KELCO E30
DIGITAL PRESSURE SWITCH

INSTALLATION INSTRUCTIONS

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WARNING

This symbol is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the pump controller

WARNING

This symbol is intended to alert the user to the presence of un-insulated "dangerous voltage" within the pump controller's enclosure that may be of sufficient magnitude to constitute a risk of severe electric shock.

IMPORTANT SAFETY INSTRUCTIONS

- **Read these instructions.**
- **Do not modify this pressure switch in any way.**
- **Keep these instructions.**
- **Heed all warnings.**
- **Follow all instructions.**
- **Do not allow water to enter this pressure switch.**
- **Install this pressure switch per the manufacturer's instructions.**
- **Do not install this pressure switch near any heat source such as radiators, gas heaters, stoves or any other appliance that produces heat.**
- **Do not drill holes in this pressure switch's casing.**
- **Refer all installation and servicing to qualified service personnel.**
- **Servicing is required when the pressure switch has been damaged in any way, such as exposed to fire, dropped, had objects dropped on it or been exposed to moisture or water when the pressure switch's lid is removed.**

WARNING

Please read these installation and operating instructions fully and carefully before installing or servicing this pressure switch. The E30 pressure switch is a mains voltage device. Death or serious injury may result if this product is not correctly installed and operated.

Overview

The E30 digital pressure switch is a multi-mode programmable pressure switch that can be configured in a variety of ways to control a pump and to protect it against running dry. The E30 can be set to operate in one of three basic modes. Within each mode a number of functions can be selected using a simple programmable interface. This document sets out in detail the installation and functions of the E30 and some of the main ways in which it can be used in pumping and irrigation systems.

MODE 1 Pressure Switch

The E30 can be set to operate as a conventional loss of prime pressure switch with digitally settable high, low and trip pressures. In addition features such as delayed restarting, anti-cycling, batch running, a start timer and a run-on timer are also available. If you choose to leave the trip point pressure set to zero the E30 functions as a conventional differential pressure switch with no low pressure (dry run) protection.

MODE 2 Pressure Guard

In mode 2 the E30 functions as a high and low pressure trip switch intended to shut down a system if the pressure exceeds normal limits. In mode 2 a set of relevant functions become available. These include a digitally settable high pressure trip point, a low pressure starting point, an under pressure trip point, a start-up timer and a run-on timer.

MODE 3 Snap Action Pressure Switch

In mode 3 the E30 functions as a single switch point snap action pressure switch. You can set the switch point to any pressure between 1 and 2000 kPa or 1 to 290 psi. In mode 3 you can configure the output to be either relay 1 or relay 2 and you can configure the relay's contacts to be either normally open or normally closed.

When operated in mode 3 relay 1 can be used to directly control large single phase pumps using the in built HD drive, or relay 2 can be used for control circuit and signalling applications. Mode 3 also provides user adjustment of the single switch points differential (delta) pressure over the range 7 to 140 kPa or 1 to 20 psi.

Remote Input

In all 3 modes an external switch or a set of relay contacts can be used to externally actuate the functions of the E30 utilising the low voltage output and remote input terminals.

E30 Modes & Functions

MODE	1	2	3
Functions (# User Settable)			
# Selectable pressure units kPa or psi	**Y**	**Y**	**Y**
# Start-up timer, fully adjustable and self terminating	**Y**	**Y**	**Y**
# Run-on timer, fully adjustable and self terminating	**Y**	**Y**	**Y**
# Delayed re-starting timer, once stopped delays the restart	**Y**		
# Batch control, set a specific run time for the pump	**Y**		
# Auto restart if run dry, both single and multiple attempts	**Y**		
# Trip pressure, fully adjustable and can be turned on or off	**Y**	**Y**	
# Snap pressure, allows the setting of a single switch point			**Y**
# Snap pressure switching differential (delta pressure)			**Y**
# Starting pressure, fully adjustable and can be turned off	**Y**	**Y**	
# Stopping pressure, fully adjustable and can be turned off	**Y**	**Y**	
# Anti-cycling controls the number of motor starts per hour	**Y**		**Y**
# Anti-cycling sensitivity control to avoid nuisance tripping	**Y**		
# Start the pump at a preset low pressure	**Y**	**Y**	**Y**
# Stop the pump at a preset high pressure	**Y**	**Y**	**Y**
# User can configure the E30's output to be relay 1 or relay 2			**Y**
# User can configure the E30's output relay to be NO or NC			**Y**
# Start & stop a pump using an external low voltage switch	**Y**	**Y**	**Y**
Displays the system's pressure in preferred units, kPa or psi	**Y**	**Y**	**Y**
Displays the high & low pressure set points in preferred units	**Y**	**Y**	
Displays the snap pressure point in preferred units			**Y**
Displays a warning if you enter incorrect pressure settings	**Y**	**Y**	
Displays the reasons for faults and alarms on its LCD screen	**Y**	**Y**	**Y**
Over pressure alarm automatically invoked at 22 Bars	**Y**	**Y**	**Y**
Alarm relay closes on all fault conditions	**Y**	**Y**	

INSTALLING THE E30 PRESSURE SWITCH

Location

Install the E30 in a location that is sheltered from direct exposure to the weather. The E30 is weatherproof and is supplied with a protective cover; however, to ensure a long reliable life from the E30 we recommend it be protected from direct exposure to the weather wherever possible. Intense sun light will eventually cause degradation of the pressure switch's enclosure and in extreme cases may cause overheating of the electronics inside the E30. It is therefore advisable to protect the E30 from the weather whenever possible.

The E30 can be wall mounted using the wall mounting bracket kit supplied with each unit or it can be installed directly onto pipework. The location of the tapping point is important. The E30 responds to positive pressures only. It should never be installed in pipework that is subject to partial vacuum or negative pressures. Do not install the E30 in the suction pipework of a pump. The tapping point should be in a location that is away from valves, elbows and concentric reducers. The dynamic pressure read by the E30 will be a function of the pipework in which it is installed. Changes in pipe diameter and obstructions can radically alter the system's dynamic pressure compared to pressure readings taken in more stable locations.

The E30 can be installed in either horizontal or vertical pipe. Flow direction has no impact on the performance of the pressure switch. Install the E30's tapping point in a section of pipe that typifies the pipework in the general system. If water hammer is a potential issue in the system's pipework, wall mount the E30 and run a length of small diameter capillary tube between the tapping point and the E30. Coil the capillary tube so the tube acts as a snubber and absorbs the pressure shock from the water hammer.

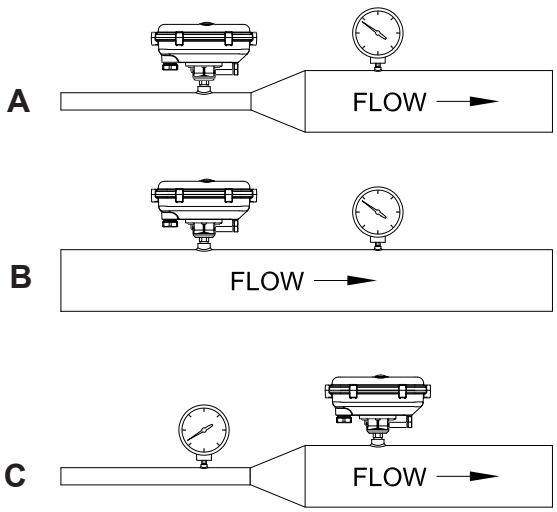
The E30 will read the line pressure at its tapping point. Consideration should be given to the layout of the pipework and its effect of the reading accuracy of the E30. If the system is subject to dynamic pressure, that is pressure generated as a function of fluid movement within the pipe system, then the location of the tapping point will effect the E30's ability to read the pressure in a sensible manner. If the pipe system is only subject to static pressure, that is pressure that may fluctuate but is from essentially stationary liquid within the system, then the tapping point is unimportant as pressure within such a closed system will be uniform at all points.

