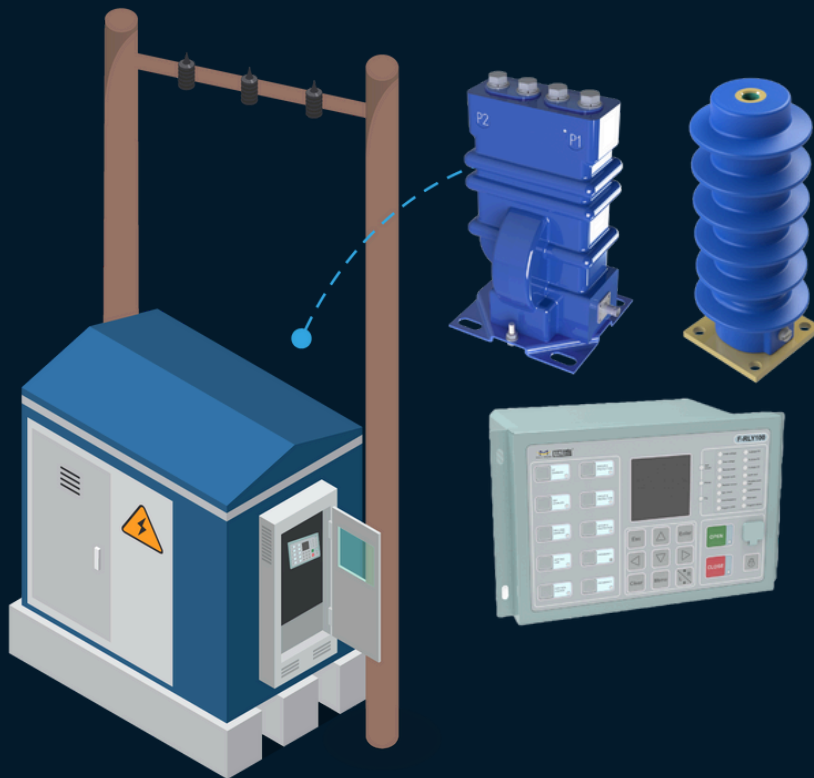


HVEX PROTECTION KIT



HVEX PROTECTION KIT

Description

The protection kit comprises: 3 electronic CTs, 3 electronic PTs, and a protection relay. The relay is primarily used for feeder protection, reclosers, and primary substations. It features protection, control, measurement, communication, data processing, energy management functions, etc.

By associating with electronic transformers, there are no issues of saturation or resonance, and their electrical withstand capability is increased. Additionally, it reduces equipment cost and weight, enabling more compact, lighter, and cheaper primary substations.

It can be combined with both internal and external primary equipment and can provide customers with a variety of automation solutions, compliant with international standards IEC/ANSI.

Features

- Scalable design, saving costs and maintenance time;
- Power supply, control, measurement, and communication are performed by independent cards;
- Power flow protection
- Multiple feeder protection functions.
- Supports 26 inverse time current curves.
- Compliant with IEC and ANSI standards;
- Modular.



HVEX PROTECTION KIT

Functions

Fault recording function:

