Commutatori serie **ML**

*Switches series **ML***



Guida alla scelta del Commutatore Serie ML	*How to select the correct compact switches ML0 to ML7*
Caratteristiche tecniche	*Technical data of the series*
Applicazioni	*Available Applications ML0 to ML3*
Dimensioni e accessori	*Accessories and dimensions*
Contatti e accessori ML0 - ML3	*Main Contacts and Accessories Series ML0 - ML3*
Contatti ausiliari e Calotte di protezione	*Auxiliary Contacts and Terminal Covers*

Caratteristiche tecniche della serie ML

Technical data of series ML

Gli interruttori della serie ML sono classificati in 3 gruppi: la serie ML0 da 16A a 32A, la serie ML1-ML3 da 25A a 125A e la serie ML4-ML7 da 125A a 630A.

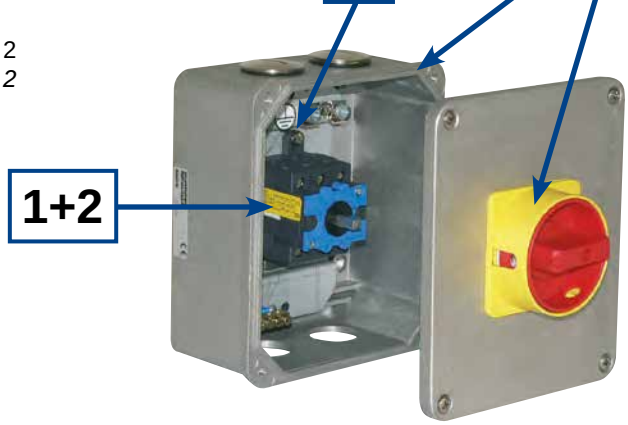
The compact switches are classified in 3 groups starting with the basic series ML0 with applications from 16A to 32A.
The well proven series ML1 to ML3 from 25A up to 125A and the high-performance series ML4-ML7 from 125A to 630A.

Esempio: *Examples:*

Esempio 1
Example 1



Esempio 2
Example 2



Position	**1**	**2**	**3**	**4**	**5**
Esempio 1*/Example 1*	**ML0-**	**032-**	**4V-**	**1581-**	**HS**
Esempio 2*/Example 2*	**ML1-**	**025-**	**V-**	**AL2-1550-**	**HI**

Caratteristiche tecniche della serie ML
Technical data of series ML

Caratteristiche tecniche (2)

Mostra la portata di corrente in intensità(I_{Ah})

Technical data (2)

Shows the rated uninterrupted current (I_{th}) of the switch.

Tipo di montaggio (3)

Indica il montaggio dell'interruttore.
"E" identifica montaggio frontale, es. 2 fori, 4 fori, o montaggio centrale (22,5 mm e 30,5 mm).
"V" identifica montaggio sul fondo e raggruppa tutti gli interruttori con blocco porta, lucchettabili, con guida 35 mm (DIN EN 50022)

Mounting type (3)

Indicates the mounting type of the switch.
„E“ stands for front mounting , e.g. 2 hole, 4-hole or central mounting (22,5 and 30,5mm)
„V“ stands for base mounting and includes as a result all switches with door coupling or door interlock in switchboards or in wall fixed enclosures, as well as switches for distribution board mounting on snap-on DIN rails.
Base of definition were 3-pole switches of series ML1-ML3. If they receive additional contacts those are added up in the type description as accessories.
As the series ML0 carries a 4-pole body, a “3” or “4” placed in front of the “E” or “V” is used to show the number of poles.
This repeats at the series ML4-ML7 where the number of poles is defined as well by the body size. Therefore the number of poles is shown in front of the mounting type indicator as well.

Applicazioni (4)

Le applicazioni descrivono le dimensioni, il montaggio e il colore dell'interruttore.

Application (4)

The application describes the size, mounting type and colours of the handles the switches are actuated with.
If switches are installed in an enclosure the indicator is extended by the definition of the enclosure as shown in example 2 (AL2 = Aluminium enclosure size 2 with front side handle)

Accessori (5)

Questo dato indica gli accessori dell'interruttore.

