



Contattori Contactors



090



La NEW ELFIN propone una nuova linea di contattori caratterizzati da una estrema modularità. L'ampia gamma di accessori in comune alle differenti taglie di potenza permette di gestire il lavoro in modo più funzionale e ottimizzare i costi al contrario di quanto l'offerta del mercato può mantenere.

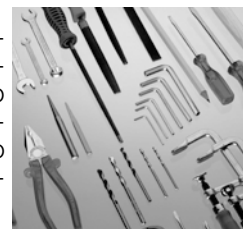
NEW ELFIN proposes a new line of contactors, characterized by an exceptional modularity. The wide range of accessories in common among different power sizes, allow you to work in a more functional way optimizing costs and time.

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accessories in common among different power sizes, allow you to work in a more functional way optimizing costs and time.

L'installazione dei contattori e la sostituzione della bobina sono estremamente semplici e non necessitano di **utensili** per il montaggio.

The contactors installation and the coils replacement are very easy operations and do not requires special tools.



Le **dimensioni** estremamente compatte dei contattori offrono una maggiore facilità di installazione anche in situazioni particolarmente difficili. L'installatore troverà quindi indubbi vantaggi sia in fase di progettazione che realizzazione.

Thanks to the very compact dimensions of the contactors installation procedure is very easy, even in particularly difficult situations. The operator responsible for their installation will gain huge benefits during both design and implementation phases.

Contrariamente a quanto è richiesto ad altre tipologie di prodotti, per i contattori il **peso** è una qualità determinante. Infatti a maggior peso corrisponde una migliore efficienza e una garanzia di lunga operatività nel tempo. *Unlike what is required by other types of products, **weight** is an important aspect for contactors, with greater weight corresponding to increased efficiency and long operational life.*



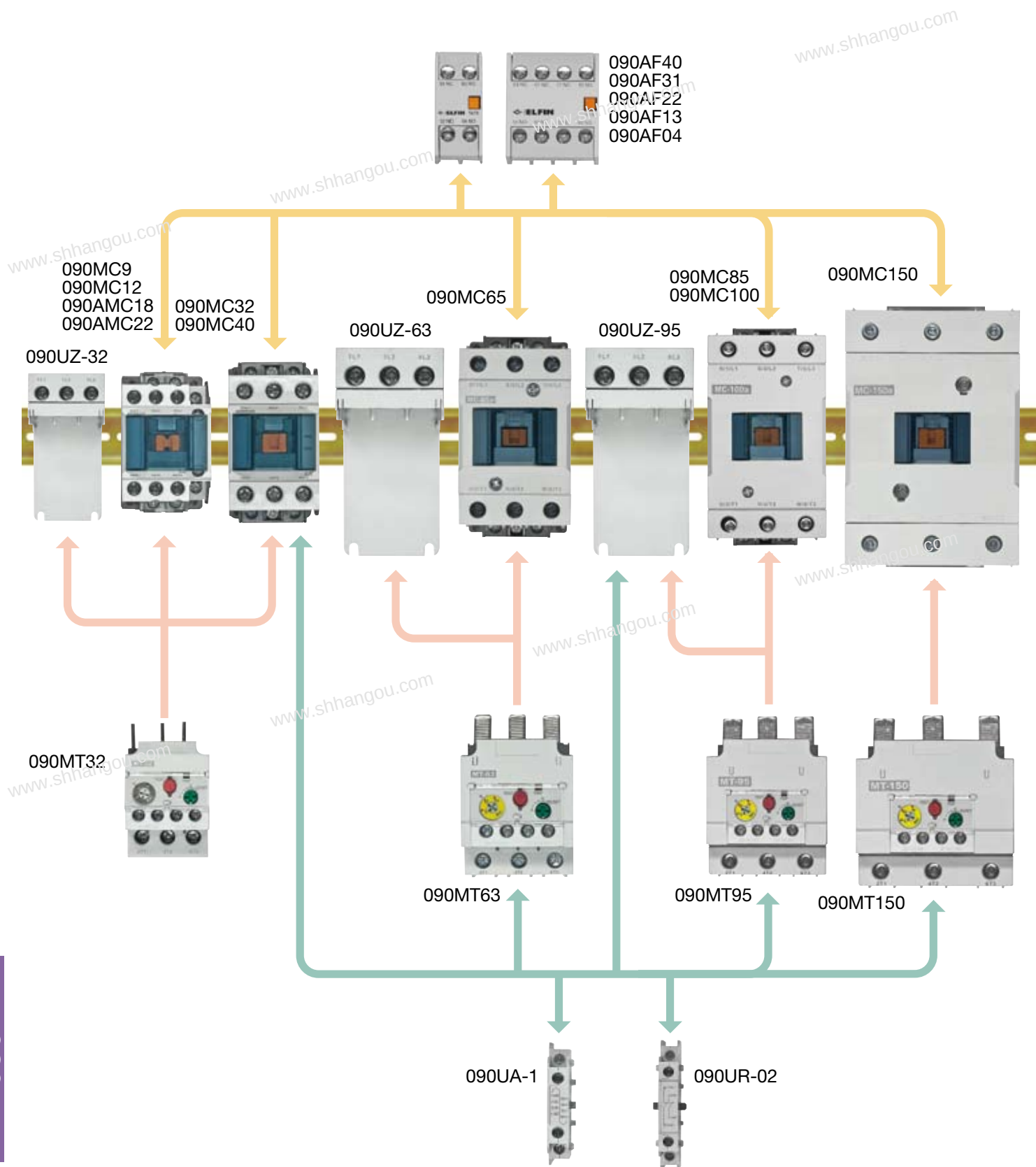
La **durata** nel tempo è fondamentale per garantire un flusso di lavoro costante ed un'ottimizzazione dell'investimento: i contattori NEW ELFIN garantiscono una media di 25 milioni di cicli come vita meccanica e 2,5 milioni come vita elettrica, queste caratteristiche pongono i nostri contattori al top della produzione mondiale.

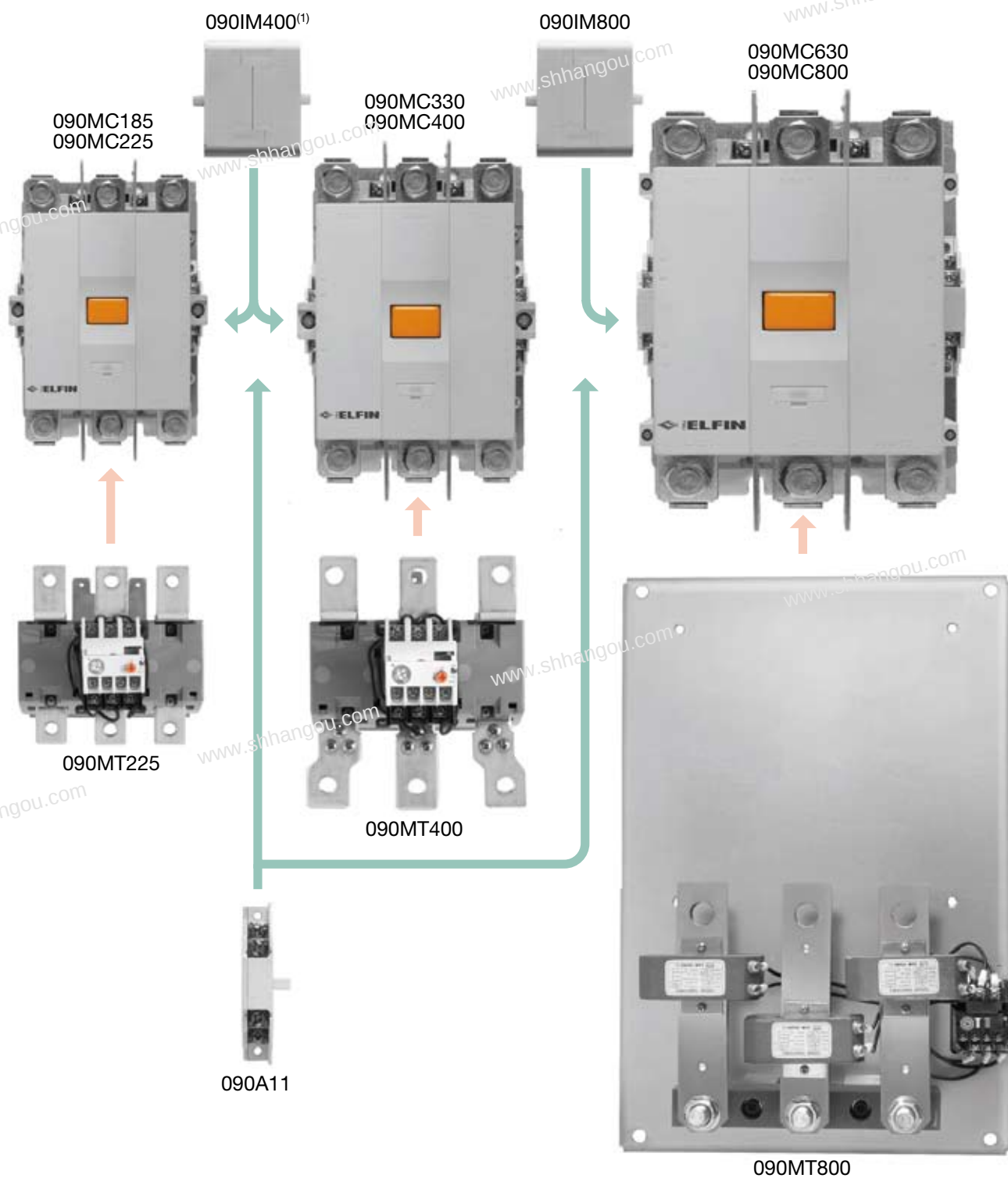
***Duration** is fundamental in order to guarantee a constant work flow and optimise the investment: NEW ELFIN contactors guarantee an average of 25,000,000 cycles of mechanical life and 2,500,000 cycles of electrical life. These characteristics place our contactors at the top of the international production.*



A parità di serie i relè hanno un **prezzo** comune per favorire una più snella gestione degli acquisti. Una opportunità da non sotto valutare facendo riferimento in particolare al range di prezzi offerti attualmente dal mercato.

*Relays in series of the same level **cost** the same, in order to streamline the management of purchases. This is an opportunity to be taken into serious consideration, making particular reference to the price range currently offered by the market.*







INTRODUZIONE



La norma definisce il contattore come un dispositivo elettromeccanico di manovra, generalmente previsto per un numero elevato di manovre, avente una sola posizione di riposo, ad azionamento non manuale, in grado di stabilire, portare e interrompere correnti in condizioni normali del circuito, incluse le condizioni di sovraccarico e manovra. La forza per la chiusura dei contatti principali normalmente aperti o per l'apertura dei contatti normalmente chiusi è fornita da un elettromagnete. Nelle pagine a seguire trovate una serie di informazioni utili per ottimizzare la scelta del contattore necessario a risolvere il problema specifico di impiego.

COME DIMENSIONARE UN CONTATTORE

Per effettuare il corretto dimensionamento di un contattore occorre tenere conto di alcuni fattori:

- categorie di utilizzazione che identificano la tipologia del carico
- della vita elettrica
- del numero di manovre/ora

CATEGORIE DI UTILIZZAZIONE DEI CONTATTORI

La normativa stabilisce delle categorie di utilizzazione riferite ad impieghi ben precisi dei contattori.

Tali categorie sono riportate nella tabella seguente.

CORRENTE ALTERNATA		CORRENTE CONTINUA	
CATEGORIE	APPLICAZIONI TIPICHE	CATEGORIE	APPLICAZIONI TIPICHE
AC-1	Carichi non induttivi o debolmente induttivi, forni a resistenza	DC-1	Carichi non induttivi o debolmente induttivi, forni a resistenza
AC-2	Motori ad anelli: avviamento, arresto		
AC-3	Motori a gabbia: avviamento, arresto del motore durante la marcia	DC-3	Motori in derivazione: avviamento, frenatura in controcorrente, manovre a impulsi. Frenatura dinamica di motori in corrente continua
AC-4	Motori a gabbia: avviamento, frenatura in controcorrente, manovra a impulsi		
AC-5a	Comando di lampade a scarica	DC-5	Motori in serie: avviamento, frenatura in controcorrente, manovre a impulsi. Frenatura dinamica di motori in corrente continua
AC-5b	Comando di lampade ad incandescenza		
AC-6a	Comando di trasformatori		
AC-6b	Comando di batterie di condensatori		
AC-12	Comando di carichi ohmici e semiconduttori con opto separazione	DC-12	Comando di carichi ohmici e semiconduttori con opto separazione
AC-13	Comando di semiconduttori con trasformatore di separazione	DC-13	Comando di elettromagneti
AC-14	Comando di piccoli carichi elettromagnetici (max 72 VA), quali bobine di piccoli conduttori o elettrovalvole	DC-14	Comando di carichi elettromagnetici con resistenza di risparmio sul circuito ausiliario
AC-15	Comando di carichi elettromagnetici (oltre 72 VA)		

CATEGORIE DI UTILIZZAZIONE DEI CIRCUITI AUSILIARI



INTRODUCTION



The standard describes the contactor as an electromechanical manoeuvring device, generally designed for a high number of operations, with just one idle position which is non-manually activated, capable of making carrying and breaking currents under normal circuit conditions, including overloading and operating conditions. The force required to close the main contacts which are normally open or to open contacts which are normally closed is supplied by an electromagnet. On the following pages you will find a series of useful information for choosing the best contactor for your specific requirements

HOW TO DIMENSION A CONTACTOR

In order to correctly dimension a contactor, several factors have to be considered:

- the categories of use which identify the type of load
- the electrical life
- the number of operations per hour

CONTACTORS UTILIZATION CATEGORIES

The standard establishes several categories of use referred to precise uses of contactors.

These categories are listed in the following table.

ALTERNATING CURRENT		DIRECT CURRENT	
CATEGORIES	TYPICAL APPLICATIONS	CATEGORIES	TYPICAL APPLICATIONS
AC-1	Non inductive or slightly inductive loads, resistance furnaces	DC-1	Non inductive or slightly inductive loads, resistance furnaces
AC-2	Slip-ring motors: starting and switching off		
AC-3	Squirrel cage motors: starting switching off motors during running	DC-3	Shunt-motors: starting - plugging inching. Dynamic breaking of D.C. motors
AC-4	Squirrel cage motors: starting plugging - inching		
AC-5a	Switching of electric discharge lamp controls	DC-5	Series motors: starting - plugging - inching Dynamic braking of D.C. motors
AC-5b	Switching of incandescent lamps		
AC-6a	Switching of transformers		
AC-6b	Switching of capacitors banks		
AC-12	Control of resistive loads and solid state loads with isolation by opto couples	DC-12	Control of resistive loads isolation by opto couples
AC-13	Control of solid state loads with transformer isolation	DC-13	Electromagnet control
AC-14	Control of small electromagnetic loads (< 72 VA)	DC-14	Control of electromagnetic loads having economic resistors in circuit
AC-15	Control of electromagnetic loads (> 72 VA)		

SWITCHING ELEMENTS UTILIZATION CATEGORIES



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

CATEGORIE D'IMPIEGO / UTILIZATION CATEGORIES

POTERI DI INSERIZIONE E INTERRUZIONE				
Categoria / category	Minimi / minimum (50 cicli / cycles)		Ordinari / standard (6000 cicli / cycles)	
	Inserzione / making	Interruzione / making	Inserzione / making	Interruzione / making
AC-1	1,5 x I _n	1,5 x I _n	1 x I _n	1 x I _n
AC-2	4 x I _n	4 x I _n	2 x I _n	2 x I _n
AC-3	10 x I _n	8 x I _n	2 x I _n	2 x I _n
AC-4	12 x I _n	10 x I _n	6 x I _n	6 x I _n
AC-5a	3 x I _n	3 x I _n	2 x I _n	2 x I _n
AC-5b	1,5 x I _n	1,5 x I _n	1 x I _n	1 x I _n
AC-6a	-	-	-	-
AC-6b	-	-	-	-
DC-1	1,5 x I _n	1,5 x I _n	1 x I _n	1 x I _n
DC-3	4 x I _n	4 x I _n	2,5 x I _n	2,5 x I _n
DC-5	4 x I _n	4 x I _n	2,5 x I _n	2,5 x I _n



AC-1

Questa categoria prevede inserzione, mantenimento e disinserzione di una data corrente nominale. Quindi oltre al comando di carichi ohmici, questa categoria può essere utilizzata per carichi elettricamente equivalenti quali softstarters ed inverter (contattore di linea manovra a vuoto) e nella distribuzione di energia.

This category provides for make, maintenance and break of a given nominal current. Therefore, in addition to the control of resistive loads, this category can be used for electrically equivalent loads, such as softstarters and inverters (no-load operation for line contactor) and to distribute power.



AC-2 - AC-3

I contattori classificati in AC-3 possono essere utilizzati per occasionali manovre a impulso e/o frenature in controcorrente per brevi periodi (max. 5 op./min. e minore di 10 op./in10min).

AC-3 Contactors classified in AC-3 can be used for occasional inching operations and/or plugging for short periods of time (max. 5 op./min. and less than 10 op./in 10 min.).

AC-4

E' la categoria più gravosa in assoluto, infatti il contattore risultata estremamente sollecitato perché oltre a inserire la corrente di spunto deve anche interromperla.

This is the most stressful category of all. The contactor undergoes tremendous stress as it is used both to make the initial current and to break it.

	AC1	AC2						AC3								AC4			
	(I _{th})	200-220V		380-440V		500-550V		200-220V		380-440V		500-550V		690V		200-220V		380-440V	
	[A]	[kW]	[A]	[kW]	[A]	[kW]	[A]	[kW]	[A]	[kW]	[A]	[kW]	[A]	[kW]	[A]	[kW]	[A]	[kW]	[A]
9	20	2.5	11	4	9	4	7	2.5	11	4	9	4	7	4	5	1.5	8	2.2	6
12	20	3.5	13	5.5	12	7.5	12	3.5	13	5.5	12	7.5	12	7.5	9	2.2	11	4	9
18	25	4.5	18	7.5	18	7.5	13	4.5	18	7.5	18	7.5	13	7.5	9	3.7	18	4	9
22	32	5.5	22	11	22	15	22	5.5	22	11	22	15	22	15	18	3.7	18	5.5	13
32	50	7.5	32	15	32	18.5	28	7.5	32	15	32	18.5	28	18.5	20	4.5	20	7.5	17
40	60	11	40	18.5	40	22	32	11	40	18.5	40	22	32	22	23	5.5	25	11	24
50	80	15	55	22	50	30	43	15	55	22	50	30	43	30	28	7.5	35	15	32
65	100	18.5	65	30	65	37	60	18.5	65	30	65	33	60	33	35	11	50	22	47
75	110	22	75	37	75	45	64	22	75	37	75	37	64	37	42	13	55	25	52
85	135	25	85	45	85	45	75	25	85	45	85	45	75	45	45	15	65	30	62
105	150	30	105	55	105	55	85	30	105	55	105	55	85	55	65	19	80	37	75
120	150	37	125	60	120	60	90	37	125	60	120	60	90	60	70	22	93	45	90
150	200	45	150	75	150	90	140	45	150	75	150	90	140	90	100	30	125	55	110
180	230	55	180	90	180	110	180	55	180	90	180	110	180	110	120	37	150	75	150
250	260	75	220	132	220	132	200	75	250	132	250	132	200	132	150	45	180	90	180
300	350	90	300	160	300	160	250	90	300	160	300	160	250	200	220	55	220	110	220
400	420	125	400	220	400	225	350	125	400	220	400	225	350	250	300	75	300	150	300
630	660	190	630	330	630	330	500	190	630	330	630	330	500	330	420	110	400	200	400
800	800	220	800	440	800	500	720	220	800	440	800	500	720	500	630	160	630	300	630



CATEGORIE D'IMPIEGO / UTILIZATION CATEGORIES



AC-5a

COMANDO LAMPADE A FLUORESCENZA FLUORESCENT LAMP CONTROL

Nelle lampade a fluorescenza non rifasate la corrente d'inserzione è circa due volte la corrente nominale del circuito con tempi di accensione fino a 10s. Il contattore va scelto con Inom. in AC 1 moltiplicata per un fattore pari a 1,3 o 1,4. Nelle lampade a fluorescenza rifasate la presenza del condensatore riduce il tempo di accensione a pochi secondi ma si ha una corrente d'inserzione pari a 20 volte la corrente nominale del circuito a causa della carica del condensatore: il contattore deve essere pertanto scelto con una Inom in AC1 $\leq$ a 20 x Inom del circuito. Se la lampada è dotata di alimentatore elettronico per l'accensione la corrente d'inserzione è pari a 10 volte la corrente nominale del circuito con tempi d'accensione intorno a qualche secondo. Il contattore va scelto con Inom. in AC 1 moltiplicata per un fattore pari a 1,2 o 1,3.

