



FP2003 QE20 WIP/Input Module Installation Instructions

1. General Description

This guide describes installation of the FP2003 QE20 WIP/Input Module. This module may be used to provide terminals for WIP phone circuits, FIP alarm inputs, MCP inputs, or general purpose inputs in a QE20 system; or as a replacement for an existing QE20 WIP/Input module.

It provides twenty (20) input circuits, each of which may be configured using QE20Config for:

- Connection to the Vigilant FP0938 WIP phone – as a field WIP with an optional adjacent Zone Manned pushbutton
- Connection to the Vigilant FP0938 WIP phone – as a field WIP with an adjacent alarm MCP
- Connection to the Vigilant FP0938 WIP phone for the master WIP in the QE20 panel (circuit 20 only)
- MCP alarm input with open and short circuit fault detection
- FIP alarm input with open circuit fault detection
- FIP alarm input with open and short circuit fault detection
- General purpose input with 4 bands
- Connection to a Vigilant FP0938 WIP phone for the intercom function.

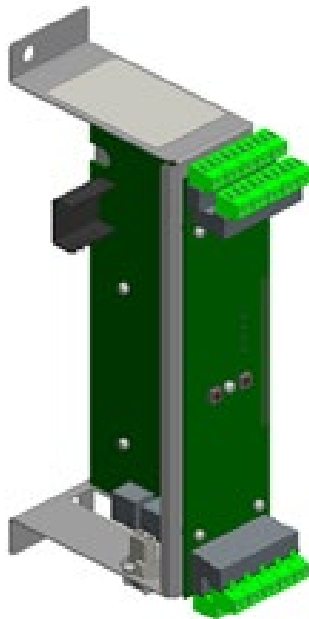


Figure 1 – FP2003 QE20 WIP/Input Module

2. Kit Contents

The FP2003 kit contains:

- 1 x WIP/Input Module with 20 2-way connectors and 10k EOL resistors fitted
- 1 x Loom 3 way DC distribution (LM0656)
- 1 x RJ45 Ethernet Cable 1.2m
- 1 x 4-way QBus Power and Comms Loom 1.2m
- 1 x LT0698 these installation instructions
- 2 x Screw M6 for mounting the module in the frame

3. Mounting the WIP/Input Module

The WIP Module occupies one of the 60mm positions on a QE20 mounting frame, as shown in Figure 2. Generally, it can be mounted in any position, but refer to the existing QE20 panel layout for an empty position when adding to a system. It is recommended the WIP/Input Modules be mounted on the top mounting frame so that the field wiring does not need to extend far into the cabinet.

The Module is secured to the frame using two M6 x 10 screws. Loosely fit one screw to the bottom hole of the desired position, then slide the open slot at the bottom of the WIP/Input Module under the screw head and then fit the top screw to secure the module. Tighten both screws to lock the module into position.

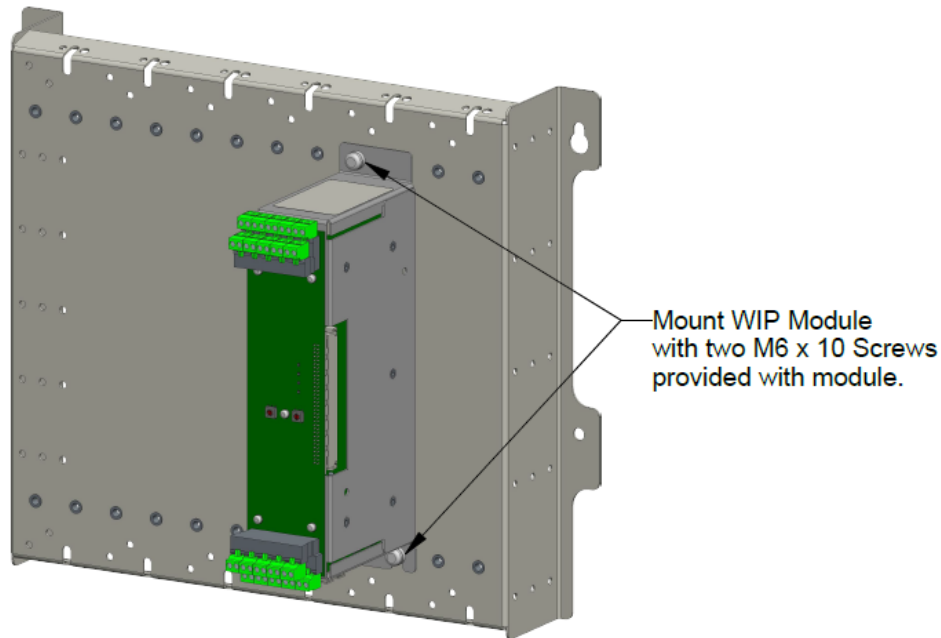


Figure 2 – QE20 WIP/Input Module Mounting

3. Replacing an Existing Module

When replacing an existing WIP/Input module, set the ADDRESS rotary switches of the new module to match the replaced module's address. Note that the rotary switches on the two modules may have different positioning of the numbers. Make sure that the selected numbers are the same for the two modules. On the new module position the mini-jumpers on Links LK1 and LK2 in the same positions as the removed module (this may need to be done once the old module is removed).

Identify all the field wiring and internal wiring to the WIP/Input Module so the cables can be reconnected to the correct terminals later.

Disconnect the field wiring connectors, the DC power loom (if fitted), the 4-way QBus loom(s) and the RJ45 patch loom(s) from the existing module.

Remove the top mounting screw and loosen the bottom mounting screw, so that the existing module can be removed.

Configure the new module address switch and links to match the removed one.

Fit the slot of the new module under the lower screw in the mounting frame, then fit the top mounting screw. Tighten both screws to secure the module in position.

Reconnect all the wiring, making sure each cable is refitted to exactly the same position as before. It may be necessary to double check all the field wiring is plugged in to the correct terminals. For example, check the correct WIP phone rings when the front panel WIP button is pressed, and the correct zone alarm is activated for MCP and FIP inputs (Test Mode could be used).

4. Fitting a New Module

When adding a WIP/Input Module to an existing QE20, the module will need to be added to the QE20 site configuration using QE20Config. A unique QBus address will need to be assigned (automatically done when the new WIP/Input module is enabled), and the inputs configured for their function and mapped to front panel WIP buttons, zones or logic equations as required. Unused inputs (Circuit Type = None) in the site configuration do not require an EOL device (10k resistor) to be fitted.

Set the Module Address

Set the ADDRESS rotary switches (SW1 - TENS and SW2 - ONES) to match the **Card Address** assigned to the WIP/Input Module in the QE20 site configuration. Refer to Figure 3 for the switch locations. Note if the WIP/Input Module is powered up with an address of 00 it will enter Bootloader mode. Select the correct address and power the WIP/Input Module down and up again to exit Bootloader mode.

