DAVIES PUMPS
SINCE 1931
Power to the Pipeline

SwitchGenie 10/12 - 12bar
Guide and Installation/Owner's Manual

Risk of damaging the pressure assemblies and/or the plant.

Risk by electric shock.

Risk for people and/or objects.

Dear Client

Congratulations on your purchase of a **SwitchGenie** Electronic Pressure Switch from the Davies Pump Controller range.

Like all Davies products, quality and reliability are first and foremost, carefully chosen from manufactures worldwide to carry this proven brand name and deliver years of service.

Please carefully read the following instruction and installation guide to ensure this is set up correctly to give a long and trouble-free service life.

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Introduction

The **SwitchGenie** SG series 12 bar pressure switches are designed to control a single-phase pump up to 2.2Kw (3.0Hp) 16A and be installed where a traditional mechanical switch could be used and with the same wiring configuration but offers an LCD screen with operating parameters and digitally adjustable settings.

The **SG10** has dry run protection function from a minimum pressure (loss of prime) setting and an auto reset (ART) function which will attempt to restart the pump after a dry run failure. It also has a fast cycling prevention function which delays pump starting in case of pressure tank failure and a cut in/cut out delay timer option. They can also be operated as a reverse differential pressure switch for auxiliary control on pump suction and has a stand-by low power usage mode.

The **SG12** has all the features of the SG10 but also has electrical current monitoring with adjustable overload setting to protect pump and provide automatic dry run protection (can also have minimum pressure run dry protection). Overload also will attempt 4 auto restarts after a failure. They can also be set as a pair to synchronise with alternate start/stop.

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Technical Features:

Rated motor power: 0.37-2.2Kw

Voltage: 1~ 110-230V

Frequency: 50-60Hz

Max. Current: 16A

Cosfi > 0.6

Protection: IP55

Max Water Temperature/Ambient: 50°C/60°C

Cut in range: 0.5-11.5 Bar

Cut out range: 1-12 Bar

Max differential: 11.5 Bar

Minimum differential: 0.5 Bar (adjustable)

Factory Setting: 3/4 Bar

Hydraulic Connection: ¼" Female

New Weight: 0.3kg

Hydraulic Installation

The SG switches must be installed to a ¼" male thread. It is recommended to use a ¼" M/F union to simplify installation and servicing.

Non-return valves must be installed in hydraulic system before the pressure switch to prevent the system cycling.

The SG10 or SG12 kit with integral tee and non-return valve has two 25mm female ports for tank/discharge and a 25mm male port for pump. The maximum size of pressure tank mounted vertically is 24L and mounted horizontally is 2.8L. Take care when installing pipework to ensure there is no weight supported off the tee to avoid damage. Do not overtighten fittings to the tee or the casing may be damaged.

Electrical Installation

WARNING: All connections must be done by qualified personal in accordance with all National electrical codes. Ensure all wiring is disconnected from mains supply before installation. Earth connections must be done first.

Remove the main cover from switch.

Fit gland cap and seal to motor supply lead and feed lead through the cable gland and do connections: Earth - U - V. Tighten the gland cap firmly to prevent water ingress.

Fit gland cap and seal to mains supply lead and feed lead through cable gland and do connections: Earth – L1 – N. Tighten the gland cap firmly to prevent water ingress.

Refit the main cover and ensure screws are firmly tightneed to maintain IP rating.
Warranty may be voided by incorrect connections.

Control Panel Status

The SG switches use an LCD screen, LED indicator lights and push buttons to display operation and set up data.

Mode	Screen Display
Operation	Shows current pressure or Amp value (SG12 only)
Adjustment	Shows start or stop pressure value (blinking) or the Amp value (blinking) on the SG12.
Alarm	Shows alarm code (see alarm menu).
Standby	Shows 3 blinking dots.
Basic Configuration	Shows the sequence of basic configuration values.
Advanced Configuration	Shows the sequence of advanced configuration values.

- 0 - indicates lit LED
- (0) – indicates slow flashing
- ((0)) – indicates fast flashing

LED	State	Meaning
Bar	0	Indicates the current pressure reading is in Bar and pump not running.
	(0)	Indicates the current pressure reading is in Bar and that pump is operating.
PSI	0	Indicates the current pressure reading is in PSI and pump not running.
	(0)	Indicates the current pressure reading is in PSI and that pump is operating
Start	0	Indicates the set start pressure.
	(0)	Screen shows pressure value when adjusting the start pressure.
Stop	0	Indicates the set stop pressure.
	(0)	Screen shows pressure value when adjusting the stop pressure.
Ⓐ (SG12)	0	Screen shows current operating amp value and pump not running.
	(0)	Screen shows current operating amp value that pump is operating.
Alarm	0	Pump shut down due to activation of dry run or overload (SG12).
	(0)	ART active after Pump shut down due to dry run or overload (SG12).
	((0))	Fast Cycle alarm active.

