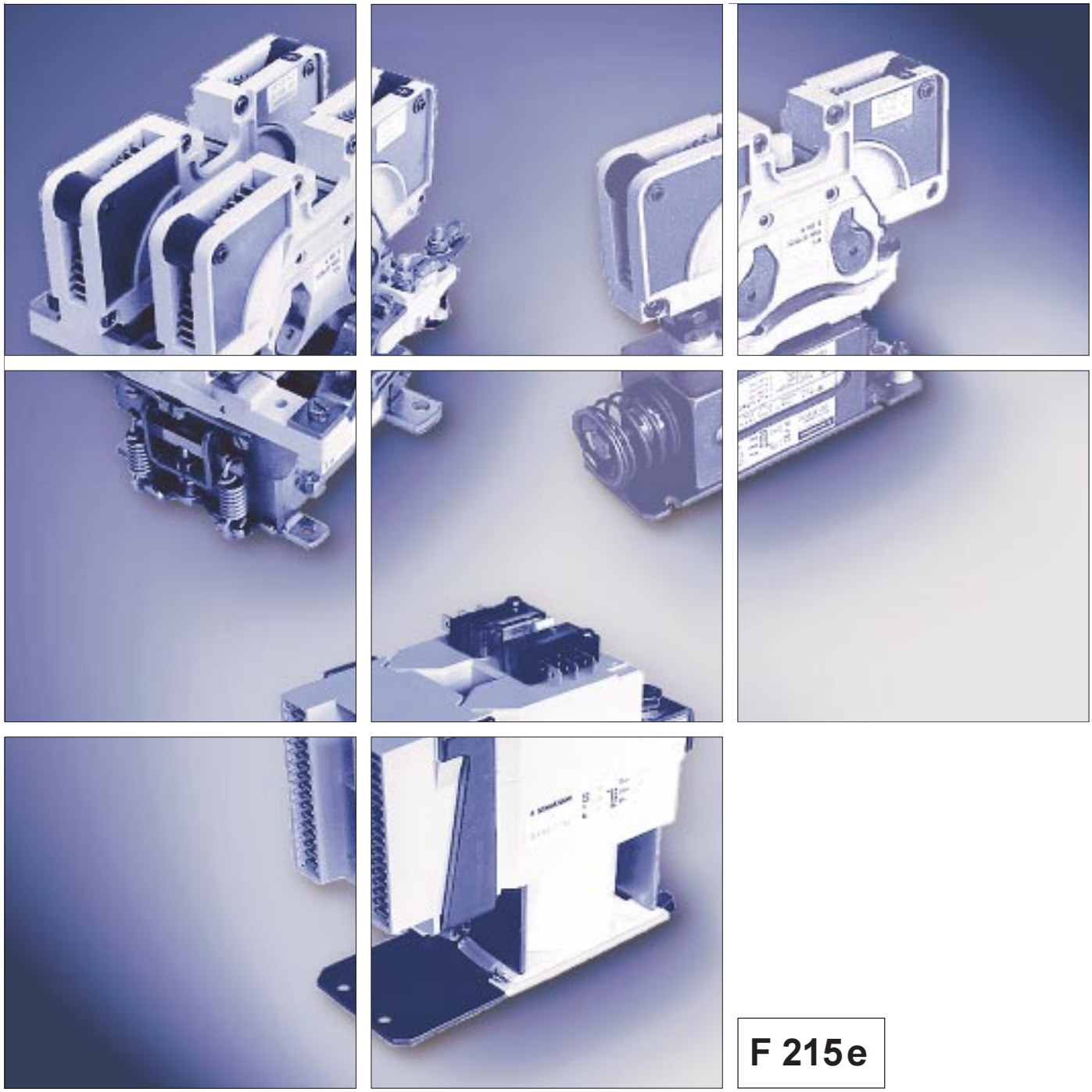
SCHALTBAU

DC Contactors
600V / 750V / 1000V



F 215e

Contents

DC Contactors, 600V to 1000V

Application

These devices are suitable for use in commuter and light rail vehicles. Potential applications include heating, air conditioning and on-board-power conversion. They are sturdily constructed, capable of switching large loads and require only minimal space. The contactors described herein are based on designs with an excellent track record of long-term applications in harsh environments.

