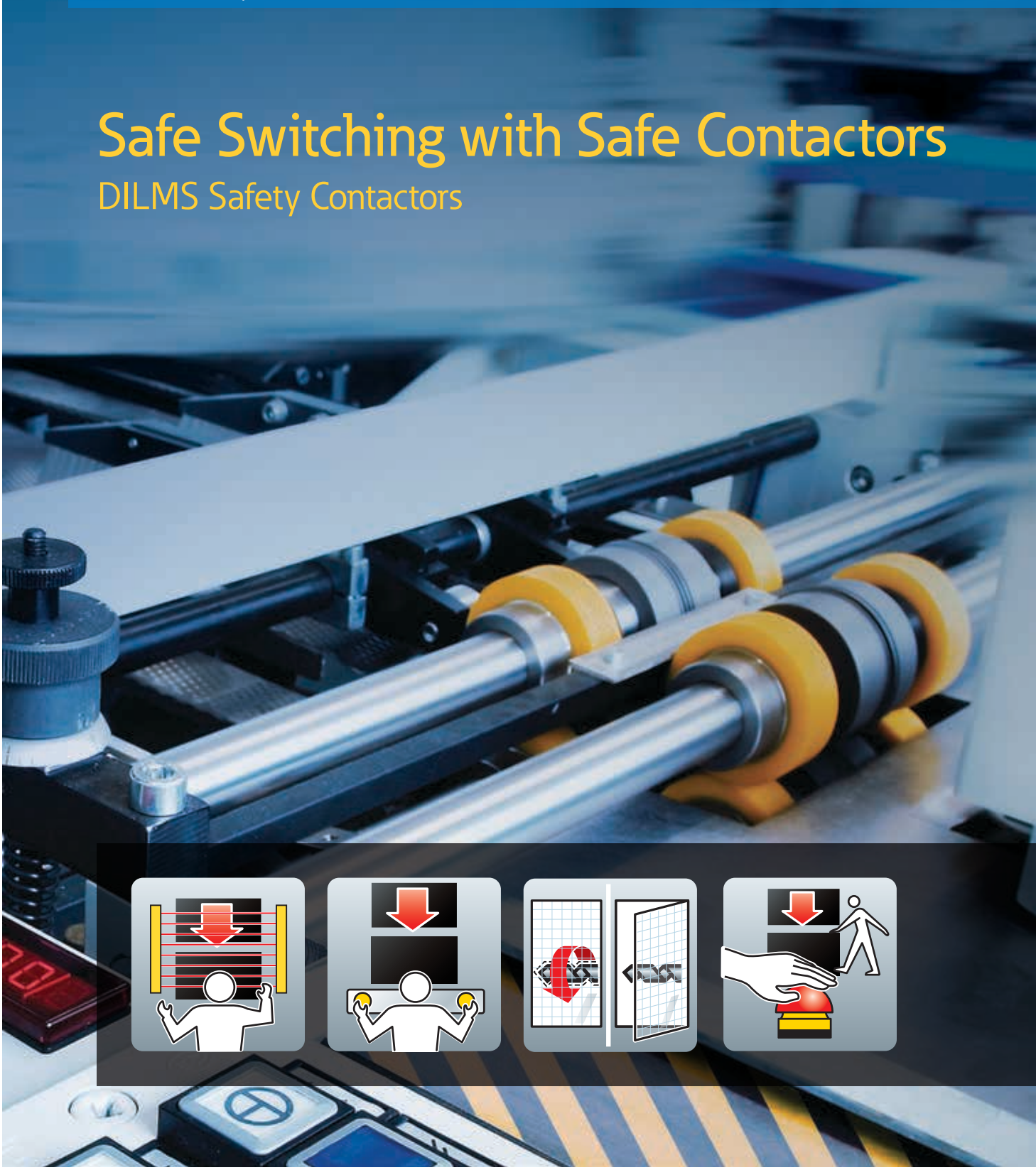
Safe Switching with Safe Contactors

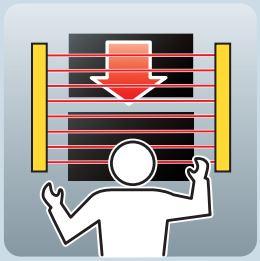
DILMS Safety Contactors



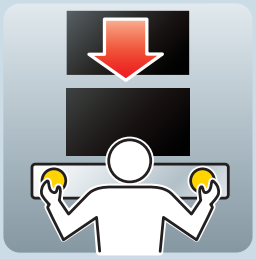
Powering Business Worldwide

The DILMS Safety Contactor is Safe, Proven and Stands out

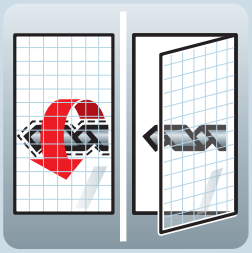
The auxiliary contact blocks of Eaton's DILMS safety contactor are now permanently front-mounted. Their conspicuous yellow color make them highly visible and easily identifiable.



