Product description	Variants	Order No.

Duobias

Multifunctional 2 winding transformer differential protection

```
 1  2  3  4  5  6  7     8  9  10 11 12    13 14 15 16
 7  S  R  2  4  2□  -  2□  A □□  -  0□  A  0
             ▲  ▲  ▲     ▲  ▲  ▲  ▲  ▲      ▲  ▲
```

Protection Product
Transformer **4**

Relay Type
Differential (2 winding) **2**

Housing I/O and Fascia [1]
E8 housing, 6 CT, 2 EF/REF CT, 1 VT, 9 Binary Inputs / 6 Binary Outputs, 16 LEDs **2**
E10 housing, 6 CT, 2 EF/REF CT, 1 VT, 19 Binary Inputs / 14 Binary Outputs, 24 LEDs **3**
E12 housing, 6 CT, 2 EF/REF CT, 1 VT, 39 Binary Inputs / 14 Binary Outputs 32 LEDs **4**

Measuring Input
1/5 A, 40-160 V, 50/60Hz **2**

Auxiliary voltage
DC 30 to 220 V, binary input threshold DC 19V .... **A**
DC 30 to 220 V, binary input threshold DC 88V .... **B**

Communication Interface
Standard version – included in all models, USB front port, RS485 rear port **1 1/2**
Standard version – plus additional rear F/O ST connectors (x2) and IRIG-B **2 1/2**
Standard version – plus additional rear RS485 (x1) and IRIG-B **3 1/2**
Standard version – plus additional rear RS232 (x1) and IRIG-B **4 1/2**
Standard version - plus additional rear Electrical Ethernet RJ45 (x2) **7 7**
Standard version - plus additional rear Optical Ethernet Duplex (x2) **8 7**

Protocol
IEC 60870-5-103 and Modbus RTU (user selectable) **1**
IEC 60870-5-103 and Modbus RTU and DNP 3.0 (user selectable) **2**
IEC 60870-5-103 and Modbus RTU and DNP 3.0 (user selectable) and IEC61850 ..... **7/8 7**

Protection Function Packages [2]
Option A: Standard version – Included in all models .... **A**
81HBL2   Inrush Detector
81HBL5   Overfluxing detector
87BD   Biased current differential
87HS   Current differential highest
            Programmable logic
For each winding/circuit breaker
50BF   Circuit breaker fail
64H   High impedance REF
74TCS/CCS   Trip/close circuit supervision

Option B: Standard version – plus .... **B**
37/37G   Undercurrent
46BC   Open circuit
46NPS   Negative phase sequence overcurrent
49   Thermal overload
50   Instantaneous phase fault overcurrent
50G/50N   Instantaneous earth fault
51   Time delayed phase fault overcurrent
51G/51N   Time delayed earth fault

[1]   For ESI48-4 compliance of binary inputs external resistors are required.
[2]   Functions are per winding unless otherwise stated, REF protection requires external resistor and metrosil at extra cost, see page 209.

Product description	Variants	Order No.

		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Duobias		7 S R 2 4 2 □ - 2 □ A □ □ - 0 □ A 0

(continued from previous page) Option C: Standard version - plus

24	Overfluxing
27/59	Under/overvoltage
59N	Neutral voltage displacement
81	Under/overfrequency
37/37G	Undercurrent
46BC	Open circuit
46NPS	Negative phase sequence overcurrent
49	Thermal overload
50	Instantaneous phase fault overcurrent
50G/50N	Instantaneous earth fault
51	Time delayed phase fault overcurrent
51G/51N	Time delayed earth fault

Position 13: **C**

Additional Functionality
No Additional Functionality   **A**