BUTTON	PUSH	Meaning
Power	Touch	When switch is on: Turns switch off. When switch is off: Pump starts and runs until stop pressure is reached. In configuration menu: Sets value and moves to next setting.
⏻	Hold	When switch is on: Turns switch off. When switch is off: Pump starts and runs until button is released.
	(0)	Indicates the current pressure reading is in PSI and that pump is operating.
Up ▲	Touch	Start pressure setting is displayed on screen for 3 seconds.
	3s Hold	Opens start pressure configuration menu.
Down ▼	Touch	Stop pressure setting is displayed on screen for 3 seconds.
	3s Hold	Opens stop pressure configuration menu.
A (SG12)	Touch	Alternates screen display between operating pressure and amps values.
	3s Hold	Opens motor current (A) configuration menu.

Start-up Configurations

Before starting switch and pump system, ensure all hydraulic and electrical connections are done correctly then follow steps for basic start up.

SG10

1. Connect SG10 to power and screen will show 'OFF'.
2. Start SG10 by pressing power button ⏻.
3. Press Up ▲ for 3s and start pressure will be displayed on screen and start LED will flash.
4. Adjust start pressure between 0.5 and 11.5 Bar using the ▲ or ▼ buttons.
5. Press power button ⏻ to set value.
6. Press Down ▼ for 3s and stop pressure will be displayed on screen and stop LED will flash.
7. Adjust stop pressure between 1 and 12 Bar using the ▲ or ▼ buttons.
8. Press power button ⏻ to set value. And SG10 is ready to operate.
9. For further settings including run dry protection and anti-cycle function see **Basic** and **Advanced** configuration menus.

SG12

1. Connect SG12 to power and screen will show 'OFF'.
2. Press Ⓐ button for 3s, Amps value is displayed flashing on screen and LED A will light up.
3. Adjust display to pump motor nameplate amps value using the ▲ or ▼ buttons.
4. Press power ⏻ button to set value and again to start.
5. Press Up ▲ for 3s and start pressure will be displayed on screen and start LED will flash.
6. Adjust start pressure between 0.5 and 11.5 Bar using the ▲ or ▼ buttons.
7. Press ⏻ button to set value.
8. Press Down ▼ for 3s and stop pressure will be displayed on screen and stop LED will flash.
9. Adjust stop pressure between 1 and 12 Bar using the ▲ or ▼ buttons.
10. Press power button ⏻ to set value.
11. SG12 is ready to operate with overload and basic run dry protection. Press enter to start.
12. For further settings including minimum pressure run dry protection, anti-cycle function and pairing see **Basic** and **Advanced** configuration menus.

Basic Menu Configurations SG10/12

Basic menu configurations can be set by simultaneously holding the ▲ and ▼ buttons for 5s, then using the ▲ or ▼ buttons to change each configuration value and the power button ⏻ to set and move to the next item.

Configuration sequence is:

Item	Value		Action	Factory Setting
1	Bar	PSI	Select pressure display in Bar or PSI.	Bar
2	rcO	rc1	Fast cycling alarm disabled (rc0) or active with delay start (rc1) or active with pump stop (rc2).	rc2
3	r.01	r.99	If fast cycle alarm is active, the maximum time allowed between 3 consecutive starts to activate alarm can be set from 1s to 99s.	3s
4	Sb0	Sb1	Standby mode disabled (Sb0) or active (Sb1).	Sb0

Advanced Menu Configurations

Advanced menu configurations can be set by simultaneously holding the ▲+▼+⏻ buttons for 5s, then using the ▲ or ▼ buttons to change each configuration value and the power button ⏻ to set and move to the next item.

