MURR ELEKTRONIK

stay connected

- Efficient Suppression
- Avoid Coil Short Circuits
- Reduce Voltage Peaks

SUPPRESSOR MODULES

for motors


MURR
Art.No. 23050

MURRELEKTRONIK SUPPRESSOR MODULES

Less Work, Big Impact

Voltage peaks create problems in machines and systems. Murrelektronik suppressors are reliable and help you avoid damage. With our motor suppression modules, coil short circuitswill never happen again! These suppressors increase the lifetimeof electronic and electrical components and with them, it's possible to design machines and systems so they are EMC-compatible. By installing suppressor modules close to the interference source, you will efficiently reduce voltage peaks.

- Reduce voltage peaks
- Avoid coil short circuits
- Increase lifetime
- Meet EMC Guidelines
- Avoid negative effects

Increased System Availability

Murrelektronik supplies motor suppressors for motors up to 20 kW. Suppressors significantly reduce voltage levels and prevent parts from retaining high frequencies, both of which are caused by increasing voltage. Using a suppressor increases the lifetime of contacts and coil-windings, as well as reduces the operating and maintenance costs. For plant operators, increased operational reliability, system availability and higher productivity are a must!

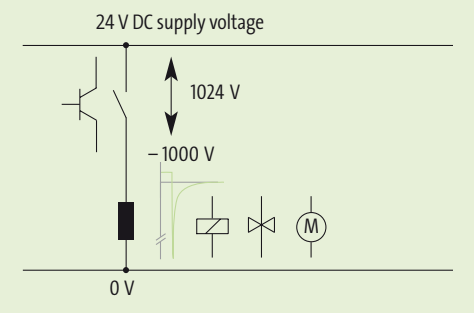
Save Money on Material and Maintenance Costs

By choosing Murrelektronik's suppressor modules, you benefit from our knowledge of over 35 years of experience in the EMC field. Our suppressor modules are extremely successful because Murrelektronik collaborates with motor, contactor and valve manufacturers when we develop them. The modules are created to respond to the voltage peak sources and they are assembled onto the machines so they achieve optimized suppression. The precise module placement enures that interference is reduced and also saves material and maintenance costs.

| EFFICIENT SUPPRESSION

The Problem

Even in today's extremely modern world, inductive loads are still governed by the rules of physics. Just like gravity, Ohm's law and Lenz's law will never change. They state that when an inductive load is switched off, current wants to keep flowing in the same direction and with the same strength as before. The voltage comes from the inductive load, and since the inductive loads can be much higher than the nominal voltage, voltage peaks can occur.



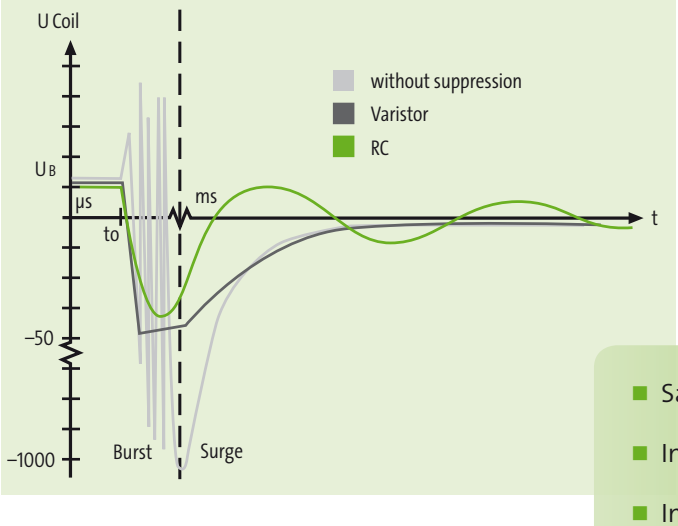
This causes the following problems:

- Powering down can cause coil short circuits
- Coil lifespan is shortened
- Data transfer via the bus system is cut off
- Control sequence is interrupted

All of which result in expensive downtime.

The Solution

Suppressors installed close to the interference source help reduce voltage peaks during shut down. Benefits:



Murrelektronik always provides the right solution, no matter what the requirements are: suitable for any load, lowest possible voltage peaks, high attenuation factor, DC or AC voltages, simple design or a short delay time.

- Save on material and maintenance costs
- Increase interference protection
- Improve system availability
- Ensure reliable run-time

The Implementation

- Suppression module inside the motor terminal box, directly next to the interference source
- 10-pole motor connector with integrated suppressor module and pre-wired cable
- Ready for world wide use: suppressors that snap onto a DIN rail or mount onto/under the motor contactor

The Approvals

The standard modules are listed in UL-File E140415, category NKCR2. Some suppressors are also listed in UL File E338196 Vol. 1, sec. 1, categories NLDX2 and NLDX8 as "Motor Controllers, Magnetic Component" acc. to UL508 and CSA C22.2 No. 14-10 and can be used in the branch circuit.

| SAFETY REVIEW ACCORDING TO ISO EN-13849

When installing a machine or a system according to category 2 of ISO EN-13849, you have to respect CCF (chapter 6.2.5). CCF means "Common Cause Failure" and describes errors with a common cause. This means, several errors, resulting from the same source cause dangerous failures.

