



Control Panel Technical Guide

How to choose the contactors
for elevator machinery?



> New EN 81-20 standard

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Components for elevator machinery:

Schneider Electric offers a simpler choice in conformance with the new EN 81-20 standard



The new EN 81-20 standard is an update of EN 81-1 and EN 81-2. It takes into account changes with regard to safety in the past 15 years.

Application:

In force since 1st July 2014, it includes a three-year transition period. Elevators built according to the old standards can be sold until 1st June 2016.

Main aspects concerned:

Ventilation, elevator car roof, safety line, operating tests, emergency lighting, suspension, etc.

Electrical aspects (see page 22):

- > Circuit breaker/contactor coordination
- > Utilization categories of contactors
- > Auxiliary contacts of contactors and relays.

Allowance for the EN 81-20 standard can entail a reappraisal of the customary technical options. Aware of this fact, Schneider Electric offers designers selection tables, calculated in accordance with the new standard and recommendations:

- > Protection/control of motors and safety brake
- > Components for the functions of the elevator shaft and car.





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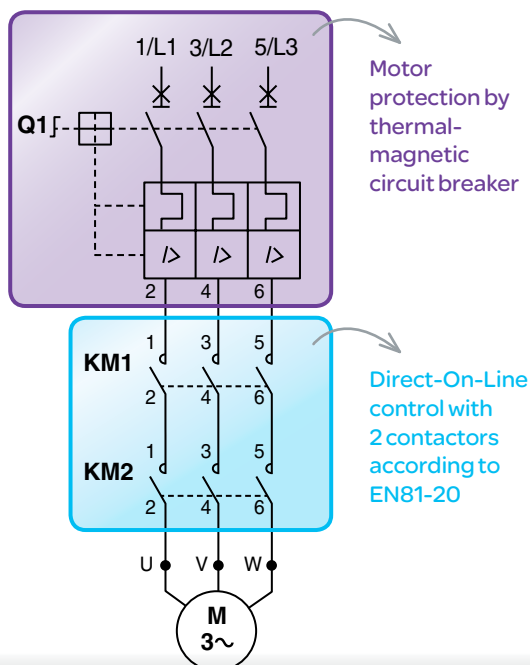


Pump motor control for hydraulic drive

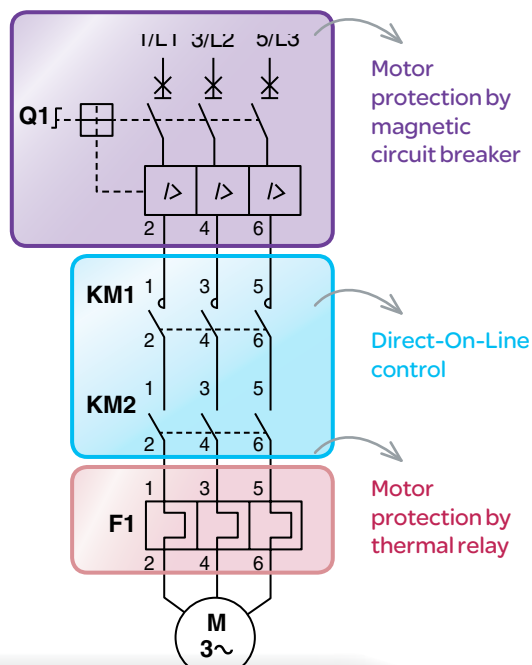
> DIRECT STARTING

Select auxiliary devices p. 17

Solution with circuit breaker only



Solution with circuit breaker + thermal relay



Motor	Thermal-magnetic circuit breaker	Contactors	Magnetic circuit breaker	Thermal relay	Contactors
	(Q1)	(KM1 = KM2)	(Q1)	(F1)	(KM1 = KM2)
Rated Load Amperage (RLA) up to 440 V (A ~)	Indicative corresponding average rated power (Pn) at 400 V (kW)	Selected to ensure 0.5 million cycles 1 million cycles		(class 10 A) + independent mounting accessory	Selected to ensure 0.5 million cycles 1 million cycles
Reference	Reference	Reference	Reference	Reference	Reference
2.7	1.1	GV2ME08	LC1D09••	LC1D09••	LC1D09••
3.6	1.5	GV2ME08	LC1D09••	LC1D09••	LC1D09••
4.9	2.2	GV2ME10	LC1D09••	LC1D09••	LC1D09••
6.5	3	GV2ME14	LC1D09••	LC1D12••	LC1D12••
8.5	4	GV2ME14	LC1D09••	LC1D12••	LC1D12••
11.5	5.5	GV2ME16	LC1D12••	LC1D18••	LC1D18••
15.5	7.5	GV2ME20	LC1D18••	LC1D32••	LC1D32••
22	11	GV2ME22	LC1D25••	LC1D50A••	LC1D50A••
29	15	GV2ME32	LC1D40A••	LC1D65A••	LC1D65A••
35	18.5	GV3P40	LC1D65A••	LC1D80••	LC1D80••

Contactors: replace dots in commercial reference by coil voltage code (above)

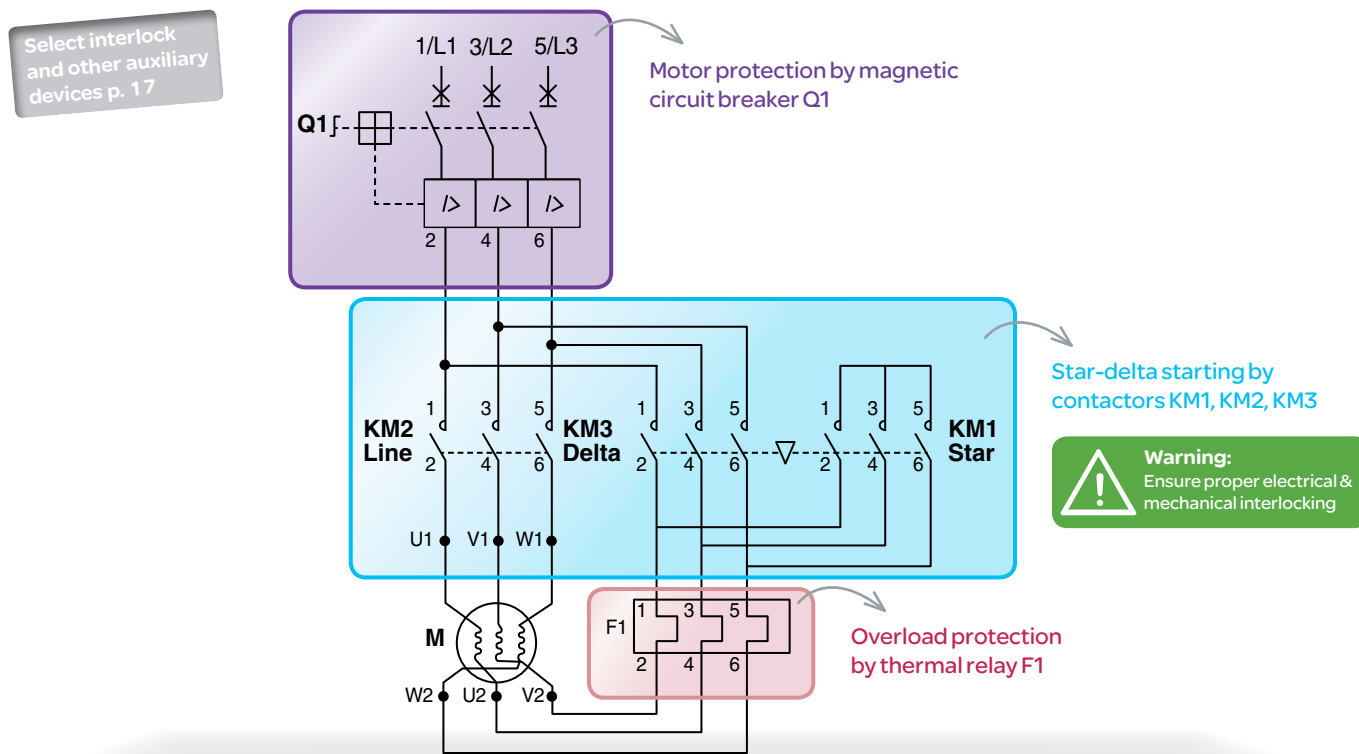
LC1D	12	24	48	110	220	230	240	400	415
50 Hz	-	B5	E5	F5	M5	P5	U5	-	-
60 Hz	-	B6	E6	F6	M6	-	U6	-	-
50/60 Hz	-	B7	E7	F7	M7	P7	U7	V7	N7
DC	JD	BD	-	-	-	-	-	-	-
DC low consumption	JL	BL	-	-	-	-	-	-	-

Product selection according to EN 81-20

- > At least 1 phase controlled by 2 separate contactors
- > Type 1 coordination between contactor and protection
- > Contactor selected for 90% AC3 and 10% AC4; utilization category to ensure 1 million cycles.

Pump motor control for hydraulic drive

> STAR-DELTA STARTING



Motor				Magnetic circuit breaker	Thermal relay	Contactors					
											
				(Q1)	(F1)	(KM2) (KM3) (KM1)					
Rated Load Amperage (RLA) up to 440 V	Indicative corresponding average nominal power (Pn) at 400 V	Indicative nominal current in:		Reference	Under Delta Ctr (class 10 A) + indep. mounting accessory	0.5 million cycles			1 million cycles		
(A ~)	(kW)	Delta wiring (A ~)	Star wiring (A ~)			Line	Delta	Star	Line	Delta	Star
15.5	7.5	8.9	5.2	GV2L20	LRD14 + LAD7B106	LC1D09••	LC1D09••	LC1D09••	LC1D12••	LC1D12••	LC1D09••
22	11	12.7	7.3	GV3L25	LRD21 + LAD7B106	LC1D12••	LC1D12••	LC1D09••	LC1D25••	LC1D25••	LC1D12••
29	15	16.7	9.7	GV3L32	LRD21 + LAD7B106	LC1D18••	LC1D18••	LC1D12••	LC1D32••	LC1D32••	LC1D18••
35	18.5	20.2	11.7	GV3L40	LRD22 + LAD7B106	LC1D25••	LC1D25••	LC1D12••	LC1D40A••	LC1D40A••	LC1D18••
41	22	23.7	13.7	GV3L50	LRD32 + LAD7B106	LC1D32••	LC1D32••	LC1D18••	LC1D65A••	LC1D65A••	LC1D25••
55	30	31.8	18.3	GV3L65	LRD35 + LAD7B106	LC1D50A••	LC1D50A••	LC1D25••	LC1D80••	LC1D80••	LC1D40A••
66	37	38.1	22.0	NS80HMA	LRD350 + LAD96560	LC1D65A••	LC1D65A••	LC1D25••	LC1D115••	LC1D115••	LC1D50A••
80	45	46.2	26.7	NSX100HMA	LRD350 + LAD96560	LC1D80••	LC1D80••	LC1D40A••	LC1D150••	LC1D150••	LC1D65A••
97	55	56.0	32.3	NSX160HMA	LRD365 + LAD96560	LC1D115••	LC1D115••	LC1D65A••	LC1F185••	LC1F185••	LC1D80••
132	75	76.2	44.0	NSX160HMA	LRD3363 + LA7D3064	LC1D150••	LC1D150••	LC1D80••	LC1F185••	LC1F185••	LC1D150••

Contactors: replace dots in commercial reference by coil voltage code (above)

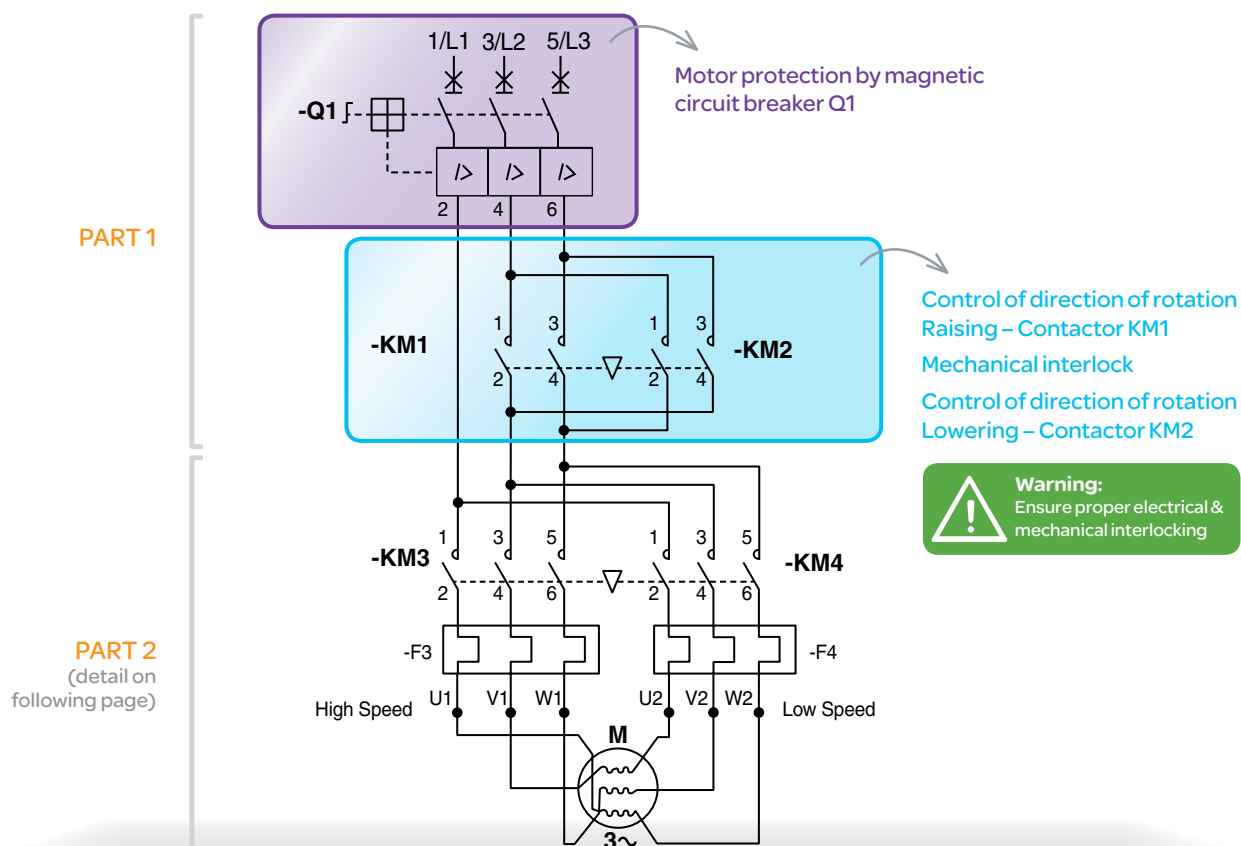
LC1D	12	24	48	110	220	230	240	400	415
Volts									
50 Hz	-	B5	E5	F5	M5	P5	U5	-	-
60 Hz	-	B6	E6	F6	M6	-	U6	-	-
50/60 Hz	-	B7	E7	F7	M7	P7	U7	V7	N7
DC	JD	BD	-	-	-	-	-	-	-
DC low consumption	JL	BL	-	-	-	-	-	-	-

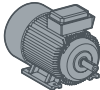
Product selection according to EN 81-20

- > At least 1 phase controlled by 2 separate contactors
- > Type 1 coordination between contactor and protection
- > Contactor selected for 90% AC3 and 10% AC4; utilization category to ensure 1 million cycles.