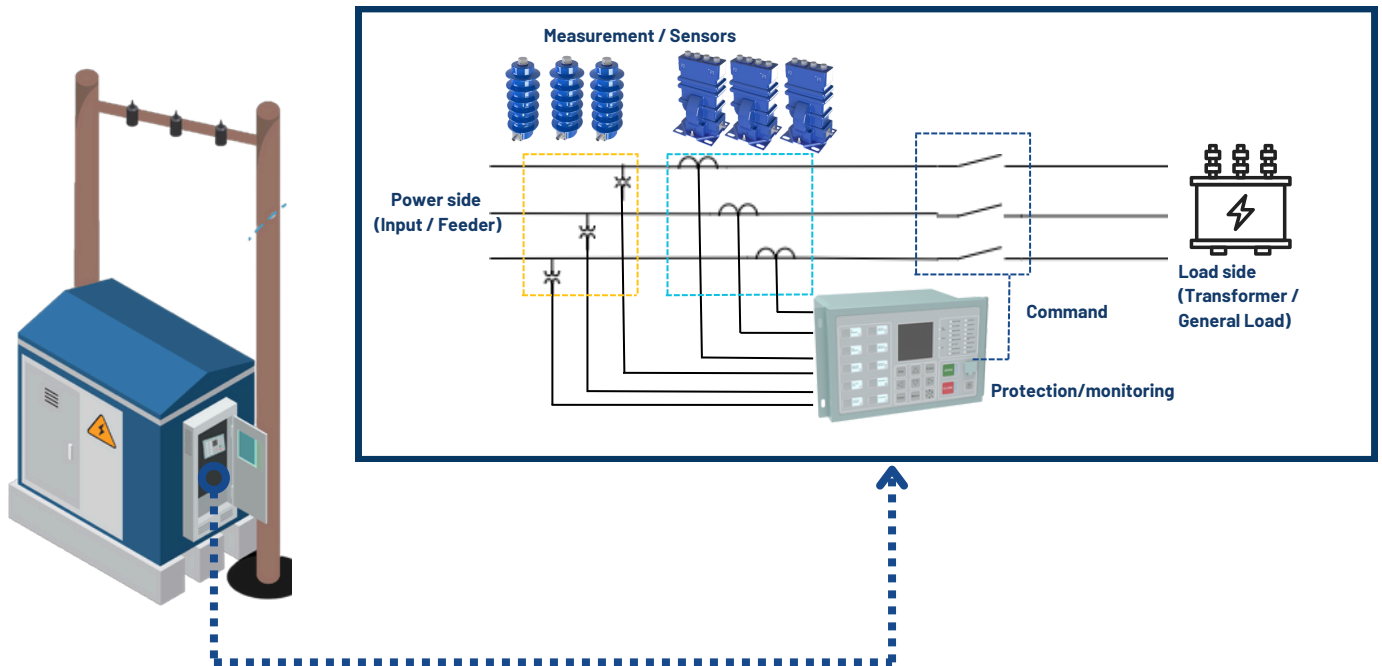
It can record 10 fault records with a maximum of 10 seconds at a storage rate of 128 sampling points in each fundamental frequency period and store up to 100 waveforms to help customers comprehensively analyze the reason for the fault, tracing the root cause to solve the problem. There are online expert algorithms that detect the type of fault and diagnosis.

Load profile function:

You can check the curve and historical data of up to 10 analog inputs, the minimum time scale is 1 minute and can rewind historical data for up to 30 days, which is convenient for customers to track and save data.

Support for power quality analysis:

It can verify the proportion of harmonic components of up to 16 analog quantities in real-time, including **current, voltage, active power, reactive power, apparent power, and up to 11 harmonics** can be calculated to meet high-quality electricity demands.



Technical Specifications - ePT

Electronic PT

Industrial frequency voltage	kV	17,5	24	36
Maximum voltage	kV	34	50	70
Insulation level	kV	95	125	170
Escape line	mm	180	238	321
Frequency	Hz	60	60	60
Capacitance value	pF	80	80	80
Accuracy		0,2%	0,3%	3%
Secondary voltage		115/ $\sqrt{3}$		115 V
Power	0,1 VA, for further powers acquire with power amplifier			
Application	Panels, exclusive relays with voltage protection function, or phase voltage differential.			
ANSI			27 V	59 V
			87 V	
It features intrinsic protection on the secondary, set at 180 V, preventing overvoltage on the relay.				
Not suitable for electromechanical relays.				
Consult HVEX universal transducer or amplifiers for other applications.				

Technical Specifications - eCT

Electronic CT

Industrial frequency voltage	kV	17,5	24	36
Maximum voltage	kV	34	50	70
Insulation Level	kV	95	125	170
Escape line	mm	180	238	321
Frequency	Hz	60	60	60
Accuracy test		0,2%	0,3%	3%
Rated current	A		25 to 5 k	
Maximum current	A		25 k	
Secondary currents	1 or 5 A with potential aplifier (optional) or 333 mV			
Power	0,1 VA, for further powers acquire with power amplifier			
Application	Panels, exclusive relays with voltage protection function, or differential.			
ANSI protection functions			27 59 87	

It features intrinsic protection on the secondary, set at 180 V, preventing overvoltage on the relay.