Dynamic Pressure

Consider the sections of pipe depicted in the sketch below. In sketch (**A**) the pressure as read by the E30 when fluid flows will be less than the pressure read by the pressure gauge. The difference between the two readings will be directly related to the flow velocity and the ratio of the two pipe diameters. The E30 will see the pressure as lower than that seen by the pressure gauge. This is due to the higher velocity through the small pipe and thus lower pressure than the pressure in the larger pipe where the velocity is lower. In sketch (**B**) both the pressure gauge and the E30 will read the same pressure since the velocity is constant between the two tapping points. In sketch (**C**) the E30 will read the dynamic pressure as higher than the pressure as read by the pressure gauge. This is the reverse of the situation in sketch (**A**)

Note that in a static situation with no fluid flow the pressure gauge and the E30 will read the same pressure in all three pipe configurations.

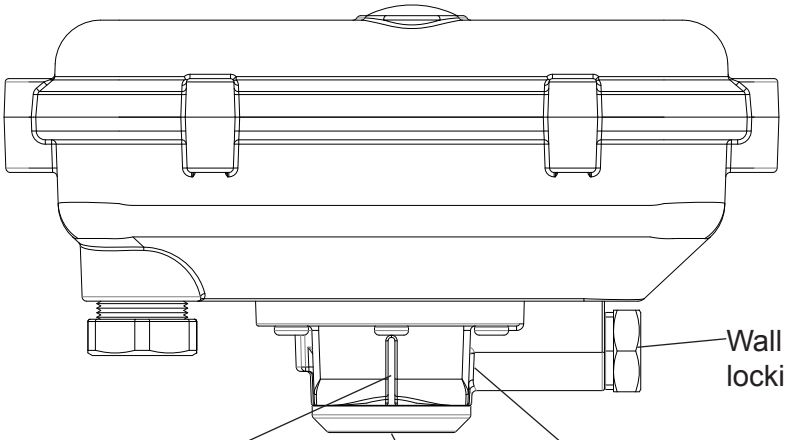
Careful consideration should therefore be given to the location of the tapping point as in a dynamic situation its location will effect the pressure the E30 actually reads.



WARNING

After programming the E30 always replace its lid and fully tighten all 6 securing screws. Also ensure all cable glands are fully tightened. Never leave the lid off the pressure switch for extended periods. Without its lid in place the E30 is not water resistant and presents a potential shock hazard. Take great care not to splash water onto the E30 when the lid is not in place. Without its lid the E30 is not weather or insect proof and presents a potential shock hazard that may result in death or serious injury.

Locking the Assemblies Together



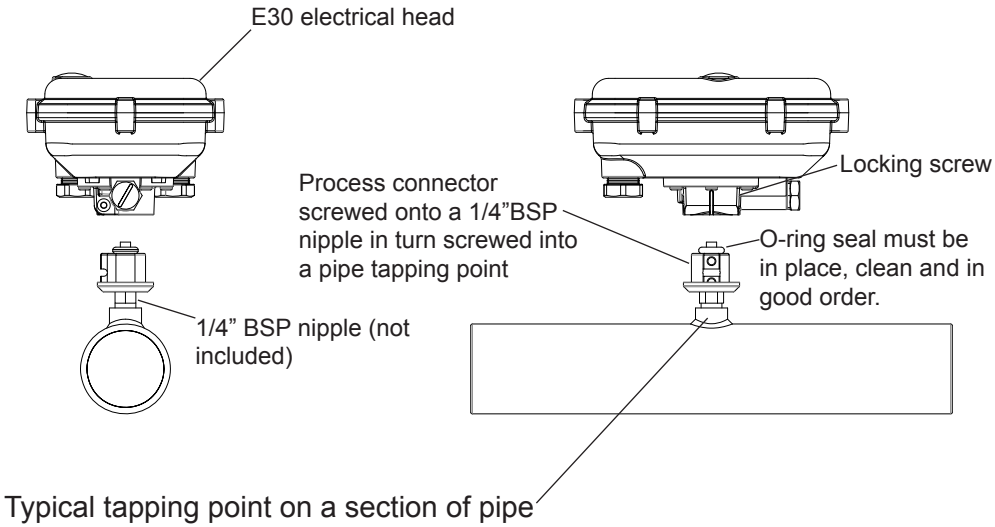
Very Important
Maximum gap 1.0mm wide when the Allen screw is fully tightened.

Installation

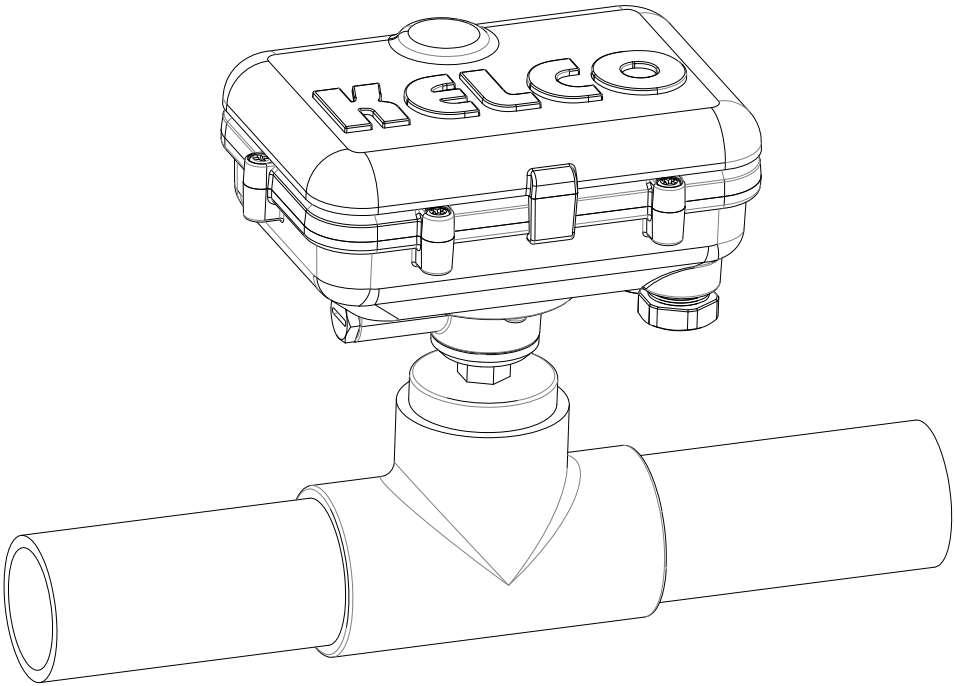
The E30 pressure switch consists of two separate parts, the process connection and the electrical housing. The two parts are locked together by an Allen screw located under the electrical housing. As supplied the two parts are separate allowing the process connector to be screwed onto pipework using a suitable 1/4" BSP pipe nipple (not included). The provision of a separate process connector means the E30 can be easily installed in awkward locations particularly when the tapping point is located close to pipe bends or other obstructions. In effect, the process connection acts as a union and can be screwed onto a pipe nipple and installed in the pipework. The electrical housing can then be fitted onto the process connection and locked in place with the Allen screw.

To lock the two parts of the E30 together with the electrical housing located on the spigot and in position, press down with the flat of your hand on the top face of the lid of the electrical enclosure. While pressing down, screw the 4mm Allen screw fully through the housing using the 3mm Allen Key (supplied). Tighten the screw and then release your hand from the top of the housing. Pressing down with your hand on the housing preloads the O-ring seal between the housing and the process connection. It enables the M4 Allen screw to easily screw fully through the side of the housing. Do not screw the Allen screw through the housing without first preloading the O-ring in the manner described above. To do so will result in the Allen screw cutting a thread through the housing and reducing the designed preload against the O-ring. This in turn will compromise the seal between the two parts of the pressure switch.

The E30's two part assembly allows the electrical head of the pressure switch to be removed for servicing or inspection without the need to unwire the whole pressure switch. Removing the electrical head from the process connection is the reverse of installing it. Turn off the power and depressurise the pipework. Press down with your hand on the electrical head and undo the M4 Allen screw and completely remove it. Lift the electrical head straight up off the process connection to complete the removal process.