Accessories (5)

This indicator describes the accessories of the compact switches which may be attacted to the main body. Several accessories may be listed. (e.g. –HS-HI = switch with terminal protection AND auxiliary contact)

Caratteristiche tecniche della serie ML

Technical data of series ML

Specifications		Tipo *Typ*	ML0 - 016	ML0 - 032	ML1 - 025	ML1 - 040	ML2 - 063	ML2 - 080
Rated operating current I_e AC 21 A		A	25	32	25	40	63	80
Rated voltage U_e		V	690	690	690	690	690	690
Rated uninterrupted current (open) $I_u=I_{th}$		A	25	32	25	40	63	80
Conventional enclosed thermal current I_{the}		A	25	32	25	40	63	63
Rated insulation voltage U_i							690	690
Insulation group C under VDE 0110		V	690	690	690	690		
Making/breaking capacity								
Service category	***AC 3***							
Motor switch	*230 V 3~*	kW	5	5,5	5,5	7,5	15	18,5
for optional	***400 V 3~***	**kW**	**7,5**	**9**	**7,5**	**11**	**22**	**30**
switching	*690 V 3~*	kW	9,5	11,5	7,5	11	22	30
Service category	***AC 23A/B***							
Motor switch	*230 V 3~*	kW	5/-	5,5/-	7,5/-	11/-	-/18,5	-/22
Main switch	***400 V 3~***	**kW**	**7,5/-**	**9/-**	**11/-**	**15/-**	**-/30**	**-/37**
Maintenance switch	*690 V 3~*	kW	9/-	11/-	11/-	15/-	-/30	-/37
Service category	***AC 22A/B***							
	230 V 3~	A	16/-	32/-	25/-	38/-	63/-	-/-
	400 V 3~	**A**	**16/-**	**32/-**	**25/-**	**38/-**	**63/-**	**-/68**
	690 V 3~	A	16/-	32/-	16/-	17/-	63/-	-/-
Rated conditional		kA	10 (4-pol.)	10 (4-pol.)	10			
short-circut current		kA	6 (3-pol.)	6 (3-pol.)				
Rated short-time							765	960
with stand current $I_{cw\ 1sec}$								
Rated short circuit							2100	2100
making capacity I_{cm}								
Max. back up fuse Service class gL		A	25	35	50	50	50	63	80
Disconnect characteristic up to 690 V~		V	690	690	690	690	690	690
Terminal cross section								
single or multi-core	min./max.	mm^2	1,5 - 6	1,5 - 6	2,5 - 16	2,5 - 16	2,5 - 35	2,5 - 35
finely stranded with sleeve	min./max.	mm^2	1,5 - 6	1,5 - 6	2,5 - 10	2,5 - 10	1,5 - 25	1,5 - 25
Terminal screws			M4	M4	M4	M4	M5	M5
Mechanical life								
switching cycles			50.000	50.000	30.000	30.000	30000	30000
Ambient temperature	*open*	°C	+50/-25	+50/-25	+50/-25	+50/-25	+50 / -25	+50 / -25
max./min.	*encapsulated*	°C	+40/-25	+40/-25	+40/-25	+40/-25	+40 / -25	+40 / -25
General purpose 3-phase								
rated operational current		A	25	40	63	80	63	80
		V	600	600	600	600	600	600
Motor 3-phase	*AC 3*							
	220/240 V 3~	hp			7,5	10	15	20
	440/480 V 3~	hp			10	20	30	40
	550/600 V 3~	hp			10	20	30	40
Motor 1-phase	*AC 3*							
(2 pole)	*110/120 V 3~*	hp			1	1,5	3	4
	220/240 V 3~	hp			2	3	7,5	10
Cable cross section		AWG-No	16 - 10	16 - 10	14 - 8	14 - 8	14 - 2	14 - 2

