

TeSys motor starters up to 150 A


Catalogue

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Applications	Pre-assembled starters			
	Small machines starting under full load: D.O.L. starters		Machines starting under no-load: star-delta starters	
Starter type	D.O.L. or reversing starters with circuit-breaker		D.O.L. starters with fuse protection	Soft start units or star-delta starters to be used in association with a circuit-breaker or fuses
				
Level of service	Type 1 coordination		Type 2 coordination	–
Power at 400 V	Up to 5.5 kW	Up to 37 kW	Up to 37 kW	Up to 132 kW
Type of components	Combination automatic motor starter with overload protection built into the circuit-breaker		Fuse carrier + plate-mounted contactor	3 contactors (line, star and delta, mounted on plate, rail or chassis)
Pages	8 and 9	10 and 11	12 and 13	Please consult our catalogue "Motor starter solutions".

Starters for customer assembly

Small machines starting under full load: D.O.L. starters
Machines starting under no-load: star-delta starters

D.O.L. or reversing starters

D.O.L., reversing or star-delta starters with circuit-breakers

D.O.L., reversing or star-delta starters with fuses



Total coordination

Type 1 and type 2 coordination

—

—

Up to 15 kW

Up to 110 kW

Up to 315 kW

Up to 355 kW

Contactor-breaker

Thermal magnetic circuit-breaker
+ contactor(s)

Magnetic circuit-breaker
+ contactor(s)
+ thermal overload relay

Fuse carrier
+ contactor(s)
+ thermal overload relay

Switch-disconnector-fuse
+ contactor(s)
+ thermal overload relay

Please consult our catalogue
"Motor starter solutions".

18 and 19, 24 and 25

20 and 21,
26 and 27

Please consult our catalogue "Motor starter solutions".

Type 1 and type 2 coordination according to the standard

The standard defines tests at different levels of current; the purpose of these tests is to place the equipment in extreme conditions.

The standard defines 2 types of coordination, according to the condition of the components after testing:

type 1,

type 2.

To determine the type of coordination, the standard requires that the behaviour of the equipment be tested under overload and short-circuit conditions for 3 fault current values, covering overload and short-circuit conditions.

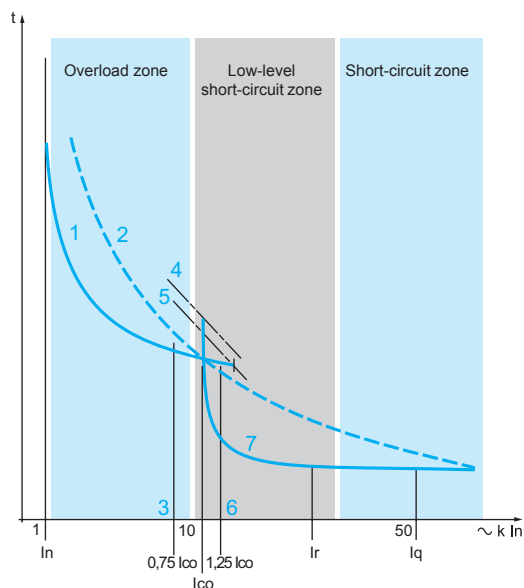
Type 1 coordination

Type 1 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must not be able to resume operation without repair or the replacement of parts.

Type 2 coordination

Type 2 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must subsequently be able to resume operation. The risk of contact welding is permissible; in this case, the manufacturer must indicate measures to be taken regarding maintenance of the equipment.

Type 2 coordination increases reliability of operation.



- 1 Thermal overload relay curve.
- 2 Fuse.
- 3 Tripping of thermal overload relay only.
- 4 Thermal limit of the circuit-breaker.
- 5 Thermal overload relay limit.
- 6 Current broken by the SCPD (1).
- 7 Circuit breaker magnetic trip.

Current values

Current "Ico" (overload $I < 10 I_n$)

The thermal overload relay associated with the contactor provides protection against this type of fault, up to a value I_{co} (see curve) defined by the manufacturer.

Standard IEC 60947-4-1 specifies the 2 current values to be used for checking coordination between the thermal overload relay and the short-circuit protection device:

- at $0.75 I_{co}$ only the thermal overload relay must trip,
- at $1.25 I_{co}$ the short-circuit protection device must operate.

Current "r" (low level short-circuit $10 < I < 50 I_n$)

The main cause of this type of fault is the deterioration of insulating materials. Standard IEC 60947-4-1 defines an intermediate short-circuit current "r". This test current makes it possible to check whether the protection device is providing protection against low-level short-circuits.

Operational current I_e (AC-3) (A)	Current "r" (kA)
$I_e \leq 16$	1
$16 < I_e \leq 63$	3
$63 < I_e \leq 125$	5
$125 < I_e \leq 315$	10
$315 < I_e \leq 630$	18
$630 < I_e \leq 1000$	30

Current "Iq" (short-circuit > current "r")

This type of fault corresponds to a dead short and is relatively rare. It can be caused by a connection error during maintenance work. Short-circuit protection is provided by fast operating devices.

Standard IEC 60947-4-1 defines a current "Iq". The coordination tables supplied by Schneider Electric are based on a current "Iq" that is generally ≥ 50 kA.

(1) SCPD: short-circuit protection device.

Selection

No coordination

Considerable risks to both persons and equipment.

Not authorised by standards:

- NF C 15-100 and IEC 60364-1, article 133-1 (installation regulations),
- EN/IEC 60204-1, article 7 (electrical equipment in machines),
- IEC 60947-4-1, article 8.2.5. (starters)

Type 1 coordination

The most frequently used solution.

- Equipment costs are lower.
- Reliability of operation is not a requirement.
- Before restarting, it may be necessary to repair the motor starter.

Consequences:

- significant amount of machine downtime,
- skilled maintenance personnel required to repair, check, obtain supplies.

Example: air conditioning in commercial premises.

Type 2 coordination

This solution ensures reliability of operation.

Consequences:

- reduced machine downtime,
- reduced maintenance after a short-circuit.

Example: escalators.

Total coordination

With this solution, no damage or misadjustment is permissible and reliability of operation is guaranteed.

Consequences:

- immediate return to service,
- no special precautions required.

Examples: smoke extraction, fire-fighting pumps.

D.O.L. starters, non-reversing, from 0.37 to 5.5 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit-breaker GV2 ME,
- 1 3-pole contactor LC1 K,
- 1 combination block GV2 AF01.

Characteristics

Starter type	GV2	ME06K1	ME07K1	ME08K1	ME10K1	ME14K1	ME16K1
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1						
	400/415 V	kA	50	50	50	50	15
	440 V	kA	50	50	50	50	15
	500 V	kA	50	50	50	50	15
						10 (4 kW) 6 (5.5 kW)	6

References



GV2 ME10K1●●

D.O.L. starters, non-reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code (3)	kg
0.37	0.37	0.37	1...1.6	22.5	GV2 ME06	LC1 K06	GV2 ME06K1●●	0.460
0.55	0.55	0.55						
—	—	0.75						
0.75	0.75	—	1.6...2.5	33.5	GV2 ME07	LC1 K06	GV2 ME07K1●●	0.460
—	1.1	1.1						
1.1	—	1.5	2.5...4	51	GV2 ME08	LC1 K06	GV2 ME08K1●●	0.460
1.5	1.5	2.2						
2.2	2.2	—	4...6.3	78	GV2 ME10	LC1 K06	GV2 ME10K1●●	0.460
—	3	3						
3	—	4	6...10	138	GV2 ME14	LC1 K09	GV2 ME14K1●●	0.460
4	4	5.5						
5.5	5.5	7.5	9...14	170	GV2 ME16	LC1 K12	GV2 ME16K1●●	0.460

Add-on blocks

Description	Sold in lots of	Unit reference	Weight kg
Combination block between circuit-breaker and contactor	10	GV2 AF01	0.020

(1) The breaking performance of circuit-breakers **GV2 ME** can be increased by adding a current limiter **GV1 L3**, see page 39.

(2) Please consult your Regional Sales Office.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	110	220/230	230	230/240	380/400
~ 50/60 Hz	B7	F7	M7	P7	U7	Q7
— (4)	BW3	—	—	—	—	—

(4) Coil: low consumption (1.5 W), wide range (0.7...1.3 U_c) with integral suppression device as standard.

D.O.L. starters, reversing, from 0.37 to 5.5 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit-breaker GV2 ME,
- 1 3-pole reversing contactor LC2 K,
- 1 combination block GV2 AF01.

Characteristics

Starter type		GV2		ME06K2	ME07K2	ME08K2	ME10K2	ME14K2	ME16K2
Breaking capacity (I _q) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	50	50	50	50	50	15
		440 V	kA	50	50	50	50	15	8
		500 V	kA	50	50	50	50	10/4 kW 6/5.5 kW	6

References



GV2 ME10K2●●

D.O.L. starters, reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code (3)	kg
0.37	0.37	0.37	1...1.6	22.5	GV2 ME06	LC2 K06	GV2 ME06K2●●	0.460
0.55	0.55	0.55						
—	—	0.75						
0.75	0.75	—	1.6...2.5	33.5	GV2 ME07	LC2 K06	GV2 ME07K2●●	0.460
—	1.1	1.1						
1.1	—	1.5	2.5...4	51	GV2 ME08	LC2 K06	GV2 ME08K2●●	0.460
1.5	1.5	2.2						
2.2	2.2	—	4...6.3	78	GV2 ME10	LC2 K06	GV2 ME10K2●●	0.460
—	3	3						
3	—	4	6...10	138	GV2 ME14	LC2 K09	GV2 ME14K2●●	0.460
4	4	5.5						
5.5	5.5	7.5	9...14	170	GV2 ME16	LC2 K12	GV2 ME16K2●●	0.460

Add-on blocks

Description	Sold in lots of	Unit reference	Weight kg
Combination block between circuit-breaker and contactor	10	GV2 AF01	0.020

(1) The breaking performance of circuit-breakers GV2 ME can be increased by adding a current limiter GV1 L3, see page 39.

(2) Please consult your Regional Sales Office.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	110	220/230	230	230/240	380/400
~ 50/60 Hz	B7	F7	M7	P7	U7	Q7
— (4)	BW3	—	—	—	—	—

(4) Coil: low consumption (1.5 W), wide range (0.7...1.3 U_c) with integral suppression device as standard.

D.O.L. starters, non-reversing, from 0.06 to 30 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit-breaker GV2 ME,
- 1 3-pole contactor LC1 D,
- 1 combination block GV2 AF3.

Characteristics

Starter type		GV2		DM 102 to DM 110	DM 114	DM 116	DM 120	DM 121	DM 122	DM 132
Breaking capacity (I _q) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	50	50	15	15	15	15	10
		440 V	kA	50	15	8	8	6	6	6
		500 V	kA	50	6	6	6	4	4	4

References



GV2 DM102●●

D.O.L. starters, non-reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code (2)	kg
0.06	0.06	—	0.16...0.25	2.4	GV2 ME02	LC1 D09●●	GV2 DM102●● (3)	0.596
0.09	0.09	—	0.25...0.40	5	GV2 ME03	LC1 D09●●	GV2 DM103●● (3)	0.596
—	0.12	—	—	—	—	—	—	—
0.12	—	—	0.40...0.63	8	GV2 ME04	LC1 D09●●	GV2 DM104●● (3)	0.596
0.18	0.18	—	—	—	—	—	—	—
0.25	0.25	—	0.63...1	13	GV2 ME05	LC1 D09●●	GV2 DM105●● (3)	0.596
0.37	0.37	—	—	—	—	—	—	—
—	—	0.37	1...1.6	22.5	GV2 ME06	LC1 D09●●	GV2 DM106●● (3)	0.596
0.55	0.55	0.55	—	—	—	—	—	—
—	—	0.75	—	—	—	—	—	—
0.75	0.75	—	1.6...2.5	33.5	GV2 ME07	LC1 D09●●	GV2 DM107●● (3)	0.596
—	1.1	1.1	—	—	—	—	—	—
1.1	—	1.5	2.5...4	51	GV2 ME08	LC1 D09●●	GV2 DM108●● (3)	0.596
1.5	1.5	2.2	—	—	—	—	—	—
2.2	2.2	—	4...6.3	78	GV2 ME10	LC1 D09●●	GV2 DM110●● (3)	0.596
—	3	3	—	—	—	—	—	—
3	—	4	6...10	138	GV2 ME14	LC1 D09●●	GV2 DM114●● (3)	0.596
4	4	5.5	—	—	—	—	—	—
5.5	5.5	7.5	9...14	170	GV2 ME16	LC1 D12●●	GV2 DM116●●	0.601
7.5	7.5	—	13...18	223	GV2 ME20	LC1 D18●●	GV2 DM120●●	0.606
—	9	9	—	—	—	—	—	—
9	11	11	17...23	327	GV2 ME21	LC1 D25●●	GV2 DM121●●	0.646
11	—	15	20...25	327	GV2 ME22	LC1 D25●●	GV2 DM122●●	0.646
15	15	18.5	24...32	416	GV2 ME32	LC1 D32●●	GV2 DM132●●	0.651

Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference	Weight kg
Combination block between circuit-breaker and contactor	1-rail	10	GV2 AF3	0.016
	Mounting plate LAD 311	10	GV2 AF4	0.016

(1) The breaking performance of circuit-breakers **GV2 ME** can be increased by adding a current limiter **GV1 L3**, see page 39.

(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
~ 50/60 Hz	B7	M7	P7
— (4)	BD	—	—

(3) Type 2 coordination also possible, see page 19.

(4) Only available for **GV2 DM**. Coil with integral suppression device as standard.

D.O.L. starters, reversing, from 0.06 to 15 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit-breaker GV2 ME,
- 1 3-pole reversing contactor LC2 D,
- 1 combination block GV2 AF3.

Characteristics

Starter type		GV2		DM202 to DM210	DM214	DM216	DM220	DM221	DM222	DM232
Breaking capacity (I _q) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	50	50	15	15	15	15	10
		440 V	kA	50	15	8	8	6	6	6
		500 V	kA	50	10	6	6	4	4	4

References



GV2 DM202●●

D.O.L. starters, reversing (2)

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (3)		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code (4)	kg
0.06	0.06	—	0.16...0.25	2.4	GV2 ME02	LC2 D09●●	GV2 DM202●●	0.963
0.09	0.09	—	0.25...0.40	5	GV2 ME03	LC2 D09●●	GV2 DM203●●	0.963
—	0.12	—	—	—	—	—	—	—
0.12	—	—	0.40...0.63	8	GV2 ME04	LC2 D09●●	GV2 DM204●●	0.963
0.18	0.18	—	—	—	—	—	—	—
0.25	0.25	—	0.63...1	13	GV2 ME05	LC2 D09●●	GV2 DM205●●	0.963
0.37	0.37	—	—	—	—	—	—	—
—	—	0.37	1...1.6	22.5	GV2 ME06	LC2 D09●●	GV2 DM206●●	0.963
0.55	0.55	0.55	—	—	—	—	—	—
—	—	0.75	—	—	—	—	—	—
0.75	0.75	—	1.6...2.5	33.5	GV2 ME07	LC2 D09●●	GV2 DM207●●	0.963
—	1.1	1.1	—	—	—	—	—	—
1.1	—	1.5	2.5...4	51	GV2 ME08	LC2 D09●●	GV2 DM208●●	0.963
1.5	1.5	2.2	—	—	—	—	—	—
2.2	2.2	—	4...6.3	78	GV2 ME10	LC2 D09●●	GV2 DM210●●	0.963
—	3	3	—	—	—	—	—	—
3	—	4	6...10	138	GV2 ME14	LC2 D09●●	GV2 DM214●●	0.963
4	4	5.5	—	—	—	—	—	—
5.5	5.5	7.5	9...14	170	GV2 ME16	LC2 D12●●	GV2 DM216●●	0.973
7.5	7.5	—	13...18	223	GV2 ME20	LC2 D18●●	GV2 DM220●●	0.983
—	9	9	—	—	—	—	—	—
9	11	11	17...23	327	GV2 ME21	LC2 D25●●	GV2 DM221●●	1.063
11	—	15	20...25	327	GV2 ME22	LC2 D25●●	GV2 DM222●●	1.063
15	15	18.5	24...32	416	GV2 ME32	LC2 D32●●	GV2 DM232●●	1.073

Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference	Weight kg
Combination block between circuit-breaker and contactor	— rail	10	GV2 AF3	0.016
	Mounting plate LAD 311	10	GV2 AF4	0.016

(1) The breaking performance of circuit-breakers GV2 ME can be increased by adding a current limiter GV1 L3, see page 39.

(2) Type 2 coordination also possible, see page 21.

(3) See page 152.

(4) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
~ 50/60 Hz	B7	M7	P7
— (5)	BD	—	—

(5) Coil with integral suppression device as standard.

D.O.L. starters, non-reversing, from 0.06 to 30 kW at 400/415 V, type 2 coordination

This pre-assembled combination comprises:

- 1 motor circuit-breaker GV2 P,
- 1 3-pole contactor LC1 D,
- 1 combination block GV2 AF3.

Characteristics

Starter type		GV2		DP102 to DP110	DP114	DP116	DP120	DP121	DP122	DP132
Breaking capacity (I _q) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	130	130	130	50	50	50	50
		440 V	kA	130	130	50	20	20	20	20
		500 V	kA	130	50	42	10	10	10	10

References



GV2 DP102●●

GV3 P651
+
LC1 D65A●●

D.O.L. starters, non-reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code (3)	kg
0.06	0.06	—	0.16...0.25	2.4	GV2 P02	LC1 D09●●	GV2 DP102●●	0.686
—	0.09	—	0.25...0.40	5	GV2 P03	LC1 D09●●	GV2 DP103●●	0.686
0.09	0.12	—	0.40...0.63	8	GV2 P04	LC1 D09●●	GV2 DP104●●	0.686
0.12	—	—	0.63...1	13	GV2 P05	LC1 D09●●	GV2 DP105●●	0.686
0.18	0.18	—	1...1.6	22.5	GV2 P06	LC1 D09●●	GV2 DP106●●	0.686
0.25	0.25	—	1.6...2.5	33.5	GV2 P07	LC1 D09●●	GV2 DP107●●	0.686
0.37	0.37	—	2.5...4	51	GV2 P08	LC1 D09●●	GV2 DP108●●	0.696
—	—	0.37	4...6.3	78	GV2 P10	LC1 D09●●	GV2 DP110●●	0.736
0.55	0.55	0.55	6...10	138	GV2 P14	LC1 D09●●	GV2 DP114●●	0.736
—	—	0.75	9...14	170	GV2 P16	LC1 D25●●	GV2 DP116●●	0.741
—	—	1.1	13...18	223	GV2 P20	LC1 D25●●	GV2 DP120●●	0.736
0.75	0.75	—	17...23	327	GV2 P21	LC1 D25●●	GV2 DP121●●	0.741
—	—	1.5	20...25	327	GV2 P22	LC1 D25●●	GV2 DP122●●	0.741
1.1	—	1.5	24...32	416	GV2 P32	LC1 D32●●	GV2 DP132●●	0.741
1.5	1.5	2.2	30...40	560	GV3 P401 (4)	LC1 D50A●●	—	1.725
2.2	2.2	—	30...40	560	GV3 P401 (4)	LC1 D65A●●	—	1.730
—	3	3	37...50	700	GV3 P501 (4)	LC1 D50A●●	—	1.725
3	—	4	37...50	700	GV3 P501 (4)	LC1 D65A●●	—	1.730
4	4	5.5	48...65	910	GV3 P651 (4)	LC1 D65A●●	—	1.730
5.5	5.5	7.5						
—	7.5	9						
7.5	9	—						
9	11	11						
11	—	15						
15	15	18.5						
18.5	—	—						
—	18.5	22						
22	—	—						
—	22	30						
30	30	—						

Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference	Weight kg
Combination block between circuit-breaker and contactor	— rail	10	GV2 AF3	0.016
	Mounting plate LAD 311	10	GV2 AF4	0.016

(1) The breaking performance of circuit-breakers GV2 P can be increased by adding a current limiter GV1 L3, see page 39.

(2) See page 152.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
~ 50/60 Hz	B7	M7	P7
— (5)	BD	—	—

(4) Circuit-breaker supplied without downstream EverLink® power terminal block, which is required for vertical mounting. For side by side mounting, use a GV3 P circuit-breaker with terminal blocks and the GV3S set of S-shape busbars (see page 175).

(5) Coil with integral suppression device as standard.

D.O.L. starters, reversing, from 0.06 to 30 kW at 400/415 V, type 2 coordination

This pre-assembled combination comprises:

- 1 motor circuit-breaker GV2 P,
- 1 3-pole reversing contactor LC2 D,
- 1 combination block GV2 AF3.

Characteristics

Starter type		GV2		DP202 to DP210	DP214	DP216	DP220	DP221	DP222	DP232
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	130	130	130	50	50	50	50
		440 V	kA	130	130	50	20	20	20	20
		500 V	kA	130	50	42	10	10	10	10

References



GV2 DP202●●

GV3 P651
+
LC2 D65A●●

D.O.L. starters, reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code (3)	kg
0.06	0.06	—	0.16...0.25	2.4	GV2 P02	LC2 D09●●	GV2 DP202●●	1.053
—	0.09	—	0.25...0.40	5	GV2 P03	LC2 D09●●	GV2 DP203●●	1.053
0.09	0.12	—	—	—	—	—	—	—
0.12	—	—	0.40...0.63	8	GV2 P04	LC2 D09●●	GV2 DP204●●	1.053
0.18	0.18	—	—	—	—	—	—	—
0.25	0.25	—	0.63...1	13	GV2 P05	LC2 D09●●	GV2 DP205●●	1.053
0.37	0.37	—	—	—	—	—	—	—
—	—	0.37	1...1.6	22.5	GV2 P06	LC2 D09●●	GV2 DP206●●	1.053
0.55	0.55	0.55	—	—	—	—	—	—
—	—	0.75	—	—	—	—	—	—
0.75	0.75	—	1.6...2.5	33.5	GV2 P07	LC2 D09●●	GV2 DP207●●	1.053
—	1.1	1.1	—	—	—	—	—	—
1.1	—	1.5	2.5...4	51	GV2 P08	LC2 D09●●	GV2 DP208●●	1.073
1.5	1.5	2.2	—	—	—	—	—	—
2.2	2.2	—	4...6.3	78	GV2 P10	LC2 D09●●	GV2 DP210●●	1.153
—	3	3	—	—	—	—	—	—
3	—	4	6...10	138	GV2 P14	LC2 D09●●	GV2 DP214●●	1.153
4	4	5.5	—	—	—	—	—	—
5.5	5.5	7.5	9...14	170	GV2 P16	LC2 D25●●	GV2 DP216●●	1.163
—	7.5	9	—	—	—	—	—	—
7.5	9	—	13...18	223	GV2 P20	LC2 D25●●	GV2 DP220●●	1.153
9	11	11	17...23	327	GV2 P21	LC2 D25●●	GV2 DP221●●	1.163
11	—	15	20...25	327	GV2 P22	LC2 D25●●	GV2 DP222●●	1.163
15	15	18.5	24...32	416	GV2 P32	LC2 D32●●	GV2 DP232●●	1.163
18.5	—	—	30...40	560	GV3 P401 (4)	LC2 D50A●●	—	2.750
—	18.5	22	30...40	560	GV3 P401 (4)	LC2 D65A●●	—	2.760
22	—	—	37...50	700	GV3 P501 (4)	LC2 D50A●●	—	2.750
—	22	30	37...50	700	GV3 P501 (4)	LC2 D65A●●	—	2.760
30	30	—	48...65	910	GV3 P651 (4)	LC2 D65A●●	—	2.760

Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference	Weight kg
Combination block between circuit-breaker and contactor	— rail	10	GV2 AF3	0.016
	Mounting plate LAD 311	10	GV2 AF4	0.016

(1) The breaking performance of circuit-breakers GV2 P can be increased by adding a current limiter GV1 L3, see page 39.

(2) See page 152.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
~ 50/60 Hz	B7	M7	P7
— (5)	BD	—	—

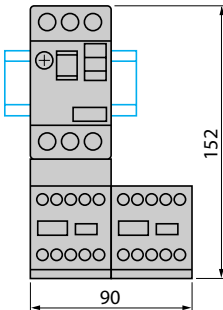
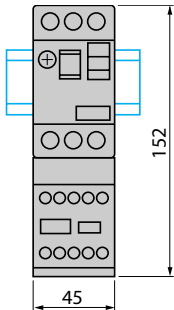
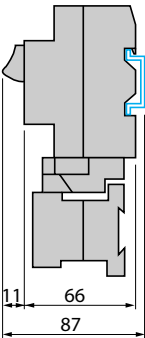
(4) Circuit-breaker supplied without downstream EverLink® power terminal block, which is required for vertical mounting. For side by side mounting, use a GV3 P circuit-breaker with terminal blocks and the GV3S set of S-shape busbars (see page 175).

(5) Coil with integral suppression device as standard.

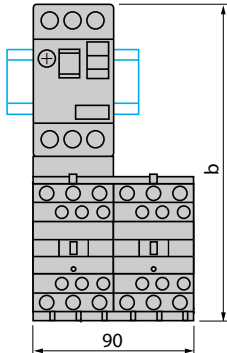
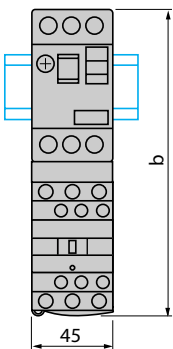
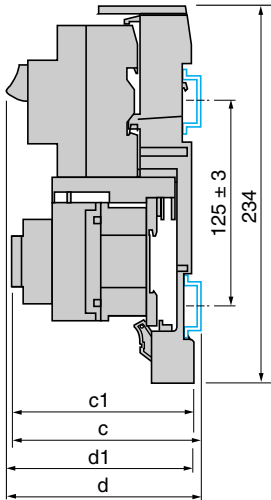
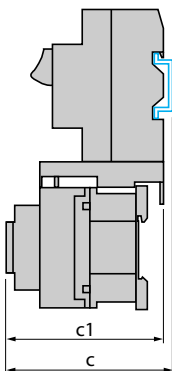
TeSys motor starters - open version

Combination automatic motor starters

GV2 ME●●K●●●	GV2 ME●●K1●●	GV2 ME●●K2●●
On mounting rail AM1 DE200		



GV2 DM●●●●●	With adapter plate LAD 311	GV2 DM1●●●●	GV2 DM2●●●●
On mounting rail AM1 DE200			



GV2	DM●02●● to DM●20●●	DM●21●● to DM●32●●
b	176.4	186.8
c	99.6	105.9
c1	94.1	100.4

GV2	DM●02●● to DM●20●●	DM●21●● to DM●32●●
c	135.6	141.9
c1	130.1	136.4
d	112.5	112.5
d1	107	107

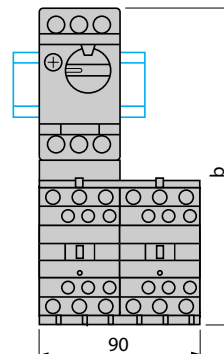
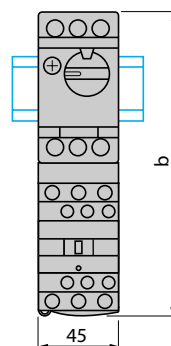
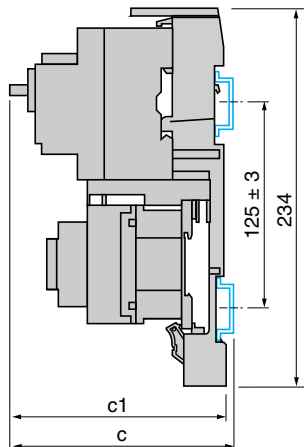
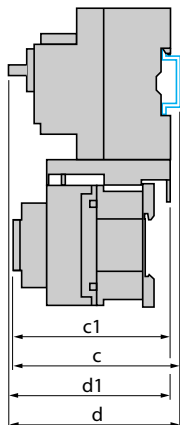
GV2 DP●●●●●

On mounting rail AM1 DE200

With adapter plate LAD 311

GV2 DP1●●●●

GV2 DP2●●●●



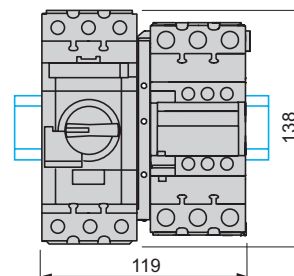
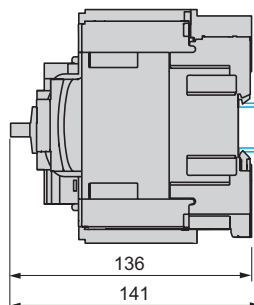
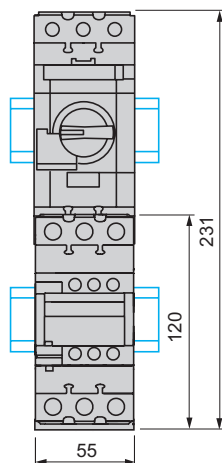
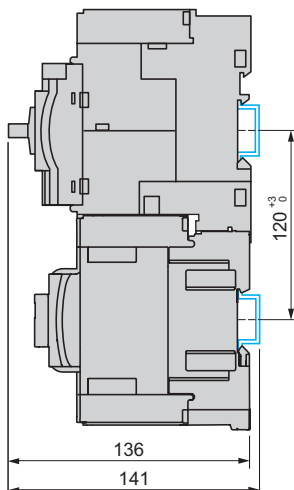
GV2	DP●02●● to DP●08●●	DP●10●● to DP●32●●
b	176.4	186.8
c	105.6	111.9
c1	100.1	106.4
d	100.5	100.5
d1	95	95

GV2	DP●02●● to DP●08●●	DP●10●● to DP●32●●
c	141.6	147.9
c1	136.5	142.4

GV3 P●●1 + LC1 D40A...D65A (for customer assembly)

Vertical mounting

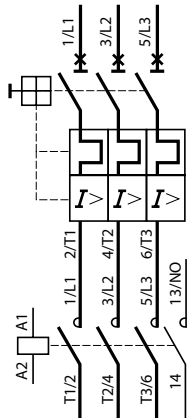
Side by side mounting with S-shape busbar system GV3 S



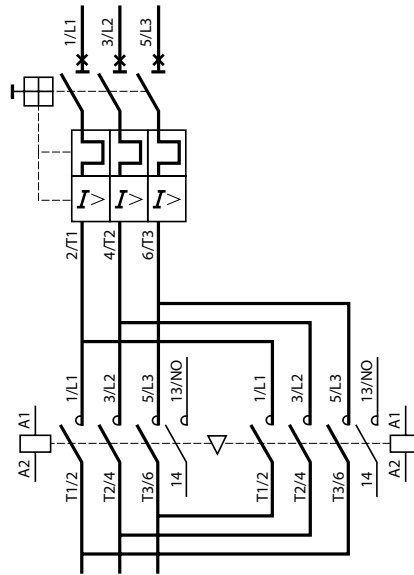
TeSys motor starters - open version

Combination automatic motor starters

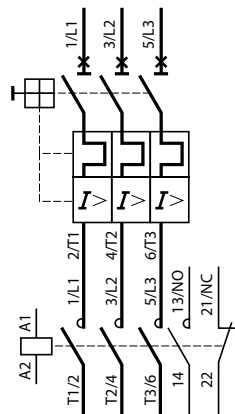
GV2 ME●●K1●●



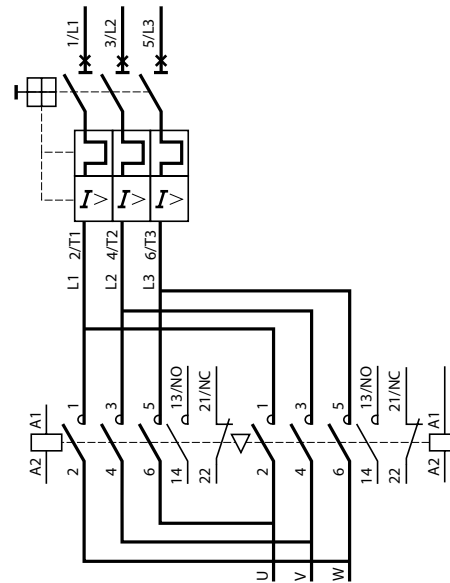
GV2 ME●●K2●●



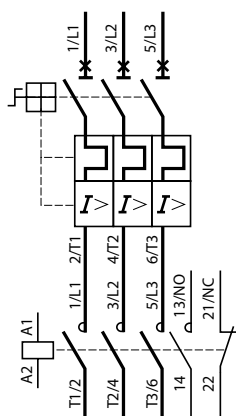
GV2 DM1●●●●



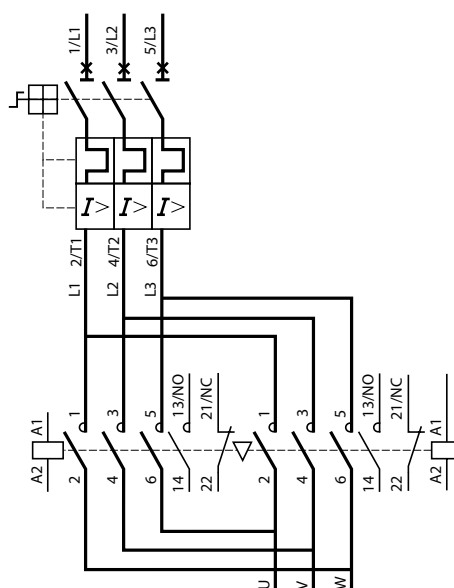
GV2 DM2●●●●



GV2 DP1●●●●

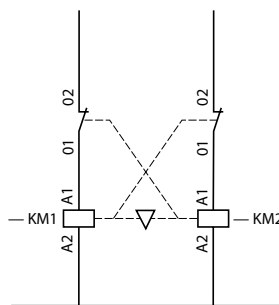
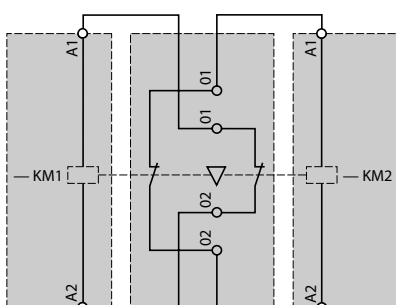


GV2 DP2●●●●

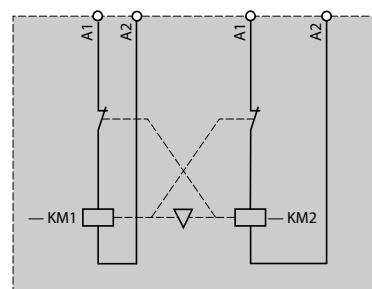


Mechanical interlock with integral electrical contacts

Control circuit ~



Control circuit ---



0.06 to 110 kW at 400/415 V: type 1 coordination											
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit-breaker		Contactor
400/415 V			440 V			500 V			Reference	Setting range of thermal trips	Reference (2)
P	I _e	I _q (1)	P	I _e	I _q (1)	P	I _e	I _q (1)		A	
kW	A	kA	kW	A	kA	kW	A	kA			
0.06	0.2	50	0.06	0.19	50	—	—	—	GV2 ME02	0.16...0.25	LC1 K06 or LC1 D09
0.09	0.3	50	0.09	0.28	50	—	—	—	GV2 ME03	0.25...0.40	LC1 K06 or LC1 D09
			0.12	0.37	50	—	—	—			
0.12	0.44	50	—	—	—	—	—	—	GV2 ME04	0.40...0.63	LC1 K06 or LC1 D09
0.18	0.6	50	0.18	0.55	50	—	—	—			
0.25	0.85	50	0.25	0.76	50	—	—	—	GV2 ME05	0.63...1	LC1 K06 or LC1 D09
0.37	1.1	50	0.37	0.99	50	—	—	—			
—	—	—	—	—	—	0.37	0.88	50	GV2 ME06	1...1.6	LC1 K06 or LC1 D09
0.55	1.5	50	0.55	1.36	50	0.55	1.2	50			
—	—	—	—	—	—	0.75	1.5	50	GV2 ME06	1...1.6	LC1 K06 or LC1 D09
0.75	1.9	50	0.75	1.68	50	—	—	—	GV2 ME07	1.6...2.5	LC1 K06 or LC1 D09
—	—	—	1.1	2.37	50	1.1	2.2	50			
1.1	2.7	50	—	—	—	1.5	2.9	50/50	GV2 ME08	2.5...4	LC1 K06 or LC1 D09
1.5	3.6	50	1.5	3.06	50	2.2	3.9	—			
2.2	4.9	50	2.2	4.42	50	—	—	—	GV2 ME10	4...6.3	LC1 K06 or LC1 D09
—	—	—	3	5.77	50	3	5.2	50			
3	6.5	50	—	—	—	4	6.8	10	GV2 ME14	6...10	LC1 K09 or LC1 D09
4	8.5	50	4	7.9	15	5.5	9.2	10			
5.5	11.5	15	5.5	10.4	8	7.5	12.4	6	GV2 ME16	9...14	LC1 K12 or LC1 D12
7.5	15.5	15	7.5	13.7	8	9	13.9	6	GV2 ME20	13...18	LC1 D18
—	—	—	9	16.9	8	—	—	—			
9	18.1	15	11	20.1	6	11	17.6	4	GV2 ME21	17...23	LC1 D25
11	22	15	—	—	—	15	23	4	GV2 ME22	20...25	LC1 D25
15	29	10	15	26.5	6	18.5	28	4	GV2 ME32	24...32	LC1 D32
18.5	35	50	18.5	32.8	50	22	33	10	GV3 P40	30...40	LC1 D40A
22	41	50	22	39	50	30	44	10	GV3 P50	37...50	LC1 D50A
30	55	50	30	51.5	50	37	53	10	GV3 P65	48...65	LC1 D65A
—	—	—	37	64	25	45	64	18	GV7 RE80	48...80	LC1 D65A
37	66	15	45	76	10	55	78	4	GV3 ME80	56...80	LC1 D80
37	66	25	45	76	25	55	78	18	GV7 RE80	48...80	LC1 D80
45	80	25	—	—	—	—	—	—	GV7 RE100	60...100	LC1 D95
—	—	—	50	90	25	—	—	—	GV7 RE100	60...100	LC1 D115
55	97	25	—	—	—	75	106	30	GV7 RE150	90...150	LC1 D115
75	132	35	75	125	35	90	128	30	GV7 RE150	90...150	LC1 D150
—	—	—	90	146	35	—	—	—	GV7 RE150	90...150	LC1 F185
90	160	35	—	—	—	110	156	30	GV7 RE220	132...220	LC1 F185
—	—	—	—	—	—	132	184	30	GV7 RE220	132...220	LC1 F265
—	—	—	110	178	35	160	224	30			
110	195	35	132	215	35	—	—	—	GV7 RE220	132...220	LC1 F225

(1) The breaking performance of circuit-breakers **GV2 ME** can be increased by adding a current limiter **GV1 L3**, see page 39.

(2) For reversing operation, replace the prefix LC1 with LC2.

0.06 to 110 kW at 400/415 V: type 2 coordination											
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit-breaker		Contactor
									Reference	Setting range of thermal trips	Reference (2)
400/415 V			440 V			500 V					
P	I _e	I _q (1)	P	I _e	I _q (1)	P	I _e	I _q (1)			
kW	A	kA	kW	A	kA	kW	A	kA		A	
0.06	0.2	130	0.06	0.19	130	—	—	—	GV2 P02 or GV2 ME02	0.16...0.25	LC1 D09
—	—	—	0.09	0.28	130	—	—	—	GV2 P03 or GV2 ME03	0.25...0.4	LC1 D09
0.09	0.3	130	0.12	0.37	130	—	—	—			
0.12	0.44	130	—	—	—	—	—	—	GV2 P04 or GV2 ME04	0.4...0.63	LC1 D09
0.18	0.6	130	0.18	0.55	130	—	—	—			
0.25	0.85	130	0.25	0.76	130	—	—	—	GV2 P05 or GV2 ME05	0.63...1	LC1 D09
0.37	1.1	130	0.37	0.99	130	—	—	—			
—	—	—	—	—	—	0.37	0.88	130	GV2 P06 or GV2 ME06	1...1.6	LC1 D09
0.55	1.5	130	0.55	1.36	130	0.55	1.2	130			
—	—	—	—	—	—	0.75	1.5	130	GV2 P06 or GV2 ME06	1...1.6	LC1 D09
0.75	1.9	130	0.75	1.68	130	—	—	—	GV2 P07 or GV2 ME07	1.6...2.5	LC1 D09
—	—	—	1.1	2.37	130	1.1	2.2	130			
1.1	2.7	130	—	—	—	1.5	2.9	130	GV2 P08 or GV2 ME08	2.5...4	LC1 D09
1.5	3.6	130	1.5	3.06	130	2.2	3.9	130			
—	—	—	—	—	—	—	—	—	GV2 P10 or GV2 ME10	4...6.3	LC1 D09
2.2	4.9	130	—	—	—	—	—	—			
—	—	—	2.2	4.42	50	—	—	—	GV2 ME10	4...6.3	LC1 D09
—	—	—	3	5.77	50	3	5.2	50			
—	—	—	2.2	4.42	130	—	—	—	GV2 P10	4...6.3	LC1 D09
—	—	—	3	5.77	130	3	5.2	130			
3	6.5	130	—	—	—	—	—	—	GV2 P14 or GV2 ME14	6...10	LC1 D09
4	8.5	130	—	—	—	—	—	—			
—	—	—	4	7.9	15	4	6.8	10	GV2 ME14	6...10	LC1 D09
—	—	—	—	—	—	5.5	9.2	10			
—	—	—	—	—	—	4	6.8	50	GV2 P14	6...10	LC1 D12
—	—	—	4	7.9	130	5.5	9.2	50			
5.5	11.5	130	5.5	10.4	50	7.5	12.4	42	GV2 P16 or GV2 ME16	9...14	LC1 D25
—	—	—	7.5	13.7	50	9	13.9	42			
7.5	15.5	50	9	16.9	20	—	—	—	GV2 P20 or GV2 ME20	13...18	LC1 D25
9	18.1	50	11	20.1	20	11	17.6	10	GV2 P21 or GV2 ME21	17...23	LC1 D25
11	22	50	—	—	—	—	—	—	GV2 P22 or GV2 ME22	20...25	LC1 D25
—	—	—	—	—	—	15	23	10	GV2 P22	20...25	LC1 D32
15	29	35	15	26.5	25	18.5	28	10	GV2 P32 or GV2 ME32	25...40	LC1 D32
18.5	35	50	—	—	—	—	—	—	GV3 P40	30...40	LC1 D50A
—	—	—	18.5	32.8	50	22	33	10	GV3 P40	30...40	LC1 D65A
22	41	50	—	—	—	—	—	—	GV3 P50	37...50	LC1 D50A
—	—	—	22	39	50	30	44	10	GV3 P50	37...50	LC1 D65A
30	55	50	30	51.5	50	—	—	—	GV3 P65	48...65	LC1 D65A
—	—	—	—	—	—	37	53	10	GV3 P65	48...65	LC1 D80
—	—	—	22	39	65	—	—	—	GV7 RS40	25...40	LC1 D80
—	—	—	—	—	—	30	44	50	GV7 RS50	30...50	LC1 D80
—	—	—	—	—	—	37	53	50	GV7 RS80	48...80	LC1 D80
22	41	70	—	—	—	—	—	—	GV7 RS50	30...50	LC1 D80
30	55	70	30	51.5	65	—	—	—	GV7 RS80	48...80	LC1 D80
37	66	70	37	64	65	—	—	—	GV7 RS80	48...80	LC1 D80
—	—	—	45	76	65	—	—	—	GV7 RS80	48...80	LC1 D80
—	—	—	—	—	—	45	64	50	GV7 RS80	48...80	LC1 D115
—	—	—	—	—	—	55	78	50	GV7 RS80	48...80	LC1 D115
45	80	70	—	—	—	—	—	—	GV7 RS100	60...100	LC1 D115
—	—	—	55	90	65	—	—	—			
55	97	70	75	125	65	—	—	—	GV7 RS150	90...150	LC1 D150
75	132	70	90	146	65	90	128	50			
90	160	70	110	178	65	110	156	50	GV7 RS220	132...220	LC1 F185
110	195	70	132	215	65	—	—	—	GV7 RS220	132...220	LC1 F225
—	—	—	—	—	—	132	184	50	GV7 RS220	132...220	LC1 F265
—	—	—	—	—	—	160	224	50			

(1) The breaking performance of circuit-breakers **GV2 P** can be increased by adding a current limiter **GV1 L3**, see page 39.

(2) Combinations with circuit-breaker **GV2 ME** are type 2 coordinated only at 400/415 V and 440 V.

(3) For reversing operation, replace the prefix **LC1** with **LC2**.

0.06 to 250 kW at 400/415 V: type 1 coordination														
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit-breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	I _{rm} (1)	Reference (2)	Reference	Setting range
P	I _e	I _q	P	I _e	I _q	P	I _e	I _q		A	A			A
kW	A	kA	kW	A	kA	kW	A	kA						
0.06	0.2	50	0.06	0.19	50	–	–	–	GV2 LE03	0.4	5	LC1 K06	LR2 K0302	0.16...0.23
–	–	–	0.09	0.28	50	–	–	–	GV2 LE03	0.4	5	LC1 K06	LR2 K0303	0.23...0.36
0.09	0.3	50	0.12	0.37	50	–	–	–	GV2 LE03	0.4	5	LC1 K06	LR2 K0304	0.36...0.54
0.12	0.44	50				–	–	–	GV2 LE04	0.63	8	LC1 K06	LR2 K0304	0.36...0.54
0.18	0.6	50	0.18	0.55	50	–	–	–	GV2 LE04	0.63	8	LC1 K06	LR2 K0305	0.54...0.8
–	–	–	0.25	0.76	50	–	–	–	GV2 LE05	1	13	LC1 K06	LR2 K0305	0.54...0.8
0.25	0.85	50	–	–	–	–	–	–	GV2 LE05	1	13	LC1 K06	LR2 K0306	0.8...1.2
0.37	1.1	50	0.37	1	50	0.37	0.88	50	GV2 LE05	1	13	LC1 K06	LR2 K0306	0.8...1.2
0.55	1.5	50	0.55	1.36	50	0.55	1.2	50	GV2 LE06	1.6	22.5	LC1 K06	LR2 K0307	1.2...1.8
–	–	–	–	–	–	0.75	1.5	50	GV2 LE06	1.6	22.5	LC1 K06	LR2 K0307	1.2...1.8
–	–	–	0.75	1.68	50	–	–	–	GV2 LE07	2.5	33.5	LC1 K06	LR2 K0307	1.2...1.8
0.75	1.9	50	–	–	–	–	–	–	GV2 LE07	2.5	33.5	LC1 K06	LR2 K0308	1.8...2.6
1.1	2.7	50	1.1	2.37	50	1.1	2.2	50	GV2 LE07	2.5	33.5	LC1 K06	LR2 K0308	1.8...2.6
1.5	3.6	50	1.5	3.06	50	1.5	2.9	50	GV2 LE08	4	51	LC1 K06	LR2 K0310	2.6...3.7
–	–	–	–	–	–	2.2	3.9	50	GV2 LE08	4	51	LC1 K06	LR2 K0312	3.7...5.5
2.2	4.9	50	2.2	4.4	50	3	5.2	50	GV2 LE10	6.3	78	LC1 K06	LR2 K0312	3.7...5.5
–	–	–	3	5.77	50	–	–	–	GV2 LE10	6.3	78	LC1 K06	LR2 K0314	5.5...8
–	–	–	4	7.9	15	–	–	–	GV2 LE14	10	138	LC1 K09	LR2 K0314	5.5...8
3	6.5	50	–	–	–	4	6.8	10	GV2 LE14	10	138	LC1 K09	LR2 K0314	5.5...8
4	8.5	50	–	–	–	–	–	–	GV2 LE14	10	138	LC1 K09	LR2 K0316	8...11.5
5.5	11.5	15	5.5	10.4	8	7.5	12.4	6	GV2 LE16	14	170	LC1 K12	LR2 K0321	10...14
–	–	–	7.5	13.7	8	9	13.9	6	GV2 LE16	14	170	LC1 D18	LRD 21	12...18
7.5	15.5	15	9	16.9	8	–	–	–	GV2 LE20	18	223	LC1 D18	LRD 21	12...18
9	18.1	15	–	–	–	11	17.6	4	GV2 LE22	25	327	LC1 D25	LRD 22	16...24
11	22	15	11	20.1	6	15	23	4	GV2 LE22	25	327	LC1 D25	LRD 22	16...24
15	29	10	15	26.5	6	18.5	28	4	GV2 LE32	32	416	LC1 D32	LRD 32	23...32
18.5	35	50	18.5	32.5	50	22	33	10	GV3 L40	40	560	LC1 D40A	LRD 340	30...40
22	41	50	22	39	50	30	44	10	GV3 L50	50	700	LC1 D50A	LRD 350	37...50

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

0.06 to 250 kW at 400/415 V: type 1 coordination (continued)														
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit-breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	I _{rm} (1)	Reference (2)	Reference	Setting range
P	I _e	I _q	P	I _e	I _q	P	I _e	I _q		A	A			A
kW	A	kA	kW	A	kA	kW	A	kA						
30	55	50	30	51.5	50	37	53	10	GV3 L65	65	910	LC1 D65A	LRD 365	48...65
–	–	–	37	64	50	37	53	10	GV3 L65	65	910	LC1 D65A	LRD 365	48...65
–	–	–	–	–	–	45	64	50	GV3 L65	65	910	LC1 D80	LRD 3361	48...65
37	66	70	45	76	65	55	78	25	NS80HMA	80	1040	LC1 D80	LRD 3363	63...80
45	80	(3)	–	–	–	–	–	–	NS100●MA (3)	100	1300	LC1 D95	LRD 3365	80...104
–	–	–	–	–	–	50	90	(3)	NS100●MA (3)	100	1200	LC1 D115	LRD 4365	80...104
–	–	–	–	–	–	75	106	(3)	NS160●MA (3)	150	1500	LC1 D115	LRD 4367	95...120
55	97	(3)	–	–	–	–	–	–	NS160●MA (3)	150	1350	LC1 D115	LRD 4367	95...120
75	132	(3)	75	125	(3)	90	128	(3)	NS160●MA (3)	150	1800	LC1 D150	LRD 4369	110...140
–	–	–	90	146	(3)	–	–	–	NS160●MA (3)	150	1950	LC1 F185	LR9 F5371	132...220
90	160	(3)	–	–	–	110	156	(3)	NS250●MA (3)	220	2200	LC1 F185	LR9 F5371	132...220
110	195	(3)	–	–	–	–	–	–	NS250●MA (3)	220	2640	LC1 F225	LR9 F5371	132...220
–	–	–	110	178	(3)	–	–	–	NS250●MA (3)	220	2420	LC1 F225	LR9 F5371	132...220
–	–	–	–	–	–	132	184	(3)	NS250●MA (3)	220	2640	LC1 F265	LR9 F5371	132...220
–	–	–	132	215	(3)	–	–	–	NS250●MA (3)	220	2860	LC1 F265	LR9 F5371	132...220
132	230	(3)	–	–	–	–	–	–	NS400●MA (3)	320	3200	LC1 F265	LR9 F7375	200...330
–	–	–	–	–	–	160	224	(3)	NS400●MA (3)	320	2860	LC1 F265	LR9 F7375	200...330
–	–	–	160	256	(3)	–	–	–	NS400●MA (3)	320	3520	LC1 F330	LR9 F7375	200...330
160	280	(3)	200	321	(3)	–	–	–	NS400●MA (3)	320	4160	LC1 F330	LR9 F7375	200...330
–	–	–	–	–	–	200	280	(3)	NS400●MA (3)	320	3840	LC1 F330	LR9 F7375	200...330
–	–	–	–	–	–	220	310	(3)	NS400●MA (3)	320	4160	LC1 F400	LR9 F7379	300...500
200	350	(3)	220	353	(3)	–	–	–	NS630●MA (3)	500	5000	LC1 F400	LR9 F7379	300...500
–	–	–	250	401	(3)	–	–	–	NS630●MA (3)	500	5550	LC1 F400	LR9 F7379	300...500
–	–	–	–	–	–	250	344	(3)	NS630●MA (3)	500	5000	LC1 F400	LR9 F7379	300...500
220	388	(3)	–	–	–	–	–	–	NS630●MA (3)	500	5500	LC1 F400	LR9 F7379	300...500
250	430	(3)	280	470	(3)	315	432	(3)	NS630●MA (3)	500	6000	LC1 F500	LR9 F7379	300...500
–	–	–	–	–	–	355	488	(3)	NS630●MA (3)	500	6500	LC1 F500	LR9 F7381	380...630

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

(3) Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance I _q (kA)	NS100●MA	NS160●MA and NS250●MA	NS400●MA and NS630●MA
400/415 V	25	70	130
440 V	25	65	130
500 V	18	50	70
660/690 V	8	10	35
Code	N	H	L

0.06 to 250 kW at 400/415 V: type 2 coordination										Circuit-breaker			Contactor	Thermal overload relay	
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Reference	Rating	I _{rm} (1)	Reference (2)	Reference	Setting range	
400/415 V			440 V			500 V									
P	I _e	I _q	P	I _e	I _q	P	I _e	I _q		A	A			A	
kW	A	kA	kW	A	kA	kW	A	kA							
0.06	0.2	130	0.06	0.19	130	–	–	–	GV2 L03 or LE03	0.4	5	LC1 D09	L RD 02	0.16...0.25	
0.09	0.3	130	0.09	0.28	130	–	–	–	GV2 L03 or LE03	0.4	5	LC1 D09	L RD 03	0.25...0.40	
–	–	–	0.12	0.37	130	–	–	–							
0.12	0.44	130	–	–	–	–	–	–	GV2 L04 or LE04	0.63	8	LC1 D09	L RD 04	0.4...0.63	
0.18	0.6	130	0.18	0.55	130	–	–	–							
0.25	0.85	130	0.25	0.76	130	–	–	–	GV2 L05 or LE05	1	13	LC1 D09	L RD 05	0.63...1	
0.37	1.1	130	0.37	0.99	130	–	–	–							
–	–	–	–	–	–	0.37	0.88	130	GV2 L05 or LE05	1	13	LC1 D09	L RD 06	1...1.7	
0.55	1.5	130	–	–	–	0.55	1.2	130	GV2 L06 or LE06	1.6	22.5	LC1 D09	L RD 06	1...1.7	
–	–	–	0.55	1.36	130	0.75	1.5	130							
0.75	1.9	130	0.75	1.68	130	1.1	2.2	130	GV2 L07 or LE07	2.5	33.5	LC1 D09	L RD 07	1.6...2.5	
1.1	2.7	130	1.1	2.37	130	1.5	2.9	130	GV2 L08 or LE08	4	51	LC1 D09	L RD 08	2.5...4	
1.5	3.6	130	–	–	–	2.2	3.9	130							
–	–	–	1.5	3.06	130	–	–	–	GV2 L08 or LE08	4	51	LC1 D09	L RD 10	4...6	
2.2	4.9	130	–	–	–	–	–	–	GV2 L10 or LE10	6.3	78	LC1 D09	L RD 10	4...6	
–	–	–	–	–	–	3	5.2	13							
–	–	–	2.2	4.42	50	–	–	–	GV2 LE10	6.3	78	LC1 D09	L RD 10	4...6	
–	–	–	3	5.77	50	3	5.2	50							
–	–	–	2.2	4.42	130	–	–	–	GV2 L10	6.3	78	LC1 D09	L RD 10	4...6	
–	–	–	3	5.77	130	3	5.2	130							
3	6.5	130	–	–	–	–	–	–	GV2 L14 or LE14	10	10	LC1 D09	L RD 12	5.5...8	
–	–	–	–	–	–	4	6.8	10	GV2 LE14	10	138	LC1 D12	L RD 12	5.5...8	
–	–	–	–	–	–	4	6.8	50	GV2 L14	10	138	LC1 D12	L RD 12	5.5...8	
4	8.5	130	–	–	–	–	–	–	GV2 L14 or LE14	10	138	LC1 D09	L RD 14	7...10	
–	–	–	4	7.9	15	–	–	–	GV2 LE14	10	138	LC1 D09	L RD 14	7...10	
–	–	–	4	7.9	130	–	–	–	GV2 L14	10	138	LC1 D09	L RD 14	7...10	
–	–	–	–	–	–	5.5	9.2	10	GV2 LE14	10	138	LC1 D09	L RD 14	7...10	
–	–	–	–	–	–	5.5	9.2	50	GV2 L14	10	138	LC1 D09	L RD 14	7...10	
5.5	11.5	130	5.5	10.4	50	7.5	12.4	42	GV2 L16	14	170	LC1 D25	L RD 16	9...13	
–	–	–	7.5	13.7	50	–	–	–	GV2 L16	14	170	LC1 D25	L RD 21	12...18	
7.5	15.5	50	9	16.9	20	9	13.9	42	GV2 L20	18	223	LC1 D25	L RD 21	12...18	
9	18.1	50	–	–	–	–	–	–	GV2 L22	25	327	LC1 D25	L RD 22	16...24	
11	22	50	11	20.1	20	–	–	–							
–	–	–	–	–	–	11	17.6	10	GV2 L22	25	327	LC1 D32	L RD 22	16...24	
–	–	–	–	–	–	15	23	10							
15	29	50	15	26.5	50	–	–	–	GV3 L32	32	448	LC1 D40A	L RD 332	23...32	
–	–	–	–	–	–	18.5	28	10	GV3 L32	32	448	LC1 D65A	L RD 332	23...32	

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

0.06 to 250 kW at 400/415 V: type 2 coordination (continued)														
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit-breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	I _{rm} (1)	Reference (2)	Reference	Setting range
P	I _e	I _q	P	I _e	I _q	P	I _e	I _q		A	A			A
kW	A	kA	kW	A	kA	kW	A	kA						
18.5	35	50	–	–	–	–	–	–	GV3 L40	40	560	LC1 D50A	LRD 340	30...40
–	–	–	18.5	32.5	50	–	–	–	GV3 L40	40	560	LC1 D65A	LRD 340	30...40
22	41	50	–	–	–	–	–	–	GV3 L50	50	700	LC1 D50A	LRD 350	37...50
–	–	–	22	39	50	30	44	10	GV3 L50	50	700	LC1 D65A	LRD 350	37...50
30	55	50	30	51.5	50	–	–	–	GV3 L65	65	910	LC1 D65A	LRD 365	48...65
–	–	–	37	64	50	37	53	10	GV3 L65	65	910	LC1 D80	LRD 3359	48...65
37	66	70	45	76	65	–	–	–	NS80HMA	80	1000	LC1 D80	LRD 3363	63...80
–	–	–	–	–	–	55	78	(3)	NS100●MA (3)	100	1040	LC1 D80	LRD 3363	63...80
45	80	(3)	55	90	(3)	–	–	–	NS100●MA (3)	100	1300	LC1 D115	LR9 D5367	60...100
55	97	(3)	–	–	–	–	–	–	NS160●MA (3)	150	1500	LC1 D115	LR9 D5369	90...150
–	–	–	–	–	–	75	106	(3)	NS160●MA (3)	150	1050	LC1 D115	LR9 D5369	90...150
75	132	(3)	75	125	(3)	–	–	–	NS160●MA (3)	150	1950	LC1 D150	LR9 D5369	90...150
–	–	–	90	146	(3)	–	–	–	NS160●MA (3)	150	1950	LC1 D150	LR9 D5369	90...150
–	–	–	–	–	–	90	128	(3)	NS160●MA (3)	150	1200	LC1 D150	LR9 D5369	90...150
90	160	(3)	110	178	(3)	–	–	–	NS250●MA (3)	220	2420	LC1 F185	LR9 F5371	132...220
–	–	–	–	–	–	110	156	(3)	NS250●MA (3)	220	1540	LC1 F185	LR9 F5371	132...220
110	195	(3)	–	–	–	–	–	–	NS250●MA (3)	220	2860	LC1 F225	LR9 F5371	132...220
–	–	–	132	215	(3)	132	184	(3)	NS250●MA (3)	220	2200	LC1 F265	LR9 F5371	132...220
132	230	(3)	160	256	(3)	–	–	–	NS400●MA (3)	320	3520	LC1 F265	LR9 F7375	200...330
–	–	–	–	–	–	160	224	(3)	NS400●MA (3)	320	2200	LC1 F265	LR9 F7375	200...330
160	280	(3)	–	–	–	–	–	–	NS400●MA (3)	320	4000	LC1 F330	LR9 F7375	200...330
–	–	–	200	321	(3)	–	–	–	NS400●MA (3)	320	4000	LC1 F330	LR9 F7379	300...500
–	–	–	–	–	–	200	280	(3)	NS400●MA (3)	320	3500	LC1 F400	LR9 F7375	200...330
–	–	–	–	–	–	220	310	(3)	NS400●MA (3)	320	3500	LC1 F400	LR9 F7379	300...500
–	–	–	220	353	(3)	–	–	–	NS630●MA (3)	500	5500	LC1 F400	LR9 F7379	300...500
200	350	(3)	250	401	(3)	–	–	–	NS630●MA (3)	500	4500	LC1 F500	LR9 F7379	300...500
–	–	–	–	–	–	250	344	(3)	NS630●MA (3)	500	4500	LC1 F500	LR9 F7379	300...500
–	–	–	–	–	–	315	432	(3)	NS630●MA (3)	500	4500	LC1 F500	LR9 F7379	300...500
220	388	(3)	–	–	–	–	–	–	NS630●MA (3)	500	6250	LC1 F500	LR9 F7379	300...500
250	430	(3)	–	–	–	–	–	–	NS630●MA (3)	500	6250	LC1 F500	LR9 F7379	300...500
–	–	–	–	–	–	355	488	(3)	NS630●MA (3)	500	5000	LC1 F630	LR9 F7381	380...630

(1) I_{rm}: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

(3) Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance I _q (kA)	NS100●MA	NS160●MA and NS250●MA	NS400●MA and NS630●MA
400/415 V	25	70	36
440 V	25	65	35
500 V	18	50	30
660/690 V	8	10	8
Code	N	H	N

1.5 to 110 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3 K: 12 starts/hour; LC3 D: 30 starts/hour.

Maximum starting time: 30 seconds.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3								Circuit-breaker		Star-delta contactors
400/415 V				440 V				Reference	Setting range of thermal trips	Reference
P	I _e	I _{rD} (1)	I _q (2)	P	I _e	I _{rD} (1)	I _q (2)		A	
kW	A	A	kA	kW	A	A	kA			
1.5	3.6	2	50	1.5	3.06	1.8	50	GV2 ME08	2.5...4	LC3 K06
2.2	4.9	2.9	50	2.2	4.42	2.6	50	GV2 ME10	4...6.3	LC3 K06
—	—	—	—	3	5.77	3.3	50			
3	6.5	3.8	50	—	—	—	—	GV2 ME14	6...10	LC3 K06
4	8.5	4.9	50	4	7.9	4.6	15			
5.5	11.5	6.4	15	5.5	10.4	6	8	GV2 ME16	9...14	LC3 K06
7.5	15.5	8.6	15	7.5	13.7	7.9	8	GV2 ME20	13...18	LC3 K09
—	—	—	—	9	16.9	9.8	8	GV2 ME20	13...18	LC3 D12A
9	18.1	10	15	11	20.1	12	6	GV2 ME21	17...23	LC3 D12A
11	22	12	15	—	—	—	—	GV2 ME22	20...25	LC3 D12A
15	29	17	10	15	26.5	15	6	GV2 ME32	24...32	LC3 D18A
18.5	35	20	50	18.5	32.8	19	50	GV3 P40	30...40	LC3 D18A
—	—	—	—	22	39	23	50	GV3 P50	37...50	LC3 D32A
22	41	24	50	30	51.5	30	50	GV3 P50	37...50	LC3 D32A
30	55	33	50	30	51.5	30	50	GV3 P65	48...65	LC3 D32A
37	66	40	50	37	64	37	50	GV3 P65	48...65	3 x LC1 D40A (3)
37	66	40	25	37	64	37	25	GV7 RE80	48...80	3 x LC1 D40A (3)
—	—	—	—	45	76	44	10	GV3 ME80	56...80	2 x LC1 D50A + 1 x LC1 D40A (3)
—	—	—	—	45	76	44	25	GV7 RE80	48...80	2 x LC1 D50A + 1 x LC1 D40A (3)
45	80	47	25	—	—	—	—	GV7 RE100	60...100	2 x LC1 D50A + 1 x LC1 D40A (3)
55	97	58	25	55	90	52	25			
75	132	78	35	75	125	72	35	GV7 RE150	90...150	LC3 D80
—	—	—	—	90	146	84	35	GV7 RE150	90...150	LC3 D115
90	160	95	35	110	178	103	35	GV7 RE220	132...220	LC3 D115
110	195	115	35							
—	—	—	—	132	215	124	35	GV7 RE220	132...220	LC3 D150

(1) I_{rD}: current in the motor windings in delta connection.

(2) The breaking performance of circuit-breakers **GV2 ME** can be increased by adding a current limiter **GV1 L3**, see page 39.

(3) For mounting 3 contactors **LC1 D...A**, star-delta starter kit **LAD 9SD3** must be ordered separately, see page 166.

1.5 to 110 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC1 D: 30 starts/hour; LC1 F: 12 starts/hour.

Maximum starting time: LC1 D: 30 seconds; LC1 F: 20 seconds.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Circuit-breaker		Star-delta contactors
400/415 V			440 V			Reference	Setting range of thermal trips	Reference
P	I _e	I _q	P	I _e	I _q (1)			
kW	A	kA	kW	A	kA		A	
1.5	3.6	130	1.5	3.06	130	GV2 P08	2.5...4	3 x LC1 D09 (2)
2.2	4.9	130	2.2	4.42	130	GV2 P10	4...6.3	3 x LC1 D18 (3)
–	–	–	3	5.77	130	GV2 P10	4...6.3	3 x LC1 D18 (3)
3	6.5	130	–	–	–	GV2 P14	6...10	3 x LC1 D18 (3)
4	8.5	130	4	7.9	130	GV2 P14	6...10	3 x LC1 D18 (3)
5.5	11.5	130	5.5	10.4	50	GV2 P16	9...14	3 x LC1 D25 (3)
–	–	–	7.5	13.7	50	GV2 P16	9...14	3 x LC1 D25 (3)
7.5	15.5	50	9	16.9	20	GV2 P20	13...18	3 x LC1 D25 (3)
9	18.1	50	11	20.1	20	GV2 P21	17...23	3 x LC1 D25 (3)
11	22	50	–	–	–	GV2 P22	20...25	3 x LC1 D25 (3)
15	29	50	15	26.5	50	GV3 P32	23...32	3 x LC1 D40A (4)
18.5	35	50	–	–	–	GV3 P40	30...40	2 x LC1 D50A + 1 x LC1 D40A (3)
–	–	–	18.5	32.8	50	GV3 P40	30...40	2 x LC1 D65A + 1 x LC1 D40A (4)
22	41	50	–	–	–	GV3 P50	37...50	2 x LC1 D50A + 1 x LC1 D40A (3)
–	–	–	22	39	50	GV3 P50	37...50	2 x LC1 D65A + 1 x LC1 D40A (4)
30	55	50	30	51.5	50	GV3 P65	48...65	2 x LC1 D65A + 1 x LC1 D40A (4)
37	66	70	37	64	65	GV7 RS80	48...80	3 x LC1 D80 (5)
–	–	–	45	76	65	GV7 RS80	48...80	3 x LC1 D80 (5)
45	80	70	–	–	–	GV7 RS100	60...100	3 x LC1 D115 (6)
55	97	70	55	90	65	GV7 RS100	60...100	3 x LC1 D115 (6)
75	132	70	75	125	65	GV7 RS150	90...150	3 x LC1 D150 (6)
–	–	–	90	146	65	GV7 RS150	90...150	3 x LC1 D150 (6)
90	160	70	110	178	65	GV7 RS220	132...220	3 x LC1 F185 (7)
110	195	70	132	215	65	GV7 RS220	132...220	3 x LC1 F225 (7)

(1) The breaking performance of circuit-breakers GV2 P can be increased by adding a current limiter GV1 L3, see page 39.

(2) For mounting 3 contactors LC1 D09, star-delta starter kit LAD 91217 must be ordered separately, see page 166.

(3) For mounting 3 contactors LC1 D18 or LC1 D25, star-delta starter kit LAD 93217 must be ordered separately, see page 166.

(4) For mounting 3 contactors LC1 D65A, star-delta starter kit LAD 9SD3 must be ordered separately, see page 166.

(5) For mounting 3 contactors LC1 D80, star-delta starter kit LA9 D8017 must be ordered separately, see page 166.

(6) For mounting 3 contactors LC1 D115 or LC1 D150, please consult our catalogue "Motor starter solutions".

(7) For mounting 3 contactors LC1 F185 or LC1 F225, please consult our catalogue "Motor starter solutions".

1.5 to 315 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3 K and LC3 F: 12 starts/hour; LC3 D: 30 starts/hour.

Maximum starting time: LC3 K and LC3 D: 30 seconds; LC3 F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3								Circuit-breaker			Star-delta contactors	Thermal overload relay	
400/415 V				440 V				Reference	Rating	I _{rm} (2)	Reference	Reference	Setting range
P	I _e	I _{rD} (1)	I _q	P	I _e	I _{rD} (1)	I _q						
kW	A	A	kA	kW	A	A	kA		A	A			A
—	—	—	—	1.5	3.06	1.8	50	GV2 LE08	4	51	LC3 K06	LR2 K0308	1.8...2.6
1.5	3.6	2	50	2.2	4.42	3	50						
2.2	4.9	3	50	3	5.77	3	50	GV2 LE10	6.3	78	LC3 K06	LR2 K0310	2.6...3.7
3	6.5	4	50	—	—	—	—	GV2 LE14	10	138	LC3 K06	LR2 K0312	3.7...5.5
—	—	—	—	4	7.9	5	50	GV2 LE10	6.3	78	LC3 K06	LR2 K0312	3.7...5.5
4	8.5	5	50	—	—	—	—	GV2 LE14	10	138	LC3 K06	LR2 K0312	3.7...5.5
—	—	—	—	5.5	10.4	6	15	GV2 LE14	10	138	LC3 K06	LR2 K0314	5.5...8
5.5	11.5	6	15	—	—	—	—	GV2 LE16	14	170	LC3 K06	LR2 K0314	5.5...8
—	—	—	—	7.5	13.7	8	8	GV2 LE16	14	170	LC3 K09	LR2 K0316	8...11.5
7.5	15.5	9	15	—	—	—	—	GV2 LE20	18	223	LC3 K09	LR2 K0316	8...11.5
—	—	—	—	9	16.9	1	8	GV2 LE16	14	170	LC3 D12A	LRD 16	9...13
9	18.1	10	15	—	—	—	—	GV2 LE22	25	327	LC3 K12	LR2 K0316	8...11.5
—	—	—	—	11	20.1	12	8	GV2 LE20	18	223	LC3 K12	LR2 K0321	10...14
11	22	12	15	—	—	—	—	GV2 LE22	25	327	LC3 K12	LR2 K0321	10...14
—	—	—	—	15	26.5	15	6	GV2 LE22	25	327	LC3 D18A	LRD 21	12...18
15	29	16	10	—	—	—	—	GV2 LE32	32	384	LC3 D18A	LRD 21	12...18
18.5	35	20	50	18.5	32.8	19	50	GV3 L40	40	560	LC3 D18A	LRD 22	16...24
22	41	24	50	22	39	23	50	GV3 L50	50	700	LC3 D32A	LRD 32	23...32
—	—	—	—	30	51.5	30	50	GV3 L65	65	910	LC3 D32A	LRD 32	23...32
30	55	33	50	—	—	—	—	GV3 L65	65	910	LC3 D32A	LRD 35	30...38
—	—	—	—	37	64	37	50	GV3 L65	65	910	3 x LC1 D40A (4)	LRD 340	30...40
—	—	—	—	45	76	44	65	NS80HMA	80	640	2 x LC1 D50A + 1 x LC1 D40A (4)	LRD 350	37...50
—	—	—	—	55	90	52	65	NS80HMA	80	800	2 x LC1 D65A + 1 x LC1 D40A (4)	LRD 365	48...65
37	66	40	70	—	—	—	—	NS80HMA	80	640	3 x LC1 D40A (4)	LRD 365	48...65
—	—	—	—	75	125	72	(3)	NS160●MA (3)	150	1200	LC3 D80	LRD 3363	63...80
45	80	47	(3)	—	—	—	—	NS100●MA (3)	100	800	2 x LC1 D50A + 1 x LC1 D40A (4)	LRD 350	37...50
55	97	58	(3)	—	—	—	—	NS100●MA (3)	100	1200	2 x LC1 D65A + 1 x LC1 D40A (4)	LRD 365	48...65
75	132	78	(3)	—	—	—	—	NS160●MA (3)	150	1200	LC3 D80	LRD 3363	63...80
—	—	—	—	90	146	85	(3)	NS160●MA (3)	150	1200	LC3 D115	LRD 4365	80...104
90	160	96	(3)	110	178	103	(3)	NS250●MA (3)	220	1760	LC3 D115	LRD 4365	80...104
—	—	—	—	132	215	125	(3)	NS250●MA (3)	220	1760	LC3 D150	LRD 4369	110...140
110	195	116	(3)	—	—	—	—	NS250●MA (3)	220	1760	LC3 D115	LRD 4369	110...140
—	—	—	—	160	256	148	(3)	NS400●MA (3)	320	2240	LC3 D150	LR9 D5369	90...150
—	—	—	—	200	321	186	(3)	NS630●MA (3)	500	3150	LC3 F225	LR9 F5371	132...220
132	230	139	(3)	—	—	—	—	NS400●MA (3)	320	2240	LC3 D150	LRD 4369	110...140
160	280	165	(3)	—	—	—	—	NS400●MA (3)	320	2560	LC3 F185	LR9 F5371	132...220
200	350	204	(3)	220	353	204	(3)	NS630●MA (3)	500	3150	LC3 F225	LR9 F5371	132...220
220	388	225	(3)	250	401	233	(3)	NS630●MA (3)	500	3500	LC3 F265	LR9 F7375	200...330
280	480	278	(3)	—	—	—	—	NS630●MA (3)	500	4000	LC3 F330	LR9 F7375	200...330
—	—	—	—	315	505	295	(3)	C801●+STR35ME	800	4000	LC3 F330	LR9 F7375	200...330
315	540	322	(3)	355	518	300	(3)	C801●+STR35ME	800	4500	LC3 F330	LR9 F7375	200...330
—	—	—	—	375	575	334	(3)	C801●+STR35ME	800	5000	LC3 F400	LR9 F7379	300...500

(1) I_{rD}: current in the motor windings in delta connection.

(2) I_{rm}: setting current of the magnetic trip.

(3) Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance I _q (kA)	NS100●MA		NS160●MA, NS250●MA		NS400●MA, NS630●MA		C801●+STR35ME	
400/415 V	25	70	36	70	70	130	70	150
440 V	25	65	35	65	65	130	65	100
Code	E	S	E	S	H	L	H	L

1.5 to 250 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC3 D: 30 starts/hour; LC3 F: 12 starts/hour.

Maximum starting time: LC3 D: 30 seconds; LC3 F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Circuit-breaker			Star-delta contactors	Thermal overload relay	
400/415 V			440 V			Reference	Rating	I _{rm} (1)	Reference	Reference	Setting range
P kW	I _e A	I _q kA	P kW	I _e A	I _q kA		A	A			A
1.5	3.6	130	1.5	3.06	130	GV2 L08	4	51	3 x LC1 D18	LRD 08	2.5...4
2.2	4.9	130	2.2	4.42	130	GV2 L10	6.3	78	3 x LC1 D18	LRD 10	4...6
3	6.5	130	3	5.77	130						
–	–	–	4	7.9	20	GV2 L14	10	138	3 x LC1 D18	LRD 14	7...10
4	8.5	130	–	–	–	GV2 L14	10	138	3 x LC1 D18	LRD 16	9...13
5.5	11.5	50	5.5	10.4	20	GV2 L16	14	170	3 x LC1 D25	LRD 16	9...13
7.5	15.5	50	7.5	13.7	20	GV2 L20	18	223	3 x LC1 D25	LRD 21	12...18
–	–	–	9	16.9	20	GV2 L22	25	327	3 x LC1 D25	LRD 21	12...18
9	18.1	50	–	–	–	GV2 L22	25	327	3 x LC1 D25	LRD 22	16...24
11	22	50	11	20.1	20						
15	29	50	15	26.5	50	GV3 L32	32	448	3 x LC1 D40A (2)	LRD 332	23...32
18.5	35	50	–	–	–	GV3 L40	40	560	2 x LC1 D50A + 1 x LC1 D40A (2)	LRD 340	30...40
–	–	–	18.5	32.8	50	GV3 L40	40	560	2 x LC1 D65A + 1 x LC1 D40A (2)	LRD 340	30...40
22	41	50	–	–	–	GV3 L50	50	700	2 x LC1 D50A + 1 x LC1 D40A (2)	LRD 350	37...50
–	–	–	22	39	50	GV3 L50	50	700	2 x LC1 D65A + 1 x LC1 D40A (2)	LRD 350	37...50
30	55	50	30	51.5	50	GV3 L65	65	910	2 x LC1 D65A + 1 x LC1 D40A (2)	LRD 365	48...65
–	–	–	37	64	50	GV3 L65	65	910	3 x LC1 D80	LRD 3359	48...65
37	66	70	45	76	65	NS80HMA	80	640	3 x LC1 D80	LRD 3363	63...80
45	80	(2)	55	90	(2)	NS100●MA (2)	100	800	3 x LC1 D115	LR9 D5367	60...100
55	97	(2)	–	–	–	NS160●MA (2)	150	1200	3 x LC1 D115	LR9 D5369	90...150
–	–	–	75	125	(2)	NS160●MA (2)	150	1200	3 x LC1 D150	LR9 D5369	90...150
75	132	(2)	90	146	(2)	NS160●MA (2)	150	1200	3 x LC1 D150	LR9 D5369	90...150
90	160	(2)	110	178	(2)	NS250●MA (2)	220	1760	3 x LC1 F185	LR9 F5371	132...220
110	195	(2)	–	–	–	NS250●MA (2)	220	1760	3 x LC1 F225	LR9 F5371	132...220
–	–	–	132	215	(2)	NS250●MA (2)	220	1760	3 x LC1 F225	LR9 F7375	200...330
132	230	(2)	160	256	(2)	NS400●MA (2)	320	2240	3 x LC1 F265	LR9 F7375	200...330
160	280	(2)	–	–	–	NS400●MA (2)	320	2560	3 x LC1 F330	LR9 F7375	200...330
–	–	–	200	321	(2)	NS400●MA (2)	320	2880	3 x LC1 F330	LR9 F7379	300...500
200	350	(2)	220	353	(2)	NS630●MA (2)	500	3150	3 x LC1 F400	LR9 F7379	300...500
220	388	(2)	250	401	(2)	NS630●MA (2)	500	3500	3 x LC1 F400	LR9 F7379	300...500
250	430	(2)	–	–	–	NS630●MA (2)	500	4000	3 x LC1 F500	LR9 F7379	300...500

(1) I_{rm}: setting current of the magnetic trip.

(2) Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance I _q (kA)	NS100●MA		NS160●MA, NS250●MA		NS400●MA, NS630●MA	
400/415 V	25	70	36	70	70	130
440 V	25	65	35	65	65	130
Code	E	S	E	S	H	L

■ Thermal-magnetic circuit-breakers

Selection guidepage 30

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■ Magnetic circuit-breakers

Selection guidepage 32

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- Dimensions, mounting page 106
- Schemes page 111

■ Enclosed circuit-breakers

- References, dimensions, schemes page 112

Applications

Protection of motors against short-circuits and overloads



Tripping threshold on short-circuit

13 In

Standard motor power ratings in AC-3, 415 V

Up to 15 kW

Up to 30 kW

37 kW

Operational current at 415 V

0.1...32 A

9...65 A

56...80 A

Breaking capacity at 415 V (Icu) to IEC 60947-2

10...100 kA

35...100 kA

50...100 kA

15 kA

Door interlock mechanism

Without

With

With

Without

Circuit-breaker type

GV2 ME

GV2 P

GV3 P

GV3 ME80

Pages

74 and 75

76

76

76



Protection of motors with high current peak on starting

7.5...110 kW

12...220 A

35 and 36 kA

With

GV7 RE

77

70 kA

GV7 RS

20 In

Up to 11 kW

0.25...23 A

15...100 kA

With

GV2 RT

78 and 79

Applications

Protection of motors
Magnetic circuit-breakers provide short-circuit protection. They must be combined with thermal overload relays to provide motor overload protection.



Tripping threshold on short-circuit

13 In

Standard motor power ratings in AC-3, 415 V

Up to 15 kW

Operational current at 415 V

0.4...32 A

Breaking capacity at 415 V (Icu) to IEC 60947-2

10...100 kA

35...100 kA

Door interlock mechanism

With

Circuit-breaker type

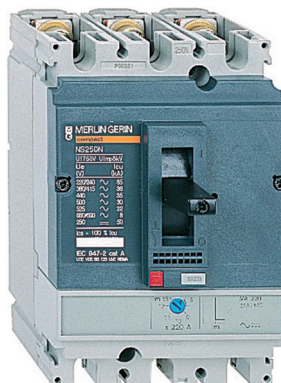
GV2 LE

GV2 L

Pages

80

81

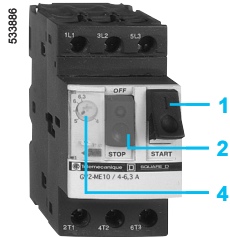


		6...14 In	8...13 In	6.3...12.5 In
Up to 30 kW	37 kW	0.37...250 kW		
25...65 A	80 A	1.5...500 A		
50...100 kA	35 kA	25.7 and 150 kA	35.7...150 kA	45.7...150 kA
With	With	With		
GV3 L	GK3 EF80	NS 80	NS 100 to NS 250	NS 400 and NS 630
81	81	Please consult our catalogue "Low Voltage Distribution".		

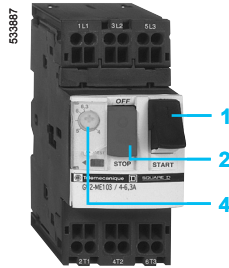
TeSys protection components

Thermal-magnetic motor circuit-breakers

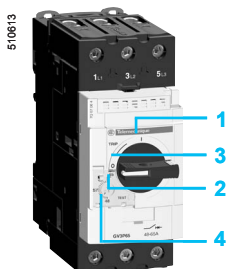
GV2, GV3 and GV7



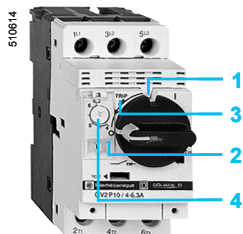
GV2 ME
with screw clamp
terminals



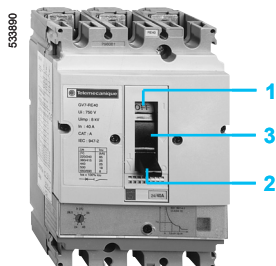
GV2 ME
with spring terminals
connections



GV3 P



GV2 P



GV7 R

Presentation

GV2 ME, GV2 P, GV3 ME, GV3 P and GV7 R motor circuit-breakers are 3-pole thermal-magnetic circuit-breakers **specifically designed for the control and protection of motors**, conforming to standards IEC 60947-2 and IEC 60947-4-1.

Connection

GV2

GV2 ME and GV2 P circuit-breakers are designed for connection by screw clamp terminals.

Circuit-breaker GV2 ME can be supplied with lugs or spring terminal connections. Spring terminal connections ensure secure, permanent and durable clamping that is resistant to harsh environments, vibration and impact and are even more effective when conductors without cable ends are used. Each connection can take two independent conductors.

GV3

GV3 circuit-breakers feature connection by BTR screws (hexagon socket head), tightened using a n° 4 Allen key.

This type of connection uses the **EverLink®** system with creep compensation (1) (Schneider Electric patent).

This technique makes it possible to achieve accurate and durable tightening torque, in order to avoid cable creep.

GV3 circuit-breakers are also available with connection by lugs. This type of connection meets the requirements of certain Asian markets and is suitable for applications subject to strong vibration, such as railway transport.

GV7

GV7 circuit-breakers: with connection by screw clamp terminals (for bars and lugs) and by clip-on connectors.

Operation

Control is manual and local when the motor circuit-breaker is used on its own. Control is automatic and remote when it is associated with a contactor.

GV2 ME and GV3 ME80

Pushbutton control.

Energisation is controlled manually by operating the Start button "I" 1. De-energisation is controlled manually by operating the Stop button "O" 2, or automatically by the thermal-magnetic protection elements or by a voltage trip attachment.

GV2 P, GV3 P and GV7 R

- Control by rotary knob: for GV2 P and GV3 P
- Control by rocker lever: for GV7 R.

Energisation is controlled manually by moving the knob or rocker lever to position "I" 1. De-energisation is controlled manually by moving the knob or rocker lever to position "O" 2. De-energisation due to a fault automatically places the knob or rocker lever in the "Trip" position 3. Re-energisation is possible only after having returned the knob or rocker lever to position "O".

(1) Creep: normal crushing phenomenon of copper conductors, that is accentuated over time.

Presentation (continued)

Protection of motors and personnel

Motor protection is provided by the thermal-magnetic protection elements incorporated in the motor circuit-breaker.

The **magnetic** elements (short-circuit protection) have a non-adjustable tripping threshold, which is equal to 13 times the maximum setting current of the thermal trips.

The **thermal** elements (overload protection) include automatic compensation for ambient temperature variations.

The rated operational current of the motor is displayed by means of a graduated knob 4. Personnel protection is also provided. All live parts are protected against direct finger contact from the front panel.

The addition of an undervoltage trip allows the circuit-breaker to be de-energised in the event of an undervoltage condition. The user is therefore protected against sudden starting of the machine when normal voltage is restored, since the Start button "I" has to be pressed to restart the motor.

With the addition of a shunt trip, de-energisation of the unit can be remotely controlled.

The operators on both open-mounted and enclosed motor circuit-breakers can be locked in the Stop position "O" by up to 4 padlocks.

Because they are suitable for isolation, these circuit-breakers, in the open position, provide an adequate isolation distance and indicate the actual position of the moving contacts by the position of the operators.

Special features

These motor circuit-breakers are easily installed in any configuration thanks to their universal fixing arrangement: screw fixing or clip-on mounting on symmetrical, asymmetrical or combination rails.

Environment																				
Circuit-breaker type				GV2 ME		GV2 P		GV3 P		GV3 ME80		GV7 R								
Conforming to standards					IEC 60947-1, 60947-2, 60947-4-1, EN 60204, UL 508, CSA C 22.2 n° 14-05, NF C 63-650, 63-120, 79-130, VDE 0113, 0660				IEC/EN 60947-1, 60947-2, 60947-4-1, UL 508 type E, CSA C 22.2 n° 14-05 type E		IEC/EN, NF EN, BS EN, DIN EN 60947-2, 60947-4-1		IEC 60947-1, 60947-2, 60947-4-1, EN 60947-1, 60947-2, EN 60947-4-1, NF C 63-650, NF C 63-120, 79-130, VDE 0113, 0660							
Product certifications					UL, CSA, CCC, CEBEC, GOST, TSE, BV, GL, LROS, DNV, PTB, EZU, SETI, RINA, ATEX				UL (1), CSA, PTB, EZU, GOST, TSE, DNV, LROS, GL, BV, RINA, CCC, ATEX		UL, CSA, CCC (pending), GOST, ATEX (pending)		UL, CSA, LROS		UL, DNV, CCC					
Protective treatment					"TH"				"TH"		"TC"		"TC"							
Degree of protection		Conforming to IEC 60529	Open mounted		IP 20				IP 20		IP 20		IP 405 with terminal shrouds							
			In enclosure		GV2 M●01: IP 41 GV2 M●02: IP 55		–		GV3 PC01 and GV3 PC02: IP 55		GV3 CE01: IP 55		–							
Shock resistance		Conforming to IEC 60068-2-27			30 gn -11 ms				On: 15 gn -11 ms Off: 30 gn -11 ms		22 gn - 20 ms		15 gn -11 ms							
Vibration resistance		Conforming to IEC 60068-2-6			5 gn (5...150 Hz)				4 gn (5...300 Hz)		2.5 gn (0...25 Hz)		2.5 gn (25 Hz)							
Ambient air temperature		Storage		°C	- 40...+ 80		- 40...+ 80		- 40...+ 80		- 40...+ 80		- 55...+ 95							
		Operation	Open mounted	°C	- 20...+ 60		- 20...+ 60		- 20...+ 60 (2)		- 20...+ 60		- 25...+ 70							
Temperature compensation			In enclosure	°C	- 20...+ 40		- 20...+ 40		- 20...+ 40		- 20...+ 40		–							
			Open mounted	°C	- 20...+ 60		- 20...+ 60		- 20...+ 60		- 20...+ 60		- 25...+ 55 (3)							
Flame resistance		Conforming to IEC 60695-2-1		°C	960				960		960		960							
Maximum operating altitude				m	2000				3000		3000		2000							
Suitable for isolation		Conforming to IEC 60947-1 § 7-1-6			Yes				Yes		–		Yes							
Resistance to mechanical impact				J	0.5		0.5		10		0.5		0.5							
					IK 04				IK 09 (in enclosure)		–		–							
Sensitivity to phase failure					Yes, conforming to IEC 60947-4-1 § 7-2-1-5-2															
Technical characteristics																				
Circuit-breaker type					GV2 ME		GV2 P		GV2 RT		GV3 P		GV3 ME80		GV7 R●20... R●100		GV7 R●150		GV7 R●220	
Utilisation category		Conforming to IEC 60947-2			A				A		A		A							
		Conforming to IEC 60947-4-1			AC-3				AC-3		AC-3		AC-3							
Rated operational voltage (Ue)		Conforming to IEC 60947-2		V	690				690		690		690							
Rated insulation voltage (Ui)		Conforming to IEC 60947-2		V	690				690		690		750							
Rated voltage		Conforming to CSA C22-2 n° 14, UL 508		V	600				600		600 (B600)		600							
Rated operational frequency		Conforming to IEC 60947-4-1 UL, CSA		Hz	50/60				50/60		50/60		50/60							
Rated impulse withstand voltage (U imp)		Conforming to IEC 60947-2		kV	6				6		6		8							
Total power dissipated per pole				W	2.5				8		8		5		8.7		14.5			
Mechanical durability (C.O.: Close, Open)				C.O.	100 000				50 000		30 000		50 000		40 000		20 000			
Electrical durability for AC-3 duty		440 V In/2		C.O.	100 000				–		30 000		50 000		40 000		20 000			
		440 V In		C.O.	–				50 000		–		30 000		20 000		10 000			
Duty class (maximum operating rate)				C.O./h	25				25		25		25							
Maximum conventional rated thermal current (Ith)		Conforming to IEC 60947-4-1		A	0.16... 32		0.16... 32		0.40... 23		13... 65		80		12... 100		150		220	
Rated duty				Conforming to IEC 60947-4-1		Continuous duty														

(1) UL 508 type E for GV2 P●●H7

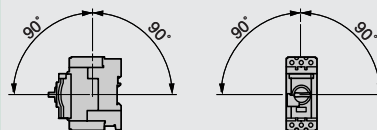
(2) Leave a space of 9 mm between 2 circuit-breakers: either an empty space, or side mounting add-on contact blocks. Side by side mounting is possible up to 40 °C.

(3) For operation up to 70 °C, please consult your Regional Sales Office.

Mounting characteristics

Operating position

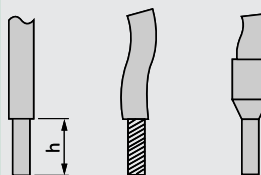
Without derating, in relation to normal vertical mounting plane (1)



Connection characteristics

Connection to screw clamp terminals or spring terminals

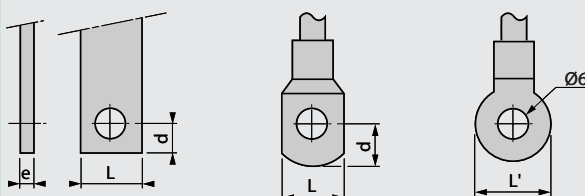
Bare cables



Circuit-breaker type			GV2 ME		GV2 P		GV3 P		GV3 ME80	
Connection to screw clamp terminals (2) (Max. number of conductors x c.s.a.)			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	Solid cable	mm ²	2 x 1	2 x 6	2 x 1	2 x 6	2 x 1	1 x 25 and 1 x 35	1 x 2.5	1 x 35
	Flexible cable without cable end	mm ²	2 x 1.5	2 x 6	2 x 1.5	2 x 6	2 x 1	1 x 25 and 1 x 35	1 x 2.5	2 x 16
	Flexible cable with cable end	mm ²	2 x 1	2 x 4	2 x 1	2 x 4	2 x 1	1 x 25 and 1 x 35	1 x 2.5	2 x 16
Tightening torque		N.m	1.7	1.7	1.7	1.7	5	5: 25 mm ² 8: 35 mm ²	5	5
Connection to spring terminals Number of conductors x c.s.a.	Solid cable	mm ²	2 x 1 (3)	2 x 6	–	–	–	–	–	–
	Flexible cable without cable end	mm ²	2 x 1.5 (3)	2 x 4	–	–	–	–	–	–

Connection by bars or lugs

Bars or lugs



Circuit-breaker type			GV2 ME●●6	GV3 P●●6	GV7 R●20...R●100	GV7 R●150	GV7 R●220
Pitch	Without spreaders	mm	13.5	17.5	35	35	35
	With spreaders	mm	–	–	45	45	45
Bars or cables with lugs	e	mm	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
	L	mm	≤ 9.5	≤ 13.5	≤ 25	≤ 25	≤ 25
	L'	mm	≤ 9.5	≤ 16.5	–	–	–
	d	mm	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
Screws			M4	M6	M6	M8	M8
	Tightening torque	N.m	1.7	6	10	15	15
Bare cables (copper or aluminium) with connectors	Height (h)	mm	–	–	20	20	20
	C.s.a.	mm ²	–	–	1.5...95	1.5...95	1.5...185
	Tightening torque	N.m	–	–	15	15	15

(1) When mounting on a vertical rail, fit a stop to prevent any slippage.

(2) For motor circuit-breakers **GV3 P**: BTR hexagon socket head screws, **EverLink®** system.

Require use of an insulated Allen key, in compliance with local electrical wiring regulations.

(3) For cross-sections 1 to 1.5 mm², the use of an **LA9 D99** cable end reducer is recommended.

TeSys protection components

Thermal-magnetic motor circuit-breakers

GV2 ME and GV2 P

Breaking capacity of GV2 ME and GV2 P																							
Circuit-breaker type				GV2 ME										GV2 P									
				01 to 06	07	08	10	14	16	20	21 & 22	32	01 to 06	07	08	10	14	16	20	21 & 22	32		
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23 & 25	32	0.1 to 1.6	2.5	4	6.3	10	14	18	23 & 25	32		
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	50	50	★	★	★	★	★	★	★	★	★		
		Ics % (1)		★	★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	★	★	
	400/415 V	Icu	kA	★	★	★	★	★	15	15	15	10	★	★	★	★	★	★	★	50	50	50	
		Ics % (1)		★	★	★	★	★	50	50	40	50	★	★	★	★	★	★	★	50	50	50	
	440 V	Icu	kA	★	★	★	50	15	8	8	6	6	★	★	★	★	★	★	50	20	20	20	
		Ics % (1)		★	★	★	100	100	50	50	50	50	★	★	★	★	★	★	75	75	75	75	
	500 V	Icu	kA	★	★	★	50	10	6	6	4	4	★	★	★	★	★	★	50	42	10	10	
		Ics % (1)		★	★	★	100	100	75	75	75	75	★	★	★	★	★	★	100	75	75	75	
	690 V	Icu	kA	★	3	3	3	3	3	3	3	3	★	8	8	6	6	6	4	4	4	4	
		Ics % (1)		★	75	75	75	75	75	75	75	75	★	100	100	100	100	100	100	100	100	100	
	Associated fuses (if required) if Isc > breaking capacity Icu conforming to IEC 60947-2	230/240 V	aM	A	★	★	★	★	★	★	★	80	80	★	★	★	★	★	★	★	★	★	
			gG	A	★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	★	★	★
		400/415 V	aM	A	★	★	★	★	★	63	63	80	80	★	★	★	★	★	★	★	100	100	100
			gG	A	★	★	★	★	★	80	80	100	100	★	★	★	★	★	★	★	125	125	125
		440 V	aM	A	★	★	★	50	50	50	50	63	63	★	★	★	★	★	★	50	63	80	80
			gG	A	★	★	★	63	63	63	63	80	80	★	★	★	★	★	★	63	80	100	100
500 V		aM	A	★	★	★	50	50	50	50	50	50	★	★	★	★	★	★	50	50	50	50	
		gG	A	★	★	★	63	63	63	63	63	63	★	★	★	★	★	★	63	63	63	63	
690 V		aM	A	★	16	25	32	32	40	40	40	40	★	20	25	40	40	50	50	50	50	50	
		gG	A	★	20	32	40	40	50	50	50	50	★	25	32	50	50	63	63	63	63	63	

* > 100 kA.