Set Power Supply Links LK1 and LK2 on the WIP/Input Main Board

Set the links LK1 and Lk2 on the Main Bd according to how the module is to be powered. Refer to the Internal Wiring – Power Supply section below for the options.

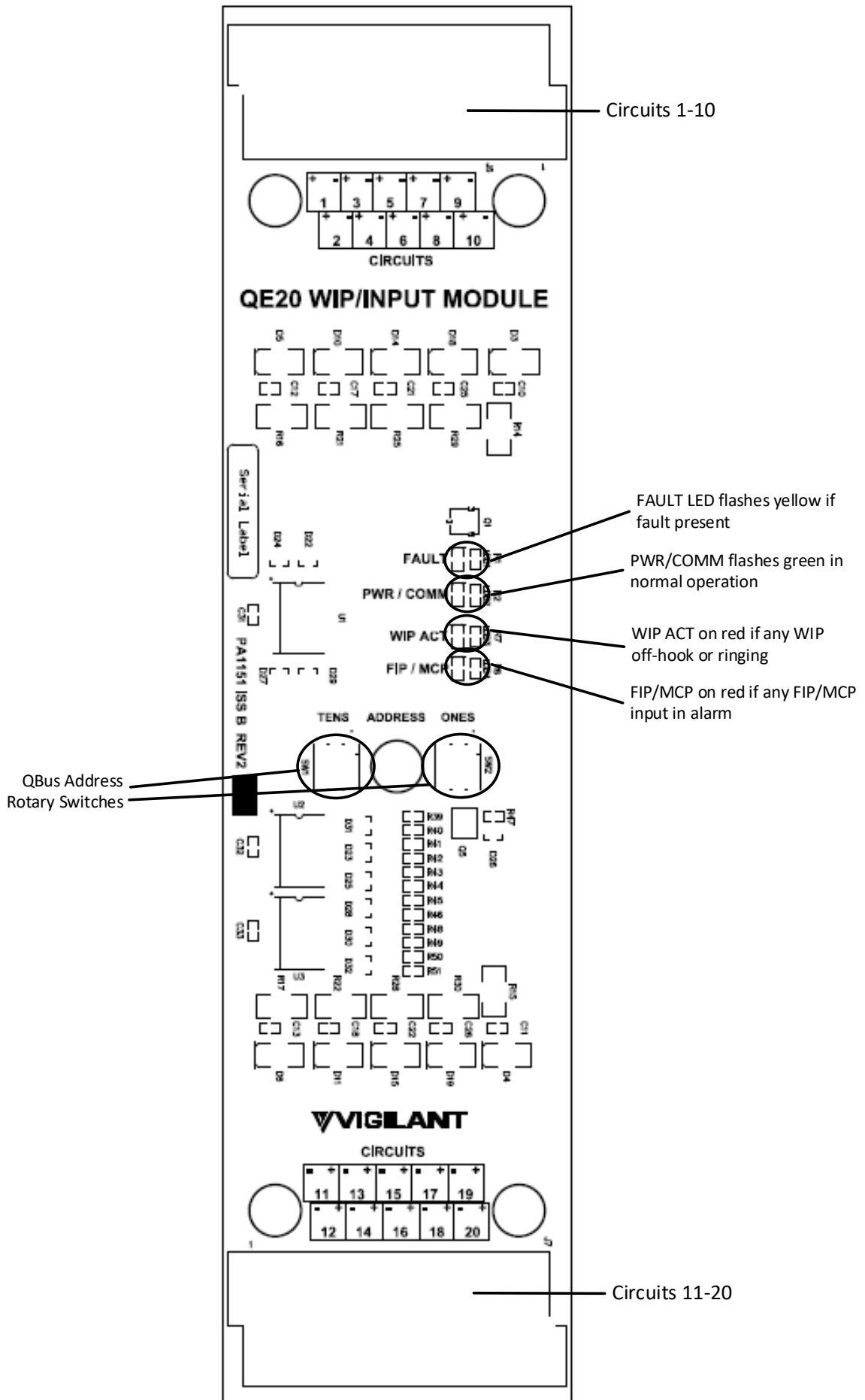


Figure 3 –WIP Module Switch, LED and Connector locations

5. Internal Wiring

POWER SUPPLY

The WIP/Input Module may be powered from the 2-way 24V IN Connector or from the 4-way QBus IN connector, and optionally provide power to an adjacent WIP/Input module via the QBus connector.

LK1 and LK2 on the WIP/Input Main PCB determine how the module obtains its 24V power and if this power is bussed on to other WIP/Input Modules via the 4-way QBus cables. Refer Figure 4.

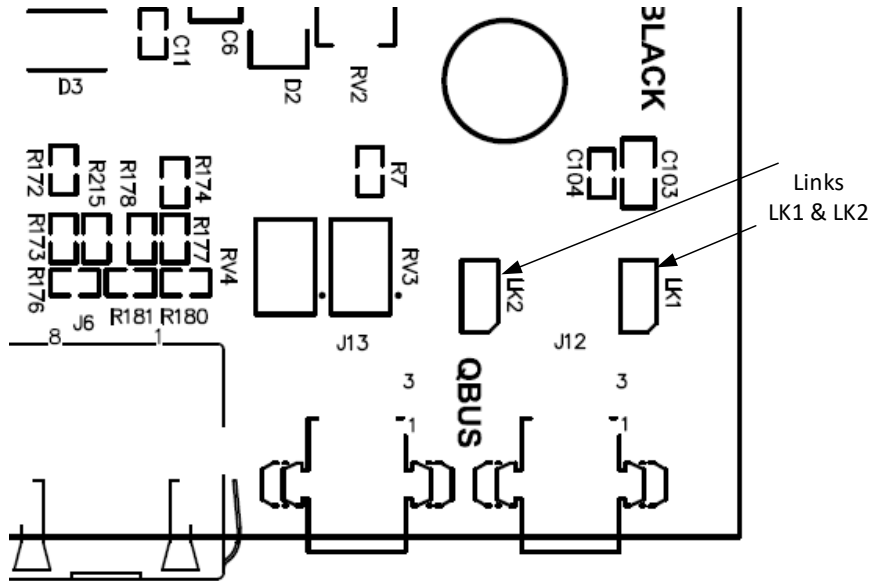


Figure 4 –WIP Main PCB Power Arrangement Links

Application	LK1 Position	LK2 Position
<ul style="list-style-type: none"> The WIP/Input Module is connected directly to, or via the RS485 Network Module, and is powered by the Controller There must be no power connection to the 24V DC IN connector. The WIP/Input Module is the second and third of up to 3 WIP/Input Modules powered together in a group. One of the three modules must have 24V power provided by its 2-way 24V IN connector. 	Fitted	Fitted
<ul style="list-style-type: none"> The WIP/Input Module the first of up to three modules powered together. This combination must be used for the first WIP/Input Module in each additional cabinet. One of the three modules must have 24V power provided by its 2-way 24V IN connector. 	Fitted	NOT Fitted

