

Accessories	Type Group KUS
Overexcitation control	



### Design

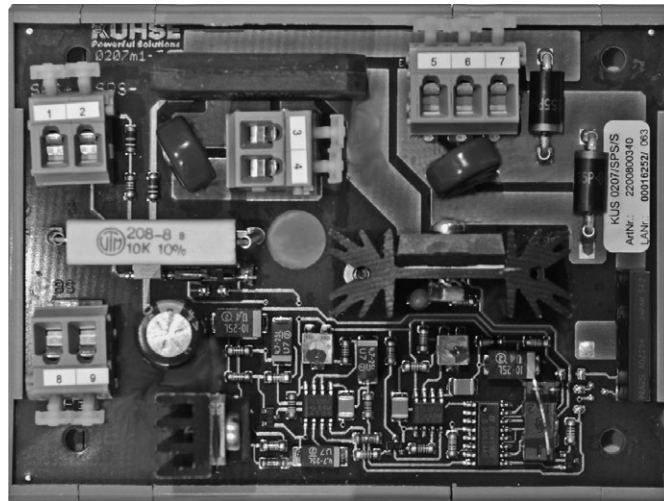
Overexcitation controls from KUHSE are used to increase the starting force of actuating solenoids. Consequently the attraction time is minimized automatically. Individual solutions can be supplied according to the customers' request. Please contact us for your special requirements.

