KX74001-V5 Master Controller & Drone

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System Overview

The **KX** range of dust extraction equipment is the most recent addition to our product range and we believe will set the standard by which all other systems are judged. Utilising the very latest in Micro-Processor technology, the **KX74001-V5 Series Master Controller** offers a unique range of features which not only offer greater reliability, but also, unparalleled ease of use, and a high level os system flexibility and tamper-proof system operation.

The **KX** range is aimed primarily at airflow dampered dust extraction systems and is designed to address the specific needs of these types of systems. The **KX74001-V5 Master Controller** itself, takes care of all aspects of system control. Using just five push buttons and the high resolution LCD Display, all aspects of system operation can be easily set up for optimal system performance. A tamper-proof version of the Master Controller is available.

Rev. J / 19.10.20

Software Vers. V5_MAS.HEX

KX74001-V5 Master Controller & Drone

Features

Advanced Micro-Processor Control

◊ Operating at over a million instructions per second, the onboard micro-processor provides ease of use and a level of control which was virtually impossible with old plc or Cmos systems.

Modular System Design

◊ The KX range is totally modular and allows the construction of large or small scale systems simply by installing additional KX Drone units. Its high speed serial bus system allows the controller to be installed in any convenient location and remotely from the slave units.

Onboard EPROM Memory

◊ This feature ensures that system settngs are retained during power failure or disconnection of the Master Controller.

Easy To Use 5 Button Control

- MODE UP: Move forward through options
- MODE DOWN: Move backwards through options
- START/STOP: Run or halt the system
- UP: Increases values selected by mode
- DOWN: Increases values selected by mode

High Resolution LCD Display

◊ Easily view and adjust system setup.

◊ Displays pressure readings in real-time.

◊ Monitor system status.

Real-Time System Monitoring

◊ Whilst the system is running, Differential Pressure (DP) and system status can be monitored in real-time. This includes system errors which will be displayed on the LCD screen and activate an audible warning.
(DP sensor and external sounder optional)

Specially Encoded Serial Bus

◊ The high speed serial bus to the Drone units is specially encoded to ensure optimal performance and glitch free operation.

Damper Handling

◊ A special DAMPERS setting on the Master Controler allows the use of spring return or power return dampers. Damper operation is then handled by the controller.
For installations not requiring dampers, this option may be turned off.

Built-in Output Amplifiers & Power Supply

◊ The unit has its own internal power supply. Power output to solenoid valves is provided directly from the controller, using the internal power amplifiers.

Features - Continued

High/Low Pressure Alarms

◊ The KX74001-V5 has two relay outputs. These are activated when the differential pressure in the system reaches the user defined settings for a high alarm or low alarm situation.

◊ The relay outputs may be used to trigger any amount of external events and allow the system malfunction to be handled immediately and effectively. The dual relay system means that high and low pressure events may be handled differently and trigger a separate chain of events to warn of, and handle the situation.

◊ The units LCD display will carry a warning message if high or low pressure alarm levels are reached.

◊ Low Alarm is inactive if set at 9mm or lower.

Separate Cleaning Cycle For System Fan Stop

◊ A separately programmable cleaning cycle is provided for optimum filter performance. This operates whilst the main system fan is not running and can be set to operate for a set number of cycles. It can also be disabled by setting the number of cyles to 0.
(Not available in Remote Control Mode)

◊ A minimum of 9mm DP is required before the fan rundown will operate.

4-20 Milliamp Output

◊ The unit features a 4-20mA output which may be used to send pressure information to other devices or system controllers. This feature enables the KX74001-V5 to communicate with any device that will accept this type of input and allow integration into virtually any application.

Remote Control

◊ The KX74001-V5 has the facility for remote start/stop of the cleaning cycles.

◊ When the controller is programmed in remote control mode (see page 8), it can be remotely started or stopped via the DIG and 24V terminals (Source). Differential Pressure (DP) control set points will be ignored in remote control mode as well as the separate cleaning cycle for System Fan Stop.

◊ The unit is arranged so that pulsing will start as soon as a closed circuit is established across DIG and 24V.

◊ If the controller is in DP sensor mode, the remote start/stop facility still functions in conjunction with the Differential Pressure Set Points. DIG and 24V connection should be establishd for DP sensor mode to work normally (linked in normal circumstances).

◊ The KX7400-V5 also has a facility to remotely start/stop from a 24VDC signal (Sink). All the options are the same as above.
Please note: Remove the factory fitted link between DIG and 24V if using the 24VDC (Sink) facility.

Empowered/Healthy Signal

◊ The on-board relay RL3, will give a changeover volt free signal when an input voltage is present. The above relay will not energise if any of the on-board protection devices fail.

KX74001-V5 Master Controller & Drone

Technical Specifications KX74001-G10-V5

Controller	Part Number KX74001-G10-V5
Input Supply	24VDC ± 10% 50W To ensure the reliable operation and longevity of your KX74001, any mains supply should not be a branch off a line carrying power to equipment containing rectifiers and/or thyristors (e.g. welders, variable speed drives, battery chargers, etc.). Keep supply cables away from other power carrying conductors. A free-standing mains filter is available if needed.
Input Fuse	F2 1.6 Amp (T) Time Lag.
Input Connections	5 Way 1.5mm 16 Amp top entry pluggable terminal block which is marked: AC (power), 230, 115, Neut.
Mains Failure	In the event of mains failure, the unit will operate to specification as soon as the voltage level comes within the above limits.
Output Voltage	24V DC, regulation as input.
Output Load Per Outlet	36W continuous, 44W pulsed into solenoid valves.
Bus Connections	12 way 1.5mm 16 Amp top entry pluggable terminal blocks which is marked: Bus Connector
Output Load Protection	1.6 Amp (T) Time Lag fuse fitted on the board will cut off the supply to the outputs without damaging the board if a short circuit occurs (FUSE 2).
24V DC Connections	A 2 way 1.5mm 16 Amp top entry pluggable terminal block marked: + - 24VDC OUT
Startup Sequence	The unit is arranged so that it will always start at output 1.
Pressure Scale	0-700mm WG.
Construction	Solid state micro-processor components mounted onto a double-sided fibreglass PCB with component mask.
Indication	1-60 (or 200) LEDs will flash as each output is energised in sequence.
Ambient Temperature At Board Surface	0 to +45°C
Storage Temperature	0 to +60°C

Technical Specifications KX74001-G10-V5 - Continued

Vibration Spec	Not greater than BEAMA Group 2.
Conducting Materials	Standard PCBs can be supplied with their surfaces coated with a layer of Parylene C, a material that is to MOD standard 59-47/4, and MIL-1-460C. This treatment reduces the risk of damage through moisture.
Identification	Each PCB will be marked with it's own serial number together with it's KX part number.
Micro-Pro Sequencer	Hinge opening Polycarbonate box with clear LCD window. Lower panel with 2 retaining screws houses terminals. Part number KX74001-V5.
Reverse Jet Drone	A Polycarbonate box with clear lid, PCB plate mounted, with pilot solenoid valves fitted into side wall, coils inside wired to PCB. Part number ([specify between 1-20] W) KX7403-V5-J2-E3-SE
Enclosure Protection	Dust and weatherproof to the International Protection Standard IP65
Ordering Information	Order as a KX74001-G10-V5 Micro-Pro Sequencer with a --- qty of Drones with or without DP sensors.

The manufacturer reserves the right to change product design and specifications at any time and without prior notice

*****Important Information*****

If the controller is to be installed in an area where it could be subjected to electrical interference, such as Frequency inverters or electrostatic equipment, we recommend fitting a 2 watt 330 ohm resister on the last drone unit across the 0V and SER terminals (Available on request)

Please do not site this controller in close proximity to Frequency inverters or Electrostatic switching devices and treat all cabling as you would for data applications.

