

PG20 PRESSURE GUARD

UNIVERSAL OVER & UNDER PRESSURE TRIP SWITCH
RANGE 0 to 20 Bars (0 to 300 psi)



The Kelco PG20 Pressure Guard is a dedicated pressure operated safety device that can be set to shut down a pump if the system pressure exceeds a preset level or falls below a preset level. It can be set for over pressure protection, under pressure protection or both.

INTRODUCTION

In pumping systems it is often desirable to protect pipework and equipment against excess pressure. For example, a high head bore pump can easily burst low class poly pipe if the standing water level in a bore is unusually high. Pumps can also benefit from dry run protection. A simple transfer pump can be badly damaged if run dry. A dedicated pressure trip switch that shuts down a pump on either excessively high or low pressure or on no pressure is a great benefit in many applications.

More complicated pumping systems that may have pressure switches or any type of controls will benefit from a dedicated pressure trip switch that acts as a guard over the whole system and shuts down the process if pressure rises or falls beyond settable levels.

THE PG20 PRESSURE GUARD

The PG20 Pressure Guard is a dedicated digitally operated pressure actuated trip switch. In a system operating normally the Pressure Guard is simply a closed switch that allows the system to operate unimpeded. If for any reason the system pressure rises or falls beyond preset limits the Pressure Guard will trip out, shut down the process and flash a red warning light. The system will not restart until attended to. Once tripped the Pressure Guard has to be manually reset by pressing its reset button. This ensures that whatever caused the fault is investigated and attended to.

DEDICATED FUNCTIONS

The PG20 Pressure Guard has 2 main control dials, one for setting the high pressure trip point and one for setting the low pressure trip point. Either dial can be set to zero. If the low pressure cut out dial is set to zero the PG20 becomes a dedicated high pressure switch with no low pressure cut out. Likewise, if the high pressure dial is set to zero the unit becomes a dedicated low pressure cut out switch with no high pressure limit. In addition, both the high and low pressure dials can be set so the PG20 holds the system between a set upper limit and a set low limit.

SELF-TESTING

The PG20 Pressure Guard tests its own operation every time it is powered up. Unlike mechanical switches that may sit undisturbed for years and fail on the one occasion when they are required to operate, the Pressure Guard is an active participant in the overall system in which it operates and runs a self diagnostic routine every time it is powered up or its reset button is pressed.

APPLICATIONS

- BURST PROTECTION FOR PIPE SYSTEMS
- DRY RUN PROTECTION FOR PUMPS
- SAFETY CONTROL FOR PUMPS

FEATURES

- SELF TESTING EACH TIME IT STARTS
- 2 DIGITALLY ADJUSTABLE SETPOINTS
- DIGITAL FINE TUNING ADJUSTMENT
- ZERO TO 3 MINUTE START TIMER
- CORROSION RESISTANT CONSTRUCTION
- SUITABLE FOR SEA WATER USE
- WARNING LIGHTS FOR ALL FUNCTIONS
- TOUGH RELIABLE CONSTRUCTION
- WEATHERPROOF HOUSING IP67
- 20 Bar (300 psi) RATED



