



# HI REL POLARIZATION BEAM COMBINER

## Fused Fiber PM Combiner

### DATASHEET

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High Reliability (HI REL) Components are deployed in environments such as undersea and space, where the costs of component replacement are prohibitive.

Gooch & Housego is established as a supplier of these components to major undersea equipment manufacturers.

G&H's HI REL capability is built upon the foundation of a long established manufacturing history of very reliable terrestrial components. Full facilities are available to perform customer-specific HI REL qualification programs, which can consist of accelerated ageing and Weibull analysis.

Manufacturing is carried out on specially-developed workstations. Advanced fiber management, in-process screening and customer-specific validation tests are implemented, to further enhance component reliability.

The G&H HI REL polarization beam combiner (PBC) enables the efficient combination of two orthogonally polarized sources of light into a common output fiber.

In optical amplifiers this provides a doubling of pump power whilst ensuring pump redundancy should a pump failure occur.

Applications include high power optical amplifiers and undersea systems. All ports consist of polarization maintaining fiber.



### Key Features

- Established HI REL supplier
- High performance
- Full qualification facilities available
- Advanced in-process testing
- Low loss fused components
- Design standard 0.1FITs (failure in one billion field hours) - confirmed for 975nm version only
- High power handling

### Applications

- Undersea equipment
- Terminal equipment
- Space
- Defense and Avionic
- Erbium doped fiber amplifiers (EDFAs)
- Raman amplifiers
- Coherent optical communications

### Compliance

- Customer Specific

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## Optical Specifications<sup>5</sup>

| Parameter                               | Specification              |                      |
|---|----------------------------|----------------------|
| Operating wavelengths <sup>1,2</sup>    | 975 nm                     | 1550 nm <sup>7</sup> |
| Insertion loss (fast axis) <sup>3</sup> |                            |                      |
| Grade H                                 | 0.70 dB Max                | 0.70 dB typ          |
| Insertion loss (slow axis) <sup>3</sup> |                            |                      |
| Grade H                                 | 0.55 dB Max                | 0.70 dB typ          |
| Return loss/directivity <sup>4</sup>    | 50 dB Min                  | 50 dB Min            |
| TDL (fast axis) <sup>4</sup>            | 0.20 dB (0.10 dB) Max(Typ) | TBD                  |
| TDL (slow axis) <sup>4</sup>            | 0.10 dB (0.05 dB) Max(Typ) | TBD                  |
| Pigtail tensile load                    | 5 N Max                    | 5 N Max              |
| Optical power handling <sup>5,6</sup>   | 4 W Max                    | 4 W Max              |
| Fiber type                              | All ports PM fiber         | All ports PM fiber   |
| Pigtail                                 | Primary coated fiber       | Primary coated fiber |
| Operating temperature range             | -5 - 45°C                  | -5 - 45°C            |
| Storage temperature range               | -40 - 85°C                 | -40 - 85°C           |

<sup>1</sup> The optical specification is typically met at center wavelength  $\pm 3$  nm

<sup>2</sup> Other wavelengths are available. Please contact the G&H sales office.

<sup>3</sup> Insertion loss at center wavelength (not including TDL or connector losses).

<sup>4</sup> Limits guaranteed by design.

<sup>5</sup> Where operation powers  $> 4$  W are required the component housing and fiber must be adequately heat-sunk (contact G&H sales to discuss high power options).

<sup>6</sup> Component performance and reliability under high power must be determined within the customer system.

<sup>7</sup> Optical specifications to be confirmed pending manufacturing test data.

## Housing Options<sup>1</sup>

| Housing Code | Description | Dimensions (mm)  | Pigtail              |
|--------------|-------------|------------------|----------------------|
| 3            | Regular     | 3.0 (Ø) x 71 (L) | Primary-coated fiber |

<sup>1</sup> For alternative housing options please contact G&H sales

## Configuration



## Order code

Order codes are comprised of a standard device prefix (e.g. PBC) followed by code letters or numbers which correspond to available options.

**Sample:** PBC-5H3275G10 (PBC, HI REL grade, regular housing, 2x2, channel center = 975nm, 980nm PM fiber 250 µm buffer, 1m pigtail, no connector).

| Order code |   |   |   | ①                             | ② | ③         | ④  | ⑤                           | ⑥  | ⑦         | ⑧  | ⑨ |
|------------|---|---|---|-------------------------------|---|-----------|----|-----------------------------|----|-----------|----|---|
| P          | B   | C | - |                               | H |           |    |                             |    |           |    |   |
| ①          | <b>Passband</b>   |   |   | 9XX                           |   |           |    | 15XX                        |    |           |    |   |
|            | Code  |   |   | 5                             |   |           |    | C                           |    |           |    |   |
| ②          | <b>Device Type</b>  |   |   | PBC HI REL                    |   |           |    |                             |    |           |    |   |
|            | Code  |   |   | H                             |   |           |    |                             |    |           |    |   |
| ③          | <b>Housing</b>  |   |   | Regular ø3x71 mm              |   |           |    |                             |    |           |    |   |
|            | Code  |   |   | 3                             |   |           |    |                             |    |           |    |   |
| ④          | <b>Port configuration<sup>3</sup></b>                       |   |   | 2x2 Terminated                |   |           |    | 2x2                         |    |           |    |   |
|            | Code  |   |   | 1                             |   |           |    | 2                           |    |           |    |   |
| ⑤          | <b>Last two digits of center wavelength(nm)<sup>1</sup></b> |   |   | e.g. XX20                     |   | e.g. XX50 |    | e.g. XX75                   |    | e.g. XX90 |    |   |
| ⑥          |   |   |   | Code                          |   |           | 20 |                             | 50 |           | 75 |   |
| ⑦          | <b>Fiber Type</b>   |   |   | 980 nm PM fiber 250 µm buffer |   |           |    | PM 1550 fiber 250 µm buffer |    |           |    |   |
|            | Code  |   |   | G                             |   |           |    | F                           |    |           |    |   |
| ⑧          | <b>Pigtail length<sup>2</sup></b>                           |   |   | 0.5 m                         |   | 1 m       |    | 2 m                         |    |           |    |   |
|            | Code  |   |   | 0                             |   | 1         |    | 2                           |    |           |    |   |
| ⑨          | <b>Connector</b>  |   |   | None                          |   |           |    |                             |    |           |    |   |
|            | Code  |   |   | 0                             |   |           |    |                             |    |           |    |   |

<sup>1</sup> For other center wavelengths please contact the G&H sales office.

<sup>2</sup> Minimum pigtail length. Other pigtail lengths are available on request.

<sup>3</sup> Where 3-port operation is required the 4th port (P3) is terminated externally using coreless fiber and recoated splice.

PM products are manufactured using 250 µm PANDA PM fiber, other options available by talking to the sales team.

## For further information

E: [torquaysales@goochandhousego.com](mailto:torquaysales@goochandhousego.com)

[goochandhousego.com](http://goochandhousego.com)