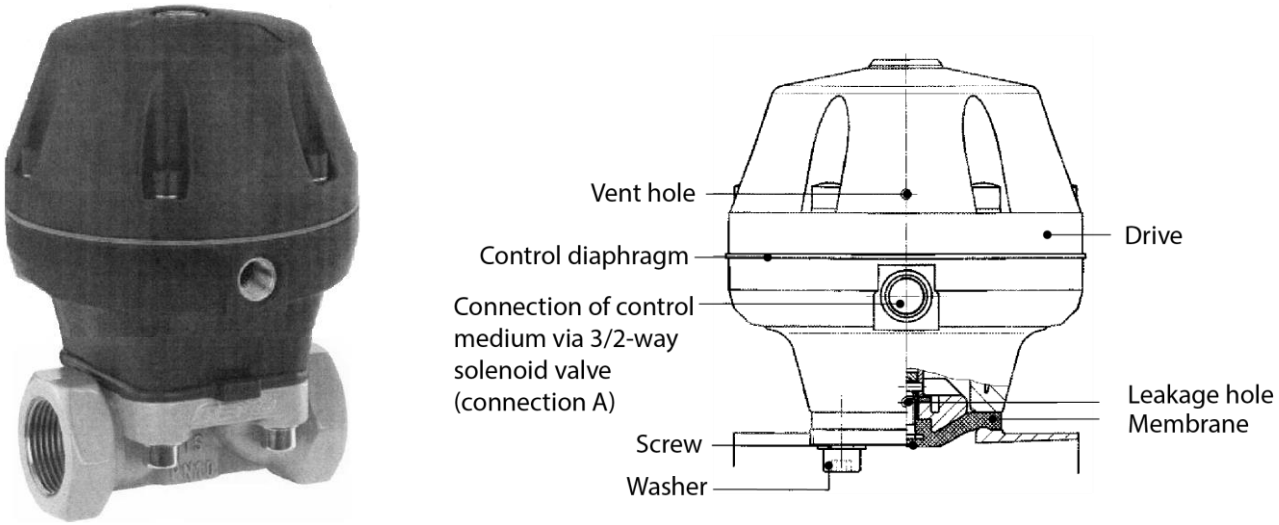

Fig. 3: Diaphragm valve

The direction of flow of the operating medium and the installation position of the diaphragm valve are arbitrary. In the idle state, the diaphragm valve is closed by spring force. The diaphragm valve opens when the drive is activated by control air. Venting the drive through the 3/2-way solenoid valve causes the diaphragm valve to close by spring force.

4.3 TP control

Filtered out impurities from the raw water remain on the permanent filter inserts so that there is an increased differential pressure between filter inlet and outlet which is registered by the differential pressure gauge. If the differential pressure reaches the value set for S1 on the differential pressure gauge and remains there for at least 20 seconds, the triggering of the automatic filter backwash is released to the control unit via microswitch S1.

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Note

As there is only a differential pressure at the filter in flowing water, the triggering of the backwash by the differential pressure gauge only takes place during water consumption!
The differential pressure controlled backwash has priority over the weekly timers or the interval flush!
The weekly timers are not affected by the differential pressure controlled backwash!
During long idle periods, backwashing is carried out time-dependently via the programmable weekly timers or interval flushing of the control unit, whereby these must be adapted to the conditions and requirements on site!
Backwashing should be carried out at least once a month!
If the differential pressure is still present after the 10th backwash or after approximately 5 minutes, a fault indication is issued and the control unit locks the system!
If the differential pressure does not reduce, the cause must be cleared, the control unit briefly switched off and the fault indication acknowledged with the △ key!

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4.3.1 Differential pressure gauge

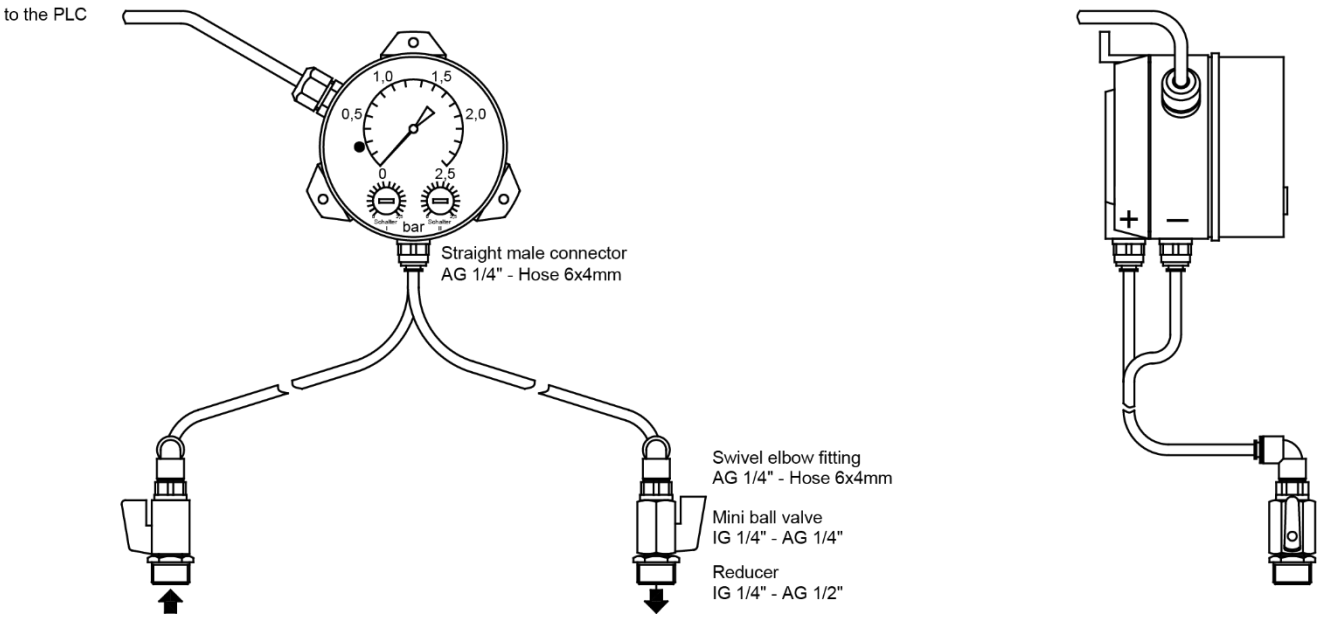

Fig. 4: Differential pressure gauge

Note

Please observe the separate installation and operating instructions of your JUDO differential pressure gauge!

The differential pressure gauge is connected via the pressure-resistant control lines to the connection (+) in the filter inlet and connection (-) in the filter outlet and registers an increased differential pressure between the filter inlet and outlet. If the differential pressure reaches the value set for S1 on the differential pressure gauge, a signal for automatic triggering of the filter backwash can be detected via microswitch S1. A fault indication can optionally be detected via microswitch S2 when its set value S2 is reached.
If necessary, the zero point must be adjusted via the correction screw, and the control lines must also be vented before commissioning.

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5 Installation

Attention

In the event that a device or supply-line leak at the installation site could cause severe damage, it should be ensured that, when personnel are not present, the water is blocked off upstream from the system!

5.1 Requirements for the place of installation

- The JRSF backwash protection filter must be installed in a dry, frost-proof location not at risk of explosion with a non-aggressive atmosphere.
- If a lot of condensation occurs at the installation site, a suitable dehumidifier must be provided on site.
- An electrical connection (on-site mains socket 230VAC/50Hz), which has been made by an electrician that has been certified according to an approved national scheme subject to the adherence of relevant and applicable VDE and local EVU regulations, should be available in the immediate vicinity of the control unit of the backwash protection filter (observe Chap. 3.4).
- The required control air for actuating the diaphragm valve via the 3/2-way solenoid valve must be provided on site (observe Chap. 3.4).
- A waste-water connection required in accordance with DIN 1986 (e.g. floor drain) that is at least one size greater than the flushing water connection on the respective diaphragm valve of the backwash protection filter must be available in order to be able to take on the backwash water without backing up occurring. The flushing water connection requires a free outlet!
- If a waste water connection directly beneath the backwash protection filter is not possible, the backwash water can be drained away via a pipe that is connected from the flushing water connection over a few metres to the closest waste water connection. This line must be of the same size as the respective flushing water connection and routed so that it slopes continuously downwards to the sewer, while a clear outlet is created above the waste water connection.
- If a retention basin is set up because the waste water connection is too small, then it must be capable of taking on the amount of accumulating backwash water during a backwashing process. Likewise a free outlet above the retention basin must be maintained!
- If a retention pond (pump sump) is installed for the backwash water, it must be ensured that the pump used there can drain the backwash water off even in the event of several sequential backwashing processes and/or that an alarm is triggered upon “overfull” of the retention pond.

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5.2 Installation notes

Attention

In order to avoid malfunctions, the direction of flow indicated by the arrow on the backwash protection filter must always be adhered to!

- The backwash protection filter can be connected with standard commercial fittings and valves to the water mains (horizontal or vertical pipes), but must not be installed into a suction pipe.
- Install the backwash protection filter at a well accessible site for simple operation and maintenance (clearance of at least 250 mm between the filter cover and, for example, a wall, is necessary to permit replacement of the permanent filter inserts in a problem-free manner).
- Fit the control unit at the central suspension arrangement on the housing rear and the two fastening holes left and right beneath the terminal cover so that it is horizontal on a level wall so that it is no more than 2 m away from the linear drive of the backwash protection filter.
- For JRSF-A-TP DN 65 - 100, connect the control line of the differential pressure gauge to the connection (+) in the filter inlet and to the connection (-) in the filter outlet.
- Installation position of the 3/2-way solenoid valve preferably with the drive upwards.
- Route and connect the hose for the control medium so that it is free of tension and kinks.
- The indicated operating data must be complied with.
- The backwash protection filter must be protected against frost.
- Separate installation and operating instructions pertaining to other devices, systems and system components must be observed.
- Install connections of the backwash protection filter free of mechanical stress.
- The pipes, to which the backwash protection filter is connected, must be safeguarded on-site with regard to net weight by taking appropriate measures.
- Shut-off valves must be fitted on site upstream and downstream of the backwash protection filter so that it can be switched to a depressurised state or in order to disconnect it in preparation for repair, replacement or checking of the piping network.
- Site-provided shut-off valves must be installed in the filter inlet and outlet such that they are not disabled when installing or removing the filter (e.g. do not install any butterfly valves directly upstream or downstream from the backwash protection filter).
- If the backwash protection filter is installed in vertical piping, the backwash water can be deflected downwards through a site-provided elbow mounted to the flushing water connection.
- Do not use the diaphragm valve as a step or climbing aid; risk of damage to the diaphragm valve and slipping.