## Technical Data

### Overexcitation control

## Type KUS 0207 SPS/S

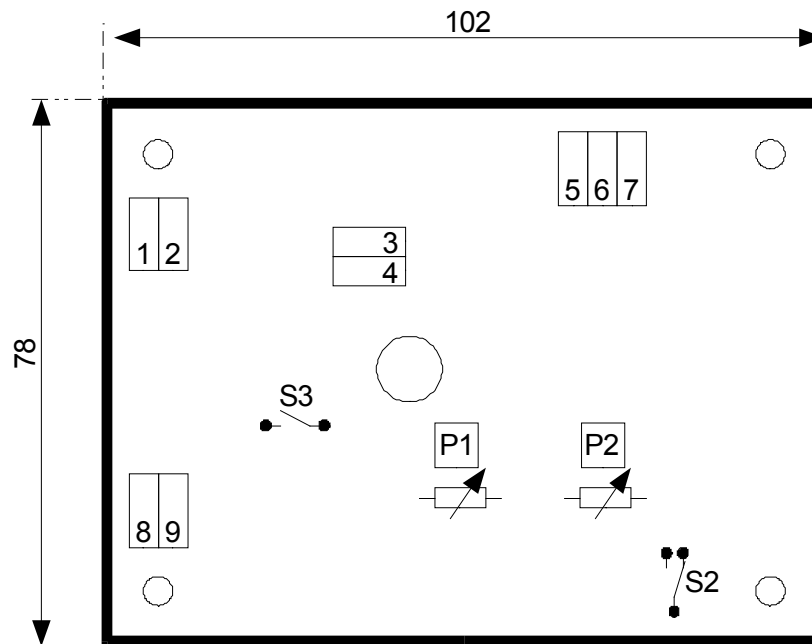
### for mounting on DIN rail



Description	Part Number																																																																																
Contactless overexcitation control for solenoids, with control input, for mounting on DIN rail	2200800340																																																																																
Specification	Technical Data																																																																																
<ul style="list-style-type: none"> <li>• Increased starting force of actuating solenoids</li> <li>• Contactless, therefore nearly wear-free</li> <li>• Chopped-mode during holding operation</li> <li>• Overexcitation time adjustable</li> <li>• Holding voltage adjustable</li> <li>• PLC Input (optional)</li> <li>• DC quick-release</li> <li>• EMS tested as per               <ul style="list-style-type: none"> <li>○ EN 61000-4-3</li> <li>○ EN 61000-4-4</li> <li>○ EN 61000-4-6</li> </ul> </li> <li>• EMI tested as per EN 55022 <sup>1</sup></li> </ul>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Supply</th> <th>min</th> <th>max</th> <th></th> </tr> </thead> <tbody> <tr> <td>Voltage</td> <td>200</td> <td>250</td> <td>V AC/DC <sup>2</sup></td> </tr> <tr> <td>Overexcitation current</td> <td></td> <td>10</td> <td>A</td> </tr> <tr> <td>Holding current</td> <td></td> <td>5</td> <td>A</td> </tr> <tr> <td>Holding current with DC quick-rel.</td> <td>0,5</td> <td></td> <td>A</td> </tr> <tr> <td>PLC-Signal active</td> <td>12</td> <td>36</td> <td>V DC</td> </tr> <tr> <td>PLC-Signal inactive</td> <td>0</td> <td>3</td> <td>V DC</td> </tr> <tr> <td colspan="4"><sup>2</sup> connection: any, as through rectifier</td> </tr> <tr> <th>Ambient temperatures</th> <th>min</th> <th>max</th> <th></th> </tr> <tr> <td>Storage</td> <td>-20</td> <td>70</td> <td>°C</td> </tr> <tr> <td>Operation</td> <td>0</td> <td>50</td> <td>°C</td> </tr> <tr> <td>Humidity</td> <td colspan="3">max. 90% uncondensed</td> </tr> <tr> <th>Weight and Dimension</th> <th>L</th> <th>W</th> <th>H</th> </tr> <tr> <td>Dimension</td> <td>102</td> <td>78</td> <td>62 mm</td> </tr> <tr> <td>Weight</td> <td colspan="3">140 g</td> </tr> <tr> <th>Connections</th> <td colspan="3"></td> </tr> <tr> <td colspan="4">Power supply</td> </tr> <tr> <td colspan="4">Connections for solenoid (one or two coils)</td> </tr> <tr> <td colspan="4">PE</td> </tr> <tr> <td colspan="4">PLC Input</td> </tr> </tbody> </table>	Supply	min	max		Voltage	200	250	V AC/DC <sup>2</sup>	Overexcitation current		10	A	Holding current		5	A	Holding current with DC quick-rel.	0,5		A	PLC-Signal active	12	36	V DC	PLC-Signal inactive	0	3	V DC	<sup>2</sup> connection: any, as through rectifier				Ambient temperatures	min	max		Storage	-20	70	°C	Operation	0	50	°C	Humidity	max. 90% uncondensed			Weight and Dimension	L	W	H	Dimension	102	78	62 mm	Weight	140 g			Connections				Power supply				Connections for solenoid (one or two coils)				PE				PLC Input			
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## Dimensions Overexcitation control

## Type KUS 0207 SPS/S for mounting on DIN rail



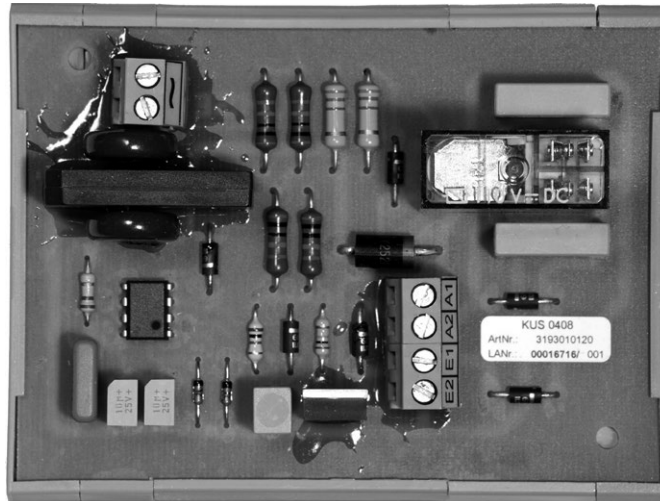
Connection	Signal	Meaning	Element	Function (closed)
1	PLC+	Positive control voltage		
2	PLC-	Negative control voltage		
3	L1	Power supply		
4	N	Power supply		
5	E1 / E2	End of coil 1 / 2	P1	Time adjustment for overexcitation: 1s - 4s <sup>3</sup>
6	unused	Terminal for series connection	P2	Fine tuning of duty cycle in chopped-mode <sup>3</sup>
7	A1 / A2	Beginning of coil 1 / 2		
8	PE	Grounding supply		
9	PE	Grounding solenoid		
				<sup>3</sup> As standard delivery basically set for the delivered solenoid. Modification of the delivery settings must be carried out by sufficient skilled staff only. False settings may result in destruction of the solenoid or the circuit.
				<b>Status LED</b>
<b>Installation</b>			<b>State</b>	<b>Meaning</b>
Mounting system	DIN mounting rail as per EN 60715		Off	No supply / no PLC signal
Mounting position	any, inside cubicle		On (bright)	Overexcitation
			On (dark)	Chopped-mode
<b>Notes</b>				
The circuit has passed an EMC-Test in an accredited EMC laboratory. Because it is not possible to test the circuit with all solenoids, the test results can not be transferred to all applications in general.			In sensitive environments, for example in the medical sector, the need of additional components like a line filter or shielded cable may be possible.	
			Fuse and wiring diameter according rated current!	

