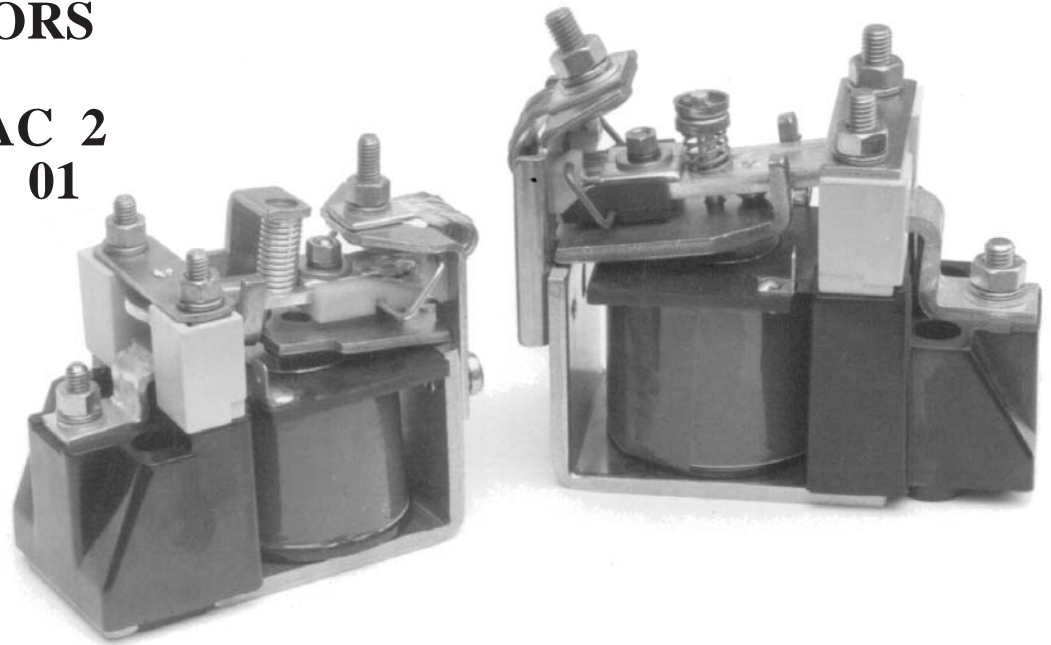




elektrosistem



UNIPOLAR CONTACTORS SERIES MAC 1, MAC 2 AND MAC 01



The unipolar contactors series MAC 1 - MAC 2 and MAC 01 have been specially designed for high performance services and for those applications in which high reliability and precision are required.

Their simple and strong structure enables easy inspection and maintenance, that is direct access to the single internal parts without disassembling the equipment.

All metal parts including bolts and nuts and springs have been tropicalized in order to be protected against oxidizing agents, while insulating materials have been realized in synthetic fiber and are mould-proof and self-extinguishing.

The contactors series MAC 1 - MAC 2 and MAC 01 have been conceived for applications up to 120 VDC and in particular to be fitted on lifting trucks, electrical vehicles, railway equipment, electric welding machines, etc... .

Thanks to their simple and strong mechanical structure as well as their precise assembling these contactors are resistant to shocks and vibrations and

may work in all positions. Moreover, their special mobile structure avoids early wear and seizure and at the same time allows utilization in cold rooms without the risk of ice formation on the central core.

In designing the models MAC 1, MAC 2 and MAC 01 a particular attention has been paid to poles conformation, in order to obtain an effective self-cleaning action, the total absence of rebound effects and a low contact resistance. These features have been made possible thanks to different factors, such as the rubbing action between the surfaces of the power contacts, their particular form, the type of load springs used and the installation of high-performance anti-arc devices (i.e. kit of magnetes).

The control magnet circuit has been designed to ensure that opening and closing of the contactor is always carried out in a single phase, thus avoiding noising rebound effects, even when slightly variable voltages are present.

The particular conformation of these contactors also ensures a marked

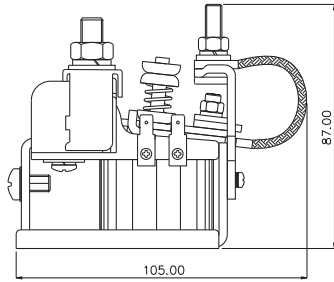
pressure on the contacts. The contactors mod. MAC 1, MAC 2 and MAC 01 are available with a single closing pole (type D) and also with an inverting pole (type R). They may be completely disassembled in order to allow easy maintenance.