Caratteristiche tecniche della serie ML

Technical data of series ML

ML3 - 125	ML4 - 125	ML4 - 160	ML5 - 200	ML5 - 250	ML6 - 315	ML6 - 400	ML6 - 500	ML7 - 630
125	125	160	200	250	315	400	500	630
690								
125	125	160	200	250	315	400	500	630
100								
800	800	800	800	800	1000	1000	1000	1000
22								
37								
45								
-/25	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
-/45	**63/63**	**80/80**	**100/100**	**132/132**	**160/160**	**220/220**	**280/280**	**280/280**
-/45	55/75	55/75	75/90	90/110	150/185	150/185	150/185	150/185
-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
-/125	**125/125**	**160/160**	**200/200**	**250/250**	**315/315**	**400/400**	**500/500**	**630/630**
-/125	125/125	125/125	125/160	125/160	250/315	250/315	250/315	315/315
1500	7000	7000	9000	9000	13000	13000	13000	13000
3400								
125	125	160	200	250	315	400	500	630
690	690	690	690	690	690	690	690	690
6 - 70	35 - 50	50	70	95	150	185	240	2 x 150
6 - 50	35 - 70	50	70	95	150	185	240	2 x 300
M5	M8	M8	M10	M10	M10	M10	M12	M12
30000	10000	10000	10000	10000	5000	5000	5000	5000
+50 / -25	+50 / -25	+50 / -25	+50 / -25	+50 / -25	+50 / -25	+50 / -25	+50 / -25	+50 / -25
+40 / -25	+40 / -25	+40 / -25	+40 / -25	+40 / -25	+40 / -25	+40 / -25	+40 / -25	+40 / -25
125								
600								
25								
50								
50								
6								
15								
8 - 1/0								

Applicazioni ML0 - ML3

Available Applications ML0 to ML3

			Handle rd/ye	Handle bk/gr bk/si	Series	ML0	ML1	ML2	ML3
	**Montaggio frontale con fissaggio a 2 fori, con mostrina e manopola, lucchettabile per 3 lucchetti**	*2-hole mounting with lockout handle for 3 padlocks*	1504	1505	*Size* 1	S	O	O	O
			1804	1805	*Size* 2	O	O	O	O
	**Montaggio frontale con fissaggio a 2 fori, con mostrina e manopola, lucchettabile per 1 o 2 lucchetti**	*2-hole mounting with lockout handle for 1 or 2 padlocks*	0201-EV	0201-EVS	*Size* 1	S	O	O	O
	**Montaggio frontale con fissaggio a 2 fori con mostrina e manopola**	*2-hole front mounting*	0201.02	0201	*Size* 1	S	O	O	O
			0401.02	0401	*Size* 2	O	O	O	O
			0601.02	0601	*Size* 3			O	O
	**Montaggio frontale con fissaggio a 4 fori, con mostrina e manopola, lucchettabile per 3 lucchetti**	*4-hole mounting with lockout handle for 3 padlocks*	1550	1551	*Size* 1	S	S	O	O
			1850	1851	*Size* 2	O	O	S	S
	**Montaggio frontale con fissaggio a 4 fori, con mostrina e manopola, lucchettabile per 1 o 2 lucchetti**	*4-hole mounting with lockout handle for 1 or 2 padlocks*	0200-EV	0200-EVS	*Size* 1	S	S	O	O
	**Montaggio frontale con fissaggio a 4 fori, con mostrina e manopola**	*4-hole front mounting*	0200.02	0200	*Size* 1	S	S	O	O
			0400.02	0400	*Size* 2	O	O	S	O
			0600.02	0600	*Size* 3			O	S
	**Montaggio frontale con foro centrale 22,5 mm e 30,5 mm, con mostrina e manopola, lucchettabile per 3 lucchetti**	*Central mounting 22.5 and 30.5 mm with lockout handle for 3 padlocks*	1560	1561	*Size* 1	S	S		
	**Montaggio frontale con foro centrale 22,5 mm e 30,5 mm, con mostrina e manopola, lucchettabile per 1 o 2 lucchetti**	*Central mounting 22.5 and 30.5 mm with lockout handle for 1 or 2 padlocks*	0260-EV	0260-EVS	*Size* 1	S	S		
	**Montaggio frontale con foro centrale 22,5 mm e 30,5 mm, con mostrina e manopola**	*Central mounting 22.5 and 30.5 mm*	0260.02	0260	*Size* 1	S	S		
	**Montaggio frontale con foro centrale 22,5 mm e 30,5 mm, senza mostrina, con manopola**	*Central mounting 22.5 and 30.5 mm without front plate*		0262	*Size* 1	S	S		
	**Montaggio frontale con foro centrale 22,5 mm e 30,5 mm, con mostrina, con chiave**	*Central mounting 22.5 and 30.5 mm Key removal in OFF position or in OFF and ON position*		0265-KA_ _	*Size* 1	S			

