Suppression modules for inductive products simplify the fulfilment of the EMC law!

Old laws have not lost their validity now. The Ohm´s law is still valid everywhere, as well as the Lenz´s rule. This states that when an inductive load is switched off, current has the desire to continue flowing in the same direction and strength as before. A voltage source is created from the inductive load, which can be many times higher than the nominal voltage. This voltage spike is the cause of many EMC problems.

What does the EMC law achieve?

From the 1st January 1996 only products which fulfil the requirements of § 4 of the EMC guidelines, can be brought into the European market.

That means:

Products cannot send out interference nor be influenced by it.
Suppression components do not fall under the EMC guidelines.

Reasons for interferences

1. High inductive voltage spikes at inductive loads:

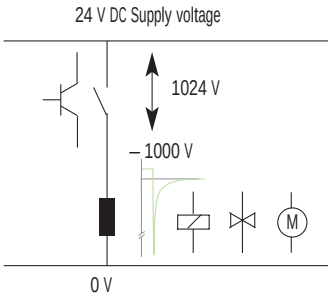
The high voltage spikes when switching off exceed the normal supply voltage many times and overload the electronics. The voltage can in some cases be so high, that the windings are shorted and the inductive product is destroyed.

2. High inductive voltage spikes in the automated system:

The voltage spikes climb at a very high speed. These very high climb rates contain high frequencies. Every cable and wire in the control system acts as a transmitter or receiver for these high frequencies.
These high frequency interferences can therefore move unhindered from cable to neighboring cable.

3. High inductive voltage spikes in the controller:

The present voltage spike at the moment of switching off adds itself in opposite polarity to the supply voltage and affects the controller i.e. PLC.



These high voltages in the controller cause energy rich arcs, due to the current flowing on in the same strength and direction at the moment that the contact is opened. The arcs cause material deformation and reduce the life expectancy of the switching elements.

Murrelektronik solves your interference problems:

- faults in the control process
- defective control system
- defective coil on the motor, contactor, valve or transformer
- interference emissions causing a reduction in functionality
- EMC problems

Suppression modules for control systems

Murrelektronik supply suppressors for all standard inductive users.

For contactors

- Integrated system solutions for all common protectors.
- Contactors or relays for universal suppressors can be snaped onto DIN-rail.

For motors

- Direct suppression inside the motor terminal box.
- Motor connection socket 10 + E with integrated suppression and manufactured cable.
- Integrated system solutions for direct mounting.
- The universal suppressors should be mounted very close to the source of interference (motor).

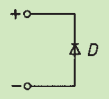
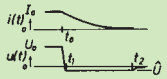
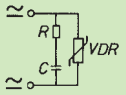
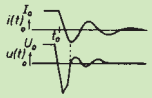
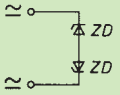
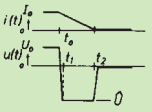
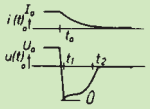
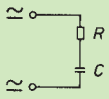
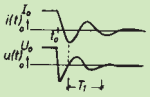
For valves

- Easy mounting of suppressor.

Advantage:

- Optimum interference through individual adaption.
- Easy mounting through prefabricated modules – always the perfect solution.
- Less breakdowns increase availability and reduces downtime.
- High life span of contacts and control units reduces maintenance cost.

An overview of different types of suppressors

Circuit	Characteristics of load current and voltage	Incorrect polarity protection and also suitable for AC	Additional switch-off delay	Back e. m. f. limitation	Damping also occurs below U_{LIMIT}	Components
		no	very large	1 V	no	**Advantages:** • matches wide range of loads • best possible damping • simple construction **Disadvantages:** • long delay time
		yes	small	U_{VDR}	yes	**Advantages:** • HF-damping due to RC-network • high energy absorption • short delay time **Disadvantages:** • must be matched to the load • limited lifespan
		yes	small	U_{ZD}	no	**Advantages:** • limits positive and negative voltages • suitable for AC and DC • matches wide range of loads **Disadvantages:** • no damping below U_{ZD}
		yes	small	U_{VDR}	no	**Advantages:** • matches wide range of loads • high energy absorption • very simple construction **Disadvantages:** • no damping below U_{VDR} • limited lifespan
		yes	small	$1{,}5 \times U_{NOM}$	yes	**Advantages:** • HF-damping due to RC-network • immediate de-energization • excellent results with AC **Disadvantages:** • must be matched to the load • limited lifespan