With fluorescent lamps where the power factor has not been corrected, the making current is about twice the nominal current of the circuit with starting times up to 10s. The contactor must be chosen with inom. in AC 1, multiplied by a factor of 1.3 or 1.4. With fluorescent lamps where the power factor has been corrected the presence of the capacitors reduces the starting time to a few seconds but has a making current which is 20 times the nominal current of the circuit due to the charge of the capacitors. The contactor must be $\leq$ than 20x inom circuit. If the lamp has an electronic feeder for starting up, the start current is 10 times the nominal current of the circuit with starting times of a few seconds. The contactor must be chosen with inom. in AC 1, multiplied by a factor of 1.2 or 1.3.

Corrente nominale Nominal current	100V							200V							
Potenza / power [W]	40		60	80	110		220	40		60	80	110		220	
No. of lamp	1	2	1	1	1	2	1	1	2	1	1	1	2	1	1
Corrente di start (A) Start current	0.95(1.2)	0.96(1)	0.92	1.17	1.55	2.5	2.7	0.29(0.6)	0.48(0.55)	0.46	0.58	0.78	1.3	1.38	2.5
9	18(9)	11(10)	12	9	7	4	4	37(18)	22(20)	23	19	14	8	8	4
12	22(10)	13(11)	14	11	8	5	4	44(21)	27(23)	28	22	16	10	9	5
18	30(15)	18(16)	19	15	11	7	6	62(30)	37(32)	39	31	23	13	13	7
22	32(15)	19(17)	20	16	12	7	7	65(31)	39(34)	41	32	24	14	14	7
32	44(21)	27(23)	28	22	16	10	9	89(43)	54(47)	56	44	33	20	19	10
40	59(29)	36(31)	38	29	22	14	13	120(58)	72(63)	76	60	44	26	25	14
50	84(41)	52(45)	54	42	32	20	18	172(83)	104(90)	108	86	64	38	37	20
65	110(54)	67(59)	70	55	41	26	24	224(108)	135(118)	141	112	83	50	43	26



AC-5a

COMANDO LAMPADE A VAPORI DI MERCURIO MERCURY VAPOUR LAMP CONTROL

Nelle lampade non rifasate la corrente d'inserzione è circa due volte la corrente nominale del circuito con tempi di accensione fino a 5min. Il contattore va scelto con Inom. in AC 1 pari alla corrente d'inserzione. Nelle lampade rifasate si ha una corrente d'inserzione pari a 20 volte la corrente nominale del circuito e i tempi di accensione ridotti. Il contattore va scelto con Inom. in AC 1 tenendo conto che il potere di chiusura deve essere $\geq$ a 20 x Inom circuito.

With lamps where the power factor has not been corrected, the making current is about twice the nominal current of the circuit with starting times up to 5 minutes. The contactor must be chosen with inom. in AC 1, equal to the making current. With lamps where the power factor has been corrected, the start current is 20 times the nominal current of the circuit with reduced starting times. The contactor must be chosen with inom. in AC 1 considering that the closing power must be $\geq$ than 20x inom circuit.

Corrente nominale Nominal current	100 V Lampada con basso/alto cos 100 V Lamp with low/high cos								200 V Lampada con basso/alto cos 200 V Lamp with low/high cos							
	40	100	200	250	300	400	700	1000	40	100	200	250	300	400	700	1000
Potenza / Power [W]																
Corrente di start (A) Start current	1.25 (0.55)	2.6 (1.4)	4.6 (2.6)	5.1 (3.0)	6.0 (3.7)	8.0 (4.9)	14.5 (8.5)	21 (12)	0.53 (-)	1.0 (0.65)	1.9 (1.2)	2.1 (1.5)	2.5 (1.8)	3.3 (2.3)	5.9 (4.1)	8.5 (5.8)
9	8(20)	4(7)	2(4)	2(3)	1(2)	1(1)	-(-)	-(-)	20(-)	11(16)	5(9)	5(7)	4(6)	3(4)	1(2)	1(1)
12	10(23)	5(9)	2(5)	2(4)	2(3)	1(1)	-(-)	-(-)	24(-)	13(20)	6(10)	6(8)	5(7)	3(5)	2(3)	1(2)
18	14(32)	6(12)	3(6)	3(6)	3(4)	2(3)	1(2)	-(-)	33(-)	18(27)	9(15)	8(12)	7(10)	5(7)	3(3)	2(3)
22	15(34)	7(13)	4(7)	3(6)	3(5)	2(3)	1(2)	-(-)	35(-)	19(29)	10(15)	9(12)	7(10)	5(8)	3(4)	2(3)
32	20(47)	10(18)	5(10)	5(8)	4(7)	3(5)	1(3)	1(2)	49(-)	26(40)	13(21)	12(17)	10(14)	7(11)	4(6)	3(4)
40	28(63)	13(25)	7(13)	6(11)	5(9)	4(7)	2(4)	1(2)	66(-)	35(53)	18(29)	16(23)	14(19)	10(15)	5(8)	4(6)
50	40(90)	19(35)	10(19)	9(16)	8(13)	6(10)	3(5)	2(4)	94(-)	50(76)	26(41)	23(33)	20(27)	15(21)	8(12)	6(8)
65	52(118)	25(46)	14(25)	12(21)	10(17)	8(13)	4(7)	3(5)	122(-)	65(100)	34(54)	30(43)	26(36)	19(28)	11(15)	7(11)



AC-5a

COMANDO LAMPADE A VAPORI DI SODIO SODIUM VAPOUR LAMP CONTROL

Sono lampade con tempi di accensione fino a 5min con una corrente d'inserzione pari a 1.7-2.2 volte la corrente nominale del circuito. Il contattore va scelto in AC 1 pari alla corrente d'inserzione.

Es.: Im circ. = 20A / I contattore = 20A * 2.2 = 44A / 090C32 con 50A AC-1

These are lamps with starting times f up to 5 minutes with a start current of 1.7 - 2.2 times the nominal current of the circuit. The contactor must be chosen with inom. in AC 1, equal to the start current.

Es.: Im circ. = 20A / I contactor = 20A * 2.2 = 44A / 090C32 with 50A AC-1



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

CATEGORIE D'IMPIEGO / UTILIZATION CATEGORIES



AC-5b

COMANDO LAMPAD E AD INCANDESCENZA INCANDESCENT LAMP CONTROL

Queste lampade hanno una corrente d'inserzione di circa 15 volte la corrente nominale del circuito che si annulla dopo pochi millisecondi. Il picco è dovuto al brusco passaggio del filamento da freddo con altissima resistenza a caldo con bassissima resistenza. Il contattore va scelto con I_{nom} in AC 1 e tenendo conto che il potere d'interruzione deve essere $\geq$ alla corrente d'inserzione.

These lamps have a making current which is about 15 times the nominal current of the circuit and which is cancelled after a few milliseconds. The peak is due to the sharp passage of the filament from cold with very high resistance to hot with very low resistance. The contactor must be chosen with I_{nom} in AC 1 and taking into account that the breaking capacity must be $\geq$ than the making current.

Corrente d'impiego / Rated operational current I_e [A]

Potenza Power [W]	100V(n. di lampade / lamps)								200V(n. di lampade / lamps)							
	100	150	200	250	300	500	1000	1500	100	150	200	250	300	500	1000	1500
9	11	7	5	4	3	2	1	-	22	14	11	8	7	4	2	1
12	13	8	6	5	4	2	1	-	26	17	13	10	8	5	2	1
18	18	12	9	7	6	3	1	1	36	24	18	14	12	7	3	2
22	19	12	9	7	6	3	1	1	38	25	19	15	12	7	3	2
32	26	17	13	10	8	5	2	1	52	34	26	20	17	10	5	3
40	35	23	17	14	11	7	3	2	70	46	35	28	23	14	7	4
50	50	33	25	20	15	10	5	3	100	66	50	40	33	20	10	6
65	65	42	32	26	19	13	6	4	130	85	65	52	42	26	13	8



AC-6a

COMANDO DI TRASFORMATORI TRANSFORMER CONTROL

L'inserzione di trasformatori è contraddistinta da un picco d'inserzione che può arrivare fino a $30 \times I_n$ dovuto ad un elevato assorbimento di correnti magnetizzanti. Ovviamente nel dimensionamento del contattore occorre che il potere d'interruzione sia $\geq$ alla corrente d'inserzione. Questa tabella è applicabile quando la corrente d'inserzione è inferiore a $20 I_n$ in circuito.

The connection of transformers is distinguished by a start peak which can reach $30 \times I_n$ due to high absorption of magnetising current. Obviously when dimensioning the contactor it is necessary for the breaking capacity to be $\geq$ than the making current.

Monofase / Mono phase

Trifase / Tri phase

	Monofase / Mono phase				Trifase / Tri phase			
	220V		440V		220V		440V	
	[kVA]	[A]	[kVA]	[A]	[kVA]	[A]	[kVA]	[A]
9	1	5	1.5	3	2	5	2.5	3
12	1.5	7.5	2	5	3	7.5	4	5
18	2	9	3	7	3.5	9	5	7
22	2.5	10	4	9.5	4	10	7.5	9.5
32	3	13	5	12	5	13	10	12
40	4	17	7.5	16	6.5	17	12	16
50	5	25	10	24	10	25	18	24
65	7	32	15	32	12	32	25	32
75	8	35	17	35	13	35	27	35
85	9	40	18	40	15	40	30	40
100	10	46	20	45	18	46	35	45
125	15	62	25	55	25	62	42	55
150	17	75	33	75	30	75	60	75
180	20	90	40	90	35	90	70	90
220	25	110	50	110	42	110	85	110
300	33	150	57	130	57	150	100	130
400	44	200	90	200	75	200	150	200
600	65	300	130	300	110	300	250	300
800	90	400	175	400	150	400	300	400



CATEGORIE D'IMPIEGO / UTILIZATION CATEGORIES



AC-6b

COMANDO DI CONDENSATORI CAPACITORS CONTROL

L'utilizzo dei condensatori negli impianti di rifasamento è caratterizzato da picchi di corrente che il carico capacitivo impone alla rete all'atto dell'inserzione. Si possono comandare condensatori singoli o batterie. Nel caso di più di una batteria di condensatori i singoli gradini vengono inseriti in parallelo uno con l'altro, si ha così una sorgente aggiuntiva di energia dovuta al trasferimento di energia della batteria sotto tensione a quella messa in servizio.

Questo rappresenta un carico supplementare per il contattore. occorre prevedere quindi l'utilizzo di induttanze e resistenze per aumentare il carico ammissibile al contattore.

Le induttanze smorzano le sollecitazioni che nascono quando si inseriscono dei condensatori in parallelo ad altri già collegati in rete e carichi (inserimento a gradini). Le resistenze proteggono i contatti di potenza del contattore durante l'inserzione del condensatore garantendo la vita elettrica dei circuiti.

I contattori per comando di condensatori hanno una vita elettrica inferiore a quelli per il comando dei motori a causa del maggior consumo dei contatti di potenza dovuto all'interruzione di corrente altamente sfasata con cosφ tendenti a zero. Occorre quindi fare attenzione al picco di corrente durante l'inserzione.

The use of capacitors in power factor correction systems is characterised by peaks of current which the capacitive charge imposes on the network when power is started. It is possible to control single capacitors or batteries of capacitors. In the case of more than one battery of capacitors to be connected separately, an additional source of power is created due to the transfer of power from the empowered battery to the one placed into service.

This represents a supplementary charge for the contactor, and it is therefore necessary to provide for the use of impedances and resistances to increase the contactor's admissible charge.

The impedances reduce the stress generated when condensers are connected parallel to others already connected to the network and charges (connected in steps). The resistances protect the contactor's power contacts during connection of the condenser, guaranteeing the electrical life of the circuits.

Comando condensatori / Capacitors control

	monofase / mono phase					trifase / tri phase				
	200~220V		400~440V		200~220V		400~440V		500~550V	
	[Kvar]	[A]	[Kvar]	[A]	[Kvar]	[A]	[Kvar]	[A]	[Kvar]	[A]
9	1,2	6	1,7	4,3	2	6	3	4,3	3	3,5
12	1,8	9	2,4	6	3	9	4	6	5	6
18	2,4	12	3,6	9	4	12	6	9	7	10
22	3	15	6	15	5	15	10	15	10	16
32	5	25	9,6	24	9	25	16	24	15	22
40	6,4	32	12	30	11	32	20	30	20	25
50	9	45	16	40	15	45	27	40	25	37
65	10	50	20	50	17	50	34	50	30	46
75	13	58	24	58	20	58	40	58	40	52
85	15	60	30	60	22	60	45	60	45	56
100					24	64	48	64		
125					29	76	58	76		
150					35	91	70	92		
180					42	109	84	110		
220					58	152	115	152		
300					69	182	139	182		
400					92	242	185	242		
600					145	382	291	382		
800					185	485	369	485		



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

CATEGORIE D'IMPIEGO / UTILIZATION CATEGORIES

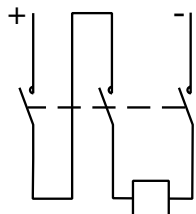


DC-1

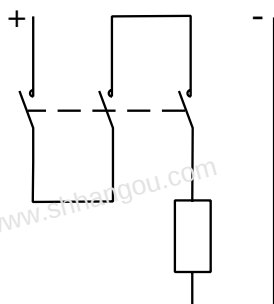


DC-3 - DC-5

2 POLI IN SERIE
2 POLES IN SERIES



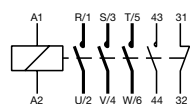
3 POLI IN SERIE
3 POLES IN SERIES



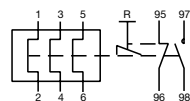
		Corrente impiego Rated operational current I _e [A] DC-1				Corrente impiego Rated operational current I _e [A] DC-3 / DC-5			
	N. poli in serie N. poles in series	24V	48V	110V	220V	24V	48V	110V	220V
9	2	10	10	6	3	8	4	2.5	0.8
9	3	10	10	8	8	8	6	4	2
12	2	12	12	10	7	12	6	4	1.2
12	3	12	12	12	12	12	10	8	4
18	2	18	18	13	8	12	6	4	1.2
18	3	18	18	18	18	12	10	8	4
22	2	20	20	15	10	20	15	8	2
22	3	20	20	20	20	20	20	15	8
32	2	25	25	25	12	25	20	10	3
32	3	25	25	25	22	25	25	20	10
40	2	35	35	25	12	35	20	10	3
40	3	35	35	35	30	35	30	20	10
50	2	50	40	35	15	45	25	15	3.5
50	3	50	50	50	40	50	35	30	12
65	2	50	40	35	15	45	25	15	3.5
65	3	65	65	65	50	50	35	30	12
75	2	75	65	50	20	65	40	20	5
75	3	75	75	75	55	80	60	50	20
85	2	80	65	50	20	65	40	20	5
85	3	80	80	80	60	80	60	50	20
100	2	100	100	80	50	100	60	40	30
100	3	100	100	100	80	100	90	80	50
125	2	120	100	80	50	120	60	40	30
125	3	120	120	100	80	120	90	80	50
150	2	150	150	150	150	150	130	120	80
150	3	80	80	80	60	80	60	50	20
180	2	180	180	150	150	180	150	120	80
180	3	180	180	180	180	180	180	150	100
220	2	220	180	150	150	220	150	120	80
220	3	220	220	220	220	220	220	150	100
300	2	300	240	200	200	300	200	150	90
300	3	300	300	300	300	300	280	200	150
400	2	400	240	200	200	400	200	150	90
400	3	400	400	400	300	400	280	200	150
600	2	630	630	630	630	630	630	630	630
600	3	630	630	630	630	630	630	630	630
800	2	800	800	630	630	800	630	630	630
800	3	800	800	800	800	800	630	630	630



CONTATTORE / CONTACTOR⁽²⁾



RELE' TERMICO DIFFERENZIALE⁽³⁾
 THERMAL O/L RELAY⁽³⁾



SISTEMA MONTAGGIO SEPARATO
 SEPARATE MOUNTING SYSTEM



CONTATTO LATERALE
 SIDE MOUNTING CONTACT
 BLOCK



CONTATTI FRONTALI
 TOP MOUNTING
 CONTACT BLOCK

SEZIONI / SECTIONS

9

12

18

22

TENSIONI DI COMANDO $\left[\frac{kg}{kg} \right]$
 CONTROL VOLTAGE

24V - 50/60 Hz	090MC9B-24	090MC12B-24	090MC18B-24	090MC22B-24
230V - 50/60 Hz	090MC9B-230	090MC12B-230	090MC18B-230	090MC22B-230
400V - 50/60 Hz	090MC9B-400	090MC12B-400	090MC18B-400	090MC22B-400

PRESTAZIONI SECONDO IEC-60947 / PERFORMANCE IN ACCORDANCE WITH IEC-60947

AC1	25A	25A	32A	40A
AC3 200-240V	2.5 kW 11 A	3 kW 13 A	4.5 kW 18 A	5.5 kW 22 A
380-440V	4 kW 9 A	5.5 kW 12 A	7.5 kW 18 A	11 kW 22 A
500-550V	4 kW 7 A	7.5 kW 12 A	7.5 kW 13 A	15 kW 20 A
690V	4 kW 6 A	7.5 kW 9 A	7.5 kW 9 A	15 kW 18 A

PRESTAZIONI SECONDO UL/CSA / PERFORMANCE IN ACCORDANCE WITH UL/CSA⁽¹⁾

lth	25A	25A	40A	40A
Monofase 115V	0.5 HP	0.75 HP	1 HP	2 HP
Mono-phase 230V	1 HP	2 HP	3 HP	3 HP
Trifase 200V	2 HP	3 HP	5 HP	7.5 HP
Tri-phase 230V	3 HP	5 HP	5 HP	10 HP
460V	5 HP	7.5 HP	10 HP	15 HP
575V	7.5 HP	10 HP	15 HP	20 HP

RELE' / RELAY

$\left[\frac{kg}{kg} \right]$	TARATURA / SETTING RANGE (A)	TARATURA / SETTING RANGE (A)
0,17	0.25 ÷ 0.4	2,5 ÷ 4
	0.4 ÷ 0.63	4 ÷ 6
	0.63 ÷ 1	6 ÷ 9
	1 ÷ 1.6	9 ÷ 13
	1.6 ÷ 2.5	12 ÷ 18
	090MT32-04	090MT32-4
	090MT32-063	090MT32-8
	090MT32-1	090MT32-9
	090MT32-1V6	090MT32-13
	090MT32-2V5	090MT32-18

$\left[\frac{kg}{kg} \right]$	TARATURA / SETTING RANGE (A)	TARATURA / SETTING RANGE (A)
38	Adattatore montaggio barra DIN 35 Bar mounting adapter DIN 35	090UZ-32

CONTATTI AUSILIARI / AUXILIARY CONTACTS

$\left[\frac{gr}{gr} \right]$	1NO+1NC	1NO+1NC	1NO+1NC	1NO+1NC	1NO+1NC
53	090UA-1				
$\left[\frac{gr}{gr} \right]$	2NO	2NC	1NO+1NC	1NO+1NC	1NO+1NC
28	090AF20	090AF02	090AF11		
$\left[\frac{gr}{gr} \right]$	4NO	4NC	3NO+1NC	1NO+3NC	2NO+2NC
50	090AF40	090AF04	090AF31	090AF13	090AF22

1) Potenza nominale massima
 2) Contatto ausiliario 1NO + 1NC integrato nel contattore
 3) Classe d'intervento 10A

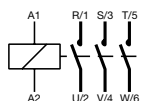
1) Maximum nominal power
 2) Auxiliary contact 1NO - 1NC integrated in the contactor
 3) Trip class 10A



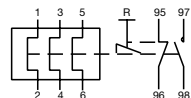
Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters



CONTATTORE / CONTACTOR⁽²⁾



RELE' TERMICO DIFFERENZIALE⁽²⁾
THERMAL O/L RELAY⁽²⁾



SISTEMA MONTAGGIO SEPARATO
SEPARATE MOUNTING SYSTEM



CONTATTO LATERALE
SIDE MOUNTING CONTACT
BLOCK



CONTATTI FRONTALI
TOP MOUNTING
CONTACT BLOCK

SEZIONI / SECTIONS

TENSIONI DI COMANDO CONTROL VOLTAGE

24V - 50/60 Hz
230V - 50/60 Hz
400V - 50/60 Hz

32

40

0,55

0,55

090MC32A-24
090MC32A-230
090MC32A-400

090MC40A-24
090MC40A-230
090MC40A-400

PRESTAZIONI SECONDO IEC-60947 / PERFORMANCE IN ACCORDANCE WITH IEC-60947

AC1	50A	60A
AC3 200~240V	7.5 kW 32 A	11 kW 40 A
380~440V	15 kW 32 A	18.5 kW 40 A
500~550V	18.5 kW 28 A	22 kW 32 A
690V	18.5 kW 20 A	22 kW 23 A

