

- Voltage Supply 480-600-690V
- Current Rating from 35 to 2100A
- Designed to drive 1-2-3 Phase loads
- Internal Fuse with Micro for Fuse Failure
- Stall Fan Protection for 1100 to 2100A
- Control Board with Plug in connections
- Thermal Protection on each Heat Sink
- Phase Angle Firing for 1-3 Phase Units

**CD AUTOMATION**

**POWERED BY INNOVATION**

# MULTIDRIVE

THE HIGH POWER STACK HORIZON  
1-2-3 PH From 35A to 2100A



**The High Power Stack Horizon**



[www.cdautomation.com](http://www.cdautomation.com)

Multidrive Catalog 2018

Release n.1

# MULTIDRIVE 2PH From 45 to 800A



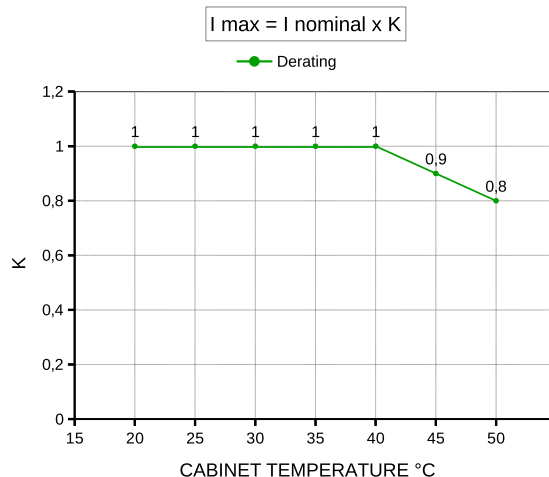
## GENERAL DESCRIPTION

- MULTIDRIVE is a full digital and universal Thyristor unit based on a very powerful dedicated micro configurable via serial communication port for all inputs, firing modes, control modes and loads types
- Suitable to drive resistive loads and transformer coupled with normal resistance loads
- Two legs switching three wires loads STAR or DELTA connection
- Frontal Key Pad standard to configure all the internal functions and parameters
- Four Analog output configurable
- Six Digital input
- Four relay output
- Universal Input signal with automatic zero/span calibration.
- Universal Firing modes, customer configurable via Key Pad or communication port as Burst Firing or Delayed Triggering
- Universal Control Mode
- Unbalanced load and Heater Break Alarm
- RS 485 port. Modbus protocol
- Comply with EMC and cUL approval up to 800A included
- IP20 Protection

## TECHNICAL SPECIFICATION

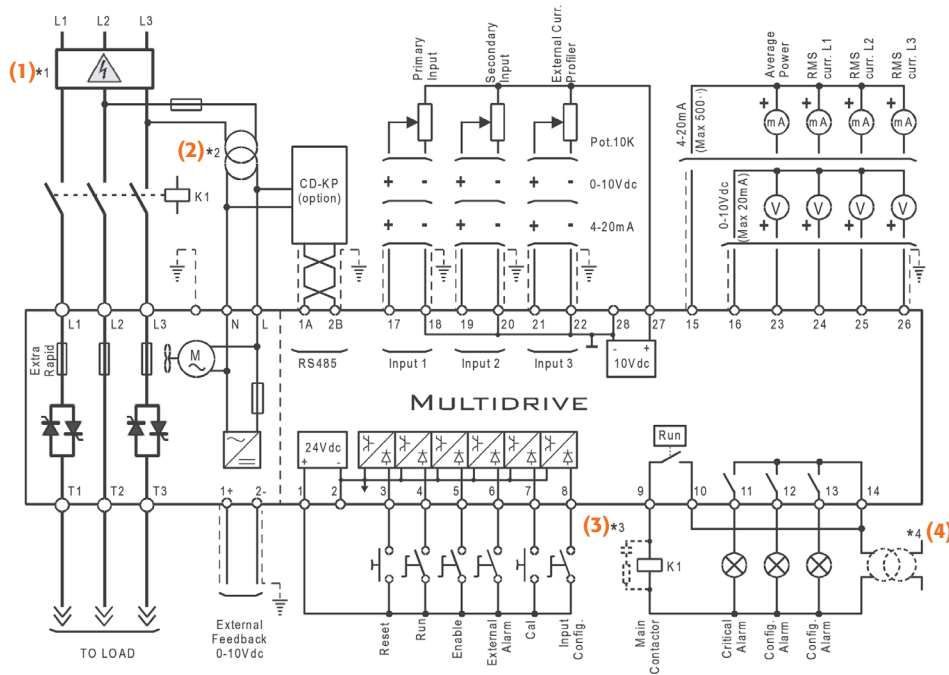
OPERATING TEMPERATURE	0+40°C over this temperature see derating curve
VOLTAGE POWER SUPPLY	480V standard, 600V or 690V on request
AUXILIARY VOLTAGE SUPPLY	90÷265V; 20VA power consumption Fan voltage supply: 230V ±15% as a standard and 110V on request
ANALOG INPUT 1	Main reference, 4÷20mA, 0÷10V, 10KPOT, RS485 port
ANALOG INPUT 2	Secondary reference, 0÷10V, 10KPot
ANALOG OUTPUT	Four Analog output (0÷20mA or 4÷20mA) for retransmission of Voltage or Power and current for each Phase
DIGITAL INPUT	Six optoisolated digital input (12/24Vdc), for START, STOP, ENABLE, CALIBRATION, RESET ALARM and EXTERNAL ALARM
RELAY OUTPUT	Three configurable relay output and one critical alarm
UNIVERSAL FIRING	One of these firing modes can be configured Burst Firing BF, Delayed Triggering
CONTROL MODE	Voltage (V), Current (C), Power (Vxl) and External feedback
HEATER BREAK ALARM	Circuit microprocessor based to diagnose partial or total load failure and short circuit on Thyristors
UNBALANCED LOAD	This protection allow to have Multidrive working up to 20% of unbalance on one phase
COMMUNICATION	RS485 Port. Modbus communication protocol 9600 or 19200 bauds
THERMAL PROTECTION	Available on forced ventilated units

