

Compact-contactors

45 mm wide



ADVANCED DESIGN AND HANDLING

high contact reliability through
ENTRELEC-SCHIELE-twin aux. contacts

ample wiring space

terminals to accept cables of up to
2 x 6 mm² / 25 mm²

fingerproof

selective coil termination connections

snap-on front label
for quick identification

Many benefits :

- ✓ powerful
- ✓ modular
- ✓ reliable contact
- ✓ dependable
- ✓ advanced design and handling



Contact reliability

- High contact reliability of control circuit by the use of ENTRELEC-SCHIELE-twin aux. contacts
- Contact reliability increased by a factor of 1.000 to 10.000 compared to standard contacts

Connection

- Large terminal space for cables up to 2 x 6 mm² / ...25 mm²
- Coil terminations for one-sided or diagonal wiring
- Coil suppressor snaps directly to coil terminal
- Colored coil voltage marking acc. to 309-1

Safety in operation

- Fingerproof to VDE 0106: Pt. 100

Approvals

- Designed to comply with all major national and international standards

Handling

- Ergonomic, user-friendly design
- Active and passive control elements are colored differently
- Large clip-on front label for identification purposes
- Terminals arranged for quick and simple mounting

Cost / performance

- Favorable cost / performance ratio
- Comprehensive range of components to complete the system family

Control relays and contactors

Compact contactors plus system accessories



✓ **Relay interface module**
the interfacing element from
programmable controller to contactor
(other modules on pages 1616-1617)

HL 4 K
DL 4 K
DL 5 K
DL 7 K
DL 11 K
DL 15 K
DL 18 K

see pages 1607-1613

✓ **Contactors**

4 to 18.5 kW at 380 V, 3 ph.
5 to 25 HP at 460 V, 3 ph.
✓ AC coil - 50/60 Hz



✓ **Coil suppressor**
snaps on directly
types : RC-K, D-K, V-K



✓ **Mechanical interlock**
for side mounting
type : MV-e



✓ **Electromechanical latch head**
clips on to front of contactor
type : MV-BN

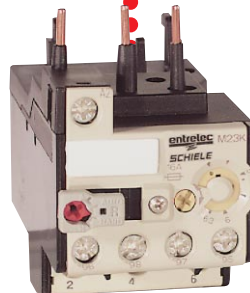


✓ **Pneumatic timer**
clips on to front of contactor
delay on energization or
de-energization up to 180 secs
types : PZ-a, PZ-r

✓ **Auxiliary contact block**
2 pole, side mounting
(left or right hand side)
1 N/O + 1 N/C contacts or
2 N/O contacts
types : S 11 / S 20



✓ **Auxiliary contact block**
two or four pole
clips on to front of contactor
type : HI-..., LI-...



✓ **Thermal overload relay**
type : M 23 K and M 40 K
see page 1682

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Control relays

HL 4 K, HL 8 K, AC-operated

HLg 4 K, DC-operated

(economy circuit coil)



- 4- and 8-pole control relay
- High contact reliability through forced opening of ENTRELEC-SCHIELE-twin aux. contacts
- Positively guided contacts acc. to ZH 1 / 457
 - Safety rules for control of powered presses in the metal working industry
- Expandable to 8 contacts by the use of additional aux. contact blocks
- Terminal numbering to DIN EN 50 011
- Simple mounting through snap-on mount, with provision for screw attachment
- Fast wiring due to plus/minus screws with terminal clamps supplied in the "open" position
- Finger protected terminals to VDE 0106: Part 100
- Bi-frequency AC coils - 50/60 Hz
- Safety isolation up to 400 V AC of coil and contact elements to DIN VDE 0106: Part 101 and A1 (draft 2/98)

■ Approvals:

Voltage codes 04 ... 73 to be added to the contactor order reference number

Code number	for coil voltage		Color code ¹⁾	
	AC	DC	AC	DC
... 04	12 V		violet	green
... 06	24 V		violet	green
... 10	32 V		violet	green
... 11	36 V		green	green
... 13	42 V		white	green
... 15	48 V		white	green
... 19	60 V		green	green
... 25	110 V		yellow	green
... 28	120 V		yellow	green
... 29	127 V	125 V	yellow	green
... 38	208 V		blue	green
... 40	230 V	220 V	blue	green
... 41	220 V		blue	-
... 43	240 V		blue	-
... 59	400 V		red	-
... 61	380 V		red	-
... 63	415 V		red	-
... 65	440 V		red	-
... 69	500 V		black	-
... 73	600 V		black	-

Our control relays and compact contactors are delivered with bi-frequency coils for 50/60 Hz.

Further notes at the bottom of this page.

Characteristics

Control relays HL 4 K-, AC-operated

Rated current I_{th}	Type	Order ref.: see supplements at the top right	Contact configuration	Circuit diagram / numbering to DIN EN 50 011	Weight kg	For dimensions see page 1674
A			N/O N/C E/M L/B			
16	HL 4 K-31	1 366 404 ..	3 1		0.38	
	HL 4 K-22	1 366 408 ..	2 2		0.38	
	HL 4 K-40*	1 366 407 ..	4 0		0.38	
16	HL 8 K-44	1 366 420 ..	4 4		0.45	
	HL 8 K-62	1 366 423 ..	6 2		0.45	
	HL 8 K-53	1 366 438 ..	5 3		0.45	
	HL 8 K- 53 ü	1 366 426 ..	4 2 1 1		0.45	
	HL 8 K-80	1 366 441 ..	8 0		0.45	

* Use control relay HL 4 K-40 + aux. contact block Hi ... when designing control to DIN EN 50 011.