PRESTAZIONI SECONDO UL/CSA / PERFORMANCE IN ACCORDANCE WITH UL/CSA⁽¹⁾

lth	50A	60A
Monofase 115V	2 HP	3 HP
Mono-phase 230V	5 HP	7.5 HP
Trifase 200V	7.5 HP	15 HP
Tri-phase 230V	10 HP	15 HP
460V	20 HP	30 HP
575V	25 HP	30 HP

RELE' / RELAY

TARATURA / SETTING RANGE (A)

0,17	18 ÷ 25 24 ÷ 32 28 ÷ 40	090MT32-25 090MT32-32 090MT32-40
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38 Adattatore montaggio barra DIN 35
Bar mounting adapter DIN 35

090UZ-32

CONTATTI AUSILIARI / AUXILIARY CONTACTS

1NO+1NC

53 090UA-1

2NO 2NC 1NO+1NC

28 090AF20 090AF02 090AF11

4NO 4NC 3NO+1NC 1NO+3NC 2NO+2NC

50 090AF40 090AF04 090AF31 090AF13 090AF22

1) Potenza nominale massima
2) Classe d'intervento 10A

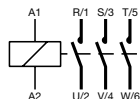
1) Maximum nominal power
2) Trip class 10A



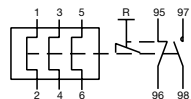
CONTATTORE / CONTACTOR



CONTATTORE / CONTACTOR



RELE' TERMICO DIFFERENZIALE⁽²⁾
 THERMAL O/L RELAY⁽²⁾



SISTEMA MONTAGGIO
 SEPARATO
 SEPARATE MOUNTING
 SYSTEM



CONTATTO LATERALE
 SIDE MOUNTING
 CONTACT BLOCK

SEZIONI / SECTIONS

65

TENSIONI DI COMANDO 1,05
 CONTROL VOLTAGE

24V - 50/60 Hz 090MC65A-24
 230V - 50/60 Hz 090MC65A-230
 400V - 50/60 Hz 090MC65A-400

SEZIONI / SECTIONS

85

100

TENSIONI DI COMANDO 1,05
 CONTROL VOLTAGE

24V - 50/60 Hz 090MC85A-24 090MC100A-24
 230V - 50/60 Hz 090MC85A-230 090MC100A-230
 400V - 50/60 Hz 090MC85A-400 090MC100A-400

PRESTAZIONI SECONDO IEC-60947 / PERFORMANCE IN ACCORDANCE WITH IEC-60947

AC1	100A	135A	160A
AC3 200~240V	18.5 kW 65 A	22 kW 85 A	30 kW 105 A
380~440V	30 kW 65 A	45 kW 85 A	55 kW 105 A
500~550V	33 kW 60 A	45 kW 75 A	55 kW 85 A
690V	33 kW 35 A	45 kW 45 A	45 kW 65 A

PRESTAZIONI SECONDO UL/CSA / PERFORMANCE IN ACCORDANCE WITH UL/CSA⁽¹⁾

lth	100A	135A	160A
Monofase 115V	5 HP	7.5 HP	10 HP
Mono-phase 230V	15 HP	15 HP	20 HP
Trifase 200V	25 HP	30 HP	30 HP
Tri-phase 230V	30 HP	40 HP	40 HP
460V	50 HP	60 HP	75 HP
575V	60 HP	75 HP	75 HP

RELE' / RELAY

65

TARATURA / SETTING RANGE (A)
 0,32 34 ÷ 50 090MT63-50
 45 ÷ 65 090MT63-65

85

100

TARATURA / SETTING RANGE (A)
 0,50 54 ÷ 75 090MT95-75
 63 ÷ 85 090MT95-85
 80 ÷ 100 090MT95-100

ADATTATORE MONTAGGIO BARRA DIN 35 - BAR MOUNTING ADAPTER DIN 35

38 090UZ-65
 090UZ-95

CONTATTI AUSILIARI / AUXILIARY CONTACTS

1NO+1NC
 33 090UA-1

1) Potenza nominale massima
 2) Classe d'intervento 20

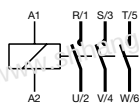
1) Maximum nominal power
 2) Trip class 20



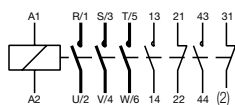
Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters



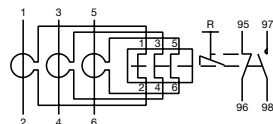
CONTATTORE / CONTACTOR



CONTATTORE / CONTACTOR⁽²⁾



RELE' TERMICO DIFFERENZIALE⁽³⁾
THERMAL O/L RELAY⁽³⁾



SEZIONI / SECTIONS

150

TENSIONI DI COMANDO
CONTROL VOLTAGE



2,4

24V - 50/60 Hz
230V - 50/60 Hz
400V - 50/60 Hz

090MC150A-24
090MC150A-100
090MC150A-400

185

225

TENSIONI DI COMANDO
CONTROL VOLTAGE



5,4

5,4

24V - 50/60 Hz 24VCC
110 ÷ 240V - 50/60 Hz
400V - 50/60 Hz

090MC185A-24 090MC225A-24
090MC185A-240 090MC225A-240
090MC185A-400 090MC225A-400

PRESTAZIONI SECONDO IEC-60947 / PERFORMANCE IN ACCORDANCE WITH IEC-60947

AC1	210A	230A	275A
AC3 200~240V	45 kW 150 A	55 kW 185 A	75 kW 225 A
380~440V	75 kW 150 A	90 kW 185 A	132 kW 225 A
500~550V	70 kW 100 A	110 kW 180 A	132 kW 200 A
690V	55 kW 60 A	110 kW 180 A	140 kW 150 A

PRESTAZIONI SECONDO UL/CSA / PERFORMANCE IN ACCORDANCE WITH UL/CSA⁽¹⁾

lth	160A	160A	210A
Monofase 115V	15 HP	15 HP	15 HP
Mono-phase 230V	25 HP	30 HP	25 HP
Trifase 200V	40 HP	60 HP	60 HP
Tri-phase 230V	50 HP	60 HP	75 HP
460V	100 HP	125 HP	150 HP
575V	75 HP	125 HP	150 HP

RELE' / RELAY

150



TARATURA / SETTING RANGE (A)

2,5

95 ÷ 130
110 ÷ 150

090MT150-130
090MT150-150

185

225

RELE' / RELAY



TARATURA / SETTING RANGE (A)

2,6

120 ÷ 185
160 ÷ 240

090MT225-185
090MT225-240

CONTATTI AUSILIARI / AUXILIARY CONTACTS



1NO+1NC

45

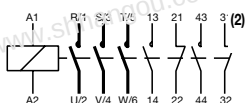
090UA-1 (150A)
090A11 (185/225A)

1) Potenza nominale massima
2) Completo di n. 2 090A11
3) Classe d'intervento 20

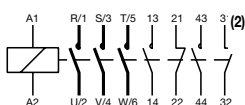
1) Maximum nominal power
2) Complete with n. 2 090A11
3) Trip class 20



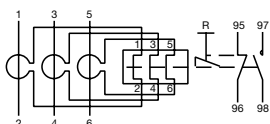
CONTATTORE / CONTACTOR⁽²⁾



CONTATTORE / CONTACTOR⁽²⁾



RELE' TERMICO DIFFERENZIALE⁽⁴⁾
 THERMAL O/L RELAY⁽⁴⁾



SEZIONI / SECTIONS

330

400

TENSIONI DI COMANDO  CONTROL VOLTAGE

9,2

9,2

110 ÷ 240V AC/DC
 400V - 50/60 Hz

090MC330A-240
 090MC330A-400

090MC400A-240
 090MC400A-400

www.shhangou.com

630

800

TENSIONI DI COMANDO  CONTROL VOLTAGE

9,2

9,2

110 ÷ 240V AC/DC
 400V - 50/60 Hz

090MC630A-240 090MC800A-240
 090MC630A-400 090MC800A-400

PRESTAZIONI SECONDO IEC-60947 / PERFORMANCE IN ACCORDANCE WITH IEC-60947

AC1	350A	450A	660A	900A
AC3 200~240V	90 kW 330A	125 kW 400A	190 kW 630A	220 kW 800A
380~440V	160 kW 330A	222 kW 400A	330 kW 630A	440 kW 800A
500~550V	160 kW 280A	225 kW 350A	330 kW 500A	500 kW 720A
690V	200 kW 225A	250 kW 300A	400 kW 420A	500 kW 630A

PRESTAZIONI SECONDO UL/CSA / PERFORMANCE IN ACCORDANCE WITH UL/CSA⁽¹⁾

lth	30A	450A	660A	900A
Monofase 115V Mono-phase 230V				
Trifase 200V Tri-phase 230V	100 HP	125 HP	200 HP	200 H
460V	125 HP	150 HP	250 HP	300 HP
575V	250 HP	300 HP	500 HP	600 HP

RELE' / RELAY

330

400

 TARATURA / SETTING RANGE (A)

2,5 200 ÷ 330
 260 ÷ 400

090MT400-330
 090MT400-400

RELE' / RELAY

630

800

 TARATURA / SETTING RANGE (A)

11,5 400 ÷ 630
 520 ÷ 800

090MT800-630
 090MT800-800

CONTATTI AUSILIARI / AUXILIARY CONTACTS

 1NO+1NC

45 090A11

- 1) Potenza nominale massima
- 2) Completo di n. 2 090A11
- 3) Possibilità di montaggio a parete
- 4) Classe d'intervento 20

- 1) Maximum nominal power
- 2) Complete with n. 2 090A11
- 3) Possibility for wall mounting
- 4) Trip class 20



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters



ACCESSORI / ACCESSORIES

CONTATTI AUSILIARI / AUXILIARY CONTACTS

SEZIONI / SECTIONS **9 12 18 22 32 40 65 85 100 150**

33	1NO+1NC	090UA-1
28	1NO+1NC	090AF11
28	2NO	090AF20
28	2NC	090AF02
50	4NO	090AF40
50	3NO+1NC	090AF31
50	2NO+2NC	090AF22
50	1NO+3NC	090AF13
50	4NC	090AF04

SEZIONI / SECTIONS **185 225 330 400 630 800**

45	1NO+1NC	090A11
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INTERBLOCCO MECCANICO / MECHANICAL INTERLOCK

SEZIONI / SECTIONS **9 12 18 22 32 40 65 85 100 150**

30	2NC	090UR-02
30	9 ÷ 22	090UW-22
30	32 ÷ 40	090UW-32
30	65	090UW-65
30	85 ÷ 100	090UW-95

SEZIONI / SECTIONS **180 225 330 400**

90	090IM400
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SEZIONI / SECTIONS **630 800**

90	090IM800
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FILTRO SOPPRESSORE / SURGE SUPPRESSOR RC UNIT

SEZIONI / SECTIONS **9 12 18 22 32 40 65 85 100 150**

150	24 ÷ 48V AC/DC	090US-11
150	200 ÷ 240V AC/DC	090US-13
150	360 ÷ 440V AC/DC	090US-14



LATERALE
SIDE MOUNTING



FRONTALE
TOP MOUNTING



FRONTALE
TOP MOUNTING



LATERALE
SIDE MOUNTING



INTERBLOCCO
MECCANICO
MECHANICAL
INTERLOCK



KIT TELEINVERSIONE
REVERSING KIT



INTERBLOCCO MECCANICO
MECHANICAL INTERLOCK





CARATTERISTICHE GENERALI / GENERAL CHARACTERISTICS



RISPONDERENZA ALLE NORME OMOLOGAZIONI	ACCORDANCE WITH STANDARDS APPROVAL
LIMITI DI TEMPERATURE	TEMPERATURE LIMITS
ALTITUDINE D'IMPIEGO	USAGE ALTITUDES
GRADO DI PROTEZIONE	PROTECTION DEGREE
DURATA MECCANICA [mil ciclo]	MECHANICAL DURABILITY (mil. cycles)
VITA ELETTRICA [mil ciclo]	ELECTRICAL LIFE (mil. cycles)
NUMERO DI MANOVRE ORA IN AC-3 [n° ciclo]	N. OF OPERATIONS PER HOUR IN AC-3 (n. cycles)
RESISTENZA AGLI SHOCK	SHOCK RESISTANCE
RESISTENZA ALLE VIBRAZIONI	VIBRATION RESISTANCE
RESISTENZA ALLA FIAMMA	FLAME RESISTANCE

IEC EN 60947-1, IEC EN 60947-4-1, UL500
UL, CSA
Stoccaggio $\geq -50^{\circ}\text{C} \div +80^{\circ}\text{C}$ - funzionamento $\geq -5^{\circ}\text{C} \div +60^{\circ}\text{C}$
3.000 m
IP 20 (IEC EN 60529)
9 $\div$ 22A 15ML/32 $\div$ 100A 12ML/150 $\div$ 300 5ML/400 $\div$ 800 2,5ML
9 $\div$ 22A 2,5ML/32 $\div$ 100A 2ML/150 $\div$ 300 1ML/400 $\div$ 800 0,5ML

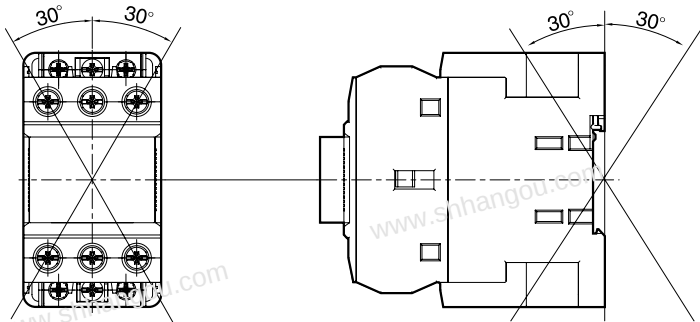
9 $\div$ 100A 1800 / 160 $\div$ 800A 1200
aperto/opened: 8g
chiuso/closed: 10g (1/2 sinusoide/sine wave = 11mS)

aperto/opened: 2g
chiuso/closed: 4g 5 $\div$ 300 (IEC 60-2-6)

VO (UL94)
960° (IEC 695-2-1)



POSIZIONE DI FUNZIONAMENTO
MOUNTING POSITION



NUMERO POLI	NUMBER OF POLES
TENSIONE NOMINALE D'ISOLAMENTO UI CONTATTORI	RATED INSULATION VOLTAGE UI
TENSIONE NOMINALE AD IMPULSO	RATED IMPULSE WITHSTAND VOLTAGE
POTERE DI CHIUSURA MASSIMO	MAXIMUM MAKING CAPACITY
POTERE DI INTERRUZIONE MASSIMO	MAXIMUM BREAKING CAPACITY
CAMPO DI FUNZIONAMENTO DELLA BOBINA	COIL OPERATING LIMITS
TENSIONE NOMINALE D'ISOLAMENTO UI RELE'	RATED INSULATION VOLTAGE UI RELAY
CLASSE D'INTERVENTO RELE' SECONDO IEC-947-4-1	RELAY TRIPPING CLASS IN ACCORDANCE WITH IEC-947-4-1
CONTATTI AUSILIARI RELE'	RELAY AUXILIARY CONTACTS
RIARMO RELE'	RELAY RESET TYPE

3
690V
UIMP 8 KV
10 X Ie in cat. AC-3
8 X Ie in cat. AC-3
-15% - +10% Uc (tensione nominale comando / rated voltage)
690 V
10A / 20
1NO + 1NC
manuale o automatico selezionabile / manual or automatic reset



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters



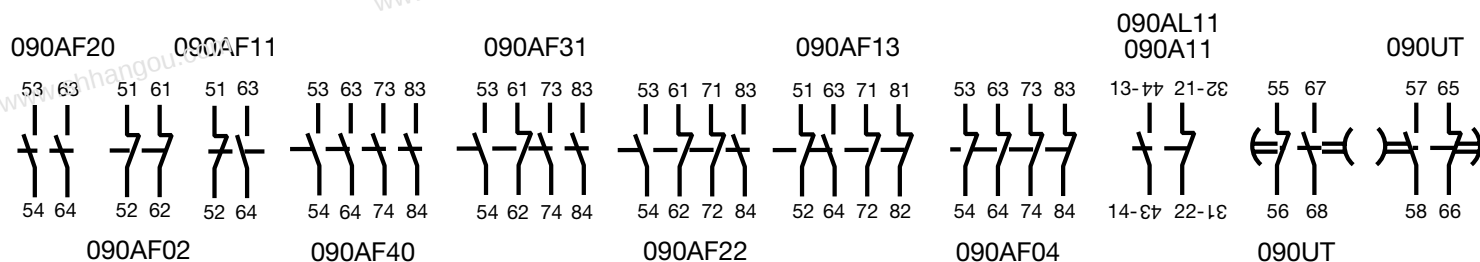
CARATTERISTICHE AUSILIARI / AUXILIARY CHARACTERISTICS

220V (50Hz)	Assorbimento [VA] Coil consumption			Limite tensione bobina [V] Coil operating limit		Corrente bobina Coil current [mA]	Tempo di funzionamento Operating time (ms)	
	Spunto Pick-up	Ritenuta Sealed	Dissipazione Dissipation [W]	Attrazione Pick-up	Rilascio Drop-out		Attrazione Pick-up	Rilascio Drop-out
9-12-18-22	58	9	2	85÷110% Un	30÷60% Un	41	12÷22	4÷15
32-40	53	12	2			54	12÷22	4÷15
65	110	13	5			59	12÷22	4÷15
85-100	230	17	4,4			77	15÷30	10÷30
150	108	18	4.4			82	20÷40	60÷70
185-225	380	11.6	4.7			53	70	70
330-400	571	14	5			64	55	55
630-800	1000	29	7.8			132	75	75

CARATTERISTICHE ELETTRICHE AUSILIARI / AUXILIARY ELECTRICAL CHARACTERISTICS

	CORRENTE NOMINALE NOMINAL CURRENT									Numero manovre/ora Operation per hour	Vita meccanica Mechanical life	VITA ELETTRICA [op x 10.000] ELECTRICAL LIFE [op x 10.000]	
	Ith	AC-15				DC-13							
	AC-1	120V	240V	480V	600V	125V	250V	440V	600V			220V-440V	24-220V
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[man/ora]	[mil/cicli]	[mil/cicli]	[mil/cicli]
090UA	10	6	3	1.5	1.2	1.1	0.55	0.31	0.2	1800	20	0.5	0.5
090AF	16	6	3	1.5	1.2	1.1	0.55	0.31	0.2	1800	20	0.5	0.5
090A	16	6	3	1.5	1.2	1.1	0.55	0.31	0.2	1800	20	0.5	0.5
090UR	10	6	3	1.5	1.2	0.55	0.27	-	-	1800	20	0.5	0.5

NUMERAZIONE CONTATTI AUSILIARI / AUXILIARY CONTACTS





CARATTERISTICHE GENERALI / GENERAL CHARACTERISTICS



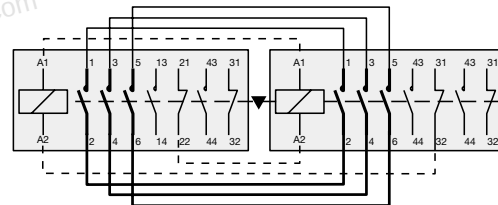
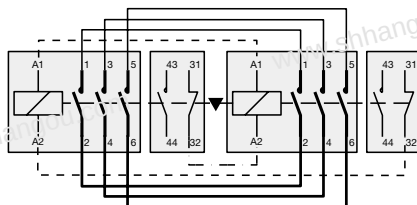
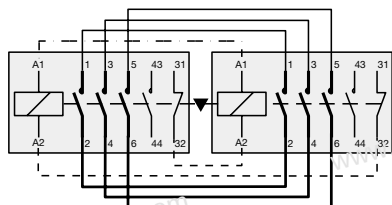
SCHEMI DI COLLEGAMENTO INTERBLOCCO MECCANICO
 MECHANICAL INTERLOCK CIRCUIT DIAGRAM