Every component of our MAC contactors is available as spare part and may be completed with a back support for the control of one or more auxiliary contacts.

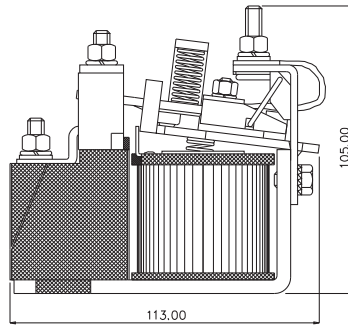
These contactors may be modified to work from permanent to intermittent duty by simply replacing the coil.

Technical features might be modified without notice.

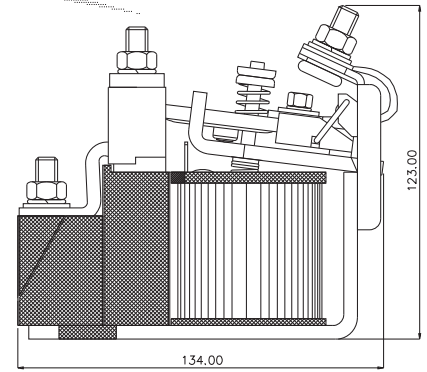
~~NEWS~~



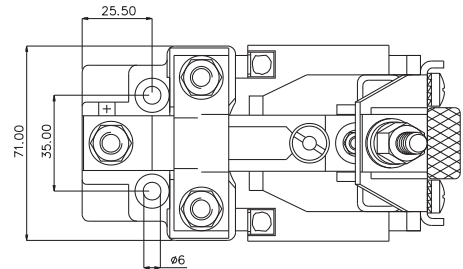
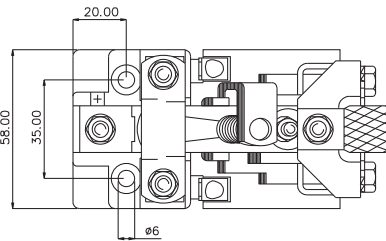
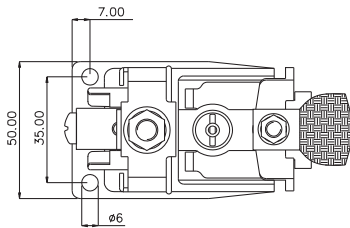
“MAC-01”



“MAC-1”



“MAC-2”



Features

TYPE		MAC-01	MAC-1	MAC-2
DC1(1) Operation Current (Free Air) With Poles Connected	-permanent duty	A 165	180	240
POLES BY:	-lift-truck duty (50% duty cycle)	A 230	250	310
35mmq for MAC1 and 70mmq for MAC2	-5 min open 5 min closed			
VOLTAGE RATING: magnetic blowout for V>48V	V ≤120	≤120	≤120	≤120
TIME CONSTANT FOR POLE TEMPERATURE	min 15	18	18	
OPENING AND CLOSING POWER				
closing pole	-D version	closing A 900	900	2000
	for V ≤96V	opening A 900	900	1200
INVERTING POLE				
normally open contact	-R version	closing A 900	900	2000
	for V ≤96V	opening A 900	900	1200
normally closed contact	-R version	closing A 400	400	550
	for V ≤96V	opening A 200	200	500
MAXIMUM RATINGS	operations/hour	300	300	300
DRIVE CIRCUIT (COIL)				
permanent duty	-admitted voltage variation	%Vn 85e110	85e110	85e110
	-disconnecting voltage	%Vn 20	20	20
	-power consumption at Vn	W 25	25	32
intermittent duty (lift-truck)	-voltage variation	%Vn 65e110	65e110	65e110
	-disconnecting voltage	%Vn 15	15	15
	-power consumption at Vn	W 44	44	53
	-duty cycle	% 50	50	50
	-maximum cycle time	s 150/150	150/150	150/150
OPERATION TIME AT NOMINAL VOLTAGE				
permanent duty	-closing	ms 55	55	75
	-opening	ms 15	15	16
intermittent duty (lift-truck)	-closing	ms 40	40	50
	-opening	ms 16	16	17
CONNECTIONS				
power	-connection size	mm 16x16	16x16	20x20
	-screws ø	mm 6	6	8
coil	-spade	mm 6.35	6.35	6.35

- 1) DC1: No or slightly inductive loads (spiral resistor)
- DC2: Shunt motor starting and stopping
- DC4: Series motor starting and stopping

(*) When a strongly inductive load (DC4 standard) is used, it is necessary to use a free-wheel diode in antiparallel to the load.