Two-speed asynchronous motor control

> PART 1: RAISING/LOWERING CONTROL



Motor		Magnetic circuit breaker	Contactors ⁽¹⁾	
				
		(Q1)	(KM1 = KM2)	
Rated Load Amperage (RLA) of the Highest Speed up to 440 V (A ~)	Indicative corresponding average nominal power (Pn) at 400 V (kW)	Reference	Selected to ensure 0.5 million cycles	1 million cycles
8.5	4	GV2L14	2 x LC1D09••	2 x LC1D12••
11.5	5.5	GV2L16	2 x LC1D12••	2 x LC1D18••
15.5	7.5	GV2L20	2 x LC1D18••	2 x LC1D32••
22	11	GV3L25	2 x LC1D25••	2 x LC1D50A••
29	15	GV3L32	2 x LC1D40A••	2 x LC1D65A••
35	18.5	GV3L40	2 x LC1D65A••	2 x LC1D95••
41	22	GV3L50	2 x LC1D65A••	2 x LC1D115••
55	30	GV3L65	2 x LC1D115••	2 x LC1D150••

(1) Select interlocking accessories page 19

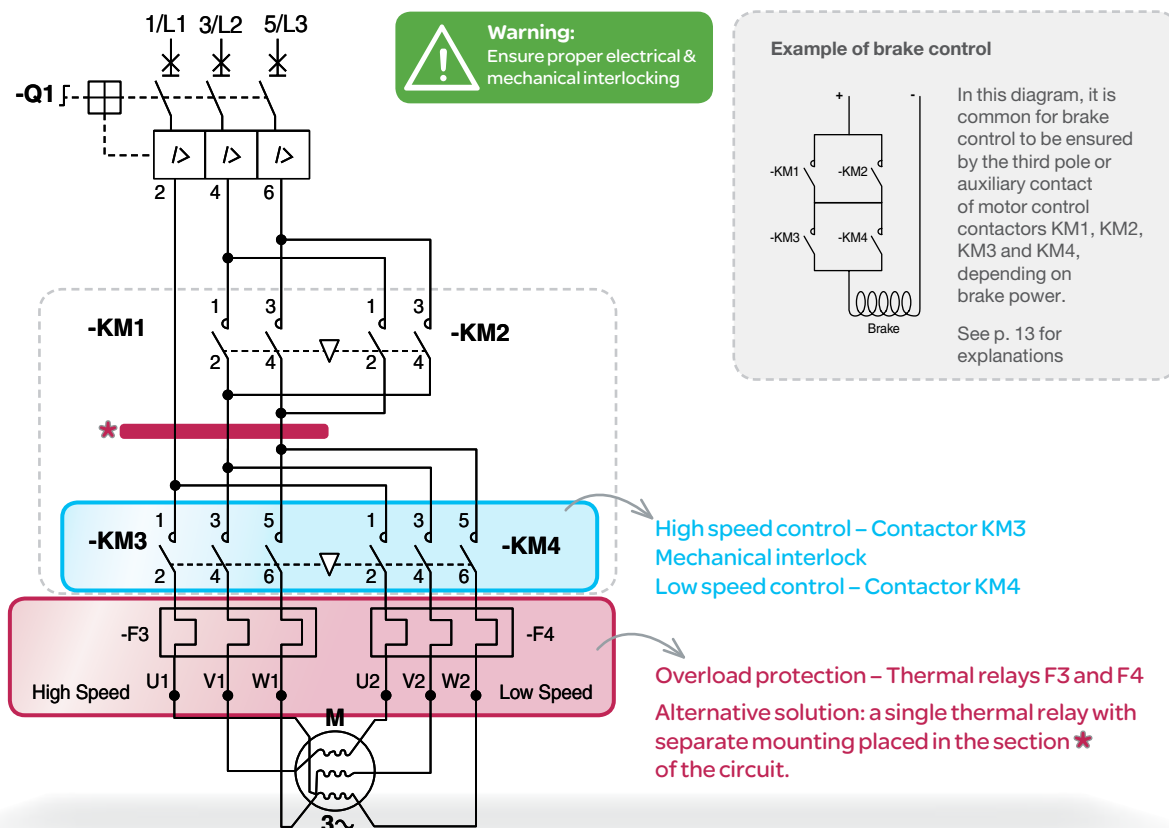
•• Replace dots by coil voltage codes (see table below)

Coil voltage codes (replacing dots in the contactor commercial references)

LC1D	12	24	48	110	220	230	240	400	415
Volts									
50 Hz	-	B5	E5	F5	M5	P5	U5	-	-
60 Hz	-	B6	E6	F6	M6	-	U6	-	-
50/60 Hz	-	B7	E7	F7	M7	P7	U7	V7	N7
DC	JD	BD	-	-	-	-	-	-	-
DC low consumption	JL	BL	-	-	-	-	-	-	-

Two-speed asynchronous motor control

> PART 2: HIGH/LOW SPEED CONTROL - OVERLOAD PROTECTION



Motor		Thermal relay	Contactors ⁽¹⁾ for High-Low Speed control	
				
		(F3 and F4)	(KM3 or KM4)	
Rated Load Amperage (RLA), up to 440 V of the Lowest or the Highest Speed (A ~)	Indicative corresponding average nominal power (Pn) at 400 V (kW)	(class 10 A) + independent mounting accessory	Selected to ensure 0.5 million cycles	1 million cycles
		Reference	Reference	Reference
2.7	1.1	LRD08 + LAD7B106	LC1D09••	LC1D09••
3.6	1.5	LRD08 + LAD7B106	LC1D09••	LC1D09••
4.9	2.2	LRD10 + LAD7B106	LC1D09••	LC1D09••
6.5	3	LRD12 + LAD7B106	LC1D09••	LC1D12••
8.5	4	LRD14 + LAD7B106	LC1D09••	LC1D12••
11.5	5.5	LRD16 + LAD7B106	LC1D12••	LC1D18••
15.5	7.5	LRD21 + LAD7B106	LC1D18••	LC1D32••
22	11	LRD22 + LAD7B106	LC1D25••	LC1D50A••
29	15	LRD32 + LAD7B106	LC1D40A••	LC1D65A••
35	18.5	LRD35 + LAD7B106	LC1D65A••	LC1D95••
41	22	LRD350 + LAD96560	LC1D65A••	LC1D115••
55	30	LRD365 + LAD96560	LC1D115••	LC1D150••

(1) Select interlocking accessories page 19

•• Replace dots by coil voltage codes (see table below)

Coil voltage codes (replacing dots in the contactor commercial references)

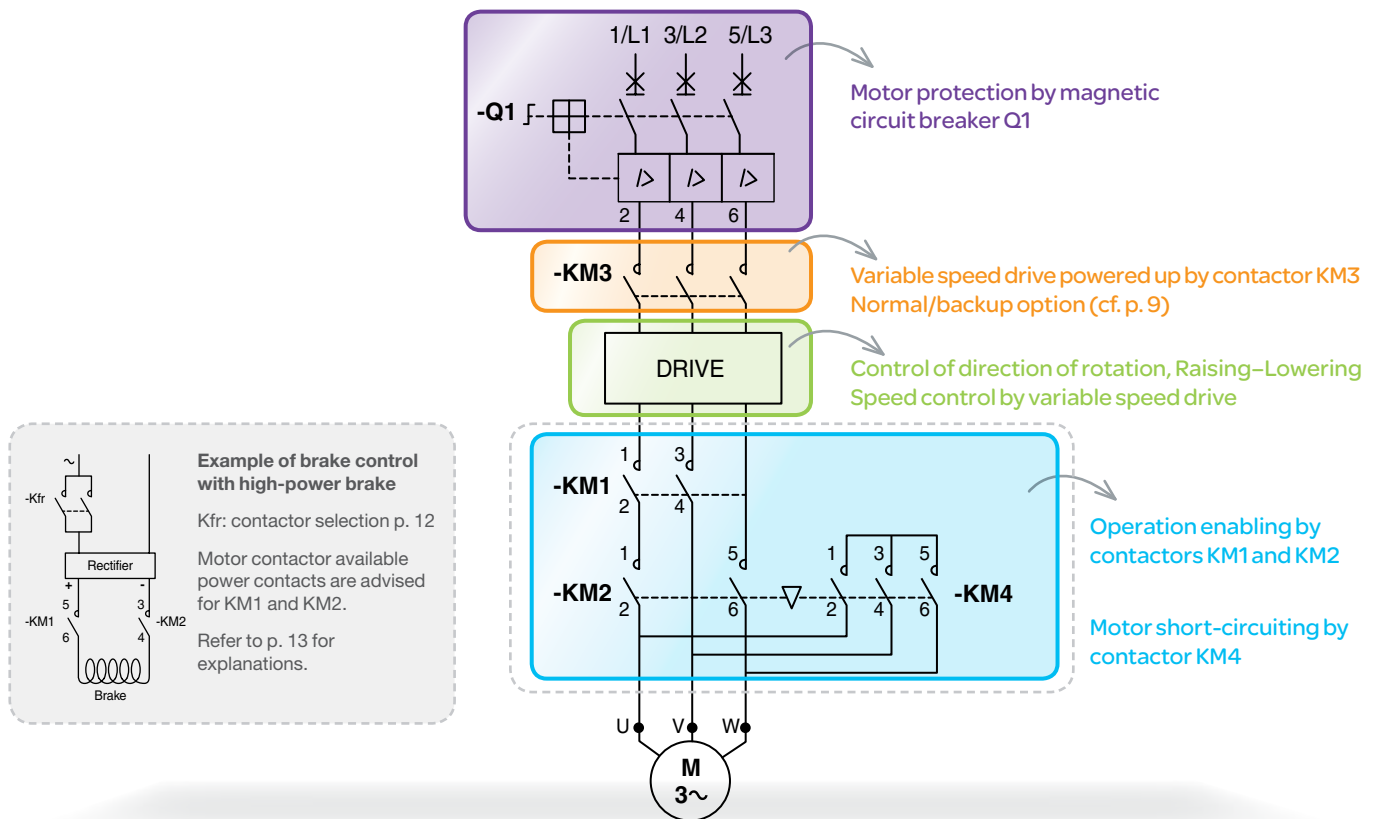
LC1D	12	24	48	110	220	230	240	400	415
Volts									
50 Hz	-	B5	E5	F5	M5	P5	U5	-	-
60 Hz	-	B6	E6	F6	M6	-	U6	-	-
50/60 Hz	-	B7	E7	F7	M7	P7	U7	V7	N7
DC	JD	BD	-	-	-	-	-	-	-
DC low consumption	JL	BL	-	-	-	-	-	-	-

Product selection according to EN 81-20

- > At least 1 phase controlled by 2 separate contactors
- > Type 1 coordination between contactor and protection
- > Contactor selected for 90% AC3 and 10% AC4; utilization category to ensure 1 million cycles.