Monitoring of open hazardous areas through light curtains



Safe operation with two-hand control



Monitoring of movable guards via guard monitoring without interlock/guard locking

Emergency-stop circuits

Safety first!

Eaton's DILMS safety contactor is the reliable choice for safety-relevant applications. In these applications, user safety is always the most important aspect.

By combining a proven technology with the most up-to-date safety standards, the DILMS safety contactor is the right choice for any installation.

Features

All versions of the DILMS safety contactor are equipped with a top-mounted auxiliary contact that is non-detachable. The integrated mirror contacts and interlocked opposing contacts make this contactor even safer.

The contactor's yellow cover allows for quick and easy identification. The built-in inspection window directly above the switch-position indicator makes it possible to monitor the operating status at any point in time. This reliably prevents the contactor from being activated manually.

Comprehensive & Targeted

The DILMS range of contactors comprises four different sizes and covers the power range between 7 and 150 A. The DILAS safety relay, available in three different coil voltages, rounds out Eaton's product range in this area.

The following drive options are available:

1. 110V 50Hz, 120V 60Hz
2. 230V 50Hz, 240V 60Hz
3. 24VDC (RDC24)

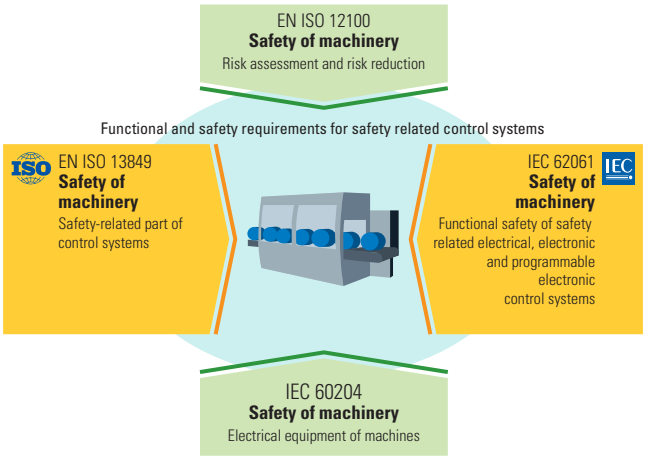
The safety contactors have been approved and certified for global use (including CE, UL, CSA, and SUVA certification).

At a Glance

- Safe status monitoring of the contactor (inspection window) manual activation is not possible
- Eligible to be used for Emergency-stop application with controlled start (category 4)
- Reliable and self-monitoring machine-control circuits
- Interlocking opposing contacts, in line with IEC 60947-5-1, Annex L
- Mirror contacts in line with IEC 60947-4-1, Annex F
- Highlighted in yellow (RAL1004)
- Reliable screw terminals
- Top-mounted and non-detachable auxiliary contact (at the front)
- SUVA - Certified

Safety Applications

Example Applications and safety related characteristics



Functional safety

During it´s entire life cycle a machine poses danger to man, machine and environment. It is therefore necessary to identify these dangers already when the machine is designed and reduce them by means of suitable measures.

The EU Machinery Directive 2006/42/EC stipulates that a machine should not pose any danger. However, as there is no 100% safety in engineering, the aim is to reduce these dangers to a tolerable level or residual risk by means of risk reduction measures.

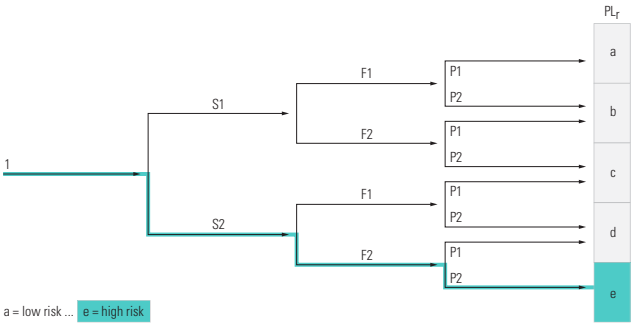
- The overall safety of a machine defines the state in which it can be considered as being free of unwarranted risks to persons or as free of danger
- The functional safety is part of the overall safety of a system which depends on the correct functioning of the safety related systems, other technology and external risk reduction facilities

3 Stages to reduce the risk of a machine

Risk parameters to determine the required PL are the severity of injury, the frequency and/or exposure to hazard and the possibility of avoiding hazard or limiting harm in accordance to EN ISO 13849-1.

The SIL performance is driven by the frequency and duration, the probability of hazard and the avoidance resulting in the risk class CL.