Technical Data

		S 155	S 156	S 157	S162	S 195
Continuous Thermal Current (I_{th})	w/o electronic coil power reduction	250 A	250 A	----------	250 A	250 A
	w/ electronic coil power reduction	300 A	300 A	250 A [2]	----------	----------
Number of Main Contacts		2	3	4	1	1
Nominal Load per Contact						
U_{nom} = 750 V (U_{max} = 900 V)	DC 1 [1]	100 kW	100 kW	100 kW	100 kW	50 kW
	DC 5 [1]	18 kW	18 kW	18 kW	18 kW	11 kW
U_{nom} = 1000 V (U_{max} = 1300 V)	DC 1 [1]	50 kW	50 kW	50 kW	50 kW	35 kW
	DC 5 [1]	10 kW	10 kW	10 kW	10 kW	7 kW
Maximum Load per Contact						
U_{nom} = 750 V (U_{max} = 900 V)	DC 1 [1]	> 500 kW	> 500 kW	> 500 kW	> 500 kW	> 280 kW
	DC 5 [1]	> 100 kW	> 100 kW	> 100 kW	> 100 kW	> 76 kW
U_{nom} = 1000 V (U_{max} = 1300 V)	DC 1 [1]	> 160 kW	> 160 kW	> 160 kW	> 160 kW	> 110 kW
	DC 5 [1]	> 50 kW	> 50 kW	> 50 kW	> 50 kW	50 kW
Switching Cycles per Hour		1800			3600	
Mechanical Life, Cycles		> 2 x 10^6			5 x 10^6	> 3 x 10^6
Insulation		Tested per VDE 0115, Group D, at 3,9 kV for U_{nom} = 1200 V Creep and arcing distances for contamination category 3 for U_{nom} = 1000 V per VDE 0660, Part 100				
Nominal Coil Power (DC) at 125% U_{nom} and coil at operating temperature		Pick-up 240W	Holding: 40W	(with series resistor)	18 W	19 W
			Holding: 10W	(with electronic power reduction)		
Nominal Coil Voltage (DC)		24 V ... 110 V	24 V ... 110 V	24 V ... 110 V	24 V ... 110 V	24 V ... 110 V
Voltage Range		70 to 125% U_{nom}				
Operating Temperature Range		-25°C to +70°C (-13°F to +158°F)				
Storage Temperature Range		-40°C to +80°C (-40°F to +176°F)				
Applicable Standards		IEC 77; VDE 0115; VDE 0660				
Shock Resistance		5 g	5 g	5 g	5 g	5 g
Weight [3]		ca. 4,5kg (9,9lb)	ca. 5,0kg (11lb)	ca. 5,5kg (12,2lb)	2,3kg (5,1lb)	2,0kg (4,4lb)
Blow-out Method		Permanent Magnet				
Coil Suppressor		Varistor				

1) Loads certified per VDE 0660, part 100 at U_{nom} and U_{max}

2) 4 pole contactor S157 can optionally be equipped with electronic coil power reduction only.

3) Dependent on the number of auxiliary contacts applied.