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- Observe DIN 1988.
- Do not install the backwash protection filter and especially the control unit under dripping pipes.
- If the backwash protection filter is connected to the public water mains, installation upstream of the water meter is only permitted with the permission of the local water supply company.
- Observe technical information, local installation regulations and general guidelines (e.g. EVU, VDE, WVU, DIN, DVGW, ÖVGW, SVGW).

Problem solutions and other installation options can be clarified by a JUDO technical consultation.

5.3 Installation example

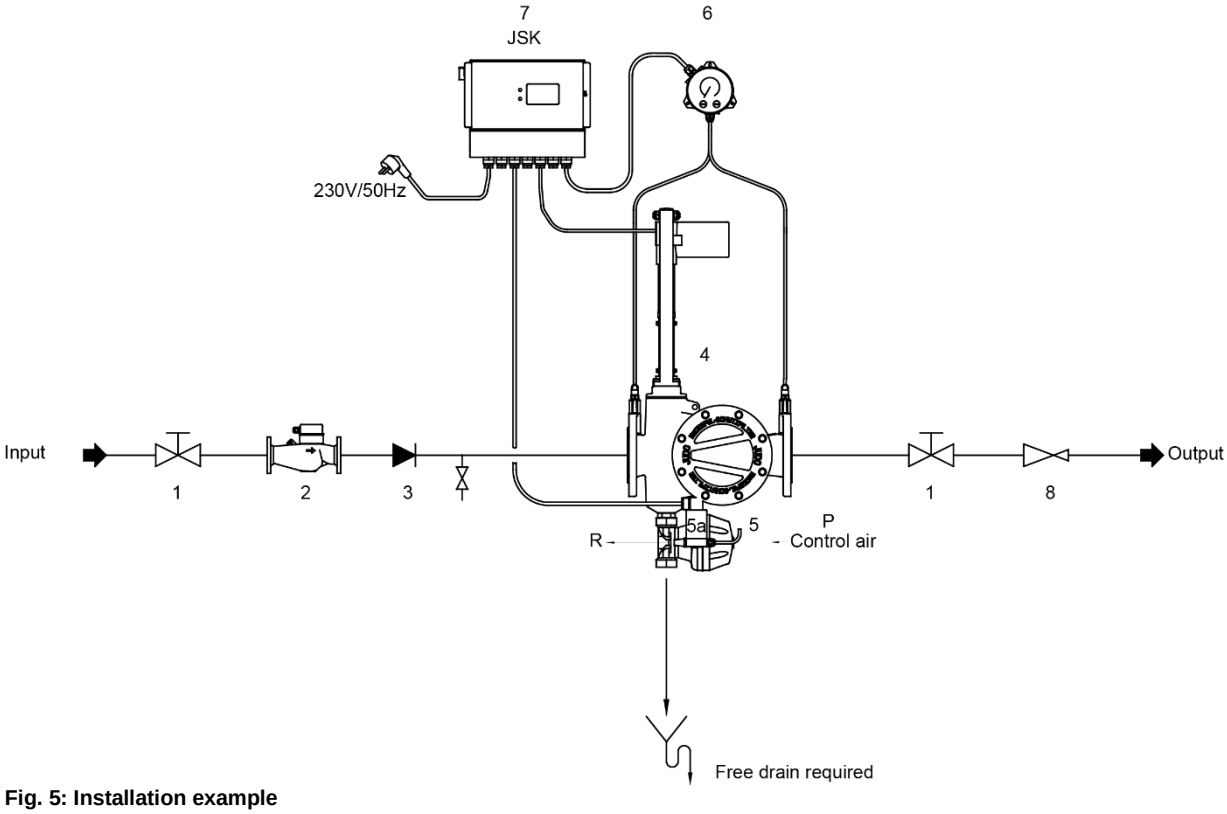

Fig. 5: Installation example

Item	Designation
1	Shut-off valve (provided on site)
2	Water meter (provided on site)
3	Backflow preventer (provided on site)
4	JUDO backwash protection filter JRSF-HW-A-TP
5	JUDO diaphragm valve
5a	JUDO 3/2-way solenoid valve
6	JUDO differential pressure gauge
7	Control unit JSK V
8	Pressure reducer (provided on site)

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6 Electrical connection

Warning

Switch off mains voltage prior to intervention or work on voltage-carrying components and secure to prevent switching back on!

Attention

The power supply must be provided by the customer via a circuit breaker!
Observe connection assignments!
The electrical connection can only be made when the system is in a voltage-free state!
Only potential-free switching contacts may be connected to the optional inputs of the control unit!
An external voltage must absolutely not be applied to these inputs!
All electrical connection lines must be routed in a cable duct or similar to protect them against external influences and tensile forces!
Avoid simultaneous pulsing of both coil windings of the 3/2-way solenoid valve!
Due to malfunctions, no other consumers (relays and the like) may be connected in parallel to the terminals of the 3/2-way solenoid valve!

Note

The electrical connection of the backwash protection filter must only be carried out by JUDO customer service or an electrician of an authorised specialist company that is certified according to the following terminal diagrams!
The mains connection cable with mains plug and the connection cable with 8-pin coupling plug for the linear drive are connected to the control unit at the factory!

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6.1 Inputs

Attention

The electrical connection can only be made when the system is in a voltage-free state!
Only potential-free switching contacts (normally open contacts) may be connected to the optional inputs of the control unit!
An external voltage must absolutely not be applied to these inputs!
Observe terminal diagrams!

Note

To trigger external backwashing via the "Ex" input, it must be closed by a potential-free normally open contact, e.g. of a building control system, for at least 3 seconds!

The various inputs of the control unit are to be assigned according to the required application.

Terminal:	Assignment:
PD / +	Differential pressure gauge
EX / +	Ext. NOC (e.g. from BMS)
SP / +	Ext. NOC (e.g. from BMS)
KS / +	C6 / S6 from last control unit (only with cascade operation)
RS / +	Spare

6.2 Outputs

Attention

Observe the max. load of the potential-free relay contacts (see Chap. 3.4)!

The various outputs of the control unit are to be assigned according to the required application.

Terminal:	Assignment:
1N / MV / PE	3/2-way solenoid valve
C3 / S3	Solenoid valve open message
C4 / S4	Backwashing message
C5 / S5 - C5 / Ö5	Operation message - fault
C6 / S6	EX / + from next control unit (only with cascade operation)

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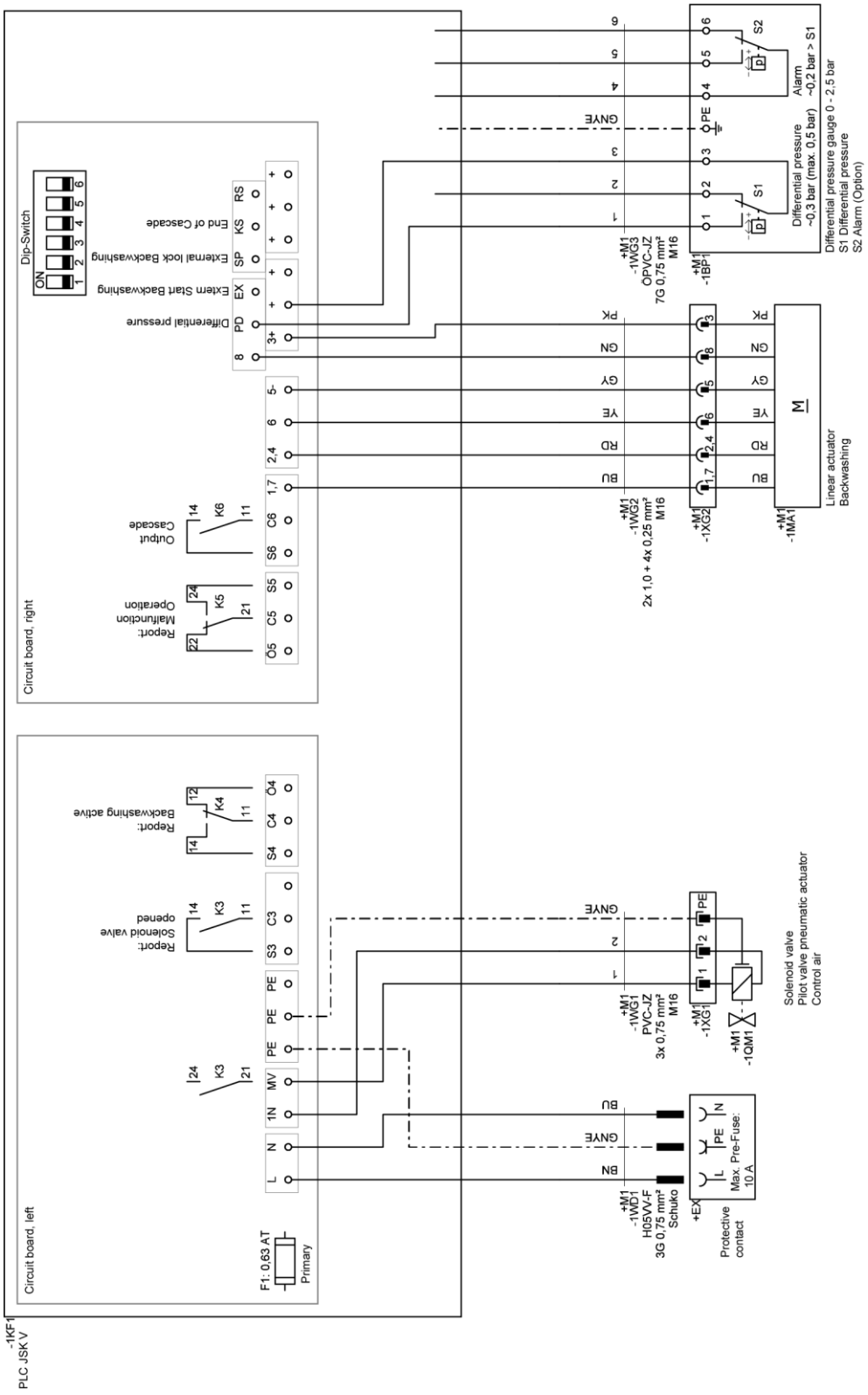

Fig. 6: Standard terminal diagram

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6.3 Cascade connection

Attention

If several backwash protection filters are operated in cascade, their electrical connection and in particular the setting of the DIP switches must be observed (see cascade connection terminal diagram)!
The DIP switches may only be switched when the control unit is de-energised!