KX74001-V5 Master Controller & Drone

Technical Specifications KX74001-G15-V5

Controller	Part Number KX74001-G15-V5
Input Supply	110-240V +10% -15% @ 50/60Hz 50VA To ensure the reliable operation and longevity of your KX74001, any mains supply should not be a branch off a line carrying power to equipment containing rectifiers and/or thyristors (e.g. welders, variable speed drives, battery chargers, etc.). Keep supply cables away from other power carrying conductors. A free-standing mains filter is available if needed.
Input Fuses	Fuse 2: 1.6 Amp 110V HBC 20mm Fuse 3: 1 Amp 240V HBC 20mm
Valve Output Fuse	Fuse 1: 1.6 Amp 24V (T) Time Lag.
Input Connections	5 Way 1.5mm 16 Amp top entry pluggable terminal block which is marked: AC (power), 240, 110, Neut.
Mains Failure	In the event of mains failure, the unit will operate to specification as soon as the voltage level comes within the above limits.
Output Voltage	24V DC, regulation as input.
Output Load Per Outlet	36W continuous, 44W pulsed into solenoid valves.
Bus Connections	12 way 1.5mm 16 Amp top entry pluggable terminal blocks which is marked: Bus Connector
Output Load Protection	1.6 Amp & 1 Amp HBC 20mm fuses fitted on the board will cut off the supply to the outputs without damaging the board if a short circuit occurs (FUSE 2, FUSE 3).
24V DC Connections	A 2 way 1.5mm 16 Amp top entry pluggable terminal block marked: + - 24VDC OUT
Startup Sequence	The unit is arranged so that it will always start at output 1.
Pressure Scale	0-700mm WG.
Construction	Solid state micro-processor components mounted onto a double-sided fibreglass PCB with component mask.
Indication	1-60 (or 200) LEDs will flash as each output is energised in sequence.
Ambient Temperature At Board Surface	0 to +45°C
Storage Temperature	0 to +60°C

Technical Specifications KX74001-G15-V5 - Continued

Vibration Spec	Not greater than BEAMA Group 2.
Conducting Materials	Standard PCBs can be supplied with their surfaces coated with a layer of Parylene C, a material that is to MOD standard 59-47/4, and MIL-1-460C. This treatment reduces the risk of damage through moisture.
Identification	Each PCB will be marked with it's own serial number together with it's KX part number.
Micro-Pro Sequencer	Hinge opening Polycarbonate box with clear LCD window. Lower panel with 2 retaining screws houses terminals. Part number KX74001-V5.
Reverse Jet Drone	A Polycarbonate box with clear lid, PCB plate mounted, with pilot solenoid valves fitted into side wall, coils inside wired to PCB. Part number ([specify between 1-20] W) KX7403-V5-J2-E3-SE
Enclosure Protection	Dust and weatherproof to the International Protection Standard IP65
Ordering Information	Order as a KX74001-G15-V5 Micro-Pro Sequencer with a --- qty of Drones with or without DP sensors.

The manufacturer reserves the right to change product design and specifications at any time and without prior notice

*****Important Information*****

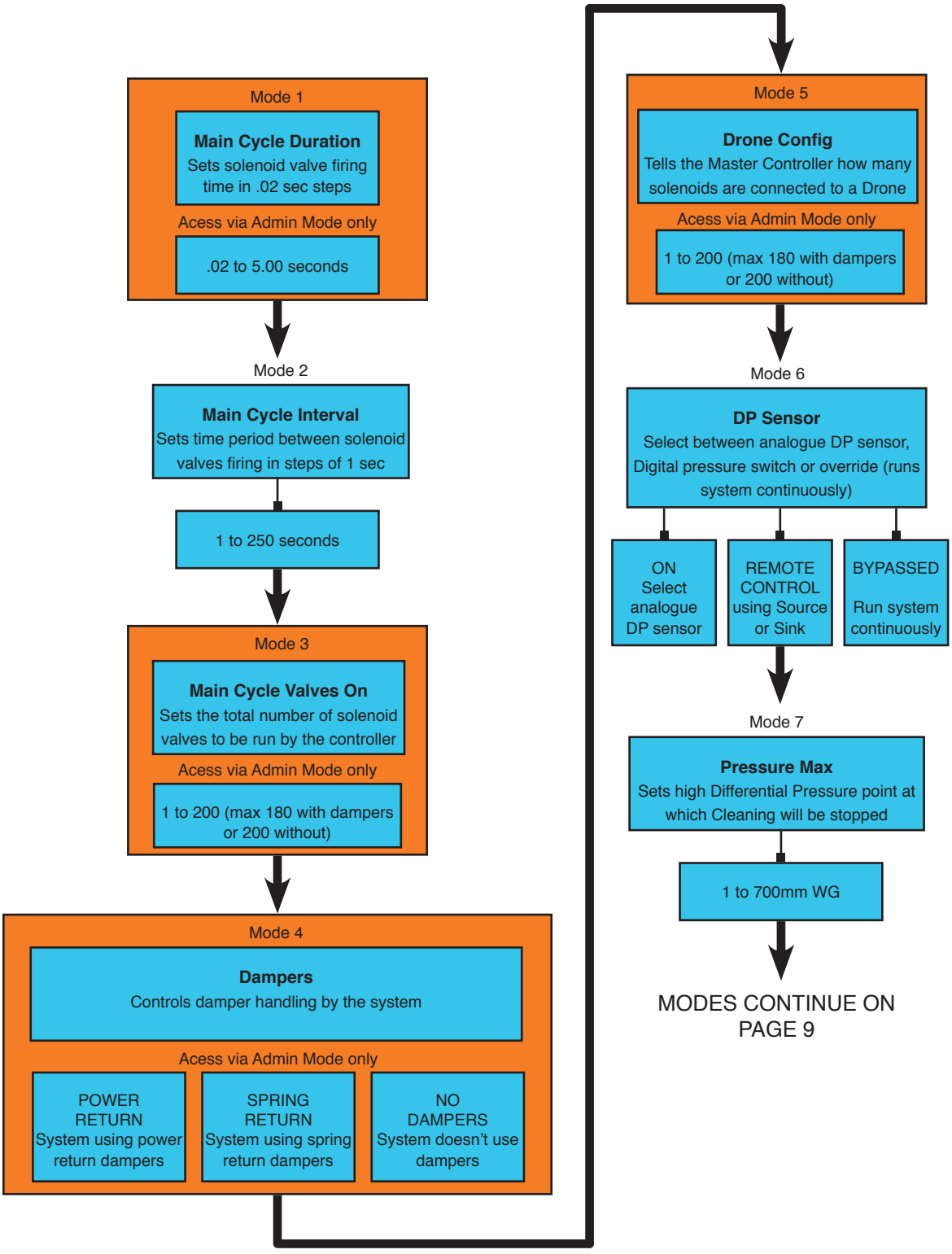
If the controller is to be installed in an area where it could be subjected to electrical interference, such as Frequency inverters or electrostatic equipment, we recommend fitting a 2 watt 330 ohm resister on the last drone unit across the 0V and SER terminals (Available on request)

Please do not site this controller in close proximity to Frequency inverters or Electrostatic switching devices and treat all cabling as you would for data applications.

