

# Installation and operating manual

## Water level control for overflow collecting tank

# NR-12-TRS-2



Art.No.3030000030 (with solenoid valve)

Art.No.3030000020 (without solenoid valve)

### Function

The **tsi** NR-12-TRS-2 collection reservoir control system is a technically high-quality product which can only correctly fulfil its function if it has been connected and assembled in accordance with the instructions and if this operating manual is followed. The **tsi** NR-12-TRS-2 is particularly suitable for use in swimming pools with overflow channels. It is constructed with integrated circuitry and consists of:

- electronic controller
- submerged electrodes (option)
- solenoid valve (option)

The submerged electrodes do not cause any electrolyte formation in the water because they are operated with alternating current. The electrode cables can be extended up to 20 m (min. 1.5mm<sup>2</sup>) without requiring electronics balancing. The electronic circuitry has been specially developed for overflow collection reservoirs. Wave movements do not cause direct switching processes due to special circuitry in order to avoid switching cycles which may be too short.

The submerged electrodes are operated using non-hazardous safety low voltage. The controller itself has been designed to comply with the currently applicable German VDE and CE regulations.

### Specifications

<b>Control system:</b>	
Dimensions:	220mm x 219mm x 100mm
Operational voltage:	230V/50Hz
Control system power consumption:	ca. 7VA
Switching capacity:	max. 1.1kW (AC3)*
Ambient temperature:	0-40°C
Air humidity:	0-95% non-condensing
Protection class:	IP 40
<b>Submerged electrodes:</b>	
Dimensions:	ø24mm x 134mm
Cable length:	3m
Operational voltage:	12V

\* See also connection plan.

### Installation

The controller must be installed in accordance with its protection class. Before opening the housing, the device must be switched voltage-free using a multi-pole main switch with a contact opening distance of at least 3 mm. This main switch must be integrated in the on-site installation. It is imperative that you observe the throughflow direction (arrow direction) indicated on the solenoid valve.

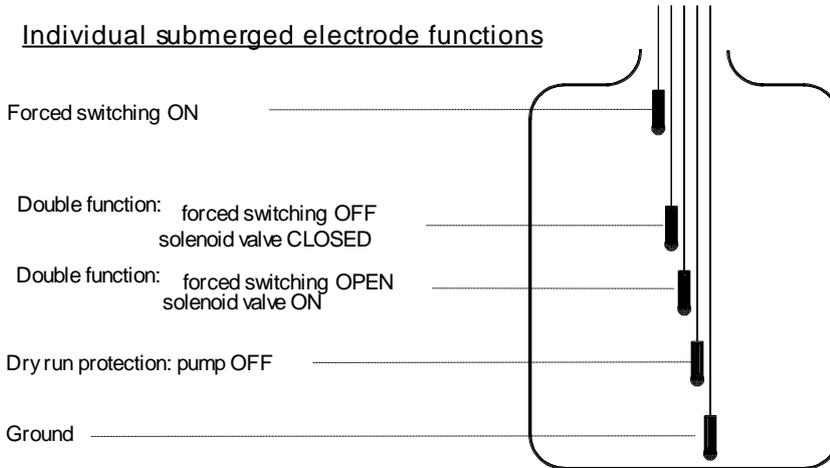
## Use in open-air pools

Depending on the swimming pool design, it is possible that rainwater raises the water level in open-air pools and activates the "forced switching" function. If this operating behaviour is not required, "forced switching ON" (terminal 8) can be disconnected.

## Installing the submerged electrodes

**ISI** submerged electrodes are supplied as series with waterproof and ozone-proof special cables. The tensile strength of the cable is sufficient for hanging the electrodes from the special cable in the overflow collection reservoir, and it is also possible for individual electrodes to touch each other. Fixing takes place above the reservoir. Fixing should be made with the aid of strain-relief clamps, cable clamps, cable binders or similar elements in accordance with the relevant local conditions. The special cables are connected in a distribution box to be installed on site. A cable (e.g. NYM-0 5x1.5mm<sup>2</sup>) is then routed from the distribution box to the control system. The submerged electrodes are not suitable for saline baths.

