# 7PG2113/4/5/6

Feeder Protection

### **Document Release History**

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## Section 1: Installation

### 1.1 Unpacking, Storage and Handling

On receipt remove the relay from the container in which it was received and inspect it for obvious damage. It is recommended that the relay not be removed from its case at this stage.

If damage has been sustained a claim should be immediately be made against the carrier, also inform Siemens Protection Devices Limited, and the nearest Siemens agent.

When not required for immediate use, the relay should be returned to its original carton and stored in a clean, dry place.

The relay contains static sensitive devices, which are susceptible to damage due to static discharge. The relay's electronic circuits are protected from damage by static discharge when the relay is housed in its case.

### **1.2 Recommended Mounting Position**

The relay uses a liquid crystal display (LCD) for programming and operation. The LCD has a vertical viewing angle of  $\pm 30^{\circ}$  and is back–lit. However, the best viewing position is at eye level, and this is particularly important given its control features.

The relay has test points fitted for use during commissioning and routine testing.

Components which have 15kV isolated pilot connections are often mounted separately from the protection relay in a location more convenient for the connection to the incoming pilot cable and/or in the interest of safety. Connections to the relay can then be made at the lower 5kV insulation level with precautions and identification to suit.

The relay should be mounted on the circuit breaker (or protection panel) to allow the operator the best access to the relay functions.

# 1.3 Wiring

The product should be wired according to the scheme requirements, with reference to the appropriate wiring diagram.

### 1.4 Earthing

Terminal 28 of the PSU (Power Supply Unit) should be solidly earthed by a direct connection to the panel earth. The Relay case earth stud connection should be connected to terminal 28 of the PSU.

It is normal practice to additionally 'daisy chain' together the case (safety) earths of all the Relays installed in a panel to prevent earth current loops posing a risk to personnel.

### 1.5 Ancillary Equipment

The relay can be interrogated locally or remotely. For local interrogation a portable PC with suitable version of MS Windows (2000 SP4 or XP SP2)and Reydisp Evolution<sup>™</sup> s/w (Latest Version available 32 bit) using USB port situated on front of the relay.



# **Section 2: Equipment Operating Conditions**

### 2.1 Current Transformer Circuits



The secondary circuit of a live CT must not be open circuited. Non-observance of this precaution can result in injury to personnel or damage to equipment.



Where external resistors are connected to the relay circuitry, these may present a danger of electric shock or burns, if touched.

### 2.3 Front Cover

The front cover provides additional securing of the relay element within the case. The relay cover should be in place during normal operating conditions.



### **Section 3: Dimensions and Panel Fixings**

### 3.1 Relay Dimensions and Weight

Hardware Model	Net Weight Kg
7PG2113/4/5/6	8.6kg
7PG2112 15kV Transformer	8.0kg
7PG212 Send End 5kV	5.4kg
7PG212 Send End 15kV	9.2kg
7PG213 B22	2.25kg
7PG214 B74/75	3.4kg
7PG215 B75	6.4kg
7PG216 B74	1.85kg

The 7PG2113/4/5/6 relay is supplied in an Epsilon size E10 case.

5kV Pilot Supervision Send and Receive End units are supplied in Epsilon size E4 case.

B22 Supply Supervision relay, B74 repeat relay for use with 15kV Receive relay (B75) and the B34 relay for Rf Intertripping, are each supplied in an Epsilon size E2 case

Mechanical diagrams of the Epsilon case dimensions and panel cut-out requirements are shown in Figure 1 to Figure 3.

15kV Send End and B75 Receive relays are supplied in Vedette size 1 1/2V case. Mechanical diagrams of case dimensions and panel cut-out requirements are shown in Figure 4.

The 15Kv Isolation Transformer is supplied in a special case for back of panel mounting and Mechanical diagrams of case dimensions and mounting requirements are shown in Figure 5.

The following drawings which are available from the website give panel cut-out and mounting details.



#### Figure 1. E2 Case









PANEL CUT-OUT

Note: The Ø3.6holes are for M4 thread forming (tri-lobular) screws. These are supplied as standard and are suitable for use in ferrous/aluminium panels 1.6mm thick and above. For other panels, holes to be M4 clearance (typically Ø4.5) and relays mounted using M4 machine screws, nuts and lockwashers (supplied in panel fixing kit).







Figure 5. 15kV Transformer Outline & Mounting Arrangement



### 3.2 Fixings

### 3.2.1 Epsilon Cases

### 3.2.1.1 Wiring Terminations

M4 Ring tongued crimps with 90° bend are recommended.

RS485 (Block "B" Terms 14, 16, 18, 20) connection to this communication facility is by screened, twisted pair cable. On site when wiring other facilities ensure that these terminals are not obscured by other wiring runs. Cable should be RS485 compliant.

### 3.2.1.2 Panel Fixings

Typical mounting screw kit per Relay

Consists of 4 off M4x10mm Screws

4 off M4 Nuts

4 off M4 Lock Washer

Typical rear terminal block fixing kit (1kit per terminal block fitted to relay) Consists of:

28 off M4, 8mm Screws

28 off M4 Lock Washer

### 3.2.2 Vedette Cases

3.2.2.1 Wiring Terminations

M5 Ring tongued crimps are recommended.

3.2.2.2 Panel Fixing

Vedette case mounting arrangement is shown in Figure 4.

### 3.2.3 Back of Panel cases

3.2.3.1 Wiring Terminations

M6 Ring tongued crimps are recommended.

#### 3.2.3.2 Mounting arrangement

Case mounting arrangement is shown in Figure 5 & 6



### **Section 4: Rear Terminal Drawings**

### 4.1 E10 Case



### <u>Notes</u>

1) RS485 (Block "B" Terms 14, 16, 18, 20) connection to this communication facility is by screened, twisted pair cable. On site when wiring other facilities ensure that these terminals are not obscured by other wiring runs. Cable should be RS485 compliant.



### Section 5: Connection/Wiring/Diagrams

### 5.1 Wiring Diagram: 7PG2113 OC/EF Relay with 3BI & 5BO





# 5.2 Wiring Diagram: 7PG2115 OC/EF Relay with 6BI & 8BO





### 5.3 Wiring Diagram: 7PG2114 OC/EF Relay with 3BI & 5BO





### 5.4 Wiring Diagram: 7PG2116 OC/EF Relay with 6BI & 8BO





# **Section 6: Data Comms Connections**

### 6.1 RS485 Connection

The RS485 communication port is located on the rear of the relay and can be connected using a suitable RS485  $120\Omega$  screened twisted pair cable.

The RS485 electrical connection can be used in a single or multi-drop configuration. The RS485 master must support and use the Auto Device Enable (ADE) feature.

The last device in the connection must be terminated correctly in accordance with the master driving the connection. A terminating resistor is fitted in each relay, when required this is connected in circuit using an external wire loop between terminals 18 and 20 of the power supply module.

Up to 64 relays can be connected to the RS485 bus.

The RS485 data communications link with a particular relay will be broken if the relay element is withdrawn from the case, all other relays will still communicate.





RS485



RS485



RS485