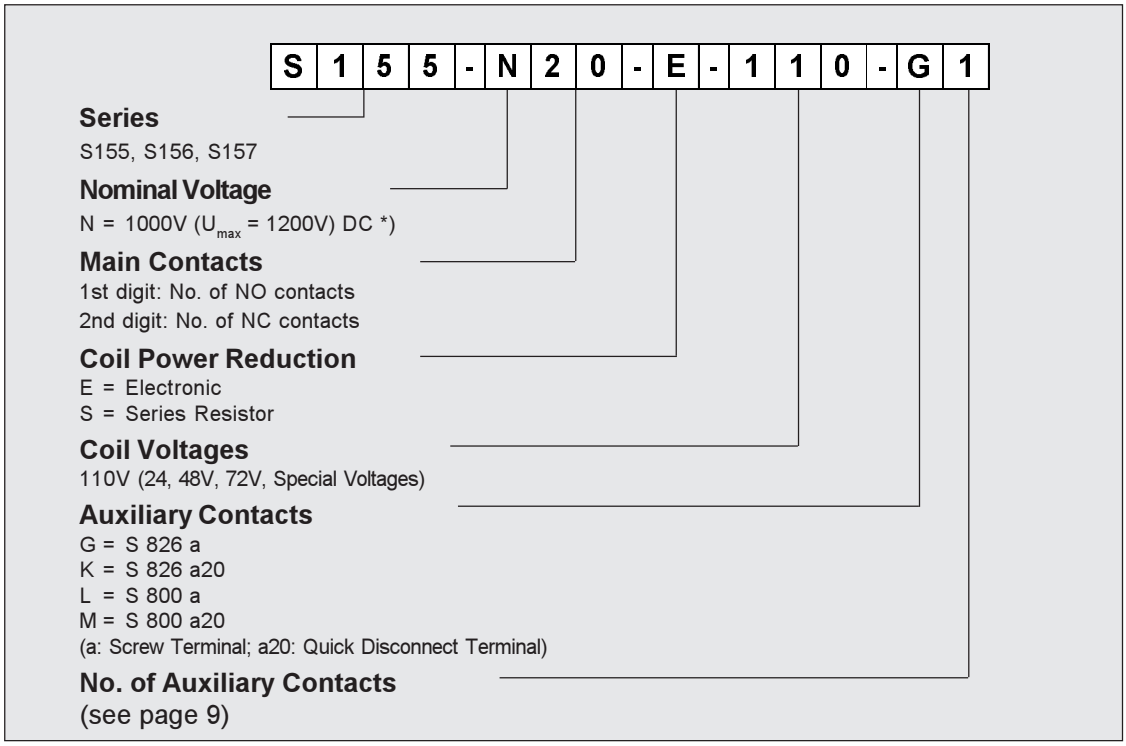
Load Capacity

Current turn-off is ***unidirectional only***. The load ratings in the above tabulation are for a single switching element only.

By placing two ***contacts in series*** the load capacity can be increased by a factor of 2. Partition plates (Part No. 0295 822) may have to be inserted between the main switching elements.

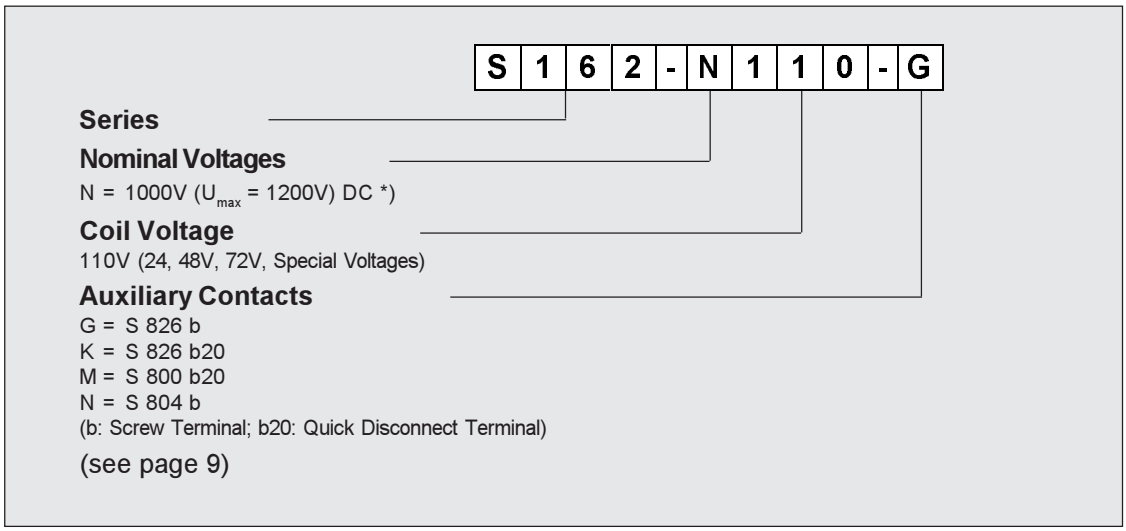
The placement of two ***contacts in parallel*** permits an increase of the continuous thermal current rating (I_{th}) by a factor of 1,7. Since two neighboring elements will never switch exactly synchronous, the load rating for the ***single contact*** must never be exceeded.