S = Standard catalogue type
O = Optional on request

Applicazioni ML0 - ML3

Available Applications ML0 to ML3

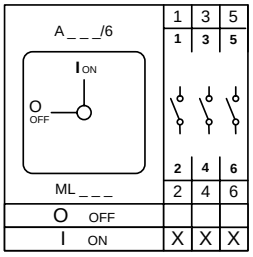
			Handle rd/ye	Handle bk/gr bk/si	Series	ML0	ML1	ML2	ML3
	**Montaggio frontale con foro centrale, con blocco porta, lucchettabile per 3 lucchetti, con manopola**	*Door coupling and door interlock with lockout handle for 3 padlocks*	1580	1581	*Size* 1	S	S	O	O
			1880	1881	*Size* 2	O	O	S	S
	**Montaggio frontale con foro centrale, con blocco porta, lucchettabile per 1 o 2 lucchetti, con mostrina e manopola**	*Door coupling and door interlock with lockout handle for 1 or 2 padlocks*	0288-EV	0288-EVS	*Size* 1	S	S		
	**Montaggio frontale con foro centrale, con blocco porta, con mostrina e manopola**	*Door coupling and door interlock*	0288.02	0288	*Size* 1	S	S		
			0488.02	0488	*Size* 2	O	O	S	O
			0688.02	0688	*Size* 3		O	O	S
		*Cover coupling with lockout handle for 3 padlocks*	1520	1521	*Size* 1	S	S	O	O
			1820	1821	*Size* 2	O	O	S	S
		*Cover coupling with lockout handle for 1 or 2 padlocks*	0210-EV	0210-EVS	*Size* 1	S	S		
		*Cover coupling*	0210.02	0210	*Size* 1	S	S		
			0410.02	0410	*Size* 2	O	O	S	S
		*Distribution board mounting with lockout handle for 1 or 2 padlocks*	9121-EV	9121-EVS	*Size* 1	S	S		
			9131-EV	9131-EVS	*Size* 2			S	
			9141-EV	9141-EVS	*Size* 3				S
		*Distribution board mounting*		9121	*Size* 1	S	S		
				9131				S	
				9141					S

S = Standard catalogue type
O = Optional on request

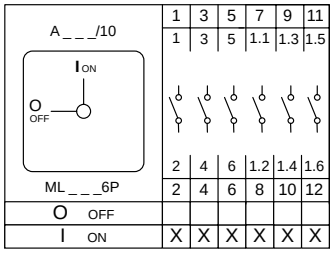
Dimensioni e accessori serie ML

Contact diagrams ML Dimensions ML + Accessories

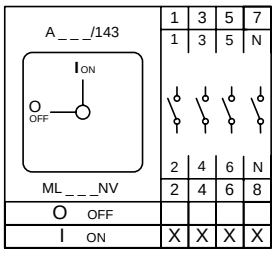
ML



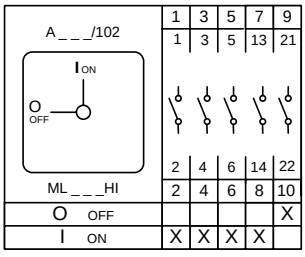
	1	3	5
	1	3	5
	2	4	6
ML _ _ _	2	4	6
O OFF			
I ON	X	X	X



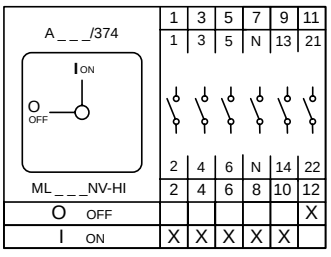
	1	3	5	7	9	11
	1	3	5	1.1	1.3	1.5
	2	4	6	1.2	1.4	1.6
ML _ _ _6P	2	4	6	8	10	12
O OFF						
I ON	X	X	X	X	X	X