Synchronous motor control with variable speed drive - Solution 1

> RAISING/LOWERING CONTROL – VARIABLE SPEED DRIVE



Motor			Downstream contactors	Drive		Upstream contactor	Upstream magnetic circuit breaker
			 (KM1 = KM2 = KM4)			 (KM3)	 (Q1)
Rated Load Amperage (RLA)	Indicative corresponding average nominal power (Pn)		3-pole			3-pole	
(A ~)	(kW)	(HP)	Reference	Reference	Line current (A)	Reference (If any)	Reference
Un = 400 V - 3-phase (380...480 V) / 50-60 Hz					At 380 V At 480 V		
10	4	5	LC1D12••	ATV71LD10N4Z	14.1 11.5	LC1D18••	GV2L16/GV2L22
14	5.5	7.5	LC1D18••	ATV71LD14N4Z	20.3 17	LC1D25••	GV2L22
17	7.5	10	LC1D25••	ATV71LD17N4Z	36.6 30	LC1D40A••	GV3L40
27	11	15	LC1D32••	ATV71LD27N4Z	48 39	LC1D50A••	GV3L50
33	15	20	LC1D38••/LC1D40A••	ATV71LD33N4Z	45.5 37.5	LC1D50A••	GV3L50
48	22	30	LC1D50A••	ATV71LD48N4Z	50 42	LC1D50A••/ LC1D65A••	GV3L50/GV3L65
Un = 230 V - 3-phase (200...240 V) / 50-60 Hz					At 200 V At 240 V		
27	5.5	7.5	LC1D32••	ATV71LD27M3	35 30.8	LC1D40A••	GV3L40
33	7.5	10	LC1D38••	ATV71LD33M3	45 39.4	LC1D50A••	GV3L50
54	11	15	LC1D65A••	ATV71LD54M3	53.3 45.8	LC1D65A••	GV3L65
66	15	20	LC1D80••	ATV71LD66M3	71.7 61.6	LC1D80••	GV7RE100 ⁽²⁾
Un = 230 V - 1-phase (200...240 V) / 50-60 Hz					At 200 V At 240 V		
17	4	5	LC1D25••	ATV71LD27M3	34.9 29.9	LC1D40A••	GV3L40
27	5.5	7	LC1D32••	ATV71LD33M3 + line choke ⁽¹⁾	47.3 40.1	LC1D50A••	GV3L50

For other voltages, please consult your Sales Support

(1) Line choke 520 uH VW3A58502

(2) Thermal-magnetic circuit breaker

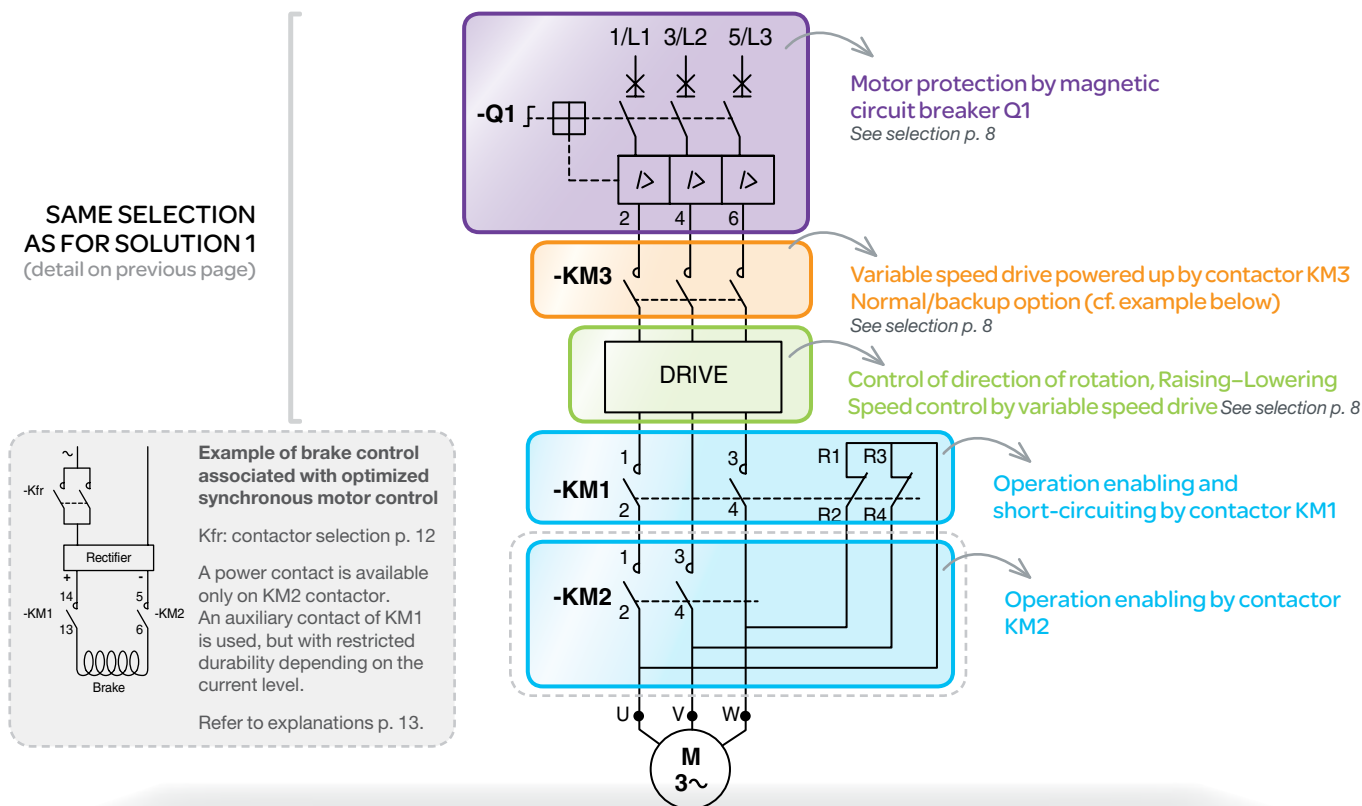
** Replace dots by coil voltage codes (see page 6 for table)

Example of ascending choice of components for 11 kW motor at 400 V: corresponding RLA = 27 A

- > 3 x LC1D32P7 contactors downstream (32 A / 230 V coil) with interlock accessories
- > 1 x ATV71LD27N4Z variable speed drive (output 27 A, input 48 A max.)
- > 1 x LC1D50AP7 contactor upstream (50 A / 230 V coil)
- > 1 x GV3L50 magnetic circuit breaker (50 A)

Synchronous motor control with variable speed drive - Solution 2

> RAISING/LOWERING CONTROL – VARIABLE SPEED DRIVE



Motor			Downstream contactors	
Rated Load Amperage (RLA) (A ~)	Indicative corresponding average nominal power (Pn) (kW) (HP)		(KM2) 3-pole	(KM1) 4-pole (2 NC, 2 NO)
			Reference	Reference
Un = 400 V - 3-phase (380...480 V) / 50-60 Hz				
10	4	5	LC1D12**	LC1D128**
14	5.5	7.5	LC1D18**	LC1D188**
17	7.5	10	LC1D25**	LC1D258**
27	11	15	LC1D32	LC1D40008** ^(a) LC1P40008** ^(b)
33	15	20	LC1D38**/LC1D40A**	LC1D40008** ^(a) LC1P40008** ^(b)
48	22	30	LC1D50A**	LC1D65008** ^(a) LC1P65008** ^(b)
Un = 230 V - 3-phase (200...240 V) / 50-60 Hz				
27	5.5	7.5	LC1D32**	LC1D40008** ^(a) LC1P40008** ^(b)
33	7.5	10	LC1D38**	LC1D40008** ^(a) LC1P40008** ^(b)
54	11	15	LC1D65A**	LC1D65008** ^(a) LC1P65008** ^(b)
66	15	20	LC1D80**	LC1D80008** ^(a) LC1P80008** ^(b)
Un = 230 V - 1-phase (200...240 V) / 50-60 Hz				
17	4	5	LC1D25**	LC1D258**
27	5.5	7	LC1D32**	LC1D40008** ^(a) LC1P40008** ^(b)

Selection of drive, KM3, Q1: see page 8

For other voltages, please consult your Sales Support

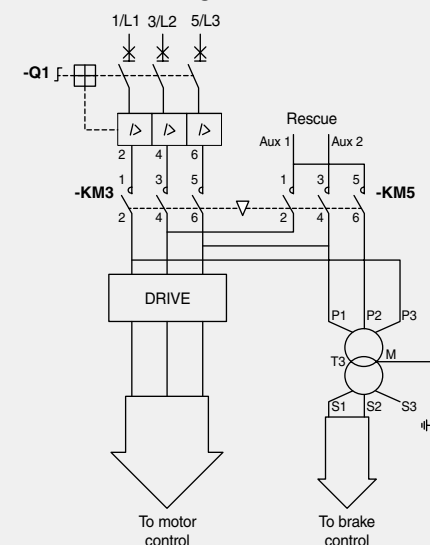
** Replace dots by coil voltage codes (see page 6 for table)

(a) AC coil

(b) DC coil

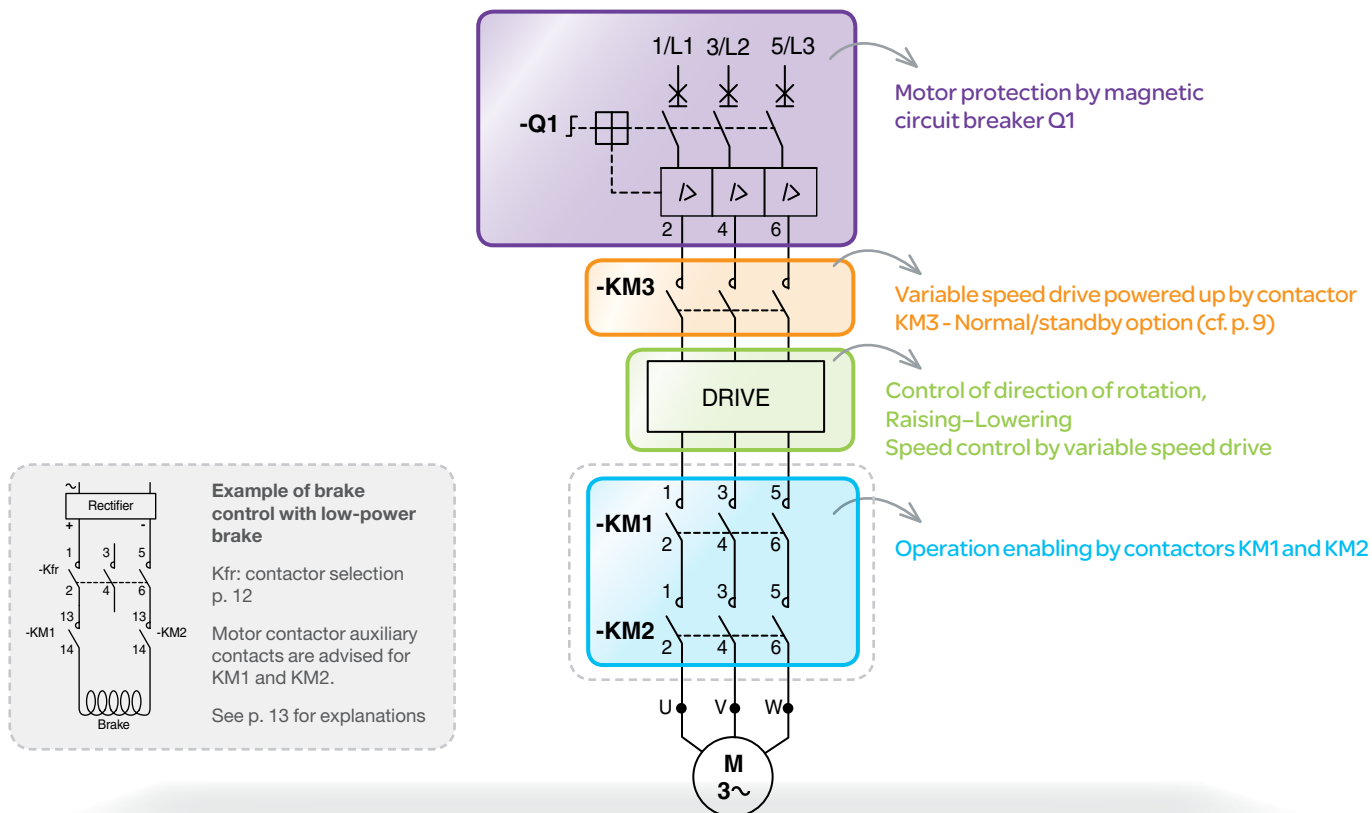
Example of rescue cabling

KM3 and KM5 are reversed contactors with mechanical interlocking



Asynchronous motor control with variable speed drive

> RAISING/LOWERING CONTROL – VARIABLE SPEED DRIVE



Motor	Downstream contactors	Drive	Upstream contactors	Upstream magnetic circuit breaker
	 (KM1) (KM2)		 (KM3)	 (Q1)
Rated Load Amperage (RLA)	Indicative corresponding average nominal power (Pn)	3-pole	3-pole	
(A ~)	(kW) (HP)	Reference	Reference (if any)	Reference
Un = 400 V - 3-phase (380...480 V) / 50-60 Hz		Reference	Reference	Reference
10	4	5	LC1D12**	GV2L16/GV2L22
14	5.5	7.5	LC1D18**	GV2L22
17	7.5	10	LC1D25**	GV3L40
27	11	15	LC1D32**	GV3L50
33	15	20	LC1D38**/LC1D40A**	GV3L50
48	22	30	LC1D50A**	GV3L50/GV3L65
Un = 230 V - 3-phase (200...240 V) / 50-60 Hz		Reference	Reference	Reference
27	5.5	7.5	LC1D32**	GV3L40
33	7.5	10	LC1D38**	GV3L50
54	11	15	LC1D65A**	GV3L65
66	15	20	LC1D80**	GV7RE100 ⁽²⁾
Un = 230 V - 1-phase (200-240) / 50-60 Hz		Reference	Reference	Reference
17	4	5	LC1D25**	GV3L40
27	5.5	7	LC1D32**	GV3L50

For other voltages, please consult your Sales Support

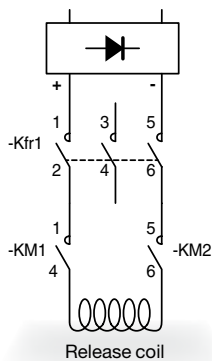
(1) Line choke 520 uH VW3A58502

(2) Thermal-magnetic circuit breaker

Example of ascending choice of components for 11 kW motor at 400 V: corresponding RLA = 27 A

- > 2 x LC1D32P7 contactors downstream (32 A / 230 V coil) with interlock accessories
- > 1 x ATV71LD27N4Z variable speed drive (output 27 A, input 48 A max.)
- > 1 x LC1D50AP7 contactor upstream (50 A / 230 V coil)
- > 1 x GV3L50 magnetic circuit breaker (50 A)

Safety brake control



[Standard EN 81-20]

requires brake control by 2 separate contacts

Braking is obtained when the coil is no longer powered, following the opening of:

> a brake contactor (here denoted Kfr), reflecting action on a chain of safety contacts (e.g., emergency stoppage);

or

> contacts KM1 and KM2 reflecting the state of the motor contactors.