Characteristics

Control relays HLg 4 K-, DC-operated (separate pull-in/hold windings)

Rated current I_{th}	Type	Order ref.: see supplements at the top right	Contact configuration	Circuit diagram / numbering to DIN EN 50 011	Weight kg	For dimensions see page 1674
A			N/O N/C			
16	HLg 4 K-22	1 366 410 ..	2 1		0.38	
16	HLg 4 K-31	1 366 411 ..	3 0		0.38	

Notes

Normal/Standard voltages are:
(Short-term availability)
Other coil voltages on request

AC: 24, 42, 110, 230 and 400 V
DC: 24, 110 and 220 V

Auxiliary contact blocks - page 1613

Further system components - pages 1613-1617

Technical details - page 1671

Possible auxiliary contact block combinations - page 1615

¹⁾ Color code to IEC 309-1 printed on the coil.
Only for compact contactors, HL 4 K / HL 8 K and DL 4 K - DL 18 K

Control relays

HL 4 K DC and HL 8 K DC

DC-operated



- 4- and 8-pole control relay
- High contact reliability through forced opening of ENTRELEC-SCHIELE-twin aux. contacts
- Positively guided contacts acc. to ZH 1 / 457
- Expandable to 8 contacts by the use of additional aux. contact blocks
- Terminal numbering to DIN EN 50 011
- Simple mounting through snap-on mount, with provision for screw attachment
- Fast wiring due to plus/minus screws with terminal clamps supplied in the "open" position
- Finger protected terminals to VDE 0106: Part 100
- Coil consumption 6.5/8.8 W only, controllable by programmable controller
- Safety isolation up to 400 V AC of coil and contact elements to DIN VDE 0106 Part 101 and A1 (draft 2/98)

■ Approvals:

Voltage codes 04 ... 40 to be added to the contactor order reference number

Code number	for coil voltage DC	Color code ¹⁾ DC
... 04	12 V	green
... 06	24 V	green
... 10	32 V	green
... 11	36 V	green
... 13	42 V	green
... 15	48 V	green
... 19	60 V	green
... 25	110 V	green
... 28	120 V	green
... 29	125 V	green
... 38	208 V	green
... 40	220 V	green

Further notes at the bottom of this page.

Characteristics

Control relays HL 4 K DC, HL 8 K DC, HL 100 DC, DC-operated

Rated current I _{th}	Type	Order ref.: see supplements at the top right	Contact configuration	Circuit diagram / numbering to DIN EN 50 011	Weight kg	For dimensions see page 1675
A			N/O N/C E/M L/B			
16	HL 4 K DC-31	1 367 361 ..	3 1		0.72	
16	HL 4 K DC-22	1 367 362 ..	2 2		0.72	
16	HL 4 K DC-40	1 367 363 ..	4 0		0.72	
16	HL 8 K DC-44	1 367 421 ..	4 4		0.78	
16	HL 8 K DC-53	1 367 422 ..	5 3		0.78	
16	HL 8 K DC-62	1 367 423 ..	6 2		0.78	
16	HL 8 K DC-71	1 367 424 ..	7 1		0.78	
16	HL 8 K DC-80	1 367 425 ..	8 0		0.78	

Notes

Normal/Standard voltages are:
(Short-term availability)

AC: 24, 42, 110, 230 and 400 V
DC: 24, 110 and 220 V

Other coil voltages on request

¹⁾ Color code to IEC 309-1 printed on the coil.
Only for compact contactors, HL 4 K / HL 8 K and DL 4 K - DL 18 K

Auxiliary contact blocks - page 1613

Further system components - pages 1613-1617

Technical details - page 1671

Possible auxiliary contact block combinations - page 1615

Contactors

DL 4 K to DL 18 K

4-18.5 kW / 5-25 HP at 460 V, 3 ph. (AC 3),

AC-operated,

3 main contacts,

integral aux. contacts

on sizes up to 11 kW



- Versatile compact contactors
- Auxiliary contacts are ENTRELEC-SCHIELE-twin aux. contacts
- Simple mounting with integral snap-on mount, with provision for screw attachment
- Ample wiring space and connecting terminals with plus/minus screws and self-lifting clamps which are supplied in the "open" position allow fast and economic wiring
- Finger protection to VDE 01060 Part 100
- Bi-frequency coils - 50/60 Hz
- Expandable due to comprehensive system components - 2- and 4-pole contact blocks, mechanical interlock, electromechanical latch head and pneumatic timer
- Safety isolation up to 400 V AC of coil and contact elements to DIN VDE 0106: Part 101 and A1

■ Approvals:

Voltage codes 04 ... 73
to be added to the contactor order
reference number

Code number	for coil voltage AC	Color code ¹⁾ AC
... 04	12 V	violet
... 06	24 V	violet
... 10	32 V	violet
... 11	36 V	green
... 13	42 V	white
... 15	48 V	white
... 19	60 V	green
... 25	110 V	yellow
... 28	120 V	yellow
... 29	127 V	yellow
... 38	208 V	blue
... 40	230 V	blue
... 41	220 V	blue
... 43	240 V	blue
... 59	400 V	red
... 61	380 V	red
... 63	415 V	red
... 65	440 V	red
... 69	500 V	black
... 73	600 V	black

Our control relays and compact contactors are delivered with bi-frequency coils for 50/60 Hz.

Further notes at the bottom of this page.

