Installation and Operating Instructions

POOL-Control-40

CE

Filter control unit with built-in level control

Part no. 310.000.0560

Connectable pumps

230V alternating-pump
(rated current max. 8A)

400V three-phase pump
(rated current max.8A)

Speck ECO-Touch-Pro pump

Speck Badu-90-ECO-VS pump

Speck Badu-90-ECO-Motion pump

Pentair IntelliFlo pump

Pentair SuperFlo pump

Zodiac FloPro VS pump

UWE PMM pump

Technical data

Dimensions:		300mm x 285mm x 85mm
Operating voltage:		400V/50Hz
Power consumption of control unit:		approx. 5VA (depends on operating mode)
Switching capacity:	Pump:	max. 8A / 3.0 kW (AC3)
	Heating:	max. 3A / 0.4 kW (AC3)
	Dosing system:	max. 3A / 0.4 kW (AC3)
	Auxiliary output:	max. 3A / 0.4 kW (AC3)
Degree of protection:		IP 40
Level sensors:		Safety Extra Low Voltage (SELV)
Ambient temperature:		0-40°C
Air humidity:		0-95% non-condensing

Contents

Installation and Operating Instructions 1

Technical data 1

Contents 2

Function 5

Installation 5

Electrical connection 5

Low-voltage lines 6
Connecting the power supply for a 400V three-phase pump 6
Connecting the power supply for a 230V single-phase AC pump 6
Connecting the power supply for a 230V pump (with electronic motor protection enabled) 7
Connecting the power supply for a Speck ECO-Touch-Pro pump 7
Connecting the power supply for a Speck ECO-VS pump 7
Connecting the power supply for a Speck ECO-Motion pump 7
Connecting the power supply for a Zodiac FloPro VS pump 8
Connecting the power supply for a Pentair IntelliFlo pump 8
Connecting the power supply for a Pentair SuperFlo VS pump 8
Connecting the power supply for a UWE PMM pump 9
Connecting the heating 9
Additional output / auxiliary input 9
Connecting the EUROTRONIK-10 for backwashing using a 6-way multiport valve 9
Operating the PC-40 without a EUROTRONIK-10 unit 9
Connecting the slide valves for backwashing 10
Connecting underwater lighting, flocculation pump, dispensing equipment 10
Connecting a main drain valve (ECO valve) 10
Connecting a fault indicator 11
Connecting a flow sensor 11
Connecting a pressure switch 11
Connecting a cover limit-switch 11

Level control 12

Overflow pools with spillway 12
Use with outdoor pools 12
How level control works for balancing tanks 12
Pools with skimmer 13
Use without level control 13
Solenoid valve for topping up the water level 13

Temperature sensor 14

Pool temperature sensor 14
Solar temperature sensor 14
Air temperature sensor 14

Fuses 14

Controls on the front panel 15

Control unit ON/OFF 16
Manual operation 16
Reset fault indicator 16
ECO ON/OFF 16
Pump indicator light 16
Heating indicator light 16
Solar heating indicator light 16
Backwash indicator light 16
Water input indicator light 16
Adjustment buttons 16
Temperature selection 16
Setting the time 16
Timer programming 17
Changing the timer settings 17
Clearing the timer settings 17

Configuration menu 18

Filter pump 18
Type 18
Motor current 18
Motor protection 18
Startup time 18
ECO mode 19
Timer 19
Temperature reduction 19
Heating 19
Operating mode 19
Priority 19
Minimum switching interval 19
Over-run time 19
Temperature limit 19
Solar heating 20
Operating mode 20
Priority 20
Minimum switching interval 20
Switch-on difference 20
Switch-off difference 20
Temperature boost 20
Pump speed 20
Frost protection 21
Operating mode 21
Air temperature 21
Water temperature 21
Backwashing 21
Operating mode 21
Timer 21
Stop backwashing 21
Backwash period 21
Rinse period 21
Valve delay 21
Fortnightly 22

Use main drain 22
Level control 22
Type 22
Time limit 22
Minimum switching interval 22
Switch-on delay 22
Switch-off delay 22
Auxiliary output 23
Operating mode 23
Time limit 23
Timer 23
Cycle time 23
ON period 23
Interlock 23
Sensor calibration 23
Water temperature 24
Solar temperature 24
Air temperature 24
Language 24
Language selection 24
Connection plan 24

Function

The OSF PC-40 control unit lets you time the on/off cycles of a filter pump based on a user-programmable daily or weekly schedule. A 400V 3-phase pump, a 230V single-phase AC pump or a variable-speed filter pump may be used as the filter pump (see wiring diagrams). When using a 3-phase filter pump, a 3-phase electronic motor protection device protects the pump from overload (current range has continuous adjustment up to 8A).

Backwashing can be performed using a 6-way multiport valve and installed EUROTRONIK-10 controller or using slide valves under manual, timed or pressure-dependent control.

The built-in level control is designed for use with overflow pools with spillway (balancing tank) and for skimmer pools.

While the filter pump is running, the swimming pool heating is controlled by the electronic temperature controller. During pauses in filtration, the heating is automatically switched off by the internal interlock. The required water temperature for the swimming pool can be set on the front panel. The heating can also be switched off from here. A live contact (terminal U2) and volt-free floating contacts (terminals 17&18) are available for connecting the heating system. Terminals are provided for connecting an OSF solar actuator when operating solar absorbers that carry a direct flow of water from the pool. This control unit is not intended for use with other types of solar collectors. The absorber temperature must not exceed 80°C at the temperature sensor.

Terminals for connecting level sensors can be used for convenient automatic control of the water level in the swimming pool. There are also terminals for connecting a flow sensor or a pressure switch, and a winding thermostat contact. These provide extra protection for the filter pump against potential damage from dry-running of the filter installation.

Spare terminals are available for connecting additional devices such as underwater lights and chemical dosing equipment. A load (230V/max. 3A) connected to terminal U4 (auxiliary output) can be timed to switch on and off by its own dedicated timer in the unit. Terminal U3 (dosing equipment) carries 230 V only while filtration is running, but is de-energized outside filtration times. Terminals 15&16 (dosing equipment) are volt-free floating contacts for custom use. The relay contact between terminals 15 and 16 is closed while filtration is running, and open outside filtration times. This contact is rated for a maximum voltage of 230V and a maximum power of 400W ($\cos \varphi$=0.6).

Terminals 19&20 are volt-free floating contacts that can be used for fault indication.

The connecting terminals for the winding protection switch (WSK terminals) can be used to connect a winding thermostat built into the filter-pump motor winding. If this thermal switch opens, e.g. as a result of the motor winding getting too hot, the filter pump is switched off automatically along with the heating and dosing equipment. Once the winding protection switch closes again after the motor winding has cooled down, the units automatically switch back on. There is no need for a manual reset. The connecting terminals for the winding protection switch carry 230V.

The motor protection device can only be used with 400V/50Hz filter pumps connected to terminals U1/V1/W1. Motor protection is not active if you have selected a configuration using a variable speed pump or a 230V pump.

Installation

The swimming pool must be designed to prevent consequential damage resulting from a potential technical fault, power failure or faulty controller.

Electrical connection

The control unit must be mounted such that it is protected from moisture in accordance with its degree of protection. The ambient temperature must lie between 0° C and + 40° C and should vary as little as possible. The relative humidity at the installation position must not exceed 95% and there must not be any condensation. Avoid exposing the unit to direct heat or sunlight.

The power supply for the unit must be provided via an all-pole disconnection switch with a minimum contact gap of 3mm and via a residual-current circuit breaker with a fault current I_{FN} of$\leq$ 30mA. When using variable-frequency drives and variable speed pumps, the residual-current circuit breakers stipulated for these devices

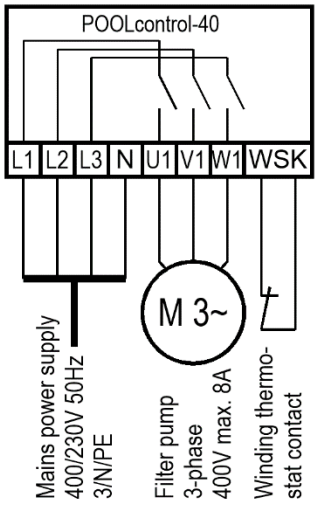
must be used and the relevant regulations observed. **Always disconnect the unit from the power supply before opening the case. All electrical wiring and calibration and servicing work must be performed solely by an approved electrician. The enclosed wiring diagrams and all applicable safety regulations must be observed.**

The switching outputs of the PC-40 are not intended as a voltage supply for variable frequency drives. Please refer to the relevant wiring diagrams in these operating instructions.

