



GEC Retrofit Relay Range

*P&B's retrofit range of relays is a comprehensive range of **Intelligent Protection and Control** products designed to meet the requirements for electrical protection and automation of switchgear.*



***P&B Retrofit Relays** cover a wide range of primary protection requirements and are designed to be both mechanically and electrically compatible to the original protection relay*



www.pbsigroup.com

Made in Manchester, United Kingdom



GEC Retrofits

For retrofit applications P&B have developed specific relays to aid compatibility and simplify end client adoption. For the replacement of GEC relays we utilise our draw out relays mounted in 50mm, 70mm, 100mm, 150mm and 200mm wide chassis and are designed to provide an immediate and effective solution to combat obsolescence of GEC products.



Most relays use a graphical LCD which provides a unique four button interface allowing access to all menu structures, data and settings.

All Setting parameters are programmed easily via the integral keypad and liquid crystal display or via the USB port.

Benefits:

High specification electronics for long-life and high-duty operations provide increased immunity to electro-magnetic interference in demanding applications and environments



Retrofitting using our existing vision hardware technology allows us to produce bespoke solutions without risk and provides a cost effective way to manage equipment obsolescence



P&B retrofits are both mechanically and electrically compatible to the original relays ensuring they can be easily installed quickly and without needing lengthy outages or downtime



FVD - MCGG

The P&B FVD – MCGG retrofit allows for a pin for pin replacement ensuring a rapid upgrade to the existing overcurrent & earth fault protection providing the same protection features as the installed MCGG but with the added features of P&B's modern device with communication protocols and displayed feeder data.

The MCGG is available in 3 case sizes (100mm, 150mm, 200mm) and provides protection for 1 phase earth through to 3 phase over-current. Each retrofit is electrically mapped to be pin for pin so panel wiring changes are not required.

FVD - MCGG

- 200mm MCGG 51, 52, 53, 82
- 150mm MCGG 42, 62, 63
- 100mm MCGG 11, 21, 31, 41, 22

100mm or 150mm or 200mm case
50 x 50 Graphical LCD and 4 function keys
ANSI: 50/51 50n/51n



200mm



150mm



100mm

Pilot Wire Protection

FVD - MBCI



150mm

The MBCI Retrofit mirrors the function of the original relay and uses electrical pilots. However, the modern retrofit can display measured current at the primary and, via the pilot wire, also the secondary CT currents.

Vice versa, the MBCI at the secondary can display the measured secondary currents, and via the pilot, the primary currents. The retrofit provides a more intuitive understanding of the pilot wire system to the user.

The MBCI provides differential protection but does so by relaying upon 2 devices at the measuring end of the protected area. The 2x MBCIs to determine if a balanced or unbalanced condition exists through the zone and thus protects the equipment within the zone.

Pilot Wire

Typically comprising 4 or 5 relays at the primary end and 4 relays at the secondary end.

MBCI, MCTH, MRTP and MVTW, on occasion the MFAC14, is used at the primary end to provide restricted earth fault protection.

FVD - MCTH



150mm

The MCTH is a fast acting overcurrent relay and is designed to provide inrush blocking to the MBCI when used with transformers. The MCTH blocks the MBCI trip signal preventing immediate trip of the transformer due to the initial instability of the pilot network during inrush.



150mm

MR-AUX-MRTP

The MRTP provides pilot supervision detecting both short circuit and open circuit conditions.



100mm

MR-AUX-MVTW

The MVTW destabilises the feeder pilot protection to control intertripping between the primary and the secondary MBCI.

MR-DIFF

The MBCH is housed in a 100mm case and typically 3 are located together providing protection for the 3 phases of the power system.



150mm

MR-DIFF

87T Biased Differential

150mm case
2 line 16 character LCD, 4 function keys
80-265V AC/DC or 24-75VDC LV PSU

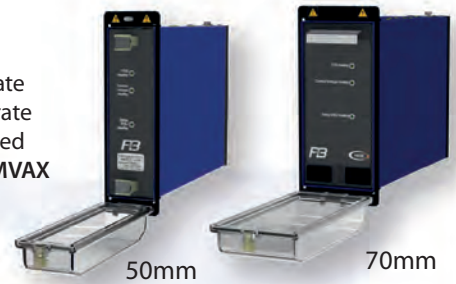
To replace the MBCH the MR-DIFF is used. The MR-DIFF is a 3 phase device, thus all 3 original cases are removed and a single 150mm case is fitted in its place along with a 50mm and 100mm blanking plate to cover the open part of the aperture.



Trip & Lockout & TCS

MR-TCS- MVAX-21/31

The MR-TCS-MVAX provides trip circuit supervision of the top coil, this is used to indicate that the electrical path for a trip command is intact. The MVAX can be supplied to operate with magnetically controlled breaker actuators to allow protection relays to be upgraded easily alongside retrofitted circuit breakers. Note then the original electromechanical MVAX cannot properly function with mag-latch type circuit breaker.



50mm

70mm



100mm

MR-AUX-MVAW

The MVAW is used as a pilot marshalling relay for trip or close commands to a breaker from a remote source. Immunity to induced signal coupling provides improved isolation.

P&B retrofits of the GEC electromechanical relays are in fact robust electronic devices yet they offer improved dielectric strength of up to 5kV.