Device Identification for Series S155 - S157



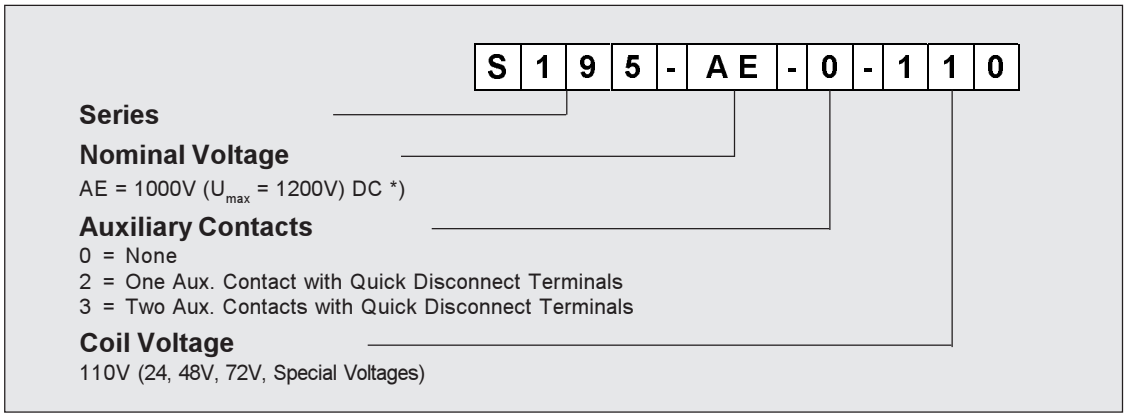
*) For low voltage contactors, series S155 - S157, see listing B80

Device Identification for Series S162



*) For low voltage contactors, series S 162 see listing B90

Device Identification for Series S195



*) For low voltage contactors, series S195 see listing B95

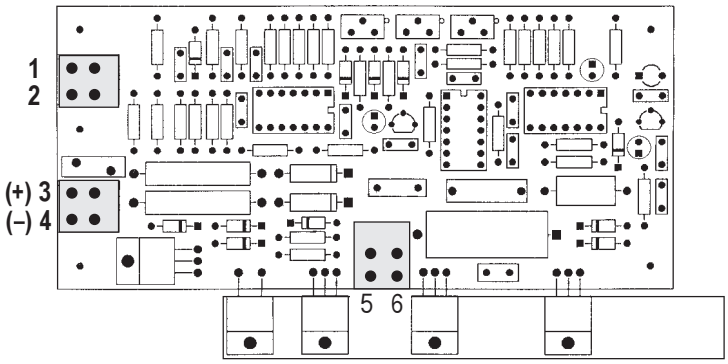
Coil Power Reduction Circuit

This device can be used with multipole contactors S155 through S157.

The power reduction module decreases coil holding power to approximately 10 W. Holding current is independent from the applied control voltage. The contactor will operate reliably between 70% and 125% of the nominal control voltage.

The application of the power reduction circuitry alters the drop-out performance of the contactor at decreasing coil voltage U_{ctl}. In standard applications drop-out will occur at U_{ctl} < 60% of U_{nom}. For some applications special solutions will have to be employed.

Control inputs will accept external control devices (e.g. overcurrent annunciators, etc.).



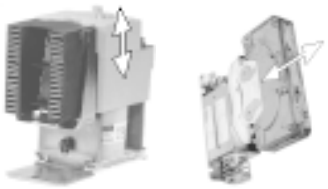
Plan View
Component Side

Input	*Function*
1	Control Input
2	
3	Control Voltage U_{ctl} (observe polarity !)
4	
5	Coil connections factory installed
6	
Input terminals 1 through 6 are equipped with WAGO spring-clip type.	

Fire Rating

Series S155 through S162 and S195: Plastic material for coil bobbins, contact carrier and arc chute conform to UL 94 - VO.

Application Information



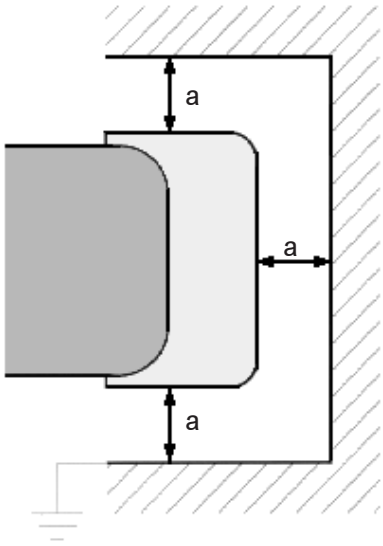
Reliability of operation is enhanced if the devices are positioned so that the prime shock axis does ***not*** coincide with the direction of the arrows shown.

