# Introduction

The Metcraft Fuel Polisher range is designed to ensure that stored fuel is kept in good condition, with minimal intervention from the user. Once set up and installed, the Metcraft Fuel Polisher Control Panel will automatically activate at predefined intervals to circulate, condition and filter the stored fuel. BMS connections are included to allow for remote monitoring of the Fuel Polisher, including notification of service requirements or faults.

# Installation

## Positioning & Mounting

Mount & fasten your polishing system to a secure wall or other suitable solid structure.
Note not to drill & fix into any of the internal fuel tank or bund walls.
The Polisher unit should ideally be positioned within 10m of the Fuel Tank.
The Polisher unit must NOT be positioned more than 5m higher than the Fuel Tank Feed (draw off) connection as this will cause inadequate suction to the system.

## Pipework & Connections

The Polisher unit has two fuel pipeline connections. The 'Feed Line' drawing from the bottom of the tank and 'Return Line' returning back to the top of the tank.
The feed & return line connections should ideally be located at opposite ends of the tank to ensure the fuel circulates efficiently.
It is advisable to fit isolation valves to both ends of the 'Feed & Return Lines' when connecting to the Polisher and tank to assist with pressure testing and maintenance works.
It is advisable to fit drain/test points to the lowest parts of the system to assist with pressure testing and maintenance works.
The Polisher Feed & Return Lines should be dedicated for the Polisher and not connected to any other equipment (e.g. pumps or any other fuel driven equipment).
We recommend using 3/4" NB pipework for both the Feed & Return Lines.

## Feed Line

The connection should draw fuel from the bottom of the tank either from a **'Low-level External Connection'** or a **'Top Entry Internal Connection'.**
The connection should be as close as possible to the bottom of the tank, ideally below the level of other plant & equipment draw off connections.
The pipeline should have an inline non-return valve (check valve) fitted to eliminate the fuel running back into the tank causing the pipeline to lose suction.
If using a '**Top Entry Internal Connection'** an internal suction tube must be fitted that extends from the top to the bottom of the tank. This must be fitted with a foot valve to ensure the pipeline remains primed at all times.
The feed line connection must not be more than 5m lower than the Polisher Unit as this will cause inadequate suction to the system.



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It is advisable to fit a high-level priming tee point. This will be used to assist with priming the pipeline for first use and/or after maintenance. The priming point should be the highest point in the system.

## Return Line

The connection should be located on top of the tank at the opposite end of the 'Feed Line' connection.

## Electrical

The electrical installation MUST be undertaken by a trained electrician and should comply with the relevant IEE regulations.
Before energising the control panel ensure that the power supply has been fully tested & certified.
The panel offers various BMS outputs via a VFC (Volt Free Contact) for each alarm/state.
See Fig.1 for termination details.

## Inputs

| | |
|---|---|
| Power Supply: | 230v 50Hz 6.0A |
| Fault/Shutdown Switch: | This N/C (normally closed) circuit is used to shut down the Polisher Unit under a fault condition such as High, Low, Bund Fuel Level or using a remote Emergency Stop. Multiple inputs can be used wired in series.<br>Circuit to be linked if not used. |

## BMS Outputs

| | |
|---|---|
| Filter Blocked: | Normally open, close on fault VFC (Volt-Free Contact) |
| Fault/Shutdown: | Normally open, close on fault VFC (Volt-Free Contact) |
| Water in Filter: | Normally open, close on fault VFC (Volt-Free Contact) |



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# Setting the Timer

Clock Setting:

1. Press ‘D+’ Until correct day is shown
2. Press ‘H+’ Until the correct Hour is shown
3. Press ‘M+’ Until the correct minute is shown
4. Check that the timer is in automatic mode by pressing the ‘MANUAL’ button until the screen displays the message ‘Auto On’.

Programming:

| Step | Key | Programming |
|---|---|---|
| 1 | P | Set on Time (Display Reads ‘1 on’) |
| 2* | D+ | Select days to be set (if the run time should be the same every day, skip this step) |
| 3 | H+/M+ | Set Hours and Minutes to read the time the Polisher should start |
| 4 | P | Set Off Time (Display Read ‘1 Off’) |
| 5 | P | Select days to be set (if the run time should be the same every day, skip this step) |
| 6 | H+/M+ | Set the Hours and Minutes to read the time the Polisher should stop |
| 7 | Repeat | Repeat the above steps to set additional on/off times (max 16) |
| 8** | ◔ | End Programming |

*there are 10 different pre-set groups of days.

1 = Mon, Tues, Wed, Thurs, Fri, Sat, Sun
2 = Mon Tues, Wed, Thurs, Fri
3 = Sat, Sun
4 = Mon
5 = Tues
6 = Wed
7 = Thurs
8 = Fri
9 = Sat
10 = Sun

**End programming at any time by pressing ◔



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## Operation

In normal operation, the Polisher should not require any intervention and will circulate and polish the fuel according to the timer. If there is a fault, a warning light will illuminate on the front of the Polisher. Please refer to troubleshooting.

## Servicing

The Filter/Water Separator should be replaced every 12 months or sooner if the 'Service Filter' lamp is illuminated. For any spare parts, including filter elements, please contact Metcraft and quote the Polisher serial number. Please note, if the Polisher is being retrofitted to an existing tank that has not previously been cleaned, the filter elements may require replacing sooner.

## Specifications

| Model | MET-12KFP | MET-60KFP | MET-120KFP |
|---|---|---|---|
| Flow Rate | 14 lit/min | 51 lit/min | 100 lit/min |
| Recommended Tank Size | 0-12,500L | 0-60,000L | 0-120,000L |
| Power Options | 0v 50hz 1ph | 230v 50hz 1ph AC | 0v 50hz 1ph |
| Particulate Removal | Micron | 10 Micron*** | Micron |
| Control Unit | Autom Timer | Automatic With Timer | Autom Timer |
| Backplate size | 80 00 | 1050 x 800 | 105 800 |
| Suction Capability | 5m **** | 5m vertical **** | 5m **** |
| Connections | 4" BS | 1" BSPT | 1" BSP |
| Pump Body | Cast Iron | Cast Iron | Cast Iron |
| Gears | Brass | Brass | Brass |
| Shaft | Stainless Steel | Stainless Steel | Stainless Steel |
| Pump Seal | eramic, Graphite and Vito | Ceramic, Graphite and Viton | eramic, Graphite and Vito |

*** 10 micron filters fitted as standard, particulate filters to 1 Micron available on request
**** We always recommend using a non return valve on a polisher suction line.



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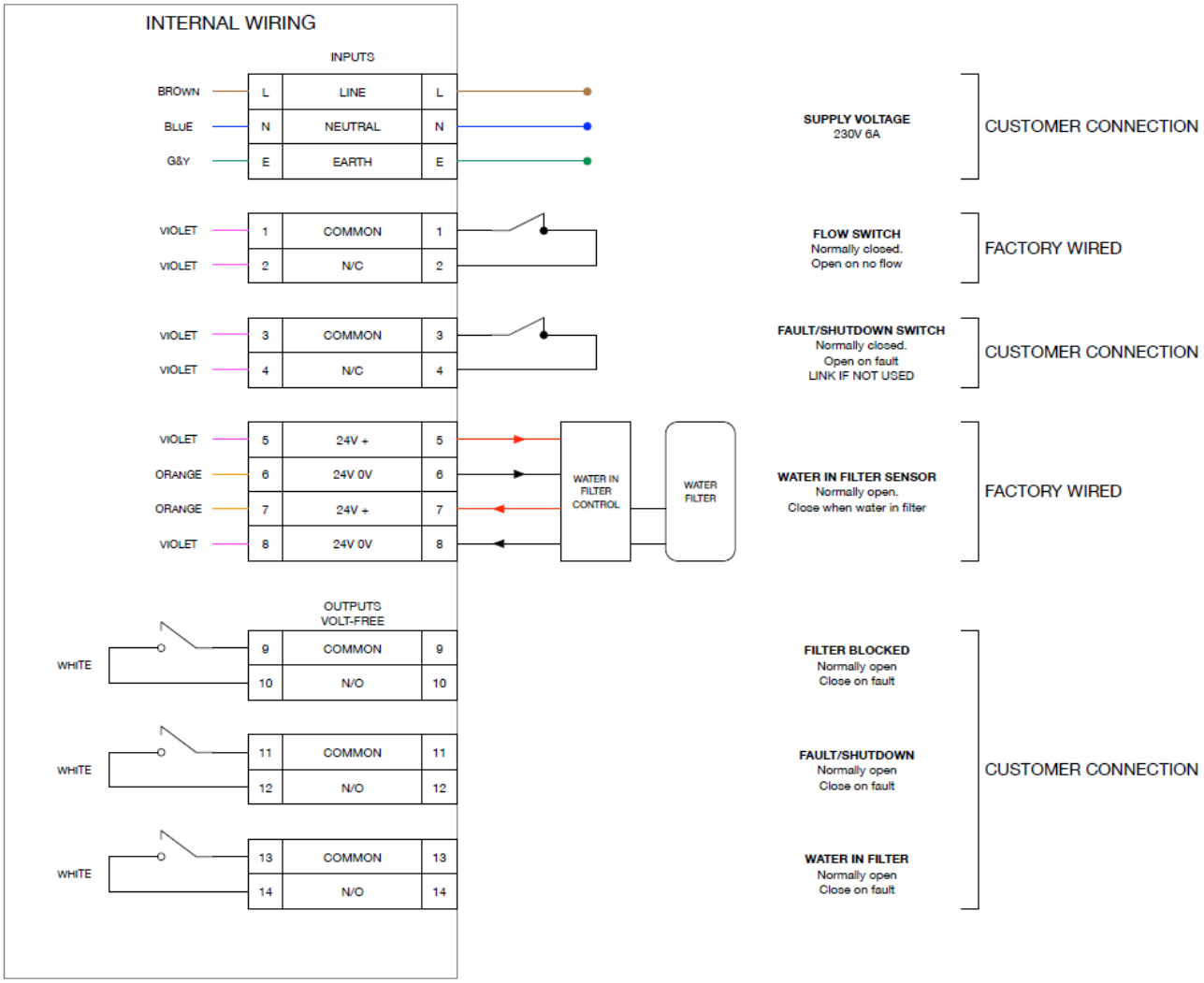
# Wiring Diagram



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# Troubleshooting

| Lamp | Indicates | Intervention required |
|---|---|---|
| White – Power | Polisher Panel is Live | None |
| Orange – Service Filter | Pump is running but no flow is detected. | Contact Metcraft for replacement filter elements |
| Orange – Drain Water | Water detected in Filter | Drain Filter by drain valve at the bottom of the filter housing.<br>Do not drain filter while pump is running. |
| Red = Fault shutdown | User configurable fault.<br>Can be used in conjunction with a float switch to indicate a fault such as a leak in the Polisher cabinet or a low level in the tank to prevent the Polisher running dry. | Pump will remain shut down until the indicating sensor has been reset. |