KX74001-V5 Master Controller & Drone

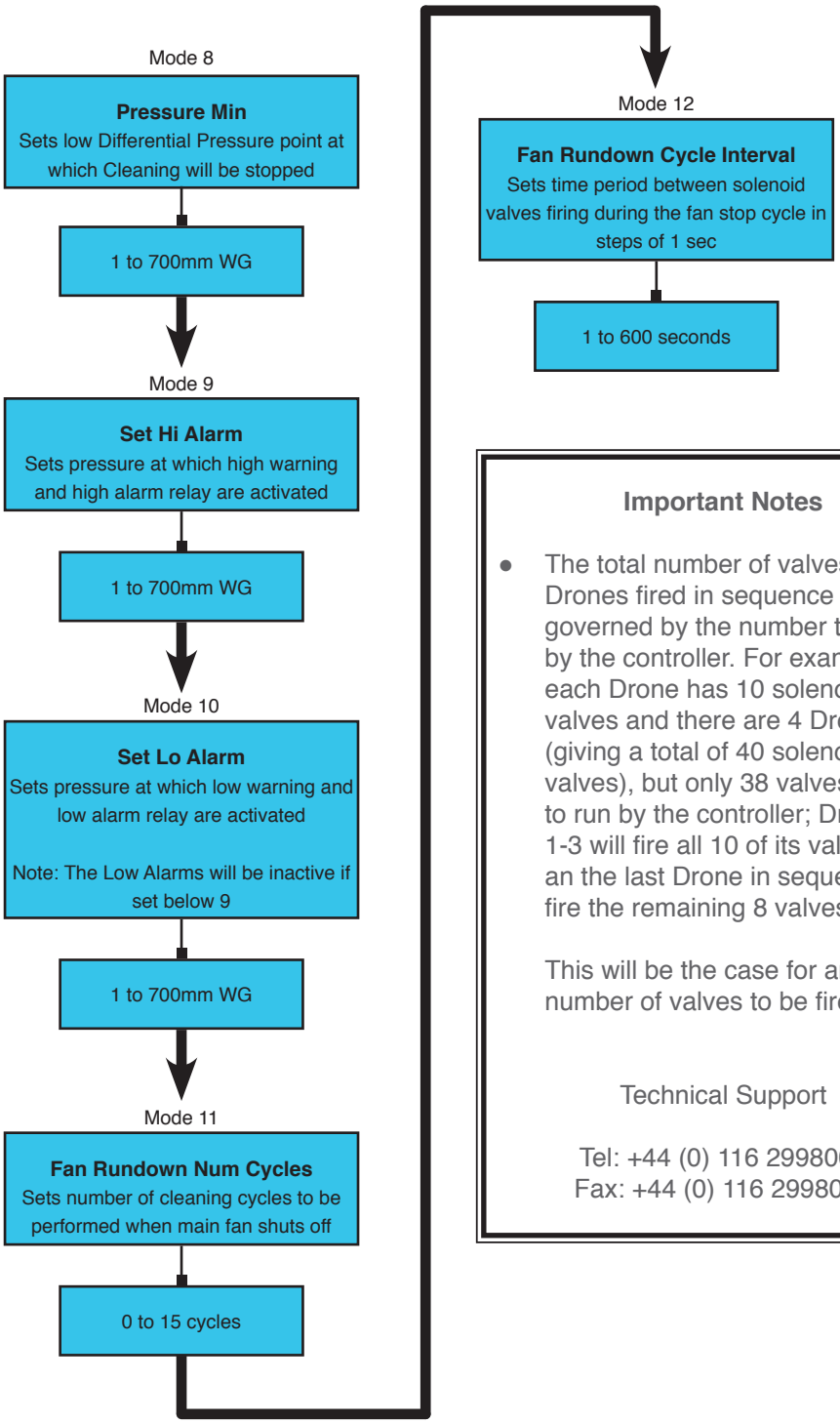
Progammable Features

The following is a flow chart of the programmable settings available on the KX74001-V5 Master Controller. The options available in each mode are explained in an easy to follow format.



MODES CONTINUE ON PAGE 9

Progammable Features - Continued



Important Notes

- The total number of valves on the Drones fired in sequence is governed by the number to be ran by the controller. For example, if each Drone has 10 solenoid valves and there are 4 Drones (giving a total of 40 solenoid valves), but only 38 valves is set to run by the controller; Drones 1-3 will fire all 10 of its valves (30) an the last Drone in sequence will fire the remaining 8 valves.

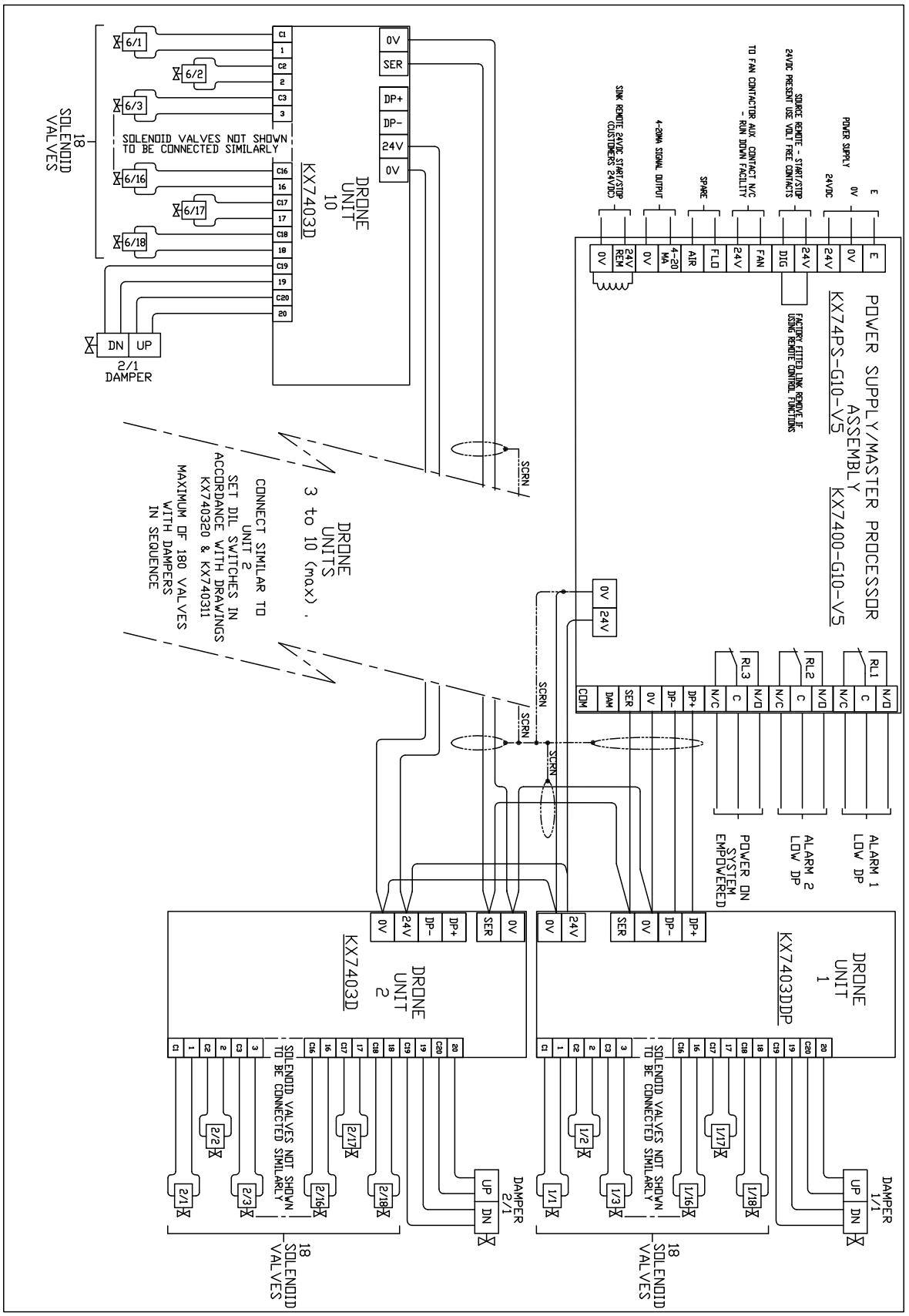
  This will be the case for any number of valves to be fired.