### Individual submerged electrode functions



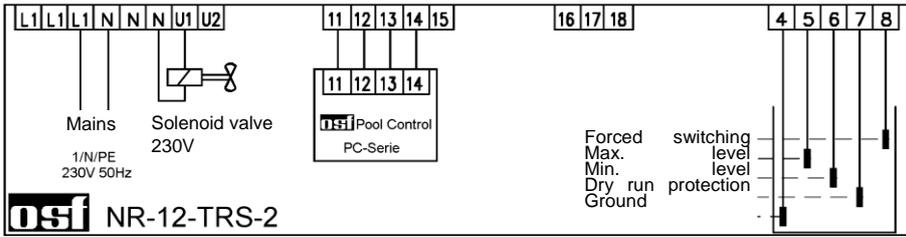
In normal operation, the water level varies between the "solenoid valve CLOSED" and "solenoid valve OPEN".

The height difference is dependent on individual conditions. A minimum of 5 cm should be ensured to achieve sufficient sensing distance.

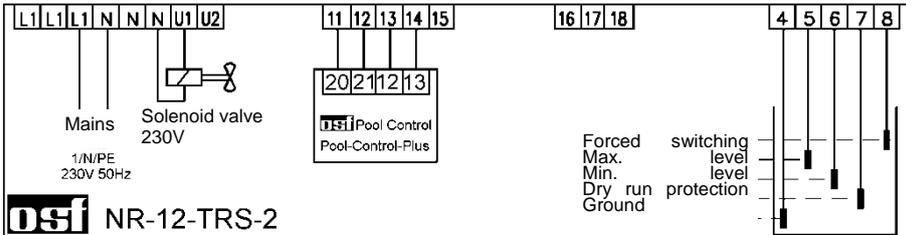
## Electrical power supply

The electrical power supply may only be installed by an approved specialist electrician. The following wiring diagram and the relevant applicable safety regulations must be observed. **The electrical equipment must include a residual current circuit breaker with  $I_{FN}=30mA$  on site.**

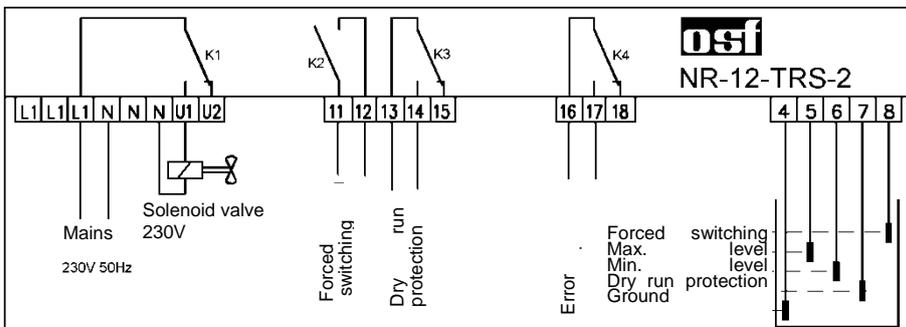
## Application examples



These 3 application examples clarify combinations using the OSi Pool-Control-Plus (PCP) filter control, a OSi PC-230-ES or PC-400-ES filter control and any other control system.



The OSi NR-12-TRS-2 collection reservoir control system can also be directly combined with other OSi devices, e.g. backflushing and solar control systems. Appropriate wiring diagrams are included with the control systems.



Relay K2 switches the filter pump on once the water level reaches the top electrode.

Relay K3 switches the pump off once the water level falls below the "dry operation protection" electrode.

## Connecting the submerged electrodes

When connecting the submerged electrodes you must ensure that the sequence is not mixed up, because mixing up the electrodes always leads to failures in the installation.

If the "forced switching" function is not required, the corresponding submerged electrode (terminal 8) can be omitted. Terminal 8 then remains unused. It does not require bypassing.

All other submerged electrodes are necessary for control system function and may not be omitted or bypassed.