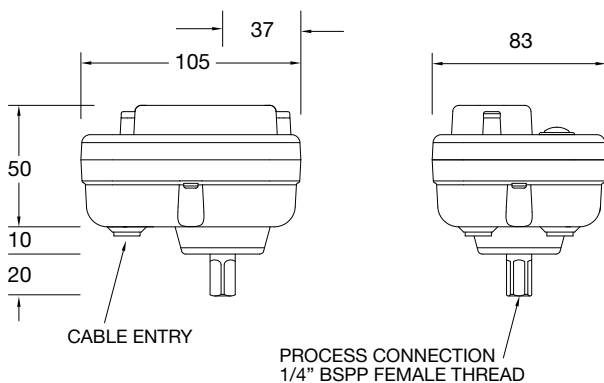
AUSTRALIAN MADE

TECHNICAL DATA

LOW PRESSURE DIP TIMER

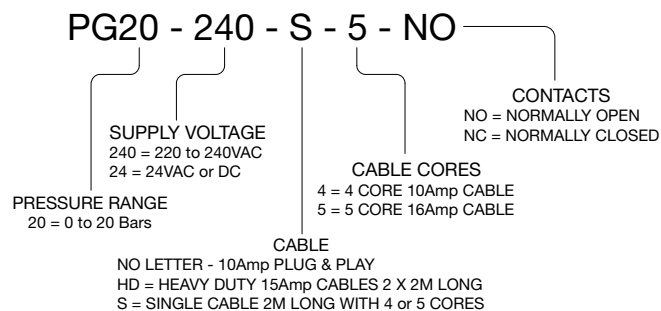
The PG20 has a built-in automatic timer that allows the system to continue to operate for up to 10 seconds if the pressure dips to below the low pressure preset trip point. When used as a low pressure cut out for loss of prime protection the PG20 will tolerate the system's pressure dropping to below the preset trip point for up to 10 seconds to allow the system's pressure time to stabilize. Valves opening and closing can cause pressure to momentarily dip to an unacceptably low level. The PG20 Pressure Guard's built-in automatic dip timer ensures such momentary dips in pressure do not cause false alarms by tripping out and shutting down the system. When used for high pressure protection no timer is used. The PG20 instantly shuts down the system as soon as it senses pressure higher than its preset limit.

DIMENSIONS



ORDERING

The PG20 is available in several configurations to suit specific applications. It is available in either 240V AC or as a universal 12 to 24V AC or DC device with a single 5-core cable for use in single and 3-phase control circuit applications. The part numbering system below sets out how to order a specific configuration. Against special order it can be supplied in additional configurations that are also set out in the part numbering system.



CONSTRUCTION

The PG20 Pressure Guard is corrosion resistant. It is constructed from high impact glass-reinforced thermoplastic, ceramic and 316 stainless steel. It is ideal for use in potable water, aggressive bore water, seawater and a huge variety of chemical solutions.

OPERATING ENVIRONMENT

| | |
|-------------------------------------|----------------------------------|
| Ambient Temperature Range | 1°C to 50°C |
| Liquid Temperature Range | 1°C to 60°C, See note below |
| Ingress Protection Rating | IP67 |
| Supply PG20-240 (240VAC Model) | 220 to 250VAC 50Hz |
| Supply PG20-24-S-5 (24VAC/DC Model) | 12 to 28 Volts AC or DC at 100mA |

OPERATING RANGE

| | |
|------------------------------------|--|
| High Pressure Cut Out | Adjustable from 5 to 19 Bars in 15 steps |
| Low Pressure Cut Out | Adjustable from 1 to 15 Bars in 15 steps |
| Fine Tune Adjustment | Range is plus to minus 1 Bar in 16 steps |
| Start Timer Adjustment Range | Adjustable from zero to 180 seconds in 16 steps |
| Maximum Switched Load PG20-240-S-5 | 240VAC 50Hz 6Amps For control circuit applications only |
| Maximum Switched Load PG20-24-S-5 | 240VAC 50Hz 6Amps For control circuit applications only |
| Operating Pressure Range | 0 to 20 Bars (0 to 300 psi), See note below |
| Burst Pressure | 45 Bars (650 psi) |

WARNING SAFETY NOTE: In the interests of safety the PG20 Pressure Guard must NOT be used in hot water applications (>60°C).

The PG20 Pressure Guard is designed to operate at pressures up to 20 Bars (300 psi) and must not be used in applications where either the static or dynamic pressure exceeds this rating.

WARRANTY

The Kelco PG20 Pressure Guard is protected by a 12 months return to base warranty. Full details of our warranty can be downloaded from: - <http://www.kelco.com.au/menu/information/warranty-statement/>

STANDARDS

The PG20 Pressure Guard is certified to Australian Standards: -
AS60529-2004
AS61010.1: 2003
AS/NZS CISPR 14.1:2003

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PLEASE NOTE: The Kelco PG20 Pressure Guard is the subject of Australian and International patent and trademark applications.

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INSTALLING AND USING THE KELCO PG20 PRESSURE GUARD

WARNING

Please read this installation sheet fully and carefully. The PG20 Pressure Guard is a mains voltage device. Death or serious injury may result if this product is not correctly installed and used.

INTRODUCTION

The PG20 Pressure Guard is a microprocessor controlled solid-state pressure switch. It is designed for guarding pipework and equipment against over or under pressure. The PG20 features two adjustable trip points that can be independently set to stop a pump if pressure exceeds settable levels. The low level trip point feature has an automatic 10-second time delay buffer built in to allow normal pressure fluctuations to be ignored. System pressure can drop to below the low level trip point setting for up to 10 seconds without triggering the switch and shutting down any equipment in the control circuit. The PG20 also has a fine tune zeroing adjustment that allows the switch to be calibrated accurately to any required pressure within its range. The fine tune adjustment dial can also be used to offset the entire operating range of the switch and to select pressure set points that may lie in between the main dial graduations of the switch.