Technical Support

Tel: +44 (0) 116 2998000
Fax: +44 (0) 116 2998001

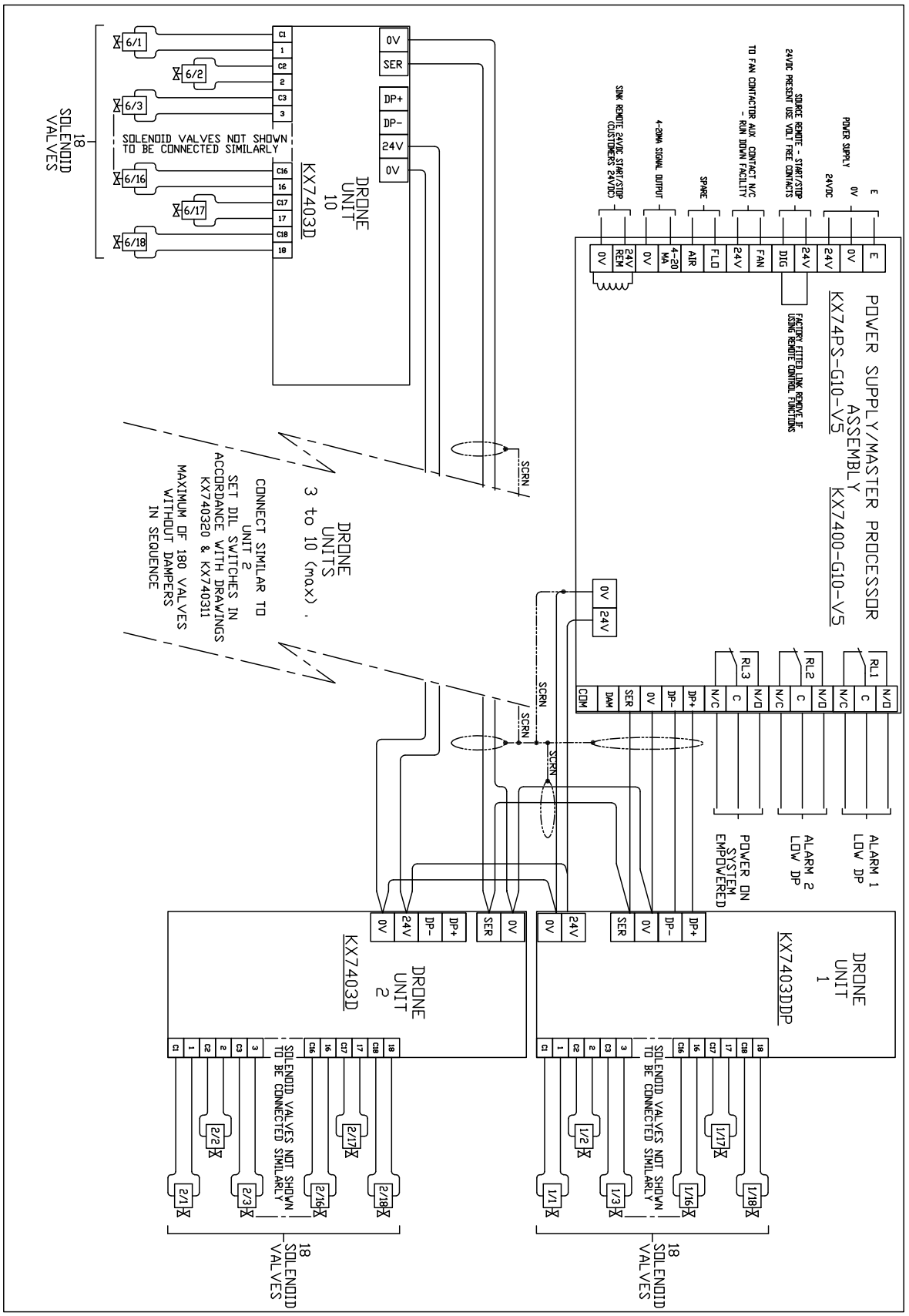
KX74001-V5 Master Controller & Drone

G10-V5 Wiring Diagram - With Dampers



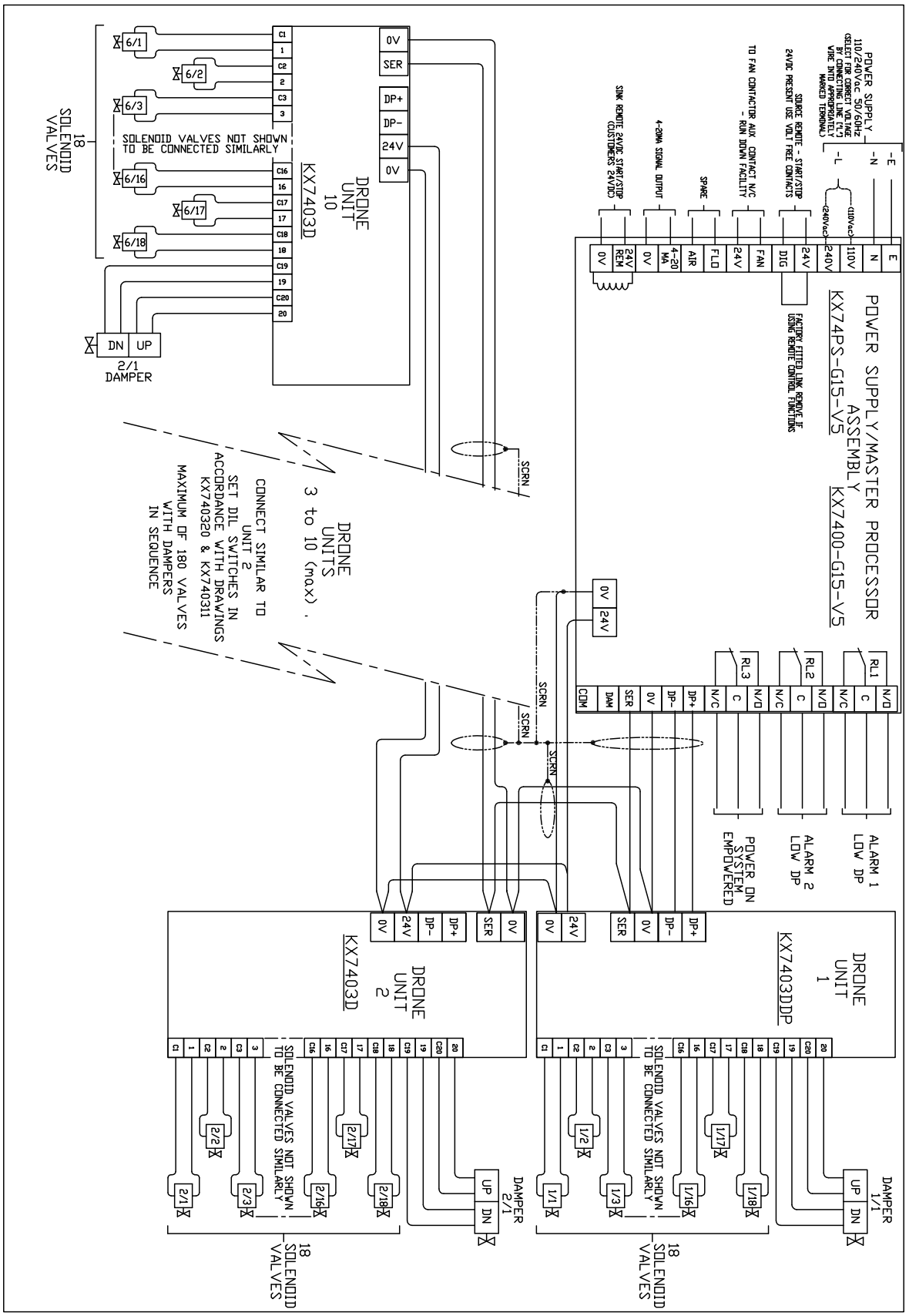
KX74001-V5 Master Controller & Drone

G10-V5 Wiring Diagram - Without Dampers



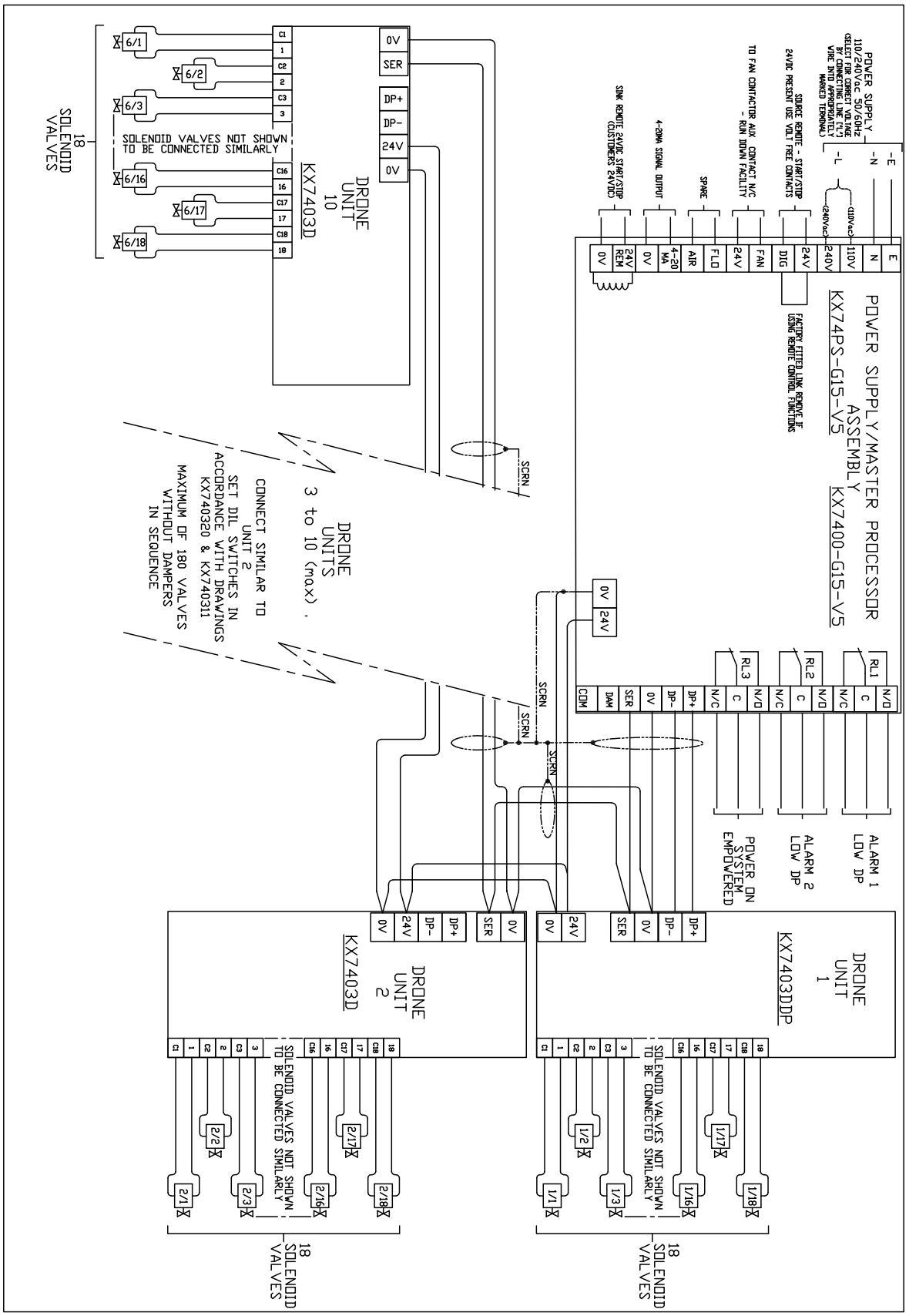
KX74001-V5 Master Controller & Drone

G15-V5 Wiring Diagram - With Dampers



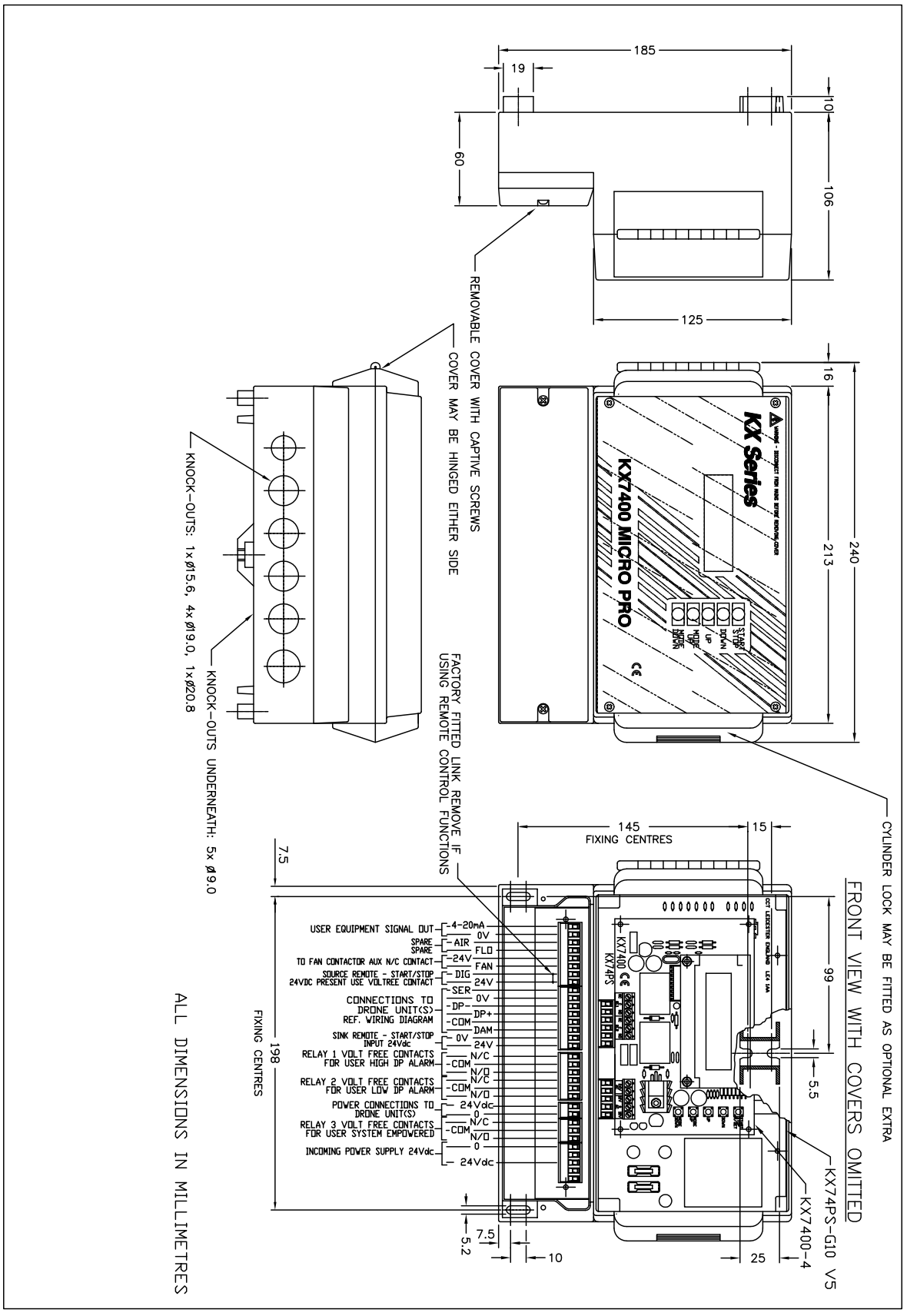
KX74001-V5 Master Controller & Drone

G15-V5 Wiring Diagram - Without Dampers



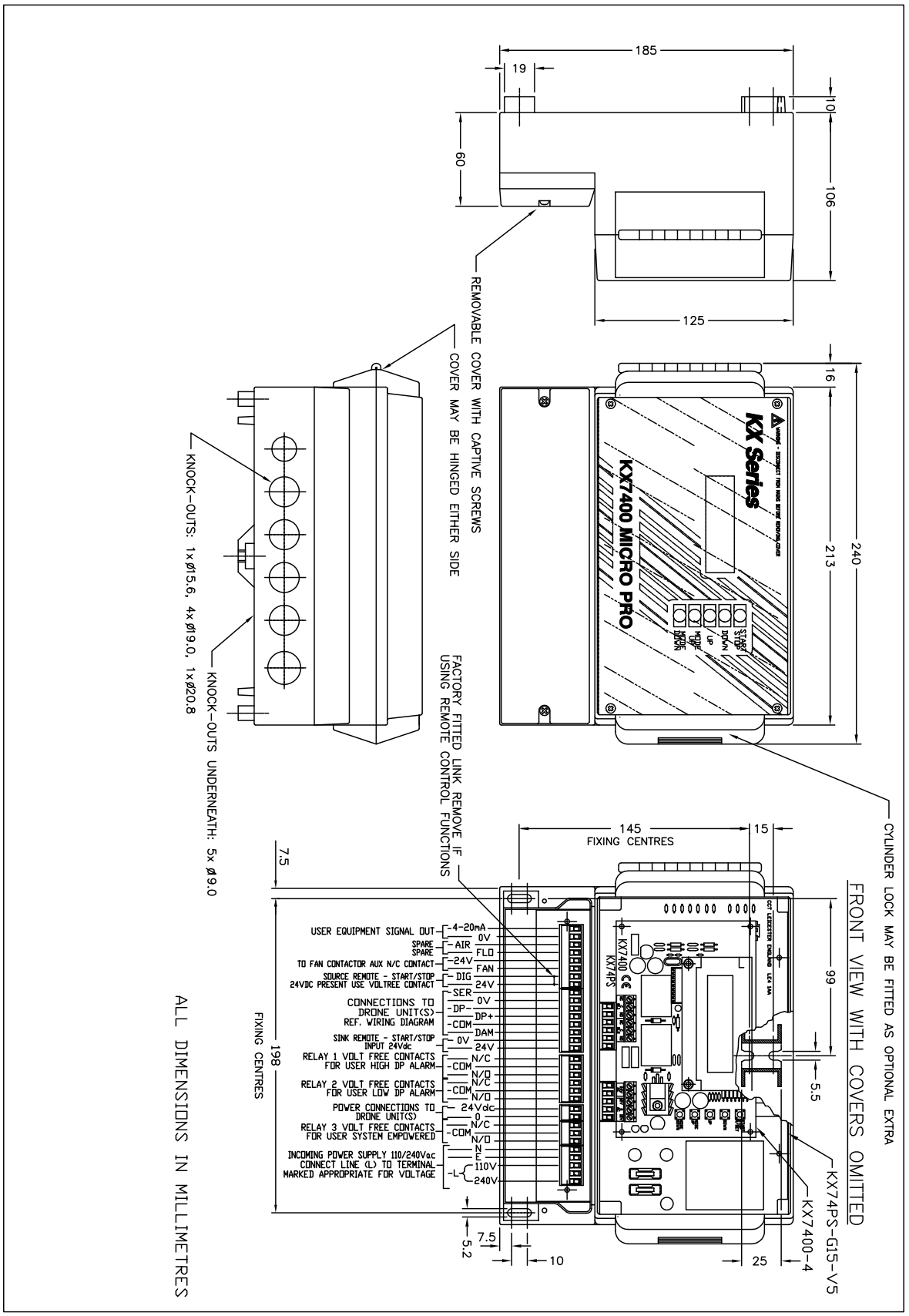
KX74001-V5 Master Controller & Drone

G10-V5 Master Controller Diagram



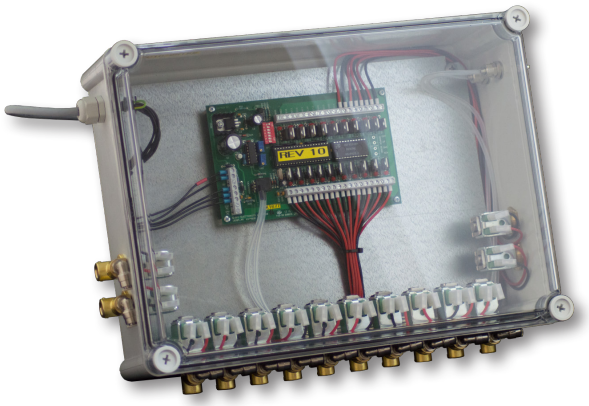
KX74001-V5 Master Controller & Drone

G15-V5 Master Controller Diagram



KX74001-V5 Master Controller & Drone

KX Series Drone Unit



System Overview

The KX74001 Series Drone unit is very much integral to the outstanding versatility of the KX series of Filter Control systems. This unit is the latest in our series of Drones and features the same advanced micro-processor as the Master Controller. This allow the unit to hve as many possible configurations and operate “intelligently” within the system. The Drones function is to respond to commands sent by the Master Controller and handle the final out-putting to the valve solenoids and dampers (where used). The Drone units are connected to the Master Controller via our specially encoded serial bus, this high speed communication system ensures glitch-free operation.