## Functional information

The OSi NR-12-TRS-2 collection reservoir control system has the following functions:

a) **Water level regulation.**

Once the water level falls below the "solenoid valve OPEN" submerged electrode due to water losses in the swimming pool, e.g. due to evaporation or backflushing, the solenoid valves opens and the fresh water flowing in raises the water level. As soon as the rising water level reaches the "solenoid valve CLOSE" (terminal 5) submerged electrodes position and contacts the electrodes, the solenoid valve closes freshwater inflow off.

b) **Filter pump dry run protection.**

If the water level sinks to below the "dry run protection pump OFF" submerged electrode due to water losses in the collection reservoir, e.g. due to backflushing, the collection reservoir control system switches the filter pump off so that it is not damaged by dry running. As soon as the

water level rises to the height of the "dry run protection pump ON" (terminal 6) and contacts the electrode, the **ISI** collection reservoir control system switches the filter control system on again automatically.

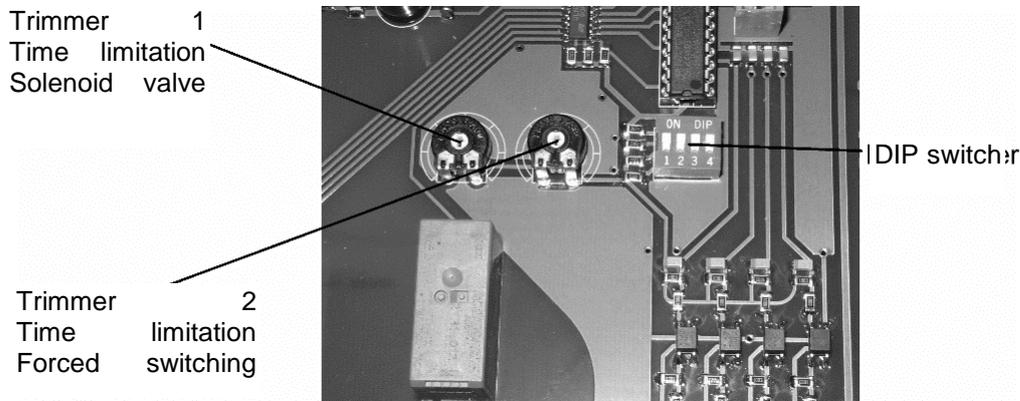
- c) Forced switching.  
 If the water level rises in the collection reservoir due to water displacement in the swimming pool and contacts the "forced switching ON" submerged electrode (terminal 8), the **ISI** NR-12-TRS-2 collection reservoir control system switches the filter pump on automatically (in connection with an **ISI** filter control system). Now the water is pumped back into the swimming pool to prevent unnecessary loss of valuable water. The "forced switching ON" submerged electrode must be located a few centimetres deeper than the overflow.

An electroless closed solenoid valve must be used.

A complete function test must be carried out once installation and assembly work has been completed.

## Device setting facilities

The control system includes 4 DIP switches and 2 trimmers which can be used to set additional control system functions.



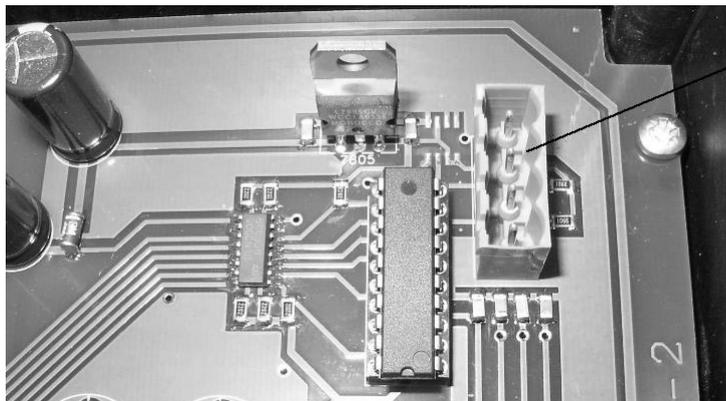
### DIP switch functions:

DIP 1:	OFF	The solenoid valve works without time limitations.
Solenoid valve time limitation	ON	The solenoid valve on duration is limited to the time with which trimmer 1 is set (0.5...60 minutes). If the maximum operating level has not been achieved within this period, the solenoid valve (K1) is switched off and the collective error messaging system (K4) is activated if necessary (see DIP 4).
DIP 2	OFF	Dry run protection works without time limitation. When the water level sinks below the "dry run protection" electrode, the pump (K3) is switched off. It is only switched on again once the water level has reached minimum operating level.
Dry run protection time limitation	ON	Dry run protection works with without time limitation. When the water level sinks below the "dry run protection" electrode, the pump (K3) is switched off. It is switched on again once the "dry run protection" electrode has been immersed in water for 60 seconds, or if the water level has reached the minimum operating level.
DIP 3:	OFF	Forced switching works without time limitation. When the water level reaches the "forced switching" electrode, the pump (K2) is switched on. It is only switched on again once the water level has sunk below the maximum operating level.

