

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:

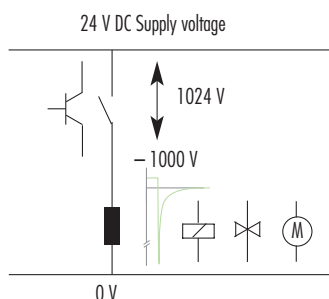
The high voltage spikes when switching off exceed the normal supply voltage many times and overload the electronics. The voltage can in some cases be so high, that the windings are shorted and the inductive product is destroyed.

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 snapped 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).

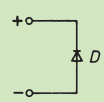
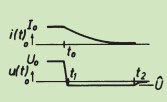
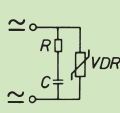
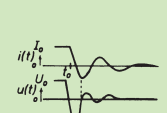
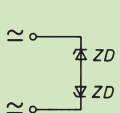
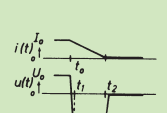
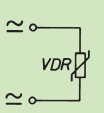
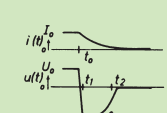
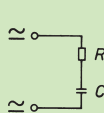
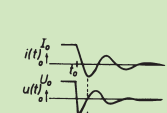
For valves

- 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 manufacturers with integrated system solution.

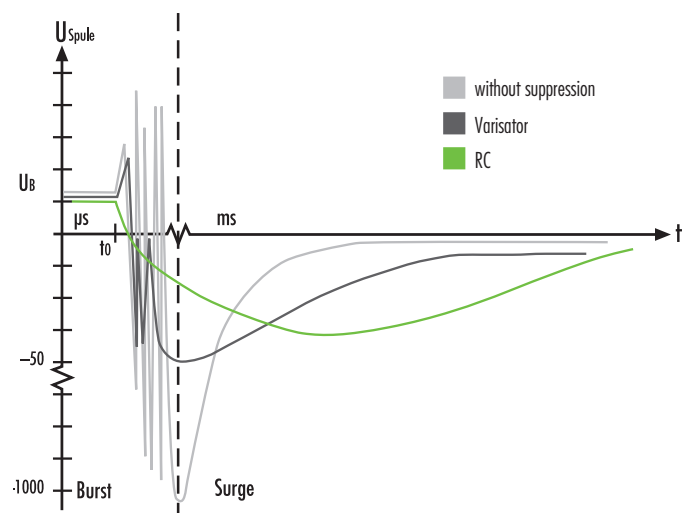


To combat high voltage switch off overloads, which lead to contact burn out and destruction of the neighboring electronic control systems, contactors should be suppressed.

Murrelektronik has for years developed and produced suppression modules, which are carefully designed together with the contactor manufacturers, 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.



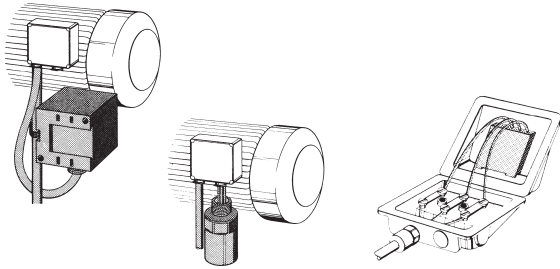
Standardized motor suppression from Murrelektronik

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.

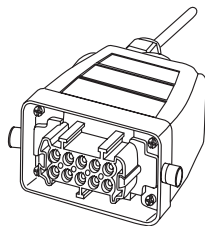
The machine or control panel will function within the EMC regulations, without affecting other electrical equipment in the surrounding area.

Suppression at the motor terminal box



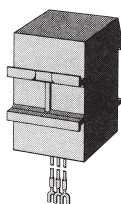
Suppression, where the interference arises !

Mounts directly on the motor



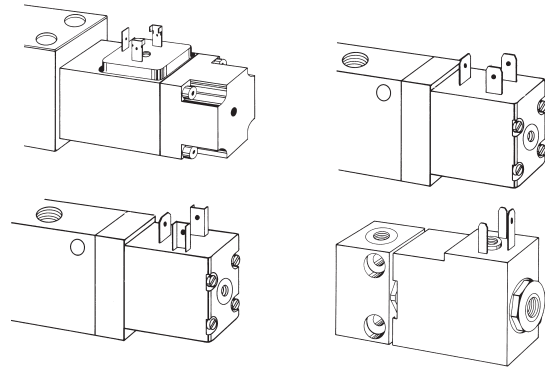
"Plugged in what else."

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

For contactors



For ABB-contactors

page 3.2.7



For AEG-contactors

page 3.2.8



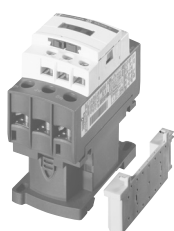
For Moeller-contactors

from page 3.2.9



For SIEMENS-contactors

from page 3.2.12



For Telemecanique-contactors

page 3.2.16



Universal suppressor module

from page 3.2.17

For motors, mounting directly at the motor



RC 3 U

Mounting universal or directly at the terminal box.

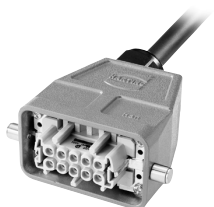
page 3.2.19



RC 3 R

Mounting at the terminal box.

page 3.2.20



RC 3 ST

Motor connectoin plug with integrated suppression and prewired cable.

page 3.2.21

For motors, mounting at the control panel



RC 3 BUR

Mounting directly in contactors.

page 3.2.22



HRC 3 AS

Space safety on DIN-rail mounting.

page 3.2.23



RC 3 RT

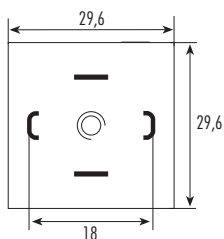
For Siemens SIRIUS contactor.

page 3.2.23

EMC suppressors for valve



VBS



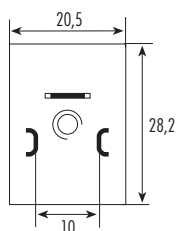
Form A EN 175301-803 (ISO 4400)

Contact form 18 mm, square
2 springs for PE-contact

page 3.2.24



DAB



Form B EN 175301-803 (ISO 6952)

Contact form 10 mm, narrow
2 springs for PE-contact

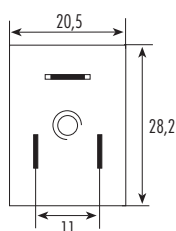
page 3.2.25



LBS



PBS



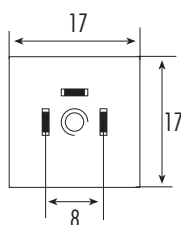
Form BI Industrial Standard

Contact form 11 mm, narrow
for plug with PE at cable entry

page 3.2.24 and 3.2.25



MVK



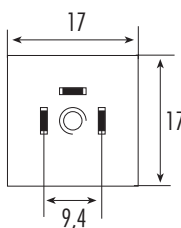
Form C EN 175301-803 (ISO 6952)

