



PoolCop
Genesis

PoolCop
Evolution

Variable speed pumps guide



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Contents

Section 1 Introduction	5
1.1 Foreword	5
1.2 Notes, Cautions, Warnings and other Definitions.....	5
1.3 Important Information, Safety Notices and Precautions	6
Section 2 Variable Speed and Multiple Speed Pumps	7
2.1 General.....	7
2.2 Pentair IntelliFlo® VF.....	9
2.3 Pentair IntelliFlo® VSD.....	16
2.4 Pentair IntelliFlo® VSF, IntelliFlo3 VSF.....	19
2.5 Pentair SuperFlo® VS / SuperFlo VS2.....	23
2.6 Pentair with Acu Drive XS (Danfoss VLT AQUA Drive)	26
2.7 Hayward VSTD range.....	29
2.8 Hayward EcoStar SP3400VSP.....	32
2.9 Speck BADU Eco (Touch, Touch-pro, Flow and 90 Eco VS), ACIS VIPool MKB VS ..	35
2.10 Speck BADU 90 Eco Motion	39
2.11 Zodiac FloPro™ VS.....	42
2.12 Triphase pump with Invertek Optidrive E ² inverter	46
2.13 Multi pumps control with several mono speed pumps.....	49
2.14 DAVEY ProMaster VSD400	50
2.15 ACIS VIPool MKB VS	53
2.16 DAB E.SWIM-E.PRO.....	54
2.17 AQUAGEM iSAVER+, INVERSTAR, INVERPRO – ACIS VARIPOOL, CF VITALIA VS...	58
2.18 SACI [e]joy, [e]pool controllers	61
2.19 SCHNEIDER Altivar ATV212	64
Section 3 Notes	67

Figures

Figure 1 Pentair IntelliFlo VF.....	9
Figure 2 Connecting VF.....	10
Figure 3 Pentair IntelliFlo VSD or VSF.....	16
Figure 4 PoolCop and VSD with IntelliComm or IntelliComm II.....	17
Figure 5 Output relays statuses.....	17
Figure 6 Pentair IntelliFlo VSF, IntelliFlo3 VSF.....	19
Figure 7 PoolCop and VSF with IntelliComm or IntelliComm II.....	20
Figure 8 PoolCop and IntelliFlo3 VSF with Relay Control BoardP/N 356365z.....	21
Figure 9 Output relays statuses.....	21
Figure 10 Pentair SuperFlo VS.....	23
Figure 11 PoolCop and SuperFlo VS.....	24
Figure 12 PoolCop and SuperFlo VS2 with Pentair Data Cable.....	24
Figure 13 Output relays statuses.....	24
Figure 14 Pentair Acu Drive XS.....	26
Figure 15 Acu Drive XS Control terminals (1).....	27
Figure 16 PoolCop and Acu Drive XS.....	27
Figure 17 Output relays statuses.....	28
Figure 18 Hayward VSTD.....	29
Figure 19 Connecting PoolCop with Hayward VSTD.....	30
Figure 20 Output relays statuses.....	30
Figure 21 Hayward EcoStar SP3400VSP.....	32
Figure 22 Connecting PoolCop with Hayward EcoStar SP3400VSP.....	33
Figure 23 Output relays statuses.....	33
Figure 24 Speck BADU Eco.....	35
Figure 25 Speck BADU Eco Cable.....	36
Figure 26 Speck BADU Eco Contôle.....	36
Figure 27 Connecting PoolCop and Speck BADU Eco.....	36
Figure 28 Output relays statuses.....	36
Figure 29 Speck BADU 90 Eco Motion.....	39
Figure 30 Connecting PoolCop with Speck BADU Eco Motion.....	40
Figure 31 Output relays statuses.....	40
Figure 32 Zodiac FloPro™ VS.....	42
Figure 33 Connecting PoolCop with Zodiac ProFlo™ VS.....	43
Figure 34 Connection PoolCop avec Zodiac ProFlo™ VS1.....	43
Figure 34 Output relays statuses.....	43
Figure 35 Invertek Optidrive E ²	46
Figure 36 Connecting PoolCop with Invertek Optidrive E ²	47
Figure 37 Output relays statuses.....	47
Figure 38 Output relays statuses.....	49
Figure 39 Davey ProMaster VSD400.....	50
Figure 40 Davey ProMaster VSD400 Cable.....	51
Figure 41 Connecting PoolCop and Davey ProMaster VSD400.....	51
Figure 42 Output relays statuses.....	51
Figure 43 ACIS VIPool MKB VS.....	53
Figure 44 DAB E.SWIM-E.PRO.....	54
Figure 45 DAB 60194528 Cable.....	55
Figure 46 Connecting PoolCop and DAB E.SWIM-E.PRO.....	55
Figure 47 Output relays statuses.....	55
Figure 48 AQUAGEM Inverpro, Inverstar and iSAVER+.....	58
Figure 49 AQUAGEM wiring.....	59
Figure 50 Connecting PoolCop and AQUAGEM/iSAVER+.....	59
Figure 51 Output relays statuses.....	59
Figure 52 SACI [e]joy, [e]pool controllers.....	61
Figure 53 SACI Wiring.....	62
Figure 55 Connecting PoolCop and SACI [e]pool, [e]joy.....	62
Figure 55 Output relays statuses.....	62
Figure 56 SCHEINDER ATV212.....	64
Figure 57 ATV212 Wiring.....	65
Figure 58 Connecting PoolCop and ATV212.....	65
Figure 59 Output relays statuses.....	65

Section 1 INTRODUCTION

1.1 Foreword 5
 1.2 Notes, Cautions, Warnings and other Definitions..... 5
 1.3 Important Information, Safety Notices and Precautions 6

1.1 Foreword

We maintain a policy of continuous research and development and therefore reserve the right to make changes and improvements to any of the products described in this guide without prior notice.

This manual is subject to change without notice.

Any reference in this manual to “the pool owner” refers to the owner of the product or products. The owner may appoint a representative to act on their behalf. The owner retains full and all responsibility for decisions made by and the actions of this representative.

1.2 Notes, Cautions, Warnings and other Definitions

Within this manual some information is highlighted in the form of notes, cautions and warnings, etc. The following definitions apply throughout:



NOTE
 A step, procedure, technique, etc. which is considered important or essential to emphasize.



CAUTION
 A step, procedure, technique, etc. which could result in damage to equipment if not carefully followed.



WARNING
 A step, procedure, or technique which could result in personal injury if not carefully followed.



WEAR HAND PROTECTION:
 Always wear correct chemical resistant hand protection when handling chemicals.



EYE PROTECTION:
 Always wear correct eye protection when handling chemicals.

- May** An acceptable or suggested means of accomplishment.
- Should** Normally used to indicate a preferred but non-mandatory method of accomplishment.
- Must, will** The instructions or procedures are mandatory.
- As installed** The instructions or procedures depend on the specific model of equipment installed.
- If installed** The instructions or procedures depend on whether the equipment is installed.
- As required** The instructions, procedures, or requirements are mandatory depending on relevant conditions.
- Verify** A planned change in an indication, annunciation, or message is observed to occur as expected. Check the state or condition prior to proceeding.

1.3 Important Information, Safety Notices and Precautions

**WARNING:**

**Read the security instructions attentively before any use.
Instructions given below are all important for your safety.**

Your PoolCop is a product of superior design, engineering and manufacture and should be treated with care. The information contained in this section will help you fulfil the warranty obligations and enjoy this product for many years.

1.3.1 NATIONAL AND REGIONAL NORMS

Always respect all norms for electrical, hydraulic, chemical and swimming pool installation and operation. No responsibility will be accepted for installation or use of this product outside the norms.

1.3.2 FRENCH NORMS

For the swimming pool to remain a place of pleasure and user-friendliness, it is necessary to take care of the safety of those who bathe and of the installation standards. There are two main groups of safety requirements: standards relating to the electric installation and standards specific to swimming pools.

1.3.2.1 Electrical Installation

The electric standard applicable is NFC15-100. It is obligatory that your installation adheres to the criteria of this standard.

1.3.2.2 Norms Specific to Swimming Pools

If your swimming pool is located in the open air, you must equip it with a safety device according to the required standards.

PCFR is a member of the FPP, the Fédération des Professionnels de la Piscine. Visit the FPP website to view safety requirements currently in force and to obtain invaluable security advice given by swimming pool construction professionals.

www.propiscines.fr



Lastly, whatever your protection system, never forget that your swimming pool must be supervised and, monitored at all times. No safety device can exempt you from being vigilant as to the safety of the people (adult or children) who are in or around the pool.

Section 2 VARIABLE SPEED AND MULTIPLE SPEED PUMPS

2.1 General

Variable speed and multiple speed pumps offer great advantages in filtration efficiency and energy savings when combined with PoolCop optimisations. In PoolCop programming various options for the specific pump make and model allow optimal pump control for maximum benefits.

2.1.1 POOL DATA

PoolCop uses flow rates in filtration duration calculations, when Filtration Cycle 2 is in an automatic mode (**ECO** or **VOLUME**):

- The exact flow rate can be measured over a 24 hour period, with a clean filter, and this data used for greatest accuracy.
- Estimated flow rates can be found using standard performance graphs supplied with the pump or obtained from the manufacturer.
- When different speeds are used for different filtration periods with variable and multi speed pumps, estimate a daily average rate for filtration. Whilst not 100% accurate, this does not seriously affect the performance provided that conservative estimates are used: if in doubt select a lower rate which will result in longer daily filtration for greatest security and pool reliability.

2.1.2 PUMP DATA

- Enter the menu Pump Data.
- Used the **UP** arrow to move to the title area; press **SELECT**.
- Use the **UP** and **DOWN** arrows to select the pump make and model installed from the list:
- Press **SELECT** to validate; depending on the pump chosen, options for this pump will be displayed.

2.1.3 PUMP MANUAL SPEED CONTROL

In the pump **Manual Control** Menu, the make and model of pump will be indicated in the title bar.

- Use the **UP** and **DOWN** arrows to navigate to pump speed.
- Press **SELECT** and the use **UP** and **DOWN** arrow to select the speed (number of available speeds depends on pump type).
- Press **SELECT** to validate.

When the next programmed cycle is activated, or any filter cleaning operation carried out, the programmed speed schedule will resume.



Note :

With Pentair VF the SINGLE SPEED PUMP is displayed; pump speed control is linked to time periods in the pump Features menu. It is not possible to change speeds in the PoolCop pump Manual Control menu.

2.1.4 CONFIGURATION CLEAN FILTER

2.1.4.1 Filtration Backwash Duration

Some variable speed pump configurations and installations can result in longer pump priming times. In this case add time to the desired backwash duration to allow for pump ramp up and priming. For pools where the pump is under charge, or for pumps that prime quickly this additional margin may not be required.

2.1.4.2 Filtration Rinse Duration

Some variable speed pump configurations and installations can result in longer pump priming times. In this case add time to the desired rinse duration to allow for pump ramp up and priming. For pools where the pump is under charge, or for pumps that prime quickly this additional margin may not be required.

2.1.4.3 Pressure

When setting the clean filter pressure, use the measured pressure (with a clean filter) while the pump is at the maximum metered flow rate or highest pump speed. Add an additional margin of approximately 0.20 bar.

2.1.4.4 Auto Pressure Mode

Recommended ON, this ensures that PoolCOP cleans the filter as required, ensuring efficient filtration at all times and reducing energy consumption.

2.1.4.5 Auto Weekly Mode

The Weekly Mode carries out a filter cleaning cycle on the selected day of the week, irrespective of the filter condition.

2.2 Pentair IntelliFlo® VF

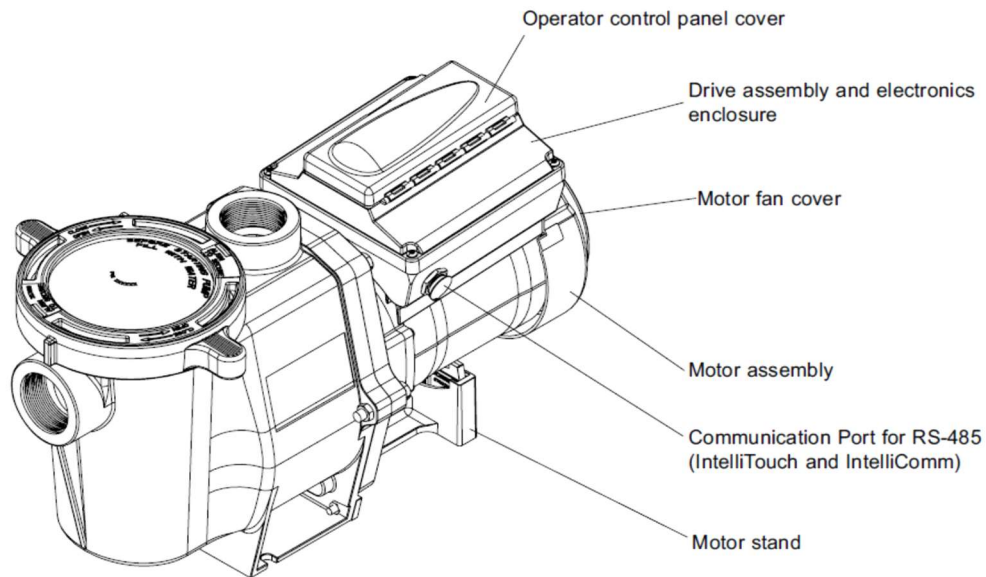


Figure 1 Pentair IntelliFlo VF



WARNING:

The information below is for guidance only.
 Follow the manufacturer's recommendations as per the latest equipment manual at all times.
 No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCOP and Pentair IntelliFlo® VF offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

VF (without IntelliComm):

- PoolCOP is programmed to control **when and how long** the filtration system runs. PoolCOP automatically cleans the filter when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- VF is programmed to control the **filtration flow rate** when it is commanded to run: higher flow rates can be used during low energy cost periods, and lower flow rates during high energy cost periods.

2.2.1 CONNECTING INTELLIFLO VF

When the VF pump is started and stopped by removing power with a relay and timer arrangement as with PoolCop, the pump relay K1 in the PoolCop Power Supply Unit (PSU) will be connected to command an external two-pole switching relay device to apply and remove power to both of the red power leads on the VF pump.

VF will be operated in "stand-alone" mode, starting and stopping when power is supplied by PoolCop. When the pump drive powers up it will return to the mode and run status that it was in when power was removed: properly programmed and left in the Filter mode with the pump selected to Start, the pump will run when commanded by PoolCop. In this way VF will be controlled by the PoolCop pump relay.

Follow all instructions in the Installation Section of the latest Pentair manual for correct electrical connection and additional bonding and earth requirements.

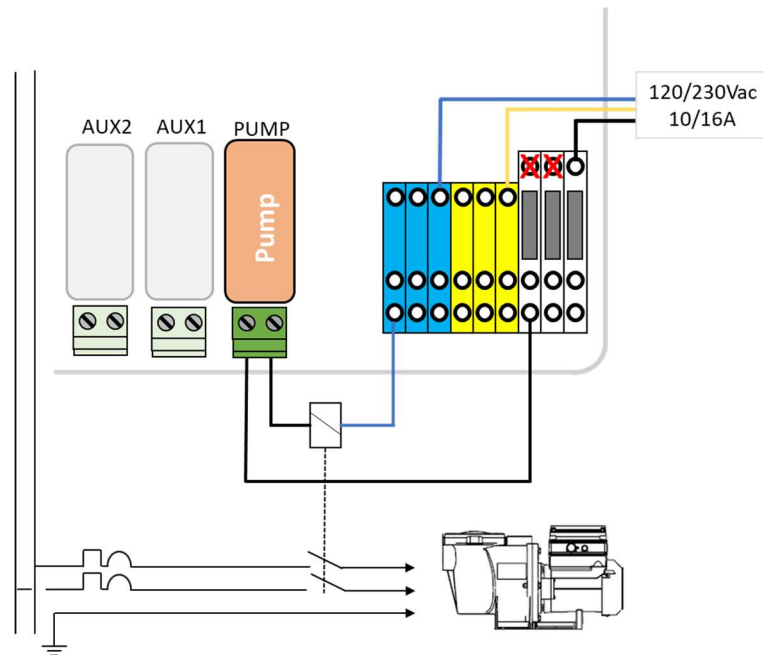


Figure 2 Connecting VF

2.2.2 POOLCOP PROGRAMMING WITH PENTAIR INTELLIFLO VF

2.2.2.1 Pool Data Menu

Metering the maximum flow rate:

- The maximum flow rate is metered during VF setup. Ensure that this maximum flow rate is metered with a filter in a clean condition. A filter cleaning cycle prior to metering is required.
- This maximum flow rate will be programmed into all modes and features as the highest flow rate permitted in order to avoid over pressurising the filtration system.



CAUTION:

**Always carry out metering in actual operating conditions.
Do not use the nominal flow rate from the filter manual as many variables affect the achievable flow rate in any given installation.
Setting the nominal filter flow rate can result in excessive filter pressures.**

Maximum metered and low flow rate selection:

- Use the maximum metered flow rate as the highest flow rate programmed, and the rate to be used during low energy cost periods.
- Select an appropriate low flow rate; this is the rate which will be used during high energy cost periods.

Example Calculation

- The maximum metered flow rate is measured as 12m³/h in actual metering.
- A low flow rate of 6m³/h is selected by the owner or programmer.
- From the energy and electricity subscription, daily low energy rates are 0000-0530 and 1400-1700:
 - From 0000-0530, and from 1400-1700 the max flow rate of 12m³/h will be used to boost filtration and allow for filter cleaning if required.
 - From 0530-1400, and from 1700-0000 the low flow rate of 6m³/h will be used to reduce energy costs and benefit from low speed and highly efficient filtration.

2.2.2.2 Pump Data Menu

- Select Pump: **SINGLE SPEED PUMP**
The pump features are programmed with flow rates and times to optimised energy consumption.
- **Low Alert:** Adjust this setting to 0.20Bar below the indicated pressure with the pump at the lowest pre-set speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the indicated pressure when the pump is not running.
- **Pump Prot: NO**, the pump will not be stopped if pressure remains low, as the VF has internal protection to prevent pump damage in the event of no or low flow.

2.2.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO or VOLUME modes, set the start time and the end time will be calculated.
- Pump speed can be different for each cycle.

