



Ref.: SI: XP95-970

Ref.: SI: XP95-960

Ref.: SI: XP95-940

Intrinsically Safe Manual Call Points

XP95 I.S. Manual Call Points

When activated, the intrinsically safe call point not only interrupts the polling cycle to indicate to the control panel that it has been operated, but also reports its address. Thus an alarm and its location can be reported in less than 0.2 seconds.

Full details of the principles of operation and the electrical description are published in the XP95 Engineering Product Guide. XP95 I.S. manual call points have the same operating characteristics as the standard versions. They are available in two types of housing and in a number of versions.

The standard call point is based on the KAC waterproof model and is a red, break-glass call point, part no: 55000-940. This model is also available in other colours and a protective lift-up flap is available. Table 4 gives full details of KAC-based versions and part numbers.

Part No.	Colour	Type	IP Rating
XP95-940	Red	Without flap	65
XP95-942	Yellow	Without flap	65
XP95-943	Yellow	With flap	65
XP95-944	Blue/white	Without flap	65
XP95-945	Blue/white	With flap	65

Table 4 KAC-based manual call points

For heavy-duty applications a robust manual call point based on a model by MEDC is available. This model is made of glass-reinforced polyester and may be ordered as a break-glass or push-button call point and in a variety of colours. Break-glass models may be supplied with or

without a stainless-steel protective flap. Table 5 gives part numbers and full details of MEDC-based call points.

MEDC-based break-glass units have two M20 cable entries on the bottom face of the back-box. Push button units have one M20 cable entry on the bottom face and one on the top face. Other cable entry configurations can be provided to special order.

Part No.	Colour	Type	IP Rating
XP95-960	Red	Break-glass	66
XP95-962	Yellow	Break-glass	66
XP95-964	Blue	Break-glass	66
XP95-966	Black/yellow stripes	Break-glass	66
XP95-961	Red	Break-glass with flap	66
XP95-963	Yellow	Break-glass with flap	66
XP95-965	Blue	Break-glass with flap	66
XP95-967	Black/yellow stripes	Break-glass with flap	66
XP95-970	Red	Push-button	66
XP95-971	Yellow	Push-button	66
XP95-972	Blue	Push-button	66
XP95-973	Black/yellow stripes	Push-button	66

Table 5 MEDC-based manual call points

Technical Data – XP95 Intrinsically Safe Manual Call Points

Specifications are typical and given at 23°C and 50% relative humidity unless otherwise specified.

Technical data for the I.S. manual call point is identical to that for the standard version, except for the information below.

Device Part No:

See Tables 4 and 5.

Supply Wiring:

Two wire supply, polarity sensitive.

Terminal Functions:

L1: positive supply

L2: negative supply

Note: I.S. devices are polarity sensitive

Supply Voltage:

14-22 Volts dc

Quiescent Current:

230µA.

Operating Temperature:

-20°C to +40°C (T5).

-20°C to +60°C (T4).

IP Rating:

See Tables 4 and 5.

BASEEFA Certificate No:

BAS02ATEX1290

Classification:

E Ex ia IIC T5 (T4 at Ta ≤ 60°C)

Dimensions:

Part No 55000-940 (KAC-based MCP): 124mm x 124mm x 60mm. Weight: approx. 400g

Part No 5500-961 (MEDC-based MCP): 126mm x 120mm x 67mm (126mm x 120mm x 114mm - push button call point). Weight: approx. 1.20kg

XP95 INTRINSICALLY SAFE COMMUNICATIONS PROTOCOL

The standard XP95 communications protocol is designed to be very robust and to give the maximum flexibility to designers of loop driver circuits. The current and voltage levels used are chosen to be well above noise levels and to operate in adverse conditions with the minimum of errors. The maximum voltage and current levels used are, however, outside the limits of intrinsically safe systems and it has been necessary to apply lower limiting values for both current and voltage in the I.S. range.