INTERNAL WIRING

The QE20 WIP/Input Module requires:

- 24V power to be provided. See the options above. When using the 2-way 24V IN connector, plug a spare connector of a 3-way DC distribution loom LM0656 into the WIP/Input Module, or use the supplied loom to connect to the DC output of a 27A PSE. Note the PSE will need to have sufficient current available to power the module (use the All-Call Peak Current figure when calculating the PSE load current).
- A 4 way QBus loom to be connected from a spare QBus connector on another QE20 WIP/Input Module, QE20 Controller, QE20 Relay Output Module, or QE20 PSU Module. The 1.2m cable supplied is suitable to wire to a module on a different frame. Coil up and secure any excess wire. Note the link combinations to use if the WIP/input Module is the first in a cabinet connecting to a previous cabinet.

The WIP audio RJ45 cables run from the WIP RIGHT port on the QE20 Controller to the WIP AUDIO LEFT port on the RS485/Network Module (if fitted) and from the WIP AUDIO RIGHT Port of the RS485/Network module to the WIP AUDIO LEFT port of the nearest WIP/Input Module. WIP AUDIO RIGHT Port of that module connects to the WIP AUDIO LEFT port of the next WIP/Input Module, and so on. The WIP/INPUT Module with address 1 must be the last in the chain and therefore its WIP AUDIO RIGHT port will be left open. Any additional WIP/Input Module needs to be inserted into the chain, so that the Controller is at the left-hand end and WIP/Input Module #1 is at the right-hand end of the chain. A 1.2m long RJ45 cable is included to allow connection to a module on a different frame.

Refer to Figure 5 for the generalised internal wiring diagram and Figure 6 for the wiring from the Controller to a Single WIP/Input Module.

