

Installation and operating instructions

JUDO i-soft

Fully automated water softener

Valid for: EU countries and Switzerland

Language: English

Attention:

Carefully read through the installation and operating instructions and safety information before installing and putting the unit into service.

These must always be issued to the owner/user.

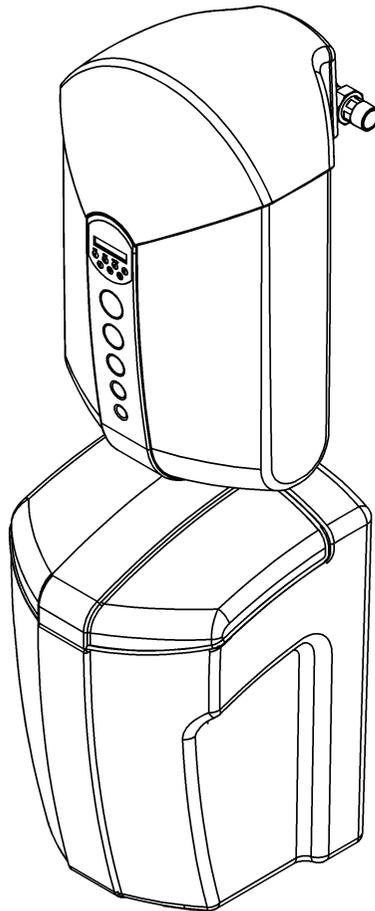


Fig.: i-soft



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Dear Customer,

thank you for the confidence you have shown in us by purchasing this unit. With this softener you have purchased a state of the art unit.

This softener is suitable for use in cold drinking water up to a maximum ambient temperature of 30 °C (86° F).

Each unit is thoroughly checked before delivery. Should difficulties occur, please contact your regional customer service (see back page).

Trademarks:

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D-71364 Winnenden

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 Wasser- Aufbereitung	EC Conformity Declaration	Document no. 251/07.10
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Manufacturer: JUDO Wasseraufbereitung GmbH

Address: Hohreuschstr. 39 - 41
D-71364 Winnenden

Product Description: JUDO i-soft

- EC-Directive: Electromagnetic Compatibility (EMC) 2004/108/EC
- Engineering Standards: Electromagnetic Compatibility, Generic Standards for Radiated Interference and Interference Immunity. EN 61000-6-2 EN 61000-6-3

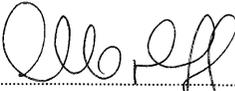
The observance of all points of the EMC requirements (EC conformity) for the use of the device in household / commercial areas and industrial areas is hereby confirmed.

- Harmonized Standard: Safety of power transformers, power supply units and similar. EN 61558-1

Issuer: JUDO Wasseraufbereitung GmbH

Place and Date: Winnenden, July 16th 2010

Legally binding signature:


.....
JUDO Wasseraufbereitung GmbH

This declaration certifies that the product is in accordance with all the stated directives; it is however not an assurance of its characteristics.

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1. About these operating instructions



(see chapter "Safety information and dangers due to non-compliance")

The instruction manual must be permanently available at the place in which the softener is in use.

This instruction manual is intended to make it easier to familiarize yourself with the softener and its possible intended uses.

The instruction manual contains important information concerning the safe, correct and economical running of this softener.

It contains fundamental information, which must be observed during installation, operation and maintenance. Observance of this information helps to avoid dangers, reduce repair costs and increase the reliability and service life of the softener.

The instruction manual must be read and used by each person entrusted with carrying out work on the softener, for example:

- **installation**
- **operation**
- **maintenance**
(servicing, inspection, repair)

Installation and maintenance may only be carried out by personnel authorized by the manufacturer, capable of fulfilling the instructions as given in this manual under consideration of all regulations covering

plumbing, safety and operation of such units valid in the country of use.

In addition to the safety regulations as given in this manual all locally valid regulations governing accident prevention, all regulations governing health and safety in the workplace must be observed at all times.

All persons involved in installing, operating or maintaining this unit must read this instruction manual before commencing on any work on or with the unit.

Special attention must be paid additionally to the safety notes embedded into the main sections of this manual.

1.1 Symbols used

The safety notes contained in this instruction manual are labelled with the following symbols:

-  **ATTENTION**  Notes on existing dangers
-  Warning, electrical voltage
-  Torques specified by the manufacturer
-  Tips for use and other information

Notes directly attached to the built-in rotary flange or the softener, e.g.

- direction of flow (see fig. 1)
- unit labelling
- cleaning information

must always be observed and kept in a fully legible condition.

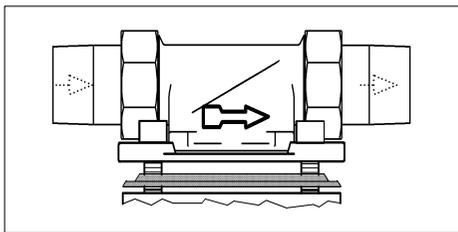


Fig. 1: Built-in rotary flange

1.2 Safety information and dangers due to non-compliance

Failure to observe the general danger symbols can result, for example, in the following risks:

- failure of important functions of the softener.
- danger to persons due to electrical and mechanical effects.
- danger both to persons and the environment due to leaks.

Refrain from any unsafe methods of work.

Failure to comply with this instruction manual and the safety information can not only result in danger to persons but also prove harmful to the environment and the unit itself.

1.3 Units used

Varying from the International System of Units (SI = System International), the following units are used:

Units	Conversion
°F	°F = 9/5°C + 32
bar	1 bar = 10 ⁵ Pa = 0.1 N/mm ² = 14.5 psi
1"	DN 25
°e	°e = 0.142 mmol/l alkaline earth ions

2. Intended use

Both installation and use of the softener are subject to all rules and regulations concerning such units and valid in the country of use.

In addition to the safety regulations as given in this manual all locally valid regulations governing accident prevention, all regulations governing health and safety in the workplace must be observed at all times.

The water to be softened must conform to the European drinking water regulations!

Always contact the manufacturer/supplier before using water of a different quality or with additives!

This softener is suitable for use in cold drinking water up to maximum ambient temperature of 30 °C (86 °F).

It is produced to state of the art standards and the safety regulations generally accepted in Germany.

The softener may only be used as described in the instruction manual. Any other or further use is deemed not to be intended use.

Additional dangers exist in case of non-intended use and where the danger symbols and safety information are not observed. The manufacturer/supplier are not liable for any losses or damage resulting from such use. The risk is borne solely by the user.

Intended use also includes observing the instruction manual.

The manufacturer/supplier must always be consulted before using the softener outside the use limitations given in the instruction manual.

The softeners are only to be used in a technically perfect condition, for their intended use, safely and in awareness of the dangers and with full observance of the instruction manual!

Have any malfunctions corrected immediately!

In order to be able to safely discharge the wastewater in operation and in case of any defect in the system, precise compliance with the details given in the chapter "Requirements for the place of installation" is necessary!



(see chapter on "Safety information and dangers due to non-compliance")

The regenerating salt used is removed from the softener columns with the wastewater. Therefore, it may not be used to water plants or for similar purposes.

The range of use for DVGW-tested softeners in Germany is specified in the DIN 1988 standard, part 2, para. 8.3.2. According to this standard, there are no restrictions regarding the range of use for these softeners. This usage specification may vary in other countries. Please consult regulations in country of use.

The capacity of the softener is designed so that it can be used to partially soften all the water for a detached or multiple use building, as well as corresponding part water quantities for hot water, swimming pools, washing machines and dishwashers.

2.1 Water pressure

The water pressure must be between 2 bar (29 psi) and 7 bar (101.5 psi).

The water pressure must not fall below 2 bar (29 psi), as otherwise the function can be impaired! If the softener is not regularly regenerated, this can result in a pressure loss and impairment of the softening function.