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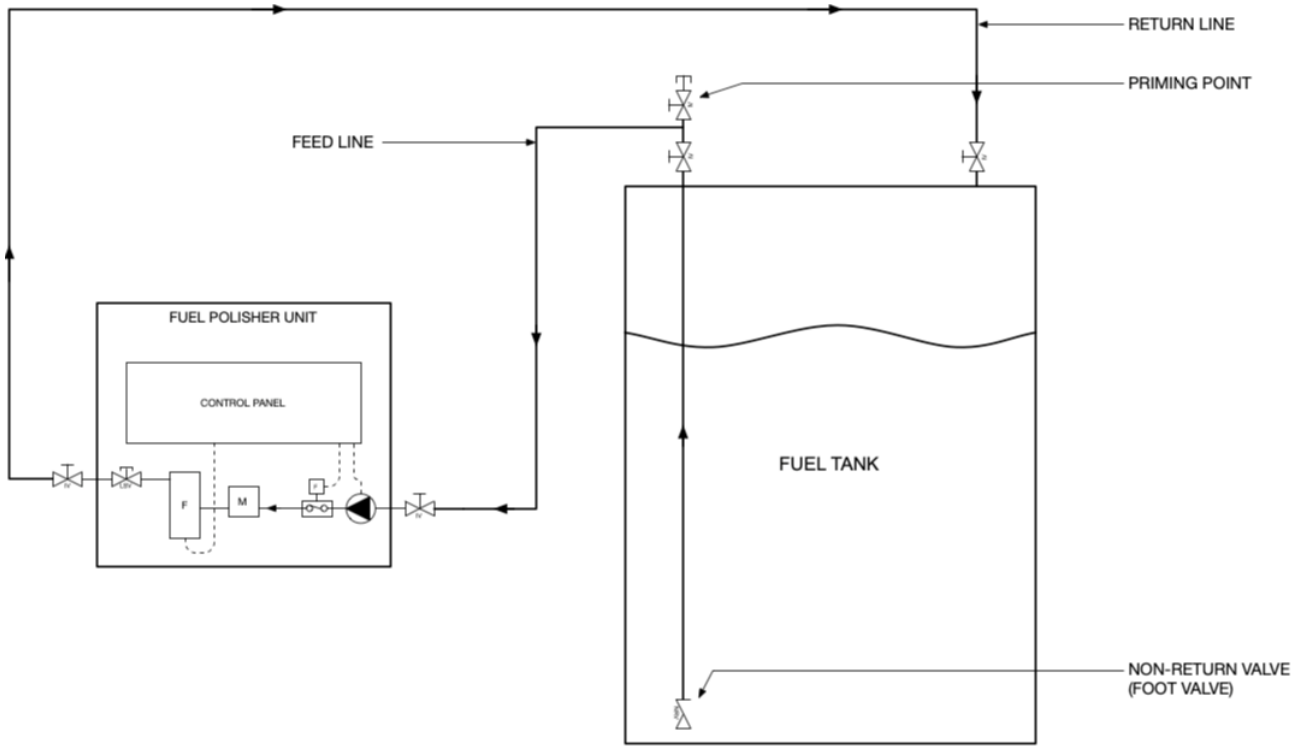
# Installation Schematic

## Top Draw Off



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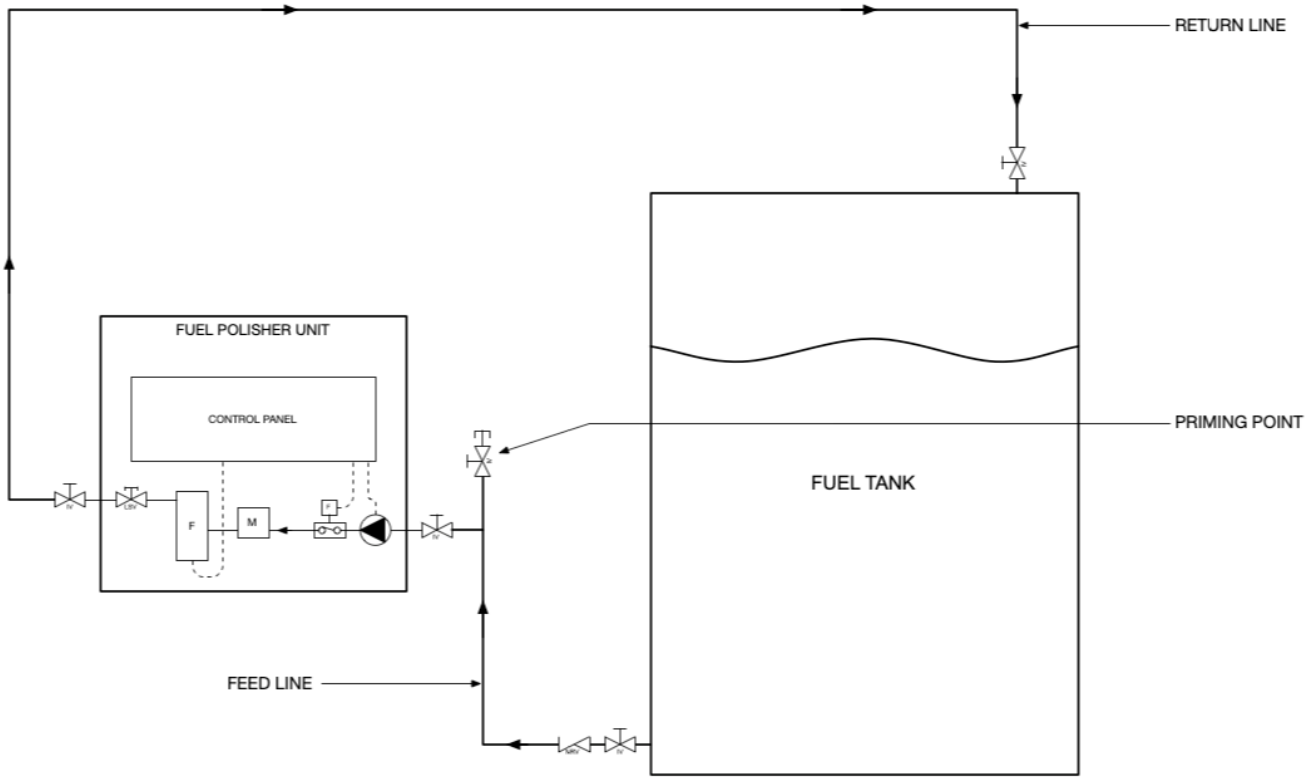
# Installation Schematic

## Bottom Draw Off



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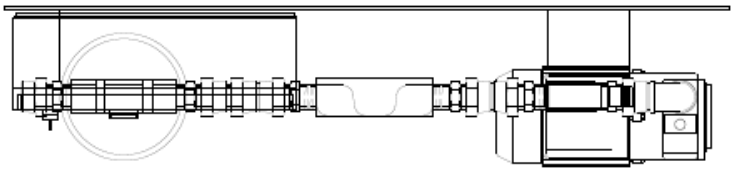
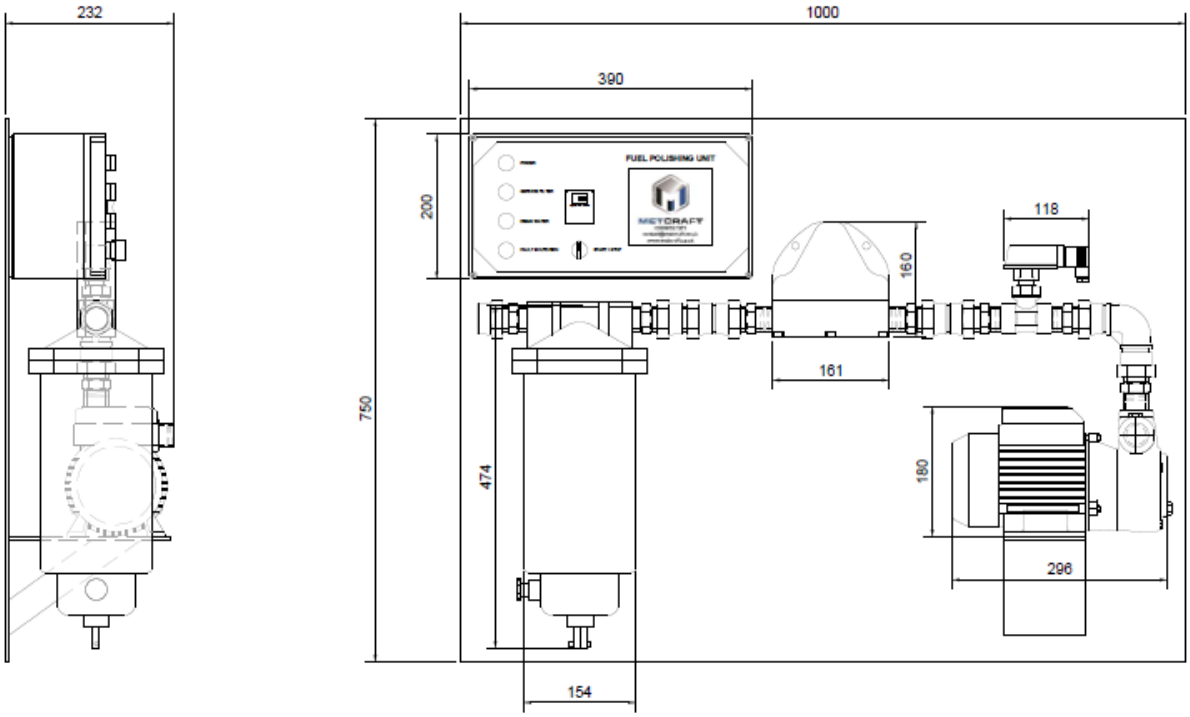
# MET-60KFP GA Drawing





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# FREEFALL FIRE VALVE

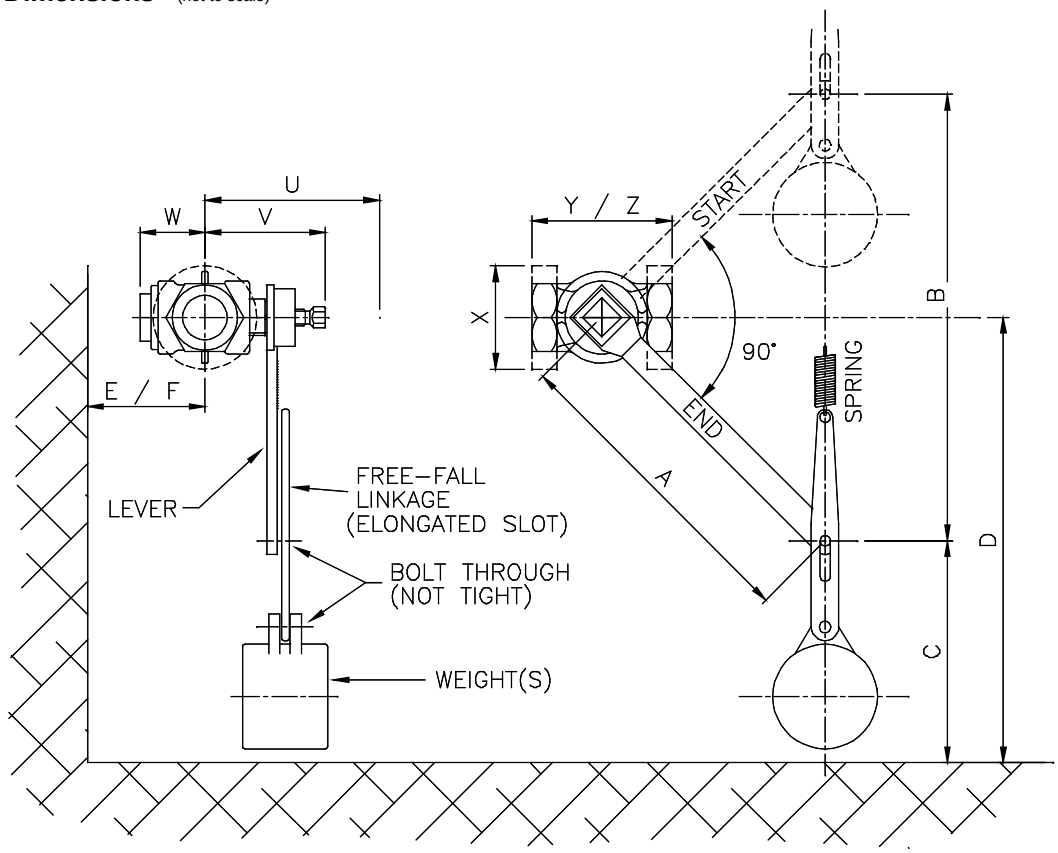
The Landon Kingsway range of free-fall fire valves provide a compact, leak-proof positive action mechanism that can be installed in either horizontal or vertical pipe runs on oil, gas or any non-aggressive media. The valve may be used for either cut-off or dump applications.

The free-fall linkage allows the weight to start to fall before it is required to move the valve lever. This makes sure that the weight achieves sufficient momentum to overcome the initial stiffness of the valve.

