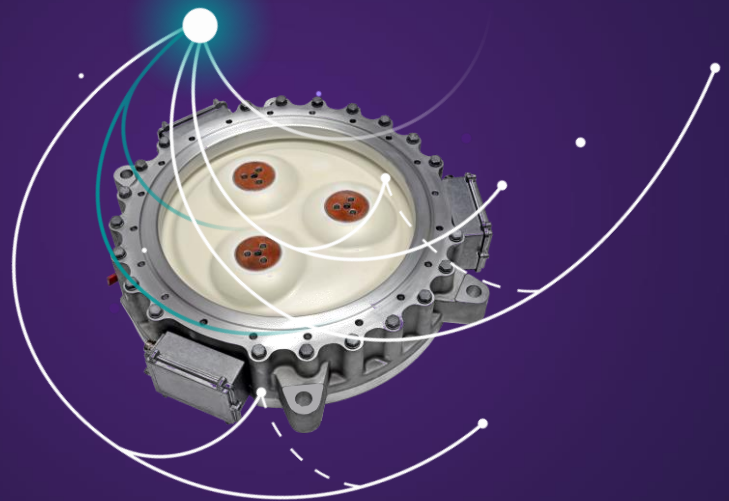


Low-Power Instrument Transformer (LPIT)

Technology for protection and metering



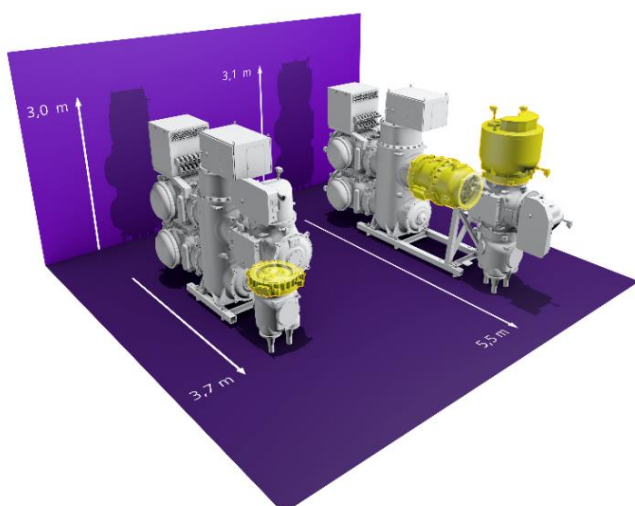
[siemens-energy.com/gas-insulated-switchgear](https://www.siemens-energy.com/gas-insulated-switchgear)

Description

Siemens Energy LPITs are innovative low power current and voltage transformers providing a safe, reliable and standardized solution for measurement and protection applications in GIS. Without saturation nor ferro-resonance phenomena, our LPIT deliver a digital signal output signal acc. to IEC 61850-9-2, with choice of two merging Units: SIPROTEC 5 and SEL-700MU.

The LPIT combines a Low Power Voltage Transformer (LPVT) and a Low Power Current Transformer (LPCT) fully compliant to the IEC 61869 series of standards in one device.

The measurement is based on Rogowski coils for current and on capacitive voltage sensors. Both sensors are integrated in the same GIS cast resin partition.



Benefits

- **Smaller size and weight of the GIS** due to the small dimensions of the sensors and their integration into a GIS partition
- **Easy connection** and lower cabling and wiring effort
- **High reliability and long lifetime** due to the robust design of the passive sensors embedded in the cast resin
- **Less insulation gas** in the switchgear
- Excellent overvoltage performance - **no need for disconnection** during GIS or HV cable tests
- **No hazardous overvoltage** at open LPIT terminals
- **A single LPIT covers all** protection and metering requirements and thanks to its linearity also a wide range of primary currents and voltages, simplifying stock management, engineering and logistics.
- **Flexible definition and modification** of the settings for rated primary current and voltage in the Merging Unit at any phase of the project and afterwards. In this way the GIS remains flexible for future increases of nominal current.

Furthermore, the LPIT sensors provide improved measurement performance due to high linearity, no saturation (unlike conventional CTs), no ferro-resonance effects (unlike conventional VT) and a wide frequency range for measuring harmonics up to the 50th harmonic frequency.

Merging units

Chose between the SIPROTEC 5 6MU85 and SEL-700MU Merging Units equipped with a dedicated LPIT input card and tested by Siemens Energy.

When using SIPROTEC 5 relays the IO240 can also be plugged directly into the relay. Merging Units provide the standardized Sampled Values digital output allowing the LPIT to seamlessly interface with IEC 61850-9-2 compatible protection relays. Differential protection schemes using both LPITs and conventional CTs are possible.

Adapts to your requirements

- Digitalization of all primary data close to the process
- Low energy analog inputs (LEA) for GIS LPIT sensors
- Scalable number of binary inputs and outputs
- Process bus interface according to IEC 61850-9-2 and IEC 61850-9-2 LE
- Seamless redundancy protocol support
- Breaker control via IEC 61850 GOOSE
- Scada communication via IEC 61850-8-1 and other protocols
- Time synchronization via IEEE 1588v2/PTP
- Redundant voltage measurement possible with SEL-700MU

Benefits

- Minimize wiring by local installation (e.g. inside LCC)
- Easy extension: simply connect a new device to the process bus and get instant access to the measured values
- Maximum network reliability through seamless redundancy protocols
- Interoperability ensured, standardized in IEC61869-9/-13 and IEC 61850 Ed. 2.1



Merging Unit Siemens SIPROTEC 6MU85 with integrated IO240, flush mounted version



Merging Unit SEL-700MU with LPIT sensor input card

General	LPIT-145 (8DN8)	LPIT-145 (8VN1)	LPIT-170 (8DN8)
Rated insulation level	145 / 275 / 650 kV	145 / 275 / 650 kV	170 / 325 / 750 kV
Rated frequency f_r	50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
Rated short-time thermal current I_{th}	50 kA (3 s)	50 kA (3 s)	63 kA (3 s)
Temperature range	-30 °C / +55 °C	-30 °C / +55 °C	-30 °C / +55 °C
Weight	100 kg	185 kg	185 kg
Measurement of harmonics up to	50	50	50
Applied standard	IEC 61869	IEC 61869	IEC 61869
LPCT			
Rated primary current I_{pr}	200 A	200 A	200 A
Rated accuracy class	0.2S / 5P250 / 2TPM	0.2S / 5P200 / 2TPM	0.2S / 5P315 / 2TPM
Rated extended primary current factor K_{pcr}	15.75	15.75	20
Rated symmetrical short-circuit current factor K_{ssc}	250	250	315
LPVT			
Rated primary voltage U_{pr}	66 to 138 / $\sqrt{3}$ kV	66 to 138 / $\sqrt{3}$ kV	66 to 154 / $\sqrt{3}$ kV
Rated accuracy class	0.2 P	0.2 P	0.2 P
Rated voltage factor F_V and permissible duration	3 / 2000 h	3 / 2000 h	3 / 2000 h

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