ATTENTION

(see chapter "Safety information and dangers due to non-compliance")

If the **water pressure is over 7 bar (101.5 psi)** a pressure reducer must be installed **upstream** of the softener (see fig. 2). An operating pressure of over 7 bar (101.5 psi) can lead to malfunction and failure.

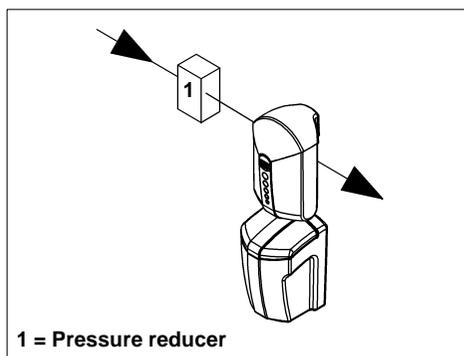


Fig. 2: Pressure reducer upstream of the unit



For a **water pressure of 5 bar (72.5 psi) to 7 bar (101.5 psi)** we recommend installation of a pressure reducer.

The optimum operating pressure for the softener lies between 3 bar (43.5 psi) and 5 bar (72.5 psi). It works most economically under these pressure conditions.

2.2 Notes on special dangers

2.2.1 Electrical equipment / installations



There must not be any electrical cables and devices underneath or in the immediate vicinity of the softener!

Electrical devices / equipment, which are not splash proof and which are located near the softener can be damaged by water which escapes from the softener during regeneration or through improper use. If the electrical devices / installations are connected to the power supply, a short circuit can also occur. In this case there is a risk of people suffering an electric shock. Electrical devices / equipment located near the softener must therefore be splash proof and comply with the legal regulations for wet rooms (IP44).



The mains voltage is reduced to a safe, extra-low voltage of 24 V in the transformer, with which the system's electronics are operated. Never use any other transformer.



ATTENTION



(see chapter "Safety information and dangers due to non-compliance")

Caution when touching the unit when the cover is removed! The components in the electrical circuit can get hot during operation. Furthermore, moving parts pose a potential danger.

Potential-free output



Only use low voltage for remote transmission of error messages via the potential-free output!

Switching voltage.....maximal 24 V
Current.....maximal 1 A

(see chapter "Potential-free error message")

3. Product information

3.1 Intended purpose

This softener is suitable for use in cold drinking water up to a maximum water temperature of 30 °C (86 °F).



(see chapter “Safety information and dangers due to non-compliance”)

Please refer to the chapter “Intended Use” for use restrictions.

This softener is used to protect the water pipes and hot water heater against lime scale.

Partially softened water protects appliances and fittings and reduces consumption of detergents and cleaning agents.



Lime scale deposits inhibit water flow and can therefore result in increased energy consumption.

3.2 Mark of conformity

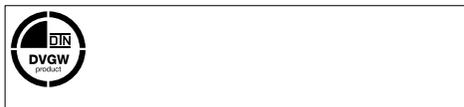


Fig. 3: DIN DVGW mark

The units conform to the technical regulations for drinking water installations in accordance with DIN 1988. They are examined by the DVGW (German Association for Gas and Water, registered society, technical scientific association) in accordance with the requirements of DIN EN 14743 and DIN 19636-100 for water softening systems (cation exchangers) in drinking-water installations and are authorised to bear the DIN DVGW mark. Regulations and authorization requirements may vary in other countries, please consult regulations in country of use.

3.3 Materials used

The materials used are resistant to the physical, chemical and corrosive loads to be expected in the drinking water and fulfil the requirements specified in Germany in the DIN EN 14743 and DIN 19636-100 standards (“Softeners (cation exchangers) in drinking water installations”). All materials are hygienically and physiologically safe. Plastics fulfil the official guideline of the German Federal Environmental Agency. Metallic materials fulfil the requirements in Germany of the DIN 50930-6 standard (Impact on the drinking water quality).

4. Installation

4.1 General



(see chapter “Safety information and dangers due to non-compliance”)

The unit may only be installed by skilled personnel.

The chapter “Intended use” must always be observed!

The pipes must be able to support the softener safely.

Otherwise mechanical damage or fractures/ bursts can occur in the pipes. This can result in major water damage. People close to the softener are exposed to a health risk due to the large quantities of water released. Therefore, if necessary, the pipes must be additionally fixed or supported.

Always observe the given dimensions and spacings to ensure convenient operation and servicing (see chapter “Installation dimensions”).

A clearance of at least 300 mm (11.8 inch) is required above the softener in order to be able to properly carry out all maintenance and servicing work (see chapter “Modifications / changes / spare parts”).

4.1.1 Requirements for the place of installation

The room where the unit is installed must be dry and frost-free!

Unauthorised persons must not have access to the softener!



ATTENTION

(see chapter "Safety information and dangers due to non-compliance")

- The ambient temperature must not exceed 30 °C (86 °F)!
- In order to be able to safely discharge the wastewater (regeneration) in operation and in case of any defects that occur in the system, precise compliance with the details given in the "Installation" chapter is necessary!
If the wastewater cannot be safely and completely discharged, then this may result in water damage to the house and installations therein.
- If no bypass valve (JQX) is installed, there must be a shut-off valve upstream of the softener! This enables the water supply to the softener to be interrupted during installation, servicing/maintenance, repairs and in case of malfunctions.
- The unit can be installed in all standard drinking water pipes.
- It is not permitted to install the softener **upstream of the water meter!**



A power connection (230 V, 50 Hz), which is permanently live, must be available.

4.1.2 Installation position



ATTENTION

(see chapter "Safety information and dangers due to non-compliance")

Always install the softener in a vertical position ($\pm 5^\circ$)!

Failure to observe this can impair its function.

4.1.3 Power supply



A splash proof socket is required for the transformer, in accordance with the legal regulations for wet rooms.



ATTENTION



(see chapter "Safety information and dangers due to non-compliance")

The mains voltage may not be interrupted (e. g. by light switches). If the power supply is interrupted during regeneration,

- no regeneration takes place.
- no alarm is given in case of faults.
- water losses or even water damage can occur.

4.1.4 Mounting the built-in rotary flange

The built-in rotary flange is used as a connecting element between the pipe and the softener.

It is suitable for both horizontal and vertical pipes.

The installation height depends on the pipe layout. The minimum installation height from the floor to the rotary flange is 52 cm (20.5 inch).

The built-in rotary flange must be installed in flow direction which is marked by a cast in arrow (see fig. 4).

Failure to comply with this means the softener cannot work.



ATTENTION



(see chapter "Safety information and dangers due to non-compliance")

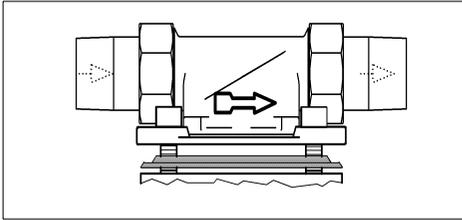


Fig. 4: Built-in rotary flange

The flange surface of the built-in rotary flange must be in a vertical position! The built-in rotary flange must be fitted so that mechanical stresses cannot occur! Otherwise mechanical damage can result in the built-in rotary flange. This can result in major water damage.

Therefore, during installation, ensure that no large forces act on the pipe, built-in rotary flange and softener.