The most compelling reason for using the Drone system is installation flexibility. The Master Controller has to be installed to allow easy and convenent user access, but the Drones can be installed completely remotely and anywhere thet are required. In an effort to cater for all sizes of system, each Drone is configurable to output 6, 12, 18 or 20 solenoids. So using up to the maximum of 10 Drones, anything from 1 to 200 valve systems are possible.

Software Vers. V5_DRONE.HEX

KX Series Drone Unit Technical Specifications - Without Differential Pressure Control

Drone Unit	Part Number KX7403-D (1-20 way)
Input Supply	24VDC from KX74001-V5 Master Controller.
Input Connections	8 way 1.5mm 16 Amp side entry insulated terminal blocks which is marked: 24V+, 0V
Mains Failure	In the event of mains failure, the unit will operate to specification as soon as the voltage level comes within the above limits.
Output Voltage	24V DC, regulation as input.
Output Load Per Outlet	36W continuous, 44W pulsed into solenoid valves.
Output Connections	1.5mm 16 Amp side entry insulated terminal block.
Construction	Solid state micro-processor components mounted onto a double-sided fibreglass PCB with component mask.
Indication	LEDs will flash as each output is energised in sequence.
Ambient Temperature At Board Surface	0 to +45°C
Storage Temperature	0 to +60°C
Vibration Specification	Not greater than BEAMA Group 2.
Conducting Materials	Standard PCBs can be supplied with their surfaces coated with a layer of Parylene C, a material that is to MOD standard 59-47/4, and MIL-1-460C. This treatment reduces the risk of damage through moisture.
Identification	Each PCB will be marked with its own serial number together with its KX part number.
Reverse Jet Drone	A polycarbonate box with clear lid, PCB plate mounted, with pilot solenoid valves fitted into the side wall, coils inside wired to PCB.
Enclosure Protection	Dust and weatherproof to the International Protection Standard IP65.