2.2.3 INTELLIFLO VF PROGRAMMING



CAUTION:

The IntelliFlo® VF is a very powerful pump, and capable of exceeding recommended operating pressures of filtration equipment.
Ensure proper programming and change flow rates and RPM settings of the pump cautiously to avoid any risk of damage.



CAUTION:

Filter clogging can occur extremely rapidly under certain conditions, especially when using a vacuum pool cleaner in any constant flow mode.
Improperly used or programmed, the IntelliFlo® pump may increase power and RPM to keep the flow rate constant with increasing filter pressure, up to and exceeding the maximum recommended pressure of certain filters.

IntelliFlo® VF is only powered with the pump **ON** in PoolCOP: in order to programme the VF switch the pump **ON** in the PoolCOP **MANUAL CONTROL** menu. When there is no flow or pressure, PoolCOP will allow 8 minutes to program the pump prior to automatically switching OFF and depowering the pump. If this occurs, restart the pump from PoolCOP, giving another 8 minutes of programming time. Once **Pump Prot OFF** selected, this will not occur.

When accessing the VF menu for any programming the pump stops but remains powered by PoolCop.

When programming is completed select a pump mode (FILTER is recommended) and press the pump Start button to enable the pump to run.

- Operating the pump in Manual mode, meter the system to obtain the maximum metered flow rate as per the instruction manual.
- Select an appropriate low flow rate.
- Pool Data menu:
 - Set the correct Pool Volume.
- Units menu:
 - Set the Time Unit to 24h for ease of programming as this is the same as the PoolCop timers.
- Priming menu:
 - Set the Max Priming Flow as per the maximum flow rate previously metered.
 - Set the Max Priming Time to 8 minutes or more.
PoolCop maximum priming time is 8 minutes.
- Filter menu:
 - Set the Clean Filter Pressure.
Verify that the starting pressure at the maximum metered flow rate with a clean filter does not exceed the maximum filter operating pressure.
In PoolCop programming, the High Pressure Limit triggers filter cleaning cycles; the cycle starts when this pressure is reached and exceeded for a period of 3 minutes.
Typically this High Pressure Limit is approximately 20 kPa (or 200 millibar) above the starting pressure.
It is recommended that the Clean Filter Pressure be set to trigger the IntelliFlo® Alert at a pressure approximately 300 millibar or 30kPa above than the High Pressure Limit in PoolCop. This will ensure that if for any reason the filter clogging occurs very rapidly, the pump will limit speed to maintain this maximum pressure and avoid any risk of damage to overpressure in the filtration system.

EXAMPLE:

The actual measured starting pressure (with a clean filter at Maximum Metered Flow) is 105 kPa.

PoolCop High Pressure Limit is therefore set to 120 kPa, as per the programming guide.

IntelliFlo® default starting pressure is 69 kPa (689 millibar), as per the manufacturer's manual.

Set the Clean Filter Pressure at 120 kPa + 30 kPa – 69 kPa = 81 kPa or 810 millibar.

EXAMPLE IN OPERATION:

PoolCop will command an automatic filter cleaning cycle when the pressure in the filter is 120 kPa or higher for 3 minutes.

During this 3 minute delay if the pressure were to climb very rapidly prior to the cleaning cycle being triggered, IntelliFlo® will trigger an Alert at 150 kPa. The pump will stop managing flow and will adjust pump speed to maintain 150 kPa.

After PoolCop has automatically cleaned the filter, the IntelliFlo® Alert can be reset by starting the pump in Backwash mode. Once the Alert is cleared, operate the IntelliFlo® in Filter Mode.

- Set the Turnovers Per Day to the maximum (8)
This ensures that the pump runs whenever commanded to run by PoolCop.
- Set Cycles Per Day to 1
- Set Start Cycle 1 to 00:00
- Set Stop Cycle 1 to 23:59
This sets the pump Filter mode to run the pump at any time that PoolCop commands the pump to run.

- Program the Features menu:

Ensure that programmed and enabled feature times cover the entire 24h period to limit pump flow rate to the maximum metered, low flow or other programmed rates.

Owner's with multiple daily high and low cost energy rates can use additional Feature programmes to set flow rates corresponding to the energy cost requirements.

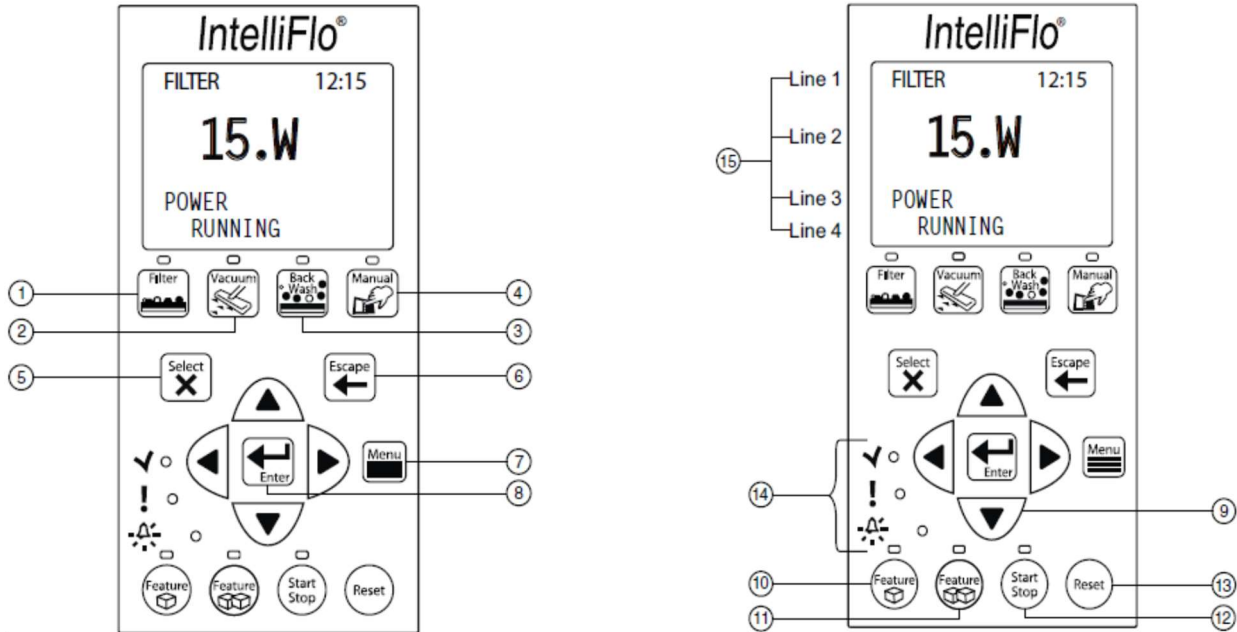
Features 3 to 9 Start and Stop times cannot overlap.

Features 3 to 9 must all have Start and Stop times set even if DISABLED in order for other Features to operate correctly.

- Feature 1 – Set Flow to maximum metered rate flow (example 12m³/h)
- Feature 2 – Set Flow to the low flow rate (example 6m³/h)
- Feature 3:
Activation ENABLED
Set Flow to maximum metered flow rate (example 12m³/h)
Set Start Time to beginning of low cost energy rate period (example 0000)
Set Stop Time to the end of the low cost energy rate period (example 0530)
- Feature 4:
Activation ENABLED
Set Flow to selected low flow rate (example 6m³/h)
Set Start Time to beginning of high cost energy rates (example 0530)
Set Stop Time to the end of the high cost energy rates (example 1430)
- Feature 5:
Activation ENABLED
Set Flow to maximum metered flow rate (example 12m³/h)
Set Start Time to beginning of low cost energy rate period (example 1430)
Set Stop Time to the end of the low cost energy rate period (example 1700)
- Feature 6:
Activation ENABLED
Set Flow to selected low flow rate (example 6m³/h)
Set Start Time to beginning of high cost energy rates (example 1700)
Set Stop Time to the end of the high cost energy rates (example 2357)
- Feature 7:
Activation DISABLED
Set Flow to maximum metered flow rate (example 12m³/h)
Set Start Time as desired (example 2357)
Set Stop Time as desired (example 2358)
- Feature 8:
Activation DISABLED
Set Flow to maximum metered flow rate (example 12m³/h)
Set Start Time as desired (example 2358)
Set Stop Time as desired (example 2359)
- Feature 9:
Activation DISABLED
Set Flow to maximum metered flow rate (example 12m³/h)
Set Start Time as desired (example 2359)
Set Stop Time as desired (example 0000)
- M.O. Flo:
The M.O. Flo feature can be used with PoolCop.
Ensure that the flow rate selected does not exceed the maximum metered flow rate to prevent system over-pressure and unnecessary backwash cycles.
For M.O. Flo Run Times of less than 3 minutes, the PoolCop will not trigger a backwash cycle if the High Pressure limit is exceeded.
If using the M.O. Flo feature to trigger filter cleaning cycles, it is recommended that the Run Time parameter be set to a minimum of 20 minutes to ensure that the backwash be carried out at the higher flow rate.

- Wave
The Wave feature can be used with PoolCop.
Ensure that the pump speed parameter selected does not result in exceeding the maximum metered flow rate to prevent system over-pressure and unnecessary backwash cycles.
- Pulse
The Pulse feature can be used with PoolCop.
Ensure that the pump speed parameter selected does not result in exceeding the maximum metered flow rate to prevent system over-pressure and unnecessary backwash cycles.

2.2.4 INTELLIFLO VF OPERATIONAL NOTES



- Always leave VF in the FILTER mode (button 1), with the pump Started (button 12); switch the pump ON and OFF using PoolCop:
 - PoolCop will power the pump to run whenever commanded in MANUAL CONTROL.
 - PoolCop will power the pump to run at periods programmed into the PoolCop filtration timer cycles.
 - VF selects the flow rate based on the Features as programmed.
 - When PoolCop starts the filtration and pump, either automatically or manually, the pump will switch on.
 - PoolCop will also start and stop the pump as needed for filter cleaning and other operations.
- When PoolCop switches the pump OFF, the VF Operator Control Panel displays "Power Out Failure, ALARM" for a brief period; this is normal. If the pump is switched on again immediately there is a short 20 second alarm reset delay before the pump restarts. After a short period of the pump off, the alarm screen times out; when the pump is started again, start-up is immediate.
- If the PoolCop Alert and security Zero Pressure is activated, verify correct programming of IntelliFlo, that the Filter mode is active and that the pump is set to Start.
- If the VF Alert "Service System Soon" is triggered, the pump must be started in Backwash Mode to reset the fault and "zero" the VF filter status reading. It is not necessary to reposition the PoolCop valve to clear this message, so with the PoolCop in position Filter:
 - Select the pump Backwash Mode.
 - Press Start; the pump will start with a countdown timer.
 - Immediately press STOP; Rinse will be displayed.
 - Press Start; the pump will start with a countdown timer.
 - Immediately press STOP.
 - Select Filter Mode.
 - Press Start, and normal functionality resumes.

- The Vacuum mode should be used with extreme care. When using a vacuum type cleaner, the pump will speed up to maintain the requested flow rate as the filter clogs and can cause filter pressure to rise very rapidly.
- The Backwash mode is not used with PoolCop (as PoolCop automatically controls the pump and cleans the filter) except to reset an Alert.
- The Manual mode functions in a similar way to the Filter mode when controlled by the PoolCop, except that the flow rate or pump speed will remain as set.
- If using Feature 1 and 2 (with countdown timer) start the pump in Filter or Manual mode upon completion to ensure automatic operation of the filtration.
- If using the PoolCop automatic Weekly filter cleaning function, the filter cycle programmed into the PoolCop timer should end at least 15 minutes before the end of a corresponding maximum metered flow rate period programmed into the corresponding VF Feature to ensure that the higher flow rate is used for optimum filter cleaning.

2.3 Pentair IntelliFlo® VSD

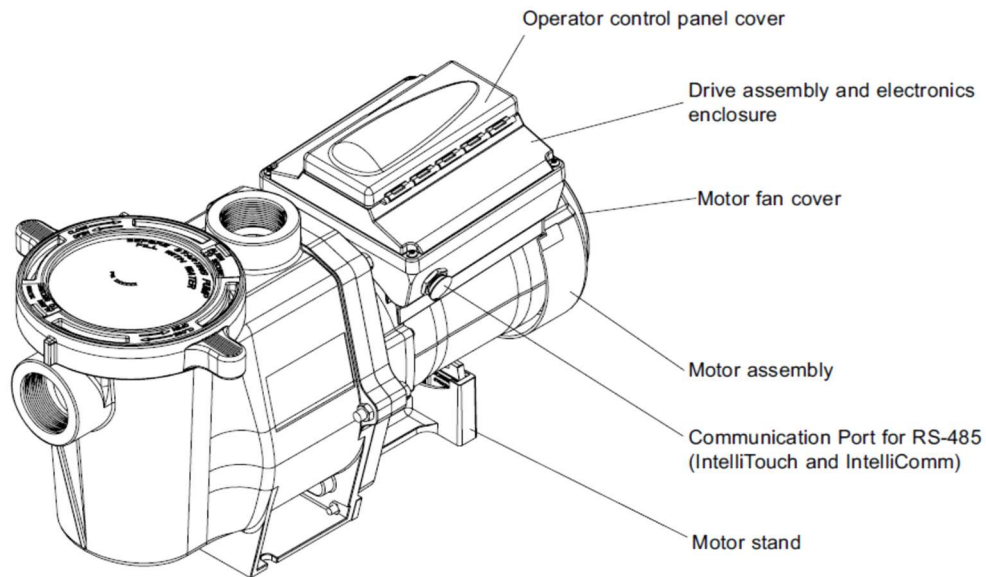


Figure 3 Pentair IntelliFlo VSD or VSF



WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCOP and Pentair IntelliFlo® VSD, communicating via the Pentair IntelliComm or Intellicomm II, together offer the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCOP controls **when, how long and at which speed** the filtration system runs, with pre-set speeds linked to filtration cycles. Higher flow rates can be used during low energy cost periods, and lower flow rates during high energy cost periods. PoolCOP automatically cleans the filter at a linked high speed when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- IntelliFlo® VSD has 4 pre-set and user adjustable pump speeds.
- IntelliFlo® VSF has 4 pre-set and user adjustable pump speeds or flows.

2.3.1 CONNECTING INTELLIFLO® VSD/VSF AND INTELLICOMM-INTELICOMM II

The Pentair IntelliComm Comis required to control the VSD at different speeds.
 The pump is permanently powered. On the pump keypad, the pump must be left in the **OFF** mode. PoolCOP starts and stops the pump, and commands the selected speed. If the pump is started from the keypad, PoolCOP cannot stop the pump from running. Securities in PoolCOP ensure that the valve will not operate under pressure, and an alert will be triggered.



WARNING:
 With this connecting scheme PoolCOP may not be able to stop the pump if it is started from the pump keypad. When no signals are sent to the IntelliComm module, the pump returns to its last state as commanded from the keypad.

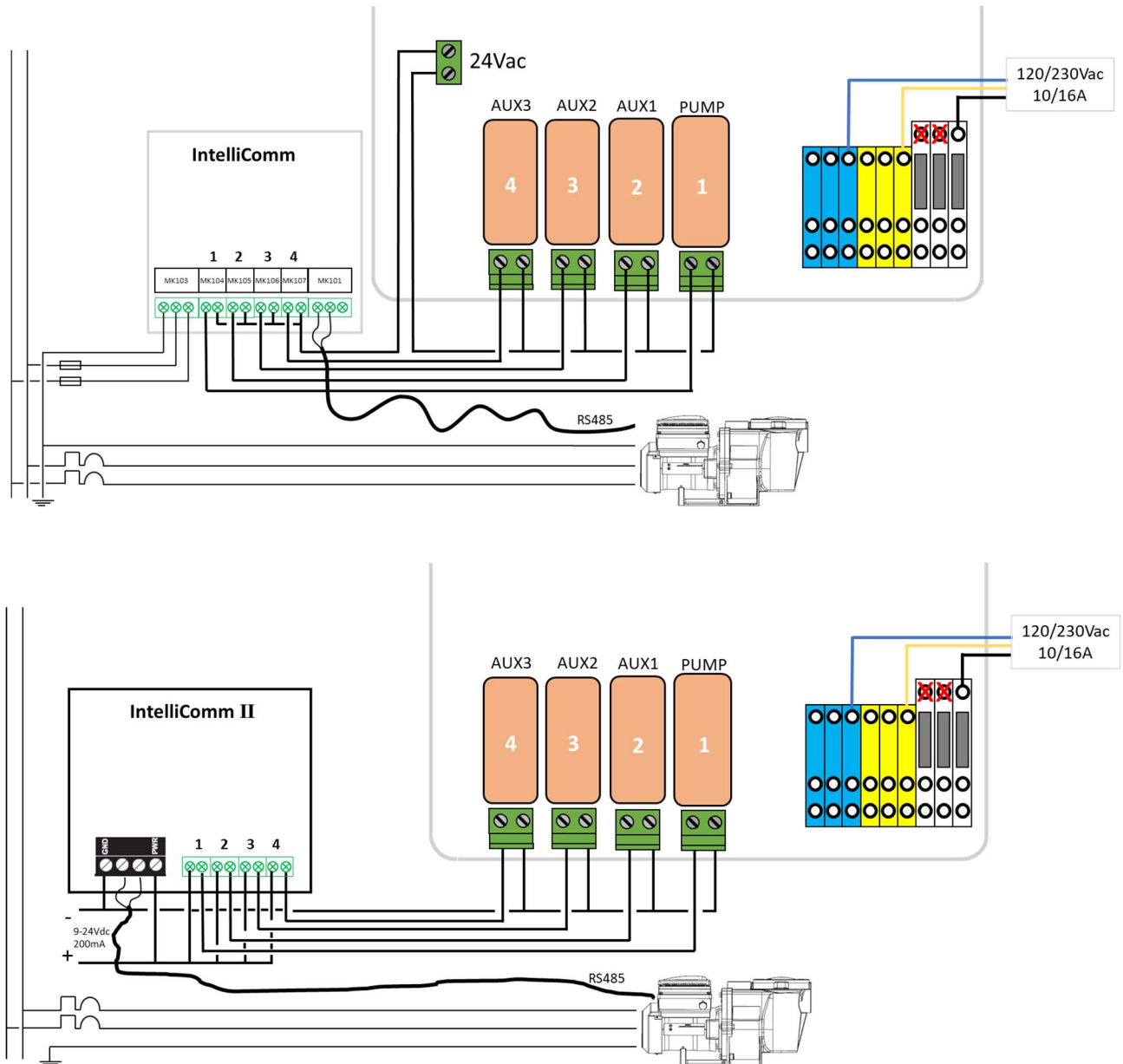


Figure 4 PoolCOP and VSD with IntelliComm or IntelliComm II

	Speed	Pump	Aux1	Aux2	Aux3
PENTAIR Intellicom	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	OFF	OFF	ON

Figure 5 Output relays statuses

2.3.2 POOLCOP PROGRAMMING WITH PENTAIR INTELLIFLO VSD

2.3.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.3.2.2 Pump Data Menu

- Select Pump: **PENTAIR IntelliComm**
- **Low Alert:** Adjust this setting to 0.20Bar below the indicated pressure with the pump at the lowest pre-set speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the indicated pressure when the pump is not running.
- **Pump Prot: YES** (default) the pump will be stopped if pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-3) to be linked to Filtration Timer Cycle 1.
The high pre-set speed is recommended, and this will be used to trigger automatic filter cleaning cycles.
- **Cyc 2 Speed:** Select the speed (1-3) to be linked to Filtration Timer Cycle 2.
Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed to be commanded during filter cleaning cycles whether manually commanded or automatically triggered. This should be the high pre-set speed; select speed 3
- **Do not use Speed 4**

2.3.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be Manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.3.2.4 Filter Data Menu

- Set Backwash duration to be minimum 60 seconds
- Set Rinse duration to be minimum 60 seconds

2.3.3 INTELLIFLO VSD PROGRAMMING

It is important that pump is only controlled by IntelliComm module and does not run on its own. Here are the recommended settings:

- **Settings, Pump Address:** make sure **pump address is 1**.
- **Settings, Set Minimum Speed:** choose minimum allowed speed ie **450rpm**.
- **Settings, Set Maximum Speed:** choose maximum speed according to the installation.
- **Speed 1-8:** make sure these speeds are in **MANUAL** or **DISABLED** mode. If a speed is in **TIMER** mode, this speed may be activated when pump is asked to be stopped by PoolCop.
- **External Ctrl:** Select speed for Programs 1, 2 and 3 as desired. These speeds can be selected by PoolCop. **Make sure Program 4 is set to 450rpm**.
- **Priming:** set to **DISABLED**.
- **Anti-freeze:** set to **DISABLED**.

