

# XP95

## MAINS SWITCHING INPUT/OUTPUT UNIT

### FUNCTION

The XP95 Mains Switching Input/Output Unit provides a voltage-free, single pole change-over relay output and a monitored switch input.

### FEATURES

The Mains Switching Input/Output Unit supervises one or more normally-open switches connected to a single pair of cables. It is set to return an analogue value of 4 in the event of an open or short-circuit fault and 16 during normal operation. The status of the input is reported by means of an input bit.

### ELECTRICAL CONSIDERATIONS

The XP95 Mains Switching Input/Output Unit is loop powered and operates at 17–28V DC with protocol voltage pulses of 5–9V. The loop connections are polarity sensitive.

### PROTOCOL COMPATIBILITY

The unit will operate only with control equipment using the Apollo Series 90, XP95 or Discovery protocol.

### PROTOCOL BIT USAGE

*The control equipment transmits a 10-bit message to the Input/Output Unit:*

The **output (or forward command) bits** from the control panel have the following function:

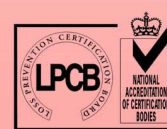
**Output bits 2 and 1** are not used.



**Part no** 55000-875

When **output bit 0** is set to logic 1 on two or more consecutive pollings, the relay changes state to the "set" condition. Bit 0 must be set to logic 1 as long as it is desired to keep the relay in its set state. The relay will remain latched in the set state until output bit 0 is set to logic 0 on two or more consecutive pollings. Neither the removal of loop power nor the discontinuation of interrogation of its address will affect the state – set or not – of the relay.

The relay will not change state during the first 30 seconds after application of loop power. If a command bit is received during this period, it will be actioned at the end of the 30 second period. If the device is not interrogated during this period, the relay will automatically reset.



After the 30 second period, ie, during normal operation, the relay changes state within 0.1 second of receipt of a command.

The **seven bits** which are then transmitted by the control panel correspond to the **address (as set on the DIL switch)** of the device to be polled.

*A response message is then sent by the Mains Switching Input/Output Unit to the control equipment:*

The **interrupt bit** is always set to logic "0".

The **analogue value bits** return a pre-set analogue value of 4 during open or short-circuit faults and 16 when the switch is open or closed. Full details are shown in the table opposite.

The **input bits** have the following function:

**Input bits 2 and 1** are not used.

**Input bit 0** is used to report the status of the monitored switch input. During normal operation, ie, when the switch is open, and in the event of a fault (open or short-circuit), input bit 0 is set to "0". When the switch is closed, input bit 0 is set to "1". Details of input conditions are given in the table opposite.

The **type bits** are used to identify the type of unit responding. The type code of the Input/Output Unit is 010 00 (bits 2, 1, 0, 4, 3 respectively). Bits 2, 1 and 0 are sent immediately after the input bits and bits 4 and 3 are sent in the XP protocol extension.

The Input/Output Unit sends **seven bits** of data to confirm its **address** and then **one bit** to indicate that the device can use the XP95 protocol (**XP95 flag**).

The **alarm flag** is not placed by the Input/Output Unit.

The next **two bits** returned by the device are bits 4 and 3 of the type code.

The next **five bits** are the second block of analogue value data bits and are not used by the Input/Output Unit.

The **parity bit** is set to "1" or "0" such that the device will always respond with an even number of data bits.

The **final seven bits** are the "**alarm/interrupt address**" and are not used by the Input/Output Unit.

## MECHANICAL CONSTRUCTION

The Input/Output Unit is supplied with a backbox for surface mounting. It is designed for indoor use only.

Three LEDs, two red and one yellow, are visible through the front cover of the enclosure.

One red LED is illuminated to indicate that the relay is set. The second red LED is illuminated to indicate that the switch input is closed.

The yellow LED is illuminated whenever a fault condition (open or short circuit) has been detected.

All LED indicators can be disabled using segment 8 of the DIL switch.

The enclosure is moulded from the same white self-extinguishing polycarbonate as Apollo detectors.

### Dimensions and weight of Mains Switching Input/Output Unit:

150 x 90 x 48mm

240g

## Input conditions and status

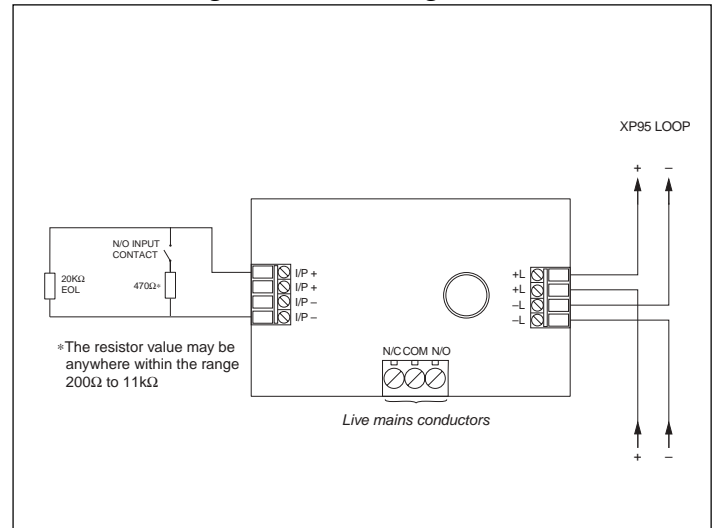
Resistance across input	Status	Analogue value	Input Bit		
			2	1	0
<100Ω	Short-circuit fault	4	0	0	0
100–200Ω	Indeterminate	4 or 16	0	0	0 or 1
200–11kΩ <i>470Ω*</i>	Switch closed	16	0	0	1
11–15kΩ	Indeterminate	16	0	0	0 or 1
15–25kΩ <i>20kΩ*</i>	Normal (switch open)	16	0	0	0
25–30kΩ	Indeterminate	4 or 16	0	0	0
>30kΩ	Open-circuit fault	4	0	0	0

\*The values in *italics* are recommended values and resistors are supplied with the unit.

## Technical data

Series 90/XP95 loop voltage	17-28V DC
Maximum current consumption at 24V <i>LED enabled</i>	
switch-on surge, max 150ms	3.5mA
quiescent, 20kΩ EOL fitted	1.25mA
switch input closed, 'switch closed' LED on	2.5mA
any other condition, max 2 LEDs on	2mA
<i>LED disabled</i>	
switch-on surge, max 150ms	3.5mA
quiescent, 20kΩ EOL fitted	1.2mA
switch input closed,	1.5mA
any other condition	2mA
Rated load (resistive)	5A at 250V AC 2A at 48V DC
Max switching capacity	1.25kVA
Switch input monitoring voltage (open-circuit condition)	9-11V DC
Maximum cable resistance	50Ω

## Schematic Diagram and Wiring Connections



## Environmental Data

Operating temperature	-20°C to +70°C	
Humidity (no condensation)	0–95%	
Cyclic humidity Impact	} to EFSG/F/95/007	
Surface temperature under max load Vibration Rigidity Dielectric strength		} BSEN61010–1:1993
IP rating	54	
Radiated emissions	} BS EN 50081–1:1992 BS EN 50081–2:1994	
Radiated immunity		