Ordering Information	Order as a KX7403-D Drone Unit(s)

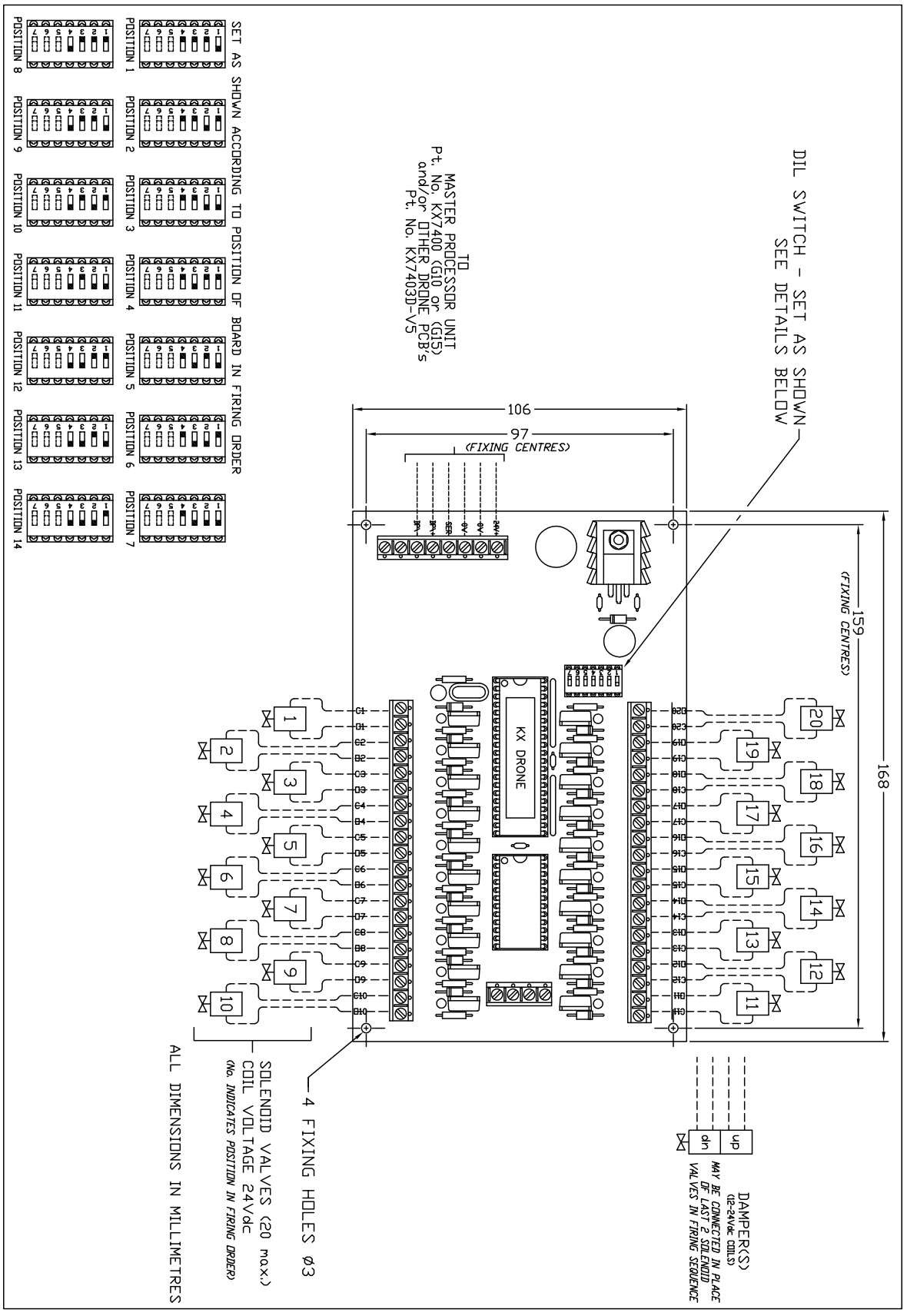
KX74001-V5 Master Controller & Drone

KX Series Drone Unit Technical Specifications - With Differential Pressure Control

Drone Unit	Part Number KX7403-DDP (1-20 way)
Input Supply	24VDC from KX74001-V5 Master Controller.
Input Connections	8 way 1.5mm 16 Amp side entry insulated terminal blocks which is marked: 24V+, 0V
Mains Failure	In the event of mains failure, the unit will operate to specification as soon as the voltage level comes within the above limits.
Output Voltage	24V DC, regulation as input.
Output Load Per Outlet	36W continuous, 44W pulsed into solenoid valves.
Output Connections	1.5mm 16 Amp side entry insulated terminal block.
Construction	Solid state micro-processor components mounted onto a double-sided fibreglass PCB with component mask.
Indication	LEDs will flash as each output is energised in sequence.
Ambient Temperature At Board Surface	0 to +45°C
Storage Temperature	0 to +60°C
Vibration Specification	Not greater than BEAMA Group 2.
Conducting Materials	Standard PCBs can be supplied with their surfaces coated with a layer of Parylene C, a material that is to MOD standard 59-47/4, and MIL-1-460C. This treatment reduces the risk of damage through moisture.
Identification	Each PCB will be marked with its own serial number together with its KX part number.
Reverse Jet Drone	A polycarbonate box with clear lid, PCB plate mounted, with pilot solenoid valves fitted into the side wall, coils inside wired to PCB.
Enclosure Protection	Dust and weatherproof to the International Protection Standard IP65.
Ordering Information	Order as a KX7403-DDP Drone Unit(s). Please note: Only one KX7403-DDP is required per system.

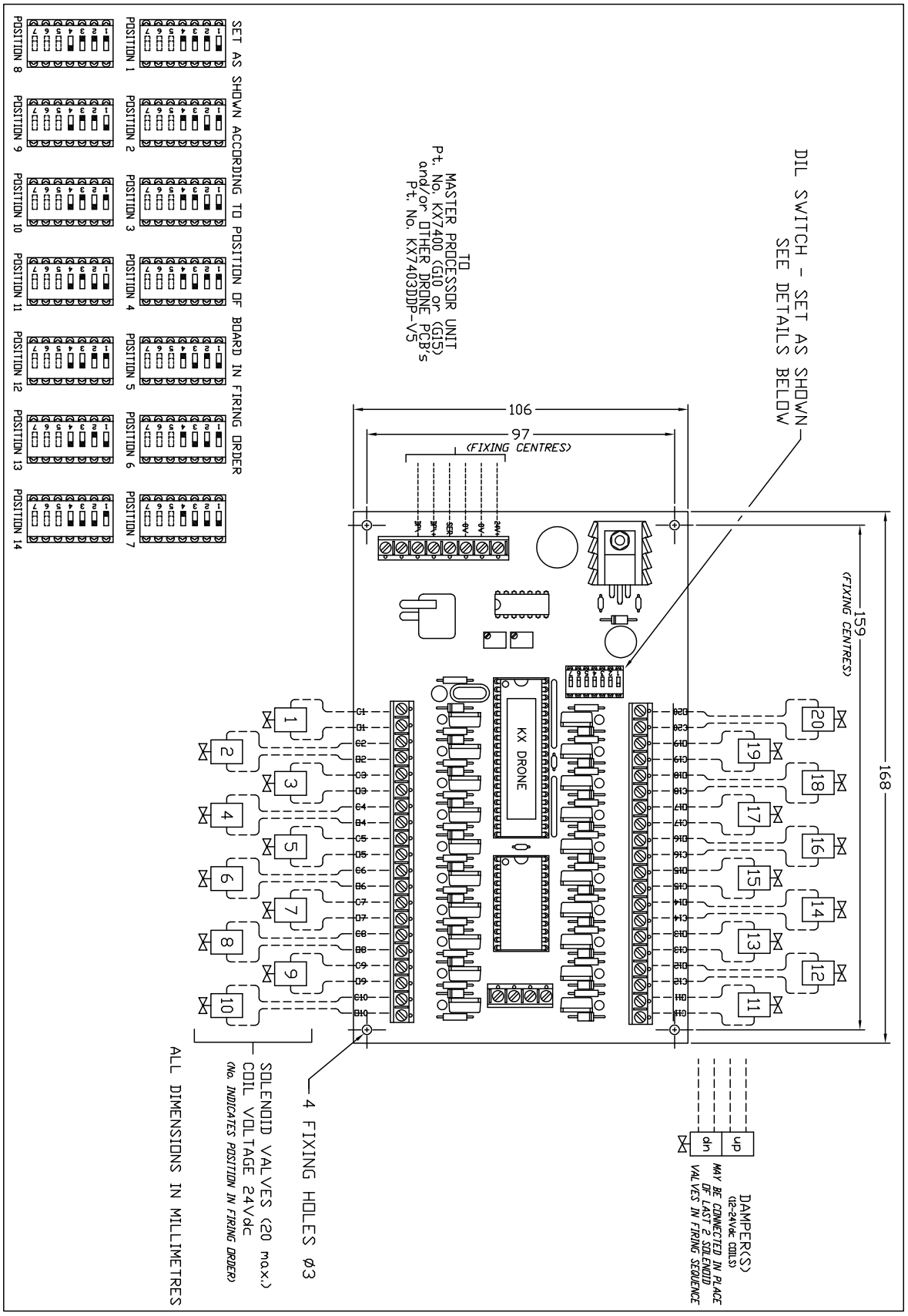
KX74001-V5 Master Controller & Drone

KX Series Drone PCB General Arrangement



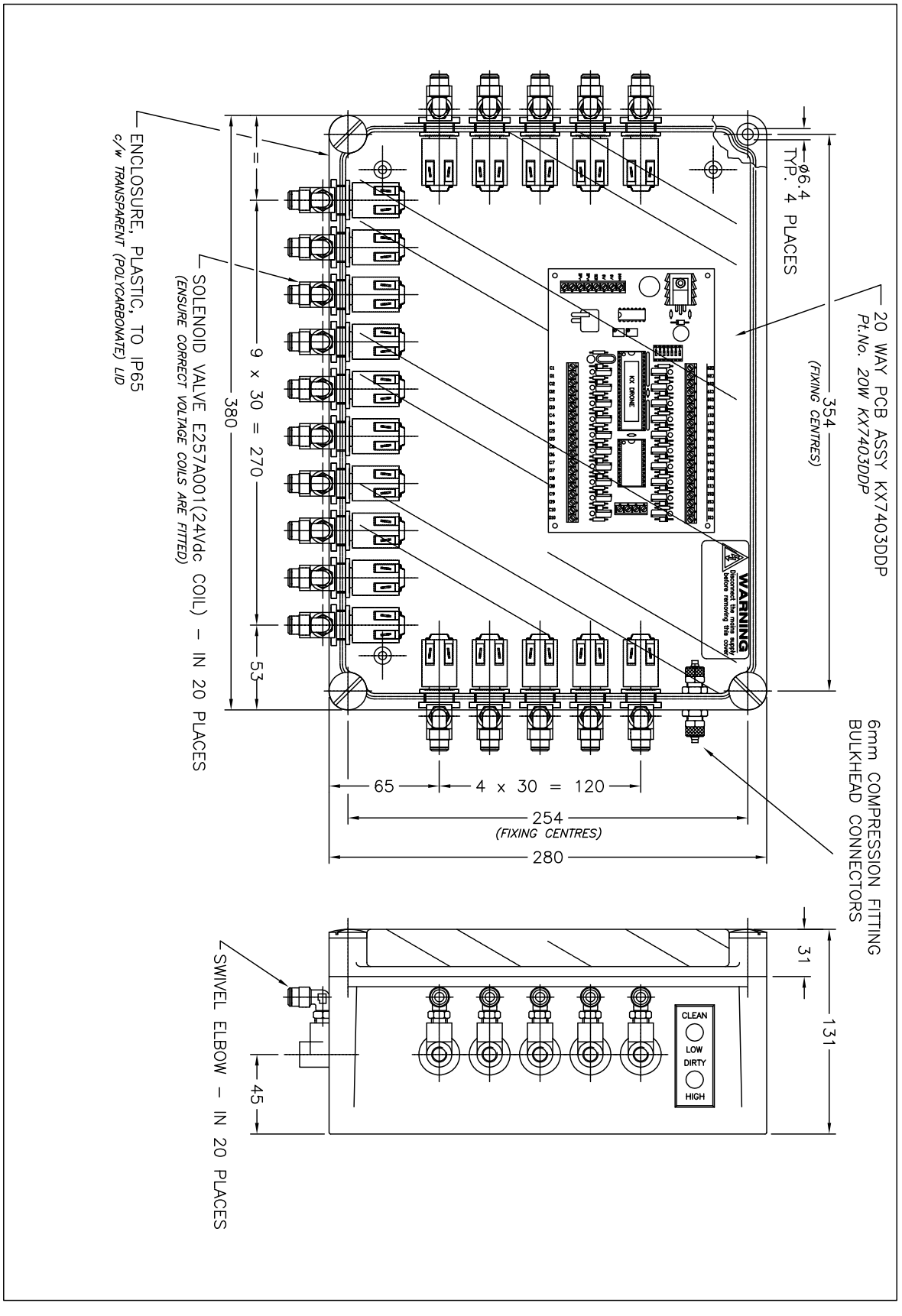
KX74001-V5 Master Controller & Drone

KX Series Drone PCB General Arrangement With Differential Pressure Control



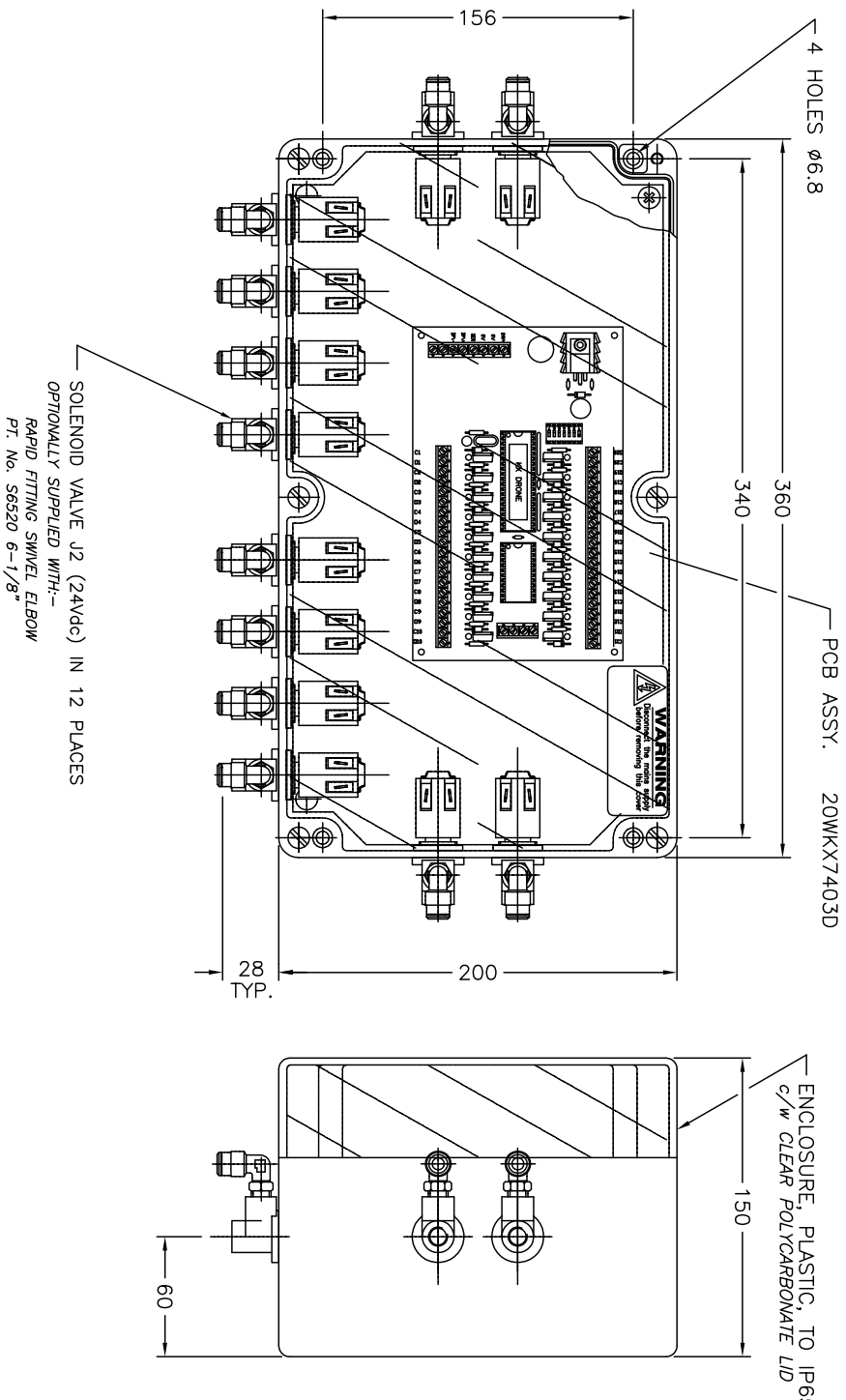
KX74001-V5 Master Controller & Drone

KX Series Drone Reverse Jet Station With Differential Pressure Control



KX74001-V5 Master Controller & Drone

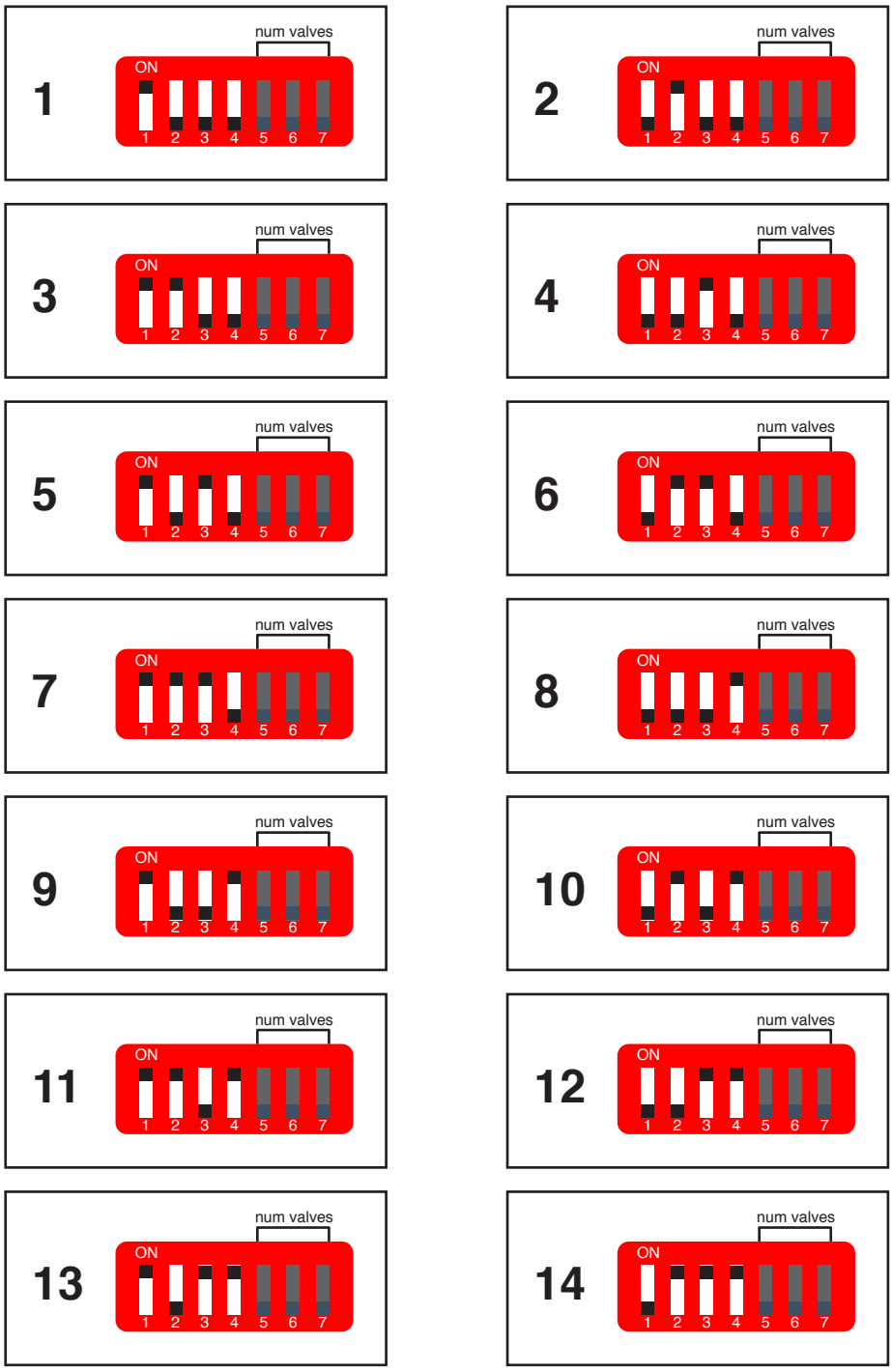
KX Series Drone Reverse Jet Station
Without Differential Pressure Control



KX74001-V5 Master Controller & Drone

KX Series Drone DIP Switch Setup Sheet

Board Number (system chain position)



Drone Valve Outputs (all Drones should have the same number of valves)