2.3.4 INTELLIFLO VSD OPERATIONAL NOTES

- It is recommended that once installed, all pump control is done from the PoolCop ONLY. Do not start the pump from the pump panel as this inhibits PoolCop control.
- The VSD defaults to the last speed and condition selected on the pump keypad. For this reason, the pump will always be left in the OFF condition. This allows the PoolCop to start and stop the pump and control speeds.
- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCop manual pump control.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.
- DO NOT start or stop the pump from the pump control panel.

2.4 Pentair IntelliFlo® VSF, IntelliFlo3 VSF

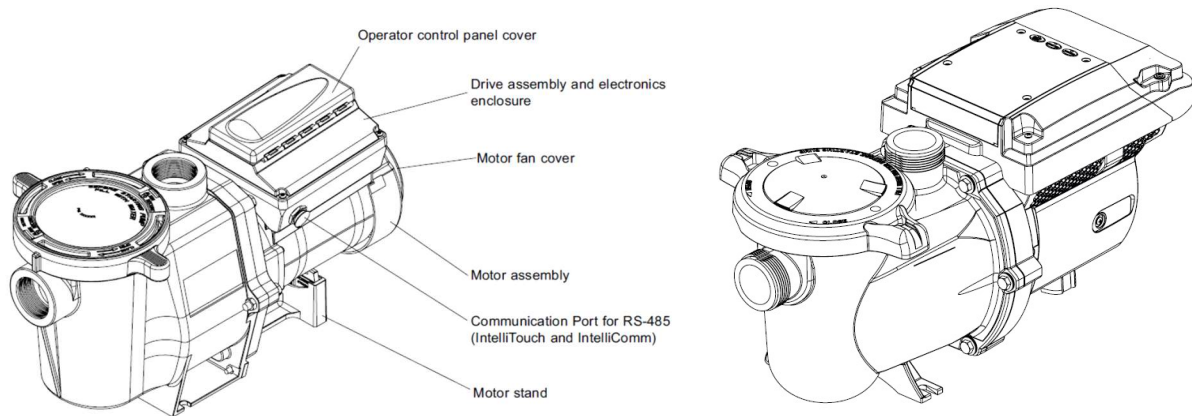


Figure 6 Pentair IntelliFlo VSF, IntelliFlo3 VSF



WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCop and Pentair IntelliFlo® VSF, communicating via the Pentair IntelliComm or Intellicomm II, together offer the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCop controls **when, how long and at which speed (or flow)** the filtration system runs, with pre-set programs linked to filtration cycles. Higher flow rates can be used during low energy cost periods, and lower flow rates during high energy cost periods. PoolCop automatically cleans the filter at a linked high speed when required in order to maintain optimal filtration efficiency. PoolCop carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- IntelliFlo® VSF has 4 pre-set and user adjustable pump speeds or flows.

2.4.1 CONNECTING INTELLIFLO VSF, INTELLICOMM-INTELLICOMM II, INTELLIFLO3 VSF

The Pentair IntelliComm is required to control the VSF at different speeds/flows.
The Pentair Relay Control Board is required to control the IntelliFlo3 VSF.
The pump is permanently powered.

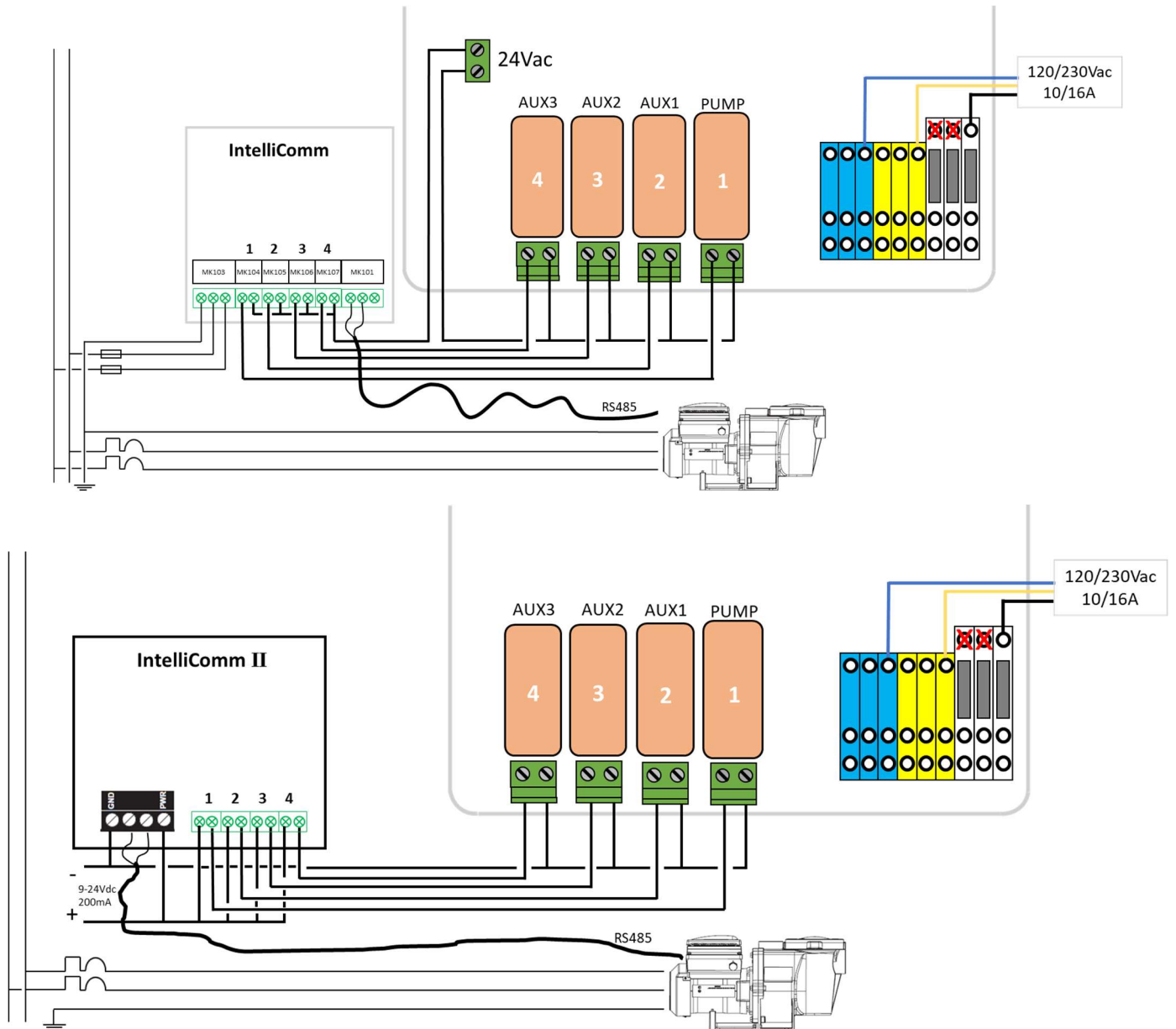


Figure 7 PoolCop and VSF with IntelliComm or IntelliComm II

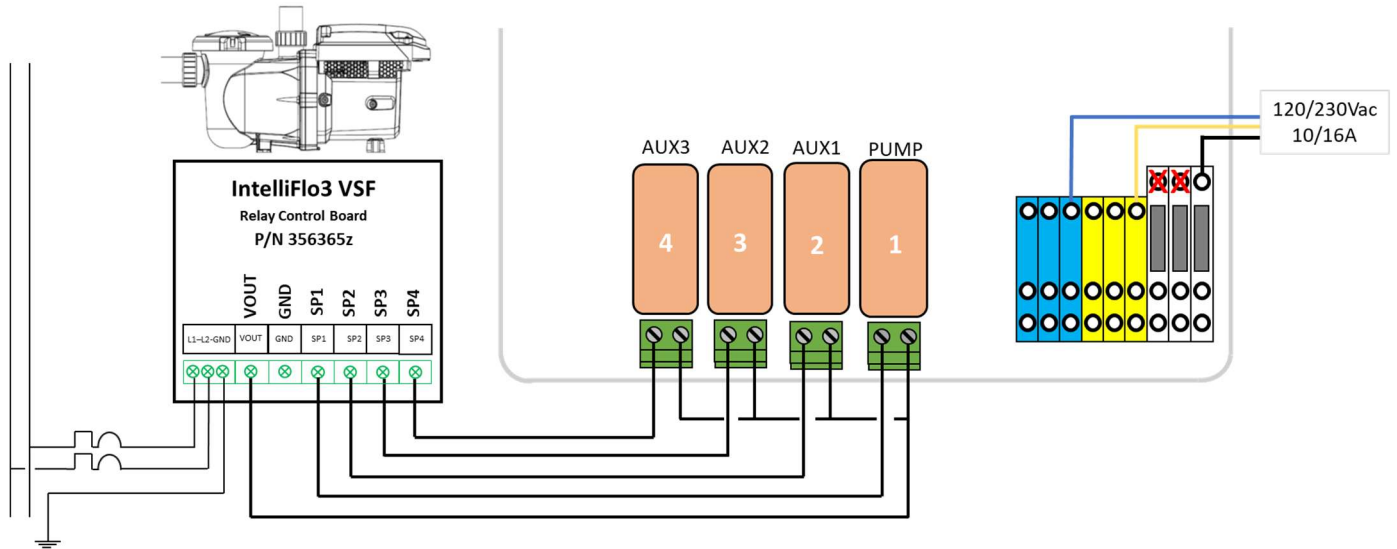


Figure 8 PoolCOP and IntelliFlo3 VSF with Relay Control Board P/N 356365z

	Speed	Pump	Aux1	Aux2	Aux3
PENTAIR Intellicom	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	OFF	OFF	ON

Figure 9 Output relays statuses

2.4.2 POOLCOP PROGRAMMING WITH PENTAIR INTELLIFLO VSF

2.4.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.4.2.2 Pump Data Menu

- Select Pump: **PENTAIR IntelliComm**
- **Low Alert:** Adjust this setting to 0.20Bar below the indicated pressure with the pump at the lowest pre-set speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the indicated pressure when the pump is not running.
- **Pump Prot: YES** (default) the pump will be stopped if pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the program (1-4) to be linked to Filtration Timer Cycle 1. The high pre-set speed/flow is recommended, and this will be used to trigger automatic filter cleaning cycles.
- **Cyc 2 Speed:** Select the program (1-4) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed/flow is recommended.
- **Clean Speed:** Select the speed/flow to be commanded during filter cleaning cycles whether manually commanded or automatically triggered. This should be the high pre-set speed/flow; select program 4

2.4.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode). Set the start and end time for required filtration duration. If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be Manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.4.2.4 Filter Data Menu

- Set Backwash duration to be minimum 60 seconds
- Set Rinse duration to be minimum 20 seconds

2.4.3 INTELLIFLO VSF PROGRAMMING

It is important that pump is only controlled by IntelliComm module and does not run on its own. Here are the recommended settings:

- **Menu, Settings, Pump Address:** make sure **pump address is 1**.
- **Menu, Settings, Min/Max:** choose min/max values for speeds, flows, and pressure according to the installation.
- **Menu, Program 1-8,** make sure these programs are in **MANUAL** or **DISABLED** mode. If a program is in **TIMER** or **EGG TIMER** mode, this speed might be activated even when pump is asked to be stopped by PoolCop.
- **Menu, Ext Control, Program 1,2,3,4:** Activate the programs and choose type (speed/flow) and desired values. By default, programs are in speed type with respectively 750rpm, 1500rpm, 2350rpm and 3110rpm. Keep 'Stop Delay' to 0 minutes.
- **Menu, Priming:** as and if needed.
- **Menu, Thermal mode:** set to **DISABLED**.

2.4.4 INTELLIFLO VSD OPERATIONAL NOTES

- It is recommended that once installed, all pump control is done from the PoolCop ONLY. Do not start the pump from the pump panel as this inhibits PoolCop control.
- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCop manual pump control.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.
- DO NOT start or stop the pump from the pump control panel.

2.4.5 INTELLIFLO3 VSF

- Disable all scheduled programs.
- Check priming settings, if required.

2.5 Pentair SuperFlo® VS / SuperFlo VS2

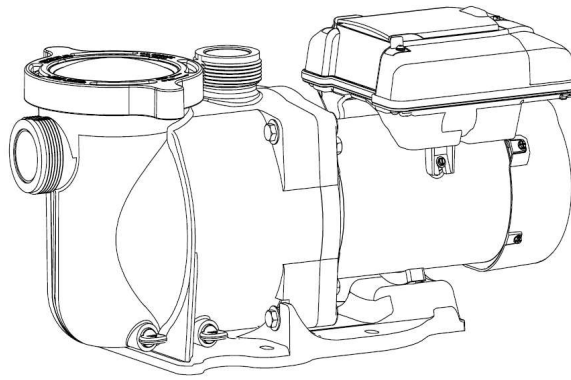


Figure 10 Pentair SuperFlo VS



WARNING:

The information below is for guidance only.

**Follow the manufacturer's recommendations as per the latest equipment manual at all times.
No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.**

The combination of PoolCop and Pentair SuperFlo® VS offer the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCop controls **when, how long and at which speed** the filtration system runs, with pre-set speeds linked to filtration cycles. Higher flow rates can be used during low energy cost periods, and lower flow rates during high energy cost periods. PoolCop automatically cleans the filter at a linked high speed when required in order to maintain optimal filtration efficiency. PoolCop carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- SuperFlo® VS has 4 pre-set and user adjustable pump speeds.

