



Contattori **Contactors**

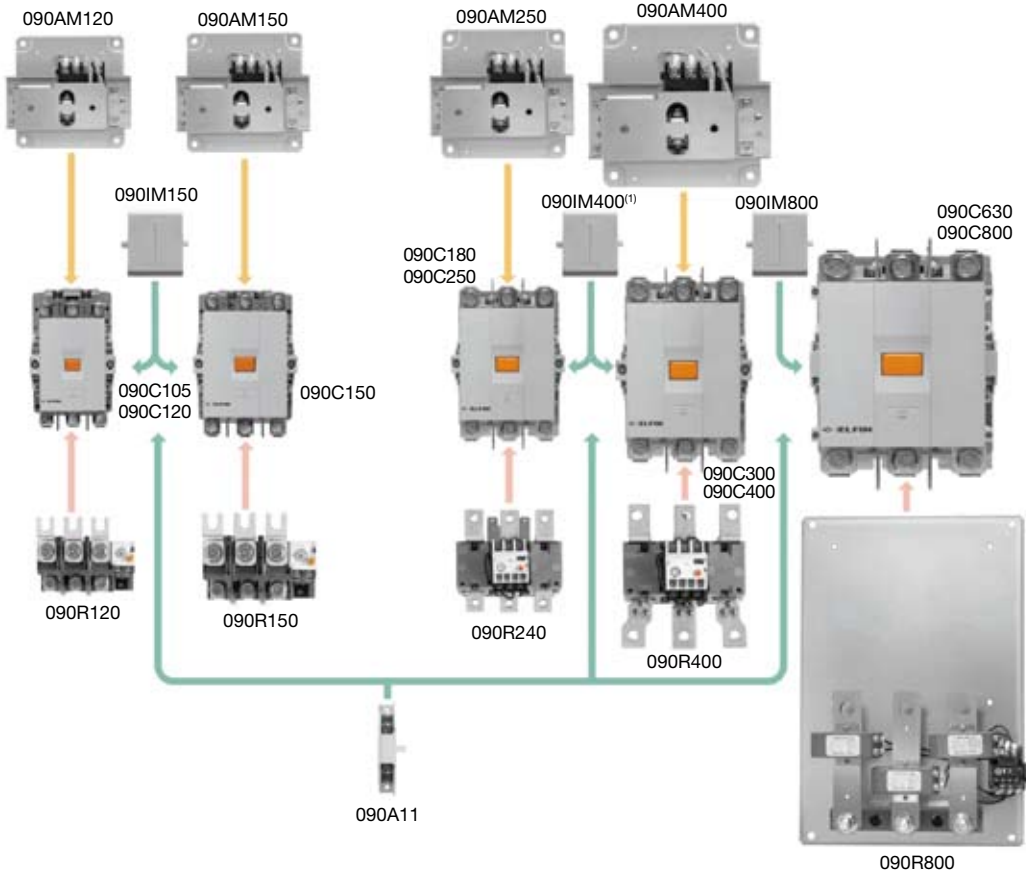


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LAY-OUT SERIE XLARGE, XXLARGE - XLARGE, XXLARGE SERIES LAY-OUT



1) Utilizzo a parità di dimensioni

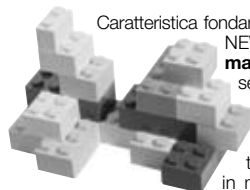


Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters



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

*The installation of contactors and the replacement of the coil are very easy and do not require **special tools**.*



Caratteristica fondamentale dei contattori NEW ELFIN è la **estrema modularità**; infatti le serie SMALL, MEDIUM e LARGE hanno gli accessori in comune; tutto ciò permette di gestire il lavoro in modo più funzionale costi al contrario di quanto

e ottimizzare i

l'offerta del mercato può mantenere.

*A fundamental characteristic of NEW ELFIN contactors is their **exceptional modularity**. The SMALL, MEDIUM and LARGE series all have the same accessories. This allows to work in a more functional way and optimise costs, unlike the products offered by our competitors.*



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

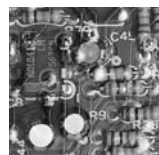
*Thanks to the very compact **dimensions***

of NEW ELFIN contactors, the 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.*



A dimostrazione di una evoluzione tecnologica spinta a superare l'offerta della concorrenza, i contattori delle serie X LARGE e XX LARGE hanno la **bobina elettronica CA/CC**.

*Technological evolution aimed at exceeding the products offered by our competitors is clear in the contactors of the X LARGE and XX LARGE series, which are fitted with an **AC/DC electronic coil**.*

A parità di serie i relè hanno un **prezzo** comune per favorire una più snella gestione degli acquisti. Una opportunità da non sottovalutare 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.*



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.*





MANUALE PER UNA CORRETTA INSTALLAZIONE - ASSEMBLY DIAGRAMS

AUSILIARI FRONTALI E LATERALI / TOP AND SIDE MOUNTING AUXILIARY CONTACTS



AGGANCIO MECCANICO / MECHANICAL LATCH



AGGANCIO UNITA' TEMPORIZZATA
PNEUMATIC TIMER

AGGANCIO RELE' SU STAFFA / RELAY FIXING ON SEPARATE MOUNTING SYSTEM

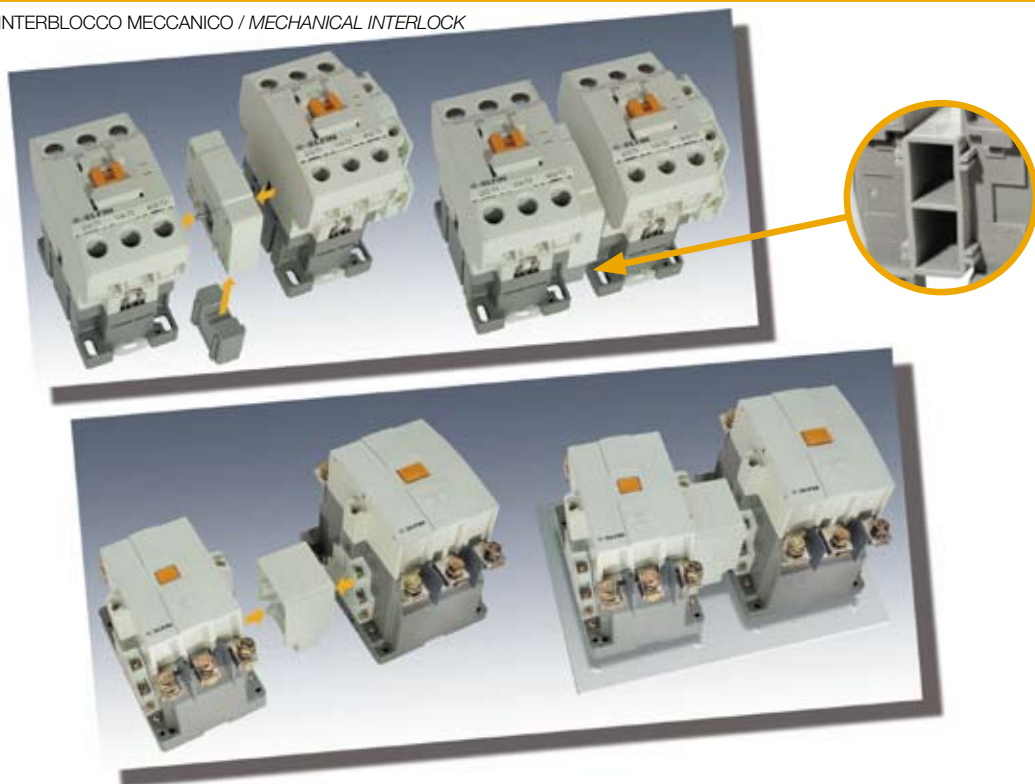




Contattori, relè termici, minicontattori, interruttori salvamotore
Contactors, thermal o/l relays, minicontactors, manual motor starters

MANUALE PER UNA CORRETTA INSTALLAZIONE - ASSEMBLY DIAGRAMS

INTERBLOCCO MECCANICO / MECHANICAL INTERLOCK



CONTATTI ED AGGANCIO RELE' / CONTACTS AND RELAY FIXING





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



Contattori, relè termici. minicontattori, interruttori salvamotore

Contactors, thermal o/l relays, minicontactors, manual motor starters

INTRODUCTION

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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		

SWITCHING ELEMENTS UTILIZATION CATEGORIES

AC-12	Control of resistive loads and solid state loads with isolation by opto couplers	DC-12	Control of resistive loads isolation by opto couplers
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)		

CATEGORIE D'IMPIEGO / UTILIZATION CATEGORIES

POTERI DI INSERZIONE 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 In	1,5 x In	1 x In	1 x In
AC-2	4 x In	4 x In	2 x In	2 x In
AC-3	10 x In	8 x In	2 x In	2 x In
AC-4	12 x In	10 x In	6 x In	6 x In
AC-5a	3 x In	3 x In	2 x In	2 x In
AC-5b	1,5 x In	1,5 x In	1 x In	1 x In
AC-6a	-	-	-	-
AC-6b	-	-	-	-
DC-1	1,5 x In	1,5 x In	1 x In	1 x In
DC-3	4 x In	4 x In	2,5 x In	2,5 x In
DC-5	4 x In	4 x In	2,5 x In	2,5 x In



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			
	(Ith)			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]	[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	18	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		



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

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 20xnom 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	48	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 20xnom 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 contattore = 20A * 2.2 = 44A / 090C32 with 50A AC-1

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 Inom 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 inom. in AC 1 and taking into account that the bre@aking capacity must be $\geq$ than the making current.

Corrente d'impiego / Rated operational current le [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 x In 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 In circuito
The connection of transformers is distinguished by a start peak which can reach 30 x In. 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

	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 addizionale 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 $\cos\phi$ 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

	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		



CATEGORIE D'IMPIEGO / UTILIZATION CATEGORIES

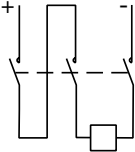


DC-1

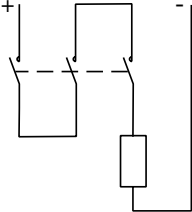


DC-3 - DC-5

2 POLI IN SERIE
2 POLES IN SERIES



3 POLI IN SERIE
3 POLES IN SERIES



		N. poli in serie N. 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			
			24V	48V	110V	220V	24V	48V	110V	220V
9	2	2	10	10	6	3	8	4	2.5	0.8
9	3	3	10	10	8	8	8	6	4	2
12	2	2	12	12	10	7	12	6	4	1.2
12	3	3	12	12	12	12	12	10	8	4
18	2	2	18	18	13	8	12	6	4	1.2
18	3	3	18	18	18	18	12	10	8	4
22	2	2	20	20	15	10	20	15	8	2
22	3	3	20	20	20	20	20	20	15	8
32	2	2	25	25	25	12	25	20	10	3
32	3	3	25	25	25	22	25	25	20	10
40	2	2	35	35	25	12	35	20	10	3
40	3	3	35	35	35	30	35	30	20	10
50	2	2	50	40	35	15	45	25	15	3.5
50	3	3	50	50	50	40	50	35	30	12
65	2	2	50	40	35	15	45	25	15	3.5
65	3	3	65	65	65	50	50	35	30	12
75	2	2	75	65	50	20	65	40	20	5
75	3	3	75	75	75	55	80	60	50	20
85	2	2	80	65	50	20	65	40	20	5
85	3	3	80	80	80	60	80	60	50	20
100	2	2	100	100	80	50	100	60	40	30
100	3	3	100	100	100	80	100	90	80	50
125	2	2	120	100	80	50	120	60	40	30
125	3	3	120	120	100	80	120	90	80	50
150	2	2	150	150	150	150	150	130	120	80
150	3	3	80	80	80	60	80	60	50	20
180	2	2	180	180	150	150	180	150	120	80
180	3	3	180	180	180	180	180	180	150	100
220	2	2	220	180	150	150	220	150	120	80
220	3	3	220	220	220	220	220	220	150	100
300	2	2	300	240	200	200	300	200	150	90
300	3	3	300	300	300	300	300	280	200	150
400	2	2	400	240	200	200	400	200	150	90
400	3	3	400	400	400	300	400	280	200	150
600	2	2	630	630	630	630	630	630	630	630
600	3	3	630	630	630	630	630	630	630	630
800	2	2	800	800	630	630	800	630	630	630
800	3	3	800	800	800	800	800	630	630	630