Description:
In cascade operation, the 1st control unit takes over the master function.
The differential pressure gauge for triggering of differential pressure controlled backwashing is connected to the master control unit, all downstream control units (slaves) do not require a differential pressure gauge, because the master control unit activates the downstream control units via its cascade output and their "Ext. Backwashing Start" input in the event that backwashing triggering differential pressure exists.
If the set differential pressure exists at the differential pressure gauge, the 1st backwash protection filter is backwashed. During this time all other backwash protection filters remain in operation.
Once backwashing of the 1st backwash protection filter is completed, the master control unit issues the signal for backwashing to the 2nd control unit. In this way, all backwash protection filters are backwashed sequentially. After the last backwash protection filter has been backwashed, its control unit activates the "Cascade end" input of the master control unit. All backwash protection filters are again in operation.

Note

The following terminal diagram shows the function of the cascade connection! The power supplies of the control units, the connections of the 3/2-way solenoid valves, the protective earth connection of the differential pressure gauge as well as the taps of any desired fault indications are not drawn here, but must be carried out in accordance with the "Standard" terminal diagram (see Fig. 7) in compliance with the valid and relevant regulations of the VDE and the local EVU!

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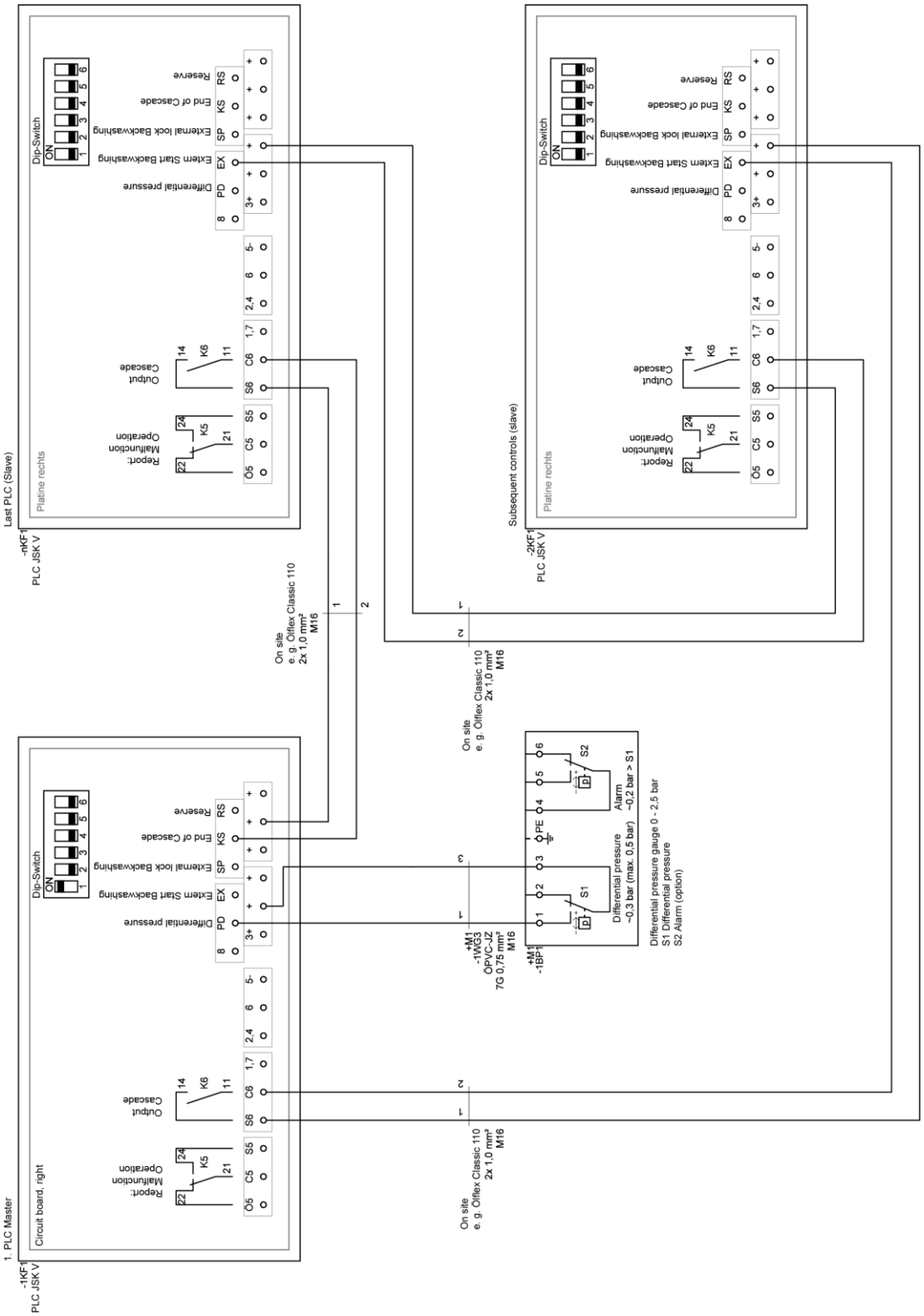

Fig. 7: Cascade connection terminal diagram

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7 Description of the control unit

The JSK V programmable logic controller must be adapted to the conditions and requirements on-site with regard to connection assignment (fault indications, cascade connection, etc.) and parametrisation and contains all the functions required for operation of the automatic backwash protection filter.

Attention

Only the steps described in this chapter may be carried out to set the control unit, as any deviation from this can lead to immediate damage to the control unit or the backwash protection filter!
The DIP switches are only intended for cascade operation or service purposes by the JUDO customer service and may only be switched when the control unit is de-energised!

7.1 Display and control elements

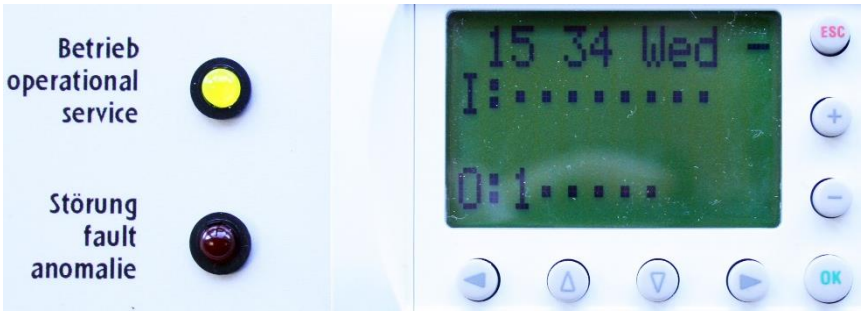

Fig. 8: Display and control elements

Key	Function
ESC	Back to the previous menu level
	Interrupt parametrisation
+/-	Activation of the selected parameter
	Increasing or reduction of a parameter value
OK	Saving of a changed parameter/parameter value
	Activation of the parametrisation of the weekly timer
▶	Triggering of manual backwashing (press for approximately 5 seconds)
	Move cursor to the right (programming of the weekly timer and expert level)
▽	Move cursor down (programming of the weekly timer and expert level)
△	Fault acknowledging
	Move cursor up (programming of the weekly timer and expert level)
◀	Step through menu levels
	Move cursor left (programming of the weekly timer and expert level)

Tab. 5: Key functions

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Note

During programming, if the set value of a parameter is not confirmed with the OK key within one minute, the display switches back to the status display without saving the changed value of the selected parameter!

7.1.1 Operating message

The operating message is indicated via the green LED on the left alongside the display and can be tapped via the potential-free relay contact (connection COM./N.O. see terminal diagram).

7.1.2 Fault indications

A fault indications is indicated via the red LED on the left alongside the display and can be tapped via the potential-free relay contact (connection COM./N.C. see terminal diagram). Here too an alarm signal also sounds.

Note

An existing fault must be rectified and acknowledged with the △ key!

Hall effect sensor:
If the Hall effect sensor has a fault during backwashing (e.g. due to a disconnected coupling or damaged connecting cable), “Hall fault” is output to the display.

Note

A backwash that has been started is not terminated after the fault has been rectified and acknowledged, but must be repeated manually if necessary (manual backwashing ▶ key)!

Differential pressure and external backwashing:
If the differential pressure gauge signal or an external request (e.g. via potential-free NOC of a BMS) for backwashing exists without interruption for longer than 5 minutes or for a duration of more than 10 backwashing processes, “Fault diff.press/External” is displayed. Increase the backwash flow pressure by suitable measures or end the external request and acknowledge the fault indication.