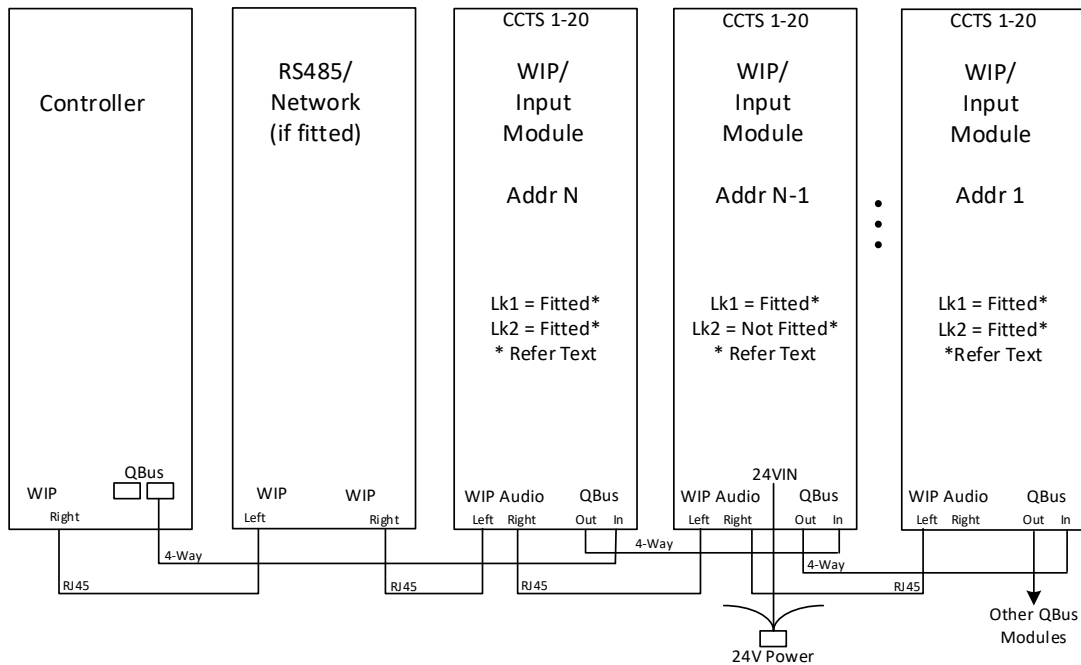


Figure 5 – Generalised Internal Wiring Diagram

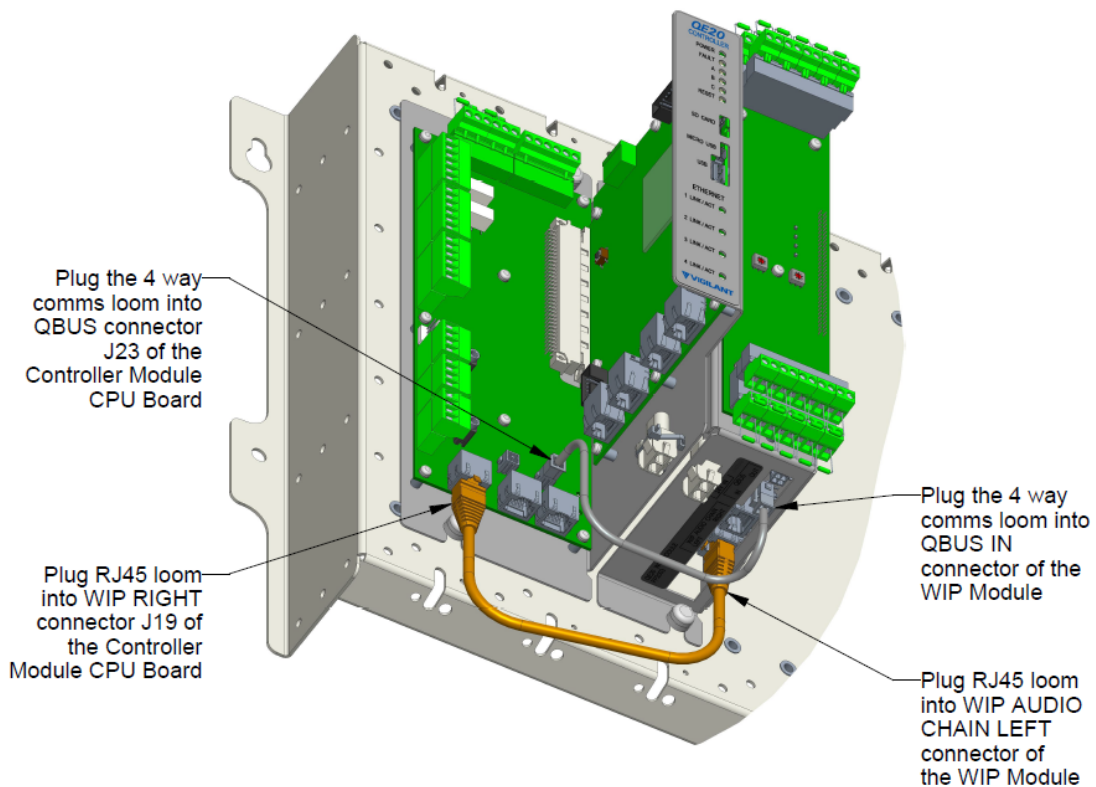


Figure 6 –Single WIP/INPUT Module Wiring To Controller

6. Field Wiring

Each circuit input on the WIP/INPUT module can be assigned a circuit type and thus functionality in the site configuration, as per Table 2. Refer to the specific QE20 site configuration for the function assigned to each of the WIP/INPUT circuits.

Table 2 – Circuit Types and Operation

Circuit Type	Function and Operation.
None	Not used. No EOL is required.
WIP	Field WIP Phone. Wires to an FP0938 WIP phone and an optional Zone Manned switch. No co-located MCP is supported. Refer to drawing 2001-2 Sheet 400 (included later) for wiring details.
Master WIP - (Input 20 only)	Master WIP Phone. One WIP/INPUT Module in the QE20 will have its Input 20 configured as Master WIP. Usually, this circuit will have been factory wired to the master WIP located in the WIP tray on the User Interface inner door. Refer to drawing 2001-2 Sheet 700 for wiring details.
WIP Special	Special WIP Phone (Intercom). Connect to the phone that is used for the Intercom function (automatically rings the other WIP Special phone when off-hook and is not part of the WIP system). Wire to an FP0938 WIP phone. No co-located MCP or Zone Manned switch is supported. Refer to drawing 2001-2 Sheet 400 (included later) for wiring details.
WIP + MCP	WIP Phone + MCP. Wire to an FP0938 WIP phone and a co-located MCP for alarm activation. A Zone Manned switch is not supported. Refer to drawing 2001-2 Sheet 400 (included later) for wiring details. Note a 1k2 resistor is required in series with the MCP contacts, as short circuit is fault.
MCP	MCP Only. Wire to an MCP for alarm activation. A co-located WIP and Zone Manned switch are not supported. Refer to drawing 2001-2 Sheet 401 (included later) for wiring details. Note a 1k2 resistor is required in series with the MCP contacts, as short circuit is fault.
FIP	FIP Alarm Input. Wire to a relay output of the fire panel. Open circuit is Fault, 10k resistor or 10V Zener Diode (from QE90) EOL is normal, short circuit is alarm. Refer to drawing 2001-2 Sheet 402 (included later) for wiring details.
FIP with S/C Fit	FIP Alarm Input with short circuit fault. Wire to a relay output of the fire panel with 1k2 resistor in series. Open circuit is Fault, 10k resistor or 10V Zener Diode (from QE90) EOL is normal, 1k2 resistance is Alarm, short circuit is Fault. Refer to drawing 2001-2 Sheet 401 (included later) for wiring details.
Four band	General Purpose input with four states available in script logic. Use with clean contacts from switches, relay contacts, etc. Can be used with a single on/off switch, 3-way switch, 4-way switch, or two on/off switches with special wiring to combine the states. Refer to drawing 2001-2 Sheet 403 (included later) for wiring details and Table 3 below for the states and logic tokens available.

Table 3 – Four Band Circuit Type Resistance Bands and States Available

Circuit Type	State, Resistance Band, Logic Token			
4 Band	Short < 270R WISCx.y	Alarm 680R WIALx.y	Normal 10K WINMx.y	Open > 20K WIOCx.y

Where x = Module address, y = input number 1 -20.

Refer to drawing 2001-2 Sheet 403 (included later) for wiring a 4-band input with on/off, 3 way or 4-way switches.

7. LED Indications

There are four LED indicators on the QE20 WIP Module.

- **LDB1 FAULT** will flash yellow when there is a fault with any of the configured circuits, the WIP AUDIO CHAIN connections, or with the module itself. A sequence of 10 flashes is shown, with a long flash indicating that a specific fault is present, and a short flash that the specific fault is not present. Table 4 explains each of the fault indications. Note the LED flashes for 5 seconds after power up and continuously if a remote terminal connection is active from the Controller.
- **LDB2 PWR/COMM** is on green, blinking off every second or so as it communicates with the QE20 Controller Module, when power is applied. Off means 24V power is not supplied or the module is faulty. Steady on means the module is not communicating with the Controller, or the module is faulty.
- **LDB3 WIP ACT** is on red when any WIP circuit is active (off-hook), i.e, ringing, calling, in talk mode, or on hold.
- **LDB4 FIP / MCP** is on red when any input configured as FIP or MCP is in the alarm condition.

In Bootloader mode all four LEDs flash together at ~8Hz. To exit Bootloader mode select the correct address on the rotary switches and power the module down and up again.

Table 4 LDB1 FAULT LED Flash Indications

Flash Number	Description	Explanation / Action
1	No configuration	There is no configuration in the WIP module. Check the site configuration includes this WIP module. Will be present on power up until communications with the QE20 Controller is established.
2	Short circuit fault	A WIP, MCP or FIP circuit is short circuit. Refer to the QE20 LCD for the circuit(s) in fault. Check the wiring, the WIP phone, etc.
3	Open circuit fault	A WIP, MCP or FIP circuit is open circuit. Refer to the QE20 LCD for the circuit(s) in fault. Check the wiring and termination at the WIP phone / MCP / alarm contacts, presence of correct EOL resistor, etc.
4	WIP AUDIO CHAIN Left port open circuit	The Left port of the WIP AUDIO CHAIN is open circuit. This should be connected to the Right port of the previous WIP/Input, Controller or RS485 Network module.
5	WIP AUDIO CHAIN Right port open circuit	The Right port of the WIP AUDIO CHAIN is open circuit. Connect to the Left port of next WIP module. Will not be shown on WIP Address #1 as this port is left open.
6	Not communicating with the Controller over QBus	Will be present on power up until communications with the QE20 Controller is established. Check: WIP Module is enabled in the site configuration; correct address is set on the rotary switches, QBus wiring is connected between the Controller and the module (may be via other modules), faulty module on QBus, or another WIP Module with the same address is present.
7	Invalid address on the ADDRESS rotary switches	Address is set to 00, which is an invalid QBus address (00 is used for Bootloader mode). Select a valid address 01 – 16 to match the site configuration. Addresses > 16 are currently not used, but do not set this fault indication. Otherwise, could be a faulty Module. Check with JCI Technical Support first, as the module could require a firmware upgrade. Otherwise replace it.
8	Firmware CRC fault	Faulty Module. Check with JCI Technical Support first, as the module could require a firmware upgrade. Otherwise replace it.
9	Software Fault	Should not occur in an operating system. Diagnostic function only. If powering the module down and up again does not clear the fault, replace the module.
10	System Fault	Unexpected restart. Should clear 30s after communications with the Controller is established. Check with JCI Technical Support as may need a firmware upgrade. Otherwise replace module.
Continuous	Remote Connection Active	A remote terminal connection is active from the QBM.