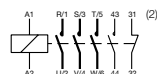


Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

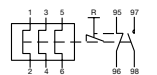
Serie / Series SMALL



CONTATTORE / CONTACTOR²⁾



RELE' TERMICO DIFFERENZIALE
THERMAL O/L RELAY



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 CONTROL VOLTAGE

0,33

0,33

0,37

0,37

24V - 50/60 Hz

090C9-24

090C12-24

090C18-24

090C22-24

48V - 50/60 Hz

090C9-48

090C12-48

090C18-48

090C22-48

110V - 50/60 Hz

090C9-110

090C12-110

090C18-110

090C22-110

230V - 50/60 Hz

090C9-230

090C12-230

090C18-230

090C22-230

400V - 50/60 Hz

090C9-400

090C12-400

090C18-400

090C22-400

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

AC1

20A

20A

25A

32A

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

22 A

690V

4 kW

5 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

20A

25A

30A

32A

Monofase

115V

0,5 HP

0,5 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 HP

Tri-phase

230V

3 HP

3 HP

5 HP

7,5 HP

460V

5 HP

7,5 HP

10 HP

10 HP

575V

7,5 HP

10 HP

15 HP

15 HP

RELE' / RELAY



TARATURA / SETTING RANGE (A)

TARATURA / SETTING RANGE (A)

0,11

0.1 ... 0.16

090R22-016

2.5 ... 4

090R22-4

0.16 ... 0.25

090R22-025

4 ... 6

090R22-6

0.25 ... 0.4

090R22-04

5 ... 8

090R22-8

0.4 ... 0.63

090R22-063

6 ... 9

090R22-9

0.63 ... 1

090R22-1

7 ... 10

090R22-10

1 ... 1.6

090R22-1V6

9 ... 13

090R22-13

1.6 ... 2.5

090R22-2V5

12 ... 18

090R22-18

16 ... 22

090R22-22



44

Adattatore montaggio barra DIN 35
Bar mounting adapter DIN 35

090DINS

CONTATTI AUSILIARI / AUXILIARY CONTACTS



33

1NO+1NC

33

090AL11



23

2NO

2NC

1NO+1NC

23

090AF20

090AF02

090AF11



50

4NO

4NC

3NO+1NC

1NO+3NC

2NO+2NC

50

090AF40

090AF04

090AF31

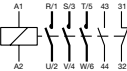
090AF13

090AF22

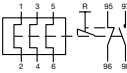
1) Potenza nominale massima - 2) Contatto ausiliario 1NO + 1NC integrato nel contattore
1) Maximum nominal power - 2) Auxiliary contact 1NO - 1NC integrated in the contactor



CONTATTORE / CONTACTOR²⁾



RELE' TERMICO DIFFERENZIALE
THERMAL O/L RELAY



SISTEMA MONTAGGIO SEPARATO
SEPARATE MOUNTING SYSTEM



CONTATTO LATERALE
SIDE MOUNTING CONTACT
BLOCK



CONTATTI FRONTALI
TOP MOUNTING
CONTACT BLOCK

SEZIONI / SECTIONS

32

40

TENSIONI DI COMANDO 
CONTROL VOLTAGE

38

38

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

090C32-24
090C32-48
090C32-110
090C32-230
090C32-400

090C40-24
090C40-48
090C40-110
090C40-230
090C40-400

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

AC1

50A

60A

AC3 200-240V
380-440V
500-550V
690V

7.5 kW 32 A
15 kW 32 A
18.5 kW 28 A
18.5 kW 20 A

11 kW 40 A
18.5 kW 40 A
22 kW 32 A
22 kW 23 A

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

lth

45A

50A

Monofase 115V
Mono-phase 230V

2 HP
5 HP

3 HP
5 HP

Trifase 200V
Tri-phase 230V
460V
575V

7.5 HP
10 HP
20 HP
20 HP

10 HP
10 HP
25 HP
25 HP

RELE' / RELAY



TARATURA / SETTING RANGE (A)

0,17 18 ... 26
24 ... 36
28 ... 40

090R40-26
090R40-36
090R40-40



72 Adattatore montaggio barra DIN 35
Bar mounting adapter DIN 35

090DINM

CONTATTI AUSILIARI / AUXILIARY CONTACTS



1NO+1NC

33

090AL11



2NO

2NC

1NO+1NC

23

090AF20

090AF02

090AF11



4NO

4NC

3NO+1NC

1NO+3NC

2NO+2NC

50

090AF40

090AF04

090AF31

090AF13

090AF22

1) Potenza nominale massima
1) Maximum nominal power



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

Serie / Series LARGE



SEZIONI / SECTIONS

TENSIONI DI COMANDO  CONTROL VOLTAGE

	50	65	75	85
24V - 50/60 Hz	090C50-24	090C65-24	090C75-24	090C85-24
48V - 50/60 Hz	090C50-48	090C65-48	090C75-48	090C85-48
110V - 50/60 Hz	090C50-110	090C65-110	090C75-110	090C85-110
230V - 50/60 Hz	090C50-230	090C65-230	090C75-230	090C85-230
400V - 50/60 Hz	090C50-400	090C65-400	090C75-400	090C85-400

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

AC1	80A	100A	110A	135A
AC3 200~240V	15 kW 55 A	18.5 kW 65 A	22 kW 75 A	25 kW 85 A
380~440V	22 kW 50 A	30 kW 65 A	37 kW 75 A	45 kW 85 A
500~550V	30 kW 43 A	33 kW 60 A	45 kW 64 A	45 kW 75 A
690V	30 kW 28 A	33 kW 35 A	45 kW 47 A	45 kW 52 A

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

lth	70A	80A	90A	100A
Monofase 115V	3 HP	5 HP	5 HP	7.5 HP
Mono-phase 230V	7.5 HP	10 HP	15 HP	15 HP
Trifase 200V	10 HP	15 HP	20 HP	25 HP
Tri-phase 230V	15 HP	20 HP	25 HP	30 HP
460V	30 HP	40 HP	50 HP	50 HP
575V	30 HP	40 HP	50 HP	50 HP

RELE' / RELAY

 TARATURA / SETTING RANGE (A)

0,3	34 ... 50	090R85-50
	45 ... 65	090R85-65
	54 ... 75	090R85-75
	63 ... 85	090R85-85



144 Adattatore montaggio barra DIN 35
Bar mounting adapter DIN 35

090DINL

CONTATTI AUSILIARI / AUXILIARY CONTACTS

 1NO+1NC
33 **090AL11**

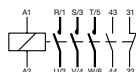
 2NO 2NC 1NO+1NC
23 **090AF20 090AF02 090AF11**

 4NO 4NC 3NO+1NC 1NO+3NC 2NO+2NC
50 **090AF40 090AF04 090AF31 090AF13 090AF22**

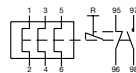
1) Potenza nominale massima - 1) Maximum nominal power



CONTATTORE / CONTACTOR



RELE' TERMICO DIFFERENZIALE
THERMAL O/L RELAY



SISTEMA MONTAGGIO SEPARATO
SEPARATE MOUNTING SYSTEM



CONTATTO LATERALE
SIDE MOUNTING CONTACT
BLOCK



CONTATTI FRONTALI
TOP MOUNTING
CONTACT BLOCK



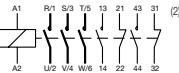
Serie / Series X LARGE



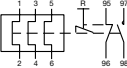
CONTATTORE / CONTACTOR²⁾



CONTATTORE / CONTACTOR²⁾



RELE' TERMICO DIFFERENZIALE²⁾
THERMAL O/L RELAY



SEZIONI / SECTIONS

TENSIONI DI COMANDO
CONTROL VOLTAGE



105

120

24V - 50/60 Hz 24VCC
48V - 50/60 Hz 48VCC
110-240V - 50/60 Hz 100-220VCC
380-450V - 50/60 Hz

090C105-24 090C120-24
090C105-48 090C120-48
090C105-100 090C120-100
090C105-400 090C120-400

150

TENSIONI DI COMANDO
CONTROL VOLTAGE



3,4

24V - 50/60 Hz 24VCC
48V - 50/60 Hz 48VCC
110-240V - 50/60 Hz 100-220VCC
380-450V - 50/60 Hz

090C150-24
090C150-48
090C150-100
090C150-400

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

AC1	150A	150A	200A
AC3 200~240V	30 kW	105 A	37 kW 125 A
380~440V	55 kW	105 A	60 kW 120 A
500~550V	55 kW	85 A	60 kW 90 A
690V	55 kW	65 A	60 kW 70 A

PRESTAZIONI SECONDO UL/CSA / PERFORMANCE IN ACCORDANCE WITH UL/CSA¹⁾

lth	160A	160A	210A
Monofase 115V	7.5 HP	10 HP	15 HP
Mono-phase 230V	15 HP	20 HP	25 HP
Trifase 200V	30 HP	40 HP	40 HP
Tri-phase 230V	30 HP	40 HP	50 HP
460V	60 HP	75 HP	100 HP
575V	60 HP	75 HP	100 HP

RELE' / RELAY



TARATURA / SETTING RANGE (A)

0,49 65 ... 100
85 ... 125

090R125-100
090R125-125

RELE' / RELAY



TARATURA / SETTING RANGE (A)

0,6 100 ... 150

090R150-150

CONTATTI AUSILIARI / AUXILIARY CONTACTS



1NO+1NC

45 090A11

1) Potenza nominale massima
2) Completo di n. 2 090A11
3) Possibilità di montaggio a parete

1) Maximum nominal power
2) Complete with n. 2 090A11
3) Possibility for wall mounting



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

Serie / Series XX LARGE



SEZIONI / SECTIONS

180

250

TENSIONI DI COMANDO  CONTROL VOLTAGE

5,4

5,4

24V - 50/60 Hz 24VCC

090C180-24

090C250-24

48V - 50/60 Hz 48VCC

090C180-48

090C250-48

110-240V - 50/60 Hz 100-220VCC

090C180-100

090C250-100

380-450V - 50/60 Hz

090C180-400

090C250-400

300

400

TENSIONI DI COMANDO  CONTROL VOLTAGE

9,2

9,2

110-240V- 50/60 Hz 100-220VCC

090C300-100

090C400-100

380-450V- 50/60 Hz

090C300-400

090C400-400

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

AC1	230A	260A	350A	420A
AC3 200-240V	55 kW 180A	75 kW 250A	90 kW 300A	125 kW 400A
380-440V	90 kW 180A	132 kW 250A	160 kW 300A	220 kW 400A
500-550V	110 kW 180A	132 kW 200A	160 kW 250A	225 kW 350A
690V	110 kW 120A	132 kW 150A	200 kW 220A	250 kW 300A

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

lth	230A	275A	350A	450A
Monofase 115V	15 HP	15 HP		
Mono-phase 230V	30 HP	40 HP		
Trifase 200V	60 HP	60 HP	100 HP	125 H
Tri-phase 230V	60 HP	75 HP	100 HP	150 HP
460V	125 HP	150 HP	200 HP	300 HP
575V	125 HP	150 HP	200 HP	300 HP



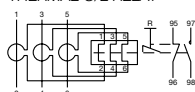
CONTATTORE / CONTACTOR



CONTATTORE / CONTACTOR



RELE' TERMICO DIFFERENZIALE
THERMAL O/L RELAY



RELE' / RELAY

180

250

 TARATURA / SETTING RANGE (A)