## Technical Data

### Overexcitation control

## Type KUS 0408

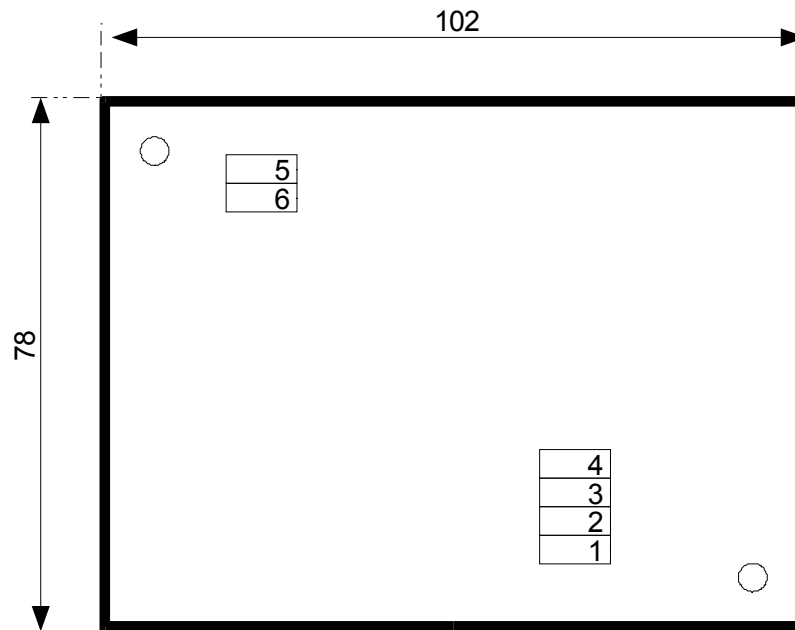
### for mounting on DIN rail



Description	Part Number				
Relais based overexcitation control for solenoids with two separated coils or one double-layer coil, switching from parallel to serial connexion, for mounting on DIN rail.	2200800270				
Features	Technical Data				
<ul style="list-style-type: none"> <li>Increased starting force of actuating solenoid</li> <li>Short reaction time</li> <li>Usable for inching mode</li> </ul>	<b>Supply</b>		<b>Min</b>	<b>Typ</b>	<b>Max</b>
	Voltage	210	230	250	V AC <sup>1</sup> /DC
	Overexcitation current				4,0 A
	Holding current				2,0 A
	<sup>1</sup> Frequency	47	50	63	Hz
	Overexcitationtime			1,5	s
	<b>Ambient Conditions</b>		<b>Min</b>	<b>Max</b>	
	Storage	-20		+70 °C	
	Operation	0		+45 °C	
	Humidity	max. 90% uncondensed			
Remarks	Weight and Dimension		L	W	H
<p>The supply and output lines have to be separated. The solenoid and the KUS must be connected to the PE-system.</p>	Dimension		102	78	52 mm
	Weight		130 g		
	<b>Connections</b>				
	Power supply				
	Connections for solenoid				

