



Effective: March 1996

Supersedes I.L. 41-347.11A, Dated March 1976

\*Denotes Change Since Previous Issue.

## Type HU, HU-1 and HU-4 Transformer Differential Relays

These instructions are supplementary to the HU and HU-1 instruction leaflet, I.L. 41-347.1, and the HU-4 supplementary instructions, L-639965.

These instructions are preliminary until such time as the information contained in I.L. 41-347.1, L-639965, and the following can be compiled into a complete printed leaflet.

The relays covered by these instructions differ from those described by I.L. 41-347.1 and L-639965 in the following two areas:

### 1. Increased Seismic Capability

The operating direction of the DU differential unit (lower polar element) is reverse to that described in I.L. 41-347.1. Tripping direction is to the right for the DU, while the HRU unit (top polar element) remains tripping to the left.

The only difference in construction is that the permanent magnet and contact arrangement on the DU unit are reversed.

For relay calibration the contact gap and shut adjustment procedure as described in I.L. 41-347.1 for the DU unit should be reversed.

### 2. Optional Lower % 2nd Harmonic Restraint

For those customers that may have special transformers or applications that require the HU line of relays to restrain at a lower % second harmonic than the present standard 15% (14% to 17%), ABB offers a 7.5% (6.5% to 9.0%) 2nd harmonic restraint HU line of relays.

The only difference from the standard relay as described in I.L. 41-347.1 is that a 3 watt resistor, 33 ohms or 68 ohms is placed in parallel with the operating coil of the HRU harmonic restraining unit (across the two rear coil terminals of the top polar element).

\* Older polar unit coils are self supporting, cotton wound and impregnated. These are large coils with more resistance and therefore require the 68 ohm resistor (style no. 763A127H18).

Newer polar unit coils are wound on a plastic spool and are smaller with less resistance. These newer spool-wound coils require the 33 ohm resistor (style no. 763A127H16).

\* For % harmonic verification, test as per I.L. 41-347.1 except use  $I_{dc}$ -2.0 amperes, and  $I_{ac}$  must be 12.6 to 8.25 amperes, which corresponds to 6.5% to 9.0% 2nd harmonic.

### Attachments:

HU or HU-1 Relays

HU, HU-1 Instruction Leaflet I.L. 41-347.1

HU-4 Relays

HU, HU-1 Instruction Leaflet I.L. 41-347.1

HU-4 Supplementary Instructions L-639965

*All possible contingencies which may arise during installation, operation or maintenance, and all details and variations of this equipment do not purport to be covered by these instructions. If further information is desired by purchaser regarding this particular installation, operation or maintenance of this equipment, the local ABB representative should be contacted.*