



Voltage Sensing Unit

The VS unit measures the regenerative voltage produced by a motor and prevents removal of the gate key until the machine has come to rest. It is typically used to ensure a trapped key sequence can only begin when the machine has come to rest. The VS unit is used where there is a 'run down period', such as mixers or high inertia roller systems. Once the key is released, the machine cannot be re-started until the gate key has been returned. The VS unit is a combination of an independently certified 'Back EMF' unit, a safety relay and a solenoid controlled lock.

The VS unit is particularly useful in situations where there is a variable rundown period or where the use of an electronic timer would introduce inefficiencies. The VS unit is housed in a Stainless Steel enclosure and sealed to IP65.

Two illuminated push buttons are provided to give operator feedback as well as to control the machine. The blue pushbutton lights when the machine has come to rest. Pressing the blue push button whilst lit enables the removal of the key. A green illuminated push button lights when the safety circuits are in an open state. If the key has been returned to the unit, and the green pushbutton is illuminated, pressing the green button resets the safety circuits to allow machine restart.

The VS unit monitors the supply lines to the motor. It is designed to detect shorts or open circuits on each input line. On request the sensitivity threshold can be altered to operate with non standard motors. A single phase version is available on request. A security label is provided to indicate if the setting has been changed after initial installation.

For installations where multiple access points are needed, the released key can be inserted into a separate mGard key exchange unit. This can be a BM, DM or XM unit and a wide variety of sequences can be generated. See relevant BM, DM or XM Data Sheets.

mGard range

mGard is the ultimate range of robust mechanical trapped key products. Trapped key technology offers purely mechanical access locks (removing the need for expensive wiring). mGard offers an extensive variety of modular interlocking solutions.

Technical Specification

Automatic self-test when control voltage is applied.
Output circuit is redundant - Two channel operation.
Measuring inputs for single or three-phase motors.

The VS unit prevents further operation in the following cases:

- Power supply failure.
- Component failure.
- Interruption of measuring circuits.
- Coil defect in a relay/cable break.

With every on-off cycle of the machine, the relays are automatically tested to make sure they open and close correctly.

External 22mm Blue illuminated push button lamp indicates that the key release solenoid can be energised.

External 22mm Green illuminated push button for system reset.

Internal Semiconductor output (Galvanically separated).

Semiconductor output 24 V DC/50mA ,PNP short-circuit proof.

External voltage supply for semiconductor output 24 V DC +/-20 %.

Internal LED for Operating Voltage (For Installation / maintenance / Checking).

Internal LED for channel 1 and channel 2 (For Installation / maintenance / Checking).

Internal LED for switching status (For Installation / maintenance / Checking).

Electrical Data

Operating Voltage : 24Vac, 24Vdc, 110Vac, 230Vac.

Voltage Tolerance UB 85-110 %.

Frequency Range (AC): 50 ... 60 Hz.

Residual Ripple (DC): 20%.

Power Consumption (Key release solenoid de-energised: 11VA / 7 W.

Power Consumption (Key release solenoid energised: 21VA / 12 W.

Life

Mechanical Life 1×10^7 cycles.

Electrical Life (1A/230V AC, $\cos \theta = .1$) 1×10^5 cycles.

Features

Hysteresis per channel:

Response time $U_{an} = 20 \dots 500$ mV.

Release time $U_{ab} = 2 \times U_{an}$.

Delay-on Energisation approximately: 1 s.

Delay-on De-Energisation approximately: 170 ms.

Delay-on Energisation after failure and applying operating voltage again approximately: 2 s.

Input Voltage 110 ... 500 V AC maximum voltage: 690 V AC.

Frequency range 0 ... 150 Hz.

Input Impedance approximately: 660 k.

Safety Data

Standards	EN60947-3:2009 ISO EN14119:2013 EN13849-1:2008 EN13849-2:2012 EN62061:2005	
Certifications	CE marked for all applicable directives	
Category	Cat. 4, PLe (EN/ISO 13849-1) and SIL3 (EN/IEC 62061)	
Functional safety data	B10d	5,000,000
	DC	High 99% (with correct monitoring)

VS - Part Numbers

- VS-CLIL-024** - VS unit: CL type lock with Stainless Steel internals, padlockable dust cover, 24V supply.
- VS-CLIL-110** - VS unit: CL type lock with Stainless Steel internals, padlockable dust cover, 110V supply.
- VS-CLIL-230** - VS unit: CL type lock with Stainless Steel internals, padlockable dust cover, 230V supply.
- VS-CLIN-024** - VS unit: CL type lock with Stainless Steel internals, no dust cover, 24V supply.
- VS-CLIN-110** - VS unit: CL type lock with Stainless Steel internals, no dust cover, 110V supply.
- VS-CLIN-230** - VS unit: CL type lock with Stainless Steel internals, no dust cover, 230V supply.
- VS-CLIS-024** - VS unit: CL type lock with Stainless Steel internals, Stainless Steel dust cover, 24V supply.
- VS-CLIS-110** - VS unit: CL type lock with Stainless Steel internals, Stainless Steel dust cover, 110V supply.
- VS-CLIS-230** - VS unit: CL type lock with Stainless Steel internals, Stainless Steel dust cover, 230V supply.
- VS-MLIL-024** - VS unit: ML (Master) type lock with Stainless Steel internals, padlockable dust cover, 24V supply.
- VS-MLIL-110** - VS unit: ML (Master) type lock with Stainless Steel internals, padlockable dust cover, 110V supply.
- VS-MLIL-230** - VS unit: ML (Master) type lock with Stainless Steel internals, padlockable dust cover, 230V supply.
- VS-MLIN-024** - VS unit: ML (Master) type lock with Stainless Steel internals, no dust cover, 24V supply.
- VS-MLIN-110** - VS unit: ML (Master) type lock with Stainless Steel internals, no dust cover, 110V supply.
- VS-MLIN-230** - VS unit: ML (Master) type lock with Stainless Steel internals, no dust cover, 230V supply.
- VS-MLIS-024** - VS unit: ML (Master) type lock with Stainless Steel internals, Stainless Steel dust cover, 24V supply.
- VS-MLIS-110** - VS unit: ML (Master) type lock with Stainless Steel internals, Stainless Steel dust cover, 110V supply.
- VS-MLIS-230** - VS unit: ML (Master) type lock with Stainless Steel internals, Stainless Steel dust cover, 230V supply.

VS Dimensional Drawing