(1) As % of Icu.

TeSys protection components

Thermal-magnetic motor circuit-breakers

GV2 ME and GV2 P

Breaking capacity of GV2 ME and GV2 P (used in association with current limiter GV1 L3)													
Circuit-breaker type				GV2 ME									
				01 to 06	07	08	10	14	16	20	21	22	32
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23	25	32
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	★	★	★
		Ics % (1)		★	★	★	★	★	★	★	★	★	★
	400/415 V	Icu	kA	★	★	★	★	★	100	100	100	100	100
		Ics % (1)		★	★	★	★	★	50	50	40	40	40
	440 V	Icu	kA	★	★	★	★	★	50	20	20	20	20
		Ics % (1)		★	★	★	★	★	75	75	75	75	75
	500 V	Icu	kA	★	★	★	★	50	42	10	10	10	10
		Ics % (1)		★	★	★	★	100	100	75	75	75	75
Circuit-breaker type				GV2 P									
				01 to 06	07	08	10	14	16	20	21	22	32
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23	25	32
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	★	★	★
		Ics % (1)		★	★	★	★	★	★	★	★	★	★
	400/415 V	Icu	kA	★	★	★	★	★	★	★	★	★	★
		Ics % (1)		★	★	★	★	★	★	★	★	★	★
	440 V	Icu	kA	★	★	★	★	★	100	100	100	100	100
		Ics % (1)		★	★	★	★	★	50	50	50	50	50
	500 V	Icu	kA	★	★	★	★	100	100	100	100	100	100
		Ics % (1)		★	★	★	★	50	50	50	50	50	50
	690 V (3)	Icu = Ics	kA	★	50	50	50	50	50	50	50	50	50
Circuit-breaker type				GV2 ME									
				01 to 06	07	08	10	14	16	20	21	22	32
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23	25	32
Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables)	Minimum c.s.a. protected at 40 °C at Isc max.	1 mm²		●	●	●	≤ 10 kA	≤ 6 kA	(2)	(2)	(2)	(2)	(2)
		1.5 mm²		●	●	●	≤ 20 kA	≤ 10 kA	(2)	(2)	(2)	(2)	(2)
		2.5 mm²		●	●	●	●	●	●	●	●	●	(2)
		4...6 mm²		●	●	●	●	●	●	●	●	●	●

★ > 100 kA
 ● Cable c.s.a. protected
 (1) As % of Icu
 (2) Cable c.s.a. not protected
 (3) With limiter LA9 LB920

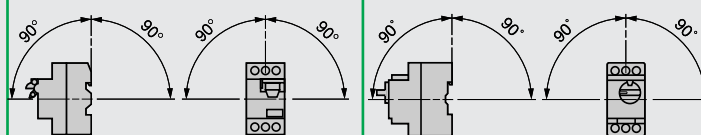
Breaking capacity of GV3 P and GV3 ME80										
Motor circuit-breaker type				GV3 P						GV3 ME80
Rating			A	13	18	25	32	40	50	65
Breaking capacity			kA	13	18	25	32	40	50	65
conforming to IEC 60947-2	230/240 V	Icu	kA	100	100	100	100	100	100	100
		Ics % (1)		100	100	100	100	100	100	100
	400/415 V	Icu	kA	100	100	100	100	50	50	50
		Ics % (1)		100	100	100	100	100	100	100
	440 V	Icu	kA	50	50	50	50	50	50	50
		Ics % (1)		100	100	100	100	100	100	100
	500 V	Icu	kA	12	12	12	12	12	12	12
		Ics % (1)		50	50	50	50	50	50	50
	690 V	Icu	kA	6	6	6	6	6	6	6
		Ics % (1)		50	50	50	50	50	50	50
Associated fuses, if required if Isc > breaking capacity Icu	230/240 V	aM	A	★	★	★	★	★	★	★
		gG	A	★	★	★	★	★	★	★
	415 V	aM	A	★	★	★	★	125	125	125
		gG	A	★	★	★	★	160	160	160
	440 V	aM	A	63	80	125	125	125	125	125
		gG	A	80	100	160	160	160	160	160
	500 V	aM	A	63	63	63	63	80	80	80
		gG	A	80	80	80	80	100	100	100
	690 V	aM	A	50	50	50	50	63	63	63
		gG	A	63	63	63	63	80	80	80

★ Fuse not required: breaking capacity Icn > Isc.

(1) As % of Icu.

Breaking capacity of GV7 R										
Circuit-breaker type					GV7					
					RE20...RE100		RS20...RS100		RE150	RS150
Rating				A	12...20 to 60...100		90...150	90...150	132...220	132...220
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	85	100	85	100	85	100	
		Ics % (1)		100	100	100	100	100	100	
	400/415 V	Icu	kA	36	70	35	70	35	70	
		Ics % (1)		100	100	100	100	100	100	
	440 V	Icu	kA	36	65	35	65	35	65	
		Ics % (1)		100	100	100	100	100	100	
	500 V	Icu	kA	18	50	30	50	30	50	
		Ics % (1)		100	100	100	100	100	100	
	690 V	Icu	kA	8	10	8	10	8	10	
		Ics % (1)		100	100	100	100	100	100	
Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables)	Minimum c.s.a. protected at 40 °C at Isc max.	4 mm²		≤ 6 kA	≤ 6 kA	(2)	(2)	(2)	(2)	
		6 mm²		●	≤ 25 kA	(2)	(2)	(2)	(2)	
		10...50 mm²		●	●	●	●	●	●	

(1) As % of Icu.
● Cable c.s.a. protected.
(2) Cable c.s.a. not protected.

Environment						
Circuit-breaker type			GV2 LE		GV2 L	
Conforming to standards			IEC 60947-1, 60947-2, EN 60204, NF C 63-650, NF C63-120, 79-130, VDE 0113, 0660.			
Product certifications			CSA, CCC		CSA, CCC, BV, DNV, GL, LROS, RINA	
Protective treatment			"TH"		"TH"	
Shock resistance	Conforming to IEC 60068-2-27		30 gn		30 gn	
Vibration resistance	Conforming to IEC 60068-2-6		5 gn (5 to 150 Hz)		5 gn (5 to 150 Hz)	
Ambient air temperature	Storage	°C	- 40...+ 80		- 40...+ 80	
	Operation	°C	- 20...+ 60		- 20...+ 60	
Flame resistance	Conforming to IEC 60695-2-1	°C	960		960	
Maximum operating altitude		m	2000		2000	
Operating position						
Connection (Max. number of conductors x c.s.a)	Solid cable	mm²	Min.	Max.	Min.	Max.
			2 x 1	2 x 6	2 x 1	2 x 6
	Flexible cable without cable end	mm²	2 x 1.5	2 x 6	2 x 1.5	2 x 6
	Flexible cable with cable end	mm²	2 x 1	2 x 4	2 x 1	2 x 4
Tightening torque		N.m	1.7		1.7	
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6		Yes		Yes	
Resistance to mechanical impact		J	0.5		0.5	
Technical characteristics						
Utilisation category	Conforming to IEC 60947-2		A		A	
	Conforming to IEC 60947-4-1		AC-3		AC-3	
Rated operational voltage (Ue)	Conforming to IEC 60947-2	V	690		690	
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	V	690		690	
Rated operational frequency	Conforming to IEC 60947-2	Hz	50/60		50/60	
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	kV	6		6	
Total power dissipated per pole		W	1.8		1.8	
Mechanical durability (C.O.: Closing, Opening)	For AC-3 duty	C.O.	100 000		100 000	
Electrical durability for AC-3/415V duty (C.O.: Closing, Opening)		C.O.	100 000		100 000	
Duty class (maximum operating rate)		C.O./h	40		40	
Rated duty	Conforming to IEC 60947-4-1		Continuous duty		Continuous duty	

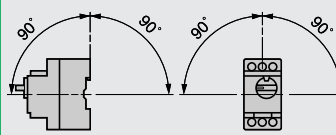
TeSys protection components

Magnetic motor circuit-breakers

GV2 LE and GV2 L

Circuit-breaker type				GV2 LE										GV2 L									
				03 to 06	07	08	10	14	16	20	22	32	03 to 05	06 & 07	08	10	14	16	20	22	32		
Rating			A	0.4 to 1.6	2.5	4	6.3	10	14	18	25	32	0.4 to 1	1.6 to 2.5	4	6.3	10	14	18	25	32		
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	50	50	★	★	★	★	★	★	★	50	50		
		Ics % (1)		★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	100	100		
	400/415 V	Icu	kA	★	★	★	★	★	15	15	15	10	★	★	★	★	★	50	50	50	50		
		Ics % (1)		★	★	★	★	★	50	50	40	50	★	★	★	★	★	50	50	50	50		
	440 V	Icu	kA	★	★	★	50	15	8	8	6	6	★	★	★	★	20	20	20	20	20		
		Ics % (1)		★	★	★	100	100	50	50	50	50	★	★	★	★	75	75	75	75	75		
	500 V	Icu	kA	★	★	★	50	10	6	6	4	4	★	★	★	★	10	10	10	10	10		
		Ics % (1)		★	★	★	100	100	75	75	75	75	★	★	★	★	100	75	75	75	75		
	690 V	Icu	kA	★	3	3	3	3	3	3	3	3	★	4	4	4	4	4	4	4	4		
		Ics % (1)		★	75	75	75	75	75	75	75	75	★	100	100	100	100	100	100	100	100		
Associated fuses (if required) if Isc > breaking capacity Icu conforming to IEC 60947-2 amendment 1	230/240 V	aM	A	★	★	★	★	★	★	★	80	80	★	★	★	★	★	★	★	100	100		
		gG	A	★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	125	125		
	400/415 V	aM	A	★	★	★	★	★	63	63	80	80	★	★	★	★	★	80	100	100	100		
		gG	A	★	★	★	★	★	80	80	100	100	★	★	★	★	★	100	125	125	125		
	440 V	aM	A	★	★	★	50	50	50	50	63	63	★	★	★	★	50	63	80	80	80		
		gG	A	★	★	★	63	63	63	63	80	80	★	★	★	★	63	80	100	100	100		
	500 V	aM	A	★	★	★	50	50	50	50	50	50	★	★	★	★	50	50	50	50	50		
		gG	A	★	★	★	63	63	63	63	63	63	★	★	★	★	63	63	63	63	63		
	690 V	aM	A	★	16	25	32	32	40	40	40	40	★	20	25	40	40	50	50	50	50		
		gG	A	★	20	32	40	40	50	50	50	50	★	25	32	50	50	63	63	63	63		
Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables) Minimum c.s.a. protected at 40 °C and at Isc max.	1 mm²	kA	●	●	●	≤10	≤6	(2)	(2)	(2)	(2)	●	●	●	≤10	≤6	(2)	(2)	(2)	(2)			
	1.5 mm²	kA	●	●	●	≤20	≤10	(2)	(2)	(2)	(2)	●	●	●	≤20	≤10	(2)	(2)	(2)	(2)			
	2.5 mm²		●	●	●	●	●	●	●	●	(2)	●	●	●	●	●	●	●	●	(2)			
	4...6 mm²		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			

★ > 100 kA
 ● Cable c.s.a. protected
 (1) As % of Icu
 (2) Cable c.s.a. not protected

Environment								
Circuit-breaker type			GV3 L		GK3 EF80			
Conforming to standards			IEC/EN 60947-1, 60947-2		IEC 60947-2, EN 60204			
Protective treatment			“TH”		“TC”			
Degree of protection	Conforming to IEC 60529		IP 20		IP 20			
Shock resistance	Conforming to IEC 60068-2-27		On : 15 gn -11 ms Off : 30 gn -11 ms		22 gn -20 ms			
Vibration resistance	Conforming to IEC 60068-2-6		4 gn (5...300 Hz)		2.5 gn (0...25 Hz)			
Flame resistance	Conforming to IEC 60695-2-1	°C	960		960			
Ambient air temperature	Storage	°C	- 40...+ 80		- 40...+ 80			
	Operation	°C	- 20...+ 60 (1)		- 20...+ 70 open mounted			
Maximum operating altitude		m	3000		3000			
Operating position Without derating, in relation to normal vertical mounting plane (2)					Any position			
Connection (Max. number of conductors x c.s.a)	Solid cable	mm²	Min.	Max.	Min.	Max.		
			2 x 1	1 x 25 1 x 35	1 x 2.5	1 x 35		
			Flexible cable without cable end	mm²	2 x 1	1 x 25 1 x 35	1 x 2.5 or 2 x 2.5	1 x 25 or 2 x 16
			Flexible cable with cable end	mm²	2 x 1	1 x 25 1 x 35	1 x 2.5 or 2 x 2.5	1 x 25 or 2 x 16
Tightening torque		N.m	5	5 : 25 mm² 8 : 35 mm²	5			
Suitable for isolation conforming to IEC 60947-1 § 7-1-6			Yes		Yes			
Technical characteristics								
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	V	690		750			
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	kV	6		10			
Rated operational voltage (Ue)	Conforming to IEC 60947-2	V	690		690			
Rated operational frequency		Hz	50/60		50...60			
Electrical durability for AC-3/415V duty (C.O.: Close - Open)		C.O.	50 000		1500			
Mechanical durability (C.O.: Closing, Opening)		C.O.	50 000		20 000			
Maximum operating rate		C.O./h	25		40			
Operating threshold of magnetic trips			14 I max		3363			
Utilisation category	Conforming to IEC 60947-2		A		A			

(1) Leave a space of 9 mm between 2 circuit-breakers: either an empty space or side-mounting add-on contact blocks. Side by side mounting is possible up to 40 °C.
(2) When mounting on a vertical rail, fit a stop to prevent any slippage.

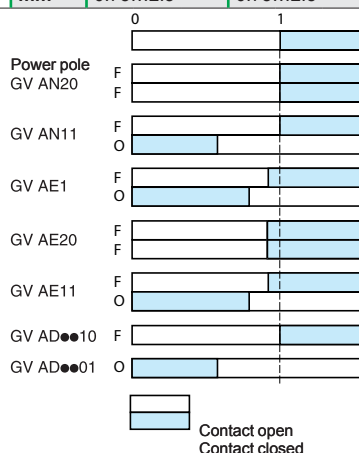
Breaking capacity of GV3 L and GK3 EF80									
Type				GV3 L25	GV3 L32	GV3 L40	GV3 L50	GV3 L65	GK3 EF80
Breaking capacity of the circuit-breaker only or of the circuit-breaker combined with a thermal overload relay	230/240 V	Icu	kA	100	100	100	100	100	50
		Ics % (1)		100	100	100	100	100	40
	400/415 V	Icu	kA	100	100	50	50	50	35
		Ics % (1)		100	100	100	100	100	25
	440 V	Icu	kA	50	50	50	50	50	25
		Ics % (1)		100	100	100	100	100	30
	500 V	Icu	kA	12	12	12	12	12	15
		Ics % (1)		50	50	50	50	50	30
	690 V	Icu	kA	6	6	6	6	6	6
		Ics % (1)		50	50	50	50	50	50
Associated fuses (if required) for use with circuit-breaker only or circuit-breaker combined with a thermal overload relay if Isc > breaking capacity	230/240 V	aM	A	★	★	★	★	★	200
		gG	A	★	★	★	★	★	315
	415 V	aM	A	★	★	★	★	125	200
		gG	A	★	★	★	★	160	250
	440 V	aM	A	63	80	125	125	125	160
		gG	A	80	100	160	160	160	250
	500 V	aM	A	63	63	63	63	80	160
		gG	A	80	80	80	80	100	200
	690 V	aM	A	50	50	50	50	63	125
		gG	A	63	63	63	63	80	160
Use of circuit-breakers without fuses				Minimum cable length (in metres) limiting the maximum short-circuit current to 35 kA maximum, so enabling breakers GK3 EF80 to be used without fuses					
Cable c.s.a.			mm²	≤ 25	35	50	70	95	120
Isc (rms) 3-phase, incoming (Ue = 415 V)	50 kA	m	5	6	8	10	13	15	
	45 kA	m	5	5	7	8	10	12	
	40 kA	m	5	5	5	5	8	9	
	37 kA	m	5	5	5	5	5	5	

★ Fuse not required: breaking capacity Icn > Isc.

(1) As % of Icu

Type of contacts			Instantaneous auxiliary GV AN, GV AD							Fault signalling GV AD, GV AM11 (1)				Instantaneous auxiliary GV AE					
Rated insulation voltage (Ui) (associated insulation coordination)	Conforming to IEC 60947-1	V	690							690				250 (690 in relation to main circuit)					
	Conforming to CSA C22-2 n° 14 and UL 508	V	600							300				300					
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	6							2.5				2.5					
	Conforming to CSA C22-2 n° 14 and UL 508	A	5							1				1					
Mechanical durability (C.O.: Close - Open)		C.O.	100 000							1000				100 000					
Operational power and current conforming to IEC 60947-5-1. a.c. operation			AC-15/100 000 C.O.							AC-14/1000 C.O.				AC-15/100 000 C.O.					
	Rated operational voltage (Ue)	V	48	110 127	230 240	380 415	440	500	690	24	48	110 127	230 240	24	48	110 127	230 240		
	Operational power, normal conditions	VA	300	500	720	850	650	500	400	36	48	72	72	48	60	120	120		
	Occasional breaking and making capacities, abnormal conditions	kVA	3	7	13	15	13	12	9	0.22	0.3	0.45	0.45	0.48	0.6	1.27	2.4		
	Rated operational current (Ie)	A	6	4.5	3.3	2.2	1.5	1	0.6	1.5	1	0.5	0.3	2	1.25	1	0.5		
Operational power and current conforming to IEC 60947-5-1. d.c. operation			DC-13/100 000 C.O.							DC-13/1000 C.O.				DC-13/100 000 C.O.					
	Rated operational voltage (Ue)	V	24	48	60	110 (2)	–	–		24	48	60	–	24	48	60	–		
	Operational power, normal conditions	W	140	240	180	140	120	–	–	24	15	9	–	24	15	9	–		
	Occasional breaking and making capacities, abnormal conditions	W	240	360	240	210	180	–	–	100	50	50	–	100	50	50	–		
	Rated operational current (Ie)	A	6	5	3	1.3	0.5	–	–	1	0.3	0.15	–	1	0.3	0.15	–		
Low power switching reliability of contact			GV AE: Number of failures for “n” million operating cycles (17 V-5 mA): = 10 ⁻⁶																
Minimum operational conditions d.c. operation		V	17																
		mA	5																
Short-circuit protection			By GB2 CB●● circuit-breaker (rating according to operational current for Ue ≤ 415 V) or by gG fuse 10 A max											GB2 CB06 or gG fuse 10 A max					
Cabling, screw clamp terminals	Number of conductors		1			2													
	Solid cable	mm²	1...2.5			1...2.5													
	Flexible cable without cable end	mm²	0.75...2.5			0.75...2.5													
	Flexible cable with cable end	mm²	0.75...1.5			0.75...1.5													
	Tightening torque	N.m	1.4 max			1.4 max													
Cabling, spring terminal connections			GV AN only																
	Flexible cable without cable end	mm²	0.75...2.5			0.75...2.5			–				0.75...1.5						

Operation of instantaneous auxiliary contacts



Operation of fault signalling contacts

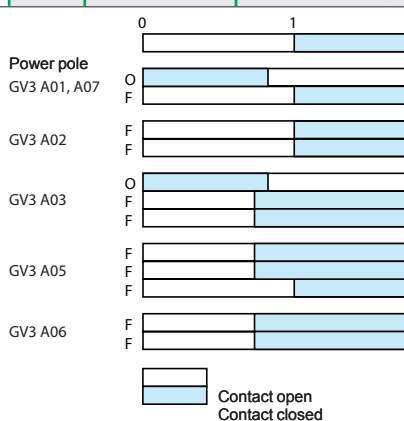
GV AM11
Change of state following tripping on
short-circuit.

GV AD10●● and GV AD01●●
Change of state following tripping on
short-circuit, overload or undervoltage.

(1) For application example of fault signalling contact and short-circuit signalling contact, see page 102.
(2) Add an RC circuit type LA4 D to the load terminals, see page 171.

Type of contacts			Instantaneous auxiliary contacts GV3 A01...A07							Fault signalling contacts GV3 A08 and A09						
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690							690						
	Conforming to CSA C22-2 n° 14, UL 508	V	600 (B600)							600 (B600)						
Conventional rated thermal current (Ith)	Conforming to IEC 60947-5-1	A	6							6						
	Conforming to CSA C22-2 n° 14, UL 508	A	5 (B600)							5 (B600)						
Mechanical durability (C.O.: Close - Open)		C.O.	100 000							1000						
Operational power and current conforming to IEC 60947-5-1 a.c. operation	Rated operational voltage (Ue)	V	48	110 127	220 240	380 415	440	500	690	48	110 127	220 240	380 415	440	500	690
	Operational power	VA	350	500	800	850	700	700	400	240	460	800	850	450	450	200
	Occasional breaking and making capacities	kVA	4	12	20	20	15	15	10	2.4	8	12	15	12	12	8
	Operational current (Ie)	A	6	4.5	3.5	2.2	1.5	1.5	0.6	5	3.6	3.5	2.2	1	1	0.3
				AC-11/100 000 C.O.							AC-11/1000 C.O.					
Operational power and current conforming to IEC 60947-5-1 d.c. operation	Rated operational voltage (Ue)	V	24	48	60	110	220			24	48	60	110	220		
	Operational power	W	180	240	180	140	120			120	120	90	70	60		
	Occasional breaking and making capacities	W	240	360	240	210	180			180	180	135	105	90		
	Operational current (Ie)	A	6	5	3	1.3	0.5			5	2.5	1.5	0.7	0.3		
				DC-11/100 000 C.O.							DC-11/1000 C.O.					
Short-circuit protection			By GB2 CB08 circuit-breaker or gG fuse, 6A max													
Connection	Number of conductors		1				2									
	Solid cable	mm²	1...2.5				1...2.5									
	Flexible cable without cable end	mm²	0.75...2.5				0.75...2.5									
	Flexible cable with cable end	mm²	0.75...2.5				0.75...1.5									

Contact operation



GV3 A08 and A09 change state following tripping on short-circuit or overload

Auxiliary contact characteristics																	
Type of contacts			GV7 AE11							GV7 AB11							
Rated insulation voltage(Ui) (associated insulation coordination)	Conforming to IEC 60947-1	V	690							690							
	Conforming to IEC 60947-5-1	A	6							6							
Mechanical durability (C.O.: Close - Open)		C.O.	50 000							50 000							
Operational current conforming to IEC 60947-5-1 a.c. operation	Rated operational voltage (Ue)	V	AC-12 or AC-15. 50 000 C.O.							AC-12 or AC-15. 50 000 C.O.							
			24	48	110	230/ 240	380/ 415	440	690	24	48	110	230/ 240	380/ 415	440	690	
	Rated operational current (Ie)	AC-12	A	6	6	6	6	6	6	6	5	5	5	5	5	5	5
		AC-15	A	6	6	5	4	3	3	0.1	5	5	4	3	2.5	2.5	0.1
Operational current conforming to IEC 60947-5-1 d.c. operation	Rated operational voltage (Ue)	V	DC-12 or DC-14. 50 000 C.O.							DC-12 or DC-14. 50 000 C.O.							
			24	48	110	250	24	48	110	250							
	Rated operational current (Ie)	DC-12	A	2.5	2.5	0.8	0.3	2	2	0.5	—						
		DC-14	A	1	0.2	0.5	0.03	0.5	0.1	0.25	—						
Minimum operational conditions d.c. operation		V	17							12							
		mA	5							5							
Short-circuit protection			By GB2 CB●● circuit-breaker (rating according to operational current for Ue ≤ 415 V) or gG fuse, 10 A max.														
Cabling	Solid cable	mm²	1 x 1.5 conductor							1 x 1.5 conductor							
	Flexible cable without cable end	mm²	1 x 1.5 conductor							1 x 1.5 conductor							
	Flexible cable with cable end	mm²	1 x 1.5 conductor							1 x 1.5 conductor							

Characteristics of Start-Stop and fault signalling contacts								
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	500					
Rated operational voltage (Ue)	Conforming to IEC 60947-1	V	500					
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	6					
Operational power and current conforming to IEC 60947-5-1 a.c. operation (C.O.: Close - Open)	Rated operational voltage (Ue)	V	AC-15. 20 000 C.O.					
			48	110/127	220/240	380/415	440	500
	Operational power	VA	360	500	800	850	700	700
	Occasional breaking and making capacities	VA	4000	12 000	20 000	20 000	15 000	15 000
	Rated operational current (Ie)	A	6	4.5	3.5	2.2	1.5	1.5
Operational power and current conforming to IEC 60947-5-1 d.c. operation (C.O.: Close - Open)	Rated operational voltage (Ue)	V	DC-13. 1000 C.O.					
			24	48	60	110	220	
	Operational power	W	180	240	180	140	120	
	Occasional breaking and making capacities	W	240	280	240	210	180	
	Rated operational current (Ie)	A	6	5	3	1.3	0.5	
Short-circuit protection	Conforming to IEC 60947-5-1		By GB2 CB08 circuit-breaker or gG fuse, 6A max					
Cabling	Solid cable	mm²	1 x 1...4 conductor					
	Flexible cable without cable end	mm²	1 x 2.5 conductor					
	Flexible cable with cable end	mm²	1 x 1...2.5 conductor or 2 x 1...2.5 conductors					
Tightening torque		N.m	0.8					

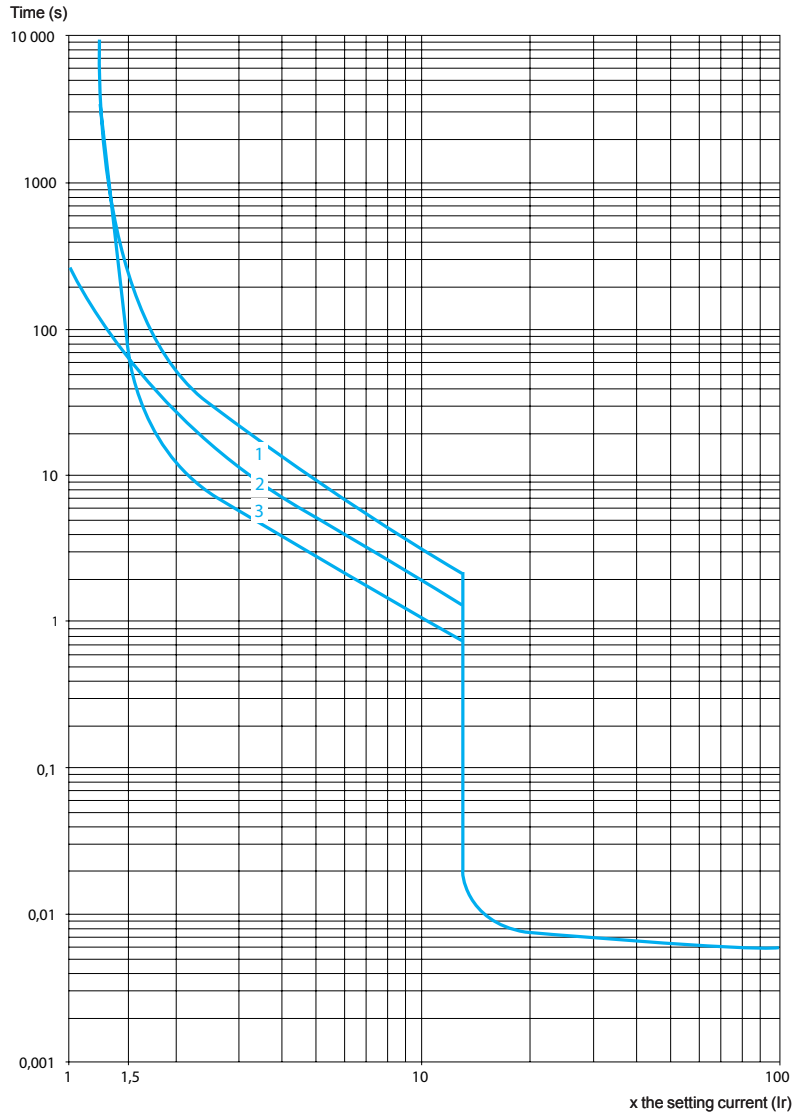
Characteristics of electric trips										
Circuit-breaker type			GV2 ME, GV2 P GV3 P, GV3 L		GV2 ME only	GV3 ME80		GV7 R		
Type of trip			GV AU	GV AS	GV AX ⁽¹⁾	GV3 B	GV3 D	GV7 AU	GV7 AS	
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690	690	500	690	690	690	690	
	Conforming to CSA C22-2 n° 14, UL 508	V	600	600	–	600 (B600)	600 (B600)	600	600	
Operational voltage	Conforming to IEC 60947-1	V	0.85... 1.1 Un	0.7... 1.1 Un	0.85... 1.1 Un	0.8...1.1 Un		0.85... 1.1 Un	0.7... 1.1 Un	
Drop-out voltage		V	0.7... 0.35 Un	0.75... 0.2 Un	0.7... 0.35 Un	0.7...0.35 Un		0.35... 0.7 Ue	0.2... 0.75 Ue	
Inrush consumption	~	VA	12	14	12	12		< 10		
	≡	W	8	10.5	8	7		< 5		
Sealed consumption	~	VA	3.5	5	3.5	7		< 5		
	≡	W	1.1	1.6	1.1	2.5		< 5		
Operating time	Conforming to IEC 60947-1		From the moment the voltage reaches its operational value until opening of the circuit-breaker.							
		ms	10...15				10	15	< 50	
On-load factor			100 %				100 %		100 %	
Cabling	Number of conductors		2 or 4				1 or 2		1	
	Solid cable	mm²	1...2.5				1...2.5		1.5	
	Flexible cable without cable end	mm²	0.75...2.5				0.75...2.5		1.5	
	Flexible cable with cable end	mm²	0.75...1.5				0.75...2.5		1	
Tightening torque		N.m	1.4 max				1.2		1.2	
Mechanical durability (C.O.: Close - Open)		C.O.	30 000 (GV2 ME and GV2 P) 10 000 (GV3 P and GV3 L)				50 % of the mechanical durability of the circuit-breaker			

(1) Wiring scheme of undervoltage trip for dangerous machines (conforming to INRS) on **GV2 ME** only, see page 102.

Characteristics of 3-pole busbars GV2 G●●● and GV3 G●64						
			GV2 G●●●		GV3 G●64	
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690		690	
Conventional thermal current (Ith)	Conforming to IEC 60439-1	A	63		115	
Permissible peak current (I peak)		kA	11		20	
Permissible thermal limit (I²t)		kA²s	104		300	
Degree of protection	Conforming to IEC 60529		IP 20		IP 20	
Terminal block			Yes		—	
Characteristics of terminal blocks GV2 G05 and GV1 G09 (for GV2 ME and GV2 P)						
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690			
Conventional thermal current (Ith)	Conforming to IEC 60439-1	A	63			
Degree of protection	Conforming to IEC 60529		IP 20			
Connection	Solid cable	mm²	1 x 1.5 to 25 conductor or 2 x 1.5 to 6 conductors			
	Flexible cable without cable end	mm²	1 x 1.5 to 16 conductor or 2 x 2.5 to 4 conductors			
	Flexible cable with cable end	mm²	1 x 1.5 to 10 conductor or 2 x 1.5 to 2 conductors			
	Flexible or solid cable AWG		1 AWG 4			
Tightening torque	Connector	N.m	2.2			
	Screw clamp terminals	N.m	1.7			
Characteristics of current limiters (GV2 ME and GV2 P)						
Type			GV1 L3		LA9 LB920	
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690		690	
Conventional thermal current (Ith)	Conforming to IEC 60947-1	A	63		63	
Operating threshold	rms current	A	1500 (non adjustable threshold)		1000 (non adjustable threshold)	
Connection			1 conductor	2 conductors	1 conductor	2 conductors
	Solid cable	mm²	1.5...25	1.5...10	1.5...25	1.5...10
	Flexible cable without cable end	mm²	1.5...25	2.5...10	1.5...25	1.5...10
	Flexible cable with cable end	mm²	1.5...16	1.5... 4	1.5...16	1.5... 4
Tightening torque		N.m	2.2			

Thermal-magnetic tripping curves for GV2 ME and GV2 P

Average operating times at 20 °C related to multiples of the setting current



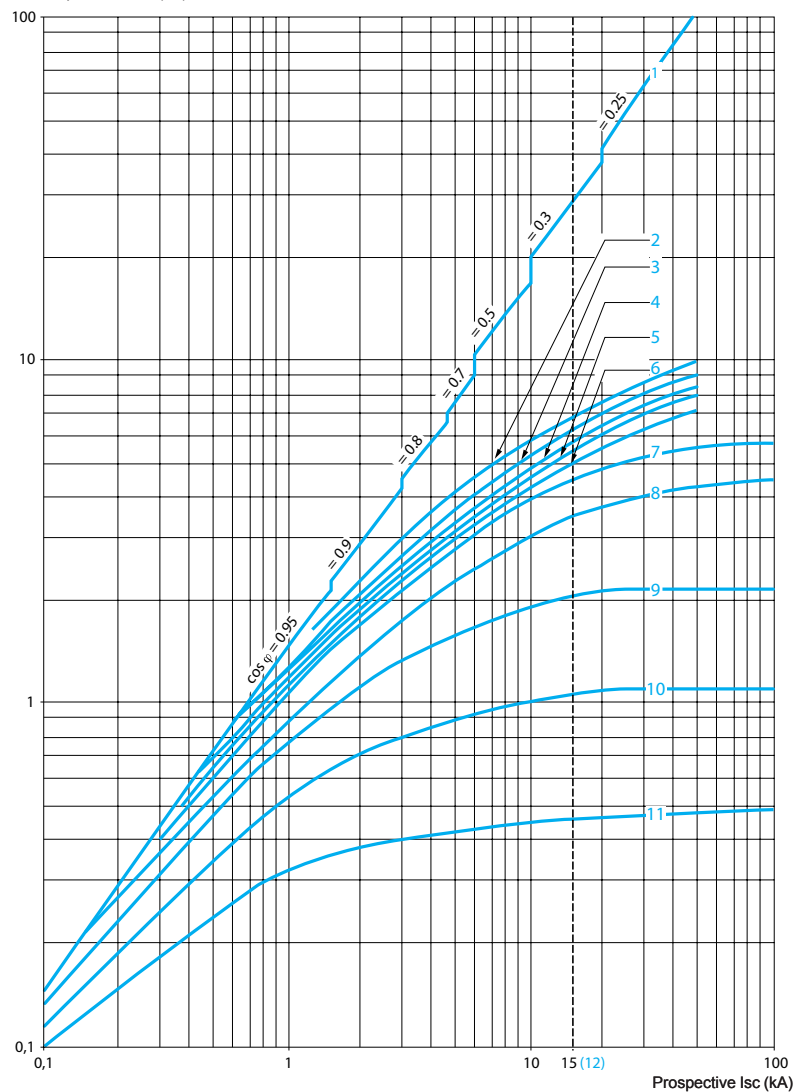
- 1 3 poles from cold state
- 2 2 poles from cold state
- 3 3 poles from hot state

Current limitation on short-circuit for GV2 ME and GV2 P (3-phase 400/415 V)

Dynamic stress

$I_{\text{peak}} = f(\text{prospective } I_{\text{sc}}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 24 -32 A

3 20 -25 A

4 17 -23 A

5 13 -18 A

6 9 -14 A

7 6 -10 A

8 4 -6.3 A

9 2.5 -4 A

10 1.6 -2.5 A

11 1 -1.6 A

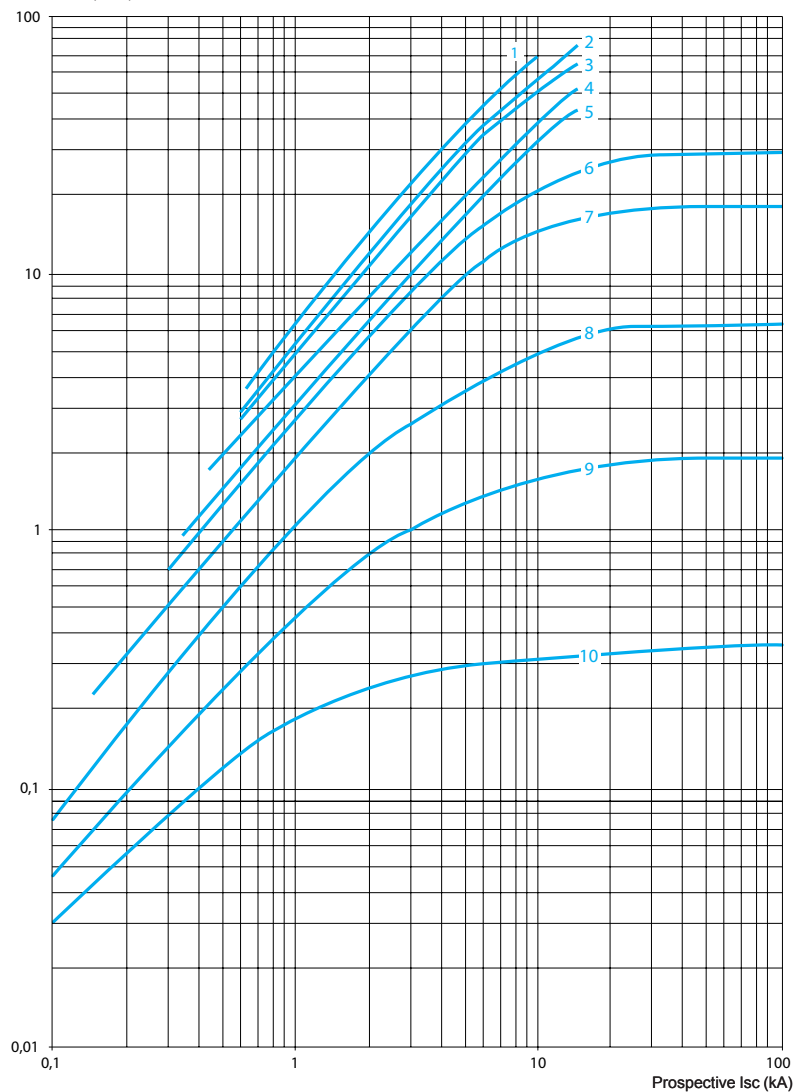
12 Limit of rated ultimate breaking capacity on short-circuit of GV2 ME (14, 18, 23 and 25 A ratings)

Thermal limit on short-circuit for GV2 ME

Thermal limit in kA^2s in the magnetic operating zone

Sum of $I^2dt = f(\text{prospective } I_{sc})$ at $1.05 U_e = 435 \text{ V}$

Sum of I^2dt (kA^2s)



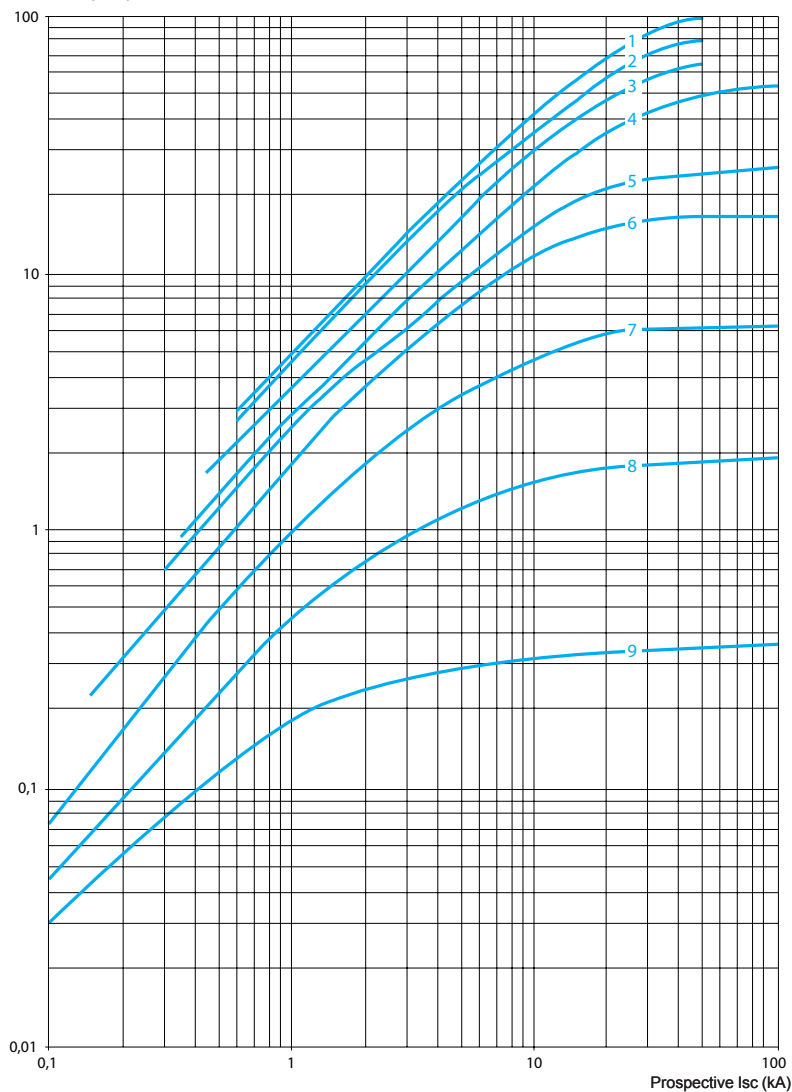
- 1 24 -32 A
- 2 20 -25 A
- 3 17 -23 A
- 4 13 -18 A
- 5 9 -14 A
- 6 6 -10 A
- 7 4 -6.3 A
- 8 2.5 -4 A
- 9 1.6 -2.5 A
- 10 1 -1.6 A

Thermal limit on short-circuit for GV2 P

Thermal limit in kA^2s in the magnetic operating zone

Sum of $I^2dt = f$ (prospective I_{sc}) at $1.05 U_e = 435 \text{ V}$

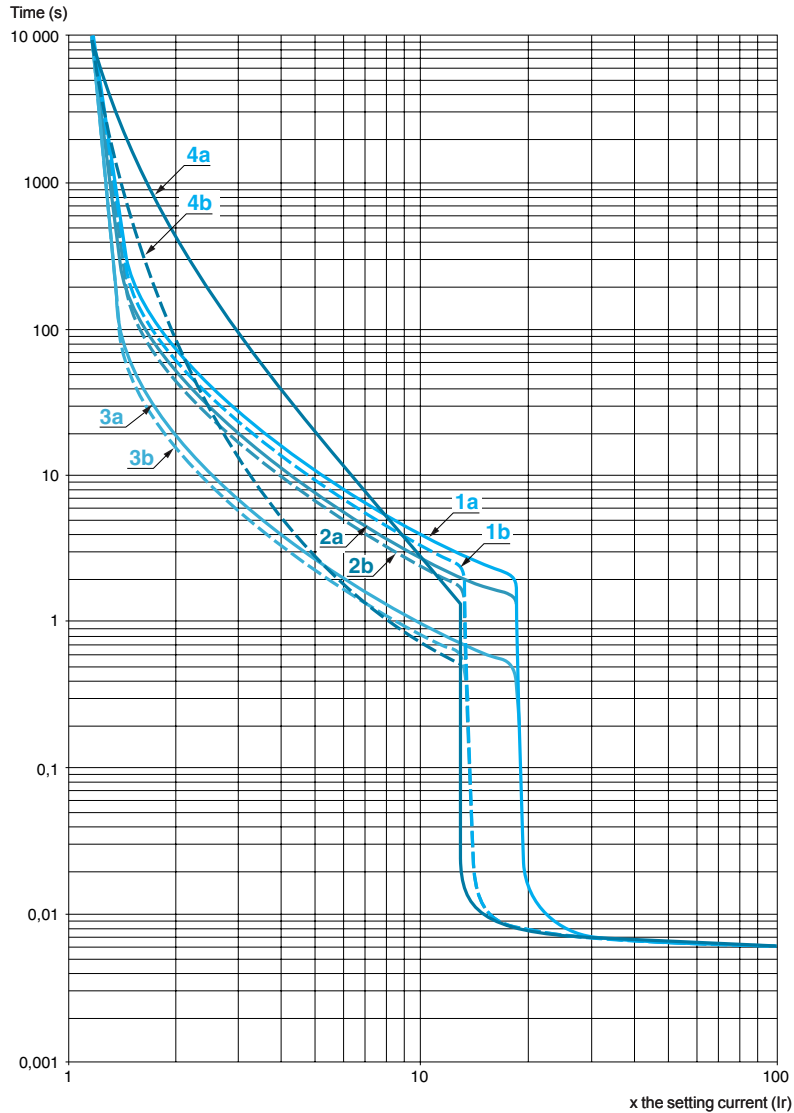
Sum of I^2dt (kA^2s)



- 1 24-32 A
- 1 20-25 A
- 2 17-23 A
- 3 13-18 A
- 4 9-14 A
- 5 6-10 A
- 6 4-6.3 A
- 7 2.5-4 A
- 8 1.6-2.5 A
- 9 1-1.6 A

Thermal-magnetic tripping curves

Average operating times at 20 °C related to multiples of the setting current



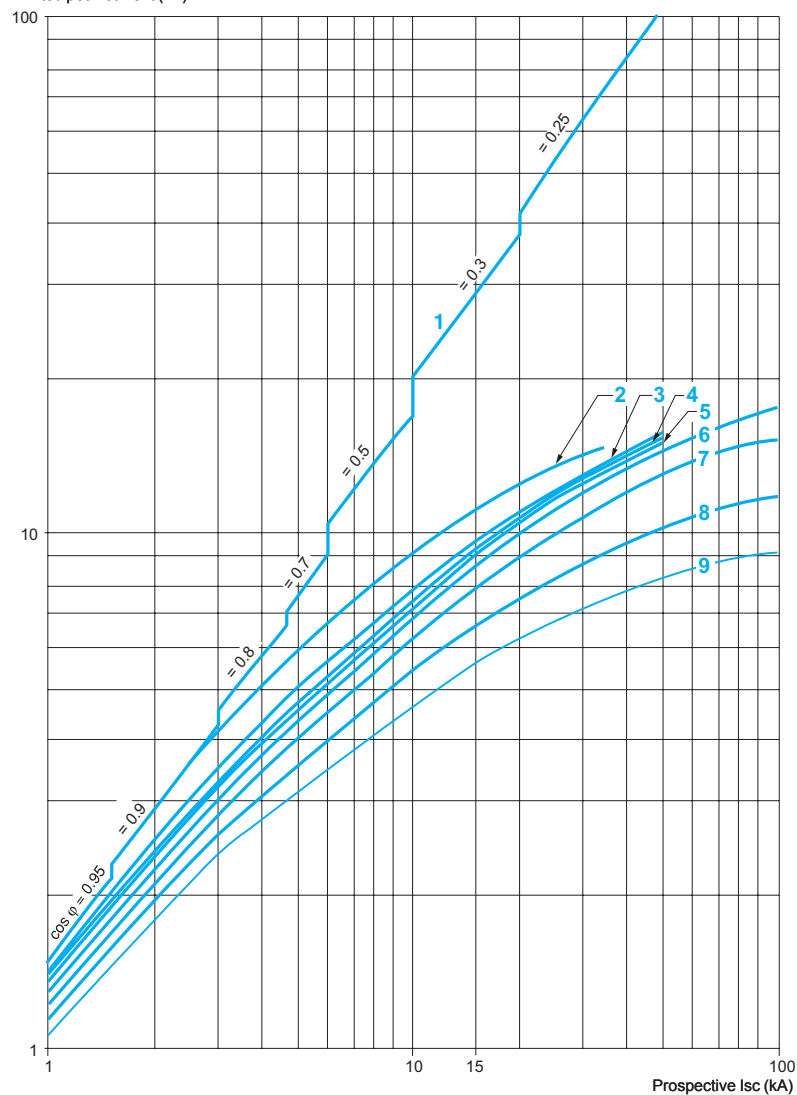
- 1a** 3 poles from cold state (I_r mini.) : GV3 P
- 1b** 3 poles from cold state (I_r maxi.) : GV3 P
- 2a** 2 poles from cold state (I_r mini.) : GV3 P
- 2b** 2 poles from cold state (I_r maxi.) : GV3 P
- 3a** 3 poles from hot state (I_r mini.) : GV3 P
- 3b** 3 poles from hot state (I_r maxi.) : GV3 P
- 4a** 3 poles from hot state (I_r mini.) : GV3 ME80
- 4b** 3 poles from hot state (I_r maxi.) : GV3 ME80

Current limitation on short-circuit (3-phase 400/415 V)

Dynamic stress

$I_{\text{peak}} = f(\text{prospective } I_{\text{sc}})$ at $1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



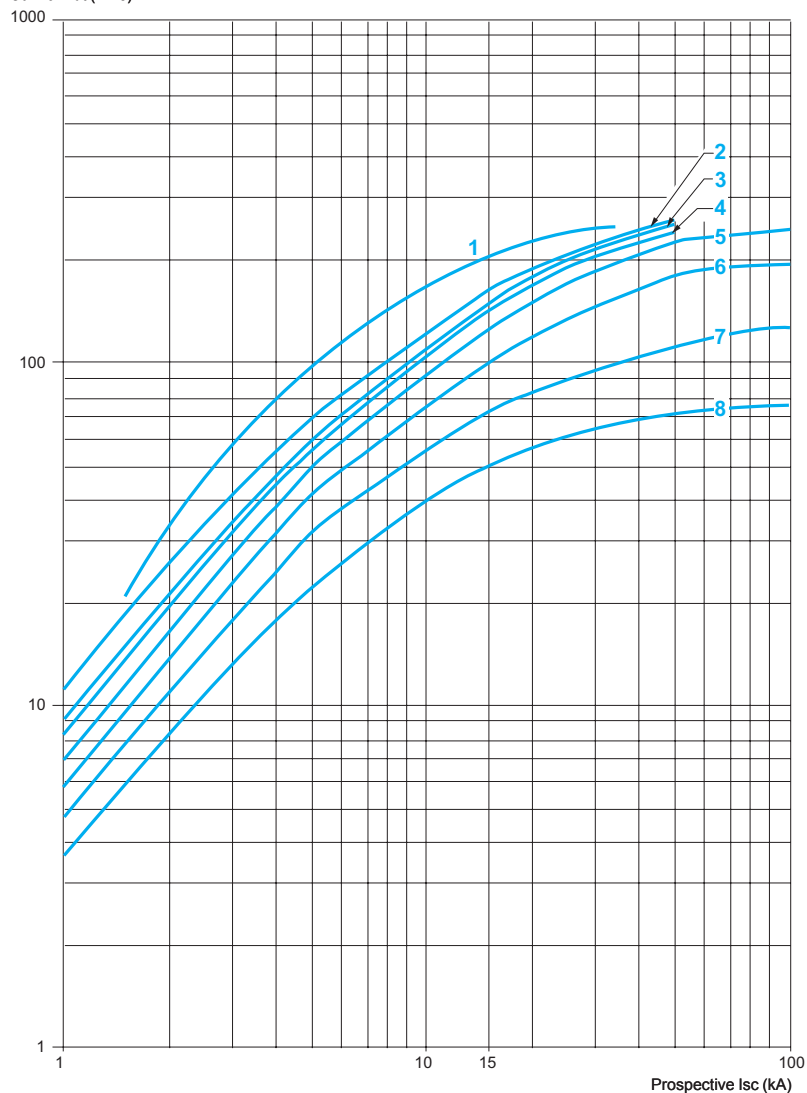
- 1 Maximum peak current
- 2 56-80 A (GV3 ME80)
- 3 48-65 A (GV3 P65)
- 4 37-50 A (GV3 P50)
- 5 30-40 A (GV3 P40)
- 6 23-32 A (GV3 P32)
- 7 17-25 A (GV3 P25)
- 8 12-18 A (GV3 P18)
- 9 9-13 A (GV3 P13)

Maximum thermal limit on short-circuit

Thermal limit in kA^2s in the magnetic operating zone

Sum of $I^2dt = f(\text{prospective } I_{sc})$ at $1.05 U_e = 435 \text{ V}$

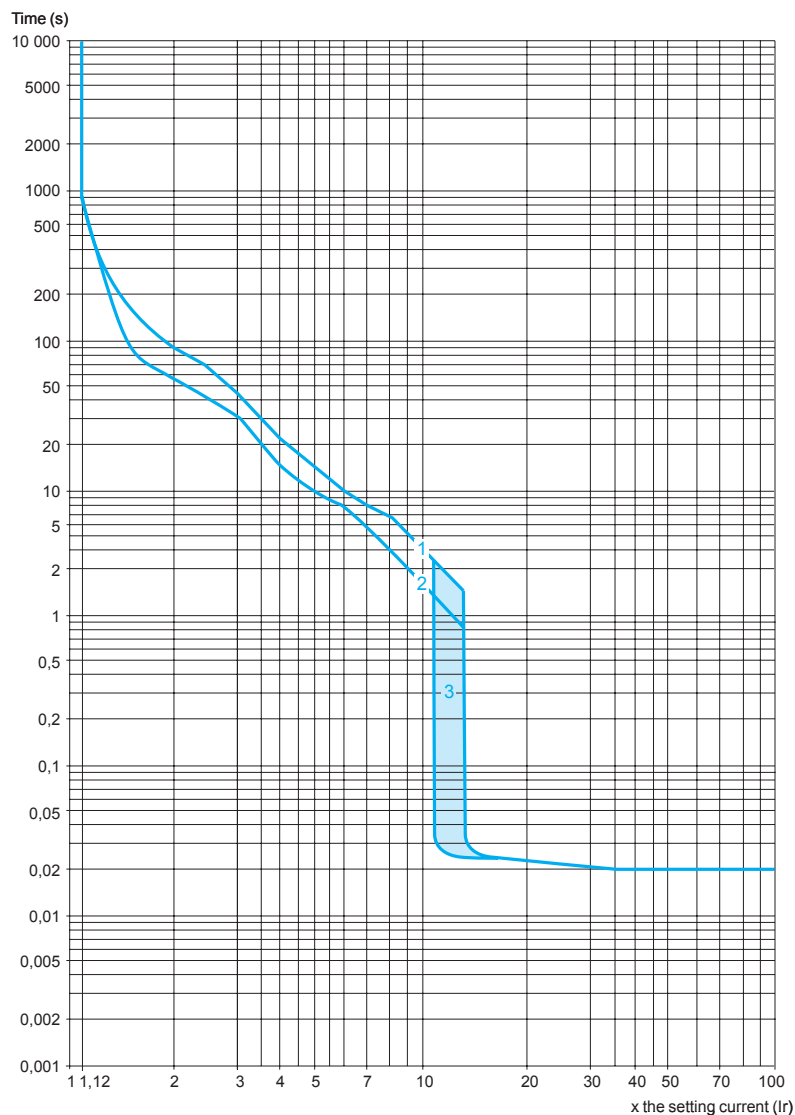
Sum of I^2dt (kA^2s)



- 1 56-80 A (GV3 ME80)
- 2 48-65 A (GV3 P65)
- 3 37-50 A (GV3 P50)
- 4 30-40 A (GV3 P40)
- 5 23-32 A (GV3 P32)
- 6 17-25 A (GV3 P25)
- 7 12-18 A (GV3 P18)
- 8 9-13 A (GV3 P13)

Thermal-magnetic tripping curves for GV7 R

Average operating times at 20 °C related to multiples of the setting current



1 Cold state curve

2 Cold state curve

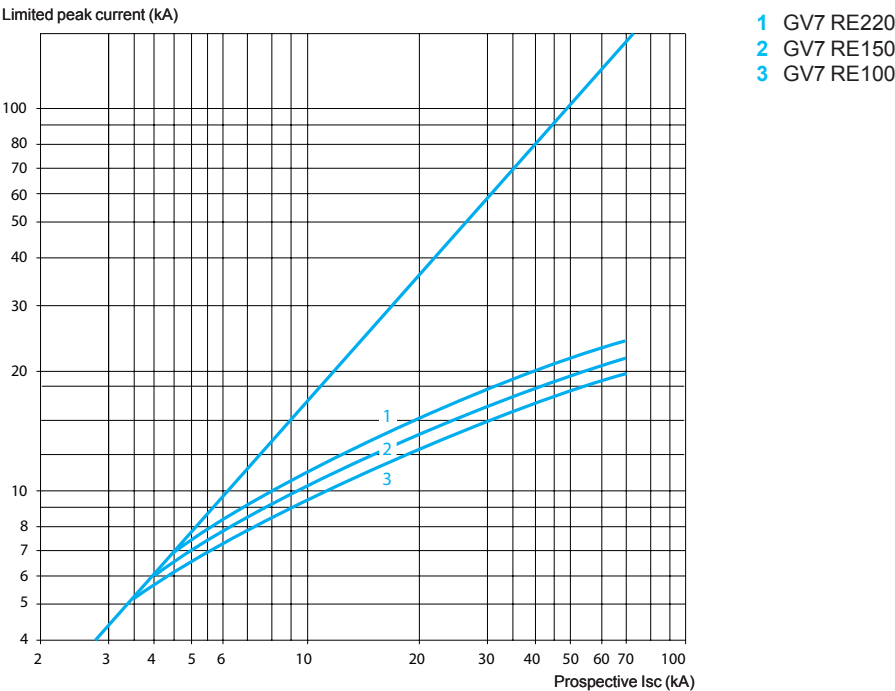
3 12...14 Ir

In the event of total phase failure, tripping occurs after 4 s \pm 20 %

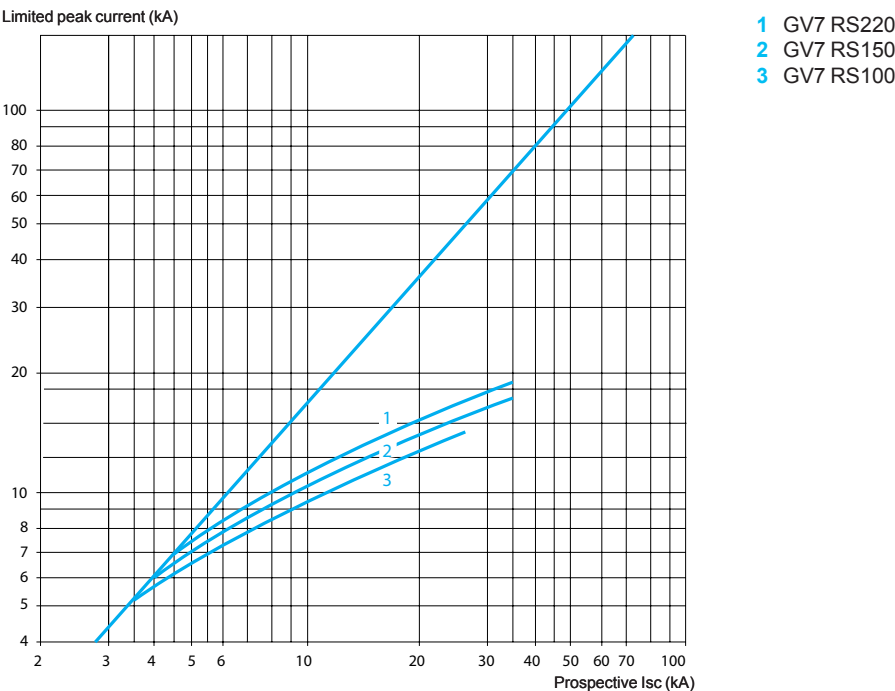
Current limitation on short-circuit (3-phase 400/415 V)
Dynamic stress

$I_{peak} = f(I_{sc})$

For GV7 RE only



For GV7 RS only



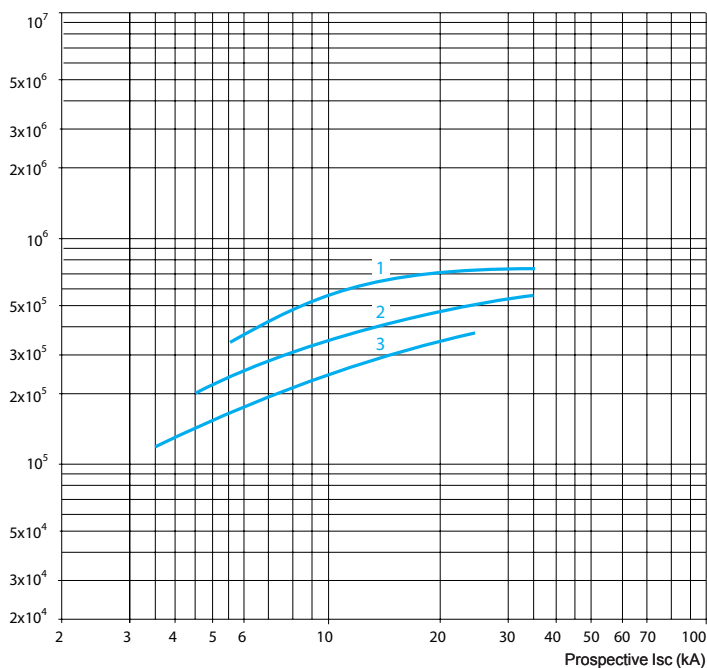
Thermal limit (3-phase 400/415 V)

Thermal limit

Sum of $I^2dt = f$ (prospective I_{sc})

For GV7 RE only

Sum of I^2dt (A²s)



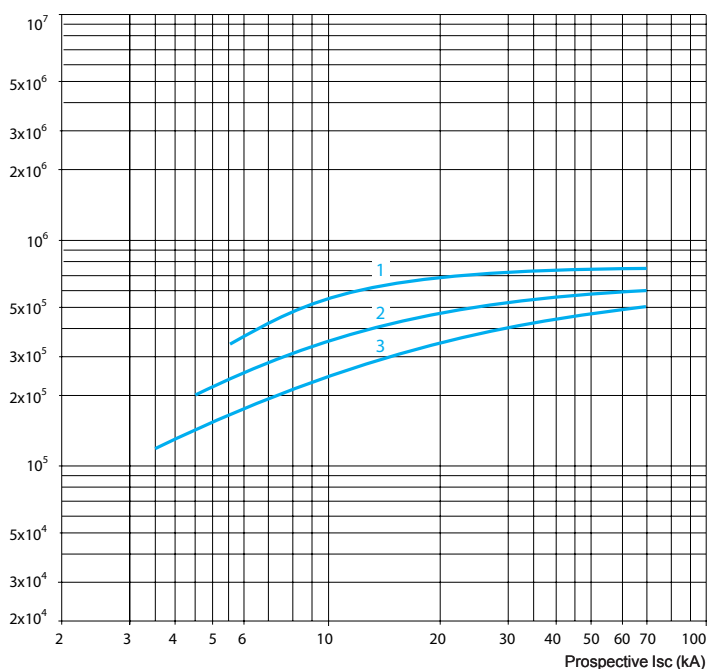
1 GV7 RE220

2 GV7 RE150

3 GV7 RE100

For GV7 RS only

Sum of I^2dt (A²s)



1 GV7 RS220

2 GV7 RS150

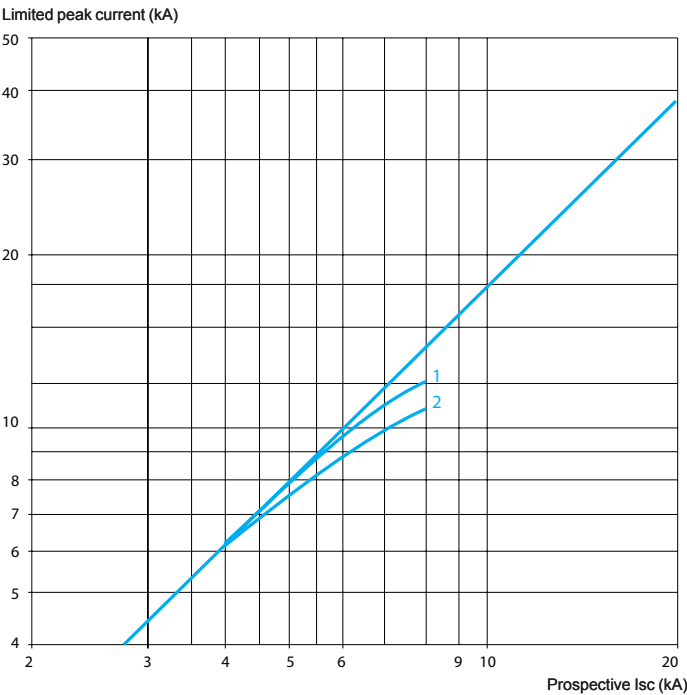
3 GV7 RS100

Current limitation on short-circuit (3-phase 690 V)

Dynamic stress

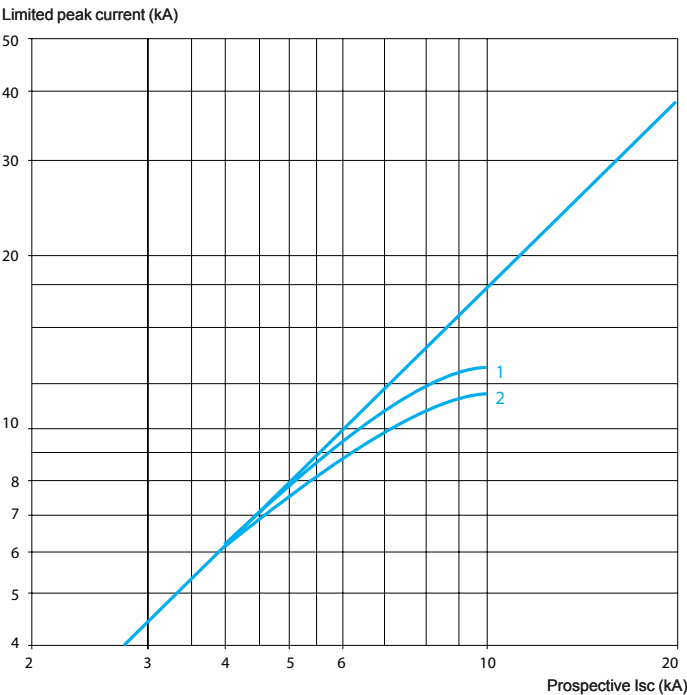
$I_{peak} = f(I_{sc})$

For GV7 RE only



- 1 GV7 RE220
- 2 GV7 RE150 and GV7 RE100

For GV7 RS only



- 1 GV7 RS220
- 2 GV7 RS150 and GV7 RS100

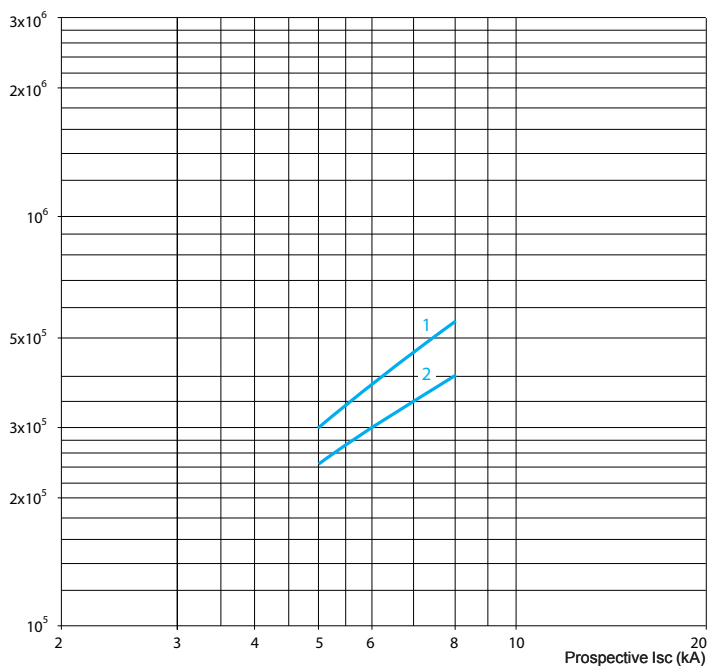
Thermal limit on short-circuit (3-phase 690 V)

Thermal limit

Sum of $I^2dt = f$ (prospective I_{sc})

For GV7 RE only

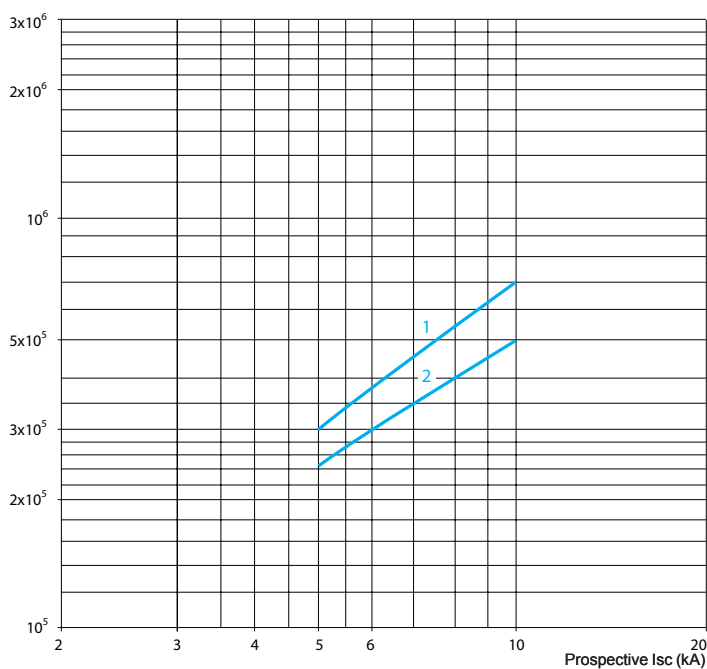
Sum of I^2dt (A²s)



- 1 GV7 RE220
- 2 GV7 RE150 and GV7 RE100

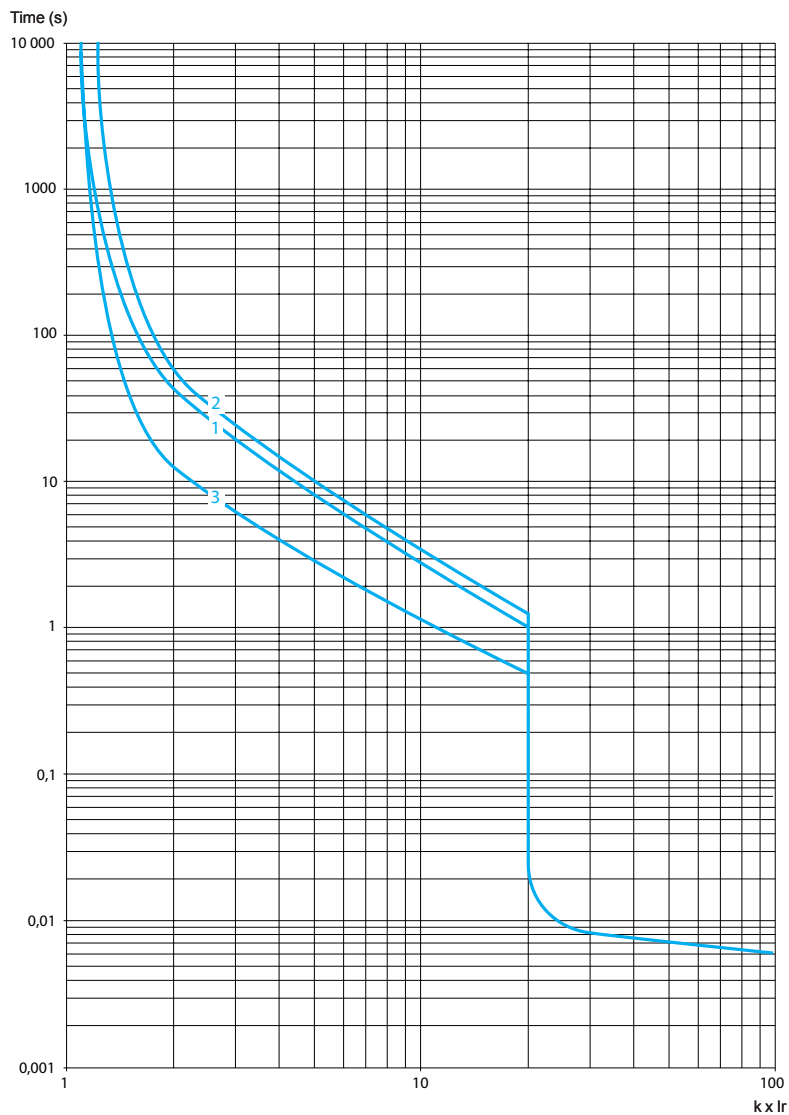
For GV7 RS only

Sum of I^2dt (A²s)



- 1 GV7 RS220
- 2 GV7 RS150 and GV7 RS100

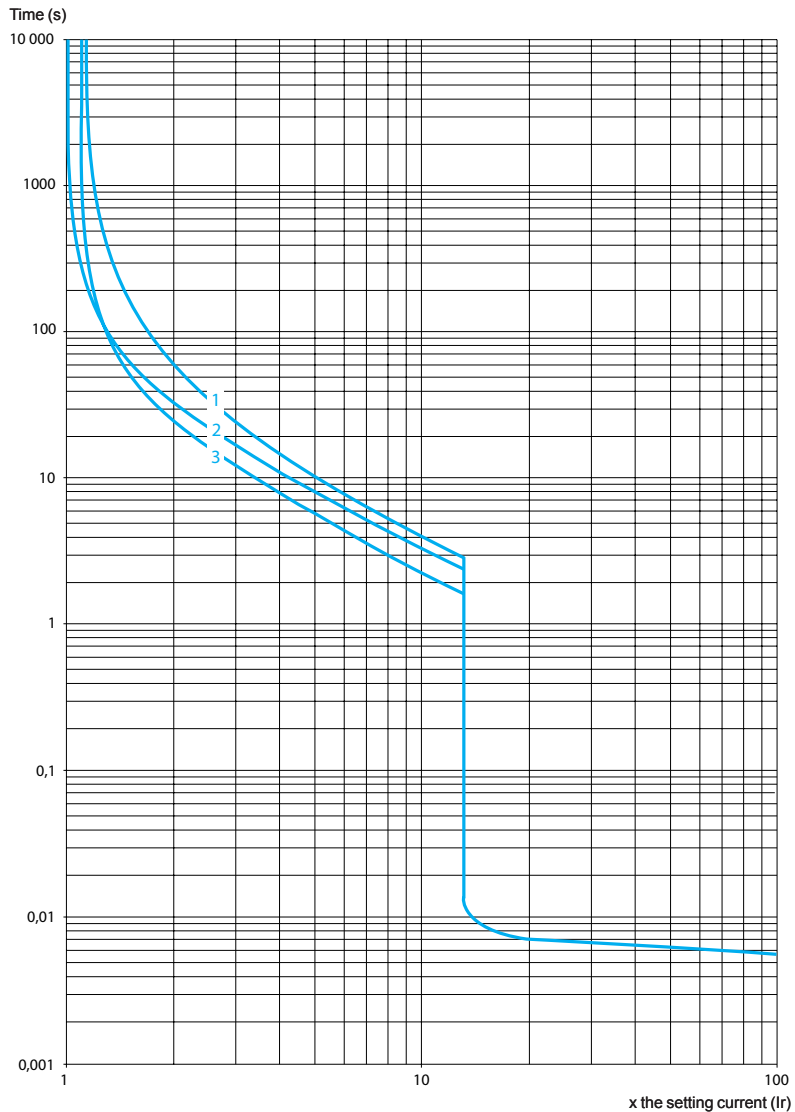
Thermal-magnetic tripping curves for GV2 RT



- 1 3 poles from cold state
- 2 2 poles from cold state
- 3 3 poles from hot state

Tripping curves for GV2 L or LE combined with thermal overload relay LRD or LR2 K

Average operating times at 20 °C related to multiples of the setting current



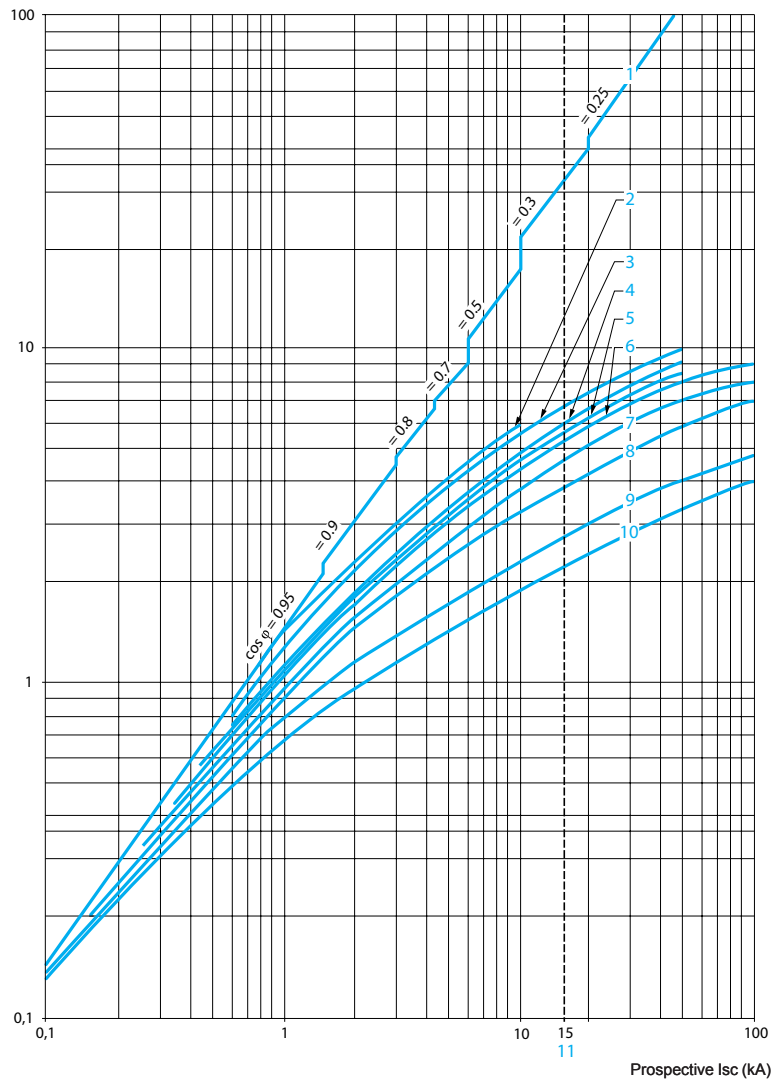
- 1 3 poles from cold state
- 2 2 poles from cold state
- 3 3 poles from hot state

Current limitation on short-circuit for GV2 L and GV2 LE only (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 32 A

3 25 A

4 18 A

5 14 A

6 10 A

7 6.3 A

8 4 A

9 2.5 A

10 1.6 A

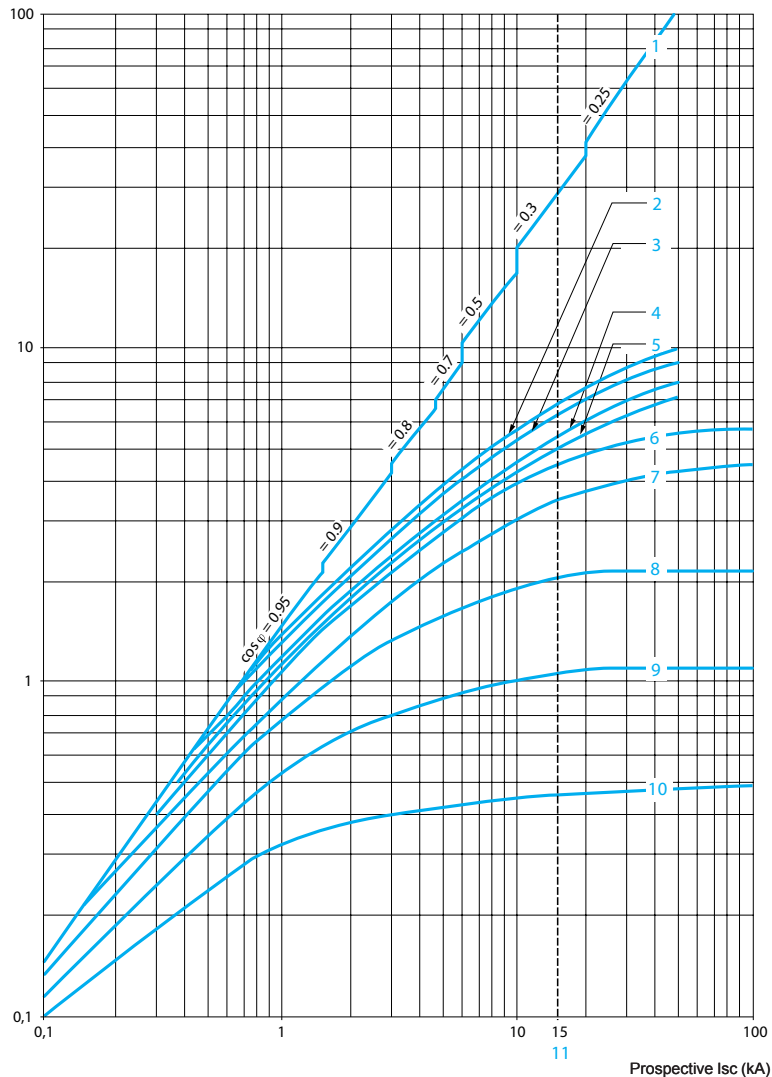
11 Limit of rated ultimate breaking capacity on short-circuit of GV2 LE (14, 18, 23 and 25 A ratings).

Current limitation on short-circuit for GV2 L and GV2 LE + thermal overload relay LRD or LR2 K (3-phase 400/415 V)

Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 32 A

3 25 A

4 18 A

5 14 A

6 10 A

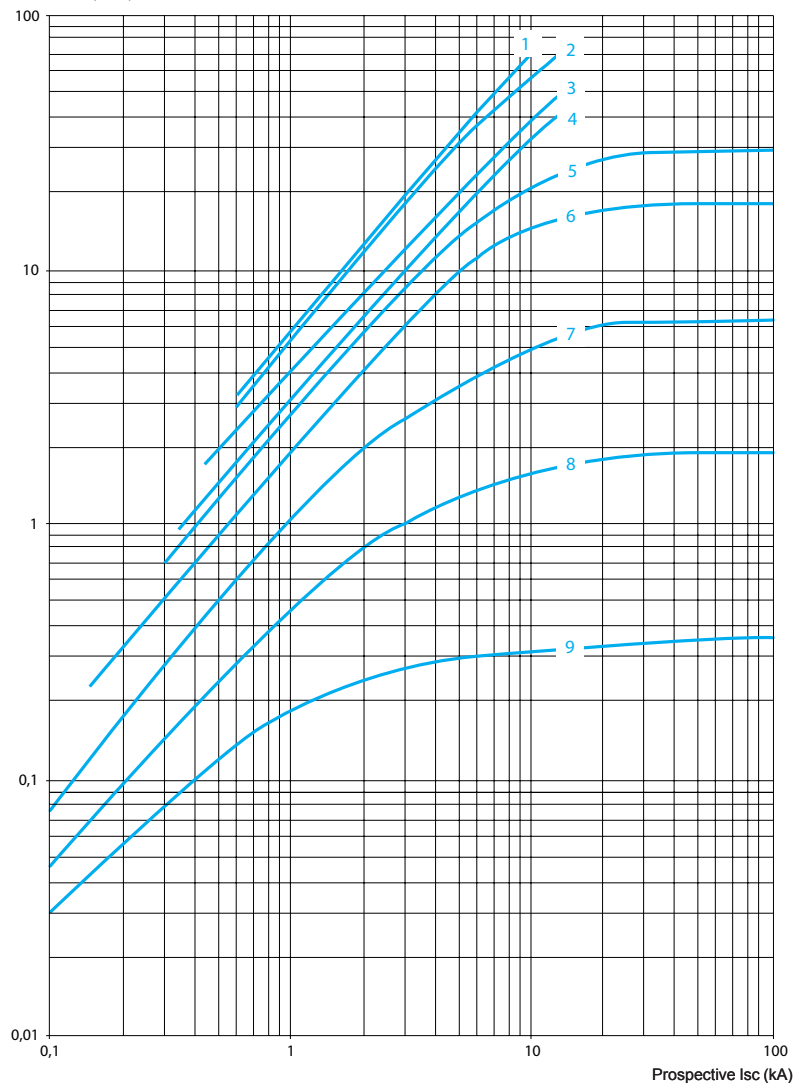
7 6.3 A

8 4 A

9 2.5 A

10 1.6 A

11 Limit of rated ultimate breaking capacity on short-circuit of GV2 LE (14, 18, 23 and 25 A ratings).

Thermal limit on short-circuit for GV2 LE onlyThermal limit in kA^2s in the magnetic operating zoneSum of $I^2dt = f(\text{prospective } I_{sc})$ at $1.05 U_e = 435 \text{ V}$ Sum of I^2dt (kA^2s)

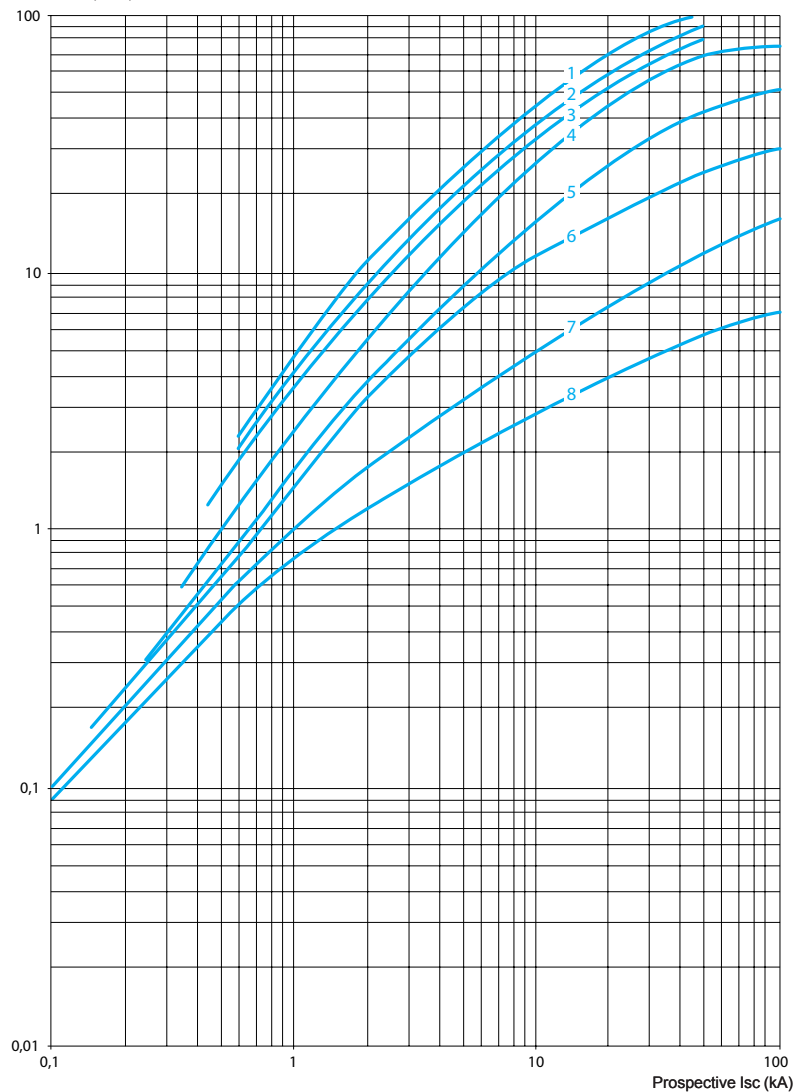
- 1 32 A
- 2 25 A
- 3 18 A
- 4 14 A
- 5 10 A
- 6 6.3 A
- 7 4 A
- 8 2.5 A
- 9 1.6 A

Thermal limit on short-circuit for GV2 L only

Thermal limit in kA^2s in the magnetic operating zone

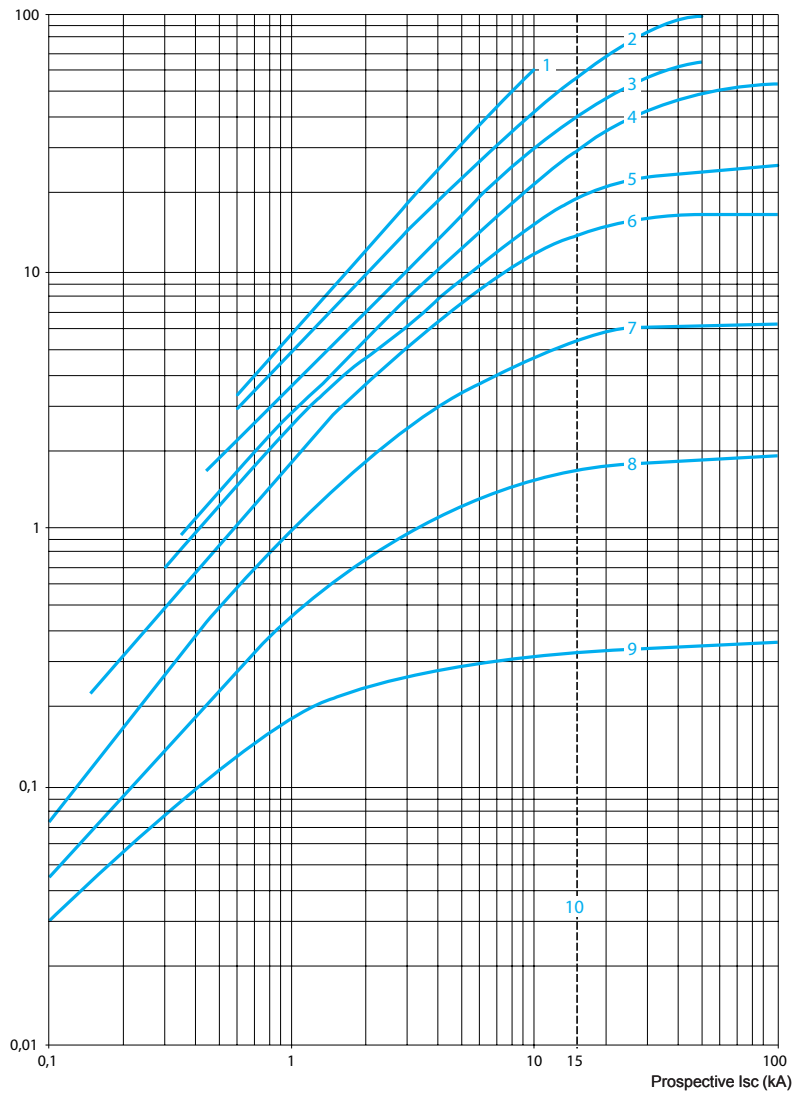
Sum of $I^2dt = f$ (prospective I_{sc}) at $1.05 U_e = 435 \text{ V}$

Sum of I^2dt (kA^2s)



- 1 25 A and 32 A
- 2 18 A
- 3 14 A
- 4 10 A
- 5 6.3 A
- 6 4 A
- 7 2.5 A
- 8 1.6 A

Thermal limit on short-circuit for GV2 L and GV2 LE + thermal overload relay LRD or LR2K

Thermal limit in kA^2s in the magnetic operating zoneSum of $I^2dt = f$ (prospective I_{sc}) at $1.05 U_e = 435 \text{ V}$ Sum of I^2dt (kA^2s)

1 32 A (GV2 LE32)

2 25 A and 32 A (GV2 L32)

3 18 A

4 14 A

5 10 A

6 6.3 A

7 4 A

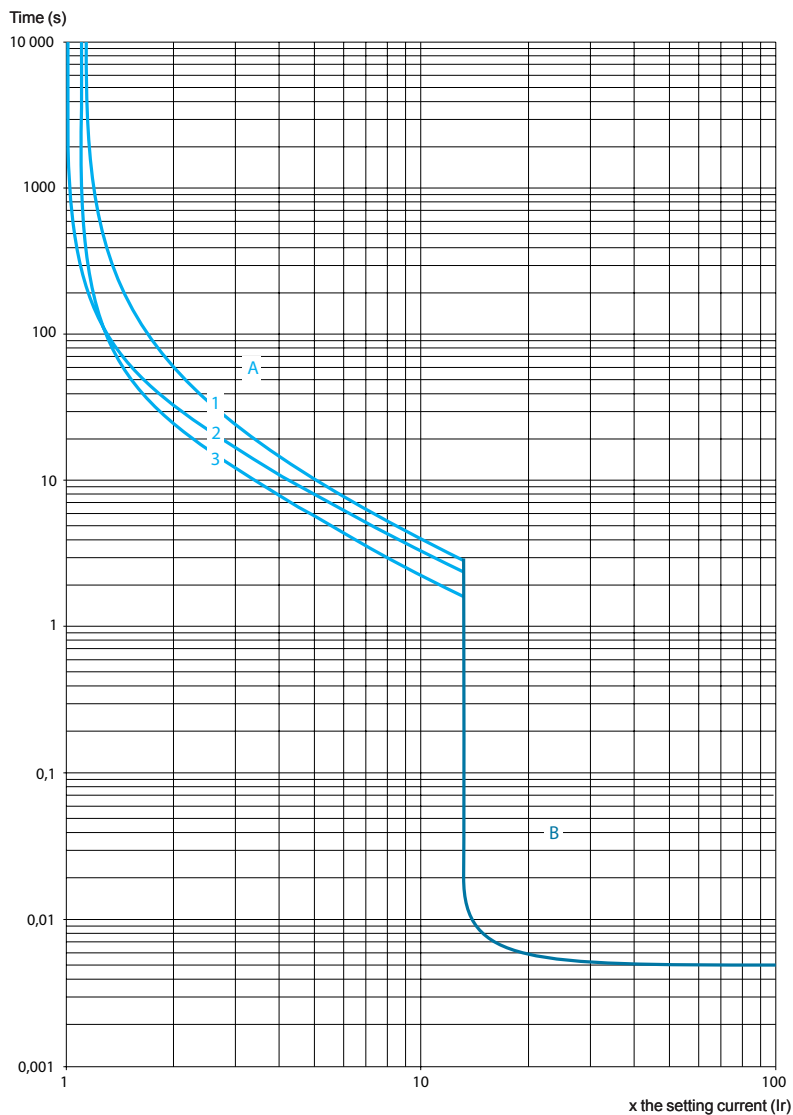
8 2.5 A

9 1.6 A

10 Limit of rated ultimate breaking capacity on short-circuit of GV2 LE (14, 18, 23 and 25 A ratings).

Tripping curves for GV3 L and GK3 EF80 combined with thermal overload relay LRD 33

Average operating time at 20 °C without prior current flow



1 3 poles from cold state

2 2 poles from cold state

3 3 poles from hot state

A Thermal overload relay protection zone

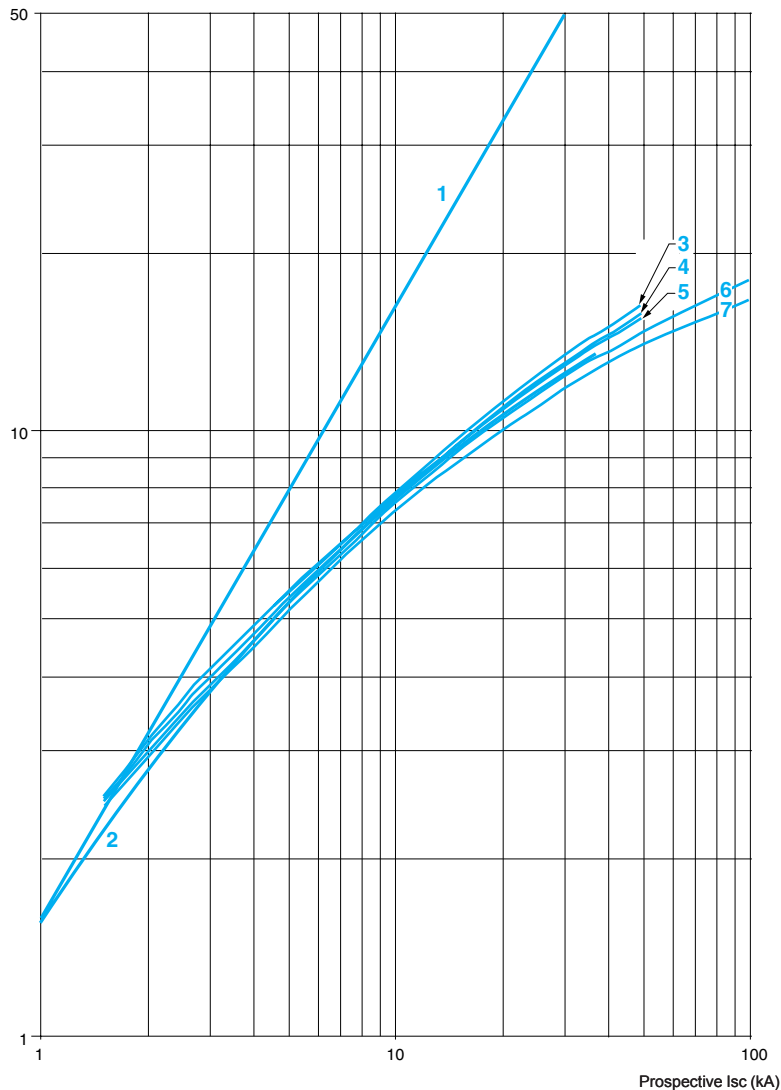
B GK3 EF80 and GV3 protection zone L

Current limitation on short-circuit for GV3 L and GK3 EF80 (3-phase 400/415 V)

Dynamic stress

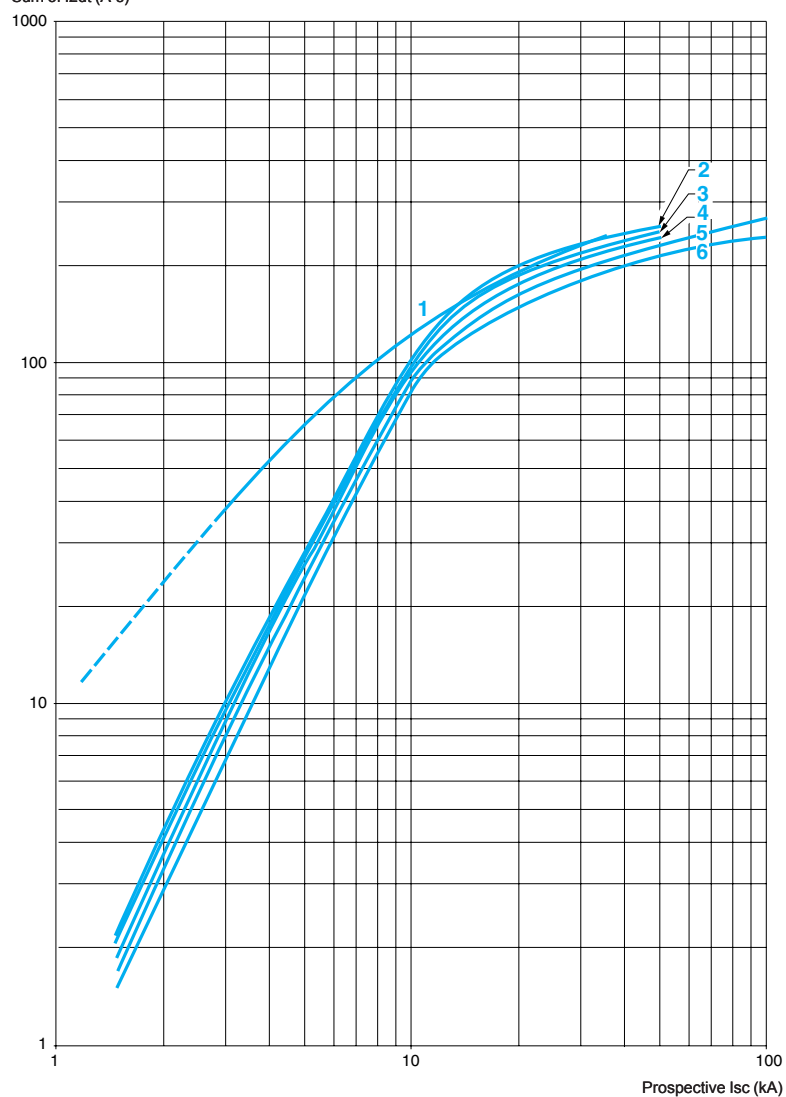
$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



- 1 Maximum peak current
- 2 GK3 EF80
- 3 GV3 L65
- 4 GV3 L50
- 5 GV3 L40
- 6 GV3 L32
- 7 GV3 L25

Thermal limit on short-circuit for GV3 L and GK3 EF80

Thermal limit in A²sSum of $I^2dt = f$ (prospective I_{sc}) at 1.05 $U_e = 435$ VSum of I^2dt (A²s)

- 1 GK3 EF80
- 2 GV3 L65
- 3 GV3 L50
- 4 GV3 L40
- 5 GV3 L32
- 6 GV3 L25



GV2 ME10

Motor circuit-breakers from 0.06 to 15 kW / 400 V, with screw clamp terminals

GV2 ME with pushbutton control

Standard power ratings of 3-phase motors
50/60 Hz in category AC-3

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips (2)	Magnetic tripping current I _d ± 20 %	Reference	Weight
400/415 V			500 V			690 V						
P	I _{cu}	I _{cs} (1)	P	I _{cu}	I _{cs} (1)	P	I _{cu}	I _{cs} (1)				
kW	kA	%	kW	kA	%	kW	kA	%	A	A		kg
—	—	—	—	—	—	—	—	—	0.1...0.16	1.5	GV2 ME01	0.260
0.06	★	★	—	—	—	—	—	—	0.16...0.25	2.4	GV2 ME02	0.260
0.09	★	★	—	—	—	—	—	—	0.25...0.40	5	GV2 ME03	0.260
0.12	★	★	—	—	—	0.37	★	★	0.40...0.63	8	GV2 ME04	0.260
0.18	★	★	—	—	—	—	—	—				
0.25	★	★	—	—	—	0.55	★	★	0.63...1	13	GV2 ME05	0.260
0.37	★	★	0.37	★	★	—	—	—	1...16	22.5	GV2 ME06	0.260
0.55	★	★	0.55	★	★	0.75	★	★				
—	—	—	0.75	★	★	1.1	★	★				
0.75	★	★	1.1	★	★	1.5	3	75	1.6...2.5	33.5	GV2 ME07	0.260
1.1	★	★	1.5	★	★	2.2	3	75	2.5...4	51	GV2 ME08	0.260
1.5	★	★	2.2	★	★	3	3	75				
2.2	★	★	3	50	100	4	3	75	4...6.3	78	GV2 ME10	0.260
3	★	★	4	10	100	5.5	3	75	6...10	138	GV2 ME14	0.260
4	★	★	5.5	10	100	7.5	3	75				
5.5	15	50	7.5	6	75	9	3	75	9...14	170	GV2 ME16	0.260
—	—	—	—	—	—	11	3	75				
7.5	15	50	9	6	75	15	3	75	13...18	223	GV2 ME20	0.260
9	15	40	11	4	75	18.5	3	75	17...23	327	GV2 ME21	0.260
11	15	40	15	4	75	—	—	—	20...25	327	GV2 ME22 (3)	0.260
15	10	50	18.5	4	75	22	3	75	24...32	416	GV2 ME32	0.260

Motor circuit-breakers from 0.06 to 15 kW / 400 V, with lugs

To order thermal magnetic circuit-breakers with connection by lugs, add the digit **6** to the end of reference selected above.