Contact form 8.0 mm
2 springs for PE-contact

page 3.2.26



MVT



Form CI Industrial Standard

Contact form 9.4 mm
2 springs for PE-contact

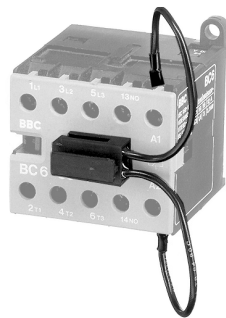
page 3.2.26

Suppressors for contactors

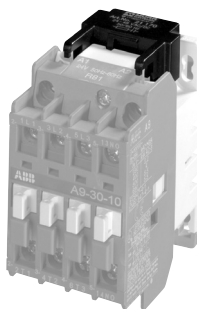


Product group BBC

BC



A 16



A 110

Circuit diagram

Diode combination
24...240V DC

Diode + LED
24 V DC

Z-Diode combination
24...240V DC

Varistor (VDR)
0...60Hz

Varistor + LED
24 V AC/DC

Varistor-RC-suppression
VDR-RC0...60Hz

RC-suppression (RC)
50...60Hz



Appropriate contactors

B 6, BC 6, VB 6, KC 6

A 9...A 16

A 26...A 110

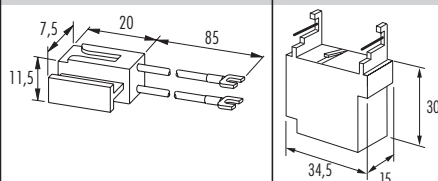
Ordering data

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Voltage	Suppression	approvals		approvals		approvals	
24 ... 240 V DC	Diode			UL + CSA		26440	
24 V DC	Diode + LED						
	Diode/Z-Diode						
24 V AC/DC	VDR	UL + CSA	26277	UL + CSA	26442		
	VDR + LED						
	RC			UL + CSA	21170		
48 V DC	Diode/Z-Diode						
48 V AC/DC	VDR	UL + CSA	26278				
	RC						
110 V AC/DC	VDR			UL + CSA	26444		
	VDR + LED						
	VDR-RC						
	RC			UL + CSA	21172	UL + CSA	21173
230 V AC/DC	VDR	UL + CSA	26079	UL + CSA	26446		
	VDR + LED						
	VDR-RC						
	VDR-RC + LED						
	RC			UL + CSA	21172	UL + CSA	21173
	RC						
400 V AC/DC	VDR						
	RC						
415 V AC/DC	RC						

Technical data

Damping factor	$\sim 1.5 \times U_N$
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.

Suppressors for contactors

AEG

AS

A0

AD


Circuit diagram

Diode combination
24...240V DC

Diode + LED
24V DC

Z-Diode combination
24...240V DC

Varistor (VDR)
0...60Hz

Varistor + LED
24V AC/DC

Varistor-RC-suppression
VDR-RCO...60Hz

RC-suppression (RC)
50...60Hz


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

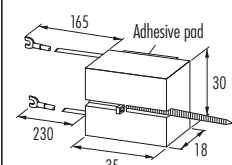
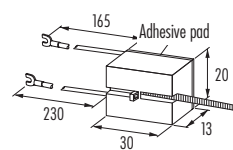
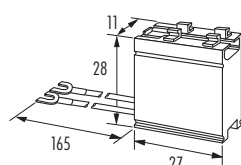
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		Art.-No.	Art.-No.	Art.-No.
Voltage	Suppression	approvals	approvals	approvals
24 ...240 V DC	Diode	UL + CSA	CSA	
24 V DC	Diode + LED			
	Diode/Z-Diode		CSA	
24 V AC/DC	VDR	UL + CSA	UL + CSA	CSA
	VDR + LED			CSA
	RC			
48 V DC	Diode/Z-Diode			
48 V AC/DC	VDR	UL + CSA	UL + CSA	CSA
	RC		UL + CSA	UL + CSA
110 V AC/DC	VDR	UL + CSA	UL + CSA	CSA
	VDR + LED			
	VDR-RC			
	RC			
230 V AC/DC	VDR	UL + CSA	UL + CSA	CSA
	VDR + LED			
	VDR-RC	UL + CSA		
	VDR-RC + LED			
	RC	UL + CSA	UL + CSA	UL + CSA
	RC			
400 V AC/DC	VDR			
	RC		UL + CSA	UL + CSA
	RC			

Technical data

Damping factor	$\sim 1.5 \times U_N$
Temperature range	-20...+70 °C
Material	flame retardant plastic to UL 94
Connection wires	self-securing fork terminal ends

Dimensions



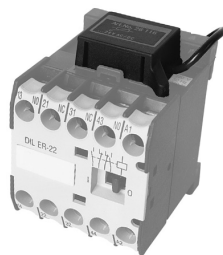
Notes

For other types, please inquire.

Suppressors for contactors

MOELLER

DIL E



B DIL



K DIL

Circuit diagram

Diode combination
24...240V DC

Diode + LED
24 V DC

Z-Diode combination
24...240V DC

Varistor (VDR)
0...60Hz

Varistor + LED
24 V AC/DC

Varistor-RC-suppression
VDR-RC0...60Hz

RC-suppression (RC)
50...60Hz



Appropriate contactors

DIL E...

DIL E...C

DIL 3 - 4...M
DIL 3 H, DIL 4 H

DIL O - 2...M
DIL R...

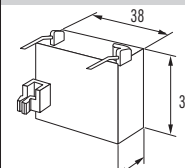
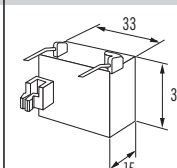
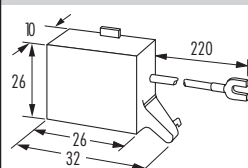
Ordering data

		Art.-No.		Art.-No.		Art.-No.		Art.-No.	
Voltage	Suppression	approvals		approvals		approvals		approvals	
24 ... 240 V DC	Diode							UL + CSA	26080
24 V DC	Diode + LED							UL + CSA	26081
	Diode/Z-Diode							UL + CSA	26170
24 V AC/DC	VDR	UL + CSA	26116			UL + CSA	26082	UL + CSA	21026
	VDR + LED								
	RC								
48 V DC	Diode/Z-Diode								
48 V AC/DC	VDR							UL + CSA	26171
	RC								
110 V AC/DC	VDR								
	VDR + LED								
	VDR-RC								
	RC	CSA	21054	UL + CSA	21056	UL + CSA	21073	UL + CSA	21028
230 V AC/DC	VDR	UL + CSA	26086	UL + CSA	26119	UL + CSA	26022	UL + CSA	26173
	VDR + LED								
	VDR-RC								
	VDR-RC + LED								
	RC	CSA	21054	UL + CSA	21056			UL + CSA	21028
	RC					UL + CSA	21073		
400 V AC/DC	VDR								
	RC								
	RC								

Technical data

Damping factor	~ 1.5 x U _N
Temperature range	-20...+70 °C
Material	flame retardant plastic to UL 94
Connection wires	ferrule ends for spring clamp terminals

Dimensions



Notes

For other types, please inquire.