2,5 120 ... 180
160 ... 240

090R240-180
090R240-240

RELE' / RELAY

300

400

 TARATURA / SETTING RANGE (A)

2,6 220 ... 300
260 ... 400

090R400-300
090R400-400

CONTATTI AUSILIARI / AUXILIARY CONTACTS

 1NO+1NC

45 090A11

- 1) Potenza nominale massima
2) Completo di n. 2 090A11
3) Possibilità di montaggio a parete

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



Serie / Series XX LARGE



SEZIONI / SECTIONS

630

TENSIONI DI COMANDO CONTROL VOLTAGE ^{kg}	22,45	22,45
100-127V - 50/60 Hz	090C630-100	090C800-100
200-240V - 50/60 Hz	090C630-200	090C800-200
380-450V - 50/60 Hz	090C630-400	090C800-400

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

AC1	660A	800A
AC3 200~240V	190 kW 630A	220 kW 800A
380~440V	330 kW 630A	440 kW 800A
500~550V	330 kW 500A	500 kW 720A
690V	330 kW 420A	500 kW 630A

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

Ith	660A	900A
Trifase 200V	150 HP	250 HP
230V	200 HP	300 HP
460V	400 HP	600 HP
575V	400 HP	600 HP

RELE' / RELAY

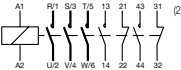
^{kg}	TARATURA / SETTING RANGE (A)	
5,5	400 ... 600	090R800-600
	520 ... 800	090R800-800

CONTATTI AUSILIARI / AUXILIARY CONTACTS

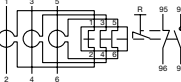
^{gf}	1NO+1NC
45	090A11



CONTATTORE / CONTACTOR



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



1) Potenza nominale massima
2) Completo di n. 2 090A11
3) Possibilità di montaggio a parete

1) Maximum nominal power
2) Complete with n. 2 090A11
3) Possibility for wall mounting



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 50 65 75 85**

										
33	1NO+1NC									090AL11
										
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 **105 120 150 180 250 300 400 630 800**

										
45	1NO+1NC									090A11



INTERBLOCCO MECCANICO / MECHANICAL INTERLOCK

SEZIONI / SECTIONS **9 12 18 22 32 40 50 65 75 85**

										
30										090IM85

SEZIONI / SECTIONS **105 120 150**

										
90										090IM150

SEZIONI / SECTIONS **180 250 300 400**

										
90										090IM400

SEZIONI / SECTIONS **630 800**

										
90										090IM800



LATERALE
SIDE MOUNTING



FRONTALE
TOP MOUNTING



FRONTALE
TOP MOUNTING



LATERALE
SIDE MOUNTING



INTERBLOCCO
MECCANICO CON
ACCESSORIO¹⁾
MECHANICAL
INTERLOCK
WITH ACCESSORY¹⁾



INTERBLOCCO MECCANICO
MECHANICAL INTERLOCK



INTERBLOCCO MECCANICO
MECHANICAL INTERLOCK



INTERBLOCCO MECCANICO
MECHANICAL INTERLOCK

¹⁾ Accessorio che permette il montaggio affiancato dei contattori in modo saldo e sicuro
¹⁾ Accessory which enables the flanked mounting of the contacts in a safe and secure way.



AGGANCIAMENTO MECCANICO
MECHANICAL LATCH

ACCESSORI / ACCESSORIES

SEZIONI / SECTIONS

9 12 18 22 32 40

TENSIONI DI COMANDO
CONTROL VOLTAGE



140

100-127V 50-60Hz
200-240V 50-60Hz
380-440V 50-60Hz

090AM40-110
090AM40-240
090AM40-440

SEZIONI / SECTIONS

50 65 75 85

TENSIONI DI COMANDO
CONTROL VOLTAGE



140

100-127V 50-60Hz
200-240V 50-60Hz
380-440V 50-60Hz

090AM85-110
090AM85-240
090AM85-440

SEZIONI / SECTIONS

105 120

TENSIONI DI COMANDO
CONTROL VOLTAGE



1600

100-127V 50-60Hz
200-240V 50-60Hz

090AM120-110
090AM120-240

SEZIONI / SECTIONS

150

TENSIONI DI COMANDO
CONTROL VOLTAGE



1700

100-127V 50-60Hz
200-240V 50-60Hz

090AM150-110
090AM150-240

SEZIONI / SECTIONS

180 250

TENSIONI DI COMANDO
CONTROL VOLTAGE



2000

100-127V 50-60Hz
200-240V 50-60Hz

090AM250-110
090AM250-240

SEZIONI / SECTIONS

300 400

TENSIONI DI COMANDO
CONTROL VOLTAGE



2400

100-127V 50-60Hz
200-240V 50-60Hz

090AM400-110
090AM400-240



UNITÀ TEMPORIZZATA PNEUMATICA / PNEUMATIC TIMER

SEZIONI
SECTIONS

9 12 18 22 32 40 50 65 75 85



100 Unità temporizzata ritardo eccitazione ON soglia 1° 1-30s
100 Unità temporizzata ritardo eccitazione ON soglia 1° 10 -180s
100 Unità temporizzata ritardo diseccitazione OFF soglia 1° 1-30s
100 Unità temporizzata ritardo diseccitazione OFF soglia 1° 10 -180s

090UT-1N
090UT-2N
090UT-1F
090UT-2F



FILTRO SOPPRESSORE / SURGE SUPPRESSOR RC UNIT

SEZIONI
SECTIONS

9 12 18 22 32 40 50 65 75 85



150 FILTRO RC 0.1µ F100Ω 24-48V
150 FILTRO RC 0.1µ F100Ω 110V
150 FILTRO RC 0.1µ F100Ω 220V

090RC48
090RC110
090RC220



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



RICAMBI / SPARE PARTS

BOBINE DI COMANDO / CONTROL COILS



SEZIONI / SECTIONS

9 12 18 22 32 40

TENSIONI DI COMANDO  80
CONTROL VOLTAGE

24V 50-60Hz	090B40-24
48V 50-60Hz	090B40-48
110V 50-60Hz	090B40-110
230V 50-60Hz	090B40-230
400V 50-60Hz	090B40-400

SEZIONI / SECTIONS

50 65 75 85

TENSIONI DI COMANDO  160
CONTROL VOLTAGE

24V 50-60Hz	090B85-24
48V 50-60Hz	090B85-48
110V 50-60Hz	090B85-110
230V 50-60Hz	090B85-230
400V 50-60Hz	090B85-400

SEZIONI / SECTIONS

105 120 150

TENSIONI DI COMANDO  80
CONTROL VOLTAGE

24V 50-60Hz	24VCC	090B150-24
48V 50-60Hz	48VCC	090B150-48
100-240V 50-60Hz	100-220VCC	090B150-100
380-450V 50-60Hz		090B150-400

SEZIONI / SECTIONS

180 250 300 400

TENSIONI DI COMANDO  
CONTROL VOLTAGE

24V 50-60Hz	24VCC	670	090B250-24	
48V 50-60Hz	48VCC	670	090B250-48	
100-240V 50-60Hz	100-220VCC	670	090B250-100	980
380-450V 50-60Hz		670	090B250-400	980

SEZIONI / SECTIONS

630 800

TENSIONI DI COMANDO  1850
CONTROL VOLTAGE

100-127V 50-60Hz	090B800-100
200-240V 50-60Hz	090B800-200
380-450V 50-60Hz	090B800-400



SET POLI DI RICAMBIO / SET OF SPARE POLES ⁽¹⁾

SEZIONI / SECTIONS

9 12 18 22 32 40 50 65 75 85

 12	13	23	25	43	45	106	107	110	113
090CP9	090CP12	090CP18	090CP22	090CP32	090CP40	090CP50	090CP65	090CP75	090CP85

105 120 150 180 250 300 400 630 800

 225	230	390	735	740	1485	1500	2400	2450
090CP105	090CP120	090CP150	090CP180	090CP250	090CP300	090CP400	090CP630	090CP800

¹⁾ Ad ogni singolo codice corrisponde un kit composto da 3 poli mobili più 6 poli fissi

¹⁾ Each individual code corresponds to a kit composed of 3 moved and 6 fixed contacts



CARATTERISTICHE GENERALI / GENERAL CHARACTERISTICS



RISPONDERENZA ALLE NORME OMOLOGAZIONI	ACCORDANCE WITH STANDARDS APPROVAL
LIMITI DI TEMPERATURE ALTITUDINE D'IMPIEGO	TEMPERATURE LIMITS 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)

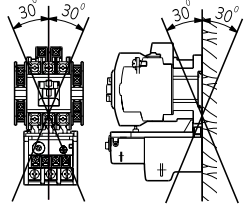
EN 60947-4-1, UL508, VDE 0660, BS 5424 Lloyd's register of shipping, UL, CSA Stoccaggio $\geq -30^{\circ}\text{C}$ $\div$ $\leq +65^{\circ}\text{C}$ - funzionamento $\geq -25^{\circ}\text{C}$ $\div$ $\leq +40^{\circ}\text{C}$ 2.000 m IP 20 SMALL / MEDIUM / LARGE - IP 00 XLARGE / XXLARGE 2.5 SMALL - 15 MEDIUM - 10 LARGE - 5 XLARGE - XX LARGE 2.5 SMALL - 2 MEDIUM/LARGE - 1 XLARGE/XXLARGE - 0,5 XXLARGE (400-630-800) 1800 SMALL / MEDIUM - 1200 LARGE - XLARGE - XXLARGE



NUMERO POLI TENSIONE NOMINALE D'ISOLAMENTO UI CONTATTORI	NUMBER OF POLES RATED INSULATION VOLTAGE UI
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
POTENZA DISSIPATA PER FASE RELE'	DISSIPATED POWER FOR EACH RELAY PHASE

3 690V - (1000V LARGE) 10 X le in cat. AC-3 8 X le in cat. AC-3 -15% - +10% Uc (tensione nominale comando / rated voltage) 690V - (1000V R85 - R125 - R150 - R240 - R400 - R800) 10A (tempo d'intervento / tripping time > 2s < 10s) 1NO + 1NC manuale o automatico selezionabile / manual or automatic reset 1,8VA R22 / 2VA R40 / 3,5VA R85 2,3VA R125 - R150 - R240 - R400 - R800
--

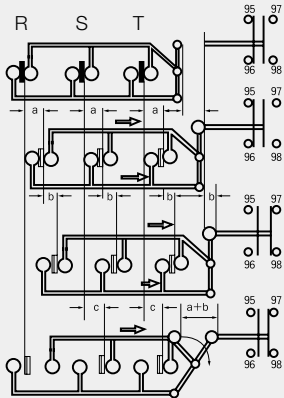
POSIZIONE DI FUNZIONAMENTO
MOUNTING POSITION



SISTEMA ESCLUSIVO DI AMPLIFICAZIONE D'INTERVENTO RELE'
EXCLUSIVE AMPLIFIED DIFFERENTIAL LEVER TRIPPING MECHANISM



- 1) STATO DI RIPOSO
NO LOAD STATE
- 2) FUNZIONAMENTO
A LIVELLO DI Inom
OPERATION AT THE RATED
CURRENT STATE
- 3) SOVRACCARICO TERMICO
OVERLOAD STATE
- 4) MANCANZA FASE (fase R)
R PHASE FAILURE STATE





