

Explosion Protected
Control Components
(8510/1)
for Motor Control &
Control Circuits



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2 General Information

2.1 Contact Information

R. STAHL Inc.
13259 N. Promenade Blvd.
Stafford, TX 77477

Phone: +1 832 539 6700
Fax: +1 281 313 9302
Internet: www.rstahl.com

R. STAHL Schaltgeräte GmbH
Am Bahnhof 30

D-74638 Waldenburg
Phone: +49 7942 943-0
Fax: +49 7942 943-4333
Internet: www.stahl.de

2.2 Information regarding this Installation, Operation and Maintenance Sheet

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The explosion protected control components should be installed, inspected, maintained, and operated by qualified and competent personnel. Read entire instructions before starting installation of this product.

Contact your R. STAHL Customer Service or R. STAHL distributor if you have any questions.

Technical information and illustrations are not binding and subject to change without notice.

The nature of these instructions is only informative and does not cover all of the details, variations or combinations in which this device may be used, its storage, delivery, installations, safe operation and maintenance.

Since conditions of use of the product are outside of the care, custody and control of the manufacturer, the purchaser should determine the suitability of the product for his intended use, and assumes all risk and liability whatsoever in connection therewith.

Save these instructions for future reference.

3 Application

The Series 8510/1 explosion protected control components (including relays, motor contactors, motor overload protection, timer relays) are devices for control circuits or motor circuits. They can be also be used in branch circuits to control lighting, heating, appliance, motors and similar circuits.

Refer to section 6 for application and details of the control devices.

4 Hazardous Location Ratings and Applicable Standards

The Control Components are in compliance with the following standards:

CSA-C22.2 No. 0-M91	General Requirements - Canadian Electrical Code Part II
CSA-C22.2 No. 65-03	Wire Connectors
CSA-C22.2 No. 60529:05	Ingress Protection
CSA-C22.2 No.60079-0	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements.
CSA-C22.2 No.60079-1	Electrical Apparatus for Explosive Gas Atmospheres - Part 1: Construction and Verification Test of Flameproof Enclosures of Electrical Apparatus
CSA-C22.2 No.60079-7	Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased Safety 'e'
CSA C22.2 No. 213-M1987	Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations.
CSA C22.2 No.14	Standard for Industrial Control Equipment
CSA C22.2 No.60947-1	Standard for Industrial Control Equipment
CSA C22.2 No. 60079-4-1	Low-Voltage Switchgear and Controlgear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters
ANSI/UL 60079-0	Standard for Safety for Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements.
ANSI/UL 60079-1	Standard for Safety for Electrical Apparatus for Explosive Gas Atmospheres - Part 1: Flameproof enclosures 'd'.
ANSI/UL 60079-7	Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased Safety 'e'
ANSI/UL 486E	Equipment Wiring Terminals
ANSI/UL 508	Standard for Industrial Control Equipment
UL 60947-1	Standard for Industrial Control Equipment
UL 60947-4-1	Low-Voltage Switchgear and Controlgear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters

5 Safety Instructions

Use the control unit only for its intended purpose.

Incorrect or impermissible use or non-compliance with these instructions invalidates our warranty provision.

Any alterations or modifications to the component impairing its explosion protection are not permitted. The control unit must be use only if it is clean and undamaged.

Observe the following when using the device:

- National and local safety regulations
- National and local accident prevention regulations
- National and local assembly and installation regulations
- Generally recognized technical regulations
- Safety instructions in these operating instructions
- Characteristic values and rated operating conditions on the rating and data plates
- Additional instruction plates on the control unit

