

6 METERING

6.1 Metering Requirement

Metering and metrology requirement shall be according to IS 13779.

6.1.1 Classification

The classification as per 4 of IS 13779 shall apply.

6.1.2 Ratings

6.1.2.1 Standard reference voltage

As per 5.1 of IS 13779.

6.1.2.2 Standard basic current

As per 5.2 of IS 13779.

6.1.2.3 Maximum current

As per 5.3 of IS 13779 with maximum current not exceeding 100A for both 3 Phase and 1 Phase meters.

6.1.2.4 Standard reference frequency

As per 5.4 of IS 13779

6.2 General Constructional Requirements

The requirements given in 6.1 to 6.4 of IS 13779 shall apply. The communication modules shall be either built in type or plug in type as mentioned in 1.2. The plug-in communication modules shall be properly secured on the smart meter, both physically and electrically so as to avoid any possible tampering with adequate provision for sealing. The load switch for disconnect/connect purpose shall be mounted inside the meter with suitable arrangement.

6.2.1 Terminals — Terminal Block(s) — Protective Earth Terminal

The requirements given in 6.4 of IS 13779 shall apply.

6.2.2 Terminal Cover

The requirements given in 6.5, 6.5.1, 6.5.2 and 6.7 of IS 13779 shall apply

6.3 Clearance and Creepage Distances

The requirements given in 6.6 of IS 13779 shall apply.

6.4 Resistance to Heat and Fire

The requirements given in 6.8 of IS 13779 shall apply.

6.5 Mechanical Requirements

The requirements for mechanical shall be as per 12.3 of IS 13779 and the requirements for protection against penetration of dust and water shall be as per 6.9 and 12.5 of IS 13779 shall apply.

6.6 Display of Values

The requirements given in 6.10 of IS 13779 shall apply. The non-volatile memory shall support retention period of 10 years.

6.7 Output Device

The requirements given in 6.11 of IS 13779 shall apply. Distinct LED/LCD indicators shall be provided for Communication in Progress (for example — TxD mode, RxD mode), Load switch Close/Open conditions.

6.8 Marking of Smart Meter

6.8.1 The requirements given in 7 of IS 13779 shall apply.

The following additional information shall also be provided as applicable in the name plate:

- Communication technology for WAN or NAN (with carrier frequency).
- Communication technology if IHD is supported (with carrier frequency).
- Symbol of load switch.

6.8.2 The use of Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6.9 Climatic Condition

The requirements given in 8 of IS 13779 shall apply.

6.10 Electrical Requirements

6.10.1 Power Consumption

The measurement of power consumption in the voltage and current circuits shall be determined as described in the followings.

6.10.1.1 Voltage circuits

The active and apparent power consumptions of a direct-connected composite Smart Meter for each circuit at reference voltage, reference temperature, and reference frequency shall not exceed 5.0 W and 15 VA during the idle mode of communication module. This applies to either one NAN or one WAN module present in the Smart Meter. If a separate module for servicing to IHD is present, the above figures shall not exceed 6W and 18VA during the idle mode of communication module.

The additional power requirement during data

transmission shall not exceed 7W per communication module. In the case of plug in communication modules, the Smart Meter shall be capable of sourcing 7W for powering the plug in communication module during data transmission.

6.10.1.2 Current Circuit

The apparent power taken by each current circuit of a direct connected payment meter at maximum current, reference frequency and reference temperature shall not exceed a maximum of 4 VA.

6.10.2 Influence of Supply Voltage

The requirements given in 4.4.2 of IS 15884 shall apply.

6.10.3 Influence of Short—Time Overcurrents

The requirements given in 4.4.3 of IS 15884 shall apply.

6.10.4 Influence of Self-Heating

The requirements given in 4.4.4 of IS 15884 shall apply.

6.10.5 Influence of Heating

The requirements given in 4.4.5 of IS 15884 shall apply.

6.10.6 Insulation Requirements

The requirements given in 9.5 of IS 13779 shall apply.

6.10.7 Immunity to Earth Fault

The requirements given in 9.6 of IS 13779 shall apply.

6.11 Electromagnetic Compatibility

The requirements given in 4.5 and 5.5 of IS 15884 shall apply.

6.12 Accuracy Requirements

The requirements given in 11, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6 and 11.7 of IS 13779 shall apply.

6.13 Test and Test Conditions

Given in 10 of this standard.

7 LOAD SWITCH REQUIREMENT

7.1 Load Switching Capability

The smart meter shall be provided with switching elements, integral with the meter enclosure, to control the flow of electricity to the load at the instance of connect/disconnect commands as per functional needs of the system. For Single Phase Smart Meter, two load switches one each in phase and neutral shall be provided.

For Three Phase Smart Meters load switches one in each phase shall be provided. The switches are to be rated to carry maximum current continuously under normal operating conditions and to withstand the switching transients during make and break operations.

7.2 Performance Requirements for Load Switching

The requirements given in 4.6.6.2 of IS 15884 shall apply.

8 DATA EXCHANGE PROTOCOL

The requirements as per IS 15959 (Part 1) shall apply. The data exchange protocol chosen for Smart Meter shall be as per IS 15959 (Part 2) including specific requirements for Smart Meters for the application layer. This application layer protocol which is primarily DLMS/COSEM shall work through the other layers as given in 9.

9 COMMUNICATION REQUIREMENT

The NAN, WAN and IHD communication modules that are shown in Fig. 1 and Fig. 2 are for establishing connectivity with Smart Meter by the external entities such as DCU and HES respectively and optionally with IHD. These are either wired or wireless communication technology, the choice of technology shall be chosen by the buyer based on the technical feasibility best suited for a given geographical area. The communication module(s) may be of PLC or RF for NAN and cellular technologies or OFC technology for WAN.

9.1 Connectivity Technologies

9.1.1 The connectivity C1, C2 and C3 in variant 1 (Fig. 1) and variant 2 (Fig. 2) are generally designed with wired or wireless technology for the physical medium. For connectivity C1 and C2 if PLC (wired) technology is chosen the standards may be any one of those given in 2. For connectivity C1 and C2 if RF (wireless) technology is chosen the standard may be as per IS 15959 (Part 2).

9.1.2 Wherever PLC technology is used the “AC line connection for coupling/decoupling shall be from within for both plug-in/built in type smart meter”.

9.1.3 The technology for WAN may be any of the cellular technologies supporting: 2G/3G/4G or an optical fiber communications network complying to IPv6.

9.1.4 The standards cited in 9.1.1 are indicative and non-exhaustive. Other suitable standards from ITU/IEC/IEEE/CEN/CENELEC/ETSI may be considered for NAN and WAN as per agreement between the supplier and the purchaser.