2.5.1 CONNECTING SUPERFLO® VS/VS2

The pump is permanently powered. PoolCop starts and stops the pump, and commands the selected speed. The cable assignment for the individual speed is as per **Erreur ! Source du renvoi introuvable.**. PoolCop will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

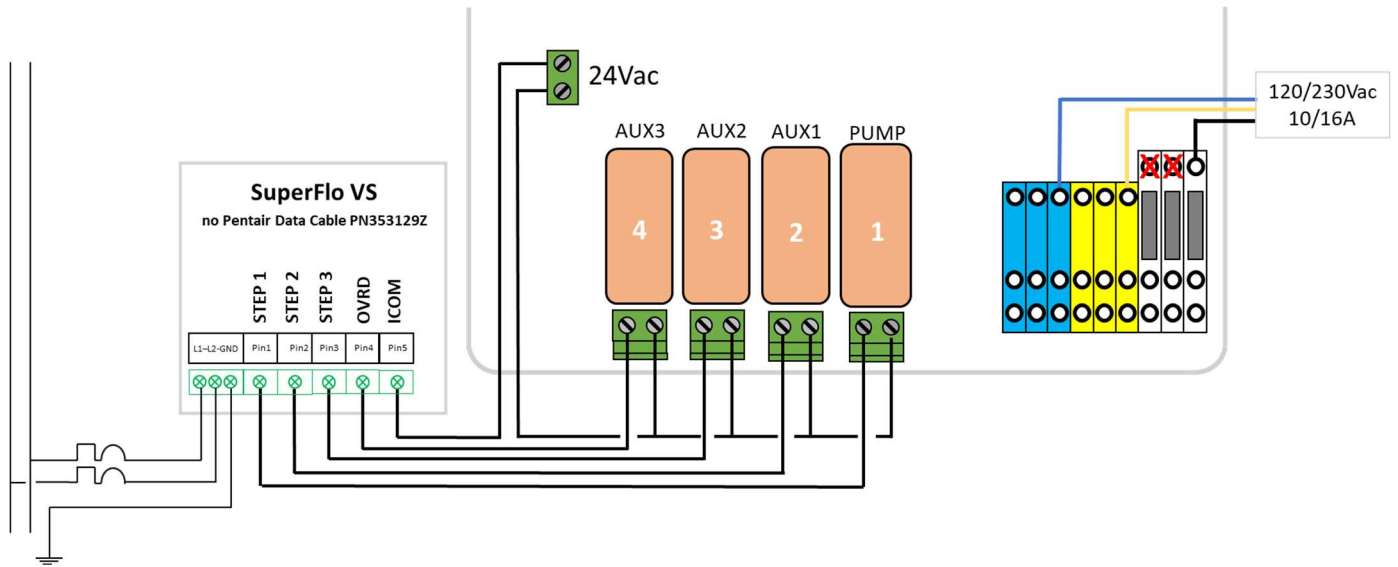


Figure 11 PoolCop and SuperFlo VS

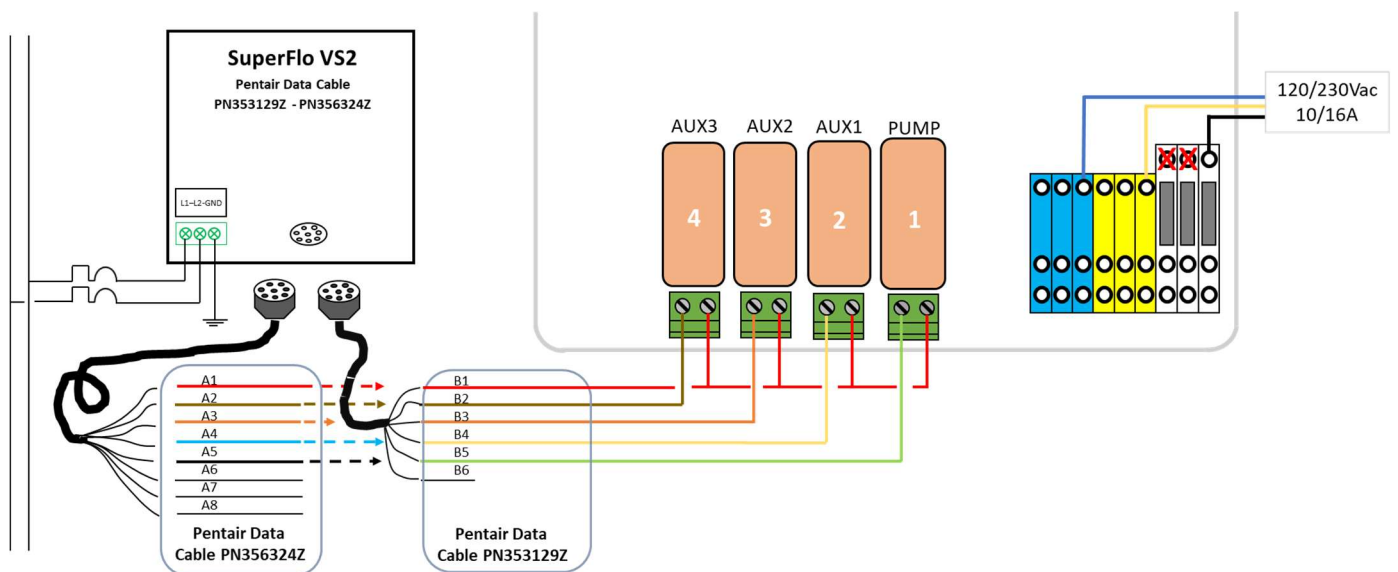


Figure 12 PoolCop and SuperFlo VS2 with Pentair Data Cable

	Speed	Pump	Aux1	Aux2	Aux3
PENTAIR SuperfloVS	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	OFF	OFF	ON

Figure 13 Output relays statuses

2.5.2 POOLCOP PROGRAMMING WITH PENTAIR SUPERFLO VS/VS2

2.5.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.5.2.2 Pump Data Menu

- Select Pump: **PENTAIR SuperFlo VS**
- **Low Alert:** Adjust this setting to 0.20Bar below the indicated pressure with the pump at the lowest pre-set speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the indicated pressure when the pump is not running.
- **Pump Prot: YES** (default) the pump will be stopped if pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-4) to be linked to Filtration Timer Cycle 1.
The high pre-set speed is recommended, and this will be used to trigger automatic filter cleaning cycles.
- **Cyc 2 Speed:** Select the speed (1-4) to be linked to Filtration Timer Cycle 2.
Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed (1-4) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered. This should be the high pre-set speed; select speed 4

2.5.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be Manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.5.3 SUPERFLO VS/VS2 PROGRAMMING

2.5.3.1 SuperFlo VS

To be defined

2.5.3.2 SuperFlo VS2

- Stop the pump (Start/Stop button)
- Press again on Start/Stop for more than 3 seconds until the "Ext_Ctrl_Only" led light.
- Press Start/Stop to allow the pump to run.

2.5.4 SUPERFLO VS OPERATIONAL NOTES

- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCOP manual pump control.
- Pump speed can be changed on the fly using the PoolCOP manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.

2.6 Pentair with Acu Drive XS (Danfoss VLT AQUA Drive)

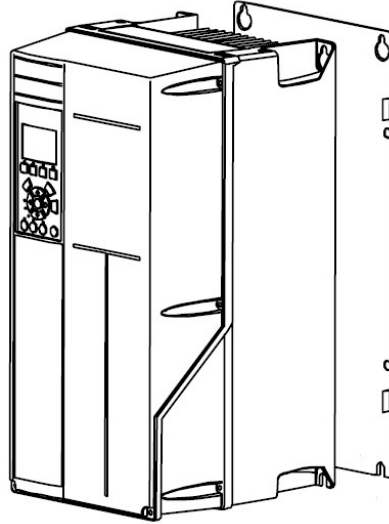


Figure 14 Pentair Acu Drive XS



WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCOP and Pentair Acu Drive XS offer the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCOP controls **when, how long and at which speed** the filtration system runs, with pre-set speeds linked to filtration cycles. Higher flow rates can be used during low energy cost periods, and lower flow rates during high energy cost periods. PoolCOP automatically cleans the filter at a linked high speed when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- Pentair Acu DriveXS offers 8 pre-set and user adjustable pump speeds.

2.6.1 CONNECTING ACU DRIVE XS

The pump is permanently powered. PoolCOP starts and stops the pump, and commands the selected speed. The cable assignment for the individual speed is as per Figure 16 PoolCOP and Acu Drive XS. PoolCOP will control start/stop and speeds using low voltage control signals via the Pump, Aux1 to Aux3 relays.

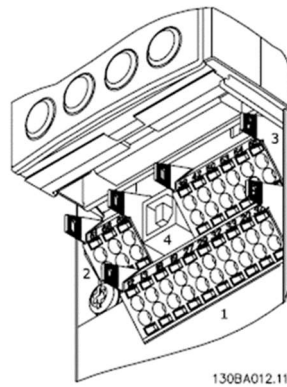


Figure 15 Acu Drive XS Control terminals (1)

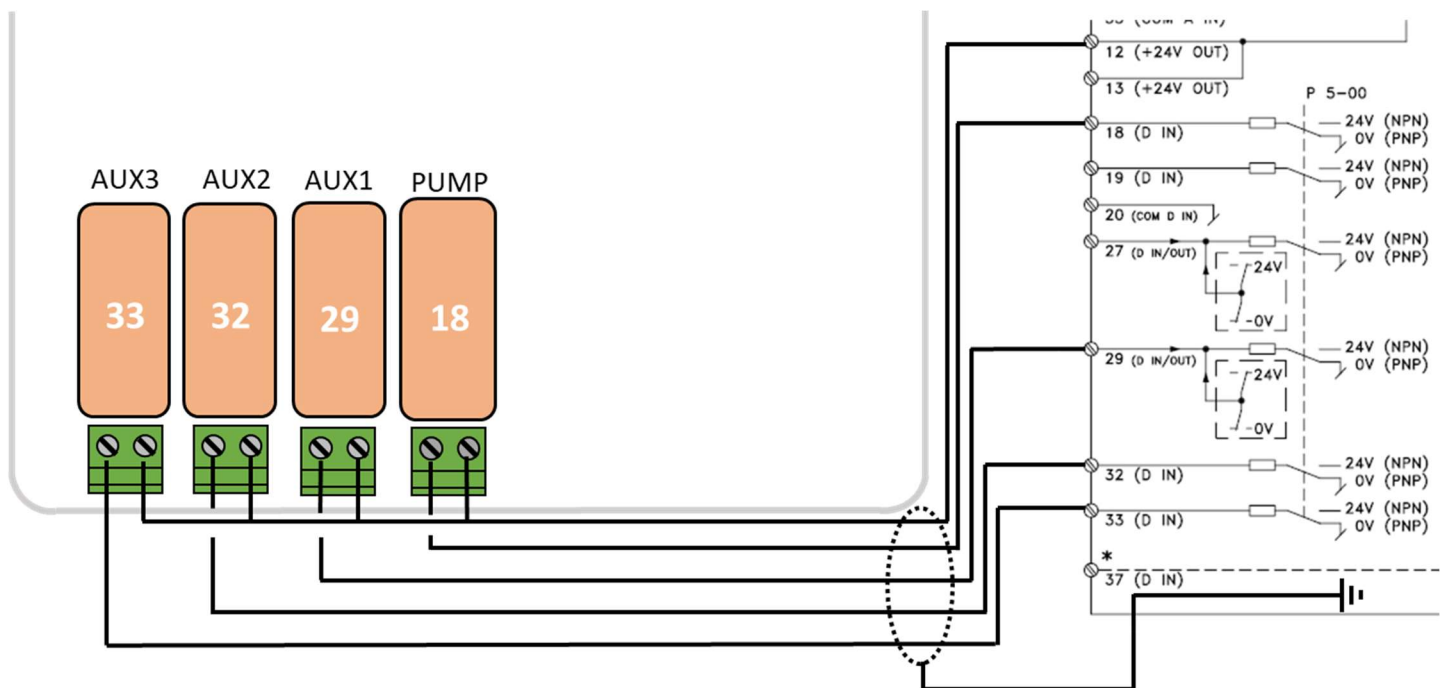


Figure 16 PoolCOP and Acu Drive XS



WARNING:
Use only screened and grounded cable for control signals.

	Speed	Pump	Aux1	Aux2	Aux3
Binary Combination	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	ON	ON	OFF
	5	ON	OFF	OFF	ON
	6	ON	ON	OFF	ON
	7	ON	OFF	ON	ON
	8	ON	ON	ON	ON

Figure 17 Output relays statuses

2.6.2 POOLCOP PROGRAMMING WITH ACU DRIVE XS

2.6.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.6.2.2 Pump Data Menu

- Select Pump: **Binary Combination**
- **Low Alert:** Adjust this setting to 0.20Bar below the indicated pressure with the pump at the lowest pre-set speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the indicated pressure when the pump is not running.
- **Pump Prot: YES** (default) the pump will be stopped if pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-8) to be linked to Filtration Timer Cycle 1.
The high pre-set speed is recommended, and this will be used to trigger automatic filter cleaning cycles.
- **Cyc 2 Speed:** Select the speed (1-8) to be linked to Filtration Timer Cycle 2.
Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed (1-8) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered. This should be the high pre-set speed; select speed 4

2.6.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be Manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.6.3 ACU DRIVE XS PROGRAMMING

Review the Acu Drive XS manual for all parameters.

For speeds control, check the following parameters :

- 3.02= Minimum reference
- 3.03= Maximum reference
- 5-??=8 (input 18 configured as Start – should be the default setting).
- 5-13=16 (input 29 configured as Preset ref bit 0)
- 5-14=17 (input 32 configured as Preset ref bit 1)
- 5-15=18 (input 33 configured as Preset ref bit 2)
- 3-10 = table of speed in % of full ref range (3-03 – 3-02)

2.7 Hayward VSTD range

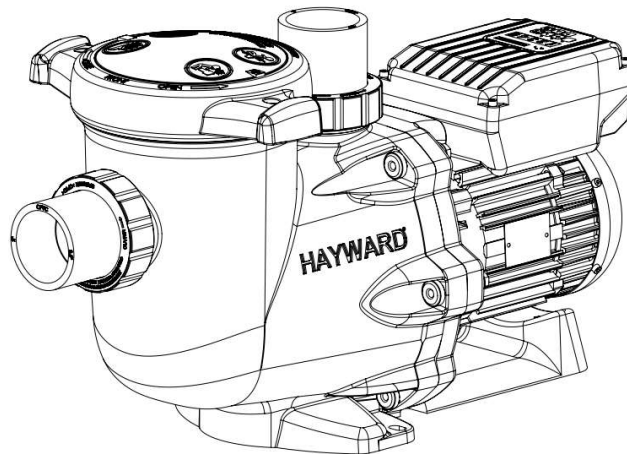


Figure 18 Hayward VSTD

WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.



The combination of PoolCOP and Hayward VSTD range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCOP controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCOP automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- External control allows to control 3 speeds

2.7.1 CONNECTING HAYWARD VSTD PUMP

Power must be supplied to the pump via an external breaker.

The pump provides 24V to energize relays external speed control. The cable assignment for the individual speed is as per Figure 19 Connecting PoolCop with Hayward VSTD. PoolCop will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

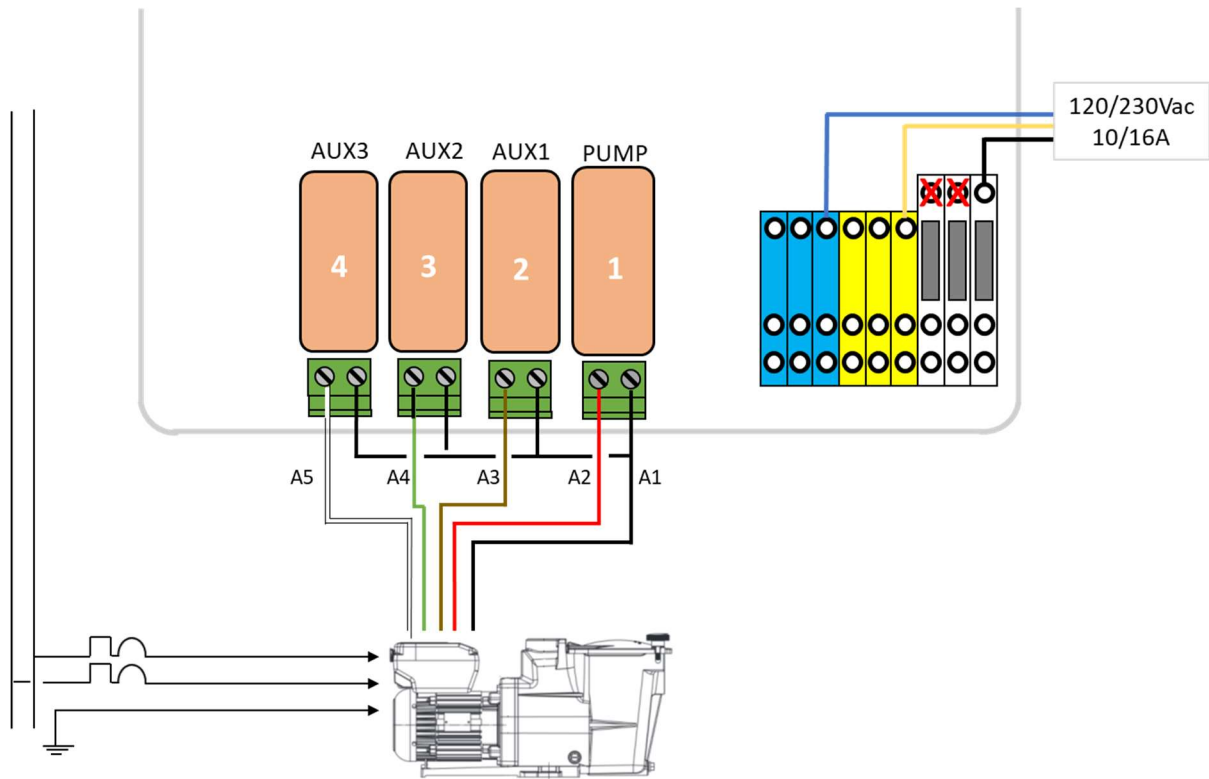


Figure 19 Connecting PoolCop with Hayward VSTD

	Speed	Pump	Aux1	Aux2	Aux3
HAYWARD VSTD	STOP	OFF	OFF	OFF	OFF
	1	ON	ON	OFF	OFF
	2	ON	OFF	ON	OFF
	3	ON	OFF	OFF	ON

Figure 20 Output relays statuses

2.7.2 POOLCOP PROGRAMMING WITH HAYWARD VSTD

2.7.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.7.2.2 Pump Data Menu

- Select Pump: **HAYWARD VSTD range**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCop measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCop when the pump is not running.
- **Pump Prot:** YES (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-3) to be linked to Filtration Timer Cycle 1.
Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed (1-3) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed (1-3) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.7.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.7.3 HAYWARD VSTD PROGRAMMING

- VSTD allows adjusting the 3 speeds (see user manual). These adjustments are done while the pump is running. Use PoolCop manual control menu to start the pump at the desired speed and then use UP and Down arrows on the pump drive to set the speed.
- Long action (3 seconds) on the current speed will memorize the setting.
- Pump timers must all be set to off (t 1off, t 2off, t 3off, t 4off, t 5off). Checking can be done by pressing "disp func" during more than 3 seconds so that to enter in "conf" menu, and then by pressing "disp func" again. The down arrow allows to set the timer off.

2.7.4 HAYWARD VSTD OPERATION NOTES

- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCop manual pump control.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.

2.8 Hayward EcoStar SP3400VSP

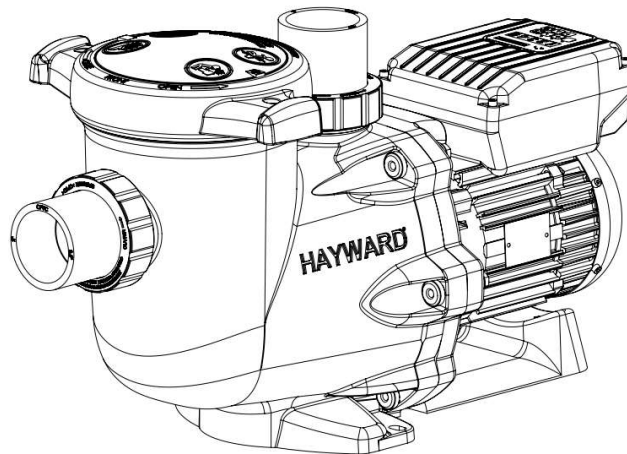


Figure 21 Hayward EcoStar SP3400VSP

WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.