6 Technical Data

Type	8510/122-03-13x-...	8510/122-03-33x-...	8510/122-03-43x-...	8510/132-03-83x-...			
Description	4kW Motor Contactor	7.5kW Motor Contactor	11kW Motor Contactor	22kW Motor Contactor			
Explosion Protection							
US & Canada			AEx / Ex db eb IIC T5 Gb				
IECEX			Ex db e IIC Gb				
ATEX			Ex II 2G Ex db eb IIC Gb				
Certificate							
US & Canada			FM 16 US 0153U / FM 16 CA 0089U				
IECEX			IECEX BVS 07.0029U				
ATEX			DMT 00 ATEX E 073U				
Ambient Temperature			-20°C ... +55°C				
Ingress Protection			IP 20 According to IEC 60529				
Main Contacts							
Arrangement	3x NO	3x NO	3x NO	3x NO			
Rated Voltage	600 VAC	600 VAC	600 VAC	600 VAC			
Rated Current	20 A	25 A	32 A	43A (AC-3) 45A (AC-1)			
Motor Rating	5 hp (4.0 kW) @ 600 VAC 5 hp (4.0 kW) @ 480 VAC 3 hp (2.2 kW) @ 220...230 VAC	15 hp @ 600 VAC 10 hp @ 480 VAC 5 hp @ 230 ... 240 VAC 5 hp @ 200...208VAC	10 kW @ 660...690 VAC 10 kW @ 500 VAC 9 kW @ 415 ... 440 VAC 7.5kW @ 380 ... 400 VAC 4 kW @ 220 ... 230 VAC	20 hp @ 600 VAC 15 hp @ 460 ... 480 VAC 7.5 hp @ 230 ... 240 VAC 5 hp @ 200 ... 208 VAC	15.0 kW @ 600 VAC 11.0 kW @ 415 VAC 11.0 kW @ 380 VAC 5.5 kW @ 220...230VAC	30 hp @ 600 VAC 30 hp @ 460 ... 480 VAC 15 hp @ 230 ... 240 VAC 10 hp @ 200 ... 208 VAC	22.0 kW @ 690 VAC 25.0 kW @ 500 VAC 22.0 kW @ 415 VAC 13 kW @ 220...230VAC
Back-up Protection (i.e.Fuse type J, gG)	45 A	50 A	70 A	90 A			
Terminal Size	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded			
Torque	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in			
Aux Contacts (if present)							
Arrangement	1x NO / 1x NC / 1x NO + 1x NC 4x NO / 3x NO + 1x NC / 2x NO + 2x NC	1x NO / 1x NC / 1x NO + 1x NC 4x NO / 3x NO + 1x NC / 2x NO + 2x NC	1x NO / 1x NC / 1x NO + 1x NC 4x NO / 3x NO + 1x NC / 2x NO + 2x NC	1x NO / 1x NC / 1x NO + 1x NC / 2x NO + 2x NC / 2x NO + 2x NC			
Rated Voltage	600 VAC	600 VAC	600 VAC	600 VAC			
Rated Current	5 A (B600)	5 A (B600)	5 A (B600)	10 A (A600)			
Back-up Protection Current (i.e.Fuse type J, gG)	10 A	10 A	10 A	10 A			
Terminal Size	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	0.75 mm ² ... 1.5mm ² stranded / solid 18 AWG ... 14 AWG stranded / solid	0.75 mm ² ... 1.5mm ² stranded / solid 18 AWG ... 14 AWG stranded / solid	0.75 mm ² ... 1.5mm ² stranded / solid 18 AWG ... 14 AWG stranded / solid			
Torque	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in			

Type	8510/111-02-209-...	8510/122-03-60x-...	8510/141-03-60x-...
Description	Relay	Auxiliary Contact Unit	Auxiliary Contact Unit
<u>Explosion Protection</u>			
US & Canada	AEx / Ex db eb IIC T5 Gb		
IECEX	Ex db e IIC Gb		
ATEX	Ex II 2G Ex db eb IIC Gb		
<u>Certificate</u>			
US & Canada	FM 16 US 0153U / FM 16 CA 0089U		
IECEX	IECEX BVS 07.0029U		
ATEX	DMT 00 ATEX E 073U		
Ambient Temperature	-20°C ... +55°C		
Ingress Protection	IP 20 According to IEC 60529		
<u>Main Contacts</u>			
Arrangement	2x CO		
Rated Voltage	250 VAC		
Rated Current	5A		
Contact Rating			
Back-up Protection (i.e.Fuse type J, gG)	8 A		
Terminal Size	0.75 mm ² ... 1.5mm ² strand 18 AWG ... 12 AWG strand		
Torque	1.2 Nm 15 lbf-in		
<u>Aux Contacts (if present)</u>			
Arrangement		1x NO / 1x NC / 1x NO + 1x NC 4x NO / 3x NO + 1x NC / 2x NO + 2x NC	1x NO / 1x NC / 1x NO + 1x NC 4x NO / 3x NO + 1x NC / 2x NO + 2x NC
Rated Voltage		600 VAC	600 VAC
Rated Current		5 A (B600)	5 A (B600)
Back-up Protection Current (i.e.Fuse type J, gG)		10 A	10 A
Terminal Size		0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid
Torque		1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in

Type	8510/122-03-74x-...	8510/122-03-75x-...	8510/132-03-54x-...	8510/132-03-55x-...
Description	14kW Contactor	14kW Contactor	26kW Contactor	26kW Contactor
Explosion Protection				
US & Canada	AEx / Ex db eb IIC T5 Gb			
IECEX	Ex db e IIC Gb			
ATEX	Ex II 2G Ex db eb IIC Gb			
Certificate				
US & Canada	FM 16 US 0153U / FM 16 CA 0089U			
IECEX	IECEX BVS 07.0029U			
ATEX	DMT 00 ATEX E 073U			
Ambient Temperature	-20°C ... +55°C			
Ingress Protection	IP 20 According to IEC 60529			
Main Contacts				
Arrangement	4x NO	2 x NO + 2x NC	4x NO	2 x NO + 2x NC
Rated Voltage	600 VAC	600 VAC	600 VAC	600 VAC
Rated Current	20 A	20 A	40 A	40 A
	AC1 (Resistive Load)	AC1 (Resistive Load)	AC1 (Resistive Load)	AC1 (Resistive Load)
Contact Rating	14.0 kW @ 400 VAC 8.0 kW @ 220...230 VAC	14.0 kW @ 400 VAC 8.0 kW @ 220...230 VAC	33.0 kW @ 600 VAC 26.0 kW @ 400 VAC 15.0 kW @ 220...230VAC	33.0 kW @ 600 VAC 26.0 kW @ 400 VAC 15.0 kW @ 220...230VAC
Back-up Protection (i.e.Fuse type J, gG)	45 A	45 A	90 A	90 A
Terminal Size	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded
Torque	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in
Aux Contacts (if present)				
Arrangement	1x NO / 1x NC / 1x NO + 1x NC	1x NO / 1x NC / 1x NO + 1x NC	1x NO / 1x NC / 1x NO + 1x NC	1x NO / 1x NC / 1x NO + 1x NC
Rated Voltage	600 VAC	600 VAC	600 VAC	600 VAC
Rated Current	5 A (B600)	5 A (B600)	5 A (B600)	5 A (B600)
Back-up Protection Current (i.e.Fuse type J, gG)	10 A	10 A	10 A	10 A
Terminal Size	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid
Torque	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in

Type	8510/132-04-136-....	8510/132-04-336-....	8510/132-04-436-....	8510/122-05-x35-....	8510/132-05-335-xx1	
Description	4kW Motor Contact w/ O/L	7.5kW Motor Contact w/ O/L	11kW Motor Contact w/ O/L	Thermal Overload Protector	Electronic Overload Protector	
Explosion Protection US & Canada IECEX ATEX			AEx / Ex db eb IIC T5 Gb Ex db e IIC Gb Ex II 2G Ex db eb IIC Gb			
Certificate US & Canada IECEX ATEX			FM 16 US 0153U / FM 16 CA 0089U IECEX BVS 07.0029U DMT 00 ATEX E 073U			
Ambient Temperature			-20°C ... +55°C			
Ingress Protection			IP 20 According to IEC 60529			
Main Contacts Arrangement	3x NO	3x NO	3x NO	3-Phase	3-Phase	
Rated Voltage	600 VAC	600 VAC	600 VAC	600 VAC	600 VAC	
Rated Current	20 A	25 A	25A	25 A	45 A	
Motor Rating	4.0 kW (5.3hp) @ 600 VAC 4.0 kW (5.3 hp) @ 480 VAC 2.2 kW (2.9 hp) @ 220...230 VAC	15 hp @ 600 VAC 10 hp @ 480 VAC 5 hp @ 230 ... 240 VAC 5 hp @ 200...208VAC	10 kW @ 660...690 VAC 10 kW @ 500 VAC 9 kW @ 415 ... 440 VAC 7.5kW @ 380 ... 400 VAC 4 kW @ 220 ... 230 VAC	20 hp @ 600 VAC 15 hp @ 460 ... 480 VAC 7.5 hp @ 230 ... 240 VAC 5 hp @ 200 ... 208 VAC	15.0 kW @ 600 VAC 11.0 kW @ 415 VAC 11.0 kW @ 380 VAC 5.5 kW @ 220...230VAC	
Back-up Protection (i.e.Fuse type J, gG)	45 A	50 A	50 A	0.5 A ... 50 A (based on overload range)	25 A ... 100 A (based on overload range)	
Terminal Size	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	
Torque	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	
Aux Contacts (if present)						
Arrangement	2x NO + 2x NC	2x NO + 2x NC	2x NO + 2x NC	1x NO + 1x NC	1x NO + 1x NC	
Rated Voltage	600 VAC	600 VAC	600 VAC	600 VAC	300 VAC	
Rated Current	5 A (B600)	5 A (B600)	5 A (B600)	5 A (B600)	5 A (B300/R300)	
Back-up Protection Current (i.e.Fuse type J, gG)	10 A	10 A	10 A	10 A	6A	
Terminal Size	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	0.75 mm ² ... 1.5mm ² stranded / solid 18 AWG ... 14 AWG stranded / solid	0.75 mm ² ... 1.5mm ² stranded / solid 18 AWG ... 14 AWG stranded / solid	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	
Torque	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	
Overload Range	0.1 A ... 22.5A	0.1 A ... 22.5A	0.1 A ... 22.5A	0.1 A ... 22.5A	0.1 A ... 45.0 A	
Reset Voltage					24 VDC	

Type	8510/132-08-13x-...	8510/132-08-33x-...	8510/132-08-43x-...	8510/112-07-xxx-....	
Description	4kW Reversing Contact	7.5kW Reversing Contact	11kW Reversing Contact	Time Relay	
Explosion Protection					
US & Canada		AEx / Ex db eb IIC T5 Gb		AEx / Ex db eb IIC T5 Gb	
IECEX		Ex db e IIC Gb		Ex d e IIC Gb	
ATEX		Ex II 2G Ex db eb IIC Gb		Ex II 2G Ex db eb IIC Gb	
Certificate					
US & Canada		FM 16 US 0153U / FM 16 CA 0089U			
IECEX		IECEX BVS 07.0029U			
ATEX		DMT 00 ATEX E 073U			
Ambient Temperature		-20°C ... +55°C			
Ingress Protection		IP 20 According to IEC 60529			
Main Contacts					
Arrangement	3x NO	3x NO	3x NO	2x NO / 2x CO	
Rated Voltage	600 VAC	600 VAC	600 VAC	300 VAC / 48 VDC	
Rated Current	20 A	25 A	32 A	5 A (B300)	
Motor Rating	4.0 kW (5.3hp) @ 600 VAC 4.0 kW (5.3 hp) @ 480 VAC 2.2 kW (2.9 hp) @ 220...230 VAC	15 hp @ 600 VAC 10 hp @ 480 VAC 5 hp @ 230 ... 240 VAC 5 hp @ 200...208VAC	10 kW @ 660...690 VAC 10 kW @ 500 VAC 9 kW @ 415 ... 440 VAC 7.5kW @ 380 ... 400 VAC 4 kW @ 220 ... 230 VAC	20 hp @ 600 VAC 15 hp @ 460 ... 480 VAC 7.5 hp @ 230 ... 240 VAC 5 hp @ 200 ... 208 VAC	15.0 kW @ 600 VAC 11.0 kW @ 415 VAC 11.0 kW @ 380 VAC 5.5 kW @ 220...230VAC
Back-up Protection (i.e.Fuse type J, gG)	45 A	50 A	70 A		
Terminal Size	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	1.5 mm ² ... 10.0 mm ² stranded 14 AWG ... 6 AWG stranded	0.75 mm ² ... 1.5mm ² stranded 18 AWG ... 12 AWG stranded	
Torque	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	2.0 Nm 25 lbf-in	1.2 Nm 15 lbf-in	
Aux Contacts (if present)					
Arrangement	1x NO + 1x NC 4x NO	1x NO + 1x NC 4x NO	1x NO + 1x NC 4x NO		
Rated Voltage	600 VAC	600 VAC	600 VAC		
Rated Current	5 A (B600)	5 A (B600)	5 A (B600)		
Back-up Protection Current (i.e.Fuse type J, gG)	10 A	10 A	10 A		
Terminal Size	0.75 mm ² ... 1.5mm ² strand / solid 18 AWG ... 14 AWG strand / solid	0.75 mm ² ... 1.5mm ² stranded / solid 18 AWG ... 14 AWG stranded / solid	0.75 mm ² ... 1.5mm ² stranded / solid 18 AWG ... 14 AWG stranded / solid		
Torque	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in	1.2 Nm 15 lbf-in		