Suppressors for contactors

MOELLER 

X-Start



Circuit diagram



Appropriate contactors

DIL M7...15 DIL MP20, DIL A	DIL M17...32	DIL M40...95
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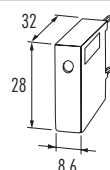
Ordering data

Voltage	Suppression	approvals	Art.-No.	approvals	Art.-No.	approvals	Art.-No.
24 ...240 V DC	Diode						
24 V DC	Diode + LED						
	Diode/Z-Diode						
24 V AC/DC	VDR						
	VDR + LED	UL + CSA	26013	UL + CSA	26015		
	RC						
48 V DC	Diode/Z-Diode						
48 V AC	VDR + LED	UL + CSA	26013	UL + CSA	26015		
	RC						
110 V AC/DC	VDR						
	VDR + LED	UL + CSA	26014				
	VDR-RC						
	RC	UL + CSA	20007	UL + CSA	20008	UL + CSA	26009
230 V AC/DC	VDR						
	VDR + LED	UL + CSA	26014				
	VDR-RC						
	VDR-RC + LED						
	RC	UL + CSA	20007	UL + CSA	20008	UL + CSA	20009
	RC						
400 V AC/DC	VDR						
	RC						
	RC						

Technical data

Damping factor	$\sim 1.5 \times U_N$
Temperature range	-20...+70 °C
Material	flame retardant plastic to UL 94
Connection wires	plug contact

Dimensions



Notes

LED indicator for 24 V DC without suppression available on request.

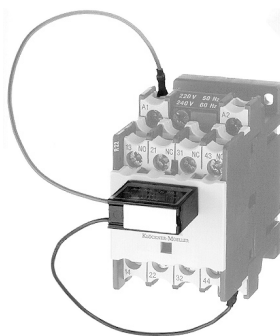
Suppressors for contactors



U3



SO 1



RC-BUG 2



Circuit diagram

Diode-combination
24...240V DC

Diode + LED
24V DC

Z-Diode-combination
24...240V DC

Varistor (VDR)
0...60Hz

Varistor + LED
24V AC/DC

Varistor-RC-suppression
VDR-RC0...60Hz

RC-suppression (RC)
50...60Hz



Appropriate contactors

DIL 6 (A) M, 6 H
DIL 8 (A) M, 8 H, 10 M, 10 H

DIL R - G
DIL R...

DIL 6 (A) M, 6 H
DIL 8 (A) M, 8 H, 10 M, 10 H

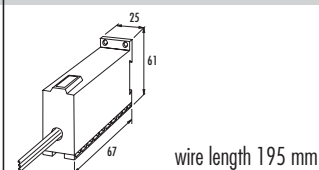
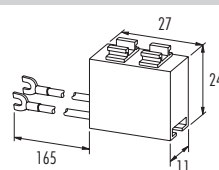
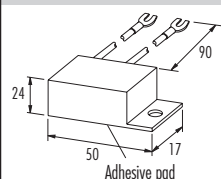
Ordering data

		Art.-No.	Art.-No.	Art.-No.
Voltage	Suppression	approvals	approvals	approvals
24 ... 240 V DC	Diode		26051	
24 V DC	Diode + LED			
	Diode/Z-Diode	UL + CSA	26284	
24 V AC/DC	VDR	UL + CSA	26315	
	VDR + LED			
	RC	UL + CSA	22050	CSA 26612
48 V DC	Diode/Z-Diode	UL + CSA	26051	
48 V AC/DC	VDR			
	RC	UL + CSA	22050	CSA 26612
110 V AC/DC	VDR			
	VDR + LED			
	VDR-RC			
	RC	UL + CSA	22051	CSA 26613
230 V AC/DC	VDR	UL + CSA	26317	
	VDR + LED			
	VDR-RC			
	VDR-RC + LED			
	RC	UL + CSA	20067	CSA 26614
	RC		22052	
	RC		22054	
400 V AC/DC	VDR			
	RC	UL + CSA	22054	
	RC			

Technical data

Damping factor	$\sim 1.5 \times U_N$
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.

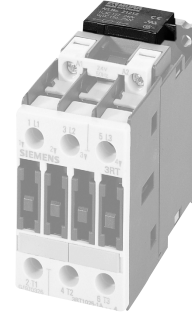
Suppressors for contactors

SIEMENS

S 00



S 0



Circuit diagram

Diode-combination
24...240V DC

Diode + LED
24 V DC

Z-Diode-combination
24...240V DC

Varistor (VDR)
0...60 Hz

Varistor + LED
24 V AC/DC

Varistor-RC-suppression
VDR-RC 0...60 Hz

RC-suppression(RC)
50...60 Hz



Appropriate contactors

3 RH 1/11, 3 RT 1/3 RH 1
3 RT 1/10.15...10.17

3 RT 10.24/25/26

Ordering data

Art.-No.

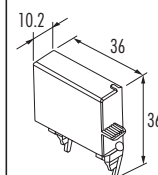
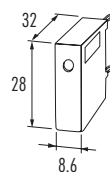
Art.-No.

Voltage	Suppression	approvals		approvals	
24 ...240 V DC	Diode/Z-Diode	UL + CSA	26500	UL + CSA	26520
	Diode/Z-Diode			UL + CSA	¹⁾ 26528
24 V DC	Diode + LED	UL + CSA	26501		
	Diode + Z-Diode + LED				
	Diode/Z-Diode	UL + CSA	26502		
24 V AC/DC	VDR	UL + CSA	26503	UL + CSA	26524
	VDR + LED	UL + CSA	26504		
	RC	UL + CSA	21200	UL + CSA	21210
110 V AC/DC	VDR				
	VDR + LED				
	VDR-RC				
	RC	UL + CSA	21201		
230 V AC/DC	VDR	UL + CSA	26507	UL + CSA	26526
	VDR + LED	UL + CSA	26508		
	VDR-RC				
	VDR-RC + LED				
	RC	UL + CSA	21202	UL + CSA	21212
	RC				
400 V AC/DC	VDR				

Technical data

Damping factor	$\sim 1.5 \times U_N$
Temperature range	-20...+70 °C
Material	flame retardant plastic to UL 94
Connection wires	plug contact

Dimensions



Notes

For other types, please inquire.
¹⁾ Mounts on the underside of the contactor.