E30 Mounted Directly on a Pipe



WARNING

Always de-pressurise the piping system before removing the electrical housing or carrying out any work on the E30. The securing screw that locks the electrical housing onto the process connection of the E30 must never be loosened or removed while the pipe system is under pressure. In order to carry out any work on the process connection itself, the pipe system must be completely depressurised and vented to atmosphere. If the E30 is located in a section of pipework that is flooded then that section of pipework must be fitted with isolation valves and the valves must be fully closed before removing the electrical head of the E30 from the pipework.

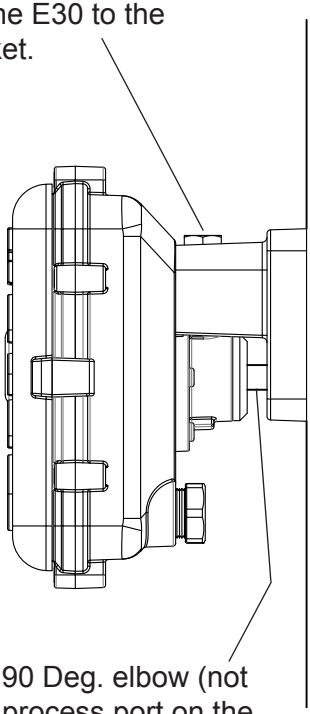
Wall Mounting the E30

The E30 pressure switch is supplied with a wall mounting bracket that can be used to mount the pressure switch in locations away from the pressure tapping point. This may be on an adjacent wall or on a bracket on the pipe or pump system. To bracket mount the E30 first install the bracket by drilling a hole pattern as depicted on page 12. Secure the bracket to the wall or mounting using suitable screws (not supplied). Fit a 1/4" BSP elbow (not supplied) to the E30's process port using Teflon tape. The elbow must point squarely toward the cable glands on the E30. Install a suitable tube adaptor into the elbow to facilitate connection to a length of capillary tube. Typically the capillary tube to use for this will be 6 to 8mm diameter.

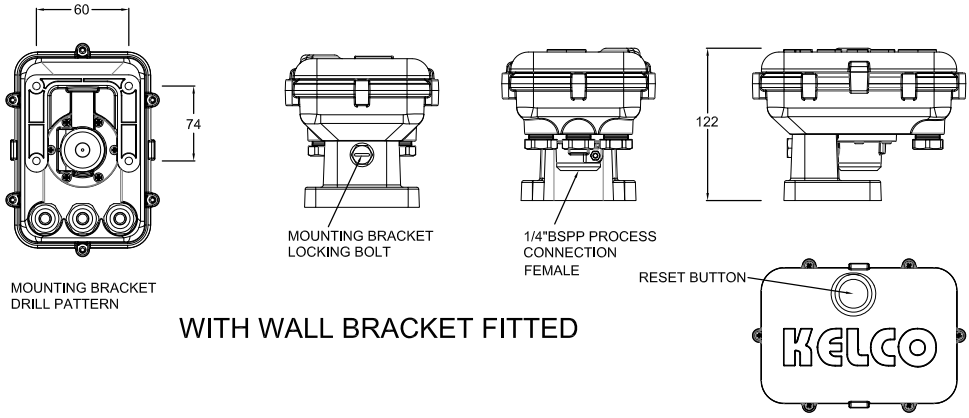
Wire up the electrical head of the E30 and fully tighten all cable glands. Lock the electrical head onto the wall bracket using the red bolt supplied with the E30. Note that there are two ears on the wall bracket that engage in two notches on the under side of the E30's electrical housing. Using a suitable tube adaptor terminate the capillary tube at the pipe system's tapping point. If water hammer or violent pressure surges are likely, coil the capillary tube between its two termination points so the coil acts as a shock absorber.

Typical Wall Mounted E30

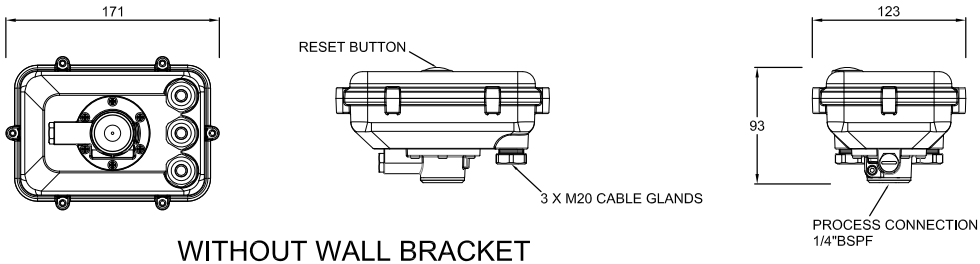
The single red locking Bolt secures the E30 to the wall bracket.



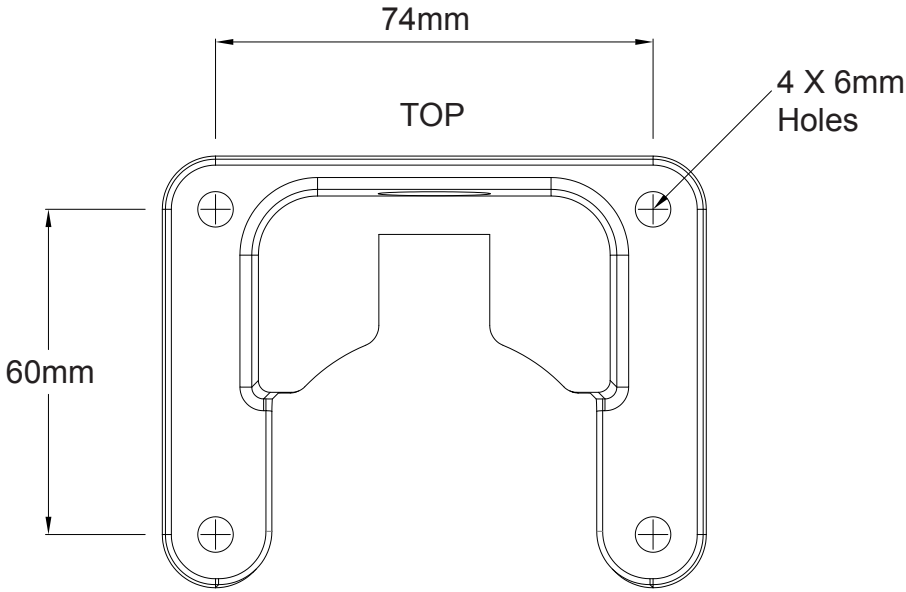
Screw a 1/4”BSP 90 Deg. elbow (not supplied) into the process port on the E30. The inlet port on the elbow must be aligned downward to accept a capillary tube adaptor and to stand clear of the wall.



WITH WALL BRACKET FITTED



WITHOUT WALL BRACKET



WALL BRACKET DRILL PATTERN

Limitations

1) Where possible avoid installing the E30 pressure switch in fully exposed locations. The E30 is weatherproof, however, to ensure a long reliable life we recommend it be protected from direct exposure to the sun and rain. Intense sun light will eventually cause degradation of the pressure switch's housing. Intense heat from the sun will also degrade the electronics within the E30. Where it is not possible to directly protect the E30 from the weather always ensure the protective skull cap cover (supplied) is installed over the pressure switch's clear lid.

2) Do not expose the E30 pressure switch to freezing. If the pipework in which the E30 is installed freezes, the pressure sensor in the pressure switch may crack and fail. If the E30 is to be used in areas where low temperatures will be encountered, always lag the pipework for several metres either side of the pressure switch and also lag the base of the E30 and any associated capillary tubing to prevent the unit and any adjacent pipework from freezing.

3) Do not use the E30 in hot water applications. The E30 is not designed to be used in liquids hotter than 60ºC.

4) Do not expose the E30 to static or dynamic pressures that exceed 20 Bars, or 290 psi.

5) Do not install the E30 in pipework that may be subject to negative pressure or partial vacuum. The E30 is designed for positive pressure applications only.

6) Do not install the E30 pressure switch in a section of pipe that is subject to vibration. Vibration will cause premature failure of the electronic components within the E30. Where vibration is unavoidable wall mount the E30 away from the source of the vibration and connect it to the vibrating pipe using a length of plastic capillary tube.