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



CARATTERISTICHE AUSILIARI / AUXILIARY CHARACTERISTICS

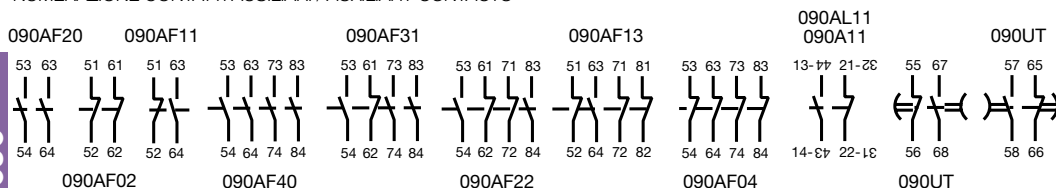
220V 60Hz (50Hz)	Assorbimento [VA] Coil consumption			Campo assorbimento bobina [V] Coil operating limit			Tempo di funzionamento Operating time (ms)	
	Spunto Pick-up	Ritenuta Sealed	Dissipazione Dissipation [W]	Attrazione Pick-up	Rilascio Drop-out	Corrente bobina Coil current [mA]	Attrazione Pick-up	Rilascio Drop-out
9-12-18-22	95	9	2	141-156(142-157)	105-125(112-132)	41(36)	10-17	6-9
32-40	95	9	2	150-165(151-166)	110-130(117-137)	41(36)	11-19	6-10
50-65-75-85	220	17	5	145-160(146-161)	100-120(107-127)	77(68)	16-25	8-15
100-125	298	12.3	4.4	77	48	56	30-34	63-67
150	298	12.3	4.4	77	48	56	37-41	47-52
180-220	380	11.6	4.7	77	48	53	45	45
300-400	571	14	5	77	48	64	45-50	48-52
600-800	1000	29	7.8	150	91	132	66-69	55

110V 60Hz (50Hz)	Assorbimento [VA] Coil consumption			Campo assorbimento bobina [V] Coil operating limit			Tempo di funzionamento Operating time (ms)	
	Spunto Pick-up	Ritenuta Sealed	Dissipazione Dissipation [W]	Attrazione Pick-up	Rilascio Drop-out	Corrente bobina Coil current [mA]	Attrazione Pick-up	Rilascio Drop-out
9-12-18-22	95	8	2	75-85(74-84)	55-65(54-64)	-73(73)	11-18	6-9
32-40	95	8	2	75-85(74-84)	55-65(54-64)	73(73)	13-20	6-9
50-65-75-85	220	17	5.5	68-78(67-77)	40-50(39-49)	154(154)	16-25	9-16
100-125	162	9.8	3.1	77	48	89	46-50	49-53
150	162	12.2	3	77	48	111	56-60	44-48
180-220	220	9.1	3.4	77	48	83	60	41
300-400	393	14	4.4	77	48	128	64-68	43-47
600-800	1000	17	6.3	77	48	155	66-70	45-49

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]			
	lth	AC-15				DC-13							AC-15	AC-12	DC-13
	AC-1	120V	240V	480V	600V	125V	250V	440V	600V				220V-440V	220V-440V	24-220V
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]			[man/ora]	[mil/cicli]	[mil/cicli]	[mil/cicli]
090AL	16	6	5	3	3	1.1	0.55	0.31	0.2	1800	20	50	25	50	
090AF	16	6	3	1.5	1.2	1.1	0.55	0.31	0.2	1800	20	50	25	50	
090A	16	6	5	3	3	1.1	0.55	0.31	0.2	1800	20	50	25	50	

NUMERAZIONE CONTATTI AUSILIARI / AUXILIARY CONTACTS





CARATTERISTICHE GENERALI / GENERAL CHARACTERISTICS



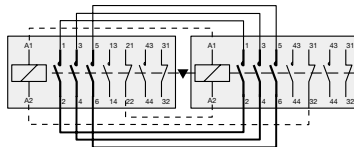
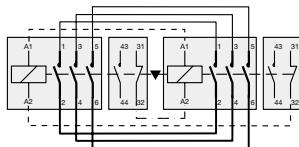
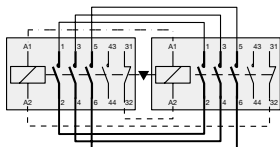
SCHEMI DI COLLEGAMENTO INTERBLOCCO MECCANICO
 MECHANICAL INTERLOCK CIRCUIT DIAGRAM

SEZIONI
 SECTIONS

9 12 18 22

32 40 50 65 75 85

105 120 150 180 250 300 400 600 800



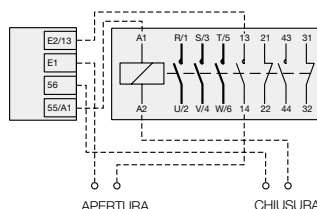
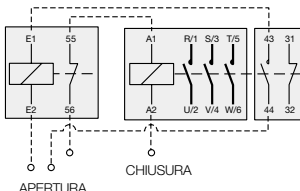
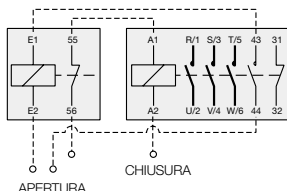
SCHEMI DI COLLEGAMENTO AGGANCIO MECCANICO CONTATTORI
 MECHANICAL LATCH CIRCUIT DIAGRAM

SEZIONI
 SECTIONS

9 12 18 22

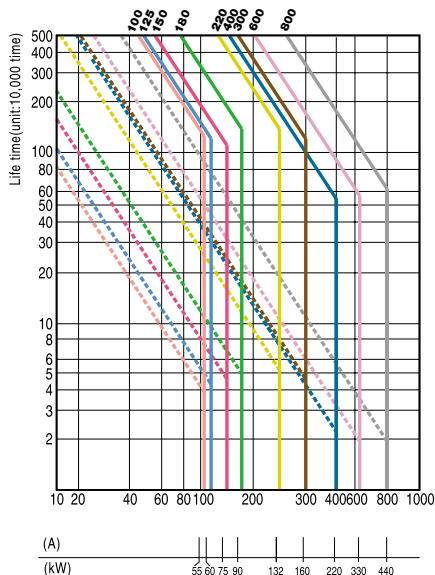
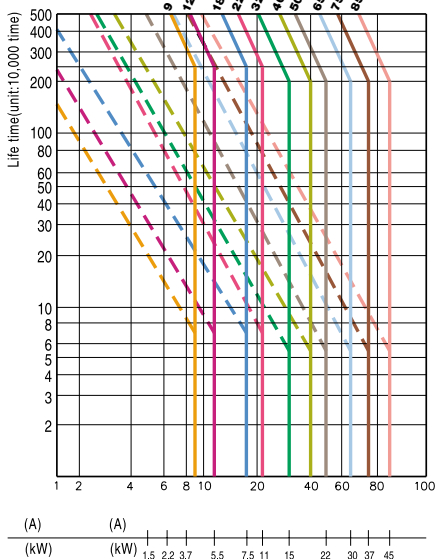
32 40 50 65 75 85

105 120 150 180 250 300 400 600 800



3ø AC380-440V

3ø AC380-440V





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

CURVE CARATTERISTICHE RELE / RELAY CURVE CHARACTERISTICS¹⁾



SEZIONI
SECTIONS

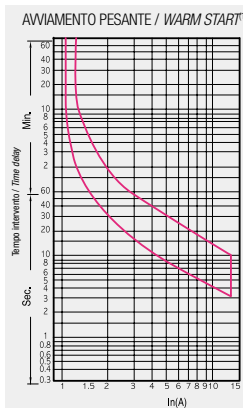
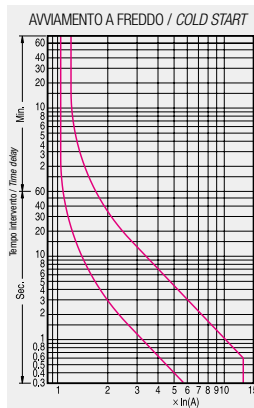
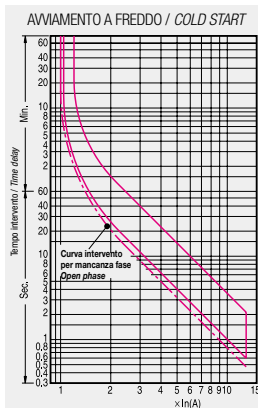
9

12

18

22

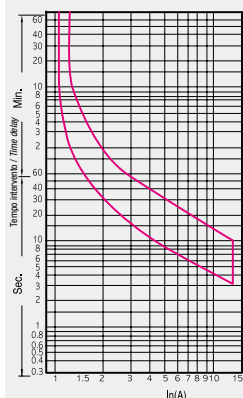
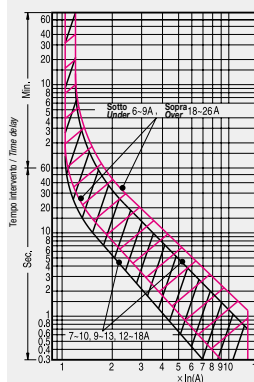
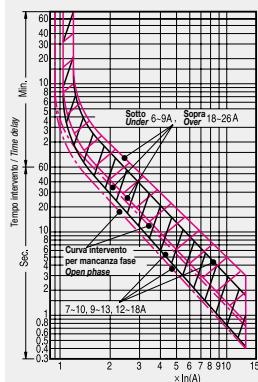
090R22



32

40

090R40



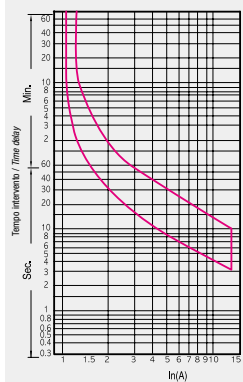
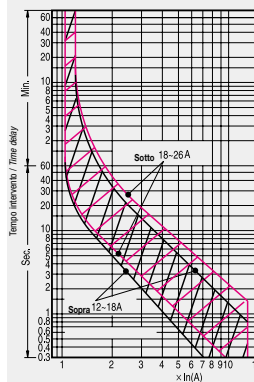
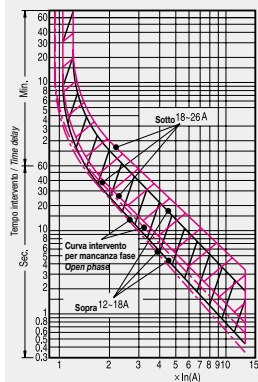
50

65

75

85

090R85



1) Per la disponibilità dei relé in classe 20 contattare la nostra rete commerciale. I relé in classe 20 hanno un tempo d'intervento da 6 a 20s
1) For availability relays in tripping class 20 contact our sales net. Class 20 relays = tripping time from 6s up to 20s



CURVE CARATTERISTICHE RELE / RELAY CURVE CHARACTERISTICS¹⁾



SEZIONI
SECTIONS

090R105

105

120

090R150

150

090R240

150

180

250

090R400

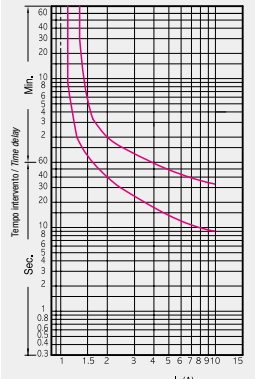
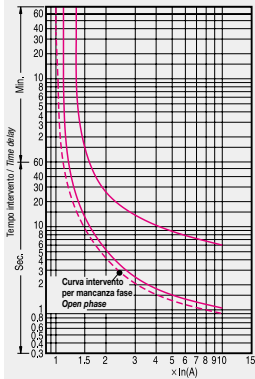
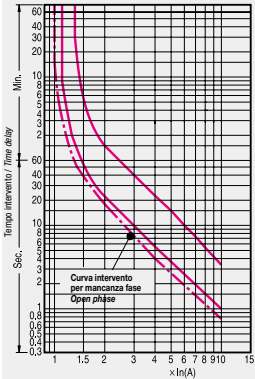
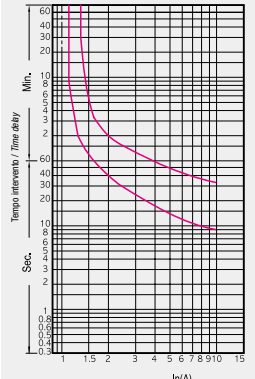
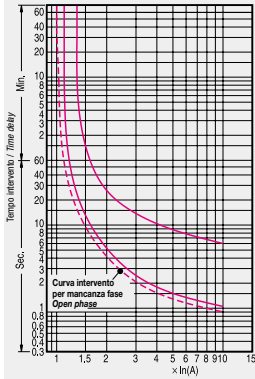
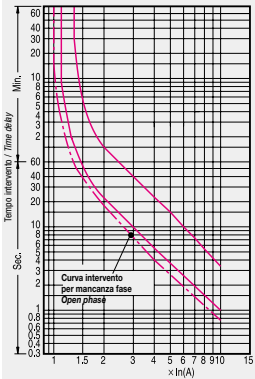
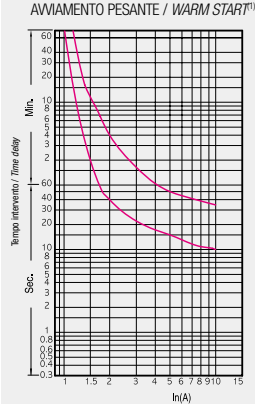
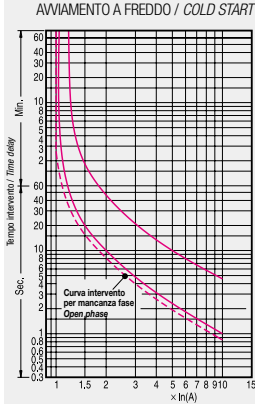
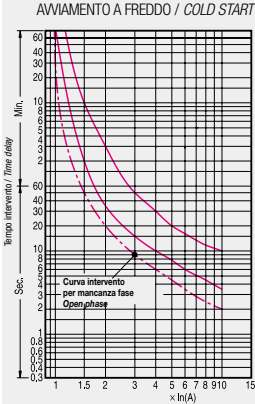
300