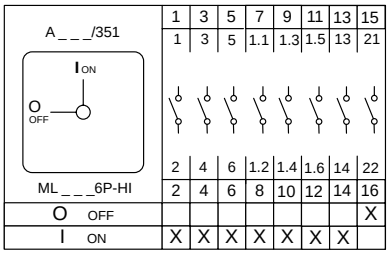
	1	3	5	7
	1	3	5	N
	2	4	6	N
ML _ _ _NV	2	4	6	8
O OFF				
I ON	X	X	X	X



	1	3	5	7	9
	1	3	5	13	21
	2	4	6	14	22
ML _ _ _HI	2	4	6	8	10
O OFF					X
I ON	X	X	X	X	

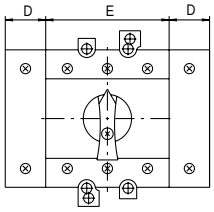


	1	3	5	7	9	11
	1	3	5	N	13	21
	2	4	6	N	14	22
ML _ _ _NV-HI	2	4	6	8	10	12
O OFF						X
I ON	X	X	X	X	X	



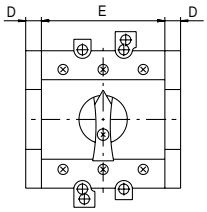
	1	3	5	7	9	11	13	15
	1	3	5	1.1	1.3	1.5	13	21
	2	4	6	1.2	1.4	1.6	14	22
ML _ _ _6P-HI	2	4	6	8	10	12	14	16
O OFF								X
I ON	X	X	X	X	X	X	X	

Main contacts
and PE- or N-terminals

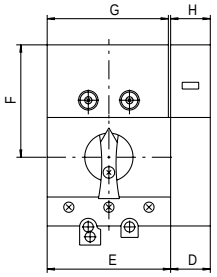


Serie *Series*	**Dimensioni (mm)** *Dimensions (mm)*	
	D	**E**
ML0	15	60
ML1	14,5	45
ML2	23	53,5
ML3	23	70

Auxiliary contact 1NO + 1NC



Main switch terminal cover



Serie *Series*	**Dimensioni (mm)** *Dimensions (mm)*					
	D	**E**				
ML0	15	60				
ML1	9,5	45				*Auxiliary contact 1NO + 1NC*
ML2	9,5	53,5				
ML3	9,5	70				
	D	**E**	**F**	**G**	**H**	
ML0	15	60	42	60	15	
ML1	14,5	45	53	41	14	*Main switch terminal cover*
ML2	23	53,5	61	52	22,5	
ML3	23	70	65	68	22,5	

X *Contact closed*

Contact closed without interruption

Contatti e accessori ML0 - ML3
Contatti addizionali principali e morsetti per terra PE e per il neutro N
Compact switches - Accessories ML0 to ML3 - Main contacts and PE- or N-terminals

IP 20



Contatto per il neutro *Neutral switched*

Serie *Series*		*Type*	*Part #*
ML1-025-E,	ML1-040-E	NV1-E	**MZ 43 001**
ML1-025-V,	ML1-040-V	NV1-V	**MZ 43 002**
ML2-063-E,	ML2-080-E	NV2-E	**MZ 43 003**
ML2-063-V,	ML2-080-V	NV2-V	**MZ 43 004**
ML3-125-E		NV3-E	**MZ 43 005**
ML3-125-V		NV3-V	**MZ 43 006**

The ML0 is designed as a 4-pole switch. Therfore an extra neutral contact is not necessary.