Configuration for SG10 sequence is:

Item	Value		Action	Factory Setting
1	nc	n0	Select operation mode as conventional switch (nc) or as reverse switch (no).	nc
2	ct0	ct9	Sets a time delay on start between 0 and 9s.	ct0
3	dt0	dt9	Sets a time delay on stop between 0 and 9s.	dt0
4	Ar0	Ar1	Disables the ART system (Ar0) or activates (Ar1).	Ar0
5	P0.0	Px.x	Sets a minimum pressure value and the switch will activate dry run protection if pressure drops below this.*	O Bar
5.1	t05	t99	Sets a time value between 5 and 99s and the switch will activate dry run protection if pressure drops below minimum pressure for longer than set time.	20s
6	rS0	rS1	If value is changed to rS1 and press enter to reset default settings.	r50

*SG10 can only detect dry run through the minimum pressure setting. Calculate the static head pressure of the installation. Ensure the minimum pressure (LOP) setting is above the static pressure value but less than the normal start pressure setting. It is also recommended to ensure the pump is not running off the performance curve and unable to maintain minimum pressure as this can activate a false dry run alarm.

If these values are not easily measured and set, then it is recommended to use the SG12 and set run dry protection via the accurate dry run detection method.

Configuration for SG12 sequence is:

Item	Value		Action	Factory Setting
1	nc	n0	Select operation mode as conventional switch (nc) or as reverse switch (no).	nc
2	E00	E01 or E02	Select operation mode for single device (E00) or as master/slave pair (E01 or E02) See menu below.	E00
2.1	d.1	d1.5	Sets minimum differential between Pstart 1 and 2, and Pstop 1 and 2 while in master/slave operation.	d.0.5
3	ct0	ct9	Sets a time delay on start between 0 and 9s.	ct0
4	dt0	dt9	Sets a time delay on stop between 0 and 9s.	dt0
5	Ar0	Ar1	Disables the ART system (Ar0) or activates (Ar1).	Ar0
6	P0.0	Px.x	Sets a minimum pressure value and the switch will activate dry run protection if pressure drops below this.*	O (Bar)
6.1	t05	t99	Sets a time value between 5 and 99s. The switch will activate dry run protection if pump pressure drops below the minimum set pressure value for longer than this time.	20s
7	c10	c30	Allows a percentage setting of nominal current above which the switch will activate overcurrent protection.	c20
8	rS0	rS1	Change value to rS1 and press enter to reset default settings.	rS0

*SG12 will automatically detect basic run dry failure with motor control setting but can also detect it through the minimum pressure setting. For the minimum pressure protection, calculate the static head pressure of the installation. Ensure the minimum pressure (LOP) setting is above the static pressure value but less than the normal start pressure setting. It is also recommended to ensure the pump is not running off the performance curve and unable to maintain minimum pressure as this can activate a false dry run alarm.

**If the Pstart value is increased, once it reaches minimum set differential, it will increase the Pstop value as well. It is recommend to check final set pressures before operation by doing single push of the ▲ and ▼ buttons to view settings on screen.

Synchronisation for SG12

The SG12 can be set in a pair with master/slave operation to alternate starts/stops. Follow the steps to set this up.

1. Set identical start and stop pressures for both units. To optimise synchronisation the minimum difference between start and stop pressure must be at least 1 bar.
2. Go to advanced configuration menu on first unit by pressing and holding the ▲+▼+ ⏻ buttons for 5s, then press the button to get to item 2 with screen setting 'E00' and press ▲ to change to 'E01'' Master.
3. Go to advanced configuration menu on second unit by pressing and holding the ▲+▼+ ⏻ buttons for 5s, then press the ⏻ button to get to item 2 with screen setting 'E00' and press ▲ to change to 'E02'' Slave.
4. Press ⏻ button on both units to save selection and move to item 2.1 with screen setting 'd.1'. Select the minimum differential required between master/slave Pstop and master/slave Pstart, using the ▲+▼ buttons. This setting must be identical on both units.
5. Press ⏻ button on each unit multiple times to exit advanced menu and screen will display 'OFF'.
6. Press ⏻ button again on both units to activate with synchronisation. The system may take 3-5 cycles to get in balance.
7. After 10 cycles the unit configured as E01 with display pressure and the unit configured E02 will display Amps.
8. The pumps will alternate starts and stops to maintain even pressure in the system and keep balanced pump usage.
9. After 10 cycles the unit configured E01 will display pressure and the unit configured E02 will display current in Amps.

Pressure Sensor Calibration

If the pressure readings displayed on the screen are incorrect to actual operating pressure, the sensor can be re calibrated by flowing the steps below. This step requires a manual gauge in the system.

Set zero pressure:

1. Open all taps so there is no pressure on the system.
2. Simultaneously press the ⏻+▲ buttons until the display shows '0.0' flashing.
3. Press power button ⏻ to set.