MR-AUX-MVAA

The MVAA is available in either 50 or 100mm size it is used for contact multiplication and can be reset electrically or by hand.

MR-AUX-MVAJ

The MVAJ 50, 70, 100 is used as a master trip and lockout relay and once triggered will remain in its latched position until it is reset, either electrically, by hand or automatically. The MVAJ retrofit requires a permanently energised supply.



50mm

70mm

100mm

In-house PCB Production



P&B design and develop bespoke retrofit relays for customers worldwide. These are manufactured solely at our relay production factory in Manchester, UK.

MR-METI

The METI31 provides directional protection, either 2 phase and earth or 3 phase.

200mm case
3 x 2 line 16 character LCD
12 function keys
80-265V AC/DC or 24-75VDC LV PSU



200mm

METI

To retrofit it we use the METI retrofit which is in fact 3 MR-ID relays mounted into 1 chassis. It is pin for pin to the original relay. Normally it is used in conjunction with a MCGG62 and provides a blocking signal to the respective phase of the overcurrent relay.

Voltage & Generator Relays

P&B retrofits provide solutions to the wide variety of instantaneous, inverse-time and definite-time delayed under and over voltage relays as well as neutral voltage displacement, check synchronism and voltage balance functions.

For generators, comprehensive protection is provided from P&B's existing generator protection relays which are conveniently housed in midos-style cases making them ideal candidates for the quick replacement of the GEC range.

Relays are easily specified by their secondary CT rating - 1A or 5A, the original relay code, the auxiliary voltage and the original relay size. We can then quickly manufacture and supply an easy to install retrofit.

The VT input of the P&B replacement is suitably rated for direct connection of phase to phase 415Vac. All relays feature a 16 character 2-line display and are available in either a 70mm or 100mm case.



70mm

100mm

Voltage

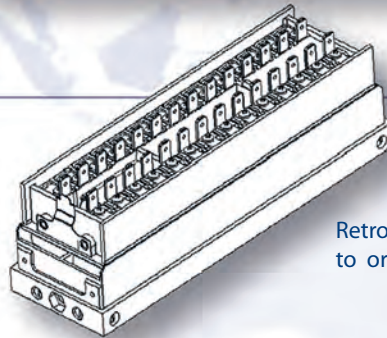
- 25 Check Sync
- 27 Undervoltage
- 59 Overvoltage
- 59n Neutral Voltage Displacement
- 60 Phase Balance

Generator

- 32 Reverse Power
- 40 Field Failure
- 46 Negative Sequence
- 51v Voltage Controlled Overcurrent / Impedance
- 81 Frequency Relay

Installation

P&B's midos-type connector allows the withdrawable relay chassis to be removed and the new relay inserted easily without changes to the fixed portion.



Retrofit relay (chassis) connector to original (case) connector

The replacement process is quick and easy, in most cases the P&B retrofits are **pin for pin** meaning the old unit is withdrawn and the new unit is simply inserted back into the same case.




The new relay interface provides a more **intuitive** user interaction, settings are **quickly** programmed via the key pad or via a laptop.

The existing current transformers would not require replacement as the new protection relay can be matched with reference to the secondary rating of the existing CTs.





GEC Retrofits

-  Pin for Pin
-  Same case size as OEM with some terminal changes
-  Different case size to OEM with some terminal changes

	RELAY TYPE	REPLACES	50mm [2]	70mm [3]	100mm [4]	150mm [6]	200mm [8]	Pin for Pin	ANSI no.
PILOT WIRE	FVD- MCGG	MCGG			■	■	■	●	50, 50n, 51, 51n
	FVD- MBCI	MBCI			■			●	85, 87
	FVD- MCTH	MCTH			■			●	50, 68
	MR-AUX- MRTP	MRTP			■			●	74
	MR-AUX- MVTW	MVTW			■			●	94
	MR-REF	MFAC		■				●	64REF
	MR-REF	MCAG		■	■			●	64REF
TRIP & LOCKOUT & TCS	MR-AUX- MVAW	MVAW	■		■			●	74
	MR-AUX-MVAA	MVAA	■		■			●	30, 94
	MR-AUX-MVAJ	MVAJ	■	■	■			●	86
	MR-TCS- MVAX	MVAX	■	■				●	74
	MR- METI	METI					■	●	67
	MR-DIFF	MBCH				■		△	87T
GENERATOR	MR-FT	MFVU			■			○	81
	MR-RP	MWTU			■			○	32
	MR-IV	MCVG			■			○	51v
	MR-NS	MCND		■				○	46
	MR-FF	MYTU		■				○	40
VOLTAGE RELAYS	MR-VT	MVTU			■			○	27, 59
	MR-NVD	MVTU			■			○	59n
	MR-NVD	MVAP			■			○	60
	MR-CS	MVAS			■			○	25
	MR-VT	MVTD		■	■			● ○	27, 59
	MR-VT	MVAG				■		△	27, 78V
	MR-VT	MVTI		■				●	27
	MR-DELAY	MVTT	■					○	2TD
MOTOR	MR-MCHG	MCHG	■					●	46, 49, 50N
	MPR3E5	MCHD		■				○	46, 49, 50, 50N, 66
	MPR3E5	MCHN		■				○	46, 49, 50, 50N, 66