The combination of PoolCop and Hayward EcoStar SP3400VSP range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCop controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCop automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCop carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- External control allows to control 8 speeds

2.8.1 CONNECTING HAYWARD ECOSTAR SP3400VSP PUMP

Power must be supplied to the pump via an external breaker.

The pump provides 12V to energize relays external speed control. The cable assignment for the individual speed is as per Figure 22 Connecting PoolCOP with Hayward EcoStar SP3400VSP. PoolCOP will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

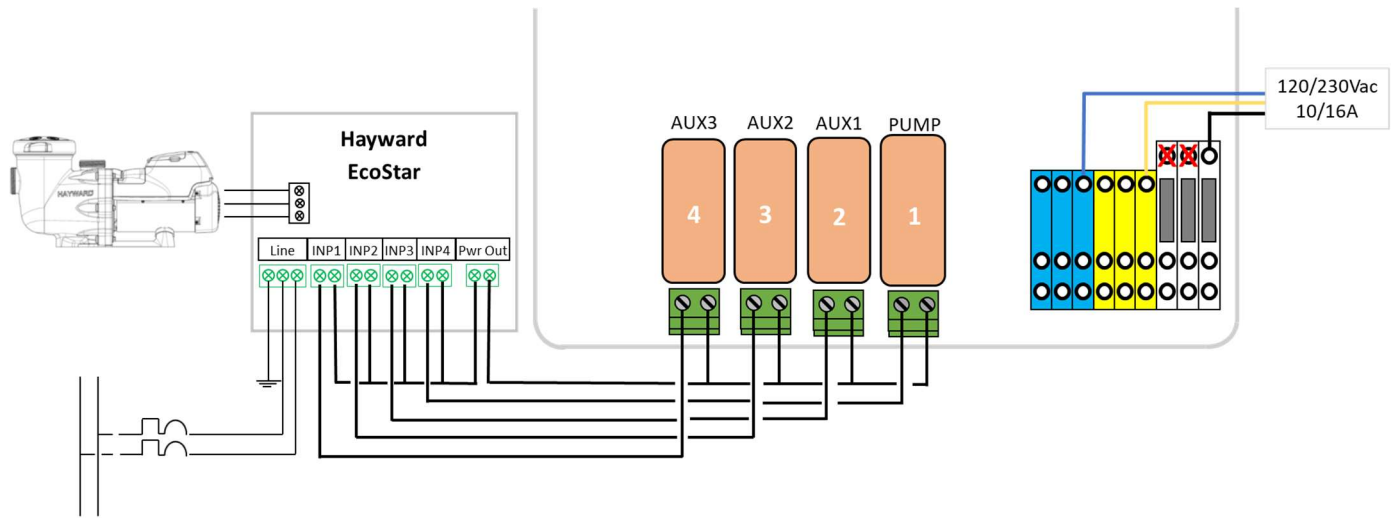


Figure 22 Connecting PoolCOP with Hayward EcoStar SP3400VSP

	Speed	Pump	Aux1	Aux2	Aux3
HAYWARD EcoStar	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	ON	ON	OFF
	5	ON	OFF	OFF	ON
	6	ON	ON	OFF	ON
	7	ON	OFF	ON	ON
	8	ON	OFF	ON	ON

Figure 23 Output relays statuses

2.8.2 POOLCOP PROGRAMMING WITH HAYWARD ECOSTAR SP3400VSP

2.8.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.8.2.2 Pump Data Menu

- Select Pump: **HAYWARD EcoStar SP3400VSP**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCop measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCop when the pump is not running.
- **Pump Prot:** YES (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-8) to be linked to Filtration Timer Cycle 1.
Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed (1-8) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed (1-8) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.8.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.8.3 HAYWARD ECOSTAR SP3400VSP PROGRAMMING

- EcoStar allows adjusting the 8 speeds (see user manual).
- Enter the 'timer' menu
- For each desired speed:
 - Set start and stop times to the same value to neutralize timer
 - Set the speed as desired.

2.8.4 HAYWARD ECOSTAR SP3400VSP OPERATION NOTES

- Pump cannot be started manually outside filtration cycles.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.

2.9 Speck BADU Eco (Touch, Touch-pro, Flow and 90 Eco VS), ACIS VIPool MKB VS

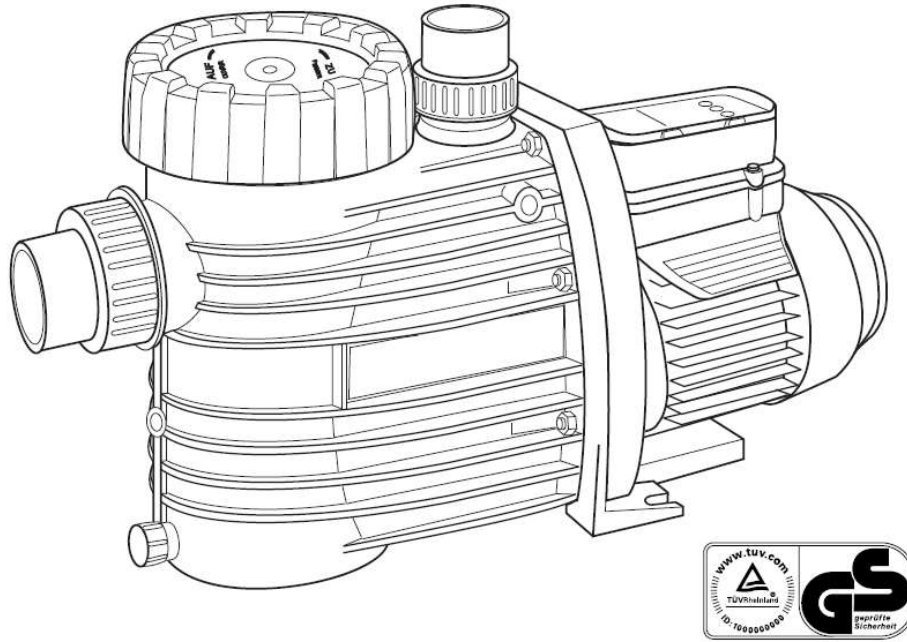


Figure 24 Speck BADU Eco



WARNING:

The information below is for guidance only.
Follow the manufacturer's recommendations as per the latest equipment manual at all times.
No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCOP and Speck BADU Eco range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCOP controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCOP automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).



CAUTION:

PoolCOP sends an active signal (close relay contact) to stop the pump. For this reason the PoolCOP should never be switched OFF when the pump is RUNNING; in this case, the pump can only be stopped by disconnecting the circuit breaker.

- **Speck BADU Eco Touch-pro and Eco Flow:**
 - These pumps are fully controllable at the 3 user configured speeds.
 - Priming speed and duration is user configured.
- **Speck BADU Eco Touch**
 - This pump is fully controllable at the 3 factory configured speeds of 2000, 2430 and 2830rpm. Refer to the manufacturer's documentation for further details.
 - Whenever started, the pump runs at priming speed of 2830rpm for 5mins.



Note Speck BADU Eco Touch:

When the pump is switched on, the top speed (2830 RPM) is always activated for 5 mins to prime the pump. When switching via the external PoolCOP relays, the linked speed is not activated until this 5 minutes priming elapsed.

2.9.1 CONNECTING SPECK BADU ECO PUMP

Power must be supplied to the pump via an external breaker.

The pump features a 5-wire cable with open ends for external control. The cable assignment for the individual speed is as per Figure 27 Connecting PoolCop and Speck BADU Eco. PoolCop will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

These wires must be connected potential-free.

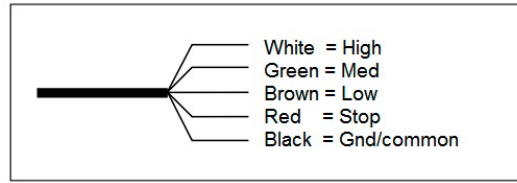


Figure 25 Speck BADU Eco Cable

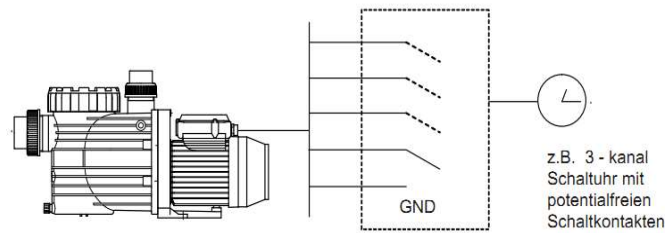


Figure 26 Speck BADU Eco Contôle

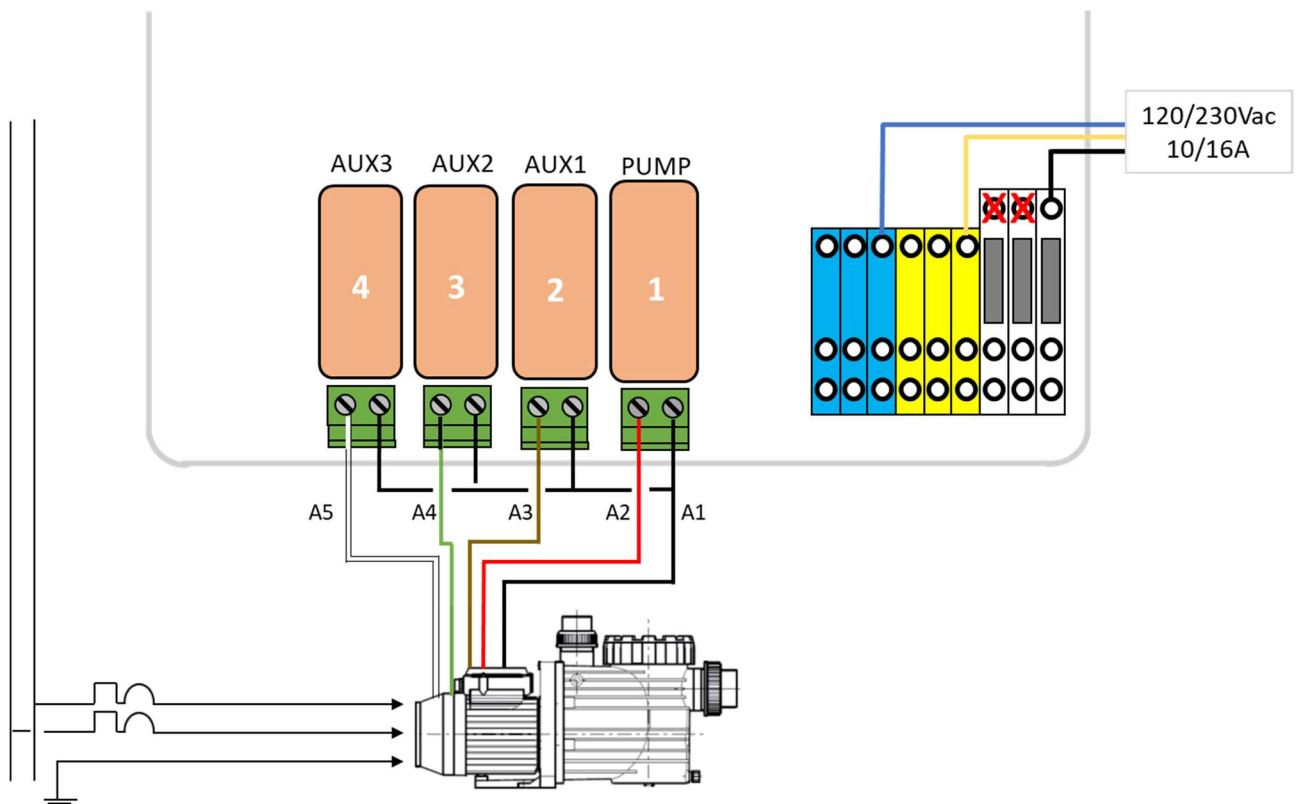


Figure 27 Connecting PoolCop and Speck BADU Eco

	Speed	Pump	Aux1	Aux2	Aux3
BADU Eco Touch-Pro	STOP	Pulse ON	OFF	OFF	OFF
	1	OFF	ON	OFF	OFF
	2	OFF	OFF	ON	OFF
	3	OFF	OFF	OFF	ON

Figure 28 Output relays statuses

2.9.2 POOLCOP PROGRAMMING WITH SPECK BADU ECO TOUCH

2.9.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.9.2.2 Pump Data Menu

- Select Pump: **BADU Eco Touch-pro**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCop measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCop when the pump is not running.
- **Pump Prot:** YES (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-3) to be linked to Filtration Timer Cycle 1.
Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed (1-3) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed (1-3) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered. The Speck BADU Eco pump will always run at high speed for approximately 5 minutes when started; setting this linked speed ensures that for longer backwash and rinse operations, the high speed is maintained.

2.9.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.9.3 BADU TOUCH-PRO AND ECO FLOW PROGRAMMING

Touch-pro version allows you to adjust the three speeds between 1,000 rpm and 2830tr/min by 50tr/min steps (refer to pump manual). These settings are done with a running pump. Use the PoolCop manual command menu to manually start the pump, at the speed you want to set and follow the instructions manual for speed adjustment.

Similarly, priming speed and time are programmable. This can only be done when pump is stopped, but is impossible if stop order is requested by PoolCop. To allow these settings, follow this procedure:

- From the PoolCop manual command menu, start the pump on speed 1.
- On the pump keypad, press '0' to stop the pump
- Follow the manual instructions to adjust priming speed and time.
- When the operation is complete, use PoolCop manual command menu to confirm pump off.
Note: If the setup operation takes more than 8 minutes, PoolCop will confirm pump off and displays an error message: "no pressure". This does not affect further use.

2.9.4 BADU Eco VS PROGRAMMING

Refer to 2.9.3 BADU Touch-pro and Eco Flow Programming for speeds and priming settings.

To enable remote control:

- Enter pump setup menu (press 3 seconds on "S" button)
- Enable external control by Digital Inputs (menu item "E" set to "dl")
- Set switching behaviour "0" to close (menu item "0" set to "cL")

2.9.5 BADU Eco TOUCH OPERATION NOTES

- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCop manual pump control.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.
- The Speck BADU Eco Touch pump will always run at high speed for approximately 5 minutes when started; linked speeds will only be active after this initial period.

This does not apply to the Eco Touch-pro and Eco Touch Flow pumps.

- Linking the high speed to Clean in the Pump Data menu ensures that the higher speed is maintained if a long duration automatic or manual backwash or rinse is commanded.
- Once connected to PoolCop, speed control on the pump keypad is inhibited.
- Should the pump be stopped by using the pump keypad, it should be restarted from the PoolCop Manual Control Menu. First **send a stop command**, followed **by a start command**. The pump will now restart under the control of the PoolCop.

2.10 Speck BADU 90 Eco Motion

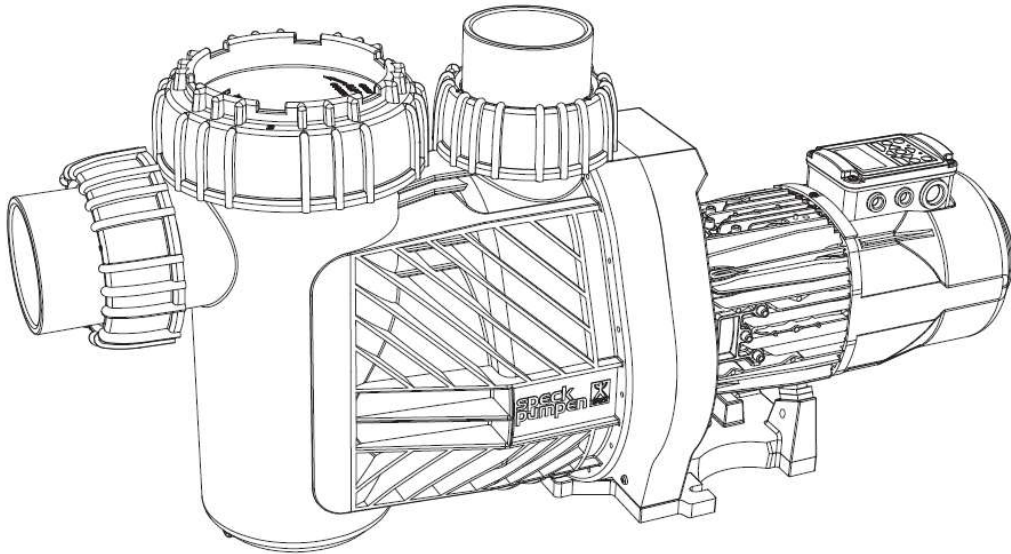


Figure 29 Speck BADU 90 Eco Motion

WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.



The combination of PoolCop and Speck BADU Eco range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCop controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCop automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCop carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- External control allows to control 6 speeds, PoolCop will select one of the 4th first speeds
- Pump is normally delivered with close loops on S1 and S2 (connected to 24V). These loops are an alternate way to stop the pump with an external mean when the loop is opened. Make sure these 2 loops are closed otherwise PoolCop will not be able to start the pump.

2.10.1 CONNECTING SPECK BADU 90 ECO MOTION PUMP

Power must be supplied to the pump via an external breaker.