IMPORTANT

The E30 must never be used in hot water applications >60°C. The E30 is rated to withstand water pressure to 2000 kPa, 20 Bars or 290 psi and must never be used in applications where the static or dynamic pressure exceeds this rating.

Operating Range

Ambient temperature range	1ºC to 50ºC
Liquid temperature range	1ºC to 60ºC
Ingress protection rating	IP67
Start-up timer	Adjustable from 1 second to 4 minutes in 1 second increments.
Run-on timer	Adjustable from 1 second to 15 minutes in 1 second increments.
Batch controller	Adjustable from 1 minute to 99 Hours 59 minutes in 1 minute increments.
Delayed restarting	Adjustable from 1 minute to 99 Hours 59 minutes in 1 minute increments.
Anti-cycling	Adjustable from 1 motor start per hour to 1800 starts per hour.
Anti-cycling sensitivity adjustment	Adjustable from 2 to 50 sequential starts.
Run dry auto restart settable to single or repeated attempts	Adjustable from 1 minute to 99 Hours 59 minutes in 1 minute increments.
Maximum operating pressure static or dynamic	20 Bars 290 psi
Minimum burst pressure, all models	> 30 Bars 435 psi
Trip pressure range	Adjustable from 0 to 2000 kPa or 0 to 290 psi in increments of 1 kPa or 1 psi.
Snap pressure range, mode 3 only	Adjustable from 1 to 2000 kPa or 1 to 290 psi in increments of 1 kPa or 1 psi.
Snap pressure differential, mode 3 only	Adjustable from 7 to 140 kPa or 1 to 20 psi in increments of 7 kPa or 1 psi
Starting pressure range	Adjustable from 0 to 2000 kPa or 0 to 290 psi in increments of 1 kPa or 1 psi.
Stopping pressure range	Adjustable from 0 to 2000 kPa or 0 to 290 psi in increments of 1 kPa or 1 psi
Minimum pressure differential on to off or off to on, modes 1 and 2 only	1 kPa or 1 psi. Practical limit is nominally 7 kPa or 1 psi.
Automatic over pressure shut down	Fixed setting 2200 kPa 22 Bars 430 psi

The E30 must never be used in hot water applications >60°C.

Electrical

WARNING

All electrical work associated with the E30 must be carried out by qualified electrical personnel and all electrical work must conform to AU/NZ standards and to local wiring rules. For mains voltage applications we recommend the supply to the E30 be isolated by an RCD that has a maximum trip current of 30mA.

Introduction

The E30 is designed to directly control single-phase pump motors to 3.75kW. No interposing contactor is required for such applications. If a supply neutral is available the E30 can also be used to control 3 phase pump motors via an appropriate interposing contactor.

The E30 requires a 220V to 240V AC 50Hz supply when operated from the mains. It can also be operated from an 18 to 24V AC or DC supply by utilising the low voltage active terminal LV and common neutral terminal N (see the included wiring diagrams). When operated from a low voltage DC supply the terminals LV and neutral N are not polarity sensitive. The controller requires a stable supply voltage in order to operate correctly. Pay particular attention to cable sizes, and ensure cables are adequate for the specific pump motor 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 E30 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 E30 is stable and that the current carrying capacity of the cable is adequate for the job.

The HD (Heavy Duty) Terminal

WARNING

The HD terminal must be left unused or only ever linked to the relay terminal Relay 1 Normally Open. It must never be used for any other purpose and it must never be connected to any external device. Under no circumstances connect the HD terminal to the terminals of Relay 2. The HD terminal must be regarded as live at all times and at full mains potential.

The E30 pressure switch contains a solid-state switch (HD Heavy Duty drive) that can be used to protect the contacts of Relay 1 by eliminating the destructive arcing caused by the starting and stopping of pump motors. The solid-state switch is accessible from the HD (Heavy Duty) terminal on the terminal block. We recommend the HD drive be used whenever the E30 is used to directly control a pump motor. The HD drive should not be used when the E30 is connected to external timers, contactors, relays or to any other external device where voltage free contacts are required. It is strictly intended for the direct control of highly inductive AC motor loads. The HD terminal and the E30's built in relays must never be connected to a DC motor under any circumstances.

When the HD terminal is linked to the terminal Relay 1 Normally Open, the HD drive in effect parallels a 40 Amp solid state switch across the relay's normally open contacts. This increases the momentary current carrying capacity of the relay's contacts to well over 60 Amps. The solid state HD drive is only activated for a short period when the pump starts and stops. It effectively handles the high inrush current associated with the pump starting, and it provides a current path for the destructive back EMF associated with the pump motor stopping.

To use the HD drive place a heavy link wire, 1.0mm or 1.5mm Sq between the HD terminal and the Normally Open terminal of Relay 1.

Brownout Or Blackout

If a blackout or brownout occurs the E30 pressure switch will retain whatever programming information you have entered, such as pressure settings and running times. However, it will not retain any memory of where in its run or stop cycle it may have been, or at what pressure it may have been operating at at the time of the power interuption, it will simply shut down the pump. When power resumes the E30 will reboot and restart the pump and run any timer settings from the beginning.

In normal operation a manual reboot can be done at any time by simply pressing the E30's reset button.

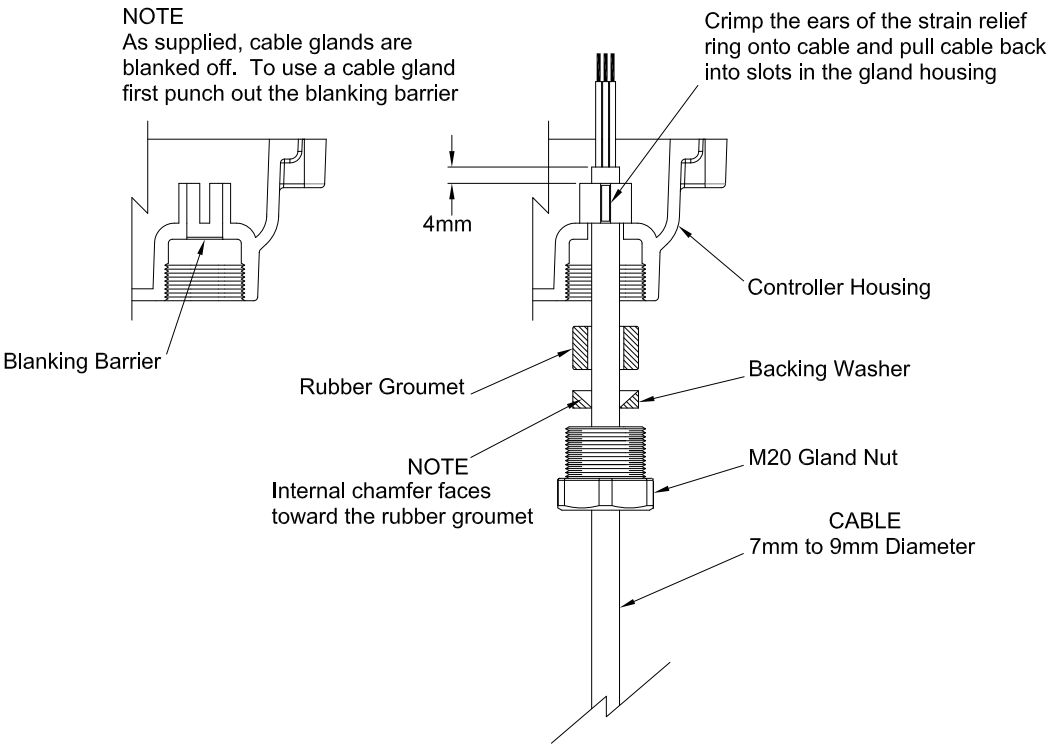
WARNING

The E30 derives low voltage for its operation from a non-isolated reactance power supply (not through an isolated transformer). All external devices connected to the E30 controller must be earthed and must be regarded as operating at full mains potential.

Cables

The E30 has 3 X M20 cable glands. As supplied, the cable glands are blanked off. To use the glands first punch out the blanking barriers using a suitable punch. The cable glands can accept cable from 7mm to 9mm diameter. See attached sketch for assembling the cable gland components. The controller is supplied with a set of steel crimp rings. The crimp rings are to provide strain relief for the controller's cables. To use the crimps, place one on the cable approximately 3 to 4mm below the end of the cable's outer sheathing. Crimp the two ears of the ring flat using bull nosed pliers. Pull the cable back through the cable gland until the crimp ring's ears are fully located into the slots in the cable gland housing.

CABLE GLAND ASSEMBLY



CABLE GLAND ASSEMBLY

VOLTAGE LIMITS ON TERMINALS A & N	
Maximum Supply Voltage	250VAC 50Hz
Minimum Supply Voltage	220VAC 50Hz

VOLTAGE LIMITS ON TERMINALS LV & N	
Maximum Supply Voltage	25VAC 50Hz or 25VDC
Minimum Supply Voltage	18VAC 50Hz or 18VDC

RELAY 1 CONTACT RATING	
16A at 250VAC	Resistive Load
16A at 30VDC	Resistive Load
500mA at 5VDC	Minimum Load

RELAY 2 CONTACT RATING	
16A at 250VAC	Resistive Load
16A at 30VDC	Resistive Load

WARNING

Do not connect any supply greater than 25VAC or DC to the LV terminal on the E30. The LV terminal is only for use with a low Voltage supply of less than 25V AC or DC. If a Voltage greater than 25V AC or DC is connected to the LV terminal of the E30, the pressure switch will be damaged and any warranty on the product will be void.

Remote Input

An external switch with voltage free contacts such as a tank level switch or a set of external relay contacts can be used to either start or to start and stop a pump under the control of the E30. The supply to the external switch must be taken from the LV terminal (Low Voltage active terminal) of the E30 when the pressure switch is powered from the mains or from a 24VAC source. The E30 must always be powered from the same source as the supply to the external switch. The supply to the remote switch on the E30-12 (low voltage DC model) must be taken from the supply positive terminal. In all cases the external switch return wire must be connected to the Remote input (R) terminal on the E30. The Supply to the external switch will range from 12 to 24 VDC or from 20V to 35V AC depending on the model of the pressure switch and on the supply voltage.

WARNING: The low voltage source available at the LV terminal is non-isolated and in terms of insulation must be regarded as operating at full mains potential whenever the E30 is powered from the mains.

The remote switch can be installed some distance from the E30. The maximum distance is limited by cable resistance and capacitance. The total cable resistance must not exceed 5K Ohms with the remote switch closed. The total capacitance of the cable must not exceed 25nF with the remote switch open. Wires to the remote switch should be run separately from power carrying cables. Do not run the remote switch wires in a conduit that also contains power cables. Capacitive coupling between the adjacent cables may cause false triggering of the E30's remote input. For cable runs longer than 150 metres we suggest using 2 separate wires to reduce capacitive coupling between the adjacent wires. When set up this way cable resistance becomes the limiting factor for distance. The table below sets out the resistance of typical copper wire of various diameters.

Nominal Cross Section of Copper Wire in Square Millimetres	Resistance in Ohms per 1000 Metres
0.2	95.30
0.5	36.20
0.75	24.13
1.0	18.10
1.5	12.10

Note: Resistance may vary depending on the wire standard and the actual construction of the wire.

Note that the cable resistance refers to the total resistance out to the remote switch and back again, as measured at the controller across the 2 remote connection wires with the external remote switch closed.

Example

A water tank is located 2000 metres from the E30. Two separate wires each 0.2mm^2 are run to the remote tank (total wire length is 4000 metres). The resistance as measured across the 2 wires back at the E30 (with the tank level switch closed) is 382 Ohms. This is well under the 5,000 Ohm limit. The remote input to the E30 will operate properly provide the wires are separated by sufficient distance that the capacitance between is less than 25nF. Capacitance should be measured between the wires when the remote switch is open and it must be less than 25nF.

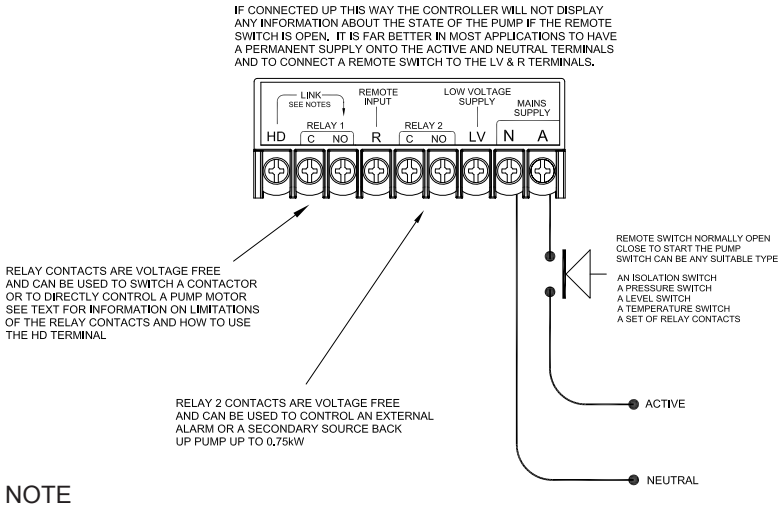
Remote Switch

The remote switch should be suitable for low voltage low current operation. In particular its contacts should only require a low wetting current. The current in the remote loop only runs to a few milliamperes and requires a switch that will conduct when closed under low current conditions. Mechanical microswitches with gold plated contacts or reed switches are the preferred method of controlling the remote input function. Conventional mechanical switches with exposed silver based contacts may initially function, however, over time their contacts will oxidise and the switch may not be able to conduct the small switching current. The contacts of reed switches are normally sealed in a glass tube filled with an inert gas that prevents oxidisation of their contacts and therefore their contact resistance does not increase over time.

WARNING

Never connect an external power source to the (R) remote input terminal of the E30. The remote input terminal must only ever be connected to a supply that is sourced from the LV terminal on the E30 itself when the controller is powered from the mains or from the supply positive terminal when the E30 is powered from a 12VDC supply.

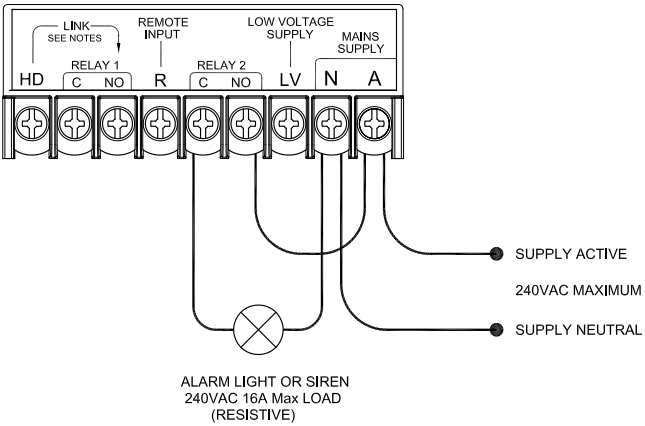
MOST BASIC WAY TO CONNECT THE SUPPLY



NOTE

IF THE CONTROLLER IS CONNECTED UP THIS WAY IT WILL NOT DISPLAY ANY INFORMATION ABOUT THE STATE OF THE PUMP IF THE REMOTE SWITCH IS OPEN. IT IS FAR BETTER TO HAVE A PERMANENT SUPPLY ONTO THE ACTIVE AND NEUTRAL TERMINALS AND TO CONNECT A REMOTE SWITCH TO THE LV AND R TERMINALS.

MAINS VOLTAGE EXTERNAL ALARM CONNECTIONS



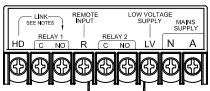
CONNECTIONS FOR PLUG & PLAY INSTALLATION

FOR PUMP MOTORS TO 2.4 kW

WARNING

ALL ELECTRICAL WIRING ASSOCIATED WITH THIS PUMP CONTROLLER PLUG & PLAY KIT MUST BE CARRIED OUT BY A QUALIFIED ELECTRICIAN

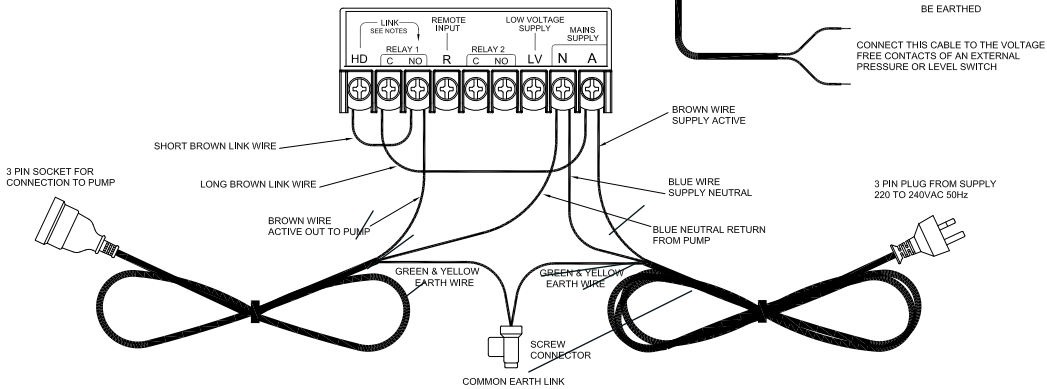
ADDITIONAL CONNECTIONS REQUIRED FOR EXTERNAL CONTROL



EXTERNAL SWITCH MUST BE EARTHED

CONNECT THIS CABLE TO THE VOLTAGE FREE CONTACTS OF AN EXTERNAL PRESSURE OR LEVEL SWITCH

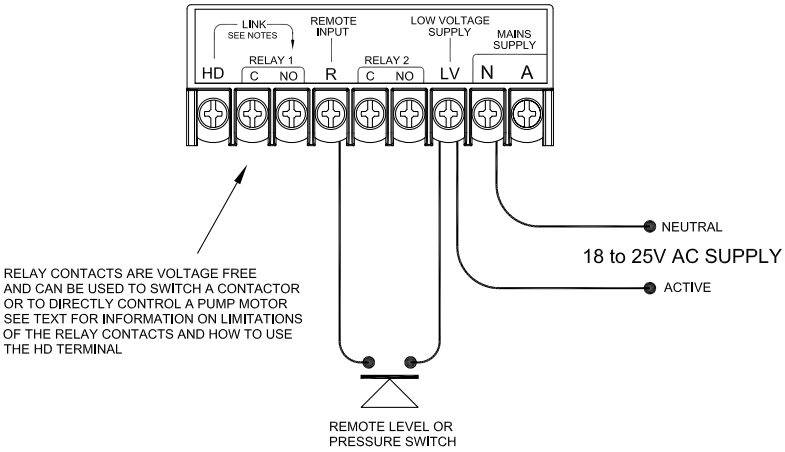
CONNECTIONS FOR PLUG & PLAY INSTALLATION



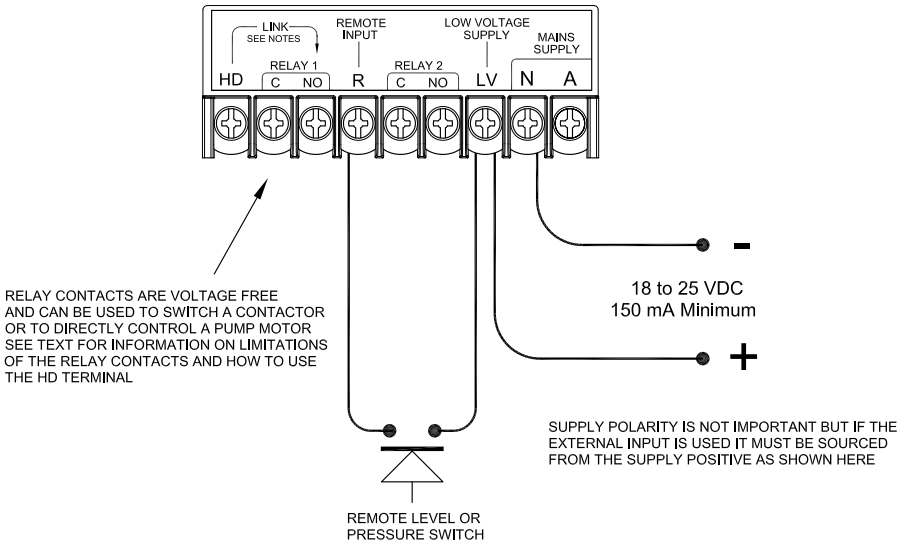
CONNECTIONS FOR PLUG & PLAY INSTALLATION

220~240VAC 10Amp Maximum

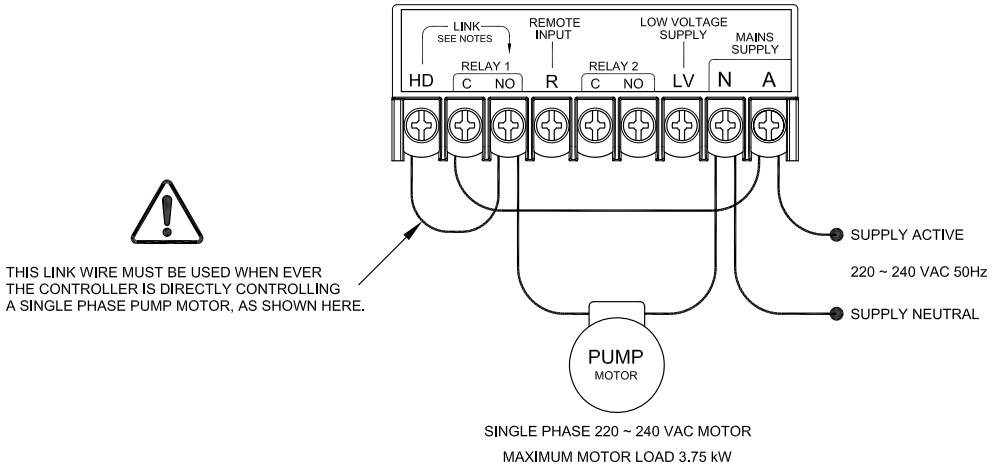
LOW VOLTAGE AC CONNECTIONS WITH A REMOTE INPUT SWITCH



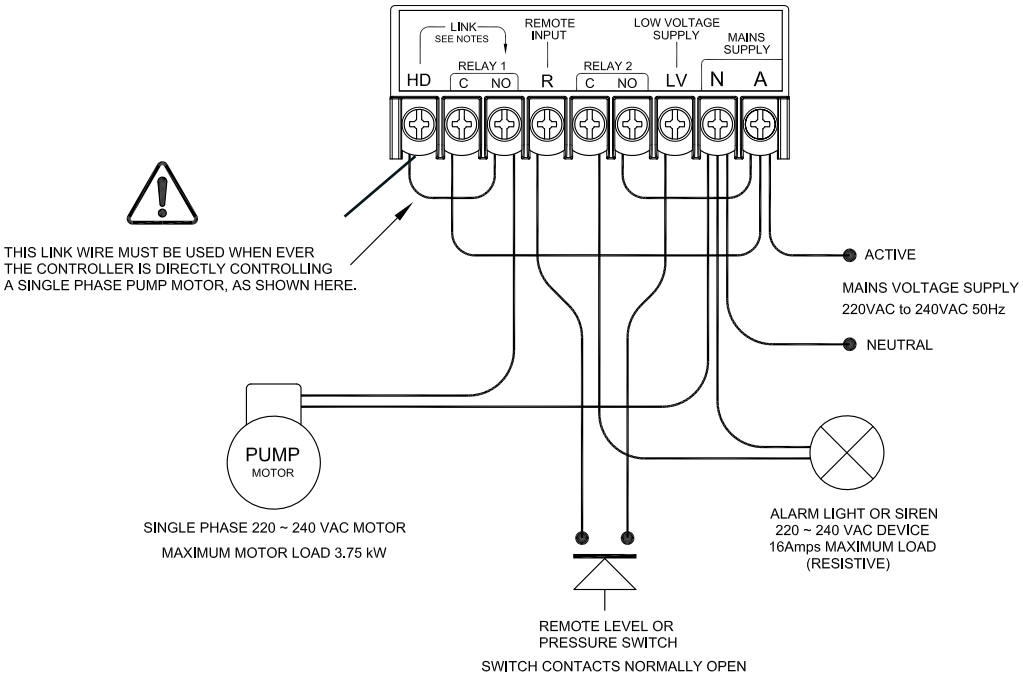
LOW VOLTAGE DC CONNECTIONS WITH A REMOTE INPUT SWITCH



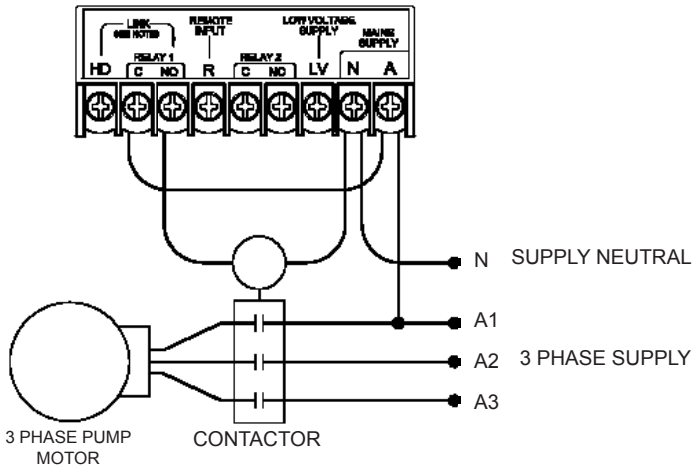
BASIC SINGLE PHASE WIRING DIAGRAM



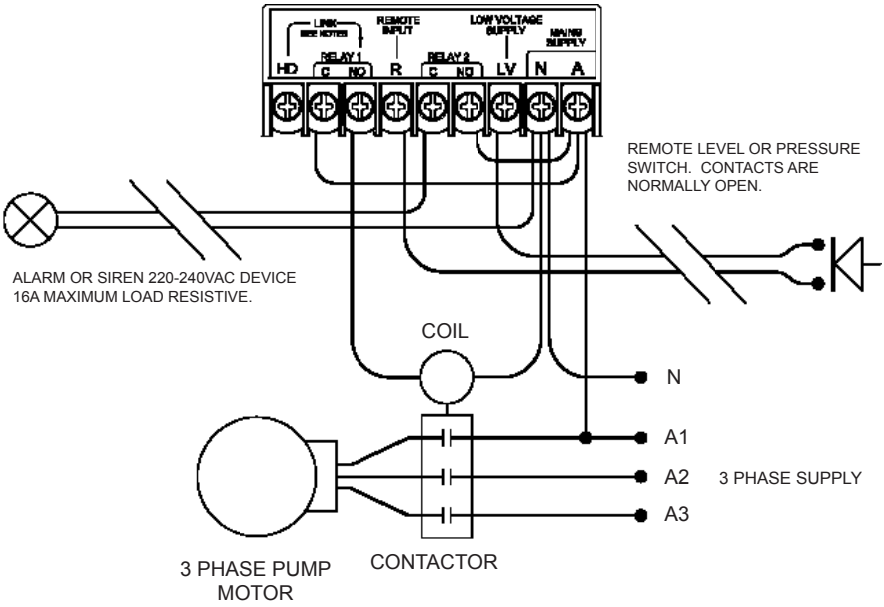
CONTROL OF A SINGLE PHASE PUMP MOTOR WITH REMOTE INPUT AND AN EXTERNAL ALARM



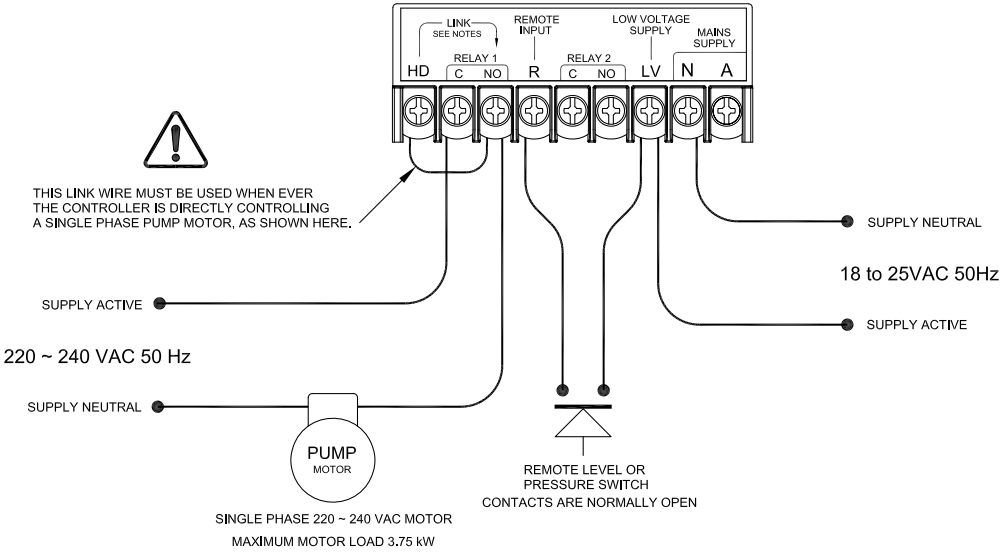
TYPICAL 3 PHASE PUMP CONNECTIONS



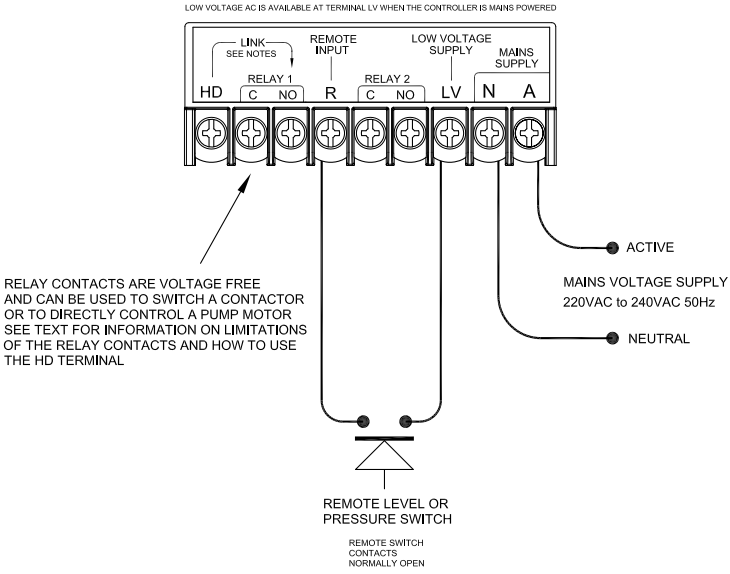
CONTROLLING A 3 PHASE PUMP WITH REMOTE INPUT AND AN EXTERNAL ALARM



CONTROLLING A 240VAC SINGLE PHASE PUMP MOTOR WITH THE PUMP CONTROLLER POWERED FROM A LOW VOLTAGE AC SUPPLY



MAINS VOLTAGE REMOTE INPUT CONNECTIONS



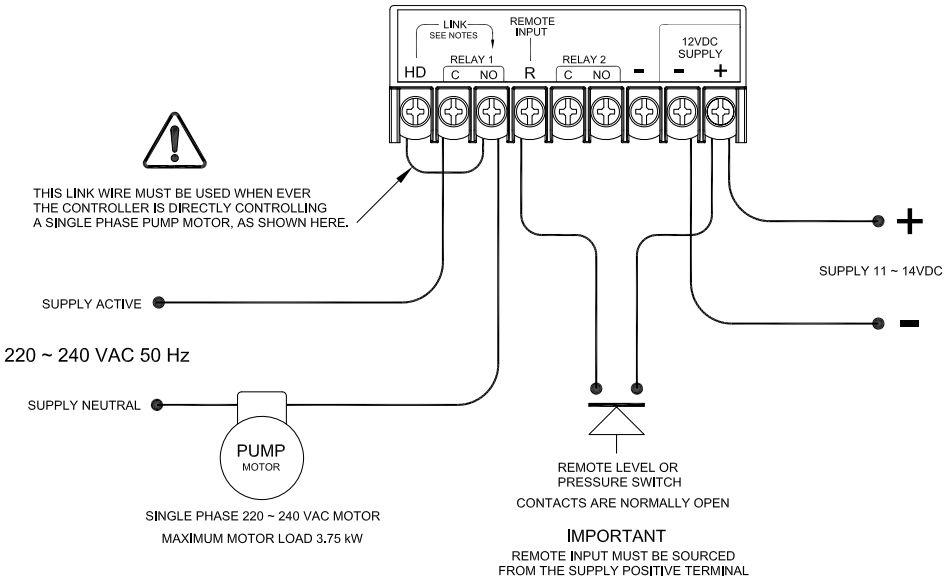
The 12VDC E30 Pressure Switch

A special 12VDC version of the E30 pressure switch is available for battery operation and for use in solar pumping systems. Functionally the 12VDC model is exactly the same as the mains voltage model except for the terminal block markings. On the 12VDC model the active and neutral terminals are replaced by a positive + and a negative – terminal. Supply voltage across the positive and negative terminals must never exceed 14VDC or the E30 will be damaged. The supply terminals are reverse polarity protected however, the E30 will simply not operate unless the supply polarity is correct.

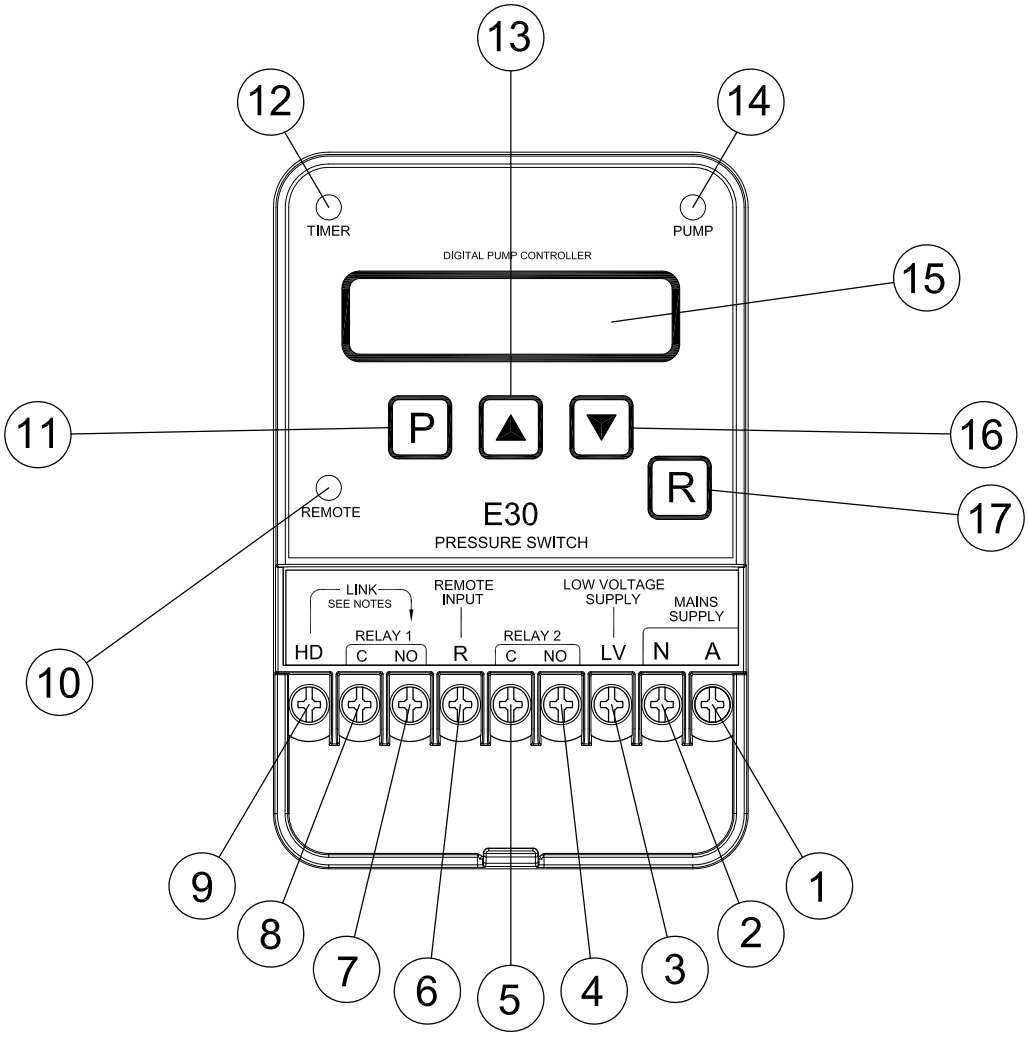
If a remote switch is connected to the 12VDC E30 the supply to the remote switch must be taken from the positive terminal on the pressure switch. The remote switch and its connecting circuit will operate at 12VDC.

CONTROLLING A 220 ~ 240 VAC SINGLE PHASE PUMP MOTOR WITH THE PUMP CONTROLLER POWERED FROM A 12V DC SUPPLY

WIRING DIAGRAM
12VDC CONTROLLER ONLY



E30 Controls & their Functions



No.	Description	Function
1	Mains Voltage Active Terminal	For all mains voltage applications this is the supply connection.
2	Supply Neutral Terminal	For all applications this is the supply neutral connection.
3	Low Voltage Active Terminal	This is the supply active terminal for all low voltage.
4	Alarm Relay Terminal Normally Open	This terminal is for connecting an external alarm, it is voltage free.
5	Alarm Relay Contact Common	This terminal is for connecting an external alarm, it is voltage free.
6	Remote Input Terminal	This is the remote switch input terminal for connection to an external switch.
7	Pump Relay Terminal Normally Open	This terminal is for connection to a pump motor or contactor.
8	Pump Relay Terminal Common	This terminal is for connection to a pump motor or contactor.
9	Heavy Duty Drive Terminal	Link this terminal to the relay 1 normally open terminal when directly controlling pump motors.
10	Remote Input Light (Blue)	This light is on whenever the remote input switch is closed.
11	Program Button	Press this button to program the E30.
12	Timer Light (Red or Green)	This light is green whenever a running timer is running. It turns red whenever a stop timer is running.