Distance between contactors: 5mm (0,2) **
Distance to current carrying parts: 10mm (0,39)
Arc chamber clearances: see sketches below

**) dimensions in brackets are given in inch

Series S152 through S162

P = Rated Load
a = 70mm (2,75)
P > Rated Load
a = 100mm (3,94)

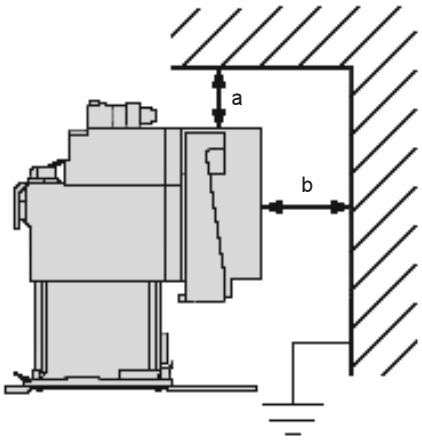


Mounting Position
No special orientation required, preferred orientation with spring downwards.

Series S195

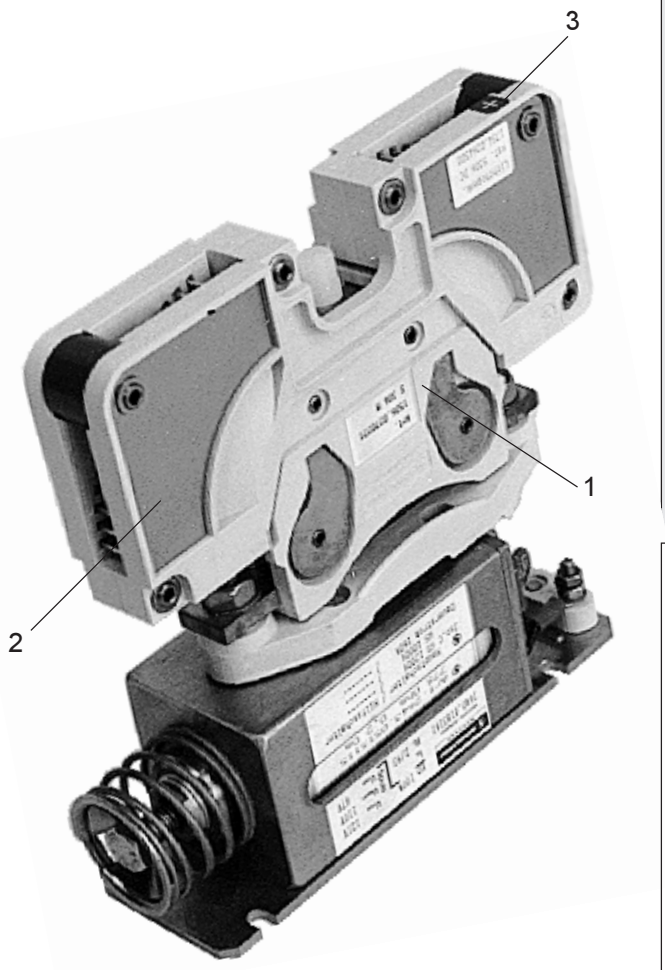
P = Rated Load
a = 20mm (0,79)
b = 30mm (1,18)

P > Rated Load
a = 20mm (0,79)
b = 60mm (2,36)



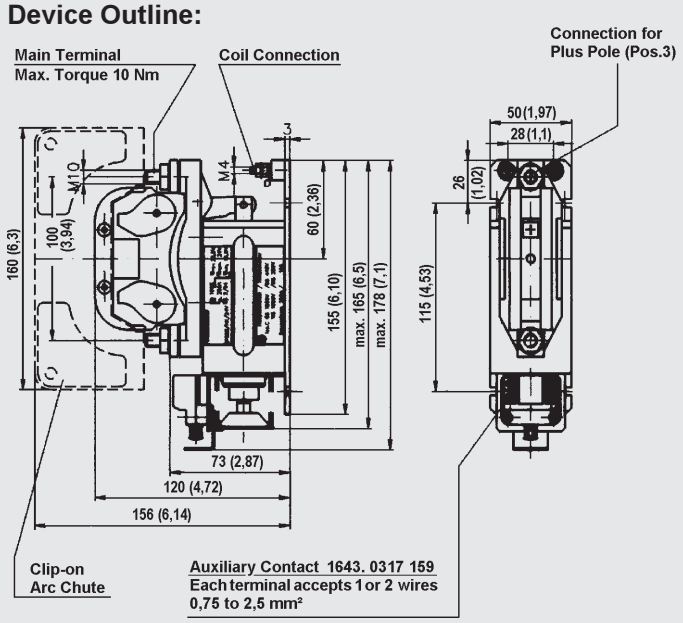
Mounting Position
No special orientation required, upright orientation preferred.