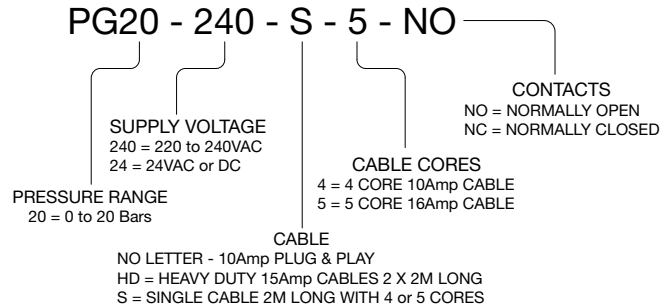
WARNING

The PG20 Pressure Guard is water resistant to IP67. This rating only applies if the clear control lid is in place and its two fixing screws fully tightened. The PG20 is not water resistant unless the clear lid is in place and fully secured. Always replace the clear lid and fully tighten its two screws after making changes to the settings. The PG20 may present a shock hazard and death or serious injury may result if water enters the PG20's electrical housing. There are no user serviceable parts in this device. Under no circumstances should the main housing be opened. Warranty on this product is automatically void if the sealed body screws are opened.

IMPORTANT

This installation and usage information sheet must be read with reference to the specific switch model being installed. The supply voltage, power switching capacity and the pressure rating of the switches may vary from model to model and it is very important to understand the limitations of a specific model before installing it.

MODELS



OPERATING ENVIRONMENT

| | |
|--|--------------------------------|
| Ambient Temperature Range | 1°C to 50°C |
| Liquid Temperature Range | 1°C to 60°C, See note below |
| Ingress Protection Rating | IP67 |
| Supply PG20-240 (all 240VAC Models) | 220 to 250VAC 50Hz |
| Supply PG20-24-S-5 (24VAC/DC Model) | 12 to 28 Volts AC or DC, 100mA |

OPERATING RANGE

| | |
|------------------------------------|---|
| High Pressure Trip Point | Adjustable from 5 to 19 Bars in 15 steps Can also be set to zero if high cut out is not required |
| Low Pressure Trip Point | Adjustable from 1 to 15 Bars in 15 steps Can also be set to zero if low cut out is not required |
| Fine Tune Adjustment | Range is plus to minus 1 Bar in 16 steps |
| Start Timer Adjustment Range | Adjustable from zero to 180 seconds in 16 steps |
| Maximum Switched Load PG20-240-S-5 | 240VAC 50Hz 6Amps For control circuit applications only |
| Maximum Switched Load PG20-24-S-5 | 240VAC 50Hz 6Amps For control circuit applications only |
| Maximum Switched Load PG20-240-S-4 | 240VAC 50Hz 10Amps (for motor loads to 3HP only) |
| Maximum Switched Load PG20-240-HD | 240VAC 50Hz 15Amps (for motor loads to 5HP only) |
| Operating Pressure Range | 0 to 20 Bars (0 to 300psi), See note below |
| Burst Pressure | 45 Bars (650 psi) |

WARNING SAFETY NOTE: In the interests of safety the PG20 Pressure Guard must NOT be used in hot water applications (>60°C). The PG20 Pressure Guard is designed to operate at pressures up to 20 Bars (300 psi) and must not be used in applications where either the static or dynamic pressure exceeds this rating.

INSTALLATION

The PG20 is suitable for use in all cold-water based applications such as potable water, seawater, bore water, chlorinated pool water, brackish water or effluent. A suitable location should be selected for the switch in the delivery pipework of the pump. The switch should be installed in a location that is away from both vibration and heat, preferably out of direct exposure to the weather and above any flood level. Drill and tap a 1/4" BSP thread in the pipework at the required location and fit the PG20 Pressure Guard using a 1/4" brass or stainless nipple (not supplied). The PG20 can be mounted in any orientation required in either vertical or horizontal pipework.

Apply a suitable thread sealant tape or thread paste and screw the PG20 and its interposing nipple into the pipework using the spanner flats provided. When properly installed the controller should be square to the axis of the pipe with the controls in an accessible position.