Characteristics

Max. AC 3 ratings of 3-phases motors (kW)				Rated operational current I _e AC 1 / AC 3 A	Contactor type	Order ref.: see supplements at the top right	Circuit diagram / numbering to DIN EN 50 005 and DIN EN 50 012	Weight kg	Suitable therm. overload relay	For dimensions see page 1674
230 V	400 V	500 V	690 V							
2.2	4	5.5	4	22/9	DL 4 K-10	1 366 001 ..		0.38	M 23 K	
					DL 4 K-01	1 366 004 ..		0.38		
					DL 4 K-22	1 366 031 ..		0.45		
3	5.5	7.5	5.5	25/12	DL 5 K-10	1 366 013 ..		0.38	M 23 K	
					DL 5 K-01	1 366 016 ..		0.38		
					DL 5 K-22	1 366 037 ..		0.45		
4	7.5	11	7.5	39/16	DL 7 K-10	1 366 201 ..		0.38	M 23 K	
					DL 7 K-01	1 366 204 ..		0.38		
					DL 7 K-22	1 366 231 ..		0.45		
5.5	11	15	11	39/23	DL 11 K-10	1 366 213 ..		0.38	M 23 K	
					DL 11 K-01	1 366 216 ..		0.38		
					DL 11 K-22	1 366 237 ..		0.45		
9	15	18.5	15	54/30	DL 15 K	1 370 001 .. ^{a)}		0.45	M 40 K	
					DL 15 K-22	1 370 017 .. ^{b)}		0.45		
11	18.5	20	18.5	54/37	DL 18 K	1 370 004 .. ^{a)}		0.45		
					DL 18 K-22	1 370 020 .. ^{b)}		0.45		

Notes

Normal/Standard voltages are:
(Short-term availability)

Other coil voltages on request

AC: 24, 42, 110, 230 and 400 V
DC: 24, 110 and 220 V

Type DL 4 K-22 to DL 18 K-22 contactors are supplied with the auxiliary contacts fitted.

Auxiliary contact blocks - page 1613

Further system components - pages 1613-1617

Technical details - page 1667

Possible auxiliary contact block combinations - page 1615

¹⁾ Color code to IEC 309-1 printed on the coil.

Only for compact contactors, HL 4 K / HL 8 K and DL 4 K - DL 18 K

Contactors

DL 4K to DL 18 K

4-18.5 kW / 5-25 HP at 460 V, 3 ph. (AC 3),

AC-operated,

3 or 4 main contacts,

no integral aux. contacts



- Versatile compact contactors
- Auxiliary contacts are ENTRELEC-SCHIELE-twin aux. contacts
- Simple mounting with integral snap-on mount, with provision for screw attachment
- Ample wiring space and connecting terminals with plus/minus screws and self-lifting clamps which are supplied in the "open" position allow fast and economic wiring
- Finger protection to VDE 01060 Part 100
- Bi-frequency coils - 50/60 Hz
- Expandable, due to comprehensive system components - 2- and 4-pole contact blocks, mechanical interlock, electromechanical latch head and pneumatic timer
- Safety isolation up to 400 V AC of coil and contact elements to DIN VDE 0106: Part 101 and A1 (draft 2/98)

■ Approvals :











Voltage codes 04 ... 73
to be added to the contactor order reference number

Code number	for coil voltage AC	Color code ¹⁾ AC
... 04	12 V	violet
... 06	24 V	violet
... 10	32 V	violet
... 11	36 V	green
... 13	42 V	white
... 15	48 V	white
... 19	60 V	green
... 25	110 V	yellow
... 28	120 V	yellow
... 29	127 V	yellow
... 38	208 V	blue
... 40	230 V	blue
... 41	220 V	blue
... 43	240 V	blue
... 59	400 V	red
... 61	380 V	red
... 63	415 V	red
... 65	440 V	red
... 69	500 V	black
... 73	600 V	black

Our control relays and compact contactors are delivered with bi-frequency coils for 50/60 Hz.

Further notes at the bottom of this page.

Characteristics

Max. AC 3 ratings of 3-phase motors (kW)				Rated operational current I _e AC 1 / AC 3 A	Contactor type	Order ref.: see supple- ments at the top right	Circuit diagram / numbering to DIN EN 50 005	Weight kg	Suitable therm. overload relay	For dimensions see page 1674
230 V	400 V	500 V	690 V							
2.2	4	5.5	4	22/9	DL 4 K	1 366 034 ..		0.38	M 23 K	
					DL 4 K-4 H	1 366 047 ..		0.38		
3	5.5	7.5	5.5	25/12	DL 5 K	1 366 044 ..		0.38	M 23 K	
					DL 5 K-4 H	1 366 050 ..		0.38		
4	7.5	11	7.5	39/16	DL 7 K	1 366 234 ..		0.38	M 23 K	
					DL 7 K-4 H	1 366 243 ..		0.38		
5.5	11	15	11	39/23	DL 11 K	1 366 240 ..		0.45	M 23 K	
					DL 11 K-4 H	1 366 246 ..		0.38		
9	15	18.5	15	54/30	DL 15 K	1 370 001 ..		0.45	M 40 K	
11	18.5	20	18.5	54/37	DL 18 K	1 370 004 ..		0.45		

Notes

Normal/Standard voltages are:
(Short-term availability)

Other coil voltages on request

AC: 24, 42, 110, 230 and 400 V
DC: 24, 110 and 220 V

Auxiliary contact blocks - page 1613

Further system components - pages 1613-1617

Technical details - page 1667

Possible auxiliary contact block combinations - page 1615

¹⁾ Color code to IEC 309-1 printed on the coil.
Only for compact contactors, HL 4 K / HL 8 K and DL 4 K - DL 18 K