8. Power On & Testing

Power up the QE20 system with its site configuration installed. Check for any fault conditions and resolve these.

- For circuits configured as **WIP, WIP + MCP** check the correct field WIP phone rings when the appropriate WIP button is pressed on the QE20 front panel and voice conversation works in both directions when the phone is answered. Check the QE20 master WIP rings and the appropriate WIP button flashes red when the field WIP is lifted off-hook. If a Zone Manned switch is wired, check that pushing the button turns the Zone Manned indicator on for the correct zone.
- For circuits configured as **WIP + MCP, MCP, FIP, or FIP with S/C Fit** check that an alarm condition on the input (e.g., from the connected fire panel or MCP) creates an alarm on the correct zone(s) of the QE20.
- For general purpose inputs (**Four Band**) check the correct functionality is activated when the input is in the required state.

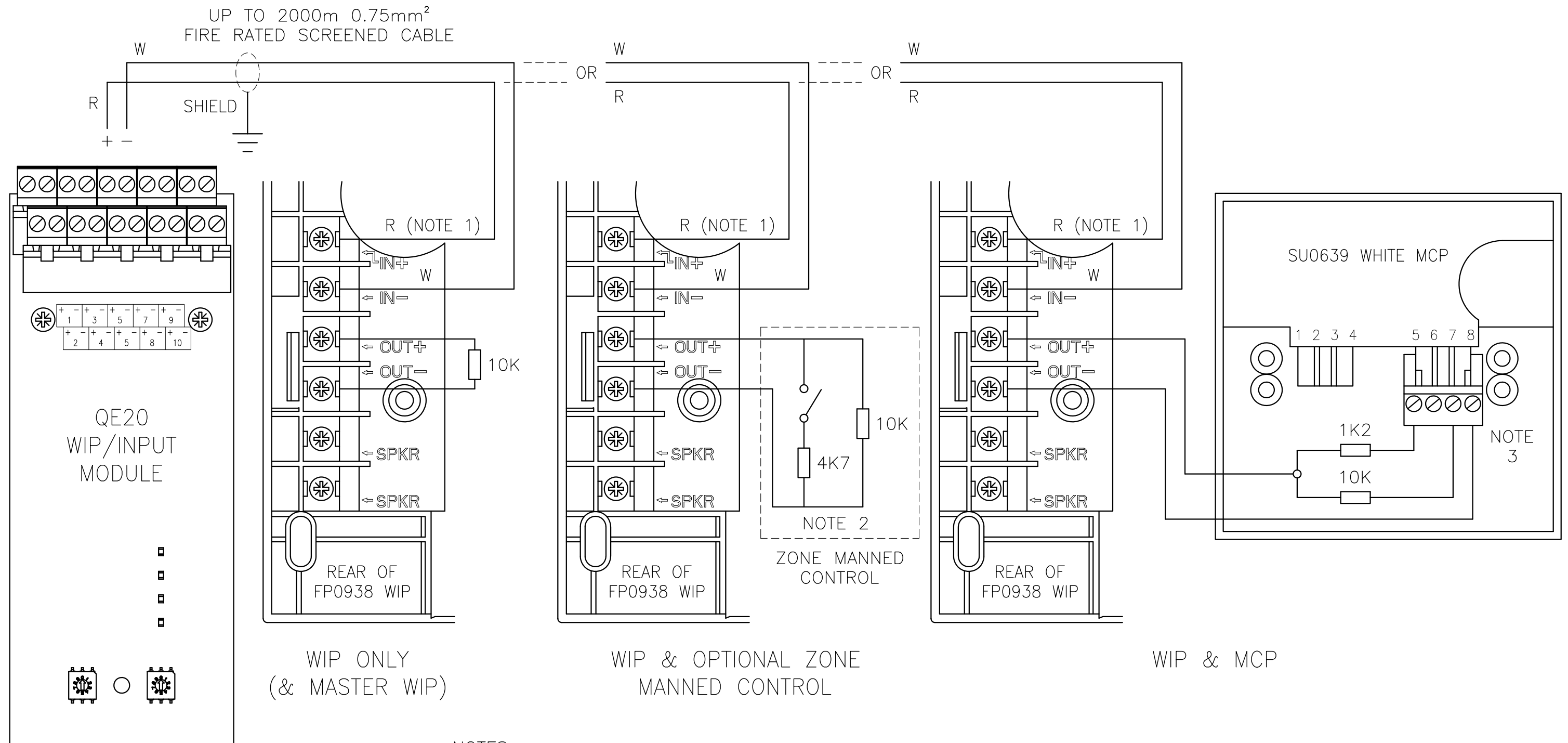
9. WIP/Input Module Specifications

Power Requirements	18V – 32Vdc 50mA typ @ 24V all circuits “None” 75mA typ @ 24V all circuits normal (10K EOL) 900mA Peak @ 27V WIP All-Call – 20 x WIPs connected.
Operating Temperature Range	-5°C to +45°C 10% to 93% RH non-condensing
WIP Circuits	2 wire 1km screened cable to Vigilant FP0938 WIP, 10K EOL Zone Manned is 4k7 resistance across the circuit MCP alarm is 1k2 resistance across the circuit
MCP (Only) Input	10K or 10V Zener Diode (ex QE90) EOL, clean contact, 1k2 for alarm
FIP Alarm Inputs	10K or 10V Zener Diode (ex QE90) EOL, short for alarm (O/C Fit) 10K or 10V Zener Diode (ex QE90) EOL, 680R for alarm (S/C Fit)
General Purpose inputs	Clean contact – 10k pull up to +24V Supply 2-Band: >1K8 (E.g. Open), <1k8 (E.g. Short) 3-Band: >20K (E.g. Open), 10K (Normal), <270R (E.g. Short) 4-Band: >20K (E.g. Open), 10K (Normal), 680R (Alarm), <270R (E.g. Short)
Master WIP Connection	Circuit 20 only. Vigilant FP0938 WIP, 10k EOL

10. End User Licence Agreement, Privacy and Licensed Software

Please refer to the following web page for the Johnson Controls End User Licence Agreement (EULA), Open Source Software (OSS) licences and Privacy information related to this product -

www.johnsoncontrols.com/techterms



- NOTES:
1. WIRING TO WIP PHONE MUST HAVE CORRECT POLARITY.
 2. OPTIONAL MANNED SWITCH OR MCP MUST BE MOUNTED ADJACENT TO WIP PHONE.
 3. SU0639 MCP TERMINALS 5 & 6 ARE INTERNALLY JOINED, 7 & 8 ARE INTERNALLY JOINED.