## Technical Specification

| | |
|---|---|
| Material | Cast Iron, painted red. |
| Maximum Pressure | 14 Bar (200psi) |
| Standard Cable | 9m |
| Fusible Link | 71°C as standard |
| Maintenance Reqd. | test & lubricate 3 times/year |
| Valve Rotation | 90° (¼ turn) |
| Lubricant | 4",5",6" valves: Type 90<br>under 4"valves: Type 44 |
| Flange Spec | BS4504, PN16 |
| Screwed Spec | BSP parallel |
| Weights Available | 2.25, 4.5, 6.8kg (5, 10, 15lb) |

## Dimensions (not to scale)




Important dimensions

E Min dist to remove plug with valve in-line
F Min dist to wall
U Clearance to remove lubricating screw
X Flange diameter
Y Length of screwed valve
Z Length of flanged valve

| Valve Size | Lever Size | Z | Y | X | W | V | U | A | B | C | D | E | F | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ½" | A | 108 | 95 | 95 | 38 | 60 | 110 | 241 | 343 | 178 | 349 | 152 | 51 | 1x 5lb |
| ¾" | A | 114 | 105 | 102 | 44 | 64 | 114 | 241 | 343 | 178 | 349 | 165 | 58 | 1x 5lb |
| 1" | A | 121 | 115 | 114 | 51 | 73 | 125 | 241 | 343 | 178 | 394 | 191 | 64 | 1x 5lb |
| 1¼" | B | 111 | 140 | 121 | 62 | 83 | 135 | 305 | 432 | 178 | 394 | 229 | 76 | 1x 5lb |
| 1½" | B | 117 | 150 | 133 | 68 | 90 | 144 | 305 | 432 | 229 | 444 | 254 | 76 | 1x 10lb |
| 2" | C | 178 | 165 | 152 | 83 | 125 | 213 | 381 | 540 | 229 | 502 | 330 | 102 | 1x 15lb |
| 2½" | C | 191 | 185 | 165 | 94 | 135 | 222 | 381 | 540 | 229 | 502 | 330 | 102 | 1x 15lb |
| 3" | D | 203 | 200 | 184 | 111 | 167 | 275 | 775 | 1092 | 251 | 800 | 457 | 152 | 1x 15lb |
| 4"† | E | 229 | — | 216 | 141 | 184 | 297 | 629 | 864 | 251 | 683 | 470 | 165 | 2x 15lb |
| 5"† | E | 254 | — | 254 | 160 | 213 | 327 | 629 | 864 | 251 | 683 | 559 | 178 | 2x 15lb |
| 6"† | F | 267 | — | 279 | 184 | 241 | 356 | 737 | 1041 | 276 | 813 | 660 | 203 | 4x 15lb |

† The 4", 5" and 6" valves are only available in flanged versions.

# FREEFALL FIRE VALVE

## INSTALLATION

The valve may be installed in either horizontal or vertical pipe providing it is oriented such that the plug is parallel to the ground. Ensure that any pipe expansion or miss-alignment will not distort the valve body as this will cause it to stick.

Fit the lever onto the square valve shaft and tighten the fixing screw. Make sure that the lever travels freely from 45° up to 45° down.

Attach the free-fall linkage and weight(s) to the lever using the supplied nuts and bolts as shown in the diagrams. If using a 4", 5" or 6" valve, multiple weights and the pulley arrangement must be used as shown below. DO NOT tighten the bolt through the lever and free-fall link too tight as the free-fall link MUST be able to slide freely.

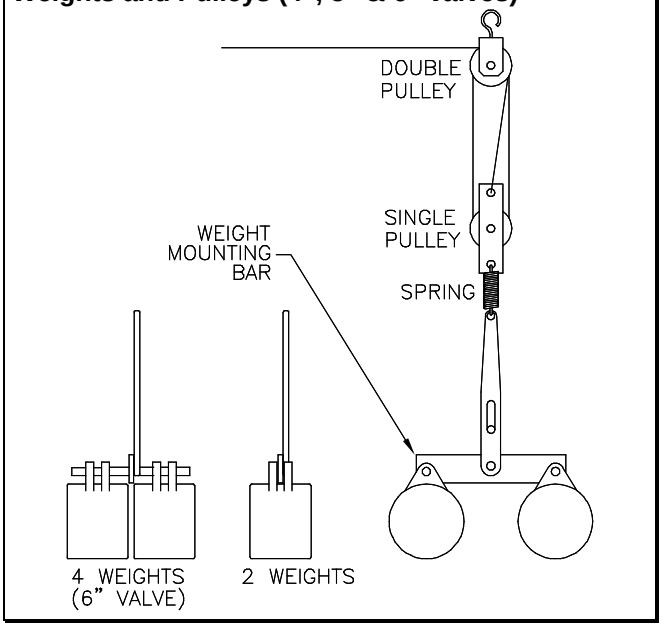
Finally fit the spring and cable to the top of the free-fall link. The cable should run vertically from the spring to the first pulley. The cable should then pass over any anticipated fire hazards with fusible link(s) installed in the cable 0.3 to 1.0m above the hazard. The cable may then be routed to a manual quick release by the exit or terminated at a wall anchor by means of crimping.

**Note:** When using a manual quick release, the distance from the release to the first pulley must be greater than the movement of the arm (B).

To crimp cables together, pass the two wires through a cable connector and crimp using a pair of pliers.

Lift the valve lever into the START/UP position and make sure that the lever pin is at the bottom of the elongated slot in the link. Use the spring/wire strainer to tension the cable.

**Weights and Pulleys (4", 5" & 6" valves)**




NOTE: The close proximity of the flange to the body does not allow room for all bolt holes to be drilled through on the larger valves. The holes are therefore tapped M16 on 4" and 5" valves and M20 on the 6" valve.

**Standard Parts & Spares** *No.* = Standard Quantity

| | |
|---|---|
| *1* | Lever (sizes A to F depending on valve size) |
| *1* | Free-fall elongated slot link |
| *9m* | Cable - s/steel (30m, 150m, 300m, 760m avail.) |
| *2* | Brass woodscrew hooks with pulleys |
| *1* | ¼" BSP screw hook with pulley |
| *1* | Brass wall anchor |
| *1* | Turnbuckle/wire strainer (for valves ≥ 2" BSP) |
| *1* | Weight mounting bar (for valves ≥ 4") |
| *5* | Cable connectors (soft tube) |
| *1* | Tension Spring (light / heavy types) |
| *1* | Fusible link 71°C (std.), 92°C, 104°C, 127°C, 143°C, 180°C avail. |
| *1* | Warning notice to hang on cable |
| *1* | Double Pulleys (for 4", 5" & 6" valves) |

## TEST

Release the cable by releasing the quick release mechanism. The valve should close in a controlled manner with the lever travelling through a full 90°.

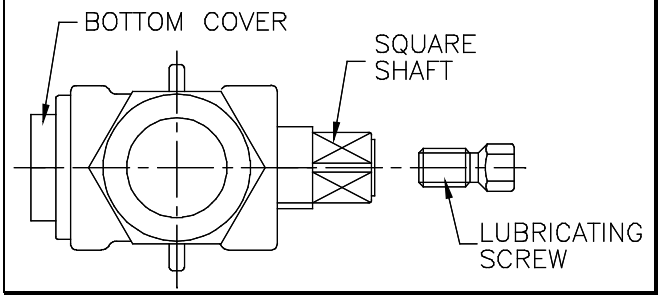
If the valve does not travel through the full 90° (¼ turn):

- Check for physical obstruction of the lever and weight(s) E.g. pipework
- Check the fusible link(s) and cable joins do not jam against pulleys
- Make sure that the cable is fitted around the pulleys and has not slipped off
- Lubricate the valve if stiff (see below)

## LUBRICATION

If using a grease injection gun, connect to the grease nipple at the end of the lubricating screw. If lubricating by hand remove the lubricating screw from the end of the square shaft. Fill the reservoir inside the shaft with lubricant and replace the screw. Tighten the screw until a definite increase in resistance is felt, inserting further lubricant as necessary. 'Pump' the valve lever up and down several times to ensure the valve is free-moving.

**Lubrication Access**




If you have any questions or need any help then please contact our sales office.

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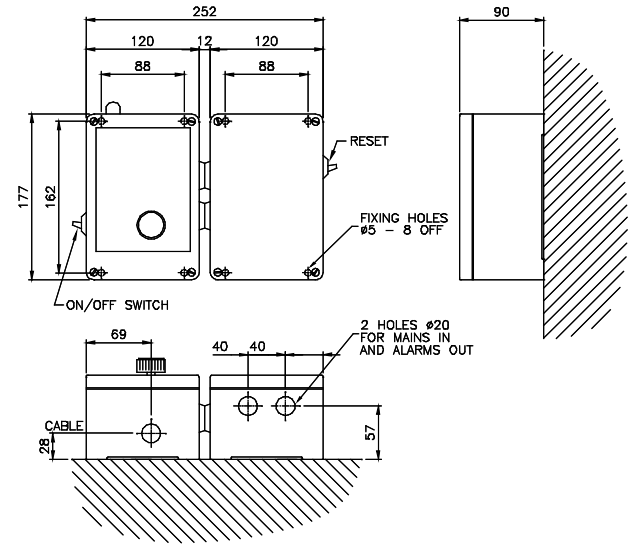
# SOLENOID QUICK RELEASE Mk II

The Solenoid Quick Release Mechanism Mk II is designed to provide a simple electro-mechanical release mechanism for gravity-operated devices such as the Landon Kingsway free-fall fire valve.

The system consists of a steel cable wound around a drum with a solenoid arranged so that when energised, the drum is locked in place. If the electrical supply to the solenoid is interrupted then the solenoid latch releases the drum and the weight of the attached load causes the cable to unwind.

The Mark II version incorporates a safe power supply to a sump switch whereby the power to the external switch is cut if there is an emergency. The unit also provides two switched power outputs, one is normally on and turns off in the event of an alarm, the other is normally off and turns on in the event of an emergency.

## Dimensions




## INSTALLATION

The mechanism should be securely fastened directly above the load to be operated such that the cable follows an uninterrupted path from the mechanism. The length of the cable should be checked and needs to be long enough to allow the load to fall to its lowest level. If necessary, the cable can be extended provided that any joins in the cable do not enter the unit when the load is raised.

Electrical Connections:

| | |
|---|---|
| 5,6 | Supply in |
| 7,8 | Normally-off switched supply out (may be used to power an alarm unit). |
| 9,10 | Switch wire connections |
| 11,12 | Normally-on switched supply out (may be used to shut-off an external system). |

## Technical Specification

| | |
|---|---|
| Supply Voltage | 230Vac, 110Vac, 24Vdc |
| Power | 20W |
| Switched Supply | 8A Max |
| Enclosure | Grey painted cast iron |
| Dimensions | 252 x 177 x 90mm (W,H,D) |
| Fixing Centres | 220 x 162mm Ø5mm |
| Weight | 3.6 kg |
| Maximum load | 13.6 kg (30 lbs) |

## OPERATION

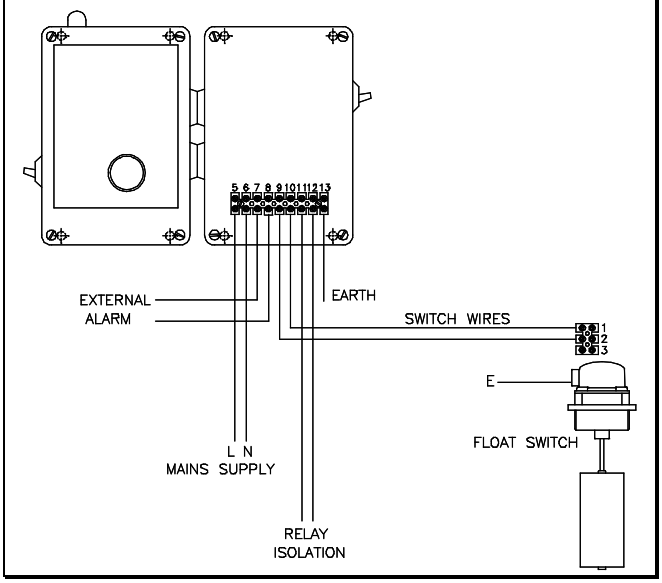
The unit has an on-off switch on the left side of the case and a momentary switch on the right side of the case which is used to reset the latch.

To set the mechanism, first check that the power switch on the left side of the case is off (up) then lift the load into the 'normal' position and while keeping the cable under tension, wind in the cable by turning the knob on the unit in a clockwise direction. Do not turn in an anticlockwise direction or try to lift the weight of the fire valve by turning the knob as this will damage the unit.