Low-voltage lines

Low-voltage lines must not be laid along with three-phase or AC power cables in the same cable conduit. In general, always avoid routing low-voltage lines close to three-phase or AC power cables.

Connecting the power supply for a 400V three-phase pump

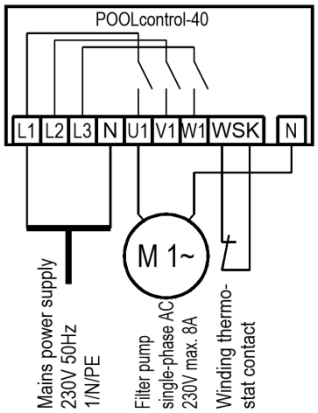


The factory-inserted link between the two WSK terminals must be removed when connecting a pump fitted with a thermal winding protection switch (winding thermostat). If the pump does not have a winding protection switch, the link must remain screwed in place. These terminals are live and carry a mains voltage!

The option Filter pump - type: 3-phase pump must be selected for the filter pump in the configuration menu.

The pump is monitored by the electronic motor protection device. To provide protection, the trip current for the motor protector must be set to the rated current of the pump (specified on the type plate).

Connecting the power supply for a 230V single-phase AC pump

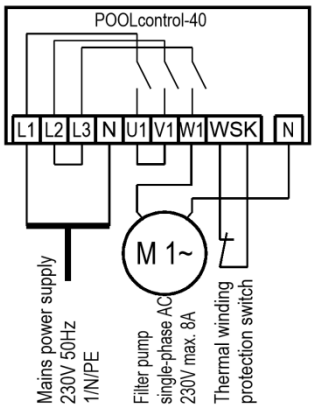


The factory-inserted link between the two WSK terminals must be removed when connecting a pump fitted with a thermal winding protection switch (winding thermostat). If the pump does not have a winding protection switch, the link must remain screwed in place. These terminals are live and carry a mains voltage!

The option Filter pump - type: monophase pump must be selected for the filter pump in the configuration menu.

In this operating mode, the pump is not monitored by the electronic motor protection device.

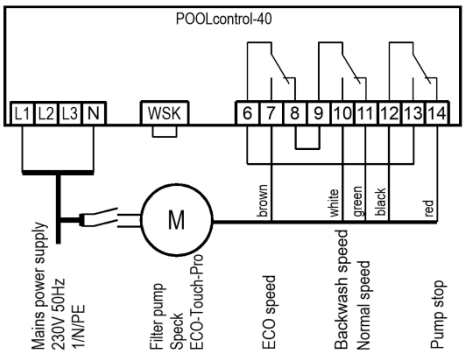
Connecting the power supply for a 230V pump (with electronic motor protection enabled)



If a 230V pump is meant to be monitored by the electronic motor protection device, the option Filter pump - type: 3-phase pump must be selected for the filter pump. The trip current for the motor protector must be set to the rated current of the pump (specified on the type plate). For the electronic motor protection to work correctly, the electrical power to the motor must pass via all three switching contacts of the filter control unit (place link between terminals L2 and L2 and between U1 and V1; connect pump to W1).

The factory-inserted link between the two WSK terminals must be removed when connecting a pump fitted with a thermal winding protection switch (winding thermostat). If the pump does not have a winding protection switch, the link must remain screwed in place. These terminals are live and carry a mains voltage!

Connecting the power supply for a Speck ECO-Touch-Pro pump



A Speck ECO-Touch-Pro pump can be connected directly to the PC-40 unit. Connect the speed controller to terminals 6-14.

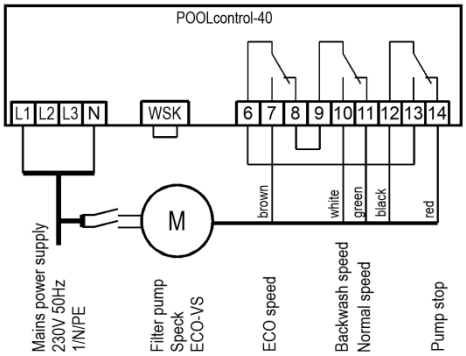
A separate mains power supply must be provided for the pump. The power supply cannot be provided by the PC-40.

There must be a link inserted between the two WSK terminals (winding protection switch).

The option Filter pump - type: var. speed pump must be selected for the filter pump in the configuration menu.

Always refer to the operating instructions for the pump.

Connecting the power supply for a Speck ECO-VS pump



A Speck ECO-VS pump can be connected directly to the PC-40 unit. Connect the speed controller to terminals 6-14.

A separate mains power supply must be provided for the pump. The power supply cannot be provided by the PC-40.

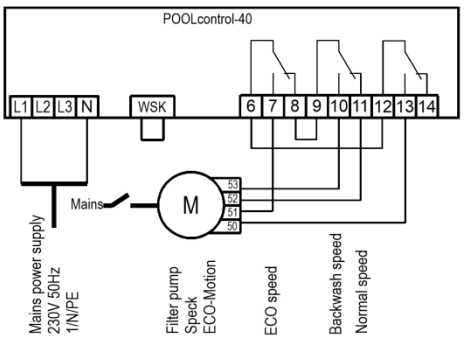
There must be a link inserted between the two WSK terminals (winding protection switch).

The option Filter pump - type: var. speed pump must be selected for the filter pump in the configuration menu.

Always refer to the operating instructions for the pump.

The digital inputs must be set at the pump to "dI" in the pump setup menu.

Connecting the power supply for a Speck ECO-Motion pump



A Speck ECO-Motion pump can be connected directly to the PC-40 unit. Connect the speed controller to terminals 6-13.

A separate mains power supply must be provided for the pump. The power supply cannot be provided by the PC-40.

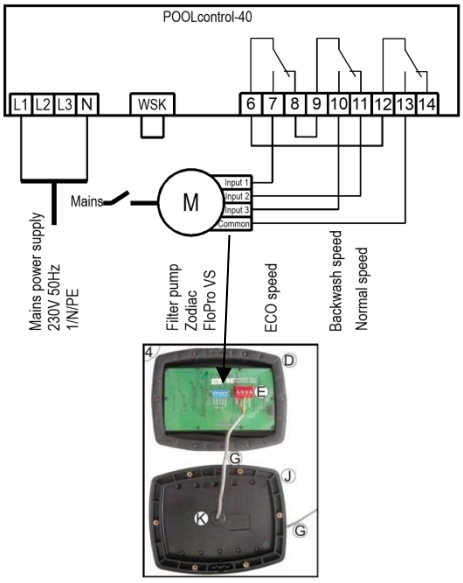
There must be a link inserted between the two WSK terminals (winding protection switch).

The option Filter pump - type: var. speed pump must be selected for the filter pump in the configuration menu.

Always refer to the operating instructions for the pump.

In the Setup menu on the pump, the external control must be enabled for "digital fixed speeds" with the signal type "continuous signal". The speeds required for ECO mode, normal mode and backwash mode must be set for the speeds N1, N2 and N3.

Connecting the power supply for a Zodiac FloPro VS pump



A Zodiac FloPro VS pump can be connected directly to the PC-40 unit. Connect the speed controller to terminals 6-13.

A separate mains power supply must be provided for the pump. The power supply cannot be provided by the PC-40.

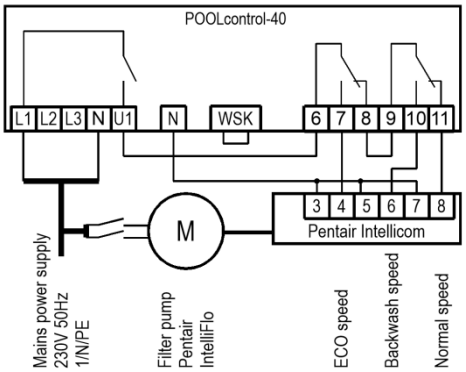
There must be a link inserted between the two WSK terminals (winding protection switch).