EMC suppressors for contactors

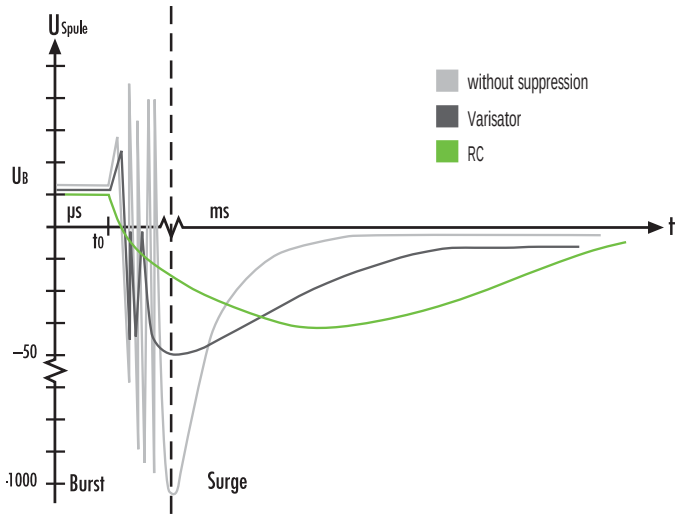
For all common manufactors with integrated system solution.

To combat high voltage switch off overloads, which lead to contact burn out and destruction of the neighboring electronic control systems, contactors should be suppressed.

Murrelektronik has for years developed and produced suppresion modules, which are carefully designed together with the contactor manufactures, to work with specific contactors.

The mechanical mounting of the modules is therefore exact and simple as well as guaranteeing the optimum suppression characteristics.

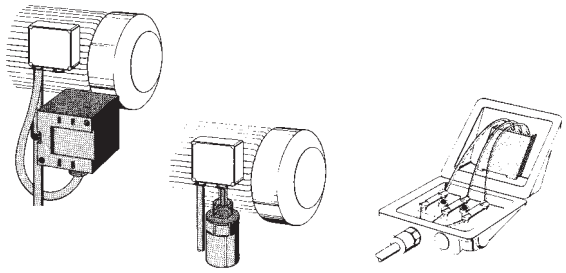
Connection is via flexible wires or direct contacts.



Standardized motor suppression from Murrelektronik

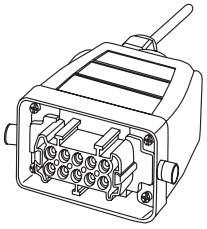
We offer a suitable motor suppressor for every application. The suppressor should, if at all possible be mounted very close to the source of interference (motor). The European norm (EN 50262) has been valid since 31st December 1999 for metric threads and replaces the DIN 46320 for PG threads. There are also modules available which can be snapped onto DIN-rail.
The use of motor suppression equipment protects the motor from high inductive voltage spikes when switching off. At the same time, it increases the contact life span of the control unit. With the optimum suppression modules from Murrelektronik, you receive the highest level of operational safety.
The machine or control panel will function within the EMC regulations, without affecting other electrical equipment in the surrounding area.

Suppression at the motor terminal box



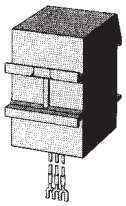
Suppression, where the interference arises !