400

090R800

600

800



1) Per la disponibilità dei relé in classe 20 contattare la nostra rete commerciale. I relé in classe 20 hanno un tempo d'intervento da 6 a 20s
1) For availability relays in tripping class 20 contact our sales net. Class 20 relays = tripping time from 6s up to 20s



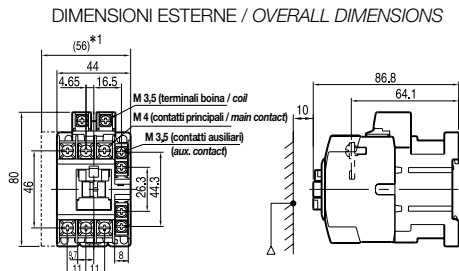
Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

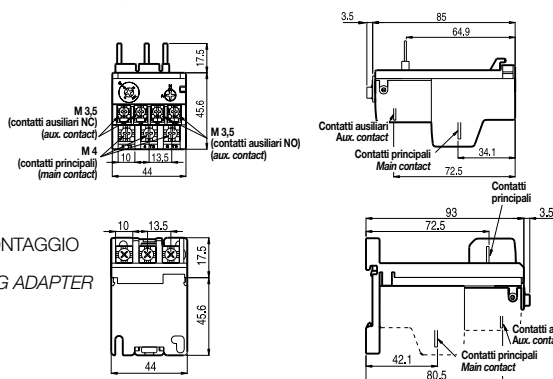
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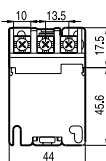
CONTATTORE CONTACTORS



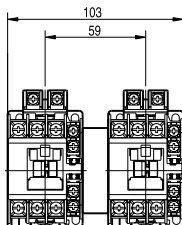
RELE' RELAY



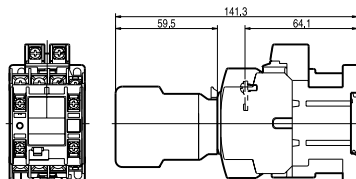
ADATTATORE MONTAGGIO RELE' RELAY MOUNTING ADAPTER



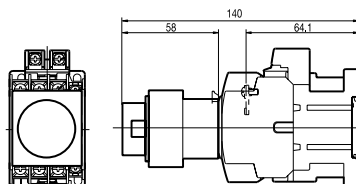
INTERBLOCCO MECCANICO MECHANICAL INTERLOCK



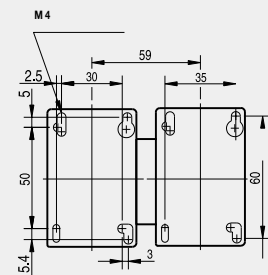
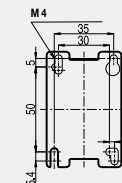
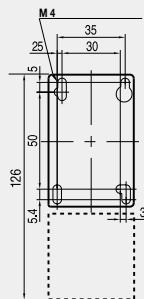
AGGANCIO MECCANICO MECHANICAL LATCH



TEMPORIZZATORE PNEUMATIC TIMER



DIME MONTAGGIO FIXING DIMENSION



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



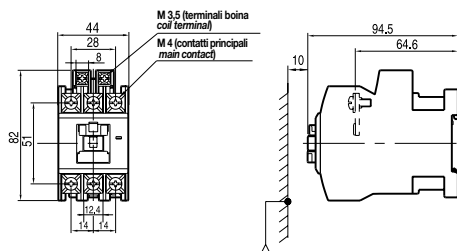
SEZIONI
SECTIONS

32 **40**

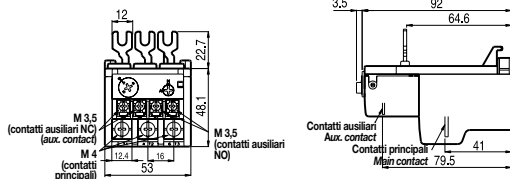
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DIMENSIONI ESTERNE / OVERALL DIMENSIONS

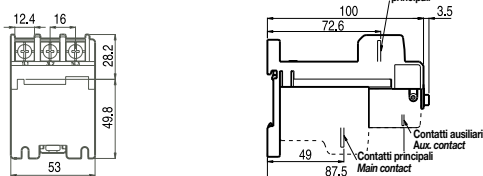
CONTATTORE
CONTACTORS



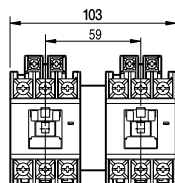
RELE'
RELAY



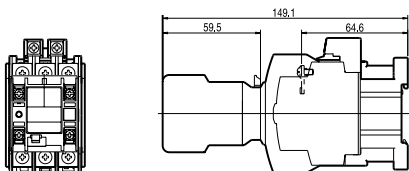
ADATTATORE MONTAGGIO
RELE'
RELAY MOUNTING ADAPTER



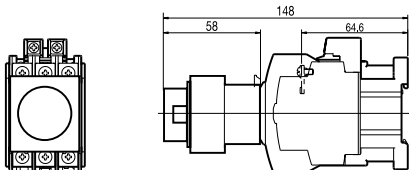
INTERBLOCCO MECCANICO
MECHANICAL INTERLOCK



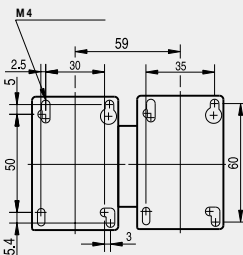
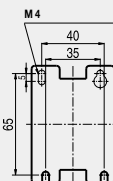
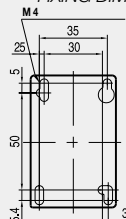
AGGANCIO MECCANICO
MECHANICAL LATCH



TEMPORIZZATORE
PNEUMATIC TIMER



DIME MONTAGGIO
FIXING DIMENSION





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

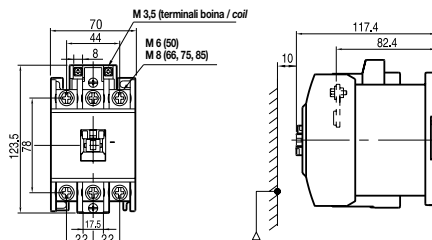
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SEZIONI SECTIONS

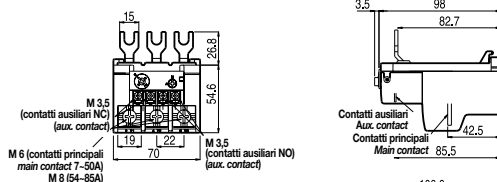
50 **65** **75** **85**

DIMENSIONI ESTERNE / OVERALL DIMENSIONS

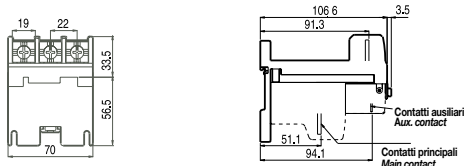
CONTATTORE CONTACTORS



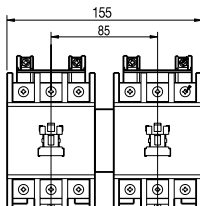
RELE' RELAY



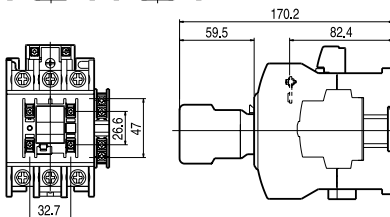
ADATTATORE MONTAGGIO RELE' RELAY MOUNTING ADAPTER



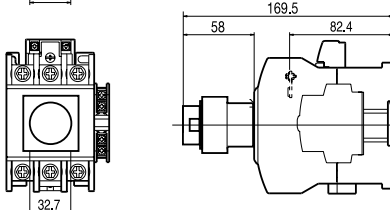
INTERBLOCCO MECCANICO MECHANICAL INTERLOCK



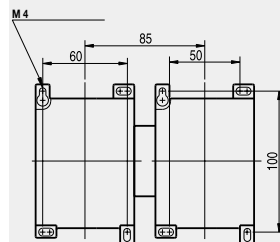
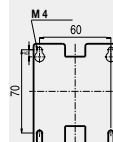
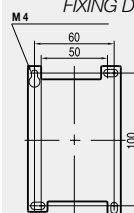
AGGANCIO MECCANICO MECHANICAL LATCH



TEMPORIZZATORE PNEUMATIC TIMER



DIME MONTAGGIO FIXING DIMENSION

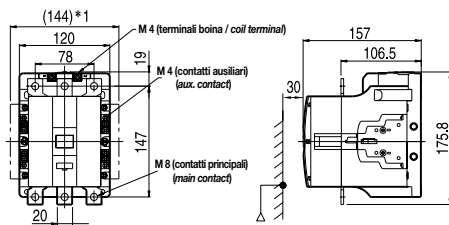
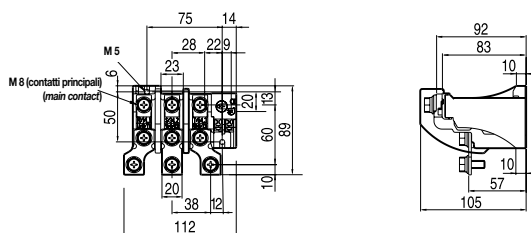


SEZIONI
SECTIONS

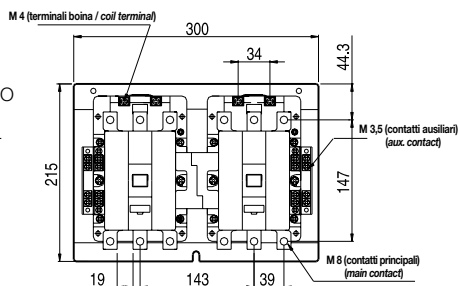
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DIMENSIONI ESTERNE / OVERALL DIMENSIONS