Measure	Points
Separation	15
Diversity	20
Design/application/experience – protection against over-voltage, over-loads, over-pressure, etc.	**15**
Design/application/experience – use of proven components	5
Assessment/analysis	5
Competency/training	5
Environment – protection from dirt and electromagnetic interference (EMC)	**25**
Other impacts	10
Total	**100**

Appendix F of the standard 13849 describes a simple method how to evaluate common cause failures. It includes a table for the evaluation process.

If you implement measures to reduce common cause failures, you score points. If you can prove that your machines and systems are installed safely according to the measures, you get 40 points. In order to have adequate machines and systems, you should have at least 65 points out of 100.

| EMC SUPPRESSION MODULES

Suppressors for motors

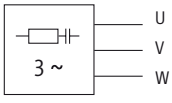
Mounting method:

- **on the motor terminal box**
- **inside the motor terminal box**
- **inside the distribution box**
- **on 35 mm DIN-rail acc. to EN 60715**

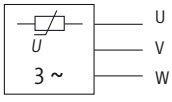
Approvals:

	RC 3 U	**RC 3 BU**	**RC 3 BUG**
	with M16 x 1.5 screw		
			

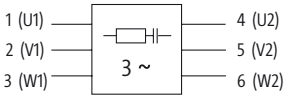
Circuit diagram



RC



VDR

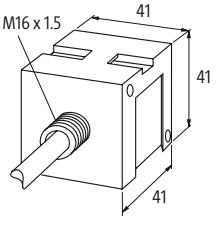


RC-(1) per phase

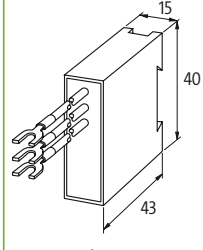
Ordering data		**Art. No.**	**Art. No.**	**Art. No.**
Voltage	Motor rating	Suppression/Approval	Suppression/Approval	Suppression/Approval
3 x 400 V AC	4 kW	RC **23022**	RC/UL **23050**	RC **23104**
	4 kW			VDR **23100**
	4 kW		VDR/UL **23115**	
	7.5 kW		VDR/UL **23115**	RC **23104**
	10 kW	RC **23011**	VDR/UL **23118**	RC **23106**
	10 kW	RC (1) per phase **23043**		
	20 kW		VDR/UL **23118**	
3 x 575 V AC	4 kW		RC/UL **23050**	
	7.5 kW	RC/UL **23035**		RC **23104**
	20 kW			VDR **23102**
	45 kW			RC (1) per phase [1] **23103**
3 x 690 V AC	4 kW		RC/UL **23056**	RC **23104**
	7.5 kW			RC **23104**

Technical Data			
Frequency	for RC: 50...60 Hz; for VDR: 10...400 Hz		
Material	plastic, flame retardant (UL 94)		
Potting compound	2-component epoxy		
Temperature range	-20...+60 °C		
Connection method	approx. 500 mm PVC cable	approx. 200 mm single core	approx. 500 mm single cores
	3 x 0.75 mm² or 6 x 0.75 mm²	0.5 mm²	1 mm²
		with self-securing M4 cable fork	

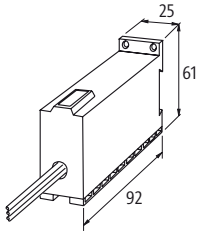
Dimension drawing



For DIN-rail mounting use
2 x **Art. No. 20900** adapter feet



For DIN-rail mounting use
1 x **Art. No. 20900** adapter foot



For DIN-rail mounting use
2 x **Art. No. 20900** adapter feet

Note

Do not use RC motor suppressors on variable frequency drives. [1] = 1 x Art. No. 23103 required per phase.

| EMC SUPPRESSION MODULES

Suppressors for motors

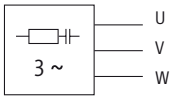
Mounting method:

- **with screw terminals M16 x 1.5 and M20 x 1.5**
- **on motor terminal box with plug connector**

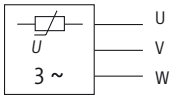
Approvals:

	RC 3 R with M16 x 1.5 screw	**RC 3 R** with M16 x 1.5 screw	**RC 3 RG** with M20 x 1.5 screw
			