Set maximum pressure:

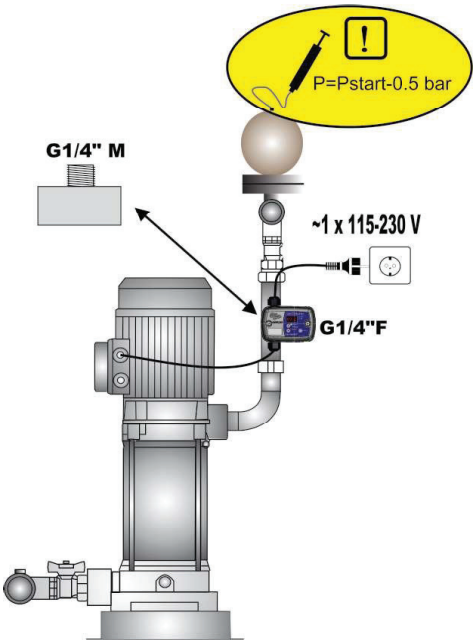
1. Start the pump and run until the switch cuts out at stop pressure.
2. Simultaneously press the ⏻+▼ buttons until the display shows a value and is flashing.
3. Adjust this value to what the pressure gauge is showing using the ▲+▼ buttons.
4. Press power button ⏻ to set.

Note this should not be a regular occurrence, if it happens frequently please contact your supplier.

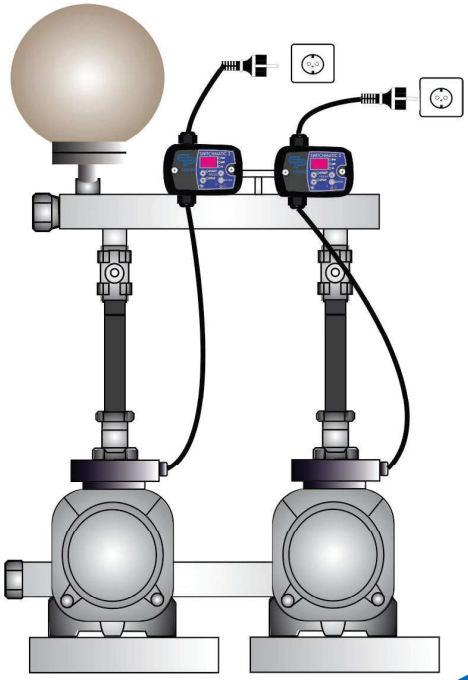
Warnings and Alarms

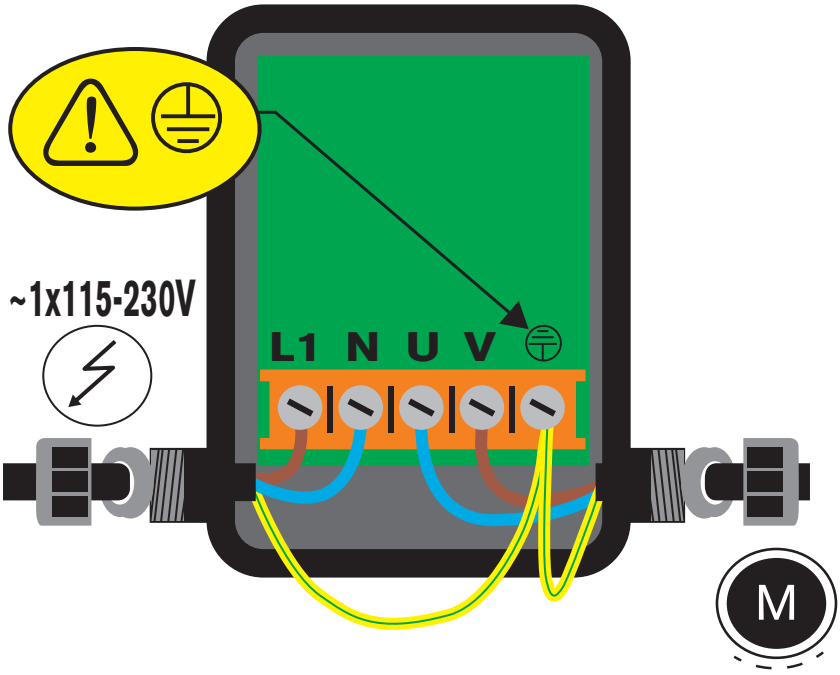
Warning	Alarm	Description	Action
A01	0	Dry run detection via min Amps (SG12 only)	When a dry run is detected, the pump will stop and can be restarted by pressing the power ⏻ button.
	(0)		If the ART system is active it will attempt to restart the pump after 5min, then every 30min for 24 hours before final failure. Pump can be restarted at any point by checking water supply and pressing the power ⏻ button.
A11	0	Dry run detection via minimum pressure.	This will display if the operating drops below minimum set pressure for longer than set time period. Once the pressure exceeds the set minimum, normal operation is resumed. Pump can be restarted by pressing the power ⏻ button at any point.
A02	0	Overload (SG12 only)	Overload alarm is activated after nominal pump current is exceed. It will attempt 4 automatic restarts before final failure and will display current on screen. Normal pump operation can be restored at any point by checking pump current and pressing the power ⏻ button.
	(0)		
A04	((0))	Fast cycling	Alarm is activated when more than 3 consecutive cycles occur in less than set time period. If rc1 is set, it does not stop normal operation but will reduce start times to minimum cycle time set. If rc2 is set, pump will stop on final failure. Normal pump operation can be restored at any point by checking tank and pressing the power ⏻ button.
A05	0	Damaged Pressure Transducer	Contact your supplier.