SEZIONI
 SECTIONS

9 12 18 22

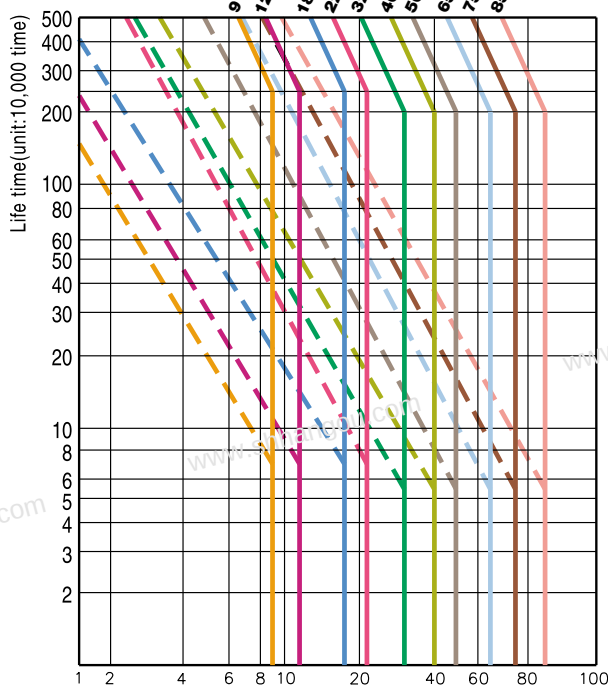
32 40 65 100 150

185 225 330 400 630 800



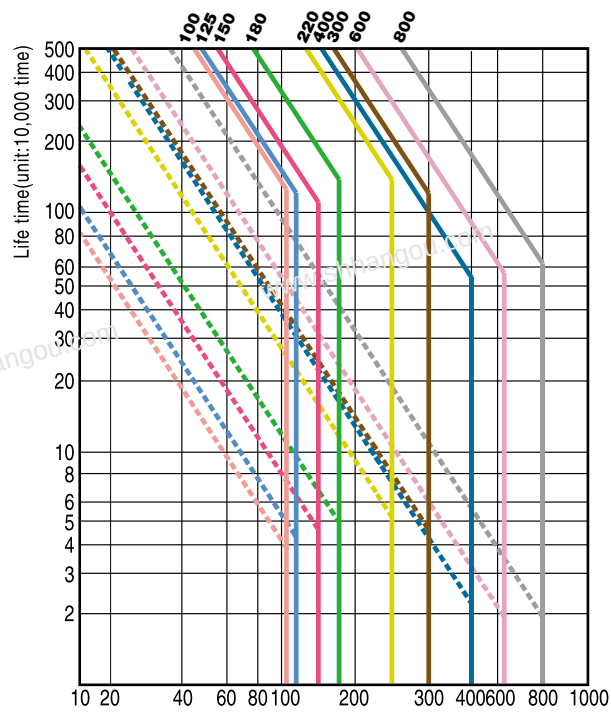
3 Ø AC380~440V

— AC-3
 - - AC-4



(A) (A)
 (kW) (kW) 1.5 2.2 3.7 5.5 7.5 11 15 22 30 37 45

3 Ø AC380~440V



(A) (A)
 (kW) (kW) 55 60 75 90 132 160 220 330 440



Contattori, relè termici, minicontattori, interruttori salvamotore
Contactors, thermal o/l relays, minicontactors, manual motor starters

CURVE CARATTERISTICHE RELE / RELAY CURVE CHARACTERISTICS'



SEZIONI
SECTIONS

9

12

18

12

32

40

090MT32

090MT63

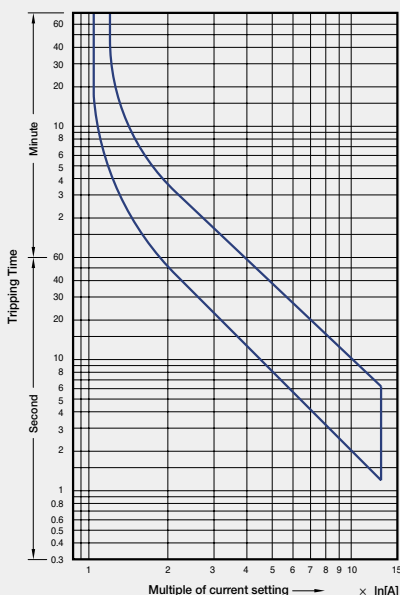
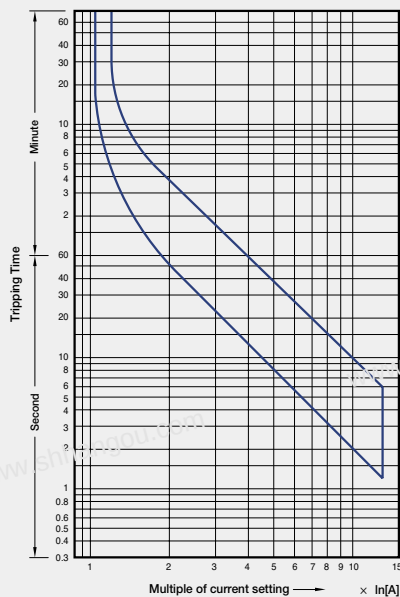
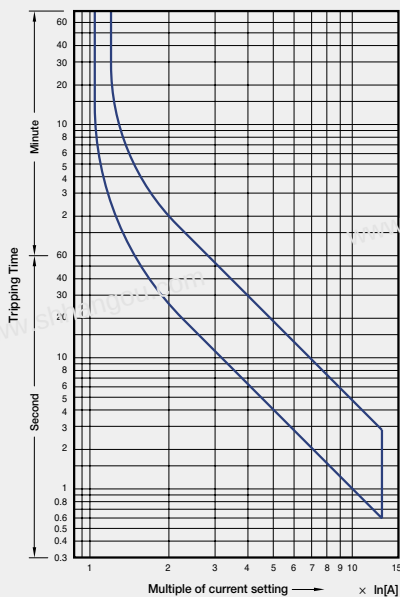
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090MT95

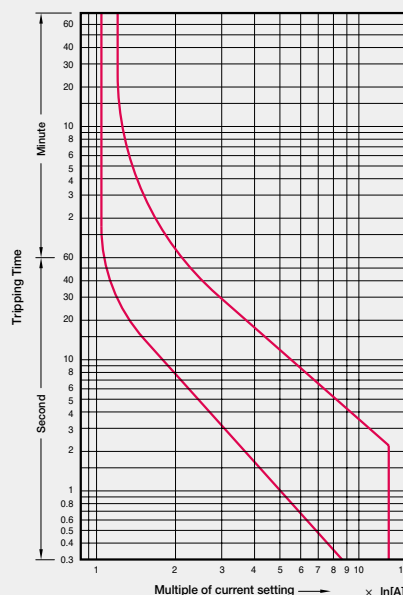
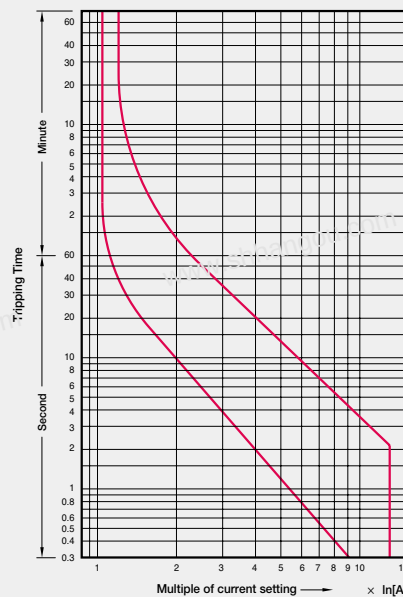
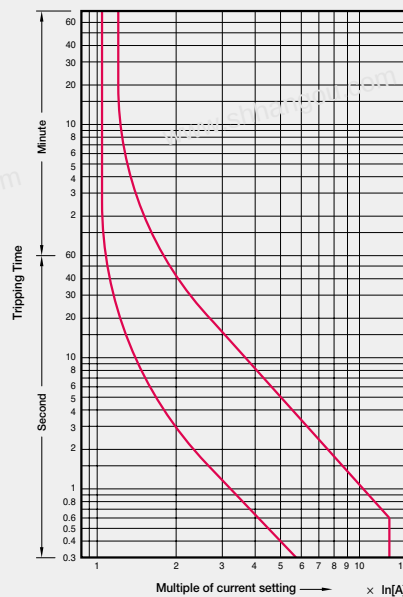
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100

AVVIAMENTO A FREDDO / COLD STARTING



AVVIAMENTO A CALDO / HOT STARTING





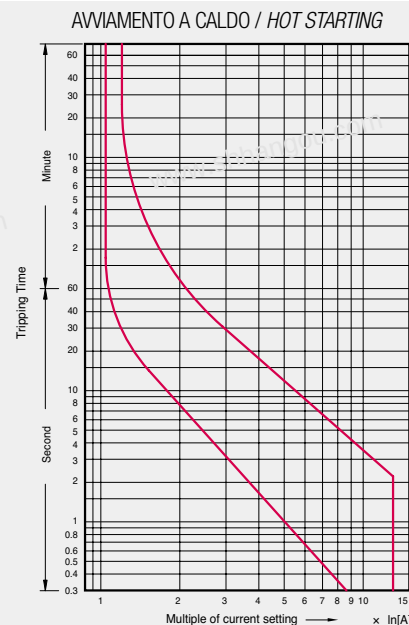
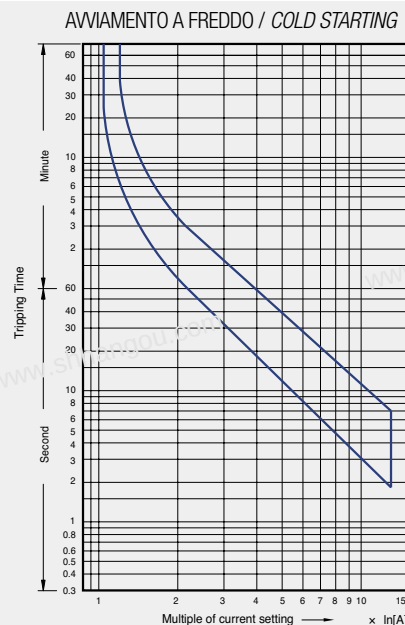
CURVE CARATTERISTICHE RELE / RELAY CURVE CHARACTERISTICS'



SEZIONI
SECTIONS

090MT150

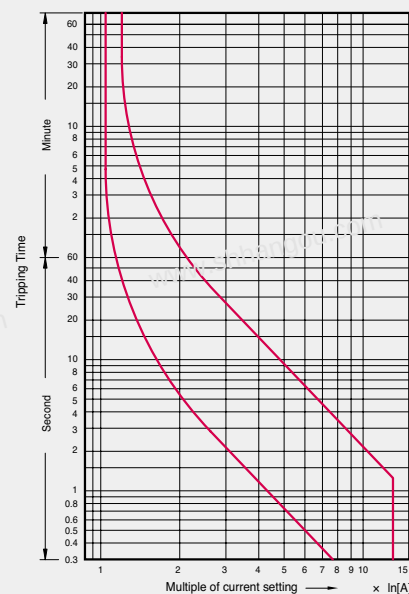
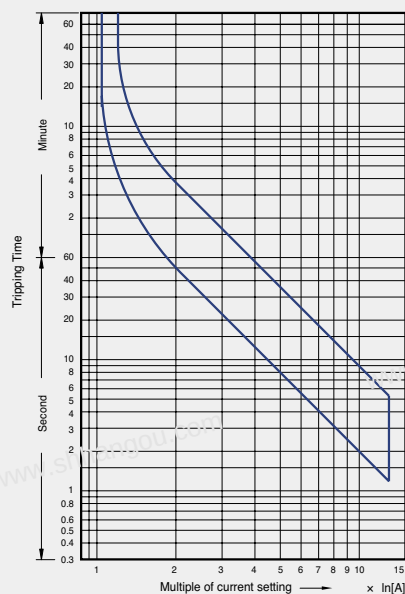
150



090MT225

185

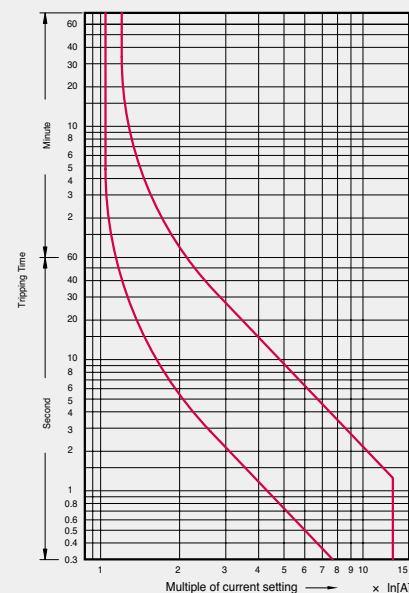
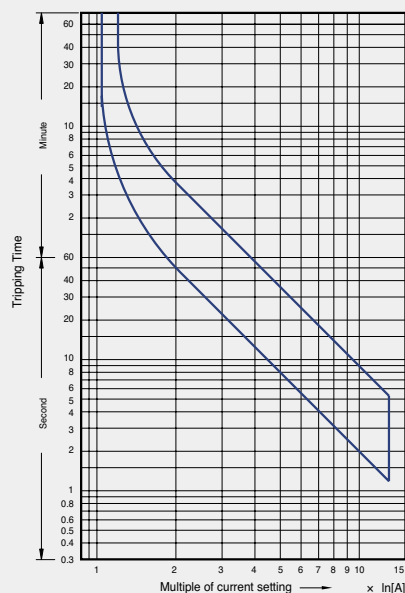
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090MT400

330

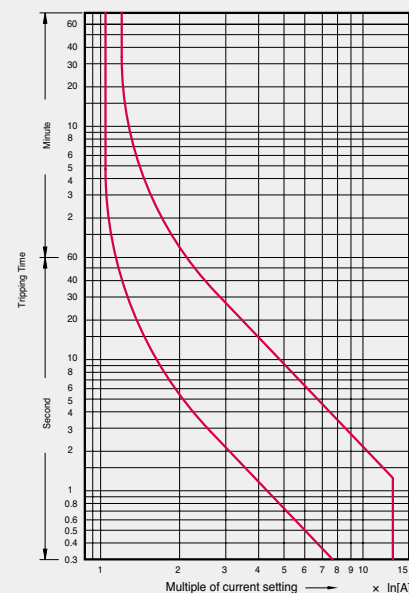
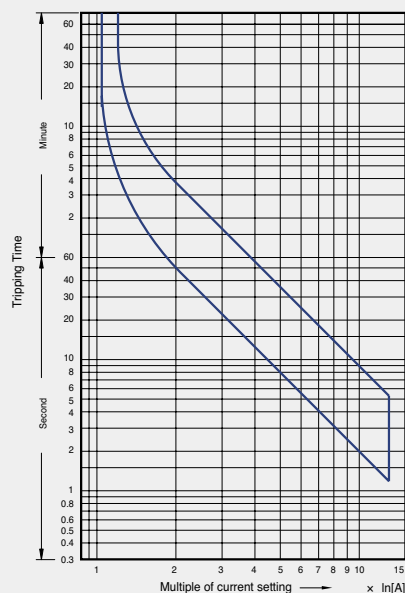
400



090MT800

630

800



090



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI
SECTIONS

9

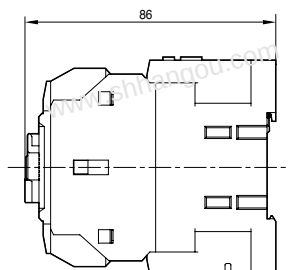
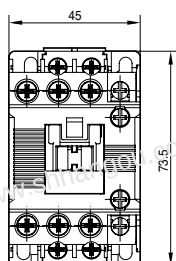
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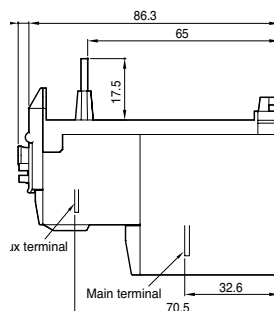
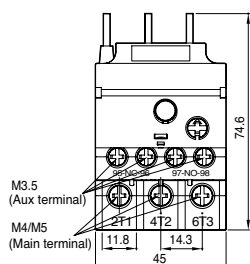
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DIMENSIONI ESTERNE / OVERALL DIMENSIONS

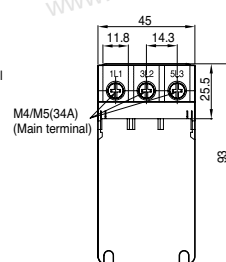
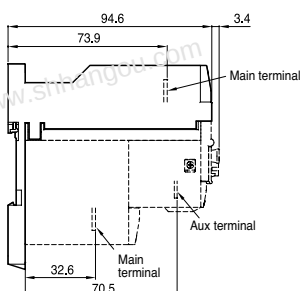
CONTATTORE
CONTACTORS



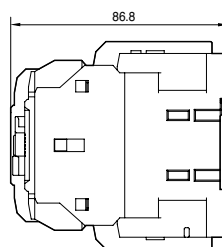
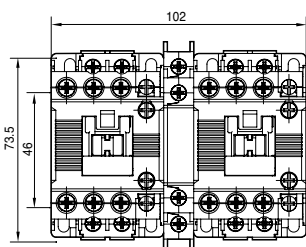
RELE'
RELAY



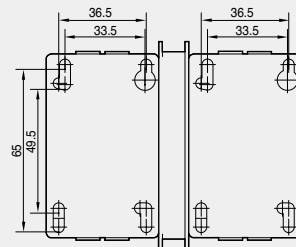
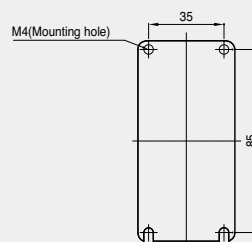
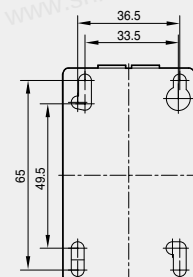
ADATTATORE MONTAGGIO
RELE'
RELAY MOUNTING ADAPTER



INTERBLOCCO MECCANICO
MECHANICAL INTERLOCK



DIME MONTAGGIO FIXING DIMENSION!





DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI
 SECTIONS

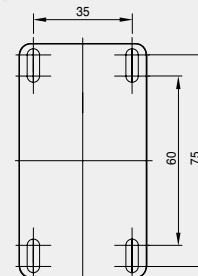
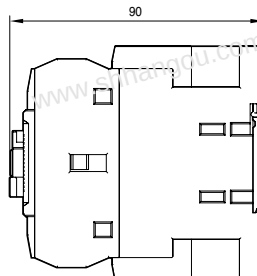
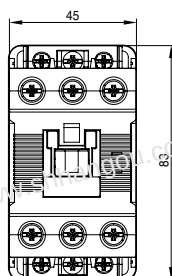
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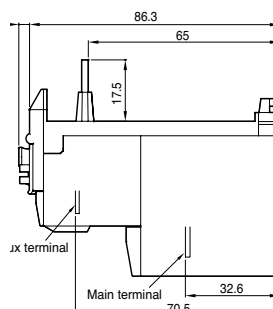
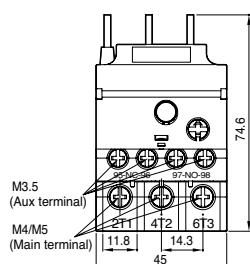
DIMENSIONI ESTERNE / OVERALL DIMENSIONS

DIME MONTAGGIO
 FIXING DIMENSION

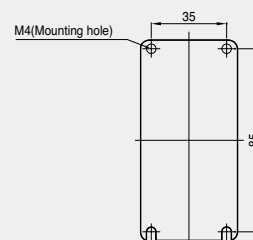
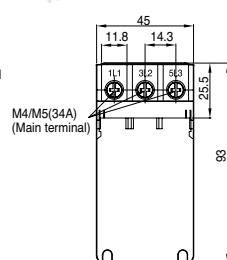
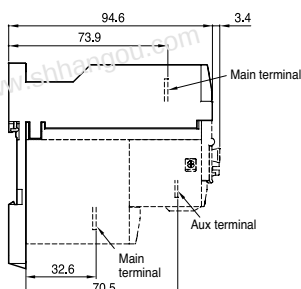
CONTATTORE
 CONTACTORS



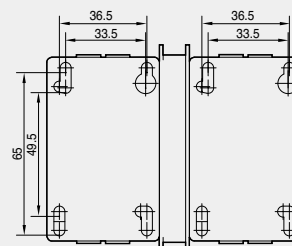
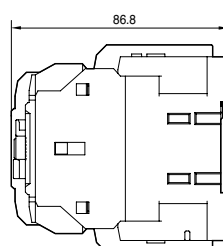
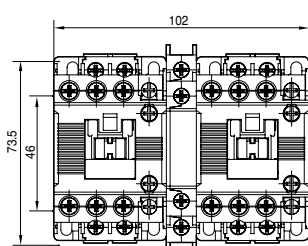
RELE'
 RELAY



ADATTATORE MONTAGGIO
 RELE'
 RELAY MOUNTING ADAPTER



INTERBLOCCO MECCANICO
 MECHANICAL INTERLOCK





Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

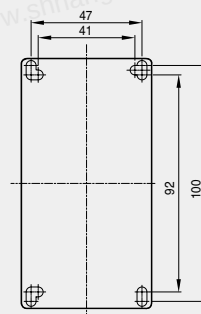
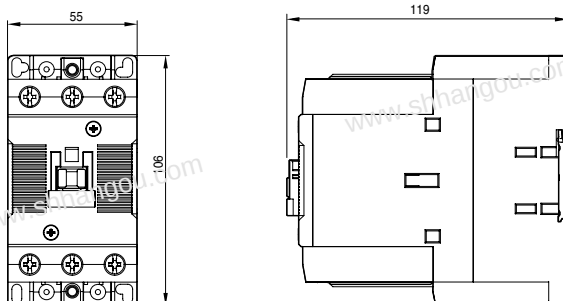
DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI SECTIONS

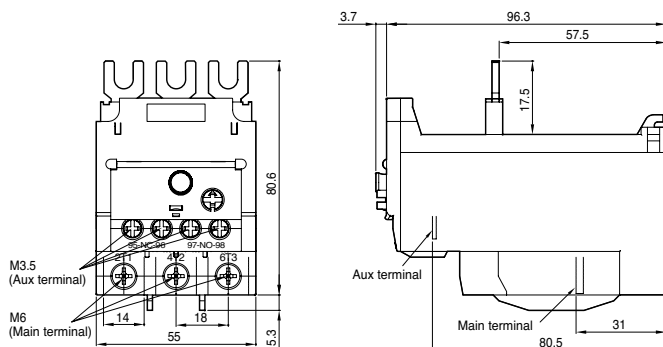
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DIMENSIONI ESTERNE / OVERALL DIMENSIONS

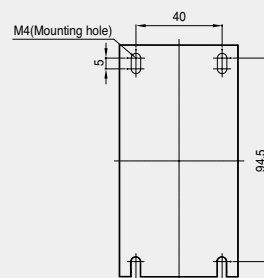
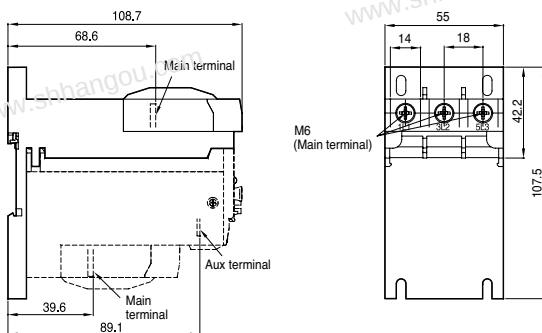
CONTATTORE CONTACTORS



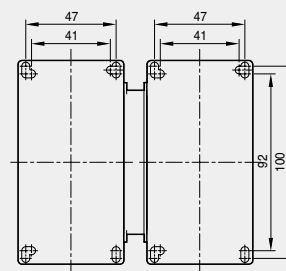
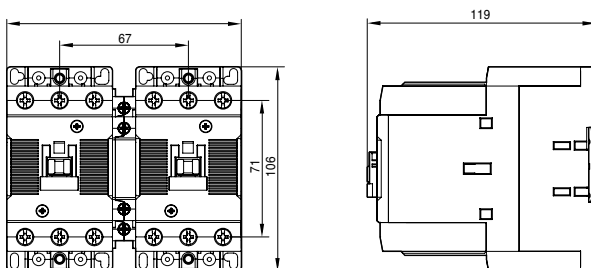
RELE' RELAY



ADATTATORE MONTAGGIO RELE' RELAY MOUNTING ADAPTER



INTERBLOCCO MECCANICO MECHANICAL INTERLOCK





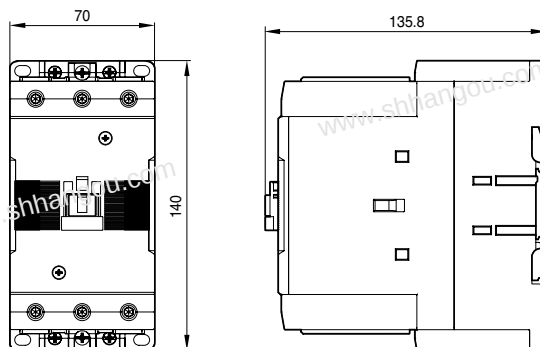
SEZIONI
 SECTIONS

85

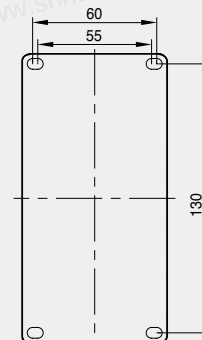
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DIMENSIONI ESTERNE / OVERALL DIMENSIONS

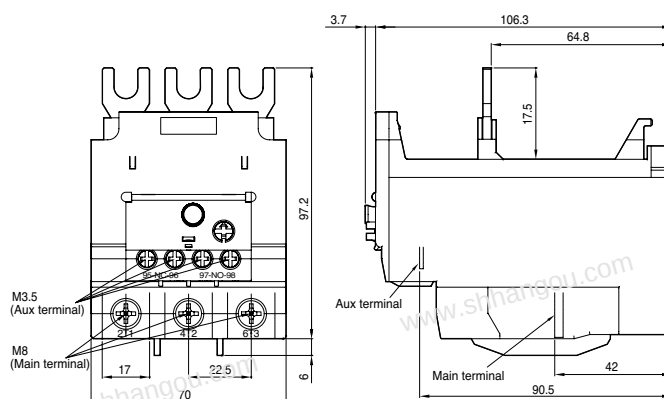
CONTATTORE
 CONTACTORS



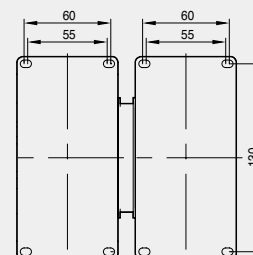
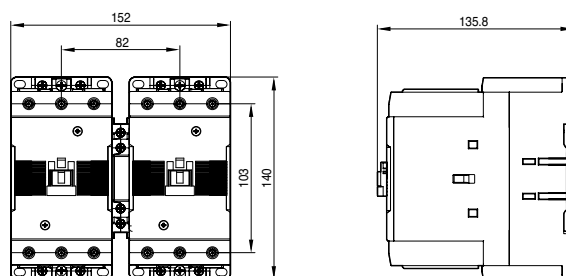
DIME MONTAGGIO
 FIXING DIMENSION



RELE'
 RELAY



INTERBLOCCO MECCANICO
 MECHANICAL INTERLOCK





Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

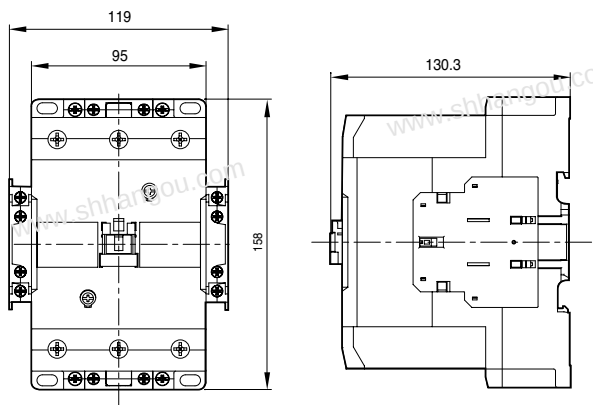
DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI
SECTIONS

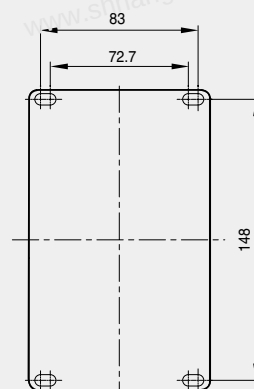
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DIMENSIONI ESTERNE / OVERALL DIMENSIONS

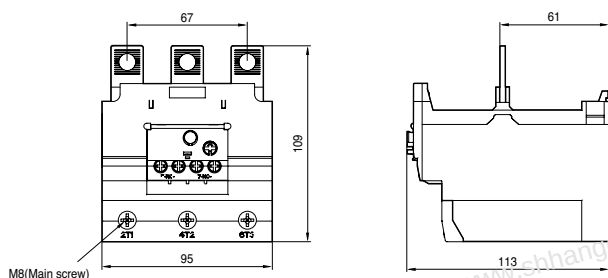
CONTATTORE
CONTACTORS



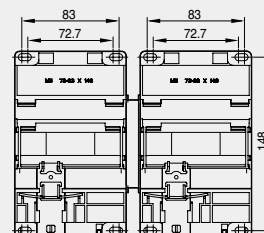
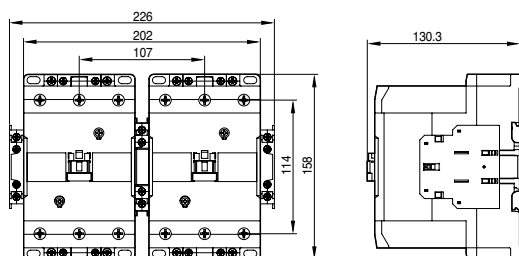
DIME MONTAGGIO FIXING DIMENSION



RELE'
RELAY



INTERBLOCCO MECCANICO
MECHANICAL INTERLOCK





DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

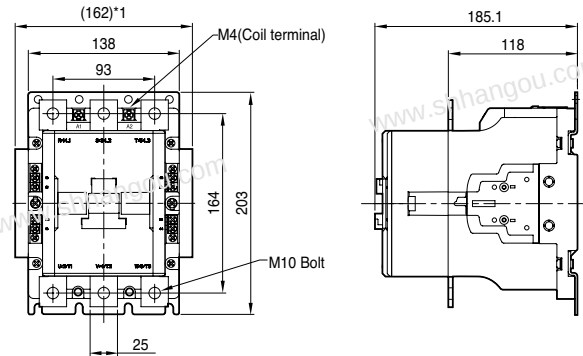
SEZIONI
 SECTIONS

185

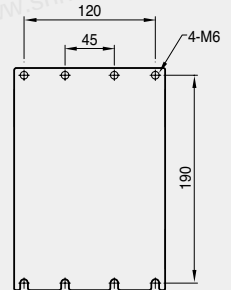
225

DIMENSIONI ESTERNE / OVERALL DIMENSIONS

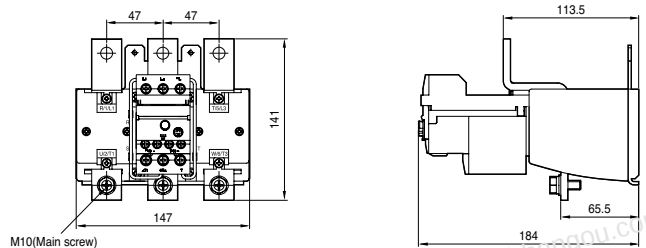
CONTATTORE
 CONTACTORS



DIME MONTAGGIO FIXING DIMENSION

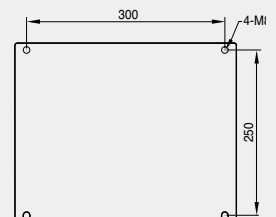
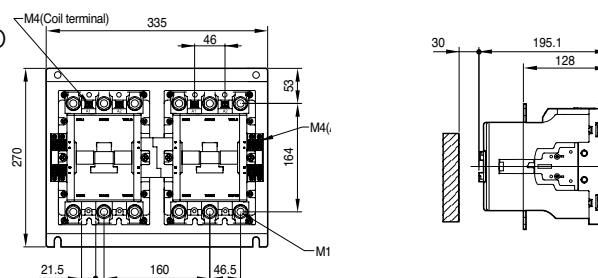


RELE'
 RELAY



www.shhangou.com

INTERBLOCCO MECCANICO
 MECHANICAL INTERLOCK





Contattori, relè termici, minicontattori, interruttori salvamotore
Contactors, thermal o/l relays, minicontactors, manual motor starters

DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

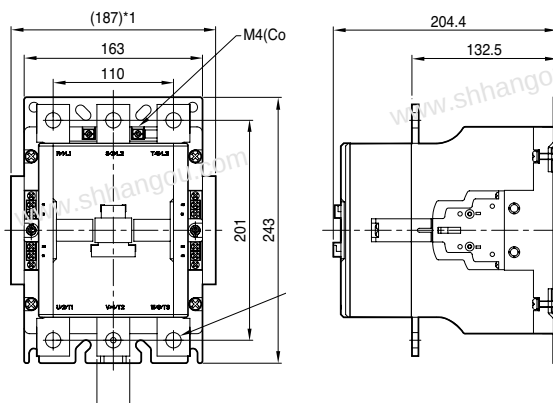
SEZIONI
SECTIONS

330

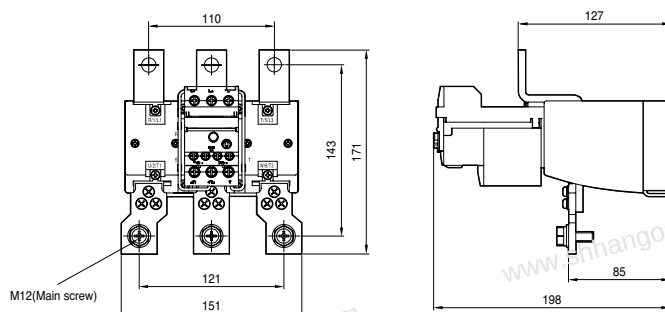
400

DIMENSIONI ESTERNE / OVERALL DIMENSIONS

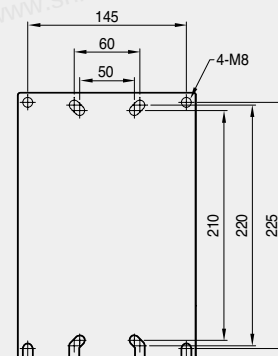
CONTATTORE
CONTACTORS



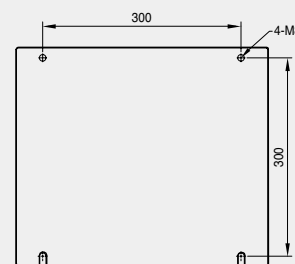
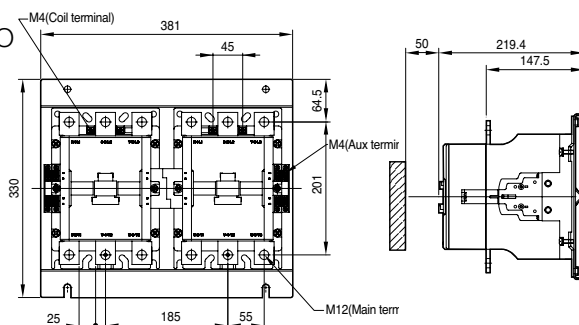
RELE'
RELAY



DIME MONTAGGIO
FIXING DIMENSION



INTERBLOCCO MECCANICO
MECHANICAL INTERLOCK





DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

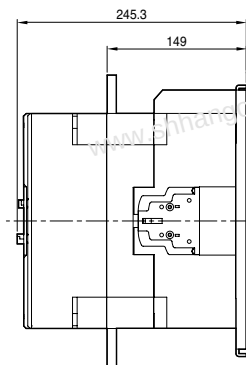
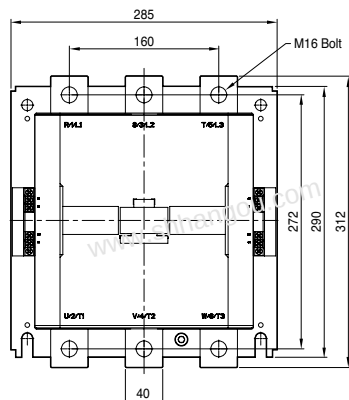
SEZIONI
SECTIONS

630

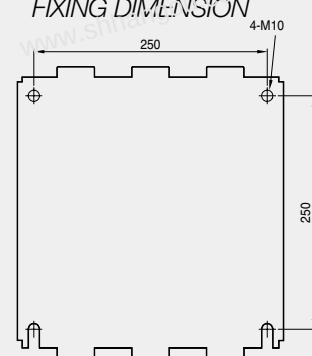
800

CONTATTORE
CONTACTORS

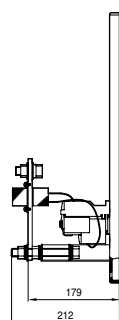
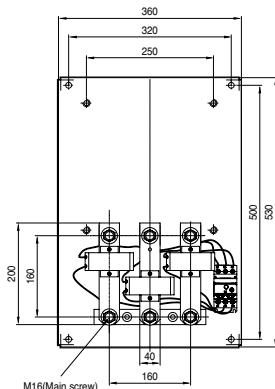
DIMENSIONI ESTERNE / OVERALL DIMENSIONS



DIME MONTAGGIO
FIXING DIMENSION



RELE'
RELAY



SEZIONI
SECTIONS

9

12

18

22

32

40

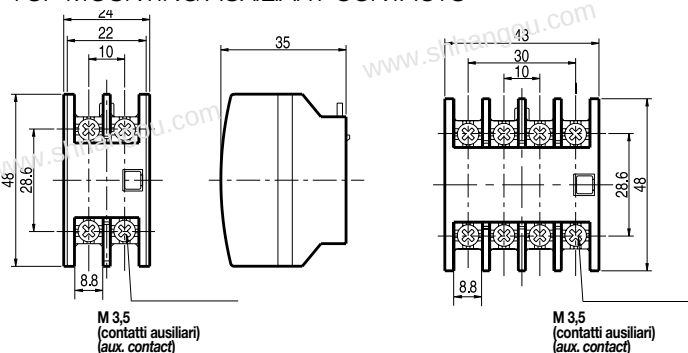
65

85

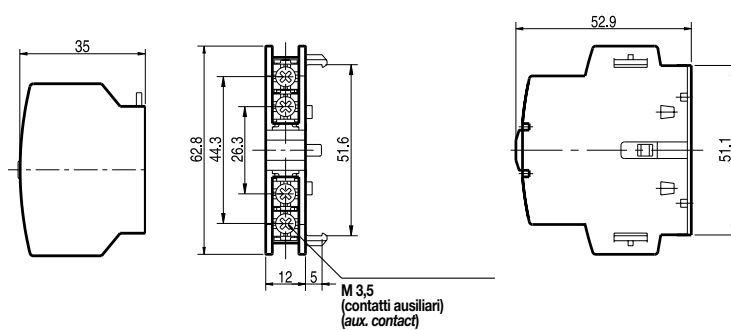
100

150

AUSILIARI FRONTALI
TOP MOUNTING AUXILIARY CONTACTS



AUSILIARI LATERALI
SIDE MOUNTING AUXILIARY CONTACTS



SEZIONI
SECTIONS

185

225

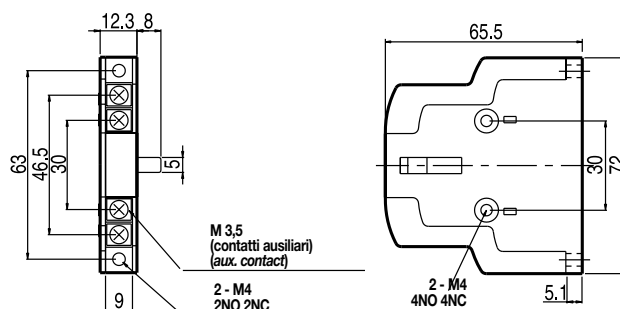
330

400

630

800

AUSILIARI LATERALI
SIDE MOUNTING AUXILIARY CONTACTS



090



Contattori, relè termici, minicontattori, interruttori salvamotore
Contactors, thermal o/l relays, minicontactors, manual motor starters



minicontattori minicontactors

TRIPOLARI DI BASE

I minicontattori New Elfin vengono forniti con tre contatti di potenza ed un contatto ausiliario normalmente aperto (NO).

STANDARD THREE POLE

New Elfin minicontactors are supplied as standard with three main pole and an auxiliary contact normally open (NO).

QUATTRO TIPOLOGIE DI CONNESSIONE

I minicontattori sono disponibili con attacchi vite-serrafilo e pin a saldare per circuito stampato. Su richiesta sono disponibili cersioni con attacchi fast-on a cage-clamp.

FOUR TYPE OF CONNECTIONS

Minicontactors are available with various connections screw, solder pins, fast-on and cage dampers (on request).