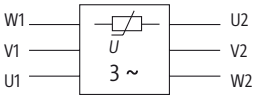
Circuit diagram



RC



VDR

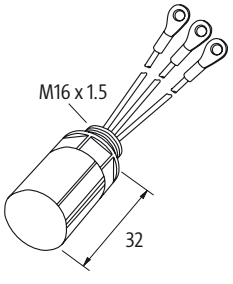


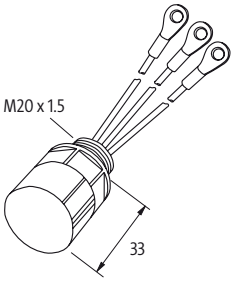
VDR-(1) per phase

Ordering data		**Art. No.**	**Art. No.**	**Art. No.**
Voltage	Motor rating	Suppression/Approval	Suppression/Approval	Suppression/Approval
3 x 400 V AC	4 kW	VDR/UL **23170**	VDR/UL **23175**	RC/UL **23141**
	7.5 kW	VDR **23171**		
	10 kW			VDR **23142**
	20 kW			VDR **23144**
3 x 575 V AC	4 kW	VDR/UL **23172**		RC/UL **23141**
	7.5 kW	VDR/UL **23173**		
	10 kW			VDR/UL **23145**
	20 kW			VDR/UL **23146**
	20 kW			VDR-(1) per phase **23147**
3 x 690 V AC	7.5 kW	VDR [1] **23174**		
	20 kW			VDR **23149**

Technical Data			
Frequency	for RC: 50...60 Hz; for VDR: 10...400 Hz		
Material	plastic, flame retardant (UL 94)		
Potting compound	2-component epoxy		
Temperature range	-20...+60 °C		
Connection method	approx. 100 mm single core		approx. 150 mm single core
	0.5 mm²		1 mm²
Ring terminals	isolated M6	isolated M4	isolated M6

Dimension drawing





Note

Do not use RC motor suppressors on variable frequency drives. [1] = wire cross section 1.5 mm².

| EMC SUPPRESSION MODULES

Suppressors for motors

Mounting method:

- **on motor terminal box with plug connector**

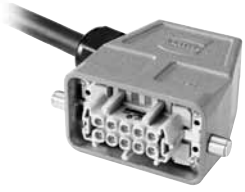
Approvals:

RC 3 ST

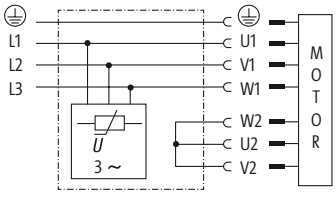
Connector with cable and integrated motor suppression
Cable outlet straight

RC 3 ST

Connector with cable and integrated motor suppression
Cable outlet right angle



Circuit diagram

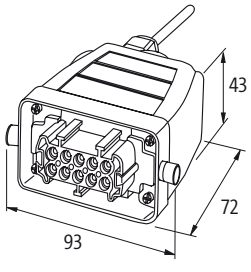


Varistor-suppression (star)

Ordering data				**Art. No.**		**Art. No.**
Voltage	Motor rating	Cable	Suppression		Suppression	
max.	5.5 kW	5 m	VDR/star	**236139**	VDR/star	**236148**
3 x 575 V AC	5.5 kW	8 m	VDR/star	**236141**		
	5.5 kW	10 m	VDR/star	**236142**	VDR/star	**236149**

Technical Data		
Frequency	10...400 Hz	
Connector	females, 10-pole + PE	
Housing	aluminium die-cast	
Temperature range	-20...+60 °C	
Connection method	PUR cable, black, 4 x 1.5 mm²; numbered wires, halogen-free	PUR cable, black, 4 x 1.5 mm²; numbered wires, DESINA ® compliant

Dimension drawing



Note

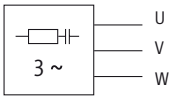
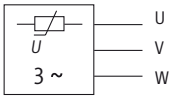
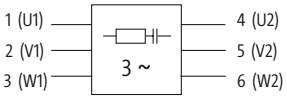
| EMC SUPPRESSION MODULES

Suppressors for motors

Mounting method:

- **on 35 mm DIN-rail acc. to EN 60715**
- **bolted together, stacked**
- **DIN-rail mounting under the control gear**

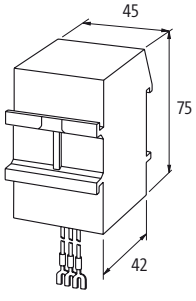
Approvals:

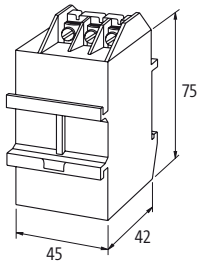
	HRC 3	HRC 3 K	RC 3 BUR Connects onto Siemens SIRIUS contactors 3 RT 10
			