Suppressors for contactors

SIEMENS

S 2



S 3



S 6 - S 12



Circuit diagram

Diode-combination
24...240 V DC

Diode + LED
24 V DC

Z-Diode-combination
24...240 V DC

Varistor (VDR)
0...60 Hz

Varistor + LED
24 V AC/DC

Varistor-RC-suppression
VDR-RC0...60 Hz

RC-suppression (RC)
50...60 Hz



Appropriate contactors

3 RT 1.3/1.4

3 RT 1.5/6/7

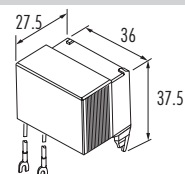
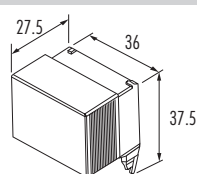
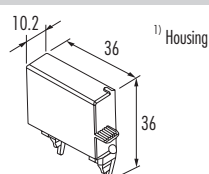
Ordering data

		Art.-No.		Art.-No.	
Voltage	Suppression	approvals		approvals	
24 ... 240 V DC	Diode			UL + CSA	26521
	Diode				
24 V DC	Diode + LED				
	Diode + Z-Diode + LED				
	Diode/Z-Diode				
24 V AC/DC	VDR			UL + CSA	26524
	VDR + LED				
	RC	UL + CSA	21215		21220
48 V DC	Diode/Z-Diode				
48 V AC/DC	VDR				
	RC				21220
110 V AC/DC	VDR				
	VDR + LED				
	VDR-RC				
	RC				21221
230 V AC/DC	VDR			UL + CSA	26526
	VDR + LED				
	VDR-RC				
	VDR-RC + LED				
	RC	UL + CSA	21217		21222
	RC				
400 V AC/DC	VDR				

Technical data

Damping factor	$\sim 1.5 \times U_N$
Temperature range	-20...+70 °C
Material	flame retardant plastic to UL 94
Connection wires	plug contact

Dimensions



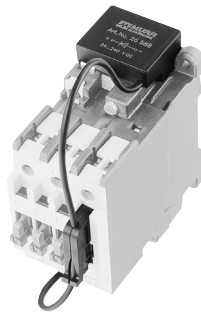
Notes

For other types, please inquire.

Suppressors for contactors

SIEMENS

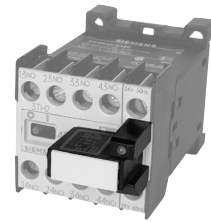
SO 4



SO 1



3 TF/L-3 TF



Circuit diagram

Diode-combination
24...240V DC

Diode + LED
24V DC

Z-Diode-combination
24...240V DC

Varistor (VDR)
0...60Hz

Varistor + LED
24V AC/DC

Varistor-RC-suppression
VDR-RC 0...60Hz

RC-suppression (RC)
50...60Hz



Appropriate contactors

3 TH 3/4
3 TF 30...35, 3 TF 40...45

3 TH 3/4/8, 3 TF 30...45
3 TB 40...3 TB 44

3 TH 2, 3 TF 2
3 TH 20, 3 TF 20

Ordering data

Art.-No.

Art.-No.

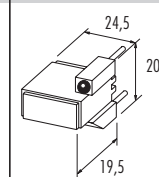
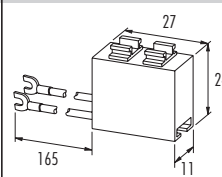
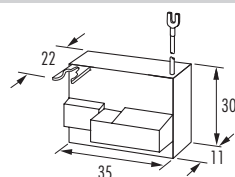
Art.-No.

Voltage	Suppression	approvals	approvals	approvals
24 ...240 V DC	Diode		UL + CSA	26283
24 V DC	Diode + LED			UL + CSA
	Diode + Z-Diode + LED			26530
	Diode/Z-Diode		UL + CSA	26051
24 V AC/DC	VDR	CSA	UL + CSA	26315
	VDR + LED		UL + CSA	26531
	RC + VDR		UL + CSA	22050
48 V DC	Diode/Z-Diode			
48 V AC/DC	VDR	CSA		UL + CSA
	RC		UL + CSA	22051
110 V AC/DC	VDR			
	VDR + LED			
	VDR-RC			
	RC	CSA	UL + CSA	22051
230 V AC/DC	VDR	CSA	UL + CSA	26317
	VDR + LED			UL + CSA
	VDR-RC			26331
	VDR-RC + LED			
	RC		UL + CSA	22052
	RC		UL + CSA	22054
400 V AC/DC	VDR			
	RC		UL + CSA	22054

Technical data

Damping factor	$\sim 1.5 \times U_N$
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.

Suppressors for contactors

SIEMENS

U 3



H



A0



Circuit diagram

Diode-combination
24...240V DC

Diode + LED
24 V DC

Z-Diode-combination
24...240V DC

Varistor (VDR)
0...60Hz

Varistor + LED
24 V AC/DC

Varistor-RC-suppression
VDR-RC0...60Hz

RC-suppression (RC)
50...60Hz



Appropriate contactors

3 TF 46...50, 3 TB 48...56
3 TC 48...56

3 TF 2, 3 TK 2
3 TF 30...33, 3 TF 40...43

3 TF 46...56, 3 TB 40...56
3 TK 48...56, 3 TC 48...56

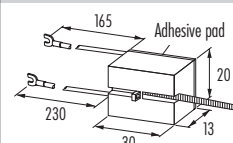
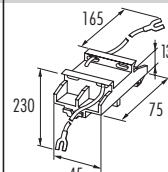
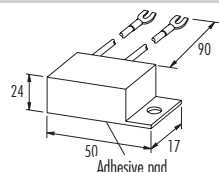
Ordering data

Voltage	Suppression	approvals	Art.-No.	approvals	Art.-No.	approvals	Art.-No.
24 ... 240 V DC	Diode		26027	CSA	26097		
	Diode + Z-Diode						
24 V DC	Diode/Z-Diode			CSA	26095		
24 V AC/DC	VDR			UL + CSA	26090	CSA	26663
	VDR + LED						
	RC						
48 V DC	Diode/Z-Diode					CSA	26663
48 V AC/DC	VDR						
	RC			CSA	20100		
110 V AC/DC	VDR			UL + CSA	26092		
	VDR + LED						
	VDR-RC						
	RC	UL + CSA	20066				
230 V AC/DC	VDR		26673	UL + CSA	26093	CSA	26665
	VDR + LED						
	VDR-RC						
	VDR-RC + LED						
	RC	UL + CSA	20067	CSA	20102		
	RC						
400 V AC/DC	VDR						
	RC						
	RC						

Technical data

Damping factor	$\sim 1.5 \times U_N$
Temperature range	-20...+70 °C
Material	flame retardant plastic to UL 94
Connection wires	self-securing fork terminal ends

Dimensions



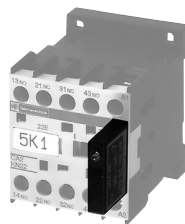
Notes

For other types, please inquire.