Cf. selection advices and tables for Kfr and KM1, KM2 p. 12 - 14

Control on DC or AC circuit

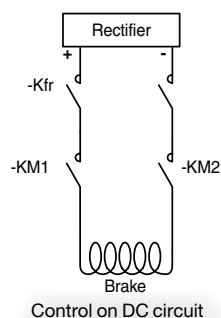
Brake coil must be supplied with DC current from a rectifier.

Depending on the need, the Kfr brake contactor can be wired either:

> To the DC output of the rectifier.

Advantage: quick brake release, useful for emergency stoppage.

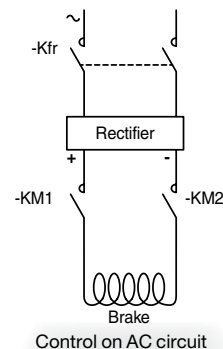
Drawback: strong and noisy arc between contacts when opening, due to the overvoltage caused by the coil.



> To the AC input of the rectifier.

Advantage: no overvoltage applied to Kfr contacts when opening, less noise, better durability.

Drawback: longer braking response time (6-10 times longer than Kfr on DC output).



The safety brake

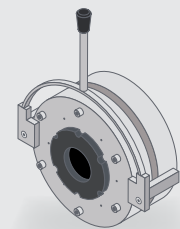
As long as the lifting motor is not powered, its shaft is held locked by the safety brake. This system can keep the car motionless when it is idle and stop it in cases of emergency or a power failure. It should be distinguished from the parachute brake which stops the car in the event of a fall.

Opening of the emergency brake is achieved by a manual device allowing maneuvers to release people if necessary. In normal operation, opening is obtained by powering its control electromagnet with direct current.

2 types of brakes are used

> **Brake without overexcitation:** generally used with installations with an asynchronous motor, because the inertia of the motor and its gearbox intrinsically reduces the car's movements.

> **Brake with overexcitation:** associated with a synchronous motor (without gearbox) which does not restrain the car when it is no longer energized. It is a high-power brake, since overexcitation allows greater speed of brake shoe opening.



Safety brake control

> PART 1 - AUTOMATIC CONTROL

The brake is controlled by a dedicated automatic control system acting on contactor Kfr.

Control takes place in normal operating conditions (motor start/stop) and during service or emergency maneuvers.

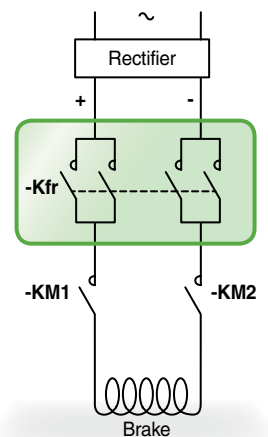
Control contacts on DC circuit

The TeSys K product range is recommended for Kfr

- > Since the current never goes through zero, DC current breaking is difficult for the contactor, which must itself overcome the voltage across the terminals of its contacts.
 - The larger the voltage, the more difficult is circuit breaking.
 - Conversely, for a given brake power, the smaller the voltage the higher the current to be broken, which damages the contactor's pads and reduces contactor lifetime.

In order to design a reliable, robust brake control, we advise you to take the following steps:

- 1 • Provide for a varistor or Transil to be used with the electromagnet coil in order to limit overvoltages.
- 2 • Place contacts in series to reduce the voltage across the terminals of each pole.
Use **table 2, p. 14**, to determine the minimum number of contacts in series to be used for the voltage/power pair of the brake coil to be powered.
- 3 • In the case of high currents and available contacts, reduce the current per contact by combining poles in parallel with each pole in series (cf. figure opposite).
This can extend the contacts' lifetime.



Control contacts on AC circuit

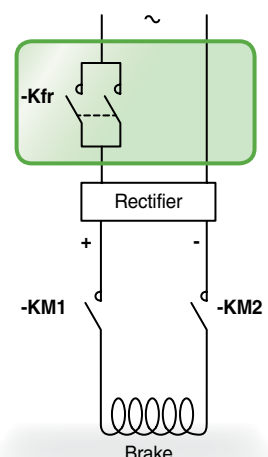
The TeSys K and D product ranges are recommended for Kfr

- > In **table 3, p. 14**, select contactor K or D depending on the endurance wanted.

The endurance of a contactor in AC depends on the current* broken by its contacts, irrespective of the voltage.

- > It is possible to increase the contactor's endurance by dividing the current in the available contacts placed in parallel.

** In case of brake with overexcitation, contactors shall be sized regarding hold current.*



Safety brake control

> PART 2 - SAFETY: COMBINED WITH MOTOR CONTROL

In order to ensure release of the brake at motor start-up, it is common to use a contact of each motor contactor in the coil power supply chain.

The contact used is:

- > Either a power contact
- > Or an auxiliary contact

The choice of one or the other should be made taking into account the current in the brake coil – see examples below.

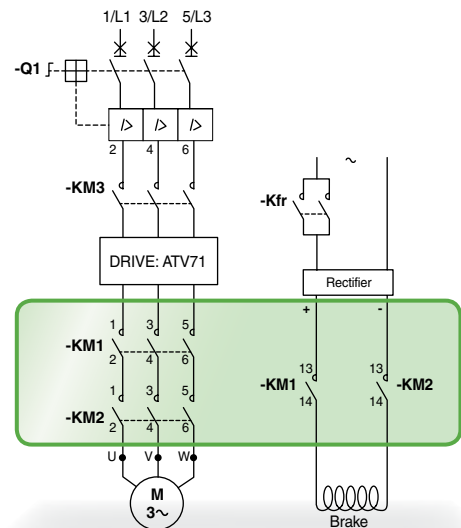
1

Low-current brake coil (within the limits of table 1, p. 14)

→ Use of a motor contactor auxiliary contact*

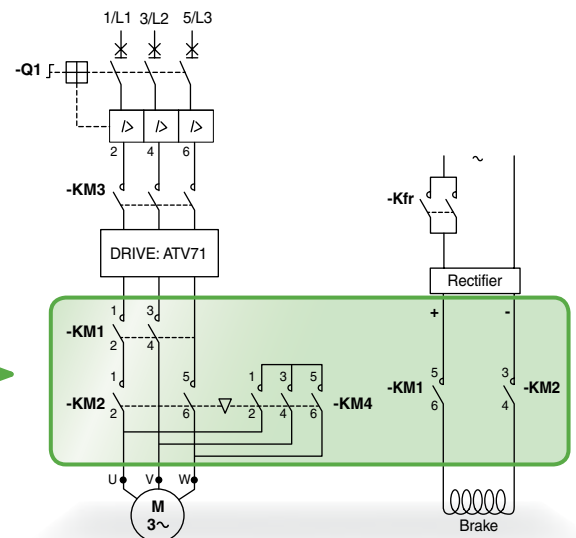
Choice to be preferred, especially if KM1 and KM2 are not heavily loaded (e.g., if the current is mostly made and broken by brake contactor Kfr).

* Embedded auxiliary contacts, auxiliary contact blocks, see page 18.



High-current brake coil (beyond the limits of table 1, p. 14)

→ Use of an available pole of contactors KM1 and KM2



Safety brake control

> CONTACTOR SELECTION

Table 1:

TeSys D auxiliary contact performance for DC control of the brake coil, depending on its broken current and voltage

Number of cycles						
Voltage (V)	1 million		3 millions		10 millions	
	Power (W)	Current (A)	Power (W)	Current (A)	Power (W)	Current (A)
24	96	4.0	48	2.0	14	0.6
48	76	1.6	38	0.8	12	0.3
125	76	0.6	38	0.3	12	0.1
250	76	0.3	32	0.1	-	-
440	44	0.1	-	-	-	-

Table 2:

TeSys K contactor performance for DC control of the brake coil, depending on voltage, broken current and number of contacts in series

Number of cycles		0.5 million				1 million			
Voltage (V)	Connected in series	LP1K06		LP1K09		LC1K06 / LC1P06		LC1K09 / LC1P09	
		P (W)	I (A)	P (W)	I (A)	P (W)	I (A)	P (W)	I (A)
24	1	41	1.69	46	1.92	30	1.25	34	1.43
	2	57	2.36	65	2.69	42	1.75	48	2.00
	3	74	3.11	85	3.54	55	2.3	63	2.62
	4	-	-	111	4.62	-	-	82	3.42
48	1	40	0.84	46	0.96	30	0.63	34	0.72
	2	57	1.20	65	1.36	43	0.9	49	1.03
	3	73	1.53	84	1.74	55	1.15	63	1.31
	4	-	-	109	2.27	-	-	82	1.71
75	1	35	0.47	40	0.53	30	0.4	34	0.46
	2	48	0.64	55	0.73	41	0.55	47	0.63
	3	61	0.82	70	0.93	52	0.7	60	0.80
	4	-	-	95	1.27	-	-	81	1.08
125	1	35	0.28	40	0.32	30	0.24	34	0.27
	2	48	0.41	58	0.47	41	0.35	50	0.40
	3	61	0.56	80	0.64	52	0.48	68	0.55
	4	-	-	97	0.77	-	-	83	0.66
220	1	36	0.17	41	0.19	28	0.13	33	0.15
	2	51	0.23	57	0.26	40	0.18	45	0.21
	3	67	0.30	76	0.35	53	0.24	60	0.27
	4	-	-	102	0.46	-	-	80	0.36

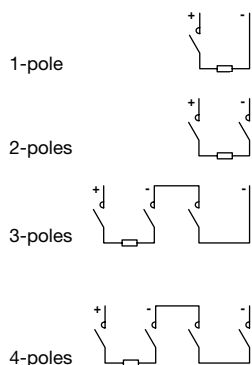


Table 3:

TeSys K and D contactor performance for AC control of the brake coil, depending on broken current

Number of cycles				
	1 million	2 millions	5 millions	10 millions
LC1K06 or LP1K06	6.00	4.50	2.50	1.60
LC1K09 or LP1K09	9.00	6.70	3.90	2.60
LC1D09	-	9.00	4.80	3.20





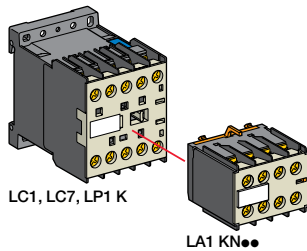


Electrical accessories

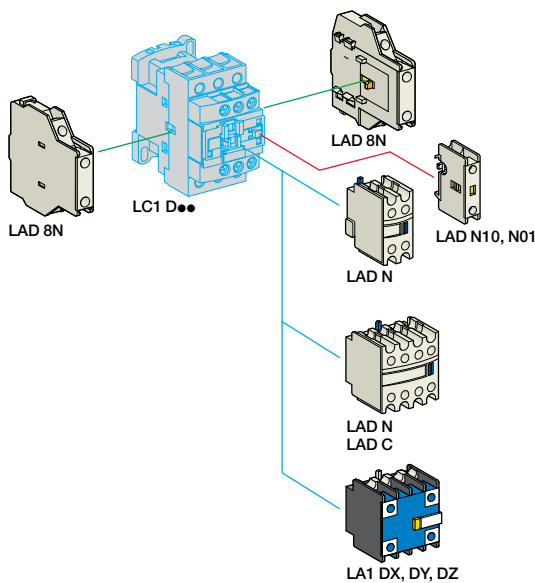
Auxiliary contact blocks

> TeSys K, D

The TeSys product range offers numerous possibilities for adding auxiliary contacts, allowing monitoring of the state of contactors, to be incorporated, for example, in a safety chain.



Combination of auxiliary contact blocks with a TeSys K contactor



Combination of auxiliary contact blocks with a TeSys D contactor



LADN22S
TeSys D contact block, for a chain of safety contacts

Auxiliary contact blocks for TeSys K and D contactors

Clip-on mounting	Number of contacts per block	Composition		Reference with screw clamp terminals ⁽¹⁾	
		Normally open	Normally closed	TeSys D	TeSys K
Front	1	1	-	LADN10	-
		-	1	LADN01	-
	2	1	1	LADN11	LA1KN11
		2	-	LADN20	LA1KN20
		-	2	LADN02	LA1KN02
	4	2	2	LADN22	LA1KN22 ⁽²⁾
		2	2	LADN22S ⁽³⁾	-
		1	3	LADN13	LA1KN13 ⁽²⁾
		4	-	LADN40	LA1KN40 ⁽²⁾
		-	4	LADN04	LA1KN04 ⁽²⁾
Side	2	3	1	LADN31	LA1KN31 ⁽²⁾
		1	1	LAD8N11	-
		2	-	LAD8N20	-
		-	2	LAD8N02	-

(1) See control and protection component catalog for more connector type references

(2) Not available for low-consumption contactors

(3) With red cover for safety chains.

