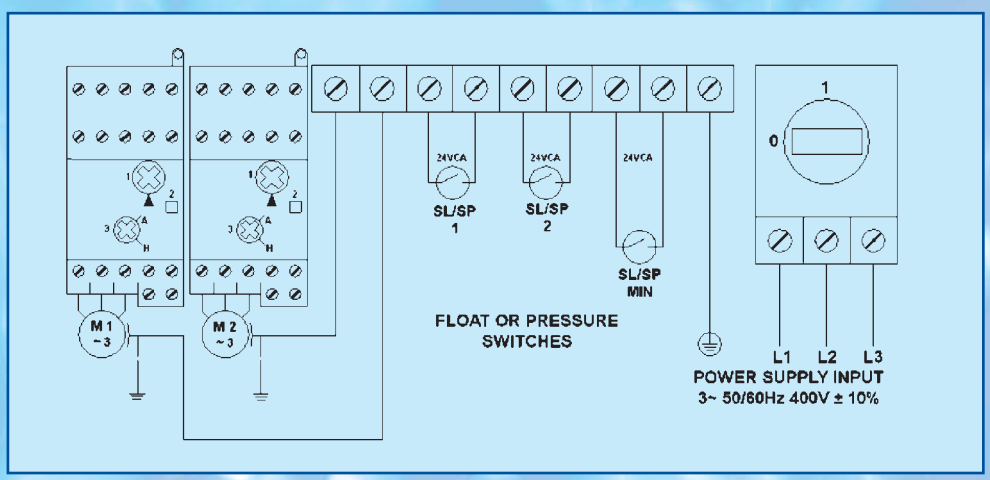
Control panel

For 3 three-phase electric pumps with thermal protection and exchanger

General features:

- Electromechanic panel with electronic control
- Sequence exchanger for 2 electro pumps
- Thermoplastic box
- Dimensions h/w/d mm. 310X240X110
- Input / output with cable holder
- Protected to IP55
- Operating temperature –5 ÷ +40°C
- Max. relative moisture 50% at Ta 40°C
- Power supply 3 ~ 50/60Hz 400V ± 10%
- General disconnecting switch with door lock
- Selectors for: automatic / off / manual operation
- Lighting led: n° 2 operating motor -n° 2 protected motor -n° 1 main pilot -n° 1 min-max water level alarm n° 1 for pressure switches
- Protection fuses: for motors and auxiliary circuits
- Contactors with thermal relay internally resetable
- 24V voltage inputs for external controls from pressure switches or float switches
- 24V voltage inputs for pressure switch or minimum level float switch against dry running or too full

Connection diagram



Thermal overload relay

1 Overload current setting
2 Test button
3 **H** - manual resetting
A - automatic resetting

Attention: if the rearmament is in position A, the thermal relay always returns automatically on, as soon as it cools off, giving tension to the pumps.

Technical data and operating powers

Code	Approx power to 400Vca For each single motor with cos φ = 0,8		Operating current (A) For each single motor	
	KW	HP	Min.	Max.
WQDA2AB01	0,6 ÷ 0,9	0,8 ÷ 1,1	1,6	2,4
WQDA2BB01	0,9 ÷ 1,4	1,1 ÷ 1,9	2,4	4
WQDA2CB01	1,4 ÷ 2,1	1,9 ÷ 2,9	4	6
WQDA2DB01	2,1 ÷ 3,2	2,9 ÷ 4,3	6	9
WQDA2EB01	3,2 ÷ 4,3	4,3 ÷ 5,8	9	12

Choice of the model: the max absorbtion current of your motor has to be within the Min ÷ Max operating currents of the control panel.

V Industrial Control

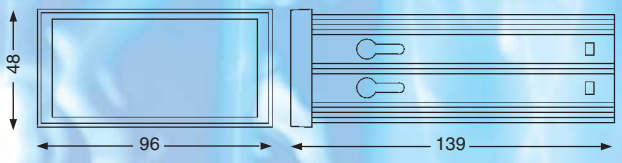
Multi-scale industrial voltmeters

The Industrial control products, as the name itself implies, are designed to satisfy the needs of the distribution board experts: These products control the various functions and are able to detect thresholds over or under which the equipment automatically blocks the power supply or starts off an alarm signal, thus avoiding damage to the main equipment.
The whole range is made up of multi-scale instruments.
The choice of the set limitations is easily done using trimmers and dip-switches and controlling them on the display.