## Dimensions Overexcitation control

Type KUS 0408  
for mounting on DIN rail

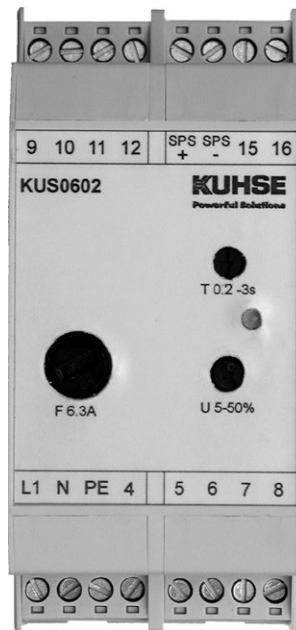


Connections and Dimension			
	<b>Connection</b>	<b>Description</b>	<b>Meaning</b>
	1	E2	End of coil 2
	2	E1	End of coil 1
	3	A2	Beginning of coil 2
	4	A1	Beginning of coil 1
	5	~	Power supply
	6	~	Power supply
<b>Installation</b>	<b>Protection (as per EN 60529)</b>		
Mounting system	DIN rail	IP 00	
Mounting position:	any, inside cubicle		
<b>Warning</b>			
<ul style="list-style-type: none"> <li>⇒ The device must be used only for the described purposes.</li> <li>⇒ Installation and commissioning must be carried out by sufficient skilled staff.</li> <li>⇒ All applicable standards and regulation must be kept, especially the DIN VDE.</li> <li>⇒ Fuse and wiring diameter according rated current.</li> <li>⇒ Nominal voltage and current must not be increased.</li> </ul>			

## Technical Data

### Overexcitation control

## Type KUS 0602



Description	Part Number			
Contactless overexcitation control for solenoids, with control input.	2200800400			
Overview	Technical Data			
<ul style="list-style-type: none"> <li>• Increased starting force of actuating solenoids</li> <li>• Contactless, therefore nearly wear-free</li> <li>• Chopped-mode during holding operation</li> <li>• Overexcitation time adjustable</li> <li>• Holding voltage adjustable</li> <li>• Multiple overexcitation feasible</li> <li>• PLC Input</li> <li>• DC quick-release with external contactor</li> <li>• EMS tested as per:               <ul style="list-style-type: none"> <li>○ EN 61000-4-2</li> <li>○ EN 61000-4-4</li> <li>○ EN 61000-4-5</li> <li>○ EN 61000-4-11</li> </ul> </li> </ul>	Supply	Min	Max	
	Voltage	100	250	V AC
	Frequency	47	63	Hz
	Overexcitation current		8	A
	Holding current		4	A
	Output voltage	20	115	V (@230V)
	PLC-Signal activ	12	36	V DC
	PLC-Signal inactiv	0	2	V DC
	Overexcitation time ( $t_{OE}$ )	0,2	3	s
	Switching interval	$t_{OE}+1$	-	s
	Recovery time		100	ms
	Ambient conditions	Min	Max	
	Storage	-20	70	° C
	Operation	0	50	° C
Humidity	max. 90% uncondensed			
Weight and Dimension	L	W	H	
Dimension	99	46	114 mm	
Weight	240 g			
<sup>1</sup> In case of longer feed lines for the solenoid the use of a line filter is recommended to achieve the compliance with the standards.				

## Dimensions Overexcitation control

Type KUS 0602

Connection	Signal	Meaning	Protection (as per EN 60529)
1	L1	Power Supply	IP 20
2	N	Power Supply	
3	PE	Grounding supply	<b>Flammability as per UL 94 (enclosure)</b>
4	PE	Grounding solenoid	V0
5	E1 / E2	End of coil 1 / 2	
6	A1 / A2	Beginning of coil 1 / 2	<b>Connections</b>
7		Jumper: DC quick-release <sup>2</sup>	Power Supply
8		Jumper: DC quick-release <sup>2</sup>	Connection for solenoid
9	--		PE
10	--		PLC Input
11	--		Jumper to deactivate DC quick-release
12	--		Jumper to deactivate PLC Input
13	PLC+	Positive control voltage	
14	PLC-	Negative control voltage	
15	M1	Jumper: PLC Input <sup>2,3</sup>	
16	M2	Jumper: PLC Input <sup>2,3</sup>	
<sup>2</sup> The wire must be short and isolated. <sup>3</sup> Switching by switch contact is not allowed!			
<b>Installation</b>			<b>Status LED</b>
Mounting system	DIN rail as per EN 60715		<b>State</b>
Mounting position	any, inside cubicle		<b>Meaning</b>
			Off
			On (bright)
			On (dark)
			No supply / no PLC-Signal
			Overexcitation
			Chopped-mode
<b>Notes</b>			
<p>The circuit has passed an EMC-Test. Because of economical reasons it is possible to test the circuit with a few types of solenoids only. Therefore the test results can not be transferred to all applications in general.</p> <p>In sensitive environments, for example in the medical sector, the use of a line filter and shielded lines may be necessary.</p>		<p>The absolute adjustment range of the output voltage may be larger than specified in this datasheet. Nevertheless the use of output voltages larger than 50% of the input voltage is not recommended and not supported by KUHSE.</p>	
Fuse and wiring diameter according rated current!			