Contactors

DL 4 K DC to DL 18 K DC

4-18.5 kW / 5-25 HP at 460 V, 3 ph. (AC 3),
DC-operated



- Versatile compact contactors
- Auxiliary contacts are ENTRELEC-SCHIELE-twin aux. contacts
- Simple mounting with integral snap-on mount, with provision for screw attachment
- Ample wiring space and connecting terminals with plus/minus screws and self-lifting clamps which are supplied in the "open" position allow fast and economic wiring
- Finger protection to VDE 01060 Part 100
- Expandable, due to comprehensive system components - 2- and 4-pole contact blocks, mechanical interlock, electromechanical latch head and pneumatic timer
- Safety isolation up to 400 V AC of coil and contact elements to DIN VDE 0106: Part 101 and A1 (draft 2/98)

■ Approvals:

Voltage codes 04 ... 40
to be added to the contactor order
reference number

Code number	for coil voltage DC	Color code ¹⁾ DC
... 04	12 V	green
... 06	24 V	green
... 10	32 V	green
... 11	36 V	green
... 13	42 V	green
... 15	48 V	green
... 19	60 V	green
... 25	110 V	green
... 28	120 V	green
... 29	125 V	green
... 38	208 V	green
... 40	220 V	green

Further notes at the bottom of this page.

Characteristics

Max. AC 3 ratings of 3-phase motors (kW)				Rated operational current I _e AC 1 / AC 3 A	Contactor type	order ref.: see supplements at the top right	Circuit diagram / numbering to DIN EN 50 005 and DIN EN 50 012	Weight kg	Suitable therm. overload relay	For dimensions see page 1675
230 V	400 V	500 V	690 V							
2.2	4	5.5	4	22/9	DL 4 K DC-10	1 367 001 ..		0.72	M 23 K	
					DL 4 K DC-01	1 367 002 ..		0.72		
					DL 4 K DC-22	1 367 005 ..		0.78		
3	5.5	7.5	5.5	25/12	DL 5 K DC-10	1 367 061 ..		0.72	M 23 K	
					DL 5 K DC-01	1 367 062 ..		0.72		
					DL 5 K DC-22	1 367 065 ..		0.78		
4	7.5	11	7.5	39/16	DL 7 K DC-10	1 367 121 ..		0.72	M 23 K	
					DL 7 K DC-01	1 367 122 ..		0.72		
					DL 7 K DC-22	1 367 125 ..		0.78		
5.5	11	15	11	39/23	DL 11 K DC-10	1 367 181 ..		0.72	M 23 K	
					DL 11 K DC-01	1 367 182 ..		0.72		
					DL 11 K DC-22	1 367 185 ..		0.78		
9	15	18.5	15	54/30	DL 15 K DC	1 367 245 .. ^{a)}		0.80	M 40 K	
					DL 15 K DC-22	1 367 241 .. ^{b)}		0.86		
11	18.5	20	18.5	54/37	DL 18 K DC	1 367 305 .. ^{a)}		0.80		
					DL 18 K DC-22	1 367 301 .. ^{b)}		0.86		

Notes

Normal/Standard voltages are:
(Short-term availability)

AC: 24, 42, 110, 230 and 400 V
DC: 24, 110 and 220 V

Other coil voltages on request

Auxiliary contact blocks - page 1613

Further system components - pages 1613-1617

Technical details - page 1667

Possible auxiliary contact block combinations - page 1615

¹⁾ Color code to IEC 309-1 printed on the coil.
Only for compact contactors, HL 4 K / HL 8 K and DL 4 K - DL 18 K

Contactors

**DL 4 K / DLg 4 K to
DL 18 K / DLg 18 K**
to switch AC or DC loads
**AC-operated or
DC-operated with economy circuit coil**
**Utilization category : AC 1 / AC 3
DC 1 ... DC 5**



Versions :

- DL 4 K to DL 18 K = DC operated, AC switching (coil with pull-in and hold winding, economy circuit coil) **A**
- DLg 4 K to DLg 18 K = DC operated, DC switching (coil with pull-in and hold winding, economy circuit coil) **B**
- DLg 4 K to DLg 18 K = AC operated/DC switching **C**
- DC contactors with sextuple break
- Favorable mounting depth due to conventional drive
- Suitable for operational voltages up to 220 V DC
- Finger protected to VDE 0106 Part 100
- Safety isolation up to 400 V AC of coil and contact elements to DIN VDE 0106: Part 101 and A1 (draft 2/98)

Voltage codes 04 ... 73 to be added to the contactor order reference number

Code number	for coil voltage		Color code ¹⁾	
	AC	DC	AC	DC
... 04	12 V		violet	green
... 06	24 V		violet	green
... 10	32 V		violet	green
... 11	36 V		green	green
... 13	42 V		white	green
... 15	48 V		white	green
... 19	60 V		green	green
... 25	110 V		yellow	green
... 28	120 V		yellow	green
... 29	127 V	125 V	yellow	green
... 38	208 V		blue	green
... 40	230 V	220 V	blue	green
... 41	220 V		blue	-
... 43	240 V		blue	-
... 59	400 V		red	-
... 61	380 V		red	-
... 63	415 V		red	-
... 65	440 V		red	-
... 69	500 V		black	-
... 73	600 V		black	-

Our control relays and compact contactors are delivered with bi-frequency coils for 50/60 Hz.

Further notes at the bottom of this page.