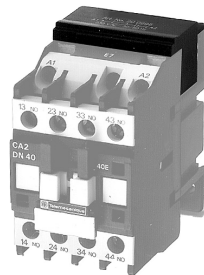
Suppressors for contactors



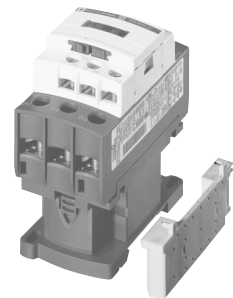
K



D



TeSys



Circuit diagram

Diode-combination
24...240V DC

Diode + LED
24 V DC

Z-Diode-combination
24...240V DC

Varistor (VDR)
0...60Hz

Varistor + LED
24 V AC/DC

Varistor-RC-suppression
VDR-RC0...60Hz

RC-suppression (RC)
50...60Hz



Appropriate contactors

CA 2-K...CA 4-K, LC...-K, LP...-K
Series "k"

CA 2 DN, CA 3 DN Series "d"
LC 1 D09...D32, LP 1 D0...D32

LC 1 D09...D38
LC 1 DT20, DT40, LC 2 D09...D38

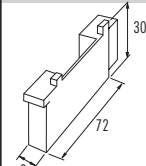
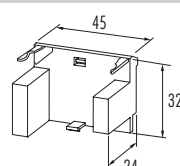
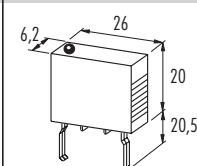
Ordering data

Voltage	Suppression	Art.-No.	Art.-No.	Art.-No.
24 ...240 V DC	Diode		26481	
24 V DC	Diode + LED			
	Z-Diode + LED	26380		26476
24 V AC/DC	VDR		26487	26477
	VDR + LED			
	RC		21070	21062
48 V DC	Z-Diode + LED			
48 V AC/DC	VDR			
	VDR + LED			
	RC		21070	
110 V AC/DC	VDR			26479
	VDR + LED	26384		
	RC		21071	21063
230 V AC/DC	VDR		26491	26478
	VDR + LED	26384		
	VDR-RC			
	VDR-RC + LED			
	RC		21060	21063
	RC + LED			
400 V AC/DC	VDR			
	RC			
	RC			

Technical data

Damping factor	$\sim 1.5 \times U_N$
Temperature range	-20...+70 °C
Material	flame retardant plastic to UL 94
Connection wires	plug contact

Dimensions



Notes

For other types, please inquire.

Suppressors

Universal

AO



AD

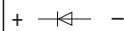


CF

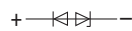


Circuit diagram

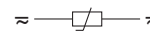
Diode-combination
24...240 V DC



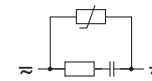
Z-Diode-combination



Varistor (VDR)
0...60 Hz



Varistor-RC-suppression
VDR-RC 0...60 Hz



RC-suppression (RC)
50...60 Hz



Appropriate contactors

universal

universal

universal

Ordering data

		Art.-No.		Art.-No.		Art.-No.		sugg. coil valves		
Voltage	Suppression	approvals		approvals		approvals		AO	AD	CF
Max. 240 V DC	Diode	CSA	26001					15 W		
24 V DC	Z-Diode	CSA	26120	CSA	26073			25 W	75 W	
24 V AC/DC	VDR	UL + CSA	26180	CSA	26720			50 VA/W	200 VA/W	
	RC					CSA	20680			15 VA
48 V DC	Z-Diode									
48 V AC/DC	VDR	UL + CSA	26181	CSA	26721			70 VA/W	200 VA/W	
	RC	UL + CSA	20001	UL + CSA	20013			10 VA	15 VA	20 VA
110 V AC/DC	VDR	UL + CSA	26182	CSA	26722			100 VA/W	200 VA/W	
	VDR-RC									
	RC									
	RC									
230 V AC/DC	VDR	UL + CSA	26183	CSA	26723			200 VA/W	200 VA/W	
	VDR	UL + CSA	¹⁾ 26184					200 VA/W		
	RC			CSA	20014	CSA	20682	10 VA	25 VA	15 VA
	RC	UL + CSA	20002	UL + CSA	20010	CSA	20683	20 VA	75 VA	20 VA
	RC			UL + CSA	20011	CSA	²⁾ 20687		100 VA	50 VA
400 V AC/DC	VDR			CSA	26724				200 VA/W	
	RC	UL + CSA	20004	UL + CSA	20012	CSA	20688	15 VA	20 VA	10 VA
	RC									

Technical data

Damping factor

~ 1.5

Temperature range

-20...+70 °C

Material

flame retardant plastic to UL 94

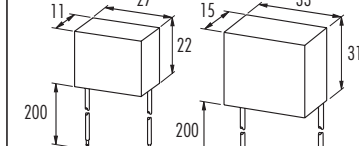
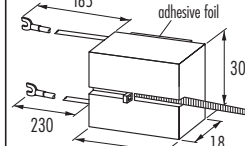
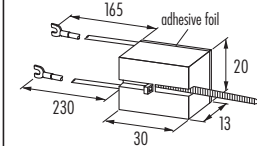
Connection wires

self-securing fork terminal ends

self-securing fork terminal ends

flexible connection wires

Dimensions



Form 1

²⁾ Form 2

Notes

For other types, please inquire.

¹⁾ up to 300 V AC/DC

Suppressors

Universal

H



RC-BUG 2

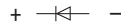


BU + UB

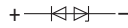


Circuit diagram

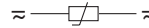
Diode-combination
24...240V DC



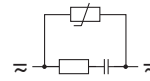
Z-Diode-combination



Varistor (VDR)
0...60Hz



Varistor-RC-suppression
VDR-RC 0...60Hz



RC-suppression (RC)
50...60Hz



Appropriate contactors

universal

universal

universal

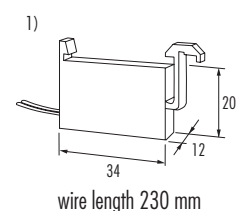
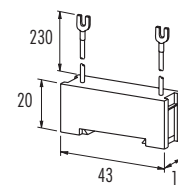
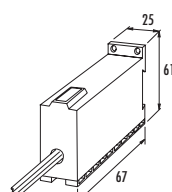
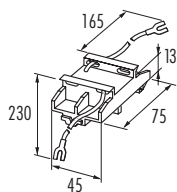
Ordering data

		Art.-No.		Art.-No.		Art.-No.		sugg. coil valves		
Voltage	Suppression	approvals		approvals		approvals		H	RC-BUG 2	BU + UB
24 ...240 V DC	Diode	CSA	26097			CSA	26020	1000V/1A		1000V/1A
24 V DC	Z-Diode	CSA	26095			CSA	26130	25 W		25 W
24 V AC/DC	VDR	UL + CSA	26090			UL + CSA	26150	50 VA/W	100 VA/W	50 VA/W
	RC			CSA	26612				146 VA	
48 V AC/DC	VDR									
	RC	CSA	20100	CSA	26612			15 VA	146 VA	20 VA
110 V AC/DC	VDR	UL + CSA	26092	CSA	26618			100 VA/W	100 VA/W	100 VA/W
	RC			CSA	26613					
230 V AC/DC	VDR	UL + CSA	26093	CSA	26603			200 VA/W	10 VA/W	200 VA/W
	VDR	UL + CSA	26094	CSA	26619	UL + CSA	26155	200 VA/W	100 VA/W	200 VA/W
	RC	CSA	20101	CSA	26614	CSA	20031	15 VA	146 VA	20 VA
	RC	CSA	20102			CSA	20033	25 VA		25 VA
	RC	CSA	20103				¹⁾ 20034	75 VA		25 VA
400 V AC/DC	VDR			CSA	26604				10 VA/W	
	RC			CSA	26615	CSA	20032	15 VA	146 VA	15 VA
	RC			CSA	²⁾ 26616			20 VA	146 VA	