ELECTRICAL

IMPORTANT

The PG20 Pressure Guard is available in a number of configurations. Options include various supply voltages and output contacts that may be normally open or normally closed. The PG20 is also available with a built in high capacity output drive system for the direct control of large single phase pump motors. Check the model number before installing this device to ensure you are installing the correct model for the specific application.

The PG20 Pressure Guard requires a stable supply voltage in order to operate correctly. Pay particular attention to cable sizes and ensure cables are adequate for the specific load. This is particularly important where long cable runs are to be used in the installation. If the voltage drop associated with the starting of the pump motor is excessive the PG20 will automatically reset and this may cause the pump to jog. Jogging can snap the main spindle of a pump very easily, so please take all precautions to ensure the voltage supply to the PG20 is stable and that the current carrying capacity of the cable is adequate for the job. For mains voltage applications we recommend that the supply to the PG20 be isolated by a 10Amp RCD that has a maximum trip current of 30mA.

WARNING

When installing the PG20 the socket outlet connection (GPO) for the input power must be accessible and must be positioned in a dry and protected location out of the weather and above any flood or water level. Where the PG20 is to be used to control pump motors up to 2.4kW 3HP the supply to the PG20 must be protected by a 10 Amp fuse or by a 10 Amp circuit breaker.

FIXED INSTALLATION

WARNING

Mains voltage fixed installations must only ever be carried out by a licensed electrician and must conform to local wiring rules.

BROWNOUT OR BLACKOUT

If a blackout or brownout occurs while the PG20 is operating, the pressure switch will not retain any memory of its previous state. It will simply shut down the system. When power resumes the PG20 will reboot, restart the system and run the preset start-up time from the beginning. A manual reboot can be done at any time by simply pressing the reset button on the top deck of the switch.

ADJUSTING SETTINGS

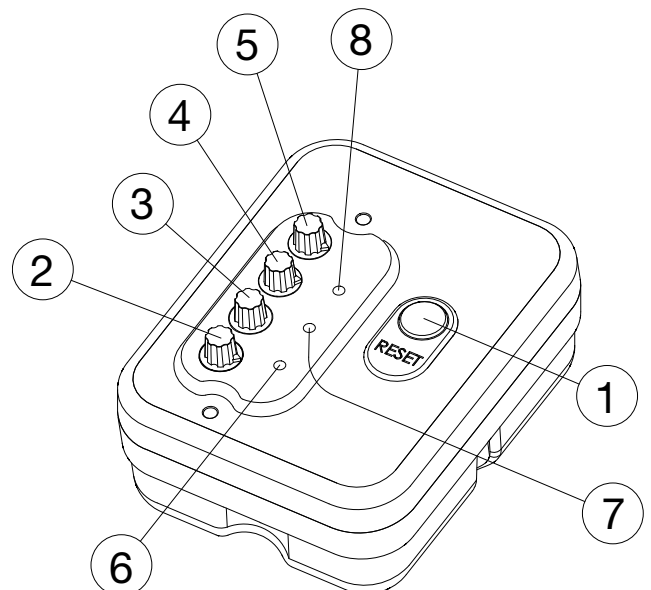
There are 4 rotary switches located under the clear cover on the top deck of the PG20. These 4 dials are for adjusting the settings that control the PG20's actions. To access the 4 dials undo the 2 screws that hold the clear cover in place. Note that the clear cover must always be replaced and tightened after making changes to the settings. Any changes to the settings will not take effect until the reset button is pressed or the supply is reset.



WARNING

Without the cover in place the PG20 is not water resistant and presents a potential shock hazard. Take great care not to splash water onto the PG20 when the control cover is removed and always replace the cover immediately and fully tighten its securing screws after any changes to the settings are made.

After you make any change to the settings on the 4 control dials you must always press the reset button for the changes to take effect.