## Technical Data

### Overexcitation control

## Type KUS 0607



Description	Part Number																												
Contactless overexcitation control for solenoids, switching over from full- to half-wave rectification.	2200800500																												
Overview	Technical Data																												
<ul style="list-style-type: none"> <li>• Double overexcitation</li> <li>• Increased starting force of actuating solenoids</li> <li>• Contactless, therefore nearly wear-free</li> <li>• DC quick-release with external contactor</li> <li>• EMS tested as per:               <ul style="list-style-type: none"> <li>○ EN 61000-4-2</li> <li>○ EN 61000-4-4</li> <li>○ EN 61000-4-5</li> <li>○ EN 61000-4-11</li> </ul> </li> </ul>	<table border="1"> <thead> <tr> <th>Supply</th> <th>Min</th> <th>Typ</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>Voltage</td> <td>100</td> <td>-</td> <td>250 VAC</td> </tr> <tr> <td>Frequency</td> <td>47</td> <td>50</td> <td>63 Hz</td> </tr> <tr> <td>Overexcitation current</td> <td></td> <td></td> <td>3 A</td> </tr> <tr> <td>Holding current</td> <td></td> <td></td> <td>1,5 A</td> </tr> <tr> <td>Overexcitation time</td> <td>0,7</td> <td>1</td> <td>1,2 s</td> </tr> <tr> <td>Recovery time</td> <td></td> <td></td> <td>100 ms</td> </tr> </tbody> </table>	Supply	Min	Typ	Max	Voltage	100	-	250 VAC	Frequency	47	50	63 Hz	Overexcitation current			3 A	Holding current			1,5 A	Overexcitation time	0,7	1	1,2 s	Recovery time			100 ms
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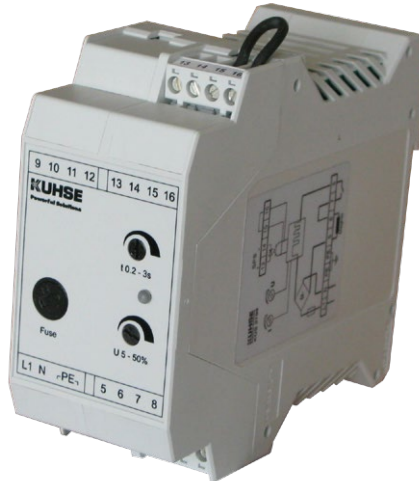
## Dimensions Overexcitation control

Type KUS 0607

Connection	Signal	Meaning	Protection (as per EN 60529)
1	L	Power supply	IP 40
2	N	Power supply	
3	-		<b>Flammability as per UL 94 (enclosure)</b>
4	-		V0
5	-		
6	A	Beginning of coil	<b>Connections</b>
7	E	End of coil	Power Supply
8		Jumper: DC quick-release <sup>2</sup>	Connection for solenoid
9		Jumper: DC quick-release <sup>2</sup>	Jumper to deactivate DC quick-release
<sup>2</sup> Jumper needed if no external contactor for DC quick-release is used. The wire must be short and isolated.			
<b>Installation</b>			<b>Notes</b>
Mounting system		DIN mounting rail as per EN 60715	The circuit has passed an EMC-Test. Because of economical reasons it is possible to test the circuit with a few types of solenoids only. Therefore the test results can not be transferred to all applications in general.  In sensitive environments, for example in the medical sector, the use of a line filter and shielded lines may be necessary.
Mounting position		any, inside cubicle	
			Fuse and wiring diameter according rated current!

