

ENSTO

ITI cabinet range

RTU control cabinets
for MV switches



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Ensto designs and markets smart electrical solutions to improve the safety, functionality, reliability and effectiveness of Smart Grids, buildings and transport.

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ITI cabinet range

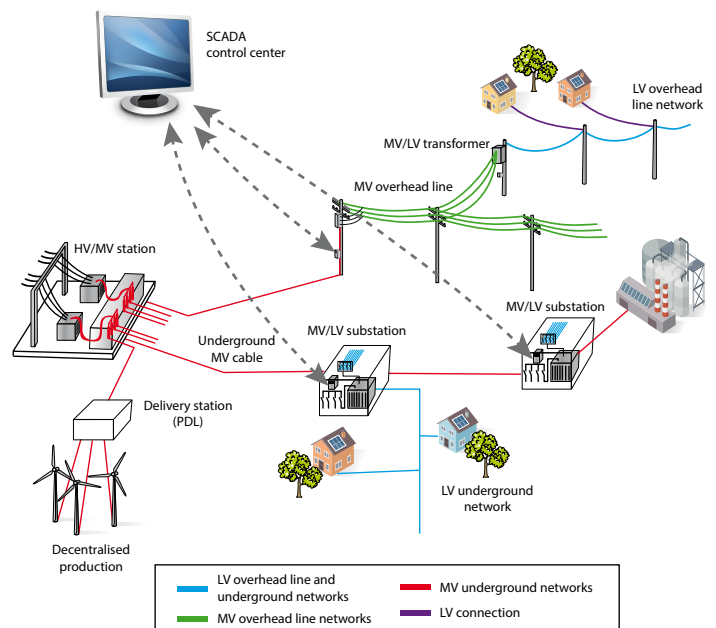
Modular and adaptable for the RTU control cabinets of all MV networks



This range of ITI cabinets marketed by Ensto is designed to control and operate MV switching devices remotely or locally. Combined with MV/LV substations or overhead line switchgears, these RTU control cabinets allow the remote control of underground and overhead line networks with respect to customer needs.

Functions linked to MV switches

- Electrical operation of switches in **local or remote mode**
- **Return of information** and dialogue with the remote control center (SCADA)
- **Measurement and detection** of fault currents occurring in the network or on the equipment
 - **Overcurrent detection**
 - **Directional detection**
- **Automation:**
 - Auto-sectionalizing function (**ASF function**) : opening during voltage drop
 - Source switching (**ASPS function**) allowing control of at least two underground cells
- **Timestamp and event transmission** that may affect the network or the cabinet





Customer benefits

Compact and ergonomic solutions that allow quick and easy installation.

HMI interface and user-friendly embedded software allowing simple, fast use and settings.

Complete range available

› Underground applications

Cabinets installed in MV/LV substations

- ITI-1S with 1 non-scalable switch
- ITI / PASA-2S/4S with 1 to 4 switches
- ITI / PASA-8S with 1 to 8 switches
- ITI PASA-H with 1 to 4 switches, size adapted to fit underneath the switches

› Overhead line applications

Cabinets installed on poles

- ITI-1A with 1 switch, adapted to remote-controlled overhead line switchgear
- ITI-1A -50°C with 1 switch, adapted to remote-controlled overhead line switchgear. This cabinet, manufactured with specific interior insulation, allows operations in severe weather conditions (snow, ice).



ITI-1S



ITI / PASA-2S/4S



ITI / PASA-H



ITI / PASA-8S



ITI-1A



ITI-1A -50°C



ITI cabinet range

Configurations and functions

The modular design of the ITI range takes into account the needs of operators for ease of configuration, diagnosis and maintenance.

Operation

Remote control mode

The ITI integrates all the transmission functions allowing messages to be exchanged with the remote control PC: remote controls, telemetry, remote signalling, DRME (Dated Recorded Maintenance Events), time setting ...

Local operation

- Using the synopsis for visualization and local operation.
- Visualization and programming of the main parameters via alphanumeric display.
- Checking and programming of parameters via computer equipped with: an Ethernet link, the Java JRE routine and a commercial browser such as IE, Chrome or Mozilla ...



ITI underground cabinet for MV Ring Main Unit (RMU)



Overhead line ITI cabinet for MV switching devices type Air Break Switch

Transmission characteristics

Via radio or LS

- Simplified HNZ66513 master-master procedure, variable or short raster, no INIT
- Speed: 200 bauds - standard R38 A - line C3 (1560Hz) or C5 (2520Hz), 600/1200 bauds - standard V23

Via switched network

- Simplified HNZ66513 master-master procedure, variable or short raster, with INIT
- Speed: 300 bauds - standard V21, 600/1200 bauds - standard V22
- Classic translator board (>10 kV)
- Decimal or MF system

Via GSM, GPRS, Numerical Radio or IP router

- Protocols: IEC 101, IEC 104, Modbus, DNP3, DNP3 IP

Detection of fault currents and measurements

The ITI cabinet contains current acquisition modules and a voltage acquisition module. The fault detectors can be configured on site by a PC for overcurrent or directional detection.

Overcurrent detection

- Adjustable earth fault thresholds (e.g. 20A - 40A - 80A - 160A - 240A or other)
- Adjustable phase fault thresholds (e.g. 500A - 750A - 1200A - 1600A or other)
- Adjustable double fault to earth thresholds (e.g. 250A - 450A - 700A - 1200A or other)

Directional detection

- 2 fault threshold calibrations: set 1 and set 2
- 1 phase fault threshold: 500A
- 1 double fault to earth threshold: 250A

Telemetry

The MV line current measurement functions, as well as the internal parameters (voltage 12V, 48V, temperature ...), are available for local consultation on the display or configuration PC or via remote control.