Example: **GV2 ME08** becomes **GV2 ME086**.

Thermal magnetic circuit-breakers GV2 ME with built-in auxiliary contact block

With instantaneous auxiliary contact block (composition, see page 83):

■ GV AE1, add suffix **AE1TQ** to the motor circuit-breaker reference selected above.

Example: **GV2 ME01AE1TQ**.

■ GV AE11, add suffix **AE11TQ** to the motor circuit-breaker reference selected above.

Example: **GV2 ME01AE11TQ**.

■ GV AN11, add suffix **AN11TQ** to the motor circuit-breaker reference selected above.

Example: **GV2 ME01AN11TQ**.

These circuit-breakers with built-in contact block are sold in lots of 20 units in a single pack.

(1) As % of I_{cu}.

(2) The thermal trip setting must be within the range marked on the graduated knob.

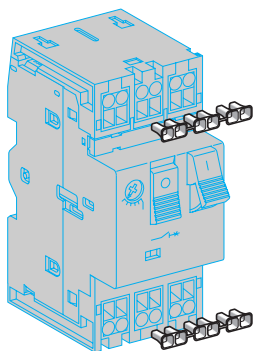
(3) Maximum rating which can be mounted in enclosures **GV2 MC** or **MP**, please consult your Regional Sales Office.

★ > 100 kA.

53987



GV2 ME●●3



LA9 D99

Motor circuit-breakers from 0.06 to 11 kW, with spring terminal connections

GV2 ME (1) with pushbutton control

Standard power ratings of 3-phase motors
50/60 Hz in category AC-3

400/415 V			500 V			Setting range of thermal trips (3)	Magnetic tripping current I _d ± 20 %	Reference	Weight kg
P	I _{cu}	I _{cs} (2)	P	I _{cu}	I _{cs} (2)				
kW	kA	%	kW	kA	%				
—	—	—	—	—	—	0.1...0.16	1.5	GV2 ME013	0.280
0.06	★	★	—	—	—	0.16...0.25	2.4	GV2 ME023	0.280
0.09	★	★	—	—	—	0.25...0.40	5	GV2 ME033	0.280
0.12	★	★	—	—	—	0.40...0.63	8	GV2 ME043	0.280
0.18	★	★	—	—	—	0.63...1	13	GV2 ME053	0.280
0.25	★	★	0.37	★	★	1...1.6	22.5	GV2 ME063	0.280
0.37	★	★	0.55	★	★	1.6...2.5	33.5	GV2 ME073	0.280
0.55	★	★	0.75	★	★	2.5...4	51	GV2 ME083	0.280
0.75	★	★	1.1	★	★	4...6.3	78	GV2 ME103	0.280
1.1	★	★	1.5	★	★	6...10	138	GV2 ME143	0.280
1.5	★	★	2.2	★	★	10...16	170	GV2 ME163	0.280
2.2	★	★	3	50	100	16...25	223	GV2 ME203	0.280
3	★	★	4	10	100	25...32	327	GV2 ME213	0.260
4	★	★	5.5	10	100	32...40	327	GV2 ME223	0.260
5.5	15	50	7.5	6	75				
7.5	15	50	9	6	75				
9	15	40	11	4	75				
11	15	40	15	4	75				

Contact blocks

Description	Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference	Weight kg
Instantaneous auxiliary contacts	Front	1	N/O + N/C	10	GV AE113	0.030
			N/O + N/O	10	GV AE203	0.030
	LH side	2	N/O + N/C	1	GV AN113	0.060
			N/O + N/O	1	GV AN203	0.060

Accessory

Description	Application	Sold in lots of	Unit reference	Weight kg
Cable end reducer	For connection of conductors from 1 to 1.5 mm ²	20	LA9 D99	—

(1) For connection of conductors from 1 to 1.5 mm², the use of an LA9 D99 cable end reducer is recommended.

(2) Maximum rating which can be mounted in enclosures GV2 MC or MP, please consult your Regional Sales Office

(3) The thermal trip setting must be within the range marked on the graduated knob.

★ > 100 kA.

TeSys protection components

Thermal-magnetic motor circuit-breakers

GV2 P, GV3 P and GV3 ME80



GV2 P10



GV3 P65



GV3 P651

Motor circuit-breakers from 0.06 to 30 kW / 400 V

Standard power ratings of 3-phase motors
50/60 Hz in category AC-3

400/415 V			500 V			690 V			Setting range of thermal trips (2)	Magnetic tripping current I _d ± 20 %	Reference	Weight
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)				
kW	kA	%	kW	kA	%	kW	kA	%	A	A		kg
GV2 P: control by rotary knob												
Screw clamp terminals												
—	—	—	—	—	—	—	—	—	0.1...0.16	1.5	GV2 P01	0.350
0.06	★	★	—	—	—	—	—	—	0.16...0.25	2.4	GV2 P02	0.350
0.09	★	★	—	—	—	—	—	—	0.25...0.40	5	GV2 P03	0.350
0.12	★	★	—	—	—	0.37	★	★	0.40...0.63	8	GV2 P04	0.350
0.18	★	★	—	—	—	—	—	—	—	—	—	—
0.25	★	★	—	—	—	0.55	★	★	0.63...1	13	GV2 P05	0.350
0.37	★	★	0.37	★	★	—	—	—	1...1.6	22.5	GV2 P06	0.350
0.55	★	★	0.55	★	★	0.75	★	★	—	—	—	—
0.75	★	★	1.1	★	★	1.5	8	100	1.6...2.5	33.5	GV2 P07	0.350
1.1	★	★	1.5	★	★	2.2	8	100	2.5...4	51	GV2 P08	0.350
2.2	★	★	3	★	★	4	6	100	4...6.3	78	GV2 P10	0.350
3	★	★	5	50	100	5.5	6	100	6...10	138	GV2 P14	0.350
5.5	★	★	7.5	42	75	9	6	100	9...14	170	GV2 P16	0.350
—	—	—	—	—	—	11	6	100	—	—	—	—
7.5	50	50	9	10	75	15	4	100	13...18	223	GV2 P20	0.350
9	50	50	11	10	75	18.5	4	100	17...23	327	GV2 P21	0.350
11	50	50	15	10	75	—	—	—	20...25	327	GV2 P22	0.350
15	35	50	18.5	10	75	22	4	100	24...32	416	GV2 P32	0.350

GV3 P: control by rotary knob

Connection by EverLink® BTR screw connectors (3)

5.5	100	100	7.5	12	50	11	6	50	9...13	182	GV3 P13	0.960
7.5	100	100	9	12	50	15	6	50	12...18	252	GV3 P18	0.960
11	100	100	15	12	50	18.5	6	50	17...25	350	GV3 P25	0.960
15	100	100	18.5	12	50	22	6	50	23...32	448	GV3 P32	0.960
18.5	50	100	22	12	50	37	6	50	30...40	560	GV3 P40	0.960
22	50	100	30	12	50	45	6	50	37...50	700	GV3 P50	0.960
30	50	100	45	12	50	55	6	50	48...65	910	GV3 P65	0.960

Connection by EverLink® BTR screw connectors, for assembly with a contactor

To assemble a GV3 P40 to P65 circuit-breaker with an LC1 D40A to D65A contactor, it is possible to use the circuit-breaker supplied without downstream EverLink® power terminal block. To order this product, add the digit 1 to the end of the references selected above. Example: GV3 P65 becomes GV3 P651.

Connection by lugs

To order thermal magnetic circuit-breakers with connection by lugs, add the digit 6 to the end of reference selected above. Example: GV3 P18 becomes GV3 P186.

GV3 ME80: pushbutton control, screw clamp terminals

37	15	50	45	4	100	55	2	100	56...80		GV3 ME80 (4)	0.700
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Motor circuit-breakers up to 50 hp / 600 V, UL 508 type E

GV2 (5)

To obtain a GV2 P motor circuit-breaker, UL 508 type E, combine:

- a circuit-breaker **GV2 P●●H7** (except 32 A),
- and a "Large Spacing" adapter **GV2 GH7**.

GV3 (6)

To obtain a motor-circuit-breaker GV3 P, UL 508 type E, use the following with the circuit-breaker:

- a "Large Spacing" cover **GV3 G66**,
- a short-circuit signalling contact **GV AM11**.

GV3 with connection by lugs (6)

To obtain a motor-circuit-breaker GV3 P, UL 508 type E, with connection by lugs, add the digit 6 to the end of reference selected above and use the following with the circuit-breaker:

- two IP 20 covers **LAD 96570**,
- a short-circuit signalling contact **GV AM11**.

(1) As % of Icu.

(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) BTR screws: hexagon socket head. Require use of an insulated Allen key, in compliance with local wiring regulations.

(4) Recommended for use in association with a contactor.

(5) Accessory: see page 91.

(6) Accessories: see page 85.

★ > 100 kA.

TeSys protection components

Thermal-magnetic motor circuit-breakers

GV7 R



GV7 RE40



GV7 RS220

Thermal-magnetic circuit-breakers GV7 R with screw clamp terminals

Control by rocker lever

Standard power ratings of 3-phase motors
50/60 Hz in category AC-3

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips	Reference	Weight
400/415 V			500 V			660/690 V					
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)			
kW	kA	%	kW	kA	%	kW	kA	%			
7.5	36	100	9	18	100	11	8	100	12...20	GV7 RE20	2.010
9	36	100	11	18	100	15	8	100			
7.5	70	100	9	50	100	11	10	100	12...20	GV7 RS20	2.010
9	70	100	11	50	100	15	10	100			
9	36	100	11	18	100	15	8	100	15...25	GV7 RE25	2.010
11	36	100	15	18	100	18.5	8	100			
9	70	100	11	50	100	15	10	100	15...25	GV7 RS25	2.010
11	70	100	15	50	100	18.5	10	100			
18.5	36	100	18.5	18	100	22	8	100	25...40	GV7 RE40	2.010
			22	18	100						
18.5	70	100	18.5	50	100	22	10	100	25...40	GV7 RS40	2.010
22	36	100	30	18	100	30	8	100	30...50	GV7 RE50	2.015
22	70	100	30	50	100	30	10	100	30...50	GV7 RS50	2.015
37	36	100	45	18	100	55	8	100	48...80	GV7 RE80	2.040
			55	18	100						
37	70	100	45	50	100	55	10	100	48...80	GV7 RS80	2.040
			55	50	100						
45	36	100	—	18	100	75	8	100	60...100	GV7 RE100	2.040
45	70	100	—	50	100	75	10	100	60...100	GV7 RS100	2.040
55	35	100	75	30	100	90	8	100	90...150	GV7 RE150	2.020
75	35	100	90	30	100	110	8	100			
55	70	100	75	50	100	90	10	100	90...150	GV7 RS150	2.020
75	70	100	90	50	100	110	10	100			
90	35	100	110	30	100	160	8	100	132...220	GV7 RE220	2.350
110	35	100	132	30	100	200	8	100			
			160	30	100						
90	70	100	110	50	100	160	10	100	132...220	GV7 RS220	2.350
110	70	100	132	50	100	200	10	100			
			160	50	100						

(1) As % of Icu

TeSys protection components

Thermal-magnetic circuit-breakers

GV2 RT



GV2 RT

For motors with high current peak on starting

Control by rocker lever

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3					Setting range of thermal trips (1)	Magnetic tripping current I _d ± 20 %	Reference	Weight
220/ 230 V	400/ 415 V	440 V	500 V	690 V				
kW	kW	kW	kW	kW	A	A		kg
0.06	0.09	0.09 0.12	—	—	0.25...0.40	8	GV2 RT03	0.350
—	0.12 0.18	0.18	—	0.37	0.40...0.63	13	GV2 RT04	0.350
0.09 0.12	0.25 0.37	0.25 0.37	0.37	0.55	0.63...1	22	GV2 RT05	0.350
0.18 0.25	0.37 0.55	0.37 0.55	0.37 0.55 0.75	0.75 1.1	1...1.6	33	GV2 RT06	0.350
0.37	0.75	0.75 1.1	1.1	1.5	1.6...2.5	51	GV2 RT07	0.350
0.55 0.75	1.1 1.5	1.5	1.5 2.2	2.2 3	2.5...4	78	GV2 RT08	0.350
1.1	2.2	2.2 3	3	4	4...6.3	138	GV2 RT10	0.350
1.5 2.2	3 4	4	4 5.5	5.5 7.5	6...10	200	GV2 RT14	0.350
2.2 3	5.5	5.5 7.5	7.5	9 11	9...14	280	GV2 RT16	0.350
4	7.5	7.5 9	9	15	13...18	400	GV2 RT20	0.350
5.5	9 11	11	11	18.5	17...23	400	GV2 RT21	0.350

(1) The thermal trip setting must be within the range marked on the graduated knob.



GV2 RT

For primaries of 3-phase transformers

Control by rocker lever

Standard power ratings					Setting range of thermal trips (1)	Magnetic tripping current $I_d \pm 20\%$	Reference	Weight
230/240 V	400/415 V	440 V	500 V	690 V				
kW	kW	kW	kW	kW	A	A		kg
–	–	–	–	–	0.25...0.40	8	GV2 RT03	0.350
–	–	–	–	–	0.40...0.63	13	GV2 RT04	0.350
–	–	0.63	0.63	1	0.63...1	22	GV2 RT05	0.350
0.4	0.63	1	1	–	1...1.6	33	GV2 RT06	0.350
0.63	1	–	1.6	1.6 2	1.6...2.5	51	GV2 RT07	0.350
1	1.6 2	1.6 2	2 2.5	2.5	2.5...4	78	GV2 RT08	0.350
1.6 2	2.5	2.5 4	4	4 5 6.3	4...6.3	138	GV2 RT10	0.350
2.5	4 5	5	5 6.3	–	6...10	200	GV2 RT14	0.350
4	6.3	6.3	–	10 12.5	9...14	280	GV2 RT16	0.350
5 6.3	10	10	10 12.5	10	13...18	400	GV2 RT20	0.350

Accessory (2)

Description	Reference	Weight kg
Padlockable external operator (IP 54) black handle, blue legend plate	GV2 AP03	0.280

(1) The thermal trip setting must be within the range marked on the graduated knob.

(2) Other accessories such as mounting, cabling and marking accessories are identical to those used for GV2 ME motor circuit-breakers, see page 91.

TeSys protection components

Magnetic motor circuit-breakers

GV2 LE



GV2 LE10

Magnetic motor circuit-breakers from 0.06 to 15 kW

GV2 L: control by rocker lever, connection by screw clamp terminals

Standard power ratings of 3-phase motors

50/60 Hz in category AC-3

400/415 V			500 V			690 V			rating	Id ± 20 %	with thermal overload relay		
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)					
kW	kA		kW	kA		kW	kA		A	A			kg
0.06	★	★	—	—	—	—	—	—	0.4	5	LR2 K0302	GV2 LE03	0.330
0.09	★	★	—	—	—	—	—	—	0.4	5	LR2 K0304	GV2 LE03	0.330
0.12	★	★	—	—	—	0.37	★	★	0.63	8	LR2 K0304	GV2 LE04	0.330
0.18	★	★	—	—	—	—	—	—	0.63	8	LR2 K0305	GV2 LE04	0.330
—	—	—	—	—	—	0.55	★	★	1	13	LR2 K0305	GV2 LE05	0.330
0.25	★	★	—	—	—	—	—	—	1	13	LR2 K0306	GV2 LE05	0.330
—	—	—	—	—	—	0.75	★	★	1	13	LR2 K0306	GV2 LE05	0.330
0.37	★	★	0.37	★	★	—	—	—	1	13	LR2 K0306	GV2 LE05	0.330
0.55	★	★	0.55	★	★	1.1	★	★	1.6	22.5	LR2 K0307	GV2 LE06	0.330
—	—	—	0.75	★	★	—	—	—	1.6	22.5	LR2 K0307	GV2 LE06	0.330
0.75	★	★	1.1	★	★	1.5	3	75	2.5	33.5	LR2 K0308	GV2 LE07	0.330
1.1	★	★	—	—	—	—	—	—	2.5	33.5	LR2 K0308	GV2 LE07	0.330
1.5	★	★	1.5	★	★	3	3	75	4	51	LR2 K0310	GV2 LE08	0.330
—	—	—	2.2	★	★	—	—	—	4	51	LR2 K0312	GV2 LE08	0.330
2.2	★	★	3	50	100	4	3	75	6.3	78	LR2 K0312	GV2 LE10	0.330
3	★	★	4	10	100	5.5	3	75	10	138	LR2 K0314	GV2 LE14	0.330
4	★	★	5.5	10	100	—	—	—	10	138	LR2 K0316	GV2 LE14	0.330
—	—	—	—	—	—	7.5	3	75	10	138	LRD 14	GV2 LE14	0.330
—	—	—	—	—	—	9	3	75	14	170	LRD 16	GV2 LE16	0.330
5.5	15	50	7.5	6	75	11	3	75	14	170	LR2 K0321	GV2 LE16	0.330
7.5	15	50	9	6	75	15	3	75	18	223	LRD 21	GV2 LE20	0.330
9	15	40	11	4	75	18.5	3	75	25	327	LRD 22	GV2 LE22	0.330
11	15	40	15	4	75	—	—	—	25	327	LRD 22	GV2 LE22	0.330
15	10	50	18.5	4	75	22	3	75	32	416	LRD 32	GV2 LE32	0.330

(1) As % of Icu.

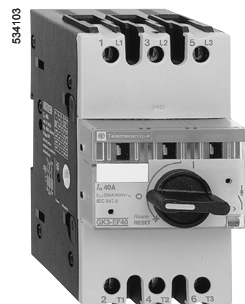
★ > 100 kA.



GV2 L10



GV3 L65



GK3 EF80

Motor circuit-breakers from 0.09 to 30 kW

GV2 L: Control by rotary knob, connection by screw clamp terminals

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Magnetic protection rating	Tripping current I _d ± 20 %	Use in association with thermal overload relay (class 10 A)	Reference	Weight
400/415 V			500 V			690 V							
P	I _{cu}	I _{cs} (1)	P	I _{cu}	I _{cs} (1)	P	I _{cu}	I _{cs} (1)					
kW	kA		kW	kA		kW	kA		A	A			kg
0.09	★	★	—	—	—	—	—	—	0.4	5	LRD 03	GV2 L03	0.330
0.12	★	★	—	—	—	0.37	★	★	0.63	8	LRD 04	GV2 L04	0.330
0.18	★	★	—	—	—	—	—	—	0.63	8	LRD 04	GV2 L04	0.330
—	—	—	—	—	—	0.55	★	★	1	13	LRD 05	GV2 L05	0.330
0.25	★	★	—	—	—	—	—	—	1	13	LRD 05	GV2 L05	0.330
—	—	—	—	—	—	0.75	★	★	1	13	LRD 06	GV2 L05	0.330
0.37	★	★	0.37	★	★	—	—	—	1	13	LRD 05	GV2 L05	0.330
0.55	★	★	0.55	★	★	1.1	★	★	1.6	22.5	LRD 06	GV2 L06	0.330
—	—	—	0.75	★	★	—	—	—	1.6	22.5	LRD 06	GV2 L06	0.330
0.75	★	★	1.1	★	★	1.5	4	100	2.5	33.5	LRD 07	GV2 L07	0.330
1.1	—	—	—	—	—	—	—	—	—	—	LRD 08	GV2 L08	0.330
1.5	★	★	1.5	★	★	3	4	100	4	51	LRD 08	GV2 L08	0.330
—	—	—	—	—	—	—	—	—	—	—	LRD 08	GV2 L08	0.330
2.2	★	★	3	★	★	4	4	100	6.3	78	LRD 10	GV2 L10	0.330
3	★	★	4	10	100	5.5	4	100	10	138	LRD 12	GV2 L14	0.330
4	—	—	—	—	—	—	—	—	—	—	LRD 14	GV2 L14	0.330
—	—	—	—	—	—	7.5	4	100	10	138	LRD 14	GV2 L14	0.330
—	—	—	—	—	—	9	4	100	14	170	LRD 16	GV2 L16	0.330
5.5	50	50	7.5	10	75	11	4	100	14	170	LRD 16	GV2 L16	0.330
7.5	50	50	9	10	75	15	4	100	18	223	LRD 21	GV2 L20	0.330
9	50	50	11	10	75	18.5	4	100	25	327	LRD 22	GV2 L22	0.330
11	50	50	15	10	75	—	—	—	25	327	LRD 22	GV2 L22	0.330
15	35	50	18.5	10	75	22	4	100	32	416	LRD 32	GV2 L32	0.330

GV3 L: control by rotary knob, connection by EverLink® BTR screw connectors

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Magnetic protection rating	Tripping current I _d ± 20 %	Use in association with thermal overload relay (class 10 A)	Reference	Weight
400/415 V			500 V			690 V							
P	I _{cu}	I _{cs} (1)	P	I _{cu}	I _{cs} (1)	P	I _{cu}	I _{cs} (1)					
kW	kA		kW	kA		kW	kA		A	A			kg
11	100	100	15	12	50	18.5	6	50	25	350	LRD 325	GV3 L25	0.960
15	100	100	18.5	12	50	22	6	50	32	448	LRD 332	GV3 L32	0.960
18.5	50	100	22	12	50	37	6	50	40	560	LRD 340	GV3 L40	0.960
22	50	100	30	12	50	45	6	50	50	700	LRD 350	GV3 L50	0.960
30	50	100	37	12	50	55	6	50	65	910	LRD 365	GV3 L65	0.960

Connection by EverLink® BTR screw connectors, for assembly with a contactor

To assemble a GV3 L40 to L65 circuit-breaker with an LC1 D40A to D65A contactor, it is possible to use the circuit-breaker supplied without downstream EverLink® power terminal block. To order this product, add the digit 1 to the end of the references selected above. Example: GV3 L65 becomes GV3 L651.

Connection by lugs

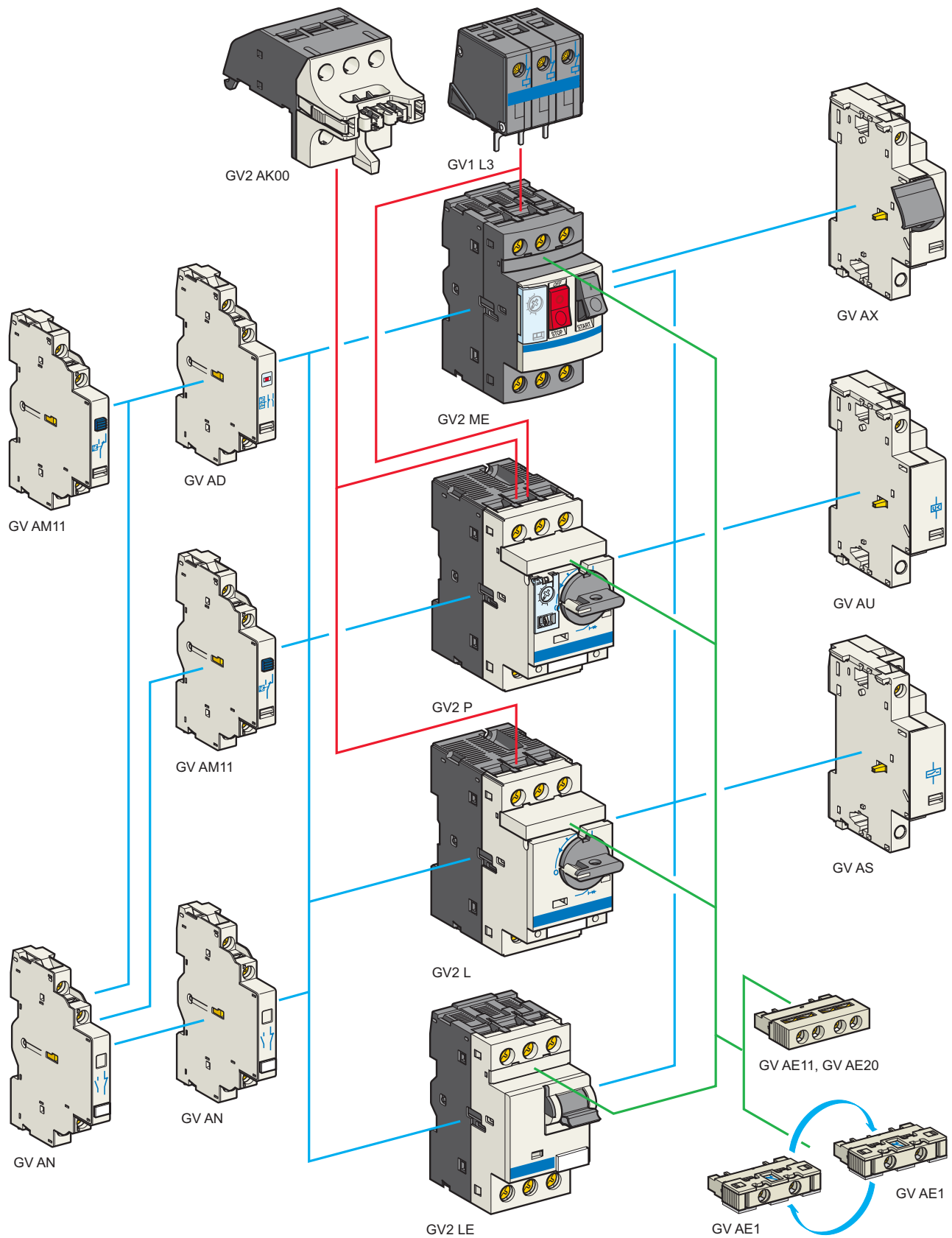
To order these circuit-breakers with connection by lugs, add the digit 6 to the end of reference selected above. Example: GV3 L32 becomes GV3 L326.

GK3: control by rotary knob, connection by screw clamp terminals

37	35	25	55	15	30	—	—	—	80	1040	LRD 3363	GK3 EF80	0.795
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(1) As % of Icu. Associated current limiter or fuses, where required. See characteristics page 45.

★ > 100 kA.



TeSys protection components

Thermal-magnetic and magnetic motor circuit-breakers GV2 with screw clamp connections
Add-on blocks and accessories

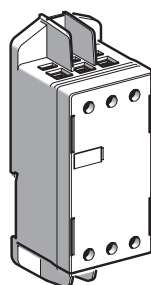
Contact blocks							
Description	Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference	Weight kg	
Instantaneous auxiliary contacts	Front (1)	1	N/O or N/C (2)	10	GV AE1	0.015	
			N/O + N/C	10	GV AE11	0.020	
			N/O + N/O	10	GV AE20	0.020	
	Side (LH)	2	N/O + N/C	1	GV AN11	0.050	
			N/O + N/O	1	GV AN20	0.050	
Fault signalling contact + instantaneous auxiliary contact	Side (3) (LH)	1	N/O (fault)	+ N/O	1	GV AD1010	0.055
				+ N/C	1	GV AD1001	0.055
			N/C (fault)	+ N/O	1	GV AD0110	0.055
				+ N/C	1	GV AD0101	0.055
Short-circuit signalling contact	Side (LH)	1	C/O common point	1	GV AM11	0.045	

Electric trips				
Mounting	Voltage		Reference	Weight kg
Undervoltage or shunt trips (4)				
Side (1 block on RH side of circuit-breaker)	24 V	50 Hz	GV A●025	0.105
		60 Hz	GV A●026	0.105
	48 V	50 Hz	GV A●055	0.105
		60 Hz	GV A●056	0.105
	100 V	50 Hz	GV A●107	0.105
	100...110 V	60 Hz	GV A●107	0.105
	110...115 V	50 Hz	GV A●115	0.105
		60 Hz	GV A●116	0.105
	120...127 V	50 Hz	GV A●125	0.105
	127 V	60 Hz	GV A●115	0.105
	200 V	50 Hz	GV A●207	0.105
	200...220 V	60 Hz	GV A●207	0.105
	220...240 V	50 Hz	GV A●225	0.105
		60 Hz	GV A●226	0.105
	380...400 V	50 Hz	GV A●385	0.105
		60 Hz	GV A●386	0.105
	415...440 V	50 Hz	GV A●415	0.105
	415 V	60 Hz	GV A●416	0.105
	440 V	60 Hz	GV A●385	0.105
	480 V	60 Hz	GV A●415	0.105
	500 V	50 Hz	GV A●505	0.105
	600 V	60 Hz	GV A●505	0.105

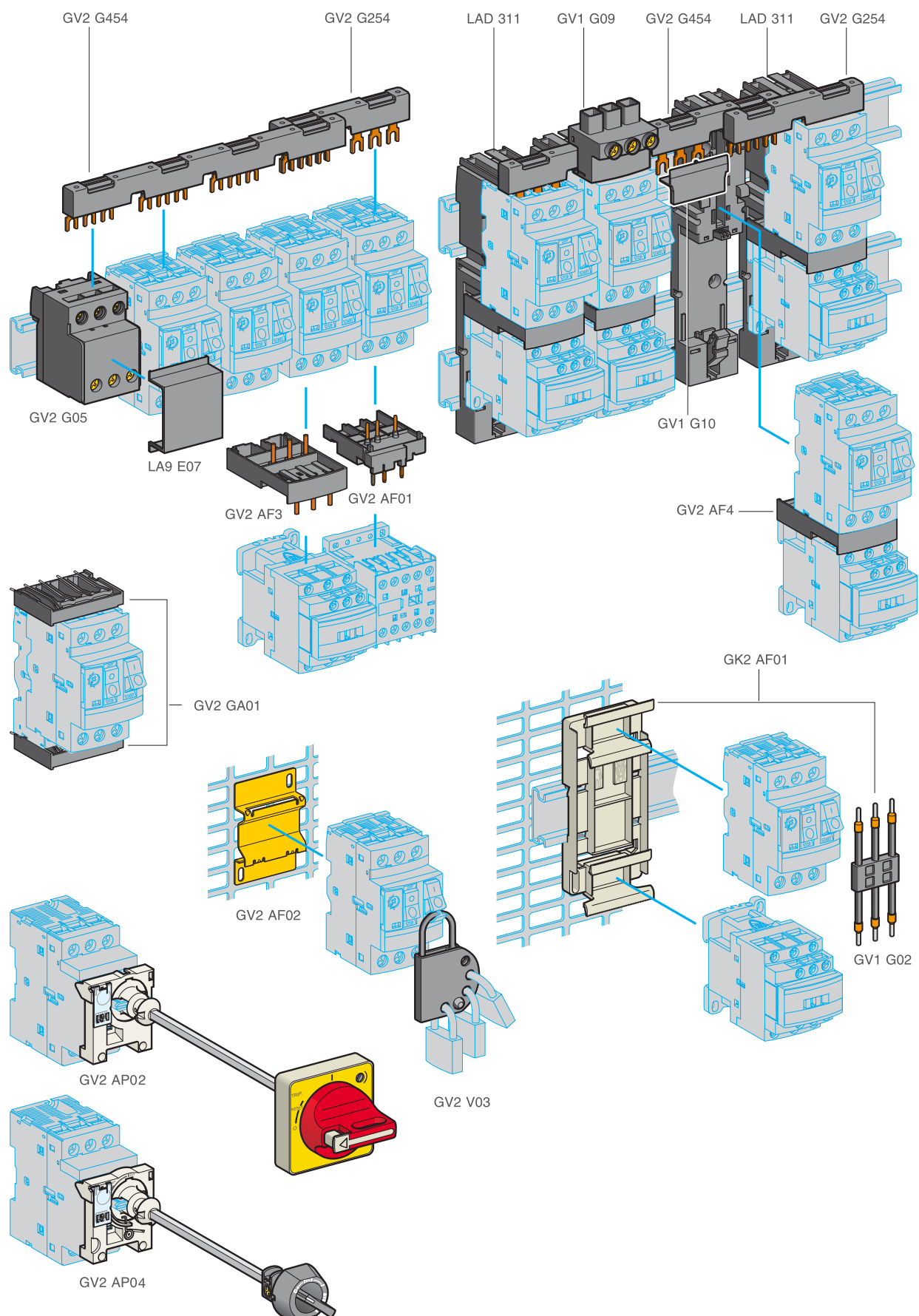
Undervoltage trip, INRS (can only be mounted on GV2 ME) Safety device for dangerous machines conforming to INRS and VDE 0113				
Side (1 block on RH side of circuit-breaker GV2 ME)	110...115 V	50 Hz	GV AX115	0.110
		60 Hz	GV AX116	0.110
	127 V	60 Hz	GV AX115	0.110
	220...240 V	50 Hz	GV AX225	0.110
		60 Hz	GV AX226	0.110
	380...400 V	50 Hz	GV AX385	0.110
		60 Hz	GV AX386	0.110
	415...440 V	50 Hz	GV AX415	0.110
	440 V	60 Hz	GV AX385	0.110

Add-on contact blocks				
Description	Mounting	Maximum number	Reference	Weight kg
Visible isolation block (5)	Front (1)	1	GV2 AK00	0.150
Limiters	At top (GV2 ME and GV2 P)	1	GV1 L3	0.130
	Independent	1	LA9 LB920	0.320

- (1) Mounting of a GV AE contact block or a GV2 AK00 visible isolation block on GV2 P and GV2 L.
 (2) Choice of N/C or N/O contact operation, depending on which way round the reversible block is mounted.
 (3) The GV AD is always mounted next to the circuit-breaker.
 (4) To order an undervoltage trip: replace the dot (●) in the reference with a U, example: GVAU025.
 To order a shunt trip: replace the dot (●) in the reference with an S, example: GVAS025.
 (5) Visible isolation of the 3 poles upstream of circuit-breaker GV2 P and GV2 L.
 Visible isolation block GV2 AK00 cannot be used with motor circuit-breakers GV2 P32 and GV2 L32 (Ith max = 25 A).



LA9 LB920

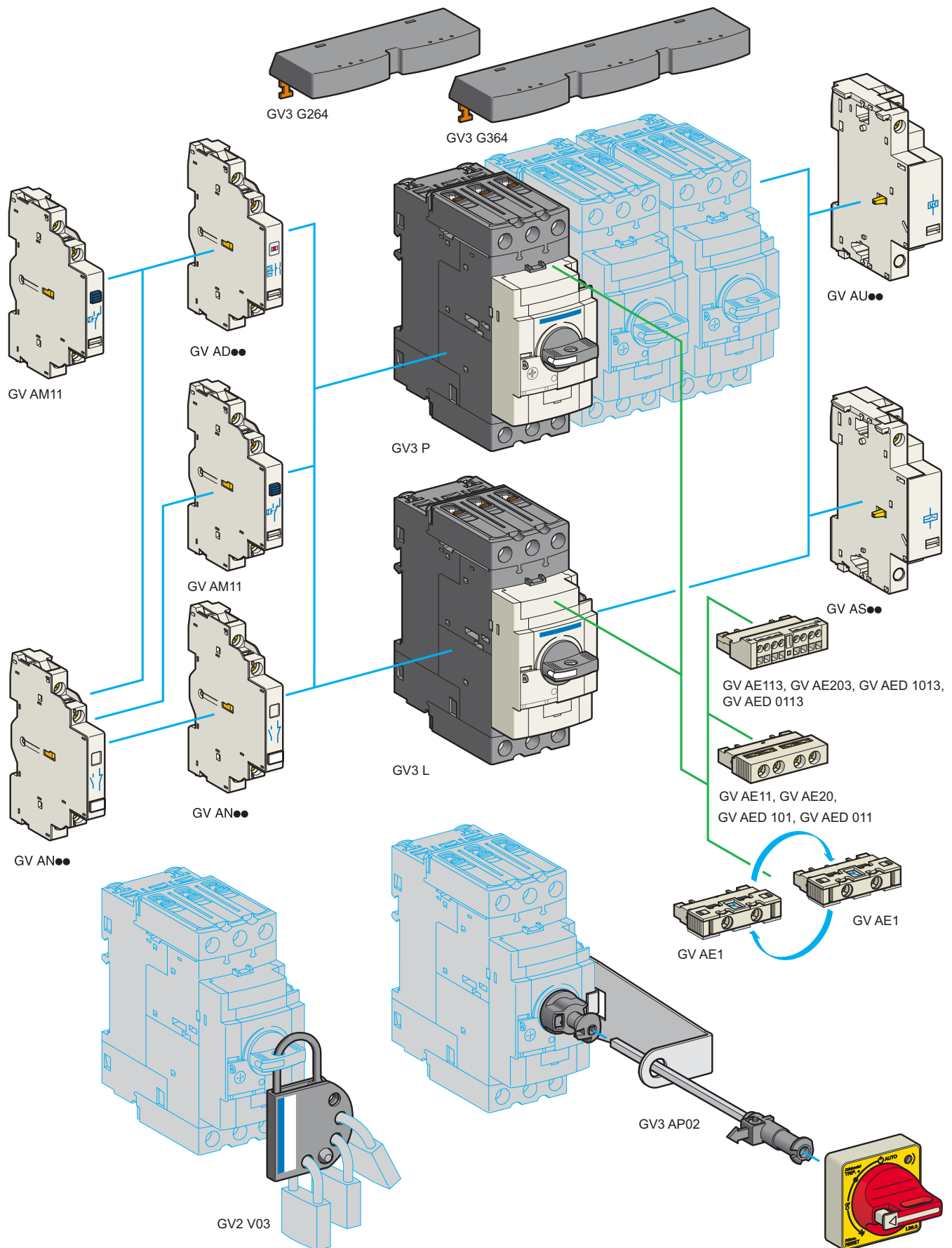


TeSys protection components

Thermal-magnetic and magnetic motor circuit-breakers GV2 with screw clamp connections

Accessories

Accessories				
Description	Application	Sold in lots of	Unit reference	Weight kg
Adapter plates	For mounting a GV2 ME or GV2 LE by screw fixing	10	GV2 AF02	0.021
	For mounting a GV2 ME or GV2 P and contactor LC1 D09...D38 with front faces aligned	1	LAD 311	0.040
Height compensation plate	7,5 mm	10	GV1 F03	0.003
Combination blocks	Between GV2 and contactor LC1 K or LP1 K	10	GV2 AF01	0.020
	Between GV2 and contactor LC1 D09...D38	10	GV2 AF3	0.016
	Between GV2 mounted on LAD 311 and contactor LC1 D09...D38	10	GV2 AF4	0.016
Motor starter adapter plate	With 3-pole connection for mounting a GV2 and a contactor LC1 D09...D25	1	GK2 AF01	0.120
Description	Application	Pitch mm	Reference	Weight kg
Sets of 3-pole 63 A busbars	2 tap-offs	45	GV2 G245	0.036
		54	GV2 G254	0.038
		72	GV2 G272	0.042
	3 tap-offs	45	GV2 G345	0.058
		54	GV2 G354	0.060
	4 tap-offs	45	GV2 G445	0.077
		54	GV2 G454	0.085
		72	GV2 G472	0.094
	5 tap-offs	54	GV2 G554	0.100
Description	Application	Sold in lots of	Unit reference	Weight kg
Protective end cover	For unused busbar outlets	5	GV1 G10	0.005
Terminal block for supply to one or more GV2 G busbar sets	Connection from the top	1	GV1 G09	0.040
	Can be fitted with current limiter GV1 L3 (GV2 ME and GV2 P)	1	GV2 G05	0.115
Cover for terminal block	For mounting in modular panels	10	LA9 E07	0.005
Flexible 3-pole connection for connecting a GV2 to a contactor LC1-D09...D25	Centre distance between mounting rails: 100...120 mm	10	GV1 G02	0.013
Set of connections upstream/downstream	For connecting GV2 ME to a printed circuit board	10	GV2 GA01	0.045
"Large Spacing" adapter UL 508 type E	For GV2 P●●H7 (except 32 A)	1	GV2 GH7	0.040
Clip-in marker holders (supplied with each circuit-breaker)	For GV2 P, GV2 L, GV2 LE and GV2 RT (8 x 22 mm)	100	LA9 D92	0.001
External operators				
Description			Reference	Weight kg
For GV2 P and GV2 L (150 to 290 mm)	Padlocking in "On" and "Off" position Black handle, blue front plate, IP 54		GV2 AP01	0.200
	Padlocking in "Off" position Red handle, yellow front plate, IP 54		GV2 AP02	0.200
	Cannot be padlocked in "On" and "Off" positions Does not lock the door or drawer operator in the "On" position. Colour: RAL 7016, IP 42		GV2 AP04	0.104
For GV2 LE	Padlocking in "On" and "Off" position Black handle, blue front plate, IP 54		GV2 AP03	0.280
Padlocking device				
Description			Reference	Weight kg
For all GV2 device	For use with up to 4 padlocks, Ø 6 mm shank max. (padlocks not included)		GV2 V03	0.092



TeSys protection components

Thermal-magnetic motor circuit-breakers

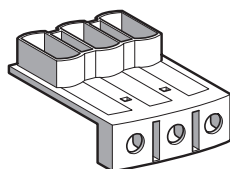
GV3 P and GV3 L

Add-on blocks and accessories

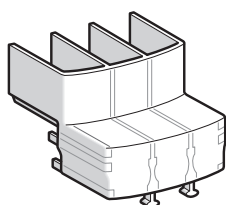
Contact blocks						
Description	Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference	Weight kg
Instantaneous auxiliary contacts	Front	1	N/O or N/C (1)	10	GV AE1	0.015
			N/O + N/C	10	GV AE11 (2)	0.020
			N/O + N/O	10	GV AE20 (2)	0.020
	Side (LH)	2	N/O + N/C	1	GV AN11 (2)	0.050
			N/O + N/O	1	GV AN20 (2)	0.050
Fault signalling contact + instantaneous auxiliary contact	Front	1	N/O (fault) + N/O	1	GV AED101 (2)	0.020
			N/O (fault) + N/C	1	GV AED011 (2)	0.020
	Side (3) (LH)	1	N/O (fault) + N/O	1	GV AD1010	0.055
			N/O (fault) + N/C	1	GV AD1001	0.055
			N/C (fault) + N/O	1	GV AD0110	0.055
Short-circuit signalling contact	Side (LH)	1	C/O common point	1	GV AM11	0.045

Electric trips - undervoltage or shunt (4)

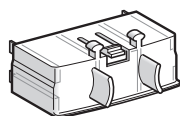
Mounting	Voltage		Reference	Weight kg
Side (1 block on RH side of circuit-breaker)	24 V	50 Hz	GV A●025	0.105
		60 Hz	GV A●026	0.105
	48 V	50 Hz	GV A●055	0.105
		60 Hz	GV A●056	0.105
	100	50 Hz	GV A●107	0.105
	100...110 V	60 Hz	GV A●107	0.105
	110...115 V	50 Hz	GV A●115	0.105
		60 Hz	GV A●116	0.105
	120...127 V	50 Hz	GV A●125	0.105
	127 V	60 Hz	GV A●115	0.105
	200 V	50 Hz	GV A●207	0.105
	200...220 V	60 Hz	GV A●207	0.105
	220...240 V	50 Hz	GV A●225	0.105
		60 Hz	GV A●226	0.105
	380...400 V	50 Hz	GV A●385	0.105
		60 Hz	GV A●386	0.105
	415...440 V	50 Hz	GV A●415	0.105
	415 V	60 Hz	GV A●416	0.105
	440 V	60 Hz	GV A●385	0.105
	480 V	60 Hz	GV A●415	0.105
	500 V	50 Hz	GV A●505	0.105
	600 V	60 Hz	GV A●505	0.105



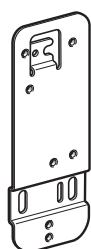
GV3 G66



LAD 96570



LAD 96575



LAD 7X3

Padlockable external operators for GV3 P and GV3 L

Description	Reference	Weight kg
External operators comprising: an LU9 AP1● handle, a shaft (max. length: 260 mm), a bracket and an adaptor.	Padlocking in "On" and "Off" position Black handle, blue front plate, IP 54	GV3 AP01 0.294
	Padlocking in "Off" position Red handle, yellow front plate, IP 54	GV3 AP02 0.294
Handles only	Black handle, blue front plate, IP 54	LU9 AP11 0.105
	Red handle, yellow front plate, IP 54	LU9 AP12 0.105

Accessories

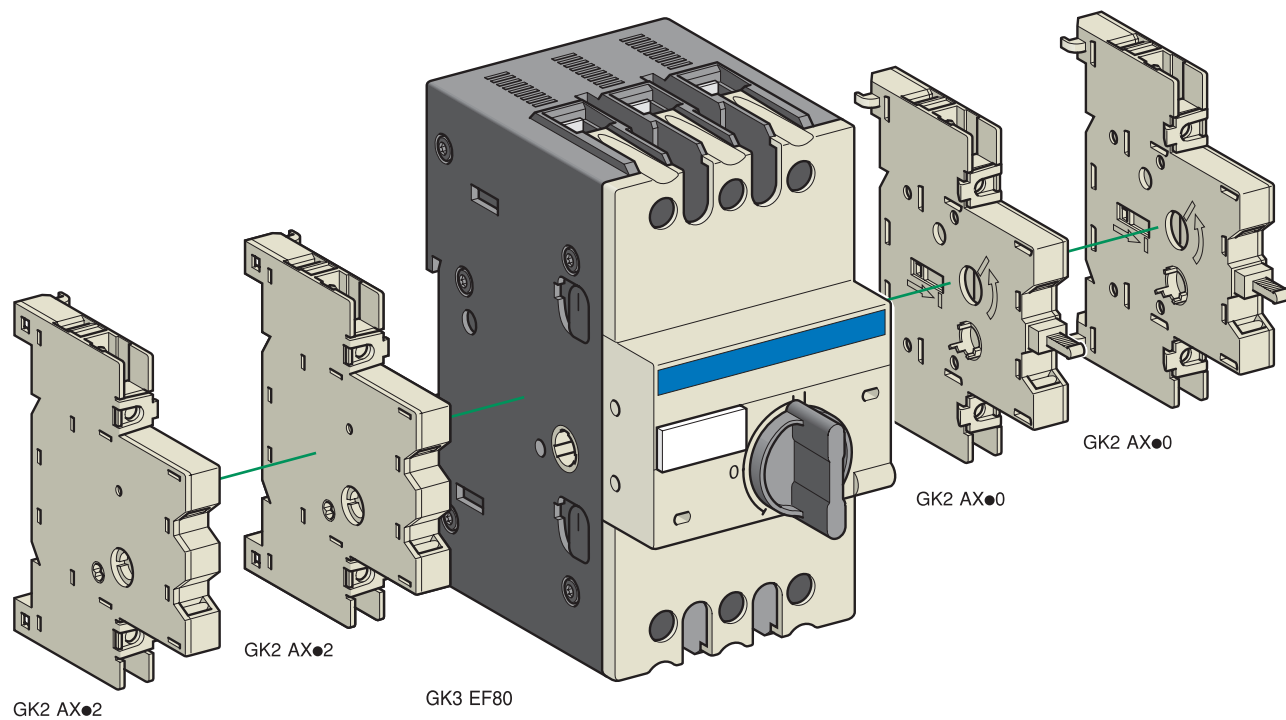
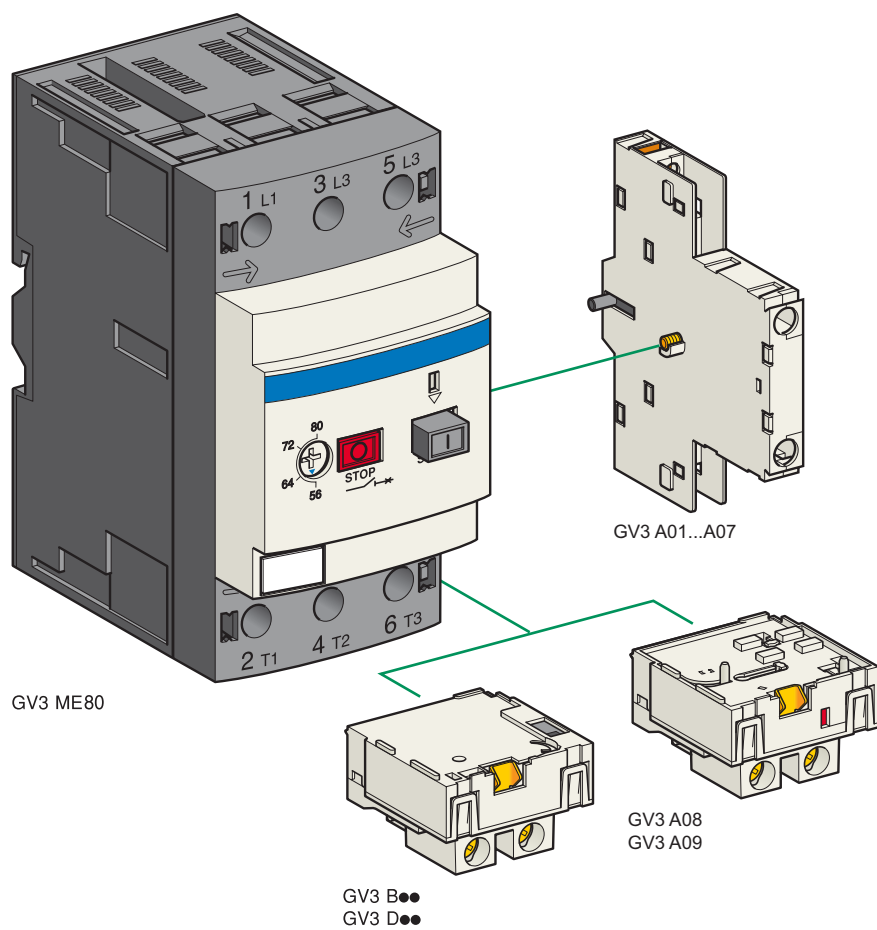
Description	For circuit-breakers	Reference	Weight kg
Sets of 3-pole 115 A busbars Pitch: 64 mm	2 tap-off	GV3 P●● and GV3 L●●	GV3 G264 0.150
	3 tap-off	GV3 P●● and GV3 L●●	GV3 G364 0.250
Cover "Large Spacing" UL 508 type E (Only one cover required on supply side)		GV3 P●●	GV3 G66 0.020
IP 20 cover (Two covers required per breaker)		GV3 P●●6 and GV3 L●●6	LAD 96570 0.021
IP 20 cover for use when mounted with circuit-breakers		GV3 P●●6 and GV3 L●●6	LAD 96575 0.010
Padlocking device for use with up to 4 padlocks (not supplied) Ø 6 mm shank max.		GV3 P●● and GV3 L●● GV3 P●●6 and GV3 L●●6	GV2 V03 0.092
Retrofit plate for screw fixing	Replacement of GV3 ME with GV3 P●● or GV2 P●●		LAD 7X3 0.150

(1) Choice of N/C or N/O contact operation, depending on which way round the reversible block is mounted.

(2) Contact blocks available in version with spring terminal connections. Add a figure 3 at the end of the references selected above.
Example: GV AED101 becomes GV AED1013.

(3) The GV AD●● is always mounted next to the circuit-breaker.

(4) To order an undervoltage trip: replace the dot (●) in the reference with a U, example: GV AU025.
To order a shunt trip: replace the dot (●) in the reference with an S, example: GV AS025.



TeSys protection components

Motor circuit-breakers GV3 ME80 and

GK3 EF80

Add-on blocks and accessories

For thermal-magnetic motor circuit-breakers GV3 ME80

Contact blocks

Description	Type of standard early break contacts	Reference	Weight kg
Instantaneous auxiliary contact blocks (1 per circuit-breaker)	N/C + N/O	GV3 A01	0,060
	N/O + N/O	GV3 A02	0.060
	N/C + N/O + N/O	GV3 A03	0.070
	N/O + N/O + N/O	GV3 A05	0.070
	N/O + N/O + 2 volt-free terminals	GV3 A06	0.070
	N/C + N/O + 2 volt-free terminals	GV3 A07	0.070
Fault signalling contacts (1)	N/C	GV3 A08	0.030
	N/O	GV3 A09	0.030

Electric trips

Description	Voltages		Reference	Weight kg
	50 Hz	60 Hz		
Undervoltage trips (1)	110, 120, 127 V	120, 127 V	GV3 B11	0.070
	220, 240 V	277 V	GV3 B22	0.070
	380, 415 V	440 V, 480 V	GV3 B38	0.070
Shunt trips (1)	110, 120, 127 V	120, 127 V	GV3 D11	0.070
	220, 240 V	277 V	GV3 D22	0.070
	380, 415 V	440 V, 480 V	GV3 D38	0.070

Accessory

Description	Sold in lots of	Unit reference	Weight kg
Padlocking device, for locking the Start button (on open-mounted product)	5	GV1 V02	0.010

For magnetic circuit-breaker GK3 EF80

Contact blocks

Description	Number of poles	Reference	Weight kg
Auxiliary contact blocks for On-Off signalling and "control circuit test" function (1 or 2 blocks per device) mounted on RH side of GK3 EF80	N/O	GK2 AX10	0.025
	N/O + N/O	GK2 AX20	0.031
	N/C + N/O	GK2 AX50	0.031
Instantaneous fault signalling contact blocks (1 or 2 blocks per device) mounted on LH side of GK3 EF80	N/O	GK2 AX12	0.025
	N/O + N/O	GK2 AX22	0.031
	N/C + N/O	GK2 AX52	0.031

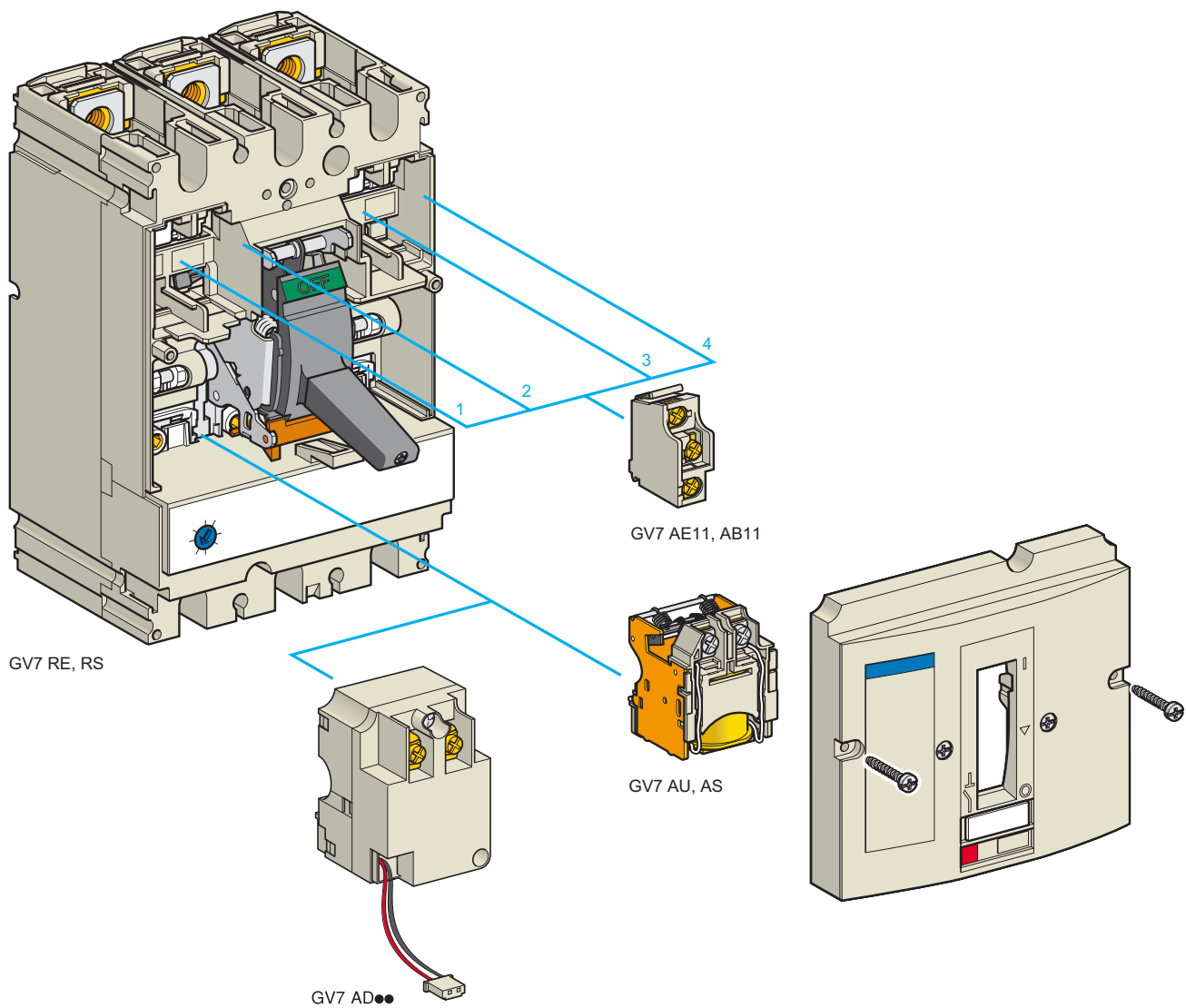
Accessories

Description	Reference	Weight kg
Padlocking device for padlocking the operator, using up to 3 padlocks (padlocks to be ordered separately)	GK3 AV01	0.020
External operator for mounting on enclosure door. Red Ø 40 knob on yellow plate, padlockable in position O (with up to 3 padlocks). Door locked when knob in position I, and when knob padlocked in position O.	GK3 AP03	0.300

(1) 1 voltage trip OR 1 fault signalling contact to be fitted inside the motor circuit-breaker.

Other versions

24 to 690 V, 50 or 60 Hz voltage trips for circuit-breakers **GV3 ME80**.
Please consult your Regional Sales Office.



TeSys protection components

Thermal-magnetic motor circuit-breakers

GV7 R with screw clamp connections

Add-on blocks and accessories

Add-on auxiliary contacts

These allow remote indication of the circuit-breaker contact states. They can be used for signalling, electrical locking, relaying, etc. They are available in two versions: standard and low level. They include a terminal block and the auxiliary circuits leave the circuit-breaker through a hole provided for this purpose.

They perform the following functions, depending on where they are located in the circuit-breaker:

Location	Function	Application
1 and/or 4	C/O contact	Indicates the position of the circuit-breaker poles
2	Trip indication	Indicates that the circuit-breaker has tripped due to an overload, a short-circuit, a differential fault or the operation of a voltage trip (undervoltage or shunt trip), or of the "push to trip" test button. It resets when the circuit-breaker is reset.
3	Electrical fault indication	Indicates that the circuit-breaker has tripped due to an overload, a short-circuit or a differential fault. It resets when the circuit-breaker is reset.

Type	Reference	Weight kg
Standard	GV7 AE11	0.015
Low level	GV7 AB11	0.015

Fault discrimination devices

These make it possible to:

- either differentiate a thermal fault from a magnetic fault,
- or open the contactor only in the event of a thermal fault.

Voltage	Reference	Weight kg
~ 24...48 and ~ 24...72 V	GV7 AD111 (1)	0.100
~ 110...240 V	GV7 AD112 (1)	0.100

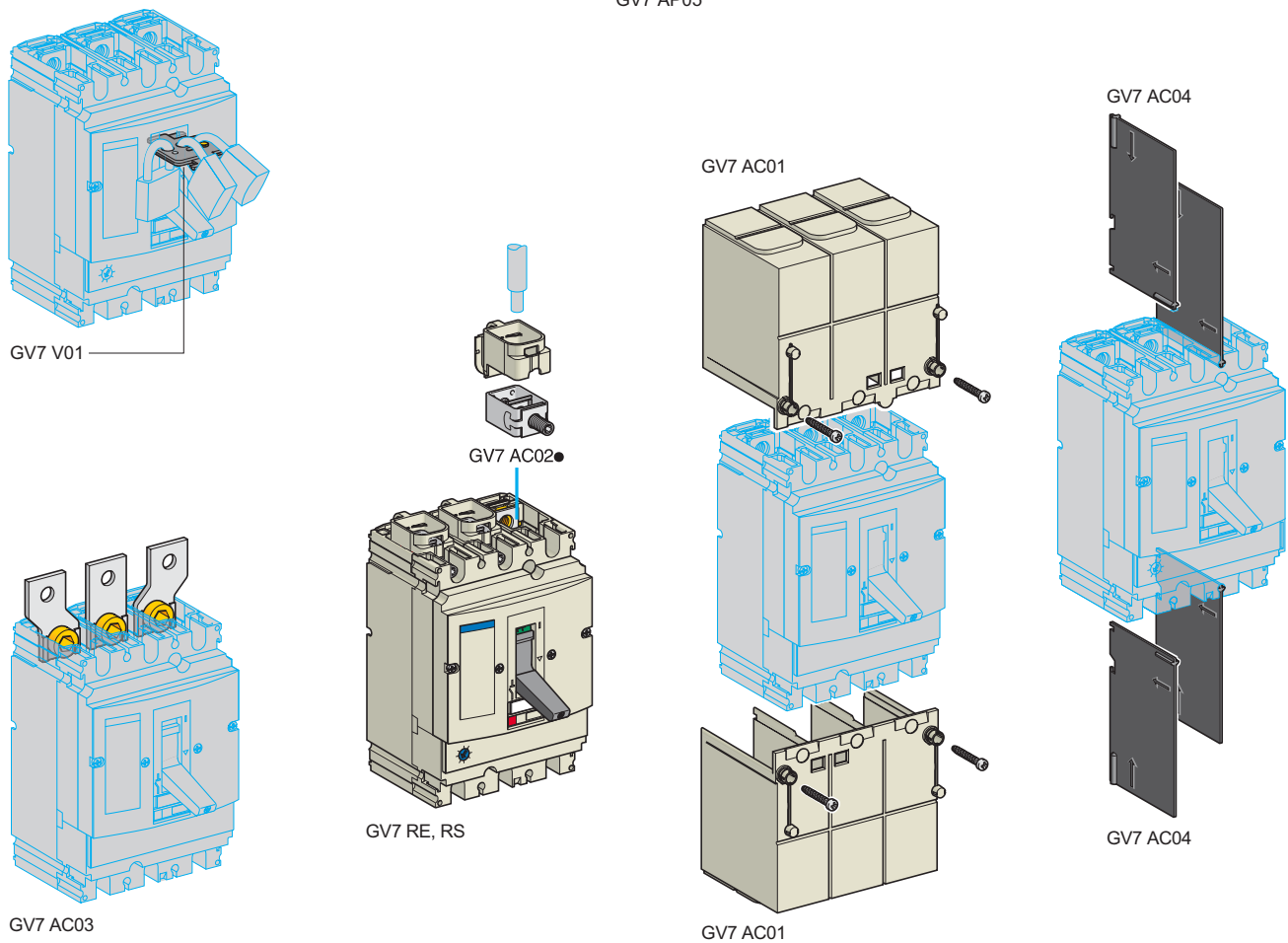
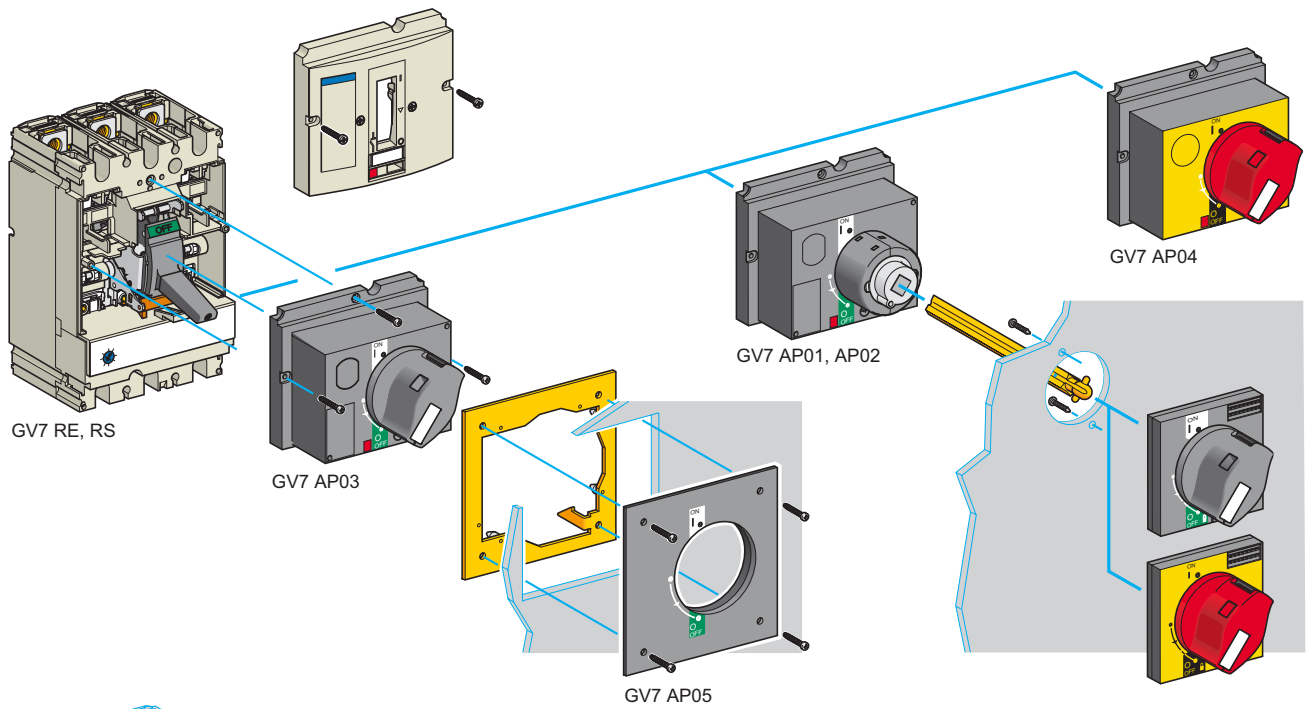
Electric trips

These allow the circuit-breaker to be tripped via an electrical control signal.

- Undervoltage trip GV7 AU
 - Trips the circuit-breaker when the control voltage drops below the tripping threshold, which is between 0.35 and 0.7 times the rated voltage.
 - Circuit-breaker closing is only possible if the voltage exceeds 0.85 times the rated voltage.
 Circuit-breaker tripping by a GV7 AU trip meets the requirements of IEC 60947-2.
- Shunt trip GV7 AS
 - Trips the circuit-breaker when the control voltage rises above 0.7 times the rated voltage.
- Operation (GV7 AU or GV7 AS)
 - When the circuit-breaker has been tripped by a GV7 AU or AS, it must be reset either locally or by remote control. (For remote control, please consult your Regional Sales Office).
 - Tripping has priority over manual closing: if a tripping instruction is present, manual action does not result in closing, even temporarily, of the contacts.
 - Durability: 50 % of the mechanical durability of the circuit-breaker.

Type	Voltage	Reference	Weight kg
Undervoltage trip	48 V, 50/60 Hz	GV7 AU055 (1)	0.105
	110...130 V, 50/60 Hz	GV7 AU107 (1)	0.110
	200...240 V, 50/60 Hz	GV7 AU207 (1)	0.110
	380...440 V, 50/60 Hz	GV7 AU387 (1)	0.105
	525 V, 50 Hz	GV7 AU525 (1)	0.100
Shunt trip	48 V, 50/60 Hz	GV7 AS055 (1)	0.105
	110...130 V, 50/60 Hz	GV7 AS107 (1)	0.110
	200...240 V, 50/60 Hz	GV7 AS207 (1)	0.110
	380...440 V, 50/60 Hz	GV7 AS387 (1)	0.105
	525 V, 50 Hz	GV7 AS525 (1)	0.100

(1) For mounting of a GV7 AD or a GV7 AU or AS.

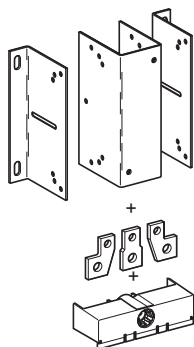


TeSys protection components

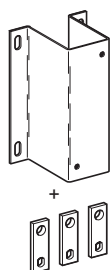
Thermal-magnetic motor circuit-breakers

GV7 R with screw clamp connections

Accessories



GV7 AC07



GV7 AC08

Cabling accessories

Description	Application	For use on contactors	Sold in lots of	Unit reference	Weight kg
Clip-on connectors for GV7 R	Up to 150 A, 1.5...95 mm ²	–	3	GV7 AC021	0.300
	Up to 220 A, 1.5...185 mm ²	–	3	GV7 AC022	0.350
Spreader 3-pole (1)	To increase the pitch to 45 mm	–	1	GV7 AC03	0.180
Terminal shields IP 405 (1)	Supplied with sealing accessory	–	1	GV7 AC01	0.125
Phase barriers	Safety accessories used when fitting of shields is impossible	–	2	GV7 AC04	0.075
Insulating screens	Ensure insulation between the connections and the backplate	–	2	GV7 AC05	0.075
Kits for combination with contactor(2)	Allowing link between the circuit-breaker and the contactor. The cover provides protection against direct finger contact	LC1 F115...F185	1	GV7 AC06	0.550
		LC1 F225 and F265	1	GV7 AC07	0.550
		LC1 D115 and D150	1	GV7 AC08	0.550

Direct rotary handle

Replaces the circuit-breaker front cover; secured by screws. It includes a device for locking the circuit-breaker in the O (Off) position by means of up to 3 padlocks with a shank diameter of 5 to 8 mm (padlocks not included). A conversion accessory allows the direct rotary handle to be mounted on the enclosure door. In this case, the door cannot be opened if the circuit-breaker is in the "ON" position. Circuit-breaker closing is inhibited if the enclosure door is open.

Description	Type	Degree of protection	Reference	Weight kg
Direct rotary handle	Black handle, black legend plate	IP 40	GV7 AP03	0.205
	Red handle, yellow legend plate	IP 40	GV7 AP04	0.205
Adapter plate (3)	Four mounting direct rotary handle on enclosure door	IP 43	GV7 AP05	0.100

Extended rotary handle

Allows a circuit-breaker installed in the back of an enclosure to be operated from the front of the enclosure. It comprises:

- a unit which screws onto the front cover of the circuit-breaker,
- an assembly (handle and front plate) to be fitted on the enclosure door,
- an extension shaft which must be adjusted (distance between the mounting surface and the door: 185 mm minimum, 600 mm maximum). It includes a device for locking the circuit-breaker in the O (Off) position by means of up to 3 padlocks with a shank diameter of 5 to 8 mm (padlocks not included). This prevents the enclosure door from being opened.

Description	Type	Degree of protection	Reference	Weight kg
Extended rotary handle	Black handle, black legend plate	IP 55	GV7 AP01	0.775
	Red handle, yellow legend plate	IP 55	GV7 AP02	0.775

Locking device

Allows circuit-breakers not fitted with a rotary handle to be locked in the O (Off) position by means of up to 3 padlocks with a shank diameter of 5 to 8 mm (padlocks not included).

Description	Application	Reference	Weight kg
Locking device	For circuit-breaker not fitted with a rotary handle	GV7 V01	0.100

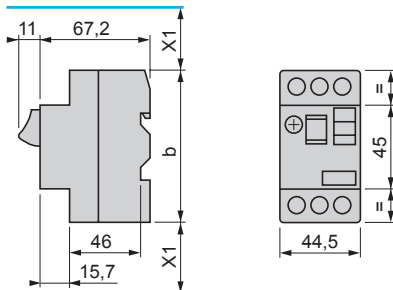
(1) Terminal shields cannot be used together with spreaders.

(2) The kit comprises links, a protective shield and a depth adjustable metal bracket for the breaker.

(3) This conversion accessory makes it impossible to open the door if the device is closed and prevents the device from being closed if the door is open.

Dimensions

GV2 ME



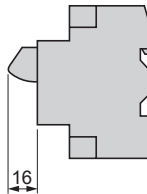
b

GV2 ME●●	89
GV2 ME●●3	101

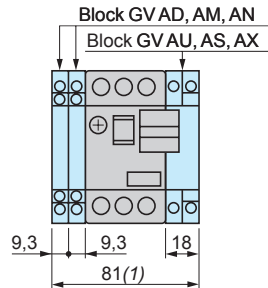
(1) Maximum

X1 Electrical clearance = 40 mm for $U_e \leq 690$ V

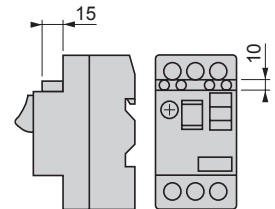
GV AX



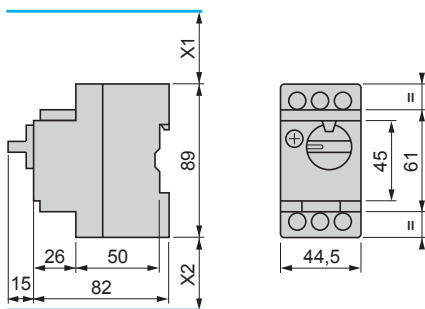
GV AD, AM, AN, AU, AS, AX



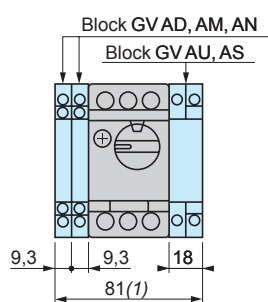
GV AE



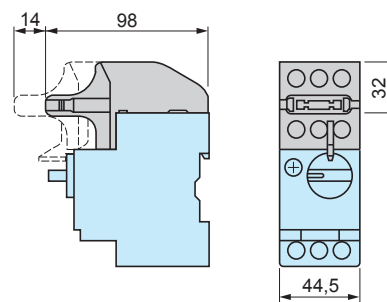
GV2 P



GV AD, AM, AN, AU, AS



GV2 AK00

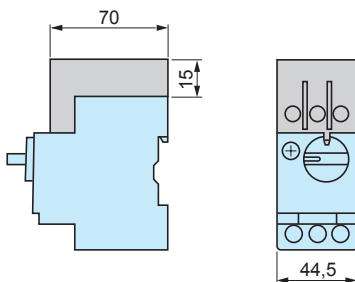


(1) Maximum

X1 Electrical clearance = 40 mm for $U_e \leq 415$ V, or 80 mm for $U_e = 440$ V, or 120 mm for $U_e = 500$ and 690 V

X2 = 40 mm

GV2 GH7



Mounting

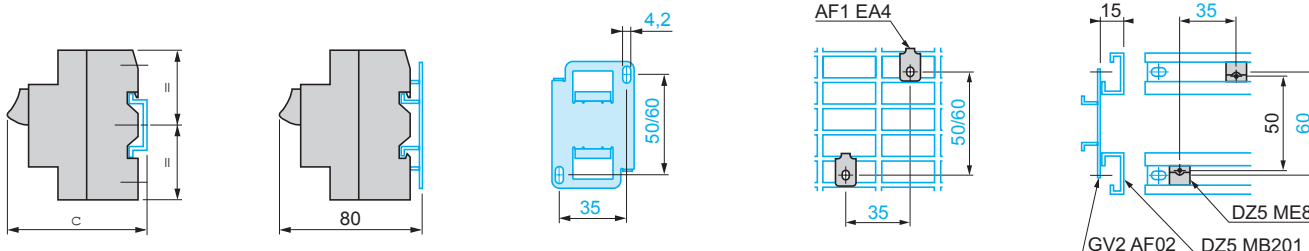
GV2 ME

On 35 mm rail

On panel with adapter plate GV2 AF02

On pre-slotted plate
AM1 PA

On rails DZ5 MB201



$c = 78.5$ on AM1 DP200 (35 x 7.5)
 $c = 86$ on AM1 DE200, ED200 (35 x 15)

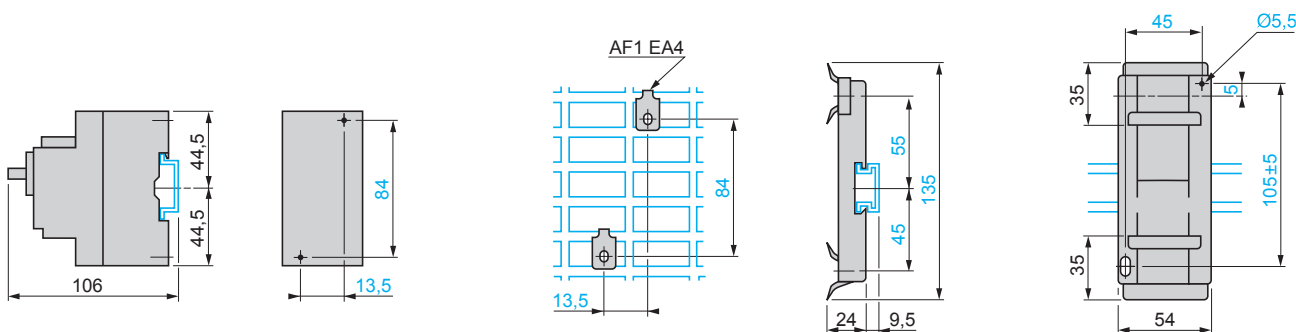
GV2 P

On rail AM1 DE200, ED200
(35 x 15)

Panel mounted

On pre-slotted plate
AM1 PA

Adapter plate GK2 AF01



Dimensions

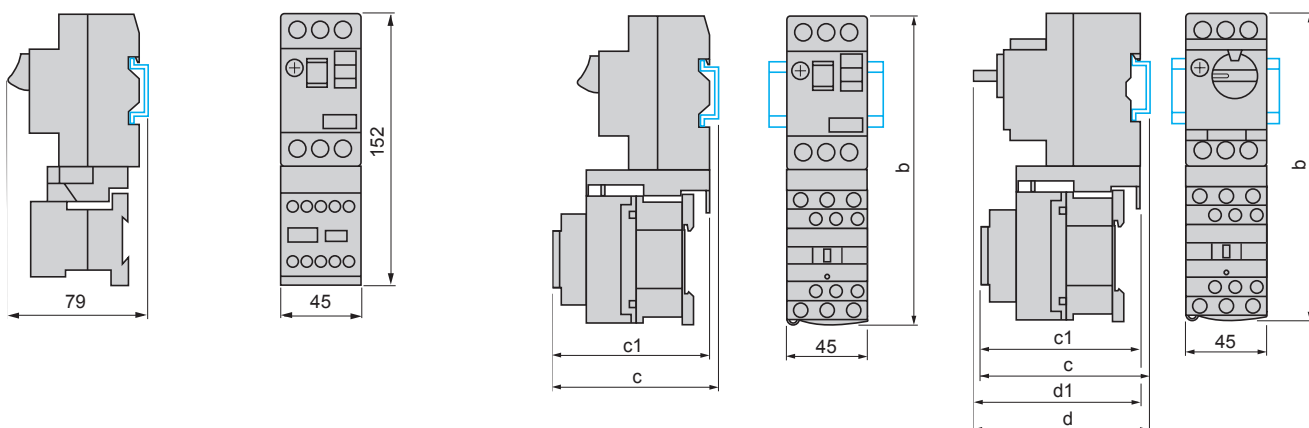
GV2 AF01

Combination GV2 ME + TeSys k contactor

GV2 AF3

Combination GV2 ME + TeSys d contactor

Combination GV2 P + TeSys d contactor



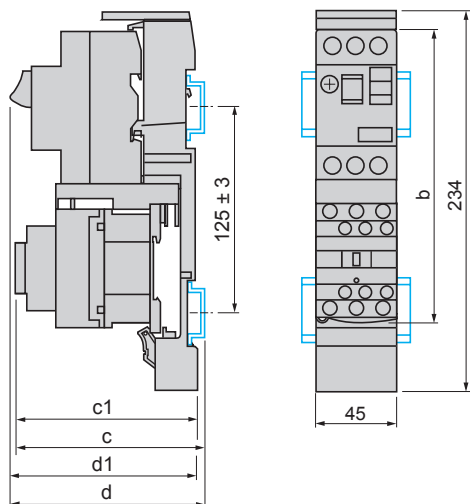
GV2 ME +	LC1 D09 ...D18	LC1 D25 and D32
b	176.4	186.8
c1	94.1	100.4
c	99.6	105.9

GV2 P +	LC1 D09 ...D18	LC1 D25 and D32
b	176.4	186.8
c1	100.1	106.4
c	105.6	111.9
d1	95	95
d	100.5	100.5

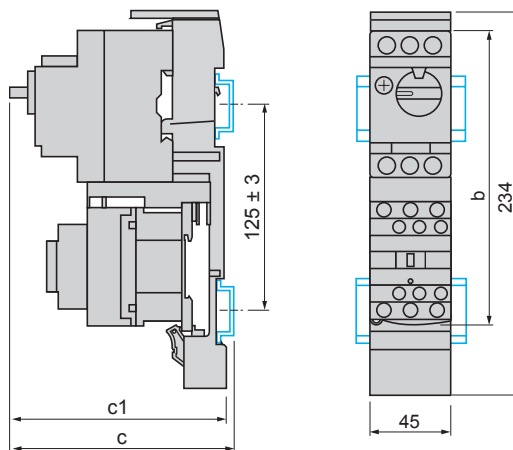
Dimensions (continued)

GV2 AF4 + LAD 311

Combination GV2 ME + TeSys d contactor



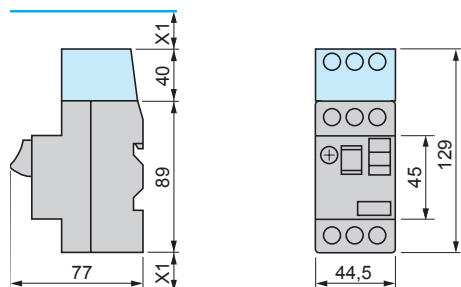
Combination GV2 P + TeSys d contactor



GV2 ME +	LC1 D09...D18	LC1 D25 and D32
b	176.4	186.8
c1	103.1	136.4
c	135.6	141.9
d1	107	107
d	112.5	112.5

GV2 P +	LC1 D09...D18	LC1 D25 and D32
b	176.4	186.8
c1	136.5	142.4
c	141.6	147.9

GV2 ME + GV1 L3 (current limiter)



X1 = 10 mm for Ue = 230 V
or 30 mm for 230 V < Ue ≤ 690 V

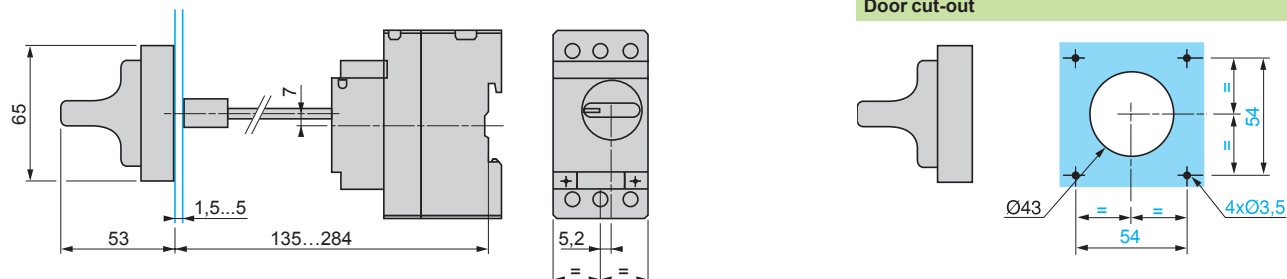
7.5 mm height compensation plate GV1 F03



Mounting

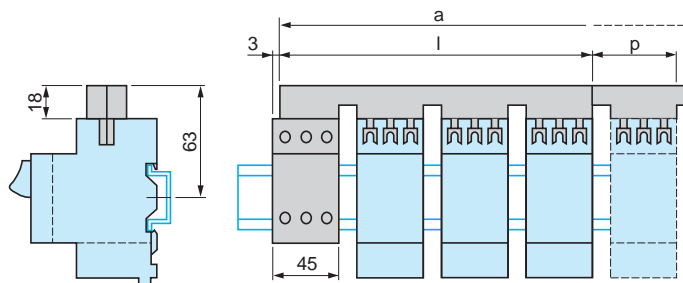
Mounting of external operator GV2 AP01 or GV2 AP02 for motor circuit-breakers GV2 P

Door cut-out



GV2 ME, GV2 P

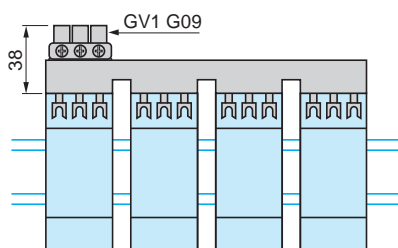
Sets of busbars GV2 G445, GV2 G454, GV2 G472, with terminal block GV2 G05



	l	p
GV2 G445 (4 x 45 mm)	179	45
GV2 G454 (4 x 54 mm)	206	54
GV2 G472 (4 x 72 mm)	260	72

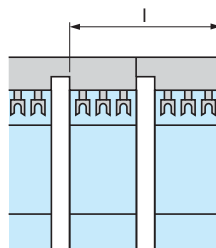
	a			
Number of tap-offs	5	6	7	8
GV2 G445	224	269	314	359
GV2 G454	260	314	368	422
GV2 G472	332	404	476	548

Sets of busbars GV2 G●●● with terminal block GV1 G09

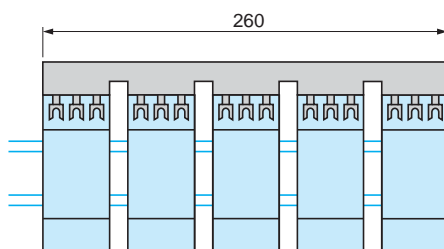


	l
GV2 G245 (2 x 45 mm)	89
GV2 G254 (2 x 54 mm)	98
GV2 G272 (2 x 72 mm)	116

Sets of busbars GV2 G245, GV2 G254, GV2 G272

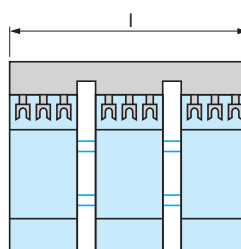


Sets of busbars GV2 G554



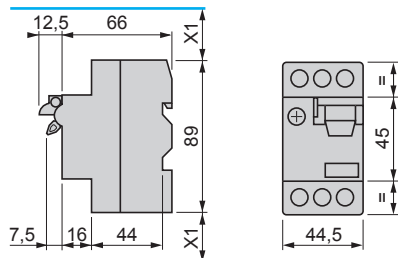
	l
GV2 G345 (3 x 45 mm)	134
GV2 G354 (3 x 54 mm)	152

Sets of busbars GV2 G345 and GV2 G354



GV2 RT

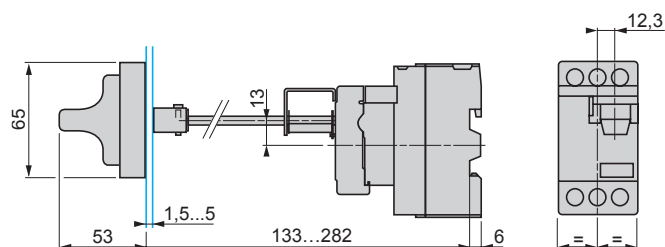
Dimensions



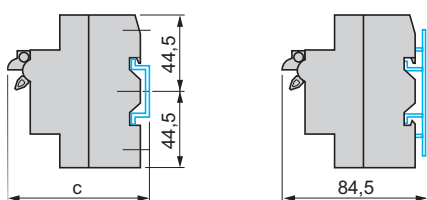
X1: Electrical clearance = 40 mm for $U_e < 690\text{ V}$

Mounting

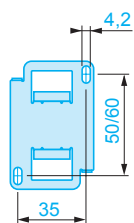
Mounting of external operator GV2 AP03



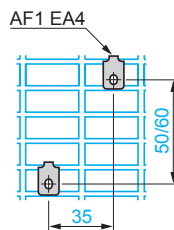
On 35 mm rail



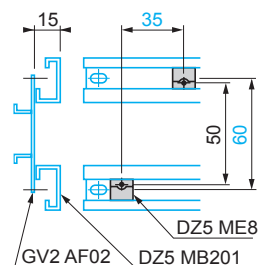
On panel with adapter plate GV2 AF02



On pre-slotted plate AM1 PA



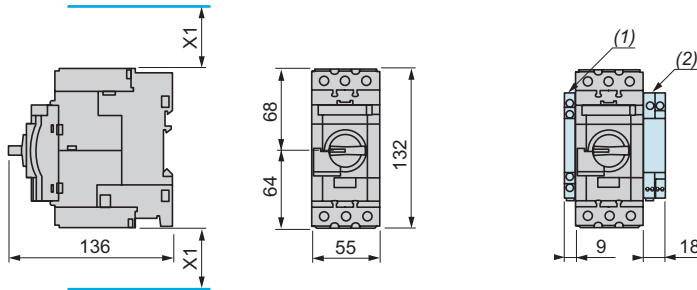
On rails DZ5 MB



$c = 80$ on AM1 DP200 (35 x 7.5)
 $c = 88$ on AM1 DE200, ED200 (35 x 15)

GV3 P

Dimensions



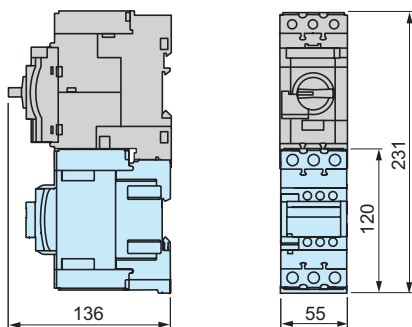
X1 = Electrical clearance (ISC max)
40 mm for $U_e \leq 500$ V, 50 mm for $U_e \leq 690$ V

(1) Blocks GV AN●●, GV AD●● and GV AM11
(2) Blocks GV3 AU●● and GV3 AS●●

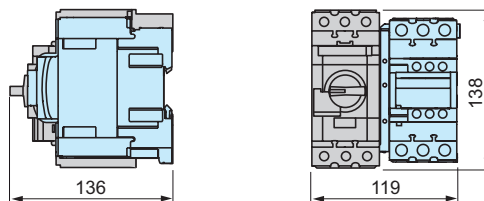
Note: Leave a gap of 9 mm between 2 circuit-breakers: either an empty space or side-mounting add-on contact blocks.
Horizontal mounting is possible up to 40 °C

Mounting

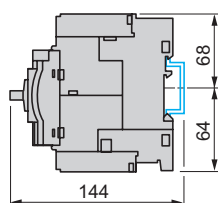
Mounting with TeSys contactor LC1 D40A...D65A



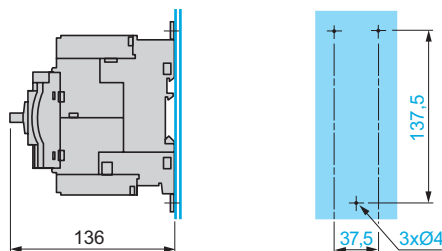
Side by side mounting with TeSys contactor LC1 D40A...D65A (S-shape busbar system GV3 S)



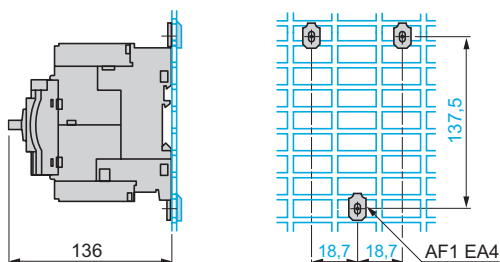
Mounting on rail AM1 DE200 or AM1 ED201



Panel mounting, using M4 screws



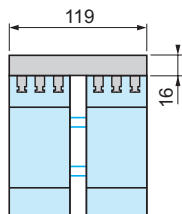
Mounting on pre-slotted plate AM1 PA



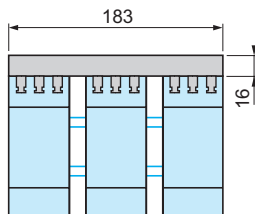
GV3 P (continued)

Busbar systems

Set of busbars GV3 G264



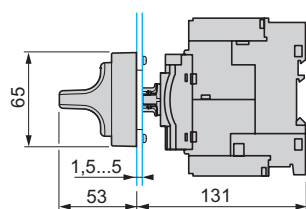
Set of busbars GV3 G364



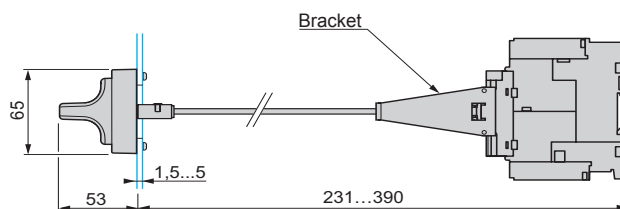
Note: Leave a space of 9 mm between 2 circuit-breakers: either an empty space or side-mounting add-on contact blocks.
Horizontal mounting is possible up to 40 °C.