Single Pole Contactor, Series S162

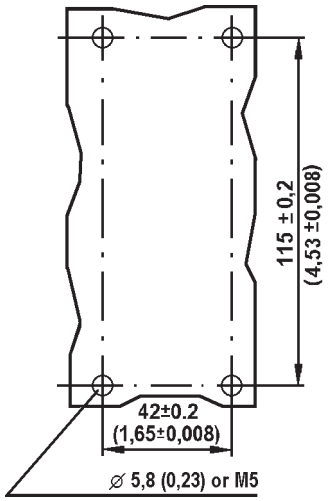


Series S162

Device Outline:



Mounting Template:



Contact (Pos.1) and arc chute (Pos. 2) can be easily replaced if necessary (for part No. see page 9).

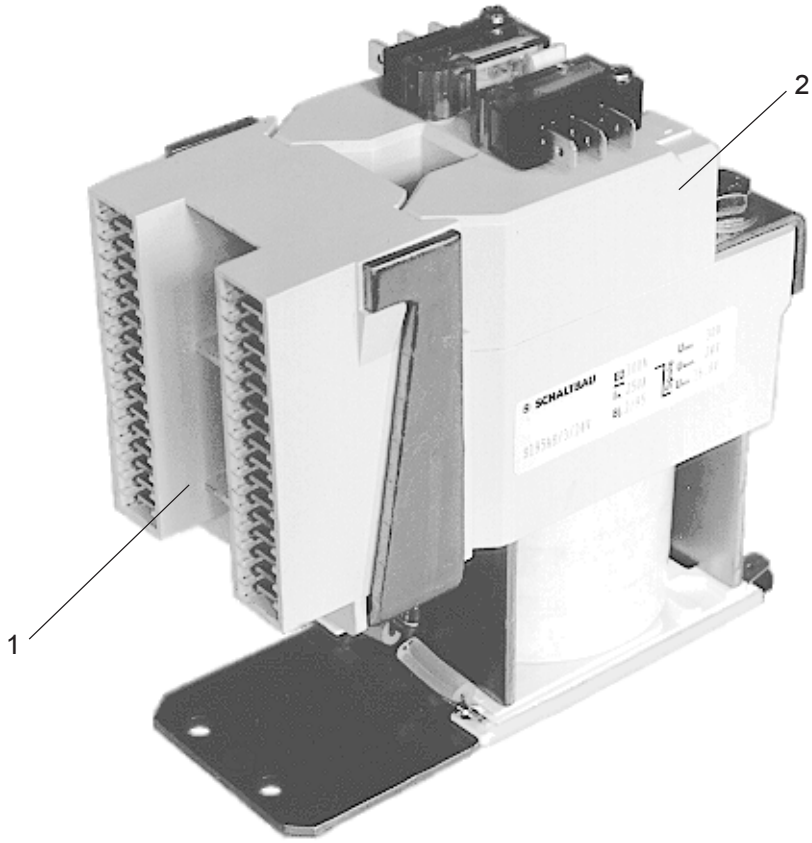
Keying prevents reverse insertion of the arc chute.

Terminal Sizes	S 162
Main Contact	M10
Coil	M4

Polarity	S 162
Coil	no special requirements
Main Contact	**Observe correct Polarity ! (Pos. 3)**
Arc Chamber	