Characteristics

DL 4 K to DL 18 K DC operated / AC switching

A

Max. AC 3 ratings of 3-phase motors (kW)				Rated operational current I _e AC 1 / AC 3 A	Contactor type	Order ref.: see supplements at the top right	Circuit diagram	Weight kg	Suitable therm. overload relay	For dimensions see page 1674
220... 240 V	380... 415 V	500 V	690 V							
2.2	4	5.5	4	22/9	DL 4 K-01	1 366 025 ..		0.39	M 23 K	
3	5.5	7.5	5.5	22/12	DL 5 K-01	1 366 026 ..		0.39	M 23 K	
4	7.5	11	7.5	39/16	DL 7 K-01	1 366 225 ..		0.39	M 23 K	
5.5	11	15	11	39/23	DL 11 K-01	1 366 226 ..		0.39	M 23 K	
9	15	18.5	15	54/30	DL 15 K-22	1 370 013 ..		0.46	M 40 K	
11	18.5	20	18.5	54/37	DL 18 K-22	1 370 014 ..		0.46	M 40 K	

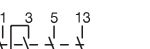
DLg 4 K bis DLg 18 K DC operated / DC switching

B

Rated operational current I _e (A)						Contactor type	Order ref.: see supplements at the top right	Circuit diagram	Weight kg	Suitable therm. overload relay	For dimensions see page 1674
DC 1			DC 2-DC 5								
24 V	110 V	220 V	24 V	110 V	220 V						
22	22	22	22	22	6	DLg 4 K-01	1 366 027 ..		0.39	M 23 K	
25	25	25	25	25	6	DLg 5 K-01	1 366 028 ..		0.39	M 23 K	
32	32	32	32	32	8	DLg 7 K-01	1 366 227 ..		0.39	M 23 K	
39	39	39	39	39	8	DLg 11 K-01	1 366 228 ..		0.39	M 23 K	
54	54	54	54	54	10	DLg 15 K-22 ü	1 370 015 ..		0.46	M 40 K	
54	54	54	54	54	16	DLg 18 K-22 ü	1 370 016 ..		0.46	M 40 K	

DLg 4 K bis DLg 18 K AC operated / DC switching

C

Rated operational current I _e (A)						Contactor type	Order ref.: see supplements at the top right	Circuit diagram	Weight kg	Suitable therm. overload relay	For dimensions see page 1674
DC 1			DC 2-DC 5								
24 V	110 V	220 V	24 V	110 V	220 V						
22	22	22	22	22	6	DLg 4 K-10	1 366 007 ..		0.34	M 23 K	
25	25	25	25	25	6	DLg 5 K-10	1 366 019 ..		0.34	M 23 K	
32	32	32	32	32	8	DLg 7 K-10	1 366 207 ..		0.34	M 23 K	
39	39	39	39	39	8	DLg 11 K-10	1 366 219 ..		0.34	M 23 K	
54	54	54	54	54	10	DLg 15 K-00	1 370 007 ..		0.45	M 40 K	
54	54	54	54	54	16	DLg 18 K-00	1 370 010 ..		0.45	M 40 K	

Notes

Normal/Standard voltages are:
(Short-term availability)

AC: 24, 42, 110, 230 and 400 V
DC: 24, 110 and 220 V

Other coil voltages on request

Auxiliary contact blocks - page 1613

Further system components - pages 1613-1617

Technical details - page 1667, 1669

Possible auxiliary contact block combinations - page 1615

¹⁾ Color code to IEC 309-1 printed on the coil.

Only for compact contactors, HL 4 K / HL 8 K and DL 4 K - DL 18 K

System components for use with AC / DC control relays and contactors

DL 4 K to DL 18 K

HL 4 K, HLg 4 K

Auxiliary contact block



- Auxiliary contacts are ENTRELEC-SCHIELE-twin aux. contacts
- Various contact combinations
- Available in two versions :
 - without plunger, no manual operation
 - with plunger, for manual operation
- Fast mounting by simply snapping to the front of the contactor
- Additional aux. contact blocks can be side mounted
- Side-mounted contacts are advantageous when using flat control boxes

Approval:

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Characteristics

Auxiliary contact blocks "without plunger"

Front mounting				
for contactor	Type	Circuit diagram	Order ref.:	
DL 15 K ¹⁾ DL 18 K and contactors on page 1610	Li-11		3 369 031 01	
	Li-22		3 369 008 01	
DLg 15 K ¹⁾ DLg 18 K on page 1612	Lig-22		3 369 021 01	
DL 4 K-10 to ²⁾ DL 11 K-10	Li-11 E		3 369 035 01	
	Li-22 E		3 369 036 01	
	Li-31 E		3 369 037 01	
DL 4 K to ³⁾ DL 18 K <u>and</u> HL 4 K HLg 4 K	Hi-11		3 369 011 01	
	Hi-22		3 369 015 01	
	Hi-02		3 369 013 01	
	Hi-20		3 369 012 01	
	Hi-40		3 369 019 01	
	Hi-22 ü		3 369 016 01	
	Hi-04		3 369 020 01	
	Hi-13		3 369 014 01	
	Hi-31		3 369 022 01	

Auxiliary contact blocks "with plunger" for manual operation

Front mounting				
for contactor	Type	Circuit diagram	Order ref.:	
DL 15 K ¹⁾ DL 18 K and contactors on page 1610	Li-11		3 369 231 01	
	Li-22		3 369 208 01	
DLg 15 K ¹⁾ DLg 18 K on page 1612	Lig-22		3 369 221 01	
DL 4 K to ³⁾	Hi-11		3 369 211 01	
DL 18 K <u>and</u>	Hi-22		3 369 215 01	
HL 4 K	Hi-02		3 369 213 01	
HLg 4 K	Hi-20		3 369 212 01	
	Hi-40		3 369 219 01	
	Hi-22 ü		3 369 216 01	
	Hi-04		3 369 220 01	
	Hi-13		3 369 214 01	
	Hi-31		3 369 222 01	