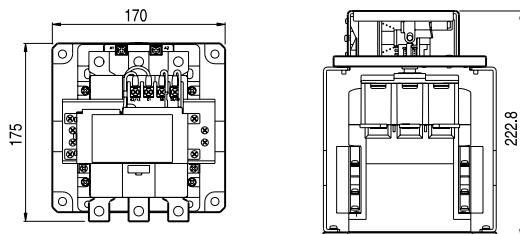
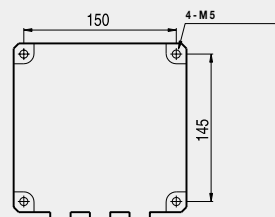
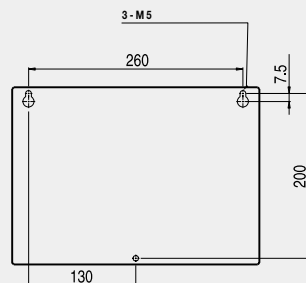
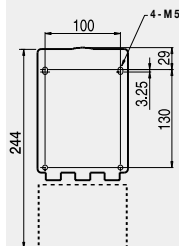
CONTATTORE
CONTACTORS

RELE'
RELAY

INTERBLOCCO
MECCANICO
MECHANICAL
INTERLOCK



AGGANCIO
MECCANICO
MECHANICAL
LATCH

DIME MONTAGGIO
FIXING DIMENSION

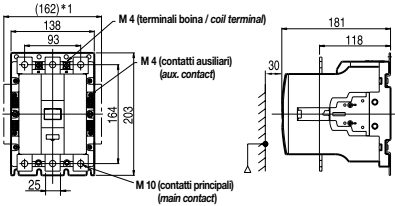


SEZIONI
SECTIONS

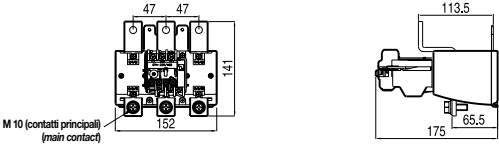
180 250

DIMENSIONI ESTERNE / OVERALL DIMENSIONS

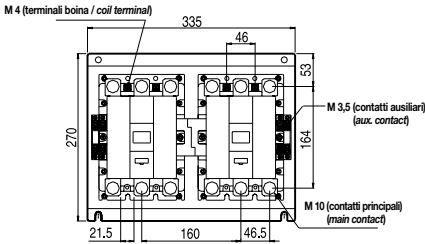
CONTATTORE
CONTACTORS



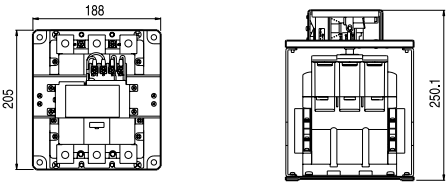
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RELAY



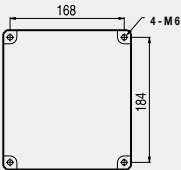
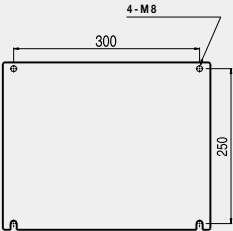
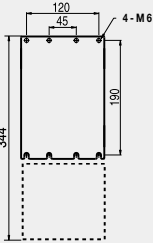
INTERBLOCCO
MECCANICO
MECHANICAL
INTERLOCK



AGGANCIO
MECCANICO
MECHANICAL
LATCH



DIME MONTAGGIO
FIXING DIMENSION





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

DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

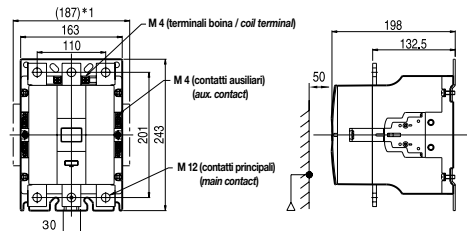
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300

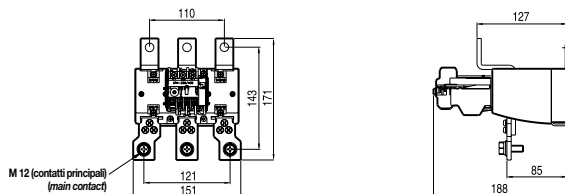
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DIMENSIONI ESTERNE / OVERALL DIMENSIONS

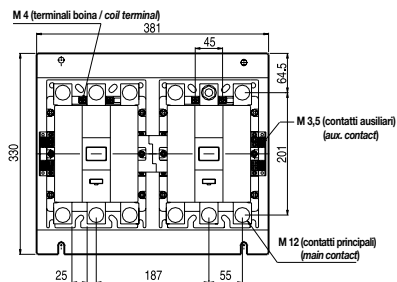
CONTATTORE CONTACTORS



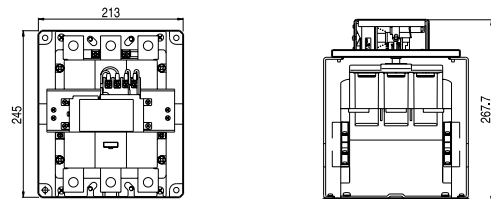
RELE' RELAY



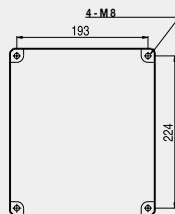
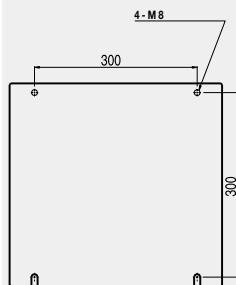
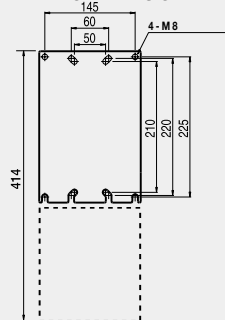
INTERBLOCCO MECCANICO MECHANICAL INTERLOCK



AGGANCIO MECCANICO MECHANICAL LATCH



DIME MONTAGGIO FIXING DIMENSION



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



DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

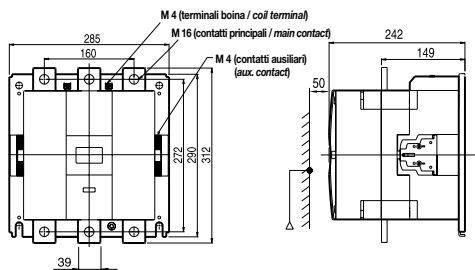
SEZIONI
SECTIONS

630

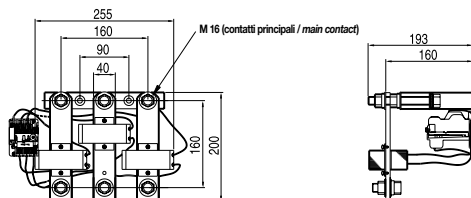
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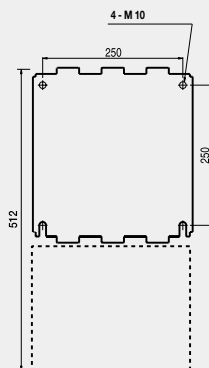
CONTATTORE
CONTACTORS



RELE'
RELAY



DIME MONTAGGIO
FIXING DIMENSION



SEZIONI
SECTIONS

9

12

18

22

32

40

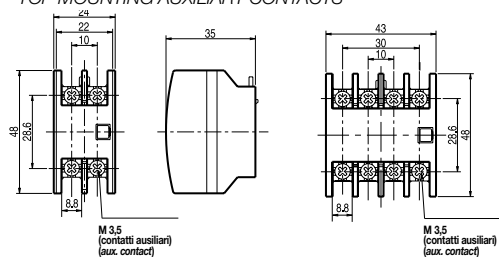
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65

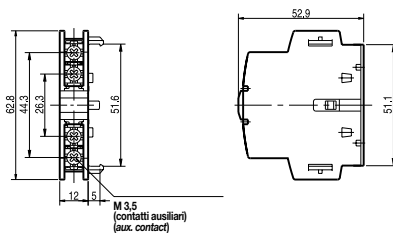
75

85

AUSILIARI FRONTALI
TOP MOUNTING AUXILIARY CONTACTS



AUSILIARI LATERALI
SIDE MOUNTING AUXILIARY CONTACTS



SEZIONI
SECTIONS

105

120

150

180

250

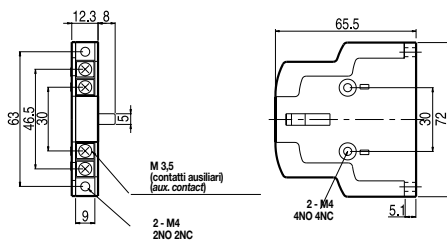
300

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 clamps (on request).

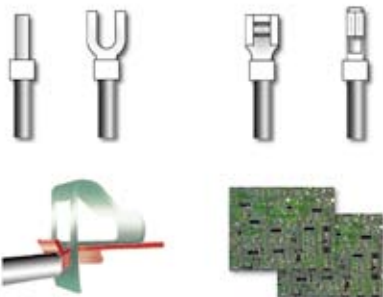
VERSATILITA' DI IMPIEGO

E' possibile trasformare un minicon-tattore standard in un circuito stampato 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 accessori della versione standard (contatti ausiliari laterali e frontali, temporizzatore, interblocco meccanico, filtro RC e relè termico.)

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 alimentazione c.a. e c.c. come ricambio.

COILS

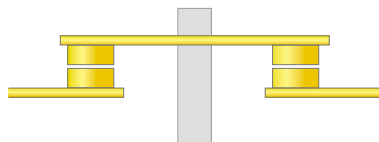
In our new range of minicontactors we can supply ac/dc coils as spare parts.

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

ALTRI
OTHERS

GAMMA ESTESA

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

WIDE RANGE

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



090MAF40
090MAF31
090MAF22
090MAF13

090MAF04
090MAF20
090MAF11
090MAF02

090MRC

090MTE

090PIN
090PINDC

090M3C6
090M3C9
090M3C12
090M3C16

090M3C6-DC
090M3C9-DC
090M3C12-DC
090M3C16-DC

090DINXS

090PINAUS
090PINAUSDC

090MAL10
090MAL01

090MIM16

090MR16



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		

CATEGORIE DI UTILIZZAZIONE DEI CIRCUITI AUSILIARI

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)		



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

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

CONTACTORS
UTILIZATION
CATEGORIES

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 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		

SWITCHING ELEMENTS
UTILIZATION CATEGORIES

AC-12	Control of resistive loadsand 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)		

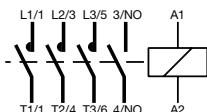


Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

Serie / Series XSMALL



2



SEZIONI / SECTIONS

6

9

12

16

TENSIONI DI COMANDO  0,17
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	0.5 HP	0.5 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 HP
Tri-phase 230V	2 HP	3 HP	5 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

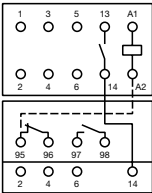
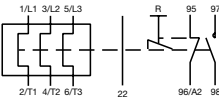
6	9	12	16
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RELE' / RELAY

 kg	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



RELE' TERMICO DIFFERENZIALE®
THERMAL O/L RELAY



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



SISTEMA MONTAGGIO SEPARATO
SEPARATE MOUNTING SYSTEM

6	9	12	16
---	---	----	----

 kg			
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



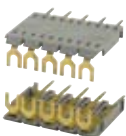
CONTATTO
LATERALE
SIDE MOUNTING



CONTATTI AUSILIARI / AUXILIARY CONTACTS



CONTATTI
FRONTALI
TOP MOUNTING



PER CONTATTORI
FOR CONTACTORS



PER CONTATTI
AUSILIARI
FOR 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**

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**

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

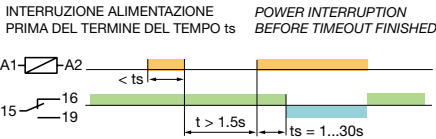
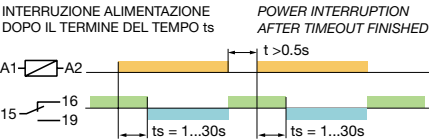
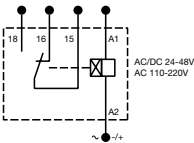
12