Technical data

Damping factor	~ 1.5		
Temperature range	-20...+70 °C		
Material	flame retardant plastic to UL 94		
Mounting method	DIN-rail mounting to EN 60715	with adapter ASA Art.-No. 20900 DIN-rail mounting to EN 60715	
Connection wires	self-securing fork terminal ends		

Dimensions



Notes

For other types, please inquire.

¹⁾ Without adapter, can be directly snapped onto DIN-rail. ²⁾ up to 600 V AC/DC

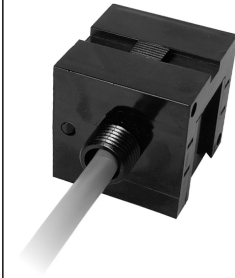
Suppressors for motors

Mounting methods:

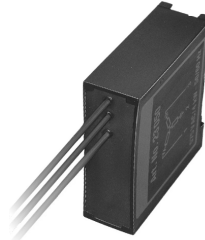
- on the motor terminal box
- inside the motor terminal box
- inside the distribution box
- on 35 mm DIN-rail to EN 60715

RC 3 U

with M16 x 1.5 screw



RC 3 BU

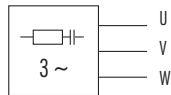


RC 3 BUG

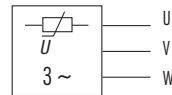


Circuit diagram

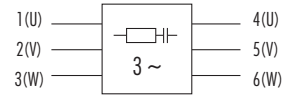
RC-suppression



Varistor-suppression (VDR)



6-wire

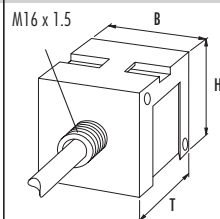


Ordering data		Art.-No.	Art.-No.	Art.-No.
Voltage	Motor rating	suppression	suppression	suppression
3 x 400 V AC	4 kW	RC	RC/UL	RC
	4 kW			VDR
	4 kW		VDR/UL	RC
	7.5 kW		VDR/UL	RC
	10 kW	RC	VDR/UL	RC
	10 kW	RC/6-wire		
3 x 575 V AC	20 kW		VDR/UL	
	4 kW		RC/UL	
	7.5 kW	RC/UL		RC
	20 kW			VDR
	45 kW			RC/6-wire
3 x 690 V AC	4 kW		RC/UL	RC
	7.5 kW			RC
	20 kW			VDR

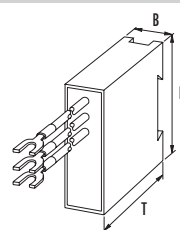
Technical data

Frequency	for RC: 50...60 Hz for VDR: 10...400 Hz		
Material	flame retardant plastic to 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 core
	3 x 0.75 mm ² resp. 6 x 0.75 mm ²	0.5 mm ²	1 mm ²
		self-securing M4 fork terminal ends	
Dimensions (H x B x T)	41 x 41 x 41 mm	40 x 15 x 43 mm	61 x 25 x 92 mm

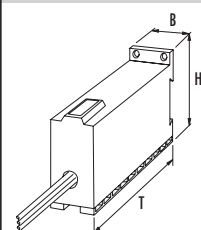
Dimension drawing



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



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



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

Notes

For other voltages, frequencies and motor ratings, please inquire. Do not use RC motor suppressors on variable frequency drives.
¹⁾ 1 x Art.-No. 23103 required per phase.

Suppressors for motors

- Mounting methods:
- with M16 x 1.5 and M20 x 1.5
 - on motor terminal box with plug connectors

RC 3 R
with M16 x 1.5
screw



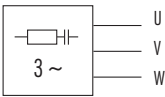
RC 3 R
with M16 x 1.5
screw

RC 3 RG
with M20 x 1.5
screw

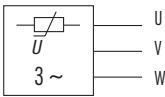


Circuit diagram

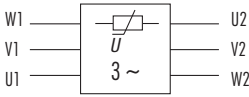
RC-suppression



Varistor-suppression (VDR)



6-wire

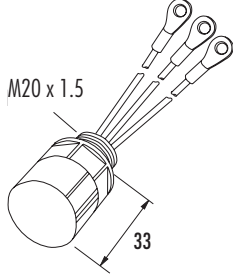
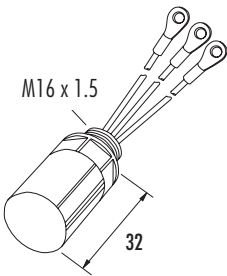


Ordering data		Art.-No.	Art.-No.	Art.-No.
3 x 400 V AC	Motor rating	suppression	suppression	suppression
	4 kW	VDR/UL	23170	23141
	4 kW			
	4 kW			
	7.5 kW	VDR	23171	
	10 kW			VDR
	10 kW			VDR/6-wire
3 x 575 V AC	20 kW			23142
	4 kW	VDR/UL		23143
	7.5 kW	VDR/UL		VDR
	10 kW			VDR/6-wire
	20 kW			23144
3 x 690 V AC	4 kW			RC/UL
	7.5 kW			23141
	10 kW			VDR/UL
	20 kW			VDR/UL
	20 kW			VDR/6-wire
				23145
				23146
				23147
				VDR/6-wire
				23148
				VDR
				23149

Technical data

Frequency	for RC: 50...60 Hz for VDR: 10...400 Hz	
Material	flame retardant plastic to UL 94	
Potting compound	2-component epoxy	
Temperature range	-20...+60 °C	
Connection method	approx. 100 mm single core 0.5 mm ²	
Ring terminals	isolated M6	isolated M4
Dimensions	40 mm, Ø 24.5 mm	approx. 150 mm single core 1 mm ² isolated M6 44 mm, Ø 39 mm

Dimension drawing



Notes

For other voltages, frequencies, motor ratings, resp. cable/wire lengths please inquire.
Do not use RC motor suppressors on variable frequency drives. ¹⁾ wire diameter 1.5 mm² ²⁾ to max. 660 V AC

Suppressors for motors

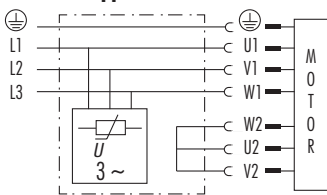
Mounting methods:
– on motor terminal box
with plug connectors