Sealed auxiliary contact blocks for TeSys D contactors

Clip-on mounting	Number of contacts per block	Composition		Normally open		Normally closed	Ref. with screw clamp terminal
		Protected Normally Closed	Protected Normally Open				
Front	2	-	2	-	-	-	LA1DX20
		1	1	-	-	-	LA1DX11
		2	-	-	-	-	LA1DX02
		-	2	2	-	-	LA1DY20
	4	-	2	-	2	-	LA1DZ40
		-	2	-	1	1	LA1DZ31

Characteristics of auxiliary contacts

	U min	I min	Ue	I max	F
	V	mA	V		Hz
				(Ie)	
LA1DY	3	0.3	24	50 mA	-
LA1DX	3	0.3	50	500 mA	-
LA1DY					
LA1DZ (protected)					
				(Ith)	
LA1DZ (not protected)	17	5	690	10 A	25...400
LADN					
LADC					
LAD8					
LA1KN...					
TeSys D aux. contacts	17	5	690	10 A	25...400

Interlocking accessory kits

> TeSys D

The table below summarizes all the interlocking accessories useful for star/delta and reversing mounting kits.

Contactor	Mechanically interlockable		Electrically interlockable		Electrical and mechanical interlock	
	With:	Using: (AC)	With:	Using:	With:	Using:
LC1D09	D09, D12, D18	LAD9V2	D09, D12, D18	LAD9V1	-	-
LC1D12	D09, D12, D18	LAD9V2	D09, D12, D18	LAD9V1	-	-
LC1D18	D09, D12, D18	LAD9V2	D09, D12, D18	LAD9V1	-	-
LC1D25	D25, D32, D38	LAD9V2	D25, D32, D38	LAD9V1	-	-
LC1D32	D25, D32, D38	LAD9V2	D25, D32, D38	LAD9V1	-	-
LC1D38	D25, D32, D38	LAD9V2	D25, D32, D38	LAD9V1	-	-
LC1D40A	D40A, D50A, D65A	LAD4CM	All	(1)	-	-
LC1D50A	D40A, D50A, D65A	LAD4CM	All	(1)	-	-
LC1D65A	D40A, D50A, D65A	LAD4CM	All	(1)	-	-
LC1D80	D80, D95	LA9D50978 (-) / LA9D80978 (DC)	All	(1)	D80, D95	LA9D4002(-) / LAD8002 (DC)
LC1D95	D80, D95	LA9D50978	All	(1)	D80, D95	LA9D4002(-) / LAD8002 (DC)
LC1D115	-	-	All	(1)	D115, D150	LA9D11502
LC1D150	-	-	All	(1)	D115, D150	LA9D11502

Contactor	Star/Delta Mounting kit ⁽²⁾		Reversing Mounting kit	
	With:	Using:	With:	Using:
LC1D09	D09, D12	LAD91217	D09	LAD9R1V ⁽³⁾ / LAD9R1 ⁽⁴⁾
LC1D12	D09, D12	LAD91217	D12	LAD9R1V ⁽³⁾ / LAD9R1 ⁽⁴⁾
LC1D18	D18, D25, D32, D38	LAD93217	D18	LAD9R1V ⁽³⁾ / LAD9R1 ⁽⁴⁾
LC1D25	D18, D25, D32, D38	LAD93217	D25	LAD9R1V ⁽³⁾ / LAD9R1 ⁽⁴⁾
LC1D32	D18, D25, D32, D38	LAD93217	D32	LAD9R1V ⁽³⁾ / LAD9R1 ⁽⁴⁾
LC1D38	D18, D25, D32, D38	LAD93217	D38	LAD9R1V ⁽³⁾ / LAD9R1 ⁽⁴⁾
LC1D40A	D40A, D50A, D65A	LAD9SD3	D40A	LAD9R3 ⁽⁵⁾
LC1D50A	D40A, D50A, D65A	LAD9SD3	D50A	LAD9R3 ⁽⁵⁾
LC1D65A	-	-	D65A	LAD9R3 ⁽⁵⁾
LC1D80	D80, D95	LA9D8017	-	-
LC1D95	D80, D95	LA9D8017	-	-

(1) Customer cabling

(2) Mounting kit comprising:

- 1 time-delay contact block LAD S2 (D09...D80) (3)
- Power-circuit connections (D09...D80)
- Hardware required for fixing the contactors on the mounting plate (LC1D80)
- 1 mechanical interlock for LAD91217, LAD93217, LAD9SD3
- 1 electrical interlock for LAD91217, LAD93217
- 1 specific part in LAD93217 to associate contactors of different sizes

(3) Mounting kit comprising:

- A mechanical interlock LAD 9V2 with electrical interlocking LAD 9V1
- A set of power connections LAD 9V5 (parallel) and LAD 9V6 (reversing)

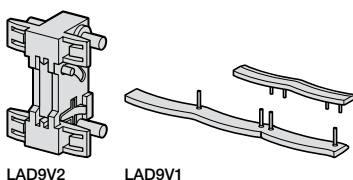
(4) Mounting kit comprising:

- A mechanical interlock LAD 9V2 without electrical interlocking
- A set of power connections LAD 9V5 (parallel) and LAD 9V6 (reversing)

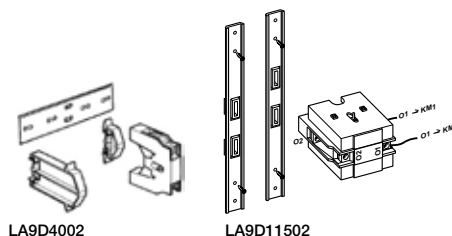
(5) Mounting Kit comprising:

- A mechanical interlock LAD 4CM
- A set of power connections LA9 D65A69

Mechanical interlock



Electro-mechanical interlock



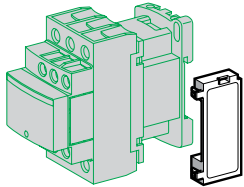
Mounting kit



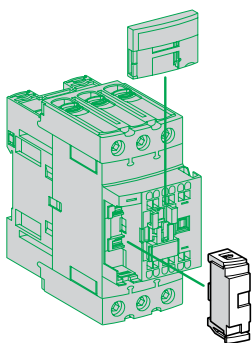
Filters and diodes for contactor coils

> TeSys D

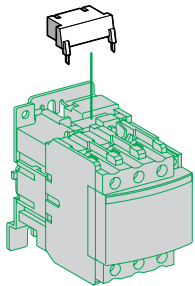
Accessories to improve control circuit operation.



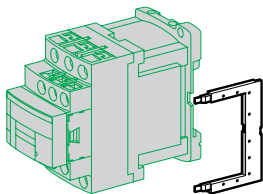
LAD 4●●



LAD 4RC3●, LAD 4V3●,
LAD 4D3U, LAD 4T3●



LAD 4●●



LAD 4DDL or LAD 4TDL

RC circuits (Resistor-Capacitor)

Effective protection for circuits highly sensitive to "high frequency" interference.

For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5% total harmonic distortion. Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max.

Slight increase in drop-out time (1.2 to 2 times the normal time).

Mounting	For use with contactor ⁽¹⁾		Reference	
	Rating	Type V ~ V ---		
Clip-on side mounting ⁽³⁾	D09...D38 (3P)	24...48	-	LAD4RCE
	DT20...DT40	50...127	-	LAD4RCG
		110...250	-	LAD4RCU
Clip-on front mounting ⁽³⁾	D40A...D65A (3P)	24...48	-	LAD4RC3E
	DT60A...DT80A (4P)	50...127	-	LAD4RC3G
		110...240	-	LAD4RC3U
		380...415	-	LAD4RC3N
Screw fixing ⁽⁴⁾	D80...D150 (3P)	24...48	-	LA4DA2E
	D40...D115 (4P)	50...127	-	LA4DA2G
		110...240	-	LA4DA2U
		380...415	-	LA4DA2N

Varistors (peak limiting)

Protection provided by limiting the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times the normal time).

Clip-on side mounting ⁽³⁾	D09...D38 (3P)	24...48	-	LAD4VE
	DT20...DT40	50...127	-	LAD4VG
		110...250	-	LAD4VU
Clip-on front mounting ⁽³⁾	D40A...D65A (3P)	24...48	24...48	LAD4V3E
	DT60A...DT80A (4P)	50...127	50...127	LAD4V3G
		110...250	110...250	LAD4V3U
Screw fixing ⁽⁴⁾	D80...D115 (3P)	24...48	-	LA4DE2E
	D80...D115 (4P)	50...127	-	LA4DE2G
		110...250	-	LA4DE2U
	D80...D95 (3P)	-	24...48	LA4DE3E
	D80 (4P)	-	50...127	LA4DE3G
		-	110...250	LA4DE3U

Flywheel diodes

No overvoltage or oscillating frequency. Increase in drop-out time (6 to 10 times the normal time). Polarized component.

Clip-on side mounting ⁽³⁾	D09...D38 (3P) DT20...DT40	-	24...250	LAD4DDL
Clip-on front mounting ⁽³⁾	D40A...D65A (3P) DT60A...DT80A (4P)	-	24...250	LAD4D3U
Screw fixing ⁽⁴⁾	D80 and D95 (3P) D40...D80 (4P)	-	24...250	LA4DC3U

Bidirectional peak limiting diodes

Protection provided by limiting the transient voltage to 2 Uc max.

Maximum reduction of transient voltage peaks.

Clip-on side mounting ^{(3) (5)}	D09...D38 (3P)	24	-	LAD4TB
	DT20...DT40 (4P) ⁽²⁾	-	24	LAD4TBDL
		72	-	LAD4TS
		-	72	LAD4TSDL
		-	125	LAD4TGD
		-	250	LAD4TUDL
Clip-on front mounting ⁽³⁾	D40A...D65A (3P)	12...24	12...24	LAD4T3B
	DT60A...DT80A (4P) ⁽²⁾	25...72	25...72	LAD4T3S
		73...125	73...125	LAD4T3G
		126...250	126...250	LAD4T3U
		251...440	251...440	LAD4T3R
		-	600	LAD4TXDL
Screw fixing ⁽⁴⁾	D80...D95 (3P)	12...24	12...24	LA4DB2B
	D40...D80 (4P)	25...72	25...72	LA4DB2S
		-	24	LA4DB3B
		-	72	LA4DB3S

(1) For satisfactory protection, a suppressor module must be fitted across the coil of each contactor.

(2) From D09 to D65A and from LC1 DT20 to DT80A, DC and low-consumption 3-pole contactors are fitted with a built-in bidirectional peak limiting diode suppressor as standard. This bidirectional peak limiting diode is removable and can therefore be replaced by the user. (See reference above). If a DC or low-consumption contactor is used without suppression, the standard suppressor should be replaced with a blanking plug (reference LAD 9DL for LC1 D09 to D38 and LC1 DT20 to DT40; reference LAD 9DL3 for LC1 D40A to D65A and LC1 DT60A to DT80A).

(3) Clipping-on establishes electrical connection. The overall size of the contactor remains unchanged.

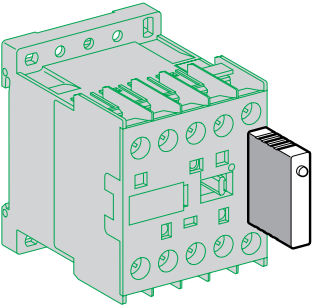
(4) Mounting at the top of the contactor on coil terminals A1 and A2.

(5) To install these accessories, the existing suppression device must first be removed.

Filters and diodes for contactor coils

> TeSys K

Accessories to improve control circuit operation.



LA4 K●●●

Suppressor modules incorporating LED indicator				
Mounting and connection	Type	For voltages	Sold in lots of	Unit reference
Clip-on fixing on the front of contactors LC1 and LP1, with locating device. No tools required.	Varistor ⁽¹⁾	~ and --- 12...24 V	5	LA4KE1B
		~ and --- 32...48 V	5	LA4KE1E
		~ and --- 50...129 V	5	LA4KE1FC
		~ and --- 130...250 V	5	LA4KE1UG
	Diode + Zener diode ⁽²⁾	--- 12...24 V	5	LA4KC1B
		--- 32...48 V	5	LA4KC1E
	RC ⁽³⁾	~ 220...250 V	5	LA4KA1U

(1) Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).

(2) No overvoltage or oscillating frequency.
Polarized component.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).

(3) Protection by limiting the transient voltage to 3 Uc max. and limitation of the oscillating frequency.
Slight increase in drop-out time (1.2 to 2 times the normal time).





Technical supplements

Relays and contactors

New features of Standard EN81-20 §5.10.3.1

Control contactors - motor

1 – Type 1 coordination: required with the upstream circuit breaker

"The main contactors with their associated short-circuit protective devices shall have type "1" coordination in accordance with EN 60947-4-1:2010, 8.2.5.1".

Type 1 coordination: Any short circuit downstream of the combined circuit breaker/contactor shall present no risk for the operator and the installation. Restarting will require servicing for repair or replacement of the contactor.

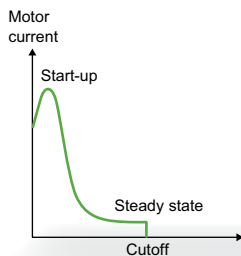
→ The selection tables proposed in this guide take into account the type 1 coordination requirement.

2 – Class of use: AC-3 & AC-4

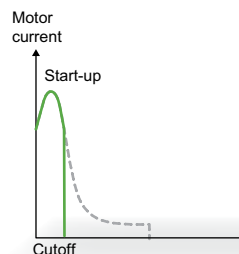
"Main contactors directly controlling motors shall, in addition, allow 10% of starting operations to be performed as inching/jogging, i.e. 90% AC-3 + 10% AC-4".