Standard voltages:
12,24,36,40,48,60,72,80,96,110,120 V,
 on request different voltages are possible.

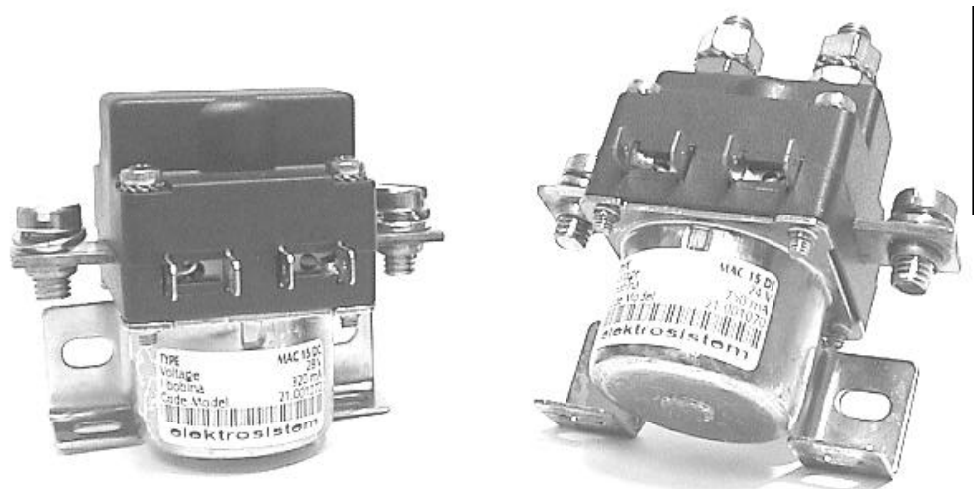


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UNIPOLAR CONTACTORS

“MAC-10”
“MAC-15”



The “MAC” series monoblock contactors are characterized by a strong interrupting power (insulation) and by small dimensions.

They are used for DC loads with operation voltages up to 96 VDC (DC1 duty) and are available with 1 (type D) or 2 (type R) contacts (1NO+1NC).

They are generally used for starting and drive of electric lift truck DC motors, remote control of battery supplied power circuits, drive of starting motors for combustion engines, power supply of board watercraft instruments, etc...

The squared assembly tongue enables every kind of assembly.

The contactors are provided with washers and screws for cables connections and with magnetic blowouts for voltages ≥ 48 VDC.

Coil and contacts can be easily inspected for maintenance and replacement.

The “MAC” series contactors are protected against dust and water sprays, can work in a wide temperature range (from -30° to $+60^{\circ}$ C) and have a maximum closing lag of 20 ms and an opening lag of 9 ms (that becomes 20 ms

with extra current peak extinguisher that is a resistance of 56 Ohm + diode).

USE:

For a correct use, a vertical assembly with the black head up for “D” type and with the black head down for “R” type is advised. Contacts must be connected according to fig. 1.

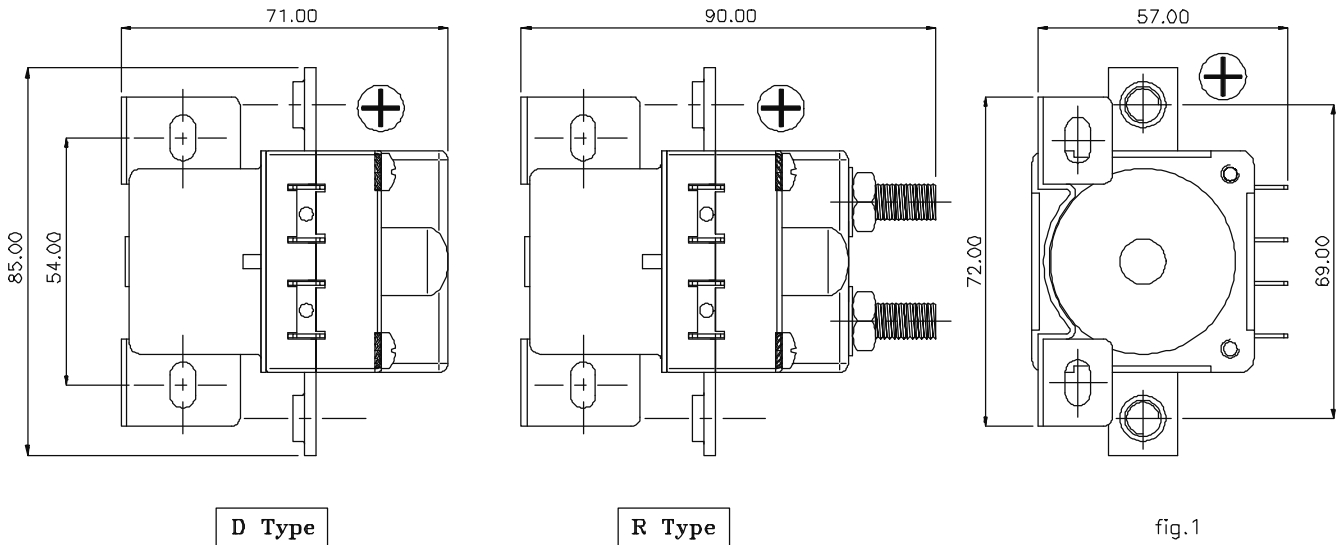
On request contactors having a different polarity than standard ones can be supplied.