The pump features 24V to energize relays external speed control. The cable assignment for the individual speed is as per Figure 30 Connecting PoolCOP with Speck BADU Eco Motion. PoolCOP will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

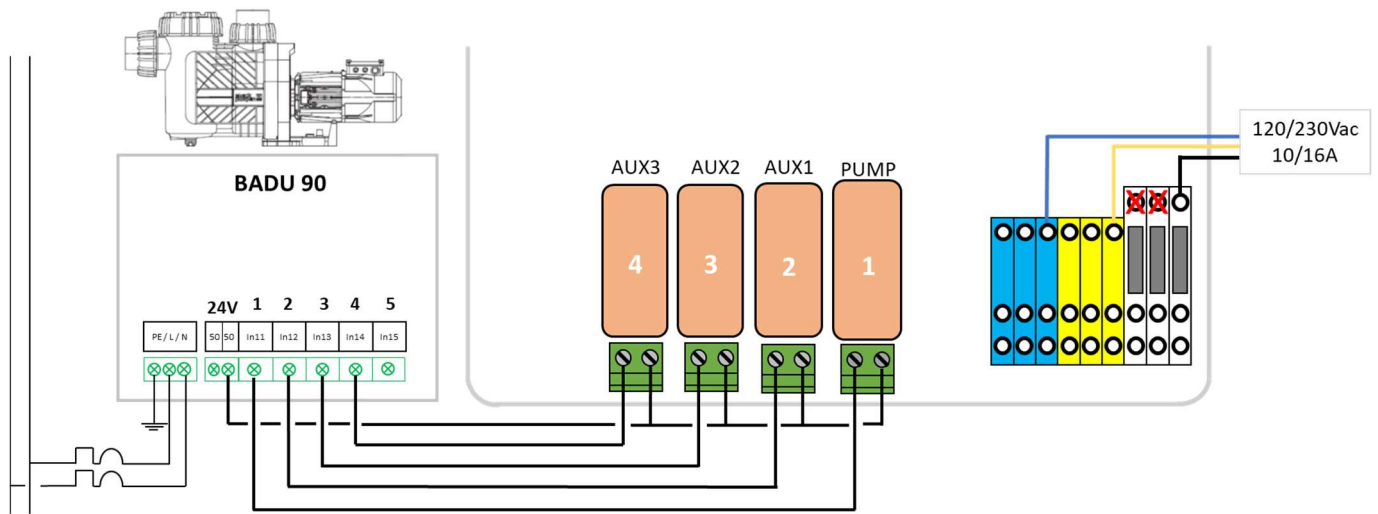


Figure 30 Connecting PoolCOP with Speck BADU Eco Motion

	Speed	Pump	Aux1	Aux2	Aux3
BADU 90 Eco Motion	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	OFF	OFF	ON

Figure 31 Output relays statuses

2.10.2 POOLCOP PROGRAMMING WITH SPECK BADU ECO

2.10.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.10.2.2 Pump Data Menu

- Select Pump: **BADU 90 Eco Motion**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCOP measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCOP when the pump is not running.
- **Pump Prot:** YES (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-4) to be linked to Filtration Timer Cycle 1. Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed (1-4) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed (1-4) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.10.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.10.3 BADU 90 Eco MOTION PROGRAMMING

Eco Motion allows you to adjust up to 6 external speeds, called N1 to N6, between 35% to 100% (refer to pump manual). PoolCop will only use N1 to N4.

- BADU 90 Eco Motion has lot of build in features which allow automating many tasks in the pool, like backwashing the filter; these features are part of the pump automation and will not be used when pump is connected to PoolCop because PoolCop will remain the "brain".
- Mainly, backwash, filter, pool cleaner, party, purge modes will not be used and will be set to OFF.
- External control will be set ON in MENU/EXTERNAL settings according to the following:
 - EXTERNAL will be set to FIXED SPEED
 - SIGNAL will be set to CONTINUOUS
 - N1 will be the lowest speed (in % or rpm according to the choice in MENU/BASIC SETTINGS/DISPLAY)
 - N2 will be the next speed higher than N1 (in % or rpm according to choice)
 - N3 will be the next speed higher than N2 (in % or rpm according to choice)
 - N4 will be the highest speed (in % or rpm according to choice)

2.10.4 BADU Eco OPERATION NOTES

- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCop manual pump control.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.

2.11 Zodiac FloPro™ VS

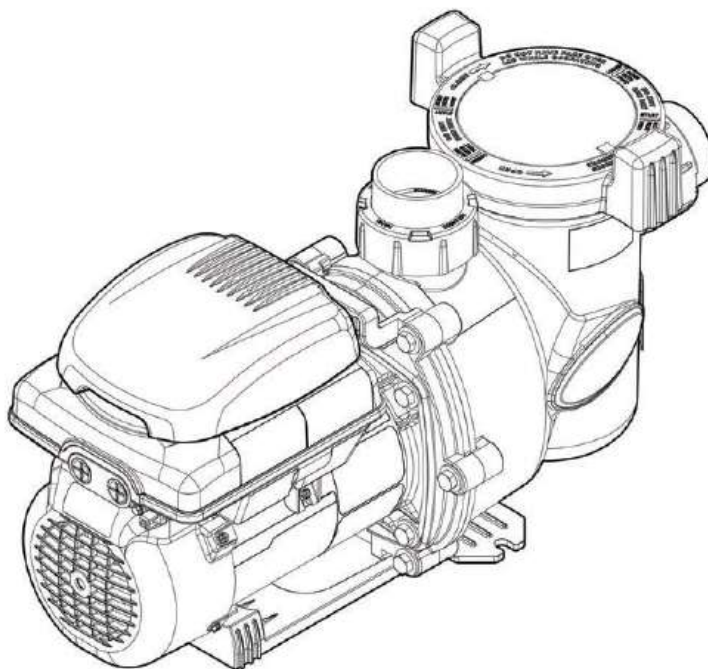


Figure 32 Zodiac FloPro™ VS



WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to inverter specifications and for incorrect connection, control and programming.

The combination of PoolCOP and Zodiac FloPro™ VS offers the pool owner the possibility to benefit of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCOP controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCOP automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).

2.11.1 CONNECTING ZODIAC FLOPRO™ VS

Single phase Power must be supplied to the pump via an external breaker.

The pump features polarity to energize external speed control. The cable assignment for the individual speed is as per Figure 33 Connecting PoolCop with Zodiac ProFlo™ VS. PoolCop will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

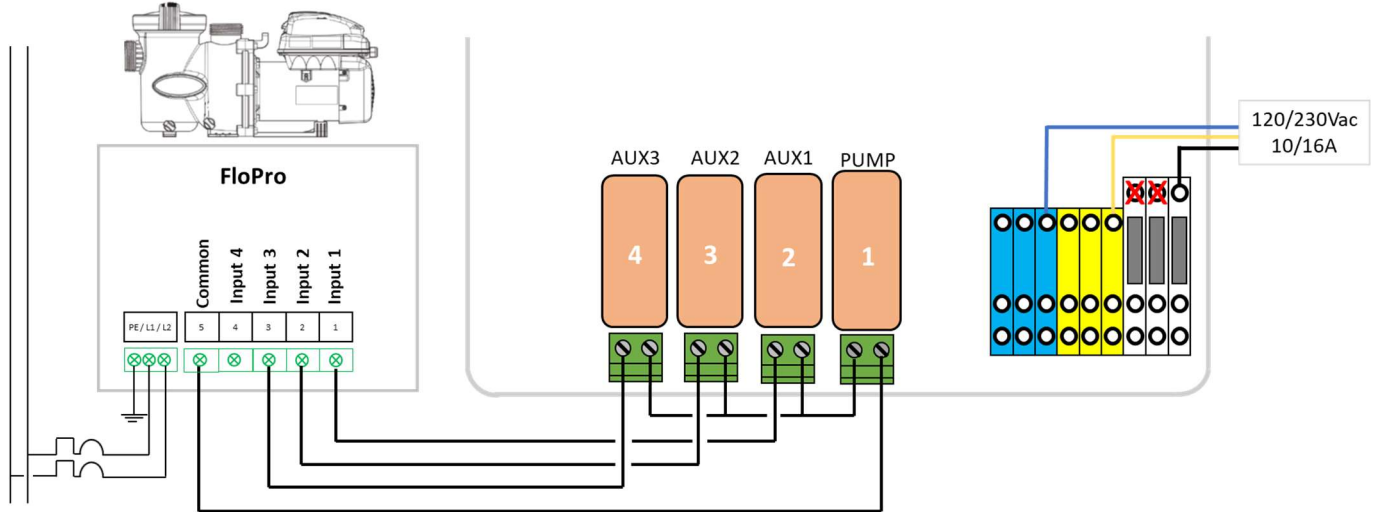


Figure 33 Connecting PoolCop with Zodiac ProFlo™ VS

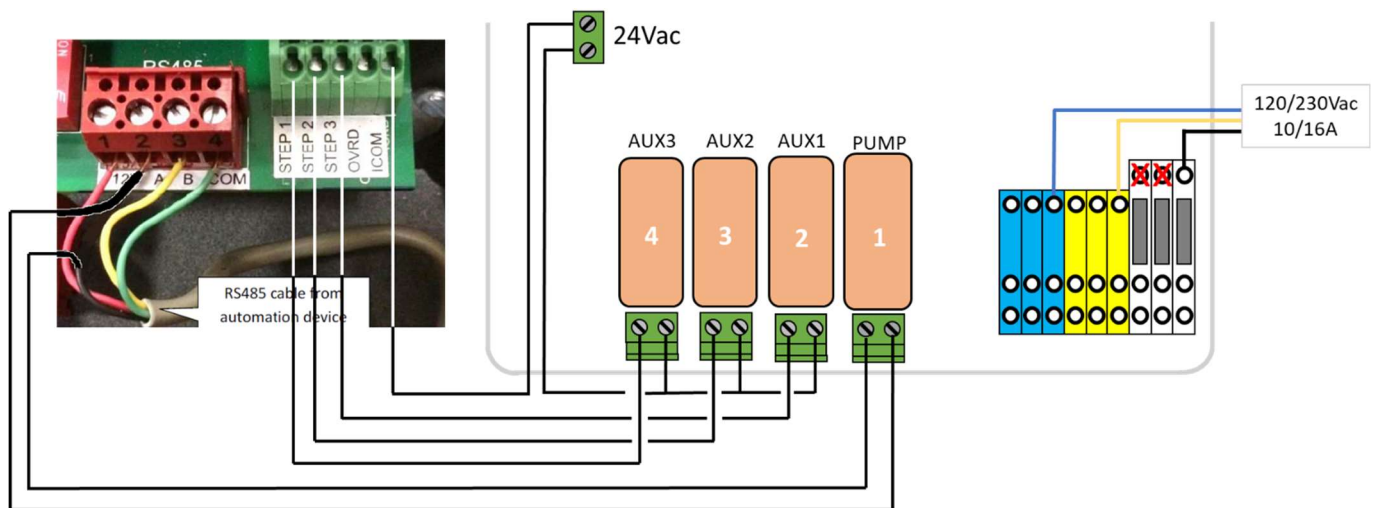


Figure 34 Connection PoolCop avec Zodiac ProFlo™ VS1

	Speed	Pump	Aux1	Aux2	Aux3
ZODIAC FloPro VS	STOP	OFF	OFF	OFF	OFF
	1	ON	ON	OFF	OFF
	2	ON	OFF	ON	OFF
	3	ON	OFF	OFF	ON

Figure 35 Output relays statuses

**NOTE:**

Use blue terminal "F" at the bottom side of user interface to connect wires. Pump manufacturer recommend to use an optional user interface remote kit to properly route the wires.

2.11.2 POOLCOP PROGRAMMING WITH ZODIAC PROFLO™ VS

2.11.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.11.2.2 Pump Data Menu

- Select Pump: **ProFloVS**
- **Low Alert:** Adjust this setting 0.2 Bar to below the PoolCop measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCop when the pump is not running.
- **Pump Prot:** YES (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-3) to be linked to Filtration Timer Cycle 1. Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed (1-3) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed (1-3) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.11.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode). Set the start and end time for required filtration duration. If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.11.3 PROGRAMMING THE PROFLO™ VS

FloProVS allows you to adjust up to 3 speeds.

To allow external speed control, the user interface must be remote in order to pass the wire through the base cable pass-thru (see procedure in "instruction for installation and use" manual).

- Selecting speed 1 (eStar) value: Enter the "service menu", then select "set eStar speed" and use UP and DOWN arrow to define the speed.
- Selecting speed 2 or speed 3 value: When the pump is running, speed value can be adjusted using UP and DOWN arrows. The final speed will be automatically saved.
- Antifreeze must be disable: Enter the "service menu", the select "pump freeze protect" and use DOWN arrow to set time to 0:00.
- Timeclock for "eStar" and speed 2 must be disabled. First start the pump in the according speed; then press MENU, set timeclock to "disable" and press MENU again to validate. Repeat operation for eStar and Speed2 speeds.

2.11.4 FLOPRO™ VS OPERATION NOTES

- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCop manual pump control.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.

2.12 Triphase pump with Invertek Optidrive E² inverter



Figure 36 Invertek Optidrive E²



WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to inverter specifications and for incorrect connection, control and programming.

The combination of PoolCop and Invertek Optidrive inverter offers the pool owner the possibility to convert a triphase single speed pump to a 5 speeds pump. He therefore benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCop controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCop automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCop carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).
- Before installation, check the pump speeds and voltage limits with the manufacturer. Avoid over speed (do not exceed nominal speed) and avoid too low speed which may lead in motor overheating.

2.12.1 CONNECTING INVERTEK OPTIDRIVE E²

Single phase Power must be supplied to the inverter via an external breaker. Pump will be powered via the inverter.

The inverter features 24V to energize relays external speed control. The cable assignment for the individual speed is as per Figure 37 Connecting PoolCOP with Invertek Optidrive E². PoolCOP will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

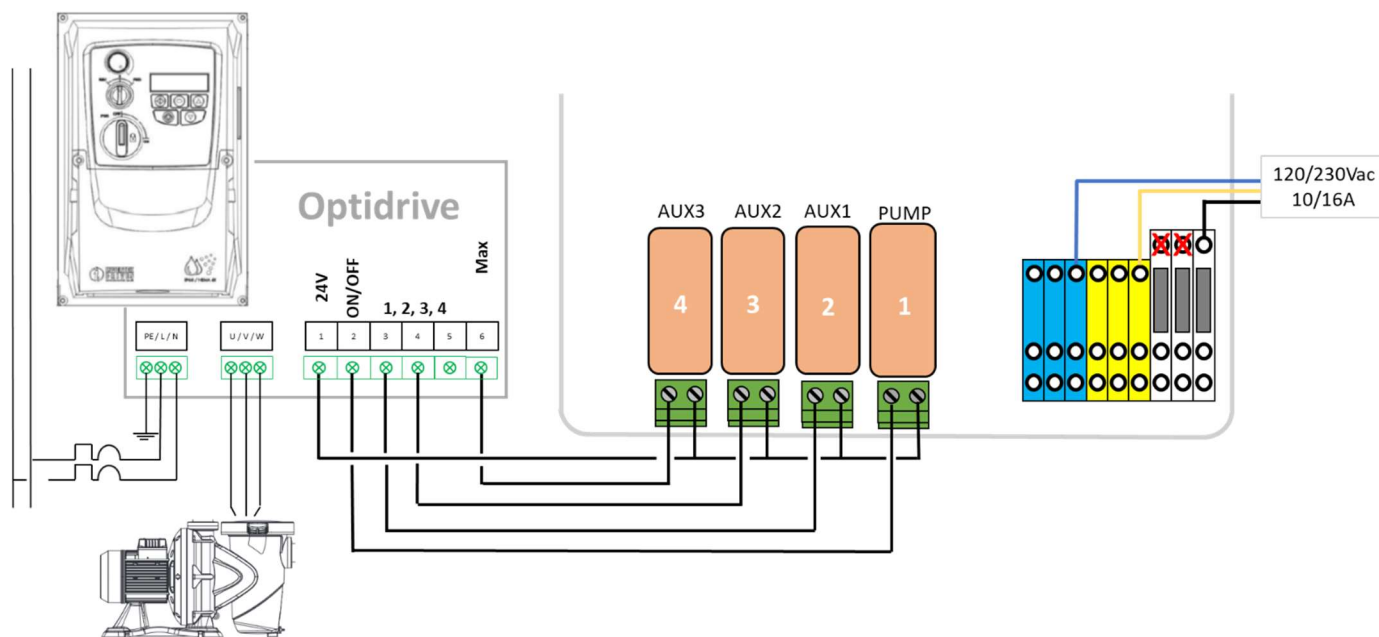


Figure 37 Connecting PoolCOP with Invertek Optidrive E²

	Speed	Pump	Aux1	Aux2	Aux3
INVERTEK OPTIDRIVE	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	ON	ON	OFF
	5	ON	OFF	OFF	ON

Figure 38 Output relays statuses

2.12.2 POOLCOP PROGRAMMING WITH INVERTEK OPTIDRIVE E²

2.12.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.12.2.2 Pump Data Menu

- Select Pump: **INVERTEK OPTIDRIVE**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCOP measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCOP when the pump is not running.
- **Pump Prot:** YES (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-5) to be linked to Filtration Timer Cycle 1. Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed (1-5) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed to be commanded during filter cleaning cycles whether manually commanded or automatically triggered..

2.12.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.12.3 PROGRAMMING THE INVERTEK OPTIDRIVE E²

Optidrive allows you to adjust up to 5 external speeds. The last speed is always the highest usable pump speed.

This notice only details the parameters needed for PoolCop control. For others settings, please check the Inverter Optidrive user guide.

Param.	Value	Function
P-01		Highest Frequency (speed) – Refer to pump manufacturer data
P-02		Lowest Frequency (speed) – Refer to pump manufacturer data
P-07		Nominal voltage – See manufacturer data sheet
P-08		Nominal amperage – See manufacturer data sheet
P-09		Nominal frequency – See manufacturer data sheet
P-12	0	Invertek is controlled by control terminal
P-15	2	4 preset speeds + 1 high speed
P-20	xxxx1	Speed #1. Value between P-01 and P-02
P-21	xxxx2	Speed #2. Value between P-01 and P-02, should be higher than xxxx1
P-22	xxxx3	Speed #3. Value between P-01 and P-02, should be higher than xxxx2
P-23	xxxx4	Speed #4. Value between P-01 and P-02, should be higher than xxxx3

2.12.4 INVERTEK OPTIDRIVE OPERATION NOTES

- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCop manual pump control.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.
- It is not possible to stop the pump by using the Invertek Optidrive keypad. Optidrive can only be controlled by PoolCop.

2.13 Multi pumps control with several mono speed pumps



WARNING:

The information below is for guidance only.
Follow the manufacturer's recommendations as per the latest equipment manual at all times.

Using channels Pump/ AUX1 / AUX2 / Aux3 of PoolCOP according to a binary combination provides 9 different configurations of outputs. These different configurations allow, for example, the control of several single speed pumps, thus allowing multiple operating modes.