STANDARD VERSION
By pressing the push button, the voltage in the single phases (R, S, T, N) is displayed, whereas, when the LED, displayed with a ∑, the average voltage is shown.

SET POINT VERSION
The set point version permits a seperate setting for low level L (low) and a high level H (high), adjustable by means of trimmers called Set Low and Set High. You will also find on the device the Led that indicate low alarm LA and high alarm HA.

Type	Standard version	Set point version
Code	T600050000	T600050100
Supply voltage	230V~ / 50 ÷ 60 Hz	
Power consumption	5VA	
Control	Measures three phases voltage	Measures three phases voltage + 2 set point (high and low)
Range	0÷600V~	
Output relay	V=250V~ I= 1A	
Display	3 green led display (h=15mm) + led	
Overange	EEE	- - -
Mounting	Panel cutout 44X90 mm	
Dimensions	48x96x139 mm	
Housing	ABS	
Wiring	Wiring for 2,5 mm²	
Weight	gr. 350	
Operating temperature	-10 °C ÷ + 50 °C	
Storage temperature	-10 °C ÷ +80 °C	
Button settings	1-display 1° phase	
	2-display 2° phase	
	3-display 3° phase	
		4-display all 3 phases
		5-display low set point
		6-display high set point



A Industrial Control

Multi-scale industrial Ammeter

The Industrial control products, as the name itself implies, are designed to satisfy the needs of the distribution board experts These products control the various functions and are able to detect thresholds over or under which the equipment automatically blocks the power supply or starts off an alarm signal, thus avoiding damage to the main equipment.
The whole range is made up of multi-scale instruments.
The choice of the set limitations is easily done using trimmers and dip-switches and controlling them on the display.

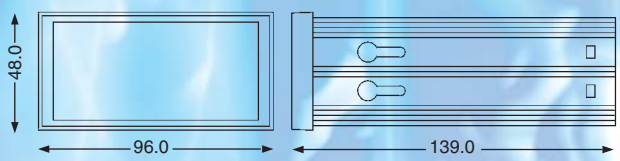
STANDARD VERSION

By pressing the push button, the current in the single phases (R, S, T, N) is displayed, whereas, when the LED, displayed with a ∑, the average current is shown.

SET POINT VERSION

The set point version permits a seperate setting for low level L (low) and a high level H (high), adjustable by means of trimmers called Set Low and Set High. You will also find on the device the Led that indicate low alarm LA and high alarm HA.

Type	Standard version	Set point version
Code	T601050000	T601050100
Supply voltage	230 V~ / 50 ÷ 60 Hz	
Power consumption	5 VA	
Control	Measures three phase current	Measures three phase current + 2 set point (high and low)
Range	Direct : 10A max With CT : limited by type of CT	
Output relay	V=250V~ I= 1A	
Display	3 green led display (h=15mm) + led	
Overange	EEE	- - -
Mounting	Panel cutout 44X90 mm	
Dimensions	48X96X139 mm	
Housing	ABS	
Wiring	Wiring for 2,5 mm2	
Weight	gr. 350	
Operating temperature	-10 °C ÷ + 50 °C	
Storage temperature	-10 °C ÷ +80 °C	
Button settings	1-display 1° phase	
	2-display 2° phase	
	3-display 3° phase	
		4-display all 3 phases
		5-display low set point
		6-display high set point

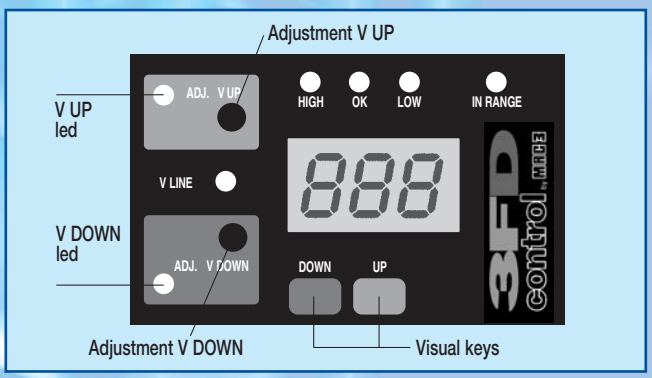


3FD Control

Mod. 22 - Single-phase mains controller with display
Mod. 33 - Three-phase mains controller with display

Mod. 22
The device developed for motor protection, checks that any drops or increases in voltage do not exceed the set values, by disactivating the relay should it occur.
The maximum and minimum voltage values can be set on the front panel by means of a potentiometer.
Visualization on a LCD display.