CONFIDENTIAL: THIS DOCUMENT MUST NOT BE COPIED NOR THE CONTENTS PASSED ON TO ANY THIRD PARTY WITHOUT THE CONSENT OF THE COMPANY.

UNLESS OTHERWISE STATED: ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE. TOLERANCES ARE TO BE: 1 DECIMAL PLACE ±0.5, 2 DECIMAL PLACES ±0.3, 3 DECIMAL PLACES ±0.1

3rd ANGLE PROJECTION

ISS/REV	AMENDMENTS	ECO	DRN	CHKD	AUTH	APVD	DATE
A	ORIGINAL.	-	KJS	RC	MH	DC	12-3-20

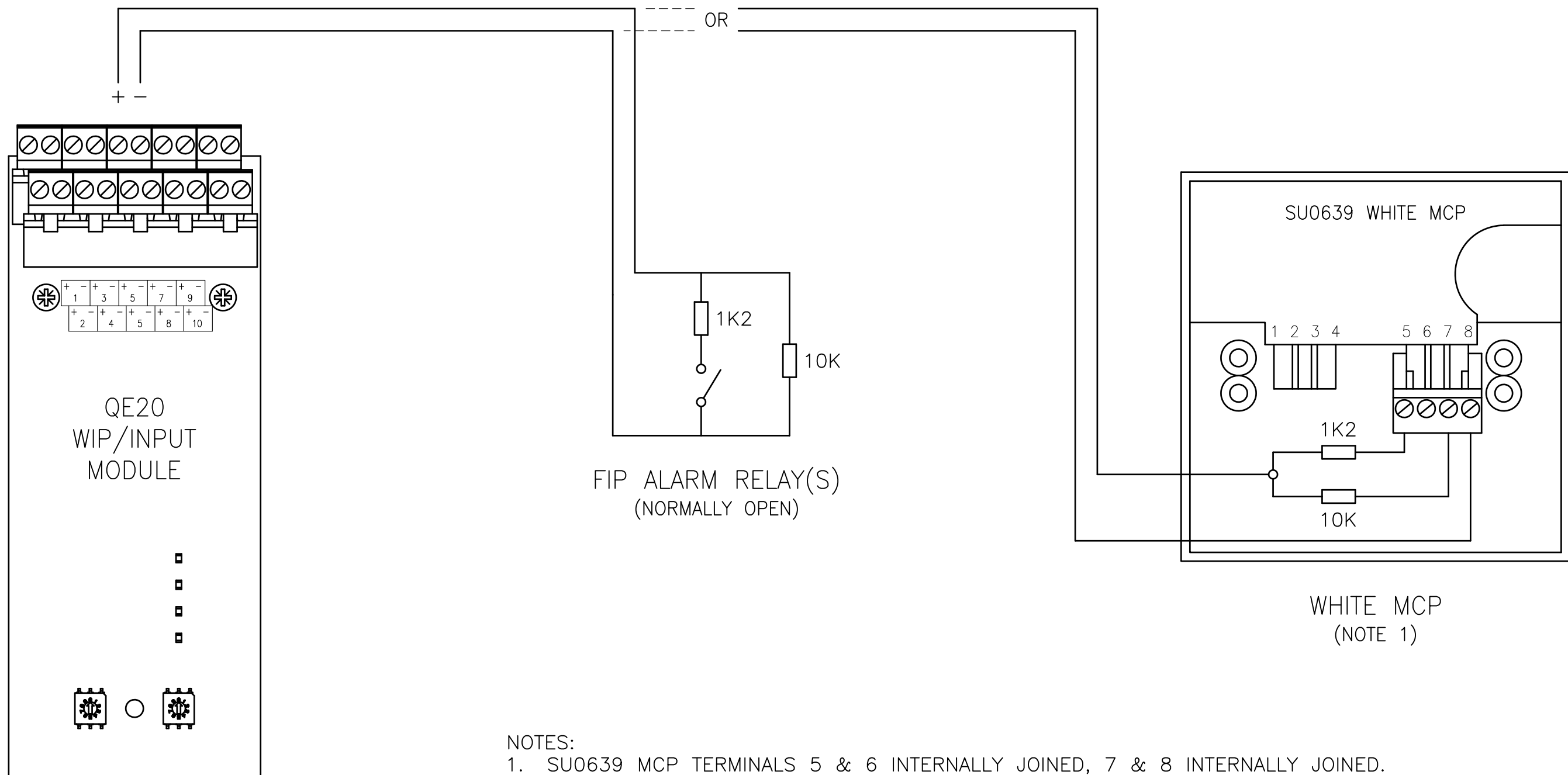
© 2020 Johnson Controls. All rights reserved. All specifications and other information shown were current as of document revision date and are subject to change without notice.

JOHNSON CONTROLS
17 MARY MULLER DRIVE
P.O. BOX 19545
CHRISTCHURCH, PH: +64 3 3895096
NEW ZEALAND. FAX: +64 3 3895938

QE20 WIP MODULE
WIP / WIP & MANNED / WIP & MCP
WIRING DIAGRAM

DRAWING No: **2001-2** SHEET **400** of **N**

A3	ISS/REV A	PART No:
-----------	------------------	----------



NOTES:
 1. SU0639 MCP TERMINALS 5 & 6 INTERNALLY JOINED, 7 & 8 INTERNALLY JOINED.

CONFIDENTIAL: THIS DOCUMENT MUST NOT BE COPIED NOR THE CONTENTS PASSED ON TO ANY THIRD PARTY WITHOUT THE CONSENT OF THE COMPANY.