Auxiliary block for side mounting

DL 4 K to	S 11		3 368 002 01	
DL 18 K and	S 20		3 368 002 02	
HL 4 K				

Notes

- ¹⁾ Li-11 ... Lig-22 for use with contactors having no integral auxiliary contact. Circuit diagram to DIN 50012
- ²⁾ Li-11 E ... Li-31 E for use with contactors with an integral N/O auxiliary contact. Circuit diagram to DIN 50012
- ³⁾ Hi-11 ... Hi-31 for use with contactors and control relays
- ⁴⁾ Numbers put into brackets = old terminal numbering

Technical details - page 1671

Permissible auxiliary switch combinations on K range contactors - page 1615

Hints regarding terminal numbering - page 1615

Dimensions - page 1674

Common system components for use with control relays and contactors for the K-range

Coil suppressor



Mechanical interlock



Pneumatic timer



Electromechanical latch head



- Easy and fast mounting
- Clipped-on coil suppressors are captive. They can be easily clipped onto coil terminations A1 and A2 and are fastened by screws.
- Other components can be front mounted or clipped on between the contactors

■ Approvals: page 1602

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Characteristics

Coil suppressors

RC-coil suppressors (for use with AC operated contactors)

Type	Voltage range	Order ref.:	
RC-K 01	24...48 V AC/DC	3 366 035 01	
RC-K 02	110...240 V AC/DC	3 366 035 02	
RC-K 03	220...400 V AC/DC	3 366 035 03	

Diode coil suppressor (for use with DC operated contactors)

Type	Voltage range	Order ref.:	
DK-01	12...220 V DC	3 366 036 01	

Varistor coil suppressor (for use with AC or DC operated contactors)

Type	Voltage range	Order ref.:	
V-K 01	12...65 V AC 12...75 V DC	3 366 037 01	
V-K 02	60...130 V AC 70...145 V DC	3 366 037 02	
V-K 03	120...260 V AC 140...320 V DC	3 366 037 03	
V-K 04	260...400 V AC 320...540 V DC	3 366 037 04	
V-K 05	400...690 V AC 540...850 V DC	3 366 037 05	

Other components¹⁾

Electromechanical latch head MV-BN

Type	Voltage	Order ref.:	
MV-BN	12 V AC/DC	3 366 061 04	
MV-BN	24 V AC/DC	3 366 061 06	
MV-BN	42...48 V AC/DC	3 366 061 15	
MV-BN	110...127 V AC/DC	3 366 061 25	
MV-BN	220...240 V AC/DC	3 366 061 40	

Pneumatic timer PZ

Type	Time range	Order ref.:	
PZ-a ²⁾	0.1...3 s	3 357 019 01	
delay on	0.1...30 s	3 357 019 02	
energization	10...180 s	3 357 019 03	
PZ-r ²⁾	0.1...3 s	3 357 020 01	
delay on	0.1...30 s	3 357 020 02	
de-energization	10...180 s	3 357 020 03	

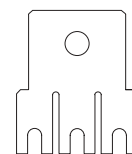
Mechanical interlock MV-e

Type	Order ref.:		
MV-e	3 359 018 01		

Connecting links, 1-pole

Connecting links are used for a parallel switching of the main contact paths of 3-pole contactors so that they can be used as 1-pole contactors with a correspondingly high rating. The conventional thermal current I_{th} will increase to approx. twice the value (set: 2 pieces for upper and lower section of the terminals).

For contactors	Order ref.:	
DL 4 K ... DL 11 K	3 366 043 02	
DL 15 K ... DL 18 K	3 370 015 02	



Connecting links, 3-pole for contactors - manual motor controllers

Type	Manual motor starter	Order ref.:	
DL 4 K...DL 11 K	MSU-K	3 366 070 00	












Notes

- ¹⁾ Detailed information - page 1615
²⁾ Not suitable for use with DL 4 K DC and DL 5 K DC contactors

Use of system components - page 1615

Further accessories - pages 1616-1617

Use of system components

Device type 	Control relays			Contactors					
	AC/DC			AC/DC					
System components 									
Side mounted auxiliary contact block Type : S 11 (1 N/O + 1 N/C contact) or you can select Type : S 20 (2 N/C contacts)		x	x		x	x		x	x
Front mounted aux. contact block Type : Hi (2 pole) Type : Hi (4 pole) Type : Li (2 pole) Type : Li (4 pole)	x x	x	x	x x	x	x		x	x
Timer Type : PZ-a (delay on energization)	x	x	x	x	x	x ¹⁾	x	x	x
Timer Type : PZ-r (delay on de-energization)	x	x	x	x	x	x ¹⁾	x	x	x
Electromechanical latch head Type : MV-BN	x	x	x	x	x	x	x	x	x

¹⁾ Not permitted on DC operated DL 4 K or DL 5 K DC contactors.

Key to symbols :



Contactor with no side mounted aux. contact block



Contactor with one side mounted aux. contact block



Contactor with two side mounted aux. contact block



Contactor can be fitted with the system component shown

Terminal numbering for circuit diagrams :

Contactors for 4 kW to 11 kW

ENTRELEC-SCHIELE contactors from 4 kW to 11 kW, i.e., contactor types DL 4 K to DL 11 K can be supplied with either one integral N/O auxiliary contact (13/14) or one auxiliary N/C contact (21/22). Positional index 1 or 2 is used for the built-in contacts.

If any additional auxiliary contacts are required, type Hi... auxiliary contacts are used. Their terminal numbering starts with positional index 5, e.g., Hi-11 (53/54 + 61/62) to avoid duplicated positional indices.

Contactors for 15 kW and 18.5 kW

ENTRELEC-SCHIELE contactors DL 15 KW and DL 18 K, i.e. contactors for 15 kW and 18.5 kW, do not have any built-in auxiliary contacts. Type Li-11 and Li-22 are intended for exclusive use with these contactors. The circuit diagram will then comply with DIN EN 50 012.