## Technical Data Overexcitation control

Type KUS 0709



Description	Part Number				
Contactless overexcitation control for solenoids, with control input.	2200800410 / 2200800450				
Overview	Technical Data				
<ul style="list-style-type: none"> <li>Increased starting force of actuating solenoids</li> <li>Contactless, therefore nearly wear-free</li> <li>Overexcitation time adjustable</li> <li>Holding voltage adjustable</li> <li>Multiple overexcitation possible</li> <li>PLC Input</li> <li>DC quick-release with external contactor</li> <li>Constant output voltage over wide input voltage range</li> <li>•</li> <li>EMS tested as per EN 61000-6-2</li> <li>EMI tested as per EN 61000-6-3 <sup>1</sup></li> </ul>	<b>Supply</b>	<b>Min</b>	<b>Max</b>		
	Voltage	200	250	V AC	
	Frequency	47	63	Hz	
	Overexcitation Current		8	A	
	Holding Current		4	A	
	Output Voltage at 230V AC	40	130	V	
	PLC-Signal activ	12	36	V DC	
	PLC-Signal inactiv	0	2	V DC	
	Overexcitation Time ( $t_{OE}$ )	0,2	3	s	
	Switching Interval	$t_{OE}+1$	-	s	
	Recovery Time		100	ms	
		<b>Ambient Conditions</b>	<b>Min</b>	<b>Max</b>	
		Storage	-20	70	° C
		Operation	0	50	° C
	Humidity	max. 90% uncondensed			
	<b>Weight and Dimension</b>	<b>L</b>	<b>W</b>	<b>H</b>	
	Dimension	99	46	114 mm	
	Weight	240 g			

<sup>1</sup> In case of longer feed lines for the solenoid the use of a line filter is recommended to achieve the compliance with the standards.

## Dimensions Overexcitation control

Type KUS 0709

Connection	Signal	Meaning	Protection as per EN 60529
1	L1	Power Supply	IP 20
2	N	Power Supply	
3	PE	Grounding Supply	<b>Flammability as per UL 94 (enclosure)</b>
4	PE	Grounding Solenoid	V0
5	E1 / E2	End of coil 1 / 2	
6	A1 / A2	Beginning of coil 1 / 2	<b>Connections</b>
7		Jumper: DC quick-release <sup>2</sup>	Power Supply
8		Jumper: DC quick-release <sup>2</sup>	Connection for Solenoid
9	-	-	PE
10	-	-	PLC Input
11	-	-	Jumper to deactivate DC quick-release
12	-	-	Jumper to deactivate PLC Input
13	PLC+	Positive Control Voltage	
14	PLC-	Negative Control Voltage	
15	M1	Jumper: PLC Input <sup>2,3</sup>	
16	M2	Jumper: PLC Input <sup>2,3</sup>	
<sup>2</sup> The wire must be short and isolated. <sup>3</sup> Switching by switch contact is not allowed!			
<b>Installation</b>			<b>Status LED</b>
Mounting System	DIN rail as per EN 60715		<b>State</b>
Mounting Position	Any, inside cubicle		<b>Meaning</b>
			Off
			On (bright)
			On (dark)
			No supply / no PLC-Signal
			Overexcitation
			Holding Mode
<b>Notes</b>			
<p>The circuit has passed an EMC-Test. Because of economical reasons it is possible to test the circuit with a few types of solenoids only. Therefore the test results can not be transferred to all applications in general.</p> <p>In sensitive environments, for example in the medical sector, the use of an additional line filter and shielded lines may be necessary.</p> <p>Fuse and wiring diameter according rated current!</p>			<p>The absolute adjustment range of the output voltage may be larger than specified in this datasheet. Nevertheless the use of output voltages larger than 50% of the input voltage is not recommended and not supported by KUHSE.</p>