It has internal protection against open CT.

Not suitable for electromechanical relays.

Consult HVEX universal transducer or amplifiers for other applications.

Technical Specifications - Protection Relay

Relay

Applicable to	Overhead Lines with voltage between 10 kV ~40.5 kV
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Power supply	24 VDC (20 to 29 VDC)
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Maximum power consumption	< 10 W
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Frequency	50 Hz / 60 Hz
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Analog inputs	4 Current
	6 Voltage US
	2 Voltage UO

CT input ratio	1 A/5 A (regular CT) or 0 to 333 mV (eCT)
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Voltage sensor input range	0 to 115 V (regular PT) or 0 to 8 VRMS (ePT)
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Binary inputs	8
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Binary output rated voltage	250 VAC
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RTD/mA inputs	4 to 20 mA
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Ports

Debugging	Ethernet RJ45 (Front)
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Communication	Serial RS232/485 and Ethernet RJ45 (Rear)
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Communication protocols	IEC101/104, DNP3.0 and Modbus
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Operatin temperature	-25 °C to +70 °C
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Storage temperature	-40 °C to +85 °C
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Technical Specifications - Protection Relay

Binary input rated voltage	24 VDC or 115 VDC
Binary input threshold voltage	> 18 VDC
Binary input reaction time	< 20 ms
Protection degrees	
Painel Frontal	IP45
Painel posterior	IP20
Dimensions	
Dimensões	253 x 172 x 167 mm
Peso	3,5 kg
Protection functions	
ANSI 50/50N	Instantaneous Overcurrent
ANSI 51/51N	Time Overcurrent
ANSI 67/67N	Directional Overcurrent
ANSI 64N	Sensitive Earth Fault
ANSI 68	Power Oscillation
ANSI 46	Negative Sequence Overcurrent
ANSI 59	Overvoltage
ANSI 27	Undervoltage
ANSI 81H	Overfrequency
ANSI 81L	Underfrequency
ANSI 81R	Frequency rate of change
ANSI 79	Reclosing
ANSI 25	Sync check
Additional	Cold Load Pickup, Hot Line Tag
Protection setting groups	5

Technical Specifications - Protection Relay

Measurements

Phase current	Ia, Ib, Ic, Io, IO	
Ground current	Ia, Ib, Ic, Io, IO	
Sensitive earth current	Ia, Ib, Ic, Io, IO	
Three-phase current DFT/RMS	Ia, Ib, Ic, Ir, Is, It	$\pm 0,5\%$ (0,1 ~ 1,2 In)
Residual current DFT/RMS	Io1, Io2	$\pm 0,5\%$ (medido), $\pm 1,0\%$ (calculado)
Phase Voltage (power and load side)	Ua, Ub, Uc, Ur, Us, Ut	$\pm 0,5\%$ (0,05 ~ 2,00 Un)
Residual Voltage (power and load side)	Uo1, Uo2	$\pm 0,5\%$ (medido), $\pm 1,0\%$ (calculado)
Active Power (single-phase and three-phase)	Pa, Pb, Pc, Pt	$\pm 1,0\%$
Reactive Power (single-phase and three-phase)	Qa, Qb, Qc, Qt	$\pm 1,0\%$
Apparent Power (single-phase and three-phase)	Sa, Sb, Sc, St	$\pm 1,0\%$
Active Energy (single-phase and three-phase)	EPa, EPb, EPc, EPt	$\pm 1,0\%$
Reactive Energy (single-phase and three-phase)	EQa, EQb, EQc, EQt	$\pm 1,0\%$
Apparent Energy (single-phase and three-phase)	ESa, ESb, ESc, ESt	$\pm 1,0\%$
Power Factor (single-phase and three-phase)	PFa, PFb, PFc, PFt	$\pm 1,0\%$
Frequency	F (50Hz/60Hz)	$\pm 0,02$ Hz (0,8 ~ 1,2 Fn)
Synchronizing Difference	Tensão, Frequência e Ângulo	
Voltage Sequence Components	U1, U2, U0	$\pm 1,0\%$
Current Sequence Components	I1, I2, I0	$\pm 1,0\%$