For very inductive loads (DC2-DC4 duty), it is necessary to add a free-wheel diode (fig. 3).

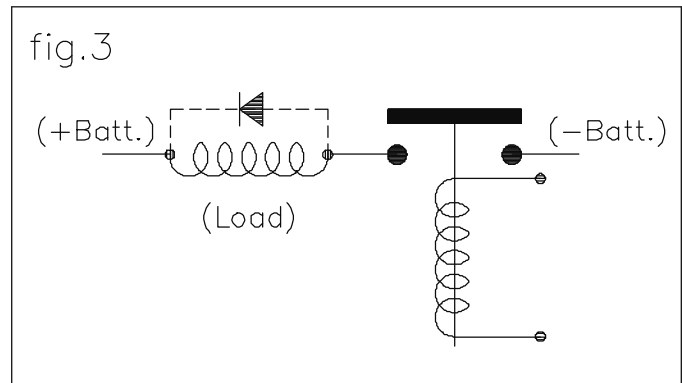
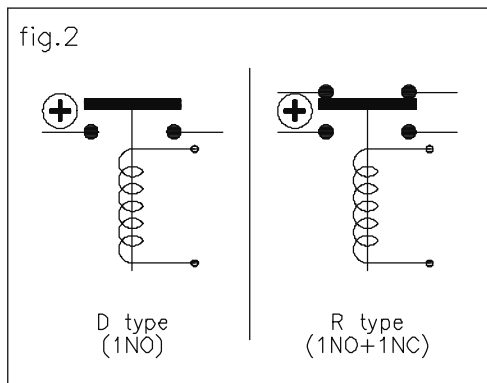
Technical features might be modified without notice.

NEWS

MECHANICAL CLEARANCES



WIRING DIAGRAM



CONTACTS AND COILS FEATURES

DC1 DUTY (Resistive load)

MAC	V	"N.O." CONTACT		"N.C." CONTACT	
		CONT.	SPUNTO	CONT.	SPUNTO
10-D	24/80	100	300	—	—
15-D	24/80	150	450	—	—
15-R	24/80	150	450	75	250

CONT.=MAX. CONTINUOUS CURRENT SPUNTO=STARTING CURRENT

Load on contacts can be increased up to 200% with a consequent shorter life of contactors.

- DC1: No or slightly inductive loads (spiral resistor)
- DC2: Shunt motor starting and stopping
- DC4: Series motor starting and stopping

ON REQUEST STANDARD

V	INTERMITTENT DUTY		CONTINUOUS DUTY	
	RES.20°C	20°C	RES.20°C	20°C
12	7,4	COIL POWER CONSUMPTION 19,5W AT 20°C OPERATIVE VOLTAGE AT 25°C FROM 60% TO 100% OF "VB"	13	COIL POWER CONSUMPTION 11W AT 20°C OPERATIVE VOLTAGE AT 25°C FROM 80% TO 110% OF "VB"
24	29,5		52,5	
36	66,5		118	
48	118		210	
60	185		327	
72	266		471	
80	328		582	
96	473		838	
108	582		1060	
120	838		1309	

For intermittent duty, work cycles of 10" (ON) and 60" (OFF) or 1' (ON) and 6' (OFF) are advised.