RC 3 ST
connector with cable and integrated motor suppression
cable outlet at the back

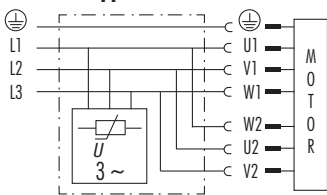
RC 3 ST
connector with cable and integrated motor suppression

Circuit diagram

Varistor-suppression (star)



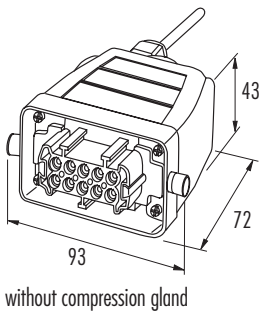
Varistor-suppression (delta)



Ordering data			Art.-No.	Art.-No.
Voltage	Motor rating	Cable length	suppression	suppression
max. 3 x 575 V AC	5.5 kW	5 m	VDR/star	236139
	5.5 kW	6 m	VDR/star	236140
	5.5 kW	8 m	VDR/star	236141
	5.5 kW	10 m	VDR/star	236142
	5.5 kW	6 m	VDR/delta	236143

Technical data	
Frequency	10...400 Hz
Plug connector	female, 10-pol. + PE
Housing	aluminium pressure diecasting
Temperature range	-20...+60 °C
Connection method	PUR cable black, 4 x 1.5 mm ² ; numbered wires, halogen free
Dimensions	see dimension drawing

Dimension drawing



Notes

Suppressors for motors

Mounting methods:

- on 35 mm DIN-rail to EN 60715
- bolted together, stacked
- DIN-rail mounted under the control gear

HRC 3



HRC 3 K



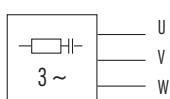
RC 3 BUR

connects onto Siemens SIRIUS contactors
3 RT 10

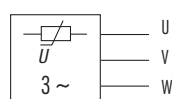


Circuit diagram

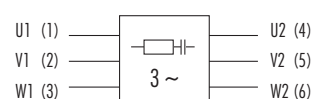
RC-suppression



Varistor-suppression (VDR)



6-wire



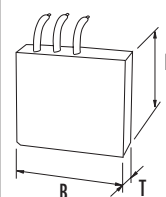
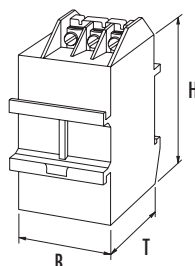
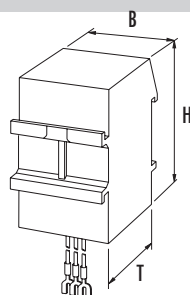
Ordering data

Voltage	Motor rating	suppression	Art.-No.	Art.-No.	Art.-No.
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/6-wire/UL	23009		
3 x 575 V AC	20 kW	VDR/UL	23015		
	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		
3 x 660 V AC	20 kW			RC	23018
	10 kW	RC	23017		

Technical data

Frequency	for RC: 50...60 Hz, for VDR: 10...400 Hz				
Material	flame retardant plastic to UL 94				
Potting compound	2-component epoxy				
Temperature range	-20...+60 °C				
Connection method	250 mm single core (Art.-No. 23000: 300 mm)	3-pole terminal	wire (solid core)		
	0.5 mm ² (Art.-No. 23000: 1.5 mm ²)	2 x (0.75...2.5 mm ²)	1.5 mm ²		
	self-securing M4 fork terminal ends	M4			
Dimensions (H x B x T)	75 x 45 x 42 mm	75 x 45 x 42 mm	40 x 15 x 43 mm		

Dimension drawing



Notes

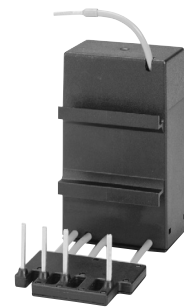
For other voltages, frequencies and motor ratings, please inquire. Do not use RC motor suppressors on variable frequency drives.

¹⁾ Has ferrule ends. ²⁾ Max. nominal voltage 3 x 500 V AC +10 %

Suppressors for motors

- Mounting methods:
- DIN-rail mounted under the control gear
 - fixes onto contactors
 - available with integrated coil suppression

HRC 3 AS

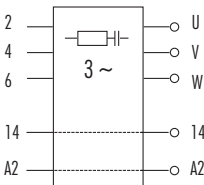
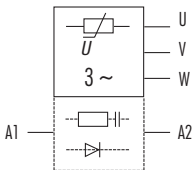
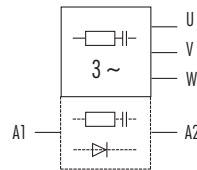


RC 3 RT

connects onto Siemens SIRIUS contactors
3 RT 10



Circuit diagram



Appropriate contactors

Motor contactors up to 5.5 kW from Siemens, Moeller, Sprecher + Schuh etc.

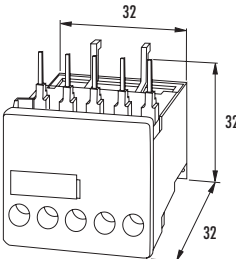
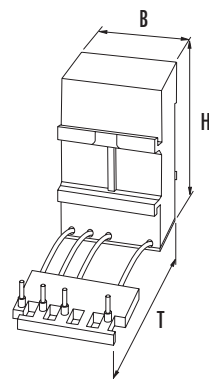
Siemens 3 RT 10

Ordering data		Art.-No.		Art.-No.		Art.-No.	
Voltage	Motor rating	suppression		suppression		suppression	
3 x 400 V AC	5.5 kW	RC	23160	VDR	23163	RC/UL + CSA ¹⁾ 23180	
	5.5 kW	RC + Diode	23151	VDR + Diode	23155		
	5.5 kW						
3 x 575 V AC	5.5 kW	RC	23161	VDR	23164	RC/UL + CSA ¹⁾ 23181	
	5.5 kW	RC + Diode	23153	VDR + Diode	23157		
	5.5 kW						

Technical data

Suppression coil	for RC: 230 V AC/20 VA, for Diode: 24...230 V DC/36 W		
Frequency	for RC: 50...60 Hz, for VDR: 10...400 Hz		
Material	flame retardant plastic to UL 94		
Temperature range	-20...+60 °C		
Connection method	ferrules, load side securely fixed		fits directly into SIRIUS contactors, size 00
Dimensions (H x B x T)	75 x 45 x max. 100 mm (fully stretched)		40 x 45 x 65.5 mm

Dimension drawing



Notes

For other voltages, frequencies and motor ratings, please inquire. Do not use RC motor suppressors on variable frequency drives.