Press the switch on the left side of the unit down to turn the unit on and latch the system via the momentary switch on the right side of the case. The solenoid will 'click' on to latch the cable drum and the lamp on the top of the unit will light.

If the solenoid fails to engage, check that the switch wires are correctly connected to the normally closed contacts on the sensor/float.

## Wiring Diagram




If you have any questions or need any help then please contact our sales office.

# Manual Quick Release Mechanism

**For use with Fire Valve Equipment**

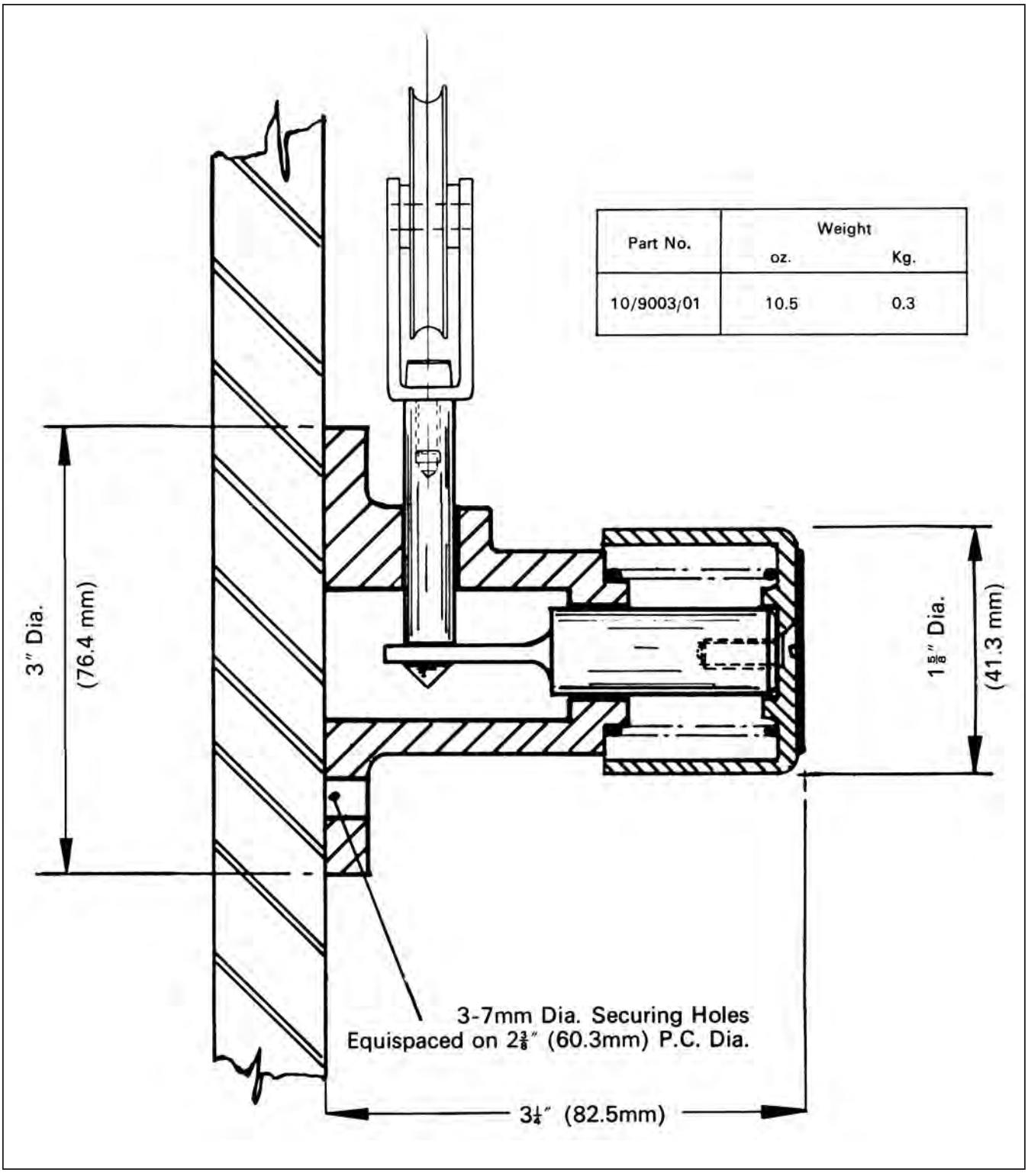
There are occasions where it is thought desirable that some provision should be made to enable the boiler-house staff or anyone else to shut down the fire valve from the boiler-house door or some other point if they should find a fire starting at or near the boilers or in some other part of the building. It is argued that it is absurd to wait until the fire assumes the proportions where the fusible links will melt and the fire valve will close. B.S.S. 799/53 recommends the use of a quick release of this type.

To meet this requirement, we have produced a Manual Quick - release mechanism of the wall-fixing type to which the fire valve cable is attached. If the button is firmly press ed or hit, the pin to which the cable is attached is released and tension on the cable released at the same time. When the emergency is over, the pin can be re-set and the cable tension restored.

A large number of these mechanisms are in use and giving good service.

The dimensions can be seen on the next page.

# Manual Quick Release Mechanism

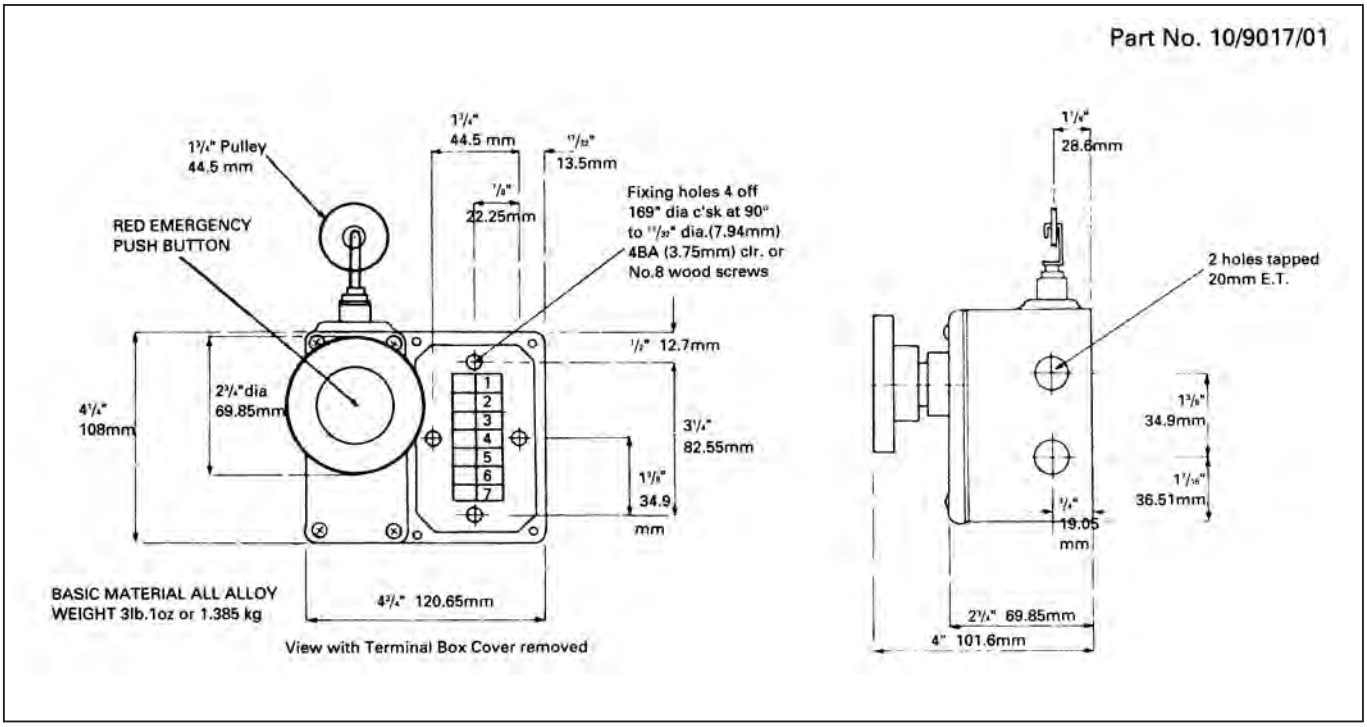


# Electromek MK2 Quick Release


This equipment replaces the original Electromek Manual Quick Release Mechanism and is designed for use in conjunction with the Kingsway Fire Valve and Accessory Equipment as an emergency button to sound alarms and render the equipment safe by a switching action. It is operated either as a mechanical switch actuated by the release of a fusible link network under tension, or by hand pressure, causing a two pole change-over switch operation as well as mechanically releasing the fire valve by means of the fusible link arrangement. Thus it may be used in conjunction also with the Kingsway Manual Quick Release Mechanism, Solenoid Quick Release Mechanism and Sumpguard Equipment.

To operate, strike the red button. The plunger situated in the top of the equipment will then be ejected and the fire valve cable released, allowing the fire valve attached to the wire to fall, shutting off the oil supply. At the same time this action will shut off the electrical supply to the burner, or other load, which is automatically disconnected and a further circuit made to indicate an alarm, either visually, audibly, or both, according to the design requirement. The mechanism will also actuate by means of the parting of the fusible links which allow the plunger normally under tension to be pulled down into the Electromek and thus repeat the same action.

**TO RESET THE MECHANISM DEPRESS THE RED PUSH BUTTON AND PLACE THE PLUNGER INTO THE HOLE IN THE TOP OF THE UNIT. SET THE CENTRE SHAFT CARRYING THE PULLEY TO ITS FULLY EXTENDED POSITION AGAINST THE SPRING BY OPERATING THE WIRE; THEN RELEASE THE PUSH BUTTON AND THE PLUNGER WILL REMAIN IN ITS OPERATING POSITION AND THE APPARATUS IS NOW IN ITS FULLY OPERATIONAL STATE.**



# Electromek MK2 Quick Release

## CONSTRUCTION AND INSTALLATION

The Electromek Mk11 is produced in an aluminium alloy box suitable for wall fixing. It is robust and damp proof and should be mounted in the vertical position by means of the fixing holes (4 off located in the terminal box on the right hand side of the push button). Electrical connection is made via two fl E.T. screw holes in the side of the terminal block housing to which may be fixed fl electrical conduit. When the apparatus is set in its working position, the plunger on to which the pulley is secured must be fully located within the housing behind the red emergency button and fully extended by the tension of the wire passing through it. The actual location of the Electromek should be on a flat surface easily accessible, preferably near to a door The position should also be such that the action of the plunger when released by the red push button is not impaired to allow easy and unrestricted action of the wire passing through the pulley.

## ELECTRICAL AND TECHNICAL DATA

Connection should be made using 1/1.13" (1mm$^2$) or 32/0.20" (1mm$^2$) cable which should be connected to the terminal block in the connection housing which is located adjacent to the emergency button and near to the cable entries. This terminal block is internally wired to two automatic reset microswitches. These two microswitches are fixed in a separate compartment under the red push button and should on no account be disturbed. W ithin the microswitch compartment is also found the releasing lever and bridge which retains the spring loaded plunger. The releasing bracket or lever is fixed to the red push button through the cover plate. The spring loaded plunger is fitted with a running sleeve which, when placed in the hole in the top of the box and depressed, is located in the bridge piece attached to the red push button. This action also sets or resets the microswitches and if the plunger is not in position the alarm circuit contacts will continue to be made, i.e. changed over to the emergency position.

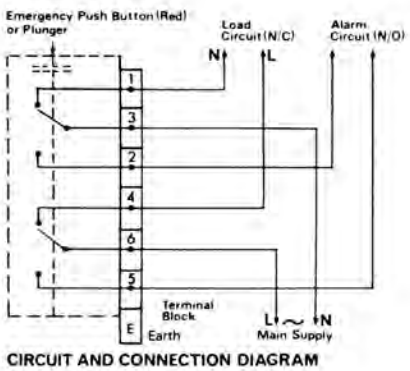
**SWITCHES**. Mechanical Rating Life is 100,000 to 1,000,000 Operations.
**PLUNGER LOADING**. The load to operate against the plunger spring should be not less than 5.5lbs. (2.4 Kg.)

