

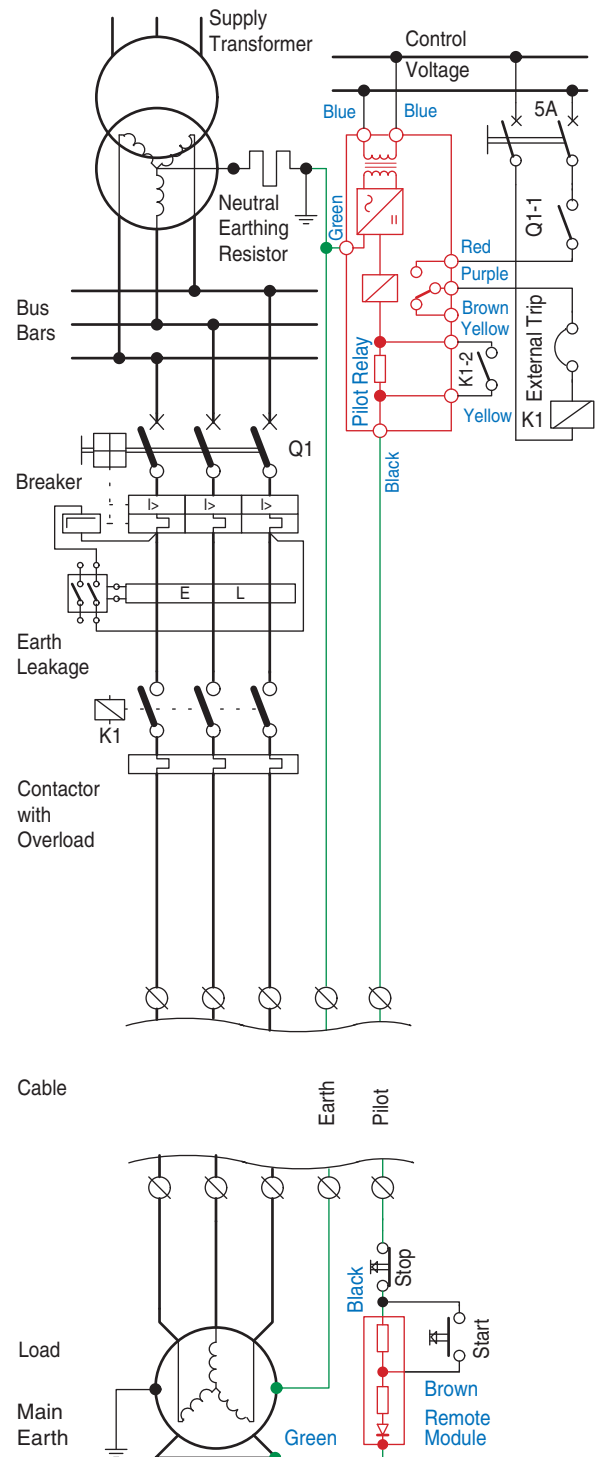
# Specifications for GBP4-NI Pilot Wire Relay

To continuously monitor the resistance of the *earth bond*, an electrical measuring signal is fed into the *earth conductor* via a separate *pilot wire*. To cater for the possibility of a short between this pilot and the earth, a *remote module* must be employed.

A loop now exists, consisting of the *pilot wire*, the *remote module* and the *earth wire* in the cable. An intrinsically safe signal is injected into the loop and, by interpreting the voltage and the current flowing, the resistance can be monitored: see Fig 1. The energy level of an intrinsically safe signal is so low that dangerous gases like hydrogen or methane cannot be ignited by it.

Depending on factors such as the length of the supply cable, the nature of the load, variable speed drives or very heavy loads, and the location of the installation, a range of noise signals can be induced or injected into the loop: the signals can vary from high frequency generated by thyristor switching, to 50Hz with an amplitude of up to 50V. New generation relays use a micro controller to filter this noise digitally enabling relays to operate normally with high noise levels.

The **GBP4-NI** is designed to operate in environments with high electrical noise levels, it is immune to electrical noise with an amplitude of up to 12 volts. When the relay detects noise levels above 12 volts it switches to its *restricted operation mode*, in this mode loop resistance measurement is suspended. If the relay is energised the load can be switched off or if the relay is not energised the load can not be switched on while noise levels greater than 12 volts exist. The GBP4-NI automatically reverts to *full operation mode* when noise levels drop to 12 volts or below. The GBP4-NI is a direct replacement for GBP4/5 series relays.