16

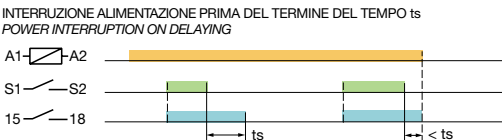
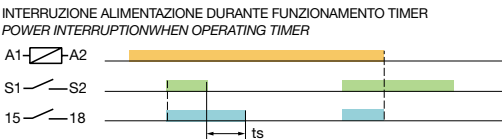
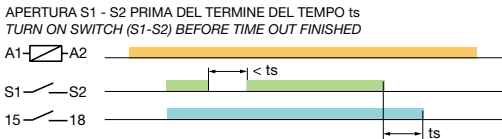
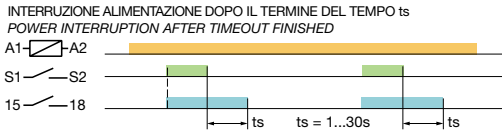
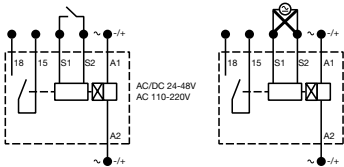


- 40 24-48V CA/CC delay ON 1-30 s
- 40 100-220V CA/CC delay ON 1-30 s
- 40 24-48V CA/CC delay OFF 1-30 s
- 40 100-220V CA/CC delay OFF 1-30 s

- 090MTEON48
- 090MTEON220
- 090MTEOFF48
- 090MTEOFF220



Senza tensione / De - energized
Sotto tensione / energized



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

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

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

RICAMBI - SPARE PARTS



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



CARATTERISTICHE GENERALI / GENERAL CHARACTERISTICS

RISPONDEZA ALLE NORME
OMOLOGAZIONI
LIMITI DI TEMPERATURE
ALTITUDINE D'IMPIEGO
GRADO DI PROTEZIONE
DURATA MECCANICA [mil ciclo]
VITA ELETTRICA [mil ciclo]
NUMERO DI MANOVRE ORA
IN AC-3 [n° ciclo]

ACCORDANCE WITH STANDARDS
APPROVAL
TEMPERATURE LIMITS
USAGE ALTITUDES
PROTECTION DEGREE
MECHANICAL DURABILITY (mil. cycles)
ELECTRICAL LIFE (mil. cycles)
N. OF OPERATIONS PER HOUR
IN AC-3 (n. cycles)

EN 60947-4-1, UL508, VDE 0660, BS 5424
UL, cUL
Stoccaggio/Storage $\geq -30^{\circ}\text{C} \div \leq +65^{\circ}\text{C}$ - funzionamento/operation $\geq -25^{\circ}\text{C} \div \leq +40^{\circ}\text{C}$
2.000 m
IP 20
12
1
1800

CERTIFICAZIONE
CERTIFICATIONS



NUMERO POLI
TENSIONE NOMINALE
D'ISOLAMENTO UI CONTATTORI

NUMBER OF POLES
RATED INSULATION VOLTAGE UI

POTERE DI CHIUSURA MASSIMO
POTERE DI INTERRUZIONE MASSIMO
CAMPO DI FUNZIONAMENTO
DELLA BOBINA
TENSIONE NOMINALE
D'ISOLAMENTO UI RELE'
CLASSE D'INTERVENTO RELE'
SECONDO IEC-947-4-1

MAXIMUM MAKING CAPACITY
MAXIMUM BREAKING CAPACITY
COIL OPERATING LIMITS
RATED INSULATION VOLTAGE
UI RELAY
RELAY TRIPPING CLASS
IN ACCORDANCE WITH IEC-947-4-1

CONTATTI AUSILIARI RELE'

RELAY AUXILIARY CONTACTS

RIARMO RELE'

RELAY RESET TYPE

POTENZA DISSIPATA PER FASE RELE'
SECONDO IEC-947-4-1

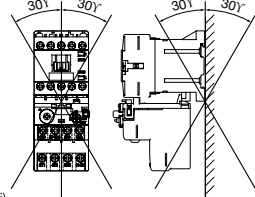
DISSIPATED POWER FOR EACH
RELAY PHASE

LIMITE DI TEMPERATURA

TEMPERATURE LIMITS

4
690V
10 X le in cat. AC-3
8 X le in cat. AC-3
-15% - +10% U_c (tensione nominale comando / rated voltage)
690V
10A (tempo d'intervento / tripping time
> 2s < 10s)
1NO + 1NC
manuale o automatico selezionabile
manual or automatic reset
1,8VA
Stoccaggio / Storage $\geq -30^{\circ}\text{C} \leq +65^{\circ}\text{C}$
Funzionamento $\geq -25^{\circ}\text{C} \leq +65^{\circ}\text{C}$ (compensati)
Operating $\geq -25^{\circ}\text{C} \leq +65^{\circ}\text{C}$ (compensated)

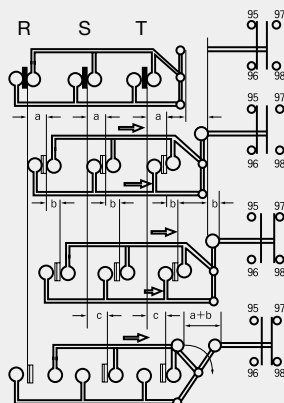
POSIZIONE DI FUNZIONAMENTO
MOUNTING POSITION



SISTEMA ESCLUSIVO DI AMPLIFICAZIONE D'INTERVENTO RELE'
EXCLUSIVE AMPLIFIED DIFFERENTIAL LEVER TRIPPING MECHANISM



- 1) STATO DI RIPOSO
NO LOAD STATE
- 2) FUNZIONAMENTO
A LIVELLO DI I_{nom}
OPERATION AT THE RATED
CURRENT STATE
- 3) SOVRACCARICO TERMICO
OVERLOAD STATE
- 4) MANCANZA FASE (fase R)
R FASE FAILURE STATE





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

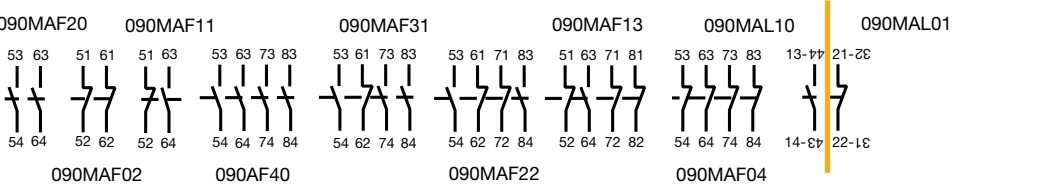


090R16	Ith	AC11/AC-15			DC11 / DC13	
	AC1	110V	220V	550V	110V	220V
	[A]	[A]	[A]	[A]	[A]	[A]
	16	0.3/2.5	0.3/2	0.3/1	0.28	0.14

CARATTERISTICHE ELETTRICHE AUSILIARI
AUXILIARY CONTACT ELECTRICAL CHARACTERISTICS

090MAF...	CORRENTE NOMINALE / NOMINAL CURRENT									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]			
	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



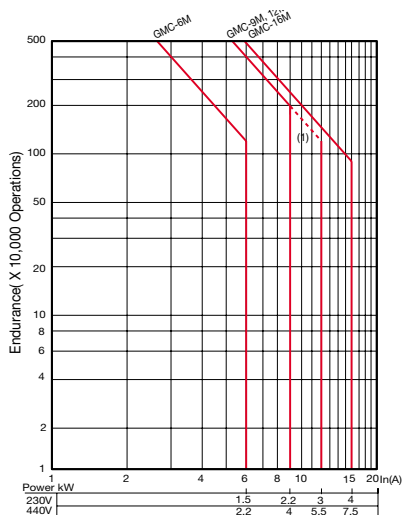


Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

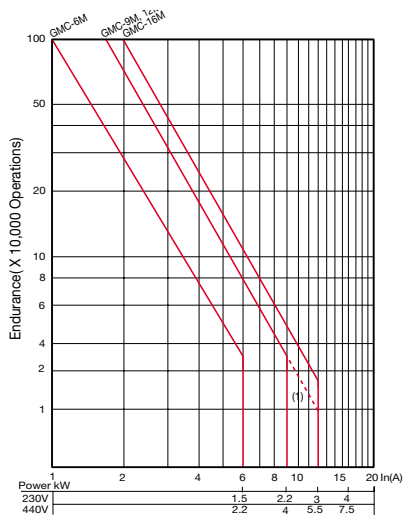


VITA ELETTRICA - ELECTRICAL LIFE TIME

AC-3 UE 380-440V



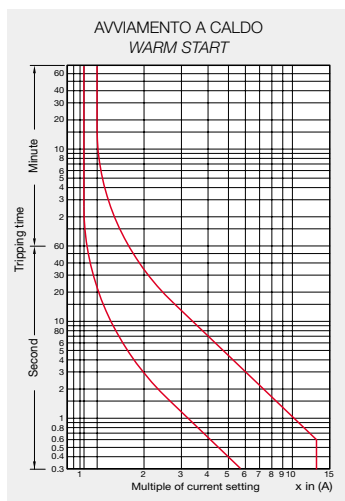
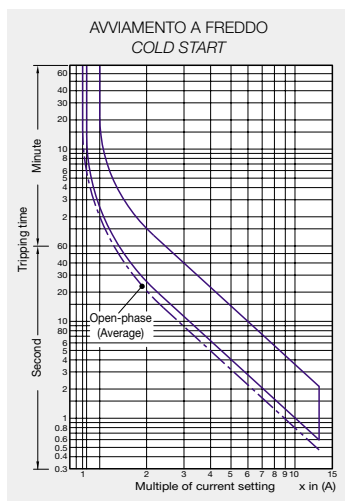
AC-4 UE 380-440V



CURVE CARATTERISTICHE RELE - RELAY CURVE CHARACTERISTICS



090MR16



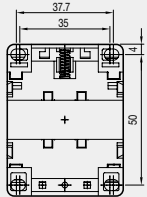
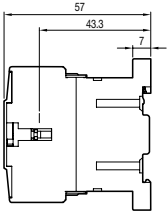
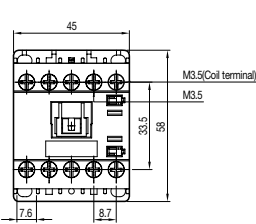


DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

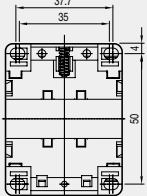
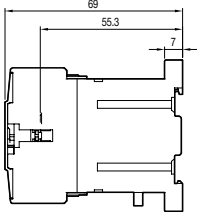
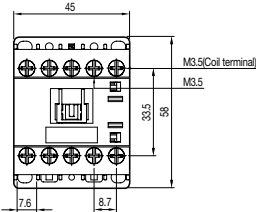
SEZIONI
SECTIONS

9 12 18 22

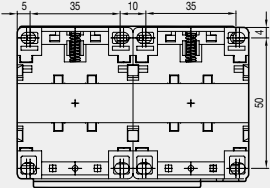
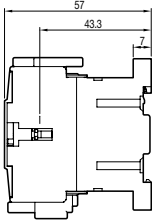
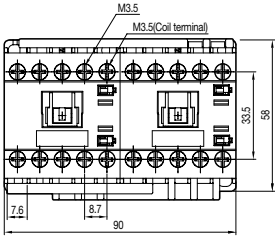
MINICONTATTORE C.A.
A.C. MINICONTACTORS



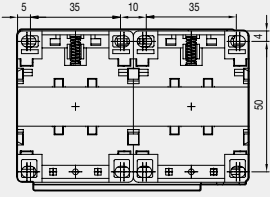
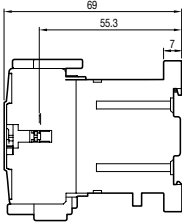
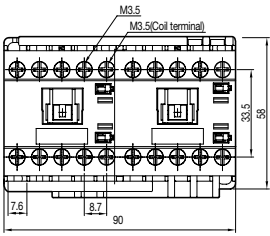
MINICONTATTORE C.C.
D.C. MINICONTACTORS