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7.1.3 Operating display

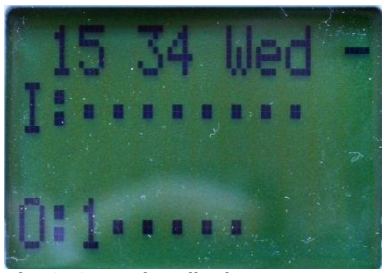

Fig. 9: Operating display

During operation the day of the week is displayed together with the current time.
Below this the activated or inactive inputs and outputs are displayed (here operating relay active, i.e. O:1).
As during backwashing the sequential pulses of the Hall effect sensor for movement of the linear drive are displayed, the inputs

Input Function (I)	Output Function (O)	Active	Inactive
Limit switch linear drive down	Operating relay or fault	1	▪
6-pin DIP switch	End cascade	2	▪
Hall effect sensor	3/2-way solenoid valve	3	▪
Differential pressure gauge	Backwashing	4	▪
Ext. Backwashing Start	Linear drive up	5	▪
Ext. Backwashing disable	Linear drive down	6	▪
End cascade		7	▪
Spare		8	▪

7.2 Power failure

In the event of a power failure, the control unit is in the same state after mains voltage restoration as it was prior to the power failure. The programmed parameters and time and date settings remain backed up in the memory of the control unit for approximately 14 days.

Attention

If there is a power failure during backwashing, the linear drive automatically starts when the mains voltage is restored in order to carry out the backwash already started!

Note

If a power failure occurs during programming, then upon mains voltage restoration the control unit is in the previously selected menu level, however without having saved the changed value of a parameter!

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7.3 Manual backwashing

If the ▶ key is pressed for approximately 5 seconds, the control unit triggers manual backwashing taking into consideration the values set under parameters “Backwash cycles” and “Opening times of the 3/2-way solenoid valve". “Backwashing” is output to the display while there is a serial pulse number.

Note

Triggering of a manual backwash is enabled in the menu level, however it is blocked during changing of a selected parameter!

7.4 Menu levels

With the ◀ key you can step through the menu levels. After the last menu item “ProgramVers.”, the menu is ended with a further key press.

Note

The menu levels must always be stepped through back to the status display, because it is not possible to escape with the ESC key!
The values displayed in the menu structure (see fig. 10) are examples and must be matched to the local circumstances and requirements!

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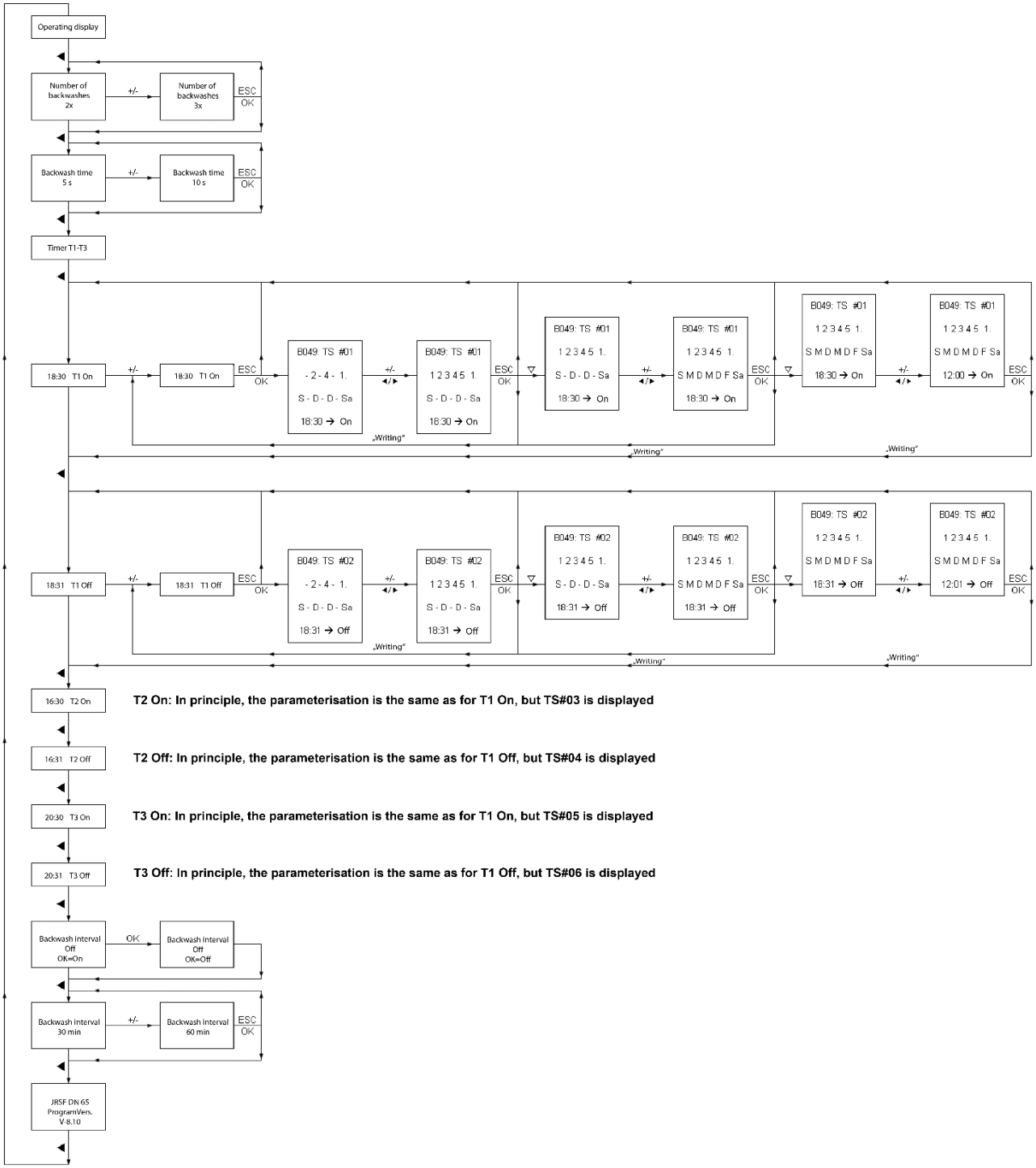

T2 On: In principle, the parameterisation is the same as for T1 On, but TS#03 is displayed

T2 Off: In principle, the parameterisation is the same as for T1 Off, but TS#04 is displayed

T3 On: In principle, the parameterisation is the same as for T1 On, but TS#05 is displayed

T3 Off: In principle, the parameterisation is the same as for T1 Off, but TS#06 is displayed

Fig. 10: Menu structure

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7.5 Backwash cycles

Note

The number of backwash cycles must be adapted to the conditions and requirements on site!
Up to 10 backwash cycles can be programmed!
If the differential pressure is still present after the 10th backwash or after approximately 5 minutes, a fault indication is issued and the control unit locks the system!
If the differential pressure does not reduce, the cause must be cleared, the control unit briefly switched off and the fault indication acknowledged with the △ key!
In the event of time-dependent backwashing, no fault indication is generated by the control unit after the 10th backwash, rather the backwashing outcome must be checked via the inspection glasses!

By default, three backwash cycles should be sufficient to clean the permanent filter inserts of the backwash protection filter.

1. Press the ◀ key to select the menu item "Flush", the display shows the currently programmed number of backwashes, e.g. "2xFlush".
2. Use the **+** or **–** key to activate the menu item; the number of backwashes starts to flash.
3. Use the **+** or **–** key to increase or reduce the number of backwashes.
4. Press the **OK** key to save the changed number of backwashes.
5. Press the ◀ key to continue to the next menu item “MV Top”.

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7.6 Opening times of the 3/2-way solenoid valve

Note

The opening times of the 3/2-way solenoid valve can be set to max. 60 seconds and must be programmed with the same time value for menu item "MV Top" and "MV Bottom"!

In this menu item, the times for activating the 3/2-way solenoid valve are programmed in order to open the diaphragm valve for this time by means of control air. Starting from the operating position (centre), the linear drive for backwashing the 1st filter chamber moves upwards to its limit stop and moves the filter flap into the required position. In the meantime, the sequential pulses are indicated in the display. Having arrived at the upper end position, the linear drive remains there for the programmed time, e.g. "MV 5s Top". After this time has elapsed, the linear drive moves to its limit stop displaying the sequential pulses and moves the filter flap into the required position for backwashing the 2nd filter chamber. Having arrived at the lower end position, the linear drive remains there for the programmed time, e.g. "MV 5s Bottom". Finally, the linear drive moves back to the middle and moves the filter flap to the operating position, indicating the pulses that are running. This process is repeated for the previously programmed number of backwash cycles.

7.6.1 MV Top

Starting from the previous menu item “Flush”, pressing the ◀ key displays the “MV Top” menu item.

1. Pressing the **+** or **–** key activates the menu item, the seconds number flashes.
2. The **+** or **–** key increases or reduces the number of seconds.
3. Press the **OK** key to save the changed number of seconds.
4. Press the ◀ key to continue to the next menu item “MV Bottom”.

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7.6.2 MV Bottom

1. Pressing the **+** or **–** key activates the menu item, the seconds number flashes.
2. The **+** or **–** key increases or reduces the number of seconds.
3. Press the **OK** key to save the changed number of seconds.
4. Press the ◀ key to continue to the next menu item “Timer T1 - T3”.

7.7 Weekly timers

The control unit has three weekly timers T1 - T3 for setting the backwashes. Thus a backwash can be individually matched to the local circumstances and requirements in respect of weekly interval, weekday and time.