INDIVIDUAL



GROUP (ONLY SG12)

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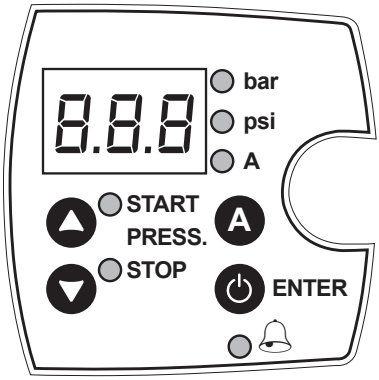
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STOP
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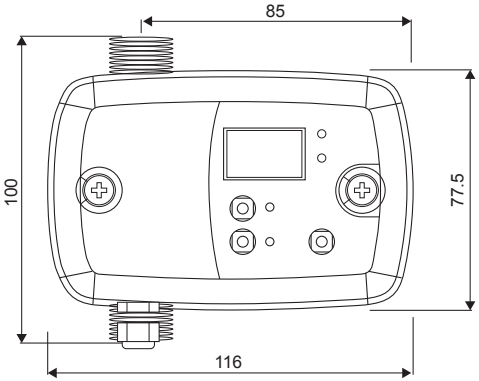
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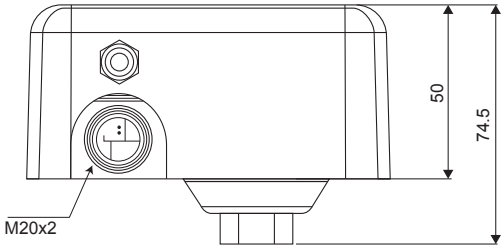
50
74.5
M20x2

Warranty Policy for Davies Pump Controllers

Your Davies Pump Controller, when used for its designed purpose should give you years of trouble free service. Please take the time to read and understand the operator's manual for this product before installing and operating. Failure to install and operate as per the operation instructions will render warranty on this unit void.

Davies Pump Controllers are warranted to be free of material and manufacturing defects at the time of purchase. Warranty Period: 2 Years from date of purchase.

This warranty is limited to the cost of the product and does not cover travel charges, removal and re-installation charges, consumables, Electrician or Plumbers charges or any other third party costs unless authorized by Argon Distributors prior to being carried out.

Argon distributors will repair or replace for the consumer any portion of the failed item which has proved to be defective within the warranty period. Replacement product or parts may include refurbished parts or components.

The warranty does not cover Damage or malfunction resulting from:

A. Misuse, accident, fire, water, lightning, negligence, abuse, product modifications.
B. Repairs or attempted repairs by unauthorized persons
C. Damages to product caused by transit
D. Removal or installation of the product
E. Normal wear and tear.
F. Water and Insect ingression
G. Exposure to corrosive conditions
H. Foreign objects in the liquid being pumped
I. Electrical power fluctuations
J. Freight

Argon Distributors liability is limited to the cost of the product and shall not be liable for:

A. Damage to other property caused by defects in the product.
B. Loss of use of the product.
C. Loss of time, loss of profits, loss of business opportunity, loss of goodwill
D. Any other damages-incidental, consequential or otherwise.
E. Claims under this warranty must give evidence of the Date of purchase, Invoice Copy, Model, Serial Number, photos and information of the installation as soon as the failure has occurred. Owner's detail must be noted.

If any of the above is unclear please contact your supplier or warranty manager at ARGON DISTRIBUTORS.

Service Records

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When it comes to pumps.... what's needed is proven:

✓ **Reliability**

✓ **Features**

✓ **Technology**

For your nearest dealer please contact Argon Distributors: 0508 634 341