Circuit diagram	 RC	 VDR	 RC-(1) per phase

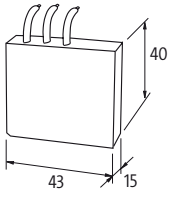
Ordering data		**Art. No.**		**Art. No.**		**Art. No.**
Voltage	Motor rating	Suppression/Approval		Suppression/Approval		
3 x 400 V AC	4 kW	RC/UL	² **23000**	RC	² **23001**	
	4 kW	RC/UL	**23004**	RC	**23005**	
	4 kW	RC/UL	¹ **233463**			
	5.5 kW					RC/UL **236082**
	7.5 kW					
	10 kW	RC/UL	**23002**	RC	**23003**	
	20 kW	RC (1) per phase/UL	**23009**			
	20 kW	VDR/UL	**23015**			
3 x 575 V AC	5.5 kW					RC/UL **236082**
	7.5 kW	RC/UL	**23006**	RC	**23007**	
	7.5 kW	RC/UL	¹ **230563**			
	10 kW	VDR/UL	**23016**			
	20 kW			RC	**23018**	
3 x 690 V AC	10 kW	RC	**23017**			

Technical Data			
Frequency	for RC: 50...60 Hz; for VDR: 10...400 Hz		
Material	plastic, flame retardant (UL 94)		
Potting compound	2-component epoxy		
Temperature range	-20...+60 °C		
Connection method	250 mm s. core (art. 23000: 300 mm)	3-pole terminal	wire (solid core)
	0.5 mm² (art. 23000: 1.5 mm²)	2 x (0.75...2.5 mm²)	1.5 mm²
	with self-securing M4 cable forks	M4	

Dimension drawing







Note

Do not use RC motor suppressors on variable frequency drives. ¹ = with ferrule ends. ² = max. nominal voltage 3 x 500 V AC +10 %.

| EMC SUPPRESSION MODULES

Suppressors for motors

Mounting method:

- **snaps on between contactor and DIN rail**
- **fixes onto contactors**
- **alternatively with integrated coil suppression**

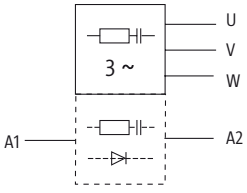
Approvals:

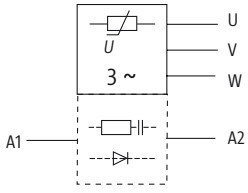
HRC 3 AS

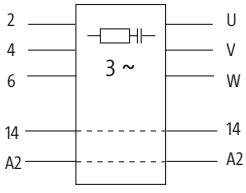
RC 3 RT

Connects onto Siemens SIRIUS contactors 3 RT 10

Circuit diagram







Appropriate contactors

Motor contactors up to 5.5 kW from Siemens, Eaton, etc.

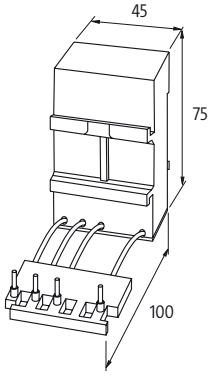
Siemens 3 RT 10

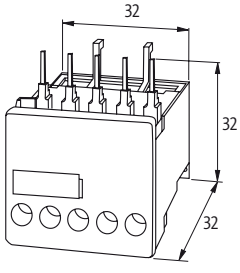
Ordering data			**Art. No.**		**Art. No.**		**Art. No.**
Voltage	Motor rating	Suppression Motor + Coil		Suppression Motor + Coil		Suppression/approval	
3 x 400 V AC	5.5 kW	RC	**23160**	VDR	**23163**	RC/UL + CSA	**23180**
	5.5 kW	RC + Diode	**23151**				
3 x 575 V AC	5.5 kW	RC	**23161**	VDR	**23164**	RC/UL + CSA	**23181**
	5.5 kW	RC + Diode	**23153**	VDR + Diode	**23157**		

Technical Data

Suppression Coil	for RC: 230 V AC/20 VA; for RC + Diode: 24...230 V DC/36 W	
Frequency	for RC: 50...60 Hz; for VDR: 10...400 Hz	
Material	plastic, flame retardant (UL 94)	
Temperature range	-20...+60 °C	
Connection method	ferrules, load side securely fixed	fits directly into SIRIUS contactors, size 00

Dimension drawing





Note

Do not use RC motor suppressors on variable frequency drives.

You can find everything for suppression modules including comprehensive information, data sheets, technical data and downloads, plus configure your own part according to your needs or order a ready-made part in our online shop:

www.murrelektronik.de

onlineshop.murrelektronik.com

In addition to EMC suppressors for motors, contactors and valves, we have a wide range of EMC filters that protect your machines and systems to the highest degree.

EMC filters from Murrelektronik

Suppressors for Motors | 05_12 EN | Art. No. 9845012

MURR ELEKTRONIK

stay connected

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