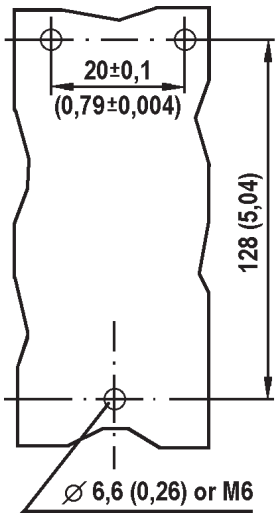
For further information see list B80

Single Pole Contactor, Series S195

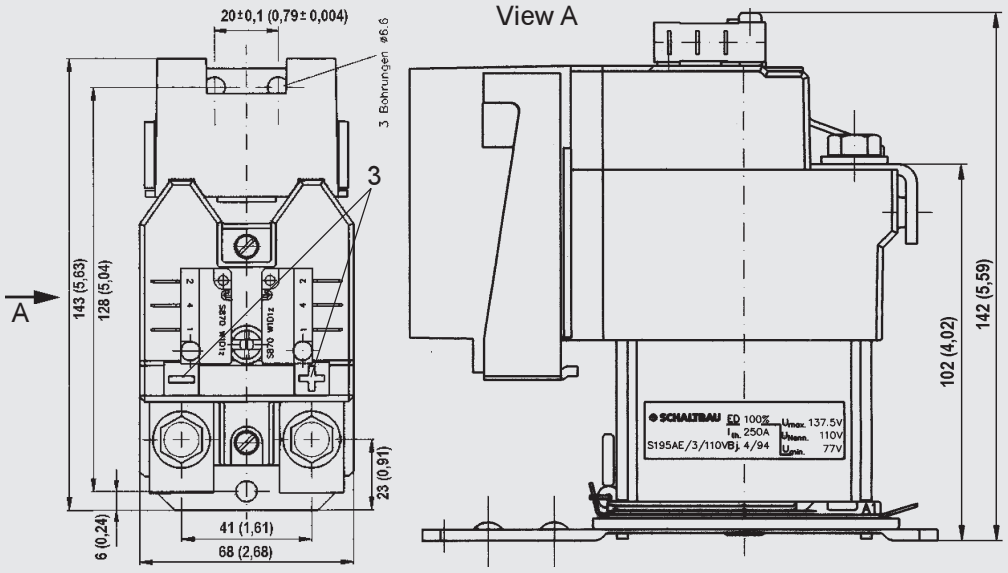


Series S 195

Mounting Template:



Device Outline:



Terminal Sizes	S195
Main Contact	M8
Coil	Connector A 6,3

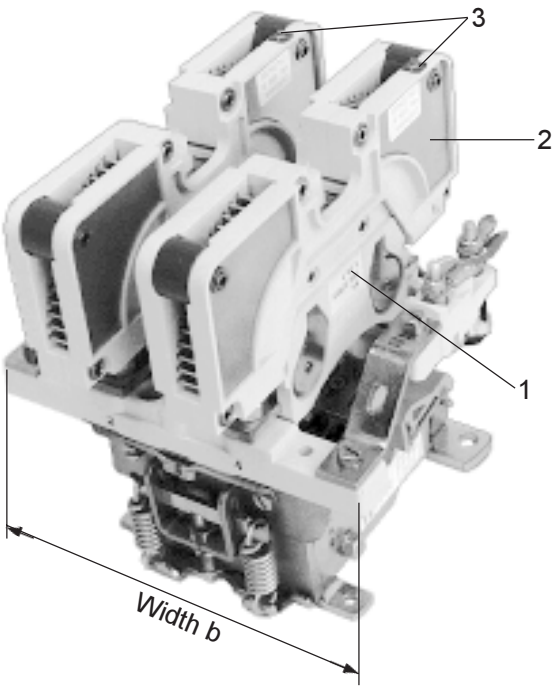
Polarity	S195
Coil	no special requirements
Main Contact	**Observe correct Polarity ! (Pos. 3)**

To change arc chamber (Pos. 1) remove cover (Pos. 2).

For further information see list B95

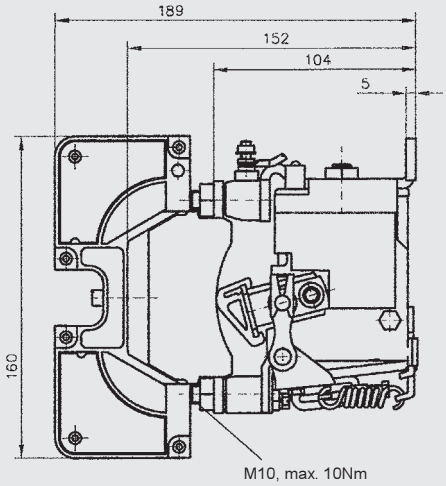
Multipole Contactors, Series S155 - S157

Contacts can be normally open (NO) or normally closed (NC).