Suppressor for valves

with LED
with suppressor and LED

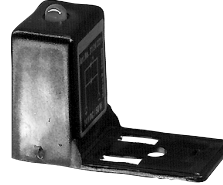
VBS

form A
pin spacing 18 mm
EN 175301-803 (ISO 4400)

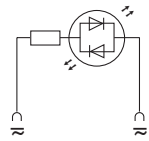


LBS

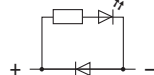
industrial standard
pin spacing 11 mm



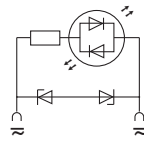
Circuit diagram



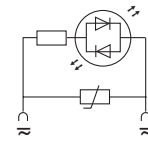
LED



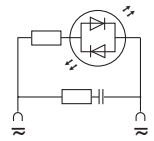
LED+Diode



LED+Z-Diode



LED+VDR



LED+RC

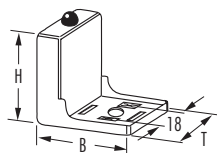
Ordering data

Voltage	Suppression	Art.-No.	Art.-No.	Switch off- delay time [ms]	Switch off- voltage peak [V]	Valve hold-on rating [W/VA]
³⁾ 24 V DC	LED + Diode	¹⁾ 3124021	3124221	200	1	50
	LED	¹⁾ 3124015	3124215	—	—	50
	LED + Z-Diode	¹⁾ 3124033	3124233	20	55	100
	LED + VDR	¹⁾ 3124048	3124248	15	45	50
	LED + RC	3124068		20	105	10
	LED + RC			20	70	20
48 V AC/DC	LED	¹⁾ 3124017		—	—	50
	LED + VDR	¹⁾ 3124052		10	75	100
	LED + RC	²⁾ 3124071		20	90	30
110 V AC/DC	LED	3124018		—	—	50
	LED + VDR	3124046		10	235	100
	LED + RC	3124070		20	250	10
	LED + RC	²⁾ 3124072		20	250	25
230 V AC/DC	LED	3124016	3124216	—	—	50
	LED + VDR	3124049	3124249	15	360	100
	LED + RC	3124063	3124263	20	300	10
	LED + RC	²⁾ 3124064		20	300	25

Technical data

Supply indicator	yellow LED
Contact material	silvered bronze
Protection	IP65 when fully mounted
Material	black polyamide, flame retardant, temp. resist. up to 130 °C
Temperature range	-20...+60 °C

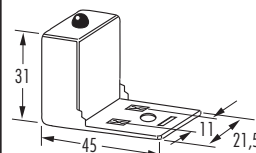
Dimension drawing



Housing H x B x T: 37 x 45 x 30 mm

¹⁾ Housing H x B x T: 37 x 39 x 30 mm

²⁾ Housing H x B x T: 37 x 53 x 33 mm



Note PIN arrangement (PE at cable outlet of connector)
180° version on request

Notes

Do not use plug gasket when fitting adapter. Other LED colors on request.
For double valves the VA 2 series is suitable (please inquire). ³⁾ Polarity dependent

Suppressor for valves

with LED
with suppressor and LED

PBS

industrial standard
pin spacing 11 mm

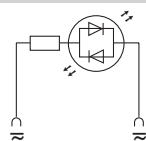


DAB

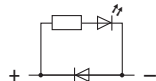
form B
pin spacing 10 mm
EN 175301-803 (ISO 6952)



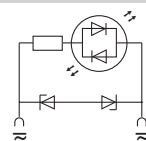
Circuit diagram



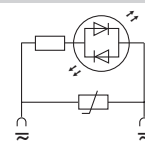
LED



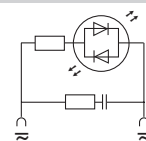
LED+Diode



LED+Z-Diode



LED+VDR



LED+RC

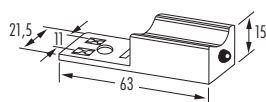
Ordering data

		Art.-No.	Art.-No.	Switch off delay time [ms]	Switch off voltage peak [V]	Valve hold-on rating [W/VA]
Voltage	Suppression					
11 24 V DC	LED + Diode	3124121	3124871	200	1	50
24 V AC/DC	LED	3124115	3124875	—	—	50
	LED + Z-Diode	3124133	3124873	20	55	100
	LED + VDR	3124148		15	45	50
	LED + RC	3124169		20	70	20
110 V AC/DC	LED + VDR	3124146		10	235	100
	LED + RC	3124170		20	250	10
230 V AC/DC	LED	3124116		—	—	50
	LED + VDR	3124149		15	360	100
	LED + RC	3124163		20	300	10

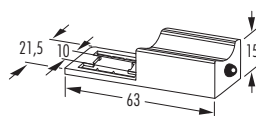
Technical data

Supply indicator	yellow LED
Contact material	silvered bronze
Protection	IP65 when fully mounted
Material	black polyamide, flame retardant, temp. resist. up to 130 °C
Temperature range	-20...+60 °C

Dimension drawing



Note PIN arrangement (PE at cable outlet of connector) 180° version on request.



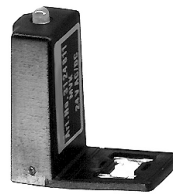
Suitable for 0 and 180° installation

Notes

Do not use plug gasket when fitting adapter. Other LED colors on request.
RT-angle housing version with 10 mm pin spacing (DAR/DARU), on request. ¹⁾ Polarity dependent

with LED
with suppressor and LED

MVK
form C
pin spacing 8.0 mm
EN 175301-803 (ISO 6952)



The figure displays five circuit diagrams for protecting LEDs from inductive voltage spikes:

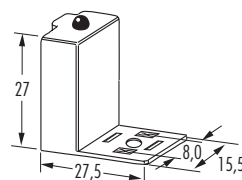
- LED:** A simple circuit with an LED and a resistor connected to a coil (C/R).
- LED+Diode:** A diode is connected in parallel with the LED, with its cathode to the positive terminal of the coil.
- LED+Z-Diode:** A Zener diode is connected in parallel with the LED, with its cathode to the positive terminal of the coil.
- LED+VDR:** A Voltage Dependent Resistor (VDR) is connected in parallel with the LED.
- LED+RC:** An RC snubber circuit (resistor and capacitor in series) is connected in parallel with the LED.

Art.-No.

Voltage	Suppression	3124815	3124811	Switch off delay time [ms]	Switch off voltage peak [V]	Valve hold-on rating [W/VA]
24 V AC/DC	LED	3124815	3124811	—	—	50
	LED + Z-Diode	3124832	3124833	20	55	100
48 V AC/DC	LED + Z-Diode		3124835	20	75	100

Supply indicator	yellow LED
Contact material	silvered bronze
Protection	IP65 when fully mounted
Material	black polyamide, flame retardant, temp. resist. up to 130 °C
Temperature range	-20...+60 °C

Technical drawing of a rectangular block. The dimensions are: height 27, width 27,5, depth 15,5, and a small protrusion with diameter 9,4.



Do not use plug gasket when fitting adapter. Other LED colors on request.
¹⁾ Polarity dependent