System components *supplements to page 1614

Pneumatic timer PZ *

The PZ pneumatic timer clips on to K range contactors. It is operated by the contactor either with delay on energization or de-energization.

The PZ is used wherever the requirements for accurate timing are not too exacting and where no extreme ambient environmental conditions are to be expected. A front-fitted lever is used for testing. When intended for use in a 60 Hz network, the associated contactor should be fitted with a 60 Hz coil.

Electromechanical latch head MV-BN (New) *

The MV-BN latch head clips onto K range contactors. Once it has closed, the contactor is mechanically latched by the MV-B. Unlatching is either manual or electrical, either by a push button or another contact (e.g., limit switch, relay contact). Contactor and latch head must not be energized simultaneously. An integral auxiliary contact disconnects the drive automatically 15 ms after the latch head has been energized. The PZ can be AC or DC operated.

Mechanical interlock MV-e *

If K range contactors are required as reversing or star-delta contactors or when used as safety assemblies with control relays, the MV-e interlock can be clipped on at the side between the adjacent contactors.

The MV-e is attached to the contactors without the use of a tool.

Technical details

Conventional current	I _{th} 10 A, V _e 660 V
Ambient temperature range (operating)	-40°C ... +70°C
Repetitive accuracy	± 2%
Long-term timing error	up to 0.5 x 10 ⁶ operations : +15 %
Long-term timing error with variation of ambient temperature	0.25 % / °C
Rated insulation voltage	Vi 690 V
To unlatch :	
Actuating power AC	25 V A
Actuating power DC	30 W
Pulse duration	≥ 100 ms
Max. duty cycle	10 %

Common system components for use with control relays and contactors for the K-range

Module



- The four modules below are cost-saving additions to complete the K range contactor family. They are designed to switch control sequences in a very simple and reliable manner.
- Mounting is extremely easy and fast. The modules are fitted to the top of the contactor. Connection is via solid leads to contactor coil terminations A1 and A2.
- Benefits :
 - It is possible to use contactors with 24 V to 415 V AC coils that are normally available off-the-shelf.
 - NP-K and RM-K modules are fitted with a RC coil suppressor as standard.
 - An LED to indicate switch position is included as standard.
 - A combined contactor / module unit is more reliable and lower priced than any additional external components.

Characteristics

Modules¹⁾²⁾

Low-signal module (with integral coil suppressor)

Type	Voltage range	Order ref.:	
NP-K	24 V AC/DC	3 366 214 01	
	42 V AC/DC	on request	
	230 V AC/DC	3 366 214 31	
	400 V AC	on request	

NP-K



Application :
Reliable switching of low level voltages and currents in uninterrupted duty.

Star-delta timer module

Type	Voltage and time range	Order ref.:	
YZ-K	24...240 V AC	3 366 207 12	
delay on energization	1.5...30 s		

YZ-K



Application :
Star-delta starters up to 30 kW/400 V.

Timer module

Type	Voltage and time range	Order ref.:	
ZM-K	24...240 V AC/DC		
	... 0.2...4 s	3 366 207 01	
	... 1.5...30 s	3 366 207 02	
	... 12.5...250 s	3 366 207 03	

ZM-K (delay on energization)



Application :
Panel building, simple control sequences.

Relay interface-module (with integral coil suppressor)

Type	Voltage range input/coil	Order ref.:	
RM-K 01	24 V DC/380...415 V AC	3 366 201 01	
RM-K 02	24 V DC/215...250 V AC	3 366 201 02	

RM-K (delay on energization)



Application :
Interface between programmable controller and AC operated K range contactors up to 18.5 kW and K range control relays.

Notes

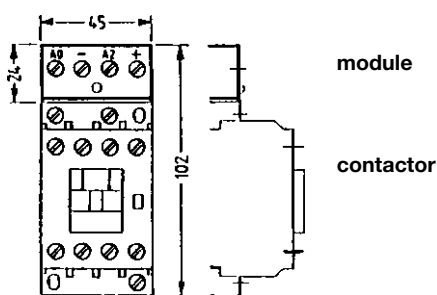
¹⁾ Technical specification - page 1617

²⁾ Safety isolation of coil and contact elements as defined by DIN VDE 0106 Part 101 and A1 (draft 2/89) is **not** possible with these modules.

Function of the modules

- These four modules below are cost-saving additions to complete the K range contactor family. They are designed to switch control sequences in a very simple and reliable manner.
- Mounting is extremely easy and fast. The modules are fitted to the top of the contactor. Connection is via solid leads to contactor coil terminations A1 and A2.
- Benefits :
 - It is possible to use contactors with 24 V to 415 V AC coils that are normally available off-the-shelf.
 - NP-K and RM-K modules are fitted with a RC coil suppressor as standard.
 - An LED to indicate switch position is fitted as standard.
 - A combined contactor / module unit is more reliable and lower-priced than any additional external components.