Technical Specifications - Protection Relay

Measurements

Currents

Voltages

Power

Demands

Energy

Power Factor

Frequency

Harmonics

Power quality

Additional

Load profile

Disturbance records

Graphics for analysis

Opening

Closing

Control

Reclosing function (ANSI 79)

Synchronization Check Function (ANSI 25)

Battery Test

Authorization Configuration

Technical Specifications - Protection Relay

Clear	Indications
	Events
	Faults record
	Disturbance recors
	Power quality
	Load profile
Enable / Disable	Reclosing
	Protection functions
	Protection setting group
Monitoring	Hot line tag
	Protection start
	Protection trip
	Protection alarm
	Measurement High Alarm and Warn
	Trip counter limit
	Reclosing operation fail
	Synchronism Check Successful
	Synchronism Check Fail
	AC Fail & DC Fail
	Low battery alarm
	Door open alarm
Device internal fault	

Technical Specifications - Protection Relay

Status	Open / Close
	Local / Remote
	Reclosing functions
	Reclosing block
Records	Faults and Trip Counter
System Event Log	Last 10000 events
Fault Record	Last 1024 faults
Disturbance Record	Maximum 500 cycles x 10 (128 samples/cycle)
Load Profile Record	Last 30 days
Distribution automation schemes	Loop Automation; Auto Changeover
Interface	
LCD	20 characters x 10 lines
LED's	16 programmables
	Fault indicators
Buttons	10 Programmable
Access security	Password

Technical Specifications - Protection Relay

Operation buttons

Botões do teclado	Navigate and configure
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Menu	Back to main screen
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Clear	Clear storage data
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L/R	Local/Remote
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Control buttons

OPEN	Signal to open contacts
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CLOSE	Signal to close contacts
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LED' s

Self Check

Pickup

Trip

Under-Voltage

Over-Voltage

Reclose reset

Reclose cycle

Reclose lockout

Syn. Check

Over-frequency

Under-frequency

Technical Specifications - Protection Relay

A-phase Overcurrent

B-phase Overcurrent

C-phase Overcurrent

Earth fault

Sensitive earth fault

Instantaneous (AC fail alarm)

Door open

Programable LED

Programming buttons

EF ENABLED	Earth fault protection function
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SEF ENABLED	Sensitive earth fault protection function
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RECLOSE ENABLED	Reclosing function
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HOT LINE TAG	Hot line protection
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CONTROL LOCKED	Lock the control buttons
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GROUP A PROTECTION	Select group of protection A
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GROUP B PROTECTION	Select group of protection B
--------------------	------------------------------

GROUP C PROTECTION	Select group of protection C
--------------------	------------------------------

PROGRAM 1	None
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PROGRAM 2	None
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Authorization	Authorization levels: Administrator, Engineer, Operator and Viewer
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Debbuging port	RJ45
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Technical Specifications - Protection Relay

Rear panel / Terminals

Power supply input (20 to 29 VDC)	PWR+, PWR-
Power supply output (modem, radio)	+12VDC, GND
Signal inputs	YXCOM, YX1, YX2, YX3, YX4
Signal output	YKCOM, YK1, YK2
Analog inputs (2 channels from 4 to 20mA)	AI1, AI2, GND
Battery voltage	BAT+, BAT-
Voltage inputs	UA1, UB1, UC1, UN, UA2, UB2, UC2, UN
Current inputs	IA+, IA-, IB+, IB-, IC+, IC-, IO+, IO-

Communication

RS232/485 terminal bus	TX/A2, RX/B2, GND
B-port for time synchronization	A1, B1
RJ45	10/100 Base - T
RS232 serial	RS-232C

We provide solutions for improvement of electrical energy generation, transmission and distribution efficiency, quality and reliability. With a highly specialized and experienced team in research, development and innovation, HVEX develops tailor-made solutions for Brazilian and foreign markets. Wide range of products with solutions focused on signal transduction, measurement, monitoring and protection.



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