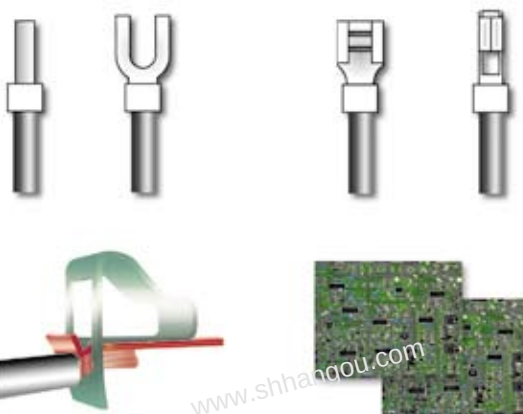
VERSATILITA' DI IMPIEGO

E' possibile trasformare un minicon-
tattore standard in un circuito stam-
pato con apposito kit accessorio. La
stessa operazione è possibile anche
per il contatto ausiliario laterale. E' inol-
tre possibile montare sul minicon-
tattore per circuito stampato tutti gli acces-
sori della versione standard (contatti ausiliari laterali e frontali, temporizzatore,
interblocco meccanico, filtro RC e relè termico.)

Customer can change a standard minicontactor into a solder pins version with a special kit. The same operation is possible for the side mounting auxiliary contact. Customer can fit on solder pin minicontactor all the accessories of standard version (auxiliary contacts, timer mechanical interlock, RC unit thermal O/L relay).

VERSATILITY UTILIZATION

Customer can change a standard minicontactor into a solder pins version with a special kit. The same operation is possible for the side mounting auxiliary contact. Customer can fit on solder pin minicontactor all the accessories of standard version (auxiliary contacts, timer mechanical interlock, RC unit thermal O/L relay).



BOBINE DI ALIMENTAZIONE

Nella nuova gamma di minicontattori New Elfin è possibile gestire le bobine di alimentazio-
ne c.a. e c.c. come ricambio.

COILS

In our new range of minicontactors we can supply ac/dc coils as spare parts.

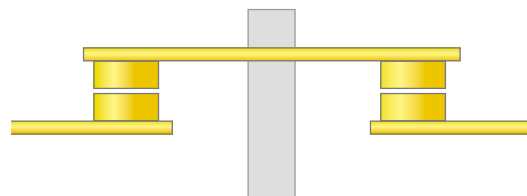


TECNOLOGIA INNOVATIVA

La traslazione dei contatti di potenza è verticale. Questa tecnologia permette di
avere una distanza maggiore tra contatti fissi e mobili rispetto ad una soluzione
standard orizzontale aumentando potere d'interruzione e vita elettrica.

INNOVATIVE TECHNOLOGY

The translation of main contacts is vertical. With this solutions minicontactors have a longer distance between fixed and moving contacts respect to a standard solution with horizontal translation. Making and breaking capacity and electrical life are longer than competitors.



16

NEW ELFIN

12

ALTRI
OTHERS

9

6

GAMMA ESTESA

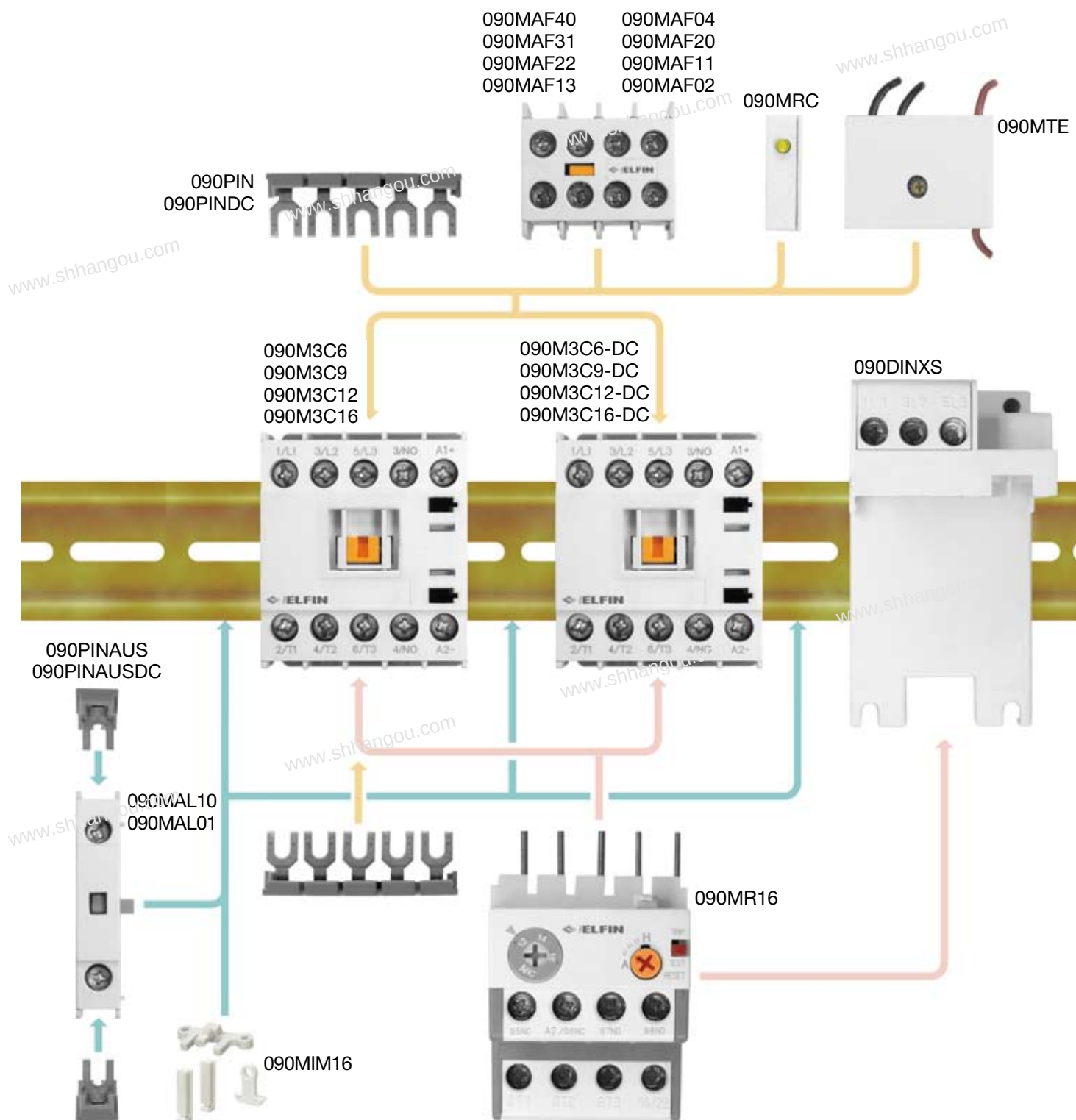
La gamma di minicontattori si esten-
de fino a 16A 7.5Kw AC-3.

WIDE RANGE

Our range of minicontactors arrive up to 16A 7.5Kw AC-3.



LAY-OUT SERIE XSMALL - XSMALL SERIES LAY-OUT





INTRODUZIONE



La norma definisce il contattore come un dispositivo elettromeccanico di manovra, generalmente previsto per un numero elevato di manovre, avente una sola posizione di riposo, ad azionamento non manuale, in grado di stabilire, portare e interrompere correnti in condizioni normali del circuito, incluse le condizioni di sovraccarico e manovra. La forza per la chiusura dei contatti principali normalmente aperti o per l'apertura dei contatti normalmente chiusi è fornita da un elettromagnete. Nelle pagine a seguire trovate una serie di informazioni utili per ottimizzare la scelta del contattore necessario a risolvere il problema specifico di impiego.

COME DIMENSIONARE UN CONTATTORE

Per effettuare il corretto dimensionamento di un contattore occorre tenere conto di alcuni fattori:

- categorie di utilizzazione che identificano la tipologia del carico
- della vita elettrica
- del numero di manovre/ora

CATEGORIE DI UTILIZZAZIONE DEI CONTATTORI

La normativa stabilisce delle categorie di utilizzazione riferite ad impieghi ben precisi dei contattori. Tali categorie sono riportate nella tabella seguente.

CORRENTE ALTERNATA		CORRENTE CONTINUA	
CATEGORIE	APPLICAZIONI TIPICHE	CATEGORIE	APPLICAZIONI TIPICHE
AC-1	Carichi non induttivi o debolmente induttivi, forni a resistenza	DC-1	Carichi non induttivi o debolmente induttivi, forni a resistenza
AC-2	Motori ad anelli: avviamento, arresto		
AC-3	Motori a gabbia: avviamento, arresto del motore durante la marcia	DC-3	Motori in derivazione: avviamento, frenatura in controcorrente, manovre a impulsi. Frenatura dinamica di motori in corrente continua
AC-4	Motori a gabbia: avviamento, frenatura in controcorrente, manovra a impulsi		
AC-5a	Comando di lampade a scarica	DC-5	Motori in serie: avviamento, frenatura in controcorrente, manovre a impulsi. Frenatura dinamica di motori in corrente continua
AC-5b	Comando di lampade ad incandescenza		
AC-6a	Comando di trasformatori		
AC-6b	Comando di batterie di condensatori		
AC-12	Comando di carichi ohmici e semiconduttori con opto separazione	DC-12	Comando di carichi ohmici e semiconduttori con opto separazione
AC-13	Comando di semiconduttori con trasformatore di separazione	DC-13	Comando di elettromagneti
AC-14	Comando di piccoli carichi elettromagnetici (max 72 VA), quali bobine di piccoli conduttori o elettrovalvole	DC-14	Comando di carichi elettromagnetici con resistenza di risparmio sul circuito ausiliario
AC-15	Comando di carichi elettromagnetici (oltre 72 VA)		

CATEGORIE DI UTILIZZAZIONE DEI CIRCUITI AUSILIARI



INTRODUCTION



The standard describes the contactor as an electromechanical manoeuvring device, generally designed for a high number of operations, with just one idle position which is non-manually activated, capable of making carrying and breaking currents under normal circuit conditions, including overloading and operating conditions. The force required to close the main contacts which are normally open or to open contacts which are normally closed is supplied by an electromagnet. On the following pages you will find a series of useful information for choosing the best contactor for your specific requirements

HOW TO DIMENSION
A CONTACTOR

In order to correctly dimension a contactor, several factors have to be considered:

- the categories of use which identify the type of load
- the electrical life
- the number of operations per hour

CONTACTORS
UTILIZATION
CATEGORIES

The standard establishes several categories of use referred to precise uses of contactors.
These categories are listed in the following table.

ALTERNATING CURRENT CATEGORIES TYPICAL APPLICATIONS		DIRECT CURRENT CATEGORIES TYPICAL APPLICATIONS	
AC-1	Non inductive or slightly inductive loads, resistance furnaces	DC-1	Non inductive or slightly inductive loads, resistance furnaces
AC-2	Slip-ring motors: starting and switching off		
AC-3	Squirrel cage motors: starting switching off motors during running	DC-3	Shunt-motors: starting - plugging inching. Dynamic braking of D.C. motors
AC-4	Squirrel cage motors: starting plugging - inching		
AC-5a	Switching of electric discharge lamp controls	DC-5	Series motors: starting - plugging - inching Dynamic braking of D.C. motors
AC-5b	Switching of incandescent lamps		
AC-6a	Switching of transformers		
AC-6b	Switching of capacitors banks		
AC-12	Control of resistive loads and solid state loads with isolation by opto couples	DC-12	Control of resistive loads isolation by opto couples
AC-13	Control of solid state loads with transformer isolation	DC-13	Electromagnet control
AC-14	Control of small electromagnetic loads (< 72 VA)	DC-14	Control of electromagnetic loads having economic resistors in circuit
AC-15	Control of electromagnetic loads (> 72 VA)		

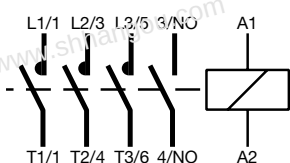
SWITCHING ELEMENTS
UTILIZATION CATEGORIES



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

Serie / Series XSMALL

21



SEZIONI / SECTIONS

6

9

12

16

TENSIONI DI COMANDO $\frac{kg}{kg}$
CONTROL VOLTAGE

0,17

0,17

0,17

0,17

24V - 50/60 Hz
48V - 50/60 Hz
110V - 50/60 Hz
230/240V - 50/60 Hz
380/400V - 50/60 Hz

090M3C6-24
090M3C6-48
090M3C6-110
090M3C6-240
090M3C6-400

090M3C9-24
090M3C9-48
090M3C9-110
090M3C9-240
090M3C9-400

090M3C12-24
090M3C12-48
090M3C12-110
090M3C12-240
090M3C12-400

090M3C16-24
090M3C16-48
090M3C16-110
090M3C16-240
090M3C16-400

0,23

0,23

0,23

0,23

12V DC
24V DC
48V DC
110V DC

090M3C6-12DC
090M3C6-24DC
090M3C6-48DC
090M3C6-110DC

090M3C9-12DC
090M3C9-24DC
090M3C9-48DC
090M3C9-110DC

090M3C12-12DC
090M3C12-24DC
090M3C12-48DC
090M3C12-110DC

090M3C16-12DC
090M3C16-24DC
090M3C16-48DC
090M3C16-110DC

SEZIONI / SECTIONS

6

9

12

16

PRESTAZIONI SECONDO IEC-60947 / PERFORMANCE IN ACCORDANCE WITH IEC-60947

AC1	20A	20A	20A	20A
AC3 200~240V	1.5 kW 7 A	2.2 kW 9 A	3 kW 12 A	4 kW 16 A
380~440V	2.2 kW 6 A	4 kW 9 A	5.5 kW 12 A	7.5 kW 16 A
500~550V	3 kW 5 A	3.7 kW 6 A	4 kW 7 A	5.5 kW 9 A
690V	3 kW 4 A	4 kW 5 A	4 kW 5 A	4 kW 5 A

PRESTAZIONI SECONDO UL/CSA / PERFORMANCE IN ACCORDANCE WITH UL/CSA⁽¹⁾

lth	20A	25A	30A	32A
Monofase 115V Mono-phase 230V	0.5 HP 1 HP	0.5 HP 2 HP	1 HP 3 HP	2 HP 3 HP
Trifase 200V Tri-phase 230V	2 HP 2 HP	3 HP 3 HP	5 HP 5 HP	7 HP 7.5 HP
460V	5 HP	7.5 HP	10 HP	10 HP
575V	7.5 HP	10 HP	15 HP	15 HP

PRESTAZIONI SECONDO IEC-60947 / PERFORMANCE IN ACCORDANCE WITH IEC-60947

DC1 24V	1 polo in serie/pole in series	9 A	10 A	12 A	16 A
L/R<1ms	2 poli in serie/poles in series	12 A	13 A	15 A	20 A
48V	1 polo in serie/pole in series	8 A	10 A	11 A	14 A
	2 poli in serie/poles in series	10 A	12V	14 A	17 A
110V	1 polo in serie/pole in series	3 A	3 A	4 A	5 A
	2 poli in serie/poles in series	6 A	7 A	8 A	9 A
DC3/DC5 24V	1 polo in serie/pole in series	6 A	7 A	9 A	12 A
L/R<10ms	2 poli in serie/poles in series	7 A	9 A	12 A	15 A
48V	1 polo in serie/pole in series	5 A	6 A	8 A	10 A
	2 poli in serie/poles in series	7 A	8 A	10 A	13 A
110V	1 polo in serie/pole in series	1 A	1 A	1 A	2 A
	2 poli in serie/poles in series	3 A	4 A	5 A	6 A

1) Potenza nominale massima
1) Maximum rated power



Serie / Series XSMALL



SEZIONI / SECTIONS

6

9

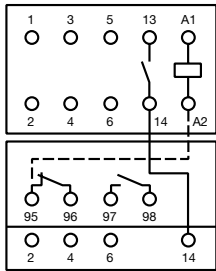
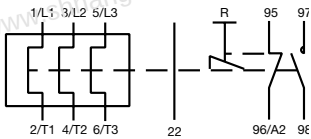
12

16

RELE' / RELAY



RELE' TERMICO DIFFERENZIALE⁽³⁾
THERMAL O/L RELAY



SCHEMA PER CABLAGGIO DIRETTO
CONTATTORE - RELE'
DIRECT MOUNTING OF T.O.R. TO
MINI CONTACTOR DIAGRAM OF
PREWIRING

	TARATURA / SETTING RANGE (A)		TARATURA / SETTING RANGE (A)	
0,1	0.1 ... 0.16	090MR16-016	2.5 ... 4	090MR16-4
	0.16 ... 0.25	090MR16-025	4 ... 6	090MR16-6
	0.25 ... 0.4	090MR16-04	5 ... 8	090MR16-8
	0.4 ... 0.65	090MR16-065	6 ... 9	090MR16-9
	0.63 ... 1	090MR16-1	7 ... 10	090MR16-10
	1 ... 1.6	090MR16-1V6	9 ... 13	090MR16-13
	1.6 ... 2.5	090MR16-2V5	12 ... 16	090MR16-16



SISTEMA MONTAGGIO SEPARATO
SEPARATE MOUNTING SYSTEM

0,3	Adattatore montaggio barra DIN 35 Mounting adapter DIN 35		090DINXS	



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

ACCESSORI - ACCESSORIES



CONTATTO
LATERALE
SIDE MOUNTING

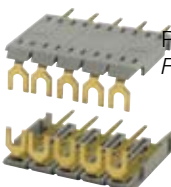


CONTATTI AUSILIARI / AUXILIARY CONTACTS

SEZIONI / SECTIONS		6	9	12	16
	1NO	1NC			
20	090MAL10	090MAL01			
	4NO	3NO+1NC	2NO+2NC	1NO+3NC	4NC
40	090MAF40	090MAF31	090MAF22	090MAF13	090MAF04
	2NO	1NO+1NC	2NC		
30	090MAF20	090MAF11	090MAF02		



CONTATTI
FRONTALI
TOP MOUNTING



PER CONTATTORI
FOR CONTACTORS

PETTINI / SOLDER PIN TERMINAL

20	Pettini corti A.C. / (A.C.) short Pettini lunghi D.C. / (D.C.) long	090PIN 090PINDC
10	Pettini corti A.C. / (A.C.) short Pettini lunghi D.C. / (D.C.) long	090PINAUS 090PINAUSDC



PER CONTATTI
AUSILIARI
FOR AUXILIARY
CONTACTS



FILTRO SOPPRESSORE / SURGE SUPPRESSOR UNIT

SEZIONI / SECTIONS		6	9	12	16
0,005	24-48V CA			090MRC48	
0,005	60-127V CA			090MRC110	
0,005	200-240V CA			090MRC240	
0,005	17-24V CC			090MRC24DC	
0,005	36-72V CC			090MRC72DC	



INTERBLOCCO MECCANICO / MECHANICAL INTRLOCK

SEZIONI / SECTIONS		6	9	12	16
0,005				090MIM16	



ACCESSORI - ACCESSORIES



UNITA' TEMPORIZZATA ELETTRONICA / ELECTRONIC TIMER UNIT

SEZIONI / SECTIONS

6

9

12

16



40 24-48V CA/CC delay ON 1-30 s
 40 100-220V CA/CC delay ON 1-30 s

090MTEON220

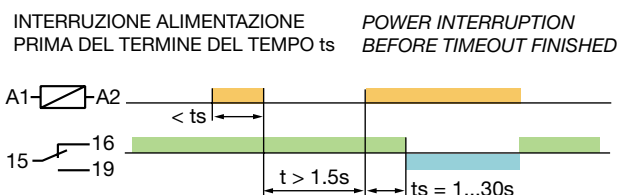
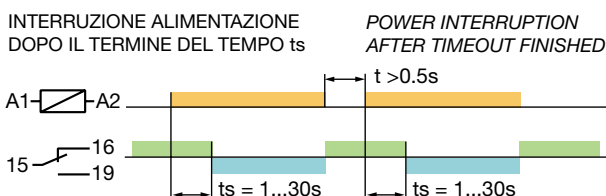
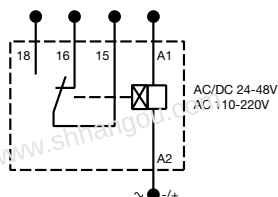
40 24-48V CA/CC delay OFF 1-30 s