Forced switching time limitation	ON	Forced switching works with without time limitation. When the water level reaches the "forced switching" electrode, the pump (K2) is switched on. It is only switched on again once the water level has sunk below the maximum operating level. If this level has not been achieved within the time set using trimmer 2 (0.5 ... 60 minutes) the pump is switched off and the error message (K4) is switched on.
DIP 4: Group error message	OFF	Relay K4 is used for group error messaging. It is switched on if: <ul style="list-style-type: none"> <li>• the dry run protection activates</li> <li>• the solenoid valve time limitation activates (see DIP 2)</li> <li>• the forced switching time limitation activates (see DIP 3)</li> <li>• inadmissible measured values are detected in the electrodes (e.g. "forced switching" electrodes in water and "dry run protection" electrodes not in water - electrodes mixed up).</li> </ul>
	ON	Relay K4 is switched on if the forced switching is switched on for longer than the period set using trimmer 2 (0.5 ... 60 minutes). This can be used to trigger backflushing using K4 in connection with the <b>OSI</b> EUROTRONIK 10 pressure switch input in order to remove excess water from the system.

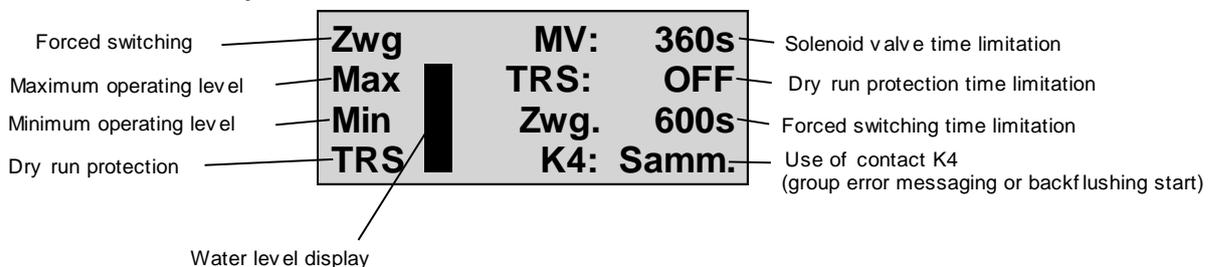
## Service terminal

There is a connecting plug inside the control unit which can be used to connect the **OSI** service terminal.



Socket for service terminal

The service terminal is used to display the level regulation operating status clearly in order to help in possible troubleshooting. **Caution! The service terminal may only be plugged in or unplugged when the control system is switched off!**



## Installation instructions solenoid valve

- The piping system must be cleaned before the valve installation, because dirt will malfunction.
- If necessary, a strainer should be mounted in front of the valve inlet.
- Mechanically clamping the valve housing, for example for non-aligned pipes or improper sealing material is to be avoided.
- Use only suitable tools.
- Do not use the solenoid coil during mounting as a lever arm.
- **The direction of flow (direction of the arrow on the brass body) must be observed during installation!** The valve closes tightly only in the specified direction of flow. In the opposite direction, the solenoid valve may be damaged.
- The preferred installation location is " solenoid vertical on top ". In this position, the wear and contamination risk is lowest.

## Electrical connection

The electrical connection may only be carried out by an authorised electrician taking into account the applicable regulations. The protective earth connection is essential.

The junction box may be inserted or removed only when the power is off. AC solenoids are destroyed when operating without armature.

## Maintenance

Maintenance work must be performed by an expert only when the pipework is pressure-free and the magnet is voltage-free.

## Trouble shooting

If the valve does not open or close, the control bores and the armature must be cleaned.

***We wish you a lot of fun and relaxation in your swimming pool.***

Further information can be found on the Internet at the following address:

<https://osf.de/download/documents/documents.php?device=NR-12-TRS-2>

