



EZY SWITCHGEAR
MEDIUM VOLTAGE SPECIALISTS

EZY-VS Voltage Sensor System

Potential Transformer Replacement for Medium Voltage Switchgear

6.6 kV – 33 kV | Class 0.5 Accuracy



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The Problem

THE PROBLEM: Conventional Potential Transformers

Traditional voltage transformers (VTs) used in medium voltage switchgear are bulky, expensive, and suffer from inherent design limitations. Ferroresonance—the most common failure mode—occurs when parasitic capacitances in the primary circuit resonate with the transformer inductance, causing destructive voltage oscillations and insulation damage. Each installation demands dedicated mounting compartments, complex installation procedures, and heavy equipment handling.

Ferroresonance Vulnerability

Uncontrolled voltage oscillations during transient events cause core saturation, overheating, and insulation failure. This unpredictable failure mode is the leading cause of VT damage in service.

Space & Weight Penalty

Conventional VTs weigh 15–30 kg and require separate measuring compartments in switchgear. This drives higher equipment costs, larger enclosures, and restricted design flexibility for retrofit applications.

High Cost & Complexity

Premium pricing, long lead times, and specialized commissioning add significant project cost and delay time-to-market for new switchgear designs.

THE SOLUTION: EZY-VS Ohmic Divider System

The EZY-VS replaces expensive conventional VTs with a two-component system: compact ohmic divider sensors (0.75 kg) installed directly inside switchgear compartments, paired with a precision voltage booster amplifier. This innovative approach eliminates ferroresonance, saves space, and cuts costs by 50–60% compared to traditional solutions. Available for 6.6 kV to 33 kV systems with Class 0.5 accuracy suitable for revenue metering.

SYSTEM OVERVIEW

The EZY-VS system comprises two integrated components working together to provide accurate voltage measurement with superior reliability.

Component 1: Ohmic Divider Sensors

Kries Energietechnik (TE Connectivity) precision ohmic voltage dividers — OAS type for gas-insulated switchgear and cable terminations, or OKE type for air-insulated switchgear. These compact sensors (0.75 kg) fit directly inside cable terminations or busbar chambers without dedicated mounting compartments. Output: $3.25 V/\sqrt{3}$ via coaxial BNC connector.

Installation Views



Figure 1: Three ohmic divider sensors — OAS/OKE type with BNC outputs

Component 2: Voltage Booster Amplifier

A precision amplifier on standard 35 mm DIN rail, converting the sensor output ($3.25 \text{ V}/\sqrt{3}$) to standard three-phase 110 VAC/ $\sqrt{3}$ secondary voltage. Powered by 24–240 VAC/DC auxiliary supply. Class 0.5 accuracy. Dimensions: 220 × 116 × 81 mm, weight 600 g.

INSTALLATION VIEWS



Figure 2: 24 kV OAS sensor installed in cable compartment (T-plug connection)



Figure 3: 12 kV OAS sensor mounted on busbar chamber (elbow connector)

Signal Path:

MV Primary → Ohmic Sensor ($3.25 \text{ V}/\sqrt{3}$) → Coaxial BNC cable → EZY-VS Booster Input → Amplified Output ($110 \text{ VAC}/\sqrt{3}$) → Screened cable (ALVERN IP005004) → Protection / Metering / Synchronisation equipment.

Technical Specifications

Ohmic Divider Sensors

Parameter	Specification
Divider Type	OAS (GIS) or OKE (AIS)
Manufacturer	Kries Energietechnik (TE Connectivity)
Voltage Ratings	12 kV, 24 kV (6.6 kV to 33 kV on request)
Insulation Class	12/28/75 kV (12 kV) or equivalent
Output Voltage	3.25 V/ $\sqrt{3}$ via BNC coaxial
Accuracy Class	Class 1 (standard), Class 0.5 or 0.2 (on request)
Burden	10 M Ω
Weight (OAS12)	0.75 kg
Temperature Range	-25 to +40°C
Connector	BNC female, Nexans 400TB/K400TB/KAA4 compatible

Voltage Booster Amplifier

Parameter	Specification
Input Signal	3.25 V/ $\sqrt{3}$ from three sensors (L1, L2, L3 + Earth)
Output Voltage	3× 110 VAC/ $\sqrt{3}$ (Class 0.5)
Output Rating	3× 5 VA (max 0.7 VA per phase)
Auxiliary Supply	24–240 VAC/DC, 50/60 Hz (ordered per variant)
Power Consumption	~7.5 VA
Dimensions	220 × 116 × 81 mm
Weight	600 g
Mounting	35 mm DIN rail (C-bar)
Protection	IP40
Item Numbers	2502073, 2502073_H001, 2502073_H002

Typical Applications

Revenue metering (Class 0.5 accuracy alternative to Bulk Metering Units)

Motor protection relays and overcurrent/earth fault detection

MV generator synchronisation systems

Voltage presence indication and alarm circuits

Critical: Use 4-pair individually screened cable (ALVERN IP005004) for booster output connections to prevent phase shift errors from inter-core capacitance.

Target Markets & Applications

1. Minisub Manufacturers

Direct replacement for expensive Bulk Metering Units in mini-substations. Aux power sourced from transformer secondary 230 V with significant space and cost savings. Ideal for retrofit and new designs.

2. Cable Termination Suppliers

VT replacement for piggy-back connector applications. Sensors install inside cable compartments without external mounting, preserving switchgear footprint. Compatible with Nexans and Suedkabel connector systems.

3. Metering Companies

Class 0.5 accuracy certified for revenue metering applications. Replaces traditional VT infrastructure with lower capital cost and reduced commissioning complexity. Example: Jacaranda Metering MV network deployments.

4. Generator Companies

MV synchronisation control for embedded generation (diesel, wind, solar). Example: Barloworld genset packages with integrated metering and protection.

5. Consulting Engineers

Design integration in new MV switchgear systems. Eliminates ferroresonance risk, reduces BOM cost, and enables compact layouts for space-constrained applications.

KEY ADVANTAGES

No ferroresonance risk — eliminates the most common VT failure mode

Compact installation — sensors fit inside existing compartments (0.75 kg vs 15–30 kg conventional VT)

Cost effective — 50–60% savings vs traditional VT solutions

Class 0.5 accuracy certified for revenue metering

Wide voltage range — 6.6 kV to 33 kV with appropriate sensor selection

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