## Technical Data

### Overexcitation control

## Type KUS 3.50



Description	Part Number		
Overexcitation control for solenoids with two separated coils or one double-layer coil	2200800107		
Features	Technical Data		
<ul style="list-style-type: none"> <li>switching from parallel to serial connection</li> <li>increased starting force of actuating solenoids</li> <li>Short reaction time</li> <li>usable for inching mode (max. 5 min)                             <ul style="list-style-type: none"> <li>- cycle range min. 5 sec</li> <li>- consider Rel. On-time</li> </ul> </li> </ul>	<b>Supply</b>	<b>min</b>	<b>max</b>
	Voltage	210	250 V AC
	Overexcitation current		6 A
	Overexcitation time	1,2	1,5 s
	Holding current		1,5 A
	Frequency	47	63 Hz
	<b>Ambient Conditions</b>	<b>min</b>	<b>max</b>
	Storage	-20	+70 °C
	Operation	0	+45 °C
Humidity	max. 90% uncondensed		
Design	Weight and Dimension		
<p>The device is in a totally insulated enclosure IP65. The standard delivery consists of cable entries with self-sealing rubber, therefore the degree of protection degrades to IP64. In case the higher protection of IP65 shall be reached, high-strength cable glands must be used.</p> <p>The control input and output cables have to be installed separately. The solenoid must be connected to the PE-system.</p>	<b>L</b>	<b>W</b>	<b>H</b>
	Dimension	160	100
	Weight	950 g	
	Connections		
	Power Supply		
	Connections for solenoid		
	PE		

## Dimensions Overexcitation control

## Type KUS 3.50

Connections																									
<p>The diagram shows a power supply section with terminals L1, N, and PE. To the right, there are two coil sections. The first coil has terminals A1 and E1, and the second coil has terminals A2 and E2. A dashed line indicates the enclosure boundary.</p>	<table border="1"> <thead> <tr> <th>Connection</th> <th>Description</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>L1</td> <td>Power supply</td> </tr> <tr> <td>2</td> <td>N</td> <td>Power supply</td> </tr> <tr> <td>3</td> <td>PE</td> <td>Grounding supply</td> </tr> <tr> <td>4</td> <td>A1</td> <td>Beginning coil 1</td> </tr> <tr> <td>5</td> <td>E1</td> <td>End of coil 1</td> </tr> <tr> <td>6</td> <td>A2</td> <td>Beginning coil 2</td> </tr> <tr> <td>7</td> <td>E2</td> <td>End of coil 2</td> </tr> </tbody> </table>	Connection	Description	Meaning	1	L1	Power supply	2	N	Power supply	3	PE	Grounding supply	4	A1	Beginning coil 1	5	E1	End of coil 1	6	A2	Beginning coil 2	7	E2	End of coil 2
	Connection	Description	Meaning																						
	1	L1	Power supply																						
	2	N	Power supply																						
	3	PE	Grounding supply																						
	4	A1	Beginning coil 1																						
	5	E1	End of coil 1																						
6	A2	Beginning coil 2																							
7	E2	End of coil 2																							
Dimension																									
<p>The diagram shows the front view of the enclosure. The main body is 100 mm wide and 160 mm high. The total height including the top and bottom flaps is 171 mm. The enclosure features a terminal block on the left, a control panel with a switch on the right, and a fuse holder at the bottom.</p>	<p><b>Protection (as per EN 60529)</b></p> <table border="1"> <tbody> <tr> <td>IP64</td> <td>Normal delivery</td> </tr> <tr> <td>IP65</td> <td>If high-strength cable glands are used</td> </tr> </tbody> </table> <p><b>Installation</b></p> <table border="1"> <tbody> <tr> <td>Mounting holes</td> <td>4,5 mm</td> </tr> </tbody> </table>	IP64	Normal delivery	IP65	If high-strength cable glands are used	Mounting holes	4,5 mm																		
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<p><b>Warning</b></p> <ul style="list-style-type: none"> <li>⇒ Installation and commissioning must be carried out by sufficient skilled staff.</li> <li>⇒ Before opening the enclosure, verify the device is free of voltage!</li> <li>⇒ All applicable standards and regulation must be kept, especially the DIN VDE.</li> <li>⇒ Fuse and wiring diameter according rated current.</li> <li>⇒ Nominal voltage and current must not be increased.</li> <li>⇒ In case of blown fuse, the device must be replaced.</li> </ul>																									