The voltage limitation arises because of the need for safety barriers. The barriers used with Apollo I.S. detectors are rated at 28 volts, the highest rating that is commercially available. These are used to limit the voltage inside the hazardous area to a (practical) maximum of about 26V DC. Although this is within the standard XP95 protocol specification, it is lower than that provided by most loop drivers.

The safety barrier is also responsible for the current limitation because the 28V barriers have a series resistance of at least 300 ohms. This resistance results in unacceptable voltage drops if the normal 20mA current pulses are used. It has therefore been necessary to reduce the amplitude of the current pulses to 10mA.

The differences between the standard protocol and the intrinsically safe are summarised in Table 6.

Parameter	XP95 Standard	XP95 I.S.
DC input voltage	17 – 28V	14 – 22V
Pulse voltage peak to peak	5 - 9V	5 - 9V
DC + pulse voltage	37V max	26.5V max
Current pulse amplitude	18 – 22mA	9 – 11mA
Input voltage polarity	polarity insensitive	L1 positive L2 negative

Table 6 Protocol Variance Data

XP95 Protocol Translator

In order to enable the use of standard control and indicating equipment in intrinsically safe systems, Apollo has developed a device to “translate” voltage levels from any loop driver operating within the XP95 limits to levels compatible with the I.S. requirements. The translator also “boosts” the current pulses returned by the I.S. detectors from 10mA to 20mA, thereby ensuring compatibility with standard loop driver thresholds.

The translator is a loop-powered device which draws a low quiescent current and is therefore transparent to both the loop driver and the I.S. detectors. Since the translator is used within the safe area, i.e., before the safety barrier, no



XP95 Protocol Translator Ref.: SI: XP95-855/856 (dual channel)

certification is necessary. The translator falls within the generic description “Safe Area Apparatus” on the certified system diagram.

The translator is housed in a moulded plastic enclosure which can be either clipped onto a standard 35mm DIN rail (DIN 46277) or panel mounted by using pull-out latches in the base. The translator is available in single-channel or dual-channel versions. Each channel should only be connected to a single intrinsically safe circuit through an appropriate safety barrier. Each channel is thus capable of supplying up to twenty XP95 I.S. devices.

A block schematic of the dual-channel translator, showing terminal designations, is given in Fig 2. In the single-channel unit the Channel 2 circuit is not fitted and terminal 12 is not used.

The input to the unit consists of the normal XP95 signal, that is a d.c. voltage on which is superimposed the protocol pulses.

Translator Operation

The translator first regulates the d.c. level to 18V. The incoming protocol pulses are then sensed and re-generated and shaped with a fixed amplitude of 6V, and superimposed on the 18V d.c. output level.

The 10mA current pulses drawn by the I.S. devices are detected by the current pulse sensor whose output is used to switch the 10mA current sink across the input terminals synchronously with the device current pulse. The current boosting mechanism is inhibited during the protocol pulses so that when low resistance loads are connected to the translator output the protocol current is not boosted.

A separate current limiting circuit is incorporated in each channel which limits the maximum (peak) output current to 35mA. This level of current will ensure that safety barrier fuses are not blown in the event of a short-circuit on the barrier output.

When the dual-channel unit is used it must be remembered that the loop input, and the negative side of the output, is common to the two channels. It is not possible, therefore, to connect the two channels to different loops. Although the two channels have a common input, their outputs are individually

current-limited to 35mA (nominal). Hence, a short-circuit on one channel will cause the loop current to increase by 35mA and as long as the panel is able to support this load the second channel will continue to operate normally.