**NOTE: The D.C. rating should never exceed its A.C. rating. For 3 phase function in excess of 5 amps. the Electromek should be used in conjunction with a 3 phase contactor.**

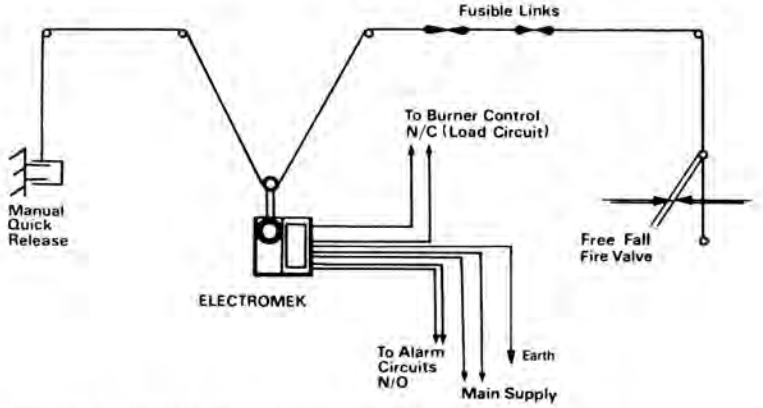
**Part No: 10/9017/01. Rating: 240 volts at 5 amps maximum. Actio n: Double pole changeover. Weight: 3lb 1oz (1.39Kg.)**

| VOLTS A.C. | RESISTIVE LOAD (AMPS) | | TUNGSTEN LAMP LOAD (AMPS) | | INDUCTIVE LOAD (AMPS) | |
|---|---|---|---|---|---|---|
| | N.C | N.O | N.C | N.O | N.C | N.O |
| 110 | 10 | 10 | 1 | 1 | 10 | 10 |
| 230 | 5 | 5 | .5 | .5 | 5 | 5 |
| 440 | 3 | 3 | .3 | .2 | 3 | 2 |
| 6/8 D.C. | 15 | 15 | 3 | 1.5 | 8 | 8 |
| 12/14 " | 15 | 15 | 3 | 1.5 | 5 | 5 |
| 24/30 " | 2 | 2 | 3 | 1.5 | 1 | 1 |
| 110/115 " | .4 | .4 | .4 | .4 | .03 | .03 |
| 220/230 " | .2 | .2 | .2 | .2 | .02 | .02 |

N.C. Refers to normally closed terminals of the switch.
N.O. Refers to normally open terminals of the switch.



CIRCUIT AND CONNECTION DIAGRAM



TYPICAL MECHANICAL ARRANGEMENT

# Solenoid Quick Release Mechanism


## For weight operated Fire Valves

There are many instances when it is desirable that the oil supply to an oil burner should be capable of being shut off by electrical means rather than by purely mechanical means. For instance, it may be desirable that the oil supply should be severed through the medium of an air thermostat recording an excessive air temperature, or by a float switch indicating that an oil pipe has fractured allowing oil to flood into a boiler house. There are also cases where it is more convenient to use thermostats and electrical cable in a boiler house rather than tension cable and fusible links, which can be unsightly and difficult to run. The use of large solenoid valves acting directly in the main oil line is both expensive and a possible source of trouble, especially where very viscous oils are used.
It therefore appeared to us that the most satisfactory solution is to use an electro-mechanical method of shutting off the oil supply. The result is the Mark I "KINGSWAY" Solenoid-Operated Quick-Release Mechanism which holds open a weight-operated fire valve whilst current is flowing to the unit which releases the weight-operated fire valve, allowing it to fall into the closed position when the current to the box is interrupted.

The solenoid-operated quick-release mechanism shown in the illustration, and which consists in essence of cable wound onto a drum, is the subject of a provisional patent. The drum is attached to a toothed gear wheel. A solenoid within the box is fitted with an extension, so arranged that it will lock the toothed gear when the solenoid is energised. If the electrical supply to the solenoid is interrupted, the toothed gear and the drum is free to rotate which allows the weight-operated fire valve to shut and close the oil supply to the boiler house. The maximum direct weight the unit will carry is 20lbs. (9.1kg) but of course by using mechanical advantage, far greater weights could be supported.
The immediate advantages which can be obtained from the "KINGSWAY" Solenoid-Operated Quick-Release Mechanism are as follows:

1. It is absolutely positive and immediate in its action.

2. The device is considerably cheaper than the use of a solenoid valve directly in an oil line.

3. It fails 'safe' because any interruption in electrical supply will result in the oil supply being closed.

## Typical uses

The "KINGSWAY" Solenoid-Operated Quick-Release Mechanism can be used in a number of different ways, i.e.,

1. It can be used to hold open weight-operated fire valves designed to close should the thermostat record excessive air temperatures.
2. It can hold open weight-operated fire valves designed to, close if a float switch registers a rise of oil level in a sump in the boiler house floor.
3. It can hold open doors or dampers, using mechanical advantage, which could be released into the closed position in case of a temperature rise.

Our technical engineers are always available to advise on other uses of this equipment which are not covered in this leaflet.

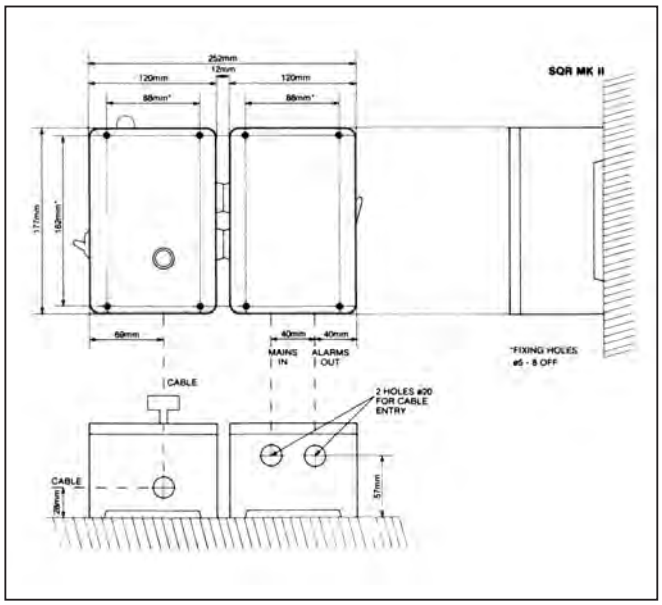
## Solenoid Quick Release Mechanism MK II

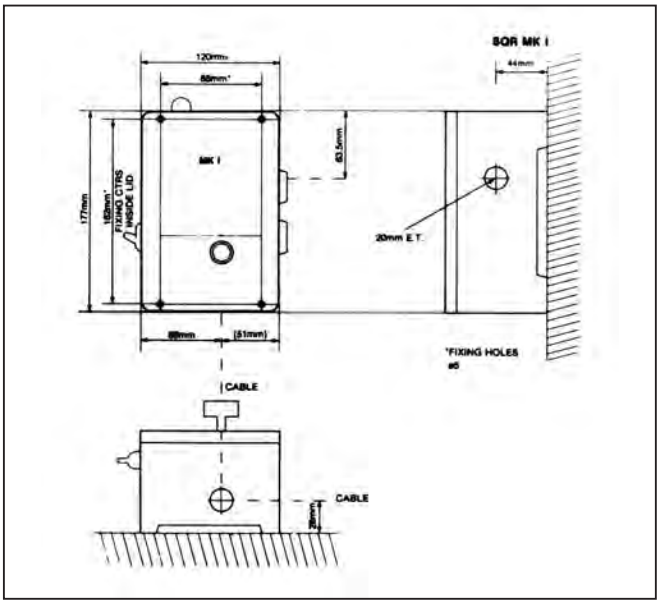
We also supply the Solenoid Quick Release Mechanism MK II. This is particularly recommended when the Solenoid Quick Release Mechanism is being used in conjunction with a sump switch. Should the Kingsway float switch operate due to the sump being filled with either oil or water, it breaks the circuit to the solenoid, allowing the fire valve to close. The self-holding relay is also de-energised, which breaks the feed to the sump switch. The relay has back contacts which break on de-energisation, enabling remote visual and audible alarm to be connected to the unit. If a self-holding relay is not used when employing a sump switch, it does mean that when the sump switch operates, a live line is still fed to the sump switch which could prove dangerous if the boiler house were to flood with water.

This additional relay can, of course, be used on other applications where it is necessary to have remote indication of the fire valve operating, or alternatively can be used to operate further solenoid quick releases which may close or open the fire prevention dampers.

| MKI | | |
|---|---|---|
| Supply | Amps | Part No. |
| 230/50V 50Hz | .07 | 10/9010/01 |
| 100/10V 50Hz. | .16 | 10/9010/04 |
| 24V DC | .62 | 10/9010/03 |

| MKII | | |
|---|---|---|
| Supply | Amps | Part No. |
| 230/50V 50Hz. | .08 | 10/9010/02 |
| 100/10V 50Hz. | .19 | 10/9010/05 |
| 24V DC | .73 | 10/9010/06 |




### Electrical Supply

Both the MKI and MKII models can now be supplied for the following voltage ranges:

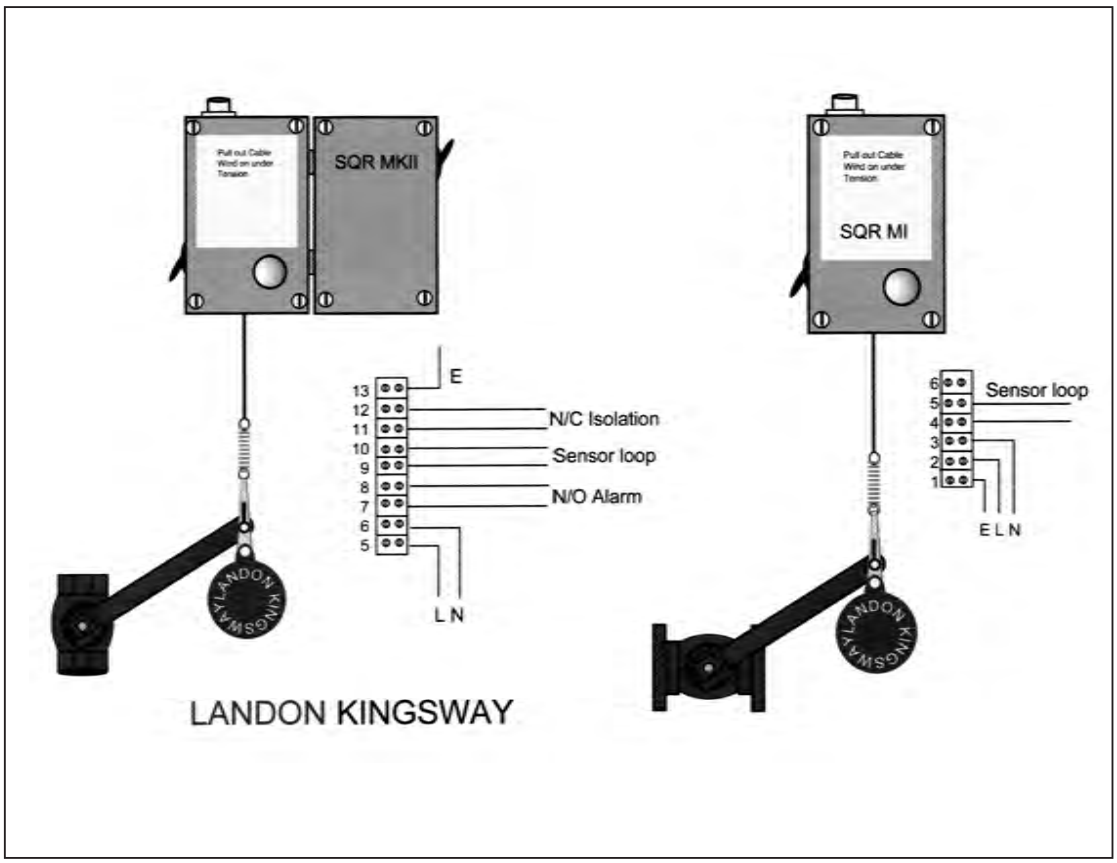
230/250V 1PH 50 Hz.

100/110V 1PH 50Hz.