Mounts directly on the motor



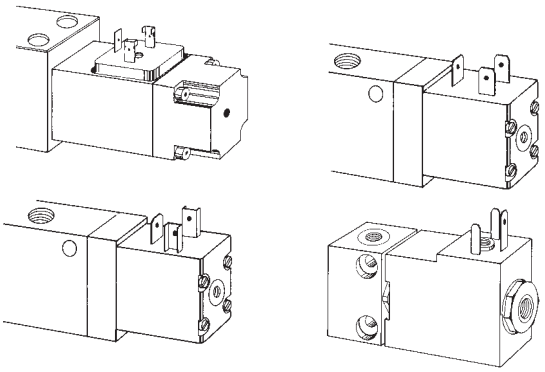
“Plugged in what else.”

Snap-on under the contactor



Space savings.

Suppression modules for valves



For every form a suitable suppression

Hydraulic and pneumatic systems are an integral part of most machines. The plug supplied is often not enough to meet the standards many applications require. Suppression is necessary for the machines functionality and a LED vital for fault-finding and maintenance.

Advantage:

- Simple plug-on mounting without any wiring
- Suitable adapter for all standard valves
- Protects the control system using the optimal network
- LED in yellow
- Adapter polarity safe for all voltages

Self wireable and pre-wired valve connector with LED and suppression see chapter 1

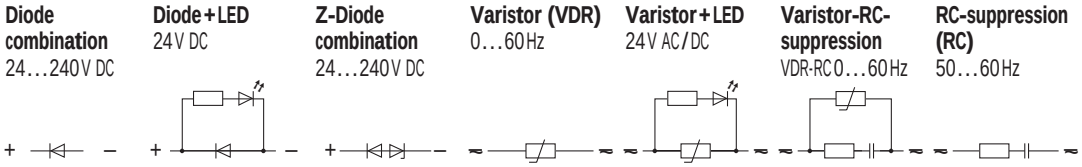
MURR ELEKTRONIK

Suppressors for contactors

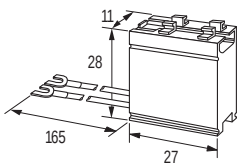
AEG

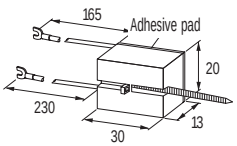
	AS	A0	AD
			

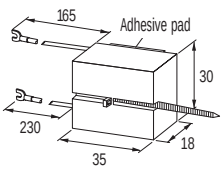
Circuit diagram



		AS	A0	AD
Appropriate contactors		LS 07, LS 4…LS 37, SH 04, SH 4, SH 08; SH 10	LS 02K, LS 05K LS 4K…LS 18K	LS 22K…LS 55K
Ordering data		**Art.-No.**	**Art.-No.**	**Art.-No.**
Voltage	Suppression	approvals	approvals	approvals
24 …240 V DC	Diode	UL + CSA **26281**	CSA **26001**	
24 V DC	Diode + LED			
	Diode/Z-Diode		CSA **26120**	CSA **26073**
24 V AC/DC	VDR	UL + CSA **26310**	UL + CSA **26180**	CSA **26720**
	VDR + LED			
	RC			
48 V DC	Diode/Z-Diode			
48 V AC/DC	VDR	UL + CSA **26311**	UL + CSA **26181**	CSA **26721**
	RC		UL + CSA **20001**	UL + CSA **20013**
110 V AC/DC	VDR	UL + CSA **26313**	UL + CSA **26182**	CSA **26722**
	VDR + LED			
	VDR-RC			
	RC			
230 V AC/DC	VDR	UL + CSA **26312**	UL + CSA **26183**	CSA **26723**
	VDR + LED			
	VDR-RC	UL + CSA **26321**		
	VDR-RC + LED			
	RC	UL + CSA **22062**	UL + CSA **20002**	UL + CSA **20010**
	RC			
400 V AC/DC	VDR			
	RC		UL + CSA **20004**	UL + CSA **20012**
	RC			
Technical data				
Damping factor		~ 1.5 x U_N		
Temperature range		-20…+70 °C		
Material		flame retardant plastic to UL 94		
Connection wires		self-securing fork terminal ends		
Dimensions				







Notes

For other types, please inquire.