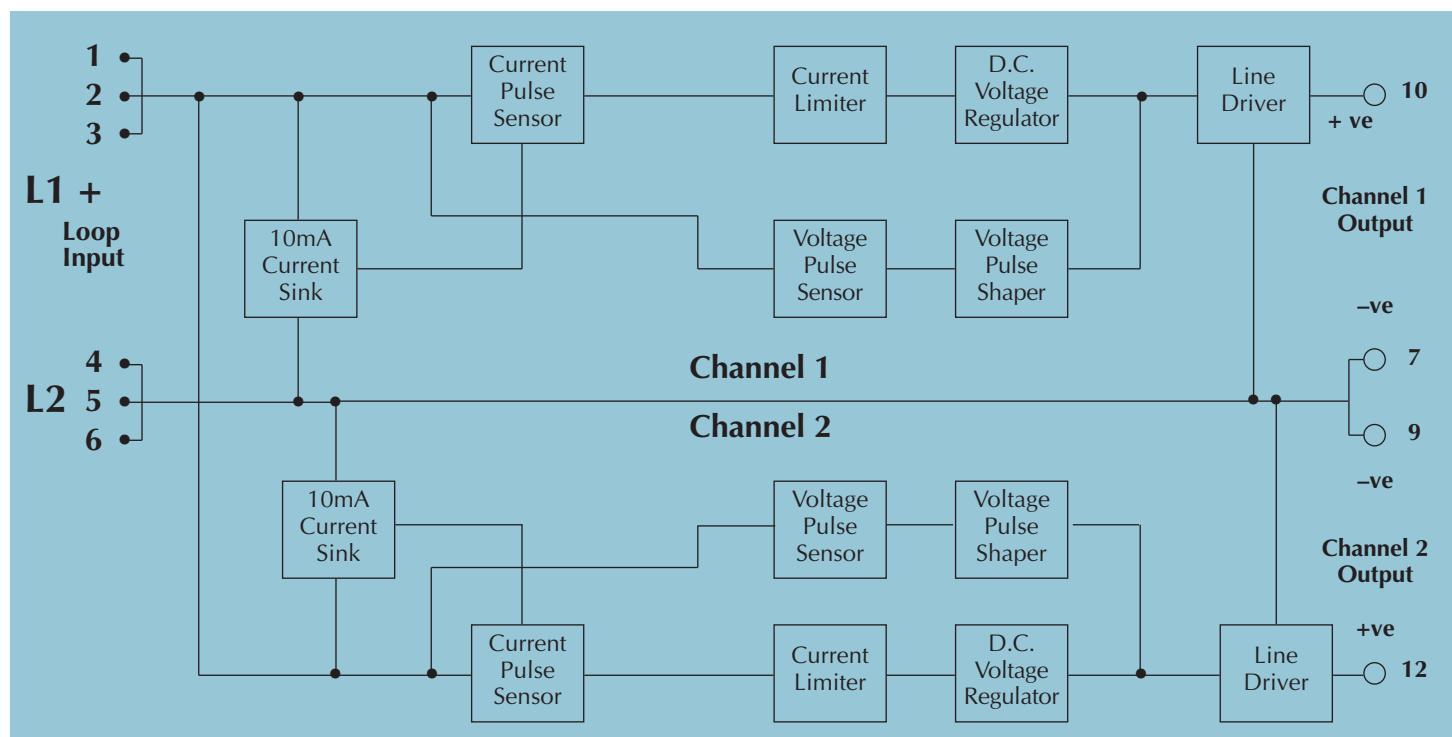


Fig. 2 Schematic Diagram – XP95 Protocol Translator

Technical Data – XP95 Protocol Translator

Specifications are typical and given at 23°C and 50% relative humidity unless otherwise specified.

Device Part No:

55000-855 (single channel).
55000-856 (dual channel).

Supply Wiring:

Two wire supply, polarity sensitive.

Supply Voltage:

19 to 28 Volts.

Modulation Voltage at Translator:

5 to 9 Volts peak to peak.

Input Current (no load condition):

2mA max (dual channel).
1mA max (single channel).

Output Voltage: (to barrier)

16.5 to 19 Volts.

Output Modulation Voltage: (to barrier)

5 to 6.5 Volts.

Output Current: (to barrier)

0.2 to 30mA

Input Pulse Current: (from barrier)

8 to 12mA.

Output Pulse Current: (drawn from loop)

17 to 23mA.

Operating Temperature:

-20°C to +60°C.

Humidity: (no condensation)

10 to 95% relative humidity.

Dimensions:

92.5 x 110 x 20mm.

Weights:

Approx. 100g.

Materials: (housing)

Makrolon 6485 V-0 rated to UL94.