Performance Level ISO EN 13849-1



Risk parameter	
S	Severity of injury
S1	Slight (Normally reversible injury)
S2	Serious (Normally irreversible injury or death)
F	Frequency and/or exposure to hazard
F1	Seldom-to-less-often and/or exposure time is short
F2	Frequent-to-continous and/or exposure time is long
P	Possibility of avoiding hazard or limiting harm
P1	Possible under specific conditions
P2	Scarcely possible

Safety Integrity Level IEC 62061

Frequency and duration, Fr	
≤ 1 hour	5
> 1h - ≤ day	5
> 1 day - ≤ 2 weeks	4
> 2 weeks - ≤ 1 year	3
> 1 year	2

+

Probability of hzd. event, Pr	
Very high	5
Likely	4
Possible	3
Rarely	2
Negligible	1

+

Avoidance, AV	
Impossible	5
Possible	3
Likely	1

=

Class CL
11-13

The result in the example is SIL 3:

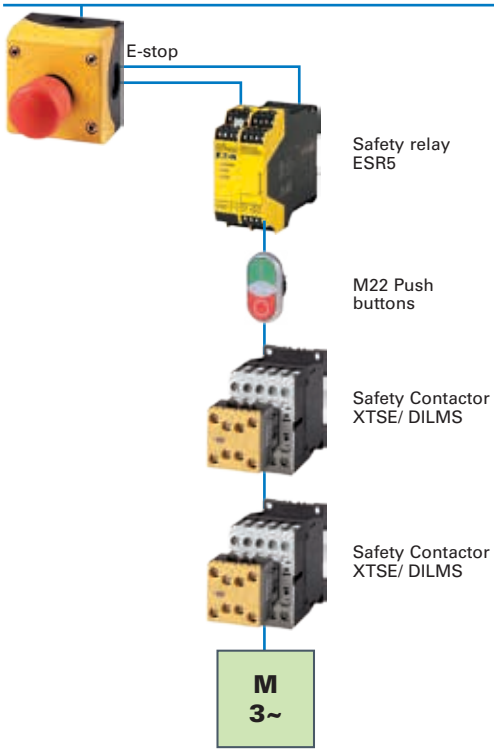
Consequences	Severity	Class CI				
	S	3-4	5-7	8-10	11-13	14-15
Death, losing an eye or arm	4	SIL2	SLI2	SIL2	SIL3	SIL3
Permanent, losing fingers	3		AM	SIL1	SIL2	SIL3
Reversibel, medical attention	2			AM	SIL1	SIL2
Reversibel, first aid	1				AM	SIL1

Safety Applications

Example Applications and safety related characteristics

Sample Application

Emergency Stop dual channel with safety relay ESR5



Safety related characteristics

Independent of the application, safety related characteristics of the components are necessary to calculate the Performance Level or Safety Integrity Level. Tools like SISTEMA from the Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA) provide assistance in the evaluation of safety-related control components and simplifies risk assessment analysis. Applicable values for safety contactors are B10/ B10d.

The Eaton safety contactors provide up to 1.3/ 1.7 million switching cycles until 10% of tested and worn components have failed.

Cat	B	1	2	3	4
PL	a	b	c	d	e
SIL	1	2	3		

Type	**En ISO 13849-1 B10d**	**EN 62061 B10**
DILMS7-12/XTSE007B-012B	1.782.229	1.336.672
DILMS17-32/XTSE018C-032C	966.617	724.963
DILMS40-65/XTSE040D-065D	1.341.161	1.005.871
DILMS80-95/XTSE080F-095F	1.058.707	772.856
DILMS115-150/XTSE115G-150G	1.705.268	1.278.951

Complete units Safety control relay DILAS	Current AC-15 [A]		Auxiliary contacts	AC operation 110 V 50 Hz, 120 V 60 Hz		AC operation 230 V 50 Hz, 240 V 60 Hz		DC operation 24 V DC	
	230 V	400 V		Type	Article no.	Type	Article no.	Type	Article no.
	4	4	4NO,4NC	DILAS-44 (110V50HZ, 120V60HZ)	191700	DILAS-44 (230V50HZ, 240V60HZ)	191739	DILAS-44 (24VDC)	191760
	4	4	4NO,4NC	DILAS-R44 (110V50HZ, 120V60HZ)	191732	DILAS-R44 (230V50HZ, 240V60HZ)	191753	DILAS-R44 (24VDC)	191720