UNLESS OTHERWISE STATED: ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE. TOLERANCES ARE TO BE: 1 DECIMAL PLACE ± 0.5 , 2 DECIMAL PLACES ± 0.3 , 3 DECIMAL PLACES ± 0.1

3rd ANGLE PROJECTION

ISS/REV	AMENDMENTS	ECO	DRN	CHKD	AUTH	APVD	DATE
A	ORIGINAL.	-	KJS	RC	MH	DC	12-3-20

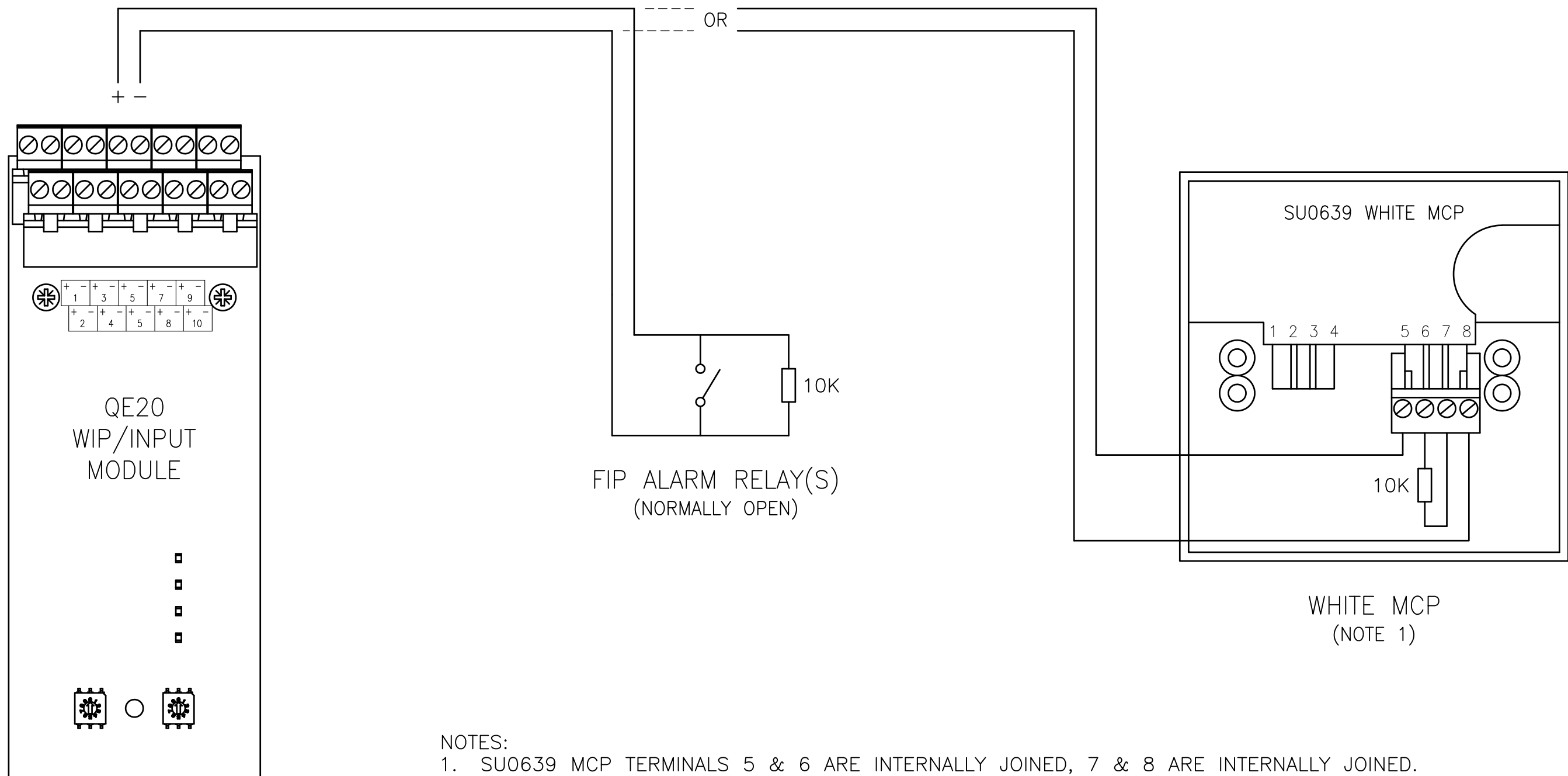
© 2020 Johnson Controls. All rights reserved. All specifications and other information shown were current as of document revision date and are subject to change without notice.

JOHNSON CONTROLS
 17 MARY MULLER DRIVE
 P.O. BOX 19545
 CHRISTCHURCH, PH: +64 3 3895096
 NEW ZEALAND. FAX: +64 3 3895938

**QE20 WIP MODULE
 MCP / FIP SHORT CIRCUIT FAULT
 WIRING DIAGRAM**

DRAWING No: 2001-2 SHEET 401 of N

A3 | ISS/REV A | PART No:



CONFIDENTIAL: THIS DOCUMENT MUST NOT BE COPIED NOR THE CONTENTS PASSED ON TO ANY THIRD PARTY WITHOUT THE CONSENT OF THE COMPANY.

UNLESS OTHERWISE STATED: ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE. TOLERANCES ARE TO BE: 1 DECIMAL PLACE ± 0.5 , 2 DECIMAL PLACES ± 0.3 , 3 DECIMAL PLACES ± 0.1

3rd ANGLE PROJECTION

ISS/REV	AMENDMENTS	ECO	DRN	CHKD	AUTH	APVD	DATE
A	ORIGINAL	-	KJS	RC	MH	DC	12-3-20

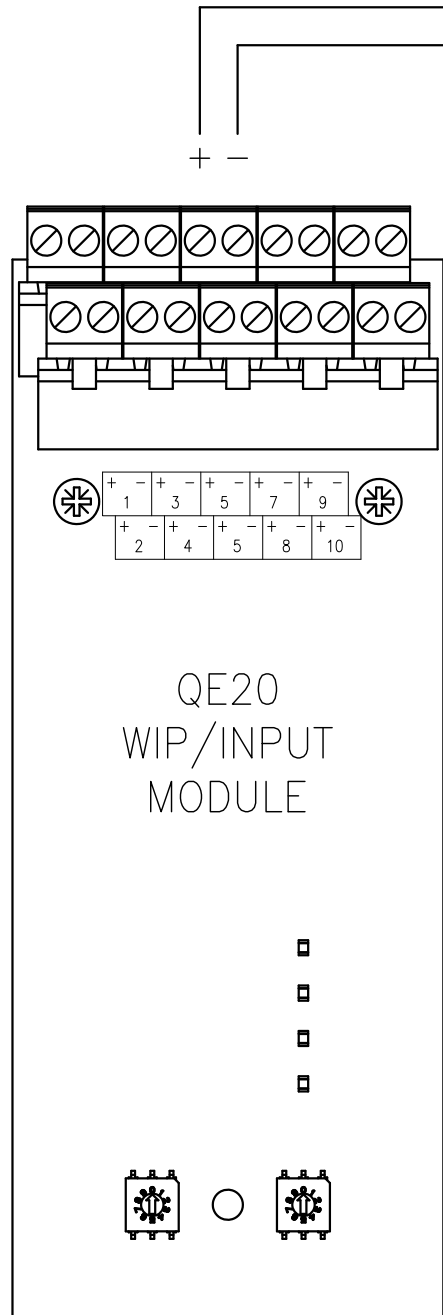
© 2020 Johnson Controls. All rights reserved. All specifications and other information shown were current as of document revision date and are subject to change without notice.