4.1.5 Mounting the wall support components

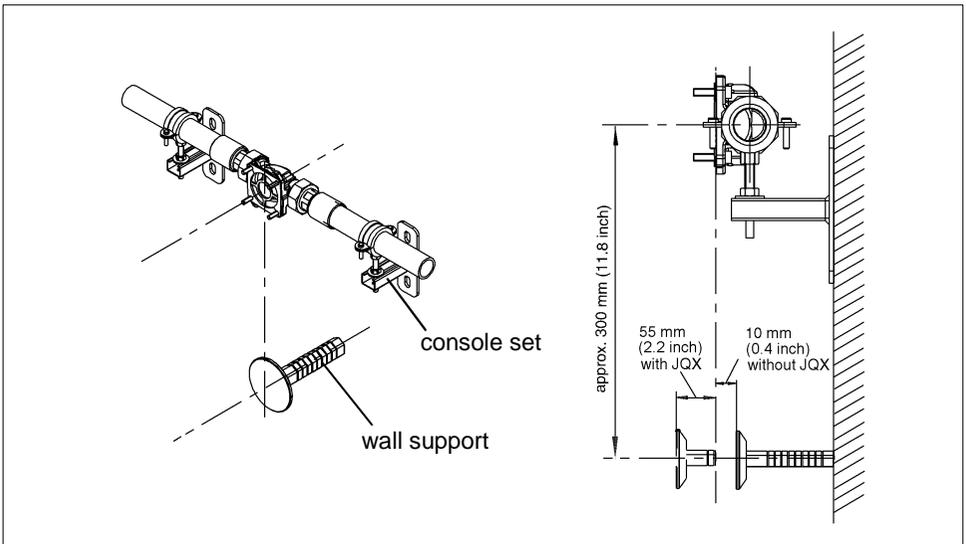


Fig. 5: Wall support components

The wall support provides the device with safe support and prevents the device from becoming entangled in tubing. When mounting the wall support (order no. 2201227), please refer to the corresponding assembly instructions.

The console set (order no. 2201231) mainly serves to secure the unit, and ease the burden on the tubing.

4.2 Mounting the softener without a bypass valve

- Firstly flush the pipe with the newly installed rotary flange (JQE).
- Then block off the water again (at the main water tap or blocking valve) and remove the assembly cover of the built-in rotary flange.

The connection flange of the softener is covered by a white protector cap. This protector cap is secured by two cylinder screws M6x130 and two threaded bolts M6x137 with nuts.

Prior to removing the protector cap, the two threaded bolts M6x137 with nuts have to be removed and replaced with the provided cylinder screws M6x130.



ATTENTION

Do not grasp into the connection flange of the device after removing the white protector cap (danger of high level pressure)!

- Loosen all four cylinder screws M6x130, but don't remove them (bayonet fixture)!
- Remove the white protector cap.

The section of the profiled flange gasket must point towards the built-in rotary flange. Failure to observe this can lead to leaks and water escaping. This can in turn cause water damage to the house and its installations.

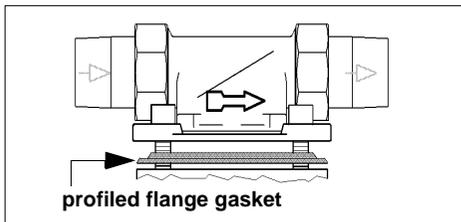


Fig. 6: Profiled flange gasket

- Lift up the softener and swivel it through approx. 30° in an anti-clockwise direction.

- Position it on the built-in rotary flange so that the screw heads pass through the bayonet fixing drill holes (see fig. 7 I).
- Swivel the softener through approx. 30° back in a clockwise direction.
- Tightly fasten the four cylinder screws M6x130 (see fig. 7 II).



Select the torque (approx. 4 Nm) so that the gasket closes and the softener is not damaged or strained!

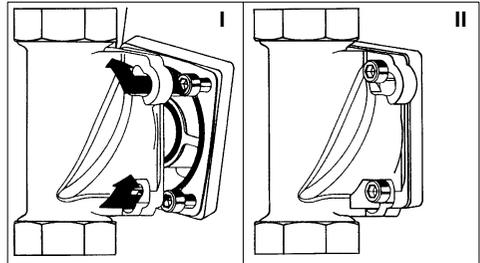


Fig. 7: Built-in rotary flange with bayonet fixture

After assembling the softener unscrew the wall support so far that it rests against the softener casing and the softener hangs vertically to the wall.

4.3 Mounting the bypass valve (accessories)

When assembling a bypass valve between the built-in rotary flange and the softener an additional bypass piping becomes superfluous to requirements.

- Firstly flush the pipe with the newly installed rotary flange (JQE).
- Then block off the water again (at the main water tap or block-off valve) and remove the assembly cover of the built-in rotary flange.
- Connect the bypass valve on the flange side with the cast in letter "R" (pipe flange) to the built-in rotary flange by engaging the bayonet fitting (see fig. 8).

- Tightly fasten the four cylinder screws M6x25.

Nm Select the torque (approx. 4 Nm) so that the gasket closes!

The hand-wheel of the bypass valve can be positioned anywhere above the unit or to the side. Depending on conditions on site, installation should be carried out ensuring sufficient access to the hand-wheel.

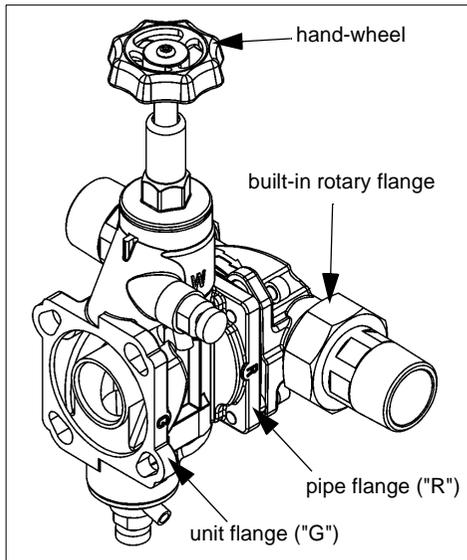


Fig. 8: Bypass valve

4.4 Mounting the softener to the pre-assembled bypass valve

The connection flange of the softener is covered by a white protector cap. This protector cap is secured by two cylinder screws M6x130 and two threaded bolts M6x137 with nuts.

Prior to removing the protector cap, the two threaded bolts M6x137 with nuts have to be removed and replaced with the provided cylinder screws M6x130.



Do not grasp into the connection flange of the device after removing the white protector cap (danger of high level pressure)!

- Loosen all four cylinder screws M6x130, but don't remove them (bayonet fixture)!
- Remove the white protector cap.

The section of the profiled flange gasket must point towards the bypass valve. Failure to observe this can lead to leaks and water escaping. This can in turn cause water damage to the house and its installations.

- Lift up the softener and swivel it through approx. 30° in an anti-clockwise direction.
- Position the softener on the flange of the bypass valve marked with the cast in letter "G" (unit flange) so that the screw heads pass through the bayonet fixing drill holes.
- Swivel the softener through approx. 30° back in a clockwise direction.
- Tightly fasten the four cylinder screws M6x130.

Nm Select the torque (approx. 4 Nm) so that the gasket closes and the softener is not damaged or strained!

After assembling the softener unscrew the wall support so far that it rests against the softener casing and the softener hangs vertically to the wall.

4.5 Connecting the softener with the salt container

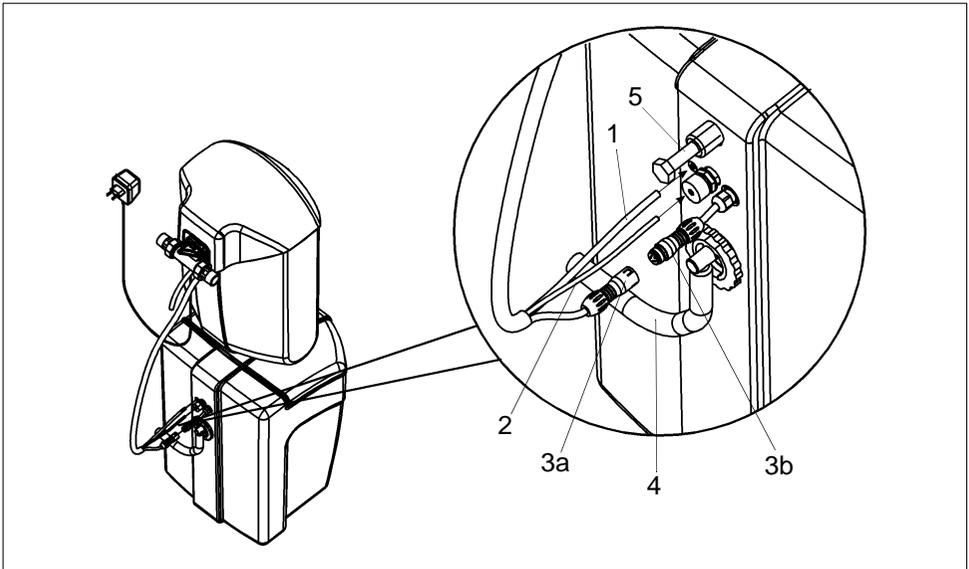


Fig. 9: Salt container assembly

- 1 Filling hose (blue)
- 2 Suction hose (black)
- 3 Electrode cable connector
(Avoid any and all contact with water before connection!)
- 4 Overflow hose
- 5 Wall spacer

Place the salt container below the water softener or next to it on the floor.

The salt container is assembled as follows (see fig. 9):

1. Push the filling hose (1) (blue) through the opening in the salt container and slide it over the connecting piece.
2. Push the suction hose (2) (black) through the union nut and gasket as far as it will go and manually tighten it.
3. Push the connector (3a) of the electrode cable into the cable housing (3b) as far as it will go.



During assembly the connector and the cable housing may not come into contact with water!

4. Slide the overflow hose (4) over the connecting piece.
5. Screw the wall spacer (5) on approx. 30 mm (1.2 inch).



When doing so, pay attention that the white marks on the connector (3a) and the cable housing (3b) correspond (correct polarity)!

4.6 Wastewater connection and back-up overflow hose

The hoses for the regeneration wastewater and the back-up overflow must both be laid up to the wastewater sewer without any kinks. Ensure free discharge above the wastewater channel or floor drain.

The waste water hose with 11 mm (0.4 inch) of outside diameters may not be shifted to a position higher than the control actuator. The tube length may amount to maximum 3 m (118 inch). Securely fix the loose end of the hose to the pipe or similar with the adhesive tape supplied.

The back-up overflow hose with a 19 mm (0.7 inch) outer diameter must be laid with a constant fall to the wastewater sewer and free of kinks.

If the connection for the wastewater sewer is higher than this, the salt container can be installed correspondingly higher with the aid of a wall bracket (see chapter "Accessories").



(see chapter "Safety information and dangers due to non-compliance")

An adequately dimensioned wastewater connection (e. g. floor drain) to DIN 1986, or local equivalent, must be available for the wastewater and the back-up overflow hose.

5. Operation



(see chapter "Safety information and dangers due to non-compliance")

Always observe the chapter "Intended use"!

5.1 Operational start

(see fig. 20)

- Optional, to speed up the process: Fill approx. 5 litres of water into the salt container (6) until it just covers the intermediate bottom.
- Fill 25-40 kg of regeneration salt into the salt container (6). The regeneration salt must comply with the requirements of DIN EN 973, or local equivalent, and be of food-grade quality.

We recommend: Broxo or Solvay salt, or local equivalent, either in blocks or tablets or in the form of coarse grains sized 7 - 15 mm. When using other regeneration salts, clean the salt container (6) more often and replace the suction strainer in shorter intervals.

- Remove the cover (7).
- Note down the installation date on the label (see fig. 12).
- Open the water supply (main water tap or block-off valve).
- Check if the bypass valve (if installed) is set to "operation".



For safety reasons the softener must be **flushed and regenerated immediately for venting** after the water supply is opened.

Ventilation is very simple:

1. Flushing the water softener

- Open a water tap (if possible, near the water softener) and adjust a volume flow of approx. 500 l/h.
- After one minute of flushing (resin container is vented), insert the mains plug into the mains socket.

After connection to the mains, the electric's will automatically perform a self-test and a pre-installation for the regulation operation.

After successful completion, the display will show the following:

Operating
res. hard. 8 °e

Fig. 10: Operating mode display

Regulation of residual hardness is pre-configured to a value of 8 °e.

Please refer to chapter "Setting the residual hardness" for more information.

2. Starting regeneration of the water softener with the touch of a button

The water softener has to be in operating mode. The display shows the operating mode.

- For manual regeneration start, press the <OK> key for at least 3 seconds.

Subsequently, the display shows "Regeneration".

Regeneration will be completed after approx. 20 minutes. Afterwards, the display again indicates the operating mode.

During system operation, regulation of residual hardness to the preset value is automatically regulated. To achieve this, approx. 10 litres of water must flow through the softener.

5.1.1 Setting the residual hardness

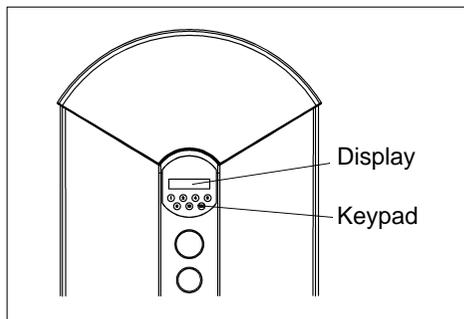


Fig. 11: Display and foil keypad

The residual hardness default of the water softener is set to 8 °e. To change the residual hardness setting, press the desired key (see table) for 3 seconds (this can only be done when in operating mode). The readjusted residual hardness is shown in the second line of the display.

Key	Residual hardness
1	1 °e
2	2 °e
4	4 °e
6	6 °e
8	8 °e
10	10 °e

The adjustment of the newly set residual hardness is automatically performed during system operation. For this purpose, approx. 10 litres of water must pass through the water softener (with approx. 500 l/h flow rate).

Residual hardness can be checked using an optional hardness measuring equipment (see chapter "Accessories").

The test water for checking water hardness may be taken from the bypass valve or from any water tap downstream of the water softener.

Ensure that the readjusted mixed water is supplied from the water softener to the tapping point.

For a correct comparison of measured values, the samples should be taken at normal flow rate (when the tap is fully open). During sampling, no larger amount of water may be taken from another tapping point.

5.1.2 Limitations for residual hardness settings

Residual hardness can only be set to a maximum of 10 °e.

The water softener control unit checks reliability of the residual hardness settings.

At a maximum, residual hardness must be about half the value of raw water hardness. Higher residual hardness can not be achieved using the blending valve.

If you try to enter higher values via the keypad, the display indicates the following:

Input not possible

After 5 seconds, the next possible setup value is shown (e. g. 8 °e):

Max. possible res. hard. 8 °e

This is adopted as the setting value.

The softening increases the sodium concentration in the mixed water, depending on the raw water hardness and the mixed water hardness set.

In Germany in accordance with the drinking water regulations of Jan 1st 2003 the limit value for sodium in drinking water is 200 mg/l. This does not apply to mineral and table water. Their limit values are considerably higher, some have values above 1000 mg of sodium per litre. Values may vary in other countries, please consult your local regulations.

Calculating the sodium content

°e	raw water hardness (ask the waterworks or measure with a hardness test device)
- °e	mixed water hardness (measured value)
= °e	difference of water hardness
X 6.4 mg Na ⁺ /l x °e	exchange value for sodium ions
= mg/l	increase in sodium content due to softening
+ mg/l	sodium already in the raw water (ask the waterworks)
= mg/l	total sodium content in mixed water

Tab. 1: Calculating the sodium content

Example calculation of the sodium content

25 °e	raw water hardness
- 10 °e	mixed water hardness
= 15 °e	difference of water hardness
x 6.4	
= 96 mg/l	due to softening
+ 10 mg/l	from waterworks
= 106 mg/l	total

Tab. 2: Example calculation of the sodium content

If the calculated overall sodium concentration exceeds the values permitted by local the drinking-water regulations, it can be corrected by increasing residual hardness.

Based on raw water hardness and the residual water setting, the electronics unit checks the sodium concentration resulting from these values. The raw water sodium concentration will not be considered in the calculation performed by the electronics unit. Upon exceeding a limit value stipulated by local drinking-water regulations, the display first indicates:

Attention!
sodium limit val

to be followed after 5 seconds with the message:

see instruction manual

After 5 seconds, the admissible minimum value for residual hardness is shown on the display. Then the display shows e. g.:

min. possible
res. hard. 10 °e

After another 5 seconds, the following comes up:

Accept <OK>
or key 1-10

By pressing the <OK> key, the admissible minimum residual hardness value is set. If a lower residual hardness value is required, it can be adjusted by pressing keys 1-10 despite the sodium threshold being exceeded.

In case the raw water shows an elevated sodium concentration it might be necessary to set residual hardness above 10 °e.

By pressing the <OK> key together with key <8>, residual hardness can be increased in steps of 2 °e. Please observe the limitations.

5.1.3 Recalibration of residual hardness

Due to the difference in the composition of tap water, the set residual hardness often cannot be reached. In this case, the regulation of residual hardness can be adapted to suit the water quality.

For example, if you have set a residual hardness of 6 °e, but the residual hardness actually measured 8 °e, the adjustment can be carried out as follows:

Press key <6> (for desired residual hardness) and shortly afterwards key <8> (measured residual hardness). The display shows:

<p>Nom. value 6 °e Meas. value 8 °e</p>

From this information, the control unit determines the required correction value. The correction value is shown on the display:

<p>Correction value -2 °e</p>

After 5 seconds, the operating mode display comes up.

The correction can be reset (see chapter „Resetting to factory setting“).

5.1.4 Country-specific setting

Country	DIP switch S5	Unit of hardness	Language
Germany	Contact 1 ON	°dH	German
France	Contact 2 ON	°TH	French
Great Britain	Contact 3 ON	°e	Englisch
USA/ Canada	Contact 1+2 ON	Grains per Gallon	Englisch
Belgium	Contact 1+3 ON	°TH	Flemish
Italy	Contact 2+3 ON	°TH	Italian

5.2 Functional description of the water softener

5.2.1 Mode of operation

The filter container is filled with ion exchanger resin in the form of small synthetic resin pellets. The calcium ions that are responsible for water hardness, are exchanged for sodium ions here. This makes water soft. The ion exchanger resin, however, can only take up a certain quantity of these hardening components. When the ability of the resin to take on calcium ions is exhausted depends on the hardness levels and general quality of the incoming water supply. The depletion time is logged by the water counter, with regeneration being initiated automatically. In this process, diluted brine (sodium chloride) is used to remove the hardening components from the resin.

5.2.2 System concept

The water softener is designed as a parallel system with regeneration taking place in two phases. During regeneration, both filter containers alternate in supplying the system with soft water. This way, the consumer is ensured a constant supply of softened water even during the regeneration phase.

5.2.3 Regeneration

With a very short regeneration time of a 10 minute interval for each of the two filter containers, extensive continuous water removal is still possible.

A water meter is installed in the soft water line of the system and precisely records the generated softened water volume and thus controls the triggering of regeneration. In accordance with DIN EN 14743 and DIN 19636-100, regeneration is executed with low amounts of salt. The system is regularly disinfected to prevent contamination. The tiny amount of chlorine required for this step is produced from the drawn-in brine in an electrolytic process during regeneration.

Regulations in other countries may vary. Please check your local regulations for details

5.2.4 Controlling the regeneration

Regeneration is automatically carried out via wear-free ceramic disc valves. The regeneration procedure is precisely defined by the disc geometry, which ensures that the procedure does not have to be re-started after power failure.

5.2.5 Raw water monitoring

A sensor (i-guard) in the supply side of the water softener continuously monitors the raw water intake. This way, the system knows the amount of water which will start a regeneration. Programming of raw water hardness is therefore unnecessary.

5.2.6 Automatic residual hardness regulation (i-matic)

Depending on the raw water quality and desired residual hardness, the internal blending unit is automatically adjusted by means of a servo motor.

5.2.7 Overflow valve

If the withdrawal of a very large amount of water (e. g. flush valve) results in a loss of pressure in the water softening system in excess of 0.8 bar (11.6 psi), an overflow valve integrated in the control head opens up to permit untreated water to pass by the water softener, thus limiting the loss of pressure. In this process, residual hardness will temporarily increase in the downstream softener line.

5.3 Salt filling

The water softener operates automatically. For each regeneration, approx. 200 g of salt is used. The regeneration salt has to be filled up regularly.

5.3.1 Message “Verify salt level”

Usually, regeneration salt is filled up using 25 kg sacks. This amount of salt provides at least 100 regenerations. After 100 regenerations, the display indicates:

**Verify
salt level**

After this message, fill up with 25 kg of regeneration salt. Then press the <OK> key briefly. This will reset the warning message.

If regeneration salt has already been filled up before the display indicates it is necessary to do so, the salt quantity regeneration counter can be reset by pressing <OK> together with key <1>. The display will then show the following message:

**Salt reg. counter
reseted**

After 5 seconds, the operating mode comes up on the display.

5.3.2 Message in case of insufficient salt

The salt concentration of the brine is checked during each regeneration. If the salt container is not topped up in time and the brine concentration is too low, the display indicates:

**Attention!
Salt deficit**

After this message, fill with 25 kg of regeneration salt. Then press the <OK> key briefly. This will reset the warning message.



This message might also come up if the brining procedure cannot be carried out properly during regeneration e.g. if the waste water hose has been installed too high, if there is insufficient line pressure or if the suction hose has not been connected properly to the salt/brine container.

If salt is only filled up after the salt storage is completely used up, the brine level might increase temporarily. In this case, the suction procedure may take longer.

Our recommendation: Broxo or Solvay salt, or local equivalent, either in blocks, tablets or in the form of coarse grains sized 7 - 15 mm.



ATTENTION



(see chapter “Safety information and dangers due to non-compliance”)

If the regeneration salt is used up or is not topped up in time, the water softener switches to economy operation.

In this case, the brine that is still available is primarily used for disinfecting the ion exchanger resin and the softening action is reduced.

This way, the water softener stays in a thoroughly hygienic condition even for weeks after the regeneration salt was indicated as being insufficient.

5.4 Potential-free error message

In the following cases a collective error message can be transferred through the potential-free relay:

- if there is an error message of the water softener
- in case of power failure
- in case of insufficient salt

**ATTENTION**

Please make sure that the mains plug is removed from the socket for any electrical installation work!

The chapter “Notes on special dangers” must strictly be adhered to!

Please observe maximum switching current and maximum switching voltage (see chapter “Electrical equipment / installations”)!

In fig. 19, the contacts of the potential-free relay are shown without a current (open).

In case of power failure, error message and insufficient salt, the relay will be open.



The failure signal cable is not contained in the scope of delivery (see chapter “Accessories”).

5.5 Integrating the water softener into a central building control system

Via the potential-free relay, the water softener can be integrated into a central building control system (e. g. EIB, LCN or LON).

Example: The potential-free relay is connected to a binary bus coupler. This way, an error message can be transmitted to the central building control system.

5.6 Modifications / changes / spare parts

**ATTENTION**

(see chapter “Safety information and dangers due to non-compliance”)

Only original spare parts are to be used!

Independent modifications and changes are prohibited for safety reasons! These can impair the function of the softener. The test marks imprinted on the unit are only valid if original spare parts are used.

5.7 Stoppages

**ATTENTION**

(see chapter “Safety information and dangers due to non-compliance”)

The water supply to the softener is interrupted. The main tap is closed or the bypass valve is switched over.



Disconnect the power pack from the socket! (If installed, disconnect the power pack of the downstream metering pump too!)

The softener must be stored in a dry, frost-free place when dismantled. The connecting flange must be protected against dirt and damage.

If the softener is refitted and put back into service, regeneration must always be carried out first (see chapter “Operational start”).

5.8 Resetting to factory settings

The settings for residual hardness and residual hardness correction can be reset to factory settings.

In order to do this, press the <OK> key together with key <10>.

- Residual hardness 8 °e
- Correction value = 0

5.9 Display message overview

Display	Description	Further information
Maintenance / service	Message shown after 1 year of operation.	(see chapter 8.1 "Message "Maintenance / service"")
Verify salt level	Message comes up after 100 regenerations.	(see chapter 5.3.1 "Message "Verify salt level"")
Salt reg. counter reseted	Shown after manual reset of salt quantity regeneration counter.	(see chapter 5.3.1 "Message "Verify salt level"")
Attention! Salt deficit	Shown after value falls below minimum chlorinating flow.	(see chapter 5.3.2 "Message in case of insufficient salt")
Input not possible	Setting a set-point residual hardness outside the admissible range. The setting is not transferred.	(see chapter 5.1.2 "Limitations for residual hardness settings")
Attention! Sodium limit value	Due to raw water hardness and the residual hardness setting, the sodium threshold value stipulated by the drinking water regulation is exceeded.	(see chapter 5.1.2 "Limitations for residual hardness settings")

6. Faults

In order to ensure unit safety and leak tightness, only approved persons may open the units and replace parts subject to water pressure.

Display text	Cause	Remedy
Fault no. 1	Drive is defective.	Contact customer service. Unplug the power supply device. If available, switch the bypass valve to bypass operation.
Fault no. 2	Salt/brine container too full or leaking	Check brine level in salt/brine container. Unplug the power supply device for 5 seconds and reconnect again. If failure persists, contact customer service.
Fault no. 3	Time out during refill	Water supply might be interrupted. If the cause cannot be found, contact customer service.

Deleting the fault:



Disconnect the transformer from the socket. Plug it back in after approx. 5 seconds!



Please always indicate the device and order number (see chapter "Technical specifications").

7. Maintenance



(see chapter “Intended use”)

7.1 Cleaning



(see chapter “Safety information and dangers due to non-compliance”)

Only use clear, clean drinking water to clean the housing.

Domestic all-purpose cleaners and glass cleaners can contain up to 25% solvents or alcohol (spirits) and may not be used.

These substances can chemically attack the plastic parts, which can lead to brittleness or even fractures.

Such cleaners must therefore not be used.

8. Warranty and services

Warranty is offered in accordance with the minimum legal requirements in the country of use. Warranty is invalid where caused by improper use, improper or lack of correct maintenance, wrong or improper quality, storage or use of regeneration salt, in order to ensure your unit a long and efficient working life, we recommend signing up for a service agreement with your local service agent and ensuring regular maintenance inspections by suitably qualified personnel.

8.1 Message “Maintenance / service”

After operating for a period of one year, the water softening system issues a message requiring maintenance. The display shows the following message:

**Maintenance /
service**

After maintenance has been carried out, reset the message by pressing the <OK> key for at least 5 seconds.

9. Data sheet

9.1 Type

JUDO i-soft

Fully automated water softener

Order no.: 8203019

9.2 Technical specifications

- Maximum ambient temperature and water temperature: 30 °C (86 °F).
- **The water to be softened must conform to the European Drinking Water Regulations!**

Operating pressure	Nominal pressure
2 - 7 bar (29 - 101.5 psi)	PN 10

The nominal pressure denotes the pressure class, to which the softener must fulfil. The maximum operating pressure is lower, in order to ensure the optimum function of the softener.

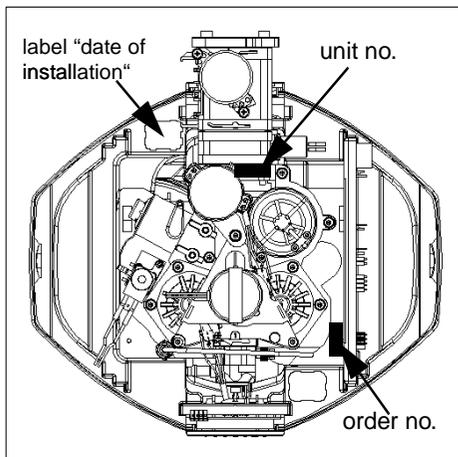


Fig. 12: Unit no., order no. and label "date of installation"

Operating weight when filled with salt	approx. 75 kg
Shipping weight	approx. 28 kg
Nominal flow rate	1.8 m ³ /h
Flow pressure at nominal flow rate at least	2 bar (29 psi)
Pressure loss at nominal flow rate	1 bar (14.5 psi)
Short-term max. flow	3.5 m ³ /h
Pipe connection	1"
Nominal capacity	1.2 mol
Capacity per kg regenerating salt	6 mol
Salt container capacity	40 kg
Volume of exchanger resin	6 l
Water consumption per regeneration	approx. 25 l
Electrical connection	230 V/ 50 Hz
Power consumption (15 W during regeneration)	3 W
Setting range for residual hardness	1-10 °e
max. raw water hardness	62 °e

For further information, please refer to the "Diagrams" chapter.

9.3 Diagrams

Pressure loss in normal operating position (pos. 1) with a raw water hardness of 25 °e and a mixed water hardness of 10 °e depending on the volumetric flow rate.

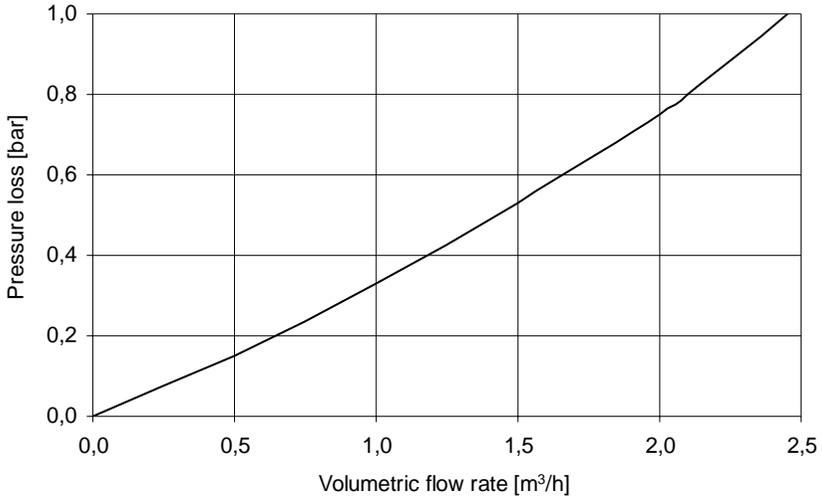


Fig. 13: Pressure loss in normal operating position

Max. possible quantity drawn off daily depending on the raw water hardness and a mixed water hardness of approx. 10 °e.

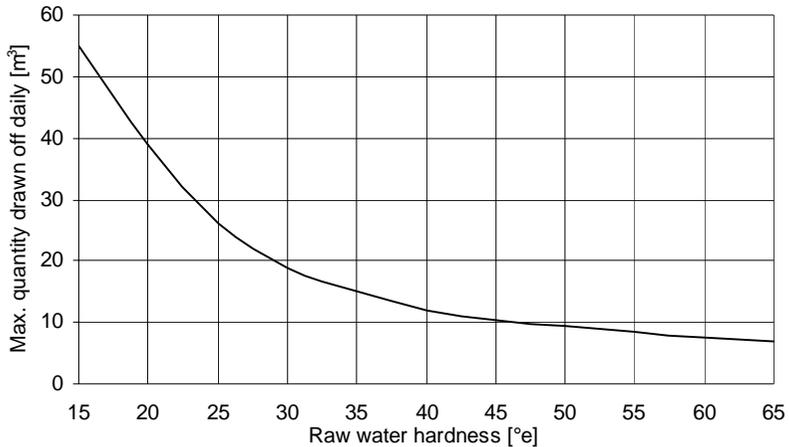


Fig. 14: Amount drawn off daily

Max. possible short term quantity continuously drawn off depending on the raw water hardness and a mixed water hardness of approx. 10 °e.