The requirement of contactor compatibility with the class of use is explained.

→ The selection tables proposed in this guide take into account the class of use requirement: 90% AC-3 + 10% AC-4.



A contactor selected in **Class AC-3** can only break the steady-state current. Breaking at start-up shall be an exceptional event.



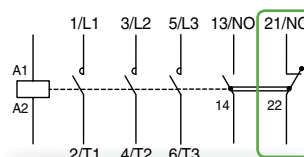
A contactor selected in **Class AC-4** can only break the starting current systematically.

3 – Mirror contacts and mechanically linked contacts

1. "These contactors shall have mirror contact(s) according to EN 60947-4-1:2010, Annex F [...]"..
2. "For the main contactors, [...] contactor relays, relays [...], it is necessary [...] that
 - a. auxiliary contacts of main contactors are mechanically linked contact elements according to Annex L of EN 60947-5-1:2004;
 - b. contactor relays comply with Annex L of EN 60947-5-1:2004;
 - c. relays comply with EN 50205, in order to ensure that any make contact(s) and any break contact(s) cannot be in closed position simultaneously."

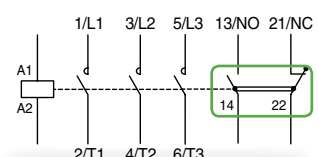
Mirror contacts:

This is a NC contact identified by a dot. It is linked to the power contacts and can **never** be closed so long as a NO power contact is closed.



Mechanically linked contacts:

A direct mechanical link the NO and NC auxiliary contacts. It prevents a simultaneously open condition of the 2 types of contacts.



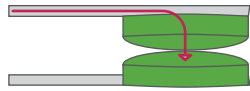
→ The contactors, relays and auxiliary contact blocks of the TeSys D range include mirror contacts and mechanically linked contacts.

Relays and contactors

Recommendations



To maintain satisfactory operation of the contacts



> Check the appropriateness of the contacts:

The contacts and the closing pressure are sized according to the contactor rating. It is the arc produced at circuit breaking which "cleans" the contacts.

→ Our selection tables are established to prevent contactor oversizing relative to the need and thus allow cleaning.

> Pay attention to the contacts connected to a PLC input:

The current supplied by the input (I switched) may be very low, a few milliamperes, at a very low voltage ≤ 24 V.

→ The match between the switching characteristics of the auxiliary contacts and the PLC current should be checked carefully.

The series connection of several contacts and large line lengths adversely affect this match.

→ Sealed contacts should be preferred if a cabled combination of contacts is required; otherwise, use intermediate relays of the TeSys CAK or CAD type.

> Make sure to keep the contactors away from dust, moisture and chemical substances.

Contamination can be a cause of thermal overheating and an adversely affected lifetime. Combined with low currents, it can be a cause of non-conducting poles.

1



To prevent contamination of the contacts



> Before assembly, make sure to store the contactors and relays in a clean place.

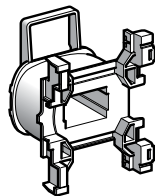
> Preferably choose assembly in an enclosure with a high degree of protection (IP55), equipped with a filter (to be replaced each year).

> Keep the contactors and relays away from the fan's air flow.

> Make sure that the enclosure is kept closed outside of technical inspections.



To maintain satisfactory operation of the coil



> Make sure to maintain coil voltage within the specified tolerances in order to maintain the contact closing speed.

Example: TeSys LC1D09P7 coil

Control limit voltages: $0.8 \dots 1.1 U_c$ for 50 Hz and 60°C.

In practice:

→ Limit the length of the line to limit the voltage drop.

→ Make sure to maintain an acceptable ambient temperature:

A temperature not exceeding the maximum recommended value will keep the coil resistance at a value capable of ensuring satisfactory switching.

Example: Max. ambient temperature 60°C for TeSys LC1D.

Relays and contactors

Recommendations



Choose discreet contactors



The coils of DC control contactors generate no hum.

These contactors should be preferred when the machinery enclosure is mounted on a partition wall common with an apartment.



Identify the relays belonging to safety chains

You have designed a safety chain incorporating standard TeSys D contactors which all comply with the EN 60947-5-1:2004 and EN 50 205 standards, and it is easy to identify them:

> LAD9ET1S, LADET3S or LADET4S red covers on contactors and relays



> LADN22S red auxiliary contact blocks



Additional information

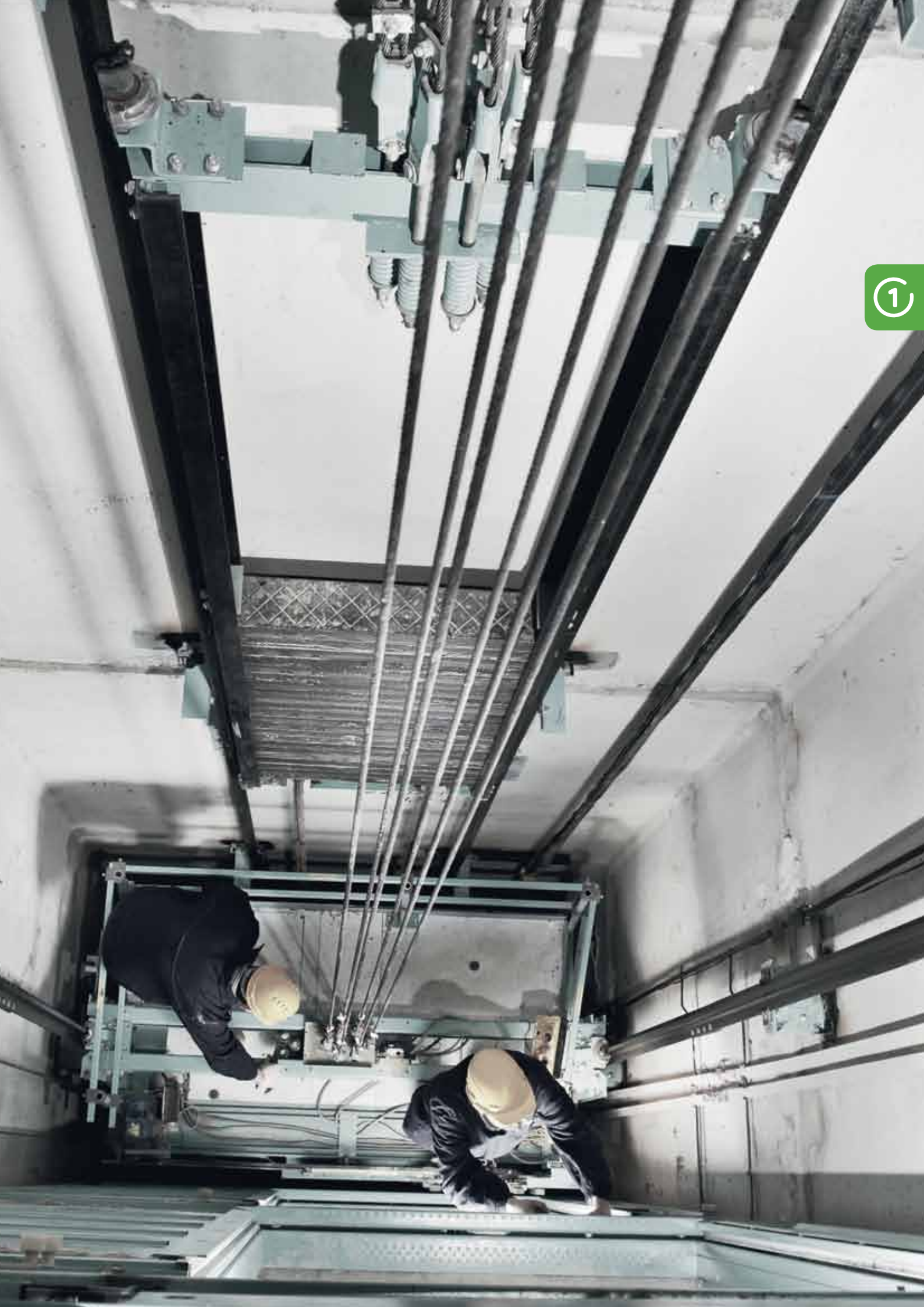


Ref.: 998-1243702_GMA-GB

Clearly visible safety chain
makes your life easier



< Click on the QR-Code for direct
access to the document



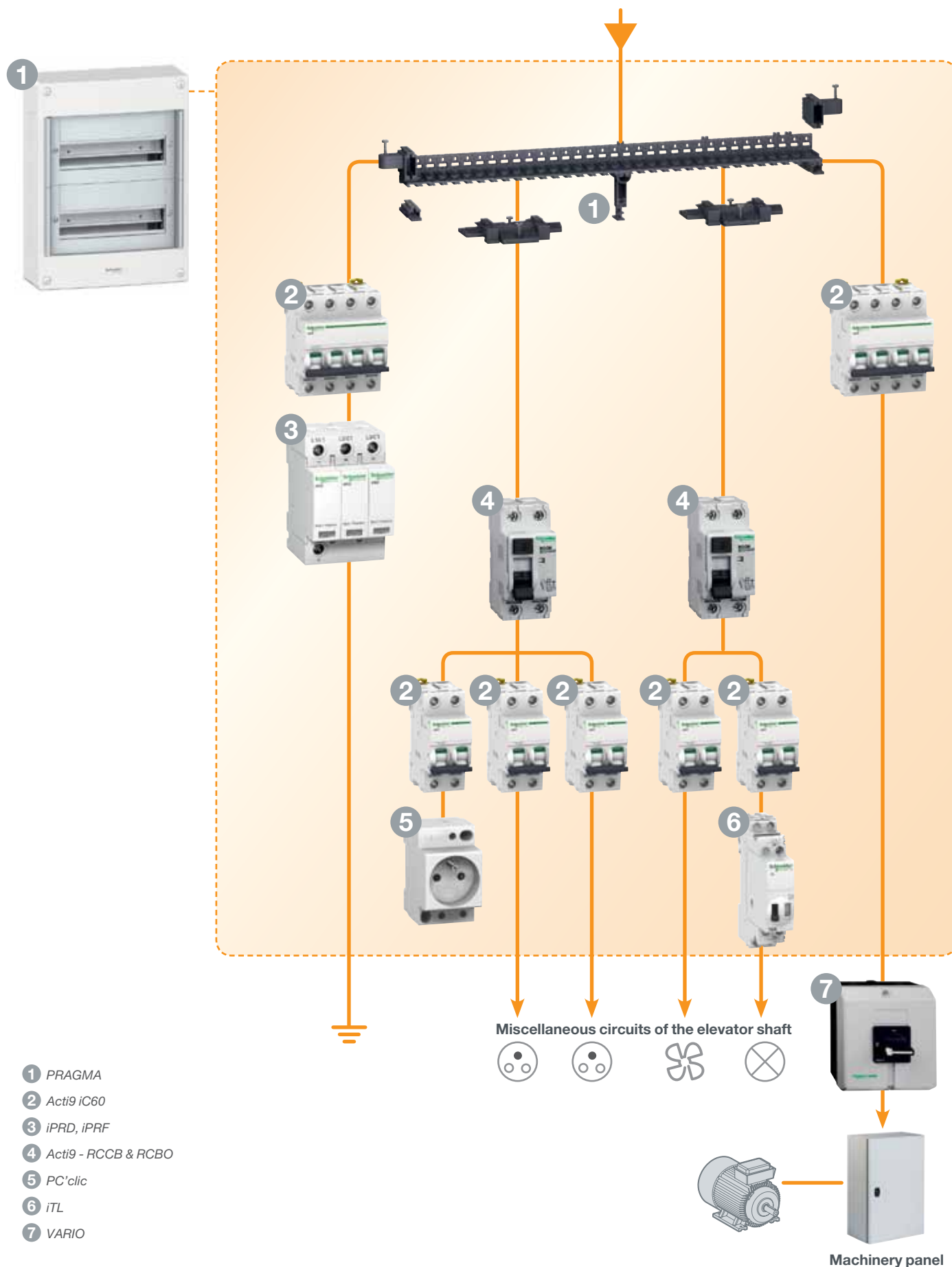




Other components for elevators



Recommended product ranges for main power panel



Recommended product ranges for main power panel



1 Enclosures and accessories - **PRAGMA**



Pragma Evolution is a comprehensive range of modular enclosures with 13/18/24 modules. Surface-mounted or flush-mounted.

- > 13 to 18 modules: 63 to 125 A.
- > 24 modules: 125 to 160 A.

➔ **PREFABRICATED ENCLOSURES - for elevators, on request**

Equipped enclosures, cabled and ready to install:
Please consult the local Schneider Electric branch office for the production of enclosure batches in line with your specifications.

2 Circuit breakers - **Acti9 iC60 & NG 125**



Range of modular circuit breakers, class 2 isolation:

- > 1 to 125 A and breaking capacity of up to 100 kA
- > Up to 440 VAC, insulation voltage: 690 V
- > Numerous accessories.

3 Surge arresters - **Acti9 iPRF 1, iPRD**



Range of surge arresters, types 1, 2 and 3.

With fixed or draw-out cartridge.

Technical focus: pages 32-33

4 Residual current protection - **Acti9 RCCB & RCBO**



Residual current protection:

- > Classes A, AC, SI
- > 10 up to 300 mA sensitivity
- > RCCB & RCBO residual current circuit breakers up to 63 A.