JOHNSON CONTROLS
17 MARY MULLER DRIVE
P.O. BOX 19545
CHRISTCHURCH, PH: +64 3 3895096
NEW ZEALAND. FAX: +64 3 3895938

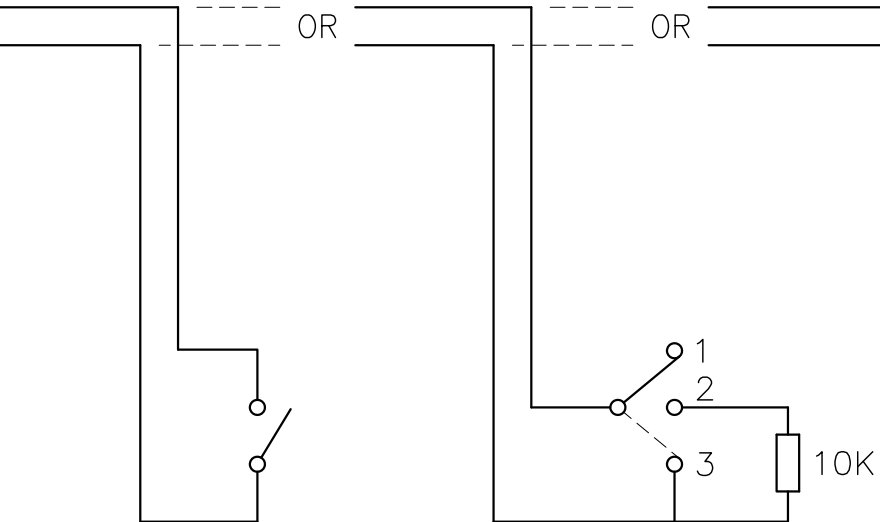
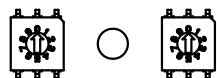
**QE20 WIP MODULE
MCP / FIP SHORT CIRCUIT ALARM
WIRING DIAGRAM**

DRAWING No: 2001-2 SHEET 402 of N

A3 | ISS/REV **A** | PART No:



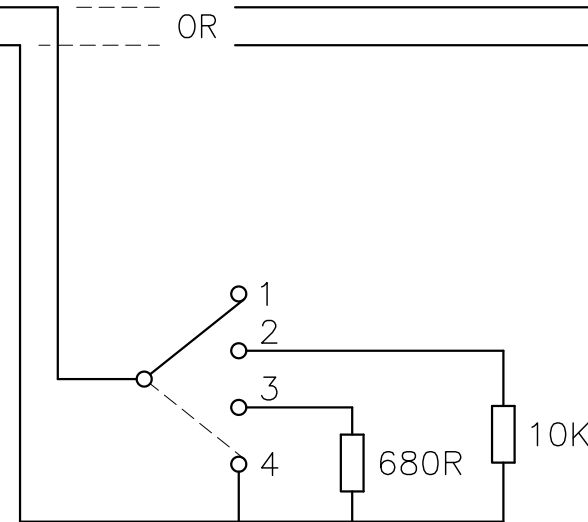
QE20
WIP/INPUT
MODULE



2 POSITION
ON/OFF CONTACT
(TABLE 1)

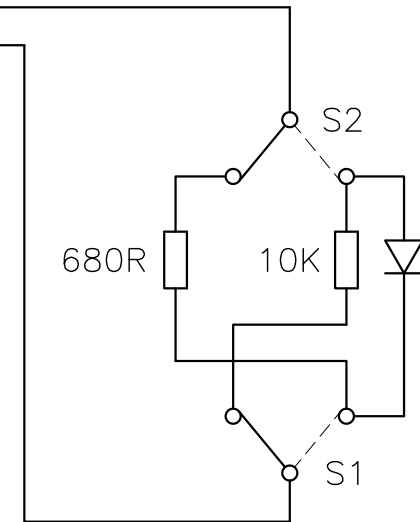
TABLE 1			
SWITCH POSITION	STATE	RESISTANCE	LOGIC TOKEN
OFF	OPEN	>20K	WIOCx.y
ON	SHORT	<270R	WISCx.y

TABLE 2			
SWITCH POSITION	STATE	RESISTANCE	LOGIC TOKEN
1	OPEN	>20K	WIOCx.y
2	NORMAL	~10K	WINMx.y
3	SHORT	<270R	WISCx.y



4 POSITION
OPEN/NORMAL/ALARM
SHORT SINGLE CONTACT
(TABLE 3)

TABLE 3					
SWITCH POSITION	S1	S2	STATE	RESISTANCE	LOGIC TOKEN
1	OFF	OFF	OPEN	>20K	WIOCx.y
2	OFF	ON	NORMAL	~10K	WINMx.y
3	ON	OFF	ALARM	~680E	WIALx.y
4	ON	ON	SHORT	<270E	WISCx.y



4 STATES FROM
2 ON/OFF CONTACTS
(TABLE 3)
S1, S2 SHOWN IN
OFF POSITION

NOTES:

- x = MODULE ADDRESS 1-16.
y = INPUT NUMBER 1-20.
- 10K RESISTOR CAN BE 10V ZENER FROM QE90.
- MUI BAND 1 IS S/C, ETC.

CONFIDENTIAL: THIS DOCUMENT MUST NOT BE COPIED NOR THE CONTENTS PASSED ON TO ANY THIRD PARTY WITHOUT THE CONSENT OF THE COMPANY.

UNLESS OTHERWISE STATED: ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE. TOLERANCES ARE TO BE: 1 DECIMAL PLACE ±0.5, 2 DECIMAL PLACES ±0.3, 3 DECIMAL PLACES ±0.1

3rd ANGLE PROJECTION

ISS/REV	AMENDMENTS	ECO	DRN	CHKD	AUTH	APVD	DATE
A	ORIGINAL.	-	KJS	RC	MH	DC	12-3-20

© 2020 Johnson Controls. All rights reserved.
All specifications and other information shown were current as of document revision date and are subject to change without notice.

JOHNSON CONTROLS
17 MARY MULLER DRIVE
P.O. BOX 19545
CHRISTCHURCH, PH: +64 3 3895096
NEW ZEALAND. FAX: +64 3 3895938

**QE20 WIP MODULE
FOUR BAND WIP / INPUT
WIRING DIAGRAM**

DRAWING No: 2001-2 SHEET 403 of N

A3 ISS/REV A PART No: