

**Contactor, 380 V 400 V 900 kW, 2 N/O, 2 NC, RAW 250, AC operation, Screw connection**



**Part no.** DILM1600/22(RAW250)  
**Catalog No.** 106727  
**Alternate Catalog No.** XTCEC16R22B  
**No.**  
**EL-Nummer (Norway)** 4130463

**Delivery program**

Product range				Contactors
Application				Contactors for Motors
Subrange				Comfort devices greater than 170 A
Utilization category				AC-1: Non-inductive or slightly inductive loads, resistance furnaces NAC-3: Normal AC induction motors: starting, switch off during running AC-4: Normal AC induction motors: starting, plugging, reversing, inching
Connection technique				Screw connection
<b>Rated operational current</b>				
AC-3				
380 V 400 V	$I_e$	A		1600
AC-1				
Conventional free air thermal current, 3 pole, 50 - 60 Hz				
Open				
at 40 °C	$I_{th} = I_e$	A		2200
Conventional free air thermal current, 1 pole				
open	$I_{th}$	A		4500
<b>Max. rating for three-phase motors, 50 - 60 Hz</b>				
AC-3				
220 V 230 V	P	kW		500
380 V 400 V	P	kW		900
660 V 690 V	P	kW		1600
1000 V	P	kW		1770
AC-4				
220 V 230 V	P	kW		430
380 V 400 V	P	kW		750
660 V 690 V	P	kW		1300
1000 V	P	kW		1650
Contact sequence				
Can be combined with auxiliary contact				DILM820-XHI...
Actuating voltage				RAW 250
Voltage AC/DC				AC operation
<b>Contacts</b>				
N/O = Normally open				2 N/O
N/C = Normally closed				2 NC
<b>Auxiliary contacts</b>				
possible variants at auxiliary contact module fitting options				on the side: 2 x DILM820-XHI11(V)-SI; 2 x DILM820-XHI11-SA
Side mounting auxiliary contacts				
<b>Instructions</b>				Interlocked opposing contacts according to IEC/EN 60947-5-1 Appendix L, inside the auxiliary contact module Auxiliary contacts used as mirror contacts according to IEC/EN 60947-4-1 Appendix F (not N/C late open)
<b>Instructions</b>				integrated suppressor circuit in actuating electronics

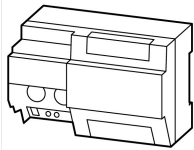
**Notes**

**Classic**

A1/A2 werden wie bisher gewohnt an Spannung gelegt

**Direct from the PLC**

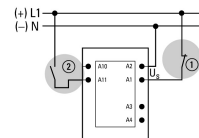
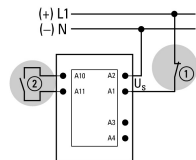
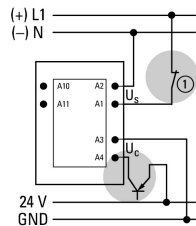
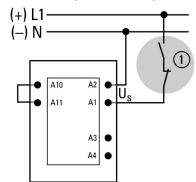
An die Anschlüsse A3/A4 kann direkt ein 24-V-Ausgang der SPS angeschlossen werden.



**From a low-power actuating device**

Gering belastbare Befehlsgeber wie Leiterplattenrelais, Befehlsgeräte oder Positionsschalter können direkt an A10/A11 angeschlossen werden.

DILM1600, DILH2000, DILH2200

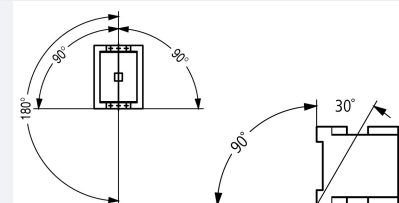


① Stopping in the event of an emergency (emergency switching off)

② max. Cable capacitance 6 nF

**Technical data**

**General**

Standards			IEC/EN 60947, VDE 0660, UL, CSA
Lifespan, mechanical			
AC operated	Operations	$\times 10^6$	5
DC operated	Operations	$\times 10^6$	5
Operating frequency, mechanical			
AC operated	Operations/h		1000
DC operated	Operations/h		1000
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature			
Open	°C		-40 - +60
Storage	°C		-40 - +80
Mounting position			
Mechanical shock resistance (IEC/EN 60068-2-27)			
Half-sinusoidal shock, 10 ms			
Main contacts			
N/O contact	g		10
Auxiliary contacts			
N/O contact	g		10
N/C contact	g		8
Degree of Protection			IP00
Altitude	m		Max. 2000
Weight			
AC operated	kg		32
DC operated	kg		32
Weight	kg		32

Terminal capacity main cable			
Busbar	Width	mm	100
Main cable connection screw/bolt			
			M12
Tightening torque			
		Nm	35
Terminal capacity control circuit cables			
Solid		mm <sup>2</sup>	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Flexible with ferrule		mm <sup>2</sup>	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded		AWG	18 - 14
Control circuit cable connection screw/bolt			
			M3.5
Tightening torque			
		Nm	1.2
Tool			
Main cable			
	Width across flats	mm	18
Control circuit cables			
	Pozidriv screwdriver	Size	2

### Main conducting paths

Rated impulse withstand voltage	$U_{imp}$	V AC	8000
Overvoltage category/pollution degree			
			III/3
Rated insulation voltage	$U_i$	V AC	1000
Rated operational voltage	$U_e$	V AC	1000
Safe isolation to EN 61140			
	between coil and contacts	V AC	500
	between the contacts	V AC	500
Making capacity (p.f. to IEC/EN 60947)			
		A	19000
Breaking capacity			
	220 V 230 V	A	16000
	380 V 400 V	A	16000
	500 V	A	16000
	660 V 690 V	A	16000
	1000 V	A	5800
Component lifespan			
			AC1: See → Engineering, characteristic curves AC3: See → Engineering, characteristic curves AC4: See → Engineering, characteristic curves

### AC

AC-1			
Rated operational current			
Conventional free air thermal current, 3 pole, 50 - 60 Hz			
Open			
	at 40 °C	$I_{th} = I_e$	A 2200
	at 50 °C	$I_{th} = I_e$	A 1970
	at 55 °C	$I_{th} = I_e$	A 1880
	at 60 °C	$I_{th} = I_e$	A 1800
Conventional free air thermal current, 1 pole			
Note			
	open	$I_{th}$	A 4500
AC-3			
Rated operational current			
Open, 3-pole: 50 – 60 Hz			
Notes			
	220 V 230 V	$I_e$	A 1600
	240 V	$I_e$	A 1600
	380 V 400 V	$I_e$	A 1600
	415 V	$I_e$	A 1600

440V	I <sub>e</sub>	A	1600
500 V	I <sub>e</sub>	A	1600
660 V 690 V	I <sub>e</sub>	A	1600
1000 V	I <sub>e</sub>	A	1200
Motor rating	P	kWh	
220 V 230 V	P	kW	500
240V	P	kW	550
380 V 400 V	P	kW	900
415 V	P	kW	930
440 V	P	kW	1000
500 V	P	kW	1180
660 V 690 V	P	kW	1600
1000 V	P	kW	1770

#### AC-4

Rated operational current			
Open, 3-pole: 50 – 60 Hz			
220 V 230 V	I <sub>e</sub>	A	1280
240 V	I <sub>e</sub>	A	1280
380 V 400 V	I <sub>e</sub>	A	1280
415 V	I <sub>e</sub>	A	1280
440 V	I <sub>e</sub>	A	1280
500 V	I <sub>e</sub>	A	1280
660 V 690 V	I <sub>e</sub>	A	1280
1000 V	I <sub>e</sub>	A	1120
Motor rating	P	kWh	
220 V 230 V	P	kW	430
240 V	P	kW	450
380 V 400 V	P	kW	750
415 V	P	kW	770
440 V	P	kW	830
500 V	P	kW	940
660 V 690 V	P	kW	1300
1000 V	P	kW	1650

#### Current heat loss

3 pole, at I <sub>th</sub> (60°)		W	155
Current heat loss at I <sub>e</sub> to AC-3/400 V		W	123

#### Magnet systems

Voltage tolerance			
U <sub>S</sub>			230 - 250 V 50/60 Hz 110 - 350 V DC
AC operated	Pick-up	x U <sub>S</sub>	0.7 x U <sub>S min</sub> - 1.15 x U <sub>S max</sub>
DC operated	Pick-up	x U <sub>S</sub>	0.7 x U <sub>S min</sub> - 1.15 x U <sub>S max</sub>
AC operated	Drop-out	x U <sub>S</sub>	0.2 x U <sub>S max</sub> - 0.6 x U <sub>S min</sub>
DC operated	Drop-out	x U <sub>S</sub>	0.2 x U <sub>S max</sub> - 0.6 x U <sub>S min</sub>
Power consumption of the coil in a cold state and 1.0 x U <sub>S</sub>			
Note on power consumption			Control transformer with u <sub>k</sub> ≤ 7%
Pull-in power	Pick-up	VA	1600
Pull-in power	Pick-up	W	1400
Sealing power	Sealing	VA	36.5
Sealing power	Sealing	W	17.3
Duty factor		% DF	100
Changeover time at 100 % U <sub>S</sub> (recommended value)			
Main contacts			
Closing delay		ms	70

Opening delay	ms	40
Behaviour in marginal and transitional conditions		
Sealing		
Voltage interruptions		
$(0 \dots 0.2 \times U_{c \min}) \leq 10 \text{ ms}$		Time is bridged successfully
$(0 \dots 0.2 \times U_{c \min}) > 10 \text{ ms}$		Drop-out of the contactor
Voltage drops		
$(0.2 \dots 0.6 \times U_{c \min}) \leq 12 \text{ ms}$		Time is bridged successfully
$(0.2 \dots 0.6 \times U_{c \min}) > 12 \text{ ms}$		Drop-out of the contactor
$(0.6 \dots 0.7 \times U_{c \min})$		Contactor remains switched on
Excess voltage		
$(1.15 \dots 1.3 \times U_{c \max})$		Contactor remains switched on
Pick-up phase		
$(0 \dots 0.7 \times U_{c \min})$		Contactor does not switch on
$(0.7 \times U_{c \min} \dots 1.15 \times U_{c \max})$		Contactor switches on with certainty
Admissible transitional contact resistance (of the external control circuit device when actuating A11)	mΩ	≤ 500
PLC signal level (A3 - A4) to IEC/EN 61131-2 (type 2)		
High	V	15
Low	V	5

### Electromagnetic compatibility (EMC)

Electromagnetic compatibility		This product is designed for operation in industrial environments (environment A). Its use in residential environments (environment B) may cause radio-frequency interference, requiring additional noise suppression measures.
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### Rating data for approved types

Switching capacity		
Maximum motor rating		
Three-phase		
200 V 208 V	HP	560
230 V 240 V	HP	640
460 V 480 V	HP	1200
575 V 600 V	HP	1300
General use	A	1600
Auxiliary contacts		
Pilot Duty		
AC operated		A600
DC operated		P300
General Use		
AC	V	600
AC	A	15
DC	V	250
DC	A	1
Short Circuit Current Rating		
Basic Rating		
SCCR	kA	85
max. Fuse	A	2000
480 V High Fault		
SCCR (fuse)	kA	85
max. Fuse	A	2000
600 V High Fault		
SCCR (fuse)	kA	85
max. Fuse	A	2000

## Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	$I_n$	A	1600
Heat dissipation per pole, current-dependent	$P_{vid}$	W	41
Equipment heat dissipation, current-dependent	$P_{vid}$	W	0
Static heat dissipation, non-current-dependent	$P_{vs}$	W	13
Heat dissipation capacity	$P_{diss}$	W	0
Operating ambient temperature min.		°C	-40
Operating ambient temperature max.		°C	60
IEC/EN 61439 design verification			
10.2 Strength of materials and parts			
10.2.2 Corrosion resistance			
			Meets the product standard's requirements.
10.2.3.1 Verification of thermal stability of enclosures			
			Meets the product standard's requirements.
10.2.3.2 Verification of resistance of insulating materials to normal heat			
			Meets the product standard's requirements.
10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects			
			Meets the product standard's requirements.
10.2.4 Resistance to ultra-violet (UV) radiation			
			Meets the product standard's requirements.
10.2.5 Lifting			
			Does not apply, since the entire switchgear needs to be evaluated.
10.2.6 Mechanical impact			
			Does not apply, since the entire switchgear needs to be evaluated.
10.2.7 Inscriptions			
			Meets the product standard's requirements.
10.3 Degree of protection of ASSEMBLIES			
			Does not apply, since the entire switchgear needs to be evaluated.
10.4 Clearances and creepage distances			
			Meets the product standard's requirements.
10.5 Protection against electric shock			
			Does not apply, since the entire switchgear needs to be evaluated.
10.6 Incorporation of switching devices and components			
			Does not apply, since the entire switchgear needs to be evaluated.
10.7 Internal electrical circuits and connections			
			Is the panel builder's responsibility.
10.8 Connections for external conductors			
			Is the panel builder's responsibility.
10.9 Insulation properties			
10.9.2 Power-frequency electric strength			
			Is the panel builder's responsibility.
10.9.3 Impulse withstand voltage			
			Is the panel builder's responsibility.
10.9.4 Testing of enclosures made of insulating material			
			Is the panel builder's responsibility.
10.10 Temperature rise			
			The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
10.11 Short-circuit rating			
			Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.12 Electromagnetic compatibility			
			Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.13 Mechanical function			
			The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

## Technical data ETIM 7.0

Low-voltage industrial components (EG000017) / Power contactor, AC switching (EC000066)			
Electric engineering, automation, process control engineering / Low-voltage switch technology / Contactor (LV) / Power contactor, AC switching (ecl@ss10.0.1-27-37-10-03 [AAB718015])			
Rated control supply voltage $U_s$ at AC 50HZ		V	230 - 250
Rated control supply voltage $U_s$ at AC 60HZ		V	230 - 250
Rated control supply voltage $U_s$ at DC		V	230 - 250
Voltage type for actuating			AC/DC
Rated operation current $I_e$ at AC-1, 400 V		A	2200
Rated operation current $I_e$ at AC-3, 400 V		A	1600
Rated operation power at AC-3, 400 V		kW	900
Rated operation current $I_e$ at AC-4, 400 V		A	1280
Rated operation power at AC-4, 400 V		kW	750
Rated operation power NEMA		kW	895
Modular version			No
Number of auxiliary contacts as normally open contact			2
Number of auxiliary contacts as normally closed contact			2
Type of electrical connection of main circuit			Rail connection
Number of normally closed contacts as main contact			0

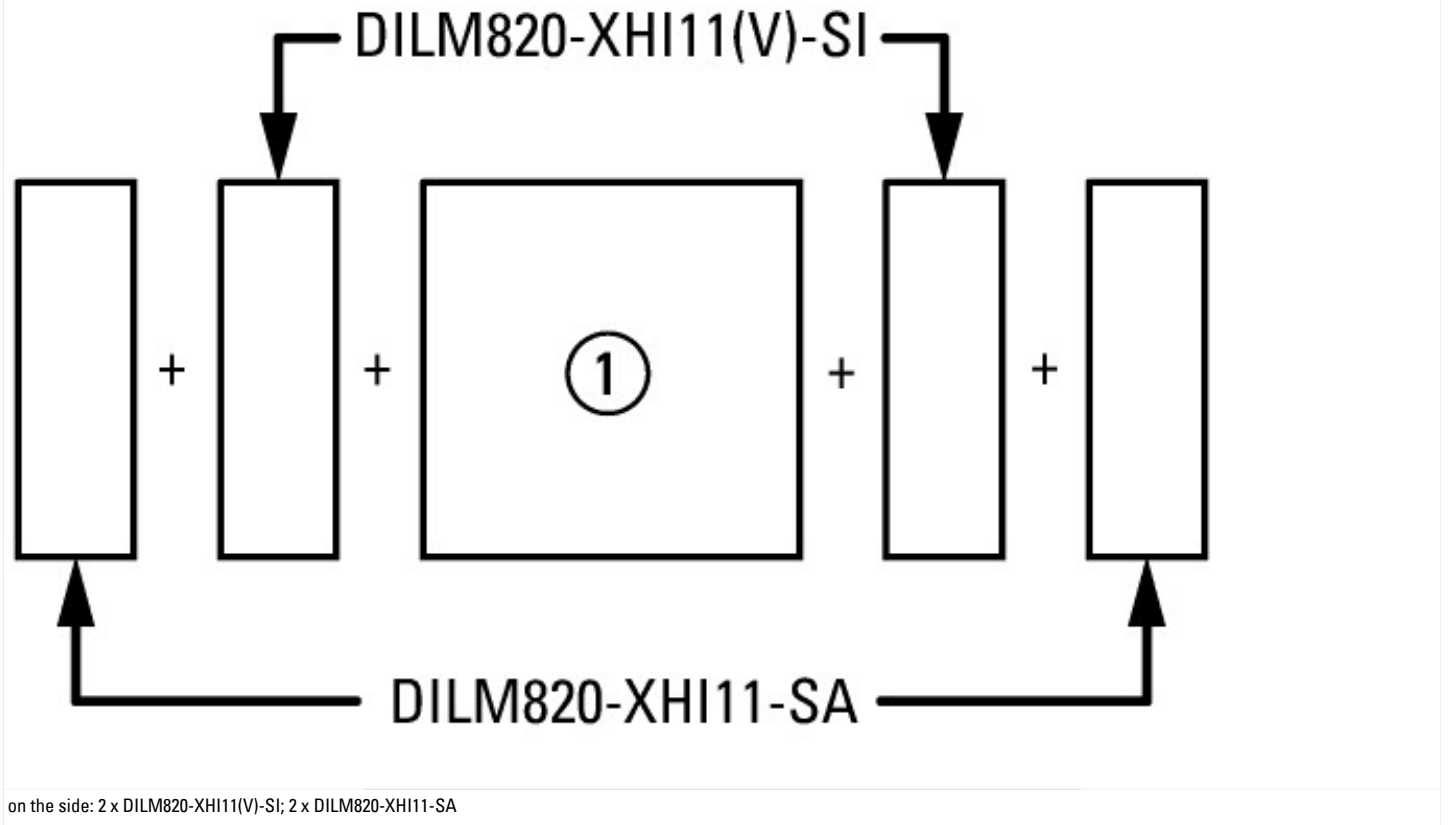
Number of main contacts as normally open contact

3

## Approvals

Product Standards	IEC/EN 60947-4-1; UL 60947-4-1; CSA - C22.2 No. 60947-4-1-14; CE marking
UL File No.	E29096
UL Category Control No.	NLDX
CSA File No.	012528
CSA Class No.	3211-04
North America Certification	UL listed, CSA certified
Specially designed for North America	No

## Characteristics





Normal switching duty  
 Normal AC induction motor  
 Operating characteristics  
 Switch on: from stop  
 Switch off: during run  
 Electrical characteristics:  
 Switch on: up to 6 x Rated motor current  
 Switch off: up to 1 x Rated motor current  
 Utility category  
 100 % AC-3  
 Typical Applications  
 Compressors  
 Lifts  
 Mixers  
 Pumps  
 Escalators  
 Agitators  
 fan  
 Conveyor belts  
 Centrifuges  
 Hinged flaps  
 Bucket-elevator  
 Air-conditioning systems  
 General drives for manufacturing and processing machines





- Extreme switching duty
- Squirrel-cage motor
- Operating characteristics
- Inching, plugging, reversing
- Electrical characteristics
- Make: up to 6 x rated motor current
- Break: up to 6 x rated motor current
- Utilization category
- 100 % AC-4
- Typical applications
- Printing presses
- Wire-drawing machines
- Centrifuges
- Special drives for manufacturing and processing machines

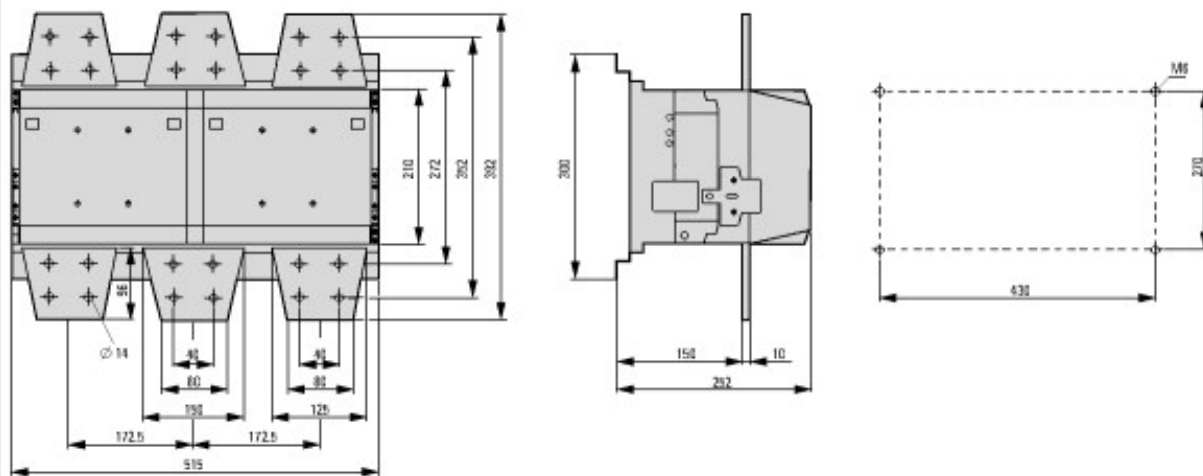


Switching conditions for 3 pole, non-motor loads  
 Operating characteristics  
 Non inductive and slightly inductive loads  
 Electrical characteristics  
 Switch on: 1 x rated operational current  
 Switch off: 1 x rated operational current  
 Utilization category  
 100 % AC-1  
 Typical examples of application  
 Electric heat



Short-time loading, 3-pole  
Time interval between two loading cycles: 15 minutes

## Dimensions



- ① DILM820-XHI11(V)-SI
- ② DILM820-XHI11-SA

DILM1600  
DILH2000, DILH2200

## Assets (links)

### Declaration of CE Conformity

00002865

### Instruction Leaflets

IL03406004Z2018\_05

## Additional product information (links)

IL03406004Z (AWA2100-2109) Contactors > 170 A	
IL03406004Z (AWA2100-2109) Contactors > 170 A	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL03406004Z2019_09.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL03406004Z2019_09.pdf</a>
Motor starters and "Special Purpose Ratings" for the North American market	<a href="http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_3258146.pdf">http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_3258146.pdf</a>
Switchgear of Power Factor Correction Systems	<a href="http://www.moeller.net/binary/ver_techpapers/ver934en.pdf">http://www.moeller.net/binary/ver_techpapers/ver934en.pdf</a>
X-Start - Modern Switching Installations Efficiently Fitted and Wired Securely	<a href="http://www.moeller.net/binary/ver_techpapers/ver938en.pdf">http://www.moeller.net/binary/ver_techpapers/ver938en.pdf</a>
Mirror Contacts for Highly-Reliable Information Relating to Safety-Related Control Functions	<a href="http://www.moeller.net/binary/ver_techpapers/ver944en.pdf">http://www.moeller.net/binary/ver_techpapers/ver944en.pdf</a>
Effect of the Cable Capacitance of Long Control Cables on the Actuation of Contactors	<a href="http://www.moeller.net/binary/ver_techpapers/ver949en.pdf">http://www.moeller.net/binary/ver_techpapers/ver949en.pdf</a>
Switchgear for Luminaires	<a href="http://www.moeller.net/binary/ver_techpapers/ver955en.pdf">http://www.moeller.net/binary/ver_techpapers/ver955en.pdf</a>
Standard Compliant and Functionally Safe Engineering Design with Mechanical Auxiliary Contacts	<a href="http://www.moeller.net/binary/ver_techpapers/ver956en.pdf">http://www.moeller.net/binary/ver_techpapers/ver956en.pdf</a>
The Interaction of Contactors with PLCs	<a href="http://www.moeller.net/binary/ver_techpapers/ver957en.pdf">http://www.moeller.net/binary/ver_techpapers/ver957en.pdf</a>
Busbar Component Adapters for modern Industrial control panels	<a href="http://www.moeller.net/binary/ver_techpapers/ver960en.pdf">http://www.moeller.net/binary/ver_techpapers/ver960en.pdf</a>