090MTEOFF48

40 100-220V CA/CC delay OFF 1-30 s

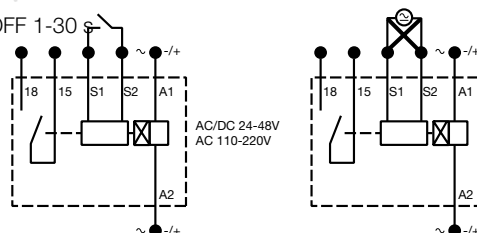
090MTEOFF220

090MTEON48

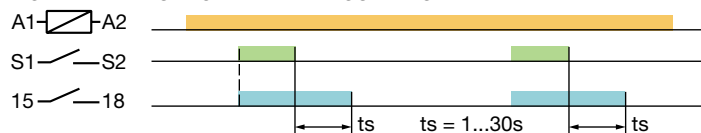


Senza tensione / De - energized

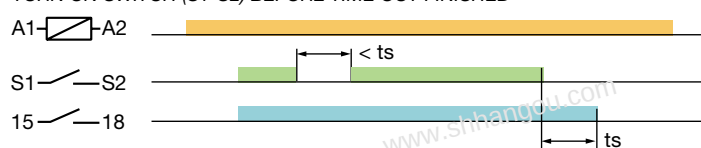
Sotto tensione / energized



INTERRUZIONE ALIMENTAZIONE DOPO IL TERMINE DEL TEMPO ts
 POWER INTERRUPTION AFTER TIMEOUT FINISHED



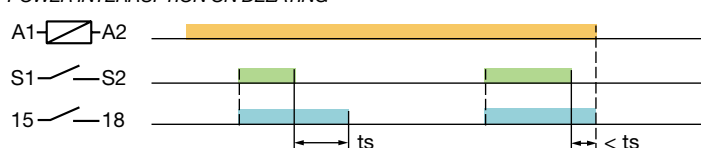
APERTURA S1 - S2 PRIMA DEL TERMINE DEL TEMPO ts
 TURN ON SWITCH (S1-S2) BEFORE TIME OUT FINISHED



INTERRUZIONE ALIMENTAZIONE DURANTE FUNZIONAMENTO TIMER
 POWER INTERRUPTION WHEN OPERATING TIMER



INTERRUZIONE ALIMENTAZIONE PRIMA DEL TERMINE DEL TEMPO ts
 POWER INTERRUPTION ON DELAYING



RICAMBI - SPARE PARTS

BOBINE / COILS



TENSIONI DI COMANDO / CONTROL VOLTAGE

24V 50-60Hz
 48V 50-60Hz
 0,07 110V 50-60Hz
 230V/240V 50-60Hz
 380V/400V 50-60Hz

12V CC basso assorbimento / low consumption
 24V CC basso assorbimento / low consumption
 0,08 48V CC basso assorbimento / low consumption
 110V CC basso assorbimento / low consumption

090B16-24
 090B16-48
 090B16-110
 090B16-220
 090B16-380

090B16-12DCL
 090B16-24DCL
 090B16-48DCL
 090B16-110DCL





Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters



CARATTERISTICHE AUSILIARI / AUXILIARY CHARACTERISTICS

60Hz (50Hz)	Assorbimento [VA] Coil consumption		Dissipazione Dissipation [W]	Campo assorbimento bobina [V] Coil operating limit		Tempo di funzionamento Operating time (ms)	
	Spunto Pick-up	Ritenuta Sealed		Attrazione Pick-up	Rilascio Drop-out	Attrazione Pick-up	Rilascio Drop-out
6	32	6	2	80 - 110%	30 - 40%	10 - 20	35 - 45
9	32	6	2	80 - 110%	30 - 40%	10 - 20	35 - 45
12	32	6	2	80 - 110%	30 - 40%	10 - 20	35 - 45
16	32	6	2	80 - 110%	30 - 40%	10 - 20	35 - 45



60Hz (50Hz)	Assorbimento [VA] Coil consumption		Dissipazione Dissipation [W]	Campo assorbimento bobina [V] Coil operating limit		Tempo di funzionamento Operating time (ms)	
	Spunto Pick-up	Ritenuta Sealed		Attrazione Pick-up	Rilascio Drop-out	Attrazione Pick-up	Rilascio Drop-out
6	1.2	1.2	1.2	80 - 125%	10 - 30%	40 - 50	35 ÷ 45
9	1.2	1.2	1.2	80 - 125%	10 - 30%	40 - 50	35 ÷ 45
12	1.2	1.2	1.2	80 - 125%	10 - 30%	40 - 50	35 ÷ 45
16	1.2	1.2	1.2	80 - 125%	10 - 30%	40 - 50	35 ÷ 45

CARATTERISTICHE ELETTRICHE AUSILIARI RELE' AUXILIARY CONTACT RELAIS ELECTRICAL CHARACTERISTICS



090R16	Ith	AC11/AC-15			DC11 / DC13	
	AC1	110V	220V	550V	110V	220V
	[A]	[A]	[A]	[A]	[A]	[A]
	16	0.3/2.5	0.3/2	0.3/1	0.28	0.14

CARATTERISTICHE ELETTRICHE AUSILIARI AUXILIARY CONTACT ELECTRICAL CHARACTERISTICS

	CORRENTE NOMINALE / <i>NOMINAL CURRENT</i>									Numero manovre/ora Operation per hour	Vita meccanica Mechanical life	Vita Elettrica Electrical life [op x 10.000]
	Ith	AC-15				DC-13						
	AC-1	120V	240V	480V	600V	125V	250V	440V	600V			
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]			
090MAF...	16	6	3	1.5	1.2	1.1	0.55	0.31	0.2	1800	1200	100
090MAL...	16	6	3	1.5	1.2	1.1	0.55	0.31	0.2	1800	1200	100

NUMERAZIONE CONTATTI AUSILIARI TERMINALS MARKING OF AUXILIARY CONTACTS

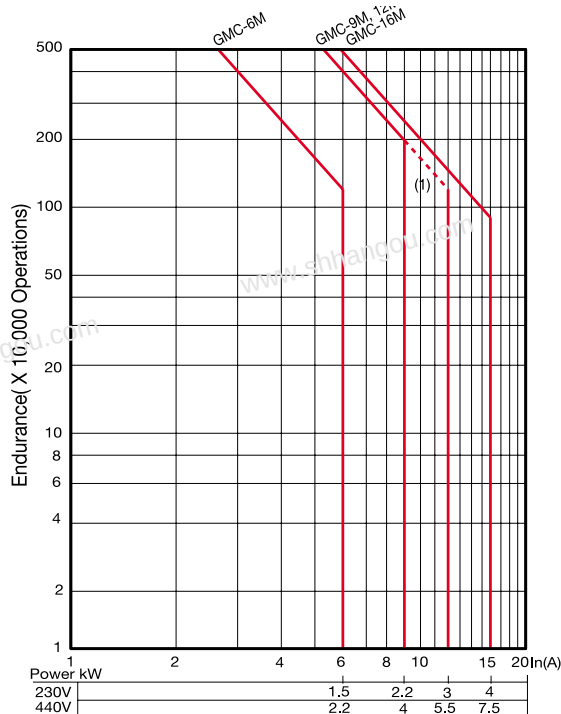
090MAF20	090MAF11	090MAF31	090MAF13	090MAL10	090MAL01
53 63 54 64	51 61 52 62	53 63 73 83 54 64 74 84	53 61 71 83 54 62 72 84	53 63 73 83 54 64 74 84	13-17 21-25 14-18 22-26
090MAF02	090AF40	090MAF22	090MAF04		



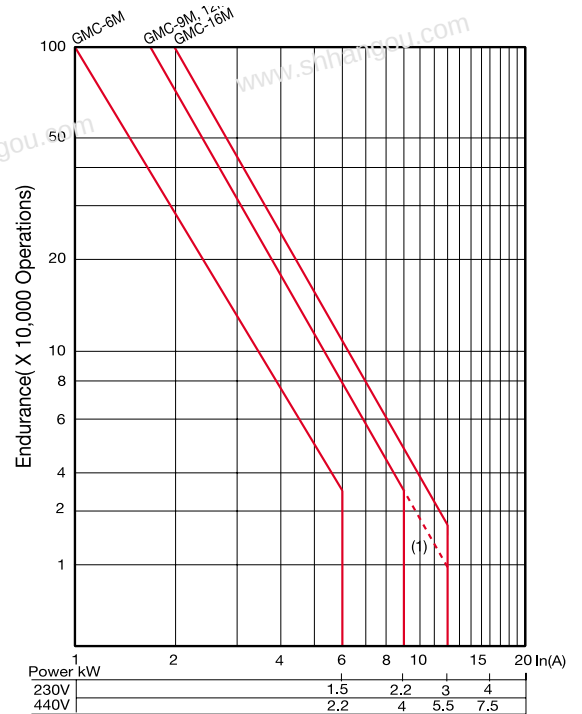
VITA ELETTRICA - ELECTRICAL LIFE TIME



AC-3 UE 380-440V



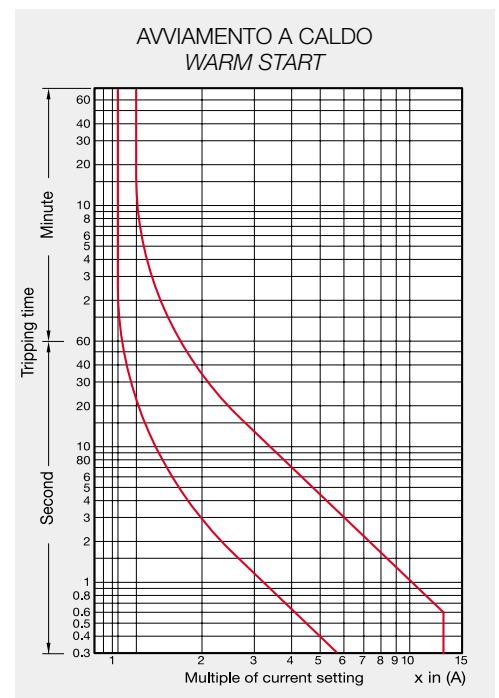
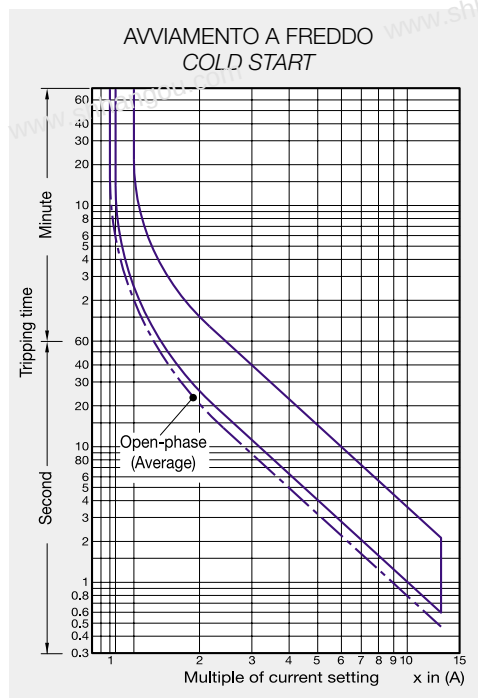
AC-4 UE 380-440V



CURVE CARATTERISTICHE RELE - RELAY CURVE CHARACTERISTICS



090MR16





Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI SECTIONS

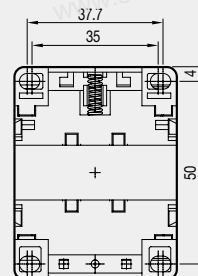
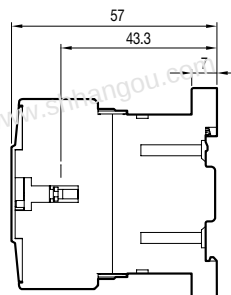
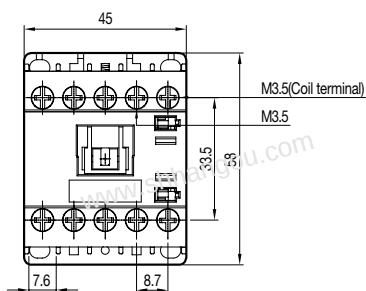
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12

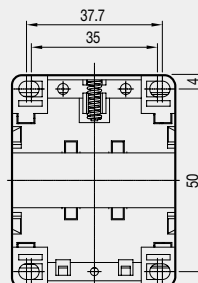
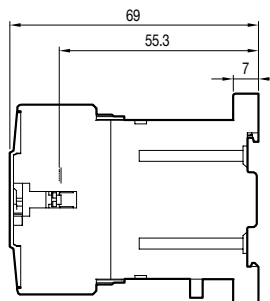
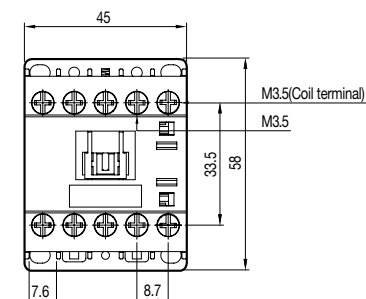
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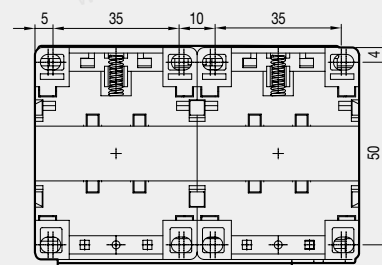
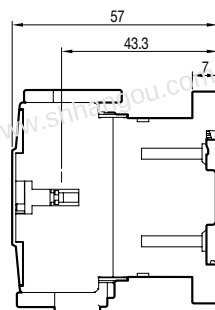
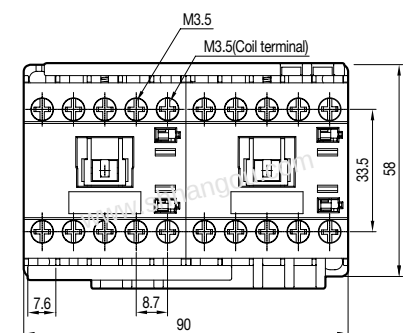
MINICONTATTORE C.A.
A.C. MINICONTACTORS



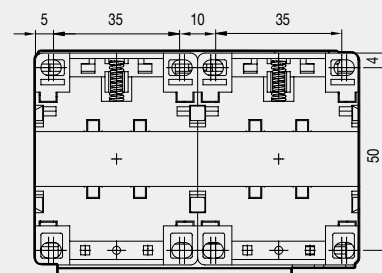
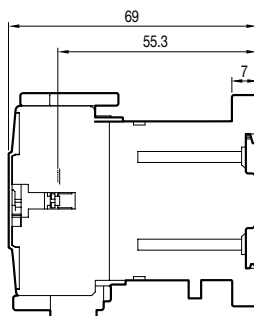
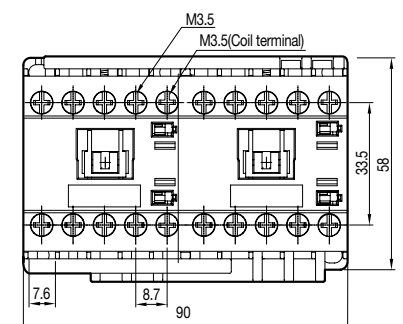
MINICONTATTORE C.C.
D.C. MINICONTACTORS



MINICONTATTORI C.A.
INTERBLOCCATI
A.C. MINICONTACTORS
INTERLOCKED



MINICONTATTORI C.C.
INTERBLOCCATI
D.C. MINICONTACTORS
INTERLOCKED





DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI
 SECTIONS

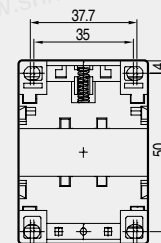
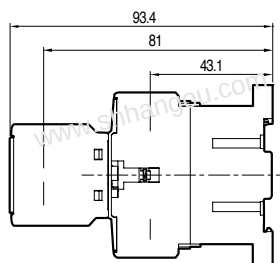
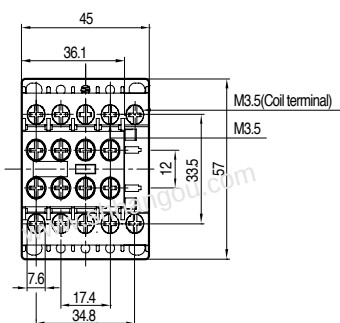
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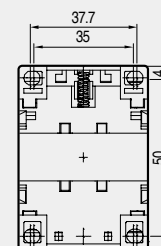
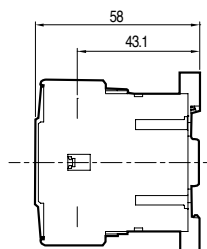
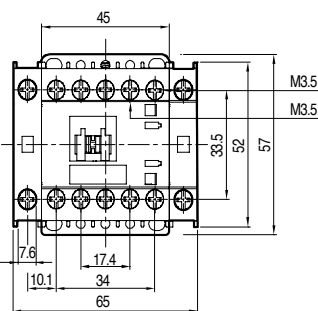
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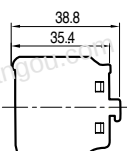
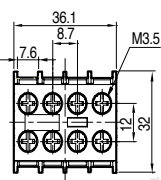
MINICONTATTORE CON
 AUSILIARIO FRONTALE
*MINI CONTACTOR WITH TOP
 MOUNTING AUX. CONTACT*



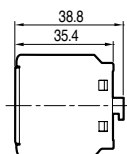
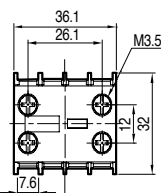
MINICONTATTORE CON
 AUSILIARIO LATERALE
*MINI CONTACTOR WITH SIDE
 MOUNTING AUX. CONTACT*



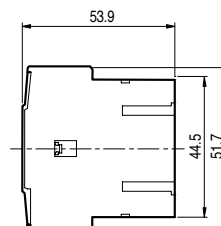
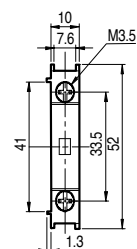
AUSILIARIO FRONTALE
 4 POLI
*TOP MOUNTING AUX.
 CONTACT (4 POLE)*



AUSILIARIO FORNTALE
 2 POLI
*TOP MOUNTING AUX.
 CONTACT (2 POLE)*



AUSILIARIO LATERALE
 TOP MOUNTING AUX.
 CONTACT (2 POLE)





Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI
SECTIONS

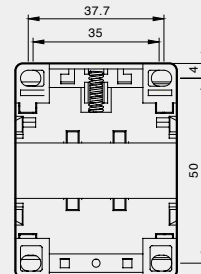
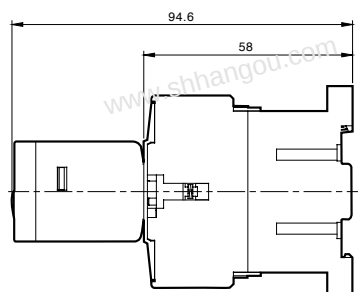
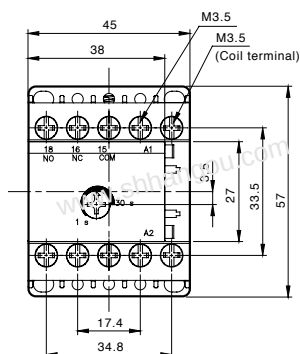
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12

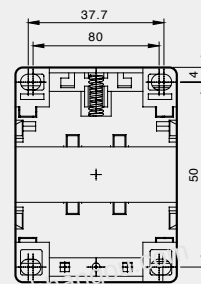
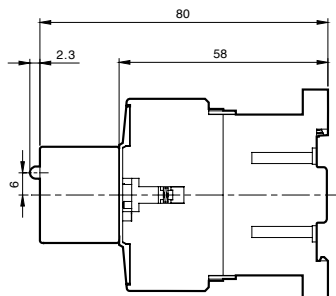
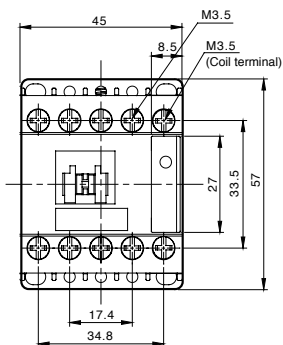
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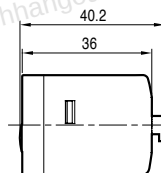
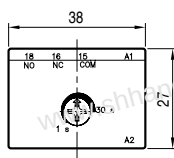
MINICONTATTORE
CON TEMPORIZZATORE
ELETTRONICO
MINI CONTACTOR WITH
ELECTRONIC TIMER



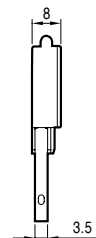
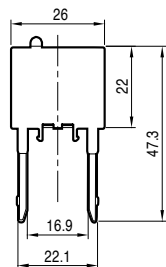
MINICONTATTORE
CON FILTRO RC
MINI CONTACTOR WITH
SURGE SUPPRESSOR
UNIT



TEMPORIZZATORE
ELETTRONICO
ELECTRONIC TIMER



FILTRO RC
SURGE SUPPRESSOR
UNIT





DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI
 SECTIONS

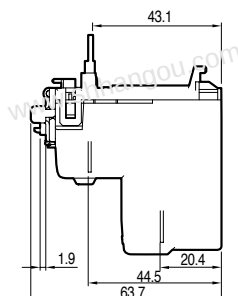
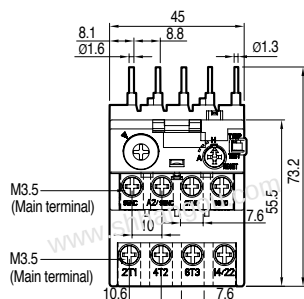
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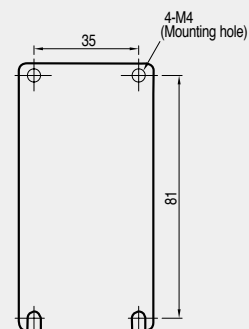
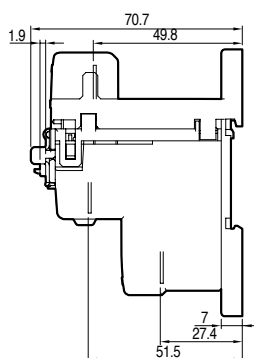
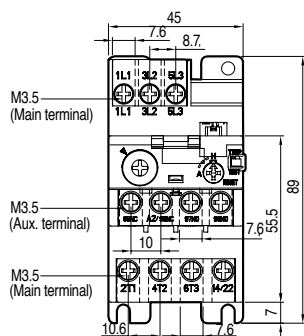
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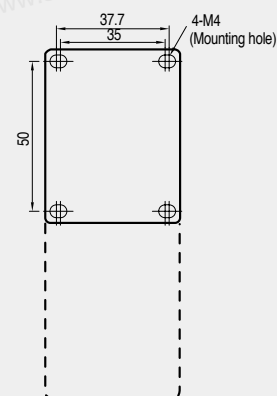
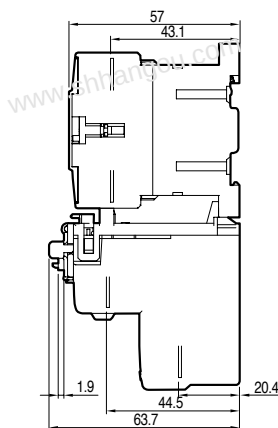
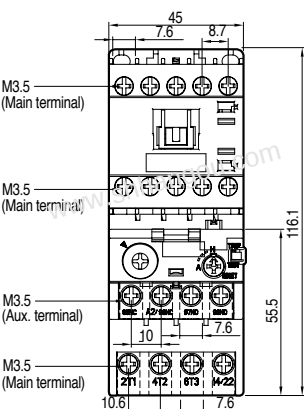
MINIRELE
 T.O.R.