Mounting of external operator GV3 AP01 or GV3 AP02

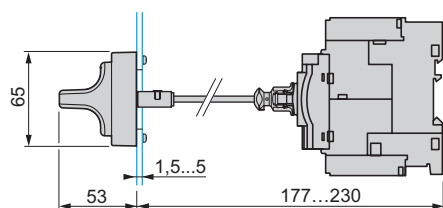
Depth 131 mm



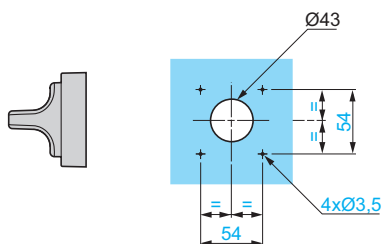
Depth 231 to 390 mm



Depth 177 to 230 mm

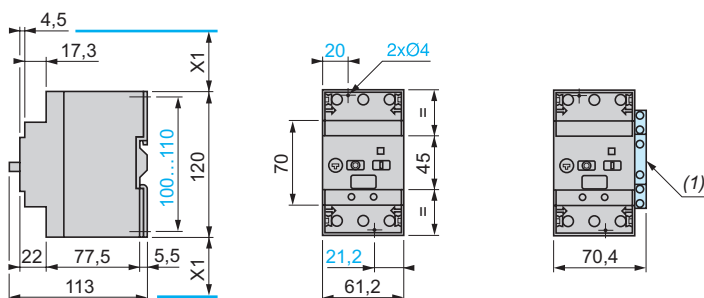


Door cut-out



GV3 ME80

Dimensions

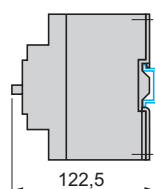


X1 = Electrical clearance (ISC max)
40 mm for $U_e \leq 500$ V, 50 mm for $U_e \leq 690$ V

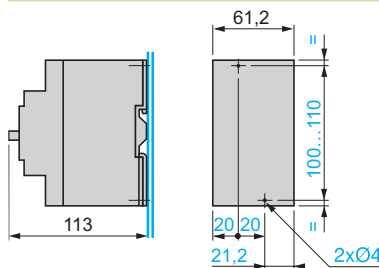
(1) Blocks GV3 A01...A07.

Mounting

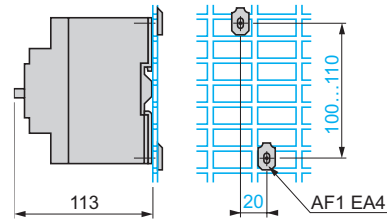
Mounting on rail AM1 DE200 or AM1 ED201



Panel mounting, using M4 screws

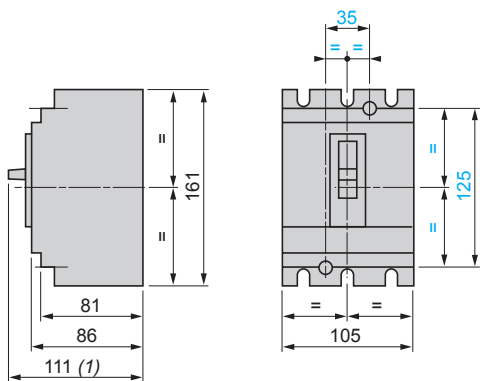


Mounting on pre-slotted plate AM1 PA



GV7 R

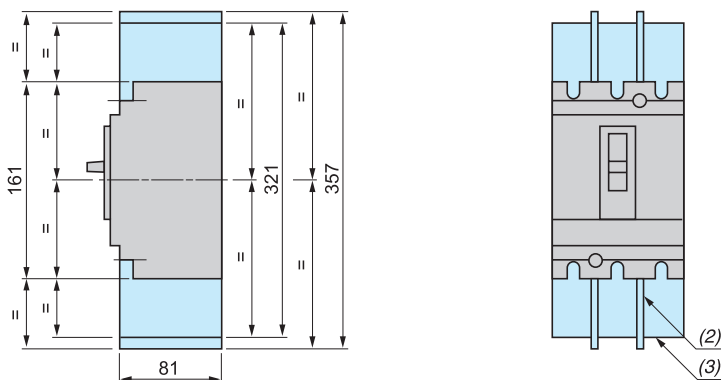
Dimensions



(1) 126 for **GV7 R●220**.

Motor circuit-breakers with terminal shields or phase barriers

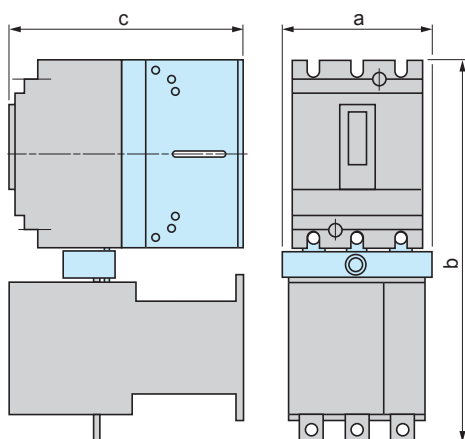
GV7 R + GV7 AC01 or AC04



(2) Phase barriers: **GV7 AC04**

(3) Terminal shields: **GV7 AC01**

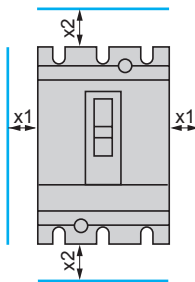
Combination of GV7 R and TeSys contactor LC1 F with kit GV7 AC0●



	a	b	c
GV7 R + LC1 F115 or F150 + GV7 AC06	119	334	181
GV7 R + LC1 F185 + GV7 AC06	119	338	188
GV7 R + LC1 F225 + GV7 AC07	131	358	188
GV7 R + LC1 F265 + GV7 AC07	131	364	215

Minimum distance between 2 circuit-breakers mounted side by side = 0

Minimum electrical clearance

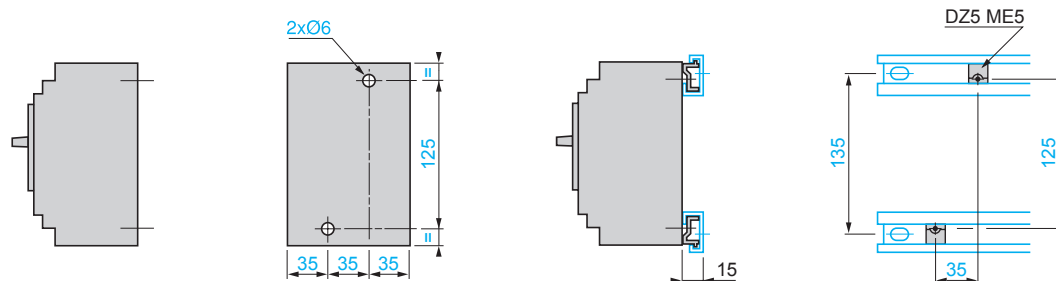


	x1	x2
Painted or insulated metal plate, insulation or insulated bar	0	30
Bare metal plate		
U ≤ 440 V	5	35
440 V < U < 600 V	10	35
U ≥ 600 V	20	35

GV7 R

Panel mounting

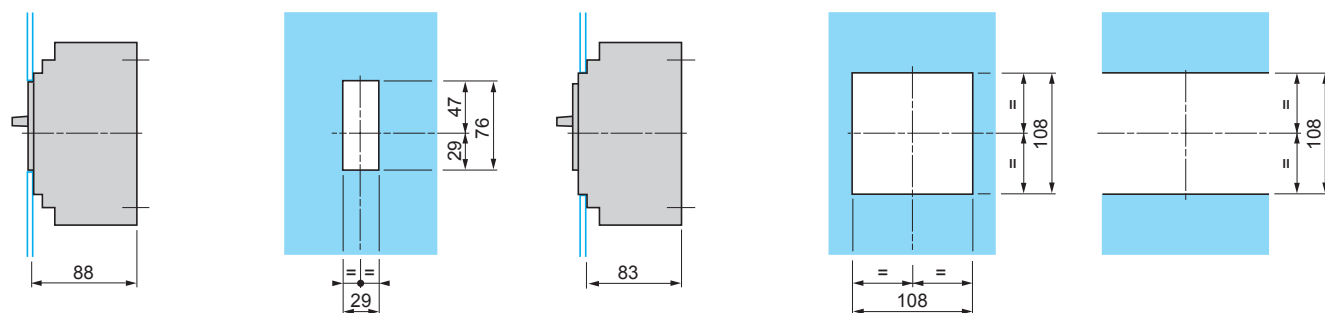
Mounting on 2 mounting rails DZ5 MB201



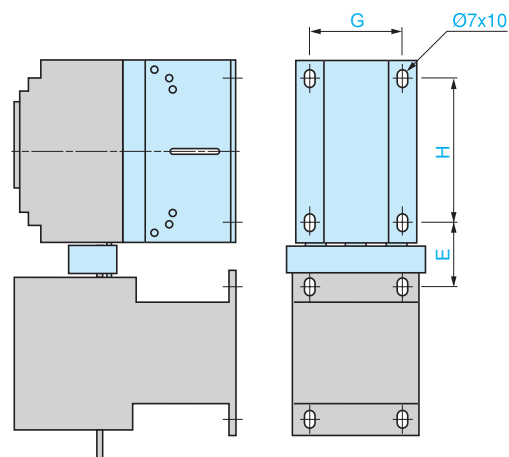
Flush-mounting

1 circuit-breaker GV7 R

n circuit-breakers GV7 R side by side



Combination of GV7 R and TeSys contactor LC1 F with kit GV7 AC0●



	E	G	H
GV7 R + LC1 F115 + GV7 AC06	44	85	120
GV7 R + LC1 F150 + GV7 AC06	46	85	120
GV7 R + LC1 F185 + GV7 AC06	48	85	120
GV7 R + LC1 F225 + GV7 AC07	57	85	120
GV7 R + LC1 F265 + GV7 AC07	60	85	120

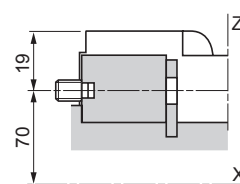
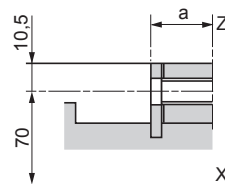
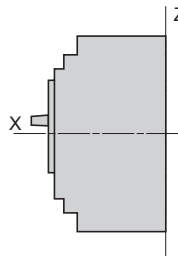
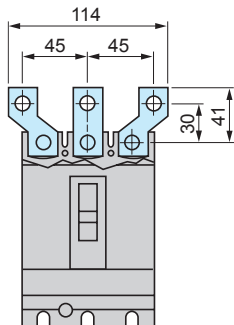
GV7 R

Spreaders GV7 AC03

Connection

Smooth terminals

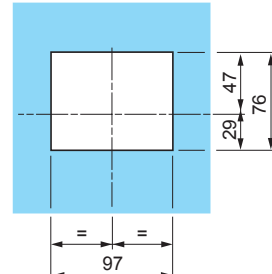
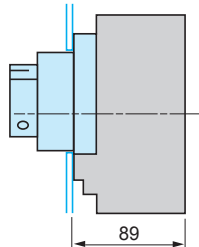
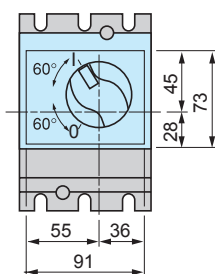
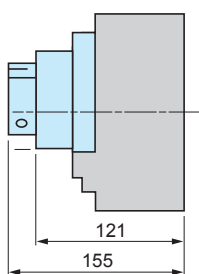
Connectors



	a
GV7 R●40...R●150	19.5
GV7 R●220	21.5

Direct rotary handle GV7 AP03, GV7 AP04

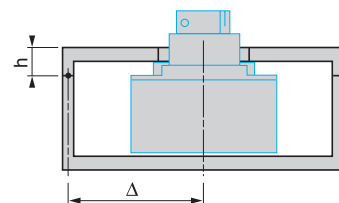
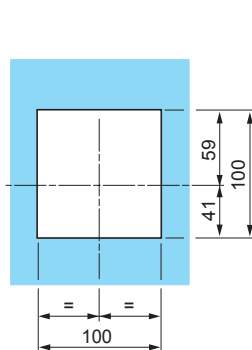
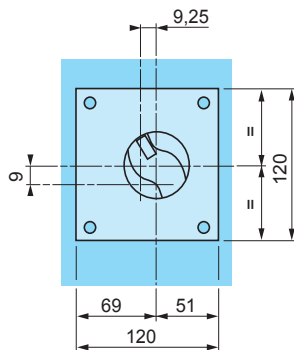
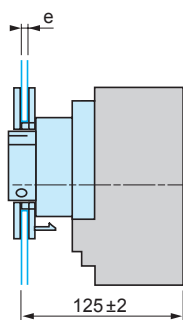
Flush-mounting



Direct rotary handle GV7 AP03 or GV7 AP04 with conversion accessory GV7 AP05

Front face cut-out

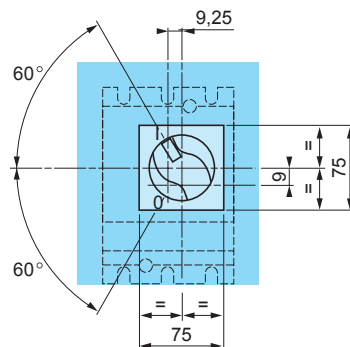
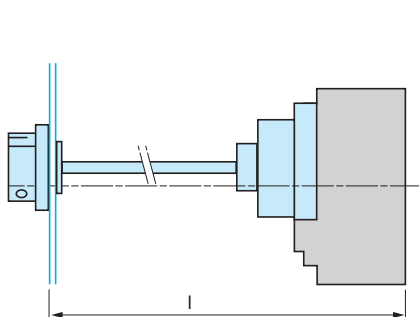
Enclosure viewed from top



Door cut-outs require a minimum distance between the centre of the circuit-breaker and the door hinge point $\Delta \geq 100 + (h \times 5)$

e = 1 to 3 max

Extended rotary handle GV7 AP01, GV7 AP02

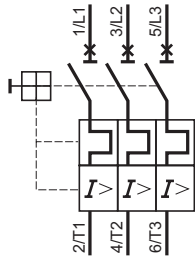


l: 185 min, 600 max

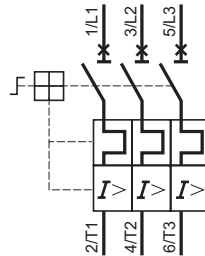
The shaft of the extended rotary handle GV7 AP01 or GV7 AP02 must be cut to length: l – 126 mm.

Schemes

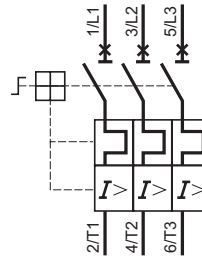
GV2 ME●● and GV2 RT



GV2 P●●



GV3 P●●

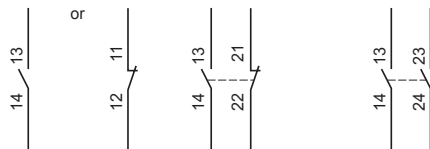


Front mounting add-on contact blocks Instantaneous auxiliary contacts

GV AE1

GV AE11

GV AE20



Front mounting add-on contact blocks

Instantaneous auxiliary contacts and fault signalling contacts

GV AED101

GV AED011



Side mounting add-on contact blocks

Instantaneous auxiliary contacts and fault signalling contacts

GV AD0110

GV AD0101

GV AD1010

GV AD1001



Instantaneous auxiliary contacts

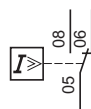
GV AN11

GV AN20



Short-circuit signalling contacts

GV AM11

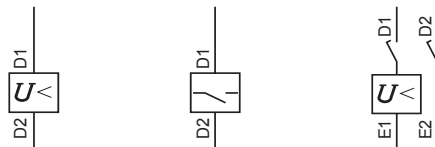


Voltage trips

GV AU●●●

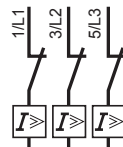
GV AS●●●

GV AX●●●

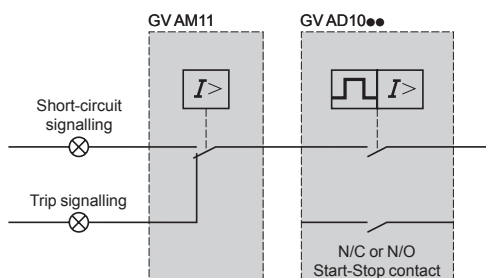


Current limiter

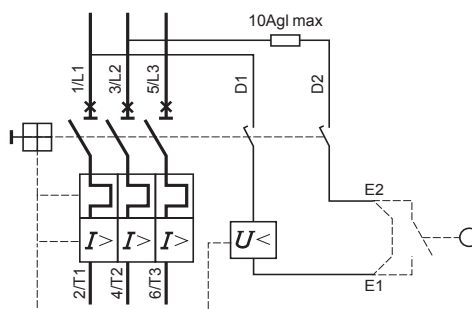
GV1 L3



Use of fault signalling contact and short-circuit signalling contact



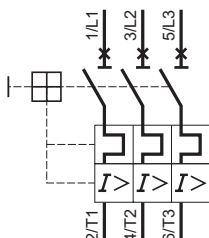
Connection of undervoltage trip for dangerous machines (conforming to INRS) on GV2 ME only



Schemes

Motor circuit-breakers

GV3 ME80



Auxiliary contact block modules

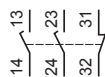
GV3 A01



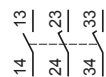
GV3 A02



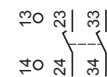
GV3 A03



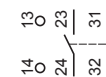
GV3 A05



GV3 A06

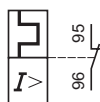


GV3 A07

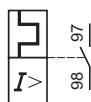


Fault signalling contacts

GV3 A08



GV3 A09



Voltage trips

GV3 B

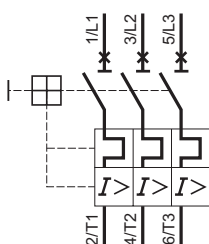


GV3 D



Motor circuit-breakers

GV7 R



Add-on auxiliary contacts according to their location (1)

GV7 AE11, GV7 AB11

Location 1 C/O contact



Location 2 Trip indication



Location 3 Electrical fault indication



Location 4 C/O contact



A self-adhesive label, supplied with the contact, can be affixed to the front face of the circuit-breaker to allow personalised marking according to the function of the contact or contacts.
(1) See pages 48 and 91.

Electric trips

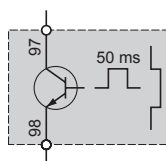
GV7 AU...••



GV7 AS...••

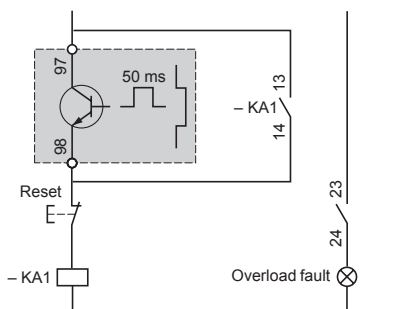


GV7 AD111, AD112

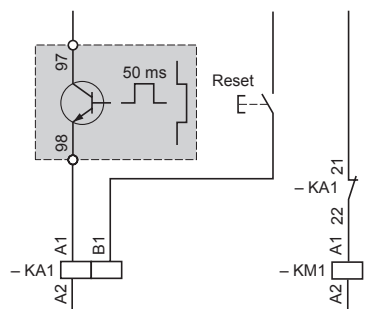


Recommended application schemes GV7 AD111, AD112

Fault indication



Contactor opening on overload

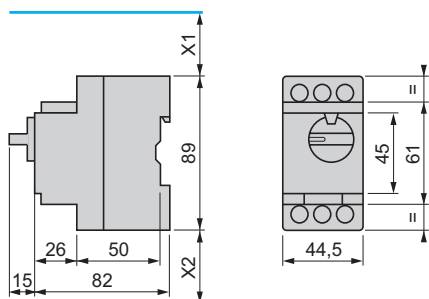


Associated components
KA1: CA2 KN or CAD N

Associated components
KA1: CAD + LAD 6K10 or RHK
KM1: LC1 D or LC1 F

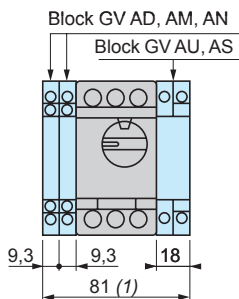
GV2 L

Dimensions



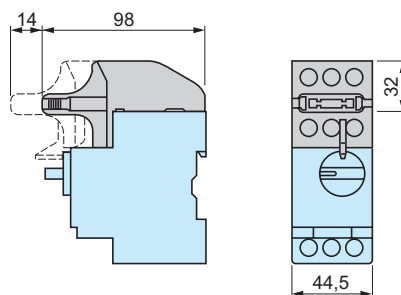
X1 Electrical clearance = 40 mm for $U_e \leq 415$ V, or 80 mm for $U_e = 440$ V, or 120 mm for $U_e = 500$ and 690 V.
X2 = 40 mm.

GV AD, AM, AN, AU, AS



(1) Maximum

GV2 AK00

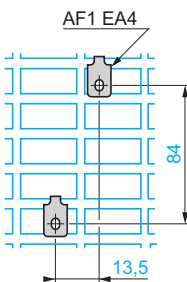
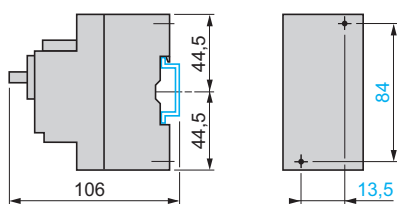


Mounting

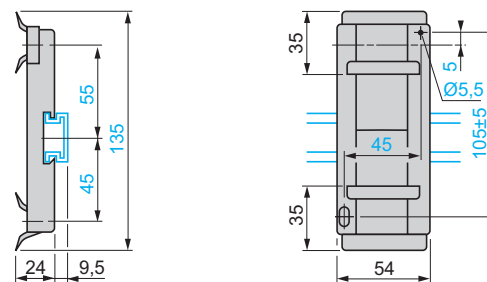
On rail AM1 DE200,
AM1 ED200 (35 x 15)

Panel mounted

On pre-slotted mounting
plate AM1 PA



Adapter plate GK2 AF01

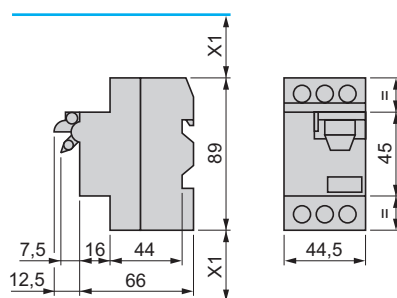


7.5 mm height compensation plate GV1 F03



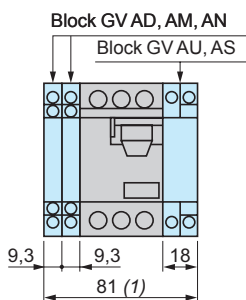
GV2 LE

Dimensions



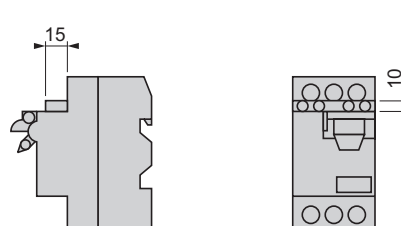
X1 Electrical clearance = 40 mm for $U_e \leq 690$ V.

GV AD, AM, AN, AU, AS



(1) Maximum

GV AE



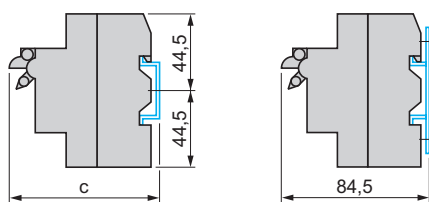
Mounting

On 35 mm rail

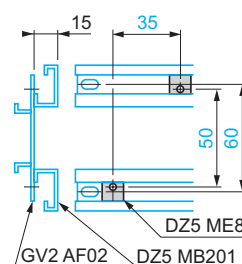
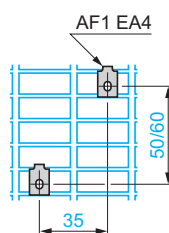
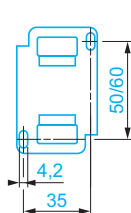
On panel with adapter plate GV2 AF02

On pre-slotted plate AM1 PA

On rails DZ5 MB201

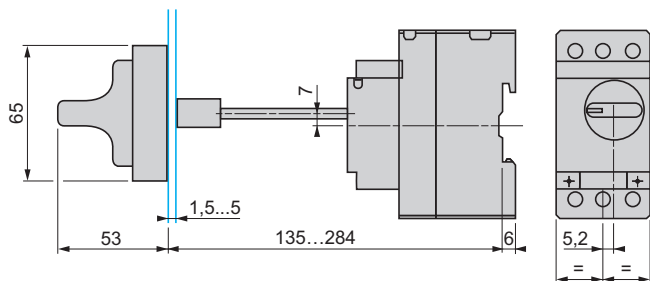


c = 80 on AM1 DP200
(35 x 7.5) and 88 on
AM1 DE200, ED200 (35 x 15)

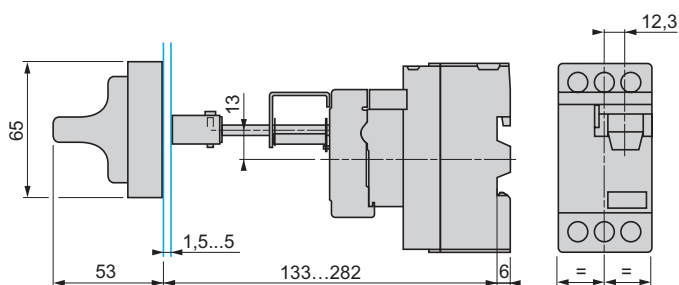


GV2 L and GV2 LE

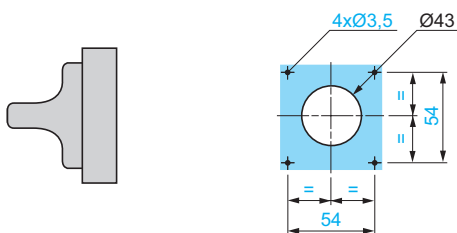
Mounting of external operator GV2 AP01 or GV2 AP02 for GV2 L



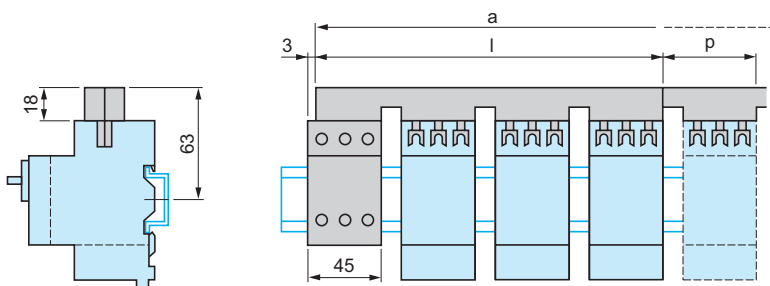
Mounting of external operator GV2 AP03 for GV2 LE



Door cut-out



Sets of busbars GV2 G445, GV2 G454, GV2 G472, with terminal block GV2 G05

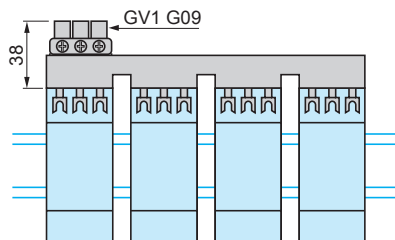


	l	p
GV2 G445 (4 x 45 mm)	179	45
GV2 G454 (4 x 54 mm)	206	54
GV2 G472 (4 x 72 mm)	260	72

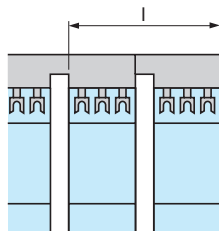
	a			
Number of tap-offs	5	6	7	8
GV2 G445	224	269	314	359
GV2 G454	260	314	368	422
GV2 G472	332	404	476	548

Sets of busbars for GV2 L and GV2 LE

Sets of busbars GV2 G●●● with term. block GV1 G09

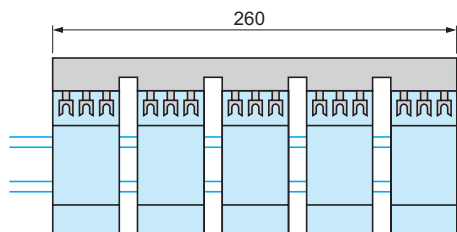


Sets of busbars GV2 G245, GV2 G254, GV2 GR272

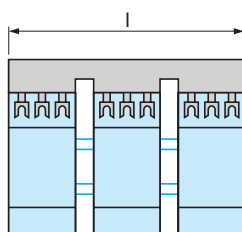


	I
GV2 G245 (2 x 45 mm)	89
GV2 G254 (2 x 54 mm)	98
GV2 G272 (2 x 72 mm)	116

Set of busbars GV2 G554



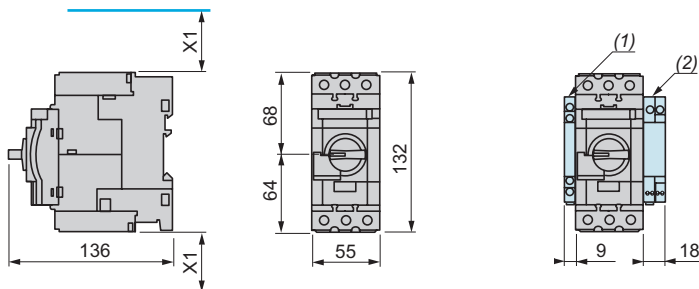
Sets of busbars GV2 G345 and GV2 G354



	I
GV2 G345 (3 x 45 mm)	134
GV2 G354 (3 x 54 mm)	152

GV3 L

Dimensions



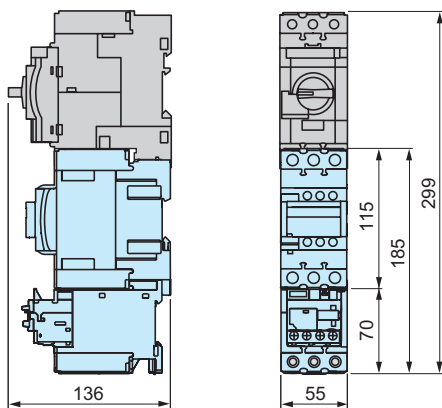
X1 = Electrical clearance (ISC max)
40 mm for $U_e \leq 500$ V, 50 mm for $U_e \leq 690$ V

(1) Blocks GV AN●●, GV AD●● and GV AM11
(2) Blocks GV3 AU●● and GV3 AS●●

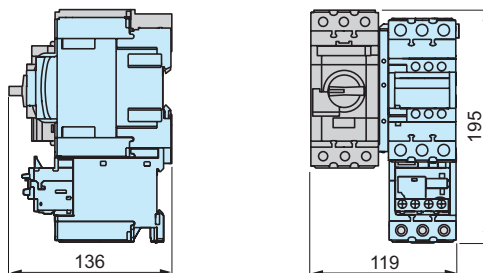
Note: Leave a space of 9 mm between 2 circuit-breakers: either an empty space or side-mounting add-on contact blocks.
Side by side mounting is possible up to 40 °C.

Mounting

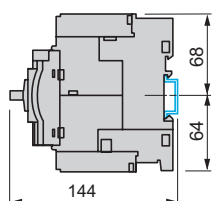
Mounting with Tesys contactor LC1 D40A...D65A and relay LR3 D313...365



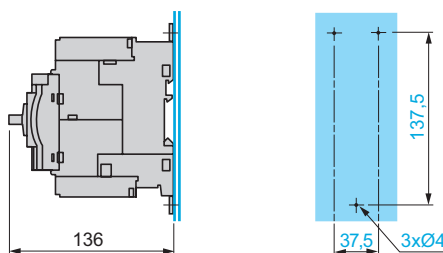
Side by side mounting with Tesys contactor LC1 D40A...D65A (S-shape busbar system GV3 S)



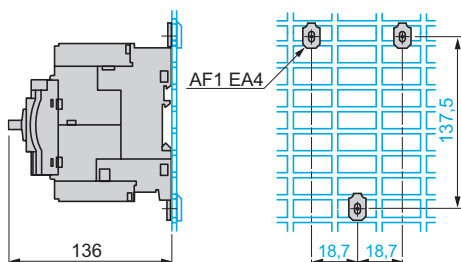
Mounting on rail AM1 DE200 or AM1 ED201



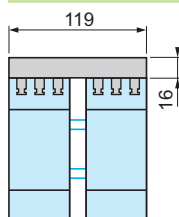
Panel mounting, using M4 screws



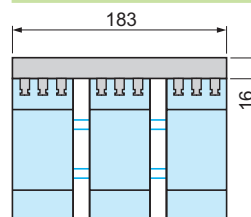
Mounting on pre-slotted plate AM1 PA



Set of busbars GV3 G264



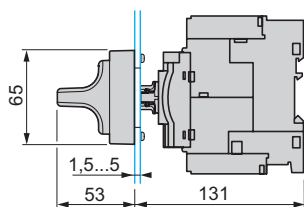
Set of busbars GV3 G364



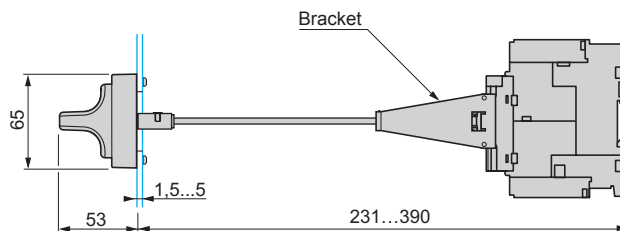
GV3 L (continued)

Mounting of external operator GV3 AP01 or GV3 AP02

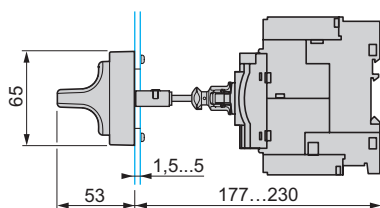
Depth 131 mm



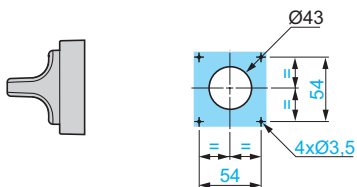
Depth 231 to 390 mm



Depth 177 to 230 mm

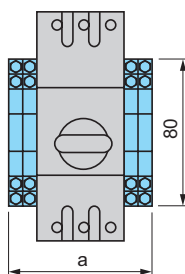
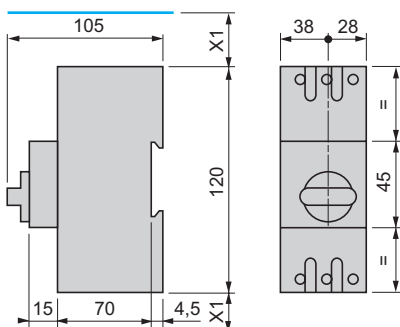


Door cut-out



GK3 EF80

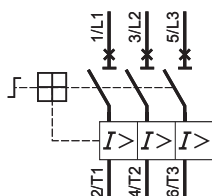
GK3 EF80 + 4 GK2 AX



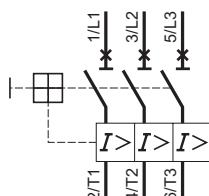
Number of GK2 AX					
	0	1	2	3	4
a	66	74.8	83.5	92.5	101

Magnetic motor circuit-breakers

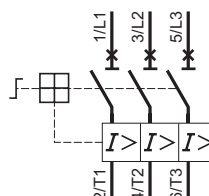
GV2 L●●



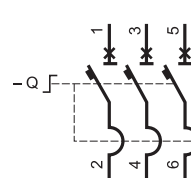
GV2 LE●●



GV3 L●●



GK3 EF80

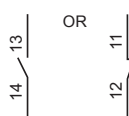


Accessories

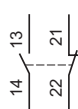
Front mounting add-on contact blocks

Instantaneous auxiliary contacts

GV AE1



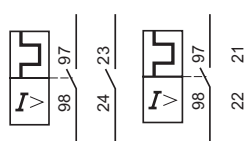
GV AE11



GV AE20



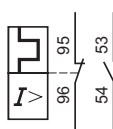
GV AED101 and GV AED011



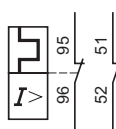
Side mounting add-on contact blocks

Instantaneous auxiliary contacts and fault signalling contacts

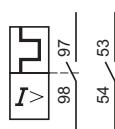
GV AD0110



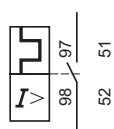
GV AD0101



GV AD1010

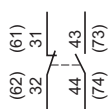


GV AD1001

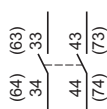


Instantaneous auxiliary contacts

GV AN11

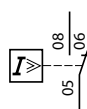


GV AN20



Short-circuit signalling contacts

GV AM11

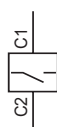


Voltage trips

GV AU●●●



GV AS●●●

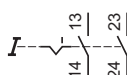


Start-Stop signalling contact blocks

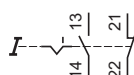
GK2 AX10



GK2 AX20



GK2 AX50

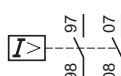


Fault signalling contact blocks

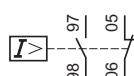
GK2 AX12



GK2 AX22



GK2 AX52



TeSys enclosed starters

Enclosed thermal-magnetic motor circuit-breakers
GV2 ME and accessories, for customer assembly

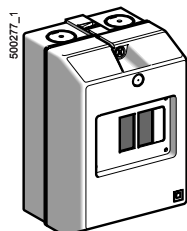
References

Thermal-magnetic motor circuit-breakers GV2 ME

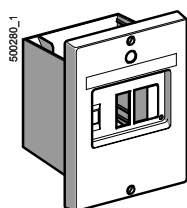
For motor circuit-breakers and accessories: see pages 75, 83 and 85.

Starters consisting of a GV2 ME motor circuit-breaker in an enclosure conform to standard IEC 60947-4-1.

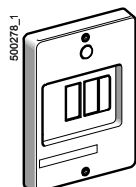
GV2	ME 01	ME 02	ME 03	ME 04	ME 05	ME 06	ME 07	ME 08	ME 10	ME 14	ME 16	ME 20	ME 21	ME 22
lthe in enclosure (A)	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6.3	9	13	17	21	23



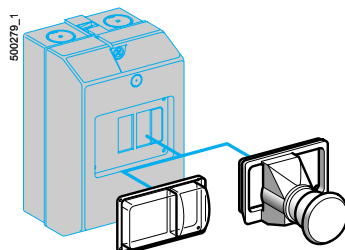
GV2 MC



GV2 MP



GV2 CP21



GV2 K011

Enclosures for thermal-magnetic circuit-breakers GV2 ME

Type	Degree of protection	Possible no. of side mounting auxiliary contact blocks on GV2 ME		Reference	Weight kg
		LH side	RH side		
Surface mounting, double insulated with protective conductor. Sealable cover	IP 41	1	1	GV2 MC01	0.290
	IP 55	1	1	GV2 MC02	0.300
				or GV2 MCK04 (1)	0.420
	IP 55 for temperature < + 5 °C	1	1	GV2 MC03	0.300
Flush mounting, with protective conductor	IP 41 (front face)	1	1	GV2 MP01	0.115
	IP 41 (reduced flush mounting)	–	1	GV2 MP03	0.115
	IP 55 (front face)	1	1	GV2 MP02	0.130
	IP 55 (reduced flush mounting)	–	1	GV2 MP04	0.130

Front plate

Description		Reference	Weight kg
For direct control, through a panel, of a chassis mounted GV2 ME	IP 55	GV2 CP21	0.800

Accessories common to all enclosures (to be ordered separately)

Accessories common to all enclosures (to be ordered separately)			Sold in lots of	Unit reference	Weight kg
Description					
Padlocking device (2) for GV2 ME operator (padlocking is only possible in the "O" position)		1 to 3 padlocks Ø 4 to 8 mm	1	GV2 V01	0.075
Mushroom head Emergency stop pushbutton Ø 40 mm, red	Spring return (2)		1	GV2 K011	0.052
	Latching (2) IP 55	Key release, key n° 455	1	GV2 K021	0.160
		Turn to release	1	GV2 K031	0.115
			1	GV2 K04 (3)	0.120
Sealing kit	For enclosures and front plate	IP 55 for temperature between + 5 °C and + 40 °C	10	GV2 E01	0.012
		IP 55 for temperature between - 20 °C and + 40 °C	10	GV2 E02	0.012
Neutral terminal			100	AB1 VV635UBL	0.015
Partition			50	AB1 AC6BL	0.003

(1) Enclosure GV2 MCK04 is fitted with a GV2 K04 mushroom head Emergency stop pushbutton as standard.

(2) Supplied with IP 55 sealing kit. To be fitted with enclosure GV2 M001.

(3) Padlockable in "O" position using Ø 4 to 8 mm shank padlocks.

TeSys enclosed starters

Enclosed thermal-magnetic motor circuit-breakers
GV3 P (for customer assembly)

References (continued)

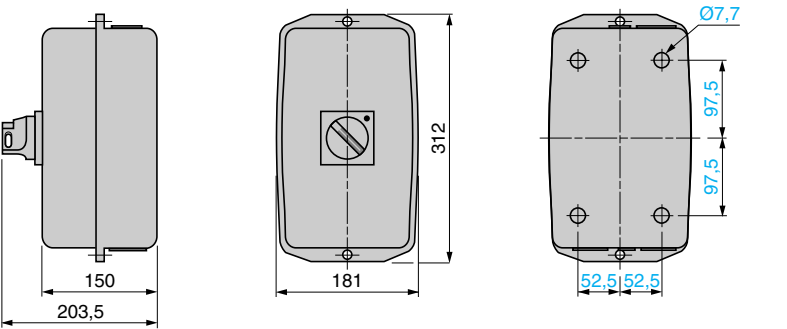
Thermal-magnetic motor circuit-breakers GV3 P

For motor circuit-breakers and accessories: see pages 76 and 87.
GV3 P40: operational current in enclosure limited to 30 A.
Starters consisting of a GV3 P motor circuit-breaker in an enclosure conform to standards IEC/EN 60947-4-1 and IEC/EN 60947-2.

Metal enclosures fitted with a padlockable rotary handle (1), for thermal-magnetic circuit-breakers GV3 P, up to 30 A				
Composition (2)	Type	Degree of protection of enclosure	Reference	Weight kg
■ Metal enclosure, ■ Black handle LU9 AP11 ■ Padlocking in ON/OFF position ■ Circuit-breaker/handle adapter	Surface mounting	IP 55 IK 09	GV3 PC01	2.000
■ Metal enclosure, ■ Red handle LU9 AP12 ■ Padlocking in OFF position ■ Circuit-breaker/handle adapter	Surface mounting	IP 55 IK 09	GV3 PC02	2.000

(1) For special applications a GV3 L magnetic motor circuit-breaker can be fitted in this type of enclosure. Please consult your Regional Sales Office.
(2) Components for customer assembly. Circuit-breaker to be ordered separately.

Dimensions



TeSys enclosed starters

Enclosed thermal-magnetic motor circuit-breakers

GV2 ME and accessories

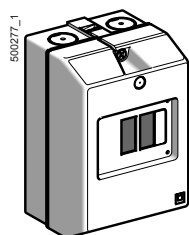
Assembly of a safety enclosure

Thermal-magnetic motor circuit-breakers GV2 ME

For motor circuit-breakers and accessories: see pages 75, 83 and 85.

Starters consisting of a GV2 ME motor circuit-breaker in an enclosure conform to standard IEC 60947-4-1.

GV2	ME 01	ME 02	ME 03	ME 04	ME 05	ME 06	ME 07	ME 08	ME 10	ME 14	ME 16	ME 20	ME 21	ME 22
lthe in enclosure (A)	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6.3	9	13	17	21	23



GV2 MC

Enclosures for thermal-magnetic circuit-breakers GV2 ME

Type	Degree of protection	Possible number of side-mounting auxiliary contact blocks on GV2 ME		Reference	Weight kg
		LH side	RH side		
Surface mounting, double insulated with protective conductor. Sealable cover	IP 41	1	1	GV2 MC01	0.290
	IP 55	1	1	GV2 MC02	0.300
				or GV2 MCK04 (1)	0.420
	IP 55 for temperature < + 5 °C	1	1	GV2 MC03	0.300

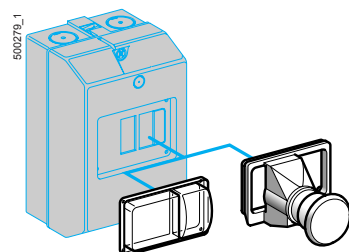
Accessories common to all enclosures (to be ordered separately)

Description		Sold in lots of	Unit reference	Weight kg
Padlocking devices (2) for GV2 ME operator (padlocking is only possible in the "O" position)	1 to 3 padlocks Ø 4 to 8 mm	1	GV2 V01	0.075
Mushroom head Emergency stop pushbutton Ø 40 mm, red	Spring return (2)	1	GV2 K011	0.052
	Latching (2) IP 55	Key release, key n° 455	GV2 K021	0.160
		Turn to release	GV2 K031	0.115
			GV2 K04 (3)	0.120
Sealing kit	For enclosures and front plate	IP 55 for temperature between + 5 °C and + 40 °C	GV2 E01	0.012
		IP 55 for temperature between - 20 °C and + 40 °C	GV2 E02	0.012
	Neutral terminal	100	AB1 VV635UBL	0.015
Partition		50	AB1 AC6BL	0.003

(1) Enclosure GV2 MCK04 is fitted with a GV2 K04 mushroom head Emergency stop pushbutton as standard.

(2) Supplied with IP 55 sealing kit. To be fitted with enclosure GV2 M●01.

(3) Padlockable in "Off" position using Ø 4 to 8 mm shank padlocks.



GV2 K011

TeSys enclosed starters

Enclosed thermal-magnetic motor circuit-breakers

GV2 ME and accessories

Assembly of a safety enclosure

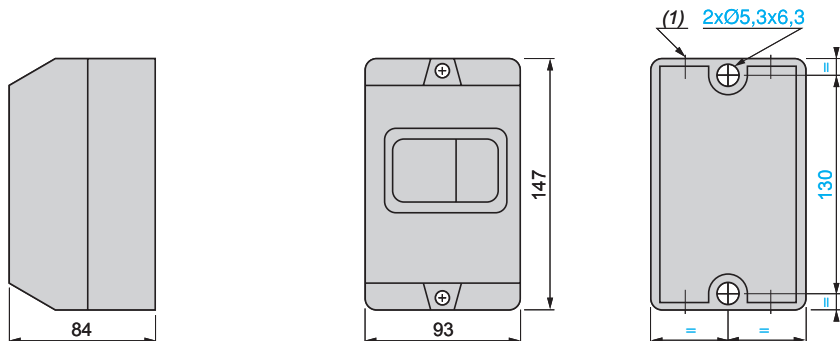
Assembly of a safety enclosure*(conforming to standards IEC 60974-4-1, IEC 60204 and IEC 60292)*

Type of product	Page	Reference
Enclosure	Opposite	GV2 MC●●
Circuit-breaker	74	GV2 ME●●
Undervoltage trip or INRS trip (1)	93	GV2 A●●●● or GV2 AX●●●
Latching mushroom head Stop pushbutton	Opposite	GV2 K021 or GV2 K031 or GV2 K04

(1) Safety device for dangerous machines conforming to INRS and VDE 0113.

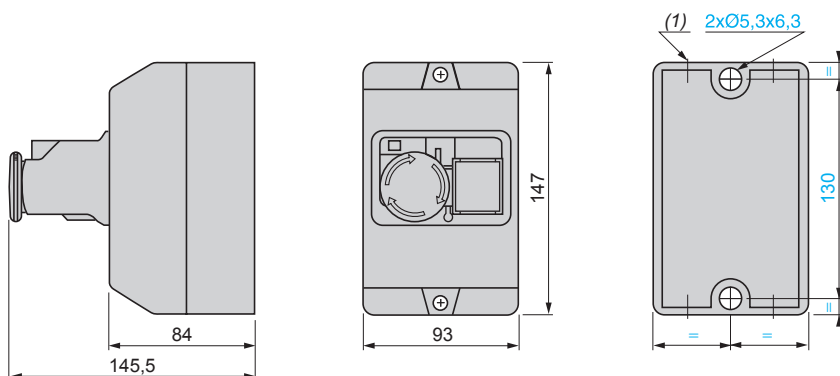
Dimensions

Surface mounting enclosure GV2 MC0●



(1) 4 knock-outs for 16 mm plastic cable gland or 16 mm conduit.

Surface mounting enclosure GV2 MCK04

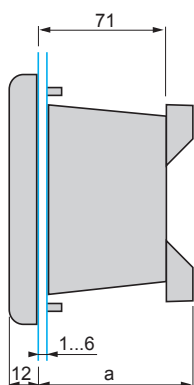


(1) 4 knock-outs for 16 mm plastic cable gland or 16 mm conduit.

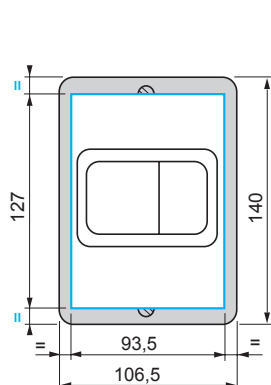
Mounting

Flush mounting enclosures GV2 MP0● (panel cut-out)

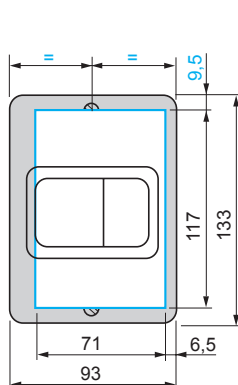
GV2 MP0●



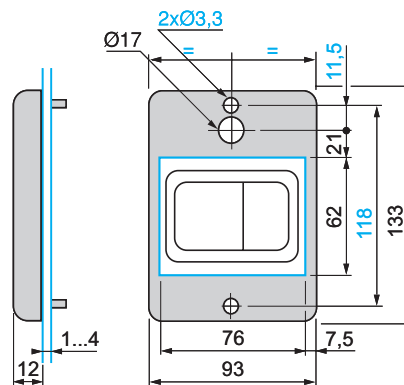
GV2 MP01, MP02



GV2 MP03, MP04



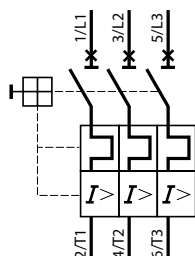
Front plate GV2 CP21



GV2	a
MP01, MP02	—
MP03, MP04	86

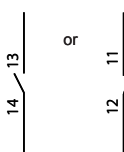
Schemes

GV2 ME●●

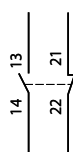


Instantaneous auxiliary contacts

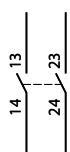
GV AE1



GV AE11

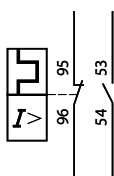


GV AE20

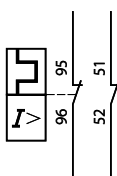


Instantaneous auxiliary contacts and fault signalling contacts

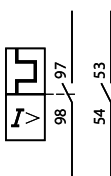
GV AD0110



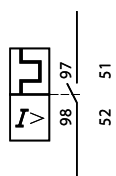
GV AD0101



GV AD1010

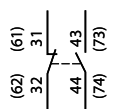


GV AD1001

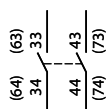


Instantaneous auxiliary contacts

GV AN11

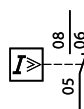


GV AN20



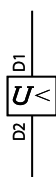
Short-circuit signalling contacts

GV AM11

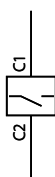


Voltage trips

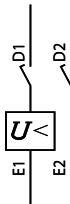
GV AU●●●



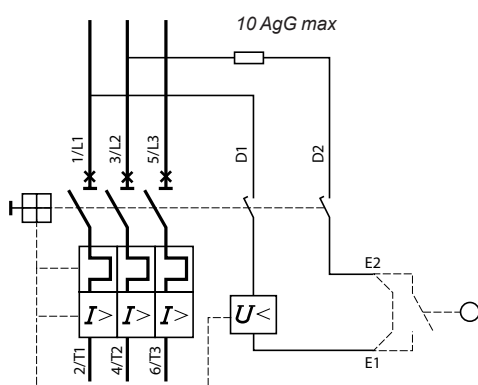
GV AS●●●



GV AX●●●



Wiring diagram for undervoltage trip used on potentially dangerous machines, conforming to INRS



Characteristics (1)

Conforming to standards	IEC 60947-4, IEC 60439-1, VDE 0660-102 and EN 60947
Degree of protection conforming to IEC 60529	GV2 LC: IP 547 GV NGC: IP 407
Operational voltage Ue	GV2 LC: 690 V GV NGC: 500 V
Material	Polycarbonate (2)

References



GV2 LC02●●



GV2 LC02●●



GV NGC02●●

Control by black rotary handle, padlockable in Off position (up to 3 padlocks with Ø 8 shank, to be ordered separately)

Rating In	Breaking capacity Icu conforming to IEC 60947-2				Magnetic tripping current I _d ± 20 %	Reference	Weight
	220/ 230 V	400/ 415 V	440 V	500 V			
A	kA	kA	kA	kA	A		kg
1.6	100	100	100	100	13 In	GV2 LC0206 (3)	0.780
2.5	100	100	100	100	13 In	GV2 LC0207 (3)	0.780
4	100	100	100	100	13 In	GV2 LC0208 (3)	0.780
6.3	100	100	100	100	13 In	GV2 LC0210 (3)	0.780
10	100	100	20	10	13 In	GV2 LC0214 (3)	0.780
14	100	50	20	10	13 In	GV2 LC0216 (3)	0.780
18	100	50	20	10	13 In	GV2 LC0220 (3)	0.780
25	100	50	30	15	12 In	GV NGC0225	2.450
32	100	50	30	15	12 In	GV NGC0232	2.450
40	100	50	30	15	12 In	GV NGC0240	2.450
50	100	50	30	15	12 In	GV NGC0250	2.450
63	100	50	30	15	12 In	GV NGC0263	2.450

Variants

Starters with control by red rotary handle on yellow background

Add the letter **R** to the references selected above.
Example: GV2 LC0206 becomes GV2 LC0206R.



GV2 LC02

Enclosure without circuit-breaker, with rotary handle mounted on cover

Description	Rating	Reference	Weight
	A		kg
Black rotary handle	1.6...18	GV2 LC02	0.300
	25...63	GV NGC02	0.550
Red rotary handle on yellow background	1.6...18	GV2 LC02R	0.300
	25...63	GV NGC02R	0.550

(1) Circuit-breaker characteristics:

GV2 L: see pages 42 and 43.

NG 125L: please consult your Regional Sales Office.

(2) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

(3) The following can be fitted by the customer: a GVAD or GVAM auxiliary contact block on the LH side and a GVA● trip on the RH side.

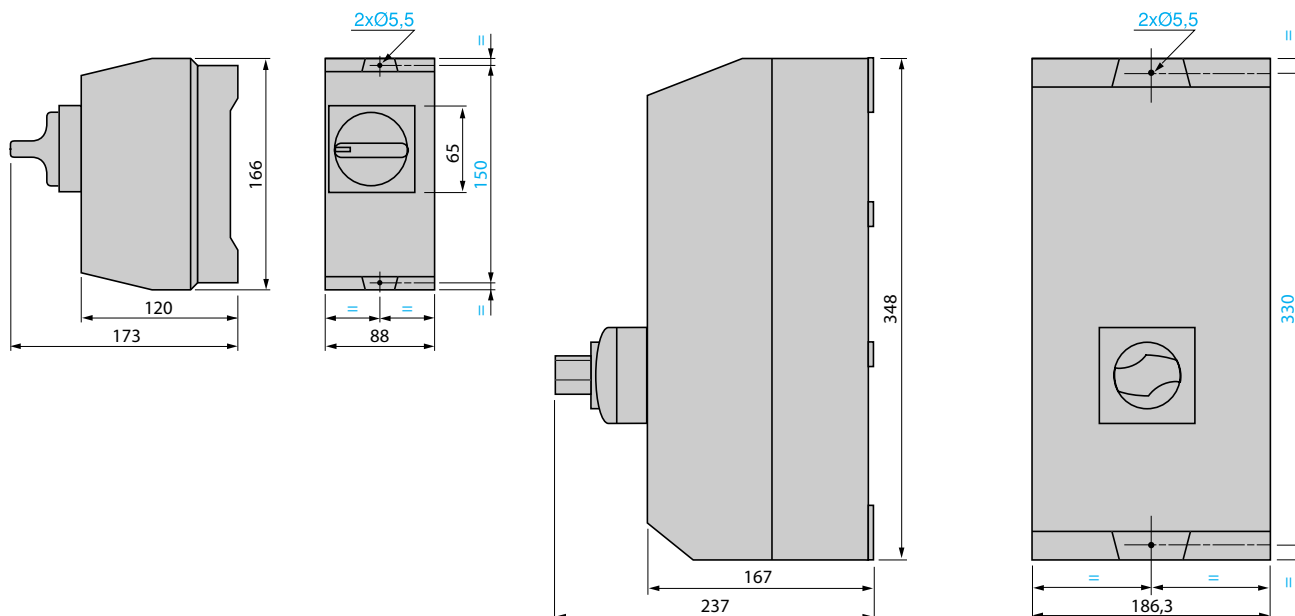
TeSys enclosed starters

D.O.L. starters with manual control,
with magnetic circuit-breaker, 0.55 to 30 kW

Dimensions

GV2 LC0206...LC0220

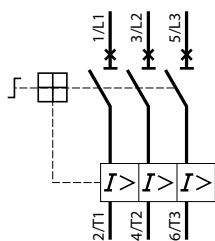
GV NGC0225...NGC0263



Knock-outs or blanking plugs for cable glands

Enclosure type	At top	At bottom
	ISO	ISO
GV2 LC	2 x 20 or 2 x 25	2 x 20 or 2 x 25
GV NGC	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40

Scheme



“Contactors” selection guide	page 122
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“Low consumption contactors” selection guide	page 124
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■ Selection according to utilisation categories

□ AC-3.	page 126
□ AC-1.	page 130
□ AC-2 or AC-4	page 132
□ DC-1 to DC-5	page 136

■ Characteristics

□ Contactors	page 140
□ Accessories	page 146

■ References

□ 3-pole contactors	page 152
□ 4-pole contactors	page 155
□ Contactors for the North American market	page 158
□ Reversing contactors	page 162
□ Components parts for assembling reversing contactors.	page 166
□ Instantaneous auxiliary contact blocks	page 169
□ Time dealy auxiliary contact blocks	page 170
□ Mechanical latch blocks	page 170
□ Suppressor modules	page 171
□ Accessories	page 173
□ Coils for 3 or 4-pole contactors.	page 176

■ Contactors dimensions and schemes page 182

■ Reversing contactors dimensions and schemes page 188

Applications

All types of control system



Rated operational current	le max AC-3 ($U_e \leq 440$ V)	9 A	12 A	18 A	25 A	32 A	38 A
	le AC-1 ($\theta \leq 60$ °C)	20/25 A		25/32 A	25/40 A	50 A	
Rated operational voltage		690 V on ~ and ---					
Number of poles		3 or 4	3 or 4	3 or 4	3 or 4	3	
Rated operational power in AC-3	220/240 V	2.2 kW	3 kW	4 kW	5.5 kW	7.5 kW	9 kW
	380/400 V	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW
	415/440 V	4 kW	5.5 kW	9 kW	11 kW	15 kW	18.5 kW
	500 V	5.5 kW	7.5 kW	10 kW	15 kW	18.5 kW	18.5 kW
	660/690 V	5.5 kW	7.5 kW	10 kW	15 kW	18.5 kW	18.5 kW
	1000 V	—	—	—	—	—	—
Auxiliary contacts		1 N/C and 1 N/O instantaneous incorporated in the contactors, with add-on blocks common to the whole range comprising up to 4 N/C or N/O instantaneous, up to 1 N/O + 1 N/C time delay and up to 2 N/O or 2 N/C protected contacts and 2 screen continuity terminals.					
Thermal overload relays manual-auto compatible	Class 10 A	0.10...10 A	0.10...13 A	0.10...18 A	0.10...32 A	0.10...38 A	0.10...38 A
	Class 20	2.5...10 A	2.5...13 A	2.5...18 A	2.5...32 A		
Suppressor modules (--- and low consumption contactors are fitted with a built-in bidirectional peak limiting diode suppressor as standard)	Varistor	•	•	•	•	•	•
	Diode	—	—	—	—	—	—
	RC circuit	•	•	•	•	•	•
	Bidirectional peak limiting diode	•	•	•	•	•	•
Interfaces	Relay output	•	•	•	•	•	•
	Relay interface with manual override switch	•	•	•	•	•	•
	Solid state	•	•	•	•	•	•
Contactor type references	~ or --- 3 pole	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38
	~ 4 pole	LC1 DT20/	LC1 DT25/	LC1 DT32/	LC1 DT40/	—	—
	--- 4 pole	LC1 D098	LC1 D128	LC1 D188	LC1 D258	—	—
Reversing contactor type references	~ 3 pole	LC2 D09	LC2 D12	LC2 D18	LC2 D25	LC2 D32	LC2 D38
	--- 3 pole	LC2 D09	LC2 D12	LC2 D18	LC2 D25	LC2 D32	LC2 D38
	~ 4 pole	LC2 DT20	LC2 DT25	LC2 DT32	LC2 DT40	—	—
	--- 4 pole	LC2 DT20	LC2 DT25	LC2 DT32	LC2 DT40	—	—
Pages	Contactors	152 to 157					
	Reversing contactors	162 to 165					



40 A	50 A	65 A	80 A	95 A	115 A	150 A
60 A	80 A		125 A		200 A	

690 V ~ or ---	1000 V on ~ supply, 690 V on --- supply
----------------	---

3	4	3	3	4	3	4	3	3	4	3
11 kW	15 kW	18.5 kW	22 kW	25 kW	30 kW	40 kW	11 kW	15 kW	18.5 kW	22 kW
18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW	75 kW	18.5 kW	22 kW	30 kW	37 kW
22 kW	25/30 kW	30 kW	45 kW	45 kW	59 kW	80 kW	22 kW	25/30 kW	30 kW	37 kW
22 kW	30 kW	37 kW	55 kW	55 kW	75 kW	90 kW	22 kW	30 kW	37 kW	45 kW
30 kW	33 kW	37 kW	45 kW	45 kW	80 kW	100 kW	30 kW	33 kW	37 kW	45 kW
—	—	—	45 kW	45 kW	75 kW	90 kW	—	—	—	—

1 N/C and 1 N/O instantaneous incorporated in the contactors, with add-on blocks common to the whole range comprising up to 4 N/C or N/O instantaneous, up to 1 N/O + 1 N/C time delay and up to 2 N/O or 2 N/C protected contacts and 2 screen continuity terminals.

13...40 A	13...50 A	13...65 A	17...104 A	17...104 A	60...150 A	60...150 A
13...40 A	13...50 A	13...65 A	17...80 A		60...150 A	60...150 A

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•	•	•	•	•	•	•
•	•	•	•	•	•	•
•	•	•	•	•	•	•

•	•	•	•	•	•	•
•	•	•	•	•	•	•
•	•	•	•	•	•	•
•	•	•	•	•	•	•

LC1 D40A	LC1 D50A	LC1 D65A	LC1 D80	LC1 D95	LC1 D115	LC1 D150
LC1 DT60A	—	LC1 DT80A	LC1 D80	—	LC1 D115	—
LC1 DT60A	—	LC1 DT80A	LC1 D80	—	LC1 D115	—

LC2 D40A	LC2 D50A	LC2 D65A	LC2 D80	LC2 D95	LC2 D115	LC2 D150
LC2 D40A	LC2 D50A	LC2 D65A	—	—	—	—
—	—	—	LC2 D80	—	LC2 D115	—
—	—	—	—	—	—	—

152 to 157
162 to 165

Applications

Automation systems



Rated operational current	Ie max AC-3 (Ue ≤ 440 V)
	Ie AC-1 (θ ≤ 60 °C)

9 A

20/25 A

12 A

20/25 A

18 A

25/32 A

Rated operational voltage

690 V

Number of poles

3 or 4

3 or 4

3 or 4

Rated operational power in AC-3

220/240 V

380/400 V

415/440 V

500 V

660/690 V

2.2 kW

4 kW

4 kW

5.5 kW

5.5 kW

3 kW

5.5 kW

5.5 kW

7.5 kW

7.5 kW

4 kW

7.5 kW

9 kW

10 kW

10 kW

Coil consumption

2.4 W (100 mA - 24 V)

Operating ranges

0.7...1.25 Uc

Operating time at 20 °C and at Uc

Closing

70 ms

Opening

25 ms

Auxiliary contact block modules

1 N/C and 1 N/O instantaneous contacts incorporated in the contactors, with add-on blocks common to the whole range, comprising up to 2 N/C or 2 N/O instantaneous standard contacts

Interference suppression

Built-in suppression as standard, by bi-directional peak limiting diode

Contactors type

3-pole

4-pole

LC1 D09
LC1 DT20/D098
LC1 D12
LC1 DT25/D128
LC1 D18
LC1 DT32/D188

Reversing contactor type

3-pole

4-pole

LC2 D09
LC2 DT20
LC2 D12
LC2 DT25
LC2 D18
LC2 DT32

Pages

Contactors

152 to 157

Reversing contactors

162 to 165

(1) With low consumption kit **LA4 DBL** (see page 173).

(2) With 2 low consumption kits **LA4 DBL** (see page 173).



25 A	32 A	38 A	40 A	50 A	65 A
25/40 A	50 A	50 A	60 A	–	80 A
690 V			690 V		
3 or 4	3	3	3	3	3
5.5 kW	7.5 kW	9 kW	11 kW	15 kW	18.5 kW
11 kW	15 kW	18.5 kW	18.5 kW	22 kW	30 kW
11 kW	15 kW	18.5 kW	22 kW	25/30 kW	30 kW
15 kW	18.5 kW	18.5 kW	22 kW	30 kW	37 kW
15 kW	18.5 kW	18.5 kW	30 kW	33 kW	37 kW
2.4 W (100 mA - 24 V)			0.6 W (25 mA - 24 V) for relay LA4 DFB + the power consumed by the contactor coil		
0.7...1.25 U _c			–	–	–
70 ms			–	–	–
25 ms			–	–	–

1 N/C and 1 N/O instantaneous contacts incorporated in the contactors, with add-on blocks common to the whole range, comprising up to 2 N/C or 2 N/O instantaneous standard contacts

Built-in suppression as standard, by bi-directional peak limiting diode

LC1 D25	LC1 D32	LC1 D38	LC1 D40A (1)	LC1 D50A (1)	LC1 D65A (1)
LC1 DT40/D258			–	–	LC1 DT80A (1)
LC2 D25	LC2 D32	LC2 D38	LC2 D40A (2)	LC2 D50A (2)	LC2 D65A (2)
LC2 DT40					
152 to 157					
162 to 165					

Operational current and power conforming to IEC ($\theta \leq 60^\circ\text{C}$)

Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1 K12	LC1 K16	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
Maximum operational current in AC-3	$\leq 440\text{ V}$	A	6	9	12	16	9	12	18	25	32	38	40
Rated operational power P (standard motor power ratings)	220/240 V	kW	1.5	2.2	3	3	2.2	3	4	5.5	7.5	9	11
	380/400 V	kW	2.2	4	5.5	7.5	4	5.5	7.5	11	15	18.5	18.5
	415 V	kW	2.2	4	5.5	7.5	4	5.5	9	11	15	18.5	22
	440 V	kW	3	4	5.5	7.5	4	5.5	9	11	15	18.5	22
	500 V	kW	3	4	4	5.5	5.5	7.5	10	15	18.5	18.5	22
	660/690 V	kW	3	4	4	4	5.5	7.5	10	15	18.5	18.5	30
	1000 V	kW	–	–	–	–	–	–	–	–	–	–	–

Maximum operating rate in operating cycles/hour (1)

On-load factor	Operational power					LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
≤ 85 %	P	–	–	–	–	1200	1200	1200	1200	1000	1000	1000
	0.5 P	–	–	–	–	3000	3000	2500	2500	2500	2500	2500
≤ 25 %	P	–	–	–	–	1800	1800	1800	1800	1200	1200	1200

Operational current and power conforming to UL, CSA ($\theta \leq 60^\circ\text{C}$)

Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
Maximum operational current in AC-3	$\leq 440\text{ V}$	A	6	9	12	9	12	18	25	32	–	40
Rated operational power P (standard motor power ratings 60 Hz)	200/208 V	HP	1.5	2	3	2	3	5	7.5	10	–	10
	230/240 V	HP	1.5	3	3	2	3	5	7.5	10	–	10
	460/480 V	HP	3	5	7.5	5	7.5	10	15	20	–	30
	575/600 V	HP	3	5	10	7.5	10	15	20	25	–	30

(1) Depending on the operational power and the on-load factor ($\theta \leq 60^\circ\text{C}$).

LC1 D50A	LC1 D65A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
50	65	80	95	115	150	185	225	265	330	400	500	630	780	800	750	1000	1500	1800
15	18,5	22	25	30	40	55	63	75	100	110	147	200	220	250	220	280	425	500
22	30	37	45	55	75	90	110	132	160	200	250	335	400	450	400	500	750	900
25	30	45	45	59	80	100	110	140	180	220	280	375	425	450	425	530	800	900
30	30	45	45	59	80	100	110	140	200	250	295	400	425	450	450	560	800	900
30	37	55	55	75	90	110	129	160	200	257	355	400	450	450	500	600	750	900
33	37	45	45	80	100	110	129	160	220	280	335	450	475	475	560	670	750	900
–	–	45	45	65	75	100	100	147	160	185	335	450	450	450	530	530	670	750

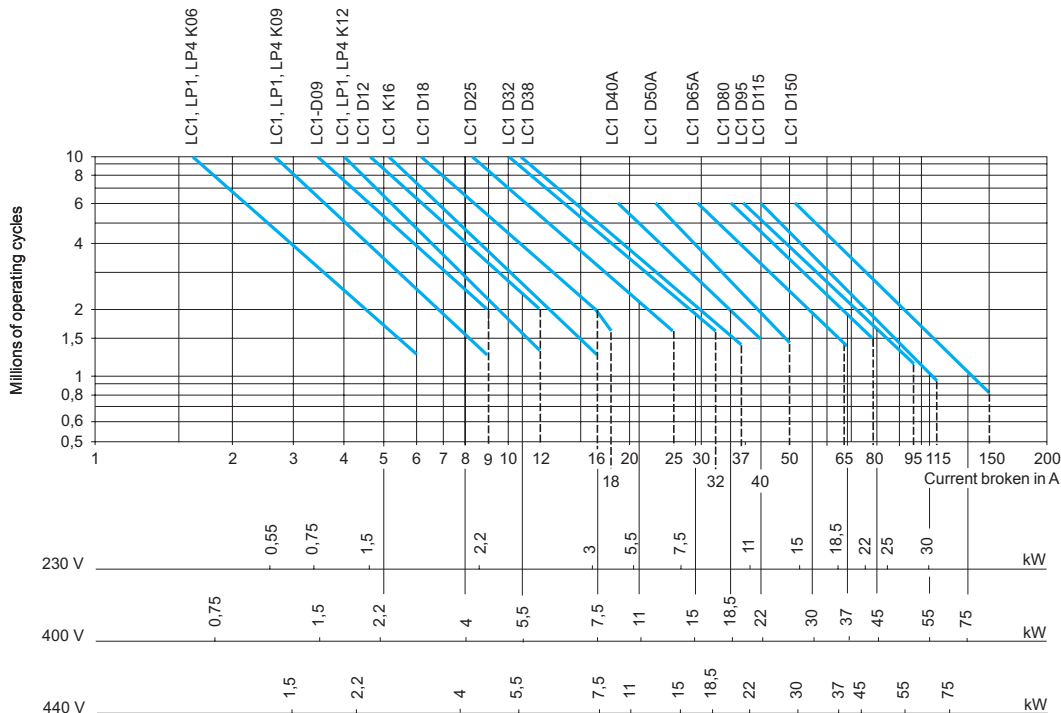
LC1 D50A	LC1 D65A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
1000	1000	750	750	750	750	750	750	750	750	500	500	500	500	500	120	120	120	120
2500	2500	2000	2000	2000	1200	2000	2000	2000	2000	1200	1200	1200	1200	600	120	120	120	120
1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	120	120	120	120

LC1 D50A	LC1 D65A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800
50	65	80	95	115	150	185	225	265	330	400	500	630	780	800
15	20	30	30	30	40	50	60	60	75	100	150	250	–	350
15	20	30	30	40	50	60	75	75	100	125	200	300	450	400
40	40	60	60	75	100	125	150	150	200	250	400	600	900	900
40	50	60	60	100	125	150	150	200	250	300	500	800	–	900

Selection according to required electrical durability, in category AC-3 ($U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.



Operational power in kW-50 Hz.

Example:

Asynchronous motor with $P = 5.5$ kW - $U_e = 400$ V - $I_e = 11$ A - $I_c = I_e = 11$ A

or asynchronous motor with $P = 5.5$ kW - $U_e = 415$ V - $I_e = 11$ A - $I_c = I_e = 11$ A

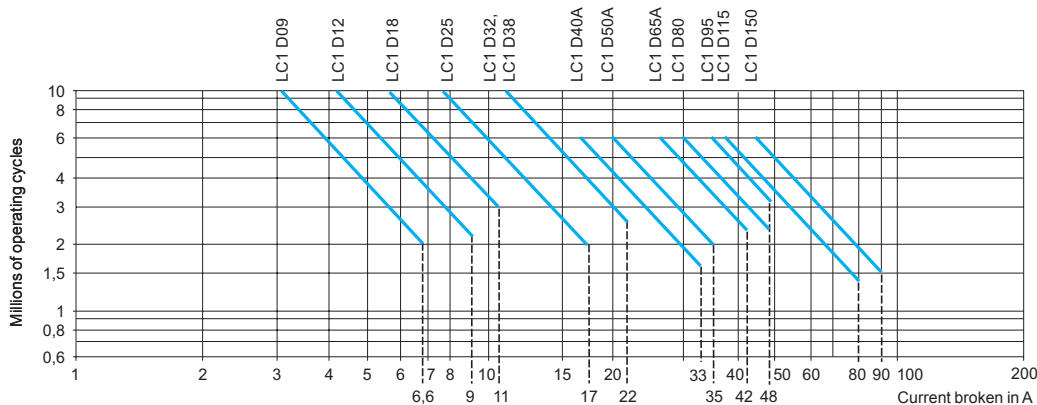
3 million operating cycles required.

The above selection curves show the contactor rating needed: LC1 D18.

Selection according to required electrical durability, in category AC-3 ($U_e = 660/690$ V) (1)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.

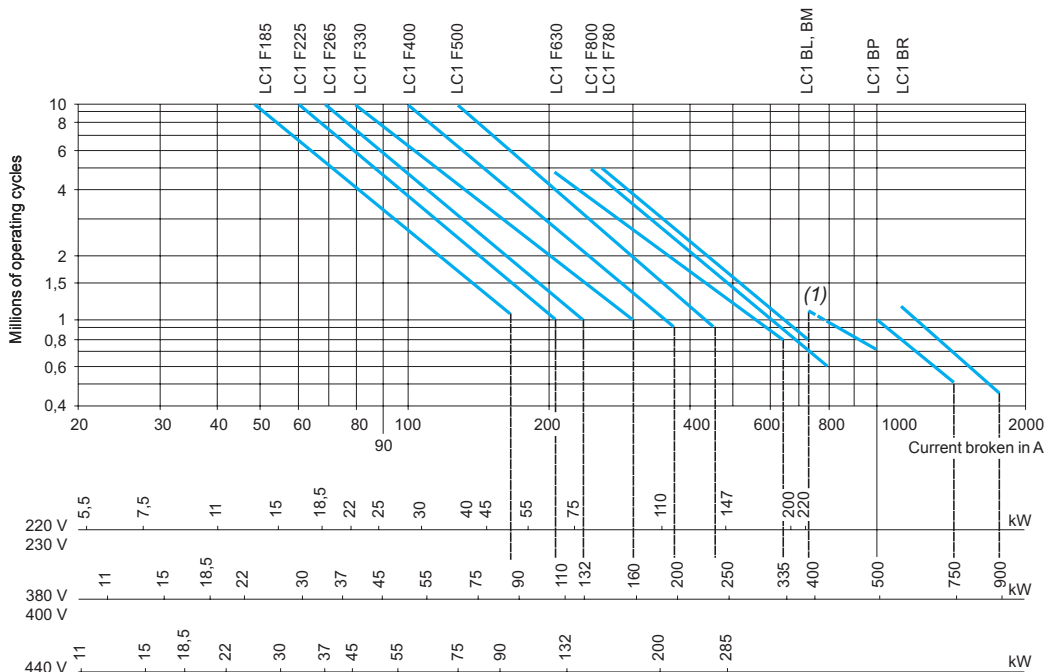


(1) For $U_e = 1000$ V, use the 660/690 V curves, but do not exceed the operational current at the operational power indicated for 1000 V.

Selection according to required electrical durability, in category AC-3 ($U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.

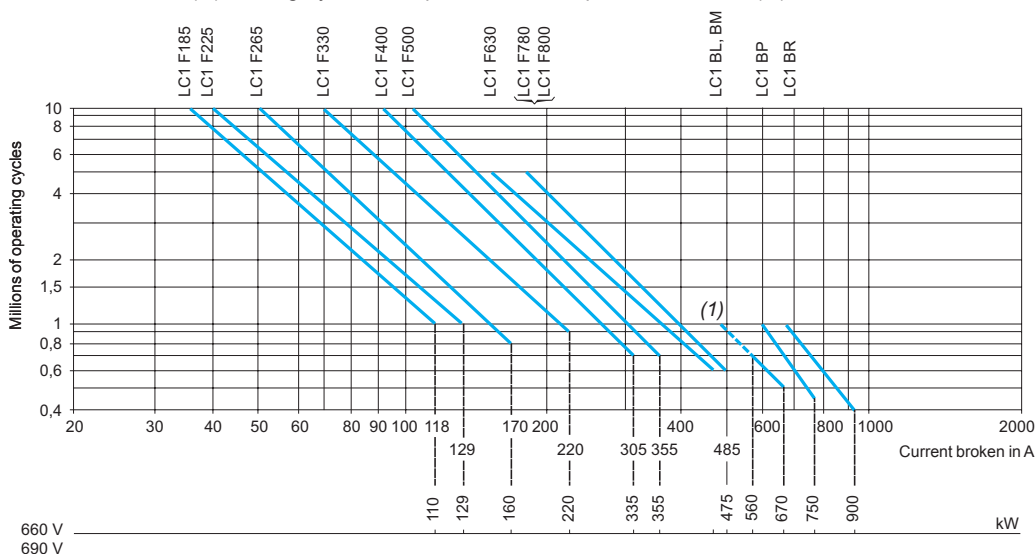


(1) The dotted lines are only applicable to LC1 BL contactors.

Selection according to required electrical durability, in category AC-3 ($U_e = 660/690$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

The current broken (I_c) in category AC-3 is equal to the rated operational current (I_e) of the motor.



(1) The dotted lines are only applicable to LC1 BL contactors.

Maximum operational current (open-mounted device)

Contactor size			LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A DT60A
Maximum operating rate in operating cycles/hour			600	600	600	600	600	600	600	600	600	600
Connection conforming to IEC 60947-1	Cable c.s.a.	mm ²	4	4	4	4	4	6	6	10	10	35
	Bar c.s.a.	mm	–	–	–	–	–	–	–	–	–	–
Operational current in AC-1 in A, according to the ambient temperature, conforming to IEC 60947-1	≤ 40 °C	A	20	20	25	20	25	32	40	50	50	60
	≤ 60 °C	A	20	20	25	20	25	32	40	50	50	60
	≤ 70 °C	A (at UC)	(1)	(1)	17	(1)	17	22	28	35	35	42
Maximum operational power ≤ 60 °C	220/230 V	kW	8	8	9	8	9	11	14	18	18	21
	240 V	kW	8	8	9	8	9	12	15	19	19	23
	380/400 V	kW	14	14	15	14	15	20	25	31	31	37
	415 V	kW	14	14	17	14	17	21	27	34	34	41
	440 V	kW	15	15	18	15	18	23	29	36	36	43
	500 V	kW	17	17	20	17	20	23	33	41	41	49
	660/690 V	kW	22	22	27	22	27	34	43	54	54	65
	1000 V	kW	–	–	–	–	–	–	–	–	–	–

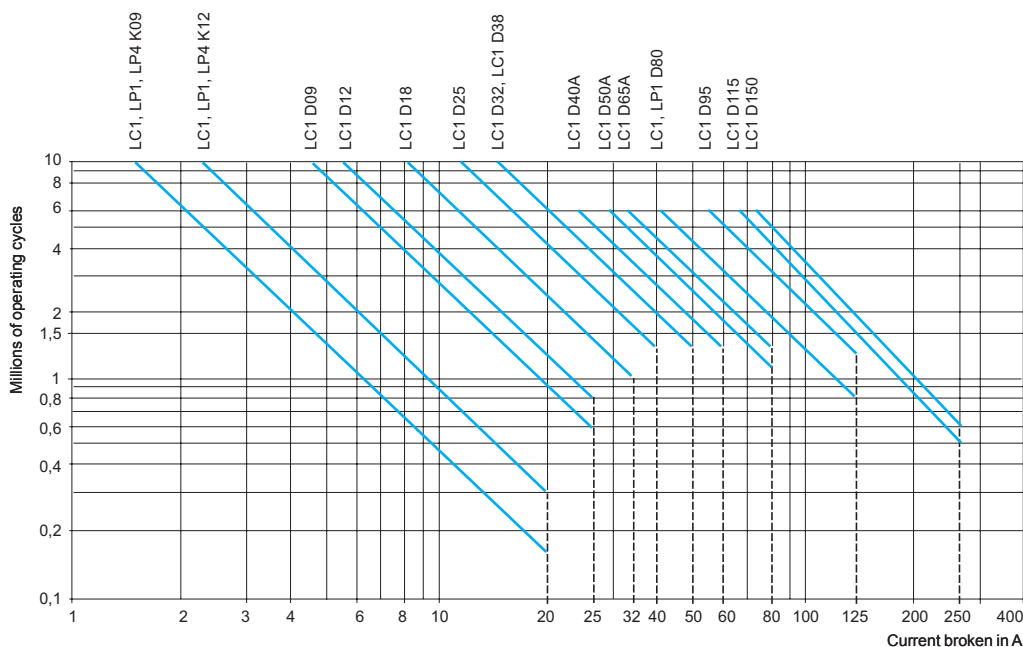
(1) Please consult your Regional Sales Office.

Increase in operational current by parallel connection of poles

Apply the following coefficients to the currents or power values given above; these coefficients take into account an often unbalanced current distribution between the poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8

Selection according to required electrical durability, in category AC-1 (U_e ≤ 440 V)



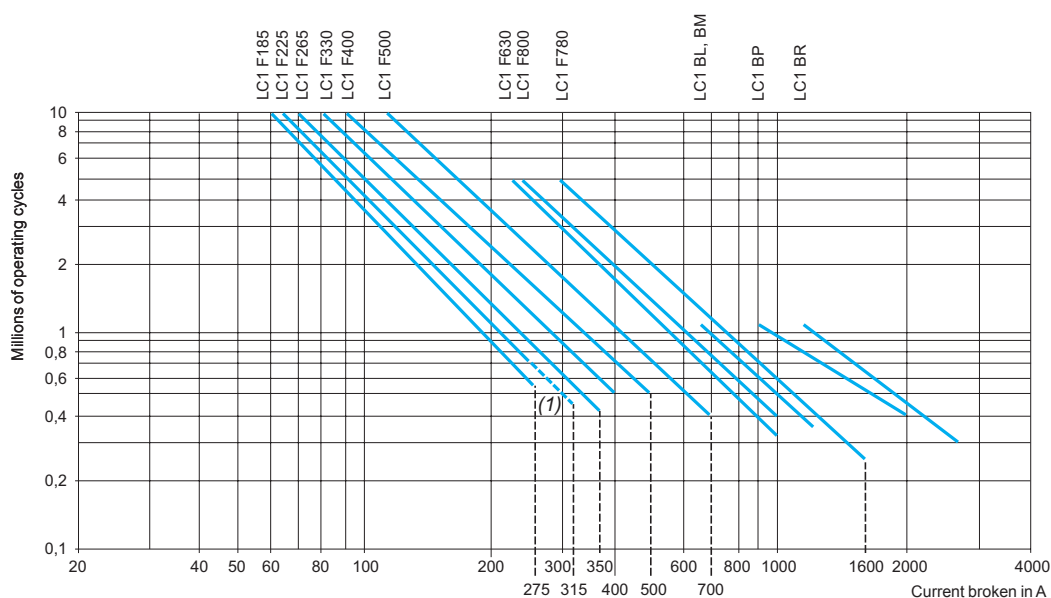
Control of resistive circuits ($\cos \phi \geq 0.95$).

The current broken (I_c) in category AC-1 is equal to the current (I_e) normally drawn by the load.

Example:

- U_e = 220 V - I_e = 50 A $\theta \leq 40$ °C - I_c = I_e = 50 A.
- 2 million operating cycles required.
- The above selection curves show the contactor rating needed: either LC1 or LP1 D50.

LC1 D50A	LC1 D65A DT80A	LC1/ LP1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	120	120	120	120
35	35	50	50	120	120	150	185	185	240	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	2 30 x 5	2 40 x 5	2 60 x 5	2 100 x 5	2 60 x 5	2 50 x 5	2 80 x 5	2 100 x 5	2 100 x 10
80	80	125	125	250	250	275	315	350	400	500	700	1000	1600	1000	800	1250	2000	2750
80	80	125	125	200	200	275	280	300	360	430	580	850	1350	850	700	1100	1750	2400
56	56	80	80	160	160	180	200	250	290	340	500	700	1100	700	600	900	1500	2000
29	29	45	45	80	80	90	100	120	145	170	240	350	550	350	300	425	700	1000
31	31	49	49	83	83	100	110	125	160	180	255	370	570	370	330	450	800	1100
50	50	78	78	135	135	165	175	210	250	300	430	600	950	600	500	800	1200	1600
54	54	85	85	140	140	170	185	220	260	310	445	630	1000	630	525	825	1250	1700
58	58	90	90	150	150	180	200	230	290	330	470	670	1050	670	550	850	1400	2000
65	65	102	102	170	170	200	220	270	320	380	660	750	1200	750	600	900	1500	2100
80	80	135	135	235	235	280	300	370	400	530	740	1000	1650	1000	800	1100	1900	2700
—	—	120	120	345	345	410	450	540	640	760	950	1500	2400	1500	1100	1700	3000	4200



Example:

- $U_e = 220\text{ V}$ - $I_e = 500\text{ A}$ - $\theta \leq 40\text{ }^\circ\text{C}$ - $I_c = I_e = 500\text{ A}$.
- 2 million operating cycles required.
- The above selection curves show the contactor rating needed: LC1 F780.

(1) The dotted lines are only applicable to LC1 F225 contactors.

Maximum breaking current

Category AC-2: slip ring motors - breaking the starting current.

Category AC-4: squirrel cage motors - breaking the starting current.

Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
In category AC-4 (Ie max)	Ue ≤ 440 V Ie max broken = 6 x I motor	A	36	54	54	54	72	108	150	192	192	240
	440 V < Ue ≤ 690 V Ie max broken = 6 x I motor	A	26	40	40	40	50	70	90	105	105	150

Depending on the maximum operating rate (1) and the on-load factor, $\theta \leq 60^\circ\text{C}$ (2)

From 150 and 15 % to 300 and 10 %	A	20	30	30	30	40	45	75	80	80	110
From 150 and 20 % to 600 and 10 %	A	18	27	27	27	36	40	67	70	70	96
From 150 and 30 % to 1200 and 10 %	A	16	24	24	24	30	35	56	60	60	80
From 150 and 55 % to 2400 and 10 %	A	13	19	19	19	24	30	45	50	50	62
From 150 and 85 % to 3600 and 10 %	A	10	16	16	16	21	25	40	45	45	53

(1) Do not exceed the maximum number of operating cycles..

(2) For temperatures higher than 60°C , use a maximum operating rate value equal to 80% of the actual value when selecting from the tables.

Counter current braking (plugging)

The current varies from the maximum plug-braking current to the rated motor current.

The making current must be compatible with the rated making and breaking capacities of the contactor.

As breaking normally takes place at a current value at or near the locked rotor current, the contactor can be selected using the criteria for categories AC-2 and AC-4.

Permissible AC-4 power rating for 200 000 operating cycles

Operational voltage			LC●/ LP● K06	LC●/ LP● K09	LC●/ LP● K12	LC● D09	LC● D12	LC● D18	LC● D25	LC● D32	LC● D38	LC● D40A
220/230 V	kW	0.75	1.1	1.1	1.5	1.5	2.2	3	4	4	4	4
380/400 V	kW	1.5	2.2	2.2	2.2	3.7	4	5.5	7.5	7.5	9	9
415 V	kW	1.5	2.2	2.2	2.2	3	3.7	5.5	7.5	7.5	9	9
440 V	kW	1.5	2.2	2.2	2.2	3	3.7	5.5	7.5	7.5	11	11
500 V	kW	2.2	3	3	3	4	5.5	7.5	9	9	11	11
660/690 V	kW	3	4	4	4	5.5	7.5	10	11	11	15	15

LC1 D50A	LC1 D65A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F26	LC1 F330	LC1 F40	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
300	390	480	570	630	830	1020	1230	1470	1800	2220	2760	3360	4260	3690	4320	5000	7500	9000

170	210	250	250	540	640	708	810	1020	1410	1830	2130	2760	2910	2910	4000	4800	5400	6600
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140	160	200	200	280	310	380	420	560	670	780	1100	1400	1600	1600	2250	3000	4500	5400
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120	148	170	170	250	280	350	400	500	600	700	950	1250	1400	1400	2000	2400	3750	5000
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100	132	145	145	215	240	300	330	400	500	600	750	950	1100	1100	1500	2000	3000	3600
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80	110	120	120	150	170	240	270	320	390	450	600	720	820	820	1000	1500	2000	2500
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70	90	100	100	125	145	170	190	230	290	350	500	660	710	710	750	1000	1500	1800
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LC● D50A	LC● D65A	LC● D80	LC● D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
5.5	7.5	7.5	9	9	11	18.5	22	28	33	40	45	55	63	63	90	110	150	200

11	11	15	15	18.5	22	33	40	51	59	75	80	100	110	110	160	160	220	250
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11	11	15	15	18.5	22	37	45	55	63	80	90	100	110	110	160	160	250	280
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11	15	15	15	18.5	22	37	45	59	63	80	100	110	132	132	160	200	250	315
----	----	----	----	------	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----

15	15	22	22	30	37	45	55	63	75	90	110	132	150	150	180	200	250	355
----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----

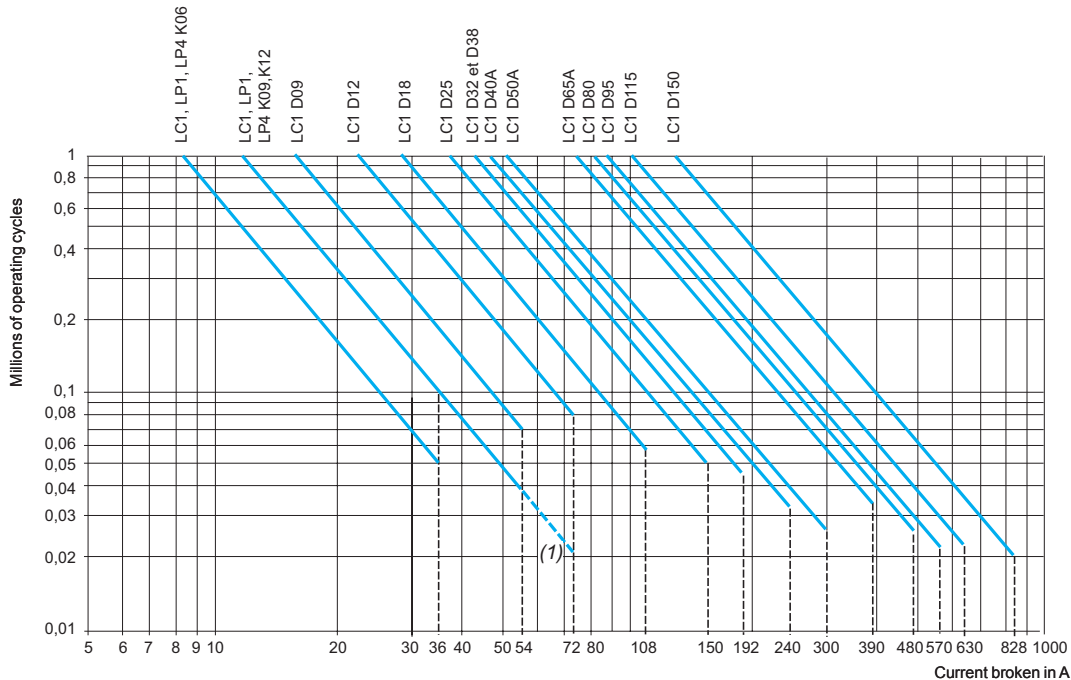
15	18.5	25	25	30	45	63	75	90	110	129	140	160	185	185	200	250	315	450
----	------	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Selection according to required electrical durability, in categories AC-2 or AC-4 ($U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors (AC-4) or slip ring motors (AC-2) with breaking whilst motor stalled.

The current broken (I_c) in AC-2 is equal to $2.5 \times I_e$.

The current broken (I_c) in AC-4 is equal to $6 \times I_e$. (I_e = rated operational current of the motor).



Example:

- Asynchronous motor with $P = 5.5$ kW - $U_e = 400$ V - $I_e = 11$ A. $I_c = 6 \times I_e = 66$ A
- or asynchronous motor with $P = 5.5$ kW - $U_e = 415$ V - $I_e = 11$ A. $I_c = 6 \times I_e = 66$ A.
- 200 000 operating cycles required.
- The above selection curves show the contactor rating needed: LC1 D25.

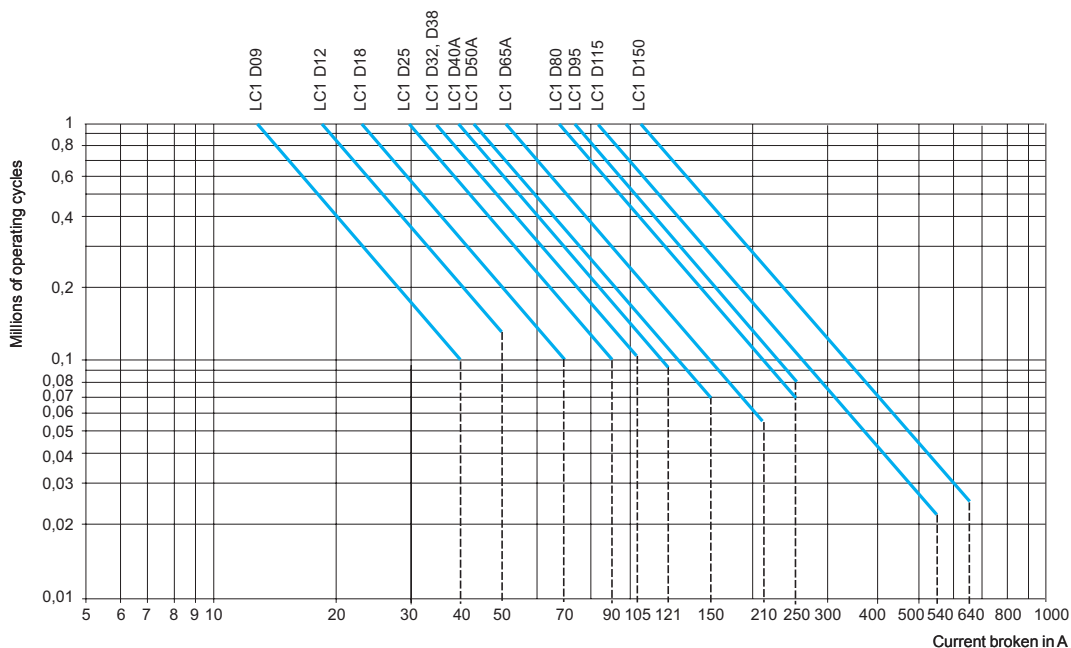
(1) The dotted lines are only applicable to LC1, LP1 K12 contactors.