The option Filter pump - type: var. speed pump must be selected for the filter pump in the configuration menu.

Always refer to the operating instructions for the pump.

At the pump, the speed controller must be connected to the designated terminals on the back of the user interface. The speeds required for ECO mode (level 1), normal mode (level 2) and backwash mode (level 3) must be assigned to speed levels 1 to 3.

Connecting the power supply for a Pentair IntelliFlo pump



An IntelliFlo pump can be controlled by the PC-40 using the Pentair Intellicom controller.

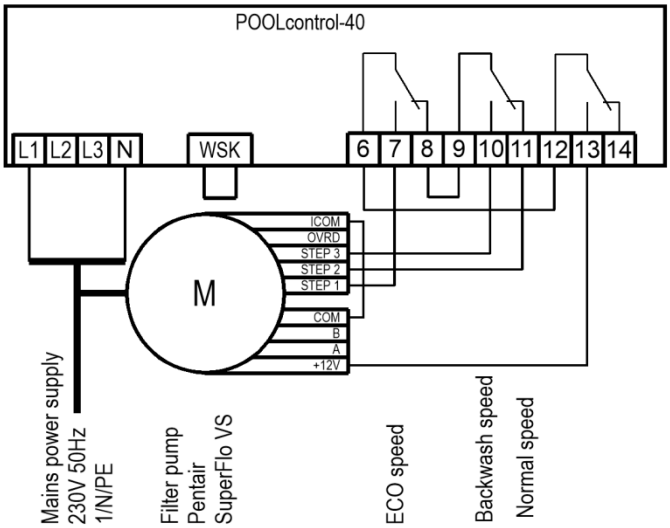
A separate mains power supply must be provided for the pump. The power supply cannot be provided by the PC-40.

There must be a link inserted between the two WSK terminals (winding protection switch).

The option Filter pump - type: var. speed pump must be selected for the filter pump in the configuration menu.

Always refer to the operating instructions for the pump.

Connecting the power supply for a Pentair SuperFlo VS pump



A SuperFlo VS pump can be controlled by the PC-40 unit.

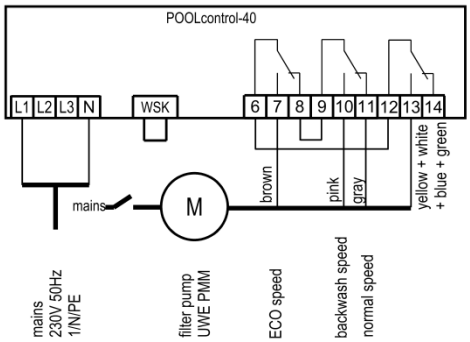
A separate mains power supply must be provided for the pump. The power supply cannot be provided by the PC-40.

There must be a link inserted between the two WSK terminals (winding protection switch).

The option Filter pump - type: var. speed pump must be selected for the filter pump in the configuration menu.

Always refer to the operating instructions for the pump.

Connecting the power supply for a UWE PMM pump



A UWE PMM pump can be controlled by the PC-40.

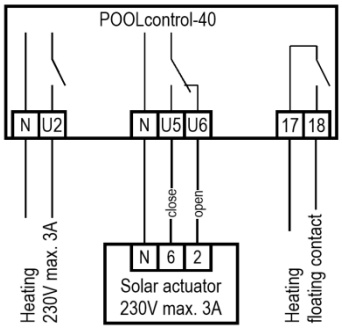
The power supply for the pump must be separate from the power supply and cannot be provided by the PC-40.

A jumper must be inserted between the two terminals WSK (winding protection contact).

In the configuration menu, filter pump type: var. speed pump must be selected for the filter pump.

The operating instructions of the pump must be observed!

Connecting the heating

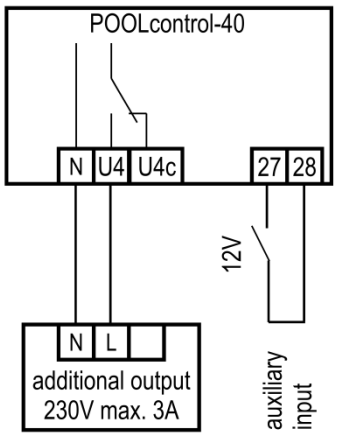


The pool heating can be connected to the terminal U2. This output supplies 230V and is rated for a maximum load of 3A.

In addition, a volt-free floating contact is provided at terminals 17&18 (e.g. for controlling the boiler).

An osi 230V solar actuator can be connected to terminals U5 and U6 for operating the solar heating. When solar heating is operating, the mains voltage is applied to terminal U6 and no voltage is applied to terminal U5. When solar heating is not actuated, no voltage is applied to terminal U6 and the mains voltage appears at terminal U5.

Additional output / auxiliary input



An additional load, such as lighting, can be connected to terminals U4 and N. This output provides 230V and can be used up to max. 3A burdened.

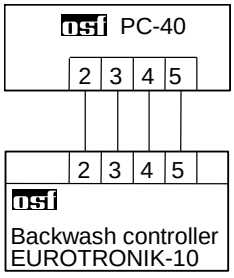
A pushbutton for switching the additional input can be connected to the additional input, terminals 27 and 28.

The terminals carry 12V safety extra-low voltage.

The auxiliary output can be switched with the on-site button on the auxiliary input, the "Aux" button in the front cover, the timer, as well as in the menu.

A runtime limitation can be set in the menu.

Connecting the EUROTRONIK-10 for backwashing using a 6-way multiport valve

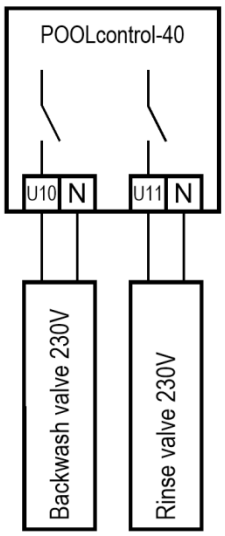


A 4-wire connection is required for connecting the EUROTRONIK-10. The wires must not be swapped over, i.e. they must be connected to the same terminal at each end. The EUROTRONIK-10 additionally requires a separate power supply.

Operating the PC-40 without a EUROTRONIK-10 unit

If the PC-40 is intended to be operated without a EUROTRONIK-10 unit, terminals 3 and 5 must be connected together (with a link). Disconnect the connecting cable before doing so.

Connecting the slide valves for backwashing



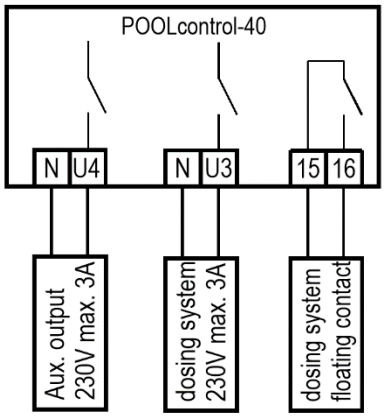
A 230V slide valve for the backwash function can be connected to the terminals U10 and N.

A 230V slide valve for the rinsing function can be connected to the terminals U11 and N.

Both valves are controlled by the internal backwash controller.

The heating and dosing systems are disabled during the backwash and rinsing operation.

Connecting underwater lighting, flocculation pump, dispensing equipment



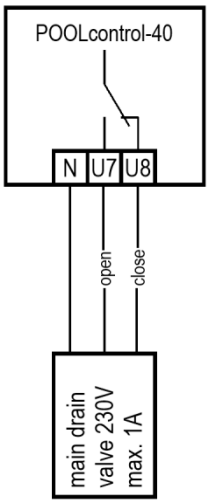
An auxiliary item of equipment running at 230V (e.g. underwater lighting) can be connected to terminal U4 and can then be timed to switch on and off by a dedicated timer in the control unit. Since this is a configurable output, it can also be used for controlling a flocculation pump.

An auxiliary item of equipment running at 230V (e.g. dosing equipment) can be connected to terminal U3. This equipment is switched on together with the filter pump during filtration.

A volt-free floating relay contact is connected between terminals 15 and 16 inside the control unit. This can be used to control additional dosing equipment (contact is closed during filtration).