Mod. 33
The device developed for motor protection, controls that any drops or increase in voltage do not exceed the set values, disactivating the relay and permitting the operation of the motor.
The maximum and minimum voltage values can be set on the front panel by means of a potentiometer.
Visualization on a LCD display.



Type	mod. 22	mod. 33
Code	T410000000	T510000000
Supply voltage	180 ÷ 260 V~ 50 - 60 Hz directly from the line	300 ÷ 500 V~ 50 - 60 Hz directly from the line
Power comsumption	5 VA max	
Monitoring range	180 ÷ 260 V~	300 ÷ 500 V~
Mounting	4 moduliules	
Response time	2 sec. max with 2,5% drop voltage	
Relay contact rating	AC 2500 VA ind. load Cos φ = 1 AC 1875 VA ind. load Cos φ = 0,4 DC 300 W resistive load	
Number of operations	30 max operation rate	
Operating temperature	- 10 °C ÷ + 50 °C	
Storage temperature	- 10 °C ÷ + 80 °C	
Housing	Noryl (PPO) UL 94 V0	
Dimensions	mm 90x69x71	
Weight	gr. 300	
Note	other power voltages on request	

Installation

Connect the device as shown in the diagram. Switch on and the device will immediately display the power voltage applied. If this voltage comes within the two set value limits the device will, after a few seconds, activate the relay which operates the motor. The minimum and maximum voltage rates can be set by means of the two potentiometers.

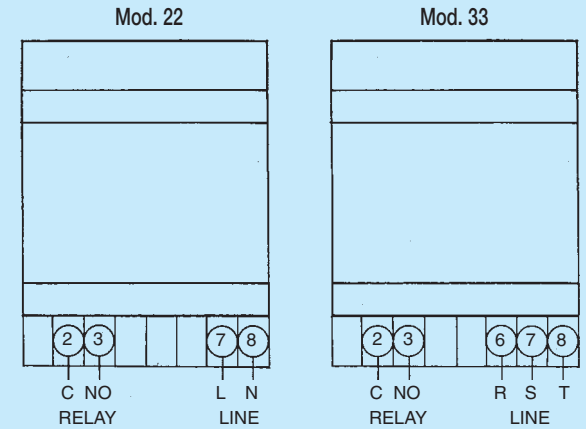
The voltage value is displayed between the two keys positioned in the middle of the front panel.

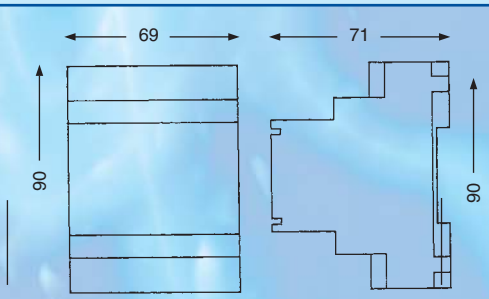
The key on the right when pressed displays the HIGH voltage set using the UP potentiometer.

The left key when pressed displays the LOW voltage set using the DOWN potentiometer.

Providing that the power voltage comes within these two limits the output relay is activated. If it does not come within these limits the led comes on indicating non-conformity situation.

Wiring diagrams





3F Control

Mod. 22 - Single-phase mains controller
Mod. 33 - Three-phase mains controller

Mod. 22
This device, for motor protection, controls that the drop voltage doesn't exceed the established value, by turning off the relay when it happens. The relay is delayed to prevent the brief and tempory breaking.

Mod. 33
This unit is designed to monitor a 3 phase supply, one failure phase and a lowering of power supply. The relay allows the motor start only if there are the above mentioned conditions. The relay is delayed to prevent brief temporary interruptions.

Type	mod. 22	mod. 33
Code	T400000000	T500000000
Supply voltage	180 ÷ 260V~ 50 - 60 Hz directly from the line	300 ÷ 500V~ 50 - 60 Hz directly from the line
Power consumption	5 VA max	
Monitoring range	180 ÷ 260V~	300 ÷ 500V~
Mounting	Sockets 11 pin	
Response time	2 sec. max with 2,5% drop voltage	
Contact rating	AC 2500VA ind. load Cos φ = 1 AC 1875VA ind. load Cos φ = 0,4 DC 300 W resistive load	
Number of operations	30 max operation rate	
Operating temperature	- 10 °C ÷ + 50 °C	
Storage temperature	- 10 °C ÷ + 80 °C	
Housing	Noryl (PPO) UL 94 V0	
Accessories included	Sockets 11 pin code TZ11000000	
Dimensions	mm 79x35x88	
Weight	gr. 116	

Mod. 33 - Installation

For nominal value of 380 V~:
before installation isolate the power supply. Connect the supply as shown in the diagram. Turn the "SET VOLTS" clock wise to (LO) position and check that the green led (RIGHT) is on. If this does not occur (wrong sequence) invert the 2 phases. After this operation the green led will be on.
If this does not occur, check the individual voltage level on all 3 phases.