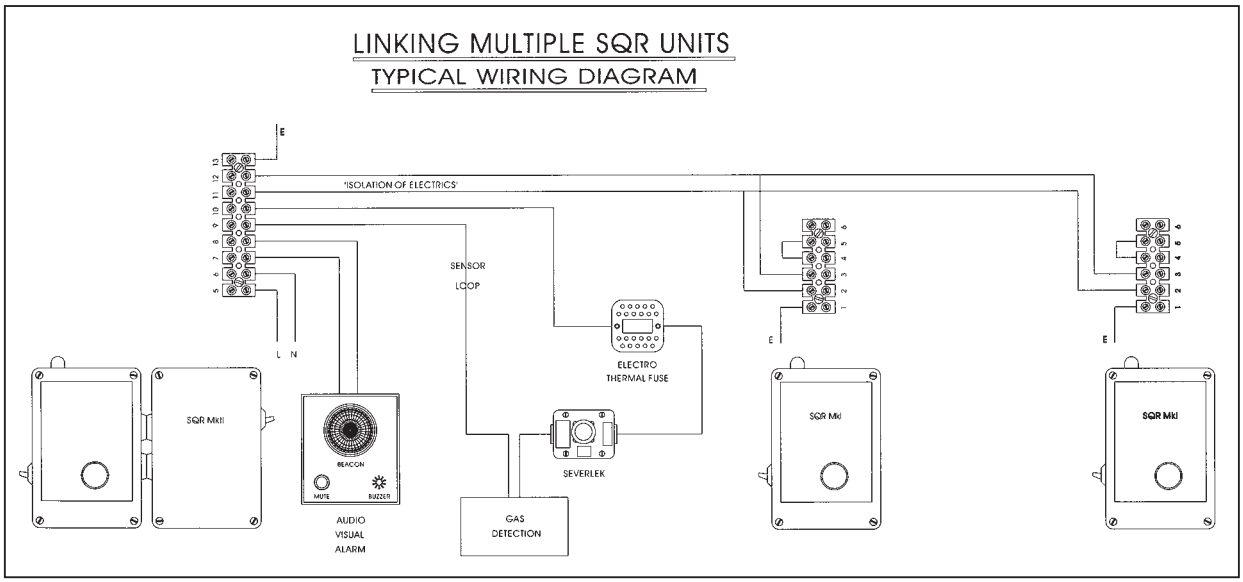
24V DC

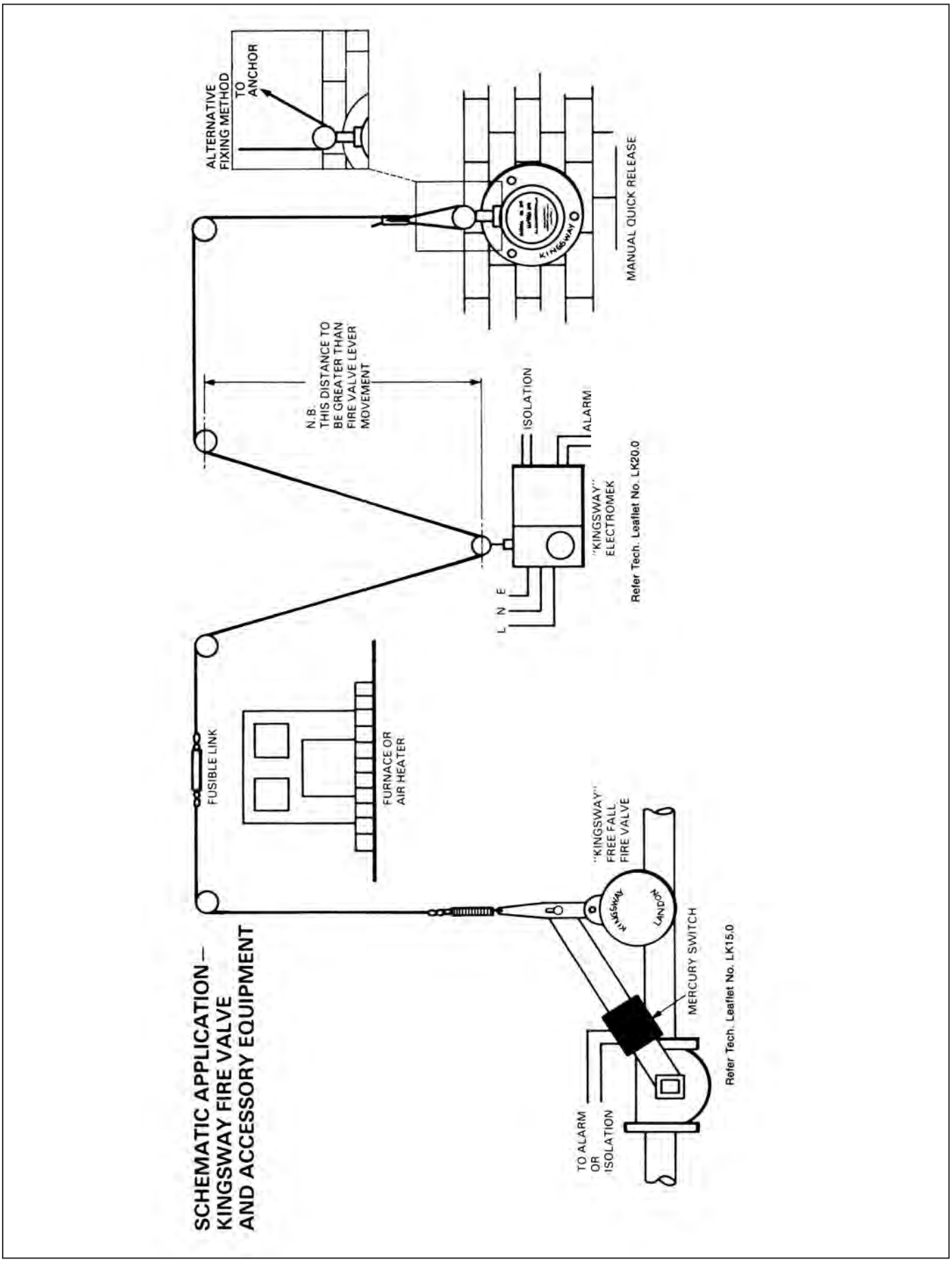
# Solenoid Quick Release Mechanism

## WIRING DIAGRAMS



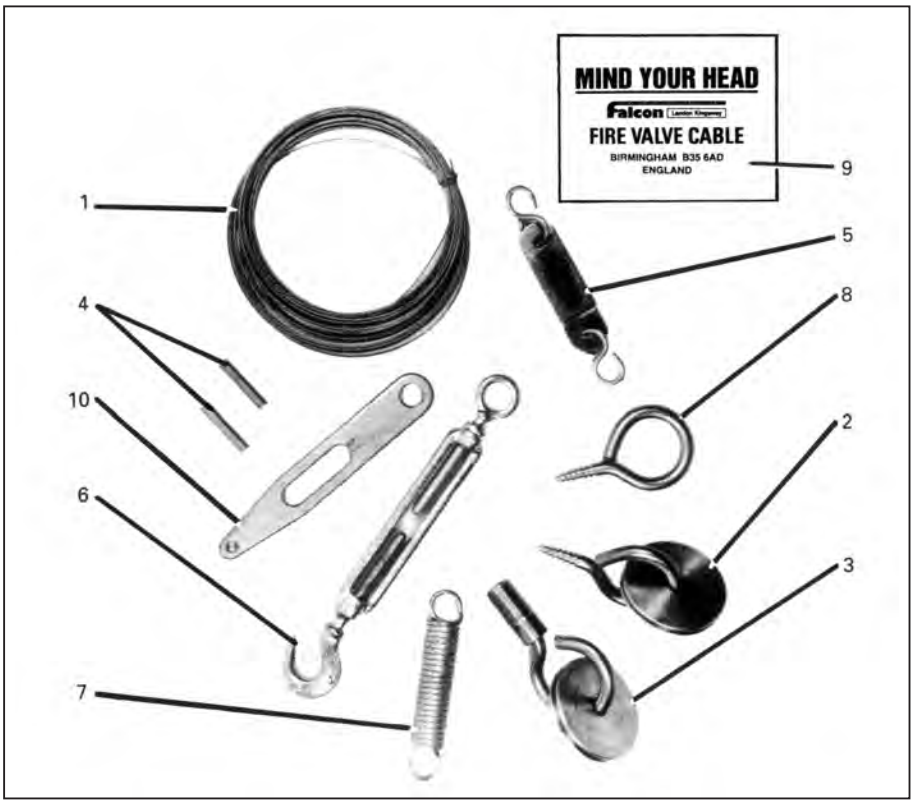

## LINKING MULTIPLE SQR UNITS TYPICAL WIRING DIAGRAM




SCHEMATIC APPLICATION –
KINGSWAY FIRE VALVE
AND ACCESSORY EQUIPMENT
ALTERNATIVE FIXING METHOD TO ANCHOR
MANUAL QUICK RELEASE
N.B.
THIS DISTANCE TO BE GREATER THAN FIRE VALVE LEVER MOVEMENT
ISOLATION
ALARM
"KINGSWAY" ELECTROMEK
Refer Tech. Leaflet No. LK20.0
L N E
FUSIBLE LINK
FURNACE OR AIR HEATER
"KINGSWAY" FREE FALL FIRE VALVE
MERCURY SWITCH
TO ALARM OR ISOLATION
Refer Tech. Leaflet No. LK15.0

# Spares for Free Fall Fire Valves

| | Spares | Part number |
|---|---|---|
| 1. | Stainless Steel Cable | |
| | 30 ft. | 10/0157/08 |
| | 100 ft. | 10/0157/09 |
| | 500 ft. | 10/0157/10 |
| | 1,000 ft. | 10/0157/11 |
| | 2,500 ft. | 10/0157/12 |
| 2. | Pulley with open eye wood thread | 10/9036/04 |
| 3. | Pulley with open eye 1/4 B.S.P. thread | 10/9036/05 |
| 4. | Cable connector | 10/0045/01 |
| 5. | Fusible Links | |
| | 160°F | 10/9028/01 |
| | 198°F | 10/9028/03 |
| | 220°F | 10/9028/05 |
| | 260°F | 10/9028/06 |
| | 290°F | 10/9028/08 |
| | 356°F | 10/9028/10 |
| 6. | Cable Strainer | 99/0097/01 |
| 7. | Tension Spring | 10/0340/01 |
| 8. | Wall Anchor Screw wood thread | 10/0303/01 |
| 9. | Mind your head notices | 10/0121/01 |
| 10. | Small gun-metal link for all valves (brass slotted) | 10/0329/02 |



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# Product Data Sheets

## Multi-Channel Tank Alarm with Relays


Codes: SWS2000 / SWS2001

CE

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# SAFETY WARNINGS

**WARNING:** Electricity can kill!

**Before** connecting the alarm
**always** disconnect the supply at the consumer unit.
If in **any** doubt consult a qualified electrician.

PLEASE USE TOOLS WITH PRECAUTION.
MISUSE OF HAND/POWER TOOLS
CAN CAUSE SERIOUS HARM!

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# INSTALLATION

**WARNING:** Electricity can kill!

**Before** connecting the alarm
**always** disconnect the supply at the consumer unit.
If in **any** doubt consult a qualified electrician.

This unit is designed for installation in exposed locations. **DO NOT** damage the front panel seal, failure to do so could result in water ingress.

**1.** Open the Perspex door by turning the white tab anticlockwise a quarter turn. Remove this door from the unit.

**2.** Remove the front panel by turning the four plastic screws anticlockwise half a turn.

**3.** Once all four plastic screws are vertical, proceed to lift the front panel from the base. **(DO NOT ALLOW THE FRONT PANEL TO HANG UNSUPPORTED ON THE RIBBON CABLES)**

**4.** Drill out the four mounting holes in the base.

**5.** Cable entry glands are to be positioned at the bottom.

**6.** Screw the base to the mounting surface ensuring the sealing caps are inserted to prevent water ingress. **(THE BASE MUST BE FLAT. DISTORTION CAN RESULT IN WATER INGRESS)**

**7.** Use four non-countersunk screws for mounting, do not overtighten.

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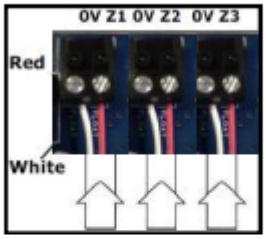
**8.** Feed the probe cable through the gland and connect to the probe screw terminal. Repeat the step for the second and third probes.