13	Up Button	Use This button when programming the pressure switch to enter data.
14	Pump Start Light (Red or Green)	This light is red whenever the pump is stopped and it is green whenever the pump is running.
15	LCD Screen	The LCD screen displays information whenever the pressure switch is switched on.
16	Down Button	Use this button when programming the pressure switch to enter data or to turn on the LCD backlight.
17	Reset Button	This button reboots the pressure switch each time it is pressed.

Maintenance

The E30 is a low maintenance device. If it is correctly installed in a location that is out of direct exposure to the elements it should give a long and reliable life and require no maintenance at all.

Factors that may reduce its life are lightning strikes or power surges, failure to fully tighten its lid and cable glands, exposure to pressures or temperatures in excess of its ratings and operation outside its electrical limitations in terms of supply voltage and motor loads.

Warranty

The E30 is guaranteed against faulty workmanship and materials for a period of 12 months from the date of purchase. Our complete warranty statement can be downloaded from :

http://www.kelco.com.au/menu/information/warranty-statement

If a warranty issue arises with this product contact your supplier or Kelco Engineering Pty Ltd. You will be issued with a returns goods authorisation number. The RGA number and proof of purchase must accompany any goods returned to us under warranty.

WARNING

If the E30 pressure switch is used in a manner not specified by the manufacturer the pump protection provided by the switch may be impaired or negated. In addition, all warranties stated or implied may be rendered invalid.

Designed and Manufactured in Australia by

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