**Fig 1**

*Pilot Wire Control Relay with 3-Wire Module provides continuity sensing & remote control.*

*Note: The relay shown above is in the OFF state.*

# Specifications for GBP4-NI Pilot Wire Relay

Control Voltage (Vnom): 110Vac +20% -30% (Grey case)  
220Vac +20% -30% (Red case)  
525Vac +20% -30% (Blue case)

Earth loop detection:  $22\Omega \pm 20\%$

Electrical noise immunity

Full operation: <12Vac

Restricted operation: >12Vac -50Vac

Short circuit detection: if short circuit resistance <  $3K\Omega$

Line-to-pilot fault withstand time

2.5A restricted earth systems: <30sec

15A restricted earth systems: <2sec

Output Contacts

110V model: Two potential free C/O rated at 5A 525Vac

220V & 525V models: One potential free C/O rated at 5A 525Vac

Indicators

Relay not energised: Red - On continuously.

Relay energised: Red - One flash per second.

Short circuit detected: Red - Three fast flashes repeated every sec.

Max ambient temp: 45°C

Relay Burden: 10VA

Compliance standard: British Standards Institute BS3101;1986

Classification: SABS Intrinsically safe  
[Ex ib] I/IIc I.A. No. SABS MS/09-636AX

Operation modes

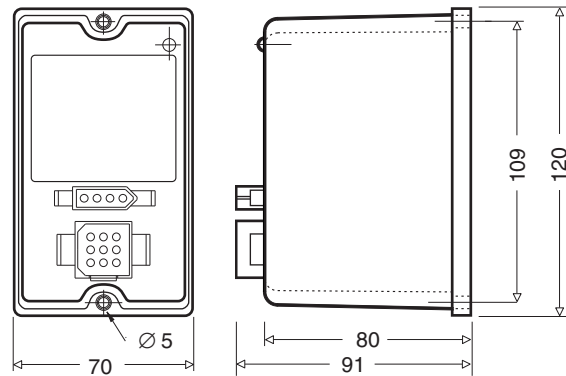
Loop sensing only: 2-wire Remote Module

Loop sensing with remote control: 3-wire Remote Module + Pushbutton Station

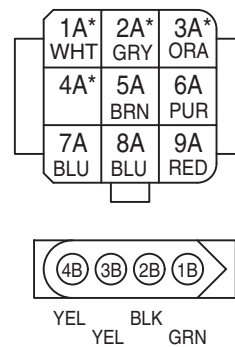
Compatibility: Direct replacement for GBP4/5 & MP130 series relays.

## Ordering:

| Stock No | Description                          |
|----------|--------------------------------------|
| 5001-013 | GBP4-110V-NI Pilot Wire Relay (Grey) |
| 5001-015 | GBP4-220V-NI Pilot Wire Relay (Red)  |
| 5001-017 | GBP4-525V-NI Pilot Wire Relay (Blue) |
| 1501-019 | GBP Pushbutton Station (Blue)        |
| 5001-020 | GBP 2-Wire Buff Module               |
| 5001-021 | GBP 3-Wire Buff Module               |
| 5001-018 | GBP4-110 Connection Leads            |
| 5001-010 | GBP4-220/525 Connection Leads        |

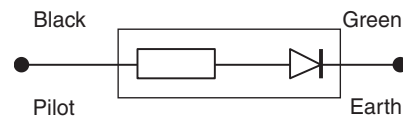


**Fig 2**  
Dimensions of relay (in mm)

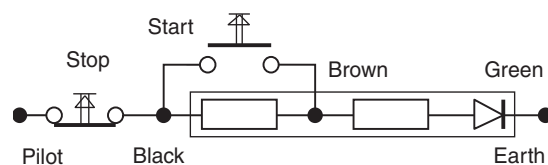


- |              |           |              |          |
|--------------|-----------|--------------|----------|
| 1A. White :  | Common-2* | 1B. Green :  | Earth    |
| 2A. Grey :   | N/O-2*    | 2B. Black :  | Pilot    |
| 3A. Orange:  | N/C-2*    | 3B. Yellow : | Feedback |
| 4A. - :      | Not used* | 4B. Yellow : | Feedback |
| 5A. Brown :  | N/C-1     |              |          |
| 6A. Purple : | Common-1  |              |          |
| 7A. Blue :   | Supply    |              |          |
| 8A. Blue :   | Supply    |              |          |
| 9A. Red :    | N/O-1     |              |          |
- \*Note: On 220V & 525V models, contacts 1A to 4A are not used.

**Fig 3**  
GBP4-NI Plug Connections



**Fig 4**  
2-Wire Remote Module Connection Diagram



**Fig 5**  
3-Wire Remote Module Connection Diagram