Typical system setting:

**Zone 1** - Overfill / High probe

**Zone 2** - Bund Probe

**Zone 3** - Low Level Probe




**9.** The power supply must be isolated.

Connect the power cable and select the voltage switch.

The unit is manufactured with a supply voltage of either 230v AC, 115v AC, 24v DC or 12v DC.

**Never connect both AC and DC power simultaneously to the power supply as this will damage the unit.**

If in any doubt consult a qualified electrician.


**Power Input - AC 230v or 115v**

**10.** Reconnect the front panel door ensuring the ribbon cable is connected and the seals are undamaged.

## Power Input - DC 12v or 24v

The DC supply, Brown wire should go to positive (B+) and Blue to negative (B-).

**It is important to take basic safety precautions and ensure the power is off during wiring.**

**12v DC or 24v DC Input**

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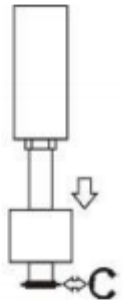
# PRELIMINARY CHECKS

## POWER

The power LED should be illuminated. Press the **TEST** button for 2 seconds to make sure the alarm is operational. If no zones are active, the lights and sounder will stop when the button is released.

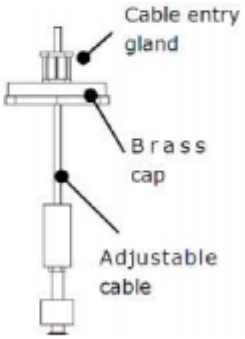
## PROBES

Before installing the probes into the tank, manually move the float by hand. The **HIGH** and **BUND** alarms will sound when the floats are moved to the top of the shaft and the corresponding LED should illuminate.




The LOW level alarm will sound when the float is moved to the bottom of the shaft.

If the **HIGH** or **BUND** alarms sound when the float is moved to the bottom of the shaft or the **LOW** level float moves to the top of the shaft, then remove the float by taking off the cir-clip, rotating the float 180°, refitting to the shaft and putting the cir-clip back to where it was removed from. (See diagram)




The probe position can be adjusted to the required height by loosening the cable gland on the brass cap. The cap can then be moved up or down the cable until the required height is achieved. Retighten the cable gland and secure the cap to the tank.

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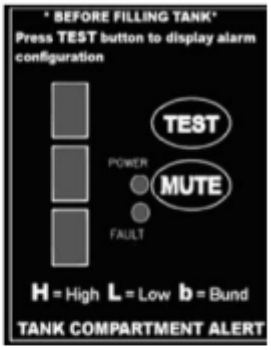
# ALARM OPERATION




To test the alarm press and hold the **TEST** button. Whilst the button is pressed, all the configured zones, fault, strobe and sounder will activate. If no zones are active, all the lights and sounder will stop when the button is released.

To mute an active alarm, press the **MUTE** button. The strobe & sounder will stop but the active zone LED will remain illuminated until the zone is cleared.

The 3 displays can be configured as any of the following:

**High - H** **Bund - b** **or** **Low Level - L**

Alarm configuration is displayed when the **TEST** button is pressed & held.

Periodically - and **specifically before each filling** - to ensure unit has power and is operating correctly press and hold the **TEST** button, all zones and the amber strobe should illuminate and the sounder should activate.

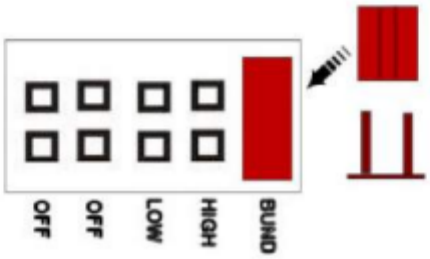
**To change the display, adjust the Zone Jumpers Z1, Z2 & Z3:**

**H** on Display = Jumper set to **HIGH**

**L** on Display = Jumper set to **LOW**

**b** on display = Jumper set to **BUND**

**No Display** = Jumper set to **OFF - Zone De-activated**

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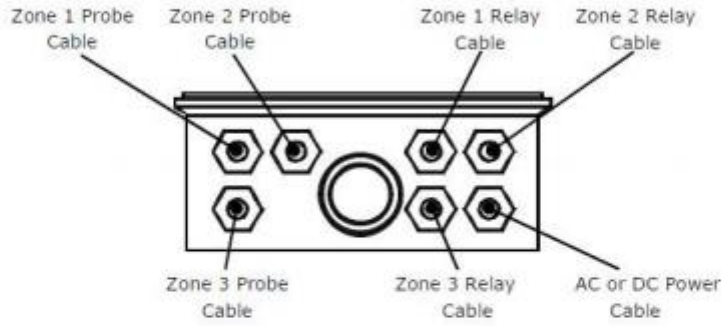
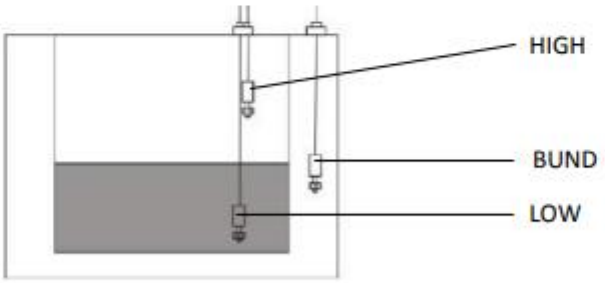
# INSTALLATION DIAGRAMS

## CABLE ENTRY

If the cable entry point is not used, remove gland and seal hole with the blanking cap supplied.




## PROBE CONNECTIONS




The probe wired to the **HIGH** connection is positioned at the topmost part of the tank and is used to alert that an overfill has occurred. The probe wired to the **LOW** connection should be positioned near the bottom of the tank to indicate a low-level. The **BUND** probe is placed between the two tank 'skins' and is used to quickly alert of any leaks.

When shipping a tank by road, make sure the probes are stored at the top of the tank to prevent any damage cause from swinging.

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## RELAY OUTPUTS (OPTIONAL)

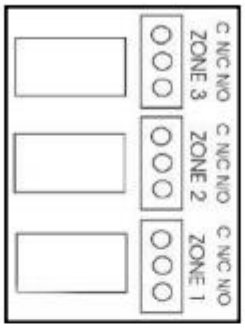
The volt free relay outputs allow switching of external equipment when either High, Bund or Low-level zones are activated e.g. an external sounder can be activated in the event of an overfill.

**Printed on the boards are:**

**C = Common**

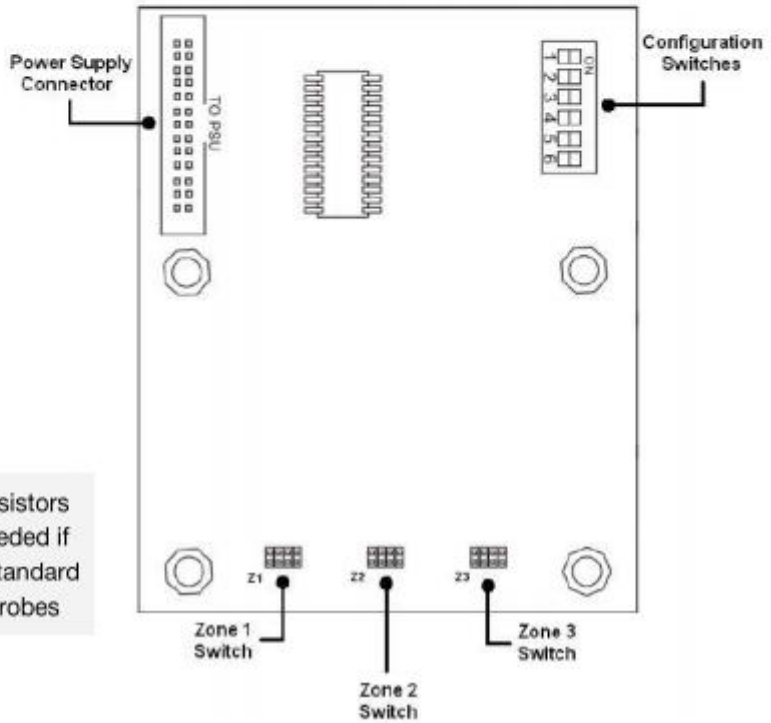
**N/O = Normally Open**

**N/C = Normally Closed**




Maximum switch voltage is 240v and maximum switch current is 8 Amps.

## INTERNAL LAYOUT DIAGRAM (DISPLAY BOARD)




Included resistors are only needed if using non-standard resistive probes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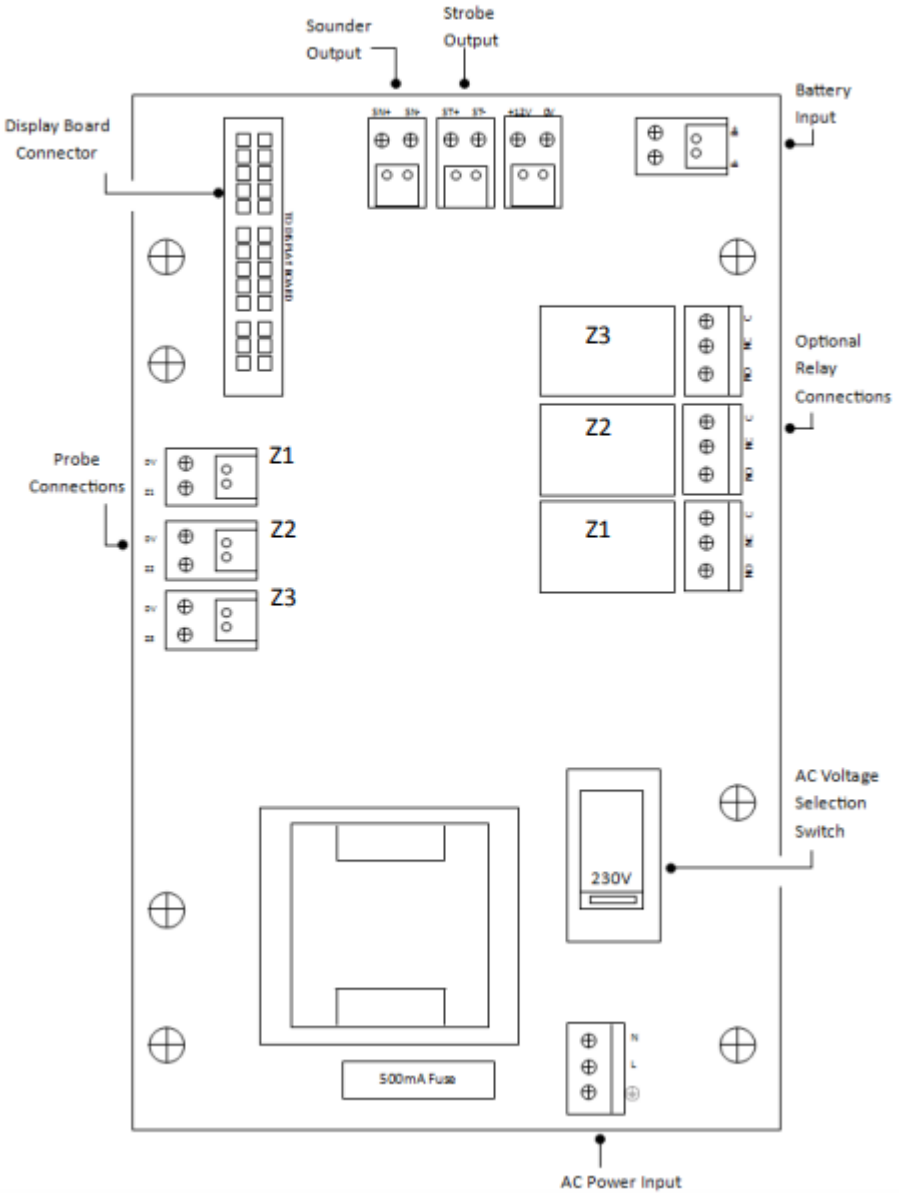
# POWER BOARD DIAGRAM