This contact is rated for a maximum load of 230V/4A.

Connecting a main drain valve (ECO valve)

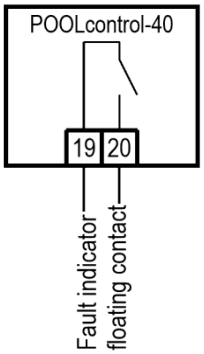


A main drain valve (ECO valve) or a valve for water extraction from the pool walls can be connected to terminals U7 and U8. Connect a 2-way valve to terminal U7 and neutral terminal N. For a 3-way valve, use terminal U7 for "*OPEN*" and terminal U8 for "*CLOSE*". This contact is rated for a maximum load of 230V/1A.

For overflow pools with spillway, this valve is opened in ECO mode to minimize evaporation losses.

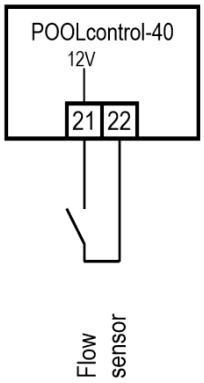
If this valve is also meant to be opened during backwashing, then the option Backwashing - floor drain: valve open in BW must be selected in the configuration menu.

Connecting a fault indicator



An external fault indicator can be connected to volt-free floating terminals 19 and 20. This contact is rated for a maximum load of 230V/4A.

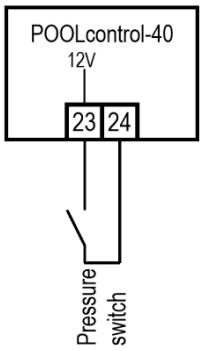
Connecting a flow sensor



A flow sensor or a pressure sensor can be connected between terminals 21 and 22 instead of the factory-fitted link, to provide additional protection for the pump against dry-running. During filtration, a certain maximum time (factory set to 10 seconds, adjustment range 5-60 sec) is allowed after the filter pump starts running before this contact must close. If the contacts do not close in this time, the filter pump is switched off and the fault indicator light comes on. This contact is not polled during backwashing.

The terminals carry a safety extra low voltage.

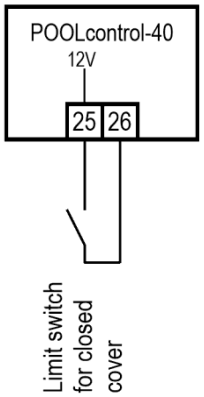
Connecting a pressure switch



A pressure switch fitted in the pressure line or in the gauge port of the central valve can be connected to terminals 23 and 24. The backwash process starts if the floating contact of the pressure switch is closed for at least 10 seconds.

The terminals carry a safety extra low voltage.

Connecting a cover limit-switch



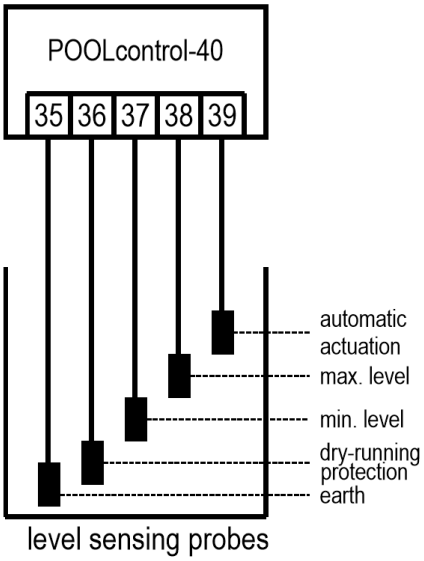
A limit switch for the swimming-pool cover can be connected to terminals 25 and 26. This switch automatically starts ECO mode when the cover is closed.

The terminals carry a safety extra low voltage.

Level control

The built-in level control is designed both for overflow pools with spillway and for skimmer pools. The version to be used must be specified when configuring the control unit before use: in the configuration menu select either the option Level control - type: collect. vessel or Level control - type: skimmer pool.

Overflow pools with spillway



DSI electrode probes must be used as the level sensors.

Thanks to the strain relief provided for the cable, these probes can be suspended by this dedicated cable in the overflow balancing tank. It does not matter if the individual probes touch each other. The probes are fixed above the tank using the DSI probe holder.

The dedicated cables must be taken to a junction box installed by the customer. A cable must be laid from this junction box to the control unit (e.g. cable NYM-0 5x1.5 mm²). The cable must not exceed 30m in length. The cable must not be laid alongside mains power cables.

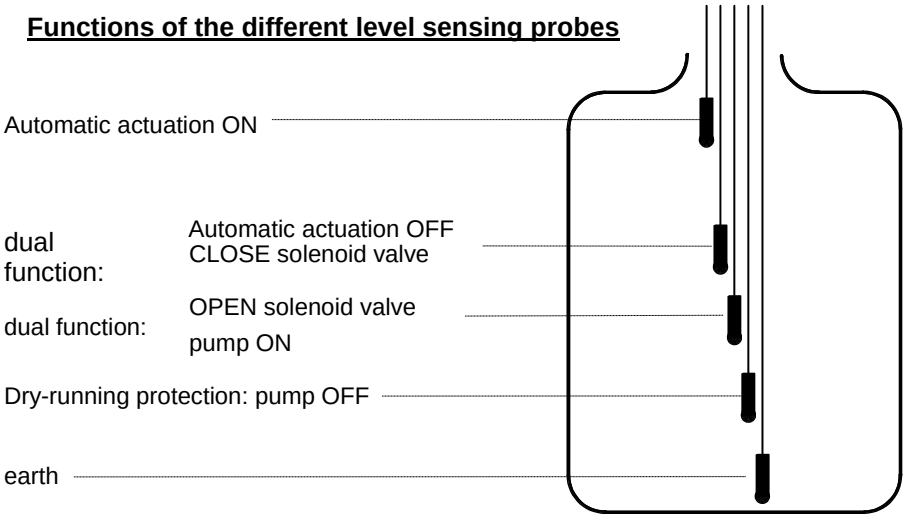
The probes operate with safety extra low voltage (SELV).

Take special care when fitting the probes to ensure they are connected in the correct order, because the installation will not work if the probes are mixed up.

Use with outdoor pools

Depending on the design of the pool installation, rain water in an outdoor pool can raise the water level, triggering the "automatic actuation" function. If you don't want this to happen, you can disconnect the "automatic actuation ON" probe (terminal 39). All the other probes are needed for the control function to work, so must not be omitted or bypassed.

Functions of the different level sensing probes



In normal mode, the water level fluctuates between the "*CLOSE solenoid valve"* and *"OPEN solenoid valve" probes.*

The height differences depend on the individual circumstances, but must be no less than 5 cm to ensure sufficient switching intervals.

How level control works for balancing tanks

Level control for balancing tanks performs the following functions:

a. Controlling the water level.

When water is lost from the swimming pool, e.g. through evaporation or backwashing, causing the water level to drop to below the "OPEN solenoid valve" probe (terminal 37), the solenoid valve (terminal U9) opens and the inflowing fresh water causes the water level to rise. As soon as the rising water level reaches the position of the "CLOSE solenoid valve" probe (terminal 38) and touches this probe, the solenoid valve closes the supply of fresh water.

b. Protecting the filter pump against dry-running.

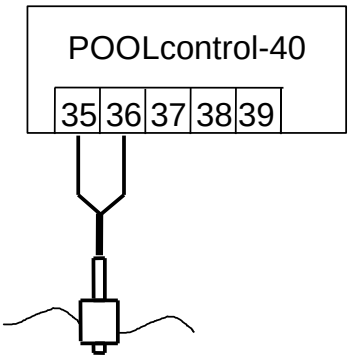
When water is lost from the swimming pool, e.g. from backwashing, causing the water level to drop to below the "Dry-running protection / pump OFF" probe (terminal 36), the level control system switches

off the filter pump to prevent it being damaged by running without water. As soon as the water level has returned to the height of the "Dry-running protection / pump ON" probe (terminal 37) and touches this probe, the level control system automatically switches the filter pump back on.

c. Automatic actuation.