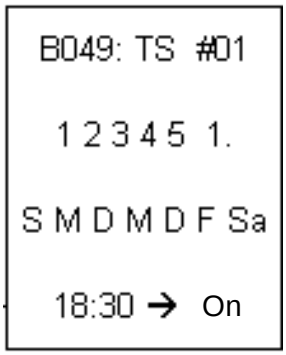

Fig. 11: Display indication T1 On Off

Time record TS: Here #01 and #02 for weekly timer T1

Weekly interval for backwashing

Day of the week for backwashing

Data record for backwashing On or Off time

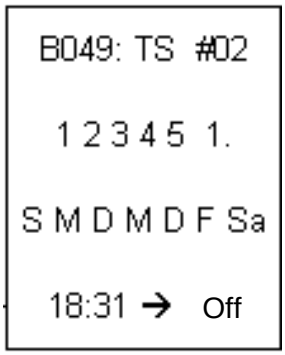

Fig. 12: Display indication T1

7.7.1 Weekly interval

If the menu item “Timer T1 - T3” is activated, then in the 2nd row of the display, the weekly interval of a backwash is indicated as a number value.
Here 1 = every 1st week, 2 = every 2nd week, 3 = every 3rd week, 4 = every 4th week and 5 = every 5th week in the month. Key ◀ or ▶ is used to navigate between the weeks, the respective selected week flashes. Key **+** or **–** is used to activate or deactivate a week (indicated by a horizontal line). If a backwash is to take place every week, all weeks must be activated.

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7.7.2 Day of the week

If the menu item “Timer T1 - T3” is activated, the weekdays are indicated in the 3rd row of the display.
Here S = Sunday, M = Monday, T = Tuesday, W = Wednesday, Th = Thursday, F = Friday and Sa = Saturday. Key ◀ or ▶ is used to navigate between the weekdays, the respective selected weekday flashes. Key **+** or **–** is used to activate or deactivate a weekday (indicated by a horizontal line). If a backwash is to take place every weekday, all weekdays must be activated.

7.7.3 Data record for start time and ending

Note

For the PLC logic, two data records per backwash time must always be programmed (e.g. TS #01 and TS #02 for weekly timer T1)!
The time for T1 - T3 On (TS #01, TS #03 and TS #05) is used as the start time for the respective backwashing (e.g. TS #01 18:30 → On)!
The time for T1 - T3 Off (TS #02, TS #04 and TS #06) is required for the PLC as an internal timer evaluation for ending of a respectively activated backwashing process and must always be selected 1 minute later than the backwashing start time (e.g. TS #2 18:31 → Off)!
The duration of the actual backwashing process is not influenced by this!
It must be ensured that the settings of the weekly intervals and the weekdays of the data records belonging to each other T1 On and T1 Off (TS #01 and TS #02), T2 On and T2 Off (TS #03 and TS #04) as well as T3 On and T3 Off (TS #05 and TS #06) are always identical!
Moreover it must be ensured that the function setting of the start time of data record TS #01, #03 and #05 is always set to → On while the stop time of data record TS #02, #04 and #06 is always set to → Off!

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Example:
The timer T1 (data record TS #01 and TS #02) is programmed here so that every week (12345) on every weekday (SMTWThFSa) a backwash takes place at 18:30 (18:30 → On).

Fig. 13: Example Timer T1

If the menu item “Timer T1 - T3” is activated, the time data record for the start of a backwash is indicated in the 4th row of the display. Key ◀ or ▶ is used to navigate between hours, minutes and the function setting (On or Off) of the respective data record, the respective selected item flashes here.
Keys **+** or **–** are used to increase the hours and minutes values and define the function setting (On = key **+,** Off = key **–**).

7.7.4 Data record weekly timer T1 On

Starting from the previous menu item “MV Bottom”, pressing the ◀ key displays the “Timer T1 - T3” menu item with a ticker help text displaying the procedure.

1. Pressing the ◀ key again causes the actual set time for T1 On to be output to the display, e.g. "18:30 T1 On".
2. Pressing the **+** or **–** key causes the currently set time to start flashing.
3. Pressing the **OK** key activates data record TS #01, the weekly interval setting flashes.
4. Key ◀ or ▶ is used to navigate between the desired week(s), here the respective selected week flashes.
5. Pressing key **+** or **–** activates or deactivates the selected week(s) (indicated by a horizontal line).
6. Press key ▽ to move a display line down to program the desired day(s) of the week.
7. Key ◀ or ▶ is used to navigate between the desired day(s) of the week, the respective selected weekday flashes.
8. Pressing key **+** or **–** activates or deactivates the selected day(s) of the week (indicated by a horizontal line).
9. Pressing key ▽ again moves down by one display line for programming the time of a time-triggered backwashing process.
10. Key ◀ or ▶ is used to navigate between the settings for hours, minutes and the function setting, here the respective selected item flashes.
11. Pressing key **+** or **–** programs the desired time as the start time for T1 On.

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Note

It must be ensured that the function setting of the time of data record TS #01 is always set to → On!

12. Press **OK** to save the settings for timer T1 On (“Writing” is indicated in the display).
13. Press the ◀ key to continue to the next menu item “Timer T1 Off”.

7.7.5 Data record weekly timer T1 Off

Starting from the previous menu item “T1 On”, pressing the key ◀ displays the “T1 Off” menu item together with the time currently set for the PLC logic, e.g. “18:31 T1 Off”.

1. Pressing the **+** or **–** key causes the currently set time to start flashing.
2. Pressing the **OK** key activates data record TS #02, the weekly interval setting flashes.
3. Key ◀ or ▶ is used to navigate between the desired week(s), here the respective selected week flashes.
4. Pressing key **+** or **–** activates or deactivates the selected week(s) (indicated by a horizontal line).

Note

It must be ensured that the settings of the weekly intervals of the data records belonging to each other T1 On and T1 Off (TS #01 and TS #02) must be identical!

5. Press key ▽ to move a display line down to program the desired day(s) of the week.
6. Key ◀ or ▶ is used to navigate between the desired day(s) of the week, the respective selected weekday flashes.
7. Pressing key **+** or **–** activates or deactivates the selected day(s) of the week (indicated by a horizontal line).

Note

It must be ensured that the settings of the days of the week of the data records belonging to each other T1 On and T1 Off (TS #1 and TS #2) must be identical!

8. Press the ▽ key again to move down by one display line and program the time for the PLC logic to complete a timed backwash.
9. Key ◀ or ▶ is used to navigate between the settings for hours, minutes and the function setting, here the respective selected item flashes.
10. Pressing key **+** or **–** programs the desired time as the stop time for T1 Off.

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Note

The time for the 2nd data record must always be selected to be 1 minute later than the time of the 1st data record (e.g. TS #01 18:30 → On, TS #02 18:31 → Off)!
It must be ensured that the function setting of the time of data record TS #02 is always set to → Off!

11. Press **OK** to save the settings for timer T1 Off (“Writing” is indicated in the display).
12. Press the ◀ key to continue to the next menu item “Timer T2 On”.

7.7.6 Data records weekly timers T2 and T3

Note

If necessary, the records for timer T2 (TS #03 and TS #04) and timer T3 (TS #05 and TS #06) must be programmed!
If the functions of the weekly timer T2 or T3 are not required, they must be switched off, in that either the weekly interval for TS #03 and TS #04 plus TS #05 and TS #06 or all days of the week for the respective two data records are deactivated (-------)!

If the weekly timers T2 and T3 are required for additional backwashing times, the programming for this must be performed analogously to that described in Chap. 7.7.4 and 7.7.5.

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7.8 Interval flushing

Note

The interval flushing takes priority over backwashing instigated via the weekly timers and is performed at the time programmed intervals from the start of activation (Interval On)!
Activation of the interval flushing automatically deactivates programmed weekly timers!

If the required backwashes cannot be covered by the three weekly timers of the control unit, as for example with extremely contaminated raw water, the backwashes can be performed via a programmable interval flushing. Thus for example, if it is necessary, backwashing can be performed every 2 hours. In this context, the timed interval can be programmed to any time between 30 - 10080 minutes.

Starting from the previous menu item “T3 Off”, pressing key ◀ displays the “Interval” menu item dependent on the current status ("Interval.On" or "Interval.Off").

1. Press the **OK** key to switch the interval flushing on or off.
2. Then select the interval time with key ◀.
3. Pressing the **+** or **–** key activates the menu item, the minutes number flashes.
4. The **+** or **–** key increases or reduces the number of minutes.
5. Press key **OK** to save the changed number of minutes.
6. Press the ◀ key to show the current program version of the control unit, e.g. "JRSF 125 ProgramVers. JRSF".
7. Press key ◀ again to exit the menu level and return to the status display.

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7.9 Expert level

Attention

Only the steps described in this chapter for setting the expert level may be carried out!
All menu items not described here are intended solely for JUDO customer service and must not under any circumstances be manipulated by other non-authorised persons or the operator!
In case of non-compliance, any warranty rights are void!
Any deviation from this can lead to immediate damage to the control unit, the software or the backwash protection filter!
JUDO Wasseraufbereitung GmbH will not be responsible for the resulting damage.

Note

The values displayed in the menu structure of the expert level are examples and must be matched to the local circumstances and requirements!