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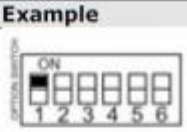
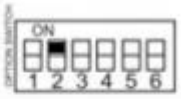
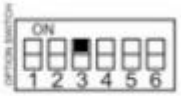
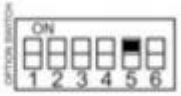
# EXTENDED CONFIGURATION

| Switch No | Status | Function | Example |
|---|---|---|---|
| 1 | OFF | Standard Switched BUNA probes |  |
| 1 | ON | Resistive Type Probes 1-2KΩ<br>(2K resistors required on non used zones) | |
| 2 | OFF | Normal |  |
| 2 | ON | Sounder OFF on Zone-1 & Zone-3<br>If SW2 = ON then SW3 must be OFF | |
| 3 | OFF | Normal |  |
| 3 | ON | Sounder OFF on Zone-3 only<br>If SW3 = ON then SW2 must be OFF | |
| 4 | OFF | Normal | |
| 4 | ON | Pump Controller on Zone-1 & Zone-3<br><br>Set Zone-3 to LOW<br>Set Zone-1 to HIGH<br>Connect Pump switching through ZONE-3 Relay<br><br>When Zone-3 (LOW) is activated, Zone-3 relay will stay switched on until Zone-1 (HIGH) is activated – system will automatically reset ready for Zone-3 (LOW) activation again.<br><br>N.B. Wire in a separate EMERGENCY stop button into pump circuit. |  |
| 5 | OFF | Normal |  |
| 5 | ON | Single Tank Mode (Fault Testing)<br><br>If Zone-1 (HIGH) and Zone-3 (LOW) activate together then fault condition occurs - (single tank mode only). | |
| 6 | OFF | N/A | |
| 6 | ON | N/A | |

Normal Condition:

Whenever a zone is activated, the seven segment display of the active zone will display the status, 'H', 'B', 'L'. The strobe will activate and the relay for the active zone will switch.
Pressing 'MUTE' will turn off the strobe and sounder, the display and relay will only

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# Product Data Sheet

# OLE C2020 Tank Gauge


**Main Features:**

- Continuous Reading 1% Tank Gauge
- High & Low Local Alarm
- Bund Alarm Circuit
- Output 4-20 mA as standard
- Local Calibration settings
- Push Button Back light for 1 hour
- Flashing Backlight when in alarm
- IP65 Weatherproof Enclosure


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## Easy Installation

Lower sensor into tank, tighten nut, join 3 wires, plug in and set-up.

A Tank fitting supplied to fit into a 1” threaded Socket or a special 30 mm bored hole fitting available, providing an IP65 seal.

The Hydrostatic Tank sensor comes with 7 meters of cable on a 3 meter probe and 10 meters on 5 and 10 meter probe (this can be extended by using an extension kit up to 100 meters).

Standard probe suits tanks 0.3 up to 3.5 meters high for fuel oils and up to 2.8 meters high for water based products (higher tanks options available, C25, C7).

## Typical Applications

Gasoil, Diesel, Kerosene, AdBlue, Lube Oil, Cooking Oil, Gear Oil, Water, Anti-Freeze, Windscreen wash

## Base Models

C2020-0-C23 = Gauge Kit with 3m Probe

C2020-A-C23 = Gauge Kit with 3m Probe + High/Low Alarm

C2020-A-C25 = Gauge Kit with 5m Probe + High/Low Alarm

C2020-A-C27 = Gauge Kit with 10m Probe + High/Low Alarm

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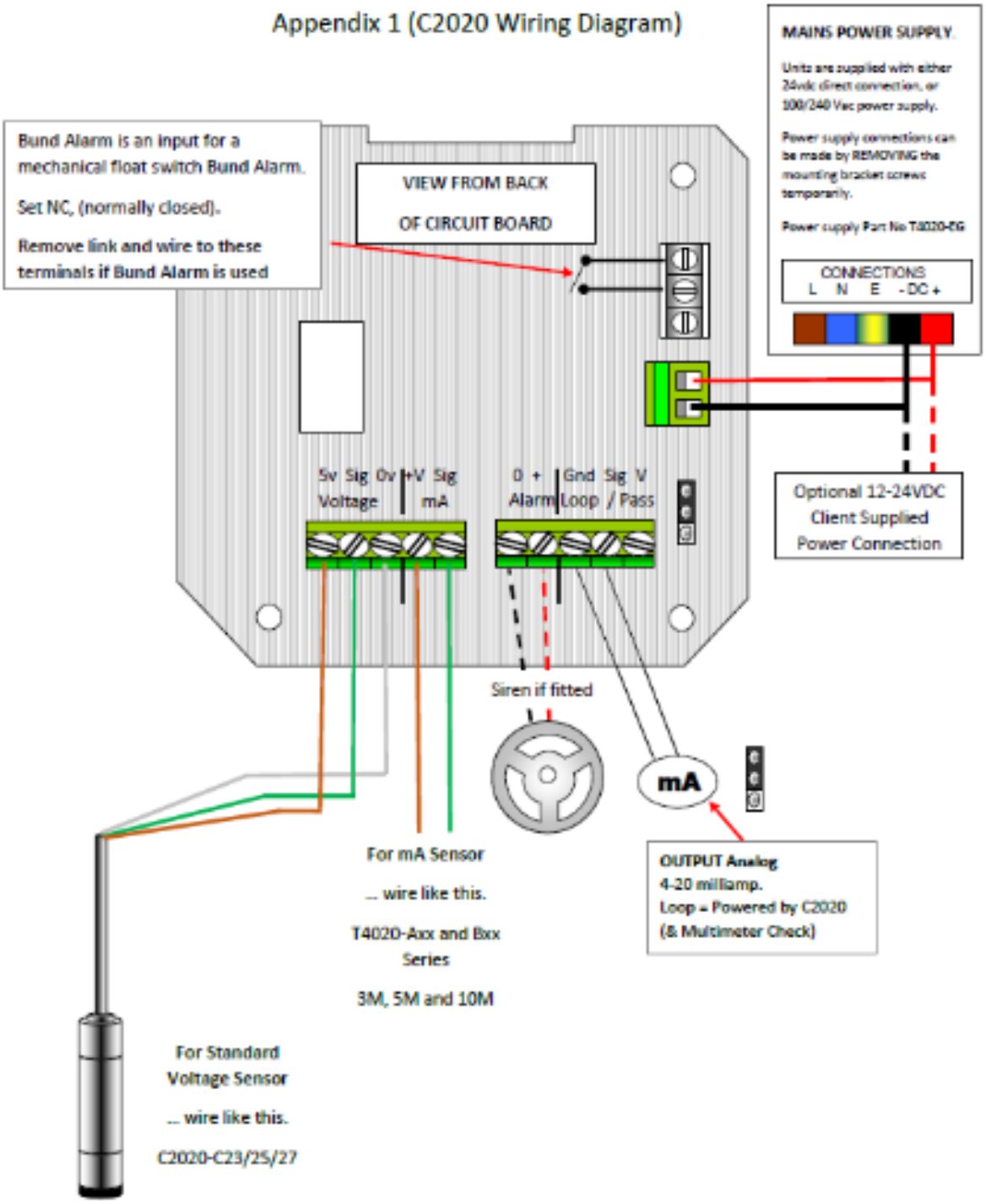
## Appendix 1 (C2020 Wiring Diagram)





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# Z2000 / C2020 Tank Gauge Set-Up

1

To Calibrate the Gauge, Open the front cover 4 screws, Connect the Tank Probe, and Power the unit.
Toggle the calibration switch, top right marked CAL (LK2)

The first screen to show is a "Cube Tank" Middle Button Scrolls through Tank Type Options

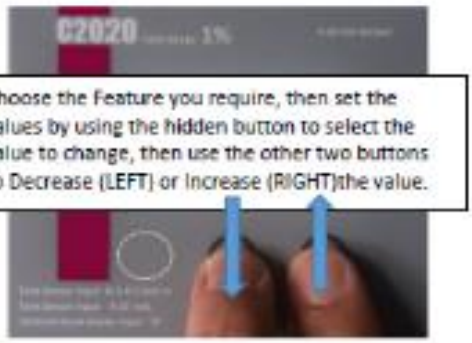
2


3


Hidden Button Scrolls through settings.

4


5




You Must Scroll to YES and use the **Hidden** button to Confirm YES for all Screens

6


Now Use the **Right Button** to Scroll across to Alarm Trigger points and SG setting

7



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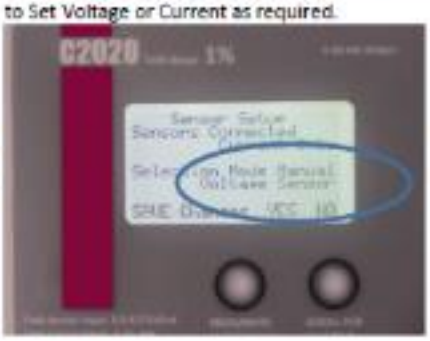
# Z2000 / C2020 Tank Gauge Set-Up Stage 2

Now Use the **Right Button** to Scroll across to Sensor Selection. The sensor should be connected at this point. This should be Automatic and read either Voltage or Current

**8**


**9** If it needs to be changed, Use the Right Button to Set Voltage or Current as required.




**10** Now use Right Button to Sensor Type screen


**11** Sensor "Span".
As Standard this comes set for 2.55 M.
Change this to suit the sensor range you have
C22 = 2.55 M C23 = 3.0 M
C25 = 5.0 M C27 = 10.0 M

Curser (Hidden button) YES

**12** END Toggle the switch Gauge returns to Standard Readings

Sensor Offset.
How far from the bottom of the tank is the sensor positioned. Enter this here.
As standard we would recommend 50 mm which is 0.05 M Curser Confirm YES
The Gauge will now read the litres value for this offset level. *It will not be Zero*

## High Accuracy Calibration Adjustments (Advanced settings)

For fine tune Calibration, the Sensor Settings can be adjusted to suit the individual sensor.

**For Voltage sensor**, the Zero Value and the Max Value can be adjusted up or down to suit.
(Both must be adjusted the same amount)
If Gauge reads LOW, increase these values. (max +0.05)
If Gauge reads HIGH, decrease these values (max -0.05)


For Current sensor, the Zero Value can be adjusted up or down to suit.(Max self adjusts)

If Gauge reads LOW, increase these values.
If Gauge reads HIGH, decrease these values



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# Hydrostatic Tank Contents Gauge


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## Contents




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# 1 About this instruction manual

This instruction manual is part of the product.

Read this manual before using the product.

Keep this manual during the entire service life of the product and always have it readily available for reference.

Always hand this manual over to future owners or users of the product.

## 1.1 Explanation of symbols and typeface

| Symbol | Meaning |
|---|---|
| ☑ | Prerequisite for an activity |
| ▶ | Activity consisting of a single step |
| 1. | Activity consisting of several steps |
| ↳ | Result of an activity |
| • | Bulleted list |
| Text | Indication on a display |
| **Highlighting** | Highlighting |

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# 2 Safety

## 2.1 Intended use

The hydrostatic tank contents gauge is exclusively suitable for the level measurement of the following liquids:

- Fuel oil EL according to DIN 51603-1
- Diesel fuel according to EN 590
- Fatty acid methyl ester (FAME) as a fuel oil according to EN 14213 • Fatty acid methyl ester (FAME) as biodiesel according to EN 14214

Inflammable liquids of danger class AIII and non-inflammable liquids which meet the following requirements:

- The fumes of the liquid do not attack plastics (PA, PS, PE) or Cu-, Zn- and Sn-alloys or elastomers.
- The liquid is not classified as hazardous class AI, AII or B.
- Kinematic viscosity < 300 $mm^2/s$.

Any use other than the use explicitly stated in this instruction manual is not permitted.

## 2.2 Predictable incorrect application

The hydrostatic tank contents gauge must never be used in the following:

- Level measurement of liquids other than those listed above.
- Hazardous areas (ex)
  If the device is operated in hazardous areas, sparks may cause deflagrations, fires or explosions

## 2.3 Safe handling

This product represents state-of-the-art technology and is manufactured in accordance with the pertinent safety regulations. Each unit is subjected to a function and safety test prior to despatch.

Operate the product only when it is in perfect condition. Always observe the instruction manual, all pertinent local and national directives and guidelines as well as health and safety regulations and directives regarding the prevention of accidents.