If water displacement in the swimming pool has increased the water level in the balancing tank so that it touches the "automatic actuation ON" probe (terminal 39), the level control system automatically switches on the filter pump. The water is then pumped back into the pool, avoiding unnecessary loss of precious water. The "automatic actuation ON" probe must be placed a few cm lower than the overspill.

Pools with skimmer



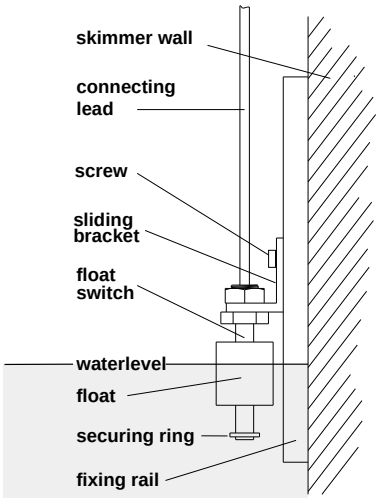
float switch

An OSi mini float switch must be used as the sensor for skimmer pools. The float switch lead can be extended with a cable (2x0.75mm²) of up to 30m in length. Please note that the connection must be absolutely watertight. The float-switch connecting cable must not be laid alongside other current-carrying cables.

The mini float switch operates with safety extra low voltage (SELV).

In this operating mode a time delay is automatically enabled in conjunction with the mini float switch. This adjustable time delay prevents over-frequent switching as a result of waves moving the pool water. The delay length can be adjusted in the configuration menu.

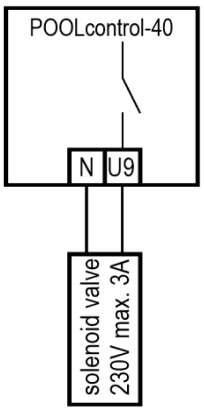
Fit the mini float switch on the sliding bracket. Then fasten the fixing rail vertically on the skimmer wall at the approximate height required for the water level. You can then set the water level by moving the sliding bracket up and down the rail. Tighten the screw to fasten the sliding bracket in place. All the parts fit easily inside each other so no great force is needed.



Use without level control

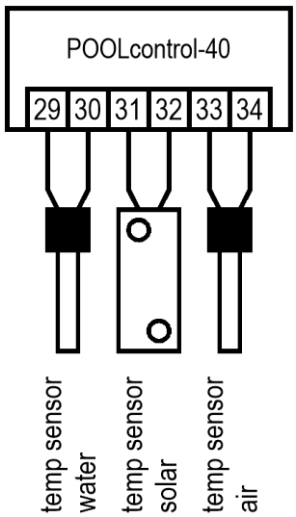
If you do not want to use the built-in level control, you must select the option Level control - type: no level control in the configuration menu.

Solenoid valve for topping up the water level



A normally closed solenoid valve must be used for the water intake. This valve must be connected to terminals U9 / N of the control unit. A suitable solenoid valve (R½"), part number 1090005804, is available from the OSi range.

Temperature sensor

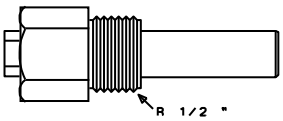


The sensors can be connected either way round (polarity not important).

Pool temperature sensor

Connect the swimming-pool temperature sensor to terminals 29 and 30. The temperature sensor is supplied as standard with a cable length of 1.5m. If required, this can be extended to a maximum length of 20m using a twin-core cable (min. cross-section 0.5mm²). Avoid running the sensor lead close to mains cables to prevent potential interference.

-thermowell



Since precise temperature control can only be achieved with good heat transfer between the temperature sensor and swimming pool water, an R1/2" thermowell (part no. 320.020.0003) must be fitted in the piping system.

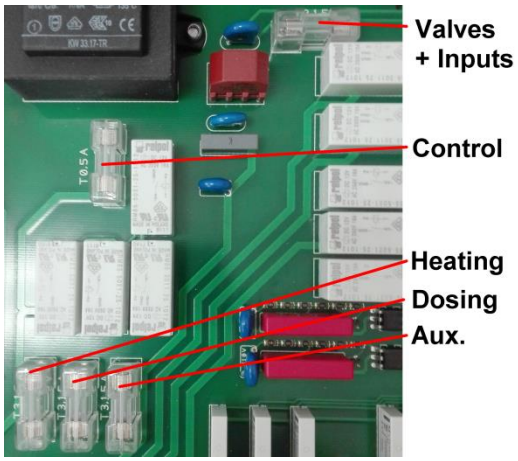
Solar temperature sensor

In addition, a solar temperature sensor (part no. 3100000033) can be connected to terminals 31 and 32. The temperature sensor is supplied as standard with a cable length of 20m. If required, this can be extended to a maximum length of 50m using a twin-core cable (min. cross-section 0.5mm²). **Avoid running the sensor lead close to mains cables to prevent potential interference**. The solar temperature sensor should be fitted at the solar collector output in good thermal contact with the returning water flow. The temperature at the installation position for the temperature sensor must not exceed 80°C.

Air temperature sensor

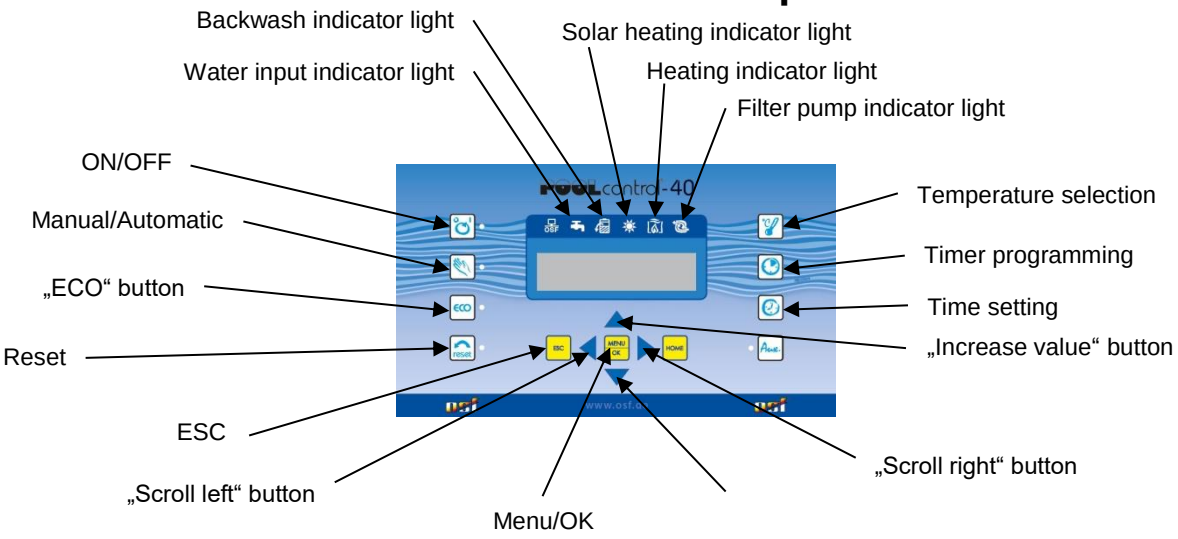
In addition, an air temperature sensor can be connected to terminals 33 and 34 (Solar temperature sensor, part no. 3100000033). This sensor is used for controlling the automatic frost protection function. The temperature sensor is supplied as standard with a cable length of 20m. If required, this can be extended to a maximum length of 50m using a twin-core cable (min. cross-section 0.5mm²). **Avoid running the sensor lead close to mains cables to prevent potential interference**.

Fuses



The electronic controller is protected by a 0.5A microfuse located on the printed circuit board inside the control unit. A separate 3.15A microfuse is provided for each of the following outputs: heating, dosing equipment and auxiliary output. Another 3.15A fuse supplies the valves and the 230V control inputs. The customer must fit mains fuses of maximum rating 16A to provide short-circuit protection for the filter pump.