DRME (Dated Recorded Maintenance Events) function

This event memory function is available for local consultation or for transmitting to the remote-control PC events occurring in the cabinet or the network (recording 1000 events).

ASF (Auto-Sectionalizing Function)

This opening function during the voltage drop is part of the standard cabinet software, whatever the selected neutral mode.

Opening possible during the drop of the first or second reclosure cycle.

ASPS Function (Automatic Switching of Power Sources)

This function allows one or more normal sources of operation to be switched to one or more backup sources if there is no voltage on the normal sources. This function can not be used if the box controls only one MV cell as for the ITI-1S case.

This switching can occur under certain conditions, such as:

- lack of voltage on all the switches of the active source and availability of voltage on at least one connected switch of the emergency source
- no external locking command or MV default locking
- authorised direction of switching

Configuration

This is done via a computer equipped with: an Ethernet link, the Java JRE routine and a browser such as IE, Chrome or Mozilla ...

The software embedded on the cPU-card allows:

- Configuration of communication
- Configuration of the fault detection parameters: overcurrent or directional, the earth-fault, multiphases fault thresholds ...
- ASF and ASPS automation configuration
- Protocol frame analysis
- Downloading a pre-established configuration
- Consultation / backup of DRMEs
- Updating cPU firmware

Electrical features

- auxiliary power supply from 150 Vac to 230 Vac
- 12 Vdc and 48 Vdc outputs
- a single sealed lead battery without any maintenance
- periodic check of the battery condition with local signalling and / or remote alarm



ITI cabinet range

Main features

		Overhead line ITI	Vertical underground ITI	Horizontal underground ITI
Number of lines		1	1 to 8	1 to 4
Service conditions	Operating temperature	-50°C to +55°C	-15°C to +55°C	-15°C to +55°C
	Storage temperature	-50°C to +55°C	-25°C to +55°C	-25°C to +55°C
	Relative humidity over 24h	< 95%	< 95%	< 95%
Mechanical features	Size (h x l x p)	625 x 310 x 340 mm	<ul style="list-style-type: none"> • 650 x 310 x 330 mm (1 to 4 lines) • 650 x 310 x 330 mm (5 to 8 lines) 	220 x 800 x 350 mm
	Weight (with battery)	40 kg	<ul style="list-style-type: none"> • 38kg (1 to 4 lines) • 40kg (5 to 8 lines) 	35kg (1 to 4 lines)
	Index of protection	IP35	IP2XC	IP2XC
	Material	Stainless steel cabinet	Galvanized sheet cabinet	Galvanized sheet cabinet
	Fixation	Pole fixation	<ul style="list-style-type: none"> • Wall fixation screw M10 on spacings of 250 x 630 mm (1 to 4 lines) • Wall fixation screw M10 on spacings of 560 x 630 mm (5 to 8 lines) 	Wall fixation screw M10 on spacings of 200 x 775 mm
Power supply	Power supply LV	150 Vac to 270 Vac (without any wiring modification), 100 VA, 50 Hz - 60Hz		
		Fuse protection gF 10.3 x 38, Ø 2A		
	Energy workshop	Single sealed lead battery 12V - 38 Ah		
		Charger 13.8V, 3.6A , temperature compensated, protected by fuse 4A Converter 12V/48V, 7A protected by fuse 6.3A		
Communication	HNZ protocol	RTC - Speed 300-600-1200 Bauds or Radio - Speed 200-600-1200 Bauds		
	DNP3 and DNP IP	On GSM or xG support, Numerical Radio, IP router		
	IEC101 protocol	On GSM Numerical Radio support		
	IEC104 protocol	On xG support, IP router		
	Modbus	On RS232		
	IEC61850 protocol	Under development		
Fault detection		Overcurrent		
		Directional		
Measurement	Phase current	Opening toroids 500/1 according to the standard NF EN 600044-1		
		Power 1.5 VA, class 3		
		MV current measurement per line: Instantaneous current, averaged current 10mn, max current (except fault)		
		Local and remote visualisation		
	MV voltage	MV voltage measurement starting from averaged LV 10 mn		
		Local and remote visualisation		
	Temperature	Cabinet temperature measurement		
Local and remote visualisation				
Automation		AFS (Auto-sectionalizing function)		
		ASPS (Automatic Switching of Power Sources)		
Configuration		Via PC with commercial browser and standard Ethernet cable		
Events		1000 events saved, precision 10 ms		

Tailored support

Global solutions to customer service



Because the availability and efficiency of electricity distribution networks are our priorities, Ensto, developer and manufacturer of ITI cabinet for more than 30 years, offers a range of dedicated services, in packages or customised, to increase the service life and performance of ITI cabinet in installed base.



For each type of ITI cabinet:

- A list of recommended spare parts,
- The provision of technical instructions for installation, settings and maintenance,
- Repair of electronic cards,
- Software update,
- A hotline of Ensto experts is available to help diagnose problems and answer queries.

It is possible to raise the level of services at any time during the warranty period of the ITI cabinet through:

- extended warranty,
- a technical coaching days package,
- intra / inter product training to support you to better understand the features of the ITI cabinet, how to install it, set it up and maintain it.



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