For nominal value 415-440 V~:
follow the procedure as for 380 V~, but the "SET VOLTS" should be turned clock wise, stopping at 3-4 division, before the low position.

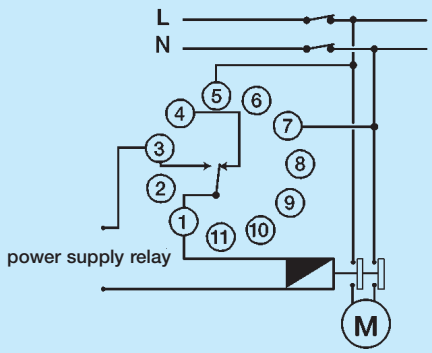
Mod. 33 - Setting valid for all supply:

when the unit is on, turn the "SET VOLTS" anti-clock wise slowly towards position "HI" until the red led (FAULT) turns on.
Turn back the "SET VOLTS" (clock wise) slowly until the red led "FAULT" goes out. With this operation we have set a trip level 5-8 V lower than the nominal voltage. In case of excessive voltage fluctuation the trip level should be increased further to prevent false tripping.
Note: each division mark correspond to a variation of 12 V.

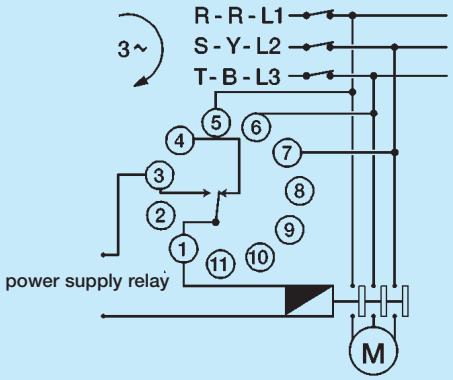
Note: Supply voltage

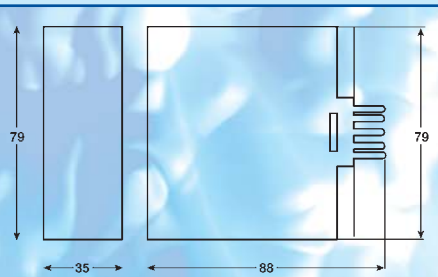
Mod. 22	90 ÷ 130V~	code T40B000000
Mod. 33	180 ÷ 250V~	code T50B000000

Wiring diagram
Mod. 22



Wiring diagram
Mod. 33





Multicontrol

Control cards for autoclaves

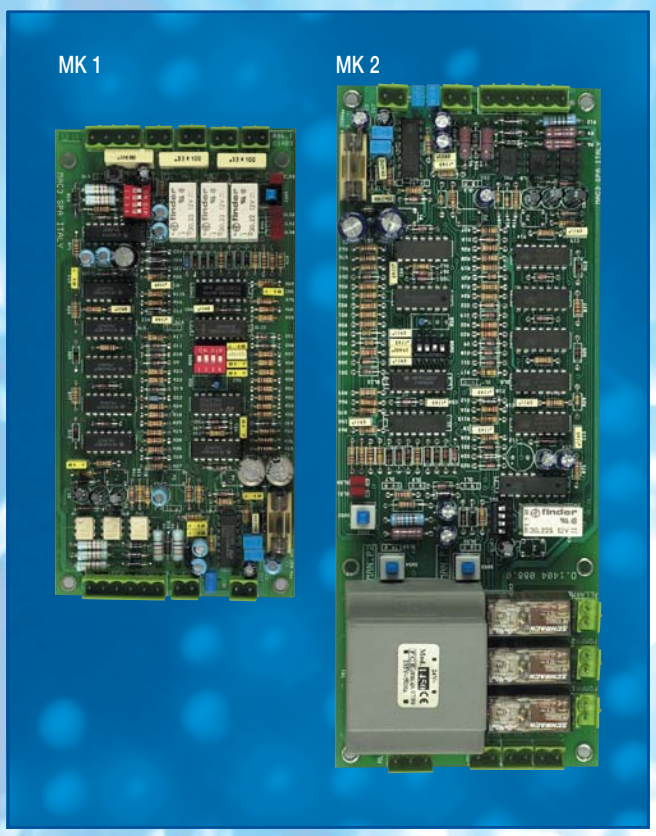
The Multicontrol autoclave cards have the principal function of ensuring the reliability of autoclave construction and adding to the normal safety checks a series of further controls that would not be possible electromechanically. The functions undertaken are displayed by a series of leds that identify the function undertaken at any given moment.