Controls on the front panel



LCD	23,4°C 14:46 Standby	Normal operating display showing actual time and water temperature. The filter pump is off (pause in filtration).
LCD	23,4°C 14:46 Filtration	Normal operating display showing actual time and water temperature. The system is in normal filtration mode.
LCD	23,4°C 14:46 Filtration ECO	Normal operating display showing actual time and water temperature. The system is running in ECO mode.
LCD	23,4°C 14:46 Subsequent run	The filter pump is still running temporarily after switching off the heating.
LCD	23,4°C 14:46 Frost protection	The filter pump has been switched on by the frost protection function.
LCD	23,4°C 14:46 Forced run	The filter pump has been switched on by the built-in level control system.
LCD	23,4°C 14:46 Lack of water	The filter pump has been switched off by the built-in level control system.
LCD	23,4°C 14:46 Backwashing 75 s	The filter is being backwashed using the slide valve on terminal U10. The display shows the time remaining for backwashing.
LCD	23,4°C 14:46 Rinseing 18 s	The filter is being rinsed using the slide valve on terminal U11. The display shows the time remaining for rinsing.
LCD	23,4°C 14:46 Backwash EUROTR.	The filter is being backwashed by a Eurotronik controller connected to terminals 2-5.
LCD	23,4°C 14:46 Level sensor def	The level sensors are not connected properly or are connected in the wrong order.
LCD	23,4°C 14:46 Pump locked	The filter pump has been switched off by a connected EUROTRONIK-10 controller or the winding protection switch. This message also appears if the fuse for valves and inputs (see “Fuses”) has blown.
LCD	23,4°C 14:46 Pump overloaded	The filter pump has been switched off by the electronic motor protection device. To switch the pump back on, press the RESET button once the pump has cooled down.
LCD	23,4°C 14:46 No water flow	The filter pump has been switched off by the flow sensor connected to terminals 21 and 22. To switch the pump back on, press the RESET button once the fault has been rectified.
LCD	23,4°C 14:46 Netphase missing	The filter pump has been switched off because current is not flowing in all three phases of the 3-phase supply. To switch the pump back on, press the RESET button once the fault has been rectified.
LCD	Sensor def.14:46 Filtration	Temperature control not working because the temperature sensor is disconnected or faulty.

Control unit ON/OFF

This button can be used to switch the entire control unit on and off. **Caution!** This does not disconnect the control unit from the power supply This button is illuminated when the control unit is on.

Manual operation

This button can be used to switch on the filter pump manually, independently of the timer. This button is illuminated during manual operation.

Reset fault indicator

This button shows a red light if the control unit detects a fault (e.g. motor protection tripped). The system can only resume normal operation once the fault indicator has been cleared by pressing this button.

ECO ON/OFF

This button can be used to switch ECO mode on and off (energy saving mode).

Pump indicator light

This indicator light indicates when the filter pump is running.

Heating indicator light

This indicator light is illuminated when the heating (heat exchanger) is on.

Solar heating indicator light

This indicator light is illuminated when the solar heating is running.

Backwash indicator light

This indicator light is illuminated when the backwash system with pneumatic valve is running.

Water input indicator light

This indicator light is illuminated when the water inlet is running.

Adjustment buttons

These buttons can be used to program water temperature, time, timer settings and backwash times. These buttons can also be used to alter values in the configuration menu.

Temperature selection

Use this button to select the water temperature for the swimming pool:

1. Press the ☑ button ⇒ the display shows `25,0°C <---` / `temper. setpoint`
2. You can now use the △ and ▽ buttons to set the temperature you require in the range 0.1°C to 40°C.
3. To save the required temperature, press the ☑ button again. If more than 10 seconds pass without any button being pressed when setting the temperature, the last temperature selected is saved automatically and the normal operation display reappears.

If a solar sensor is connected to the control unit, you can use this button to display the current temperature at the solar sensor:

1. Press the ☑ button twice ⇒ the display shows the temperature at the solar sensor, e.g. `28,1°C` / `at solar sensor`
2. To close this display, press the ☑ button again. If more than a minute passes without any button being pressed, the normal operation display reappears automatically.

If an air temperature sensor is connected to the control unit, you can use this button to display the current air temperature:

3. Press the ☑ button three times ⇒ the display shows the air temperature, e.g. `16,7°C` / `at air sensor`
4. To close this display, press the ☑ button again. If more than a minute passes without any button being pressed, the normal operation display reappears automatically.

Setting the time

Use this button to set the actual time:

1. Press the ⏲ button ⇒ the display shows: `Set the clock` / `Tuesday 14:26` The

day of the week flashes.

2. Use the ◀ and ▶ buttons to select whether you want to set the day, hour or minutes. The relevant text flashes.
3. Use the △ and ▽ buttons to make the setting for the currently flashing text (day, hour or minutes).
4. To save the time, press the Menü button again. If more than 5 seconds pass without any button being pressed when making the setting, programming is aborted without any settings being saved. The normal operation display reappears.

Timer programming

Use this button to program the built-in timer. Note that the switch-on time and the associated switch-off time must always be entered as a pair:

1. Press the ⏲ button ⇒ the display shows `switch.time 01` / `Su10:00-Su20:00`. The bottom line shows the currently set switch-on and switch-off times (Dy means daily). The number in the top right indicates the number of the pre-programmed timer setting (01 means 1st timer setting).
2. Press the Menü button. The day of the week flashes.
3. Use the ◀ and ▶ buttons to select whether you want to set the day, hour or minutes. The relevant text flashes.
4. Use the △ and ▽ buttons to make the setting for the currently flashing text (day, hour or minutes). ON in the top line means switch-on time.
5. Press the Menü button to save the timer setting.
6. The display automatically shows the menu for setting the switch-off time. The day of the week flashes.
7. Use the ◀ and ▶ buttons to select whether you want to set the day, hour or minutes. The relevant text flashes.
8. Use the △ and ▽ buttons to make the setting for the currently flashing text (day, hour or minutes). OFF in the top line means switch-off time.
9. Press the Menü button to save the timer setting.
10. Repeat steps 1-9 if you wish to program further timer settings.

Changing the timer settings

Pre-programmed timer settings can be changed as follows:

1. Press the ⏲ button ⇒ the display shows `switch.time 01` / `Su10:00-Su20:00`. The bottom line shows the currently set switch-on and switch-off times (Dy means daily).
2. If more than one timer setting is programmed, you can use the ◀ and ▶ buttons to select the timer setting you require. (Check the number in the top right).
3. Press the Menü button. The day of the week flashes.
4. Use the ◀ and ▶ buttons to select whether you want to alter the day, hour or minutes. The relevant text flashes.
5. Use the △ and ▽ buttons to change the setting for the currently flashing text (day, hour or minutes).
6. Press the Menü button to save the changes.

Clearing the timer settings

Pre-programmed timer settings can be cleared as follows:

1. Press the ⏲ button ⇒ the display shows `switch.time 01` / `Su10:00-Su20:00`. The bottom line shows the currently set switch-on and switch-off times (Dy means daily).
2. If more than one timer setting is programmed, you can use the ◀ and ▶ buttons to select the timer setting you require. (Check the

number in the top right)

3. Press the Menü button. The day of the week flashes.
4. Use the △ and ▽ buttons to change the setting for the currently flashing text. To clear the setting, select "not progr." (short for "not programmed").
5. Press the Menü button to clear the timer setting.