Dimensions



■ Approvals : RM-K module

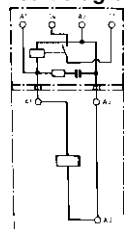
Modules¹⁾

Low-signal module NP-K

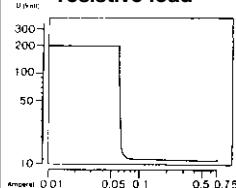


Voltage range :
24 V AC/DC
Order ref.: 3 366 214 01
Voltage range :
42 V AC/DC
Order ref.: on request
Voltage range :
230 V AC/DC
Order ref.: 3 366 214 31
Voltage range :
400 V AC
Order ref.: on request

Circuit diagram



Max. load curve at resistive load

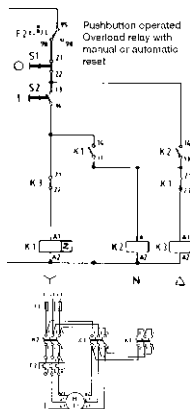


Star-delta module YZ-K

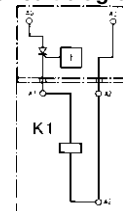


Voltage range :
24...240 V AC
1.5...30 s
Order ref.: 3 366 207 12

Star-delta connection



Circuit diagram

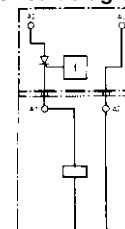


Timer module ZM-K



ZM-K delay on energization
Voltage range :
... 0.2...4 s
Order ref.: 3 366 207 01
Voltage range :
... 1.5...30 s
Order ref.: 3 366 207 02
Voltage range :
... 12.5...250 s
Order ref.: 3 366 207 03

Circuit diagram



Function

"Delay on energization"

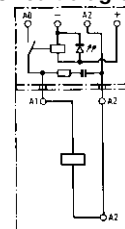
Timing starts when the supply is applied - via an external control contact, for ex. - to contactor and timer which are connected in series. The thyristor triggers and energizes the contactor once the set delay time has elapsed. The ZM-K works as a "switch delay unit"

Relay-interface module RM-K



RM-K 01
Voltage range :
24 V DC/415 V AC
Order ref.: 3 366 201 01
RM-K 02
Voltage range :
24 V DC/250 V AC
Order ref.: 3 366 201 02

Circuit diagram



Technical data

Output circuit

Min. load current			
Max. load current		0.5 A at 20°C amb. temp.	0.5 A at 20°C amb. temp.
Load current de-rating		10 mA/°C	10 mA/°C
Max. surge current		≤ 20 A for t ≤ 20 ms	≤ 20 A for t ≤ 20 ms
Relay	1 N/O contact		
Relay contact	Ruthenium reed contact		
Contact resistance	200 mΩ max. (initial value)		
Max. switching voltage	200 V =/~ (peak)		
Max. switching current	V > 12 V : 0.05 A =/~ (peak) V ≤ 12 V : 0.75 A =/~ (peak)		
Max. switching capacity	10 V A		
Dielectric strength	350 V =/~ min. between open contacts 2000 V ~ min. between input - output circuit		

Input circuit

Supply voltage and power consumption	24 V AC/DC - 0.072 W 42 V AC/DC - 0.132 W 230 V AC/DC - 0.800 W		
--------------------------------------	---	--	--

Supply voltage range	A1-A2	24...240 V AC	24...240 V AC/DC
Voltagess loss while timing		(A1/A2) ≤ 3 V	(A1/A2) ≤ 3 V
Power consumption while timing		≤ 2 mA (24...60 V AC) ≤ 8 mA (60...240 V AC)	≤ 2 mA (24...60 V AC/DC) ≤ 8 mA (60...240 V AC/DC)
Supply voltage tolerance		-15 %, +10 %	
Supply voltage frequency		50...60 Hz	
Ambient temperature range		-20°C ... +60°C	
Switch position indication		LED red	LED red

Time circuit

Recovery time		150 ms	150 ms
Repetitive accuracy		± 0.2 %	± 0.2 %
Timing error within tolerance of supply voltage		≤ 0.5 %	≤ 0.5 %
Timing error within tolerance of ambient temperature		≤ 0.07 % / °C	≤ 0.07 % / °C
Ambient temperature range		-20°C ... +60°C	-20°C ... +60°C
Time range (delay on energization)		1.5...30 s	1.5...30 s

RM-K module

RM-K 01

Input: 19...40 V DC
15...30 mA
Output: 415 V AC
AC 11 : 1.5 A
470 Ω
0.15 μF

RM-K 02

Input: 19...40 V DC
15...30 mA
Output: 250 V AC
AC 11 : 1.5 A
220 Ω
0.22 μF

Contact life:
2 million operations (approx.)

Function :

1. A DC voltage, e.g. 24 V, to energize the RM-K coil is applied to terminals - and +.
2. An AC voltage, e.g. 230 V, is applied to terminals A0 and A2. The contactor coil is energized by the RM-K contact.

LED green

Notes

- ¹⁾ Safety isolation of coil and contact elements as defined by DIN VDE 0106 Part 101 and A1 (draft 2/89) is **not** possible on modules.

**Voltage code numbers 04 ...73
to be added to the contactor order reference
number for compact contactors**

Code number	for coil voltage		Color code ¹⁾	
	AC	DC	AC	DC
... 04	12 V		violet	green
... 06	24 V		violet	green
... 10	32 V		violet	green
... 11	36 V		green	green
... 13	42 V		white	green
... 15	48 V		white	green
... 19	60 V		green	green
... 25	110 V		yellow	green
... 28	120 V		yellow	green
... 29	127 V	125 V	yellow	green
... 38	208 V		blue	green
... 40	230 V	220 V	blue	green
... 41	220 V		blue	-
... 43	240 V		blue	-
... 59	400 V		red	-
... 61	380 V		red	-
... 63	415 V		red	-
... 65	440 V		red	-
... 69	500 V		black	-
... 73	600 V		black	-

Our control relays, compact contactors and mini contactors are delivered with bi-frequency coils for 50/60 Hz.

Our N-contactors are available with mono-frequency coils for 50 or 60 Hz.



Notes

Normal/Standard voltages are:
(Short-term availability)

AC: 24, 42, 110, 230 and 400 V
DC: 24, 110 and 220 V

Other coil voltages on request

¹⁾ Color code to IEC 309-1 printed on the coil. Only for compact contactors HL 4 K / HL 8 K and DL 4 K - DL 18 K