⚠ WARNING

Please observe the technical data on the rating plate
Please consult the manufacturer if operating conditions are non-standard

Typical Rating Plates for 8510

(this sample is for an 8510/132-04-436-xx0-14 (where the xx refers to the requested coil voltage))

This is a sample **for reference only**. Please refer to the product for the information relating to the device that you have.

7 Installation

WARNING

To avoid fire or shock hazard, the electrical power must be turned OFF before and during installation.

- Refer to the technical data and installation information on the front and side mounted nameplates of the control unit.
- For Class I, Zone 1 installations, Series 8510/1 control components must be installed in a Certified Increased Safety 'e' enclosure. When installing the control components into 'e' enclosures the spacing distances through air and over surface, in accordance with CAN/CSA E60079-7 and C22.2 No. 5-02 for Canada, or ANSI/ISA 60079-7 + UL508A for USA, must be maintained.
- For Class I, Division 2 installations, Series 8510/1 control components must be installed in a suitable enclosure providing mechanical protection, provisions for conduit/cable entry, and sufficient clearance for electrical connections as per C22.2 No. 5 and 14 for Canada and UL508A for USA.
- Series 8510/1 control components have been Certified as a component and the suitability of the final assembly is to be determined by the authorities having jurisdiction.
- The terminals on the control component have been identified on the control unit. Refer to the device label and technical information for proper connection.
- Field wiring conductors shall be copper wires only, stranded – and sized based on the conductor rated for 75°C.(for North American Installations)
- The Main Circuit shall be protected by a Class J fuse rated not more than 225% of the rated full load current.
- The Auxiliary Circuits shall be protected by a Class J fuse rated not more than 10A

8 Maintenance

WARNING

To avoid electrical shock, fire and/or explosions, always disconnect primary power source before inspection, service or Maintenance.

- We recommend an Electrical Prevention Maintenance program as described in the National Electrical Code® (NEC) and the National Fire Protection Association Bulletin NFPA No. 70B or the Canadian Electrical Code (CEC) respectively, and any local regulations. It is recommended that it should be at least once a year.
- Maintenance should only be performed by qualified and experienced personnel.
- Perform visual, electrical, and mechanical checks on all components on a regular basis.
 - Visually check for undue heating evidence by distortion of wires or other components, damaged or worn parts.
 - Electrically check to make sure that all connections are clean and tight.
 - Mechanically check that all parts are properly assembled, and operating mechanisms move freely.
- The Flameproof joint CANNOT be repaired
- Replacement parts are available through R. STAHL distributors. Replace the explosion protected control components only with R. STAHL's explosion protected control components Series 8510/1.
Replace only with parts of identical rating.