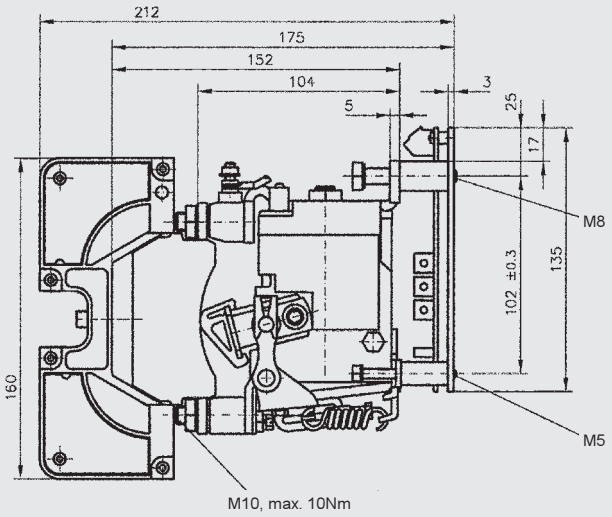


Series S 155

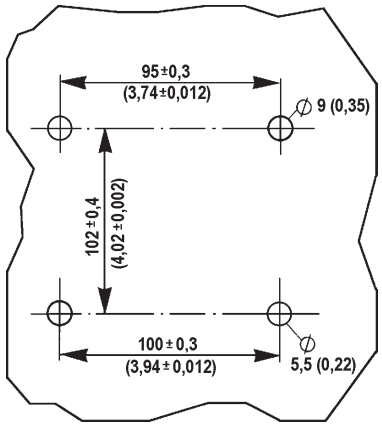
Device Outline:



Device Outline (with electronic coil power reduction):



Mounting Template:



Contacts (Pos. 1) and arc chute (Pos. 2) can be easily replaced (for part No. see page 9). Keying prevents reverse insertion of the arc chute.

Width b dependent on number of main and aux. contacts used.

Series	Width b [mm] with up to 2 aux. contacts	Width b [mm] with up to 4 aux. contacts
S 155	134mm (5,28)	172mm (6,77)
S 156	134mm (5,28)	170mm (6,69)
S 157	172mm (6,77)	208mm (8,19)

Terminal Sizes	S155, S156, S157	Polarity	S152 - S157
Main Contact	M10	Coil	no special requirements
Coil	M4	Main Contact	**Observe correct polarity ! (Pos. 3)**
		Arc Chute	

For further information see list B90

Auxiliary Contacts

Series	Type	Quantity
S155 - S157	S 800a xx [1]	4 max.
	S 826a xx [1]	
S162	S 826b xx [1]	1 max. (For mounting of an assembly see table page 7 on list B80)
	S 804b [1]	
S195	S 870z [2]	2 max.

1) One NO and one NC contact; I_{th} = 10 A 2) One change-over contact; I_{th} = 3 A

Contacts S800 and S826 can be supplied with either screw terminals (XX = blank) or connector (XX = 20). For further information see listings D19, D20 and D23.

Note: for small current switching at low voltages (24V and below, e.g. computer inputs, etc.) use contacts S826 and S870.

Spare Parts

Series	Contact Part No.	Continuous Current [I_{th}]	Arc Chute Part No.
S155, S156	S307 CN 1512.0293 677	300A	LK 307 DC 1754.0 265 592
S157, S162	S307 GN 1512.0293 666	250A	LK 307 DC 1754.0265 592

Electrical Components and Systems for Railway and Industrial Applications

Connectors	• Industry-standard connectors • Special connectors for communication technology (MIL-connectors) • Connectors for railway technology including UIC connectors • Special connectors per customer requirements
Switchgear	• Single and multipole DC contactors • High-voltage AC/DC contactors • Contactors for battery powered vehicles and power supplies • Contactors for railway applications • Special devices per customer requirements
Switching Elements	• Snap-action switches with direct opening action • Snap-action switches with self-cleaning contacts • Switching elements with high breaking capacity • Control and safety switches • DC emergency break switches • Special switches per customer requirements
Control and Signal Devices	• Master controllers and reversers for railway applications • Toggle switches • Hand-operated and foot switches for railway applications (Dead Man´s Device) • Emergency brake handle
Systems and Components for Railway Technology	• Power supply plants for passenger coaches • Battery chargers for locomotives and restaurant cars • High-voltage equipment for single and multi-voltage operation • Heaters • Projecting performance for passenger coaches • Projecting performance for diesel MUs • Electrical drives with magnetic drive technology • Special devices per customer requirements

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