Selection according to required electrical durability, use in category AC-4 (440 V < $U_e \leq 690$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst motor stalled

The current broken (I_c) in AC-2 is equal to $2.5 \times I_e$.

The current broken (I_c) in AC-4 is equal to $6 \times I_e$. (I_e = rated operational current of the motor).

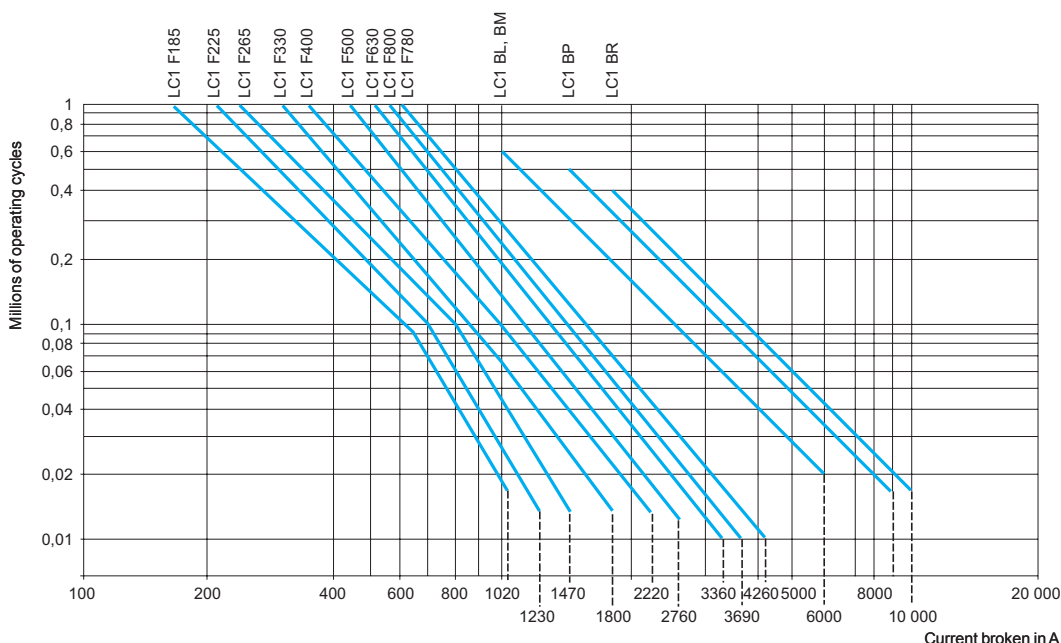


Selection according to required electrical durability, in categories AC-2 or AC-4 ($U_e \leq 440 \text{ V}$)

Control of 3-phase asynchronous squirrel cage motors (AC-4) or slip ring motors (AC-2) with breaking whilst motor stalled.

The current broken (I_c) in AC-4 is equal to $6 \times I_e$.

(I_e = rated operational current of the motor).



Example:

■ Asynchronous motor with $P = 90 \text{ kW}$ - $U_e = 380 \text{ V}$ - $I_e = 170 \text{ A}$. $I_c = 6 \times I_e = 1020 \text{ A}$

or asynchronous motor with $P = 90 \text{ kW}$ - $U_e = 415 \text{ V}$ - $I_e = 165 \text{ A}$. $I_c = 6 \times I_e = 990 \text{ A}$.

■ 60 000 operating cycles required.

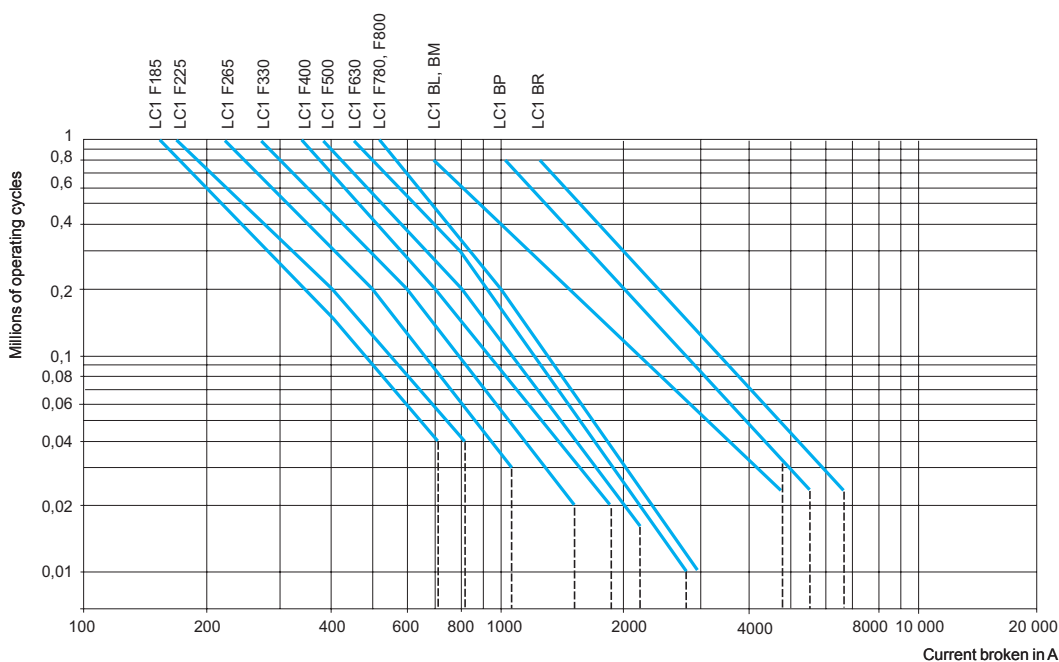
■ The above selection curves show the contactor rating needed: LC1 F265.

Selection according to required electrical durability, use in category AC-4 ($440 \text{ V} < U_e \leq 690 \text{ V}$)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst motor stalled.

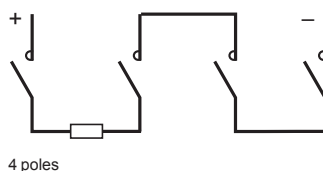
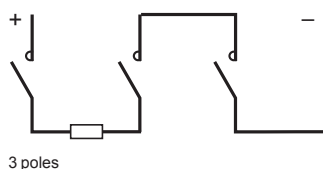
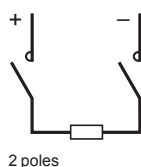
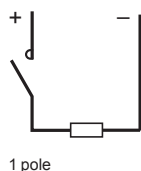
The current broken (I_c) in AC-4 is equal to $6 \times I_e$.

(I_e = rated operational current of the motor).



TeSys contactors

For utilisation categories DC-1 to DC-5



Rated operational current (I_e) in Amperes, in utilisation category DC-1, resistive loads: time constant $\frac{L}{R} \leq 1$ ms, ambient temperature ≤ 60 °C

Rated operational voltage U _e	No. of poles connected in series	Contactor rating (1)								
		LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A	LC1 DT60A
V										
24	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
48/75	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
125	1	4	4	4	4	7	7	7	7	7
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
250	1	1	1	1	1	1	1	1	1	1
	2	4	4	4	4	7	7	7	7	7
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
300	3	4	4	4	4	7	7	7	7	—
	4	—	20	20	25	32	—	—	—	50
460	1	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
900	2	—	—	—	—	—	—	—	—	—
1200	3	—	—	—	—	—	—	—	—	—
1500	4	—	—	—	—	—	—	—	—	—

Rated operational current (I_e) in Amperes, in utilisation category DC-2 to DC-5, inductive loads: time constant $\frac{L}{R} \leq 15$ ms, ambient temperature ≤ 60 °C

Rated operational voltage U _e	No. of poles connected in series	Contactor rating (1)								
		LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A	LC1 DT60A
V										
24	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
48/75	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
125	1	2	2	2	2	3	3	3	4	4
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
250	1	0,5	0,5	0,5	0,5	0,5	0,5	0,5	1	1
	2	2	2	2	2	3	3	3	4	4
	3	8	8	8	8	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
300	3	2	2	2	2	3	3	3	3	3
	4	—	8	8	8	32	—	—	—	50
460	1	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
900	2	—	—	—	—	—	—	—	—	—
1200	3	—	—	—	—	—	—	—	—	—
1500	4	—	—	—	—	—	—	—	—	—

(1) For rated operational currents of contactors LC1 and LP1 K: please consult your Regional Sales Office.

LC1 D50A	LC1 D65A	LC1 DT80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
7	7	7	12	12	12	12	210	230	270	320	380	520	760	1180	760	700	1100	1750	2400
65	65	65	100	100	200	200	210	230	270	320	380	520	760	1180	760	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
1	1,5	1,5	2	2	10	10	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
7	7	7	12	12	200	200	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
7	7	7	12	12	200	200	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1000	850	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	200	–	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400

LC1 D50A	LC1 D65A	LC1 DT80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	–	–	–	–
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
4	4	4	5	5	10	10	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
65	65	65	100	100	200	200	160	180	250	300	350	500	700	1000	700	700	1100	1750	2400
65	65	65	100	100	200	200	240	240	280	310	350	550	850	1000	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	240	280	310	350	550	850	1000	850	700	1100	1750	2400
1	1,5	1,5	1	1	3	3	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
4	4	4	5	5	200	200	140	160	220	280	310	480	680	900	680	700	1100	1750	2400
65	65	65	100	100	200	200	160	180	250	300	350	500	700	1000	700	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
3	3	3	5	5	200	200	140	160	220	280	310	480	680	900	680	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	200	–	140	160	220	280	310	480	680	800	680	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400

Selection according to required electrical durability, use in categories DC-1 to DC-5

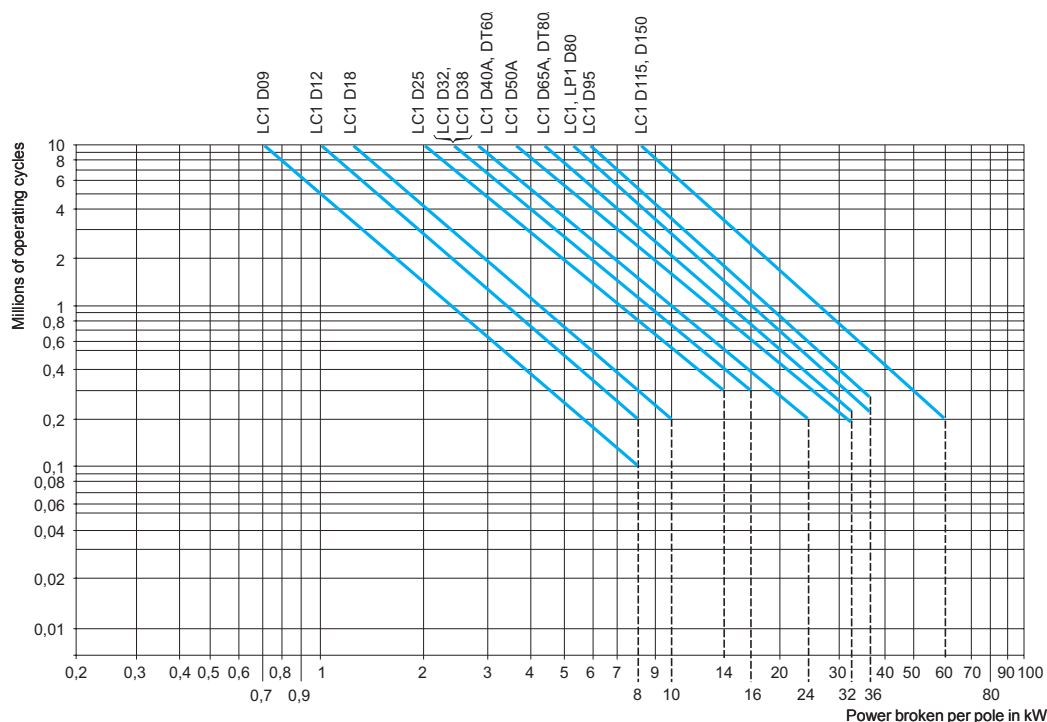
The criteria for contactor selection are:

- the rated operational current I_e ,
- the rated operational voltage U_e ,
- the utilisation category and the time constant L/R,
- the required electrical durability.

Maximum operating rate (operating cycles)

The following limits must not be exceeded: 120 operating cycles/hour at rated operational current I_e .

Electrical durability



Example

Series wound motor - $P = 1.5 \text{ kW}$ - $U_e = 200 \text{ V}$ - $I_e = 7.5 \text{ A}$. Utilisation: reversing, inching.

- Utilisation category = DC-5.
- Select contactor LC1 D09 with 3 poles in series.
- The power broken is: $P_c \text{ total} = 2.5 \times 200 \times 7.5 = 3.75 \text{ kW}$.
- The power broken per pole is: 1.25 kW .
- The electrical durability read from the curve is ≥ 3 millions of operating cycles.

Use of poles in parallel



Electrical durability can be increased by using poles connected in parallel.

With N poles connected in parallel, the electrical durability becomes: electrical durability read from the curves $\times N \times 0.7$.

Note: 1

When the poles are connected in parallel, the maximum operational currents indicated on pages 136 et 137 must not be exceeded.

Note: 2

Ensure that the connections are made in such a way as to equalise the currents in each pole.

Selection according to required electrical durability, use in categories DC-1 to DC-5

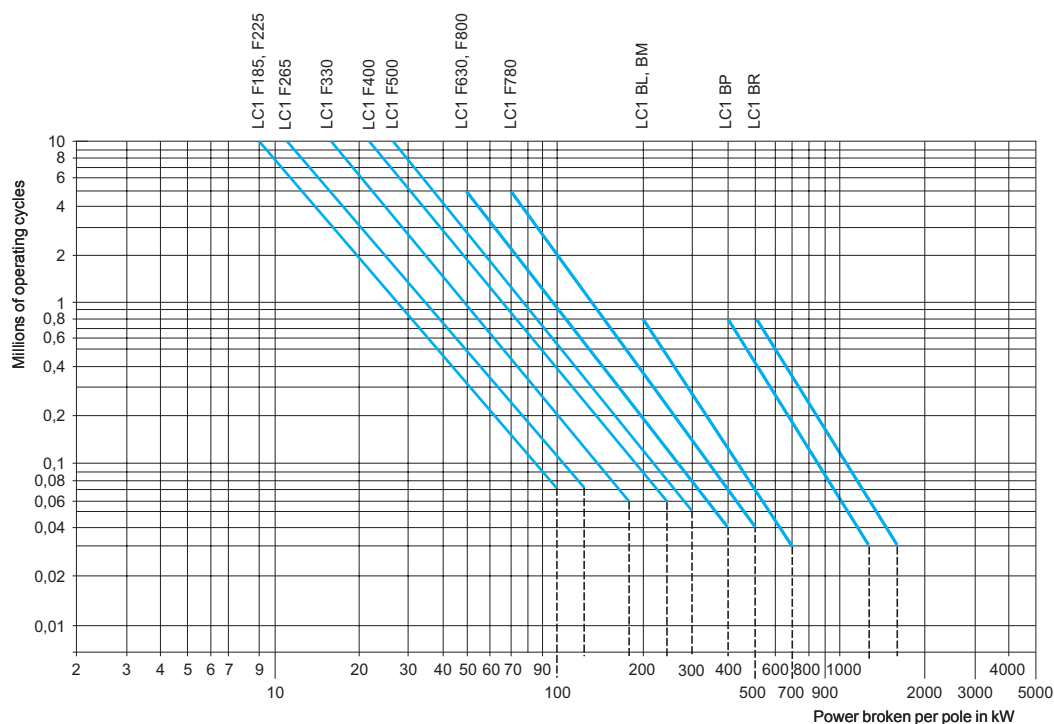
Determining the electrical durability

The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$P_{\text{broken}} = U_{\text{broken}} \times I_{\text{broken}}$

The tables below give the values of U_c and I_c for the various utilisation categories.

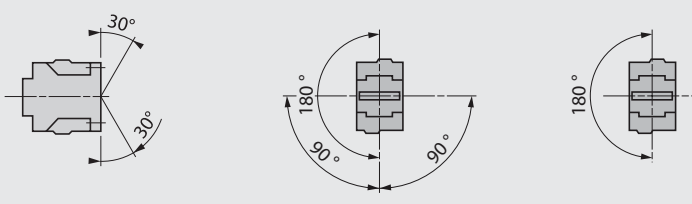
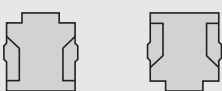
Power broken			
Utilisation categories	U_{broken}	I_{broken}	P_{broken}
DC-1 Non inductive or slightly inductive loads	U_e	I_e	$U_e \times I_e$
DC-2 Shunt wound motors, breaking whilst motor running	$0.1 U_e$	I_e	$0.1 U_e \times I_e$
DC-3 Shunt wound motors, reversing, inching	U_e	$2.5 I_e$	$U_e \times 2.5 I_e$
DC-4 Series wound motors, breaking whilst motor running	$0.3 U_e$	I_e	$0.3 U_e \times I_e$
DC-5 Series wound motors, reversing, inching	U_e	$2.5 I_e$	$U_e \times 2.5 I_e$



Example

Series wound motor: $P = 40 \text{ kW}$ - $U_e = 200 \text{ V}$ - $I_e = 200 \text{ A}$. Utilisation: reversing, inching.
Utilisation category = DC-5.

- Select contactor LC1 F265 with 2 poles in series.
- The power broken is: $P_c \text{ total} = 2.5 \times 200 \times 200 = 100 \text{ kW}$.
- The power broken per pole is 50 kW .
- The electrical durability read from the curve is 500 000 operating cycles.

Contactor type		LC1	D09...D18 DT20 and DT25	D25...D38 DT32 and DT40	D40A...D65A DT60A and DT80A	D80...D95	D115 and D150
Environment							
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1, overvoltage category III, degree of pollution: 3	V	690				1000
	Conforming to UL, CSA	V	600				
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947	kV	6				8
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508, CSA C22.2 n°14.				
Product certifications			UL, CSA (1), CCC, GOST GL, DNV, RINA, BV, LROS (pending for contactors LC1 D40A to D65A)				
Degree of protection (2) (front face only)	Conforming to VDE 0106 and IEC 60529						
	Power circuit connections		Protection against direct finger contact IP 2X				
	Coil connection		Protection against direct finger contact IP 2X				
Protective treatment	Conforming to IEC 60068-2-30		"TH"				
Ambient air temperature around the device	Storage	°C	- 60...+ 80				
	Operation	°C	- 5...+ 60				
	Permissible	°C	- 40...+ 70, for operation at Uc				
Maximum operating altitude	Without derating	m	3000				
Operating positions (3)	Without derating in the following positions						
	Positions that are not permissible		For --- contactors LC1 D09 to LC1 D65A. 				
Flame resistance	Conforming to UL 94		V1				
	Conforming to IEC 60695-2-1	°C	850				
Shock resistance (4) 1/2 sine wave = 11 ms	Contactor open		10 gn	8 gn	10 gn	8 gn	6 gn
	Contactor closed		15 gn	15 gn	15 gn	10 gn	15 gn
Vibration resistance (4) 5...300 Hz	Contactor open		2 gn				
	Contactor closed		4 gn	4 gn	4 gn	3 gn	4 gn

(1) Contactor LC1 D95 with d.c. coil is not UL/CSA certified.

(2) Protection provided for the cabling c.s.a.'s indicated on the next page and for connection by cable.

(3) When mounting on a vertical rail, use a stop.

(4) Without modifying the contact states, in the most unfavourable direction (coil energised at Ue).

Contactor type		LC1	D09 and D12 DT20 and DT25	D18 (3P)	D25 (3P)	D32	D38	D18 and D25 (4P) DT32 and DT40	D40A to D65A DT60A and DT80A (1)	D80 and D95	D115 and D150
Power circuit connections											
Screw clamp terminal connections											
Tightening			Screw clamp terminals					Connector 2 inputs	Screw clamp terminals	Connector 1 input	Connector 2 inputs
Flexible cable without cable end	1 conductor	mm²	1...4	1.5...6	2.5...10		2.5...10		1...35	4...50	10...120
	2 conductors	mm²	1...4	1.5...6	2.5...10		2.5...10		1...25 and 1...35	4...25	10...120 + 10...50
Flexible cable with cable end	1 conductor	mm²	1...4	1...6	1...10		2.5...10		1...35	4...50	10...120
	2 conductors	mm²	1...2.5	1...4	1.5...6		2.5...10		1...25 and 1...35	4...16	10...120 + 10...50
Solid cable without cable end	1 conductor	mm²	1...4	1.5...6	1.5...10		2.5...16		1...35	4...50	10...120
	2 conductors	mm²	1...4	1.5...6	2.5...10		2.5...16		1...25 and 1...35	4...25	10...120 + 10...50
Screwdriver	Philips		N° 2	N° 2	N° 2		N° 2		—	—	—
	Flat screwdriver Ø		Ø 6	Ø 6	Ø 6		Ø 6		—	Ø 6...Ø 8	—
Hexagonal key			—	—	—		—		4	4	4
Tightening torque		N.m	1.7	1.7	2.5		1.8		5: ≤ 25 mm² 8: 35 mm²	9	12
Spring terminal connections (2)											
Flexible cable without cable end	1 conductor	mm²	2.5 (4: DT25)	4	4	4	—	10	—	—	
	2 conductors	mm²	2.5 (except DT25)	4	4	4	—	—	—	—	
Connection by bars or lugs											
Bar c.s.a.			—	—	—	—	—		—	3 x 16	5 x 25
Lug external Ø		mm	8	8	10	10	8		16.5	17	25
Ø of screw		mm	M3.5	M3.5	M4	M4	M3.5		M6	M6	M8
Screwdriver	Philips		N° 2	N° 2	N° 2	N° 2	N° 2		—	—	—
	Flat screwdriver Ø		Ø 6	Ø 6	Ø 6	Ø 6	Ø 6		—	Ø 8	—
Key for hexagonal headed screw			—	—	—	—	—		10	10	13
Tightening torque		N.m	1.7	1.7	2.5	2.5	1.8		6	9	12
Control circuit connections											
Connection by cable (tightening via screw clamps)											
Flexible cable without cable end	1 conductor	mm²	1...4	1...4	1...4	1...4	1...4		1...4	1...4	1...2.5
	2 conductors	mm²	1...4	1...4	1...4	1...4	1...4		1...4	1...4	1...2.5
Flexible cable with cable end	1 conductor	mm²	1...4	1...4	1...4	1...4	1...4		1...4	1...2.5	1...2.5
	2 conductors	mm²	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5		1...2.5	1...2.5	1...2.5
Solid cable without cable end	1 conductor	mm²	1...4	1...4	1...4	1...4	1...4		1...4	1...4	1...2.5
	2 conductors	mm²	1...4	1...4	1...4	1...4	1...4		1...4	1...4	1...2.5
Screwdriver	Philips		N° 2	N° 2	N° 2	N° 2	N° 2		N° 2	N° 2	N° 2
	Flat screwdriver Ø		Ø 6	Ø 6	Ø 6	Ø 6	Ø 6		Ø 6	Ø 6	Ø 6
Tightening torque		N.m	1.7	1.7	1.7	1.7	1.7		1.7	1.2	1.2
Spring terminal connections (2)											
Flexible cable without cable end	1 conductor	mm²	2.5	2.5	2.5	2.5	—	2.5	0.75...2.5	—	—
	2 conductors	mm²	2.5	2.5	2.5	2.5	—	2.5	0.75...2.5	—	—
Connection by bars or lugs											
Lug external Ø		mm	8	8	8	8	8		8	8	8
Ø of screw		mm	M3.5	M3.5	M3.5	M3.5	M3.5		M3.5	M3.5	M3.5
Screwdriver	Philips		N° 2	N° 2	N° 2	N° 2	N° 2		N° 2	N° 2	N° 2
	Flat screwdriver Ø		Ø 6	Ø 6	Ø 6	Ø 6	Ø 6		Ø 6	Ø 6	Ø 6
Tightening torque		N.m	1.7	1.7	1.7	1.7	1.7		1.7	1.2	1.2

(1) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LAD ALLEN4**, see page 175).

(2) If cable ends are used, choose the next size down (example: for 2.5 mm², use 1.5 mm²) and square crimp the cable ends using a special tool.

Contactor type	LC1	D09 (3P)	DT20 D098	D12 (3P)	DT25 D128	D18 (3P)	DT32 D188	D25 (3P)	DT40 D258	
Pole characteristics										
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 60 °C	A	9		12		18		25	
	In AC-1, θ ≤ 60 °C	A	25 (1)	20	25 (1)	25	32 (1)	32	40 (1)	40
Rated operational voltage (Ue)	Up to	V	690		690		690		690	
Frequency limits	Of the operational current	Hz	25...400		25...400		25...400		25...400	
Conventional thermal current (Ith)	θ ≤ 60 °C	A	25 (1)	20	25 (1)	25	32 (1)	32	40 (1)	40
Rated making capacity (440 V)	Conforming to IEC 60947	A	250		250		300		450	
Rated breaking capacity (440 V)	Conforming to IEC 60947	A	250		250		300		450	
Permissible short time rating No current flowing for preceding 15 minutes with θ ≤ 40 °C	For 1 s	A	210		210		240		380	
	For 10 s	A	105		105		145		240	
	For 1 min	A	61		61		84		120	
	For 10 min	A	30		30		40		50	
Fuse protection against short-circuits (U ≤ 690 V)	Without thermal overload relay, gG fuse	type 1 type 2 A A	25 20		40 25		50 35		63 40	
	With thermal overload relay	A	See pages 208 to 211, for aM or gG fuse ratings corresponding to the associated thermal overload relay							
	Average impedance per pole	At Ith and 50 Hz	mΩ	2.5		2.5		2.5		2
Power dissipation per pole for the above operational currents	AC-3	W	0.20		0.36		0.8		1.25	
	AC-1	W	1.56		1.56		2.5		3.2	

Control circuit characteristics, a.c. supply

Rated control circuit voltage (Uc)		50/60 Hz	V	12...690	
Control voltage limits					
50 or 60 Hz coils	Operation			–	
	Drop-out			–	
50/60 Hz coils	Operation			0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C	
	Drop-out			0.3...0.6 Uc at 60 °C	
Average consumption at 20 °C and at Uc	~ 50 Hz	Inrush	50 Hz coil	VA	–
			Cos φ		0.75
		Sealed	50/60 Hz coil	VA	70
			50 Hz coil	VA	–
			Cos φ		0.3
			50/60 Hz coil	VA	7
	~ 60 Hz	Inrush	60 Hz coil	VA	–
			Cos φ		0.75
			50/60 Hz coil	VA	70
		Sealed	60 Hz coil	VA	–
			Cos φ		0.3
			50/60 Hz coil	VA	7.5
Heat dissipation		50/60 Hz	W	2...3	
Operating time (2)		Closing "C"	ms	12...22	
		Opening "O"	ms	4...19	
Mechanical durability in millions of operating cycles		50 or 60 Hz coil		–	
		50/60 Hz coil on 50 Hz		15	
Maximum operating rate at ambient temperature ≤ 60 °C		In operating cycles per hour		3600	

(1) Versions with spring terminal connections:

16 A for LC1 D093 and LC1 D123 (20 A possible with 2 x 2.5 mm² in parallel),

25 A for LC1 D183 to LC1 D323 (32 A possible for LC1 D183 connected with 2 x 4 mm² cables in parallel; 40 A possible for LC1 D253 and LC1 D323 connected with 2 x 4 mm² in parallel).

(2) The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

D32	D38	D40A	DT60A	D50A	D65A	DT80A	D80	D95	D115	D150
32	38	40	–	50	65	–	80	95	115	150
50 (1)	50	60	60	80	80	80	125	125	200	200
690	690	690	690	690	690	690	1000	1000	1000	1000
25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400
50	50	60	60	80	80	80	125	125	200	200
550	550	800	800	900	1000	1000	1100	1100	1260	1660
550	550	800	800	900	1000	1000	1100	1100	1100	1400
430	430	720	720	810	900	900	990	1100	1100	1400
260	310	320	320	400	520	520	640	800	950	1200
138	150	165	165	208	260	260	320	400	550	580
60	60	72	72	84	110	110	135	135	250	250
63	63	80	80	100	125	125	200	200	250	315
63	63	80	80	100	125	125	160	160	200	250
See pages 208 to 211 for aM or gG fuse ratings corresponding to the associated thermal overload relay										
2	2	1.5	1.6	1.5	1.5	1.6	0.8	0.8	0.6	0.6
2	3	2.4	–	3.7	6.3	–	5.1	7.2	7.9	13.5
5	5	5.4	5.8	9.6	9.6	10.2	12.5	12.5	24	24
12...690		12...690							24...500	
–		–					0.85...1.1 Uc at 55 °C			
–		–					0.3...0.6 Uc at 55 °C		0.3...0.5 Uc at 55 °C	
0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C		0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C					0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 55 °C		0.8...1.15 Uc on 50/60 Hz at 55 °C	
0.3...0.6 Uc at 60 °C		0.3...0.6 Uc at 60 °C					0.3...0.6 Uc at 55 °C		0.3...0.5 Uc at 55 °C	
–		–					200		300	–
0.75		0.75					0.75		0.8	0.9
70		160					245		280...350	280...350
–		–					20		22	–
0.3		0.3					0.3		0.3	0.9
7		15					26		2...18	2...18
–		–					220		300	–
0.75		0.75					0.75		0.8	0.9
70		140					245		280...350	280...350
–		–					22		22	–
0.3		0.3					0.3		0.3	0.9
7.5		13					26		2...18	2...18
2...3		4...5					6...10		3...8	3...4.5
12...22		12...26	12...26	12...26	12...26	12...26	20...35	20...35	20...50	20...35
4...19		4...19	4...19	4...19	4...19	4...19	6...20	6...20	6...20	40...75
–		–	–	–	–	–	10	10	8	–
15		6	6	6	6	6	4	4	8	8
3600		3600	3600	3600	3600	3600	3600	3600	2400	1200

Contactor type				LC1 D09...D38 LC1 DT20...DT40	LC1 D40A...D65A LC1 DT60 and DT80	LC1 or LP1 D80 LC1 D95	LC1 D115 and LC1 D150
d.c. control circuit characteristics							
Rated control circuit voltage (Uc)			---	V	12...440	12...440	24...440
Rated insulation voltage	Conforming to IEC 60947-1		V	690			
	Conforming to UL, CSA		V	600			
Control voltage limits	Operation	Standard coil		0.7...1.25 Uc at 60 °C	0.75...1.25 Uc at 60 °C	0.85...1.1 Uc at 55 °C	0.75...1.2 Uc at 55 °C
		Wide range coil		–	–	0.75...1.2 Uc at 55 °C	–
	Drop-out			0.1...0.25 Uc at 60 °C	0.1...0.3 Uc at 60 °C	0.1...0.3 Uc at 55 °C	0.15...0.4 Uc at 55 °C
Average consumption at 20 °C and at Uc	---	Inrush	W	5.4	19	22	270...365
		Sealed	W	5.4	7.4	22	2.4...5.1
Operating time (1) average at Uc	Closing	"C"	ms	63 ± 15 %	50 ± 15%	95...130	20...35
	Opening	"O"	ms	20 ± 20 %	20 ± 20%	20...35	40...75
				Note: The arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.			
Time constant (L/R)			ms	28	34	75	25
Mechanical durability at Uc	In millions of operating cycles			30	10	10	8
Maximum operating rate at ambient temperature ≤ 60 °C	In operating cycles per hour			3600	3600	3600	1200
Low consumption control circuit characteristics							
Rated insulation voltage	Conforming to IEC 60947-1		V	690	–		
	Conforming to UL, CSA		V	600	–		
Maximum voltage	Of the control circuit on ---		V	250	–		
Average consumption d.c. at 20 °C and at Uc	Wide range coil (0.7...1.25 Uc)	Inrush	W	2.4	–		
		Sealed	W	2.4	–		
Operating time (1) at Uc and at 20 °C	Closing	"C"	ms	77 ± 15 %	–		
	Opening	"O"	ms	25 ± 20 %	–		
Voltage limits (θ ≤ 60 °C) of the control circuit	Operation			0.8 to 1.25 Uc	–		
	Drop-out			0.1...0.3 Uc	–		
Time constant (L/R)			ms	40	–		
Mechanical durability	In millions of operating cycles			30	–		
Maximum operating rate at ambient temperature ≤ 60 °C	In operating cycles per hour			3600	–		

(1) The operating times depend on the type of contactor electromagnet and its control mode.

The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.

The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate

Characteristics of auxiliary contacts incorporated in the contactor				
Mechanically linked contacts	Conforming to IEC 60947-5-1			Each contactor has 2 N/O and N/C contacts mechanically linked on the same movable contact holder
Mirror contact	Conforming to IEC 60947-4-1			The N/C contact on each contactor represents the state of the power contacts and can be connected to a PREVENTA safety module
Rated operational voltage (U_e)	Up to	V		690
Rated insulation voltage (U_i)	Conforming to IEC 60947-1	V		690
	Conforming to UL, CSA	V		600
Conventional thermal current (I_{th})	For ambient temperature ≤ 60 °C	A		10
Frequency of the operational current		Hz		25...400
Minimum switching capacity λ = 10⁻⁶	U min	V		17
	I min	mA		5
Short-circuit protection	Conforming to IEC 60947-5-1			gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1, I _{rms}	A		~: 140, ---: 250
Short-time rating	Permissible for	1 s	A	100
		500 ms	A	120
		100 ms	A	140
Insulation resistance		MΩ		> 10
Non-overlap time	Guaranteed between N/C and N/O contacts	ms		1.5 (on energisation and on de-energisation)

Operational power of contacts
conforming to IEC 60947-5-1

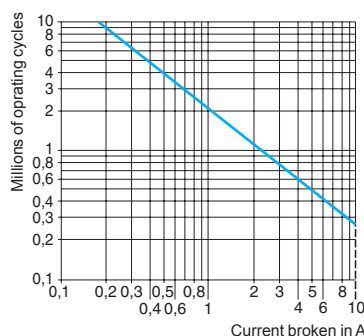
1 million operating cycles
3 million operating cycles
10 million operating cycles

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

V	24	48	115	230	400	440	600
VA	60	120	280	560	960	1050	1440
VA	16	32	80	160	280	300	420
VA	4	8	20	40	70	80	100

AC-15

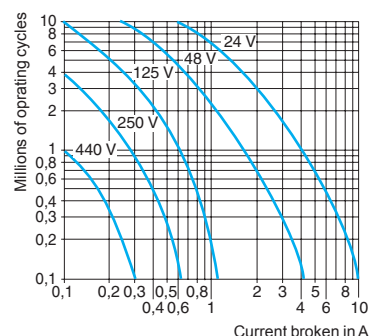


d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

V	24	48	125	250	440
W	96	76	76	76	44
W	48	38	38	32	—
W	14	12	12	—	—

DC-13



Contact block type			LAD N or LAD C	LAD T and LAD S	LAD R	LAD 8
Environment						
Conforming to standards			IEC 60947-5-1, NF C 63-140, VDE 0660, BS 4794, EN 60947-5-1			
Product certifications			UL, CSA			
Protective treatment	Conforming to IEC 60068		“TH”			
Degree of protection	Conforming to VDE 0106		Protection against direct finger contact IP 2X			
Ambient air temperature around the device	Storage	°C	- 60...+ 80			
	Operation	°C	- 5...+ 60			
	Permissible for operation at U _c	°C	- 40...+ 70			
Maximum operating altitude	Without derating	m	3000			
Connection by cable	Phillips N° 2 and Ø 6 mm Flexible or solid cable with or without cable end	mm²	Min: 1 x 1; max: 2 x 2.5			
Spring terminal connections	Flexible or solid cable without cable end	mm²	Max: 2 x 2.5			
Instantaneous and time delay contact characteristics						
Number of contacts			1, 2 or 4	2	2	2
Rated operational voltage (U _e)	Up to	V	690			
Rated insulation voltage (U _i)	Conforming to IEC 60947-5-1	V	690			
	Conforming to UL, CSA	V	600			
Conventional thermal current (I _{th})	For ambient temperature ≤ 60 °C	A	10			
Frequency of the operational current		Hz	25...400			
Minimum switching capacity	U min	V	17			
	I min	mA	5			
Short-circuit protection	Conforming to IEC 60947-5-1 and VDE 0660. gG fuse	A	10			
Rated making capacity	Conforming to IEC 60947-5-1	I rms	~: 140; ---: 250			
Short-time rating	Permissible for	1 s	100			
		500 ms	120			
		100 ms	140			
Insulation resistance		MΩ	> 10			
Non-overlap time	Guaranteed between N/C and N/O contacts	ms	1.5 (on energisation and on de-energisation)			
Overlap time	Guaranteed between N/C and N/O contacts on LAD C22	ms	1.5	–	–	–
Time delay (LADT, R and S contact blocks) Accuracy only valid for setting range indicated on the front face	Ambient air temperature for operation	°C	–	- 40...+ 70	- 40...+ 70	–
	Repeat accuracy		–	± 2 %	± 2 %	–
	Drift up to 0.5 million operating cycles		–	+ 15 %	+ 15 %	–
	Drift depending on ambient air temperature		–	0.25 % per °C	0.25 % per °C	–
Mechanical durability	In millions of operating cycles		30	5	5	30
Operational power of contacts			See page 148			

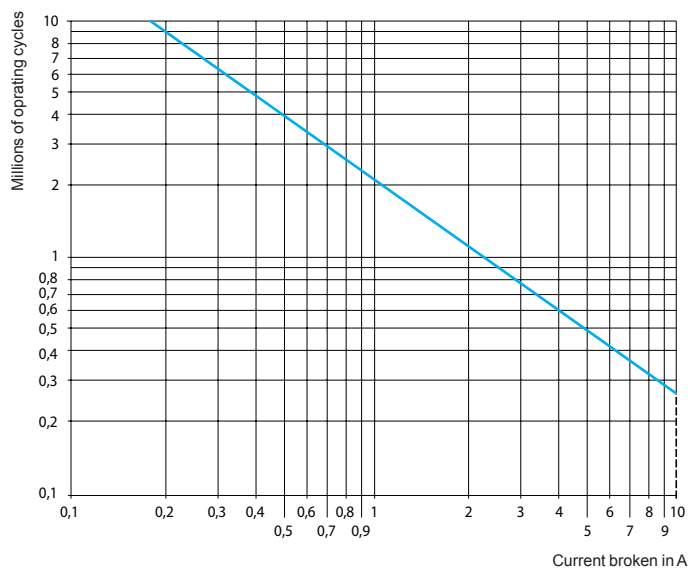
Contact block type			LA1 DX	LA1 DZ		LA1 DY
				Protected	Non protected	
Environment						
Conforming to standards			IEC60947-5-1, VDE0660			
Product certifications			UL, CSA			
Protective treatment	Conforming to IEC 60068		“TH”			
Degree of protection	Conforming to VDE 0106		Protection against direct finger contact IP 2X			
Ambient air temperature	Storage and operation	°C	- 25...+ 70			
Cabling	Phillips N° 2 and Ø 6 mm Flexible or solid conductor with or without cable end	mm²	Min: 1 x 1; max: 2 x 2.5			
Number of contacts			2	2	2	2
Contact characteristics						
Rated operational voltage (Ue)	Up to	V	50	50	690	24
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1	V	250	250	690	250
	Conforming to UL, CSA	V	–	–	600	–
Conventional thermal current (Ith)	For ambient temperature ≤ 40 °C	A	–	–	10	–
Maximum operational current (Ie)		mA	500	500	–	50
Frequency of the operational current		Hz	–	–	25...400	–
Minimum switching capacity	U min	V	3	3	3	3
	I min	mA	0.3	0.3	0.3	0.3
Short-circuit protection	Conforming to IEC 609475-1 gG fuse	A	–	–	10	–
Rated making capacity	Conforming to IEC 609475-1	I rms	A	–	–	~:140; ∴: 250
Short-time rating	Permissible for	1 s	A	–	–	100
		500 ms	A	–	–	120
		100 ms	A	–	–	140
Insulation resistance		MΩ	> 10	> 10	> 10	> 10
Mechanical durability	In millions of operating cycles		5	5	30	5
Materials and technology used for dust and damp protected contacts			Silver - Single break	Silver - Single break	–	Gold - Single break with crossed bars

Rated operational power of contacts (conforming to IEC 60947-5-1)

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ($\cos \varphi 0.7$) = 10 times the power broken ($\cos \varphi 0.4$).

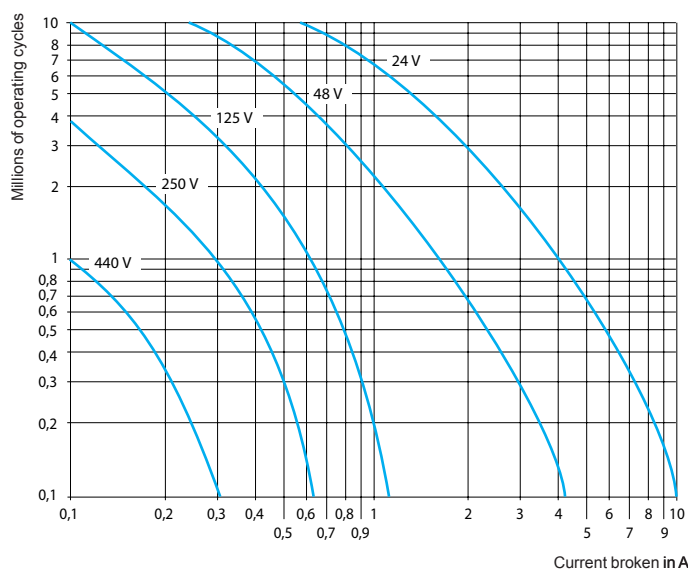
	V	24	48	115	230	400	440	600
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100



d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	125	250	440
1 million operating cycles	W	120	90	75	68	61
3 million operating cycles	W	70	50	38	33	28
10 million operating cycles	W	25	18	14	12	10



Environment			
Conforming to standards			IEC 60947-5-1
Product certifications			UL, CSA
Protective treatment	Conforming to IEC 60068		"TH"
Degree of protection	Conforming to VDE 0106		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	°C	– 40...+ 80
	Operation	°C	– 25...+ 55
	Permissible for operation at U _c	°C	– 25...+ 70

Suppressor modules						
Module type			LA4 DA, LAD 4RC, LAD 4RC3	LA4 DB, LAD 4T, LAD 4T3	LA4 DC, LAD 4D3	LA4 DE, LAD 4V, LAD 4V3
Type of protection			RC circuit	Bidirectional peak limiting diode	Diode	Varistor
Rated control circuit voltage (U _c)		V	~ 24...415	~ or ~ 24...440	~ 12...250	~ or ~ 24...250
Maximum peak voltage			3 U _c	2 U _c	U _c	2 U _c
Natural RC frequency	24/48 V	Hz	400	–	–	–
	50/127 V	Hz	200	–	–	–
	110/240 V	Hz	100	–	–	–
	380/415 V	Hz	150	–	–	–

Mechanical latch blocks (1)						
Mechanical latch block type			LAD 6K10		LA6 DK20	
For use on contactor			LC1 D09...D65A DT20...DT80A		LC1 D80...D150 LP1 D80 and LC1 D115	
Product certifications			UL, CSA		UL, CSA	
Rated insulation voltage	Conforming to IEC 60947-5-1	V	690		690	
Rated control circuit voltage	~ 50/60 Hz and ~	V	24...415		24...415	
Power required	For unlatching	~	VA	25	25	
		~	W	30	30	
Maximum operating rate	In operating cycles/hour		1200		1200	
On-load factor			10 %		10 %	
Mechanical durability at U _c	In millions of operating cycles		0.5		0.5	

(1) Unlatching can be manually operated or electrically controlled (pulsed).

The LA6 DK or LAD 6K latch coil and the LC1 D operating coil must not be energised simultaneously.

The duration of the LA6 DK or LAD 6K and LC1 D control signals must be ≥ 100 ms.

Module type		LA4 DT (On-delay)	
Environment			
Conforming to standards			IEC 60255-5
Product certifications			UL, CSA
Protective treatment	Conforming to IEC 60068		“TH”
Degree of protection	Conforming to VDE 0106		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	°C	– 40...+ 80
	Operation	°C	– 25...+ 55
	For operation at Uc	°C	– 25...+ 70
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	250
Cabling	Phillips n° 2 and Ø 6 mm Flexible or solid conductor with or without cable end	mm²	Min: 1 x 1; max: 2 x 2.5

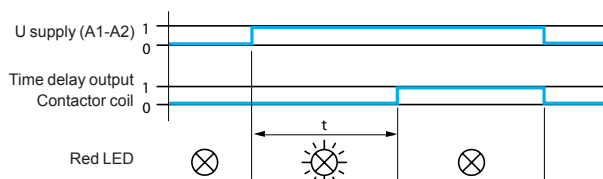
Control circuit characteristics			
Built-in protection	Of the input		By varistor
	Contact coil suppression		By varistor
Rated control circuit voltage (U _c)		V	~ or --- : 24...250
Permissible variation			0.8...1.1 U _c
Type of control			By mechanical contact only

Timing characteristics			
Timing ranges		s	0.1...2; 1.5...30; 25...500
Repeat accuracy	0...40 °C		± 3 % (10 ms minimum)
Reset time	During time delay period	ms	150
	After time delay period	ms	50
Immunity to microbreaks	During time delay period	ms	10
	After time delay period	ms	2
Minimum control pulse duration		ms	–
Time delay signalling	By LED		Illuminates during time delay period

Switching characteristics (solid state type)			
Maximum power dissipated		W	2
Leakage current		mA	< 5
Residual voltage		V	3.3
Overvoltage protection			3 kV; 0.5 joule
Electrical durability	In millions of operating cycles		30

Function diagram

Electronic on-delay timer LA4 DT



Environment								
Conforming to standards				IEC 60255-5				
Product certifications				UL, CSA				
Protective treatment	Conforming to IEC 60068			“TH”				
Degree of protection	Conforming to VDE 0106			Protection against direct finger contact IP 2X				
Ambient air temperature around the device	Storage	°C	– 40...+ 80					
	Operation	°C	– 25...+ 55					
	Permissible for operation at U _c	°C	– 25...+ 70					
Other characteristics								
Module type			LA4 DFB With relay		LA4 DWB Solid state			
Conventional thermal current (I _{th})	For ambient temperature ≤ 50 °C		A	8				
Rated insulation voltage	Conforming to IEC 60947-5-1		V	250				
Rated operational voltage	Conforming to IEC 60947-5-1		V	250				
Indication of input state				By integral LED which illuminates when the contactor coil is energised				
Input signals	Control voltage (E1-E2)		V	~ 24	~ 24			
	Permissible variation		V	17...30	5...30			
	Current consumption at 20 °C		mA	25	8.5 for 5 V 15 for 24 V			
	State “0” guaranteed for	U	V	< 2.4	< 2.4			
		I	mA	< 2	< 2			
	State “1” guaranteed for	U	V	17	5			
Built-in protection	Against reversed polarity			By diode	By diode			
	Of the input			By diode	By diode			
Electrical durability at 220 A/240 V	In millions of operating cycles			10	20			
Maximum immunity to microbreaks			ms	4	1			
Power dissipated	At 20 °C		W	0.6	0.4			
Direct mounting on contactor	With coil	~ 24...250 V		LC1 D80...D150	–			
		~ 100...250 V		–	LC1 D80...D115			
		~ 380...415 V		–	–			
Mounting with cabling adapter LAD 4BB	With coil	~ 24...250 V		LC1 D09...D38, LC1 DT20...DT40	LC1 D09...D38, LC1 DT20...DT40			
		~ 380...415 V		–	–			
Mounting with cabling adapter LAD 4BB3	With coil	~ 24...250 V		LC1 D40A...D65A	LC1 D40A...D65A			
		~ 380...415 V		LC1 D40A...D65A	LC1 D40A...D65A			
Total operating time at U _c (of the contactor)			The operating times depend on the type of contactor electromagnet and its control mode. The closing time “C” is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time “O” is measured from the moment the coil supply is switched off to the moment the main poles separate.					
				LC1 D09...D38, LC1 DT20...DT40	LC1 D40A...D65A	LC1 D80 and D95		
			With LA4 DFB	“C”	ms	20...30	28...34	28...43
				“O”	ms	16...24	20...24	18...32
Cabling	Phillips N° 2 and Ø 6 mm Flexible or solid cable with or without cable end		mm ²	Min: 1 x 1; max: 2 x 2.5				

TeSys contactors

TeSys D contactors for motor control
up to 75 kW at 400 V, in category AC-3
For connection by screw clamp terminals and lugs



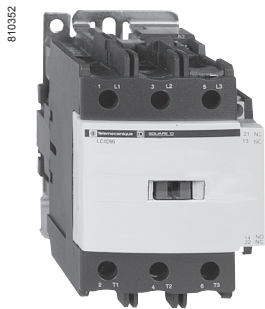
LC1 D09●●



LC1 D25●●



LC1 D65A●●



LC1 D95●●



LC1 D115●●

3-pole contactors

Standard power ratings of 3-phase motors
50-60 Hz in category AC-3
($\theta \leq 60^\circ\text{C}$)

Rated oper-
ational
current
in AC-3
440 V
up to

Instan-
taneous
auxiliary
contacts

Basic reference,
to be completed by adding
the control voltage code (2)

Weight
(3)

220 V 380 V 415 V 440 V 500 V 660 V 1000 V
230 V 400 V 690 V

Fixing (1)

kW kW kW kW kW kW kW A kg

Connection by screw clamp terminals

2.2	4	4	4	5.5	5.5	—	9	1	1	LC1 D09●●	0.320
3	5.5	5.5	5.5	7.5	7.5	—	12	1	1	LC1 D12●●	0.325
4	7.5	9	9	10	10	—	18	1	1	LC1 D18●●	0.330
5.5	11	11	11	15	15	—	25	1	1	LC1 D25●●	0.370
7.5	15	15	15	18.5	18.5	—	32	1	1	LC1 D32●●	0.375
9	18.5	18.5	18.5	18.5	18.5	—	38	1	1	LC1 D38●●	0.380

Power connections by EverLink® BTR screw connectors (4) and control by spring terminals

11	18.5	22	22	22	30	—	40	1	1	LC1 D40A●● (5)	0.850
15	22	25	30	30	33	—	50	1	1	LC1 D50A●● (5)	0.855
18.5	30	30	30	37	37	—	65	1	1	LC1 D65A●● (5)	0.860

Connection by screw clamp terminals or connectors

22	37	45	45	55	45	45	80	1	1	LC1 D80●●	1.590
25	45	45	45	55	45	45	95	1	1	LC1 D95●●	1.610
30	55	59	59	75	80	65	115	1	1	LC1 D115●●	2.500
40	75	80	80	90	100	75	150	1	1	LC1 D150●●	2.500

Connection by lugs or bars

In the references selected above, insert a figure 6 before the voltage code.

Example: LC1 D09●● becomes LC1 D096●●.

Separate components

Auxiliary contact blocks and add-on modules: see pages 168 to 175.

- (1) LC1 D09 to D65A: clip-on mounting on 35 mm rail AM1 DP or screw fixing.
LC1 D80 to D95: clip-on mounting on 35 mm rail AM1 DP or 75 mm rail AM1 DL or screw fixing.
LC1 D80 to D95: clip-on mounting on 75 mm rail AM1 DL or screw fixing.
LC1 D115 and D150: clip-on mounting on 2 x 35 mm rails AM1 DP or screw fixing.

- (2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply

Volts 24 42 48 110 115 220 230 240 380 400 415 440 500

LC1 D09...D150 (D115 and D150 coils with built-in suppression as standard, by bi-directional peak limiting diode).

50/60 Hz B7 D7 E7 F7 FE7 M7 P7 U7 Q7 V7 N7 R7 S7

LC1 D80...D115

50 Hz B5 D5 E5 F5 FE5 M5 P5 U5 Q5 V5 N5 R5 S5

60 Hz B6 — E6 F6 — M6 — U6 Q6 — — R6 —

d.c. supply

Volts 12 24 36 48 60 72 110 125 220 250 440

LC1 D09...D65A (coils with integral suppression device fitted as standard)

U 0.75...1.25 Uc JD BD CD ED ND SD FD GD MD UD RD

LC1 D80...D95

U 0.85...1.1 Uc JD BD CD ED ND SD FD GD MD UD RD

U 0.75...1.2 Uc JW BW CW EW — SW FW — MW — —

LC1 D115 and D150 (coils with integral suppression device fitted as standard)

U 0.75...1.2 Uc — BD — ED ND SD FD GD MD UD RD

Low consumption

Volts 5 12 20 24 48 110 220 250

LC1 D09...D38 (coils with integral suppression device fitted as standard)

U 0.8...1.25 Uc AL JL ZL BL EL FL ML UL

For other voltages between 5 and 690 V, see pages 176 to 181.

- (3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1 D09 to D38, 0.075 kg from LC1 D40A to D65A and 1 kg for LC1 D80 and D95.

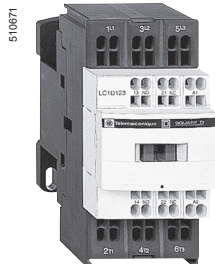
- (4) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LAD ALLEN4, see page 175).

- (5) For low consumption kit LA4 DBL (see page 173).

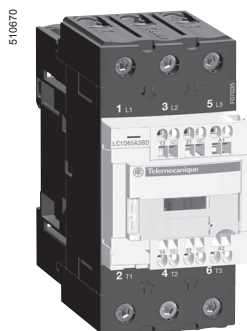
TeSys contactors

TeSys D contactors for motor control
up to 30 kW at 400 V, in category AC-3

For connection by spring terminals



LC1 D123●●



LC1 D65A3●●

3-pole contactors

Standard power ratings of 3-phase motors
50-60 Hz in category AC-3
($\theta \leq 60^\circ\text{C}$)

Rated
oper-
ational
current
in AC-3
440 V
up to

Instan-
taneous
auxiliary
contacts

Basic reference,
to be completed by adding
the control voltage code (2)

Weight
(3)

220 V 380 V 415 V 440 V 500 V 660 V 1000 V
230 V 400 V 690 V

Fixing (1)

kW	kW	kW	kW	kW	kW	kW	A				kg
Power and control connections by spring terminals											
2.2	4	4	4	5.5	5.5		9	1	1	LC1 D093●●	0.320
3	5.5	5.5	5.5	7.5	7.5		12	1	1	LC1 D123●●	0.325
4	7.5	9	9	10	10		18	1	1	LC1 D183●●	0.330
5.5	11	11	11	15	15		25	1	1	LC1 D253●●	0.370
7.5	15	15	15	18.5	18.5		32 (4)	1	1	LC1 D323●●	0.375

Power connections by EverLink® BTR screw connectors (5) and control by spring terminals

11	18.5	22	22	30	30		40	1	1	LC1 D40A3●● (6)	0.850
15	22	25	30	30	33		50	1	1	LC1 D50A3●● (6)	0.855
18.5	30	30	30	37	37		65	1	1	LC1 D65A3●● (6)	0.860

Connection by Faston connectors

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil and auxiliary terminals.

For contactors LC1 D09 and LC1 D12 only, replace the figure 3 with a 9 in the references selected above.

Example: LC1 D093●● becomes LC1 D099●●.

Separate components

Auxiliary contact blocks and add-on modules: see pages 168 to 175.

(1) LC1 D09 to D32: clip-on mounting on 35 mm rail AM1 DP or screw fixing.

(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440
LC1 D09...D65A												
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
-------	----	----	----	----	----	----	-----	-----	-----	-----	-----

LC1 D09...D65A (coils with built-in suppression as standard, by bi-directional peak limiting diode)

U 0.75...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
------------------	----	----	----	----	----	----	----	----	----	----	----

Low consumption

Volts ---	5	12	20	24	48	110	220	250
-----------	---	----	----	----	----	-----	-----	-----

LC1 D09...D32 (coils with integral suppression device fitted as standard)

U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL
-----------------	----	----	----	----	----	----	----	----

For other voltages between 5 and 690 V, see pages 176 to 181.

(3) The weights indicated are for contactors with a.c. control circuit.

For d.c. or low consumption control circuit, add 0.160 kg from LC1 D09 to D32 and 0.075 kg from LC1 D40A to D65A.

(4) Must be wired with 2 x 4 mm² cables in parallel on the upstream side. On the downstream side, outgoing terminal block LAD 331 may be used (Quickfit technology, see page 227). When wired with a single cable, the product is limited to 25 A (11 kW/400 V motors).

(5) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LAD ALLEN4, see page 175).

(6) For low consumption kit LA4 DBL (see page 173).

TeSys contactors

TeSys D, 3-pole contactors

for control in category AC-1, from 25 to 200 A

810356



LC1 D09●●

108896



LC1 D65A●●

3-pole contactors

Non inductive loads maximum current ($\theta \leq 60^\circ\text{C}$) utilisation category AC-1	Number of poles	Instan- taneous auxiliary contacts	Basic reference, to be completed by adding the control voltage code (1)	Weight (3)
			Fixing (2)	
A				kg
Connection by screw clamp terminals				
25	3	1	1	LC1 D09●● 0.320
			or	LC1 D12●● 0.325
32	3	1	1	LC1 D18●● 0.330
40	3	1	1	LC1 D25●● 0.370
50	3	1	1	LC1 D32●● 0.375
			or	LC1 D38●● 0.380

Connection by EverLink®, BTR screw connectors (4)

60	3	1	1	LC1 D40A●● (7)	0.850
80	3	1	1	LC1 D50A●● (7)	0.855
			or	LC1 D65A●● (5) (7)	0.860

Connection by screw clamp terminals or connectors

125	3	1	1	LC1 D80●● 1.590
			or	LC1 D95●● (5) 1.610
200	3	1	1	LC1 D115●● 2.500
			or	LC1 D150●● (6) 2.500

3-pole contactors for connection by lugs

In the references selected above, insert a figure 6 before the voltage code.

Example: LC1 D09●● becomes LC1 D096●●.

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1 D09...D150 (coils D115 and D150 fitted with integral suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	—
LC1 D80...D150													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1 D09...D65A (coils with integral suppression device fitted as standard)											
U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1 or LP1 D80 and D95											
U 0.85...1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75...1.2 Uc	JW	BW	CW	EW	—	SW	FW	—	MW	—	—
LC1 D115 and D150 (coils with integral suppression device fitted as standard)											
U 0.75...1.2 Uc	—	BD	—	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts	5	12	20	24	48	110	220	250
LC1 D09...D38 (coils with integral suppression device fitted as standard)								
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages 176 to 181.

(2) LC1 D09 to D65A: clip-on mounting on 35 mm rail AM1 DP or screw fixing.

LC1 D80 and D95: clip-on mounting on 35 mm rail AM1 DP or 75 mm rail AM1 DL or screw fixing.

LC1 or LP1 D80 to D95: clip-on mounting on 75 mm rail AM1 DL or screw fixing.

LC1 D115 and D150: clip-on mounting on 2 x 35 mm rails AM1 DP or screw fixing.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1 D09 to D38, 0.075 kg from LC1 D40 to D65 and 1 kg for LC1 D80 and D95.

(4) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LAD ALLEN4, see page 175).

(5) Selection according to the number of operating cycles, see AC-1 curve, page 130.

(6) 32 A with 2 x 4 mm² cables connected in parallel.

(7) For low consumption kit LA4 DBL (see page 173).



LC1 D123●●





LC1 D65A3●●

3-pole contactors for connection by Faston connectors

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil terminals. For contactors LC1 D09 and LC1 D12 only, in the references selected from the previous page, insert a figure 9 before the voltage code. Example: **LC1 D09●●** becomes **LC1 D099●●**.

3-pole contactors

Non inductive loads maximum current ($\theta \leq 60\text{ }^{\circ}\text{C}$) utilisation category AC-1	Number of poles	Instan- taneous auxiliary contacts		Basic reference, to be completed by adding the control voltage code (1)	Weight (3)
				Fixing (2)	
A					kg
Connection by spring terminals					
16	3	1	1	LC1 D093●● (4)	0.320
				or LC1 D123●● (4)	0.325
25	3	1	1	LC1 D183●● (5)	0.335
				or LC1 D253●● (6)	0.325
				or LC1 D323●● (6)	0.325

Power connections by EverLink® BTR screw connectors and control by spring terminals

60	3	1	1	LC1 D40A3●● (8)	0.850
80	3	1	1	LC1 D50A3●● (7) (8)	0.855
				or LC1 D65A3●● (7) (8)	0.860

Separate components

Auxiliary contact blocks and add-on modules: see pages 168 to 175.

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply													
Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1 D09...D150 (coils D115 and D150 fitted with integral suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	–
LC1 D80...D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	–	E6	F6	–	M6	–	U6	Q6	–	–	R6	–
d.c. supply													
Volts	12	24	36	48	60	72	110	125	220	250	440		
LC1 D09...D65A (coils with integral suppression device fitted as standard)													
U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD		
LC1 or LP1 D80 and LC1 D95													
U 0.85...1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD		
U 0.75...1.2 Uc	JW	BW	CW	EW	–	SW	FW	–	MW	–	–		
LC1 D115 and D150 (coils with integral suppression device fitted as standard)													
U 0.75...1.2 Uc	–	BD	–	ED	ND	SD	FD	GD	MD	UD	RD		
Low consumption													
Volts –	5	12	20	24	48	110	220	250					
LC1 D09...D38 (coils with integral suppression device fitted as standard)													
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL					

For other voltages between 5 and 690 V, see pages 176 to 181.

(2) **LC1 D09 to D65A**: clip-on mounting on 35 mm rail **AM1 DP** or screw fixing.

LC1 D80 and D95: clip-on mounting on 35 mm rail **AM1 DP** or 75 mm rail **AM1 DL** or screw fixing.

LC1 or LP1 D80 and D95: clip-on mounting on 75 mm rail **AM1 DL** or screw fixing.

LC1 D115 and D150: clip-on mounting on 2 x 35 mm rails **AM1 DP** or screw fixing.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1 D09 to D38** and 0.075 kg from **LC1 D40A to D65A**.

(4) 20 A with 2 x 2.5 mm² cables connected in parallel.

(5) 32 A with 2 x 4 mm² cables connected in parallel.

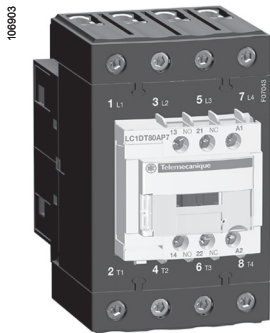
(6) 40 A with 2 x 4 mm² cables connected in parallel.

(7) Selection according to the number of operating cycles, see AC-1 curve, page 130.

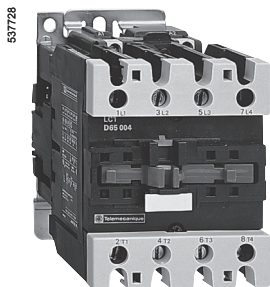
(8) For low consumption kit **LA4 DBL** (see page 173).



LC1 DT20●●




LC1 DT80A●●



LC1 D65008●●

4-pole contactors for connection by screw clamp terminals or connectors

Non inductive loads maximum current ($\theta \leq 60\text{ }^{\circ}\text{C}$) utilisation category AC-1	Number of poles	Instan- taneous auxiliary contacts		Basic reference, to be completed by adding the control voltage code (1)	Weight (3)	
				Fixing (2)		
A					kg	
Connection by screw clamp terminals						
20	4	–	1	1	LC1 DT20●●	0.365
	2	2	1	1	LC1 D098●●	0.365
25	4	–	1	1	LC1 DT25●●	0.365
	2	2	1	1	LC1 D128●●	0.365
32	4	–	1	1	LC1 DT32●●	0.425
	2	2	1	1	LC1 D188●●	0.425
40	4	–	1	1	LC1 DT40●●	0.425
	2	2	1	1	LC1 D258●●	0.425
Connection by EverLink®, BTR screw connectors						
60	4	–	1	1	LC1 DT60A●●	1.090
80	4	–	1	1	LC1 DT80A●●	1.150
Connection by screw clamp terminals or connectors						
60	2	2	–	–	LC1 D40008●●	1.440
					or LP1 D40008●●	2.210
80	2	2	–	–	LC1 D65008●●	1.450
					or LP1 D65008●●	2.220
125	4	–	–	–	LC1 D80004●●	1.760
					or LP1 D80004●●	2.685
	2	2	–	–	LC1 D80008●●	1.840
					or LP1 D80008●●	2.910
200	4	–	–	–	LC1 D115004●●	2.860

4-pole contactors for connection by lugs or bars

In the references selected above, insert a figure 6 before the voltage code.

Example: LC1 DT20●● becomes LC1 DT206●●.

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1 D09...D150 and LC1 DT20...DT80A (coils D115 and D150 fitted with integral suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	—
LC1 D80...D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1 D09...D65A and LC1 DT20...DT80A (coils with integral suppression device fitted as standard)											
U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1 or LP1 D80											
U 0.85...1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75...1.2 Uc	JW	BW	CW	EW	—	SW	FW	—	MW	—	—
LC1 D115 (coils with integral suppression device fitted as standard)											
U 0.75...1.2 Uc	—	BD	—	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts	5	12	20	24	48	110	220	250
LC1 D09...D38 and LC1 DT20...DT40 (coils with integral suppression device fitted as standard)								
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages 176 to 181.

(2) LC1 D09 to D38 and LC1 DT20 to DT80A: clip-on mounting on 35 mm rail AM1 DP or screw fixing.

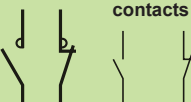
LC1 D80 ~: clip-on mounting on 35 mm rail AM1 DP or 75 mm rail AM1 DL or screw fixing.

LC1 or LP1 D80 ~: clip-on mounting on 75 mm rail AM1 DL or screw fixing.

LC1 D115 and D150: clip-on mounting on 2 x 35 mm rails AM1 DP or screw fixing.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1 D09 to D38, 0.075 kg from LC1 DT60A and D80A and 1 kg for LC1 D80.

4-pole contactors

Non inductive loads maximum current ($\theta \leq 60^\circ\text{C}$) utilisation category AC-1	Number of poles	Instan- taneous auxiliary contacts	Basic reference, to be completed by adding the voltage code (1)	Weight (3)
			Fixing (2)	
A				kg
Connection by spring terminals				
20	4 —	1 1	LC1 DT203●●	0.380
	2 2	1 1	LC1 D0983●●	0.380
25	4 —	1 1	LC1 DT253●●	0.380
	2 2	1 1	LC1 D1283●●	0.380
32	4 —	1 1	LC1 DT323●●	0.425
	2 2	1 1	LC1 D1883●●	0.425
40	4 —	1 1	LC1 DT403●●	0.425
	2 2	1 1	LC1 D2583●●	0.425
Connection by by EverLink®, BTR screw connectors and control circuit by spring terminals				
60	4 —	1 1	LC1 DT60A3●●	1.090
80	4 —	1 1	LC1 DT80A3●●	1.150

Separate components

Auxiliary contact blocks and add-on modules: see pages 168 to 175.

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
-------	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

LC1 D09...D25 and LC1 DT20...DT80A (coils with integral suppression device fitted as standard)

50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	—
----------	----	----	----	----	-----	----	----	----	----	----	----	----	---

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
-------	----	----	----	----	----	----	-----	-----	-----	-----	-----

LC1 D09...D25 and LC1 DT20...DT80A (coils with integral suppression device fitted as standard)

U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
-----------------	----	----	----	----	----	----	----	----	----	----	----

Low consumption

Volts —	5	12	20	24	48	110	220	250
---------	---	----	----	----	----	-----	-----	-----

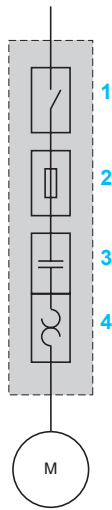
LC1 D09...D25 and LC1 DT20...DT40 (coils with integral suppression device fitted as standard)

U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL
-----------------	----	----	----	----	----	----	----	----

For other voltages between 5 and 690 V, see pages 176 to 181.

(2) LC1 D09 to D38 and LC1 DT20 to DT80A: clip-on mounting on 35 mm rail AM1DP or screw fixing.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1 D09 to D38, 0.075 kg for LC1 DT60A and DT80A.



- 1 Motor Disconnect (Disconnect switch)
- 2 Motor Branch Circuit Protection (Short-circuit protection)
- 3 Motor Controller (Contactor)
- 4 Motor Overload Protection (Thermal overload relay)

Starters for the North American market

In recent years, the North American market has started to harmonise UL, CSA and ANCE standards, as well as the industrial installation codes provided by national regulations (NEC for the United States, CEC for Canada and MEC for Mexico). (1)

Major improvements, carried out by the Canena (2) are aimed at harmonising product requirements based on IEC (3) standards.

However, the North American codes use specific terminology for defining the functions of a starter.

These functions can be fulfilled by standard IEC products, accompanied by appropriate certifications.

Combination Starters

Combination Starters are the most common type of packaged motor starter. They are called "Combination" because of their structure and their combined functions.

The figure opposite shows the four combined functions that constitute a complete motor starter circuit, defined as a "Motor branch circuit" by the NEC (US National Electric Code) in article 430. Standard UL508 currently gives different types of combination starter that meet the requirements of a "Motor branch circuit".

Type E, called "**self-protected combination starter**", covers all these functions and can be controlled manually (thermal-magnetic circuit-breaker) or remotely (starter-controller). Type E starters withstand faults within their declared nominal rating without sustaining damage, after which they can be put back into service. In addition, they can withstand more severe short-circuit and durability performance tests without welding or excessive wear of the contact tips.

Type F, called "**Combination motor starter**", consists of a type E manual starter (thermal-magnetic circuit-breaker) combined with a contactor. These starters are evaluated by means of basic short-circuit tests, but are not considered as "self-protected".

For this combination, the type E starter must be marked "Combination Motor Controller when used with ...", followed by the reference of the load side contactor.

(1) **UL**: Underwriters Laboratories, **CSA**: Canadian Standards Association, **ANCE**: Association of Standardization and Certification, **NEC**: National Electric Code, **CEC**: Canadian Electrical Code, **MEC**: Mexican Electrical Code.

(2) **Canena**: Council for Harmonization of Electrotechnical Standardization of North America.

(3) **IEC**: International Electrotechnical Commission.

Control panels

To help users properly coordinate their motor control equipment with their distribution system in the event of a fault, article 409 of the 2005 NEC requires panel builders to list the short-circuit withstand rating of their motor control panels.

According to standard UL508A, manufacturers must use the short-circuit withstand value of the lowest rated device as the nominal withstand rating of the panel, unless the devices have been tested together for a higher coordinated rating.

The minimum **“short-circuit current rating”** (SCCR), on motor control components for horsepower ratings of 50 hp or below is 5 000 A.

Using a **type E** or **type F** combination starter eliminates the coordination problems of using individual components for the “motor branch circuit protection”, “motor controller” and “motor overload protection” functions.

The panel builder uses the declared short-circuit current rating for the combination starter. This value is generally higher than 5 000 A.

This makes it easier to list the short-circuit current ratings and to check the compatibility of a UL508A motor control panel within a given distribution system.

Group protection

Article 430.53 of the NEC allows a single short-circuit protection device to be used for more than one motor circuit if the components used are marked and listed for such use.

Components suitable for use in group protection, known as “**motor group installations**”, can be marked in one of the following two ways:

Case n° 1

The contactor and the motor overload relay are both listed as suitable for group installation.

An inverse time circuit-breaker can be used as the short-circuit protection device if it is also listed as suitable for group installation.

The panel builder must therefore make sure that the short-circuit protection device selected (fuses or inverse time circuit-breaker) does not exceed the value allowed by article 430.40 for the smallest overload relay used in the circuit.

Once these conditions have been met, the panel builder can reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one third of the size of the upstream circuit conductor supplying the protection device.

The panel builder must limit the length of the motor starter conductor (connecting the short-circuit protection device to the motor contactor/overload relay) to a maximum of 7.6 m (25 feet).

Case n° 2

The motor contactor and overload relay are listed as suitable for “**tap conductor protection**” in group installations.

This category allows the panel designer to reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one tenth of the size of the upstream circuit conductor supplying the protection device.

The designer must limit the length of this conductor to a maximum of 3.05 m (10 feet).

In both cases, the supply circuits must not be less than 125 % of the connected motor FLA (Full Load Amps) rating.

For panel builders, using **type F** combination starters in group installations simplifies group motor considerations.
Each starter is a fully coordinated motor branch circuit.

The panel builder follows the same NEC requirements for sizing the supply conductors as those required for single motor branch circuits.

The size of the supply conductors can be reduced in accordance with the specifications of article 430.28.

This allows the same flexibility in conductor sizing as that offered in article 430.53 (D), without a requirement to check the short-circuit protection rating marked on the components and the overload relay limit.

A UL508A panel does not need a short-circuit protection device when each motor starter installed is a **type F**.

The upstream short-circuit protection device supplying the starter protects the panel. The panel builder only has to consider the panel/enclosure disconnect requirements specified by the NEC or local codes.

TeSys contactors

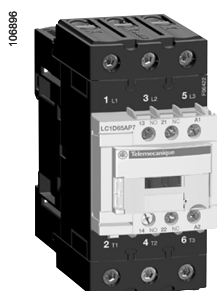
for the North American market,
conforming to UL and CSA standards, 20 to 200



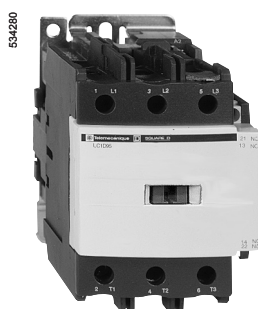
LC1 D09●●



LC1 D25●●



LC1 D65A●●



LC1 D95●●

Contactors

Standard power ratings of motors 50/60 Hz						Size	Associated cable type 75 °C-Cu	Continuous current	Type of contactor required Basic reference, to be completed (1) Fixing, connection (2)
Single-phase 1 Ø		3-phase 3 Ø							
115 V	230 V 240 V	200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V				
HP	HP	HP	HP	HP	HP			A	
Connection by screw clamp terminals									
0.5	1	2	2	5	7.5	00	AWG10	20	LC1 D09●●
1	2	3	3	7.5	10	0	AWG10	25	LC1 D12●●
1	3	5	5	10	15	0	AWG8	32	LC1 D18●●
2	3	5	7.5	15	20	1	AWG6	40	LC1 D25●●
2	5	7.5	10	20	30	1	AWG6	50	LC1 D32●●

Power connections by EverLink® BTR screw connectors (4) and control by spring terminals

3	5	10	10	30	30	2	AWG3	60	LC1 D40A●●
3	7.5	15	15	40	40	2	AWG3	70	LC1 D50A●●
5	10	20	20	40	50	2	AWG3	80	LC1 D65A●●

Connection by screw clamp terminals or connectors

7.5	15	20	25	60	60	2	AWG2	110	LC1 D80●●
7.5	15	20	25	60	60	2	AWG2	110	LC1 D95●●
—	—	30	40	75	100	3	AWG2/0	175	LC1 D115●●
—	—	40	50	100	125	4	AWG3/0	200	LC1 D150●●

Applications with High-Fault Short-Circuit ratings

For contactors **LC1 D40A** to **LC1 D65A**, the High-Fault Short-Circuit ratings are 50 kA at 480 V and 25 kA at 600 V. If these contactors are used, stick the **LAD UL1** warning sticker on the enclosure door..

Description	Language	Sold in lots of	Reference
Warning sticker	English, Spanish, French	10	LAD UL1

Application example

For a 15 HP-230 V motor

Select a contactor type **LC1 D50A**.

Information: the contactor rating selected corresponds to "size 2", the associated cable is type AWG3 75 °C-Cu.

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1 D09...D150 (D115 and D150 coils with integral suppression device fitted as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
LC1 D80...D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1 D09...D65A (coils with integral suppression device fitted as standard)											
U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1 D80 and D95											
U 0.85...1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75...1.2 Uc	JW	BW	CW	EW	—	SW	FW	—	MW	—	—
LC1 D115 and D150 (coils with integral suppression device fitted as standard)											
U 0.75...1.2 Uc	—	BD	—	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts ---	5	12	20	24	48	110	220	250
LC1 D09...D38 (coils with integral suppression device fitted as standard)								
U 0.7...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

(2) **LC1 D09** to **D65A**: clip-on mounting on 35 mm L rail **AM1 DP** or screw fixing.

LC1 D80 and **LC1 D95**: clip-on mounting on 35 mm L rail **AM1 DP** or 75 mm L rail **AM1 DL** or screw fixing.

LC1 D115 and **D150**: clip-on mounting on 2 x 35 mm L rails **AM1 DP** or screw fixing.

TeSys contactors

TeSys D, 3-pole reversing contactors for motor control
up to 75 kW at 400 V, in category AC-3
Horizontally mounted, pre-assembled

810389



LC2 D12●●

106905



LC2 D65A●●

113119



LC2 D115●●

3-pole reversing contactors for connection by screw clamp terminals

Pre-wired power connections.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ($\theta \leq 60^\circ\text{C}$)								Rated opera- tional current in AC-3 440 V up to	Instan- taneous auxiliary contacts per contactor	Contactors supplied with coil Basic reference, to be completed by adding the control voltage code (2)	Weight (3)
220 V	380 V	415 V	440 V	500 V	660 V	1000 V				Fixing (1)	
230 V	400 V				690 V						
kW	kW	kW	kW	kW	kW	kW	A				kg
With mechanical interlock, without electrical interlocking, for connection by screw clamp terminals or connectors											
2.2	4	4	4	5.5	5.5	—	9	1	1	LC2 D09●● (4)	0.687
3	5.5	5.5	5.5	7.5	7.5	—	12	1	1	LC2 D12●● (4)	0.697
4	7.5	9	9	10	10	—	18	1	1	LC2 D18●● (4)	0.707
5.5	11	11	11	15	15	—	25	1	1	LC2 D25●● (4)	0.787
7.5	15	15	15	18.5	18.5	—	32	1	1	LC2 D32●● (4)	0.797
9	18.5	18.5	18.5	18.5	18.5	—	38	1	1	LC2 D38●● (4)	0.807
11	18.5	22	22	22	30	—	40	1	1	LC2 D40A●● (5)	1.870
15	22	25	30	30	33	—	50	1	1	LC2 D50A●● (5)	1.880
18.5	30	30	30	37	37	—	65	1	1	LC2 D65A●● (5)	1.890
22	37	45	45	55	45	—	80	1	1	LC2 D80●●	3.200
25	45	45	45	55	45	—	95	1	1	LC2 D95●●	3.200

With mechanical interlock and electrical interlocking, for connection by screw clamp terminals or connectors

30	55	59	59	75	80	65	115	1	1	LC2 D115●●	6.350
40	75	80	80	90	100	75	150	1	1	LC2 D150●●	6.400

Connection by lugs or bars

For reversing contactors LC2 D09 to LC2 D38, LC2 D115 and LC2 D150, in the references selected above, insert a figure 6 before the voltage code. Example: **LC2 D09●●** becomes **LC2 D096●●**.

To build a 40 to 65 A reversing contactor, for connection by lugs, order 2 contactors **LC1 D●●A6** and mechanical interlock **LAD 4CM** (see page 166).

Component parts

Auxiliary contact blocks and add-on modules: see pages 168 to 175.

(1) LC2 D09 to D38: clip-on mounting on 35 mm rail **AM1 DP** or screw fixing.

LC2 D40 to D95: clip-on mounting on 35 mm rail **AM1 DP** or 75 mm rail **AM1 DL** or screw fixing.

LC2 D115 and D150: clip-on mounting on 35 mm rail **AM1 DP** or screw fixing.

(2) Standard control circuit voltages (for other voltages between 16 and 690 V, please consult your Regional Sales Office):

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC2 D09...D150 (D115 and D150 coils with integral suppression device fitted as standard))													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7

LC2 D80...D115

50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC2 D09...D65A (coils with integral suppression device fitted as standard)											
U 0.75...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts —	5	12	20	24	48	110	220	250
LC2 D09...D38 (coils with integral suppression device fitted as standard)								
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages 176 to 181.

(3) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.330 kg for **LC2 D09** to **D38**, 0.150 kg for **LC1 D40A** to **D65A**.

(4) For reversing contactors with electrical interlocking pre-wired at the factory, add suffix **V** to the references selected above.

Example: **LC2 D09P7** becomes **LC2 D09P7V**.

(5) For low consumption kit **LA4 DBL** (see page 173).

Note: when assembling a reversing contactor, it is good practice to incorporate a 50 ms time delay.

TeSys contactors

TeSys D, 3-pole reversing contactors for motor control
up to 15 kW at 400 V, in category AC-3
Horizontally mounted, pre-assembled

565133




LC2 D123●●

3-pole reversing contactors, for connection by spring terminals

Pre-wired power connections.

Mechanical interlock without electrical interlocking.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 (θ ≤ 60 °C)							Rated operational current in AC-3 440 V up to	Instan- taneous auxiliary contacts per contactor	Contactors supplied with coil		Weight (3)
Basic reference, to be completed by adding the voltage code (2)											
Fixing (1)											
220 V 380 V 415 V 440 V 500 V 660 V 230 V 400 V 690 V							A				kg
kW	kW	kW	kW	kW	kW						
For connection by spring terminals											
2.2	4	4	4	5.5	5.5	9	1	1	LC2 D093●●	0.687	
3	5.5	5.5	5.5	7.5	7.5	12	1	1	LC2 D123●●	0.697	
4	7.5	9	9	10	10	18	1	1	LC2 D183●●	0.707	
5.5	11	11	11	15	15	25	1	1	LC2 D253●●	0.787	
7.5	15	15	15	18.5	18.5	32 (4)	1	1	LC2 D323●●	0.797	

Power connection by EverLink®, BTR screw connectors (5) and control by spring terminals

11	18.5	22	22	22	30	40	1	1	LC2 D40A3●● (6)	1.870
15	22	25	30	30	33	50	1	1	LC2 D50A3●● (6)	1.880
18.5	30	30	30	37	37	65	1	1	LC2 D65A3●● (6)	1.890

For connection by Faston connectors

All power connections are to be made by the customer.

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil terminals.

For reversing contactors LC2 D09 and LC2 D12 only, in the references selected above, replace the figure 3 before the voltage code with a figure 9.

Example: LC2 D093●● becomes LC2 D099●●.

Component parts

Auxiliary contact blocks and add-on modules: see pages 168 to 175.

(1) LC2 D09 to D32: clip-on mounting on 35 mm rail AM1 DP or screw fixing.

(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply													
Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC2 D09...D65													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
d.c. supply													
Volts	12	24	36	48	60	72	110	125	220	250	440		
LC2 D09...D65A (coils with integral suppression device fitted as standard)													
U 0.75...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD		
Low consumption													
Volts ---	5	12	20	24	48	110	220	250					
LC2 D09...D32 (coils with integral suppression device fitted as standard)													
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL					

For other voltages between 5 and 690 V, see pages 176 to 181.

(3) The weights indicated are for reversing contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.330 kg for LC2 D09 to D38, 0.150 kg for LC1 D40A to D65A.

(4) Must be wired with 2 x 4 mm² cables in parallel on the upstream side. On the downstream side, outgoing terminal block LAD 331 may be used (Quickfit technology, see page 227). When wired with a single cable, the product is limited to 25 A (11 kW/400 V motors).

(5) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LAD ALLEN4, see page 175).

(6) For low consumption kit LA4 DBL (see page 173).

TeSys contactors

TeSys D, 4-pole changeover contactor pairs
for control in category AC-1,
20 to 200 A

537835



LC2 DT20●●

Pre-assembled. Pre-wired power connections.

For connection by screw clamp terminals or connectors

LC2 DT20 to LC2 DT40: mechanical interlock without electrical interlocking.

LC2 D80004: order separately 2 auxiliary contact blocks LAD N●1 to obtain electrical interlocking between the 2 contactors (see page 169). For electrical interlocking incorporated in the mechanical interlock, please consult your Regional Sales Office.

LC2 D115004: mechanical interlock with integral, pre-wired electrical interlocking.

Utilisation category AC-1 Non-inductive loads Maximum rated operational current ($\theta \leq 60^\circ\text{C}$)	Instantaneous auxiliary contacts per contactor		Contactors supplied with coil Basic reference, to be completed by adding the voltage code (1) Fixing (2)	Weight
A				kg
20	1	1	LC2 DT20●●	0.730
25	1	1	LC2 DT25●●	0.730
32	1	1	LC2 DT32●●	0.850
40	1	1	LC2 DT40●●	0.850
125	–	–	LC2 D80004●●	3.200
200	–	–	LC2 D115004●●	7.400
For connection by lugs or bars				
20	1	1	LC2 DT206●●	0.730
25	1	1	LC2 DT256●●	0.730
32	1	1	LC2 DT326●●	0.850
40	1	1	LC2 DT406●●	0.850
For customer assembly.				
For connection by screw clamp terminals or connectors				
60	1	1	LC1 DT60A●● (3)	–
80	1	1	LC1 DT80A●● (3)	–
For connection by lugs or bars				
60	1	1	LC1 DT60A6●● (3)	–
80	1	1	LC1 DT80A6●● (3)	–

Accessories

Auxiliary contact blocks and add-on modules: see pages 168 to 175.

(1) See note (1) on next page.

(2) LC2 DT20 to LC2 DT80: clip-on mounting on 35 mm rail AM1 DP or screw fixing.

LC2 D80: clip-on mounting on 35 mm rail AM1 DP or 75 mm rail AM1 DL or screw fixing.

LC2 D115: clip-on mounting on 2 x 35 mm rails AM1 DP or screw fixing.

(3) For these operational currents, order 2 identical contactors and a mechanical interlock LAD 4CM (see page 166).

Note: when assembling changeover contactor pairs, it is good practice to incorporate a 50 ms time delay.

TeSys contactors

TeSys D, 4-pole changeover contactor pairs
for control in category AC-1, 20 A

Pre-assembled. Pre-wired power connections.

For connection by spring terminals.

Utilisation category AC-1 Non-inductive loads Maximum rated operational current ($\theta \leq 60^\circ\text{C}$)	Instantaneous auxiliary contacts per contactor	Contactor supplied with coil Basic reference, to be completed by adding the control voltage code (1) Fixing (2)	Weight
A			kg
20	1 1	LC2 DT203●●	0.760

For customer assembly.

Power connection by EverLink®, BTR screw connectors (3) and control by spring terminals

60	1 1	LC1 DT60A3●● (4)	—
80	1 1	LC1 DT80A3●● (4)	—

Separate components

Auxiliary contact blocks and add-on modules: see pages 168 to 175.

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC2 DT20...DT40, LC1 DT60...DT80													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	—
LC2 D80004...D115004													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC2 DT20...DT40, LC1 DT60...DT80 (coils with integral suppression device fitted as standard)											
U 0.7...1.25 U _c	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption

Volts	5	12	20	24	48	110	220	250
LC2 DT20...DT40 (coils with integral suppression device fitted as standard)								
U 0.8...1.25 U _c	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages 176 to 181.

(2) Clip-on mounting on 35 mm rail **AM1 DP** or screw fixing.

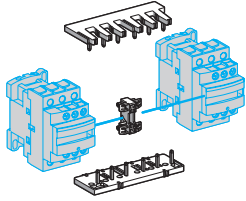
(3) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LAD ALLEN4**, see page 175).

(4) For these operational currents, order 2 identical contactors and a mechanical interlock **LAD 4CM** (see page 166).

TeSys contactors

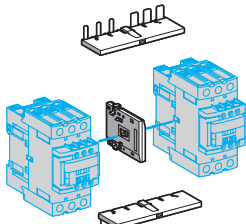
Component parts for assembling
reversing contactors for motor control,
low-speed/high-speed starters and star-delta starters

537729



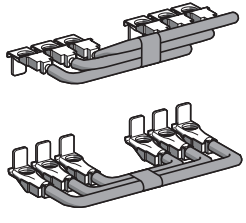
LAD 9R1

537730



LAD 9R3

537731



LA9 D8069

For 3-pole reversing contactors for motor control

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer

Description	For contactors (1) (2 identical contactors)	Reference	Weight kg
Kits for assembly of reversing contactors			
Kit comprising: ■ a mechanical interlock LAD 9V2 with electrical interlocking LAD 9V1 . ■ a set of power connections LAD 9V5 (parallel) and LAD 9V6 (reversing)	LC1 D09 to D38	LAD 9R1V	0.045
Kit comprising: ■ a mechanical interlock LAD 9V2 without electrical interlocking ■ a set of power connections LAD 9V5 (parallel) and LAD 9V6 (reversing)	LC1 D09 to D38	LAD 9R1	0.045
Kit comprising: ■ a mechanical interlock LAD 4CM , ■ a set of power connections LA9 D65A69 .	LC1 D40A to D65A	LAD 9R3	0.170
Mechanical interlocks			
Mechanical interlock with integral electrical interlocking	LC1 D80 and D95 (∼)	LA9 D4002	0.170
	LC1 D80 and D95 (---)	LA9 D8002	0.170
	LC1 D115 and D150	LA9 D11502	0.290
Mechanical interlock without integral electrical interlocking	LC1 D09 to D38	LAD 9V2	0.040
	LC1 D40A to D65A	LAD 4CM	0.040
	LC1 D80 and D95 (∼)	LA9 D50978	0.170
	LC1 D80 and D95 (---)	LA9 D80978	0.170
Sets of power connections			
Comprising: ■ a set of parallel bars, ■ a set of reverser bars.	LC1 D09 to D38 with screw clamp terminals or connectors	LAD 9V5 + LAD 9V6	—
	LC1 D09...D32 with spring terminal connections	LAD 9V12 + LAD 9V13 (2)	—
	LC1 D40A to D65A	LA9 D65A69	0.130
	LC1 D80 and D95 (∼)	LA9 D8069	0.490
	LC1 D80 and D95 (---)	LA9 D8069	0.490
	LC1 D115 and D150	LA9 D11569	1.450

For low-speed/high-speed starter

Description	For contactors with connection type	Reference	Weight kg
Connection kit enabling reversing of low and high speed directions using a reversing contactor and a 2N/O + 2N/C main pole contactor	Screw clamps or connectors	LAD 9PVG	0.016
	Power connection module with spring terminal connections	LAD 3PVG	0.034
	Outgoing terminal block with spring terminal connections	LAD 3PVG10	0.034

For star-delta starter

Description	For contactors	Reference	Weight kg
Mounting kit comprising: ■ 1 time delay contact block LAD S2 (LC1 D09...D80), ■ power circuit connections (LC1 D09...D80), ■ hardware required for fixing the contactors onto the mounting plate (LC1 D80).	LC1 D09 and D12	LAD 91217	0.180
	LC1 D18 to D32	LAD 93217	0.310
	LC1 D40A and D50A	LAD 9SD3	0.380
	LC1 D80	LA9 D8017	0.680
Equipment mounting plates	LC1 D09, D12 and D18	LA9 D12974	0.150
	LC1 D32	LA9 D32974	0.180
	LC1 D40A and D50A	—	—
	LC1 D80	LA9 D80973	0.300

(1) To order the 2 contactors: see pages 154 and 162.

(2) To assemble a reversing contactor with spring terminal connections, the following components must be ordered:

- 1 mechanical interlock **LAD 9V2**,

- 1 upstream power connection kit and 1 downstream power connection kit..

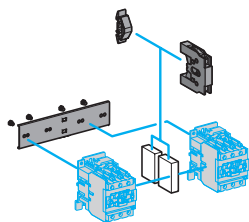
Upstream power connection kit **LAD 9V10**: installed in the Quickfit system with power connection module **LAD 34**.

(If module **LAD 34** is not used, replace **LAD 9V10** with **LAD 9V12**).

Downstream power connection kit **LAD 9V11**: installed in the Quickfit system with outgoing terminal block **LAD 331**.

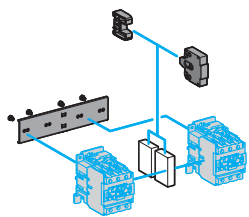
(If **LAD 331** is not used, replace **LAD 9V11** with **LAD 9V13**).

537732



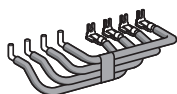
LA9 D4002

537733



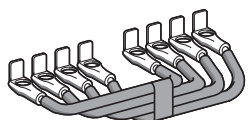
LA9 D50978

537734



LA9 D6570

537735



LA9 D8070

For 4-pole changeover contactor pairs (3-phase distribution + neutral)

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

Description	For contactors (1) (2 identical contactors)	Reference	Weight kg
Kits for assembly of changeover contactor pairs			
Kit comprising: ■ a mechanical interlock LAD 9V2 with electrical interlocking LAD 9V1 , ■ a set of power connections (changeover) LAD 9V7 .	LC1 DT20 to DT40 with screw clamps or connectors	LAD T9R1V	0.045
Kit comprising: ■ a mechanical interlock LAD 9V2 without electrical interlocking, ■ a set of power connections (changeover) LAD 9V7 .	LC1 DT20 to DT40 with screw clamps or connectors	LAD T9R1	0.045
Mechanical interlocks			
With integral electrical interlocking	LC1 D80004	LA9 D4002	0.170
	LP1 D80004	LA9 D8002	0.170
	LC1 D115004	LA9 D11502	0.280
Without integral electrical interlocking	LC1 DT20 to DT40 with screw clamps or connectors	LAD 9V2 (2)	0.040
	LC1 DT203 to DT403 with spring terminals	LAD 9V2 (2)	0.040
	LC1 DT60A and DT80A	LAD 4CM	0.040
	LC1 D80004	LA9 D50978	0.155
	LP1 D80004	LA9 D80978	0.180

Sets of power connections

Comprising a set of parallel bars	LC1 D60A and D80A	LA9 D65A70 ▲	0.150
	LC1 D80004	LA9 D8070	0.280
	LP1 D80004	LA9 D8070	0.280
	LC1 D115004	LA9 D11570	1.100
	LC1 DT203 to DT403 with spring terminals	LAD 9V9	0.100
	LC1 D80004	LA9 D8070 (2)	—
	LP1 D80004	LA9 D8070 (2)	—

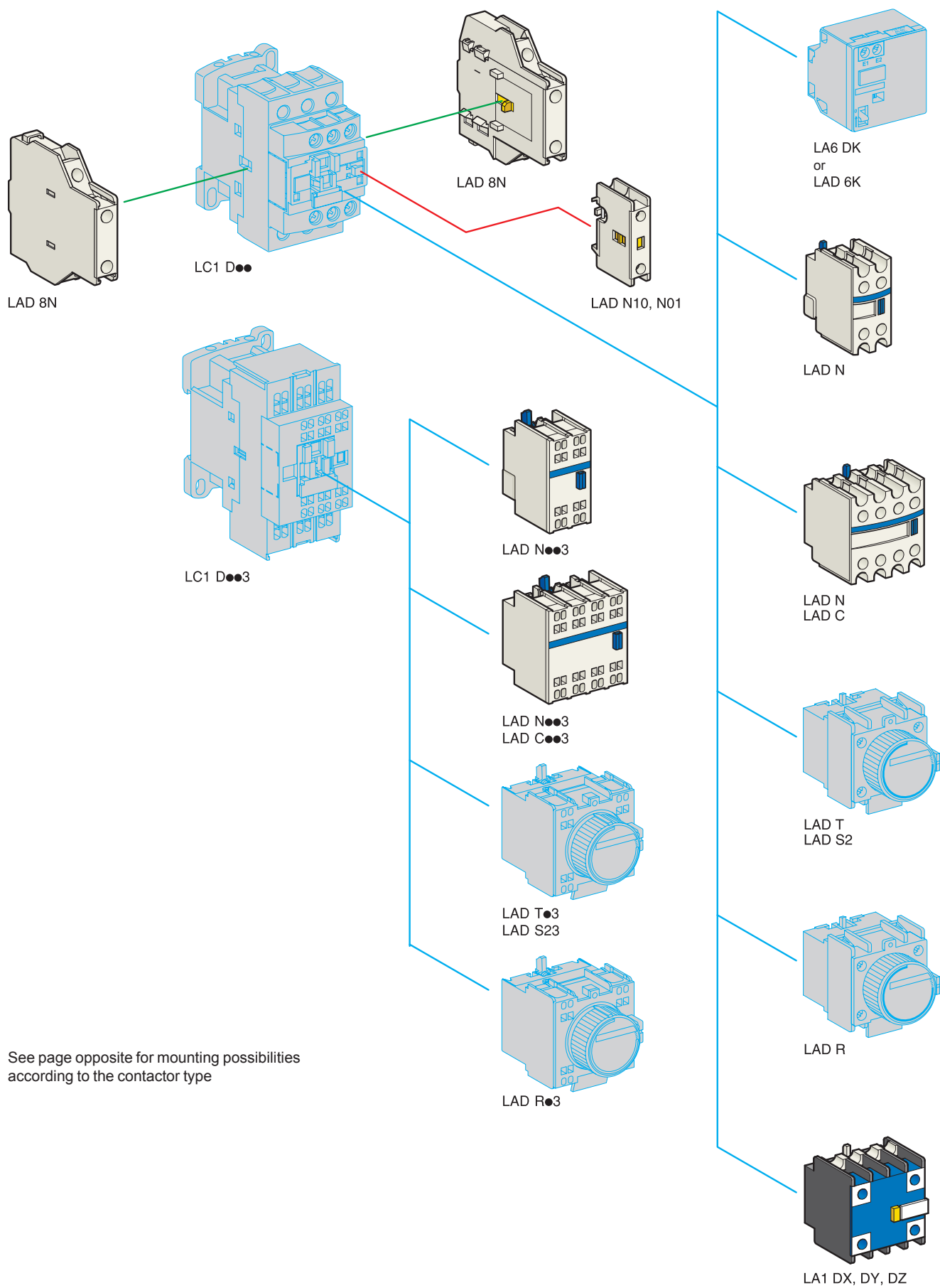
For 3-pole changeover contactor pairs

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

Description	For contactors (1) (2 identical contactors)	Reference	Weight kg
Mechanical interlocks			
Without integral electrical interlocking	LC1 D40A...D65A	LAD 9R3S	0.105
With integral electrical interlocking	LC1 D115 and D150	LA9 D11502	0.280
Sets of power connections			
Comprising a set of parallel bars,	LC1 D115 and D150	LA9 D11571	0.960

(1) To order the 2 contactors: see pages 154 and 162.