IP 20



Contatto di chiusura *Switching contact*

Serie *Series*		*Type*	*Part #*
ML1-025-E,	ML1-040-E	SK1-E	**MZ 43 017**
ML1-025-V,	ML1-040-V	SK1-V	**MZ 43 018**
ML2-063-E,	ML2-080-E	SK2-E	**MZ 43 019**
ML2-063-V,	ML2-080-V	SK2-V	**MZ 43 020**
ML3-125-E		SK3-E	**MZ 43 021**
ML3-125-V		SK3-V	**MZ 43 022**

IP 20



Morsetto di terra PE *PE-terminal*

Serie *Series*		*Type*	*Part #*
ML0-016,	ML0-032*[1]	PE0	**MZ 57 903**
ML1-025-E,	ML1-040-E	PE1-E	**MZ 43 023**
ML1-025-V,	ML1-040-V	PE1-V	**MZ 43 024**
ML2-063-E,	ML2-080-E	PE2-E	**MZ 43 025**
ML2-063-V,	ML2-080-V	PE2-V	**MZ 43 026**
ML3-125-E		PE3-E	**MZ 43 027**
ML3-125-V		PE3-V	**MZ 43 028**

IP 20



Morsetto per il neutro N *N-terminal*

Serie *Series*		*Type*	*Part #*
ML0-016,	ML0-032*[1]	N0	**MZ 57 906**
ML1-025-E,	ML1-040-E	N1-E	**MZ 43 039**
ML1-025-V,	ML1-040-V	N1-V	**MZ 43 040**
ML2-063-E,	ML2-080-E	N2-E	**MZ 43 041**
ML2-063-V,	ML2-080-V	N2-V	**MZ 43 042**
ML3-125-E		N3-E	**MZ 43 043**
ML3-125-V		N3-V	**MZ 43 044**

E = Front mounting V = Base mounting

**1) For ML0 -E and -V types the same accessories can be used.*

Contatti ausiliari, Calotte di protezione

Auxiliary contacts 2KL Terminal 2-pole - Terminal covers

IP 20



Contatti ausiliari 1NO + 1NC

Auxiliary contact 1NO + 1NC

Snap on right or left side of series ML. For ML1-3 also usable if a SK- or NV contact is installed. Main contacts and N0 switch simultaneous.

Type	*Part #*
for ML0	
E- und V-Typen/*E- and V-typs*	
HI0	MZ 57 902
Front mounting	
HI11-E	MZ 43 055
Base mounting	
HI11-V	MZ 43 056

Max. number of auxiliary contacts

Series	*right*	*left*	*Total*
ML0	1	1	1
ML1	1 or 2	1 or 2	3
ML2 / ML3	max. 3	max. 3	3

Technical Data

auxiliary switch for series ML0 to ML3			
auxiliary switch acc. IEC 947-5-1			
Rated uninterrupted current I_u open = I_{th}		A	12
I_{the} encapsulated		A	12
Rated insulation voltage U_i (III/3)		V	690
Rated impulse withstand voltage U_{imp} (III/3)		kV	6
Rated operational current I_e	230 V	A	6
	400 V	A	4
	690 V	A	2
short-circuit capacity. Max. fuse rating (gL)		A	16
Rated conditional short circuit current		kAeff	3
Cable cross section		min. mm²	1
Solid or multi-stranded		max.mm²	4
Flexible with ferule		min. mm²	1
(DIN 46228)		max.mm²	2,5
Terminal screws (Pozidrive)			M3
Torque terminal screws		Nm	0,6



Contatti ausiliari 2 poli

2KL
Terminal 2-pole

For ML1-3. Snap on right or left side. For the connection of PTC's, thermo switches or other control lines. Also usable if SK- or NV contact or N- / PE-terminals are installed.

Technical data as HI11

Type	*Part #*
Front mounting	
für / *for* ML1, ML2, ML3	
2KL-E	MZ 43 053
Base mounting	
für / *for* ML1, ML2, ML3	
2KL-V	MZ 43 054



Calotte di protezione

Main switch terminal cover

Series		*Type*	*Part #*
ML0	*single*	HS1-ML0	MZ 57 905
ML0	*quadruple*	HS4-ML0	MZ 57 904
ML1	*single*	HS1-ML1	MZ 43 057
ML1	*triple*	HS3-ML1	MZ 43 066
ML2	*single*	HS1-ML2/3	MZ 43 058
ML2	*triple*	HS3-ML2	MZ 43 067
ML3	*single*	HS1-ML2/3	MZ 43 058
ML3	*triple*	HS3-ML3	MZ 43 068