The checks undertaken are as follows:

- Inversion of command between the main pump (Pump 1) and the reserve pump (Pump 2) on each cycle.
- Pump start inhibition in the event of lack of water in the main tank.
- Alarm with total block of functions, in the event that after a certain time (the time can be programmed), with the two pumps in operation, at least one pump is not disactivated (broken delivery pipe, or pumps that are drained and running idle).
- Complete stoppage in the event of lack of air cushion.
- Activation of an alarm relay even with possibility of remote control. By activating the relay the functions are halted, and the reset must be undertaken manually. The card also features a Manual-Automatic control, which permits the transfer from automatic to manual function at any time, allowing or not by means of the two buttons, the activation of the individual pumps. The card permits the control and command of a series of functions that are vital for a water pressurization system. The card also allows for high degree of personalization by the plant constructor.

Type	MK1	MK2
Code	TMK1000000	TMK2000000
Supply voltage	24 V ~ 50 ÷ 60 Hz	230 V ~ 50 ÷ 60 Hz
Power consumption	6 VA	10 VA
Function display front panel)		
Pump 1 control	●	●
Pump 2 control	●	●
Voltage	●	●
Pressure switch 1	●	●
Pressure switch 2	●	●
Pump 1 thermal switch	●	●
Pump 2 thermal switch	●	●
Pump 1 running	●	●
Pump 2 running	●	●
Manual	●	●
Automatic	●	●
Minimum float switch	●	●
Memory engaged		●
Alarm		●
Inputs		
Voltage	●	●
Pressure switch 1	●	●
Pressure switch 2	●	●
Minimum float swich	●	●
Pump 1 thermal switch	●	●
Pump 2 thermal switch	●	●
External alarm	●	●
Reset	●	●
Outputs	Pressure switch 1 (24 V~) Pressure switch 2 (24 V~) Allarm (24 V~)	Free contact Free contact Free contact
Controls		
Automatic Manual button	●	●
Pump 1 manual button	●	●
Pump 2 manual button	●	●
Alarm Reset button		●

Type	MK1	MK2
Output characteristics Power supply and voltage)		
Pump 1 Pump 2 Alarm	Output is the same as the input voltage with max 2 A allowing for control of a 24 V~ remote control switches	NO contacts (250 V~ 5A)
Operating temperature	0 ÷ + 50 °C	0 ÷ + 50 °C
Storage temperature	-10 °C ÷ + 80 °C	-10 °C ÷ + 80 °C
Dimensions	mm 166x90x35	230x90x50
Weight	gr. 170	gr. 465
Assembly on panel by screw fastening	●	●
Note	The card is complete with a circuit protection guard. The maximum and minimum pump operation times may be regulated from the rear of the panel and can be programmed by means of dipswitch.	



V/A/KW Control

Voltmeters/Ammeter/Wattmeter digital

The range of Control products presented by MAC 3 is ideal for measuring electrical parameters in both the industrial and civil fields. The range comprises three digital reading instruments with which it is possible to keep a check on the voltage (V-Control), (A-Control) and (KW-Control).
The operational ranges of these instruments meets all the possible requirements to adapt the ranges to the values to be measured by means of a dipswitch.
The 3-module device has been developed for use on the DIN rail.

Type	V Control cc	V Control ca
Code	TVdc000000	TV00000000
Supply voltage	117/230V~ 50 ÷ 60 Hz	
Power consumption	3VA max	
Monitoring	3 green displays	3 red displays
Mounting	On DIN rail	
Connections	On terminal board for Ø ≤ mm² 2,5	
Field of measurement	With dipswitch 0 ÷ 999 V f.s.	