| No. | DESCRIPTION | FUNCTION |
|-----|---|--|
| 1 | MASTER RESET BUTTON | With power on, press this button to start the system at any time. Always press it after making any changes to the settings on the 4 dials. Any changes you have made will not take effect until you press the reset button. This button can be pressed at any time. The start timer is reset to zero when the reset button is pressed. |
| 2 | FINE TUNE SETTING | This dial allows the entire pressure range of the switch to be shifted up or down in a series of fine steps. In effect, it allows the PG20 to be zeroed in against any pressure within the overall range of 0 to 20 Bars. Using the fine tune dial it is possible to set the PG20 to trip at virtually any point above or below the settings on the main pressure setting dials. Turning this dial clockwise raises the high and low set points. Turning it anticlockwise lowers the set points. |
| 3 | START-UP TIMER | <p>Each time power is turned on or the reset button is pressed the PG20 switches its output on and holds it on for the time set on this dial. The range of adjustment is zero to 180 seconds in 16 steps. The start-up timer gives the system time to pressurise and for the pressure to rise to a level higher than the low level trip point set on the PG20. If the pressure fails to rise to above the point that the low pressure trip is set to, the PG20 runs its fixed 10 second dip timer and then shuts down the system and rapidly flashes its blue light (6) to indicate there is a low pressure problem. Pressing the reset button causes the PG20 to reset the system, pump the pump and again reattempt to raise the system's pressure.</p> <p>WARNING Use the start timer carefully and never set the start time to longer than the minimum required to prime the system. The system pressure is not monitored while the start timer is running and can potentially rise to excessive levels during an excessive start time.</p> |
| 4 | LOW PRESSURE TRIP POINT | This dial sets the low-pressure trip point. It is adjustable from 0 to 15 Bars in steps of one Bar. If the system pressure falls to below this setting the PG20 runs its internal 10 second dip timer and then rechecks the pressure. If after the 10 second delay period the pressure is still below the pressure set on this dial, the PG20 shuts down the system and rapidly flashes its blue alarm light (6). The system can only be started by resetting the power or pressing the reset button. The low pressure trip point can be set to zero if no low pressure cut out is required. With this dial set to zero, the PG20 becomes a dedicated high pressure cut out switch with no low pressure limit. |
| 5 | HIGH PRESSURE TRIP POINT | This dial sets the high pressure trip point. It is adjustable from 0 to 19 Bars in one Bar steps. If the system pressure rises to above the pressure set on this dial the PG20 shuts down the system and rapidly flashes its red alarm light (8). Once tripped the system will not restart unless the power is reset or the reset button is pressed. The high pressure trip point can be set to zero if no high pressure cut out is required. With this dial set to zero the PG20 becomes a dedicated low pressure cut out switch with no high pressure limit. |
| 6 | BLUE START TIMER LED & LOW PRESSURE ALARM | This light shows steady blue whenever the start timer is running. It also flashes rapidly blue if the system has shut down on low pressure. It indicates a low pressure problem. |
| 7 | GREEN NORMAL RUN LED | This light will show a steady green whenever the system is operating within its normal pressure range. It means all is OK. This light will also flash rapidly green for up to 10 seconds if the pressure dips to below the low pressure trip point. It does this to indicate the pressure is low and the system will be shut down if the pressure fails to rise to within its correct limits within 10 seconds. |
| 8 | RED HIGH PRESSURE ALARM LED | This light flashes rapidly red if the PG20 as tripped out on high pressure. If the pump has exceeded the pressure set on the high pressure trip point dial (5) this light will flash rapidly red. It means the PG20's alarm feature has been activated and the system has been shut down because of a high pressure fault. |

GETTING THE SETTINGS WRONG

If the pressure setting dials are not correctly set the PG20 Pressure Guard will not allow the system to start. The lights (6), (7) and (8) will flash rapidly and alternately red green and blue to indicate to you that there is a problem. Check the dial settings and make sure the high pressure trip point is set to a higher pressure than the low pressure trip point. Once you have corrected the switch settings, press the master reset button for the changes to take effect. The system should then start normally.

LIMITATIONS

The PG20 Pressure Guard requires a stable voltage supply in order to operate properly. Where large pumps are connected to a PG20 care should be taken to ensure cable sizes are adequate. Never use the PG20 with long or coiled extension leads or on generator sets. The electronics built into the PG20 are protected against surges and brownouts and these protection systems can be triggered by voltage drop, severe voltage spikes or by an erratic electrical supply.

The PG20 should only be used in ambient temperature water applications. It is neither designed for, nor is it intended to be used with liquids other than water. The PG20 must never be used in hot water applications (greater than 60°C) and must also be protected from freezing in cold water applications.

The PG20 is designed to withstand water pressures up to 20 Bars (300 psi) and must not be used in applications where either the static or dynamic pressure exceeds this rating.

WARNING

If the PG20 Pressure Guard is used in a manner not specified by the manufacturer the protection provided by the device may be impaired or negated. In addition, all warranties stated or implied will be rendered invalid.

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PLEASE NOTE: The Kelco PG20 Pressure Guard is the subject of Australian and International patent and trademark applications.

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