Combinations of the relay outputs are given below:

	Speed	Pump	Aux1	Aux2	Aux3
Binary Combination	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	ON	ON	OFF
	5	ON	OFF	OFF	ON
	6	ON	ON	OFF	ON
	7	ON	OFF	ON	ON
	8	ON	ON	ON	ON

Figure 39 Output relays statuses

For example, if a swimming pool is equipped with a booster pump and a circulation pump and:

- The filtration pump is controlled by the 'Pump' relay.
- The circulation pump is controlled by Aux1 relay.
- The booster pump is controlled by Aux2 relay.

Then :

- In speed 1, the filtration pump is running alone.
- In speed 2, filtration pump and the circulation pump are running, the booster is stopped.
- In speed 3, the filtration pump and booster are running, the circulation pump is stopped.
- In speed 4, all pumps are running.

Speed selection from PoolCOP allows to change configuration.

2.14 DAVEY ProMaster VSD400



Figure 40 Davey ProMaster VSD400



WARNING:

The information below is for guidance only.
Follow the manufacturer's recommendations as per the latest equipment manual at all times.
No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCop and Davey ProMaster VSD400 range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

PoolCop controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCop automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCop carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).

2.14.1 CONNECTING DAVEY PROMASTER VSD400

Power must be supplied to the pump via an external breaker.

The pump features a 8-wire cable ended with a RJ45 connector for external control. The cable assignment for the individual speed is as per Figure 41 Davey ProMaster VSD400 Cable. PoolCop will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

These wires must be connected potential-free.

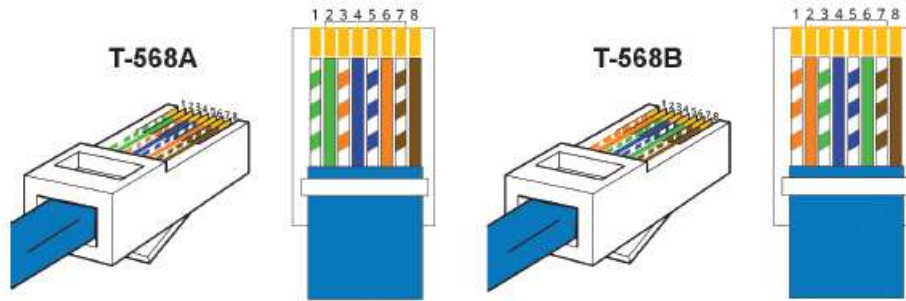


Figure 41 Davey ProMaster VSD400 Cable

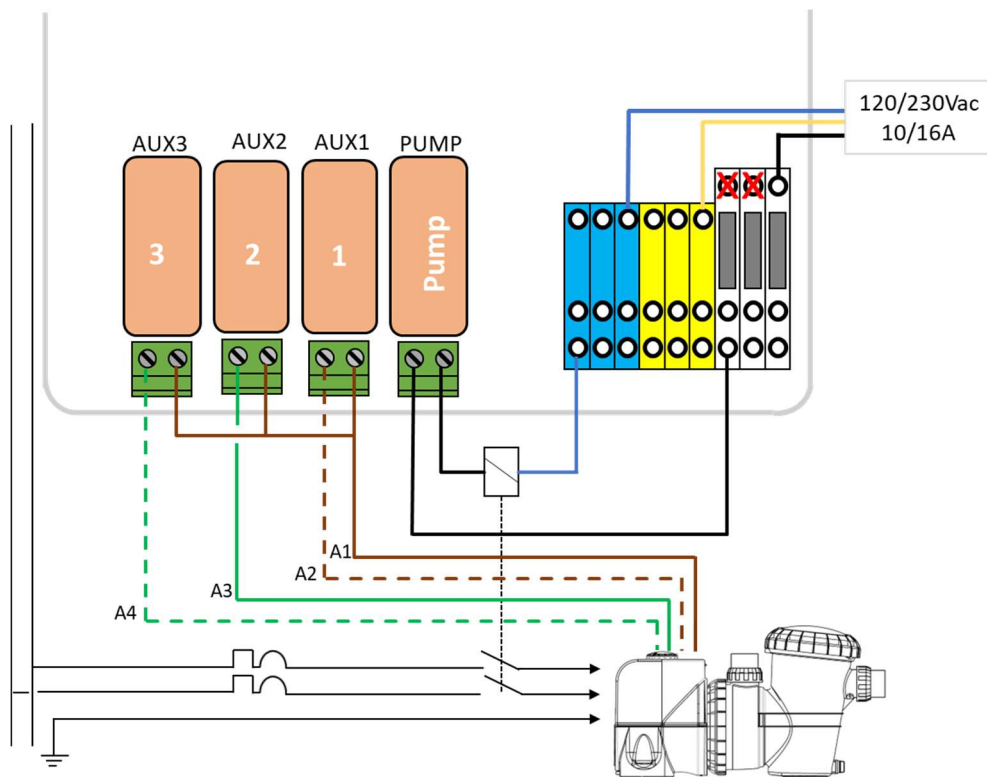


Figure 42 Connecting PoolCop and Davey ProMaster VSD400

	Speed	Pump	Aux1	Aux2	Aux3
DAVEY ProMaster VSD	STOP	OFF	OFF	OFF	OFF
	1 (33%)	ON	OFF	OFF	ON
	2 (50%)	ON	OFF	ON	OFF
	3 (67%)	ON	ON	OFF	ON
	4 (83%)	ON	ON	ON	OFF
	5 (100%)	ON	ON	OFF	OFF
	BCKWSH	ON	OFF	ON	ON

Figure 43 Output relays statuses

2.14.2 POOLCOP PROGRAMMING WITH DAVEY PROMASTER VSD400

2.14.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.14.2.2 Pump Data Menu

- Select Pump: **Davey ProMaster VSD**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCOP measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCOP when the pump is not running.
- **Pump Prot:** YES (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed (1-6) to be linked to Filtration Timer Cycle 1.
Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed (1-6) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed (BCKWSH) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.14.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.14.3 DAVEY PROMASTER VSD400 PROGRAMMING

- At startup, pump enters a priming period at full speed for about 45 seconds.
- There are no specific settings on the pump. Available speeds are preselected.
- During backwash, speed alternates between low speed and high speed to facilitate stirring and unclogging while saving water.
- The boost cycle can be set using the switches on the back of the motor cover.

2.14.4 DAVEY PROMASTER VSD400 OPERATION NOTES

- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCOP manual pump control.
- Pump speed can be changed on the fly using the PoolCOP manual pump control.
- If during a programmed filtration cycle the user manually selects a different pump speed on the pump the linked speed will be reset for the next filtration cycle.
- Linking the BCKWSH speed to clean in the Pump Data menu ensures that the higher speed is maintained if a long duration automatic or manual backwash or rinse is commanded.

2.15 ACIS VIPool MKB VS



Figure 44 ACIS VIPool MKB VS



WARNING:

The information below is for guidance only.
 Follow the manufacturer's recommendations as per the latest equipment manual at all times.
 No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCOP and ACIS VIPool MKB VS range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

- PoolCOP controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCOP automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).



CAUTION:

PoolCOP sends an active signal (close relay contact) to stop the pump. For this reason the PoolCOP should never be switched OFF when the pump is RUNNING; in this case, the pump can only be stopped by disconnecting the circuit breaker.



NOTE:

To connect pump to PoolCOP, the cable C5FVS is required. Ask your pump provider.

2.15.1 CONNECTING/PROGRAMMING/NOTES

See §2.9 Speck BADU Eco (Touch, Touch-pro, Flow and 90 Eco VS), ACIS VIPool MKB VS

2.16 DAB E.SWIM-E.PRO

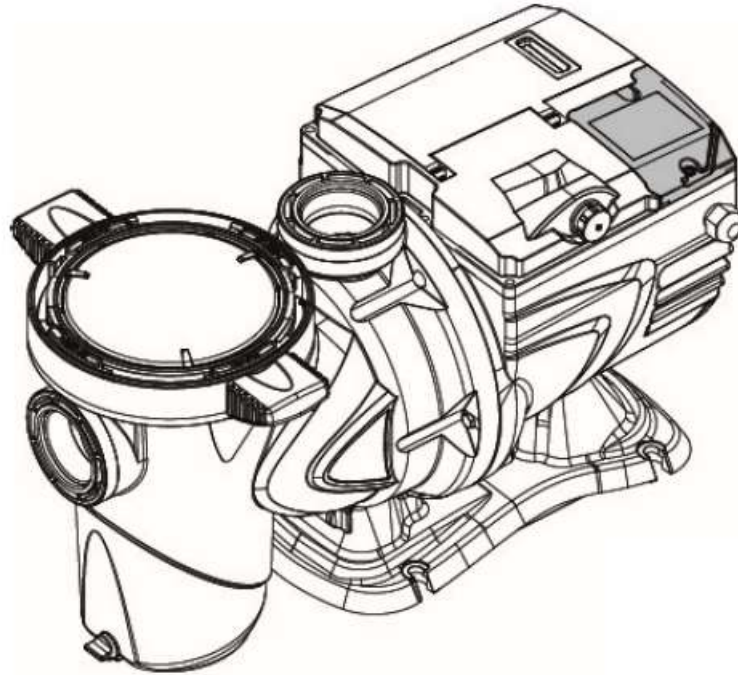


Figure 45 DAB E.SWIM-E.PRO

WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.



The combination of PoolCop and DAB E.SWIM-E.PRO range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

PoolCop controls **when, how long and at which speed (or flowrate)** the filtration system runs, with speeds/flow associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCop automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCop carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).

2.16.1 CONNECTING DAB E.SWIM-E.PRO

Power must be supplied to the pump via an external breaker and a contactor.

The 12 points DAB external cable (Ref 60194528) must be used to control the pump.

The pump features a 8-wire cable ended with a RJ45 connector for external control. If needed, a cable can be handmade with a Weipu SP2110/S12 connector.

The cable assignment for the individual speed is as per Figure 47 Connecting PoolCop and DAB E.SWIM-E.PRO. PoolCop will control start/stop and speeds using low voltage control signals via the Aux1 to Aux3 relays.

These wires must be connected potential-free.

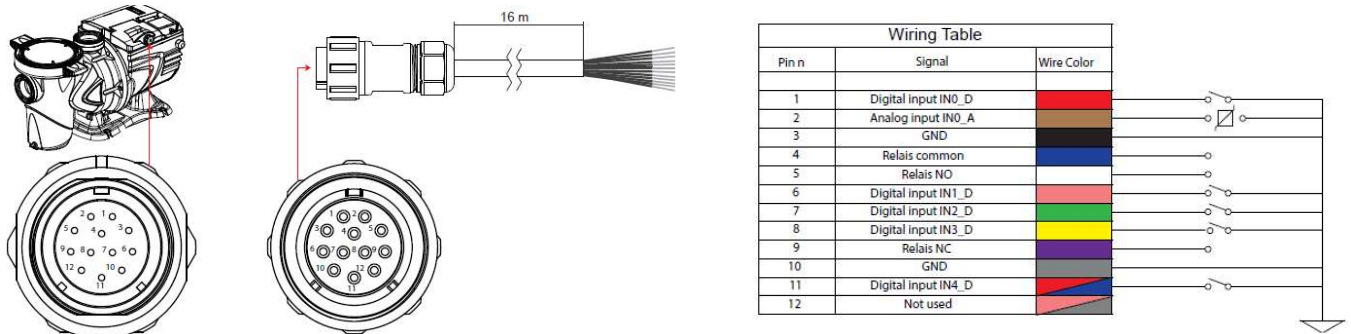


Figure 46 DAB 60194528 Cable

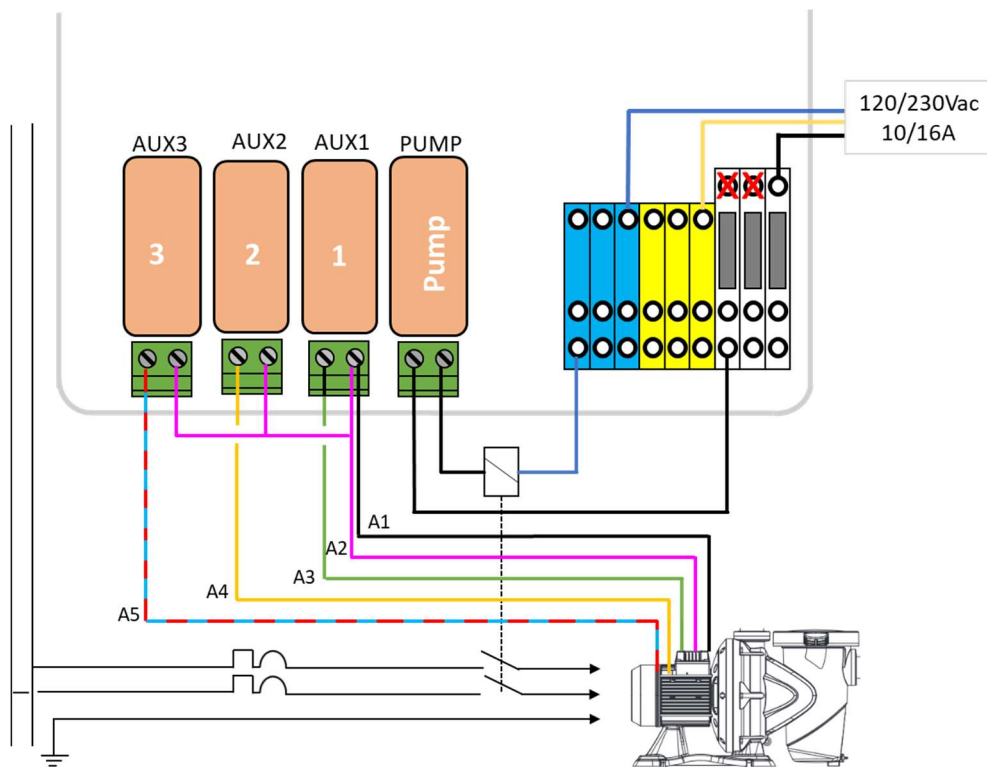


Figure 47 Connecting PoolCop and DAB E.SWIM-E.PRO

	Speed	Pump	Aux1	Aux2	Aux3
DAB E.SWIM	STOP	OFF	OFF	OFF	OFF
	1	ON	OFF	OFF	OFF
	2	ON	ON	OFF	OFF
	3	ON	OFF	ON	OFF
	4	ON	OFF	OFF	ON

Figure 48 Output relays statuses

2.16.2 POOLCOP PROGRAMMING WITH DAB E.SWIM-E.PRO

2.16.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.16.2.2 Pump Data Menu

- Select Pump: **DAB E.SWIM_E.PRO**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCop measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCop when the pump is not running.
- **Pump Prot: YES** (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed/flow (1-4) to be linked to Filtration Timer Cycle 1. Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed/flow (1-4) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed/flow (BCKWSH) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.16.2.3 Filtration Timers

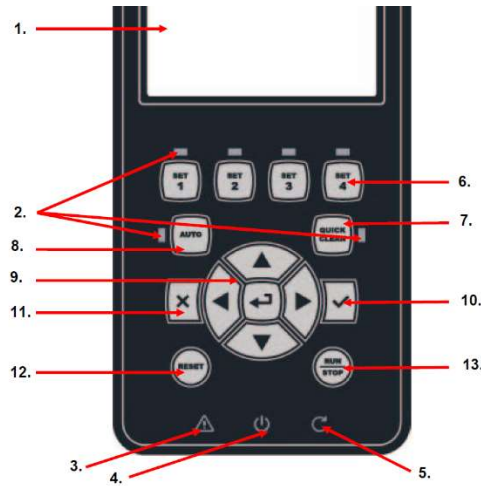
- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.16.3 DAB E.SWIM-E.PRO PROGRAMMING

- Start the pump: After ending the wiring, ask the pump to start from PoolCop
- Use the Pump user manual to understand how to navigate in the menus. The following menus need to be checked: and settings in bold must be applied:
 - Settings: To be defined according to needs; if pump can exceed the flow/pressure of the installation (filter, pipes..) it is recommended to set limit in head and/or speed.
 - Manual control: Allow to define flow/speed linked to keypad buttons Set1, Set2, Set3 Set4.
 - Timer control: will not be used, PoolCop will control timers.
 - External control:
 - External speeds:
 - Control Mode: speed/flow
 - X1/X4, setting for the 4 speed/flow setpoint
 - Settings:
 - Config: **Override.**
 - Source Speeds: **Digital IN.**
 - Start Input: **Speeds.**
 - Speed Mode: **Priority.**
 - Priming: According to needs, in general not necessary when pump is below water level.
 - Protections:
 - Anti-freeze: **No**, By default, PoolCop will take care of freezing risk.
 - Anti-Lock: **Yes.**

2.16.4 DAB E.SWIM-E.PRO OPERATION NOTES

- Pump can be started manually outside filtration cycles and stopped during filtration cycle using PoolCop manual pump control.
- Pump speed can be changed on the fly using the PoolCop manual pump control.
- To take control of the pump from PoolCop :



- Start the pump from PoolCop in speed/flow 1.
- On the pump, if the light #3 in steady ON, with text "SYSTEM FAULT", take note of the fault and press button #12 'reset' to clear.
- Nota : light #3 is blinking until the SVRS system is armed, this is normal.
- If light #5 is OFF and light #4 'standby' is blinking, with text 'SYSTEM DISABLE', press button start/stop #13. Light #5 must light ON.
- If one of the SET1, SET2, SET3, SET4, QUICKCLEAN is ON, press on the correspond button to light OFF.
- Press on Auto button to get the light ON.
- Press on Auto button 8 to get the light ON and enable external control.
- In normal operation, the text 'EXT CONTROL' should be visible on the screen. If the text is not present, PoolCop is not controlling the pump.

2.17 AQUAGEM iSAVER+, INVERSTAR, INVERPRO – ACIS VARIPOOL, CF VITALIA VS



Figure 49 AQUAGEM Inverpro, Inverstar and iSAVER+



WARNING:

The information below is for guidance only.

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No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCOP and AQUAGEM pumps and inverters range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

PoolCOP controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCOP automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).

2.17.1 CONNECTING AQUAGEM SERIES

Power must be supplied to the pump or inverter via an external breaker and a contactor.

