FINEMET® Cores for High Precision Current Transformers for Electronic Electricity Meters

Electronic electricity meters have been replacing traditional electromechanical electricity meters around the world in households, industry and commerce because of its high accuracy in electricity metering, smaller size and easy data collection system.

Electronic electricity meters require current sensors with high accuracy, high reliability, low loss, small size, simple construction and low cost. From the standpoint of these requirements, current transformers have many advantages compared with other current sensors such as shunt resistors, Rogowski coils and hall effect devices. Hitachi Metals has newly developed 2 series of cores for current transformers for this application.

CT001 Series Cores for Current Transformers for Direct Connection with DC-Tolerance According to IEC 62053-21 and IEC 62053-23

1. Features

Current transformers made of CT001 series cores have the following features.

1. Small size due to high saturation induction and low permeability
2. Small amplitude error
3. Extremely linear, easily compensable phase curve because of high linear B-H loop
4. Low temperature dependence

2. Specification and Core Dimensions of Standard Cores

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Product Code</th>
<th>AC Current Capability (Arms)</th>
<th>DC Bias Current Capability (A)</th>
<th>Dimensions OD x ID x HT (mm)</th>
<th>Effective Cross Section $A_e$ (mm²)</th>
<th>Mean Path Length $l_p$ (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT001 F2016F</td>
<td>F1AH1018</td>
<td>40</td>
<td>40</td>
<td>21.0 x 14.2 x 9.5</td>
<td>10.6</td>
<td>54.8</td>
</tr>
<tr>
<td>CT001 F2218Y</td>
<td>F1AH1019</td>
<td>60</td>
<td>60</td>
<td>23.6 x 15.9 x 7.8</td>
<td>10.2</td>
<td>61.7</td>
</tr>
<tr>
<td>CT001 F2421Y</td>
<td>F1AH1020</td>
<td>100</td>
<td>100</td>
<td>26.3 x 19.0 x 7.6</td>
<td>7.9</td>
<td>70.7</td>
</tr>
<tr>
<td>CT001 F5027Y</td>
<td>F1AH1021</td>
<td>120</td>
<td>120</td>
<td>32.7 x 24.6 x 7.9</td>
<td>7.9</td>
<td>89.5</td>
</tr>
</tbody>
</table>

FT-3S Series Cores for Current Transformers for Direct Connection without DC-Tolerance

1. Features

Current transformers made of FT-3S series cores have the following features.

1. Very small amplitude and phase error due to extremely high permeability
2. Low temperature dependence

2. Specification of Standard Cores

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Product Code</th>
<th>AC Current Capability (Arms)</th>
<th>DC Bias Current Capability (A)</th>
<th>Dimensions OD x ID x HT (mm)</th>
<th>Effective Cross Section $A_e$ (mm²)</th>
<th>Mean Path Length $l_p$ (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-3S F1813A</td>
<td>F1AH1022</td>
<td>60</td>
<td>–</td>
<td>19.0 x 11.0 x 7.6</td>
<td>10.0</td>
<td>47.1</td>
</tr>
<tr>
<td>FT-3S F1813Y</td>
<td>F1AH1023</td>
<td>100</td>
<td>–</td>
<td>19.0 x 11.0 x 7.6</td>
<td>12.4</td>
<td>47.1</td>
</tr>
</tbody>
</table>

⚠️ For safety and the proper usage, you are requested to approve our product specifications or to transit the approval sheet for product specifications before ordering. This catalog and its contents are subject to change without notice.
NOTICES

1. When designing a component using this product and applying the designed components in any system, use this product only in the guaranteed range specified by Hitachi Metals, Ltd. Do not use the product beyond guaranteed values specified by Hitachi Metals, Ltd. Hitachi Metals, Ltd. will not be responsible for any damage or accident when this product is used beyond guaranteed values specified by Hitachi Metals, Ltd. Even when the product is used within the specification given by Hitachi Metals, take appropriate measures for system, such as fail-safe, to avoid any accident resulting in any bodily injury and/or property damage. It is the responsibility of a user to take such measures.

2. This product is designed to be used for general electronic devices (e.g. office machinery, communication devices, measurement devices, household appliances, etc.). Performance and safety of this product for applications in the special fields which require particularly high reliability and quality, and whose application is potentially life threatening or could lead to physical harm in the event of malfunction is not confirmed. Such fields may include: space science, aviation, nuclear energy, combustion control, transportation, safety devices and medical equipment. Be sure to examine the performance and safety when the product is used for these applications, and take appropriate measures for system, such as fail-safe, to avoid any accident resulting in any bodily injury and/or property damage. It is the responsibility of a user to take such measures.

3. Take appropriate measures, such as using an overvoltage protective device to prevent high voltage surge from being applied to the product if direct lightning surge, inductive lightning surge, switching surge, etc. is applied to this product. This product may deteriorate in function when high-voltage surge is applied. It is the responsibility of a user to take such measures.

4. Do not use this product in devices under massive radiation, such as neutron rays. This product is not a radiation-proof and may result in deterioration of this product.

5. In no event shall Hitachi Metals, Ltd. be responsible for any claim, loss or damages caused by defect in design by user.

6. The products and their specifications are subject to change without notice. Please check the latest catalog, technical documents or specifications before your final design, procurement or use of the products.

7. No warranty, right or license in connection with any patent, trademark, copyright, or any other intellectual property right shall be, expressly or impliedly, given or granted to any party by Hitachi Metals, Ltd. under this catalog.


Do not duplicate any part of this catalog without written permission from Hitachi Metals, Ltd.