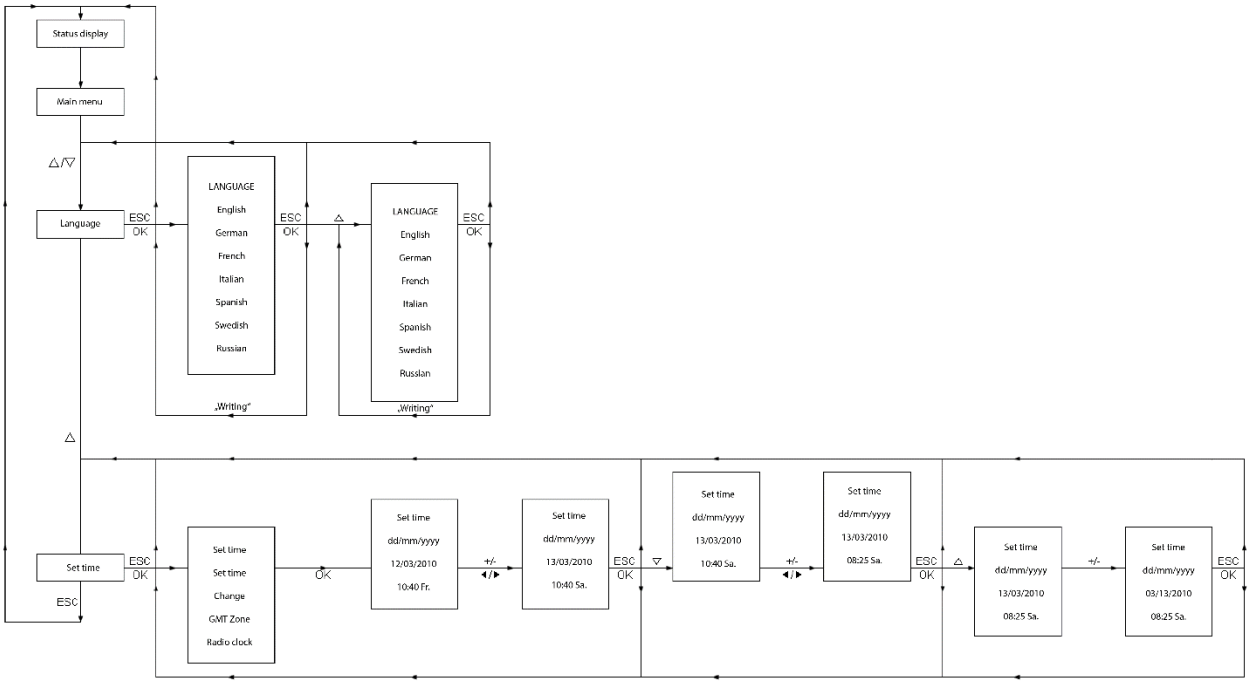

Fig. 14: Expert level menu structure

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7.9.1 Setting the language

In the factory the operating language of the control unit is set to German. If necessary under menu item “LANGUAGE” it is possible to choose between English, German, French, Italian, Spanish, Swedish or Russian.

Note

The display outputs of the menu level are always displayed in German! Selecting another language only changes the language in which the main menu of the expert level plus the days of the week and the programming of the weekly timers in the operating menu are displayed.

1. Starting from the status display press keys **ESC** and **OK** simultaneously to open the main menu. The displays shows the last selected menu item in the currently selected language in flashing format.
2. With key ▽ or △ select the “LANGUAGE” menu item.
3. Press **OK** to activate the menu item. The currently selected language is shown flashing.
4. Select the desired language with key ▽ or △**.**
5. Press **OK** to activate the desired language. “Writing” is displayed in the selected language in the display.
6. Pressing the **ESC** key returns to the main menu of the expert level, which is now displayed in the selected language.
7. Press **ESC** again to return to the status display or press key △ to update the time and date under the “Set time” menu item.

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7.9.2 Updating the time and date

If the control unit was disconnected from the operating voltage for a long period (> about 14 days), the time and date must be updated as necessary. Likewise the display format of the date can be changed, e.g. from dd/mm/yyyy to mm/dd/yyyy.
Starting from menu item “LANGUAGE”, pressing the key △ selects the “Set time” menu item. Otherwise, starting from the status display, press keys **ESC** and **OK** simultaneously to open the main menu. The displays shows the last selected menu item in the currently selected language in flashing format. Then with key ▽ or △ select the “Set time” menu item.

1. Press **OK** to activate the menu item. This opens a sub-menu.

Attention

Only the menu item “Set time” can be selected in this sub-menu.
All menu items not described here are intended solely for JUDO customer service and must not under any circumstances be manipulated by other non-authorised persons or the operator!
In case of non-compliance, any warranty rights are void!
Any deviation from this can lead to immediate damage to the control unit, the software or the backwash protection filter!
JUDO Wasseraufbereitung GmbH will not be responsible for the resulting damage.

2. Pressing the **OK** key again activates the sub-menu, the setting for years flashes.
3. Key ◀ or ▶ is used to navigate between the settings for days, months and years, here the respective selected item flashes.
4. Press the **+** or **-** key to program the current value for this.
5. Press key ▽ to move a display line down to update the time.
6. Key ◀ or ▶ is used to navigate between the settings for hours and minutes, here the respective selected item flashes.
7. Press the **+** or **–** key to program the current time.
8. If necessary press key △ 2x, the date display format starts to flash.
9. Use key **+** or **–** to select the desired display format.
10. Then press **OK** to confirm the settings, the sub-menu is output to the display again.
11. Pressing the **ESC** key displays the main menu of the expert level.
12. Press **ESC** again to return to the status display.

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8 Commissioning

Attention

Correct installation of the backwash protection filter and of all its components is a prerequisite for commissioning!
All connections must be checked for leak-tightness prior to commissioning!
The backwash protection filter must only be operated when all the components are in a closed state, using mounted servo motor protective covers, as well as with the housing cover of the control unit closed!
The DIP switches may only be switched when the control unit is de-energised!

Note

Commissioning should only be carried out by JUDO customer service or an authorised specialist company!
Separate installation and operating instructions pertaining to other devices, systems and system components must be observed!

1. If necessary bleed the control lines of the differential pressure gauge.
2. Set switching point S1 (additionally S2, if necessary) at the differential pressure gauge.
3. Connect on-site control air to 3/2-way solenoid valve.
4. Switch on the control unit and program in consideration of the local requirements.

Attention

Only the steps described in chapter 7.4 - 7.9.2 for setting the control unit may be carried out!
All menu items not described here are intended solely for JUDO customer service and must not under any circumstances be manipulated by other non-authorised persons or the operator!
In case of non-compliance, any warranty rights are void!
Any deviation from this can lead to immediate damage to the control unit, the software or the backwash protection filter!
JUDO Wasseraufbereitung GmbH will not be responsible for the resulting damage.

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8.1 Programming the control unit

	Key	Action	Display
1.	◀	Select the "Flush" menu item	Currently set number of backwash cycles
2.	**+/–**	Activate menu item	Number of backwash cycles flashes
3.	**+/–**	Increase/decrease backwash cycles	Selected number of backwash cycles
4.	**OK**	Save number of backwash cycles	Saved number of backwash cycles
5.	◀	Continue to next menu item	"MV Top" menu item
6.	**+/–**	Activate menu item	Number of seconds flashes
7.	**+/–**	Increase/decrease seconds	Selected number of seconds
8.	**OK**	Save number of seconds	Saved number of seconds
9.	◀	Continue to next menu item	"MV Bottom" menu item
10.	**+/–**	Activate menu item	Number of seconds flashes
11.	**+/–**	Increase/decrease seconds	Selected number of seconds
12.	**OK**	Save number of seconds	Saved number of seconds
13.	◀	Continue to next menu item	Menu item “Timer T1 - T3”
14.	◀	Select menu item “Timer T1 On”	Actual set time for T1 On
15.	**+/–**	Activate menu item	Time for T1 On flashes
16.	**OK**	Activate record TS #01	Weekly interval setting flashes
17.	◀/▶	Move below desired week	Respectively selected week flashes
18.	**+/–**	Activate/deactivate week	Week activated (e.g. “1”) / deactivated (“-”)
19.	▽	Move display line down	Days of the week setting flashes
20.	◀/▶	Move below the desired day of the week	Respectively selected day of the week flashes
21.	**+/–**	Activate/deactivate day of the week	Day of the week activated (e.g. “S”) / deactivated (“-”)
22.	▽	Move display line down	Hour indicator for T1 On flashes
23.	◀/▶	Move between hour, min. and function	Respectively selected item flashes
24.	**+/–**	Increase/reduce hour, min., select function	Selected time T1 On with function
25.	**OK**	Save settings for Timer T1 On	“Writing” is displayed
26.	◀	Continue to next menu item	Actual set time for T1 Off
27.	**+/–**	Activate menu item	Time for T1 Off flashes
28.	**OK**	Activate record TS #02	Weekly interval setting flashes
29.	◀/▶	Move below desired week	Respectively selected week flashes
30.	**+/–**	Activate/deactivate week	Week activated (e.g. “1”) / deactivated (“-”)
31.	▽	Move display line down	Days of the week setting flashes
32.	◀/▶	Move below the desired day of the week	Respectively selected day of the week flashes
33.	**+/–**	Activate/deactivate day of the week	Day of the week activated (e.g. “S”) / deactivated (“-”)
34.	▽	Move display line down	Hour indicator for T1 Off flashes
35.	◀/▶	Move between hour, min. and function	Respectively selected item flashes
36.	**+/–**	Increase/reduce hour, min., select function	Selected time T1 Off with function

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37.	**OK**	Save settings for Timer T1 Off	“Writing” is displayed
38.	◀	If necessary program TS #03 - TS #06	See point 14 - 37
	Key	**Action**	**Display**
39.	◀	Continue to next menu item	Current status (On/Off) for interval
40.	**OK**	If necessary switch interval on or off	Selected status (On/Off) for interval
41.	◀	Continue to next menu item	Currently selected interval time
42.	**+/–**	Activate menu item as necessary	Interval time flashes
43.	**+/–**	Increase/decrease interval time as necessary	Selected interval time
44.	**OK**	Save selected interval time	Saved interval time
45.	◀	Continue to program version	Program version for respective JRSF type
46.	◀	Exit programming of the menu levels	Operating display

Tab. 6: Programming the control unit

8.1.1 Programming the expert level

	Key	Action	Display
1.	**ESC+OK**	Open main menu	Main menu
2.	△/▽	Select “LANGUAGE” menu item as necessary	Selected menu item
3.	**OK**	Activate menu item as necessary	The currently selected language flashes
4.	△/▽	Select the desired language	Desired language
5.	**OK**	Activate the selected language	“Writing” in selected language
6.	**ESC**	Back to main menu	Main menu in selected language
7.	**ESC** △	Back to the status display Select “Set time” menu item	Operating display Selected menu item
8.	**OK**	Activate “Set time” menu item	Sub-menu of “Set time” menu item
9.	**OK**	Activate “Set time” sub-menu	Year value flashes
10.	◀/▶	Move between day, month and year	Respectively selected item flashes
11.	**+/–**	Set actual day, month and, if necessary, year	Selected date
12.	▽	Update time	Time flashes
13.	◀/▶	Move under hours and minutes	Respectively selected item flashes
14.	**+/–**	Set actual time	Selected time
15.	△	If necessary, set date display format	Date display format flashes
16.	**+/–**	If necessary, select desired display format	Selected display format
17.	**OK**	Save selected settings	Sub-menu of “Set time” menu item
18.	**ESC**	Exit “Set time” menu item	Main menu
19.	**ESC**	Exit main menu	Operating display

Tab. 7: Programming the expert level

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8.2 Faults

Warning

Troubleshooting must only be performed by JUDO customer service or authorised technical personnel and while adhering to the applicable safety conditions!
Switch off mains voltage prior to intervention on voltage-carrying components and secure to prevent switching back on!