Safety contactors DILMS	Current output		Auxiliary contacts	AC operation 110 V 50 Hz, 120 V 60 Hz		AC operation 230 V 50 Hz, 240 V 60 Hz		DC operation 24 V DC	
	A	kW		Type	Article no.	Type	Article no.	Type	Article no.
	7	3	2NO,3NC	DILMS7-23 (110V50HZ, 120V60HZ)	191701	DILMS7-23 (230V50HZ, 240V60HZ)	191740	DILMS7-23 (24VDC)	191761
	9	4	2NO,3NC	DILMS9-23 (110V50HZ, 120V60HZ)	191702	DILMS9-23 (230V50HZ, 240V60HZ)	191741	DILMS9-23 (24VDC)	191762
	12	5.5	2NO,3NC	DILMS12-23 (110V50HZ, 120V60HZ)	191703	DILMS12-23 (230V50HZ, 240V60HZ)	191742	DILMS12-23 (24VDC)	191709
	7	3	1NO,2NC+ 1NO1NC[1)]	DILMS7-R23 (110V50HZ, 120V60HZ)	191733	DILMS7-R23 (230V50HZ, 240V60HZ)	191754	DILMS7-R23 (24VDC)	191721
	9	4	1NO,2NC+ 1NO1NC [1)]	DILMS9-R23 (110V50HZ, 120V60HZ)	191734	DILMS9-R23 (230V50HZ, 240V60HZ)	191755	DILMS9-R23 (24VDC)	191722
	12	5.5	1NO,2NC+ 1NO1NC [1)]	DILMS12-R23 (110V50HZ, 120V60HZ)	191735	DILMS12-R23 (230V50HZ, 240V60HZ)	191756	DILMS12-R23 (24VDC)	191723
	18	7,5	2NO,3NC	DILMS17-23 (110V50HZ, 120V60HZ)	191704	DILMS17-23 (230V50HZ, 240V60HZ)	191743	DILMS17-23 (RDC24)	191710
	25	11	2NO,3NC	DILMS25-23 (110V50HZ, 120V60HZ)	191705	DILMS25-23 (230V50HZ, 240V60HZ)	191744	DILMS25-23 (RDC24)	191711
	32	15	2NO,3NC	DILMS32-23 (110V50HZ, 120V60HZ)	191706	DILMS32-23 (230V50HZ, 240V60HZ)	191745	DILMS32-23 (RDC24)	191712
	18	7,5	1NO,2NC+ 1NO1NC[1)]	DILMS17-R23 (110V50HZ, 120V60HZ)	191736	DILMS17-R23 (230V50HZ, 240V60HZ)	191757	DILMS17-R23 (RDC24)	191724
	25	11	1NO,2NC+ 1NO1NC[1)]	DILMS25-R23 (110V50HZ, 120V60HZ)	191737	DILMS25-R23 (230V50HZ, 240V60HZ)	191758	DILMS25-R23 (RDC24)	191725
	32	15	1NO,2NC+ 1NO,2NC+[1)]	DILMS32-R23 (110V50HZ, 120V60HZ)	191738	DILMS32-R23 (230V50HZ, 240V60HZ)	191759	DILMS32-R23 (RDC24)	191726
	40	18,5	2NO,2NC	DILMS40-22 (110V50HZ, 120V60HZ)	191707	DILMS40-22 (230V50HZ, 240V60HZ)	191746	DILMS40-22 (RDC24)	191713
	50	22	2NO,2NC	DILMS50-22 (110V50HZ, 120V60HZ)	191708	DILMS50-22 (230V50HZ, 240V60HZ)	191747	DILMS50-22 (RDC24)	191714
	65	30	2NO,2NC	DILMS65-22 (110V50HZ, 120V60HZ)	191727	DILMS65-22 (230V50HZ, 240V60HZ)	191748	DILMS65-22 (RDC24)	191715
	80	37	2NO,2NC	DILMS80-22 (110V50HZ, 120V60HZ)	191728	DILMS80-22 (230V50HZ, 240V60HZ)	191749	DILMS80-22 (RDC24)	191716
	95	45	2NO,2NC	DILMS95-22 (110V50HZ, 120V60HZ)	191729	DILMS95-22 (230V50HZ, 240V60HZ)	191750	DILMS95-22 (RDC24)	191717
	115	55	2NO,2NC	DILMS115-22 (RAC120)	191730	DILMS115-22 (RAC240)	191751	DILMS115-22 (RDC24)	191718
	150	75	2NO,2NC	DILMS150-22 (RAC120)	191731	DILMS150-22 (RAC240)	191752	DILMS150-22 (RDC24)	191719

1) 1NO1NC Electronic compatible

At Eaton, we are solution-driven, supplying energy to a world that is ever more demanding. With over 100 years of expertise in electrical power management, we have the expertise to see beyond today. Core industries all around the globe rely on Eaton and on our pioneering products, comprehensive solutions and engineering services.

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Eaton
Eaton Industries GmbH
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D-53115 Bonn / Germany

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