Model	Range	Risolution	Range setting
V-Control Multiscala	0 - 9.99	0.1 V	ON OFF 1 2 3 4
	0 - 99.9	0.1 V	ON OFF 1 2 3 4
	0 - 999	1 V	ON OFF 1 2 3 4

Operating temperature	- 10 °C ÷ + 50 °C
Storage temperature	- 30 °C ÷ + 80 °C
Out of range indication	"EEE"
Housing	Noryl (PPO) UL 94 V0
Dimensions	mm 54x95x59
Weight	gr. 220
Note	
Supply voltage on request 24 V~ Code	TVdc000024 TV00000024

For V Control DC only:
If appears the signal - - - invert the input connection of the 16 and 18 pin.

Type	KW Control
Code	TW00000000
Supply voltage	117/230V~ 50 ÷ 60 Hz
Power consumption	3VA max
Monitoring	3 green digit displays
Mounting	On DIN rail
Connections	On terminal board for Ø ≤ mm² 2,5
Range without CT..	0 ÷ 999 W

	CT.	Range	Risolution	Range setting
Wiring diagram 1	–	0 - 999 W	1 W	ON OFF 1 2 3 4 5 6
Range with CT.		0 ÷ 30 Kw		
Wiring diagram 2	50/5	0 - 9.99 Kw	10 W	ON OFF 1 2 3 4 5 6
	100/5	0 - 20 Kw	100 W	ON OFF 1 2 3 4 5 6
	150/5	0 - 30 Kw	100 W	ON OFF 1 2 3 4 5 6

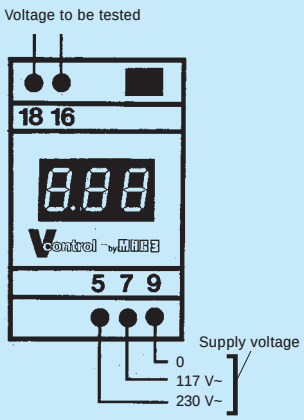
Operating temperature	- 10 °C ÷ + 50 °C
Storage temperature	- 20 °C ÷ + 80 °C
Housing	Noryl (PPO) UL 94 V0
Out of range indication	"EEE"
Dimensions	mm 54x95x59 3 moduli
Weight	gr. 220
Note	If appears the signal - - - invert the input connection of the C.T.
Supply voltage on request	24V~ Codice TW00000024

Type	A Control AC
Code	Ta00000000
Supply voltage	Bitensione 117/230 V~ 50 ÷ 60 Hz
Power consumption	3 VA max
Monitoring	3 display verdi
Mounting	Barra DIN
Connections	On terminal board for Ø ≤ mm² 2,5
Range with CT.	0 ÷ 999 A

Model	CT.	Range	Risolution	Range setting
A-Control Multiscale	25/5	0 - 25.0 A	0.1 A	ON OFF 1 2 3 4
	60/5	0 - 60.0 A	0.1 A	ON OFF 1 2 3 4
	100/5	0 - 99.9 A	0.1 A	ON OFF 1 2 3 4
	250/5	0 - 250 A	1 A	ON OFF 1 2 3 4
	600/5	0 - 600 A	1 A	ON OFF 1 2 3 4
	1.000/5	0 - 999 A	1 A	ON OFF 1 2 3 4

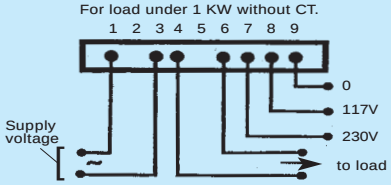
Operating temperature	- 10 °C ÷ + 50 °C
Storage temperature	- 20 °C ÷ + 80 °C
Housing	Noryl (PPO) UL 94 V1
Out of range indication	"EEE"
Dimensions	mm 54x95x59 3 module
Weight	gr. 220
Note	
Supply voltage on request	24 V~ Code Ta00000024

Wiring diagram

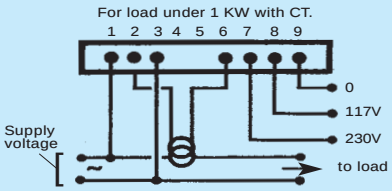


It is however in the interest of safety that the range alteration operation is undertaken with the instrument disconnected.

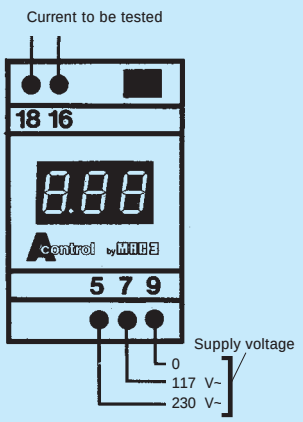
Wiring diagram 1
(0 ÷ 999 KW)



Wiring diagram 2
(0 ÷ 30 KW)



Wiring diagram



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