(2) Order 2 contact blocks **LAD N●1** to build the electrical interlock, see page 169.▲ Available 3rd quarter 2009.



See page opposite for mounting possibilities according to the contactor type

Instantaneous auxiliary contact blocks for connection by screw clamp terminals**For use in normal operating environments**

In order to mount an LAD 8N on an LC1 D80 to D95, a set of shims must be ordered separately, see page 175

Clip-on mounting (1)	Number of contacts per block	Composition	Reference	Weight kg
Front	1	 – – – 1 –	LAD N10	0.020
		– – – – 1	LAD N01	0.020
	2	– – – 1 1	LAD N11	0.030
		– – – 2 –	LAD N20	0.030
		– – – – 2	LAD N02	0.030
	4	– – – 2 2	LAD N22	0.050
		– – – 1 3	LAD N13	0.050
		– – – 4 –	LAD N40	0.050
		– – – – 4	LAD N04	0.050
		– – – 3 1	LAD N31	0.050
		4 incl. 1 N/O & 1 N/C make before break	LAD C22	0.050
Side	2	– – – 1 1	LAD 8N11	0.030
		– – – 2 –	LAD 8N20	0.030
		– – – – 2	LAD 8N02	0.030

For terminal referencing conforming to EN 50012

Front on 3P contactors and 4P contactors 20 to 80 A	2	– – – 1 1	LAD N11G	0.030
	4	– – – 2 2	LAD N22G	0.050
Front on 4P contactors 125 to 200 A	2	– – – 1 1	LAD N11P	0.030
	4	– – – 2 2	LAD N22P	0.050

With dust and damp protected contacts, for use in particularly harsh industrial environments

Front	2	– 2 – – –	LA1 DX20	0.040
		1 1 – – –	LA1 DX11	0.040
		2 – – – –	LA1 DX02	0.040
	4	– 2 2 – –	LA1 DY20 (2)	0.040
		– 2 – 2 –	LA1 DZ40	0.050
		– 2 – 1 1	LA1 DZ31	0.060

Instantaneous auxiliary contact blocks for connection by lugs

This type of connection is not possible for blocks with 1 contact or blocks with dust and damp protected contacts. For all other instantaneous auxiliary contact blocks, add the figure 6 to the end of the references selected above. Example: LAD N11 becomes LAD N116.

Instantaneous auxiliary contact blocks for connection by spring terminals

This type of connection is not possible for LAD 8, LAD N with 1 contact or blocks with dust and damp protected contacts. For all other contact blocks, add the figure 3 to the end of the references selected above. Example: LAD N11 becomes LAD N113.

Instantaneous auxiliary contact blocks for connection by Faston connectors

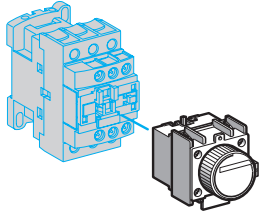
This type of connection is not possible for LAD 8, LAD N with 1 contact or blocks with dust and damp protected contacts. For all other contact blocks, add the figure 9 to the end of the references selected above. Example: LAD N11 becomes LAD N119.

(1) Maximum number of auxiliary contacts that can be fitted:

Contactors			Instantaneous auxiliary contacts				Time delay Front mounted	
Type	Number of poles and size		Side mounted	Front mounted				
				1 contact	2 contacts	4 contacts		
~	3P	LC1 D09...D38	1 on LH side	and –	1	or 1	or 1	
		LC1 D40A...D65A	1 on LH or 1 on RH side	and –	1	or 1	or 1	
		LC1 D80 and D95 (50/60 Hz)	1 on each side	or 2	and 1	or 1	or 1	
		LC1 D80 and D95 (50 or 60 Hz)	1 on each side	and 2	and 1	or 1	or 1	
		LC1 D115 and D150	1 on LH side	and –	1	or 1	or 1	
	4P	LC1 DT20...DT40	1 on LH side	and –	1	or 1	or 1	
		LC1 DT60A and DT80A	1 on LH or 1 on RH side	and –	1	or 1	or 1	
		LC1 D40008, D65008 and D80	1 on each side	or 1	or 1	or 1	or 1	
		LC1 D115	1 on each side	and 1	or 1	or 1	or 1	
		---	3P	LC1 D09...D38	–	–	1	or 1
LC1 D40A...D65A	–			–	1	or 1	or 1	
LC1 D80 and D95	–			1	or 1	or 1	or 1	
LC1 D115 and D150	1 on LH side			and –	1	or 1	or 1	
4P	LC1 DT20...DT40			–	–	1	or 1	or 1
	LC1 DT60A and DT80A		–	–	1	or 1	or 1	
	LC1 D40008, D65008 and D80		–	2	and 1	or 1	or 1	
	LC1 D115		1 on each side	–	and 1	or 1	or 1	
	BC (3)		3P	LC1 D09...D38	–	–	1	–
4P			LC1 DT20...DT40	–	–	1	–	–

(2) Device fitted with 4 earth screen continuity terminals.

(3) LC: low consumption.



LAD T●

Time delay auxiliary contact blocks for connection by screw clamp terminals

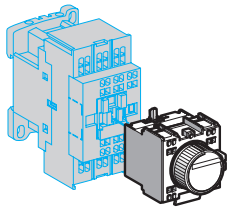
Maximum number of auxiliary contact blocks that can be fitted per contactor, see page 169.

Sealing cover to be ordered separately, see page 175.

LAD T0 and LAD R0: with extended scale from 0.1 to 0.6 s.

LAD S2: with switching time of 40 ms ± 15 ms between opening of the N/C contact and closing of the N/O contact.

Clip-on mounting	Number of contacts	Time delay		Reference	Weight kg
		Type	Setting range		
Front	1 N/O + 1 N/C	On-delay	0.1...3 s	LAD T0	0.060
			0.1...30 s	LAD T2	0.060
			10...180 s	LAD T4	0.060
			1...30 s	LAD S2	0.060
		Off-delay	0.1...3 s	LAD R0	0.060
			0.1...30 s	LAD R2	0.060
			10...180 s	LAD R4	0.060



LAD T●3

Time delay auxiliary contact blocks for connection by lugs

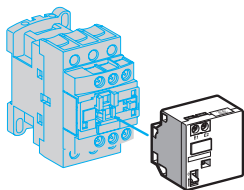
Add the figure 6 to the end of the references selected above. Example: LAD T0 becomes LAD T06.

Time delay auxiliary contact blocks for connection by spring terminals

Add the figure 3 to the end of the references selected above. Example: LAD T0 becomes LAD T03

Time delay auxiliary contact blocks for connection by Faston connectors

Add the figure 9 to the end of the references selected above. Example: LAD T0 becomes LAD T09.



LAD 6K10●

Mechanical latch blocks (1)

Clip-on mounting	Unlatching control	For use on contactor	Basic reference, to be completed by adding the control voltage code (2)	Weight kg
Front	Manual or electric	LC1 D09...D38 (∼ or ∴)	LAD 6K10●	0.070
		LC1 DT20...DT40 (∼ or ∴)		
		LC1 D40A...D65A (3 P ∼ or ∴) LC1 DT60A and DT80A (4 P ∼ or ∴)	LAD 6K10●	0.070
		LC1 D80...D150 (3 P ∼) LC1 D80 and D115 (3 P ∴) LC1 D80 (4 P ∼) LC1 D80 and D115 (4 P ∼) LP1 D80 and LC1 D115 (4 P ∴)	LA6 DK20●	0.090

(1) The mechanical latch block must not be powered up at the same time as the contactor.

The duration of the control signal for the mechanical latch block and the contactor should be:

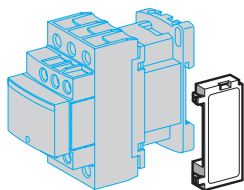
≥ 100 ms for a contactor operating on an a.c. supply,

≥ 250 ms for a contactor operating on a d.c. supply.

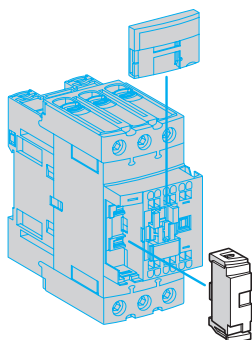
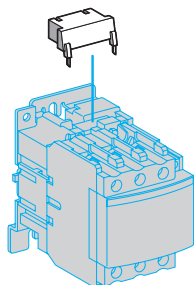
Maximum impulse duration for the LAD 6K10● mechanical latch block: 10 seconds.

(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office).

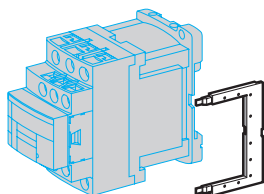
Volts 50/60 Hz, ∴	24	32/36	42/48	60/72	100	110/127	220/240	256/277	380/415
Code	B	C	E	EN	K	F	M	U	Q



LAD 4●●

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

LA4 D●●



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) Rating	Type		Reference	Weight kg
		V ~	V ---		
Clip-on side mounting (3)	D09...D38 (3P) DT20...DT40	24...48	—	LAD 4RCE	0.012
		50...127	—	LAD 4RCG	0.012
		110...250	—	LAD 4RCU	0.012
Clip-on front mounting (3)	D40A...D65A (3P) DT60A...DT80A (4P)	24...48	—	LAD 4RC3E	0.020
		50...127	—	LAD 4RC3G	0.020
		110...240	—	LAD 4RC3U	0.020
		380...415	—	LAD 4RC3N	0.040
Screw fixing (4)	D80...D150 (3P) D40...D115 (4P)	24...48	—	LA4 DA2E	0.018
		50...127	—	LA4 DA2G	0.018
		110...240	—	LA4 DA2U	0.018
		380...415	—	LA4 DA2N	0.018

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) DT20...DT40	24...48	—	LAD 4VE	0.012
		50...127	—	LAD 4VG	0.012
		110...250	—	LAD 4VU	0.012
Clip-on front mounting (3)	D40A...D65A (3P) DT60A...DT80A (4P)	24...48	24...48	LAD 4V3E	0.020
		50...127	50...127	LAD 4V3G	0.020
		110...250	110...250	LAD 4V3U	0.020
		—	—	—	—
Screw fixing (4)	D80...D115 (3P) D80...D115 (4P)	24...48	—	LA4 DE2E	0.018
		50...127	—	LA4 DE2G	0.018
		110...250	—	LA4 DE2U	0.018
	D80...D95 (3P) D80 (4P)	—	24...48	LA4 DE3E	0.018
		—	50...127	LA4 DE3G	0.018
		—	110...250	LA4 DE3U	0.018

Flywheel diodes

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

Clip-on side mounting (5)	D09...D38 (3P), DT20...DT40	—	24...250	LAD 4DDL	0.012
Clip-on front mounting (5)	D40A...D65A (3P), DT60A...DT80A (4P)	—	24...250	LAD 4D3U	0.020
Screw fixing (4)	D80 and D95 (3P), D40...D80 (4P)	—	24...250	LA4 DC3U	0.018

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) DT20...DT40 (4P) (2)	24	—	LAD 4TB	0.012
		—	24	LAD 4TBDL	0.012
		72	—	LAD 4TS	0.012
		—	72	LAD 4TSDL	0.012
		—	125	LAD 4TGDL	0.012
		—	250	LAD 4TUDL	0.012
Clip-on front mounting (3)	D40A...D65A (3P) DT60A...DT80A (4P) (2)	—	600	LAD 4TXDL	0.012
		12...24	12...24	LAD 4T3B	0.020
		25...72	25...72	LAD 4T3S	0.020
		73...125	73...125	LAD 4T3G	0.020
		126...250	126...250	LAD 4T3U	0.020
		251...440	251...440	LAD 4T3R	0.020
Screw fixing (4)	D80...D95 (3P) D40...D80 (4P)	24	—	LA4 DB2B	0.018
		72	—	LA4 DB2S	0.018
		—	24	LA4 DB3B	0.018
		—	72	LA4 DB3S	0.018

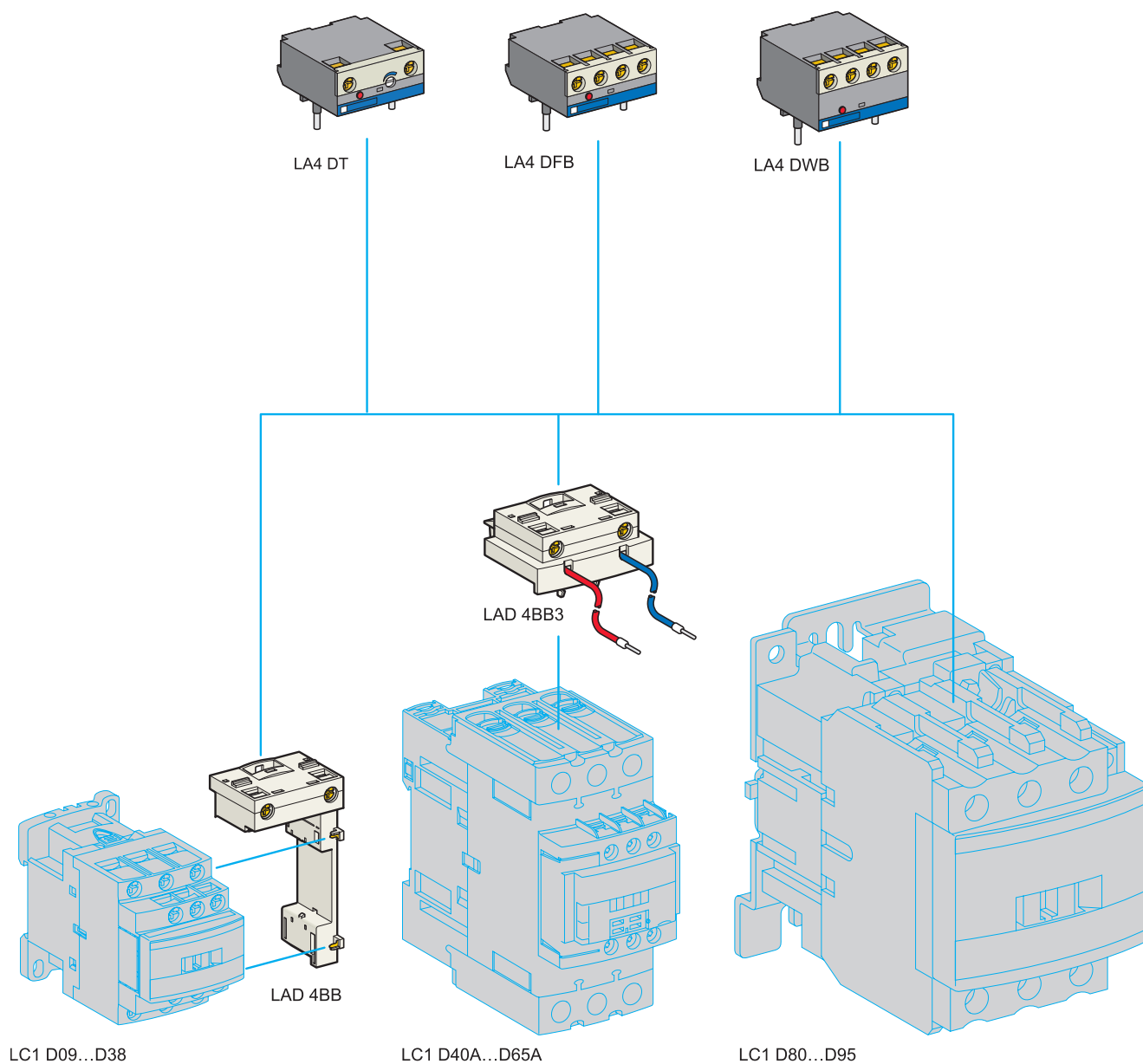
(1) For satisfactory protection, a suppressor module must be fitted across the coil of each contactor.

(2) From D09 to D65A and from LC1 DT20 to DT80A, d.c. 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 d.c. 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 makes the 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) In order to install these accessories, the existing suppression device must first be removed.



See page opposite for mounting possibilities
according to the contactor type

Electronic serial timer modules (1)

- 3-pole contactors LC1 D09 to D38:
mounted using adapter LAD 4BB, to be ordered separately, see below.
- 3-pole contactors LC1 D40A to D65A:
mounted using adapter LAD 4BB3, to be ordered separately, see below.
- 3-pole contactors LC1 D80 to D150 and 4-pole contactors LC1 D40 to D115:
mounted directly across terminals A1 and A2 of the contactor.

On-delay type		Time delay	Reference	Weight kg
Operational voltage ~				
24...250 V	100...250 V			
LC1 D09...D65A (3P)	LC1 D80...D150 (3P)	0.1...2 s	LA4 DT0U	0.040
		1.5...30 s	LA4 DT2U	0.040
		25...500 s	LA4 DT4U	0.040

Interface modules

- 3-pole contactors LC1 D09 to D38: mounted using adapter LAD 4BB, to be ordered separately, see below.
- 3-pole contactors LC1 D40A to D65A: mounted using adapter LAD4 BB3, to be ordered separately, see below.

Relay interface		Supply voltage E1-E2 (---)	Reference	Weight kg
Operational voltage ~				
24...250 V				
LC1 D09...D150 (3P)		24 V	LA4 DFB	0.050

Relay interface with "AUTO-I" manual override switch (output forced "ON"), solid state type

Operational voltage ~		Supply voltage E1-E2 (---)	Reference	Weight kg
24...250 V	100...250 V			
LC1 D09...D65A (3P)	LC1 D80...D115 (3P)	24 V	LA4 DWB	0.045

Low consumption kit

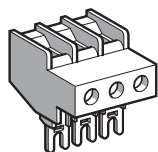
For use on contactors	Composition	Reference	Weight kg
LC1 D40A...D65A (3P) (2)	Kit comprising: ■ a retrofit coil LAD 4BB3. ■ a relay interface module LA4 DFB.	LA4 DBL	0.077

Retrofit: coil for 3-pole contactor**For adapting existing wiring to a new product**

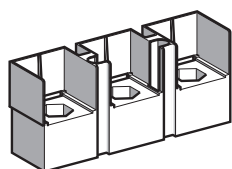
For use on contactors			Reference	Weight kg
LC1 D09...D38	Without coil suppression		LAD 4BB	0.019
	With coil suppression	~ 24...48 V	LAD 4BBVE	0.014
		~ 50...127 V	LAD 4BBVG	0.014
		~ 110...250 V	LAD 4BBVU	0.014
LC1 D40A...65A	Without coil suppression		LAD 4BB3	0.027

(1) For 24 V operation, the contactor must be fitted with a 21 V coil (code Z). See pages 176 to 181.

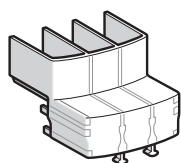
(2) The kit is compatible with a coil voltage of ~ 24 V to ~ 250 V (B7 to U7) and --- 24 V to --- 250 V (BD to UD).



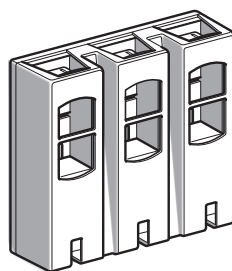
LA9 D3260



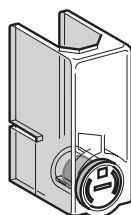
LA9 D11550



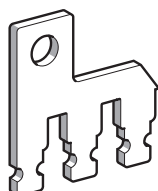
LAD 96570



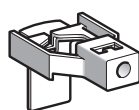
LA9 D11560



LA9 D11570



LA9 D80962



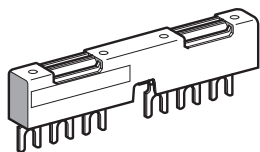
LA9 D11567

Accessories for main pole and control connections

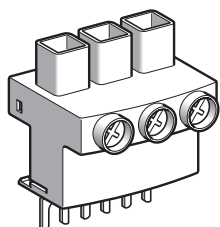
Description		For use with contactors LC1		Sold in lots of	Unit reference	Weight kg
		~	...			
Connectors for cable, size (1 connector)	4-pole 10 mm ²	DT20, DT25	DT20, DT25	1	LAD 92560	0.030
	3-pole 25 mm ²	D09...D38	D09...D38	1	LA9 D3260	0.040
EverLink® terminal block	3-pole	D40A...D65A	D40A...D65A	1	LAD 96560	0.087
Connectors for cables (2 connectors)	3-pole 120 mm ²	D115, D150	D115, D150	1	LA9 D115603	0.560
	4-pole 120 mm ²	D115	D115	1	LA9 D115604	0.740
Connectors for lug type terminals (2 connectors)	3-pole	D1156, D1506	D1156, D1506	1	LA9 D115503	0.300
	4-pole	D1156	D1156	1	LA9 D115504	0.360
Protective covers for connectors for lug type terminals	3-pole	D40A6...D65A6	D40A6...D65A6	1	LAD 96570	0.021
		D1156, D1506	D1156, D1506	1	LA9 D115703 (1)	0.250
	4-pole	D60A6...D80A6	D60A6...D80A6	1	LAD 96580	0.027
		D1156, D1506	D1156, D1506	1	LA9 D115704	0.300
IP 20 covers for lug type terminals (for mounting with circuit-breakers GV3 P●●6 and GV3 L●●6)	3 poles	D40A6...D65A6	D40A6...D65A6	1	LAD 96575	0.010
Links for parallel connection of	2 poles	D09...D38	D09...D38	10	LA9 D2561	0.060
		DT20, DT25 (4P)	DT20, DT25 (4P)	10	LA9 D1261	0.012
		DT32, DT40 (4P)	DT32, DT40 (4P)	10	LAD 96061	0.060
		D40A...D65A	D40A...D65A	1	LAD 9P32	0.021
		D80, D95	D80	2	LA9 D80961	0.060
	3 poles	D09...D38	D09...D38	10	LAD 9P3 (2)	0.005
		D40A...D65A	D40A...D65A	1	LAD 9P33	0.021
		D80, D95	D80, D95	1	LA9 D80962	0.080
	4 poles	DT20, DT25	DT20, DT25	2	LA9 D1263	0.024
		D80, D95	D80	2	LA9 D80963	0.100
Staggered coil connection	—		D80	10	LA9 D09966	0.006
Control circuit take-off from main pole		D80, D95	D80, D95	10	LA9 D8067	0.010
		D115, D150	D115, D150	10	LA9 D11567	0.014
Spreaders for increasing the pole pitch to 45 mm		D115, D150	D115, D150	3	GV7 AC03	0.180

(1) For 3-pole contactors: 1 set of 6 covers, for 4-pole contactors: 1 set of 8 covers.

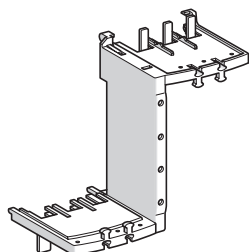
(2) Separate connecting bar for connecting 2 poles in parallel.



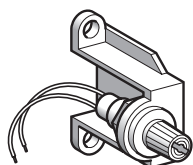
GV2 G245



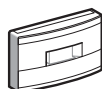
GV1 G09



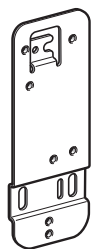
GV3 S



LA9 D941



LAD 9ET3



LAD 7X3

Sets of contacts and arc chambers

Description	For contactor		Reference	Weight kg
Sets of contacts	3-pole	LC1 D115	LA5 D1158031	0.260
		LC1 D150	LA5 D150803	0.260
	4-pole	LC1 D115004	LA5 D115804	0.330
Arc chambers	3-pole	LC1 D115	LA5 D11550	0.395
		LC1 D150	LA5 D15050	0.395
	4-pole	LC1 D115004	LA5 D115450	0.470

Power connection accessories

Terminal block	For supply to one or more GV2 G busbar sets	GV1 G09	0.040
Set of 63 A busbars for paralleling of contactors	2 contactors LC1 D09...D18 or D25...D38	GV2 G245	0.036
	4 contactors LC1 D09...D18 or D25...D38	GV2 G445	0.077
Set of 115 A busbars for paralleling of contactors	2 contactors LC1 D40A...D65A	GV3 G264	0.150
	3 contactors LC1 D40A...D65A	GV3 G364 (1)	0.250
Set of S-shape busbars	For circuit-breakers GV3 P●● and GV3 L●● and contactors LC1 D40A...D65A	GV3 S	0.111

Protection accessories

Description	Use	Sold in lots of	Reference	Weight kg
Miniature control circuit fuse holder	5 x 20 with 4 A-250 V fuse	1	LA9 D941	0.025
Sealing cover	For LAD T, LAD R	1	LA9 D901	0.005
Safety cover preventing access to the moving contact carrier	LC1 D09...D65A and DT20...DT80A	1	LAD 9ET1	0.026
	LC1 D80 and D95	1	LAD 9ET3	0.004
	LC1 D115 and D150	1	LAD 9ET4	0.004

Marking accessories

Description	Use	Sold in lots of	Unit reference	Weight kg
Sheet of 64 blank legends, self-adhesive, 8 x 33 mm (2)	Contactors (except 4P) LC1 D80...D115, LAD N (4 contacts), LA6 DK	10	LAD 21	0.020
Sheet of 112 blank legends, self-adhesive, 8 x 12 mm (2)	LAD N (2 contacts), LAD T, LAD R, LRD	10	LAD 22	0.020
Sheet of 64 blank legends for marking using plotter or 8 x 33 mm engraver	Contactors (except 4P) LC1 D80...D115, LAD (4 contacts), LA6 DK	10	LAD 23	0.050
Sheet of 440 blank legends for marking using plotter or 8 x 12 mm engraver	All products	35	LAD 24	0.200
Marker holder snap-in, 8 x 22 mm	4-pole contactors, LC1 D80...D115, LA6 DK	100	LA9 D92	0.001
Marker holder snap-in, 8 x 18 mm	LC1 D09...D65A, LC1 DT20...DT80A, LAD N (4 contacts), LAD T, LAD R	100	LAD 90	0.001
Bag of 300 blank legends self-adhesive, 7 x 21 mm	On holder LA9 D92	1	LA9 D93	0.001
"SIS Label" labelling software supplied on CD-Rom	Multi-language version: English, French, German, Italian, Spanish	1	XYB 2U	0.100

Mounting accessories

Retrofit plate for screw fixing	For replacement of LC1 D40 to D65 with LC1 D40A to D65A	1	LAD 7X3	0.150
Mounting plate	For replacement of LC1 F115 or F150 with LC1 D115 or D150	1	LA9 D730	0.360
Set of shims	For fitting side mounting blocks LAD 8N on LC1 D80 and D95	1	LA9 D511	0.020
Size 4 Allen key, insulated, 1000 V	For use on contactors LC1 D40A to LC1 D150	5	LAD ALLEN4	0.026

(1) With this set of busbars, any one contactor can be supplied directly by its EverLink® double cage power terminal block. The other two contactors are supplied by the busbar set. The 115 A limitation is therefore applied to these two contactors.
Example: 1 LC1 D65A supplied directly + 1 contactor LC1 D65A and 1 contactor LC1 D50 A supplied via the busbar set = 115 A. This combination is compatible with busbar set GV3 G364.

(2) These legends are for sticking onto the safety cover of the contactors or add-on block, if fitted.

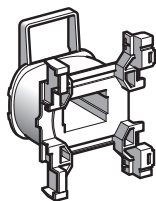
For ~ contactors LC1 D09...D38 and LC1 DT20...DT40

Specifications

Average consumption at 20 °C:

- inrush ($\cos \varphi = 0.75$) 70 VA,- sealed ($\cos \varphi = 0.3$) 50 Hz: 7 VA, 60 Hz: 7.5 VAOperating range ($\theta \leq 60$ °C): 50 Hz: 0.8...1.1 Uc, 60 Hz: 0.85...1.1 Uc.

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LXD 1●●

Control circuit voltage Uc	Average resistance at 20 °C ± 10 %	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H	50/60 Hz	kg
12	1.33	0.05	LXD 1J7	0.070
21 (2)	4.17	0.17	LXD 1Z7	0.070
24	5.37	0.22	LXD 1B7	0.070
32	10.1	0.39	LXD 1C7	0.070
36	12.8	0.49	LXD 1CC7	0.070
42	17	0.67	LXD 1D7	0.070
48	21.7	0.87	LXD 1E7	0.070
60	34.6	1.4	LXD 1EE7	0.070
100	100.4	3.8	LXD 1K7	0.070
110	124.1	4.6	LXD 1F7	0.070
115	129.8	5	LXD 1FE7	0.070
120	150.6	5.4	LXD 1G7	0.070
127	158.5	6.1	LXD 1FC7	0.070
200	410.7	15	LXD 1L7	0.070
208	430.4	16	LXD 1LE7	0.070
220	515.4	18	LXD 1M7 (3)	0.070
230	538.6	20	LXD 1P7	0.070
240	562.3	22	LXD 1U7	0.070
277	800.7	29	LXD 1W7	0.070
380	1551	55	LXD 1Q7 (4)	0.070
400	1633	60	LXD 1V7	0.070
415	1694	65	LXD 1N7	0.070
440	1993	73	LXD 1R7	0.070
480	2398	87	LXD 1T7	0.070
500	2499	95	LXD 1S7	0.070
575	3294	125	LXD 1SC7	0.070
600	3810	136	LXD 1X7	0.070
660	4656	165	LXD 1YC7	0.070
690	5020	180	LXD 1Y7	0.070

(1) The last 2 digits in the reference represent the voltage code.

(2) Voltage for special coils fitted in contactors with serial timer modules, with 24 V supply.

(3) Suitable for use on 230 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page 142).

(4) Suitable for use on 400 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page 142).

TeSys contactors

a.c. coils
for TeSys D, 3 or 4-pole contactors

For ~ contactors LC1 D40A...D65A, LC1 DT60A and LC1 DT80A

Specifications

Average consumption at 20 °C:

- inrush ($\cos \varphi = 0.75$) 160 VA.

- sealed ($\cos \varphi = 0.3$) 50 Hz: 15 VA, 60 Hz: 15 VA

Operating range ($\theta \leq 60$ °C): 50 Hz: 0.8...1.1 Uc, 60 Hz: 0.85...1.1 Uc.

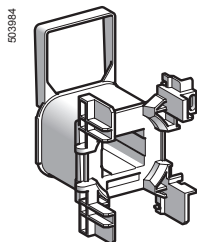
Control circuit voltage Uc	Average resistance at 20 °C \pm 10%	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H	50/60 Hz	kg
12	0.49	0.03	LXD 3J5 (2)	0.070
24	1.98	0.12	LXD 3B7	0.070
32	3.76	0.22	LXD 3C7	0.070
42	6.18	0.37	LXD 3D7	0.070
48	7.97	0.48	LXD 3E7	0.070
100	37.63	2.07	LXD 3K7	0.070
110	42.28	2.50	LXD 3F7	0.070
115	48.76	2.74	LXD 3FE7	0.070
120	37.63	2.07	LXD 3G7	0.070
127	60.29	3.34	LXD 3FC7	0.070
200	149	8.27	LXD 3L7	0.070
208	105	6.22	LXD 3LE7	0.070
220	182	10	LXD 3M7 (3)	0.070
230	192	10.9	LXD 3P7	0.070
240	202	11.9	LXD 3U7	0.070
277	193	11	LXD 3W7	0.070
380	512	29.9	LXD 3Q7 (4)	0.070
400	607	33.1	LXD 3V7	0.070
415	635	35.6	LXD 3N7	0.070
440	682	40.1	LXD 3R7	0.070
480	607	33.1	LXD 3T7	0.070
500	878	51.7	LXD 3S7	0.070
575	1238	68.4	LXD 3SC7	0.070
600	1304	74.5	LXD 3X7	0.070
660	1593	90.1	LXD 3YC7	0.070
690	1683	98.5	LXD 3Y7	0.070

(1) The last 2 digits in the reference represent the voltage code.

(2) This coil can only be used on 50 Hz.

(3) Suitable for use on 230 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page 142).

(4) Suitable for use on 400 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page 142).



LXD 3●●

For 3 or 4-pole contactors LC1D40, D50, D65, D80, D95

Specifications

Average consumption at 20 °C:

- inrush ($\cos \varphi = 0.75$) 50 Hz: 200 VA, 60 Hz: 220 VA,- sealed ($\cos \varphi = 0.3$) 50 Hz: 20 VA, 60 Hz: 22 VAOperating range ($\theta \leq 55$ °C): 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20°C ± 10 %	Inductance of closed circuit	Reference (1)	Average resistance at 20°C ± 10 %	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		Ω	H		kg
			50 Hz				60 Hz
24	1.4	0.09	LX1 D6B5	1.05	0.06	LX1 D6B6	0.280
32	2.6	0.16	LX1 D6C5	—	—	—	0.280
42	4.4	0.27	LX1 D6D5	—	—	—	0.280
48	5.5	0.35	LX1 D6E5	4.2	0.23	LX1 D6E6	0.280
110	31	1.9	LX1 D6F5	22	1.2	LX1 D6F6	0.280
115	31	1.9	LX1 D6FE5	—	—	—	0.280
120	—	—	—	28	1.5	LX1 D6G6	0.280
127	41	2.4	LX1 D6G5	—	—	—	0.280
208	—	—	—	86	4.3	LX1 D6L6	0.280
220	—	—	—	98	4.8	LX1 D6M6	0.280
220/230	127	7.5	LX1 D6M5	—	—	—	0.280
230	133	8.1	LX1 D6P5	—	—	—	0.280
240	152	8.7	LX1 D6U5	120	5.7	LX1 D6U6	0.280
256	166	10	LX1 D6W5	—	—	—	0.280
277	—	—	—	157	8	LX1 D6W6	0.280
380	—	—	—	300	14	LX1 D6Q6	0.280
380/400	381	22	LX1 D6Q5	—	—	—	0.280
400	411	25	LX1 D6V5	—	—	—	0.280
415	463	26	LX1 D6N5	—	—	—	0.280
440	513	30	LX1 D6R5	392	19	LX1 D6R6	0.280
480	—	—	—	480	23	LX1 D6T6	0.280
500	668	38	LX1 D6S5	—	—	—	0.280
575	—	—	—	675	33	LX1 D6S6	0.280
600	—	—	—	775	36	LX1 D6X6	0.280
660	1220	67	LX1 D6Y5	—	—	—	0.280

Specifications

Average consumption at 20 °C:

- inrush ($\cos \varphi = 0.75$) 50/60 Hz: 245 VA at 50 Hz,- sealed ($\cos \varphi = 0.3$) 50/60 Hz: 26 VA at 50 Hz.Operating range ($\theta \leq 55$ °C): 0.85...1.1 Uc.

			50/60 Hz	
24	—	—	1.22	0.08 LX1 D6B7 0.280
42	—	—	3.5	0.25 LX1 D6D7 0.280
48	—	—	5	0.32 LX1 D6E7 0.280
110	—	—	26	1.7 LX1 D6F7 0.280
115	—	—	—	— LX1 D6FE7 0.280
120	—	—	32	2 LX1 D6G7 0.280
220/230 (2)	—	—	102	6.7 LX1 D6M7 0.280
230	—	—	115	7.7 LX1 D6P7 0.280
230/240 (3)	—	—	131	8.3 LX1 D6U7 0.280
380/400 (4)	—	—	310	20 LX1 D6Q7 0.280
400	—	—	349	23 LX1 D6V7 0.280
415	—	—	390	24 LX1 D6N7 0.280
440	—	—	410	27 LX1 D6R7 0.280

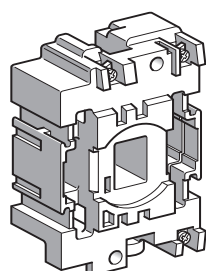
(1) The last 2 digits in the reference represent the voltage code.

(2) For use on 230 V / 50 Hz, apply a coefficient of 0.6 to the mechanical durability of the contactor; see pages 142 and 143.
This coil can be used on 240 V at 60 Hz.

(3) This coil can be used on 220/240 V at 50 Hz and on 240 V only at 60 Hz.

(4) For use on 400 V / 50 Hz, apply a coefficient of 0.6 to the mechanical durability of the contactor; see pages 142 and 143.

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LX1 D6●●

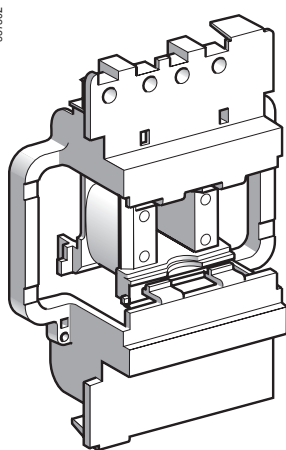
For 3 or 4-pole contactors LC1 D115

Specifications

Average consumption at 20 °C:

- inrush ($\cos \varphi = 0.8$) 50 or 60 Hz: 300 VA,- sealed ($\cos \varphi = 0.3$) 50 or 60 Hz: 22 VAOperating range ($\theta \leq 55$ °C): 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20°C ± 10 %	Inductance of closed circuit	Reference (1)	Average resistance at 20°C ± 10 %	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		Ω	H		kg
50 Hz				60 Hz			
24	1.24	0.09	LX1 D8B5	0.87	0.07	LX1 D8B6	0.260
32	2.14	0.17	LX1 D8C5	—	—	—	0.260
42	3.91	0.28	LX1 D8D5	—	—	—	0.260
48	4.51	0.36	LX1 D8E5	3.91	0.28	LX1 D8E6	0.260
110	26.53	2.00	LX1 D8F5	19.97	1.45	LX1 D8F6	0.260
115	26.53	2.00	LX1 D8FE5	—	—	—	0.260
120	—	—	—	24.02	1.70	LX1 D8G6	0.260
127	32.75	2.44	LX1 D8FC5	—	—	—	0.260
208	—	—	—	67.92	5.06	LX1 D8L6	0.260
220	104.77	7.65	LX1 D8M5	79.61	5.69	LX1 D8M6	0.260
230	104.77	8.29	LX1 D8P5	—	—	—	0.260
240	125.25	8.89	LX1 D8U5	97.04	6.75	LX1 D8U6	0.260
277	—	—	—	125.75	8.89	LX1 D8W6	0.260
380	338.51	22.26	LX1 D8Q5	243.07	17.04	LX1 D8Q6	0.260
400	368.43	25.55	LX1 D8V5	—	—	—	0.260
415	368.43	27.65	LX1 D8N5	—	—	—	0.260
440	441.56	30.34	LX1 D8R5	338.51	22.26	LX1 D8R6	0.260
480	—	—	—	368.43	25.55	LX1 D8T6	0.260
500	566.62	38.12	LX1 D8S5	—	—	—	0.260



LX1 D8●●

For 3 or 4-pole contactors LC1 D115, LC1 D150

Specifications

Average consumption at 20 °C:

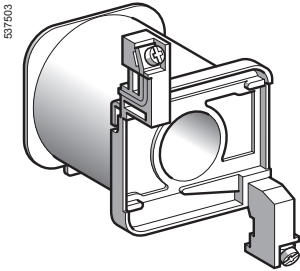
- inrush: $\cos \varphi = 0.9$ - 280 to 350 VA,- sealed: $\cos \varphi = 0.9$ - 2 to 18 VA.Operating range ($\theta \leq 55$ °C): 0.8...1.15 Uc.

Coils with integral suppression device fitted as standard, class B.

Control circuit voltage Uc	Average resistance at 20°C ± 10 %	Inductance of closed circuit	Reference (1)	Average resistance at 20°C ± 10 %	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		Ω	H		kg
				50/60 Hz			
24	—	—	—	147	3.03	LX1 D8B7	0.290
32	—	—	—	301	8.28	LX1 D8C7	0.290
42	—	—	—	498	13.32	LX1 D8D7	0.290
48	—	—	—	1061	24.19	LX1 D8E7	0.290
110	—	—	—	4377	109.69	LX1 D8F7	0.290
115	—	—	—	4377	109.69	LX1 D8FE7	0.290
120	—	—	—	4377	109.69	LX1 D8G7	0.290
127	—	—	—	6586	152.65	LX1 D8FC7	0.290
208	—	—	—	10 895	260.15	LX1 D8LE7	0.290
220	—	—	—	9895	210.72	LX1 D8M7	0.290
230	—	—	—	9895	210.72	LX1 D8P7	0.290
240	—	—	—	9895	210.72	LX1 D8U7	0.290
277	—	—	—	21 988	533.17	LX1 D8UE7	0.290
380	—	—	—	21 011	482.42	LX1 D8Q7	0.290
400	—	—	—	21 011	482.42	LX1 D8V7	0.290
415	—	—	—	21 011	482.42	LX1 D8N7	0.290
440	—	—	—	21 501	507.47	LX1 D8R7	0.290
480	—	—	—	32 249	938.41	LX1 D8T7	0.290
500	—	—	—	32 249	938.41	LX1 D8S7	0.290

(1) The last 2 digits in the reference represent the voltage code.

TeSys contactors
d.c. coils
for TeSys D, 3 or 4-pole contactors



LX4 D7●D

For 3-pole contactors LC1 D80 or 4-pole contactors LP1 D80

Specifications

Average consumption: 22 W.
Operating range: 0.85...1.1 Uc.

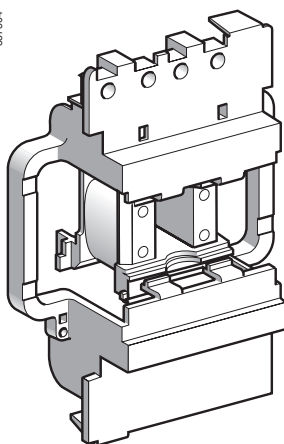
Control circuit voltage Uc	Average resistance at 20 °C ± 10%	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		kg
12	6.6	0.46	LX4 D7JD	0.680
24	27	1.89	LX4 D7BD	0.680
36	57	4	LX4 D7CD	0.680
48	107	7.5	LX4 D7ED	0.680
60	170	11.9	LX4 D7ND	0.680
72	230	16.1	LX4 D7SD	0.680
110	564	39.5	LX4 D7FD	0.680
125	718	50.3	LX4 D7GD	0.680
220	2215	155	LX4 D7MD	0.680
250	2850	200	LX4 D7UD	0.680
440	9195	640	LX4 D7RD	0.680

(1) The last 2 digits in the reference represent the voltage code.

TeSys contactors

d.c. coils for TeSys D, 3 or 4-pole contactors

537504



LX4 D8●D

For contactors LC1 D115, D150

Specifications

Consumption: inrush 270 to 365 W, sealed 2.4 to 5.1 W.

Operating range: 0.75...1.2 Uc.

Coils with integral suppression device fitted as standard, class B.

Control circuit voltage Uc	Average resistance at 20 °C ± 10 %	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		kg
24	147	3.03	LX4 D8BD	0.300
48	1061	24.19	LX4 D8ED	0.300
60	1673	38.44	LX4 D8ND	0.300
72	2500	56.27	LX4 D8SD	0.300
110	4377	109.69	LX4 D8FD	0.300
125	6586	152.65	LX4 D8GD	0.300
220	9895	210.72	LX4 D8MD	0.300
250	18 022	345.40	LX4 D8UD	0.300
440	21 501	684.66	LX4 D8RD	0.300

For 3-pole contactors LC1 D80 or 4-pole contactors LP1 D80

Specifications

Wide range coils for specific applications

Average consumption: 23 W.

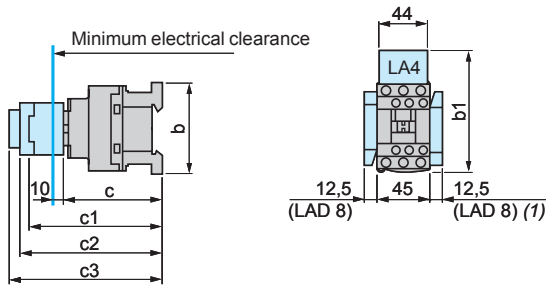
Operating range: 0.75 to 1.2 Uc.

Coils with "TH" treatment as standard.

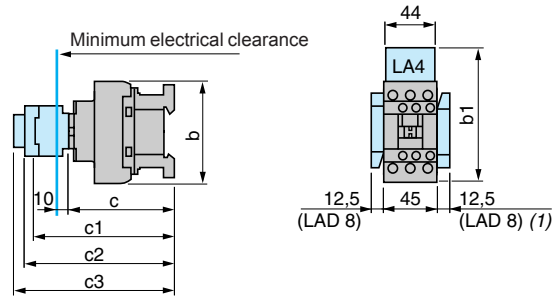
Control circuit voltage Uc	Average resistance at 20 °C ± 10 %	Inductance of closed circuit	Reference (1)	Weight
V	Ω	H		kg
12	6.2	0.49	LX4 D7JW	0.680
24	23.5	1.75	LX4 D7BW	0.680
36	51.9	4.18	LX4 D7CW	0.680
48	94.2	7	LX4 D7EW	0.680
72	204	15.7	LX4 D7SW	0.680
110	483	36	LX4 D7FW	0.680
220	1922	144	LX4 D7MW	0.680

(1) The last 2 digits in the reference represent the voltage code.

LC1 D09...D18 (3-pole)



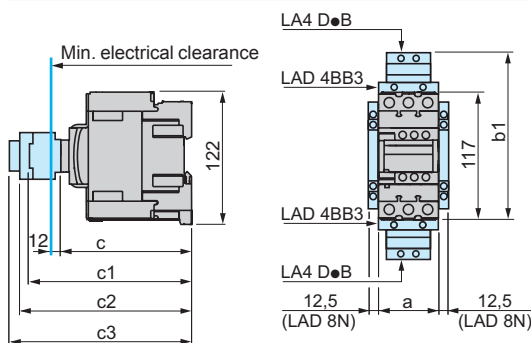
LC1 D25...D38 (3-pole), LC1 DT20...DT40 (4-pole)



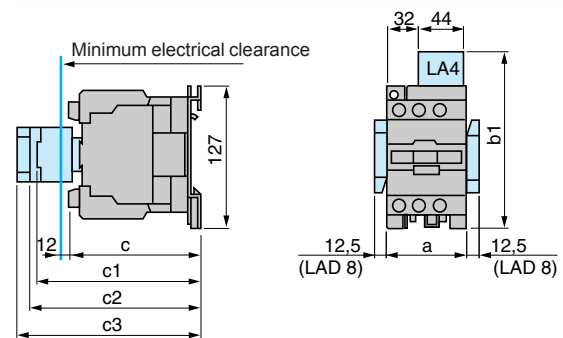
LC1	D09...D18	D093... D123	D099... D129	D25... D38	D183... D323	D098, D128, DT20 and DT25	DT203 and DT253	DT32 and DT40	D188, D258, DT323 and DT403
b without add-on blocks	77	99	80	85	99	85	99	91	105
b1 with LAD 4BB	94	107	95,5	98	107	98	—	—	—
with LA4 D●2	110 (1)	123 (1)	111,5 (1)	114 (1)	123 (1)	114	—	—	—
with LA4 DF, DT	119 (1)	132 (1)	120,5 (1)	123 (1)	132 (1)	129	—	—	—
with LA4 DW, DL	126 (1)	139 (1)	127,5 (1)	130 (1)	139 (1)	190	—	—	—
c without cover or add-on blocks	84	84	84	90	90	90	90	97	97
with cover, without add-on blocks	86	86	86	92	92	92	92	99	99
c1 with LAD N or C (2 or 4 contacts)	117	117	117	123	123	123	123	131	131
c2 with LA6 DK10, LAD 6K10	129	129	129	135	135	135	135	143	143
c3 with LAD T, R, S	137	137	137	143	143	143	143	151	151
with LAD T, R, S and sealing cover	141	141	141	147	147	147	147	155	155

(1) Including LAD 4BB.

LC1 D40A...D65A (3-pole), LC1 DT60A...DT80A (4-pole)



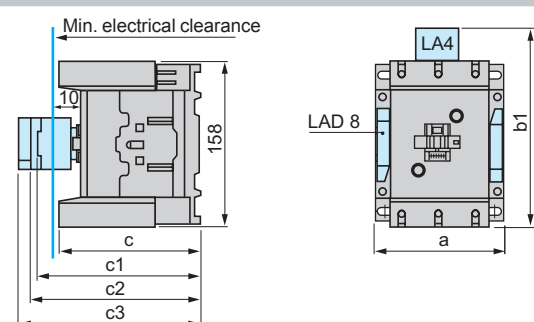
LC1 D80 and D95 (3-pole), LC1 D80004 and D80008 (4-pole), D40008 and D65008 (4-pole)



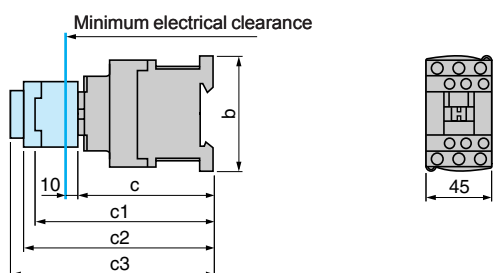
LC1	D40A...D65A	DT60A...DT80A	D40008	D80	D95, D65008	D80004	D80008
a	55	70	85	85	85	96	96
b1 with LA4 D●2	—	—	135	135	135	135	135
with LA4 DB3 or LAD 4BB3	136	—	—	135	—	—	—
with LA4 DF, DT	157	—	142	142	142	142	142
with LA4 DM, DW, DL	166	—	150	150	150	150	150
c without cover or add-on blocks	118	118	125	125	125	125	140
with cover, without add-on blocks	120	120	—	130	130	—	—
c1 with LAD N (1 contact)	—	—	139	150	150	150	150
with LAD N or C (2 or 4 contacts)	150	150	147	158	158	158	158
c2 with LAD 6K10 or LA6 DK	163	163	159	170	170	170	170
c3 with LAD T, R, S	171	171	167	178	178	178	178
with LAD T, R, S and sealing cover	175	175	171	182	182	182	182

LC1 D115 and D150 (3-pole), LC1 D115004 (4-pole)

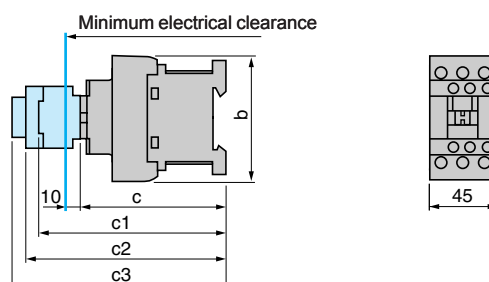
LC1	D115, D150	D115004	D1150046
a	120	150	155
b1 with LA4 DA2	174	174	174
with LA4 DF, DT	185	185	185
with LA4 DM, DL	188	188	188
with LA4 DW	188	188	188
c without cover or add-on blocks	132	132	115
with cover, without add-on blocks	136	—	—
c1 with LAD N or C (2 or 4 contacts)	150	150	150
c2 with LA6 DK20	155	155	155
c3 with LAD T, R, S	168	168	168
with LAD T, R, S and sealing cover	172	172	172



LC1 D09...D18 (3-pole)

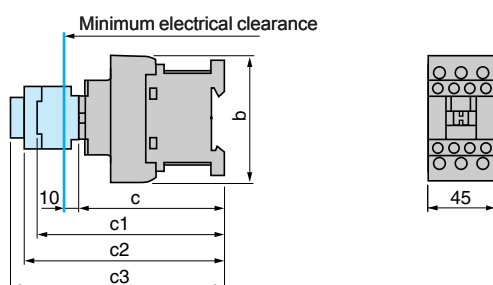


LC1 D25...D38 (3-pole)



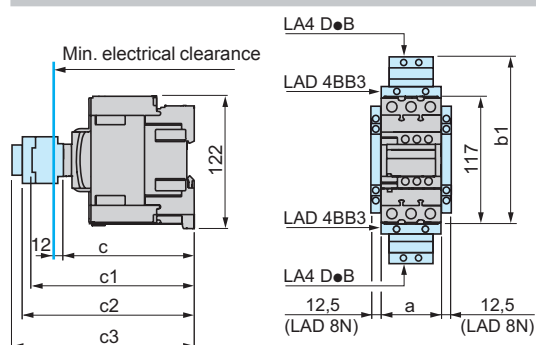
LC1	D09...D18	D093...D123	D099...D129	D25...D38	D183...D323
b	77	99	80	85	99
c without cover or add-on blocks	93	93	93	99	99
with cover, without add-on blocks	95	95	95	101	101
c1 with LAD N or C (2 or 4 contacts)	126	126	126	132	132
c2 with LA6 DK10	138	138	138	144	144
c3 with LAD T, R, S	146	146	146	152	152
with LAD T, R, S and sealing cover	150	150	150	156	156

LC1 DT20...DT40 (4-pole)

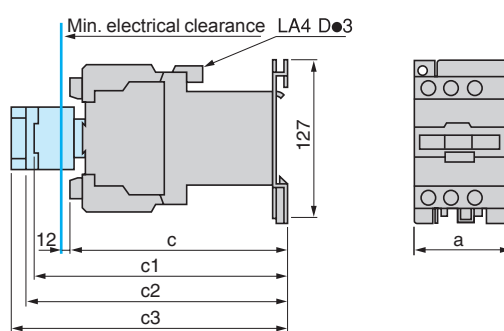


LC1	DT20 and DT25 D098 and D128	DT203 and DT253 D0983 and D1283	DT32 and DT40 D188...D258	DT323 and DT403 D1883 and D2583
b	85	99	91	105
c with cover	99	99	107	107
c1 with LAD N or C (2 or 4 contacts)	123	123	131	131
c2 with LA6 DK10	135	135	143	143
c3 with LAD T, R, S	143	143	151	151
with LAD T, R, S and sealing cover	147	147	155	155

LC1 D40A...D65A (3-pole), LC1 DT60A...DT80A (4-pole)



LC1 D80 and D95 (3-pole), LP1 D80004, LP1 D80008 (4-pole), LP1 D40008 and D65008 (4-pole)

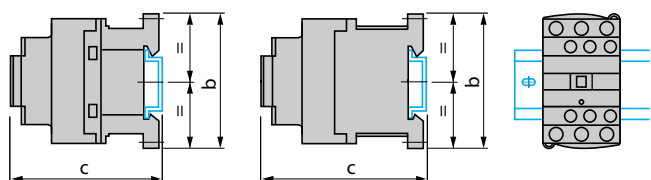


	LC1 D40A ... D65A	LC1 DT60A...DT80A	LP1 D40008 and D65008	LC1 D80 and D95	LP1 D80004	LP1 D80008
a	55	70	85	96	96	96
b1 with LAD 4BB3	136	136	—	—	—	—
with LA4 DF, DT	157	157	—	—	—	—
c without cover or add-on blocks	118	118	182	181	181	196
with cover, without add-on blocks	120	120	—	186	—	—
c1 with LAD N (1 contact)	—	—	196	204	204	204
with LAD N or C (2 or 4 contacts)	150	150	202	210	210	210
c2 with LA6 DK10	163	163	213	221	221	221
c3 with LAD T, R, S	171	171	221	229	229	229
with LAD T, R, S and sealing cover	175	175	225	233	233	233

LC1 D115... and LC1 D150... with ... coil: see page 182

LC1 D09...D38, DT20...DT40

On mounting rail AM1 DP200, DR200 or AM1 DE200 (width 35 mm)



Control circuit: a.c.

LC1	D09... D18	D25... D38	DT20 and DT25	DT32 and DT40
b	77	85	85	100
c (AM1 DP200 or DR200) (1)	88	94	94	109
c (AM1 DE200) (1)	96	102	102	117

Control circuit: d.c.

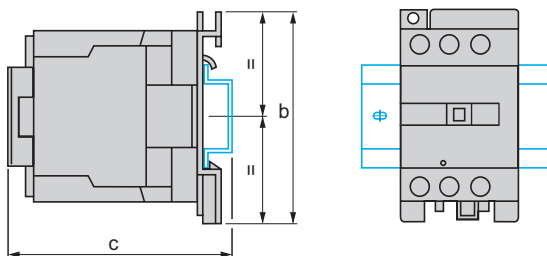
LC1	D09... D18	D25... D38	DT20 and DT25	DT32 and DT40
b	77	85	94	109
c (AM1 DP200 or DR200) (1)	97	103	103	118
c (AM1 DE200) (1)	105	110	111	1236

(1) with safety cover.

LC1 D40A...D65A, LC1 DT60A and DT80A, LC1 D80 and D95, LC1 D40008 and D65008

On mounting rail AM1 DL200 or DL201 (width 75 mm)

On mounting rail AM1 ED... or AM1 DE200 (width 35 mm)



Control circuit: a.c.

LC1	D40A...D65A DT60A...DT80A	D80 and D95	D40008 and D65008
b	122	127	127
c (AM1 DL200) (1)	—	147	143
c (AM1 DL201) (1)	—	137	133
c (AM1 ED... or DE200) (1)	128	137	133

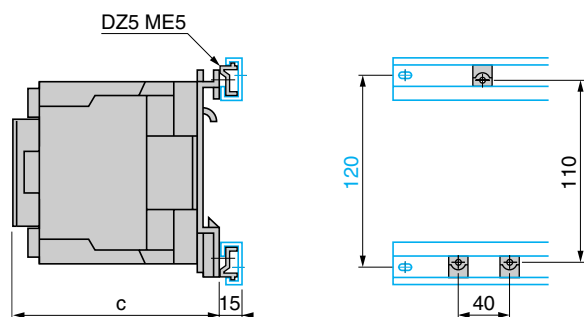
Control circuit: d.c.

LC1	D40A...D65A DT60A...DT80A	D80 and D95	D40008 and D65008
c (AM1 DL200) (1)	—	205	200
c (AM1 DL201) (1)	—	195	190
c (AM1 ED... or DE200) (1)	128	128	190

(1) with safety cover.

LC1 D80 and D95, LP1 D80

On 2 mounting rails DZ5 MB on 120 mm centres



Control circuit: a.c.

LC1	D80 and D95
c with cover	130

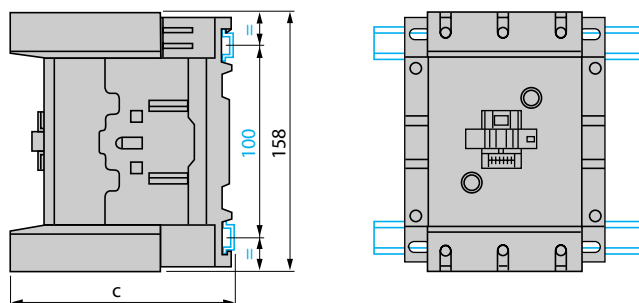
Control circuit: d.c.

LC1	D80 and D95
c with cover	186

LP1	D80
c	181

LC1 D115, D150

On 2 mounting rails DZ5 MB on 120 mm centres

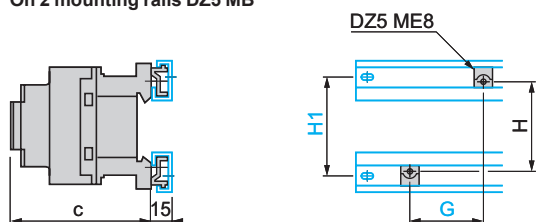


Control circuit: a.c. or d.c.

LC1	D115 and D150	D1156 and D1506
c (AM1 DP200 or DR200)	134,5	117,5
c (AM1 DE200 or ED...)	142,5	125,5

LC1 D09...D38 and LC1 DT20...DT40

On 2 mounting rails DZ5 MB



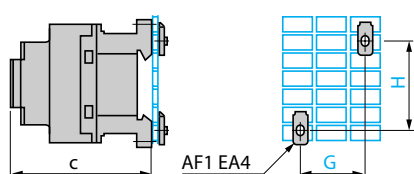
Control circuit:	a.c.		d.c.	
LC1	D09...D18	D25...D38	D09...D18	D25...D38
c with cover	86	92	95	101
G	35	35	35	35
H	60	60	70	70
H1	70	70	70	70

4-pole contactors

LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c	92	100	101	109
G	35	35	35	35
H	60	60	70	70
H1	70	70	70	70

LC1 D09...D38 and LC1 DT20...DT40

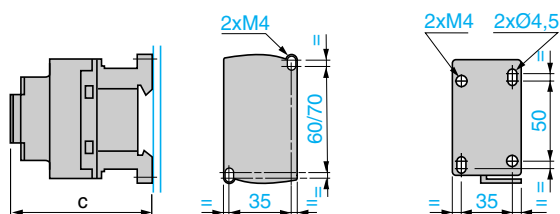
On pre-slotted mounting plate AM1 PA, PB, PC



Control circuit:	a.c.		d.c.	
LC1	D09...D18	D25...D38	D09...D18	D25...D38
c with cover	86	92	95	101
G	35	35	35	35
H	60/70	60/70	70	70
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c with cover	80	93	118	132
G	35	35	35	35
H	60	60	70	70

LC1 D09...D38, LC1 DT20...DT40

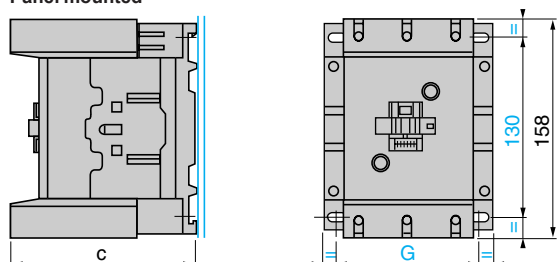
Panel mounted



Control circuit:	a.c.		d.c.	
LC1	D09...D18	D25...D38	D09...D18	D25...D38
c with cover	86	92	95	101
4-pole contactors				
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c with cover	90	98	90	98

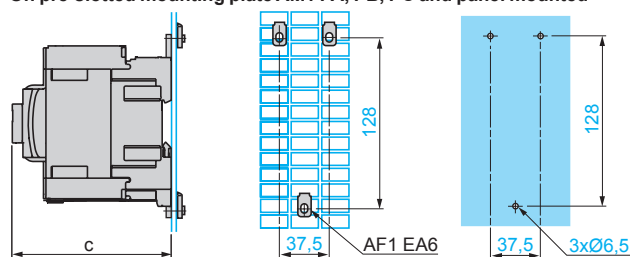
LC1 D115, D150

Panel mounted



LC1 D40A...D65A, LC1 DT60A...DT80A

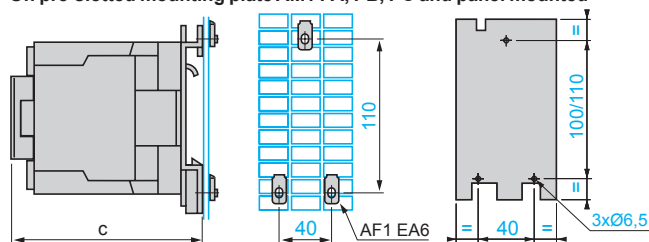
On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted



Control circuit:	a.c.	d.c.
LC1	D40A...65A, DT60A...DT80A	D40A...65A, DT60A...DT80A
c with cover	120	120

LC1 D80 and D95, LC1 D40008 and D65008, LP1 D80

On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted



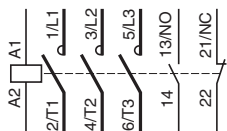
Control circuit:	a.c.	d.c.
LC1	D80 and D95, D40008 and D65008	D80 and D95, D40008 and D65008
c with cover	130	186
LP1		D80
c without cover	—	181

LC1	D115	D1156	D150	D1506
c	132	115	132	115
G (3-pole)	96/110	96/110	96/110	96/110
G (4-pole)	130/144	130/144	—	—

Contactors

3-pole contactors (References: pages 152 to 155)

LC1 D09 to D150



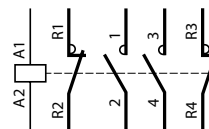
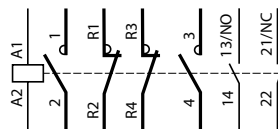
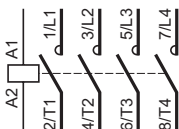
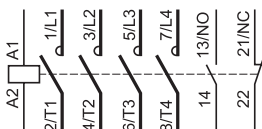
4-pole contactors (References: pages 154 and 155)

LC1 DT20 to DT80A

LC1 D115004

LC1 D098 to D258

LC1 and LP1 D40008 to D80008



Front mounting add-on contact blocks

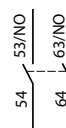
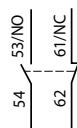
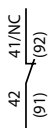
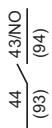
Instantaneous auxiliary contacts (References: page 169)

1 N/O LAD N10 (1)

1 N/C LAD N01 (1)

1 N/O + 1 N/C LAD N11

2 N/O LAD N20

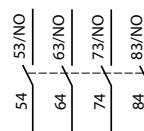
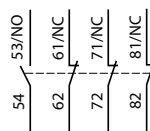
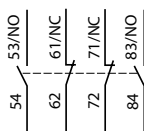
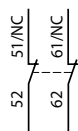


2 N/C LAD N02

2 N/O + 2 N/C LAD N22

1 N/O + 3 N/C LAD N13

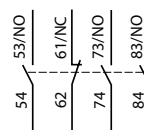
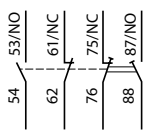
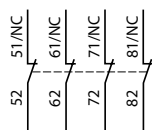
4 N/O LAD N40



4 N/C LAD N04

2 N/O + 2 N/C including 1 N/O + 1 N/C make before break LAD C22

3 N/O + 1 N/C LAD N31



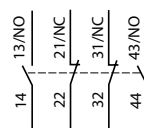
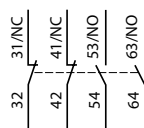
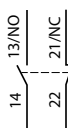
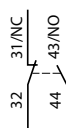
Instantaneous auxiliary contacts conforming to standard EN 50012 (References: page 169)

1 N/O + 1 N/C LAD N11G

1 N/O + 1 N/C LAD N11P

2 N/O + 2 N/C LAD N22G

2 N/O + 2 N/C LAD N22P

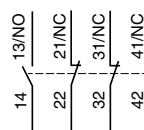
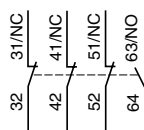
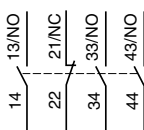
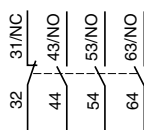


3 N/O + 1 N/C LAD N31G

3 N/O + 1 N/C LAD N31P

1 N/O + 3 N/C LAD N13G

1 N/O + 3 N/C LAD N13P

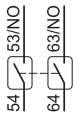


(1) Items in brackets refer to blocks mounted on right-hand side of contactor.

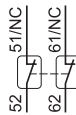
Front mounting add-on contact blocks

Dust and damp protected instantaneous auxiliary contacts (References: page 169)

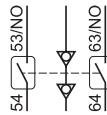
2 N/O (24-50 V)
LA1 DX20



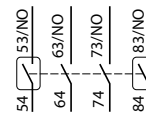
2 N/C (24-50 V)
LA1 DX02



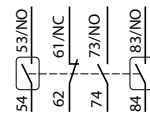
2 N/O (5-24 V)
LA1 DY20



2 N/O protected (24-50 V)
2 N/O standard LA1 DZ40

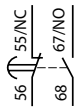


2 N/O protected (24-50 V)
+ 1 N/O + 1 N/C standard LA1 DZ31

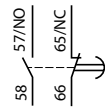


Time delay auxiliary contacts (References: page 170)

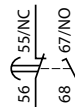
On-delay 1 N/O + 1 N/C LAD T



Off-delay 1 N/O + 1 N/C LAD R

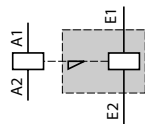


On-delay 1 N/C + 1 N/O break before make LAD S



Mechanical latch blocks (References: page 170)

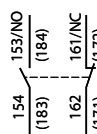
LAD 6K10 and LA6 DK20



Side mounting add-on contact blocks

Instantaneous auxiliary contacts (References: page 169)

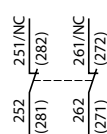
1 N/O + 1 N/C LAD 8N11 (1)



2 N/O LAD 8N20 (1)



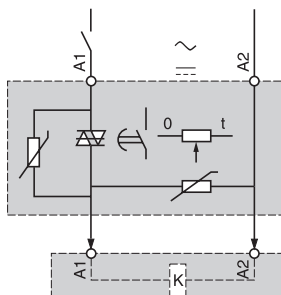
2 N/O LAD 8N02 (1)



(1) Items in brackets refer to blocks mounted on right-hand side of contactor.

Electronic serial timer module

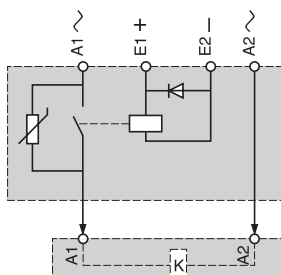
On-delay LA4 DT•U



Interface modules

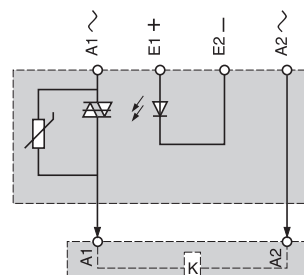
Relay output

LA4 DFB



Solid state

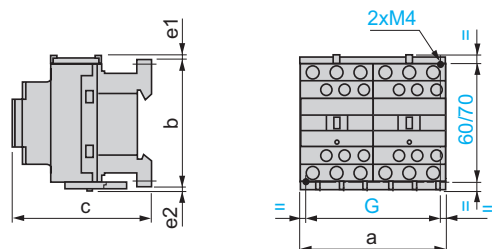
LA4 DWB



References: page 173.

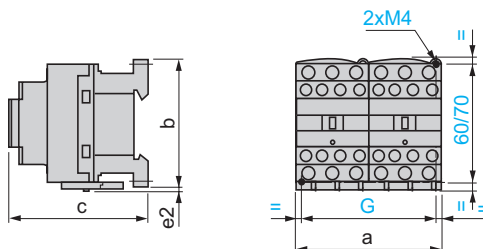
LC2 D09 to D38

2 x LC1 D09 to D38



LC2 DT20 to DT40

2 x LC1 DT20 to DT40



LC2 or 2 x LC1	a	b	c (1)	e1	e2	G
D09 to D18 ~	90	77	86	4	1.5	80
D093 to D123 ~	90	99	86	—	—	80
D09 to D18 ...	90	77	95	4	1.5	80
D093 to D123 ...	90	99	95	—	—	80
D25 to D38 ~	90	85	92	9	5	80
D183 to D383 ~	90	99	92	—	—	80
D25 to D32 ...	90	85	101	9	5	80
D183 to D383 ...	90	99	101	—	—	80

e1 and e2: including cabling.

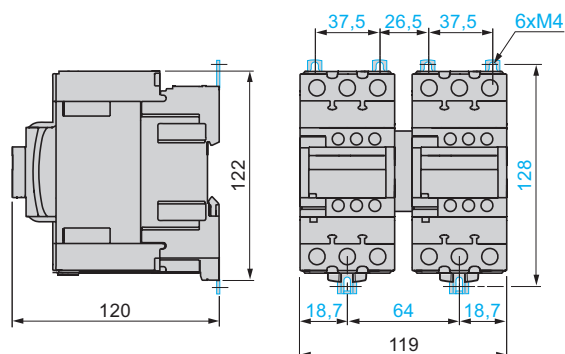
(1) With safety cover, without add-on block.

LC2 or 2 x LC1	a	b	c	G
DT20 and DT25	90	85	90	80
DT32 and DT40	90	91	98	80

c, e: including cabling.

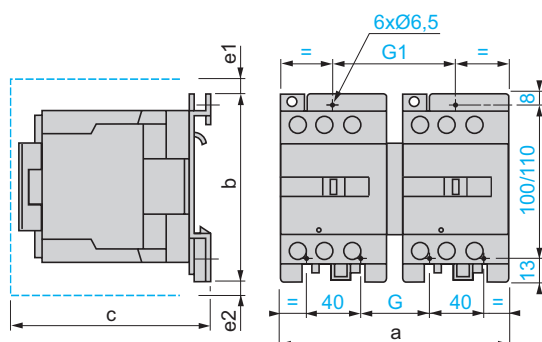
LC2 D40A to D65A

2 x LC1 D40A to D65A

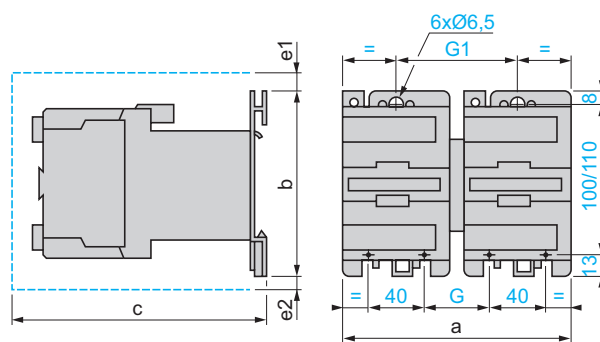


LC2 D80 and D95

2 x LC1 D80 and D95 ~



2 x LC1 D80 and D95 ---



LC2 or 2 x LC1	a	b	c	e1	e2	G	G1
D80 and D95 ~	182	127	158	13	—	57	96
D80004 ~	207	127	158	—	20	71	111

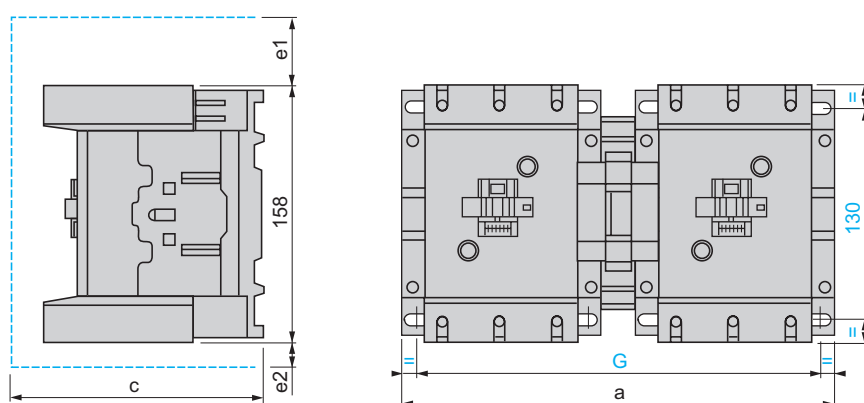
c, e1 and e2: including cabling.

2 x LC1	a	b	c	e1	e2	G	G1
D80 and D95	207	127	215	13	20	96	111

c, e1 and e2: including cabling.

LC2 D115 and D150

2 x LC1 D115 and D150



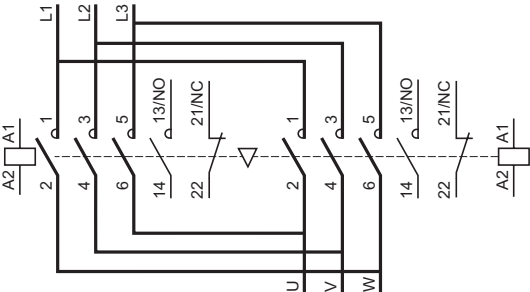
LC2 or 2 x LC1	a	c	e1	e2	G
D115 and D150	266	148	56	18	242/256
D115004	334	148	—	60	310/324

c, e1 and e2: including cabling.

Reversing contactors for motor control

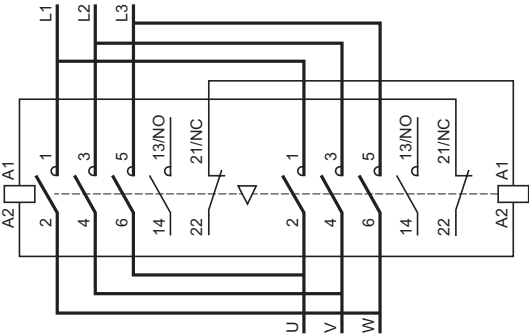
LC2 D09...D150

Horizontally mounted



LAD 9R1V

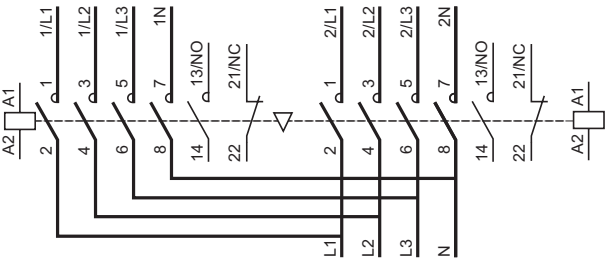
With integral electrical interlocking



Changeover contactor pairs

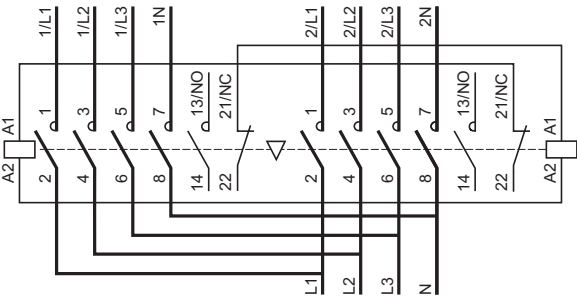
LC2 DT20...DT40

Horizontally mounted



LAD T9R1V

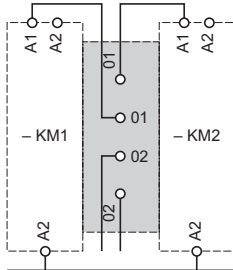
With integral electrical interlocking



Electrical interlocking of reversing contactors fitted with:

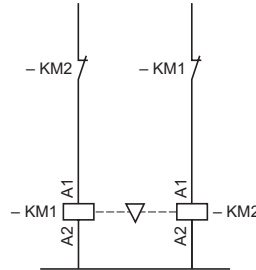
Mechanical interlock with integral electrical contacts

LA9 D4002, LA9 D8002 and LA9 D11502

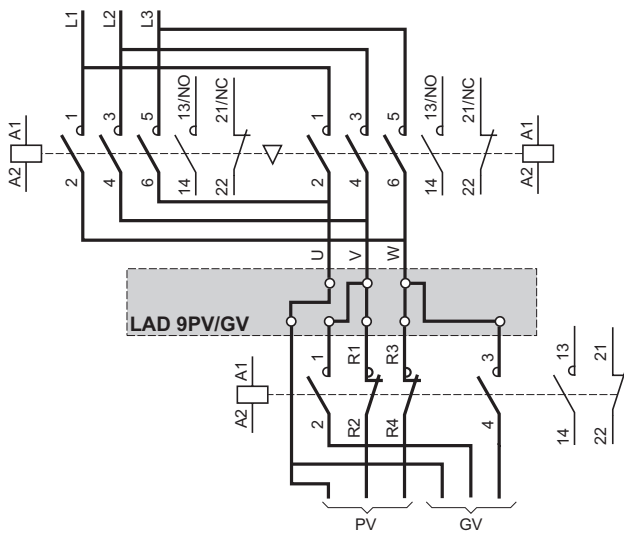


Mechanical interlock without integral electrical contacts

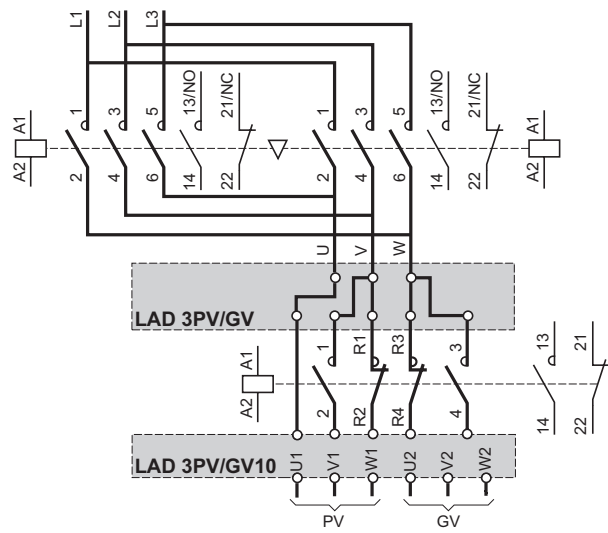
LAD 9V2, LAD 4CM, LA9 D50978 and LA9 D80978



Low speed-High speed cabling kit, screw clamp terminals



Low speed-High speed cabling kit, spring terminals



General: motor and machine protection	page 194
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<i>“Protection relays and controllers” selection guide</i>	<i>page 200</i>
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■ TeSys D thermal overload relays

□ Presentation	page 202
□ Description	page 202
□ Characteristics	page 203
□ Relays references	page 208
□ Accessories references	page 212
□ Dimensions	page 214
□ Schemes	page 217

Introduction

Exceeding the operating limits of an electric motor will lead, eventually, not only to destruction of the motor itself but also of the mechanisms it drives.

This type of load can be the cause of electrical or mechanical faults.

■ **Electrical faults:**

- overvoltage, voltage drop, imbalance and phase failure which cause variations in the current drawn,
- short-circuits which can cause the current to reach levels capable of destroying the load.

■ **Mechanical faults:**

- locked rotor,
- brief or prolonged overload which leads to an increase in the current drawn by the motor, and therefore overheating.

The cost of these faults must take into account loss of production, loss of raw materials, repair of the production tool, poor quality of production and delays in delivery.

These faults can also have dramatic consequences on the safety of persons in direct or indirect contact with the motor.

To prevent these faults, protection measures are necessary. They make it possible to isolate the equipment to be protected from the mains supply by measuring variations in electrical values (voltage, current, etc...).

Each motor starter must therefore have:

■ **short-circuit protection**, to detect and break, as quickly as possible, abnormal currents generally greater than 10 times the rated current (I_n).

■ **overload protection**, to detect increases in current up to about $10 I_n$ and switch off the starter before overheating of the motor and conductors damages the insulation.

This protection is provided by specific devices such as fuses, circuit-breakers and thermal overload relays, or by more integrated devices offering several types of protection.

Causes, effects and consequences of various faults

There are two types of fault:

- Internal faults within the motor.
- External faults: these are located outside the electric motor but their consequences can lead to damage inside the motor.

Faults	Causes	Effects	Consequences on the motor and on the machine
Short-circuit	Contact between several phases, or between one phase and neutral or between several turns of the same phase.	<ul style="list-style-type: none"> ■ Current peak ■ Electrodynamical forces on the conductors 	Destruction of windings
Overvoltage	<ul style="list-style-type: none"> ■ Lightning ■ Electrostatic discharge ■ Operation 	Dielectric breakdown in the windings	Destruction of the windings due to loss of insulation
Phase imbalance and phase failure	<ul style="list-style-type: none"> ■ Opening of a phase ■ Single-phase load upstream of the motor ■ Short-circuit between the turns of the same winding 	<ul style="list-style-type: none"> ■ Reduction of usable torque, efficiency and speed ■ Increase in losses ■ Starting impossible if phase failure 	Overheating (1)
High starting frequency	<ul style="list-style-type: none"> ■ Failure of the automation system ■ Too many manual control operations ■ Numerous fault trips 	High stator and rotor temperature rise due to the frequent start current	Overheating (1) Consequences on the process
Voltage variations	<ul style="list-style-type: none"> ■ Instability of the mains voltage ■ Connection of heavy loads 	<ul style="list-style-type: none"> ■ Reduction of usable torque ■ Increase in losses 	Overheating (1)
Harmonics	■ Pollution of the mains supply by variable speed drives, inverters, etc...	<ul style="list-style-type: none"> ■ Reduction of usable torque ■ Increase in losses 	Overheating (1)
Long starting time	<ul style="list-style-type: none"> ■ Resistive torque too high (load too heavy) ■ Voltage drop 	Increase in starting time	Overheating (1)
Jamming	<ul style="list-style-type: none"> ■ Mechanical problem (crusher) ■ Seizures 	Overcurrent	Overheating (1) Consequences on the process
No-load running	<ul style="list-style-type: none"> ■ Pump running empty ■ Mechanical break in drive to the load 	Drop in current drawn	Consequences on the process
Frequency fluctuations	<ul style="list-style-type: none"> ■ Overload of a supply powered by limited independent sources ■ Faulty alternator speed regulator 	<ul style="list-style-type: none"> ■ Increase in losses ■ Interferes with synchronous devices (clock, recorder, ...) 	–
Overload	<ul style="list-style-type: none"> ■ Increase in resistive torque ■ Voltage drop ■ Drop in power factor 	Increase in current consumption	Overheating (1)
Loss of machine excitation	<ul style="list-style-type: none"> ■ Significant drop in excitation current ■ Break in rotor winding 	<ul style="list-style-type: none"> ■ Increase in active power ■ Drop in power factor 	Significant overheating of rotor and cage
Phase-Earth fault	<ul style="list-style-type: none"> ■ Accidental Phase-Earth contacts ■ Accidental Phase-machine casing contacts (casing connected to earth) 	<ul style="list-style-type: none"> ■ Overvoltage developed in the mains supply ■ Rise in earth potential (safety of persons) 	Consequences on safety of persons

(1) Then, in the longer or shorter term, depending on the seriousness of the fault and/or its frequency, short-circuit and destruction of the windings.

Protection functions

Short-circuit protection

General

A short-circuit results in a very rapid rise in current which can reach several hundred times the value of the operational current. The consequences of a short-circuit are dangerous to both equipment and persons. It is therefore imperative to use protection devices to detect the fault and very quickly break the circuit.

Two types of protection are commonly used:

- fuses (cutout) which break the circuit by melting, which then requires their replacement,
 - magnetic trip circuit-breakers, often more simply called "magnetic circuit-breakers", which only require re-setting to put them back into service.
- Short-circuit protection can also be built into multifunction devices such as motor circuit-breakers and contactor-breakers.

The main characteristics of short-circuit protection devices are:

- their breaking capacity: this is the highest prospective short-circuit current value that a protection device can break at a given voltage.
 - their making capacity: this is the highest current value that the protection device can make at its rated voltage in specified conditions.
- The making capacity is equal to k times the breaking capacity.



LS1 D32
fuse carrier



GS2 N3
switch disconnectors

Fuses (cutouts)

Fuses provide individual phase protection (single-pole), with a high breaking capacity in a compact size:

- mounted either in fuse carriers,
- or in isolators, replacing the original links or shunt bars.

For motor protection, aM type fuses are used. Their design characteristics allow them to conduct the high magnetising currents that occur when motors are switched on. They are therefore unsuitable for overload protection (unlike gG type fuses). This is why an overload relay must be included in the motor power supply circuit.



GV2 L
magnetic circuit-breaker



TeSys U LUB 12 starter with
LUCA12 control unit

Magnetic circuit-breakers

These circuit-breakers protect installations against short-circuits, within the limit of their breaking capacity.

Magnetic circuit-breakers provide omnipole breaking as standard.

For relatively low short-circuit currents, the operation of a circuit-breaker is faster than that of fuses.

This protection conforms to standard IEC 60947-2.

The thermal and electrodynamic effects are also limited, therefore ensuring better protection of cables and equipment.



LRD 02
thermal overload relay



LRD 365
thermal overload relay



RM4 JA current measurement relay



TeSys U starter with "thermal overload alarm" function module

Protection functions (continued)

Overload protection

General

An overload condition is the most frequently encountered fault. The symptoms are a rise in the current drawn by the motor and thermal effects. A rapid return to normal operating conditions is important.

The actual operating conditions (ambient temperature, operating altitude and type of standard duty) are essential to determine the operating values of the motor (power, current) and to be able to select effective overload protection. These operational values are given by the motor manufacturer.

According to the level required, protection can be provided by:

- overload relays and thermal overload relays (bi-metallic or electronic type) which protect motors in the event of:
 - overload, by monitoring the current drawn by each phase,
 - phase imbalance or failure, by their differential mechanism.
- relays with PTC thermistor probes (Positive Temperature Coefficient).
- overtorque relays,
- multifunction relays.

Overload relays

These relays protect motors against overload. They must allow the temporary overload that occurs on starting and must only trip if the starting time is abnormally long.

The overload relay will be selected according to the length of the starting time (tripping class) and the motor rating.

These relays have a thermal memory (except for certain electronic overload relays, indicated by their manufacturers) and can be connected:

- either in series with the load,
- or to current transformers placed in series with the load.

Bi-metallic thermal overload relays

Combined with a contactor, these relays protect the line and the equipment against small and prolonged overloads. They must be protected against strong overcurrent by a circuit-breaker or fuses.

These relays may be used on an a.c. or d.c. system and are generally:

- 3-pole,
- compensated, i.e. insensitive to ambient temperature variations,
- with manual or automatic reset,
- graduated with a "motor FLC" scale: allowing direct setting to the full load current as shown on the motor rating plate.

They can also be sensitive to phase failure: this is known as 'differential'. This function conforms to standards IEC 60947-4-1 and 60947-6-2

This type of relay is extremely reliable and is a relatively low cost device.

Electronic thermal overload relays

Electronic thermal overload relays have the advantage of electronics which allow a more complex thermal image of the motor to be created.

They can be combined with products having complementary functions, such as:

- temperature sensing via PTC probes,
- protection against jamming and overtorque,
- protection against phase reversal,
- earth fault protection,
- protection against no-load running,
- alarm function.



LT3 S relays for use with thermistor probes



LR97 D07 instantaneous electronic overcurrent relays



TeSys U LUB 32 starter with multifunction control unit LUC M



TeSys U controller LUTM 20BL



TeSys T controller LTM R08MBD

Protection functions (continued)

Overload protection (continued)

Relays for use with PTC thermistor probes

With direct sensing of the stator windings, these relays can be used to protect motors against:

- overload,
- a rise in ambient temperature,
- a ventilation circuit fault,
- a high starting frequency,
- mechanical shocks, etc...

Overload (or overtorque) relays

These relays protect the drive line in the event of a locked rotor, seizure or mechanical shocks. This is an additional protection.

Unlike thermal overload relays, these relays do not have a thermal memory. They have definite time characteristics (adjustable current threshold and time delay).

The overtorque relay can be used as overload protection for motors with long starting times or very frequent starting (for example, lifting hoists).

Multifunction relays

■ Overcurrent relays are limited when it is necessary to take into account problems associated with voltage, temperature or special applications. New production or maintenance management needs have prompted manufacturers to offer products which provide not only adaptable protection, but also complete management of the motor and its load.

They incorporate:

- current and voltage sensors (TeSys T controllers),
- hybrid analog and digital electronic technology,
- the use of communication buses for data exchange and control,
- powerful motor modelling algorithms,
- integrated application programs whose parameters can be set.

These products make it possible to reduce installation and operating costs by reducing maintenance and downtime.

TeSys U starters:

The multifunction relay is incorporated in the motor starter.

This solution is very compact with reduced wiring. It is limited to 32 A.

TeSys U controllers:

The multifunction relay is separate from the power line and reuses the function blocks from the TeSys U solution. It can be used in conjunction with a contactor up to 810 A.

TeSys T controllers:

The multifunction relay is separate from the power line and incorporates inputs and outputs. It can be used in conjunction with a contactor up to 810 A.

Protection components

Motor and machine protection

Protection relay selection table					
Relay type	Motor protection		Machine protection	Motor and machine protection	
	Thermal overload relay	Relays for use with PTC probes	Overtorque relays	TeSys U controller	TeSys T controller
	LR2 K, LRD, LRD 3, LR9 F, LR9 D (1)	LT3 S	LR97 D, LT47	LUT M	LTM R
Causes of overheating	(2)		(2)	(2)	(3)
Slight overload					
Locked rotor					
No-load running					
Supply phase failure			LR9 7D		
Ventilation fault					With probes
Abnormal temperature rise					With probes
Shaft bearing seizure					With probes
Insulation fault					
Protracted starting time					
Severe duty					With probes
Voltage variation					
Frequency fluctuations					
Loss of machine excitation					

	Ideally suited
	Possible solution
	Not suitable (no protection)

(1) for motor circuit-breaker type GV2ME.

(2) Protection based on current.

(3) Protection based on current and voltage.

Applications

Motor protection

Thermal motor protection



Protection

- Motor overload
- Stalling
- Phase failure

Tripping class

Class 10 A

Classes 10 A and 20

Classes 10 and 20

Communication

—

Used with contactor type

LC1 K, LP1 K

LC1 D

LC1 F

Motor current (In)

0.11...16 A

0.1...150 A

30...630 A

Relay or controller type

LR2 K

LRD, LR2 D and LR9 D







LR9 F

Pages

Please consult our catalogue "Motor starter solutions".

208 to 211

Please consult our catalogue "Motor starter solutions".

		Machine protection		Motor and machine protection	
Protection of slip ring motors and of circuits without current peaks		Protection of resistors, bearings, capacitors		Specific motor protection	
Protection and control					
					
<div><div>- Strong overcurrent</div><div>- Stalling</div></div>	<div><div>- Frequent starting</div><div>- Harsh environments</div></div>	<div><div>- Overtorque</div><div>- Mechanical shocks</div><div>- Locked rotor</div><div>- Phase failure</div></div>	<div><div>- Overtorque</div><div>- Mechanical shocks</div></div>	<div><div>- Thermal overload</div><div>- Phase imbalance and phase failure</div><div>- Motor stalling</div><div>- Long starting times</div><div>- Earth fault</div></div>	<div><div>- Thermal overload</div><div>- Phase imbalance and phase failure</div><div>- Locked rotor</div><div>- Long starting times</div><div>- Phase reversal</div><div>- Earth fault</div></div>
-				Classes 5 to 30	Classes 5 to 30
-				AS-Interface, Modbus, CANopen, Advantys STB	Modbus, CANopen, DeviceNet, Profibus DP
All contactors					
0.7...630 A	Unlimited	0.3...38 A	0.3...60 A	0.35...800 A	0.4...810 A
RM1 XA	LT3 S	LR97D	LT47	LUTM 00BL	LTM R
Please consult our catalogue "Motor starter solutions".					Please consult our catalogue "Motor Management System - TeSys T"

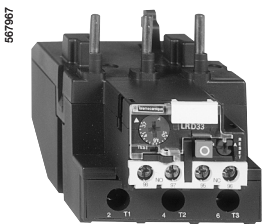
Presentation



LRD 08



LRD 365



LRD 33●●

TeSys D thermal overload relays are designed to protect a.c. circuits and motors against:

- overloads,
- phase failure,
- excessively long starting times,
- prolonged stalled rotor condition.

Power connection

LRD 01 to LRD 35

LRD 01 to 35 relays are designed for connection by screw clamp terminals. They can be supplied for connection by spring terminals or by lugs (1).

LRD 313 to LRD 365

LRD 313 to 365 relays are for connection by BTR screw connectors (hexagon socket head).

The screws are tightened by means of a size 4, insulated Allen key.

This type of connection uses the **EverLink®** system with creep compensation (2) (Schneider Electric patent).

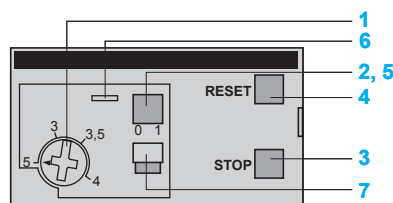
This technique makes it possible to achieve accurate and durable tightening torque.

These relays are also available for connection by lugs (1).

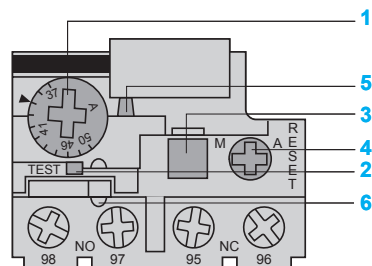
LRD 3361 to 4369, LR2 D3561 to D3563

LRD 3361 to 4369 and LR2 D3561 to D3563 relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs (1).