5 6 Modular sockets, impulse relays and other modular components - **Acti9**



A range of components to be installed on DIN rail to form electrical distribution switchboards. Functions that can be implemented:

- > Control and signaling
- > Power sockets.

7 Switch-disconnectors - **TeSys Vario, mini Vario**



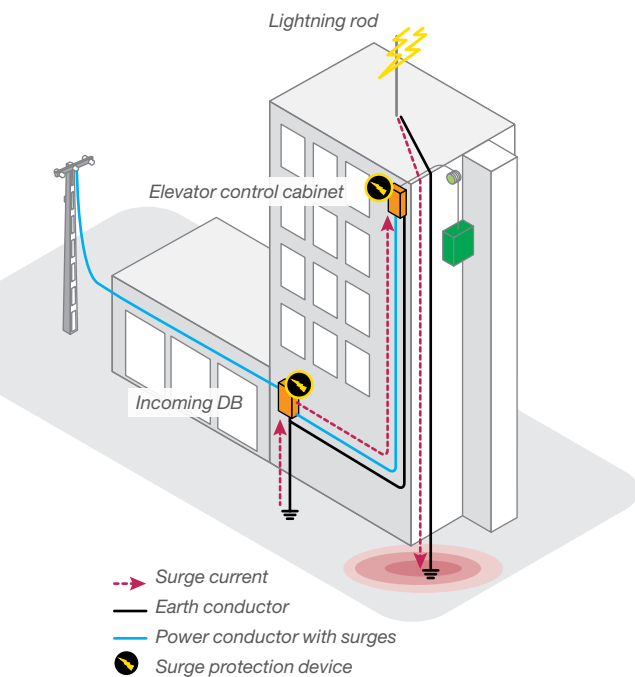
- > Switch-disconnectors with rotary control unit.
- > Installation in cabinet or cubicle.
- > Available in uncovered version or in cubicle.
- > Mounting on the front panel or back of the cabinet.
- > Padlockable versions.

2

Technical focus

Surge protection devices

Properly selected and installed, a surge arrester provides real protection for electronic equipment against overvoltages conveyed by the utility or the earth conductor.



A lightning protection system protects buildings from direct strikes (as per IEC 62305). The lightning current is directed towards the ground but at the same time generates overvoltage in the electrical installation.

Overvoltages can also be generated through the incoming power and telephone lines.

The basic precautions to prevent the disturbing energy from reaching the elevator equipment are:

- > Equipotential bonding of the installation;
- > Installing **Surge Protection Devices** (as per IEC 60364-4-44 & IEC 60364-5-534).

Since in most countries elevator systems are subject to occupational health and safety regulations, Surge Protection Devices should be used in these systems.

Surge protection device for 'power network'

Case of unknown composition of main switchboard



Disconnecter:
NG125N C80 A circuit breaker



Type 1+2 SPD:
iPRF1 (Iimp 12.5 kA)

- > 1P or 3P for TN-C earthing systems
- > 1P+N or 3P+N for TNS, TT

Type 1+2 SPDs
iPRF 12.5



3P
A9L16633



1P+N
A9L16632



3P+N
A9L16634

Case of presence of a surge protection device in the main switchboard



Disconnecter:
iC60H - 50 A circuit breaker or 63 A gG fuse



Type 2 SPDs:
iPRD40 (I_{max} 40 kA)

- 1P or 3P for TN-C earthing systems
- 1P+N or 3P+N for TNS, TT

Type 2 SPDs
iPRD40



1P
A9L40101



3P
A9L40301



1P+N
A9L40501



3P+N
A9L40601

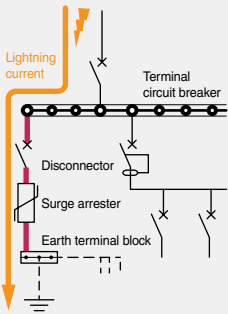
The proposed choice of solutions can ensure real protection in all possible cases when the presumed short-circuit current (I_{sc}) of the power supply enclosure is ≤ 15 kA.

Technical focus

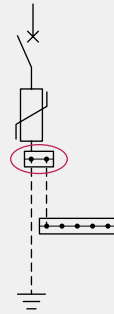
Surge protection devices

INFO: Cabling of Type 2 and Type 1+2 SPDs

The circuit of the surge protection device is cabled in parallel with those of the loads that it protects. In the presence of an overvoltage its impedance falls considerably, to facilitate voltage discharge.



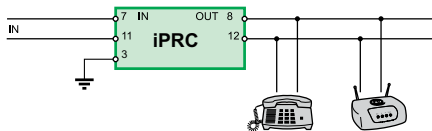
To obtain optimal efficiency of the surge protection device, the sum of the lengths of **red** segments should not exceed 50 cm.



Tip to reduce the length:

connect the earth incoming cable directly to a small double terminal block, as close as possible to the surge protection device, and then connect the latter to the enclosure's earthing strip.

Surge protection devices for 'communication network'

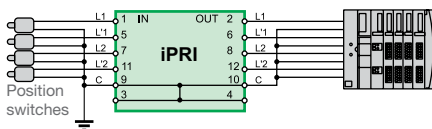


iPRC
A9L16337

Protection of PLC inputs by iPRC surge protection device

Telephone lines can conduct lightning surge.

The iPRC surge protection device is compatible with ADSL transmission.



iPRI
A9L16339

Protection of PLC inputs by iPRI 4-line surge protection device

This is especially recommended when digital sensors are connected to long lines (several dozen meters).

Additional information



Ref.: CPTG002_EN

How to prevent machine malfunctioning and electronic damage due to voltage surge.



Click on the QR-Code for direct access to the document



Ref.: A9DP96EN

Surge arresters for commercial and industrial buildings – Selection guide.



Click on the QR-Code for direct access to the document

Recommended product ranges for machinery panel



Recommended product ranges for machinery panel



1 Sealed boxes and enclosures - **Spacial**



From small industrial boxes to floor-standing enclosures, Spacial enclosures are made of high-quality materials (steel, stainless steel and insulating material) that resist harsh conditions and/or outdoor environments.

 **Technical focus: page 36**

2 Fans, filters - **ClimaSys**



The best partner for our insulating enclosure range. Efficient thermal management solutions that extend the service life of your equipment, electrical devices, etc.

 **Technical focus: page 36**

3 Circuit breakers - **Acti 9**

4 Circuit breakers for motors - **TeSys GV**



- > Acti9 iC60 circuit breakers
- > TeSys GV thermal-magnetic and magnetic circuit breakers

5 Variable speed drives for elevators - **Altivar lift**



These devices are designed to control elevators equipped with synchronous or asynchronous motors (with or without encoder). They are suitable for applications for which the rated current ranges between 27 and 66 A (200/240 VAC) and between 10 and 48 A (380/480 VAC).

 **Technical focus: page 38**

6 Transformers - DC power supplies - **Phaseo**



A wide range of single-phase and three-phase regulated switch mode power supplies. A choice of safety transformers.

2

7 PLCs - **Modicon M241; M221; M251**



From logic to motion control, the benchmark-performing Modicon range provides flexibility and scalability to suit your needs.

8 9 Relays and contactors - **Zelio & TeSys D**



- > Zelio plug-in relays
- > TeSys D relays and contactors. Mountings for reversing and star-delta starters.

10 Thermal relays - **TeSys LRD**



Tesys LRD thermal protective relays. They cover all motor ratings up to 150 A. Combined with TeSys D contactors, they form a very compact starter.

Product ranges to be discovered in detail on www.schneider-electric.com

Technical focus

Spacial & ClimaSys ranges

Spacial range: up to IP66

- > Wide choice of dimensions, to adapt easily to the diversity of electrical configurations
- > IP55 to IP66, withstand dusty atmospheres
- > Certified UL, BV, DNV, LR, GL, for export markets
- > Choice of locks (S3D)
- > Customizable



Spacial SBM



Simple, ergonomic boxes, modular dimensions

- > Plain boxes (SBM), FL21 entry boxes (SBMC), bus boxes (SBMB)
- > 24 sizes, from 150 x 150 x 80 mm to 400 x 800 x 120 mm, up to 42 sizes with the extension unit
- > Opening and closing by screwdriver
- > Indoor/outdoor installation
- > Up to IP66, IK10

Spacial S3D



Enclosures resistant to aggressive environments, wide choice of sizes and accessories

- > Wall-mounted enclosures with plain or glazed door
- > 54 sizes from 300 x 200 x 150 mm to 1400 x 1000 x 300 mm
- > Variety of mounting plates (plain, microperforated, DIN, etc.)
- > Reversible door, single or double
- > Juxtaposition accessories
- > Cable entry accessories
- > Choice of locks
- > Indoor/outdoor installation
- > Up to IP66, IK10 (enclosures with 1 plain door)
- > Customization (painting, cutaways, etc.)

ClimaSys CV



Fans, filters

- > IP54 fans with filter
- > IP54 gratings with filters
- > Standard filters (G2 M1) & thin filters (G3 M1), anti-insect grating
- > IP55 cover

Tools for panel design



CAD vignettes



ProClima thermal computation software



Digital rules for selection of accessories

Find the electronic catalogs and tools for our Universal Enclosure and Thermal Management ranges.



< Click on the QR-code for direct access to the webpage

Technical focus

Spacial FlexiCable

The revolutionary cable entry plate!

Up to
IP55

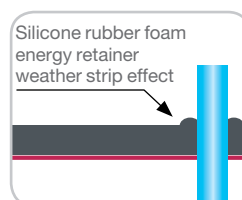
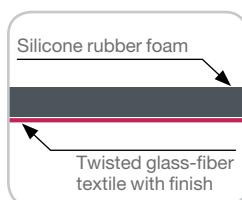
Fire-
resistant
650°C

Short-
circuit
validated
250 A, 25 kA

- > For cable diameters up to 26 mm
- > Number of cables limited only by the size of the plate
- > Copper or aluminum
- > Rigid or multiwire
- > Power, control or IT



**[No marking, no drilling,
no tool... It works!]**



Round cables

Exclusive, patented technology: composite material, made of reticulated silicone rubber foam combined with high-performance glass fiber textile (Siltop® by Ferrari SA).

ELEVATOR SOLUTION



**[With flat cable
for elevator: IP50]**

Additional information



Universal Enclosures
catalogue.



< Click on the
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to the document

Ref.: UE13MK03EN



Selection Guide:
How to choose the
right cable entry
for your enclosure.

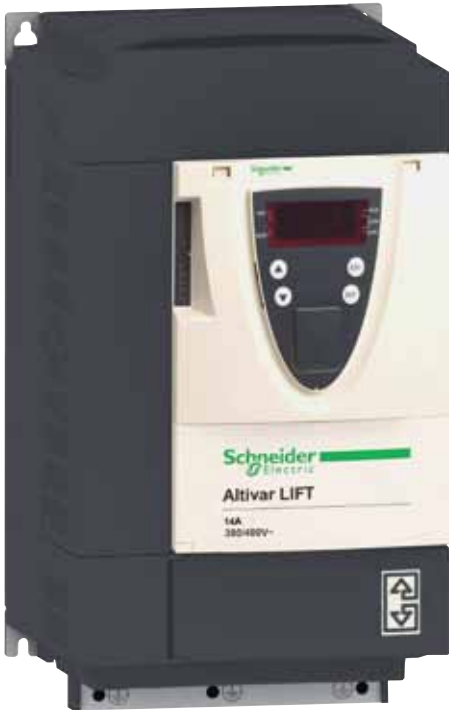


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Ref.: UE12MK04EN

Technical focus

Altivar Lift



For synchronous and asynchronous motors (with or without encoder)

3-phase supply

- > 200/240 V - 27 A to 66 A
- > 380/480 V - 10 A to 48 A

1-phase supply

- > 200/240 V - 17 & 27 A

Plug & Play installation:

- > Dedicated elevator menu for installers
- > Elevator-specific units.

Communication tools for customized setup:

- > Remote graphic display terminal
- > Multi-loader
- > Single-loader
- > PowerSuite software.

Hardware specially designed to:

- > Handle the specific constraints of elevator applications (repetitive starting/stopping, equipment power always on, control at 0 Hz, etc.);
- > Comply with elevator standards (EN12015 and EN2016 without external filter);
- > Prevent vibration during operation (optimized current measurements).

All-round high performance:

- > Elevator ramp allows simple adjustment for optimum comfort;
- > Passenger comfort at starting regardless of the elevator type and age (load measurement and rollback management);
- > Wide choice of encoders for all types of motor;
- > Option to perform static angle test for synchronous motors on existing elevators.

Integrated safety:

- > Power Removal® function certified for use with a single motor contactor.



6 languages available as standard

You can use your graphic display terminal to customize menus, create shortcuts using the function keys and save configurations, among many other things.

Carry out maintenance without interrupting operation

Synchronous open-loop operation in degraded mode means, for example, that the elevator car can be moved to a safe position when the encoder is not operating.

Technical focus

Altivar Lift



Quick configuration and communication with PowerSuite software and Multi-Loader. Configurations can be duplicated in just a few seconds using Single Loader.



Remote communication - use the remote graphic display terminal to configure and communicate with the drive, even when the enclosure is closed.



Additional information



Ref.: DIA2ED1101201EN

Variable speed drives for synchronous and asynchronous motors (with or without encoder).