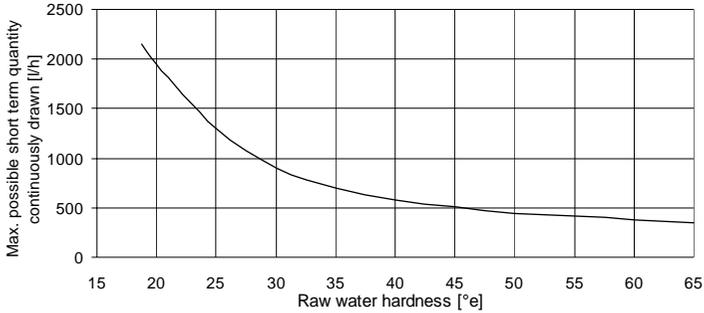


Fig. 15: Max. possible short term quantity continuously drawn off

Wastewater quantity related to 1 m³ of mixed water with 10 °e depending on the raw water hardness.

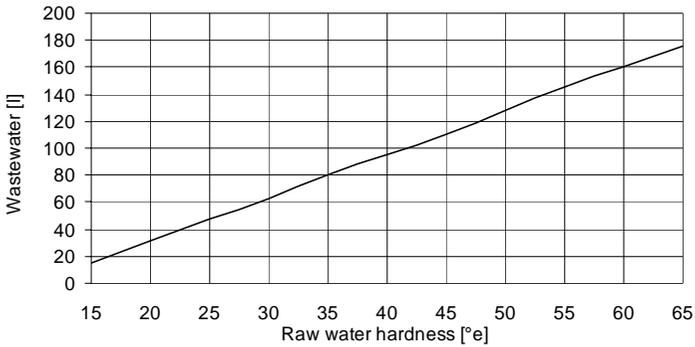


Fig. 16: Wastewater quantity

Salt consumption related to 1 m³ of mixed water with 10 °e depending on the raw water hardness.

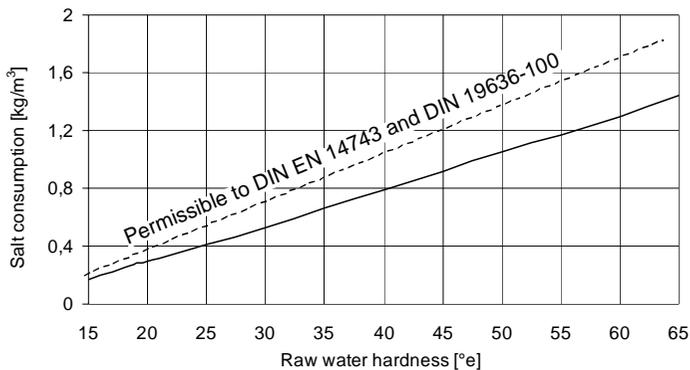


Fig. 17: Salt consumption

9.4 Installation dimensions

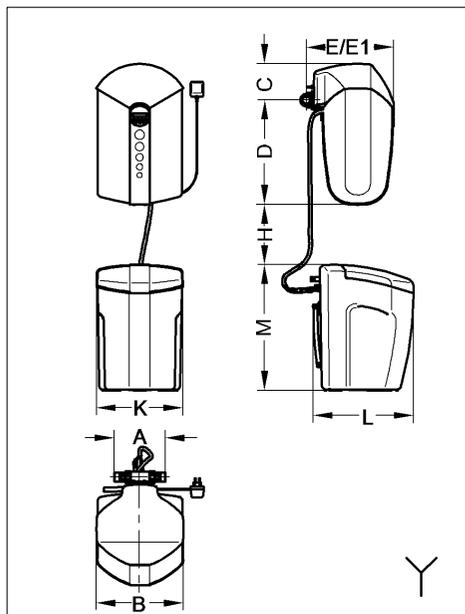


Fig. 18: Installation dimensions

A	195	installation length (rotary flange)
B	390	unit width
C	165	height above pipe centre
D	465	height below pipe centre
E	375	installation depth up to pipe centre
E1	450	installation depth up to pipe centre with JQX
H	100	minimum distance between softener and salt container
K	390	width of the salt container
L	460	depth of the salt container (with overflow)
M	560	height of the salt container
Y		sewer junction necessary

All dimensions in [mm](see fig. 18)

9.5 Scope of supply

- softener (incl. i-guard, i-matic)
- salt container
- accessories bag

- installation and operating instructions
- built-in rotary flange JQE 1" with threaded fitting
- backup overflow hose
- wall support

9.6 Accessories

- bypass valve JQX (order no. 8735210)
- hardness measuring equipment JGHP 0 - 37.5 °e (order no. 8742120)
- JUDO extension quick set JQR for series connection of two JUDO devices (e.g. filter and softener) to a pipe connection (JQE) (order no. 8250041)
- wall bracket for salt container (order no. 8733066)
- connection cable for ZEWA water stop (order no. 2201239)
- failure signal cable (order no. 2200717)

9.6.1 Protective measures against corrosion

If water has a water hardness of 0 °e plastic pipes or corrosion resistant pipes should be laid. In the case of water with partial softening (approx. 10 °e), zinc pipes and copper pipes can be laid.

Our recommendation:

Install a JUDO JULIA metering pump in the mixed water pipe downstream of the softener, in order to proportionately enrich the water with a JUL mineral solution.

The JUL mineral solutions contain active components, which stabilise the residual carbonate constituents and create the prerequisites for developing a homogeneous protective layer in downstream pipe systems. These active ingredient components correspond to the prescribed type, quality and quantity in the German drinking-water regulations (treatment substances and disinfection methods).