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



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





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

DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

SEZIONI
SECTIONS

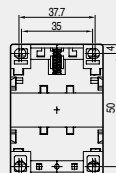
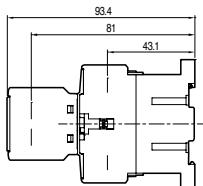
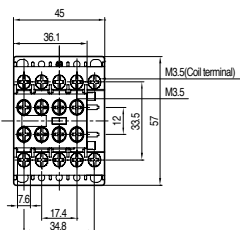
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12

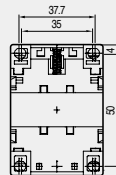
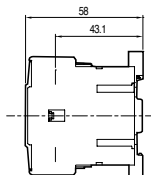
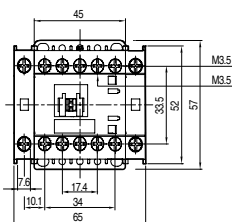
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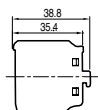
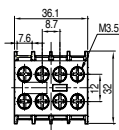
MINICONTATTORE CON
AUSILIARIO FRONTALE
MINICONTACTOR WITH TOP
MOUNTING AUX. CONTACT



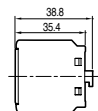
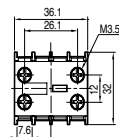
MINICONTATTORE CON
AUSILIARIO LATERALE
MINICONTACTOR WITH SIDE
MOUNTING AUX. CONTACT



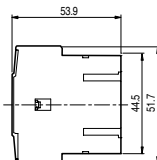
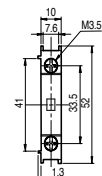
AUSILIARIO FRONTALE
4 POLI
TOP MOUNTING AUX.
CONTACT (4 POLE)



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



AUSILIARIO LATERALE
TOP MOUNTING AUX.
CONTACT (2 POLE)



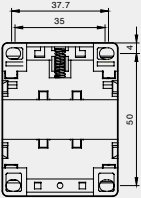
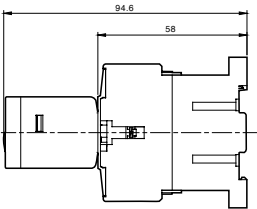
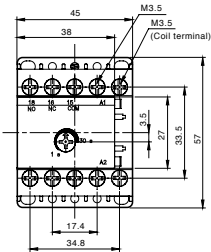


DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

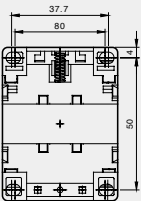
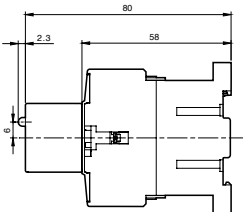
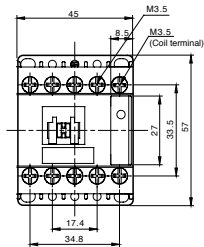
SEZIONI
SECTIONS

9 12 18 22

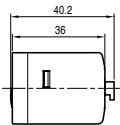
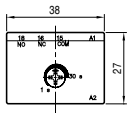
MINICONTATTORE
CON TEMPORIZZATORE
ELETTRONICO
*MINI CONTACTOR WITH
ELECTRONIC TIMER*



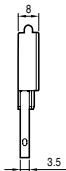
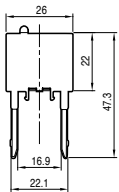
MINICONTATTORE
CON FILTRO RC
MINI CONTACTOR WITH
SURGE SUPPRESSOR
UNIT



TEMPORIZZATORE
ELETTRONICO
ELECTRONIC TIMER



FILTRO RC
SURGE SUPPRESSOR
UNIT





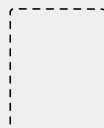
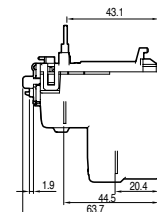
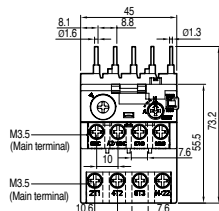
Contattori, relè termici, minicontattori, interruttori salvamotore Contactors, thermal o/l relays, minicontactors, manual motor starters

DIMENSIONI D'INGOMBRO / OVERALL DIMENSIONS

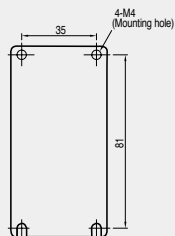
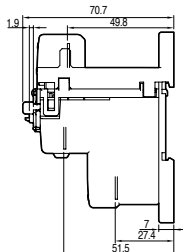
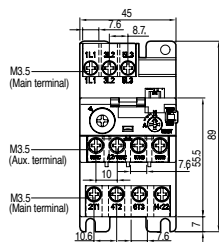
SEZIONI SECTIONS

9 12 18 22

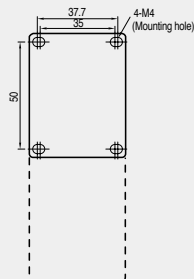
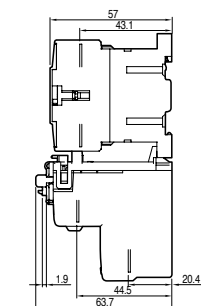
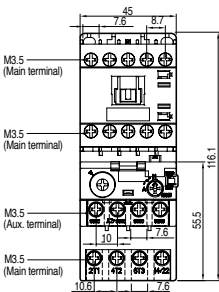
MINIRELE T.O.R.



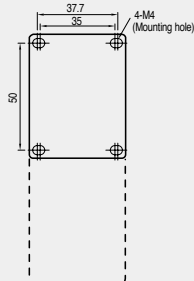
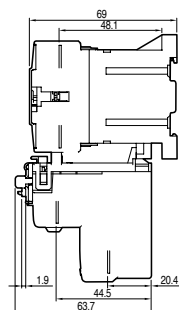
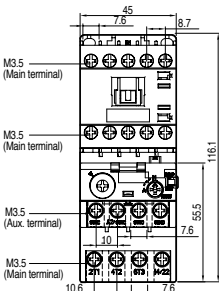
MINIRELE' MONTAGGIO SU ACCESSORIO SEPARATO T.O.R. WITH SEPARATE MOUNTING ADAPTOR



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

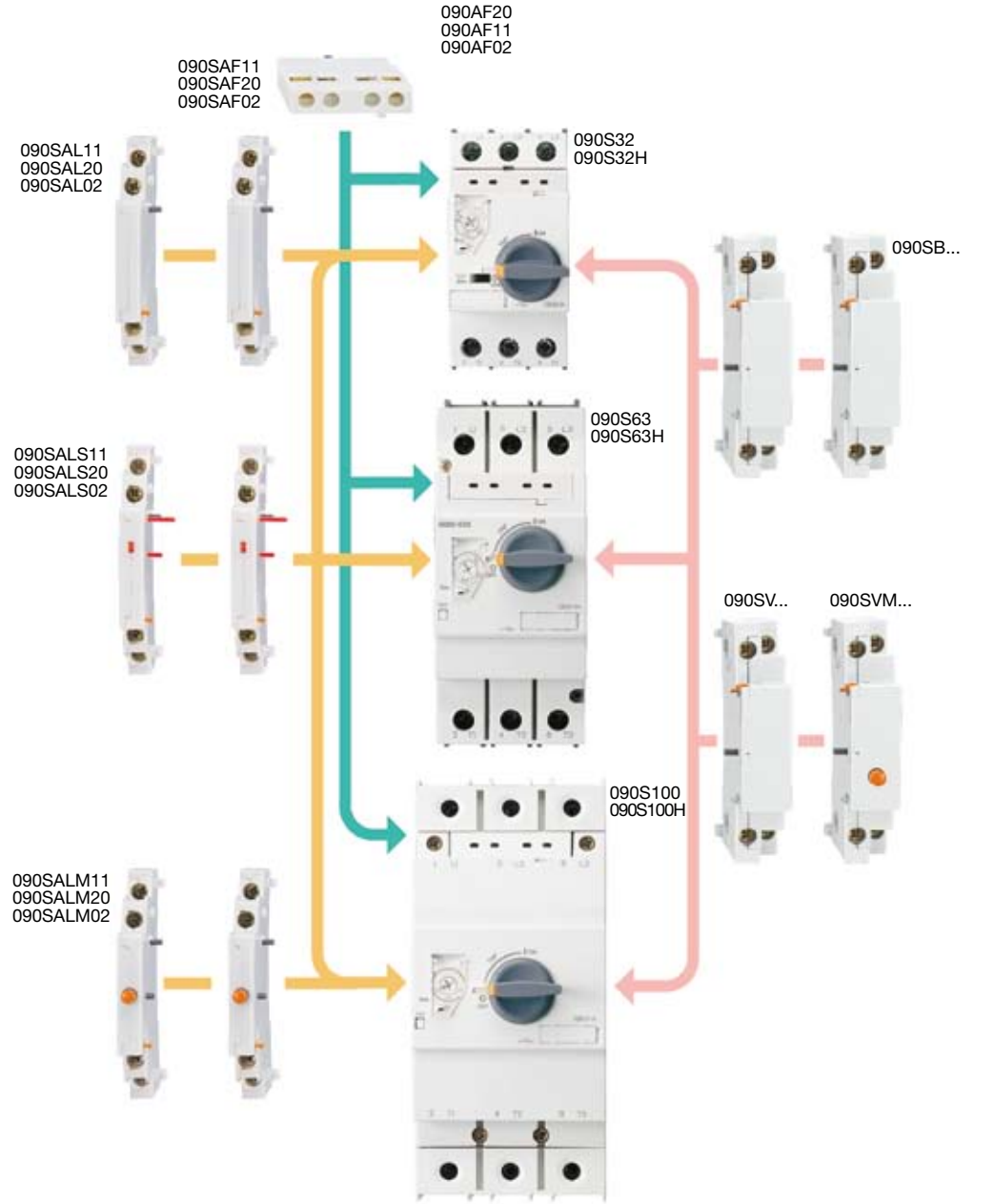


MINIRELE' MONTAGGIO DIRETTO SU MINICONTATTORE C.C. T.O.R. DIRECT MOUNTING ON D.C. MINICONTACTOR





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





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

INTERRUTTORI AUTOMATICI SALVAMOTORE - MANUAL MOTOR STARTERS



SEZIONI SECTIONS

32
63
100

Taratura [A]
Setting range [A]



0,32

0,36

1,00

1,00

2,20

2,20

0,1-0,16
0,16-0,25
0,25-0,4
0,4-0,63
0,63-1
1-1,6
1,6-2,5
2,5-4
4-6
5-8
6-10
9-13
11-17
14-22
18-26
22-32
28-40
34-50
45-63
55-75
70-90
80-100

090S32-016
090S32-025
090S32-04
090S32-063
090S32-01
090S32-1V6
090S32-2V5
090S32-4
090S32-6
090S32-8
090S32-10
090S32-13
090S32-17
090S32-22
090S32-26
090S32-32

100
KA
100
KA

090S32H-016
090S32H-025
090S32H-04
090S32H-063
090S32H-01
090S32H-1V6
090S32H-2V5
090S32H-4
090S32H-6
090S32H-8
090S32H-10
090S32H-13
090S32H-17
090S32H-22
090S32H-26
090S32H-32

25
KA

090S63-40
090S63-50
090S63-63

50
KA

090S63H-40
090S63H-50
090S63H-63

50
KA

090S100-75
090S100-90
090S100-100

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
110...127V 50Hz / 120V 60 Hz
220...230V 50Hz / 240...260V 60 Hz
240V 50Hz / 277V 60 Hz
380...400V 50Hz / 440...480V 60 Hz
415...440V 50Hz / 460...480V 60 Hz

090SB24
090SB110
090SB230
090SB240
090SB400
090SB440

090SV24
090SV110
090SV230
090SV240
090SV400
090SV440

090SVA24
090SVA110
090SVA230
090SVA240
090SVA400
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