Fault	Cause	Remedy
Backwash process does not start automatic	Power failure	Mains cable and fuses check, replace as necessary
	Differential pressure gauge set incorrectly or defective	Check differential pressure gauge, replace as necessary
	Incorrect programming	Check the programming, correct as necessary
"Hall fault" with interruption of the backwashing	Hall effect sensor defective	Replace linear drive as necessary Request JUDO customer service
	Connecting cable interrupted	Check linear drive connecting cable
	Malfunction of the control unit	Request JUDO customer service
"Fault diff.pressure/external"	No reduction in the differential pressure	End requirement at "PD" input
	External requirement for backwashing exists for too long	End requirement at "Ex" input
	Backwashing pressure too low	Ensure min. required flow pressure (e.g. throttle filter outlet)
Severe clogging of the permanent filter inserts	Short-term heavy contamination in raw water	If necessary, perform multiple manual backwashes, check the settings of the differential pressure gauge
No sufficient backwashing outcome	Insufficient flow pressure or open outlet	Ensure min. required flow pressure (e.g. throttle filter outlet)
3/2-way solenoid valve not energised	Incorrect programming	Check the programming, correct as necessary
	Short-circuit / coil interruption	Replace 3/2-way solenoid valve
Control medium escapes at control diaphragm	Connecting screws between upper and lower part of the drive loose	Tighten the connecting screws crosswise
Operating medium escapes from leakage hole	Diaphragm defective	Check diaphragm, replace if necessary
Control medium escapes from leakage hole	Spindle seal leaks	Replace diaphragm valve

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Fault	Cause	Remedy
Control medium escapes from vent hole	Control diaphragm defective	Replace diaphragm valve
Valve body leaks	Valve body defective or corroded	Replace diaphragm valve, as necessary
Diaphragm valve between drive and valve body leaks	Diaphragm incorrectly fitted	Observe Chap. 9.1 - 9.3
	Screw connection between drive and valve body loose	Tighten screw connections crosswise
	Diaphragm defective	Check diaphragm for damage, replace as necessary
	Valve body damaged	Replace diaphragm valve
Connection between valve body and pipe leaks	Incorrect installation	Check installation
	Connection loose	Make connection correctly
	Sealant defective	Replace sealant
Diaphragm valve in passageway leaks (does not close or not completely)	Operating pressure too high	Operate the diaphragm valve with appropriate operating pressure (see Chap. 3.4)
	Foreign body between diaphragm and valve body web	Dismantle drive, remove foreign bodies, check diaphragm and valve body web for damage, replace as necessary
	Valve body web leaks or damaged	Replace diaphragm valve, as necessary
	Diaphragm defective	Check diaphragm for damage, replace as necessary
	Drive spring defective	Replace diaphragm valve
Diaphragm valve does not open or not completely	Diaphragm incorrectly fitted	Observe Chap. 9.1 - 9.3
	3/2-way solenoid valve defective	Check 3/2-way solenoid valve, replace as necessary
	Lack of control medium	Check control medium and connect
	Control medium incorrectly connected	Check connections, correct as necessary
	Control pressure too low	Observe Chap. 3.4

Tab. 8: Faults

If a fault cannot be rectified based on the information in Table 8, contact your JUDO customer service representative or an authorised specialist company.

Customer service headquarters:

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Stamp of installation company:

9 Maintenance and inspection

Warning

It is essential to depressurise the system before working on the diaphragm valve, the cover of the diaphragm valve is under spring pressure!

Warning

Danger due to hot surfaces or danger due to scalding!

Warning

Switch off mains voltage prior to intervention or work on voltage-carrying components and secure to prevent switching back on!

Note

Maintenance and servicing must only be performed by JUDO customer service or authorised technical personnel and while adhering to the applicable safety conditions!

According to DIN 1988, Part 8, every technical system requires regular maintenance and inspection. The maintenance should principally be performed at a half-year interval, however, at a yearly interval at the latest, by JUDO customer service or an authorised specialist company, who will replace defective parts or wear parts if required. We recommend that you set up a customer service contract, so that the backwash protection filter can be regularly tested for fault-free operation.

Note

The exact test cycles must be adapted to ambient and operating conditions! When interacting with various device components, the operating instructions for other devices must be observed!

Depending on the operating conditions, circumstances and requirements on site, an on-site visual inspection of the backwash protection filter must be carried out at regular intervals. The level of soiling of the permanent filter inserts can be checked using the two inspection glasses. If necessary manual backwashing must be performed by pressing the ▶ key (dependent on the level of soiling, several backwashing processes may be necessary).

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9.1 Dismantling the diaphragm valve and diaphragm

1. Move the drive to the open position, dismantle it from the valve body and then move it back to the closed position.
2. After dismantling, clean parts to remove soiling and check for damage (replace damaged parts as necessary).
3. Unscrew the diaphragm.
4. Clean all parts to remove product residues and dirt, do not damage or scratch parts in the process.
5. Check all parts for damage (replace damaged parts if necessary).

9.2 Fitting the diaphragm

Attention

If the diaphragm is not screwed far enough into the connector, the closing force acts directly on the screw pin and not via the thrust piece, which can lead to damage and premature failure of the diaphragm as well as to leaks in the diaphragm valve!
If the diaphragm is screwed in too far, there will not be a perfect seal at the valve seat and the function of the diaphragm valve is therefore no longer guaranteed!
An incorrectly fitted diaphragm may lead to leaks in the diaphragm valve or to medium escaping!
If this is the case, the diaphragm must be dismantled, the complete diaphragm valve incl. diaphragm checked and reassembled according to the instructions!

Note

The diaphragm is a wear part!
Before commissioning and during the entire period of use of the diaphragm valve, the technical condition and proper functioning must be checked!
Determine time intervals for the inspection according to the operational loads and/or the rules and regulations applicable to the application case and carry them out regularly!

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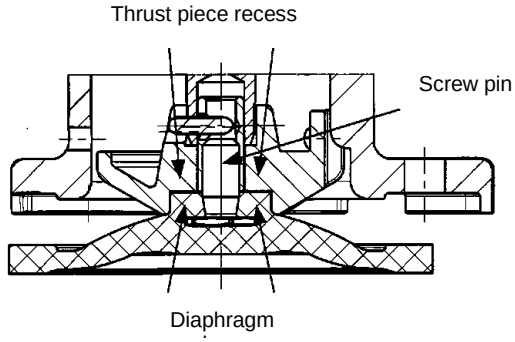

Fig. 15: Fitting the diaphragm

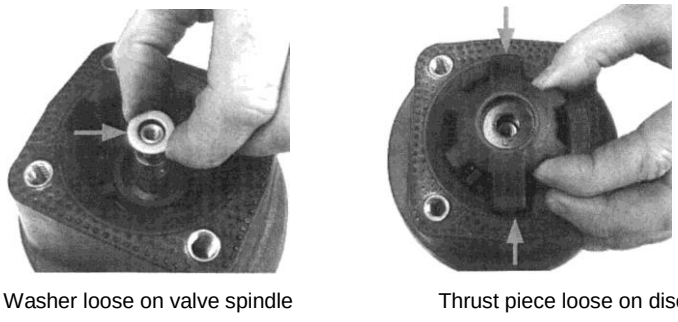

Fig. 16: Washer on valve spindle and thrust piece on disc

1. Move the drive to the closed position.
2. Place washer loosely on valve spindle, place thrust piece loosely on washer and fit lugs into guides (see Fig. 16).
3. Check whether the thrust piece is in the guides.
4. Screw the new diaphragm firmly into the thrust piece by hand.
5. Check whether the diaphragm dome is in the thrust piece recess.
6. If it is difficult to move, check the thread and replace damaged parts as necessary.
7. If you feel significant resistance, screw the diaphragm back until the diaphragm hole pattern matches the drive hole pattern.

9.3 Fitting the drive on the valve body

Note

The diaphragm settles over time, so it is essential to retighten the screws (see Chap. 4.2) after installing and commissioning the diaphragm valve!

1. Move drive to open position, place on valve body with fitted diaphragm and ensure that diaphragm web and valve body web match.
2. Mount the screws with washers hand-tight.
3. Move the drive to the closed position and tighten the screws crosswise, making sure that the diaphragm is evenly compressed (approx. 10 - 15 %, recognisable by an even outer bulge).
4. Check completely mounted diaphragm valve for tightness.