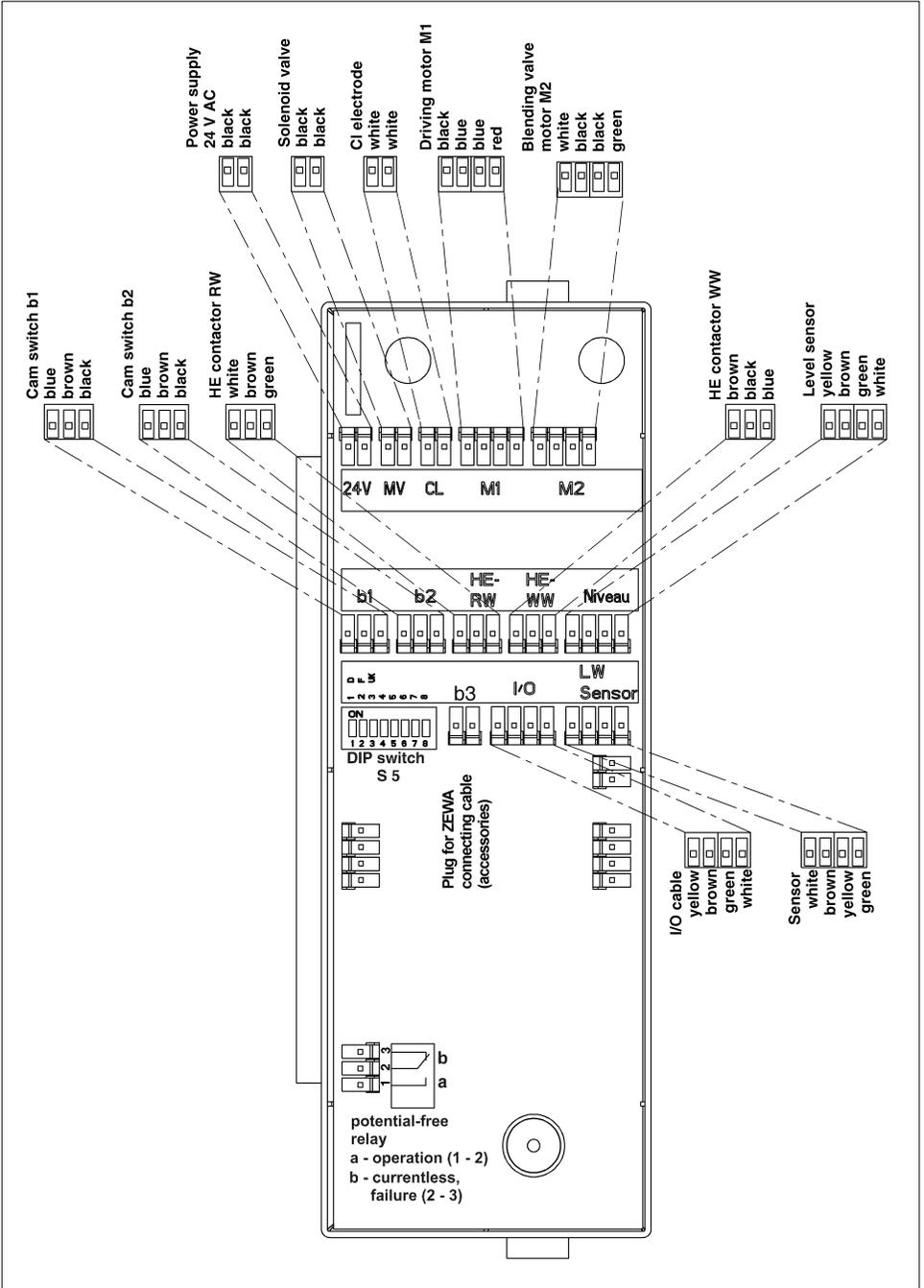


Fig. 19: Electrical circuit with failure signal relay

10. Positions i-soft

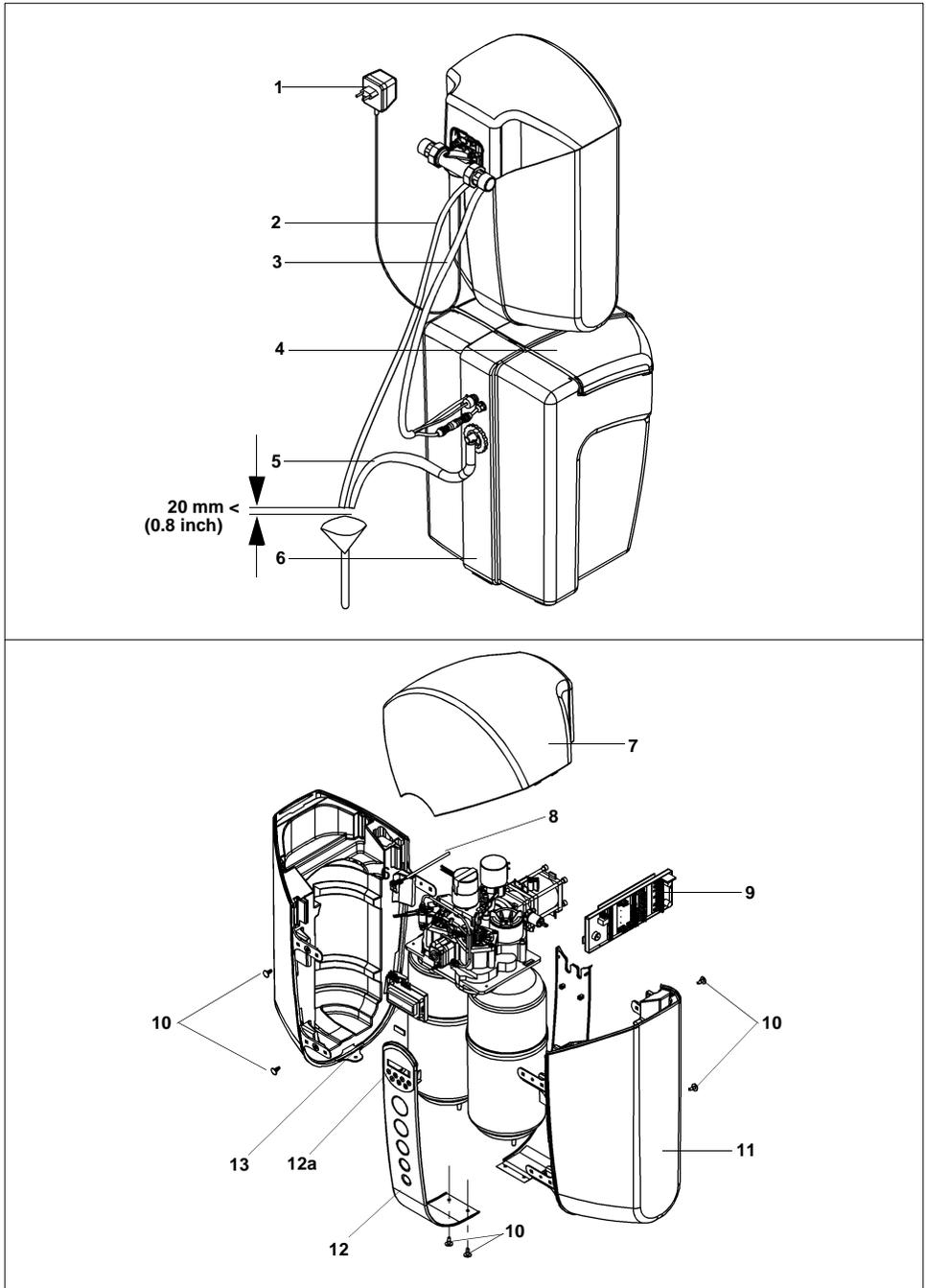


Fig. 20: Positions JUDO i-soft

Item	Name
1	power supply complete
2	wastewater hose
3	flexible hose
4	salt container cover
5	backup overflow hose
6	salt container
7	cover
8	I/O cable
9	electrical circuit
10	plastic blind revet
11	panelling complete
12	middle faceplate complete
12a	keypad i-soft
13	I/O module

Worn parts	No.	Order no.
Suction strainer *	1	2201270
O-ring 43x3 **	1	2201316
Impeller **	1	2201258
Rate regulator ***	1	2201312
Injector chamber, pre-mounted *	1	2201310
Injector chamber cover, pre-mounted ***	1	2201308
Gasket set for injector *	1	2201218
O-ring 18,64x3,53 ***	1	2201314
Pressure reducer screen ***	1	2201306
Spare parts kit for overflow valve	1	2200418
Spare parts kit for water meter	1	2200763
Spare parts kit for controls	1	2200579
Spare parts kit for pressure reducer	1	2200582

Replacement interval

* = 1 year, ** = 2 years, *** = 3 years

11. Customer support



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Installed by:

<p>JUDO PROMI domestic water station Backwashing protective filter with JUDO PROFI-PLUS technology, pressure reducer and backflow preventer.</p>	<p>JUDO JULIA Metering pump for JUL mineral solution against corrosion (brown water) and limescale deposits.</p>	<p>JUDO PROFI-PLUS Backwashing protective filter in the germ protection class with silver plated strainer and point rotation system for optimum cleaning of the strainer.</p>
<p>JUDO ZEWA-WATERSTOP Central water safety fitting. Stops water flow in the event of water pipe bursts and detects leaks.</p>	<p>JUDO HEIFI-KOM Combination of the heating backwashing filter and automatic heating feed station for fulfilment of the DIN EN 1717 standard.</p>	

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