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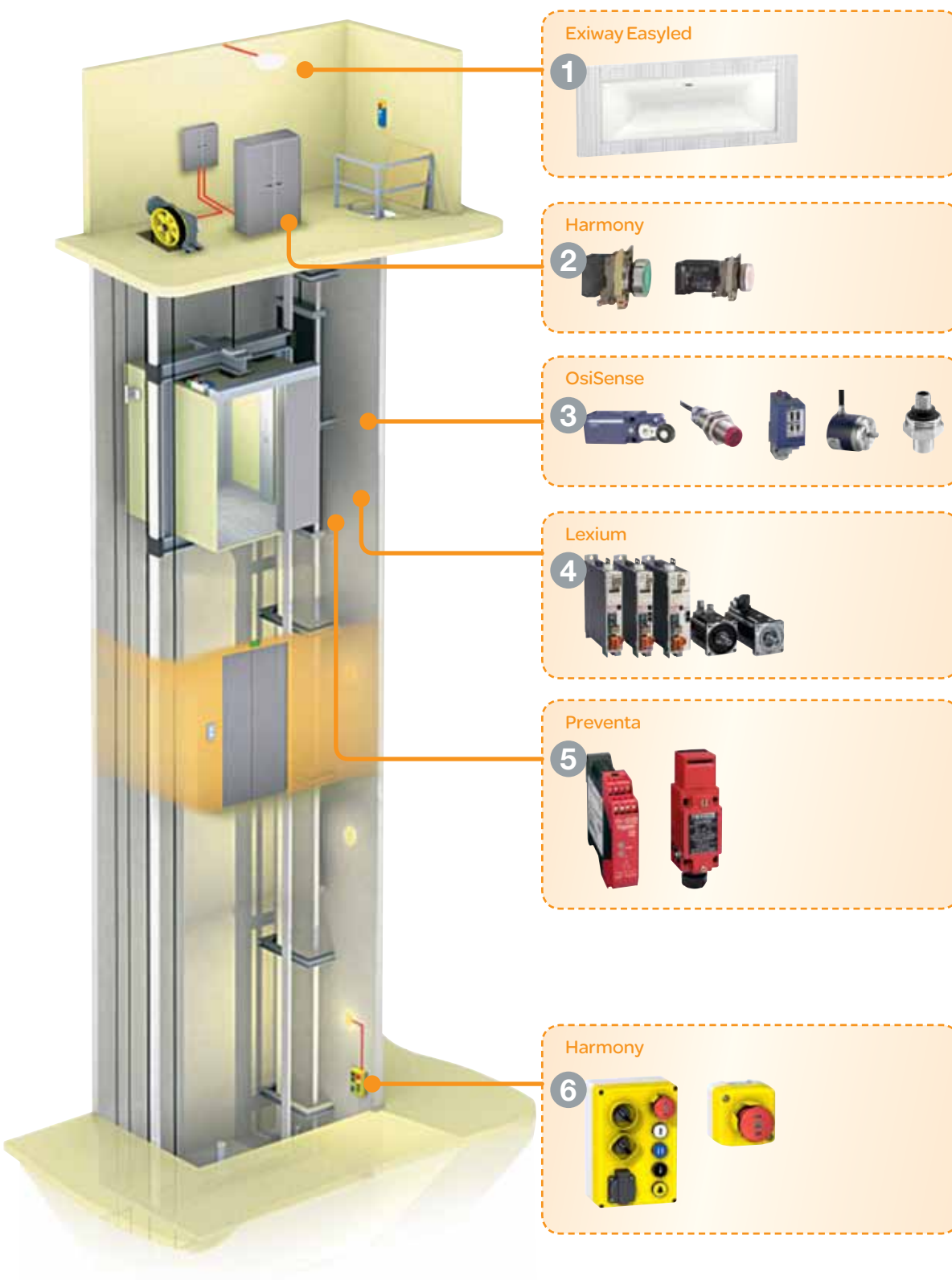


Altivar Lift Drives for elevator applications from 4 kW to 22 kW.



< Click on the QR-Code for direct access to the document

Recommended product ranges for elevator shaft and car



Recommended product ranges for elevator shaft and car



1 Emergency lighting - **Exiway & Guardian**



- > **Exiway:** Exiway Easyled range of emergency lighting units
- > **Guardian:** emergency lighting by projectors, for premises of large surface area or high ceiling clearance

2 Buttons, indicator lamps - **Harmony XB**



- > **Harmony XB4:** buttons, metal indicator lamps, dia. 22 mm
- > **Harmony XB5:** buttons, plastic indicator lamps, dia. 22 mm

 **Technical focus: page 45**

3 Sensors, encoders - **OsiSense**



- > **OsiSense XC, XU, XS:** electromechanical and electronic sensors
- > **OsiSense XML:** pressure switches - electronic pressure sensors
- > **OsiSense XCC:** rotary encoders

 **Technical focus: page 42**

4 Servomotors, motors - **Lexium**



The Lexium 32 range of variable speed servo drives combined with BSH and BMH servomotors is suitable for meeting performance and ease-of-use requirements.

It covers power ratings from 0.15 to 11 kW.

2

5 Module, safety switches - **Preventa**



- > **Preventa XPS:** safety modules
- > **Preventa XCS:** safety position switches

6 Inspection boxes - **Harmony XALF**



Range of inspection boxes fitted or to be fitted for elevators.

In accordance with standards: IEC/EN 60947-1, IEC/EN 60947-5-1, IEC/EN 60947-5-4, IEC/EN 60947-5-5, EN 418 ("sudden locking" emergency stop switches) and EN 81 (elevator standard).

 **Technical focus: page 44**

Technical focus

OsiSense

Telemecanique Sensors has accompanied you for more than 50 years in all your detection, position, pressure and safety functions with a comprehensive range of switches in compliance with EN81-20, and specialized electronic sensors.



> **Overrun, safety function**, limit switch with manual reset, **OsiSense XCNR25**



> **Shaft space, Pit station, Parachute information, Cable slack**, limit switches for position detection, **OsiSense XCKN25** or **XCKS5** (plastic, double insulation - EN 50041)
Reference example: *XCKN2549P20*
1 NO contact + 1 NC contact
Thermoplastic roller lever of diameter 50 mm



> **Car positioning**, depending on the structure design and the elevator manufacturer's requirements:

- Optical detection of flag by fork, **OsiSense XUVH**
- Electromechanical detection by limit switch, **OsiSense XCKN2549** or **XCKS549**
- Steel flag detection on each floor by inductive sensors, **OsiSense XS Cubic range**, **SIL2 certified**

(safety can be ensured with only one sensor when used with controller SIL2, TUV certified)



> **For hydraulic drive machinery:**

- Overpressure, with 2 thresholds, **OsiSense XMLD**
- Pressure monitoring, analog signal, **OsiSense XMLP**



Limited noise of limit switches

- > No audible "click" during maneuver
- > Reduced noise when operating, thanks to a rubber layer on the roller.

[EN81-20 compliance]

§5.11.2.2.5: "In the case of multiple breaks, the distance after separation between the contacts shall be at least 2 mm."

For all limit switches, the "5" digit in the reference refers to the distance after separation of the contacts. It is either the first digit for the XCKS range (e.g.: XCKS5) or the second digit for the other ranges (e.g.: XCKN25).

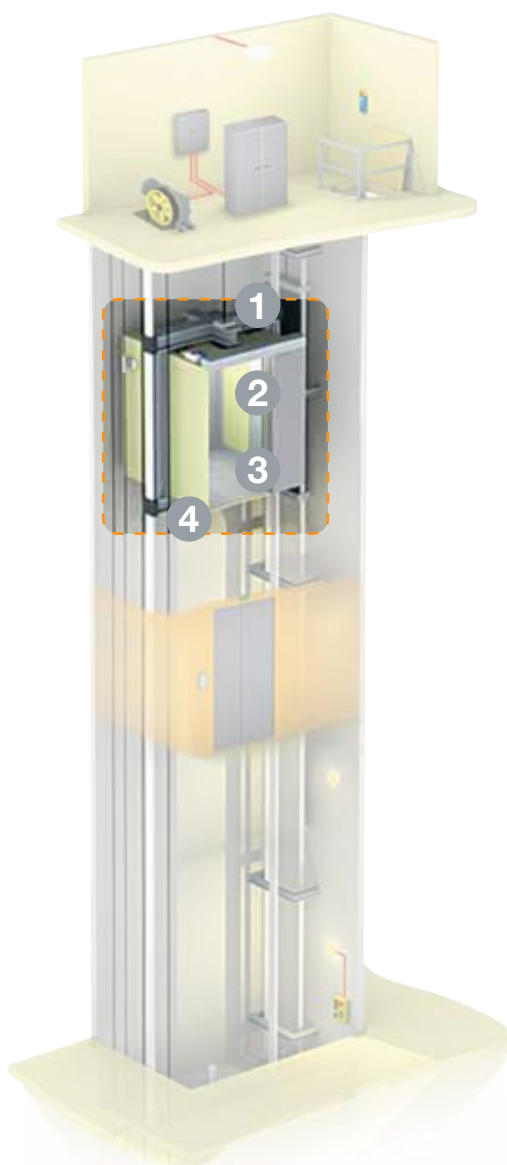
§5.11.2.2.2: "The operation of a safety contact shall be by positive separation of the circuit-breaking devices. This separation shall occur even if the contacts have welded together."

All our limit switches ensure this positivity thanks to an undeformable link.

Technical focus

OsiSense

OsiSense products can be customized according to customer needs, depending on quantities.
Contact Schneider Electric for more information



> Car position and/or motor speed detection

Rotary encoder, **OsiSense XCC**



> Automatic door management

Detection with photoelectric sensor,
OsiSense XU range

Reference example: XUK9ARCNL2

- Photoelectric sensor;
- Relay output 1O+1C;
- 24-240 V AC/DC supply;
- 5 m nominal detection with XUZC50 reflector;
- Pre-wired with 2 m cable.



> Automatic door management

Door position monitoring with non-contact safety interlock switches, **Preventa XCSDM**

Reference example: XCSDMR5902

- Cylindrical magnetic switch;
- Dia. 30 mm;
- Output 1O+1C;
- Pre-wired with 2 m cable.



> Final limit detection, maintenance access position

Safety switches,

- **Preventa XCSA** metal body
- **Preventa XCSPA** plastic body

2

Additional information



Sensors &
RFID system



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Technical focus

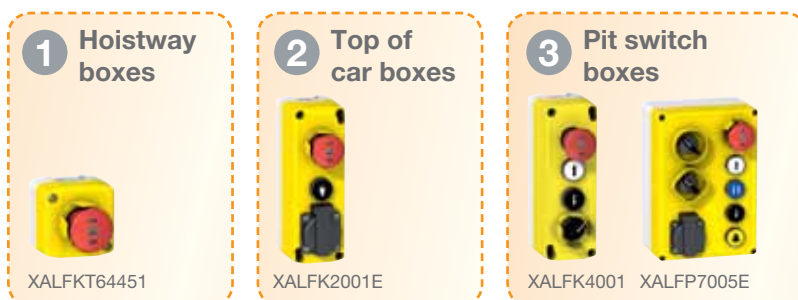
Harmony XALF

The Harmony XALF elevator inspection stations* are designed for elevator maintenance applications.



- 1 Hoistway boxes
- 2 TeSys GV
- 3 Pit switch boxes

Three types of stations are available:



These boxes make it possible to control movement of the elevator.

Used in conjunction with the other operating components, they facilitate inspection and repair works.

They are installed outside the car.

- > Safety: Inspection stations prevent any risk of uncontrolled movement of the elevator while such work is being carried out.
- > Supplied complete, these elevator inspection stations are equipped with Ø 22 control and signaling units from the Harmony® XB5 and XB7 ranges; they are catalog listed and are certified.

XALF products can be customized according to customer needs, depending on quantities.
Contact Schneider Electric for more information

* Current product range in compliance with the EN81-1 standard valid until mid-2017. Currently being brought into line with the new EN81-20 standard.

Additional information



Ref.: DIA4ED2070703EN

Lift inspection stations
Harmony® XAL F



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Harmony XALF
Lift inspection stations
for Ø 22 mm plastic
signaling units



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Technical focus

Harmony XB4R, XB5R / ZBRRRA

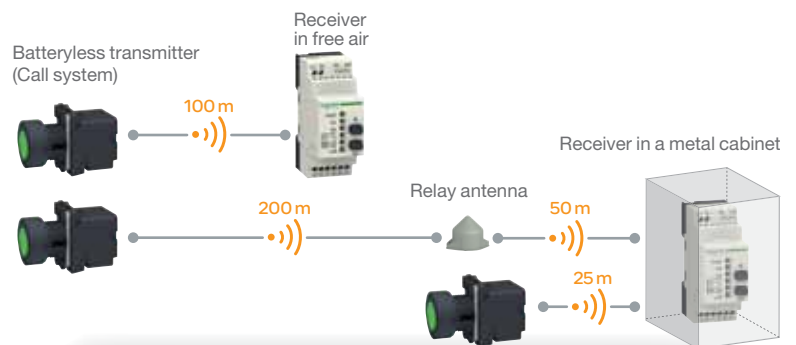


- > Reduced installation time and cabling cost.
- > Can be used in many applications, including construction site hoists, explosive atmospheres, and dust and gas environments.



Application example: construction site hoist

- > **Transmitters (XB4R metal, XB5R plastic):** convert into electrical energy the mechanical energy produced when the pushbutton is pressed. A radio-encoded message is sent with a unique ID code to one or more receivers.
- > **Receivers:** actuated by up to 32 transmitters. 1 or 2 functions for standard receiver, more for ModBus version (**Access Point ZBRN2**).
- > **Relay-antennas:** increase the transmission range, to be used in the case of long distances or obstacles.
- > **Free worldwide band:** 2.4 GHz radio-encoded transmission.



Additional information



Ref.: DIA5ED21214EN

Wireless and
batteryless
pushbuttons



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Notes

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