The Inverpro pump is provided with a control cable according to the following color code:

Name	Color	Description
AUX1	Red	Digital Input 4
AUX2	Black	Digital Input 3
AUX3	White	Digital Input 2
PUMP	Grey	Digital Input 1
Commun	Yellow	Digital Ground

For other pumps or frequency inverters wire must be connected to the internal terminal as per the following:



5 wires are needed for:

Name	Description
AUX1	Digital Input 4
AUX2	Digital Input 3
AUX3	Digital Input 2
PUMP	Digital Input 1
Commun	Digital Ground

Figure 50 AQUAGEM wiring

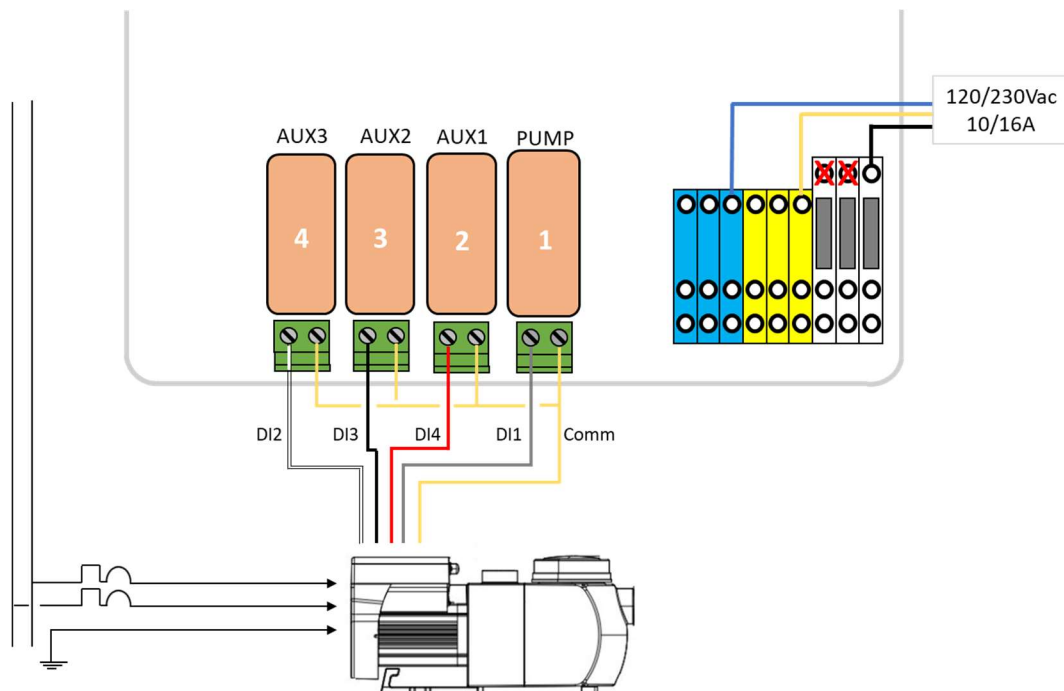


Figure 51 Connecting PoolCOP and AQUAGEM/iSAVER+

	Speed	Pump	Aux1	Aux2	Aux3
AQUAGEM	STOP	ON	OFF	OFF	OFF
	1	OFF	ON	OFF	OFF
	2	OFF	OFF	ON	OFF
	3	OFF	OFF	OFF	ON

Figure 52 Output relays statuses

2.17.2 POOLCOP PROGRAMMING WITH AQUAGEM/ISAVER+

2.17.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.17.2.2 Pump Data Menu









- Select Pump: **AQUAGEM**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCOP measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCOP when the pump is not running.
- **Pump Prot: YES** (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed/flow (1-3) to be linked to Filtration Timer Cycle 1.
Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed/flow (1-3) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed/flow (BCKWSH) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.17.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.17.3 AQUAGMEM/ISAVER+ PROGRAMMING

- Set the speeds:

Buttons	Action	Parameter	Setting
	Press to turn pump OFF		
	Press both for 3 seconds	Address 1 (PIN3)	Set high capacity from 30%-100%
	Press both for 3 seconds	Address 2 (PIN2)	Set medium capacity from 30%-100%
	Press both for 3 seconds	Address 3 (PIN1)	Set low capacity 30%-100%
	Press both for 3 seconds	Address 4 (Backwash)	Set backwash capacity 30%-100%. Not used when PoolCOP is in control.
	Press both for 3 seconds	Address 5 (PIN1)	Analog mode of analog input. Not used when PoolCOP is in control.
	Press both for 3 seconds	Address 6 (Priming)	Enable priming =25 Disable priming = 0
	Press to turn pump ON		

- **Note:** For inverpro, the Auto-Inverter mode (control of flow rate) is inactive when speed are controlled by PoolCOP via digital inputs.

2.18 SACI [e]joy, [e]pool controllers



Figure 53 SACI [e]joy, [e]pool controllers



WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCOP and SACI controllers range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

PoolCOP controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCOP automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCOP carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).

2.18.1 CONNECTING SACI CONTROLLER

Power must be supplied to the pump or inverter via an external breaker and a contactor.

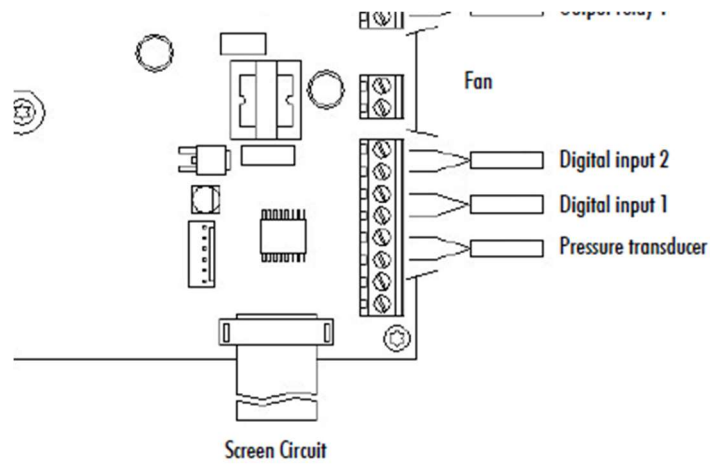


Figure 54 SACI Wiring

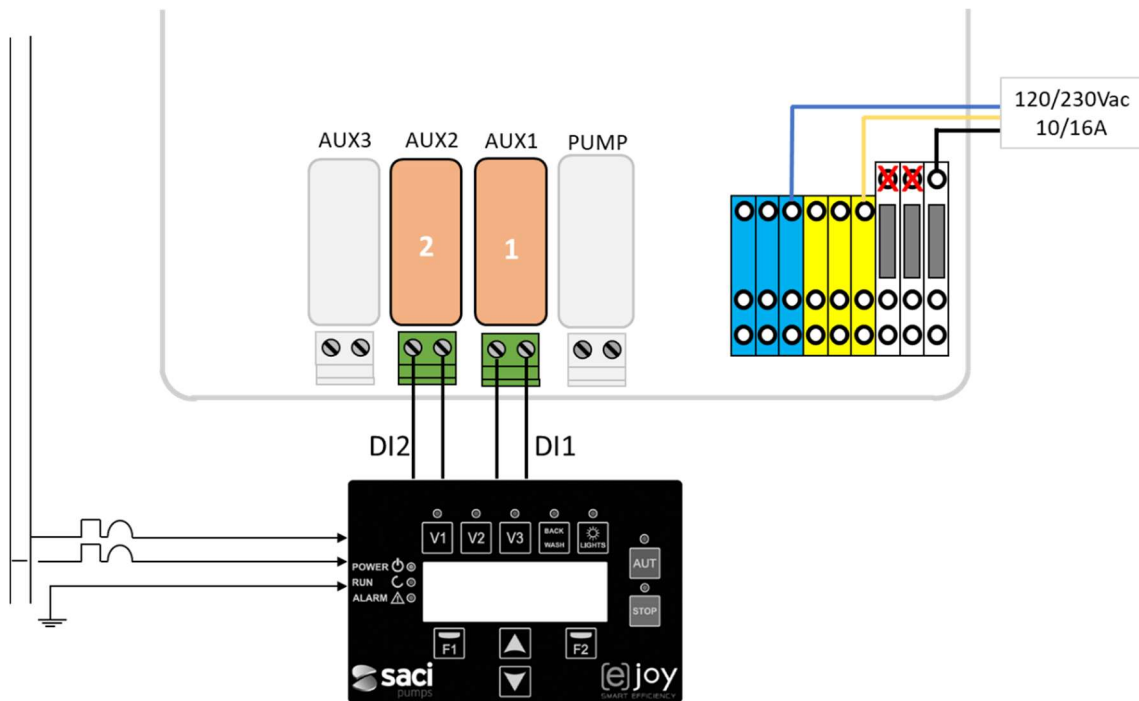


Figure 55 Connecting PoolCop and SACI [e]pool, [e]joy

	Speed	Pump	Aux1	Aux2	Aux3
SACI [e]pool [e]joy	STOP	OFF	OFF	OFF	OFF
	1	ON	ON	OFF	OFF
	2	ON	OFF	ON	OFF

Figure 56 Output relays statuses

2.18.2 POOLCOP PROGRAMMING WITH SACI

2.18.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.18.2.2 Pump Data Menu

- Select Pump: **AQUAGEM**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCOP measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCOP when the pump is not running.
- **Pump Prot: YES** (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed/flow (1-2) to be linked to Filtration Timer Cycle 1. Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed/flow (1-2) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed/flow (BCKWSH) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.18.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode). Set the start and end time for required filtration duration. If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.18.3 SACI PROGRAMMING

- **GENERAL CONFIG:**
 - Configure motor nominal current (1.3) and check rotation direction (1.4) in
- **FILTRATION:**
 - Reset all filtration bands (2.01 to 2.97).
- **SKIMMING:**
 - Set skimming interval (5.02) and speed (5.03) if desired. This will override the selected speed for the programmed skimming duration.
- **INPUTS OUTPUTS:**
 - Select digital input 1 as fixed speed (7.01).
 - Choose fixed speed for input 1 (7.02).
 - Select digital input 2 as fixed speed (7.03).
 - Choose fixed speed for input 2 (7.04).
 - It is recommended to set (7.04) higher than (7.02).
- **ADVANCED CONFIG:**
 - Control motor nominal frequency (8.01).
 - Set the maximum filter pressure (8.04) according to installation.
 - Set running dry protection (8.06, 8.07).
 - Set priming time as required (8.08).

After programming, press **AUTO** to set the pump in normal operation mode.

If pressing **STOP**, the pump will stop no matter what the selected speed on the digital inputs is.

2.19 SCHNEIDER Altivar ATV212



Figure 57 SCHEINDER ATV212



WARNING:

The information below is for guidance only.

Follow the manufacturer's recommendations as per the latest equipment manual at all times.

No responsibility will be accepted for changes to pump specifications and for incorrect connection, control and programming of the pump.

The combination of PoolCop and SACI controllers range offers the pool owner the benefits of great filtration and energy efficiencies. The result is excellent water quality with lower chemical levels, and substantial savings.

PoolCop controls **when, how long and at which speed** the filtration system runs, with speeds associated with the filtration cycles. Higher speed can be used during low energy cost periods, and lower speed during high energy cost periods. PoolCop automatically cleans the filter at a high linked speed when required in order to maintain optimal filtration efficiency. PoolCop carries out other pool automation tasks such as water level control, water treatment and control of auxiliaries (lighting, cleaner, heating, etc.).

2.19.1 CONNECTING THE ATV212 INVERTER

Power must be supplied to the pump or inverter via an external breaker and a contactor.

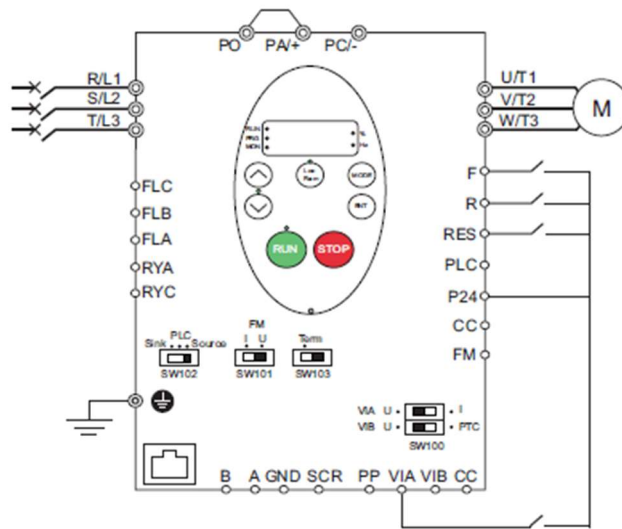


Figure 58 ATV212 Wiring

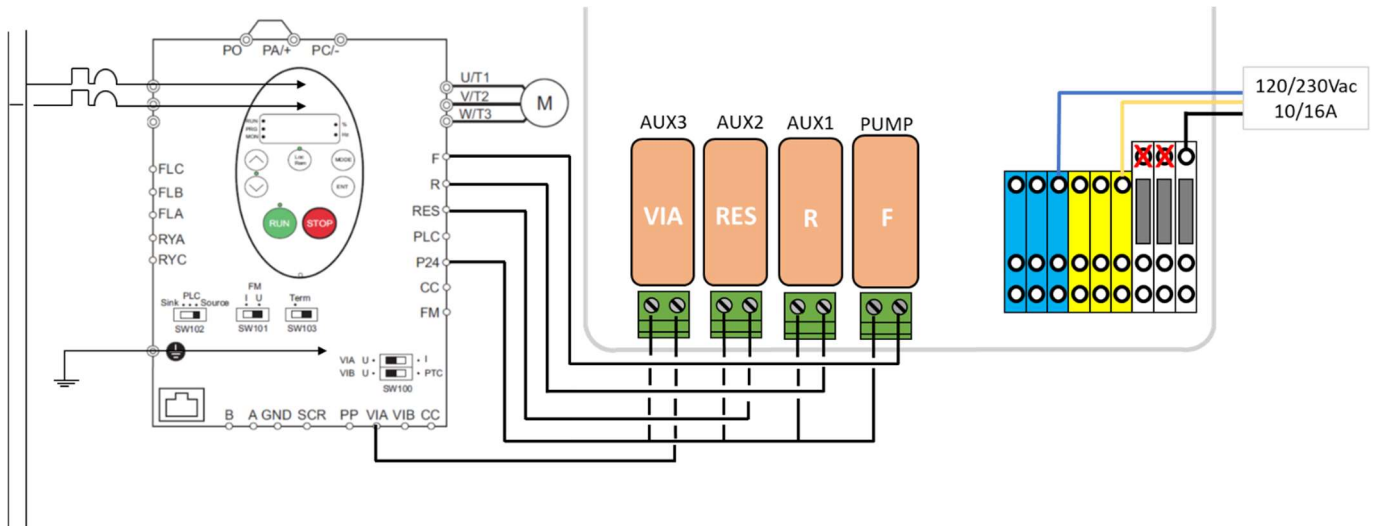


Figure 59 Connecting PoolCop and ATV212

	Speed	Pump	Aux1	Aux2	Aux3
SCHNEIDER ATV212	STOP	OFF	OFF	OFF	OFF
	1	ON	ON	OFF	OFF
	2	ON	OFF	ON	OFF
	3	ON	ON	ON	OFF
	4	ON	OFF	OFF	ON
	5	ON	ON	OFF	ON
	6	ON	OFF	ON	ON
	7	ON	ON	ON	ON

Figure 60 Output relays statuses

2.19.2 POOLCOP PROGRAMMING WITH ATV212

2.19.2.1 Pool Data Menu

- **Flow Rate:** Estimated average flow rate in m³/h.

2.19.2.2 Pump Data Menu

- Select Pump: **AQUAGEM**
- **Low Alert:** Adjust this setting 0.2Bar to below the PoolCop measured pressure when the pump is running at low speed.
- **Prot Press:** Adjust this setting to 0.1Bar higher than the pressure measured by PoolCop when the pump is not running.
- **Pump Prot: YES** (default) the pump will be stopped if the pressure remains low, to prevent pump damage.
- **Cyc 1 Speed:** Select the speed/flow (1-7) to be linked to Filtration Timer Cycle 1.
Medium or High speed is recommended, and this will be used to trigger automatic filter cleaning cycles if required.
- **Cyc 2 Speed:** Select the speed/flow (1-7) to be linked to Filtration Timer Cycle 2. Filtration Timer 2 has automatic modes that allow optimised filtration. A medium or low speed is recommended.
- **Clean Speed:** Select the speed/flow (BCKWSH) to be commanded during filter cleaning cycles whether manually commanded or automatically triggered.

2.19.2.3 Filtration Timers

- Filtration Timer Cycle 1 is a manual timer (unless in Forced Mode).
Set the start and end time for required filtration duration.
If a high speed is linked in the Pump Data menu as recommended, then this period can be set during a low cost energy period to run high speed filtration and trigger a filter cleaning cycle (if required).
- Filtration Timer Cycle 2 at the linked pump speed can be manual or an automatic mode (ECO or VOLUME):
 - In Manual set the start and end time for required filtration.
 - In ECO and VOLUME modes, set the start time and the end time will be calculated.

2.19.3 ATV212 PROGRAMMING

- Set switch SW102 to source.
- Program common parameters of ATV212 (see ATV212 gui)
- Program specific parameters for preset speed as indicated in the following table:

Parameter	Setting	Factory value
F109 [VIA selection]	2 [LI source]	0 [Analog Input]
F111 [LIF selection]	2 [forward]	2 [forward]
F112 [LIR selection]	6 [PS1]	6 [PS1]
F113 LIRES selection]	7 [PS2]	10 [Fault Reset]
F118 [VIALI selection]	8 [PS3]	7 [PS2]
Sr1 [Preset speed speed1]	Above or egal to 15Hz	15.0
Sr2 [Preset speed speed2]	Between Sr1 and Sr3	20.0
Sr3 [Preset speed speed3]	Between Sr2 and Sr4	25.0
Sr4 [Preset speed speed4]	Between Sr3 and Sr5	30.0
Sr5 [Preset speed speed5]	Between Sr4 and Sr6	35.0
Sr6 [Preset speed speed6]	Between Sr5 and Sr7	40.0
Sr7 [Preset speed speed7]	Below or agal to 50Hz	45.0