Description



LRD 01...35 and LRD 313...LRD 365



LRD 3361...4369, LR2 D3561...3563

TeSys D 3-pole thermal overload relays are designed to protect a.c. circuits and motors against overloads, phase failure, long starting times and prolonged stalling of the motor.

- 1 Adjustment dial Ir.
- 2 Test button.
Operation of the Test button allows:
 - checking of control circuit wiring,
 - simulation of relay tripping (actuates both the N/O and N/C contacts).
- 3 Stop button. Actuates the N/C contact; does not affect the N/O contact.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Selector for manual or automatic reset.

LRD 01 to 35 and LRD 313 to LRD 365 relays are supplied with the selector in the manual position, protected by a cover. Deliberate action is required to move it to the automatic position.

(1) Connection by lugs meets the requirements of certain Asian markets and is suitable for applications subject to strong vibration, such as railway transport.

(2) Creep: normal crushing phenomenon of copper conductors, that is accentuated over time.

Environment			
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508, CSA C22.2 n° 14. ATEX directive 94/9/EC (1)
Product certifications			UL, CSA, CCC, GOST ATEX INERIS (1). GL, DNV, RINA, BV, LROS (2).
Degree of protection	Conforming to VDE 0106		Protection against direct finger contact IP 2X
Protective treatment	Conforming to IEC 60068		"TH"
Ambient air temperature around the device	Storage	°C	- 60...+ 70
	Normal operation, without derating (IEC 60947-4-1)	°C	- 20...+ 60
	Minimum /maximum operating temperatures (with derating)	°C	- 40...+ 70
Operating positions without derating	In relation to normal vertical mounting plane		Any position. When mounting on a vertical rail, use a stop.
Flame resistance	Conforming to UL 94		V1
	Conforming to IEC 60695-2-1	°C	850
Shock resistance	Permissible acceleration conforming to IEC 60068-2-7		15 gn - 11 ms
Vibration resistance (3)	Permissible acceleration conforming to IEC 60068-2-6		6 gn
Dielectric strength at 50 Hz	Conforming to IEC 60255-5	kV	6
Surge withstand	Conforming to IEC 60801-5	kV	6

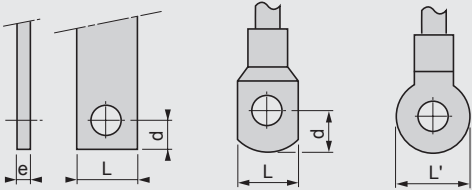
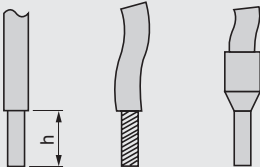
Electrical characteristics of power circuit										
Relay type		LRD 01 ...16, LR3 D01 ...16	LRD 1508 ...1532	LRD 21 ...35, LR3 D21 ...35	LRD 313 ...365 LR3 D313 ...365	LRD 313L ...365L	LRD 3322 ...33696 LR3 D3322 ... 33696	LR2 D3522 ... 3563	LRD 4365 ...4369	
Tripping class	Conforming to UL 508, IEC 60947-4-1	10 A	20	10 A	10 A	20	10 A	20	10 A	
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	690				1000			
	Conforming to UL, CSA	V	600						600 except LRD 4369	
Rated impulse withstand voltage (Uimp)		kV	6							
Frequency limits	Of the operating current	Hz	0...400							
Setting range	Depending on model	A	0.1...13	2.5...32	12...38	9...65	9...65	17...140	17...80	80...140

Auxiliary contact characteristics										
Conventional thermal current		A	5							
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply, AC-15	V	120	240	380	480	500	600		
		A	3	1.5	0.95	0.75	0.72	0.12		
	d.c. supply, DC-13	V	125	250	440					
		A	0.22	0.1	0.06					
Protection against short-circuits	By gG, BS fuses. Maximum rating or by GB2	A	5							

(1) For relays LRD01 to LRD365.

(2) Pending for relays LRD313 to LRD365.

(3) For relays LRD 313 to LRD 365: 6 gn only with independent plate mounting and 4 gn when mounted beneath the contactor.

Power circuit connection characteristics										
Relay type			LRD 01 ...16, LR3 D01 ...16	LRD 1508 ...1532	LRD 21 ...35, LR3 D21 ...35	LRD 313 ...365 LR3 D313 ...365	LRD 313L ...365L	LRD 3322 ...33696 LR3 D3322 ... 33696	LR2 D3522 ...3563	LRD 4365 ...4369
Connection to screw clamp terminals										
Flexible cable without cable end	1 conductor	mm²	1.5...10		1.5...10	1...35	1...35	4...35		4...50
Flexible cable with cable end	1 conductor	mm²	1...4		1...6 except LRD 21: 1...4	1...35	1...35	4...35		4...35
Solid cable without cable end	1 conductor	mm²	1...6		1.5/10 except LRD 21: 1/6	1...35	1...35	4...35		4...50
Tightening torque		N.m	1.7	1.85	2.5	1...25 : 5 35 : 8	1...25 : 5 35 : 8	9	9	9
Connection to spring terminals (Min/max c.s.a.)										
Flexible cable without cable end	1 conductor	mm²	1.5...4	–	1.5...4	–	–	–	–	–
Flexible cable with cable end	1 conductor	mm²	1.5...4	–	1.5...4	–	–	–	–	–
Connection by bars or lugs										
Relay type			LRD 016 ... 166	LRD 216 ... 356	LRD 3136 ... 3656	LRD 313L6 ... 365L6	LRD 3322A66 ... 3365A66			
Pitch	Without spreaders	mm	14.5	17.5	17.5	17.5	21.5			
Bars or cables with lugs	e	N.m	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6			
	L	mm	≤ 8	≤ 8	≤ 13.5	≤ 13.5	≤ 16			
	L'	mm	≤ 9.5	≤ 10	≤ 16.5	≤ 16.5	≤ 16			
	d		≤ 7	≤ 7	≤ 10	≤ 10	≤ 12			
Screws			M4	M4	M6	M6	M10			
Tightening torque		N.m	2.3	2.3	6	6	11.3			
Control circuit connection characteristics										
Connection to screw clamp terminals or spring terminals										
Bare cables										
Relay type			LRD 01 ...16, LR3 D01 ...16	LRD 1508 ... 1532	LRD 21 ...35, LR3 D21 ...35	LRD 313 ...365 LR3 D313 ...365	LRD 313L ...365L	LRD 3322 ...33696 LR3 D3322 ... 33696	LR2 D3522 ... 3563	LRD 4365 ...4369
Connection to screw clamp terminals (1)										
Solid cable without cable end		mm²	2 x 1...2.5							
Flexible cable without cable end		mm²	2 x 1...2.5							
Flexible cable with cable end		mm²	2 x 1...2.5							
Tightening torque		N.m	1.7							
Connection to spring terminals (Min/max c.s.a.)										
Solid cable		mm²	1...2.5	–	1...2.5		–			
Flexible cable without cable end		mm²	1...2.5	–	1...2.5		–			

(1) For relays LRD 313 to 365: BTR hexagon socket head screws, EverLink® system.
In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LAD ALLEN4, see page 175).

Operating characteristics

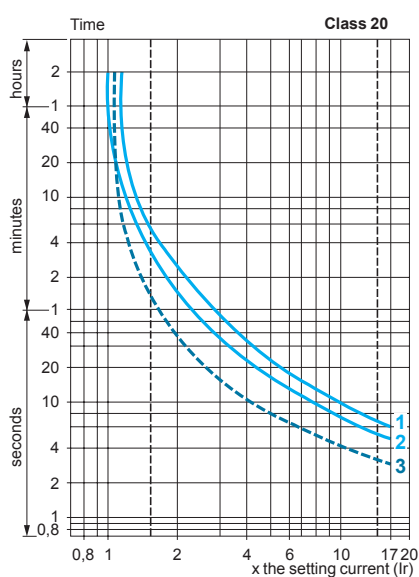
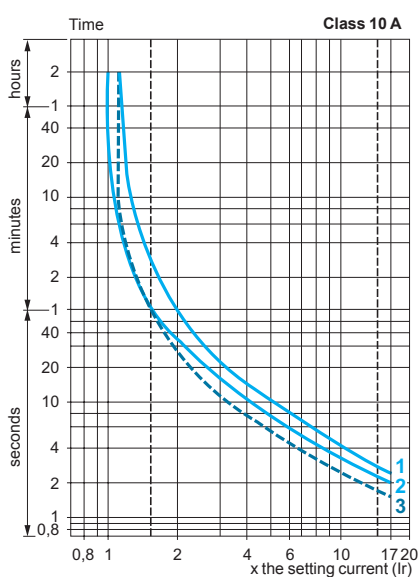
Relay type		LRD 01 ...16, LR3 D01 ...16	LRD 1508 ... 1532	LRD 21 ...35, LR3 D21 ...35	LRD 313 ...365 LR3 D313 ...365	LRD 313L ...365L	LRD 3322 ...33696 LR3 D3322 ... 33696	LR2 D3522 ... 3563	LRD 4365 ...4369
Temperature compensation		°C - 20...+ 60							
Tripping threshold		Conforming to IEC 60947-4-1	A						
Sensitivity to phase failure		Conforming to IEC 60947-4-1	Tripping current I 30 % of Ir on one phase, the others at Ir.						

Tripping curves

Average operating time related to multiples of the setting current

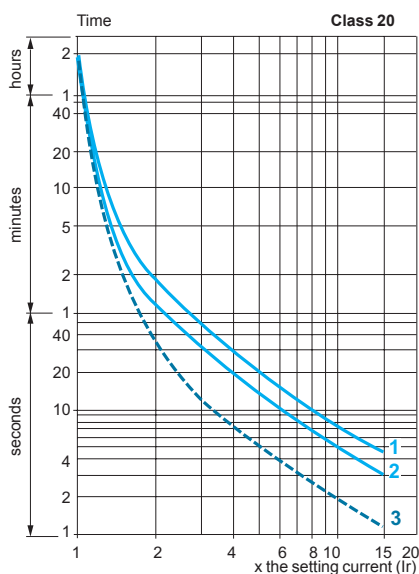
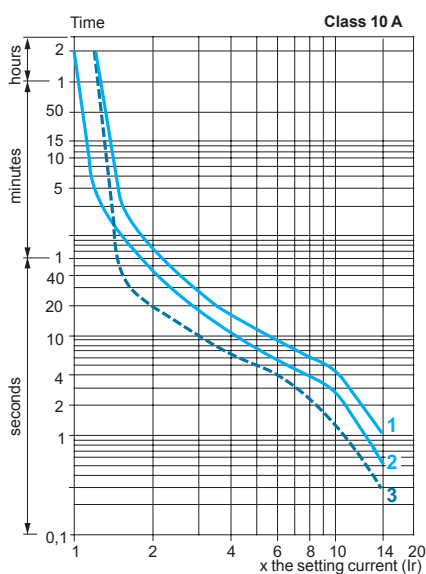
LRD 01 to LRD 35, LR2 D and LRD 3322 to LRD 4369

LRD 1508 to LRD 32 and LR2 D3522 to LR2 D3563



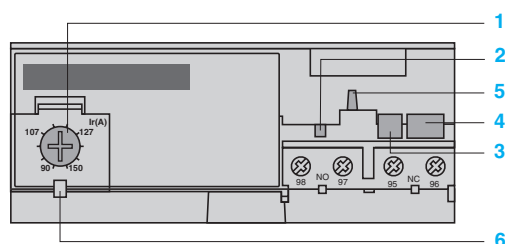
LRD 313 to LRD 365

LRD 313L to LRD 365L

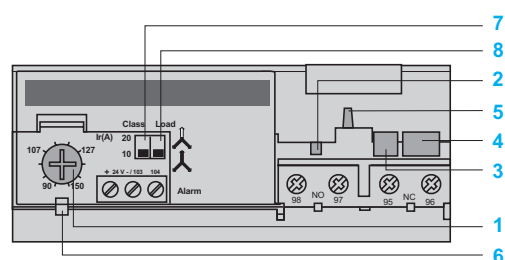


- 1 Balanced operation, 3-phase, without prior current flow (cold state).
- 2 2-phase operation, without prior current flow (cold state).
- 3 Balanced operation, 3-phase, after a long period at the set current (hot state).

Description



LR9 D5367...D5569





LR9 D67 and D69

LR9 D electronic thermal overload relays are designed for use with contactors LC1 D115 and D150.

In addition to the protection provided by TeSys D thermal overload relays (see page 205), they offer the following special features:

- protection against phase imbalance,
- choice of starting class,
- protection of unbalanced circuits,
- protection of single-phase circuits,
- alarm function to avoid tripping by load shedding.

- 1 Adjustment dial I_r .
- 2 Test button.
- 3 Stop button.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Class 10/class 20 selector switch.
- 8 Selector for balanced load  / unbalanced load 

Environment

Conforming to standards		IEC 60947-4-1, 255-8, 255-17, VDE 0660 and EN 60947-4-1	
Product certifications		UL 508 , CSA 22-2	
Degree of protection	Conforming to IEC 60529 and VDE 0106		IP 20 on front panel with protective covers LA9 D11570● or D11560●
Protective treatment	Standard version		"TH"
Ambient air temperature around the device (Conforming to IEC 60255-8)	Storage	°C	- 40...+ 85
	Normal operation	°C	- 20...+ 55 (1)
Maximum operating altitude	Without derating	m	2000
Operating positions without derating	In relation to normal vertical mounting plane		Any position
Shock resistance	Permissible acceleration conforming to IEC 60068-2-7		13 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6		2 gn - 5...300 Hz
Dielectric strength at 50 Hz	Conforming to IEC 60255-5	kV	6
Surge withstand	Conforming to IEC 61000-4-5	kV	6
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	kV	8
Immunity to radiated radio-frequency disturbances	Conforming to IEC 61000-4-3 and NF C 46-022	V/m	10
Immunity to fast transient currents	Conforming to IEC 61000-4-4	kV	2
Electromagnetic compatibility	Draft EN 50081-1 and 2, EN 50082-2		Meets requirements

Electrical characteristics of auxiliary contacts

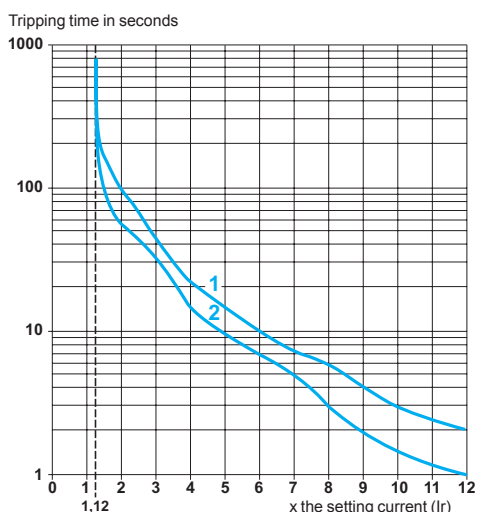
Conventional thermal current		A	5						
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply	V	24	48	110	220	380	600	
		VA	100	200	400	600	600	600	
	d.c. supply	V	24	48	110	220	440	—	
		W	100	100	50	45	25	—	
Protection against short-circuits	By gG or BS fuses or by circuit-breaker GB2	A	5						
Cabling	1 or 2 conductors	mm²	Minimum c.s.a.: 1 Maximum c.s.a.: 2.5						
Flexible cable without cable end	Tightening torque	Nm	1.2						

(1) For operating temperatures up to 70 °C, please consult your Regional Sales Office.

Relay type		LR9 D	
Electrical characteristics of power circuit			
Tripping class	Conforming to UL 508, IEC 60947-4-1	A	10 or 20
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	1000
	Conforming to UL, CSA	V	600
Rated impulse withstand voltage (Uimp)		Hz	8
Frequency limits	Of the operating current	Hz	50...60 (1)
Setting range	Depending on model	A	60...150
Power circuit connections	Width of terminal lug	mm	20
	Clamping screw		M8
	Tightening torque	N.m	18
Operating characteristics			
Temperature compensation		°C	- 20...+ 70
Tripping thresholds	Conforming to IEC 60947-4-1		
	Alarm	A	1.05 ± 0.06 In
	Trip	A	1.12 ± 0.06 In
Sensitivity to phase failure	Conforming to IEC 60947-4-1		Tripping in 4 s ± 20 % in the event of phase failure
Alarm circuit characteristics			
Rated supply voltage	d.c. supply	V	24
Supply voltage limits		V	17...32
Current consumption	No-load	mA	≤ 5
Switching capacity		mA	0...150
Protection	Short-circuit and overload		Self protected
Voltage drop	Closed state	V	≤ 2.5
Cabling	Flexible cable without cable end	mm²	0.5...1.5
Tightening torque		N.m	0.45

(1) For other frequencies and for applications involving the use of these overload relays with soft starters or variable speed drives, please consult your Regional Sales Office.

LR9 D tripping curves



Average operating time related to multiples of the setting current

- 1 Cold state curve
- 2 Hot state curve

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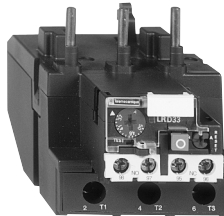
LRD 01

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LRD 30

910466



LRD 300

107651



LRD 3006

Differential thermal overload relays

for use with fuses or magnetic circuit-breakers GV2 L and GV3 L

- Compensated relays with manual or automatic reset,
- with relay trip indicator,
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference	Weight kg
	aM (A)	gG (A)	BS88 (A)			
Class 10 A (1) for connection by screw clamp terminals or connectors						
0.10...0.16	0.25	2	–	D09...D38	LRD 01	0.124
0.16...0.25	0.5	2	–	D09...D38	LRD 02	0.124
0.25...0.40	1	2	–	D09...D38	LRD 03	0.124
0.40...0.63	1	2	–	D09...D38	LRD 04	0.124
0.63...1	2	4	–	D09...D38	LRD 05	0.124
1...1.6	2	4	6	D09...D38	LRD 06	0.124
1.6...2.5	4	6	10	D09...D38	LRD 07	0.124
2.5...4	6	10	16	D09...D38	LRD 08	0.124
4...6	8	16	16	D09...D38	LRD 10	0.124
5.5...8	12	20	20	D09...D38	LRD 12	0.124
7...10	12	20	20	D09...D38	LRD 14	0.124
9...13	16	25	25	D12...D38	LRD 16	0.124
12...18	20	35	32	D18...D38	LRD 21	0.124
16...24	25	50	50	D25...D38	LRD 22	0.124
23...32	40	63	63	D25...D38	LRD 32	0.124
30...38	40	80	80	D32 and D38	LRD 35	0.124
Class 10 A (1) for connection by EverLink® BTR screw connectors (3)						
9...13	16	25	25	D40A...D65A	LRD 313	0.375
12...18	20	32	35	D40A...D65A	LRD 318	0.375
17...25	25	50	50	D40A...D65A	LRD 325	0.375
23...32	40	63	63	D40A...D65A	LRD 332	0.375
30...40	40	80	80	D40A...D65A	LRD 340	0.375
37...50	63	100	100	D40A...D65A	LRD 350	0.375
48...65	63	100	100	D50A and D65A	LRD 365	0.375
Class 10 A (1) for connection by screw clamp terminals or connectors						
17...25	25	50	50	D80 and D95	LRD 3322	0.510
23...32	40	63	63	D80 and D95	LRD 3353	0.510
30...40	40	100	80	D80 and D95	LRD 3355	0.510
37...50	63	100	100	D80 and D95	LRD 3357	0.510
48...65	63	100	100	D80 and D95	LRD 3359	0.510
55...70	80	125	125	D80 and D95	LRD 3361	0.510
63...80	80	125	125	D80 and D95	LRD 3363	0.510
80...104	100	160	160	D80 and D95	LRD 3365	0.510
80...104	125	200	160	D115 and D150	LRD 4365	0.900
95...120	125	200	200	D115 and D150	LRD 4367	0.900
110...140	160	250	200	D150	LRD 4369	0.900
80...104	100	160	160	(2)	LRD 33656	1.000
95...120	125	200	200	(2)	LRD 33676	1.000
110...140	160	250	200	(2)	LRD 33696	1.000

Class 10 A (1) for connection by lugs

Select the appropriate overload relay with screw clamp terminals or connectors from the table above and add one of the following suffixes:

- figure 6 for relays LRD 01 to LRD 35 and relays LRD 313 to LRD 365.
- A66 for relays LRD 3322 to LRD 3365.

Relays LRD 4300 are suitable, as standard, for use with lug-clamps.

Thermal overload relays for use with unbalanced loads

Class 10 A (1) for connection by screw clamp terminals or lugs

In the references selected above, change the prefix **LRD** (except **LRD 4000**) to **LR3 D**.

Example: **LRD 01** becomes **LR3 D01**.

Example with EverLink® connectors: **LRD 340** becomes **LR3 D340**.

Example with lugs: **LRD 3406** becomes **LR3 D3406**.

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R :
class 10 A: between 2 and 10 seconds

(2) Independent mounting of the contactor.

(3) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LAD ALLEN4**, see page 175).

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LRD ●●3

Differential thermal overload relays

for use with fuses or magnetic circuit-breakers GV2 L and GV3 L

- Compensated relays with manual or automatic reset,
- with relay trip indicator,
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference	Weight kg
	aM (A)	gG (A)	BS88 (A)			
Classes 10 A (1) for connection by spring terminals (only for direct mounting beneath the contactor)						
0.10...0.16	0.25	2	–	D09...D38	LRD 013	0.140
0.16...0.25	0.5	2	–	D09...D38	LRD 023	0.140
0.25...0.40	1	2	–	D09...D38	LRD 033	0.140
0.40...0.63	1	2	–	D09...D38	LRD 043	0.140
0.63...1	2	4	–	D09...D38	LRD 053	0.140
1...1.6	2	4	6	D09...D38	LRD 063	0.140
1.6...2.5	4	6	10	D09...D38	LRD 073	0.140
2.5...4	6	10	16	D09...D38	LRD 083	0.140
4...6	8	16	16	D09...D38	LRD 103	0.140
5.5...8	12	20	20	D09...D38	LRD 123	0.140
7...10	12	20	20	D09...D38	LRD 143	0.140
9...13	16	25	25	D12...D38	LRD 163	0.140
12...18	20	35	32	D18...D38	LRD 213	0.140
16...24	25	50	50	D25...D38	LRD 223	0.140

Class 10 A with connection by EverLink® BTR screw connectors(2) and control by spring terminals

9...13	16	25	25	D40A...D65A	LRD 3133	0.375
12...18	20	32	35	D40A...D65A	LRD 3183	0.375
17...25	25	50	50	D40A...D65A	LRD 3253	0.375
23...32	40	63	63	D40A...D65A	LRD 3323	0.375
30...40	40	80	80	D40A...D65A	LRD 3403	0.375
37...50	63	100	100	D40A...D65A	LRD 3503	0.375
48...65	63	100	100	D50A and D65A	LRD 3653	0.375

Thermal overload relays for use with unbalanced loads

Classes 10 A (1) for connection by BTR screw connectors (2) and control by spring terminals

In the references selected above, replace **LRD 3** with **LR3 D3**.

Example: **LRD 3653** becomes **LR3 D3653**.

Thermal overload relays for use on 1000 V supplies

Classes 10 A (1) for connection by screw clamp terminals

For relays LRD 06 to LRD 35 only, for an operating voltage of 1000 V, and only for independent mounting, the reference becomes **LRD 33●●A66**.

Example: **LRD 12** becomes **LRD 3312A66**.

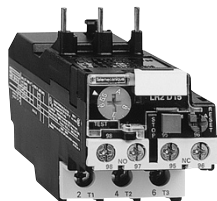
Order an **LA7 D3064** terminal block separately, see page 213.

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R :

class 10 A: between 2 and 10 seconds

(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LAD ALLEN4**, see page 175).

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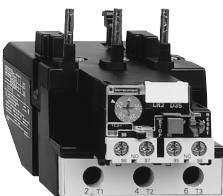
LRD 15●●

536762



LRD 3●●L

536765



LR2 D35●●

Differential thermal overload relays

for use with fuses or magnetic circuit-breakers GV2 L and GV3 L

- Compensated relays with manual or automatic reset,
- with relay trip indicator,
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference	Weight kg
	aM (A)	gG (A)	BS88 (A)			

Classes 20 (1) for connection by screw clamp terminals

2.5...4	6	10	16	D09...D32	LRD 1508	0.190
4...6	8	16	16	D09...D32	LRD 1510	0.190
5.5...8	12	20	20	D09...D32	LRD 1512	0.190
7...10	16	20	25	D09...D32	LRD 1514	0.190
9...13	16	25	25	D12...D32	LRD 1516	0.190
12...18	25	35	40	D18...D32	LRD 1521	0.190
17...25	32	50	50	D25 and D32	LRD 1522	0.190
23...28	40	63	63	D25 and D32	LRD 1530	0.190
25...32	40	63	63	D25 and D32	LRD 1532	0.190

Class 20 (1) for connection by EverLink® BTR screw connectors (2)

9...13	20	32	35	D40A...D65A	LRD 313L	0.375
12...18	25	40	40	D40A...D65A	LRD 318L	0.375
17...25	32	50	50	D40A...D65A	LRD 325L	0.375
23...32	40	63	63	D40A...D65A	LRD 332L	0.375
30...40	50	80	80	D40A...D65A	LRD 340L	0.375
37...50	63	100	100	D40A...D65A	LRD 350L	0.375
48...65	80	125	125	D50A and D65A	LRD 365L	0.375

Classes 20 (1) for connection by screw clamp terminals

17...25	32	50	50	D80 and D95	LR2 D3522	0.535
23...32	40	63	63	D80 and D95	LR2 D3553	0.535
30...40	40	100	80	D80 and D95	LR2 D3555	0.535
37...50	63	100	100	D80 and D95	LR2 D3557	0.535
48...65	80	125	100	D80 and D95	LR2 D3559	0.535
55...70	100	125	125	D80 and D95	LR2 D3561	0.535
63...80	100	160	125	D80 and D95	LR2 D3563	0.535

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R :
class 20: between 6 and 20 seconds

(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LAD ALLEN4, see page 175).

Differential thermal overload relays for use with fuses or magnetic circuit-breakers NSX

- Compensated relays, with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting(1).

Relay setting range (A)	Fuses to be used with selected relay		For mounting beneath contactor LC1	Reference	Weight kg
	aM (A)	gG (A)			
Classes 10 or 10A (2) for connection using bars or connectors					
60...100	100	160	D115 and D150	LR9 D5367	0.885
90...150	160	250	D115 and D150	LR9 D5369	0.885
Classes 20 (2) for connection using bars or connectors					
60...100	125	160	D115 and D150	LR9 D5567	0.885
90...150	200	250	D115 and D150	LR9 D5569	0.885

Electronic thermal overload relays for use with balanced or unbalanced loads

- Compensated relays,
- with separate outputs for alarm and tripping.

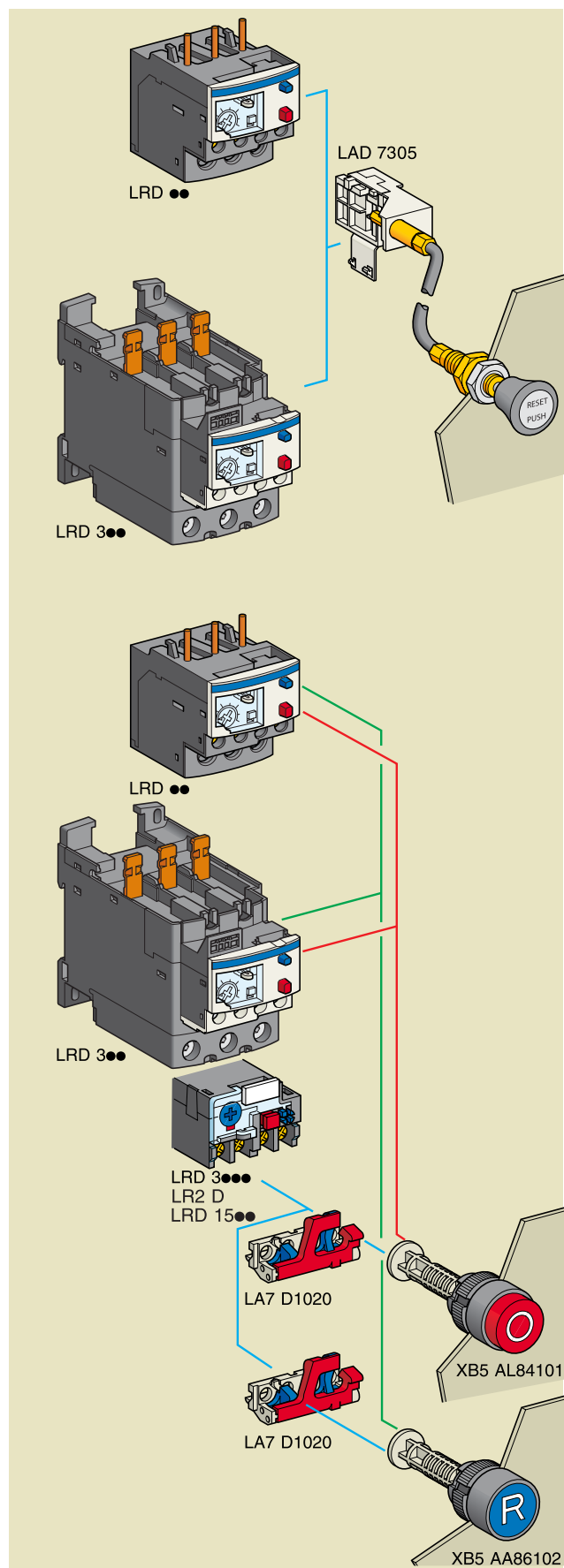
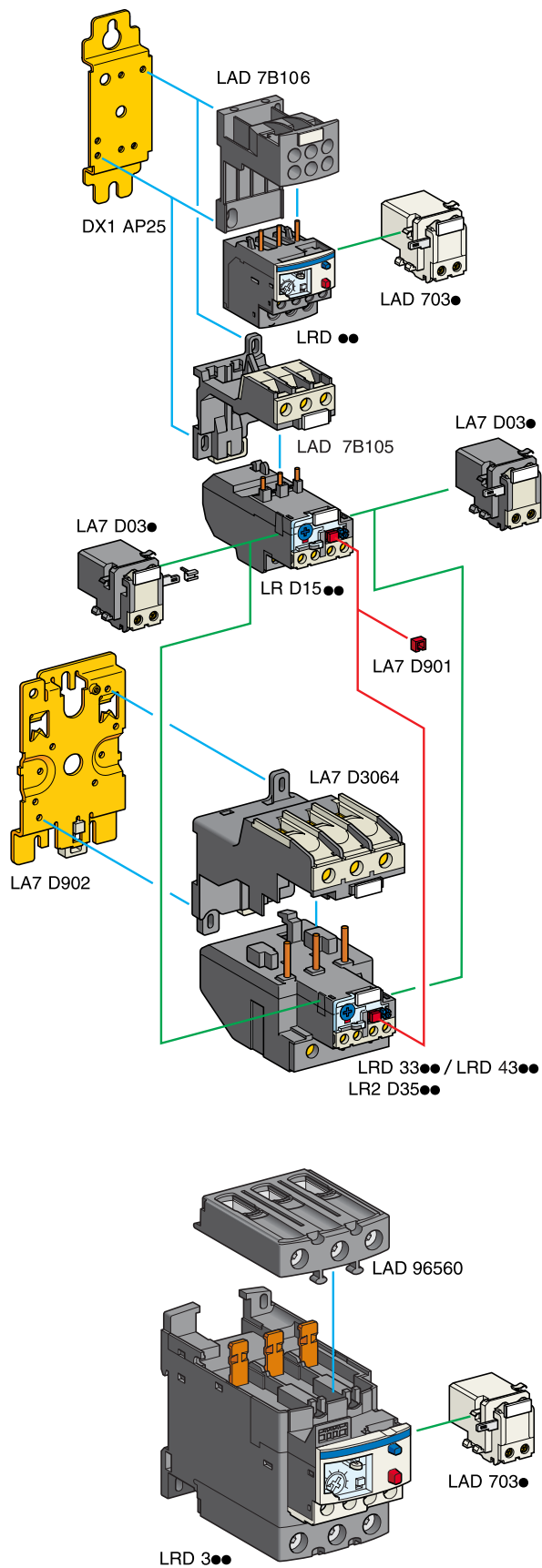
Relay setting range (A)	Fuses to be used with selected relay		For mounting beneath contactor LC1	Reference	Weight kg
	aM (A)	gG (A)			
Classes 10 or 20 (2) selectable, for connection using bars or connectors					
60...100	100	160	D115 and D150	LR9 D67	0.900
90...150	160	250	D115 and D150	LR9 D69	0.900

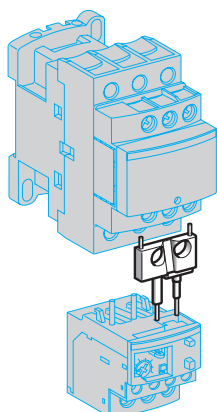
(1) Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page 174).

(2) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R :
 class 10: between 4 and 10 seconds,
 class 10 A: between 2 and 10 seconds,
 class 20 A: between 6 and 20 seconds

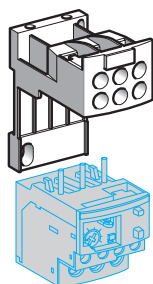
Other versions

Thermal overload relays for resistive circuits in category AC-1.
 Please consult your Regional Sales Office.

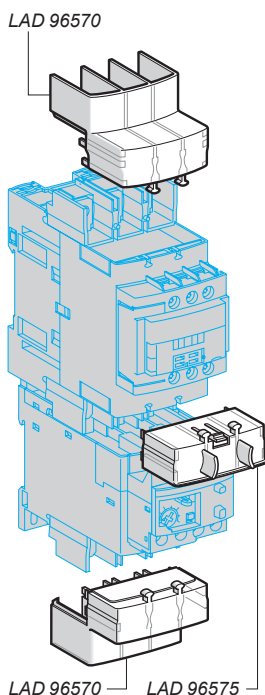




LAD 7C●



LAD 7B106



LAD 96570 — LAD 96575

Separate components for relays

Description	For use with	Sold in lots of	Unit reference	Weight kg
Pre-wiring kit allowing direct connection of the N/C contact of relay LRD 01...35 or LR3 D01...D35 to the contactor	LC1 D09...D18	10	LAD 7C1 (1)	0.002
	LC1 D25...D38	10	LAD 7C2 (1)	0.003
Terminal block (2) for clip-on mounting on 35 mm rail (AM1 DP200) or screw fixing; for fixing centres, see pages 214 to 216	LRD 01...35 and LR3 D01...D35	1	LAD 7B106	0.100
	LRD 1508...32	1	LAD 7B105	0.100
	LRD 33●●, LR3 D33●●, LR2 D35●●	1	LA7 D3064 (3)	0.370
EverLink® terminal block for independent mounting	LRD 3●●, LRD 3●●L and LR3 D3●●	1	LAD 96560	0.087
Size 4 Allen key, insulated, 1000 V	LRD 3●●, LRD 3●●L and LR3 D3●●	5	LAD ALLEN4	0.026
Terminal block adapter for mounting a relay beneath an LC1 D115 or D150 contactor	LRD 3●●, LR3 D33●●, LRD 35●●	1	LA7 D3058 (3)	0.080
Mounting plates (4) for screw fixing on 110 mm centres	LRD 01...35, LR3 D01...D35, LRD 1508...32	10	DX1 AP25	0.065
	LRD 33●●, LR3 D33●●, LR2 D35●●	1	LA7 D902	0.130
Marker holders, snap-in 8 x 18 mm	LRD 3●●	100	LAD 90	0.001
	All relays except LRD 01...35, LR3 D01...D35, LRD 3●●, LRD 3●●L and LR3 D3●●	100	LA7 D903	0.001
Bag of 400 blank legends (self-adhesive, 7 x 16 mm)	All relays	1	LA9 D91	0.001
Stop button locking device	All relays except LRD 01...35, LR3 D01...D35, LR9 D and LRD 313...LRD 365	10	LA7 D901	0.005
Remote Stop or electrical reset device (5)	LRD 01...35, LR3 D01...D35 and LRD 313...LRD 365	1	LAD 703● (6) (7)	0.090
Remote tripping or electrical reset device (5)	All relays except LRD 01...35, LR3 D01...D35, LRD 3●●, LRD 3●●L and LR3 D3●●	1	LA7 D03● (6)	0.090
Block of insulated terminals	LR9 D	2	LA9 F103	0.560
IP 20 cover for lug type terminals for independent mounting	LRD 3136...3656	1	LAD 96570	0.021
IP 20 cover for lug type terminals for mounting with contactor LC1 D40A6...D65A6	LRD 3136...3656	1	LAD 96575	0.010
Terminal block for lug type terminals for independent mounting	LRD 3136...3656	1	LAD 96566	0.010

Remote control

"Reset" function

Description	For use with	Sold in lots of	Unit reference	Weight kg
By flexible cable (length = 0.5 m)	LRD 01...35, LR3 D01...D35 and LRD 313...LRD 365	1	LAD 7305 (7)	0.075
	All relays except LRD 01...35, LR3 D01...D35, LRD 3●●, LRD 3●●L and LR3 D3●●	1	LA7 D305	0.075

"Stop" and/or "Reset" functions

The terminal protection shroud must be removed and the following 3 products must be ordered separately:

Adapter for door mounting	LRD 33●●, LR2 D and LRD 15●●.	1	LA7 D1020	0.005
Operating heads for spring return pushbutton	Stop All relays	1	XB5 AL84101	0.027
	Reset All relays	1	XB5 AA86102	0.027

- (1) These pre-wiring kits cannot be used with reversing contactors.
- (2) Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.
- (3) To order a terminal block for connection by lugs, the reference becomes **LA7 D30646**.
- (4) Remember to order the terminal block corresponding to the type of relay.
- (5) The time for which the coil of remote tripping or electrical resetting device **LA7 D03** or **LAD 703** can remain energised depends on its rest time: 1 s pulse duration with 9 s rest time; 5 s pulse duration with 30 s rest time; 10 s pulse duration with 90 s rest time; maximum pulse duration 20 s with a rest time of 300 s. Minimum pulse time: 200 ms.
- (6) Reference to be completed by adding the code indicating the control circuit voltage.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office) :

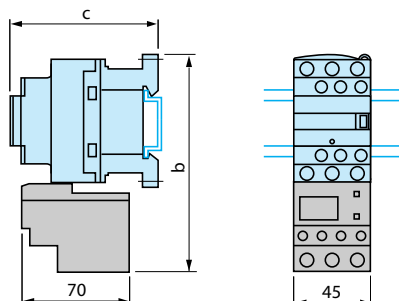
Volts	12	24	48	96	110	220/230	380/400	415/440
50/60 Hz	—	B	E	—	F	M	Q	N
Consumption, inrush and sealed: < 100 VA								
—	J	B	E	DD	F	M	—	—

Consumption, inrush and sealed: < 100 W.

(7) Not compatible with 3-pole relays fitted with spring terminals.

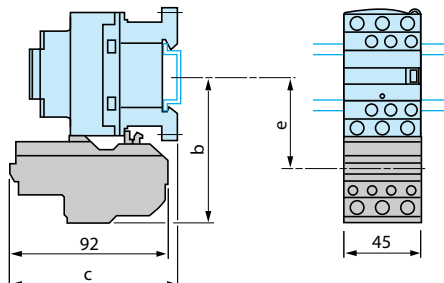
LRD 01...35

Direct mounting beneath contactors with screw clamp connections



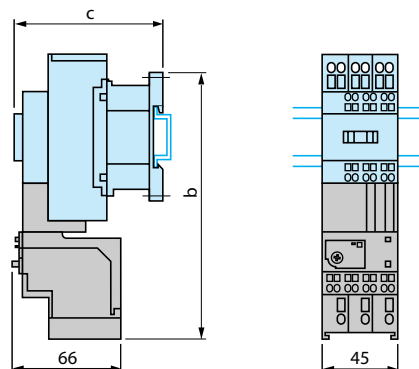
LRD 1508...32

Direct mounting beneath contactors with screw clamp connections



LRD 013...223

Direct mounting beneath contactors with spring terminal connections



LC1 D09...D18 D25...D38

b	123	137
c	See pages 182 and 183	

LC1 ~D09...~D18 ~D25...~D38

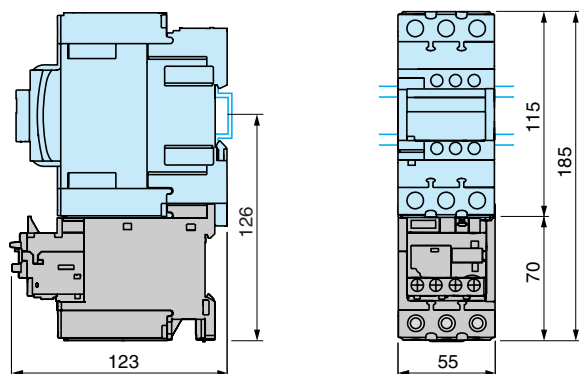
b	90	97	90	97
c	97	96	107	106
e	53	60	53	60

LC1 D093...D253

b	168
c	See pages 182 and 183

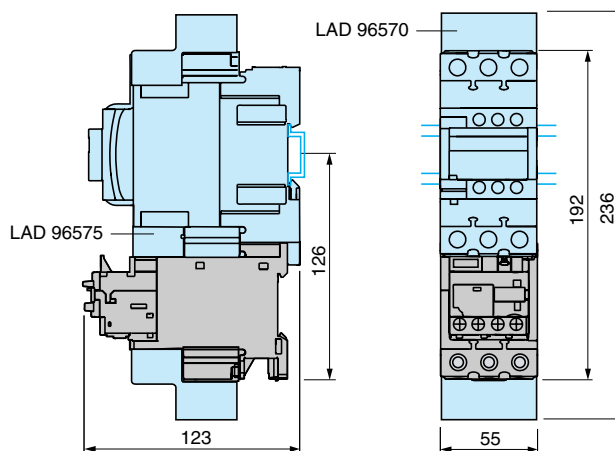
LRD 313 ...365

Direct mounting beneath contactors LC1 D40A...D65A with screw clamp connections or EverLink® connectors



LRD 3136 ...3656

Direct mounting beneath contactors LC1 D40A6...D65A6 with lugs



LRD 4...●●			LR9 D		
Direct mounting beneath contactors LC 1D115 and D150			Direct mounting beneath contactors LC 1D115 and D150		
AM1	DL200 and DR200	DE200 and ED...●●	AM1	DP200 and DR200	DE200 and ED...●●
d	2.5	10.5	d	2.5	10.5

LRD 01...35			LRD 01...35		
Independent mounting on 50 mm centres or on rail AM1 DP200 or DE200			Independent mounting on 110 mm centres		

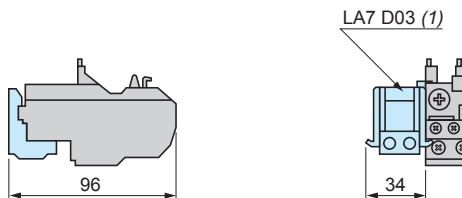
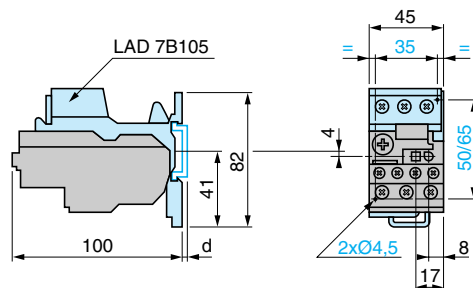
LRD 313 ...365			LRD 313 ...365		
Mounting on rail AM1 D...200 or ED200			Panel mounting	Mounted on plate AM1 P	
With terminal block LAD 96560			Outgoing terminal block not shown		
AM1	DP200	DE200 ED200	(1)		
d	2	9.5 9.5	(1) 2 elongated holes Ø 4.2 x 6.		

LRD 01...35 and LRD 313...365		
Remote tripping or electrical reset		
(1) Can only be mounted on RH side of relay LRD01...35 and LRD313...365		

LRD 15●●

Independent mounting on 50 mm centres or on rail AM1 DP200 or DE200

Remote tripping or electrical reset



AM1

DP200

DE200

d

2

9.5

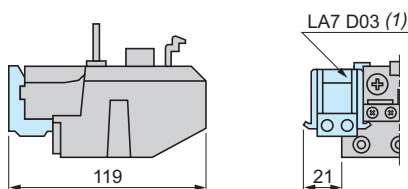
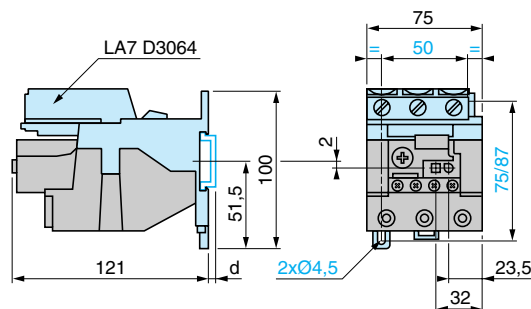
(1) Can be mounted on RH or LH side of relay LR2 D15.

LRD 3●●● and LR2 D35●●

Independent mounting on 50 mm centres or on rail AM1 DP200 or DE200

LRD 3●●●, LR2 D35●● and LR9 D

Remote tripping or electrical reset



AM1

DP200

DE200

d

2

9.5

(1) Can be mounted on RH or LH side of relay LRD 3●●●, LR2 D35●● or LR9 D.

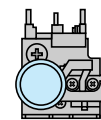
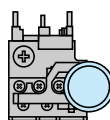
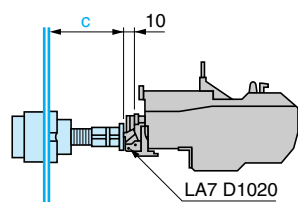
LRD 15 and LRD 3●●●

Adapter for door mounted operator

LA7 D1020

Stop

Reset



c : adjustable from 17 to 120 mm

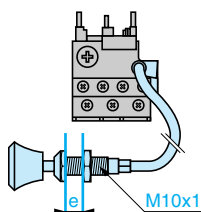
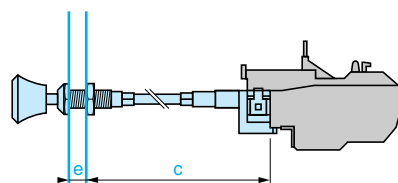
LRD, LRD 313...365, LRD 15 and LR9 D

"Reset" by flexible cable

LA7 D305 and LAD 7305

Mounting with cable straight

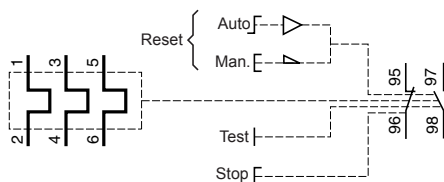
Mounting with cable bent



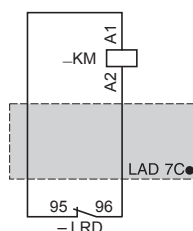
e : up to 20 mm
c : up to 550 mm

e : up to 20 mm

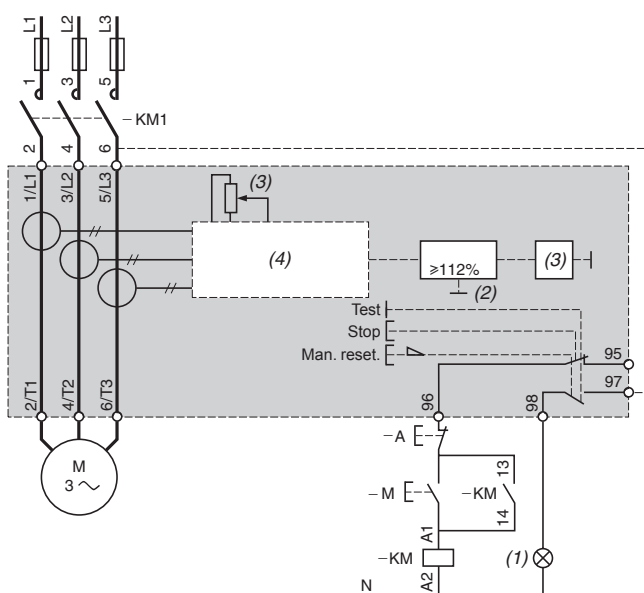
LRD ●●, LRD 3●● and LR2 D●●



Pre-wiring kit LAD 7C1, LAD 7C2

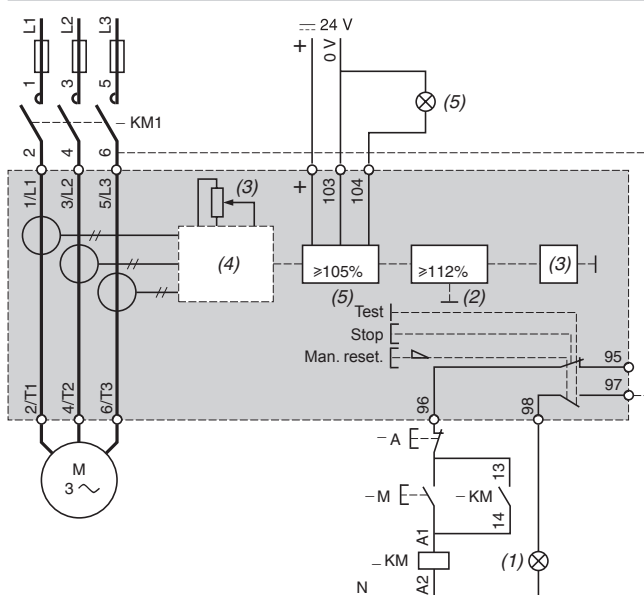


LR9 D5●●●



- | | |
|---------------|--------------------------|
| (1) Tripped. | (3) Setting current. |
| (2) Overload. | (4) Specialised circuit. |

LR9 D67 and LR9 D69



- | | |
|----------------------|--------------------------|
| (1) Tripped. | (4) Specialised circuit. |
| (2) Overload. | (5) Alarm. |
| (3) Setting current. | |

TeSys Quickfit selection guide	page 221
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■ **TeSys Quickfit for motor starter components**

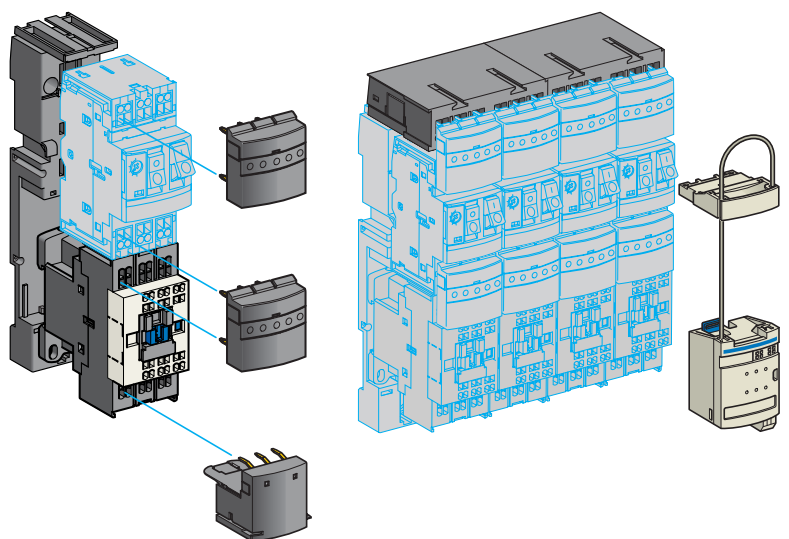
□ Presentation	page 222
□ Description	page 224
□ References	page 227
□ Characteristics	page 230
□ Dimensions	page 232
□ Schemes	page 234

■ **Pre-assembled panel busbar system AK5**

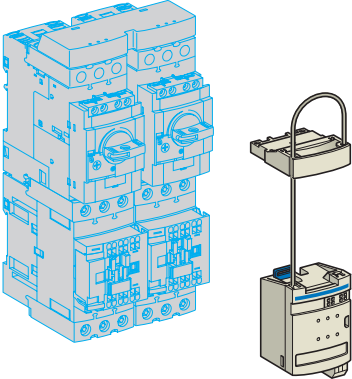
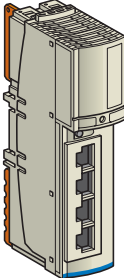
□ Presentation	page 237
□ Characteristics	page 238
□ Mounting: equipment possibilities	page 240
□ References	page 242
□ Dimensions	page 244

Installation system

TeSys Quickfit for motor starter components
Components with spring terminals

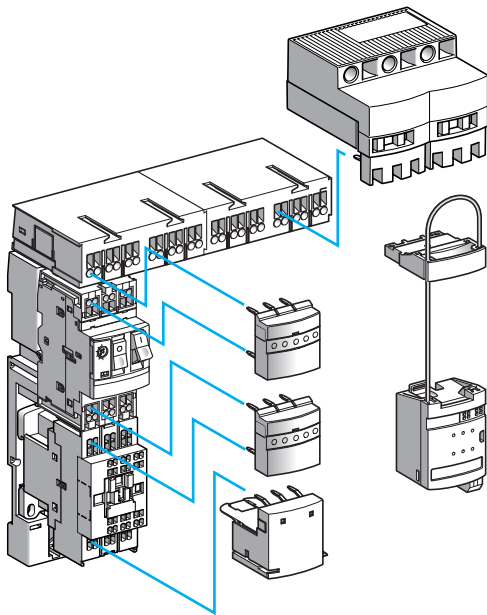
Functions	Assembly and connection of motor starter components with spring terminals, without using tools				
Product type	Power circuit pre-wiring components		Control-command pre-wiring components for TeSys motor circuit-breakers GV2 ME		
					
For contactors	TeSys D (9 to 25 A)				
Type of starter	Direct and reversing		Direct		Reversing
Coil control	—		Yes	No	Yes No
Use with motor starters	Limited to 60 A (lth) Limited to 8 starters (1)		—		
Number of motor starters	1		—		
Type of connection or bus	—		—		
Number of channels	—		—		
References	LAD 3●		LAD 9AP3●●		
Pages	227		229		

(1) With TeSys circuit-breakers GV2 ME and upstream terminal block LAD 3B1.

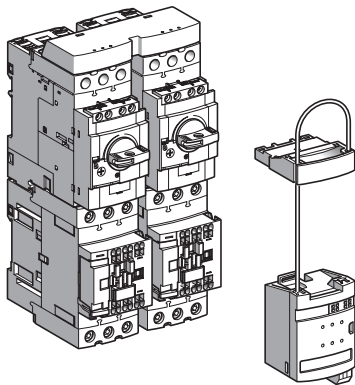
		Communication with the processing part	
Control-command pre-wiring components for TeSys motor circuit-breakers GV3 P		Splitter box	Parallel interface module, with Advantys STB network interface module
			
TeSys D (40 to 65 A)		—	—
Direct	Reversing	—	—
Yes	Yes	—	—
—		—	—
—		8 starters per splitter box	4 starters per module
—		HE 10	Modbus Plus, Fipio, CANopen, Ethernet, TCP/IP, Profibus DP, INTERBUS, DeviceNet
—		16 inputs/12 outputs	—
		LU9 G02	STB EPI2145
		229	229

Installation system

TeSys Quickfit for motor starter components Components with spring terminals



Motor starter with GV2 ME circuit-breakers



Motor starter with GV3 P circuit-breakers

TeSys Quickfit is a modular system which standardises and simplifies setting up of motor starters with its pre-wired control and power circuits. Installation of a motor starter is therefore quick, simple, safe and flexible. In addition, this system:

- enables the motor starter to be customised at a later date,
- reduces maintenance time and
- optimises panel space by reducing the number of terminals and intermediate interfaces and the amount of ducting.

System for motor starters with spring terminals

Motor starters with TeSys GV2 ME circuit-breakers

- From 0 to 18 A max.,
- TeSys GV2 ME circuit-breakers combined with TeSys D contactors from 9 to 25 A (spring terminal version),
- Quickfit pre-wired power and control connections.

Motor starters with TeSys GV3 P circuit-breakers

- From 9 to 65 A max.,
- TeSys GV3 P circuit-breakers combined with TeSys D contactors from 40 to 65 A (spring terminal version),
- Quickfit pre-wired control connections only,
- For pre-wired power connections, use busbar sets from the TeSys D 40 to 65 A contactor range (see page 175).

This range comprises pre-wiring components for:

- the power circuits,
- the control circuits.

Power circuit pre-wiring components

(motor starters with TeSys GV2 circuit-breakers only)

- a **power circuit connection kit** comprising, for each starter, a plate for mounting the contactor and the circuit-breaker and two power connection modules,
- a **power splitter box** for 2 or 4 starters,
- an **upstream terminal block** for a power supply up to 60 A (16 mm²),
- an **outgoing terminal block** for connection of the motor power supply cables and the earth cables (6 mm²).

Note: with GV3 circuit-breakers, no accessories are required for pre-wiring of the power circuit. The GV3 P●● outgoing terminal block can be removed.

This circuit-breaker is also sold with only one terminal block (reference: GV3 P●●1).

Control circuit pre-wiring components

(motor starters with TeSys GV2 and GV3 circuit-breakers)

- a **control circuit connection module** which plugs directly into the contactor and the circuit-breaker on each starter. This module incorporates status and control data for this motor starter.
- a **parallel wiring module** which concentrates the data of each motor starter:
 - **HE 10** connector, for centralised applications. Data is transmitted to the PLC via the Advantys Telefast pre-wired system.
 - **STB**, designed for decentralised automation architectures. This module is suitable for use in an Advantys STB configuration for connection to the PLC via a field bus.

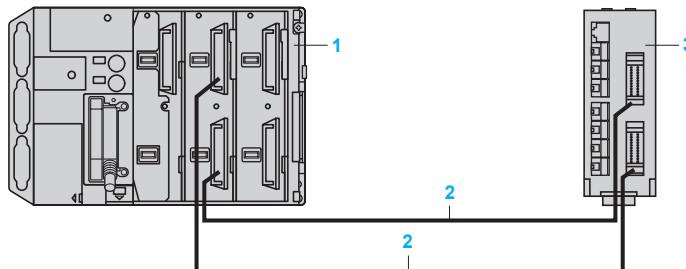
Installation system

TeSys Quickfit for motor starter components
Components with spring terminals

Control/command

HE 10 connection

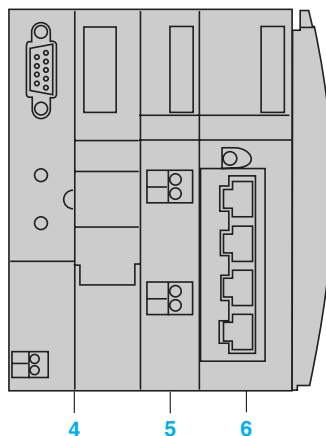
- 1 Automation platform
- 2 Connection cable
TSXCDP●● or **ABFH20●●**
- 3 Splitter box **LU9 G02**



Connection on bus using Advantys STB (1)

Configuration example (for motor starter applications only):

- 4 Network interface module
- 5 Supply module
- 6 Parallel interface module



Power supply module

Module	STB PDT 3100
Connection base	STB XBA 2200
Terminal block	STB XTB 1130

Parallel interface module (2)

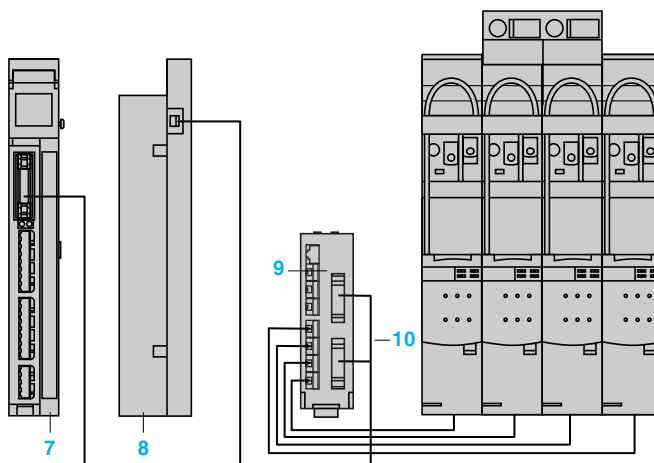
Module	STB EPI 2145
Connection base	STB XBA 3000

Network interface module (3)

CANopen	STB NCO 1010 (4)
Fipio	STB NFP 2210
Ethernet TCP/IP	STB NIP 2210
InterBus	STB NIB 1010 (4)
Profibus DP	STB NDP 1010 (4)
DeviceNet	STB NDN 1010 (4)
Modbus Plus	STB NMP 2210
Terminal block	STB WTS 2120

TeSys Quickfit LAD 9AP3 ●● used with modules APP1 C●●

- 7 TeSys Quickfit module
- 8 Adapter plate **APP 2CX**
- 9 Splitter box **LU9 G02** for 8 direct motor starters, with channel connections on the **APP 1C** module side by two HE 10 connectors (20-way) and on the TeSys Quickfit side, by RJ45 connectors
- 10 Connection cable **APP 2AH40H060**



The motor starter is connected to an **APP 1C●●** module **7** using an adapter plate **APP 2CX 8** and a connection cable **APP 2AH40H060 10**.

Information is available on the module for each motor starter:

- 1 output: motor control,
- 2 inputs: circuit-breaker status and contactor status.

(1) Please consult our catalogue "Advantys STB I/O. The open solution".

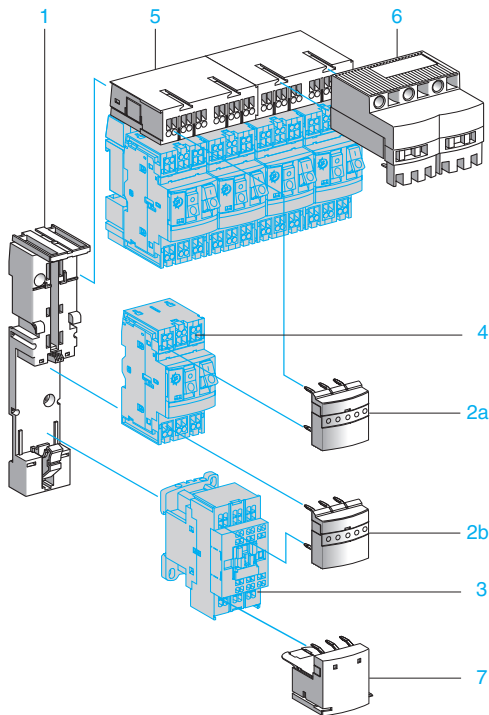
(2) For 4 direct or 2 reversing motor starters.

(3) Reference to be selected according to the network used.

(4) Optimised version.

Installation system

TeSys Quickfit for motor starter components
Components with spring terminals




Power components

(only for motor starters with TeSys GV2 circuit-breakers)

Power kits LAD 3●

Each motor starter requires a power kit which consists of a plate **1** and two Quickfit technology power connection modules **2**.

The plate is used for mounting TeSys D contactors **3** (9 to 25 A, **direct or reversing**, with spring terminals and fitted with a.c. or d.c. coil) and the GV2 ME circuit-breaker **4** only. This plate is mounted on two 35 mm  rails or is screwed onto a base plate. The two power connection modules **2a** and **2b** are identical, whatever the rating of the contactor up to 18 A.

The upper power connection module **2a** connects the power between the splitter box and the circuit-breaker.

The lower power connection module **2b** connects the power between the circuit-breaker and the contactor.

Splitter boxes LAD 32●

Splitter boxes **5** are available for 2 or 4 starters.

They can be combined to create motor starters up to 60 A per power supply.

A reversing starter occupies a width equivalent to that of 2 direct starters.

Direct supply of power to the splitter boxes is possible up to 25 A (4 mm²).

Upstream terminal block LAD 3B1

The upstream terminal block **6** performs two functions:

- power supply up to 60 A (16 mm²),
- power supply between two connected splitter boxes.

The upstream terminal block connects to the splitter box using Quickfit technology. It is positioned on the splitter box or straddling two splitter boxes and takes up a width equivalent to two motor starters.

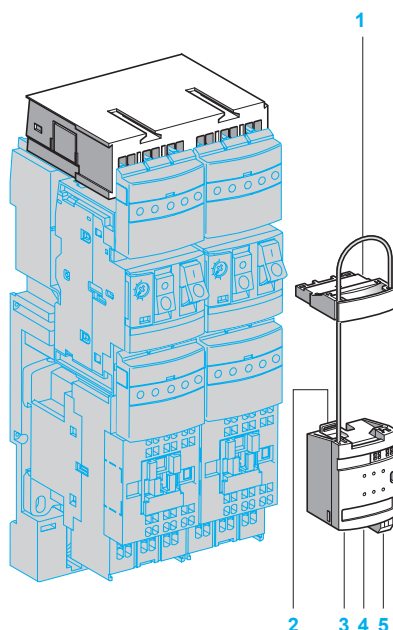
Outgoing terminal block LAD 331

The outgoing terminal block **7** performs two functions:

- connection of the motor power supply cables up to 6 mm²,
- connection of the motor earth cables.

In addition, the terminal block enables quick connection and disconnection for maintenance, avoiding the risk of phase reversal.

The outgoing terminal block connects to the downstream spring terminals on the contactor, using Quickfit technology.

**Control/command components****Control circuit connection modules LAD 9 AP3 ●●**

The control circuit connection module **1** plugs directly into the control terminals on the contactor and on the TeSys GV2 ME or TeSys GV3 P motor circuit-breaker, in the location provided for the front-mounting block.

It is compatible with all contactor ratings up to 18 A for TeSys GV2 ME and 65 A for TeSys GV3 P.

Mechanical locking **2** of the system onto the top of the contactor ensures a perfect connection, whatever the operating conditions (vibrations, knocks, etc.).

These modules are available in 4 versions: for direct or reversing starter, with or without contactor coil interface relay.

The coil control can be a.c. or d.c., up to ~ 250 V and ~ 130 V.

The version without relay is designed to control the contactor coils with no interface, at 24 V d.c.

The version with relay has a connector for connecting the contactor power supply.

Module **LAD9 AP3●●** incorporates, in its lower part, several external connectors:

3 RJ45 connector, for connecting the automation system.

4 2-way connector, for connecting the contactor power supply (only on versions with relay).

5 2-way connector, for connecting an external contact in series with the contactor coil (supplied complete with shunt)

Parallel wiring modules

The parallel wiring system makes it possible to connect motor starters which incorporate TeSys Quickfit technology to the processing unit (PLC) quickly and without any need for tools. The parallel wiring module provides the status and command information for each motor starter.

Control connection modules **LAD9 AP3●●** are connected to the parallel wiring modules using RJ45 cables **LU9R●● 6**, which are available in different lengths.

The following information is available for each motor starter:

- 2 inputs: circuit-breaker status and contactor status,
- 1 output: contactor coil control.

A direct motor starter uses one RJ45 channel.

A reversing motor starter uses **two RJ45 channels**.

Note: for motor starters built using TeSys GV3 circuit-breakers and TeSys D contactors, the Quickfit pre-wired system allows the contactor to be mounted below the circuit-breaker or mounting of the two devices side by side.

Parallel wiring module LU9 G02

This module **7** enables connection of up to 8 direct or 4 reversing motor starters directly to the I/O modules of PLCs. It is used with the Advantys Telefast pre-wiring system (1).

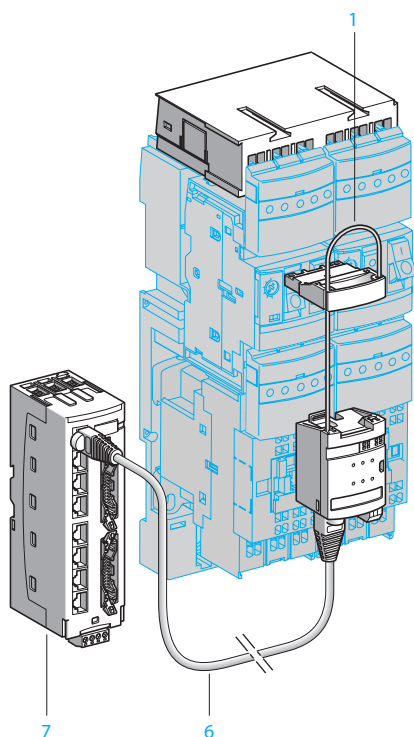
This splitter box is optimised for use with card **TSX DMZ28DTK**.

Dedicated parallel interface module STB EPI 2145 (2)

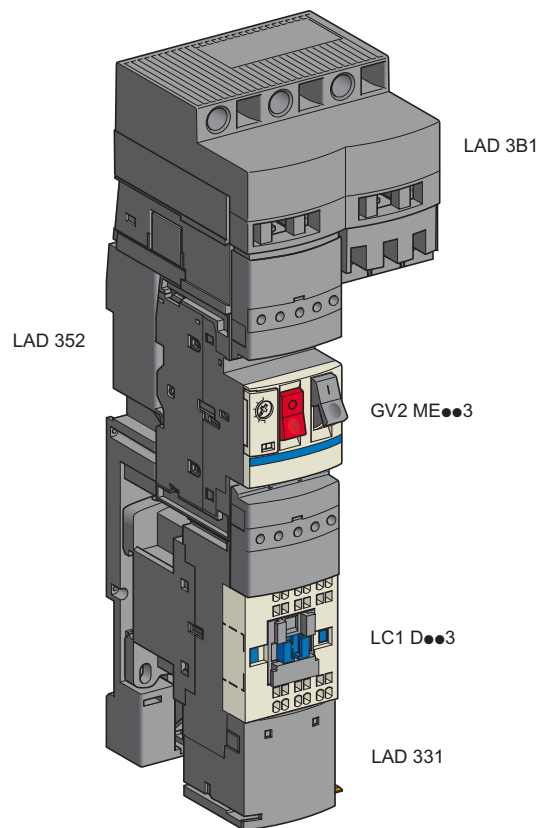
This module enables 4 direct or 2 reversing motor starters to be connected via the Advantys STB distributed I/O solution. With STB network interface modules, motor starters can be connected to the following communication networks: Modbus Plus, FIPIO, CANopen, Ethernet TCP/IP, Profibus DP, INTERBUS and DeviceNet.

(1) Please consult our catalogue "Power supplies, splitter boxes and interfaces".

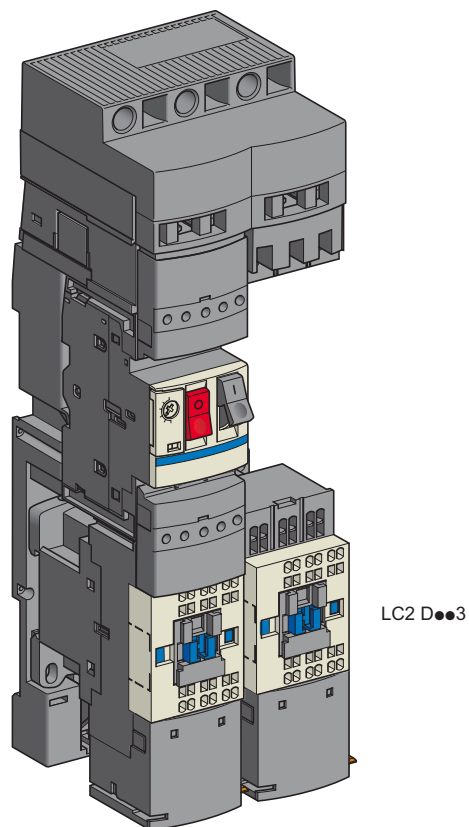
(2) Please consult our catalogue "Advantys STB I/O. The open solution".

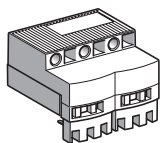


Power circuit pre-wiring
components
Direct starter

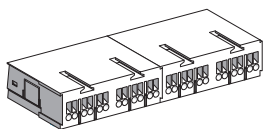


Power circuit pre-wiring
components
Reversing starter

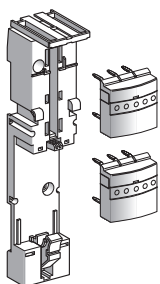




LAD 3B1



LAD 324



LAD 352



LAD 331

Power circuit pre-wiring components (only for motor starters with TeSys GV2 circuit-breakers)

Description	Maximum connection c.s.a.	Application	Sold in lots of	Reference	Weight kg
Upstream terminal block	16 mm ² (1)	Power supply of 1 or 2 power splitter boxes	1	LAD 3B1	0.212

Description	Extension by	Number of starters	Reference	Weight kg
Power splitter box, 60 A	LAD 324	2	LAD 322	0.120
		4	LAD 324	0.240

Description	Composition	Reference	Weight kg
Direct starter			
Power connection kit	1 plate LAD 311 for GV2 ME and 2 power connection modules LAD 341	LAD 352	0.078

Reversing starter

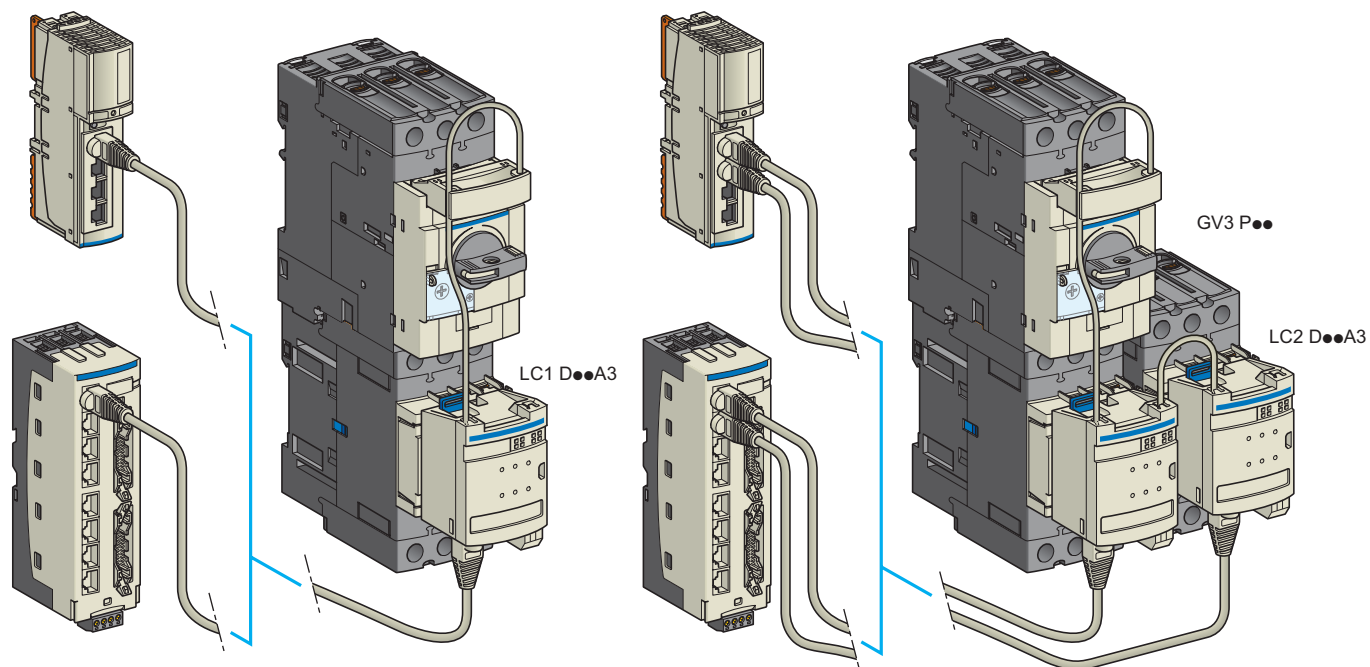
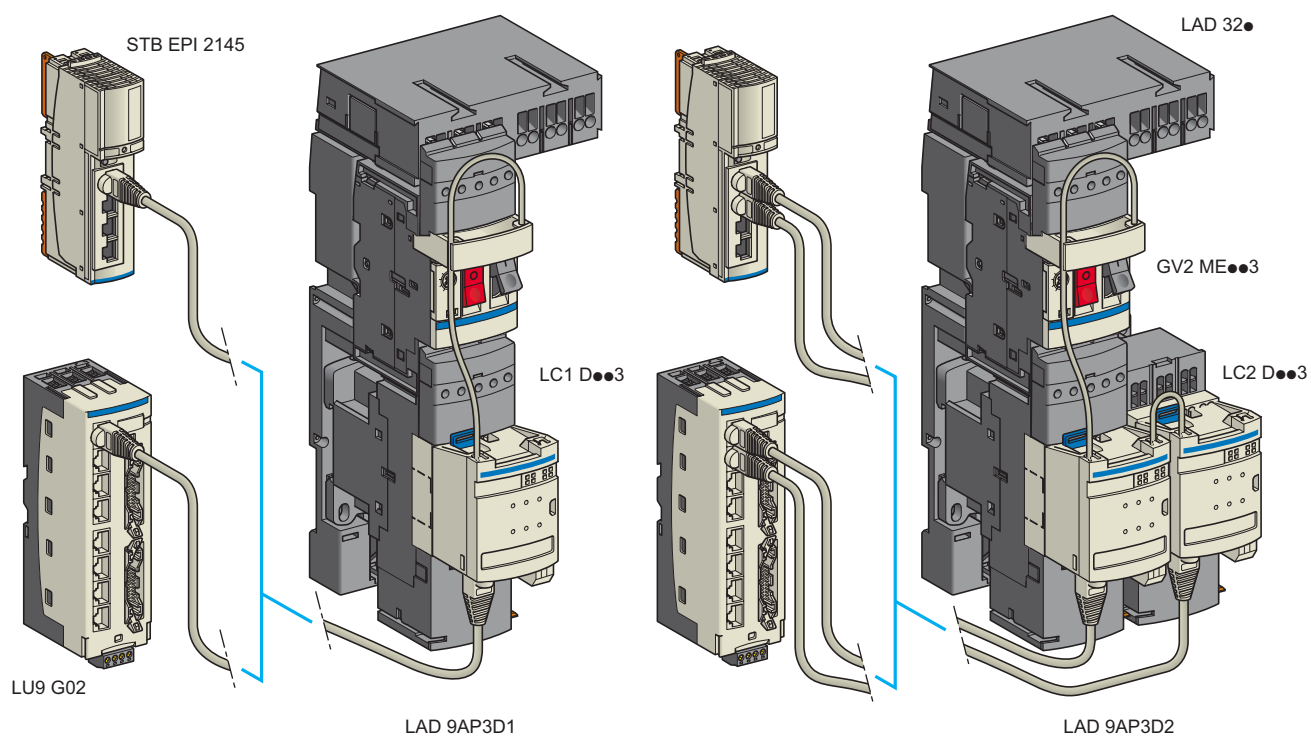
To build a reversing starter, order 2 kits LAD 352

Description	Maximum connection c.s.a.	Application	Sold in lots of	Reference	Weight kg
Outgoing terminal block	6 mm ²	Connection of motor cables	10	LAD 331	0.050

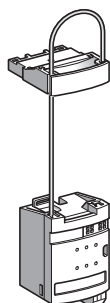
Description	No. of starters	Sold in lots of	Unit reference	Weight kg
Plate for mounting a GV2 ME circuit-breaker and a contactor	1	10	LAD 311	0.042
Power connection module	1	10	LAD 341	0.018

(1) Cables with one end pre-crimped are available to allow fast connection. References:

1 set of 3 x 6 mm² cables (length 1 m: LAD 3B061, length 2 m: LAD 3B062 and length 3 m: LAD 3B063),
1 set of 3 x 10 mm² cables (length 1 m: LAD 3B101, length 2 m: LAD 3B102 and length 3 m: LAD 3B103),
1 set of 3 x 16 mm² cables (length 1 m: LAD 3B161, length 2 m: LAD 3B162 and length 3 m: LAD 3B163).



Note: Circuit-breakers TeSys GV3 P and contactors LC1 D40A3 to D65A3 can be mounted side by side, using a set of S-shape busbars (GV3 S)



LAD 9AP3●

Control-command pre-wiring components

Description	TeSys D coil voltage	Type of coil control relay	Type of starter	Reference	Weight kg
Control connection modules	~ 12... 250 V or ~ 5...130 V	Electromechanical	Direct	LAD 9AP31	0.150
			Reversing	LAD 9AP32	0.200
	~ 24 V	Without relay	Direct	LAD 9AP3D1	0.140
			Reversing	LAD 9AP3D2	0.190

Parallel wiring modules (~ 24 V)

Description	Connectors		Reference	Weight kg
	PLC side	Motor starter side		
Splitter box	2 x HE 10 20-way	8 x RJ45	LU9 G02	0.260
Advantys STB parallel interface module	—	4 x RJ45	STB EPI 2145	0.165

Connection cables**Between the control connection module and the splitter box LU9 G02 or STB EPI 2145**

Connectors	Length m	Reference	Weight kg
2 x RJ45 connectors	0.3	LU9 R03	0.045
	1	LU9 R10	0.065
	3	LU9 R30	0.125

Between splitter box LU9 G02 and the PLC

Type of connection		Gauge	C.s.a.	Length	Reference	Weight
PLC side	Splitter box side					
		AWG	mm²	m		kg
HE 10 20-way	HE 10 20-way	22	0.324	0.5	TSX CDP 053	0.085
				1	TSX CDP 103	0.150
				2	TSX CDP 203	0.280
				3	TSX CDP 303	0.410
				5	TSX CDP 503	0.670
		28	0.080	1	ABF H20 H100	0.080
				2	ABF H20 H200	0.140
				3	ABF H20 H300	0.210
Bare wires	HE 10 20-way	22	0.324	3	TSX CDP 301	0.400
				5	TSX CDP 501	0.660

Separate components

Description	Characteristics	Sold in lots of	Unit reference	Weight kg
Spring terminal connections for: ■ the external contact ■ the auxiliary power supply	2-way, 5 mm pitch Wire c.s.a.: 0.2...2.5 mm ²	10	APE 1PRE21	0.020
Self-stripping connector for: ■ the external contact ■ the auxiliary power supply	2-way, 5 mm pitch Wire c.s.a.: 0.75 mm ²	16	APE 1PAD21	0.020
Connecting cable between module APP 1C● and splitter box LU9 G02 (length: 0.6 m)	Connectors: 1 x HE 10, 30-way 2 x HE 10, 20-way	1	APP 2AH40H060	0.400

Type of control connection module			LAD 9AP3●●	
General environment				
Standard				IEC 60439-1
Certifications				UL, CSA
Degree of protection	Conforming to IEC 60529			IP 40 (mounted assembly)
Resistance to incandescent wire	Conforming to IEC 60695-2-1	°C		960
Shock resistance	Conforming to IEC 60068-2-27			11 ms and 15 gn (half sine wave)
Vibration resistance	Conforming to IEC 60068-2-6 and BV/LR	gn		2...100 Hz : 4 and 3...100 Hz: 0,7
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2			Level 3
Resistance to radiated fields	Conforming to IEC 61000-4-3	V/m		10 (26...1000 MHz)
Immunity to fast transient currents	Conforming to IEC 61000-4-4			Level 3
Surge withstand	Conforming to IEC 61000-4-5	kV		2 in common mode, 0.6 in differential mode Wave form: 1.2/50 µs - 8/20 µs
Immunity to radioelectric fields	Conforming to IEC 61000-4-6	V		10 (0.15...80 MHz)
Ambient air temperature	Operation in floor-standing enclosure	°C		- 5...+ 60
	Operation in wall-mounted enclosure	°C		- 5...+ 40
	Storage	°C		- 40...+ 70
Space required around mounted assembly	For inserting cables and heat dissipation	mm		> 30
Degree of pollution				3
Assembly fixing (with TeSys GV2 circuit-breakers only)				On 2 x 35 mm rails or with 2 x Ø 5.5 mm screws on plate for GV2 ME
Suitable wire c.s.a.	Voltage supply for power	Number of wires		3
		Flexible cable with cable end	mm²	16
		Flexible cable without cable end	mm²	25
		Solid cable	mm²	25
	Voltage supply for contactor coil control	Number of wires		2
		Flexible cable with cable end (max)	mm²	1.5
		Flexible cable without cable end (max)	mm²	2.5
		Solid cable (max)	mm²	2.5

3-phase power circuit characteristics				
Maximum current	Per power supply	Conforming to IEC 60439-1	A	60 (single power supply to one or more sub-bases or splitter boxes)
	Per sub-base	Conforming to IEC 60439-1	A	60
GV2 operating limit				80 % of I _{max} at 60° C ambient temperature (see table on opposite page)
Maximum current per starter			A	18 (with an empty slot between two starters)
Insulation voltage			V	750
Operational voltage			V	690
U _{imp}			kV	6
Rated operational frequency			Hz	50-60
Rated short-circuit current conditional I _{sc} at 415 V		Conforming to IEC 60439-1	kA	50
Permissible short-time rating I _{cw}		Conforming to IEC 60439-1	kA	9.1 (for 70 ms)
Control circuit characteristics				
Contactor coil control voltage			V	~ 12...250 (with interface relay)
			V	~ 5...24 (without interface relay)
			V	~ 5...130 (with interface relay)

Table of GV2 circuit-breaker current limitation at 60°C ambient temperature with TeSys Quickfit

Circuit-breaker reference	GV2 ratings (1)	Maximum current of GV2 with TeSys Quickfit
GV2 ME06	1 - 1.6 A	1.28 A
GV2 ME07	1.6 - 2.5 A	2 A
GV2 ME08	2.5 - 4 A	3.2 A
GV2 ME10	4 - 6.3 A	5 A
GV2 ME14	6 - 10 A	8 A
GV2 ME16	9 - 14 A	11.2 A
GV2 ME20	13 - 18 A	14.4 A
GV2 ME21	17 - 23 A	18 A

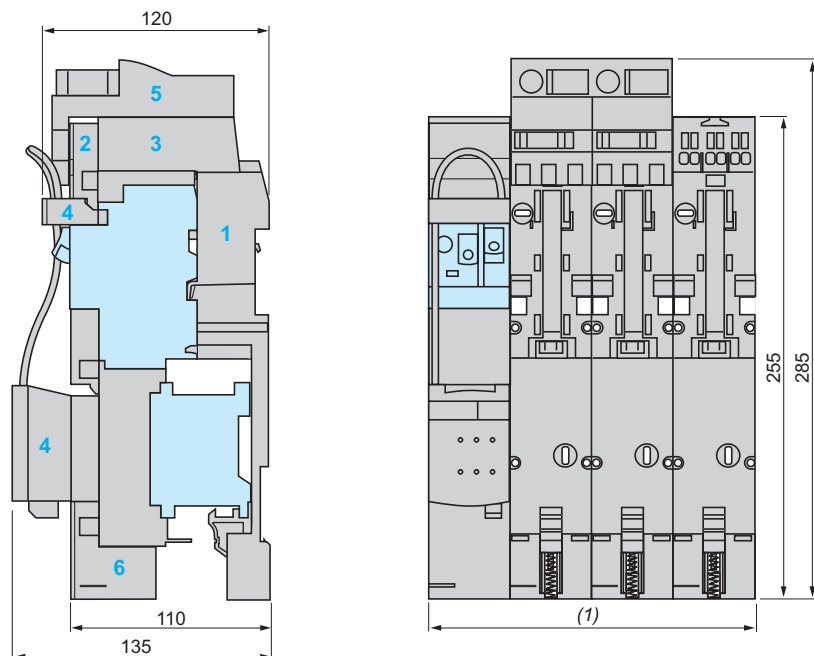
Electromechanical relay characteristics

Electromechanical relay characteristics		LAD 9AP31, LAD 9AP32	
Type of control connection module			
Characteristics of the electromechanical relay control circuit (PLC side)			
Rated voltage at Us	V	≡	24
Energisation threshold at 40 °C	V	≡	19.2
Drop-out voltage at 20 °C	V	≡	2.4
Maximum operational voltage	V	≡	30
Maximum current at Us	mA		15
Drop-out current at 20 °C	mA		1
Maximum power dissipated at Us	W		0.36
Supply failure	ms		5
Characteristics of the electromechanical relay output circuit			
Type of contact			1F
Maximum switching voltage	V	~	250
	V	≡	130
Frequency of the operating current	Hz		50/60
Maximum current of the contact	A		4
Other characteristics of the electromechanical relay			
Maximum operating time at Us (including bounce)	Between coil energisation and closing of the contact	ms	10
	Between coil de-energisation and opening of the contact	ms	5
Maximum operating ratet	No load	Hz	10
	At Ie	Hz	0.5
Mechanical life	In millions of operating cycles		20
Dielectric strength	V		1000 (50/60 Hz) - 1 mn
Rated impulse withstand voltage (Uimp)	kV		2.5
Primary/secondary rated insulation voltage	V		300
Maximum current for 500 000 operations	24 V - DC13	A	0.6
	230 V - AC15	A	0.9

(1) Thermal trip setting range.

Dimensions

Mounted assembly, with TeSys GV2 ME circuit-breakers and TeSys D contactors



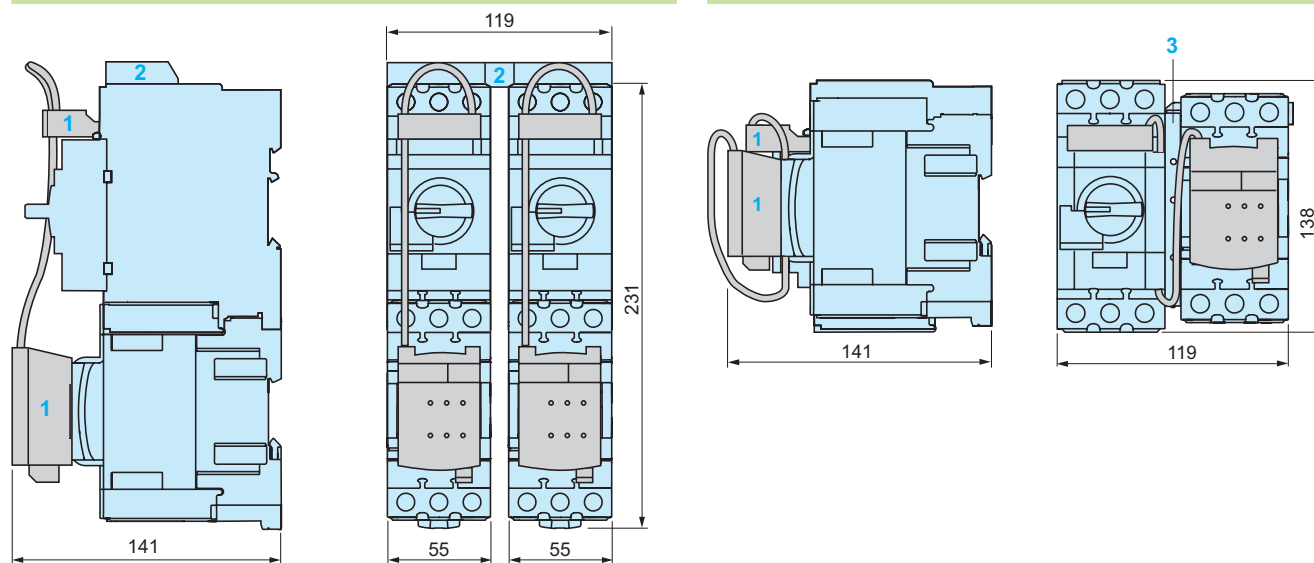
- 1 Circuit-breaker and contactor support plate
- 2 Power connection module
- 3 Power splitter box
- 4 Control splitter box
- 5 Upstream terminal block
- 6 Outgoing terminal block

(1) 2 starters: 90 mm, 4 starters: 180 mm, 8 starters: 360 mm.

Mounted assembly with TeSys GV3 P circuit-breakers and TeSys D contactors (LC1 D40A3... LC1 D65A3)

Vertical mounting

Side by side mounting

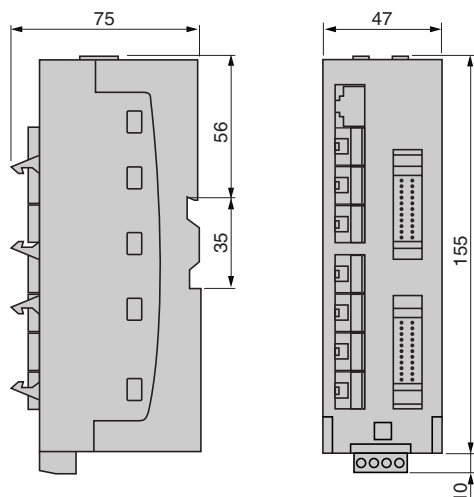


- 1 Control splitter box
- 2 Set of GV3 G264 busbars
- 3 Set of S-shape busbars GV3 S

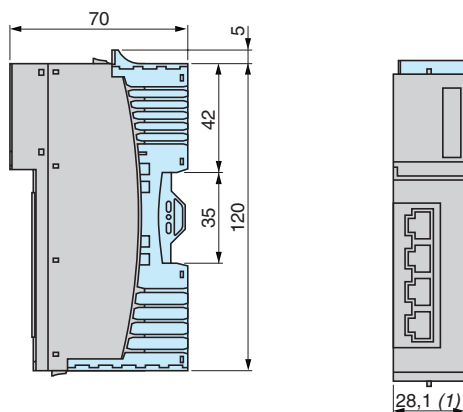
Dimensions

Parallel wiring modules

Splitter box LU9 G02



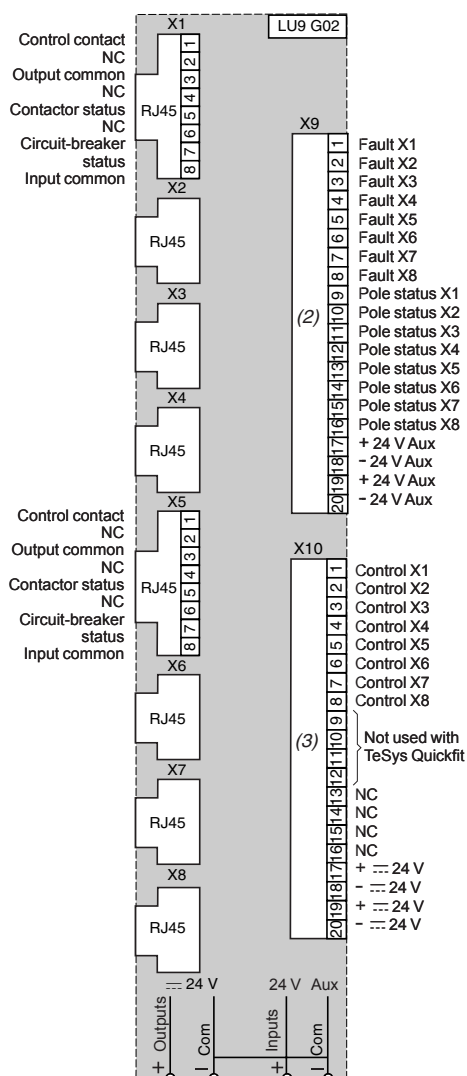
Parallel wiring module Advantys STB EPI 2145



(1) Dimension to be multiplied by the number of **STB EPI 2145** modules present in the configuration.

Schemes

Splitter box LU9 G02



Colours of TSX CDP... connection cable wires (4)

- 1 White
- 2 Brown
- 3 Green
- 4 Yellow
- 5 Grey
- 6 Pink
- 7 Blue
- 8 Red
- 9 Black
- 10 Violet
- 11 Grey-pink
- 12 Red-blue
- 13 White-green
- 14 Brown-green
- 15 White-yellow
- 16 Yellow-brown
- 17 White-grey
- 18 Grey-brown
- 19 White-pink
- 20 Pink-brown

(2) 20-way HE10 input connector.

(3) 20-way HE10 output connector.

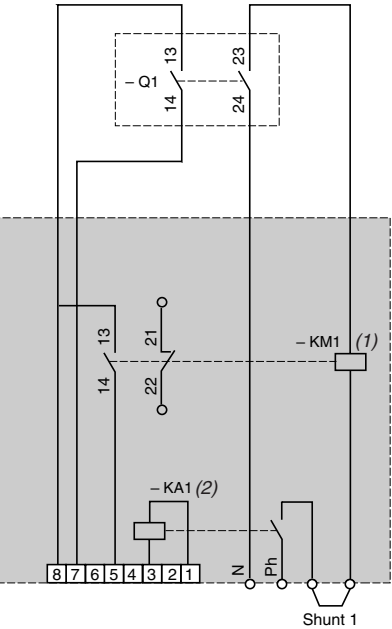
(4) Wire colours and corresponding HE10 connector pin numbers.