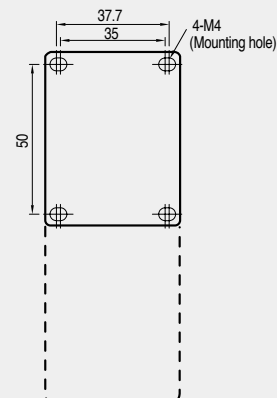
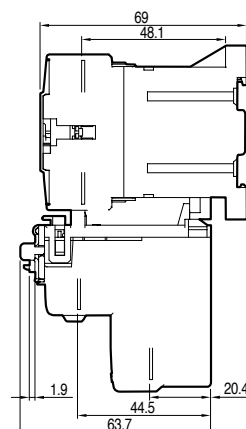
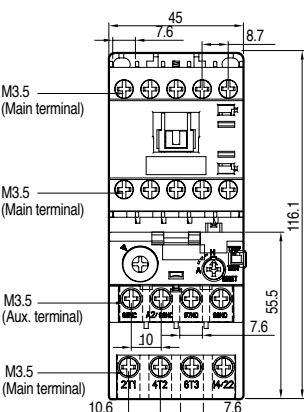
MINIRELE'
 MONTAGGIO SU
 ACCESSORIO SEPARATO
 T.O.R. WITH SEPARATE
 MOUNTING ADAPTOR



MINIRELE'
 MONTAGGIO DIRETTO
 SU MINICONTATTORE
 C.A.
 T.O.R. DIRECT
 MOUNTING ON A.C.
 MINICONTACTOR



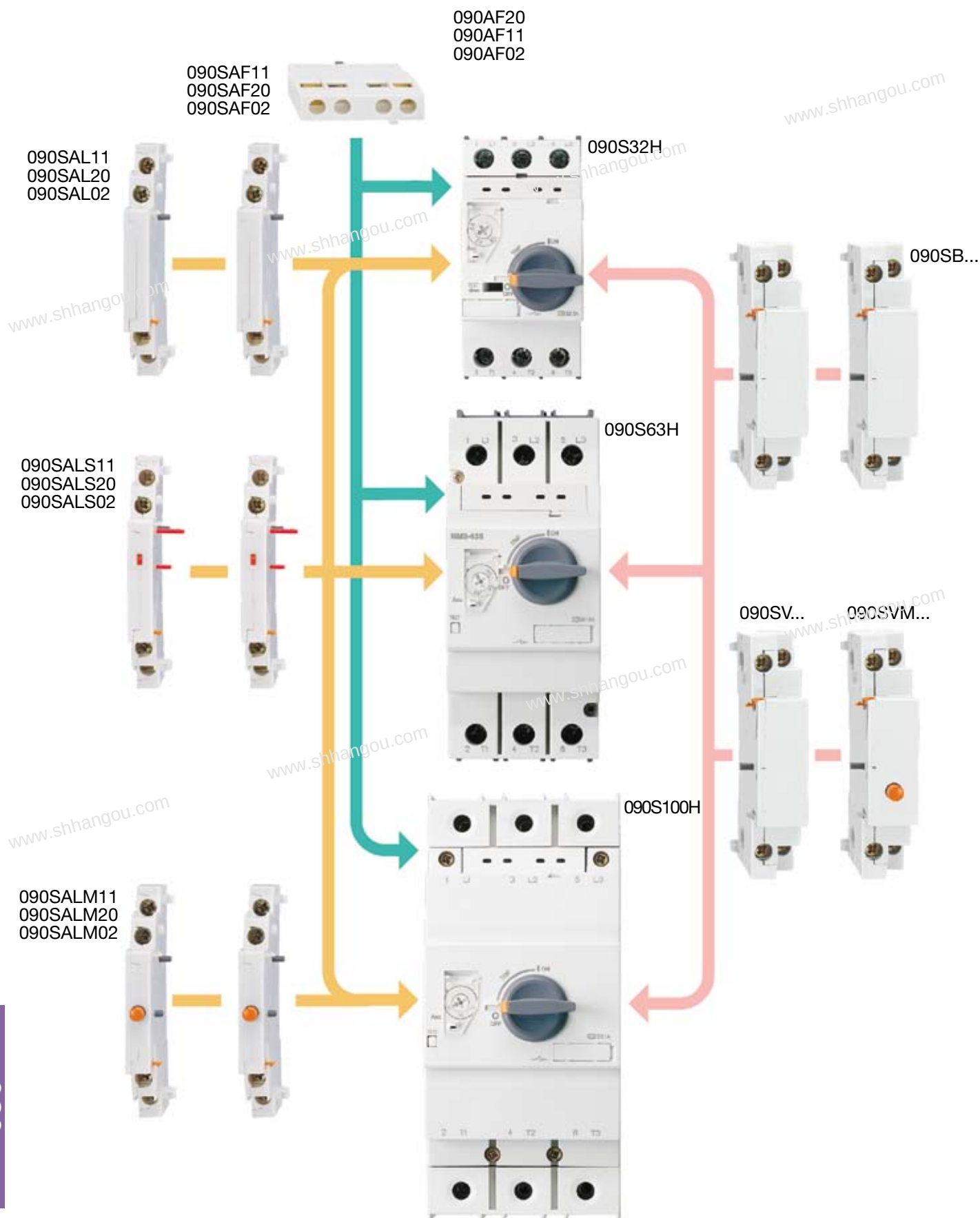
MINIRELE'
 MONTAGGIO DIRETTO
 SU MINICONTATTORE
 C.C.
 T.O.R. DIRECT
 MOUNTING ON D.C.
 MINICONTACTOR





Contattori, relè termici, minicontattori, interruttori salvamotore
Contactors, thermal o/l relays, minicontactors, manual motor starters

LAY-OUT INTERRUTTORI AUTOMATICI - MANUAL MOTOR STARTERS LAY-OUT





INTERRUTTORI AUTOMATICI SALVAMOTORE - MANUAL MOTOR STARTERS



SEZIONI
SECTIONS

32

63

100

Taratura [A]
Setting range [A]



0,36

1,00

2,20

0,1-0,16

090S32H-016

0,16-0,25

090S32H-025

0,25-0,4

090S32H-04

0,4-0,63

090S32H-063

0,63-1

090S32H-01

1-1,6

090S32H-1V6

1,6-2,5

090S32H-2V5

2,5-4

090S32H-4

4-6

090S32H-6

5-8

090S32H-8

6-10

090S32H-10

9-13

090S32H-13

11-17

090S32H-17

14-22

090S32H-22

18-26

090S32H-26

22-32

090S32H-32

28-40

34-50

45-63

55-75

70-90

80-100

100
KA

50
KA

50
KA

090S63H-40

090S63H-50

090S63H-63

100
KA

090S100H-75

090S100H-90

090S100H-100

ACCESSORI / ACCESSORIES



0,018

1NO+1NC

2NO

2NC

Contatto ausiliario frontale / Front mounting auxiliary contact

090SAF11

090SAF20

090SAF02



0,030

1NO+1NC

2NO

2NC

Contatto ausiliario laterale⁽¹⁾ / Side mounting auxiliary contact⁽¹⁾

090SAL11

090SAL20

090SAL02



0,040

1NO+1NC

2NO

2NC

Contatto ausiliario laterale di segnalazione intervento magnetico e/o termico⁽¹⁾ / Side mounting alarm contact (any trip)⁽¹⁾

090SALS11

090SALS20

090SALS02



0,040

1NO+1NC

2NO

2NC

Contatto ausiliario laterale di segnalazione intervento magnetico⁽¹⁾ / Side mounting alarm contact (magnetic trip)⁽¹⁾

090SALM11

090SALM20

090SALM02



0,110

Bobina di sgancio
a distanza⁽²⁾
Shunt release

Bobina di minima
tensione⁽²⁾
Undervoltage release

Bobina di minima tensione
con contatti ausiliari
anticipati 2NO⁽²⁾⁽³⁾
Undervoltage release
with switch with 2NO⁽²⁾⁽³⁾
advanced auxiliary
contacts

24V 50Hz / 28V 60 Hz

090SB24

090SV24

090SVA24

110...127V 50Hz / 120V 60 Hz

090SB110

090SV110

090SVA110

220...230V 50Hz / 240...260V 60 Hz

090SB230

090SV230

090SVA230

240V 50Hz / 277V 60 Hz

090SB240

090SV240

090SVA240

380...400V 50Hz / 440...480V 60 Hz

090SB400

090SV400

090SVA400

415...440V 50Hz / 460...480V 60 Hz

090SB440

090SV440

090SVA440

(1) Montaggio a sinistra

(2) Montaggio a destra

(3) Montaggio solo su interruttore con manopola rotativa

(1) Side mounting on the left

(2) Side mounting on the right

(3) Mounting only rotary handle



Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

INTERRUTTORI AUTOMATICI / MANUAL MOTOR STARTERS CARATTERISTICHE GENERALI / GENERAL CHARACTERISTICS



INTERVENTO TERMICO REGOLABILE
INTERVENTO MAGNETICO $13 \times I_n$ max
CLASSE D'INTERVENTO 10
COMPENSAZIONE TEMPERATURA AMBIENTE
FUNZIONI DI PROTEZIONE:
- Mancanza fase
- Corto circuito
- Sovraccarico

ADJUSTABLE THERMAL RELEASE
MAGNETIC RELEASE $13 \times I_n$ max
TRIP CLASS 10
AMBIENT TEMPERATURE COMPENSATION
PROTECTIVE FUNCTIONS:
- Phase failure
- Short circuit
- Overload

CERTIFICAZIONE
CERTIFICATIONS

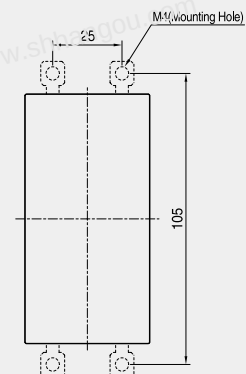
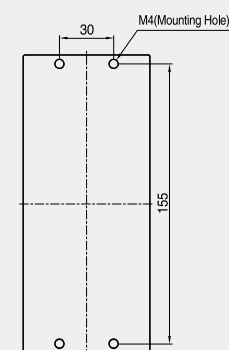
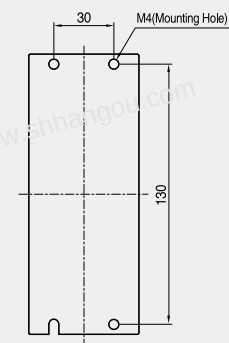


NUMERO DI POLI
TENSIONE NOMINALE (U_n)
FREQUENZA NOMINALE
TENSIONE NOMINALE DI ISOLAMENTO
CATEGORIA D'IMPIEGO
DURATA MECCANICA
DURATA ELETTRICA
NUMERO MANOVRE ORA
COMPENSAZIONE TEMPERATURA
SGANCIO ISTANTANEO PER CORTO CIRCUITO

NUMBER OF POLES
RATED VOLTAGE (U_n)
RATED FREQUENCY
RATED INSULATION VOLTAGE
UTILIZATION CATEGORY
MECHANICAL ENDURANCE
ELECTRICAL ENDURANCE
MAX OPERATING FREQUENCY
TEMPERATURE COMPENSATION
INSTANTANEOUS SHORT CIRCUIT RELEASE

3
fino a / up to 690V
50/60 Hz
 U_n 690V / U_{imp} 6kV
IEC 60947-2 (interruttore - breaker): CAT.A
IEC 60947-4 (avviatore - motor starter): AC3
S32H 100.000 oper. / S63H - S100H 50.000 oper.
S32H 100.000 oper. / S63H - S100H 25.000 oper.
25 oper./hour
 $-20 \div +60$ °C
 $13 \times I_n$

Type	Rated operational current I _e [A]	Thermal release adjustment range [A]	Magnetic release operating current [A]	Switching of 3 phase AC motors, AC-2, AC-3						400/415V	
				3-phase [kW] (50/60Hz)			3-phase [HP] (60Hz)				
				230V	400V	690V	230V	460V	575V	I _{cu} [kA]	I _{cs} [kA]
090S32H	0.16	0.1...0.16	2.1	-	0.02	-	-	-	-	100	100
	0.25	0.16...0.25	3.3	0.03	0.06	-	-	-	-	100	100
	0.4	0.25...0.4	5.2	0.06	0.09	-	-	-	-	100	100
	0.63	0.4...0.63	8.2	0.09	0.12	0.25	-	-	-	100	100
	1	0.63...1.0	13	0.12	0.25	0.55	-	1/2	1/2	100	100
	1.6	1.0...1.6	20.8	0.25	0.55	1.1	1/3	3/4	1	100	100
	2.5	1.6...2.5	32.5	0.37	0.75	1.5	1/2	1½	1½	100	100
	4	2.5...4.0	52	0.75	1.5	3	1	2	3	100	100
	6	4...6	78	1.5	2.2	4	1½	5	5	100	100
	8	5...8	104	1.5	3	5.5	2	5	5	100	100
	10	6...10	130	3	4	7.5	3	7½	10	100	100
	13	9...13	169	3	5.5	11	3	7½	10	100	100
	17	11...17	221	4	7.5	11	5	10	15	50	38
	22	14...22	286	4	7.5	15	7½	15	20	50	38
	26	18...26	338	5.5	11	18.5	7½	15	20	50	38
32	22...32	416	7.5	15	22	10	20	30	50	38	
40	28~40	520	7.5	18.5	30	15	30	40	40	30	
090S63H	10	6~10	130	3	4	7.5	3	7½	10	100	100
	13	9~13	169	3	5.5	11	3	7½	10	100	100
	17	11~17	221	4	7.5	11	5	10	15	50	50
	22	14~22	286	4	7.5	15	7½	15	20	50	50
	26	18~26	338	5.5	11	18.5	10	20	25	50	50
	32	22~32	416	7.5	15	22	10	25	30	50	50
	40	28~40	520	7.5	18.5	30	15	30	40	50	50
	50	34~50	650	11	22	45	15	40	50	50	50
	63	45~63	819	15	30	55	20	50	60	50	50
65	47~65	845	15	30	55	20	50	60	35	27	
090S100H	17	11~17	221	4	7.5	11	5	10	15	100	100
	22	14~22	286	4	7.5	15	7½	15	20	100	50
	26	18~26	338	5.5	11	18.5	10	20	25	100	50
	32	22~32	416	7.5	15	22	10	25	30	100	50
	40	28~40	520	7.5	18.5	30	15	30	40	100	50
	50	34~50	650	11	22	45	15	40	50	100	50
	63	45~63	819	15	30	55	20	50	60	100	50
	75	55~75	975	22	37	63	25	60	75	75	50
	90	70~90	1170	30	45	75	30	75	100	75	50
100	80~100	1300	30	45	90	40	75	100	75	50	

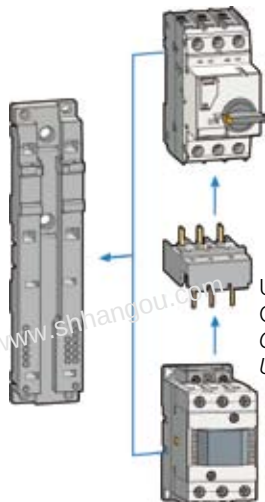
[illegible]



Contattori, relè termici, minicontattori, interruttori salvamotore
Contactors, thermal o/l relays, minicontactors, manual motor starters

COMBINAZIONE DI INTERRUTTORE AUTOMATICO E CONTATTORE COMBINATION MANUAL MOTOR STARTERS AND CONTACTORS

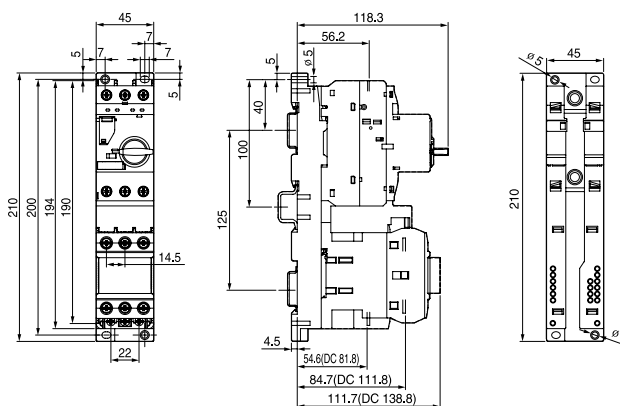
UNITA' DI FISSAGGIO
 MOUNTING UNIT



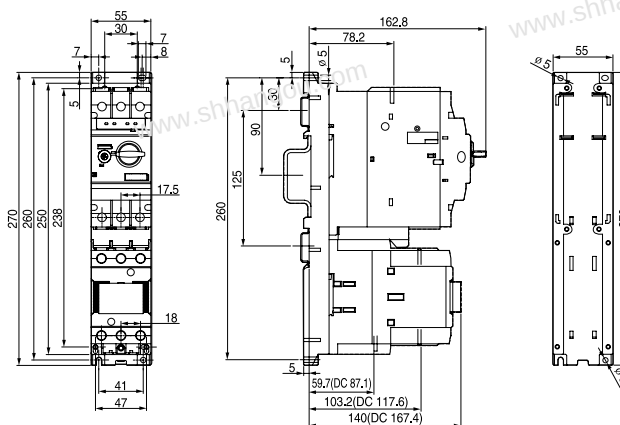
UNITA' DI
 GIUNZIONE
 CONNECTION
 UNIT

kg	UNITA' DI GIUNZIONE CONNECTION UNIT	UNITA' DI FISSAGGIO MOUNTING UNIT	INTERRUTTORE MOTOR STARTER	CONTATTORE CONTACTOR
1	090DA-16HA	090MU-45	090S32H	090M3C6 ÷ 090M3C16
1	090DA-16HD	090MU-45	090S32H	090M3C6DC ÷ 090M3C16DC
1,2	090DA-22HA	090MU-45	090S32H	090MC9B ÷ 090MC22B
1,2	090DA-32HA	090MU-45	090S32H	090MC32A ÷ 090MC40A
2,3	090DA-63A	090MU-55	090S63H	090MC65A
4,6	090DA-95A	090MU-70	090S100H	090MC85A ÷ 090MC100A

090S32H
 +
 090MC40A



090S63H
 +
 090MC65A



090S100H
 +
 090MC100A