Configuration menu

Filter pump	Select menu < filter pump >	Press the Menü button. Use the ◁ and ▷ buttons to scroll through the menu until the display shows "filter pump". Press the Menü button again to select filter pump mode.
Type	filter pump < type >	Press the Menü button. The display shows the currently selected type of filter pump (3-phase pump, single-phase AC pump or variable speed pump). You can use the △ and ▽ buttons to change the selection. Press the Menü button to save the setting. Factory setting: 3-phase pump
Motor current	filter pump < motor current>	Use the ◁ and ▷ buttons to scroll through the filter pump mode until the display shown here appears. Press the Menü button. The display shows the instantaneous current consumption of the filter pump.
Motor protection	filter pump < motor protect>	Use the ◁ and ▷ buttons to scroll through the filter pump mode until the display shown here appears. Press the Menü button. The display shows the motor protection trip current. You can use the △ and ▽ buttons to change the setting. Press the Menü button to save the setting. Adjustment range 0.5 to 8A, factory setting 4A
Startup time	filter pump < startup time >	Use the ◁ and ▷ buttons to scroll through the filter pump mode until the display shown here appears. Press the Menü button to set the startup time using the △ and ▽ buttons. Press the Menü button to save the setting. The startup time is the time that elapses after the filter pump starts running before the flow sensor reading is retrieved. Adjustment range 5 to 60s, factory setting 10s

ECO mode	Select menu < ECO-mode >	Press the Menü button. Use the ◄ and ► buttons to scroll through the menu until the display shows "ECO mode". Press the Menü button again to select ECO mode.
Timer	ECO-mode < timer >	Press the Menü button to program the timer settings (see procedure described under Timer programming)
Temperature reduction	ECO-mode < Temp. reduct.>	Use the ◄ and ► buttons to scroll through the ECO mode until the display shown here appears. Press the Menü button to set the temperature reduction using the △ and ▽ buttons. Then press the Menü button to save the setting. Adjustment range 0 to 15°, factory setting 0°
Heating	Select menu < heating >	Press the Menü button. Use the ◄ and ► buttons to scroll through the menu until the display shows "heating". Press the Menü button to select the heating settings.
Operating mode	heating <operation mode>	Press the Menü button. The display shows the current heating operating mode (automatic mode or off). You can use the △ and ▽ buttons to change the selection. Press the Menü button to save the setting.
Priority	heating < Priority >	Use the ◄ and ► buttons to scroll through the heating settings until the display shown here appears. Press the Menü button to enable or disable the priority using the △ and ▽ buttons. Press the Menü button to save the setting. With priority off (disabled), the heating is only actuated during filtration operating times. Factory setting: priority off
Minimum switching interval	heating <minim.sw-time >	Use the ◄ and ► buttons to scroll through the heating settings until the display shown here appears. Press the Menü button to set the minimum switching interval (hysteresis) using the △ and ▽ buttons. Press the Menü button to save the setting. The minimum switching interval is set in seconds. Adjustment range 10 to 1800s, factory setting 120s
Over-run time	heating < subseq. run >	Use the ◄ and ► buttons to scroll through the heating settings until the display shown here appears. Press the Menü button to set the over-run time (subseq. run) using the △ and ▽ buttons. Press the Menü button to save the setting. When an over-run time is active, the timer switches the heating off at the end of the filtration operating time, but the filter pump keeps running for the period set by the over-run time. Adjustment range 0 to 1800s, factory setting 0s
Temperature limit	heating < temp. limit >	Use the ◄ and ► buttons to scroll through the heating settings until the display shown here appears. Press the Menü button to set the temperature limit using the △ and ▽ buttons. Press the Menü button to save the setting. The temperature limit is the maximum water temperature that can be selected. Adjustment range 30 to 50°C, factory setting 40°C

Solar heating

Select menu
< solar heating>

Press the Menü button.

Use the ◁ and ▷ buttons to scroll through the menu until the display shows "solar heating".

Press the Menü button to select the solar heating settings.

Operating mode

solar heating
<operation mode>

Press the Menü button.

The display shows the current operating mode for the solar heating (automatic mode or off). You can use the △ and ▽ buttons to change the selection. Press the Menü button to save the setting.

Priority

solar heating
<Priority sol. >

Use the ◁ and ▷ buttons to scroll through the solar heating settings until the display shown here appears.

Press the Menü button to enable or disable the priority using the △ and ▽ buttons. Press the Menü button to save the setting. With priority on (enabled), the solar heating (and simultaneously the filter pump) is also actuated outside filtration operating times.

Factory setting: priority on

Minimum switching interval

solar heating
<minim.sw-time >

Use the ◁ and ▷ buttons to scroll through the solar heating settings until the display shown here appears.

Press the Menü button to set the minimum switching interval (hysteresis) using the △ and ▽ buttons. Press the Menü button to save the setting. The minimum switching interval is set in seconds.

Adjustment range 10 to 1800s, factory setting 120s

Switch-on difference

solar heating
< Solar ON dT >

Use the ◁ and ▷ buttons to scroll through the solar heating settings until the display shown here appears.

Press the Menü button to set the switch-on difference (difference between pool temperature and solar temperature) using the △ and ▽ buttons. Press the Menü button to save the setting.

Adjustment range 0.5 to 20°C, factory setting 5°C

Switch-off difference

solar heating
< Solar OFF dT >

Use the ◁ and ▷ buttons to scroll through the solar heating settings until the display shown here appears.

Press the Menü button to set the switch-off difference (difference between pool temperature and solar temperature) using the △ and ▽ buttons. Press the Menü button to save the setting.

Adjustment range 0 to 15°C, factory setting 0°C

Temperature boost

solar heating
<Temp.increase >

Use the ◁ and ▷ buttons to scroll through the solar heating settings until the display shown here appears.

Press the Menü button to set the solar heating temperature boost using the △ and ▽ buttons. Press the Menü button to save the setting. The pool temperature is only boosted by the set value during solar operation.

Adjustment range 0 to 15°C, factory setting 5°C

Pump speed

solar heating
< pump power >

Use the ◁ and ▷ buttons to scroll through the solar heating settings until the display shown here appears.

Press the Menü button to set the filter pump speed using the △ and ▽ buttons.

The following settings are possible (only for variable-speed filter pump):

pump power
normal (Filter)

In solar operating mode, the filter pump runs at "*filtration*" speed.

pump power
higher (Backw.)

In solar operating mode, the filter pump runs at the higher "*backwash" speed.*

pump power
auto (ECO/Filt.)

In solar operating mode, the filter pump runs at the speed for the current operating mode, either *"ECO mode = low speed"* or *"filtration mode = filter speed"*.

Press the Menü button to save the setting.

Factory setting: filter speed

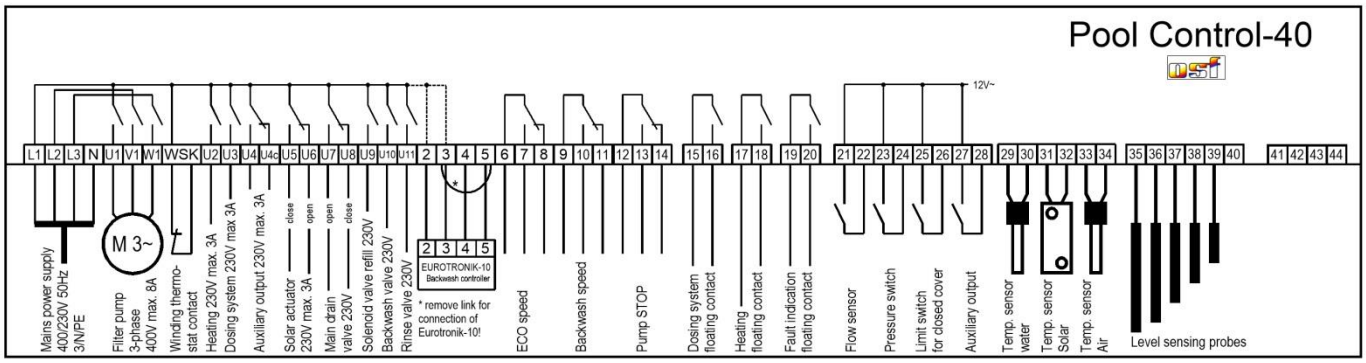
Frost protection		Press the Menü button.
	Select menu < frost protect>	Use the ◀ and ▶ buttons to scroll through the menu until the display shows "Frost protection". Press the Menü button to select the frost protection settings.
Operating mode	frost protect <operation mode>	Press the Menü button. The display shows the current operating mode for the frost protection function (automatic mode or off). You can use the △ and ▽ buttons to change the selection. Press the Menü button to save the setting.
Air temperature	frost protect < Air temperat.>	Use the ◀ and ▶ buttons to scroll through the frost protection settings until the display shown here appears. Press the Menü button to use the △ and ▽ buttons to set the air temperature at which frost protection will start operating. Press the Menü button to save the setting. Adjustment range -5°C to +5°C, factory setting 0°C
Water temperature	frost protect < water temp. >	Use the ◀ and ▶ buttons to scroll through the frost protection settings until the display shown here appears. Press the Menü button to use the △ and ▽ buttons to set the target water temperature for frost protection. Press the Menü button to save the setting. Adjustment range 0°C to 20°C, factory setting 5°C
Backwashing		Press the Menü button.
	Select menu < backwashing >	Use the ◀ and ▶ buttons to scroll through the menu until the display shows "backwashing". Press the Menü button to select the settings for backwashing using slide valves.
Operating mode	backwashing <operation mode>	Press the Menü button to set the backwash start condition using the △ and ▽ buttons. The following options can be set:
	operation mode start manually	Press the Menü button to start backwashing immediately.
	operation mode automatic mode	Press the Menü button to start backwashing under timer control. Press the Menü button to save the setting.
Timer	backwashing < Timer >	Use the ◀ and ▶ buttons to scroll through the backwashing settings until the display shown here appears. Press the Menü button to program the timer settings (see Procedure described under Timer programming).
Stop backwashing		Press the ⏻ button to switch off the control unit. This terminates the backwash cycle.
Backwash period	backwashing < Durat. backw.>	Use the ◀ and ▶ buttons to scroll through the backwashing settings until the display shown here appears. Press the Menü button to use the △ and ▽ buttons to set how long the backwash cycle should last. Press the Menü button to save the setting.
Rinse period	backwashing < Durat. rinse.>	Use the ◀ and ▶ buttons to scroll through the backwashing settings until the display shown here appears. Press the Menü button to use the △ and ▽ buttons to set how long the rinse cycle should last. Press the Menü button to save the setting. Adjustment range 0 to 120s, factory setting 30s
Valve delay	backwashing < valve delay >	Use the ◀ and ▶ buttons to scroll through the backwashing settings until the display shown here appears.

		Press the Menü button to use the △ and ▽ buttons to set how long the filter pump should stop running whenever the slide valves are operated. Press the Menü button to save the setting. Adjustment range 0 to 120s, factory setting 0s
Fortnightly	backwashing < fortnightly >	Use the ◀ and ▶ buttons to scroll through the backwashing settings until the display shown here appears. Press the Menü button to use the △ and ▽ buttons to set whether filter backwashing should be performed only once a fortnight. Press the Menü button to save the setting. Factory setting: disabled (weekly backwashing)
Use main drain	backwashing < Floor Drain >	Use the ◀ and ▶ buttons to scroll through the backwashing settings until the display shown here appears. Press the Menü button to use the △ and ▽ buttons to set whether the main drain (floor drain) should be opened during backwashing. Press the Menü button to save the setting. Factory setting: backwashing without main drain
Level control	Select menu < level control>	Press the Menü button. Use the ◀ and ▶ buttons to scroll through the menu until the display shows "level control". Press the Menü button to select the level control settings.
Type	level control < type >	Press the Menü button. The display shows the currently selected type of level control (skimmer pool or balancing tank ("collecting vessel")). You can use the △ and ▽ buttons to change the selection. Press the Menü button to save the setting. Factory setting: no level control
Time limit	level control < time limit >	Use the ◀ and ▶ buttons to scroll through the level control settings until the display shown here appears. Press the Menü button to set the time limit using the △ and ▽ buttons. Press the Menü button to save the setting. After the set time has expired, the solenoid valve is switched off regardless of the water level. Adjustment range 0 to 240 minutes, factory setting 60 minutes ***0 means no time limit.***
Minimum switching interval	level control < minim.sw-time>	Use the ◀ and ▶ buttons to scroll through the level control settings until the display shown here appears. Press the Menü button to set the minimum switching interval using the △ and ▽ buttons. Press the Menü button to save the setting. The minimum switching interval is the time difference between switching operations when using a mini float switch as sensor. Adjustment range 10 to 180s, factory setting 10s
Switch-on delay	level control < delay v. open>	Use the ◀ and ▶ buttons to scroll through the level control settings until the display shown here appears. Press the key Menü to set the delay with the △ and ▽ keys. Press the Menü key to save the setting. The switch-on delay is from the time the water level falls below the set level until the solenoid valve opens (when using a mini float switch as a sensor). Adjustment range 10 to 30s, factory setting 0s
Switch-off delay	level control < delay v.close>	Use the ◀ and ▶ buttons to scroll through the level control settings until the display shown here appears. Press the key Menü to set the delay with the △ and ▽ keys. Press the Menü key to save the setting. The switch-off delay is from the time the water level rises above the set level until the solenoid valve closes

		(when using a mini float switch as a sensor). Adjustment range 10 to 30s, factory setting 0s
Auxiliary output	Select menu < auxil. output>	Press the Menü button. Use the ◁ and ▷ buttons to scroll through the menu until the display shows "auxil. output". Press the Menü button to select the settings for the auxiliary output (U4).
Operating mode	auxil. output <operation mode>	Press the Menü button to select the operating mode using the △ and ▽ buttons. The following options can be set:
	operation mode switched ON	The auxiliary output is permanently on.
	operation mode switched OFF	The auxiliary output is permanently off.
	operation mode automatic mode	The auxiliary output is controlled by its timer. Press the Menü button to save the setting.
Time limit	auxil. output < time limit >	Use the ◁ and ▷ buttons to scroll through the auxiliary output settings until the display shown here appears. Press the key Menü to set the time limit with the △ and ▽ keys. Press the Menü key to save the setting. After the set time has elapsed, the additional output is automatically switched off if it was switched on beforehand with the "Aux" button or the external button. With a setting of 0 minutes, there is no time limit. Adjustment range 0 to 600 minutes, factory setting 180
Timer	auxil. output < Timer >	Use the ◁ and ▷ buttons to scroll through the auxiliary output settings until the display shown here appears. Press the Menü button to program the timer. (See Procedure described under Timer programming).
Cycle time	auxil. output < Cycle time >	Use the ◁ and ▷ buttons to scroll through the auxiliary output settings until the display shown here appears. Press the Menü button to set the cycle time using the △ and ▽ buttons. Press the Menü button to save the setting. The auxiliary output is switched on and off on the basis of this setting. A setting of 0 minutes means that there is no cycling of the auxiliary output on and off. Adjustment range 0 to 240 minutes, factory setting 0
ON period	auxil. output <Pulse duration>	Use the ◁ and ▷ buttons to scroll through the auxiliary output settings until the display shown here appears. Press the Menü button to set the ON period (pulse duration) using the △ and ▽ buttons. This does not affect the cycle time. Press the Menü button to save the setting. Adjustment range 5 to 240s, factory setting 10s
Interlock	auxil. output < Interlocking >	Use the ◁ and ▷ buttons to scroll through the auxiliary output settings until the display shown here appears. Press the Menü button to use the △ and ▽ buttons to select whether the auxiliary output is meant to be interlocked to the filter pump. Press the Menü button to save the setting. When the interlock is enabled, the auxiliary output is only switched on during filtration. Factory setting: no interlock
Sensor calibration		Press the Menü button.
	Select menu <Calibr.sensors>	Use the ◁ and ▷ buttons to scroll through the menu until the display shows "Calibr.sensors". Press the Menü button to select the sensor calibration function.

Water temperature	Calibr.sensors < water temp. >	Press the Menü button to adjust the water temperature indicator using the △ and ▽ buttons. Press the Menü button to save the setting.
Solar temperature	Calibr.sensors < solar temp. >	Use the ◁ and ▷ buttons to scroll through the sensor calibration menu until the display shown here appears. Press the Menü button to adjust the solar temperature indicator using the △ and ▽ buttons. Press the Menü button to save the setting.
Air temperature	Calibr.sensors < Air temperat.>	Use the ◁ and ▷ buttons to scroll through the sensor calibration menu until the display shown here appears. Press the Menü button to adjust the air temperature indicator using the △ and ▽ buttons. Press the Menü button to save the setting.
Language	Select menu < language >	Press the Menü button. Use the ◁ and ▷ buttons to scroll through the menu until the display shows "language". Press the Menü button to select the language for the front panel display.
Language selection	select lang. english	Press the Menü button to select the language using the △ and ▽ buttons. Press the Menü button to save the setting.

Connection plan



Relax and enjoy your swimming pool!

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

https://osf.de/download/documents/documents.php?device=PC-40

Hansjürgen Meier
Elektrotechnik und Elektronik GmbH & Co KG
Eichendorffstraße 6
D-32339 Espelkamp
Email: info@osf.de
Internet: www.osf.de

Subject to changes 04/2021