Wiring schemes

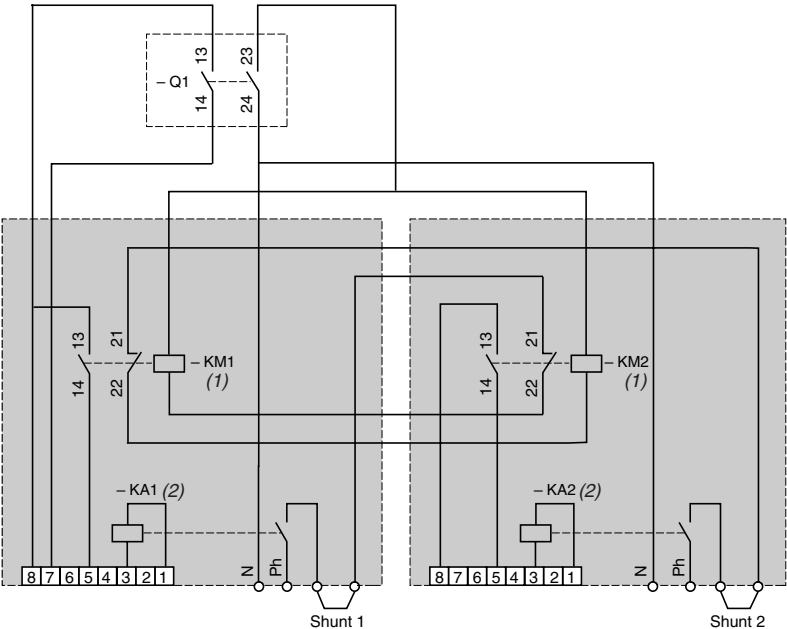
With relay

LAD9 AP31

LAD9 AP32



Q1 Thermal-magnetic motor circuit-breaker.
(1) Contactor coil.
(2) Interface relay.

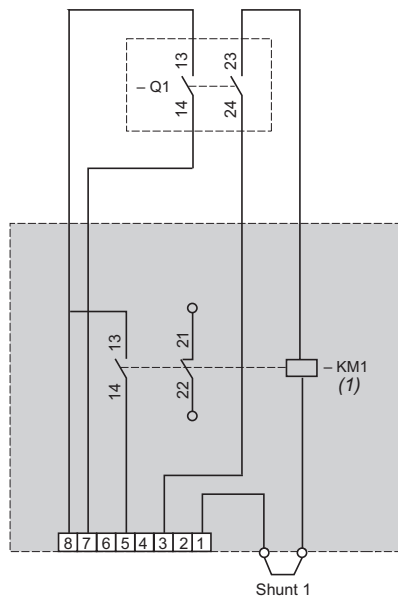


Wiring schemes (continued)

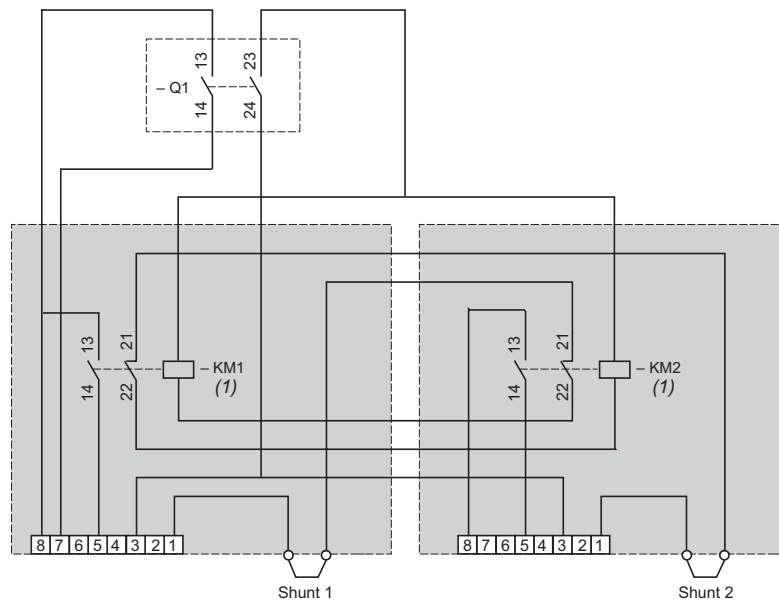
Without relay

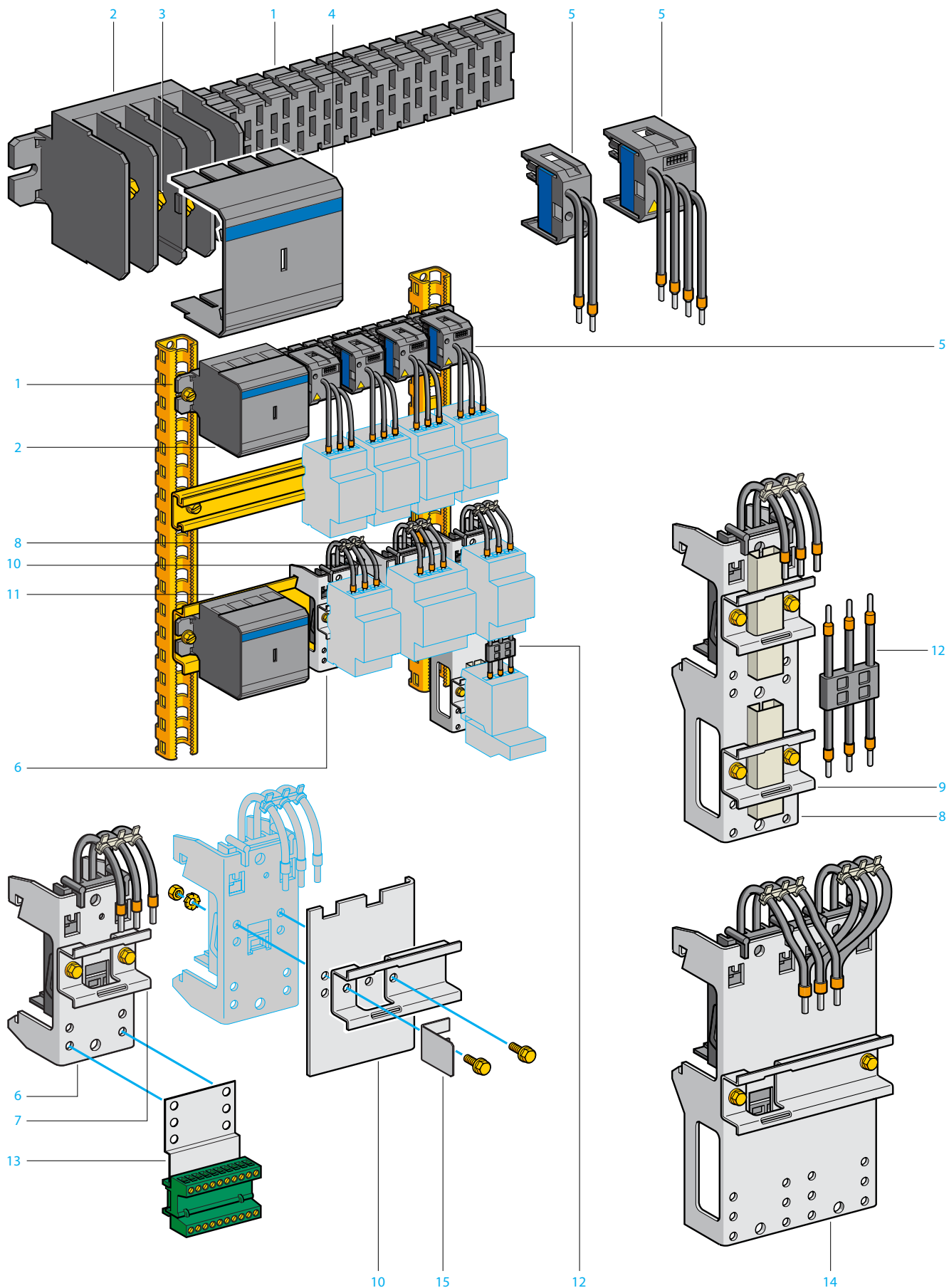
LAD9 AP3D1

LAD9 AP3D2



Q1 Thermal-magnetic motor circuit-breaker.
(1) Contactor coil.





The assembly of automated control and distribution panels requires the use of products that are not only safe but also simple and quick to mount and cable.

The AK5 pre-assembled busbar system meets all these criteria by incorporating prefabricated components which cater for 3 principal functions:

Carrying of electric current

By the pre-assembled 4-pole busbar system **1**, 160 A at 35 °C.

4-pole busbar systems can be used for 3-phase + Neutral or 3-phase + Common.

The busbar systems are available in 6 lengths: 344, 452, 560, 668, 992, 1100 mm.

An incoming supply terminal block **2** is located at the extreme left of the busbar system.

"Knock-out" partitions allow connection of the power supply from above or below to connectors **3** which are protected by a removable cover **4**.
Upstream protection of the busbar system is shown on page 238.

Current distribution

Tap-off units **5** (factory assembled) are available in 4 versions:

- 2-pole,
- 3-pole,
- 4-pole (3-phase + Neutral),
- 4-pole (3-phase + Common).

The tap-offs clip onto the busbar system with instantaneous mechanical and electrical connection to the busbars.

2 ratings are available: 16 and 32 A.

The tap-off units ensure not only rapid mounting, but also a neat appearance for the power distribution system and complete safety when accessing under live circuit conditions.

Component mounting

Component mounting plates with incorporated tap-off allow mounting of and supply of power to components.

They are available in 25 A or 50 A ratings.

These mounting plates clip onto the mounting rail **11**, which also supports the busbar system, and at the same time make electrical connection via the incorporated tap-off.

2 types of mounting plate are available:

- single plates **6** (height 105 mm), with bolt-on 35 mm wide rail **7**, which may be bolted on in one of two positions, allowing height adjustment of 10 mm.
- double plates **8** and **14** (height 190 mm), with two bolt-on, 35 mm wide rails **9** mounted on 100 mm fixing centres; each rail may be bolted on in one of 4 positions, allowing height adjustment in 10 mm steps. These plates are supplied with connectors **12** to allow wiring between control and protection devices.

Single mounting plates enable the following types of distribution:

- 2-pole (Ph + N) and (Ph + Ph)
- 3-pole,
- 4-pole (3 Ph + N or 3 Ph + common).

Double mounting plates enable the following types of distribution: 2-pole (Ph + N, Ph + Ph), 3-pole or 4-pole (3Ph+N and 3Ph + common).


Extension plates **10** can be bolted onto single and double mounting plates to enable mounting of wider components. Using a side stop **15** in conjunction with these extension plates also supports the AK5 JB busbar system when used vertically.

A control terminal block **13** comprising a support plate bolted onto the single or double mounting plates and a 10-pole plug-in block, enables connection of the control circuit wires (c.s.a. 1.5 mm² max).

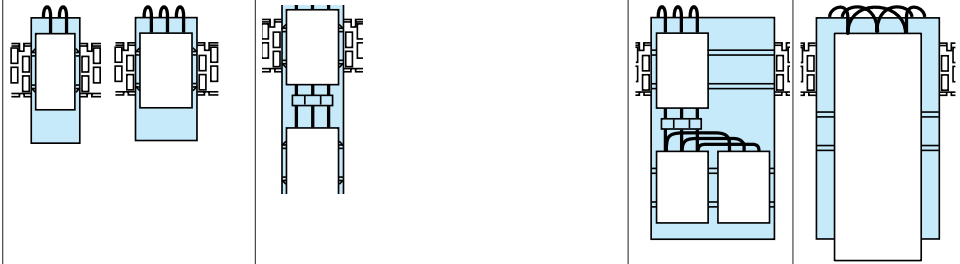
Busbar system characteristics								
Conforming to standards			IEC 60439					
Product certifications			UL, CSA, DNV, LROS					
Degree of protection	Against access to live parts		IP XXB conforming to IEC 60529					
Flame resistance	Conforming to IEC 60695	°C	850 (incandescent wire)					
	Conforming to standard UL 94		V0					
Number of conductors	AK5 JB14●		4					
Supply current			~					
Rated operational frequency		Hz	50 or 60					
Rated operational current	Ambient temperature 35 °C	A	160					
	Coefficient K to be applied according to the ambient temperature	°C	35	40	45	50	55	60
		K	1	0.96	0.92	0.88	0.83	0.78
Rated insulation voltage	Conforming to IEC 60439-1	V	690					
	Conforming to UL and CSA	V	600					
Operational voltage			Off-load plugging-in and unplugging, with supply switched on					
	Conforming to IEC 60439-1	V	400					
	Conforming to UL, CSA	V	480					
			Plugging-in and unplugging, with supply switched off					
	Conforming to IEC 60439-1	V	690					
	Conforming to UL, CSA	V	600					
Maximum permissible peak current		kA	25					
Maximum let-through energy		A·s	1 x 10 ⁷					
Upstream short-circuit (1) and overload protection	Type of protection		Schneider Electric circuit-breaker			Fuses		
			NS 160 H	NS 160 H	aM	gF		
	Rating	A	160	160	160	160		
	Prospective short-circuit current	kA	36	70	100	100		
	Operational current	A	160	160	160	160		
Cabling			Maximum c.s.a.			Minimum c.s.a.		
	Flexible cable with cable end	mm²	70			2.5		
	Solid cable	mm²	70			2.5		
	Tightening torque	Nm	10					
Mounting position	Horizontal or vertical (2)		Fixing with screws provided					

(1) For conditions where conditional short-circuit current exceeds 25 kA.

(2) Using side stop AK5 BT01 on mounting plates AK5 PA.

Tap-off characteristics											
Type		AK5 PC12	AK5 PC12PH	AK5 PC13	AK5 PC14	AK5 PC131	AK5 PC32L	AK5 PC32LPH	AK5 PC33 PC33L	AK5 PC34 PC34L	AK5 PC331
Conforming to standards		IEC 60439									
Product certifications		UL, LROS, CSA, DNV									
Degree of protection		Against access to live parts: IP XXB conforming to IEC 529									
Polarity		Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common	Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common
Conductor c.s.a. (UL cables)	mm²	2 x 2.5	2 x 2.5	3 x 2.5	4 x 2.5	3 x 2.5 1 x 1.5	2 x 4	2 x 4	3 x 4	4 x 4	3 x 4 1 x 1.5
Conductor colours		Black Blue (Neutral)	Black	Black	Black Blue (Neutral)	Black White	Black Blue (Neutral)	Black	Black	Black Blue (Neutral)	Black White (Common)
Permissible current	A	16	16	16	16	16 10 (Common)	32	32	32	32	32 10 (Common)
Rated insulation voltage	V	690 conforming to IEC 60439-1									
Rated peak current	kA	6									
Maximum let-through energy	A²s	100 000					200 000				
Type of conductor insulation		PVC 105 °C									
Tap-off characteristics											
Type		AK5 PA211N1 PA211N2 PA211N3 PA212N1 PA212N2 PA212N3	AK5 PA211PH12 PA211PH13 PA211PH23 PA212PH12 PA212PH13 PA212PH23	AK5 PA231 PA232 PA232S	AK5 PA241 PA242	AK5 PA2311 PA2312 PA2312S	AK5 PA532	AK5 PA542	AK5 PA5312		
Conforming to standards		IEC 60439									
Product certifications		UL, LROS, CSA, DNV									
Degree of protection		Against access to live parts: IP XXB conforming to IEC 60529									
Polarity		Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common	3-phase	3-phase + Neutral	3-phase + Common		
Conductor c.s.a. (UL cables)	mm²	2 x 4	2 x 4	3 x 4	4 x 4	3 x 4 1 x 1.5	2 x (3 x 4)	2 x (4 x 4)	2 x (3 x 4) 1 x 1.5		
Permissible current	A	25	25	25	25	25 10 (Common)	50	50	50 10 (Common)		
Rated insulation voltage	V	690 conforming to IEC 60439-1									
Rated peak current	kA	6									
Maximum let-through energy	A²s	200 000									
Type of conductor insulation		PVC 105 °C									
Characteristics of mounting rails AM1 DL201 and AM1 DL2017											
Type		Omega  (width 75 mm, depth 15 mm)									
Material		2 mm sheet steel									
Surface treatment		Galvanized									

Component mounting plates incorporating tap-off mounted on AK5 JB busbar system



Note: if the equipment is wider than the mounting plate, an extension plate can be used to increase the width of the support plate.

(1) 3-pole + common

Mounting plate incorporating tap-off		AK5 PA211N1 PA211N2 PA211N3	AK5 PA231 PA2311 (1)	AK5 PA241	AK5 PA212N1 PA212N2 PA212N3	AK5 PA212PH12 PA213PH13 PA212PH23	AK5 PA232 PA2312 (1)	AK5 PA242	AK5 PA232S PA2312S (1)	AK5 PA532 PA5312 (1)	AK5 PA542
Width in mm		54	54	54	54	54	54	54	108	108	108
Height in mm		105	105	105	190	190	190	190	190	190	190
No. of 18 mm pitches		3	3	3	3	3	3	4	6	6	6
Thermal current		25 A	25 A	25 A	25 A	25 A	25 A	25 A	25 A	50 A	50 A
Application		Ph + N	3-pole	3-pole + N	Ph + N	Ph + Ph	3-pole	3-pole + N	3-pole	3-pole	3-pole + N

Motor starter type	Minimum centres with 60 mm ducting	Number of points used on the busbar system
--------------------	------------------------------------	--

Fuses, contactors and thermal overload relay

LS1 D25	170	4	4	—	—	—	—
LS1 D25 + LA8 D254	170	—	—	5	—	—	—
LS1 D25 + LC1 D09 to D25 and overload relay up to LR2 D1322	320	—	—	—	4	—	—
LS1 D25 + LC1 D09 to D25 (with 1 add-on block LA8 D) + overload relay up to LR2 D1322	320	—	—	—	4	—	—

Fuses, reversing contactors + thermal overload relay

LS1 D25 + LC2 D09 to D18 (with 1 add-on block LA8 D) + overload relay up to LR2 D1322	320	—	—	—	—	6	—
LS1 D25 + LC2 D25 with 1 add-on block LA8 D) + overload relay up to LR2 D1322	320	—	—	—	—	7	—

Optimal breaker switch

GK2 CF03 to CF22	170	—	3	—	—	—	—
GK2 CF03 to CF22 + 4 blocks GK2 AX	170	—	5	—	—	—	—
GK3 EF40	270	—	—	—	—	—	6
GK3 EF40 + 4 blocks GK2 AX	270	—	—	—	—	—	6

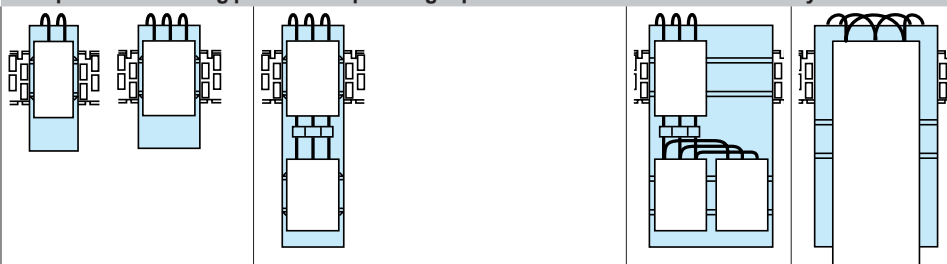
Optimal breaker switch + contactor + thermal overload relay

GK2 CF03 to CF21 + LC1 D09 to D18 + overload relay up to LR2 D1322	320	—	—	—	3	—	—
GK2 CF03 to CF22 + LC1 D09 to D25 + overload relay up to LR2 D1322	320	—	—	—	4	—	—
GK2 CF03 to CF22 + 4 blocks GK2-AX + LC1 D09 to D18 with 1 block LA8 D + overload relay up to LR2 D1322	320	—	—	—	5	—	—

Optimal breaker switch + reversing contactor + thermal overload relay

GK2 CF03 to CF22 + 4 blocks GK2 AX + LC1 D09 to D18 with 1 block LA8 D + overload relay up to LR2 D1322	320	—	—	—	—	6	—
GK2 CF03 to CF22 + 4 blocks GK2 AX + LC2 D25 with 1 block LA8 D + overload relay up to LR2 D1322	320	—	—	—	—	7	—

Component mounting plates incorporating tap-off mounted on AK5 JB busbar system



Note 1: if the equipment is wider than the mounting plate, an extension plate can be used to increase the width of the support plate.

Note 2: for upstream protection, see page 238

(1) 3-pole + common

Mounting plate incorporating tap-off		AK5 PA211N1 PA211N2 PA211N3	AK5 PA231 PA2311 (1)	AK5 PA241	AK5 PA212N1 PA212N2 PA212N3	AK5 PA212PH12 PA213PH13 PA212PH23	AK5PA 232 PA2312 (1)	AK5 PA242	AK5 PA232S PA2312S (1)	AK PA532 PA5312 (1)	AK5 PA542
Width in mm		54	54	54	54	54	54	54	108	108	108
Height in mm		105	105	105	190	190	190	190	190	190	190
No. of 18 mm pitches		3	3	3	3	3	3	4	6	6	6
Thermal current		25 A	25 A	25 A	25 A	25 A	25 A	25 A	25 A	50 A	50 A
Application		Ph + N	3-pole	3-pole + N	Ph + N	Ph + Ph	3-pole	3-pole + N	3-pole	3-pole	3-pole + N

Motor starter type	Minimum centres with 60 mm ducting	Number of points used on the busbar system

Motor circuit-breaker (type 1 coordination)

GV2●06 to ●22	170	—	3	—	—	—	—	—
GV3M01 to M40	270	—	—	—	—	—	—	6

Motor circuit-breaker + contactor

GV2●06 to ●16 + LC1 D09 or D12 with 1 add-on block LA8 D	270	—	—	—	4	—	—	—
GV2●06 to ●20 + LC1 D09 to D18	270	—	—	—	3	—	—	—
GV2●06 to ●22 + LC1 D09 or D12 with 1 add-on block LA8 D	270	—	—	—	4	—	—	—
GV3M01 to M40 with GV1A●● + LC1D09 to D32	270	—	—	—	—	—	—	7
GV3M01 to M40 + LC1 D09 to D32 with 1 add-on block LA8 D	270	—	—	—	—	—	—	8

Motor circuit-breaker + reversing contactor

GV2●06 to ●20 + LC2-D09 to D18 with or without add-on block LA8 D	270	—	—	—	—	6	—	—
GV2●22 with 1 add-on block LA8-D	270	—	—	—	—	7	—	—

Integral contactor breaker + protection module

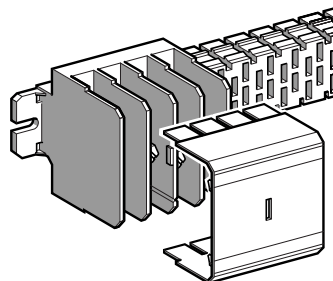
LD1 LB030 + LB1 LB03P●● (integral 18)	270	—	3	—	—	—	—	—
LD1 LB030 with 2 add-on blocks LA1 -LB + LB1 LB30P (integral 18)	270	—	4	—	—	—	—	—
LD1 LB030 with 4 add-on blocks LA1 LB + LB1 LB03P (integral 18)	270	—	—	—	—	6	—	—
LD1 LC030 + LB1 LC03M (integral 32)	270	—	—	—	—	—	—	6
LD1 LC030 + LB1 LC03M (integral 32) with 1 add-on block LA1 LC and 1 reset device LA1 LC052●	270	—	—	—	—	—	—	7
LD1 LC030 with 2 add-on blocks LA1 LB + LB1 LC03M (integral 32)	270	—	—	—	—	—	—	6

Reversing contactor breaker integral 18 + protection module

LD5 LB130 + LB1 LB03P●●	270	—	—	—	—	6	—	—
LD5 LB130 with 3 add-on blocks LA1 LB + LB1 LB03P	270	—	—	—	—	8	—	—

Schneider Electric C 60 circuit-breaker for circuit protection

2369●	170	2	—	—	2	2	—	—	—	—	—
2370●	170	—	3	—	—	—	3	—	3	3	—
2371● and 2372●	170	—	—	4	—	—	—	4	—	—	4



AK5 JB1●●

Busbar systems

The busbar system can be screw-mounted onto any type of support. However, if it is to be used in conjunction with component mounting plates incorporating a tap-off, it is essential that it is mounted on the AM1 DL201 rail. When mounting tap-offs, the rated operational current of the busbar system should be taken into account: 160 A at 35 °C.

Number of conductors	Number of tap-offs at 18 mm intervals	Length mm	Suitable for mounting in enclosure width mm	Reference	Weight kg
4 (1)	12	344	600	AK5 JB143	0.700
	18	452	800	AK5 JB144	0.900
	24	560	800	AK5 JB145	1.100
	30	668	800	AK5 JB146	1.300
	48	992	1200	AK5 JB149	1.900
	54	1100	1200	AK5 JB1410	2.100

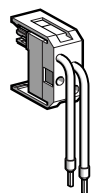
Omega rail, width 75 mm

This rail is designed to accommodate the busbar system when it is used with AK5 PA mounting plates incorporating tap-offs. It supports the busbar system. The plates simply clip onto the rail.

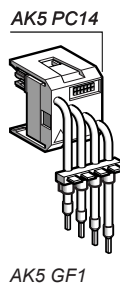
Material and surface treatment	Depth mm	Length mm	Sold in lots of	Unit reference	Weight kg
2 mm sheet steel	15	2000 (4)	6	AM1 DL201	3.000

Removable power sockets

Use	Number of points used on the busbar system	Thermal current A	Cable lengths mm	Sold in lots of	Unit reference	Weight kg
Single-phase + Neutral	1	16	200	6 (2)	AK5 PC12	0.035
		32	1000	6 (2)	AK5 PC32L	0.040
2-phase	1	16	200	6 (3)	AK5 PC12PH	0.035
		32	1000	6 (3)	AK5 PC32LPH	0.040
3-phase	2	16	200	6	AK5 PC13	0.040
			250	6	AK5 PC33	0.045
			1000	6	AK5 PC33L	0.060
3-phase + Neutral	2	16	200	6	AK5 PC14	0.045
			250	6	AK5 PC34	0.050
			1000	6	AK5 PC34L	0.065
3-phase + common	2	16 10 (common)	200	6	AK5 PC131	0.045
			250	6	AK5 PC331	0.050
			10 (common)			



AK5 PC12



AK5 PC14

AK5 GF1

Accessories

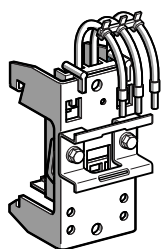
Description	Maximum no. of connections	C.s.a. mm ²	Sold in lots of	Unit reference	Weight kg
Cable guide	4	2.5 or 4	20	AK5 GF1	0.300

(1) 4-pole: 3-phase + Neutral or 3-phase + Common.

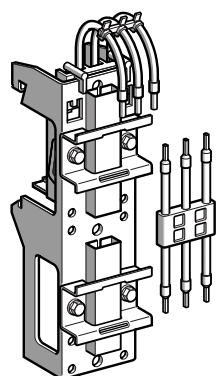
(2) Total of 6 sockets supplied: 2 sockets (N + L1), 2 sockets (N + L2), 2 sockets (N + L3).

(3) Total of 6 sockets supplied: 2 sockets (L1 + L2), 2 sockets (L1 + L3), 2 sockets (L2 + L3).

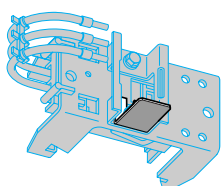
(4) Cut and drill to suit use.



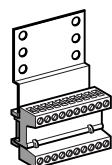
AK5 PA231



AK5 PA232



AK5 BT01



AK5 SB1

Component mounting plates incorporating tap-off

Single plate (height 105 mm)

Use	No. of 18mm points used on the busbar system	Phase	Thermal current A	Number of L rails for component support	Reference	Weight kg
Single-phase + neutral	3	Ph1+N	25	1	AK5 PA211N1	0.135
		Ph2+N	25	1	AK5 PA211N2	0.135
		Ph3+N	25	1	AK5 PA211N3	0.135
2-phase	3	Ph1+Ph2	25	1	AK5 PA211PH12	0.135
		Ph1+Ph3	25	1	AK5 PA211PH13	0.135
		Ph2+Ph3	25	1	AK5 PA211PH23	0.135
3-phase	3	—	25	1	AK5 PA231	0.140
3-phase + common	3	—	25	1	AK5 PA2311	0.145
3-phase + neutral	3	—	25	1	AK5 PA241	0.145

Double plate (height 190 mm)

Prefabricated 25 A connectors are supplied for connecting the 2 protection and control devices.

Single-phase + neutral	3	Ph1+N	25	2	AK5 PA212N1	0.135
		Ph2+N	25	2	AK5 PA212N2	0.135
		Ph3+N	25	2	AK5 PA212N3	0.135
2-phase	3	Ph1+Ph2	25	2	AK5 PA212PH12	0.135
		Ph1+Ph3	25	2	AK5 PA212PH13	0.135
		Ph2+Ph3	25	2	AK5 PA212PH23	0.135
3-phase	3	—	25	2	AK5 PA232	0.230
	6	—	25	2	AK5 PA232S	0.600
			50	1	AK5 PA532	0.700
3-phase + neutral	3	—	25	2	AK5 PA242	0.230
3-phase + common	3	—	25 (10 common)	2	AK5 PA2312	0.235
	6	—	25 (10 common)	2	AK5 PA2312S	0.610
			50 (10 common)	1	AK5 PA5312	0.710
3-phase + neutral	6	—	50	1	AK5 PA542	0.715

Extension plates

These plates bolt onto the equipment support plates, after having removed them from the rails, to be able to mount wider components.

Use		Number of tap-offs at 18 mm intervals	Reference	Weight kg
For mounting plates incorporating tap-off	Single	4	AK5 PE17	0.100
	Double	4	AK5 PE27	0.150

Side stop (AK5 JB mounted vertically)

Use	Sold in lots of	Unit reference	Weight kg
For extension plate	50	AK5 BT01	0.005

Control terminal blocks

Description	Thermal current A	Sold in lots of	Unit reference	Weight kg
10-pole terminal blocks, for screwing onto plate AK5 PA●●●				
	10	10	AK5 SB1	0.065
10-pole front connecting plug-in terminal blocks which can be clipped onto 25 L rails				
Fixed part	10	10	AB1 DV10235U	0.047
Moving part	10	10	AB1 DVM10235U	0.021

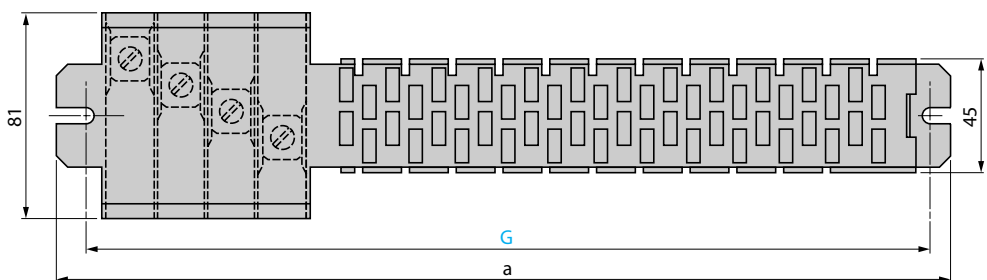
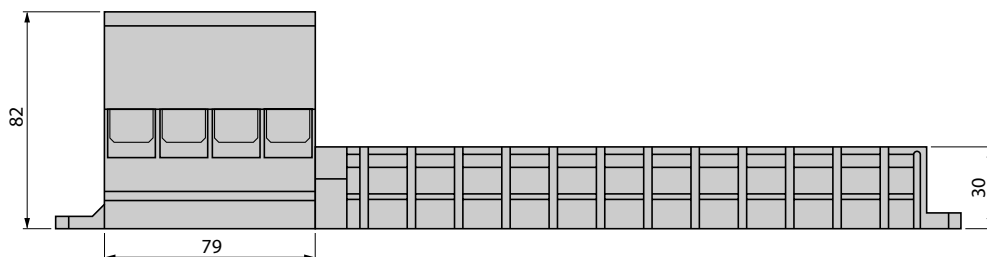
Accessories

Description	Marking	Sold in lots of	Unit reference	Weight kg
Strips of clip-in markers				
10 identical numbers, signs or capital letters per strip	0...9	25	AB1 R● (1)	0.050
	+	25	AB1 R12	0.050
	—	25	AB1 R13	0.050
	A...Z	25	AB1 G● (1)	0.050

(1) Replace the ● in the selected reference with the number or letter required. Example: AB1 R1 or AB1 GA.

Busbar systems

AK5 JB●●●

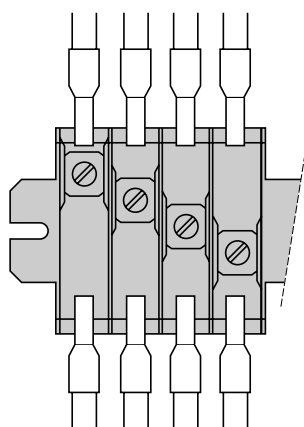


AK5	a	G	No. of 18 mm points
JB143	344	330	12
JB144	452	438	18
JB145	560	546	24
JB146	668	654	30
JB149	992	978	48
JB1410	1100	1086	54

Busbar feed units

AK5 JB●●●

Installation of AK5 JB●●● busbar systems



Connection	C.s.a. in mm ²	
	min	max
Flexible cable with or without cable end		
		 2 x 2.5 2 x 35
Flexible bar		
	—	2 x (9 x 4)
Flexible bar		
	9 x 4	9 x 4
+	+	+
flexible cable with or without cable end	1 x 2.5	1 x 35

(1) Maximum c.s.a. or connection of conductor without cable end.

Removable power sockets 16 and 32 A

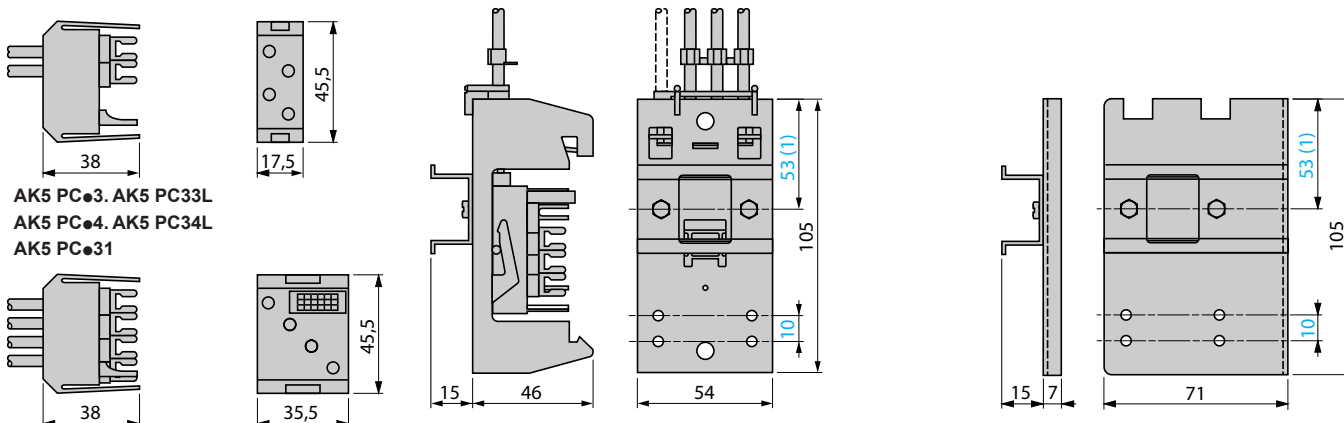
AK5 PC12●. AK5 PC32L●

Mounting plates incorporating tap-offs, 25 A

AK5 PA2●1. AK5 PA2311. AK5 PA211●●●●

Single width extension plates

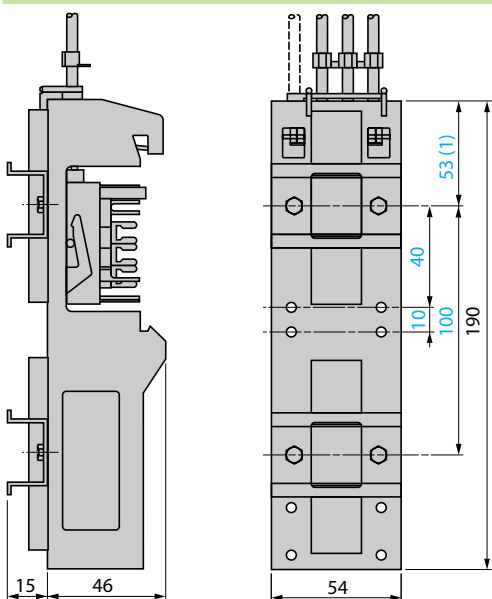
AK5 PE17



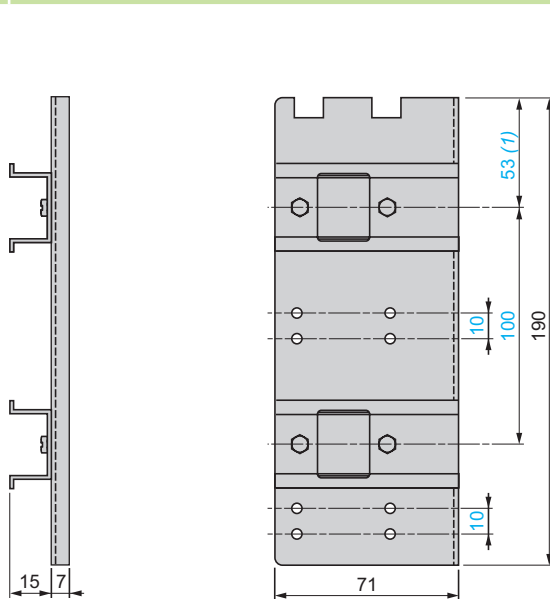
Note: It is recommended that the power sockets or the removable plates are connected as close as possible to the busbar feed unit.

(1) Can be fixed at 43 mm

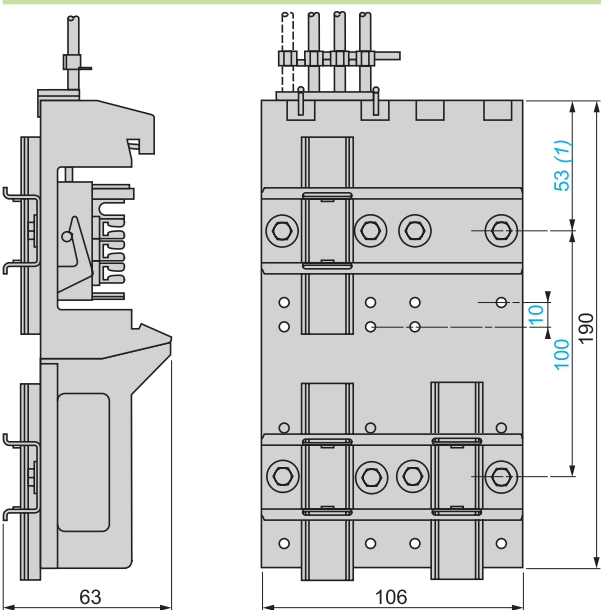
Component mounting plates incorporating tap-off
AK5 PA232. AK5 PA2312. AK5 PA242



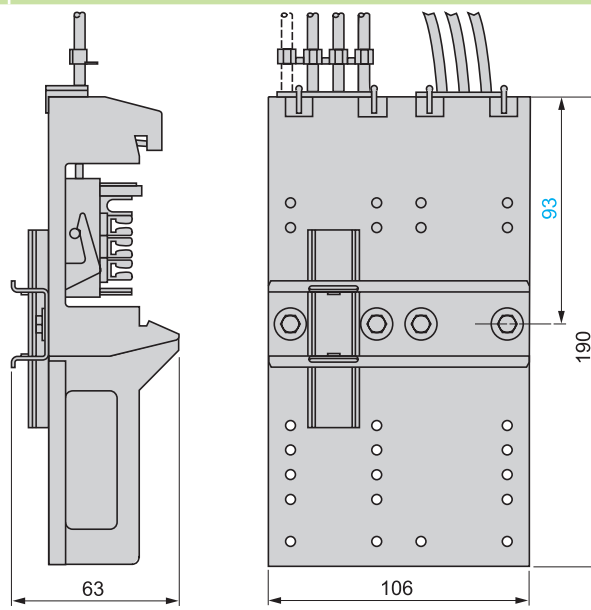
Double extension plate
AK5 PE27



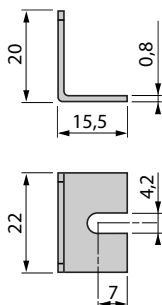
Component mounting plates incorporating tap-off
AK5 PA232S. AK5 PA2312S



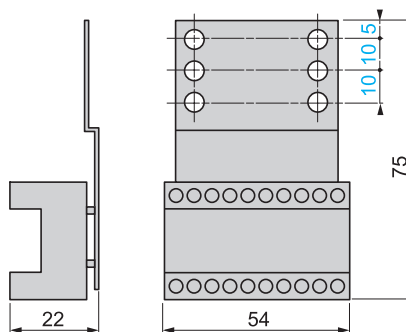
AK5 PA532. AK5 PA5312. AK5 PA542



Side stop
AK5 BT01




Control terminal block
AK5 SB1



(1) Can be fixed at 43 mm

■ Contactors: definitions and comments	page 248
■ Product standards and certifications	page 250
■ Tests according to standard utilisation categories conforming to IEC 60947-4-1 and 5-1	page 252
■ Current of asynchronous squirrel cage motors at nominal load	page 253
■ Contactors: long distance remote control	page 254

Definitions

Altitude	The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the contactor. It also reduces the cooling effect of the air and hence the rated operational current of the contactor (unless the temperature drops at the same time).				
	No derating is necessary up to 3000 m.				
	Derating factors to be applied above this altitude for main pole operational voltage and current (a.c. supply) are as follows.				
	Altitude	3500 m	4000 m	4500 m	5000 m
	Rated operational voltage	0,90	0,80	0,70	0,60
	Rated operational current	0,92	0,90	0,88	0,86
Ambient air temperature	The temperature of the air surrounding the device, measured near to the device. The operating characteristics are given : - with no restriction for temperatures between - 5 and + 55 °C, - with restrictions, if necessary, for temperatures between - 50 and + 70 °C.				
Rated operational current (Ie)	This is defined taking into account the rated operational voltage, operating rate and duty, utilisation category and ambient temperature around the device.				
Rated conventional thermal current (Ith) (1)	The current which a closed contactor can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards.				
Permissible short time rating	The current which a closed contactor can sustain for a short time after a period of no load, without dangerous overheating.				
Rated operational voltage (Ue)	This is the voltage value which, in conjunction with the rated operational current, determines the use of the contactor or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits it is expressed as the voltage between phases. Apart from exceptional cases such as rotor short-circuiting, the rated operational voltage Ue is less than or equal to the rated insulation voltage Ui.				
Rated control circuit voltage (Uc)	The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a near sinusoidal wave form (less than 5% total harmonic distortion).				
Rated insulation voltage (Ui)	This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths and creepage distances. As the specifications are not identical for all standards, the rated value given for each of them is not necessarily the same.				
Rated impulse withstand voltage (Uimp)	The peak value of a voltage surge which the device is able to withstand without breaking down.				
Rated operational power (expressed in kW)	The rated power of the standard motor which can be switched by the contactor, at the stated operational voltage.				
Rated breaking capacity (2)	This is the current value which the contactor can break in accordance with the breaking conditions specified in the IEC standard.				
Rated making capacity (2)	This is the current value which the contactor can make in accordance with the making conditions specified in the IEC standard.				
On-load factor (m)	<div><div><div>$m = \frac{t}{T}$</div></div><div>This is the ratio between the time the current flows (t) and the duration of the cycle (T) Cycle duration: duration of current flow + time at zero current</div></div>				
Pole impedance	The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal. The impedance comprises a resistive component (R) and an inductive component ($X = L\omega$). The total impedance therefore depends on the frequency and is normally given for 50 Hz. This average value is given for the pole at its rated operational current.				
Electrical durability	This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.				
Mechanical durability	This is the average number of no-load operating cycles (i.e. with zero current flow through the main poles) which the contactor can perform without mechanical failure.				

(1) Conventional thermal current, in free air, conforming to IEC standards.

(2) For a.c. applications, the breaking and making capacities are expressed by the rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.

Note : these definitions are extracted from standard IEC 60947-1.

Contactor utilisation categories conforming to IEC 60947-4

The standard utilisation categories define the current values which the contactor must be able to make or break.

These values depend on:

- the type of load being switched : squirrel cage or slip ring motor, resistors,
- the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

a.c. applications

Category AC-1	<p>This category applies to all types of a.c. load with a power factor equal to or greater than 0.95 ($\cos \varphi \geq 0.95$).</p> <p>Application examples: heating, distribution.</p>
Category AC-2	<p>This category applies to starting, plugging and inching of slip ring motors.</p> <ul style="list-style-type: none"> □ On closing, the contactor makes the starting current, which is about 2.5 times the rated current of the motor. □ On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.
Category AC-3	<p>This category applies to squirrel cage motors with breaking during normal running of the motor.</p> <ul style="list-style-type: none"> □ On closing, the contactor makes the starting current, which is about 5 to 7 times the rated current of the motor. □ On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the contactor terminals is about 20% of the mains supply voltage. Breaking is light. <p>Application examples: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc...</p>
Category AC-4	<p>This category covers applications with plugging and inching of squirrel cage and slip ring motors. The contactor closes at a current peak which may be as high as 5 or 7 times the rated motor current. On opening it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.</p> <p>Application examples: printing machines, wire drawing machines, cranes and hoists, metallurgy industry.</p>

d.c. applications

Category DC-1	<p>This category applies to all types of d.c. load with a time constant (L/R) of less than or equal to 1 ms.</p>
Category DC-3	<p>This category applies to starting, counter-current braking and inching of shunt motors. Time constant ≤ 2 ms.</p> <ul style="list-style-type: none"> □ On closing, the contactor makes the starting current, which is about 2.5 times the rated motor current. □ On opening, the contactor must be able to break 2.5 times the starting current at a voltage which is less than or equal to the mains voltage. The slower the motor speed, and therefore the lower its back e.m.f., the higher this voltage. <p>Breaking is difficult.</p>
Category DC-5	<p>This category applies to starting, counter-current braking and inching of series wound motors. Time constant ≤ 7.5 ms.</p> <p>On closing, the contactor makes a starting current peak which may be as high as 2.5 times the rated motor current. On opening, the contactor breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.</p>

Utilisation categories for auxiliary contacts & control relays conforming to IEC 60947-5

a.c. applications

Category AC-14 (1)	<p>This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is less than 72 VA.</p> <p>Application example: switching the operating coil of contactors and relays.</p>
Category AC-15 (1)	<p>This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is more than 72 VA.</p> <p>Application example: switching the operating coil of contactors.</p>

d.c. applications

Category DC-13 (2)	<p>This category applies to the switching of electromagnetic loads for which the time taken to reach 95 % of the steady state current ($T = 0.95$) is equal to 6 times the power P drawn by the load (with $P \leq 50$ W).</p> <p>Application example: switching the operating coil of contactors without economy resistor.</p>
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(1) Replaces category AC-11.

(2) Replaces category DC-13.

Standardisation

Conformity to standards

Schneider Electric products satisfy, in the majority of cases, national (for example: BS in Great Britain, NF in France, DIN in Germany), European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 for low voltage equipment).

When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines).

Schneider Electric is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system.

On request, and depending on the situation, Schneider Electric can provide the following:

- a declaration of conformity,
- a certificate of conformity (ASEFA/LOVAG),
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

Code	Certification authority		Country
	Name	Abbreviation	
ANSI	American National Standards Institute	ANSI	USA
BS	British Standards Institution	BSI	Great Britain
CEI	Comitato Elettrotecnico Italiano	CEI	Italy
DIN/VDE	Verband Deutscher Electrotechniker	VDE	Germany
EN	Comité Européen de Normalisation Electrotechnique	CENELEC	Europe
GOST	Gosudarstvennii Komitet Standartov	GOST	Russia
IEC	International Electrotechnical Commission	IEC	Worldwide
JIS	Japanese Industrial Standards Committee	JISC	Japan
NBN	Institut Belge de Normalisation	IBN	Belgium
NEN	Nederlands Normalisatie Instituut	NNI	Netherlands
NF	Union Technique de l'Electricité	UTE	France
SAA	Standards Association of Australia	SAA	Australia
UNE	Asociación Española de Normalización y Certificación	AENOR	Spain

European EN standards

These are technical specifications established in conjunction with, and with approval of, the relative bodies within the various CENELEC member countries (European Union, European Free Trade Association and many central and eastern European countries having «member» or «affiliated» status). Prepared in accordance with the principle of consensus, the European standards are the result of a weighted majority vote. Such adopted standards are then integrated into the national collection of standards, and contradictory national standards are withdrawn.

European standards incorporated within the French collection of standards carry the prefix NF EN. At the 'Union Technique de l'Electricité' (*Technical Union of Electricity*) (UTE), the French version of a corresponding European standard carries a dual number: European reference (NF EN ...) and classification index (C ...).

Therefore, the standard NF EN 60947-4-1 relating to motor contactors and starters, effectively constitutes the French version of the European standard EN 60947-4-1 and carries the UTE classification C 63-110.

This standard is identical to the British standard BS EN 60947-4-1 or the German standard DIN EN 60947-4-1.

Whenever reasonably practical, European standards reflect the international standards (IEC).

With regard to automation system components and distribution equipment, in addition to complying with the requirements of French NF standards, Schneider Electric brand components conform to the standards of all other major industrial countries.

Regulations

European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.

The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".

The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.

As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the CE mark.

The CE mark is affixed to Schneider Electric brand products concerned, in order to comply with French and European regulations.

Significance of the CE mark

- The CE mark affixed to a product signifies that the manufacturer certifies that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The CE mark is intended solely for national market control authorities.
- The CE mark must not be confused with a conformity marking.

Technical information

Product standards and certifications

European Directives (continued)

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.

For Schneider Electric brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 2006/95/EC: the CE mark relating to this Directive has been compulsory since **16th January 2007**.
- the Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC: the CE mark on products covered by this Directive has been compulsory since **1st January 1996**.

ASEFA-LOVAG certification

The function of ASEFA (Association des Stations d'Essais Française d'Appareils électriques - Association of French Testing Stations for Low Voltage Industrial Electrical Equipment) is to carry out tests of conformity to standards and to issue certificates of conformity and test reports. ASEFA laboratories are authorised by the French authorisation committee (COFRAC). ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

Quality labels

When components can be used in domestic and similar applications, it is sometimes recommended that a "Quality label" be obtained, which is a form of certification of conformity.

Code	Quality label	Country
CEBEC	Comité Electrotechnique Belge	Belgium
KEMA-KEUR	Keuring van Electrotechnische Materialen	Netherlands
NF	Union Technique de l'Electricité	France
ÖVE	Österreichischer Verband für Electrotechnik	Austria
SEMKO	Svenska Elektriska Materiel Kontrollnatanalen	Sweden

Product certifications

In some countries, the certification of certain electrical components is a legal requirement. In this case, a certificate of conformity to the standard is issued by the official test authority.

Each certified device must bear the relevant certification symbols when these are mandatory:

Code	Certification authority	Country
CSA	Canadian Standards Association	Canada
UL	Underwriters Laboratories	USA
CCC	China Compulsory Certification	China

Note on certifications issued by the Underwriters Laboratories (UL). There are two levels of approval:

- "Recognized" (UL)** The component is fully approved for inclusion in equipment built in a workshop, where the operating limits are known by the equipment manufacturer and where its use within such limits is acceptable by the Underwriters Laboratories.
The component is not approved as a "Product for general use" because its manufacturing characteristics are incomplete or its application possibilities are limited.
A "Recognized" component does not necessarily carry the certification symbol.
- "Listed" (UL)** The component conforms to all the requirements of the classification applicable to it and may therefore be used both as a "Product for general use" and as a component in assembled equipment. A "Listed" component must carry the certification symbol.

Marine classification societies

Prior approval (= certification) by certain marine classification societies is generally required for electrical equipment which is intended for use on board merchant vessels.

Code	Classification authority	Country
BV	Bureau Veritas	France
DNV	Det Norske Veritas	Norway
GL	Germanischer Lloyd	Germany
LR	Lloyd's Register	Great Britain
NKK	Nippon Kaiji Kyokai	Japan
RINA	Registro Italiano Navale	Italy
RRS	Register of Shipping	Russia

Note

For further details on a specific product, please refer to the "Characteristics" pages in this catalogue or consult your Regional Sales Office.

Technical information

Tests according to standard utilisation categories conforming to IEC 60947-4-1 and 5-1 based on rated operational current I_e and rated operational voltage U_e

Contactor

		Electrical durability: making and breaking conditions						Occasional duty: making and breaking conditions					
a.c. supply													
Typical applications	Utilisation category	Making			Breaking			Making			Breaking		
		I	U	cos φ	I	U	cos φ	I	U	cos φ	I	U	cos φ
Resistors, non inductive or slightly inductive loads	AC-1	1e	Ue	0.95	1e	Ue	0.95	1.5 1e	1.05 Ue	0.8	1.5 1e	1.05 Ue	0.8
Motors													
Slip ring motors: starting, breaking.	AC-2	2.5 1e	Ue	0.65	2.5 1e	Ue	0.65	4 1e	1.05 Ue	0.65	4 1e	1.05 Ue	0.65
Squirrel cage motors: starting, breaking whilst motor running.	AC-3												
	1e ≤ (1)	6 1e	Ue	0.65	1 1e	0.17 Ue	0.65	10 1e	1.05 Ue	0.45	8 1e	1.05 Ue	0.45
	1e > (2)	6 1e	Ue	0.35	1 1e	0.17 Ue	0.35	10 1e	1.05 Ue	0.35	8 1e	1.05 Ue	0.35
Squirrel cage motors: starting, reversing, inching	AC-4												
	1e ≤ (1)	6 1e	Ue	0.65	6 1e	Ue	0.65	12 1e	1.05 Ue	0.45	10 1e	1.05 Ue	0.45
	1e > (2)	6 1e	Ue	0.35	6 1e	Ue	0.35	12 1e	1.05 Ue	0.35	10 1e	1.05 Ue	0.35
d.c. supply													
Typical applications	Utilisation category	Making			Breaking			Making			Breaking		
		I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)
Resistors, non inductive or slightly inductive loads	DC-1	1e	Ue	1	1e	Ue	1	1.5 1e	1.05 Ue	1	1.5 1e	1.05 Ue	1
Shunt wound motors: starting, reversing, inching	DC-3	2.5 1e	Ue	2	2.5 1e	Ue	2	4 1e	1.05 Ue	2.5	4 1e	1.05 Ue	2.5
Series wound motors: starting, reversing, inching	DC-5	2.5 1e	Ue	7.5	2.5 1e	Ue	7.5	4 1e	1.05 Ue	15	4 1e	1.05 Ue	15

Control relays and auxiliary contacts

		Electrical durability: making and breaking conditions						Occasional duty: making and breaking conditions					
a.c. supply													
Typical applications	Utilisation category	Making			Breaking			Making			Breaking		
		I	U	cos φ	I	U	cos φ	I	U	cos φ	I	U	cos φ
Electromagnets													
≤ 72 VA	AC-14	–	–	–	–	–	–	6 Ie	1.1 Ue	0.7	6 Ie	1.1 Ue	0.7
> 72 VA	AC-15	10 Ie	Ue	0.7	Ie	Ue	0.4	10 Ie	1.1 Ue	0.3	10 Ie	1.1 Ue	0.3
d.c. supply													
Typical applications	Utilisation category	Making			Breaking			Making			Breaking		
		I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)
Electromagnets	DC-13	Ie	Ue	6 P (3)	Ie	Ue	6 P (3)	1.1 Ie	1.1 Ue	6 P (3)	1.1 Ie	1.1 Ue	6 P (3)

(1) $I_e \leq 17$ A for electrical durability, $I_e \leq 100$ A for occasional duty.

(2) $I_e > 17$ A for electrical durability, $I_e > 100$ A for occasional duty.

(3) The value $6 P$ (in watts) is based on practical observations and is considered to represent the majority of d.c. magnetic loads up to the maximum limit of $P = 50$ W i.e. $6 P = 300$ ms = L/R .

Above this, the loads are made up of smaller loads in parallel. The value 300 ms is therefore a maximum limit whatever the value of current drawn.

3-phase 4-pole motors

Current values for power in kW					Current values for power in hp							
Rated operational power (1)	Indicative rated operational current values at:				Rated operational power (2)	Indicative rated operational current values at:						
	230 V	400 V	500 V	690 V		110 - 120 V	200 V	208 V	220 - 240 V	380 - 415 V	440 - 480 V	550 - 600 V
kW	A	A	A	A	hp	A	A	A	A	A	A	A
0.06	0.35	0.2	0.16	0.12	1/2	4.4	2.5	2.4	2.2	1.3	1.1	0.9
0.09	0.52	0.3	0.24	0.17	3/4	6.4	3.7	3.5	3.2	1.8	1.6	1.3
0.12	0.7	0.44	0.32	0.23	1	8.4	4.8	4.6	4.2	2.3	2.1	1.7
0.18	1	0.6	0.48	0.35	1 1/2	12	6.9	6.6	6	3.3	3	2.4
0.25	1.5	0.85	0.68	0.49	2	13.6	7.8	7.5	6.8	4.3	3.4	2.7
0.37	1.9	1.1	0.88	0.64	3	19.2	11	10.6	9.6	6.1	4.8	3.9
0.55	2.6	1.5	1.2	0.87	5	30.4	17.5	16.7	15.2	9.7	7.6	6.1
0.75	3.3	1.9	1.5	1.1	7 1/2	44	25.3	24.2	22	14	11	9
1.1	4.7	2.7	2.2	1.6	10	56	32.2	30.8	28	18	14	11
1.5	6.3	3.6	2.9	2.1	15	84	48.3	46.2	42	27	21	17
2.2	8.5	4.9	3.9	2.8	20	108	62.1	59.4	54	34	27	22
3	11.3	6.5	5.2	3.8	25	136	78.2	74.8	68	44	34	27
4	15	8.5	6.8	4.9	30	160	92	88	80	51	40	32
5.5	20	11.5	9.2	6.7	40	208	120	114	104	66	52	41
7.5	27	15.5	12.4	8.9	50	260	150	143	130	83	65	52
11	38	22	17.6	12.8	60	–	177	169	154	103	77	62
15	51	29	23	17	75	–	221	211	192	128	96	77
18.5	61	35	28	21	100	–	285	273	248	165	124	99
22	72	41	33	24	125	–	359	343	312	208	156	125
30	96	55	44	32	150	–	414	396	360	240	180	144
37	115	66	53	39	200	–	552	528	480	320	240	192
45	140	80	64	47	250	–	–	–	604	403	302	242
55	169	97	78	57	300	–	–	–	722	482	361	289
75	230	132	106	77	350	–	–	–	828	560	414	336
90	278	160	128	93	400	–	–	–	954	636	477	382
110	340	195	156	113	450	–	–	–	1030	–	515	412
132	400	230	184	134	500	–	–	–	1180	786	590	472
160	487	280	224	162								
200	609	350	280	203								
250	748	430	344	250								
315	940	540	432	313								
355	1061	610	488	354								
400	1200	690	552	400								
500	1478	850	680	493								
560	1652	950	760	551								
630	1844	1060	848	615								
710	2070	1190	952	690								
800	2340	1346	1076	780								
900	2640	1518	1214	880								
1000	2910	1673	1339	970								

(1) Values conforming to standard IEC 60072-1 (at 50 Hz).

(2) Values conforming to standard UL 508 (at 60 Hz).

Nota : These values are given as a guide. They may vary depending on the type of motor, its polarity and the manufacturer.

TeSys contactors

Long distance remote control

Voltage drop caused by the inrush current

When the operating coil of a contactor is energised, the inrush current produces a voltage drop in the control circuit cable caused by the resistance of the conductors, which can adversely affect closing of the contactor.

An excessive voltage drop in the control supply cables (both a.c. and d.c.) can lead to non closure of the contactor poles or even destruction of the coil due to overheating.

This phenomenon is aggravated by:

- a long line,
- a low control circuit voltage,
- a cable with a small c.s.a.,
- a high inrush power drawn by the coil.

The maximum length of cable, depending on the control voltage, the inrush power and the conductor c.s.a., is indicated in the graphs below.

Remedial action

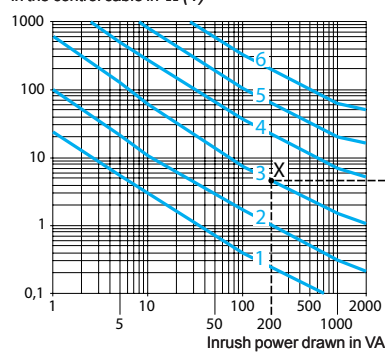
To reduce the voltage drop at switch-on:

- increase the conductor c.s.a.,
- use a higher control circuit voltage,
- use an intermediate control relay.

Selection of conductor c.s.a.

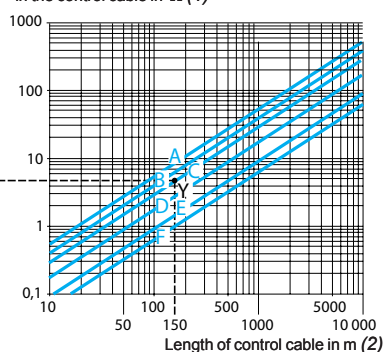
These graphs are for a maximum line voltage drop of 5%. They give a direct indication of the copper conductor c.s.a. to be used for the control cable, depending on its length, the inrush power drawn by the contactor coil and the control circuit voltage (see example page 255).

Total resistance of the 2 conductors in the control cable in Ω (1)



1 ~ 24 V	3 ~ 115 V	5 ~ 400 V
2 ~ 48 V	4 ~ 230 V	6 ~ 690 V

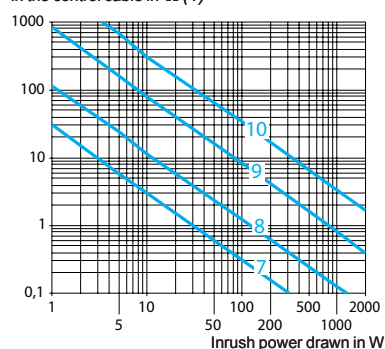
Total resistance of the 2 conductors in the control cable in Ω (1)



C.s.a. of copper cables

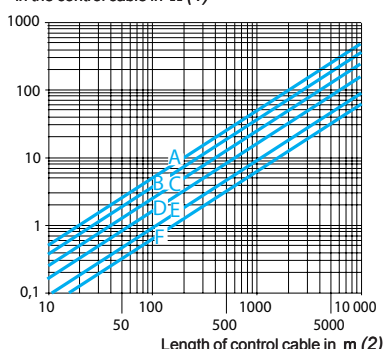
A 0.75 mm²	C 1.5 mm²	E 4 mm²
B 1 mm²	D 2.5 mm²	F 6 mm²

Total resistance of the 2 conductors in the control cable in Ω (1)



7 ~ 24 V	9 ~ 125 V
8 ~ 48 V	10 ~ 250 V

Total resistance of the 2 conductors in the control cable in Ω (1)



C.s.a. of copper cables

A 0.75 mm²	C 1.5 mm²	E 4 mm²
B 1 mm²	D 2.5 mm²	F 6 mm²

(1) For 3-wire control, the current only flows in 2 of the conductors.

(2) This is the length of the cable comprising 2 or 3 conductors. (Distance between the contactor and the control device).

Voltage drop caused by the inrush current (continued)

What cable c.s.a. is required for the control circuit of an LC1 D40A, 115 V contactor, operated from a distance of 150 metres?

- Contactor LC1 D40A, voltage 115 V, 50 Hz: inrush power: 200 VA

On the left-hand graph on the page opposite, point X is at the intersection of the vertical line corresponding to 200 VA and the ~ 115 V voltage curve.

On the right-hand graph on the page opposite, point Y is at the intersection of the vertical line corresponding to 150 m and the horizontal line passing through point X.

Use the conductor c.s.a. indicated by the curve which passes through point Y, i.e.: 1.5 mm².

If point Y lies between two c.s.a. curves, choose the larger of the c.s.a. values.

Calculating the maximum cable length

The maximum permissible length for acceptable line voltage drop is calculated by the formula:

$$L = \frac{U^2}{SA} \cdot s \cdot K$$

where:

L : distance between the contactor and the control device in m (length of the cable),

U : supply voltage in V,

SA : apparent inrush power drawn by the coil in VA,

s : conductor c.s.a. in mm²,

K : factor given in the table below.

a.c. supply	SA in VA	20	40	100	150	200
	K	1.38	1.5	1.8	2	2.15
d.c. supply	Irrespective of the apparent inrush power SA, expressed in W					
	K = 1.38					

Residual current in the coil due to cable capacitance

When the control contact of a contactor is opened, the control cable capacitance is effectively in series with the coil of the electromagnet. This capacitance can cause a residual current to be maintained in the coil, with the risk that the contactor will remain closed.

This only applies to contactors operating on an a.c. supply.

This phenomenon is aggravated by:

- a long line length between the coil control contact and the contactor, or between the coil control contact and the power supply,
- a high control circuit voltage,
- a low coil consumption, sealed,
- a low value of contactor drop-out voltage.

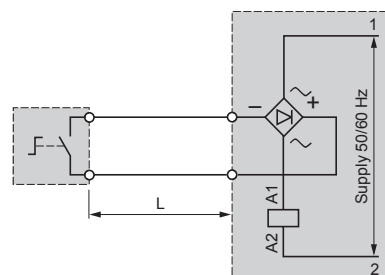
The maximum control cable length, according to the contactor coil supply voltage, is indicated in the graph on the page opposite

Remedial action

Various solutions can be adopted to avoid the risk of the contactor remaining closed due to cable capacitance:

- use a d.c. control voltage, or,
- add a rectifier, connected as shown in the scheme below, but retaining an a.c. operating coil: in this way, rectified a.c. current flows in the control cable.

When calculating the maximum cable length, take the resistance of the conductors into account.



- Connect a resistor in parallel with the contactor coil (1).

Value of the resistance :

$$R \, \Omega = \frac{1}{10^{-3} C \, (\mu F)} \quad (C \text{ capacitance of the control cable})$$

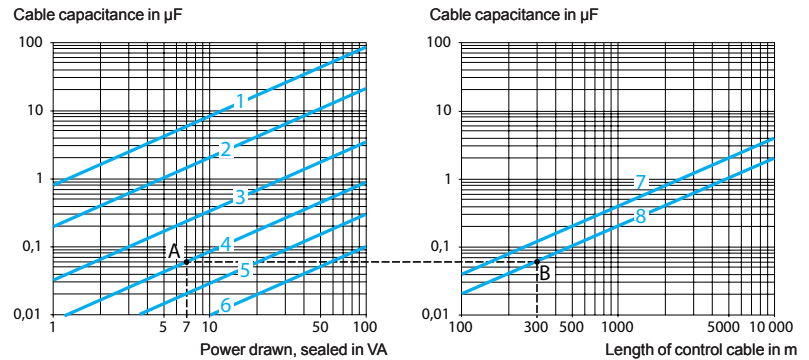
Power to be dissipated :

$$PW = \frac{U^2}{R}$$

(1) To avoid increasing the voltage drop due to inrush current, this resistor must be brought into operation after the contactor has closed by using an N/O contact.

Residual current in the coil due to cable capacitance (continued)

These graphs are for a capacitance, between 2 conductors, of 0.2 µF/km. They make it possible to determine whether there is a risk of the contactor remaining closed due to the power drawn by the coil when sealed, as well as the control circuit voltage, according to the length of the control cable.



1 ~ 24 V	3 ~ 115 V	5 ~ 400 V	7 3-wire control
2 ~ 48 V	4 ~ 230 V	6 ~ 690 V	8 2-wire control

In the zones below the straight lines for 3-wire and 2-wire control respectively, there is a risk of the contactor remaining closed.

Examples

What is the maximum length for the control cable of an LC1 D12 contactor, operating on 230 V, with 2-wire control?

■ Contactor LC1 D12, voltage 230 V, 50 Hz: power sealed 7 VA.

On the left-hand graph, point A is at the intersection of the vertical line for 7 VA with the ~ 230 V voltage curve.

On the right-hand graph, point B is at the intersection of the horizontal line with the 2-wire control curve.

The maximum cable length is therefore 300 m.

In the same example, with a 600 m cable, the point lies in the risk zone. A resistor must therefore be connected in parallel with the contactor coil.

Value of this resistance :

$$R = \frac{1}{10^{-3} \cdot C} = \frac{1}{10^{-3} \cdot 0.12} = 8.3 \, \Omega$$

Power to be dissipated :

$$P = \frac{U^2}{R} = \frac{(220)^2}{8300} = 6 \, \text{W}$$

Alternative solution: use a d.c. control supply.

Calculating the cable length

The maximum permitted length of control cable to avoid the effects of capacitance is calculated using the formula:

$$L = 455 \cdot \frac{S}{U^2 \cdot C_0}$$

L : distance between the contactor and the control device in km (length of the cable),

S : apparent power, sealed, in VA,

U : control voltage in V,

C₀ : line capacitance of the cable in µF/km.

Thermal-magnetic motor circuit-breakers GV3 ME

Old reference	Icu / 400 V	New reference	Icu / 400 V	Ir
GV3 ME06	100 kA	GV2 P06	> 100 kA	1...1.6 A
GV3 ME07	100 kA	GV2 P07	> 100 kA	1.6...2.5 A
GV3 ME08	100 kA	GV2 P08	> 100 kA	2.5...4 A
GV3 ME10	100 kA	GV2 P10	> 100 kA	4...6 A
GV3 ME14	100 kA	GV2 P14	> 100 kA	6...10 A
GV3 ME20	100 kA	GV3 P13	100 kA	9...13 A
		GV3 P18	100 kA	12...18 A
GV3 ME25	100 kA	GV3 P25	100 kA	17...25 A
GV3 ME40	35 kA	GV3 P32	100 kA	23...32 A
		GV3 P40	50 kA	30...40 A
GV3 ME63	35 kA	GV3 P50	50 kA	37...50 A
		GV3 P65	50 kA	48...65 A

Magnetic motor circuit-breakers GK3 EF

Old reference	Icu / 400 V	New reference	Icu / 400 V	Ie
GK3 EF40	50 kA	GV3 L25	100 kA	25 A
		GV3 L32	100 kA	32 A
		GV3 L40	50 kA	40 A
GK3 EF65	35 kA	GV3 L50	50 kA	50 A
		GV3 L65	50 kA	65 A

Enclosed motor circuit-breakers GV3 ME

Old reference	Type of operator (not included)	New reference	Type of handle included
GV3 CE01	GV1K0●	GV3 PC01	LU9 AP11 (black)
		GV3 PC02	LU9 AP12 (red)

Contact blocks (1)

Old reference	For circuit-breaker	New reference	For circuit-breaker
GV3 A01	GV3 ME	GV AE11 or GV AN11	GV2, GV3 P and GV3 L
GV3 A02	GV3 ME	GV AE20 or GV AN20	GV2, GV3 P and GV3 L
GV3 A03	GV3 ME	GV AE1 + GV AN20	GV2, GV3 P and GV3 L
GV3 A05	GV3 ME	GV AE1 + GV AN20	GV2, GV3 P and GV3 L
GV3 A06	GV3 ME	—	—
GV3 A07	GV3 ME	—	—
GV3 A08	GV3 ME	GVA D0110 or GVA D0101	GV2, GV3 P and GV3 L
GV3 A09	GV3 ME	GVA D1010 or GVA D1001	GV2, GV3 P and GV3 L
		GVA ED101 or GVA ED011	GV3 P and GV3 L
GK2 AX10	GK3 EF	GVA E1	GV2, GV3 P and GV3 L
GK2 AX20	GK3 EF	GVA E20 or GVA N20	GV2, GV3 P and GV3 L
GK2 AX50	GK3 EF	GVA E11 or GVA N11	GV2, GV3 P and GV3 L
GK2 AX12	GK3 EF	GVA D1010 or GVA D1001	GV2, GV3 P and GV3 L
		GVA ED101 or GVA ED011	GV2, GV3 P and GV3 L
GK2 AX22	GK3 EF	—	—
GK2 AX52	GK3 EF	—	—

Electric trips (1)

Old reference	For circuit-breaker	New reference	For circuit-breaker
GV3 B11 (50 Hz)	GV3 ME	GVA U115 or GVA U125	GV2, GV3 P and GV3 L
GV3 B11 (60 Hz)	GV3 ME	GVA U115	GV2, GV3 P and GV3 L
GV3 B22 (50 Hz)	GV3 ME	GVA U225	GV2, GV3 P and GV3 L
GV3 B38	GV3 ME	GVA U385 or GVA U415	GV2, GV3 P and GV3 L
GV3 D11 (50 Hz)	GV3 ME	GVA S115 or GVA S125	GV2, GV3 P and GV3 L
GV3 D11 (60 Hz)	GV3 ME	GVA S115	GV2, GV3 P and GV3 L
GV3 D22 (50 Hz)	GV3 ME	GVA S225	GV2, GV3 P and GV3 L
GV3 D38 (50/60 Hz)	GV3 ME	GVA S385 or GVA S415	GV2, GV3 P and GV3 L

Padlocking devices and external operator (1)

Old reference	For circuit-breaker	New reference	For circuit-breaker
GV1 V02	GV3 ME	GV2 V03	GV2, GV3 P and GV3 L
GK3 AV01	GK3 EF	GV2 V03	GV2, GV3 P and GV3 L
GK3 AP03	GK3 EF	GV3 AP02	GV3 P and GV3 L

(1) The old references are still available for circuit-breakers GV3 ME80 and GK3 EF80.

3-pole contactors, 40 to 65 A								
Power (kW) at 400 V / AC3	Old reference	Power connection	Control connection	Type of coil	New reference	Power connection	Control connection	Type of coil
18.5	LC1D40●●	Screw clamp terminals	Screw clamp terminals	~/---	LC1D40A●●	EverLink	Screw clamp terminals	~/---
18.5	LC1D4011●●	Screw clamp terminals	Screw clamp terminals	~/---	LC1D40A●●	EverLink	Screw clamp terminals	~/---
18.5	LC1D405●●	Screw clamp terminals	Screw clamp terminals	~/---	LC1D40A5●●TQ (1)	EverLink	Screw clamp terminals	~/---
18.5	LC1D406●●	Lug type terminals	Lug type terminals	~/---	LC1D40A6●●	Lug type terminals	Lug type terminals	~/---
18.5	LC1D40116●●	Lug type terminals	Lug type terminals	~/---	LC1D40A6●●	Lug type terminals	Lug type terminals	~/---
22	LC1D50●●	Screw clamp terminals	Screw clamp terminals	~/---	LC1D50A●●	EverLink	Screw clamp terminals	~/---
30	LC1D65●●	Screw clamp terminals	Screw clamp terminals	~/---	LC1D65A●●	EverLink	Screw clamp terminals	~/---
4-pole contactors, 60 to 80 A								
Maximum current in AC1	Old reference	Power connection	Control connection	Type of coil	New reference	Power connection	Control connection	Type of coil
60	LC1D40004●●	Screw clamp terminals	Screw clamp terminals	~/---	LC1DT60A●●	EverLink	Screw clamp terminals	~/---
60	LC1D400046●●	Lug type terminals	Lug type terminals	~/---	LC1DT60A6●●	Lug type terminals	Lug type terminals	~/---
60	LP1D40008●●	Screw clamp terminals	Screw clamp terminals	~/---	—	—	—	—
60	LP1D400086●●	Lug type terminals	Lug type terminals	~/---	—	—	—	—
80	LC1D65004●●	Screw clamp terminals	Screw clamp terminals	~/---	LC1DT80A●●	EverLink	Screw clamp terminals	~/---
80	LC1D650046●●	Lug type terminals	Lug type terminals	~/---	LC1DT80A6●●	Lug type terminals	Lug type terminals	~/---
80	LP1D65008●●	Screw clamp terminals	Screw clamp terminals	~/---	—	—	—	—
80	LP1D650086●●	Lug type terminals	Lug type terminals	~/---	—	—	—	—
Coil voltage: example with a 40 A contactor								
Power (kW) at 400 V / AC3	Old reference	Connector plate width	Frequency Hz	Type of coil	New reference	Connector plate width	Frequency Hz	Type of coil
18.5	LC1D40●5	—	50	~	LC1D40A●7	—	50/60	~
18.5	LC1D40●6	—	60	~	LC1D40A●7	—	50/60	~
18.5	LC1D40●7	—	50/60	~	LC1D40A●7	—	50/60	~
18.5	LC1D40●D	Standard	—	---	LC1D40A●D	Wide	—	---
18.5	LC1D40●W	Wide	—	---	LC1D40A●D	Wide	—	---
18.5	LP1D40●D	Standard	—	---	LC1D40A●D	Wide	—	---
18.5	LP1D40●W	Wide	—	---	LC1D40A●D	Wide	—	---

(1) Packed in lots of 10.

3-pole reversing contactors, 40 to 65 A

Power (kW) at 400 V / AC3	Old reference	Power connection	Control connection	Type of coil	New reference	Power connection	Control connection	Type of coil
18.5	LC2D40●●	Screw clamp terminals	Screw clamp terminals	~/---	LC2D40A●●	EverLink	Screw clamp terminals	~/---
18.5	LC2D4011●●	Screw clamp terminals	Screw clamp terminals	~/---	LC2D40A●●	EverLink	Screw clamp terminals	~/---
18.5	LC2D405●●	Screw clamp terminals	Screw clamp terminals	~/---	LC2D40A●●	EverLink	Screw clamp terminals	~/---
22	LC2D50●●	Screw clamp terminals	Screw clamp terminals	~/---	LC2D50A●●	EverLink	Screw clamp terminals	~/---
30	LC2D65●●	Screw clamp terminals	Screw clamp terminals	~/---	LC2D65A●●	EverLink	Screw clamp terminals	~/---

4-pole reversing contactors, 60 to 80 A

Maximum current in AC1	Old reference	Power connection	Control connection	Single and dual frequency coil	New reference
60	LC2D40004●●	Screw clamp terminals	Screw clamp terminals	~	For customer assembly 2 x LC1 DT60A●● + LAD 4CM
80	LC2D65004●●	Screw clamp terminals	Screw clamp terminals	~	For customer assembly 2 x LC1 DT80A●● + LAD 4CM

Star-delta contactors, 40 to 50 A

Power (kW) at 400 V / AC3	Old reference	Power connection	Control connection	Single and dual frequency coil	New reference
37	LC3D40●●	Screw clamp terminals	Screw clamp terminals	~	For customer assembly: 3 x LC1 D40A●● + LAD 9SD3 (star-delta kit)
55	LC3D50●●	Screw clamp terminals	Screw clamp terminals	~	For customer assembly: 3 x LC1 D50A●● + LAD 9SD3 (star-delta kit)

Coils for ~ contactors, 40 to 65 A						
Voltage	Old reference	Type of current	Frequency	New reference	Type of current	Frequency
V			Hz			Hz
12	LX1D6J5	~	50	LXD3J5	~	50
20	LX1D6Z5 or Z6 or Z7	~	50 or 60 or 50/60	–	~	50/60
24	LX1D6B5 or B6 or B7	~	50 or 60 or 50/60	LXD3B7	~	50/60
32	LX1D6C5	~	50	LXD3C7	~	50/60
42	LX1D6 or D5 or D7	~	50 or 50/60	LXD3D7	~	50/60
48	LX1D6E5 or E6 or E7	~	50 or 60 or 50/60	LXD3E7	~	50/60
100	LX1D6K7	~	50/60	LXD3K7	~	50/60
110	LX1D6F5 or F6 or F7	~	50 or 60 or 50/60	LXD3F7	~	50/60
115	LX1D6FE7	~	50/60	LXD3FE7	~	50/60
120	LX1D6G5 or G8 or G7	~	50 or 60 or 50/60	LXD3G7	~	50/60
155	LX1D6GG5	~	50	–	~	50/60
200	LX1D6 L7	~	50/60	LXD3L7	~	50/60
208	LX1D6L6 or LE7	~	60 or 50/60	LXD3LE7	~	50/60
220	LX1D6M5 or M6 or M7	~	50 or 60 or 50/60	LXD3M7	~	50/60
230	LX1D6P5 or P7	~	50 or 50/60	LXD3P7	~	50/60
240	LX1D6U5 or U6 or U7	~	50 or 60 or 50/60	LXD3U7	~	50/60
256	LX1D6W5	~	50	–	~	50/60
277	LX1D6W6	~	60	LXD3W7	~	50/60
380	LX1D6Q5 or Q6 or Q7	~	50 or 60 or 50/60	LXD3Q7	~	50/60
400	LX1D6V5 or V7	~	50 or 50/60	LXD3V7	~	50/60
415	LX1D6N5 or N6 or N7	~	50 or 60 or 50/60	LXD3N7	~	50/60
440	LX1D6R5 or R6 or R7	~	50 or 60 or 50/60	LXD3R7	~	50/60
480	LX1D6T6	~	60	LXD3T7	~	50/60
500	LX1D6S5	~	50	LXD3S7	~	50/60
550	LX1D6SF5	~	50	–	~	50/60
575	LX1D6S7	~	50/60	LXD3SC7	~	50/60
600	LX1D6X6	~	60	LXD3X7	~	50/60
660	LX1D6Y5	~	50	LXD3YC7	~	50/60

Thermal overload relays up to 65 A									
Old reference	Setting range Ir	Class	Type	Power connection	New reference	Setting range Ir	Class	Type	Power connection
	A					A			
LRD3306	1...1.6	10	Differential	Screw clamp terminals	LRD06	1...1.6	10A	Differential	Screw clamp terminals
LRD3307	1.6...2.5	10	Differential	Screw clamp terminals	LRD07	1.6...2.5	10A	Differential	Screw clamp terminals
LRD3308	2.5...4	10	Differential	Screw clamp terminals	LRD08	2.5...4	10A	Differential	Screw clamp terminals
LRD3310	4...6	10	Differential	Screw clamp terminals	LRD10	4...6	10A	Differential	Screw clamp terminals
LRD3312	5.5...8	10	Differential	Screw clamp terminals	LRD12	5.5...8	10A	Differential	Screw clamp terminals
LRD3314	7...10	10	Differential	Screw clamp terminals	LRD14	7...10	10A	Differential	Screw clamp terminals
LRD3316	9...13	10	Differential	Screw clamp terminals	LRD313	9...13	10A	Differential	EverLink
LRD3321	12...18	10	Differential	Screw clamp terminals	LRD318	12...18	10A	Differential	EverLink
LRD3322	17...25	10	Differential	Screw clamp terminals	LRD325	17...25	10A	Differential	EverLink
LRD3353	23...32	10	Differential	Screw clamp terminals	LRD332	23...32	10A	Differential	EverLink
LRD3355	30...40	10	Differential	Screw clamp terminals	LRD340	30...40	10A	Differential	EverLink
LRD3357	37...50	10	Differential	Screw clamp terminals	LRD350	37...50	10A	Differential	EverLink
LRD3359	48...65	10	Differential	Screw clamp terminals	LRD365	48...65	10A	Differential	EverLink
LR2D33●●	1...65	10	Differential	Screw clamp terminals	LRD3●●	9...65	10A	Differential	EverLink
LRD33●●A66	1...65	10	Differential	Lug type terminals	LRD3●●6	9...65	10A	Differential	Lug type terminals
LR2D33●●A66	1...65	10	Differential	Lug type terminals	LRD3●●6	9...65	10A	Differential	Lug type terminals
LR2D35●●	17...65	20	Differential	Screw clamp terminals	LRD3●●L	9...65	20	Differential	EverLink
LR3D33●●	17...65	10	Non differential	Screw clamp terminals	LR3D3●●	9...65	10A	Non differential	EverLink
LR3D35●●	17...65	20	Non differential	Screw clamp terminals	–	–	–	–	–

Suppressor modules for contactors, 40 to 65 A						
Setting range V	Old reference	Type of current	Type	New reference	Type of current	Type
24...48	LA4DA1E	~	RC circuit	LAD4RC3E	~	RC circuit
110 ... 240	LA4DA1U	~	RC circuit	LAD4RC3U	~	RC circuit
24 ... 48	LA4DA2E	~	RC circuit	LAD4RC3E	~	RC circuit
50 ... 127	LA4DA2G	~	RC circuit	LAD4RC3G	~	RC circuit
380 ... 415	LA4DA2N	~	RC circuit	LAD4RC3N	~	RC circuit
> 24	LA4DB2B	~	Bidirectional peak limiting diode	LAD4T3B	~/---	Bidirectional peak limiting diode
25 ... 72	LA4DB2S	~	Bidirectional peak limiting diode	LAD4T3G	~/---	Bidirectional peak limiting diode
> 24	LA4DB3B	---	Bidirectional peak limiting diode	LAD4T3B	~/---	Bidirectional peak limiting diode
25 ... 72	LA4DB3S	---	Bidirectional peak limiting diode	LAD4T3G	~/---	Bidirectional peak limiting diode
24 ... 250	LA4DC3U	---	Flywheel diode	LAD4D3U	---	Flywheel diode
24 ... 48	LA4DE2E	~	Varistor	LAD4V3E	~/---	Varistor
50 ... 127	LA4DE2G	~	Varistor	LAD4V3G	~/---	Varistor
110 ... 250	LA4DE2U	~	Varistor	LAD4V3U	~/---	Varistor
24 ... 48	LA4DE3E	---	Varistor	LAD4V3E	~/---	Varistor
50 ... 127	LA4DE3G	---	Varistor	LAD4V3G	~/---	Varistor
110 ... 250	LA4DE3U	---	Varistor	LAD4V3U	~/---	Varistor

Accessories for contactors and relays, 40 to 65 A

Old reference	Description	New reference	Notes
LA4DT0U	Electronic serial timer module, 0.1 to 2 s. 24...250V	LA4DT0U	Use accessory LAD4BB3
LA4DT2U	Electronic serial timer module, 1.5 to 30 s. 24...250V	LA4DT2U	Use accessory LAD4BB3
LA4DT4U	Electronic serial timer module, 25 to 500 s. 24...250V	LA4DT4U	Use accessory LAD4BB3
LA6DK10B	Mechanical latch block 24 V ~	LAD6K10B	
LA6DK10E	Mechanical latch block 42/48 V ~	LAD6K10E	
LA6DK10F	Mechanical latch block 110/127 V ~	LAD6K10F	
LA6DK10M	Mechanical latch block 220/240 V ~	LAD6K10M	
LA6DK10Q	Mechanical latch block 380/415 V ~	LAD6K10Q	
LA7D03B	Remote electrical reset 24 V	LAD703B	
LA7D03DD	Remote electrical reset 96 V	LAD703DD	
LA7D03E	Remote electrical reset 48 V	LAD703E	
LA7D03F	Remote electrical reset 110 V	LAD703F	
LA7D03J	Remote electrical reset 12 V	LAD703J	
LA7D03M	Remote electrical reset 220/230 V	LAD703M	
LA7D03N	Remote electrical reset 415/440 V	LAD703N	
LA7D03Q	Remote electrical reset 380/400 V	LAD703Q	

Accessories for contactors and relays, 40 to 65 A (continued)			
Old reference	Description	New reference	Notes
LA7D03Q	Remote electrical reset 380/400 V	LAD703Q	
LA7D1020	Adapter for door mounted operator	–	No equivalent - Not necessary with the new range.
LA7D305	Remote control by flexible cable	LAD7305	
LA7D3058	Terminal block adapter for mounting a relay beneath a contactor	–	No equivalent
LA7D3064	Terminal block for clip-on mounting of a relay on 35 mm rail	LAD96560	EverLink terminal block
LA7D901	Stop button locking device	–	No equivalent
LA7D902	Mounting plate	–	No equivalent - Not necessary with the new range.
LA7D903	Marker holder for contactor	LAD90	
LA9D09966	Retrofit coil for 3-pole contactor	LAD4BB3	
LA9D4002	Mechanical interlock for reversing contactors	LAD4CM	
LA9D40961	Link for parallel connection for 2 poles	LAD9P32	
LA9D40963	Link for parallel connection for 4 poles	2 x LAD9P33	
LA9D50978	Kits for assembly of reversing contactors, 40 to 65 A	LAD9R3	
LA9D6567	Control circuit take-off from main pole	–	No equivalent
LA9D6569	Set of power connections for contactor	LA9D65A69	
LA9D92	Marker holder for contactor	LA9D90	
LAD9ET2	Safety cover	LAD9ET1	
XB5 AA86102	Operating head for spring return pushbutton. Reset	XB5 AA86102	Same product
XB5 AL84101	Operating head for spring return pushbutton. Stop	XB5 AL84101	Same product

A		G					
AB1 DV10235U	243	GK2 AF01	85	GV2 AF01	85	GV2 ME203	75
AB1 DVM10235U	243	GK2 AX10	89	GV2 AF02	85	GV2 ME213	75
AB1 R12	243	GK2 AX12	89	GV2 AF3	85	GV2 ME223	75
AB1 R13	243	GK2 AX20	89	GV2 AF4	85	GV2 P01	76
AB1 AC6BL	112, 114	GK2 AX22	89	GV2 AK00	83	GV2 P02	76
AB1 G●	243	GK2 AX50	89	GV2 AP01	85	GV2 P03	76
AB1 R●	243	GK2 AX52	89	GV2 AP02	85	GV2 P04	76
AB1 VV635UBL	112, 114	GK3 AP03	89	GV2 AP03	79, 85	GV2 P05	76
ABF H20 H100	229	GK3 AV01	89	GV2 AP04	85	GV2 P06	76
ABF H20 H200	229	GV AD0101	83, 87	GV2 G05	85	GV2 P07	76
ABF H20 H300	229	GV AD0110	83, 87	GV2 G245	85, 175	GV2 P08	76
AK5 BT01	243	GV AD1001	83, 87	GV2 G254	85	GV2 P10	76
AK5 GF1	242	GV AD1010	83, 87	GV2 G272	85	GV2 P14	76
AK5 JB1410	242	GVAED011	87	GV2 G345	85	GV2 P16	76
AK5 JB143	242	GVAED101	87	GV2 G354	85	GV2 P20	76
AK5 JB144	242	GV AE1	83, 87	GV2 G445	85, 175	GV2 P21	76
AK5 JB145	242	GV AE11	83, 87	GV2 G454	85	GV2 P22	76
AK5 JB146	242	GV AE113	75	GV2 G472	85	GV2 P32	76
AK5 JB149	242	GV AE20	83, 87	GV2 G554	85	GV2 RT03	78, 79
AK5 PA211N1	243	GV AE203	75	GV2 GA01	85	GV2 RT04	78, 79
AK5 PA211N2	243	GV AM11	83, 87	GV2 L03	81	GV2 RT05	78, 79
AK5 PA211N3	243	GV AN11	83, 87	GV2 L04	81	GV2 RT06	78, 79
AK5 PA211PH12	243	GV AN113	75	GV2 L05	81	GV2 RT07	78, 79
AK5 PA211PH13	243	GV AN20	83, 87	GV2 L06	81	GV2 RT08	78, 79
AK5 PA211PH23	243	GV AN203	75	GV2 L07	81	GV2 RT10	78, 79
AK5 PA212N1	243	GV A●025	83, 87	GV2 L08	81	GV2 RT14	78, 79
AK5 PA212N2	243	GV A●026	83, 87	GV2 L10	81	GV2 RT16	78, 79
AK5 PA212N3	243	GV A●055	83, 87	GV2 L14	81	GV2 RT20	78, 79
AK5 PA212PH12	243	GV A●056	83, 87	GV2 L16	81	GV2 RT21	78
AK5 PA212PH13	243	GV A●107	83, 87	GV2 L20	81	GV2 V03	85
AK5 PA212PH23	243	GV A●115	83, 87	GV2 L22	81	GV2 AF01	8, 9
AK5 PA231	243	GV A●116	83, 87	GV2 L32	81	GV2 A●●●●	115
AK5 PA2311	243	GV A●125	83, 87	GV2 LC02	118	GV2 AX●●●	115
AK5 PA2312	243	GV A●207	83	GV2 LC0206	118	GV2 CP21	112
AK5 PA2312S	243	GV A●207	83, 87	GV2 LC0207	118	GV2 E01	112, 114
AK5 PA232	243	GV A●225	83, 87	GV2 LC0208	118	GV2 E02	112, 114
AK5 PA232S	243	GV A●226	83, 87	GV2 LC0210	118	GV2 GH7	85
AK5 PA241	243	GV A●385	83, 87	GV2 LC0214	118	GV2 K011	112, 114
AK5 PA242	243	GV A●386	83	GV2 LC0216	118	GV2 K021	112, 114, 115
AK5 PA5312	243	GV A●386	87	GV2 LC0220	118	GV2 K031	112, 114, 115
AK5 PA532	243	GV A●415	83, 87	GV2 LC02R	118	GV2 K04	112, 114, 115
AK5 PA542	243	GV A●416	83, 87	GV2 LE03	80	GV2 MC01	112, 114
AK5 PC12	242	GV A●505	83, 87	GV2 LE04	80	GV2 MC02	112, 114
AK5 PC12PH	242	GV AX115	83	GV2 LE05	80	GV2 MC03	112, 114
AK5 PC13	242	GV AX116	83	GV2 LE06	80	GV2 MCK04	112, 114
AK5 PC131	242	GV AX225	83	GV2 LE07	80	GV2 MC●●	115
AK5 PC14	242	GV AX226	83	GV2 LE08	80	GV2 ME01	74
AK5 PC32L	242	GV AX385	83	GV2 LE10	80	GV2 ME02	74
AK5 PC32LPH	242	GV AX386	83	GV2 LE14	80	GV2 ME03	74
AK5 PC33	242	GV AX415	83	GV2 LE16	80	GV2 ME04	74
AK5 PC331	242	GV NGC02	118	GV2 LE20	80	GV2 ME05	74
AK5 PC33L	242	GV NGC0225	118	GV2 LE22	80	GV2 ME06	74
AK5 PC34	242	GV NGC0232	118	GV2 LE32	80	GV2 ME07	74
AK5 PC34L	242	GV NGC0240	118	GV2 ME013	75	GV2 ME08	74
AK5 PE17	243	GV NGC0250	118	GV2 ME023	75	GV2 ME10	74
AK5 PE27	243	GV NGC0263	118	GV2 ME033	75	GV2 ME14	74
AK5 SB1	243	GV NGC02R	118	GV2 ME043	75	GV2 ME16	74
AM1 DL201	242	GV1 F03	85	GV2 ME053	75	GV2 ME20	74
APE 1PAD21	229	GV1 G02	85	GV2 ME063	75	GV2 ME21	74
APE 1PRE21	229	GV1 G09	85, 175	GV2 ME073	75	GV2 ME22	74
APP 2AH40H060	229	GV1 G10	85	GV2 ME083	75	GV2 ME32	74
D		GV1 L3	83	GV2 ME103	75	GV2 MP01	112
		GV1 V02	89	GV2 ME143	75	GV2 MP02	112
				GV2 ME163	75	GV2 MP03	112
DX1 AP25	213					GV2 MP04	112
						GV2 V01	112, 114
						GV2 V03	87
						GV2 AF3	10 to 13
						GV2 AF4	10 to 13
						GV3 A01	89
						GV3 A02	89
						GV3 A03	89
						GV3 A05	89
						GV3 A06	89
						GV3 A07	89
						GV3 A08	89
						GV3 A09	89
						GV3 AP01	87
						GV3 AP02	87
						GV3 B11	89
						GV3 B22	89
						GV3 B38	89
						GV3 D11	89
						GV3 D22	89
						GV3 D38	89
						GV3 G264	175
						GV3 G364	175
						GV3 L32	81
						GV3 L40	81
						GV3 L50	81
						GV3 L65	81
						GV3 ME80	76
						GV3 S	175
						GV3 G264	87
						GV3 G364	87
						GV3 G66	87
						GV3 L25	81
						GV3 P13	76
						GV3 P18	76
						GV3 P25	76
						GV3 P32	76
						GV3 P40	76
						GV3 P50	76
						GV3 P65	76
						GV3 PC01	113
						GV3 PC02	113
						GV7 AB11	91
						GV7 AC01	93
						GV7 AC021	93
						GV7 AC022	93
						GV7 AC03	93, 174
						GV7 AC04	93
						GV7 AC05	93
						GV7 AC06	93
						GV7 AC07	93
						GV7 AC08	93
						GV7 AD111	91
						GV7 AD112	91
						GV7 AE11	91
						GV7 AP01	93
						GV7 AP02	93
						GV7 AP03	93
						GV7 AP04	93
						GV7 AP05	93
						GV7 AS055	91
						GV7 AS107	91
						GV7 AS207	91
						GV7 AS387	91

GV7 AS525	91	LA9 D09966	174	LAD 4RC3G	171	LAD C22	169	LC1 D95●●	152, 154
GV7 AU055	91	LA9 D11502	166, 167	LAD 4RC3N	171	LAD N01	169	LC1 DT203●●	157
GV7 AU107	91	LA9 D115503	174	LAD 4RC3U	171	LAD N02	169	LC1 DT20●●	156
GV7 AU207	91	LA9 D115504	174	LAD 4RCE	171	LAD N04	169	LC1 DT253●●	157
GV7 AU387	91	LA9 D115603	174	LAD 4RCG	171	LAD N10	169	LC1 DT25●●	156
GV7 AU525	91	LA9 D115604	174	LAD 4RCU	171	LAD N11	169	LC1 DT323●●	157
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