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9.4 Exploded drawing

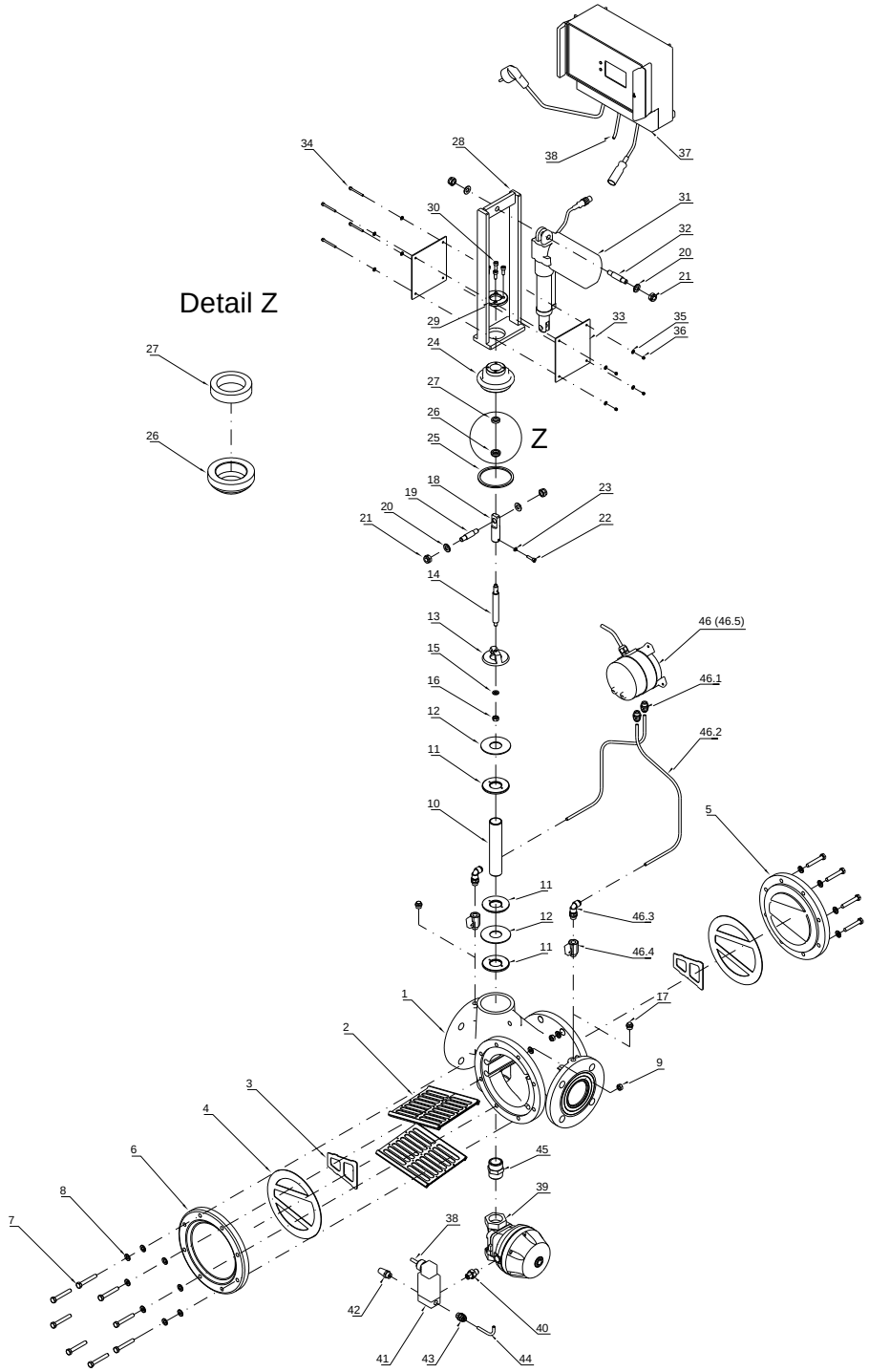

Fig. 17: Exploded drawing JRSF-HW-A-TP DN 65 – 100

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9.4.1 Spare parts for exploded drawing

Model JRSF-HW-A-TP		DN 65			DN 80			DN 100		
Item	**Designation**	**Order no.**	**pc.**	**AU/pc.**	**Order no.**	**pc.**	**AU/pc.**	**Order no.**	**pc.**	**AU/pc.**
1	Coated housing	2310038	1	1510	2310039	1	1582	2310037	1	1920
2 - 4	Filter spare part set	2030206	1	633	2030206	1	633	2030208	1	891
2*	Permanent filter insert 0.32 mm **	2050147	2	322	2050147	2	322	2050148	2	425
3	Sieve support plate	2621103	2	16	2621103	2	16	2623103	4	28
4*	Web seal	1621104	2	14	1621104	2	14	1623104	2	19
5	Coated cover, left	2050021	1	288	2050021	1	288	2050023	1	338
6	Coated cover, right	2050022	1	288	2050022	1	288	2050024	1	338
7	Hex. screw M 8x55	1623109	16	2	1623109	16	2	1623109	16	2
8	Washer B 8.4	1621108	32	2	1621108	32	2	1621108	32	2
9	Hex. nut M 8	1621107	16	1	1621107	16	1	1621107	16	1
10	Connecting pipe	2621133	1	67	2621133	1	67	2623133	1	87
11	Counter washer	2621132	3	44	2621132	3	44	2623132	3	62
12	Sealing washer 72x29x2	1200034	2	5	1200034	2	5			
	Sealing washer 84x39x2							1200037	2	5
13	Sliding head	2621130	1	67	2621130	1	67	2623130	1	82
14	Valve spindle	2621128	1	43	2621128	1	43	2623128	1	45
15	Spring washer A 8	1650019	1	1	1650019	1	1	1650019	1	1
16	Hex. nut M 8	1607117	1	2	1607117	1	2	1607117	1	2
17	Plug ¼" AG	1440017	****	6	1440017	****	6	1440017	****	6
18	Spindle adapter	1440133	1	*****	1440133	1	*****	1440134	1	*****
19	Threaded bolt L=55	1440141	1	*****	1440141	1	*****	1440141	1	*****
20	Washer B 10.5	1635113	4	2	1635113	4	2	1635113	4	2
21	Lock nut M 10	1650170	4	*****	1650170	4	*****	1650170	4	*****
22	Cyl. screw M 5x20	1650031	1	2	1650031	1	2	1650031	1	2
23	Spring washer A 5	1650035	1	1	1650035	1	1	1650035	1	1
24 - 27	Spare part set Threaded flange	2310151	1	250	2310151	1	250	2310152	1	290
24	Threaded flange	2310123	1	250	2310123	1	250	2310124	1	290
25	Flat gasket 85x75x3	1200033	1	10	1200033	1	10			
	Flat gasket 100x88x3							1200036	1	10
26	Wiper ring 14x22x8x4	1621136	1	7	1621136	1	7	1621136	1	7
27	Lip seal 14x20x4.7	1621125	1	4	1621125	1	4	1621125	1	4
28	Motor mount	2170166	1	85	2170166	1	85	2170166	1	85
29	Clamping washer	1440135	1	43	1440135	1	43	1440135	1	43
30	Cyl. screw M 6x16	1610127	4	1	1610127	4	1	1610127	4	1
31	Linear drive	1510165	1	1071	1510165	1	1071	1510165	1	1071
32	Threaded bolt L=60	1440140	1	*****	1440140	1	*****	1440140	1	*****
33	Protective plate	1420032	2	7	1420032	2	7	1420032	2	7
34	Cyl. screw M 4x40	1650294	4	*****	1650294	4	*****	1650294	4	*****
35	Washer A 4.3	1609376	8	1	1609376	8	1	1609376	8	1
36	Hex. nut M 4	1650295	4	*****	1650295	4	*****	1650295	4	*****
37	Control unit JSK V	1510162	1	3087	1510162	1	3087	1510162	1	3087
***	Main switch	1500509	1	*****	1500509	1	*****	1500509	1	*****

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Model JRSF-HW-A-TP		DN 65			DN 80			DN 100		
Item	**Designation**	**Order no.**	**pc.**	**AU/pc.**	**Order no.**	**pc.**	**AU/pc.**	**Order no.**	**pc.**	**AU/pc.**
***	Circuit board with transformer	1510173	1	539	1510173	1	539	1510173	1	539
***	Primary fuse	1510149	1	4	1510149	1	4	1510149	1	4
***	Secondary fuse	1500382	1	4	1500382	1	4	1500382	1	4
38	Ölflex control cable 3G 0.75 mm²	1500041	2	3	1500041	2	3	1500041	2	3
39	Metal diaphragm valve	1610012	1	2136	1610012	1	2136	1610013	1	2546
*/***	Diaphragm	1200021	1	84	1200021	1	84	1200022	1	118
40	Double nipple ¼“	1440058	1	15	1440058	1	15	1440058	1	15
*/***	O-ring 7.5x2 mm	1200340	1	1	1200340	1	1	1200340	1	1
41	3/2-way solenoid valve	1510022	1	458	1510022	1	458	1510022	1	458
42	Silencer	1610373	1	24	1610373	1	24	1610373	1	24
43	Restrictive plug-in lock.	1130361	1	12	1130361	1	12	1130361	1	12
44	Hose 6x4 mm	1100018	0.5	10	1100018	0.5	10	1100018	0.5	10
45	Threaded double nipple	1621110	1	27	1621110	1	27	1623110	1	31
46	JUDO differential pressure gauge, complete	8621444	1	1625	8621444	1	1625	8621444	1	1625
46.1	Restrictive plug-in lock.	1130361	2	12	1130361	2	12	1130361	2	12
46.2	Hose 6x4 mm	1100018	5	10	1100018	5	10	1100018	5	10
46.3	Angle plug-in lock.	1130363	2	14	1130363	2	14	1130363	2	14
46.4	Mini ball valve ¼“	1610010	2	43	1610010	2	43	1610010	2	43
46.5	Differential pressure gauge 0 - 2.5 bar	1610011	1	997	1610011	1	997	1610011	1	997

Tab. 9: Spare parts for exploded drawing
* Wear parts
** Custom mesh size available upon request
*** Not shown
**** Not used
***** Price on request
AU = Accounting Unit (see price list)

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Space for notes

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