## CURRENT DERATING AS FUNCTION OF CABINET TEMPERATURE



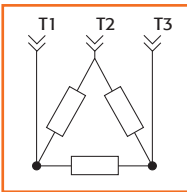
# WIRING CONNECTION MULTIDRIVE 2PH from 45A to 700A

## MULTIDRIVE 2PH



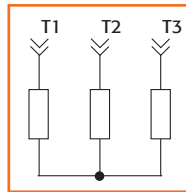
### NOTE:

#### LOAD TYPE



**DELTA**  
resistive or infrared lamps  
long and medium waveform

#### LOAD TYPE



**STAR**  
without neutral  
resistive or infrared lamps  
long and waveform

- (1) The user must provide for protection external electromagnetic circuit breaker or fuse isolator.
- (2) Use an appropriate external transformer to supply of the electronic board (see the identification label).
- (3) The coil contactor, the relays and other inductive loads must be equipped with proper RC filter.
- (4) Before give the Start command supply the input of auxiliary voltage

### DIMENSION AND FIXING HOLES



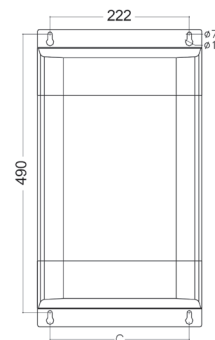
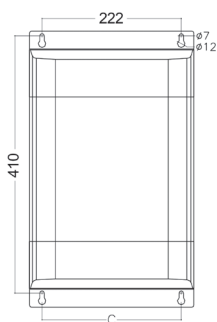
**MULTIDRIVE 45A - 225A**

**S13** W 262mm - H 440mm - D 270mm - Kg 18



**MULTIDRIVE 275A - 700A**

**S14** W 262mm - H 520mm - D 270mm - Kg 22,5



# MULTIDRIVE 3PH From 35 to 800A



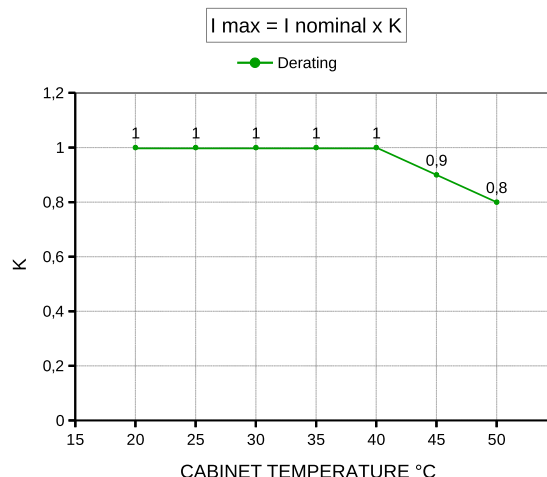
## GENERAL DESCRIPTION

- MULTIDRIVE is a full digital and universal Thyristor unit based on a very powerful dedicated micro configurable via serial communication port for all inputs, firing modes, control modes and loads types
- Suitable to drive resistive, inductive, transformer and complex loads requiring current limit and power control mode
- Frontal Key Pad standard to configure all the internal functions and parameters
- Four Analog output configurable
- Six Digital input
- Four relay output
- Universal Input signal with automatic zero/span calibration
- Universal Firing modes, customer configurable via Key Pad or communication port as Burst Firing and Phase Angle, Delay triggering and single cycle with star + neutral
- Universal Feed back modes V - I - VxI
- Soft Start can be used in addition to Burst Firing and Phase Angle
- Unbalanced load and Heater Break Alarm
- RS 485 port. Modbus protocol
- Comply with EMC and cUL approval up to 600A included
- IP20 Protection

## TECHNICAL SPECIFICATION

OPERATING TEMPERATURE	0+40°C over this temperature see derating curve
VOLTAGE POWER SUPPLY	480V standard, 600V or 690V on request
AUXILIARY VOLTAGE SUPPLY	90+265V; 20VA power consumption. Fan voltage supply: 230V ±15% as a standard and 110V on request
ANALOG INPUT 1	Main reference, 4+20mA, 0+10V, 10KPOT, RS485 port
ANALOG INPUT 2	Secondary reference, 0+10V, 10KPot
ANALOG INPUT 3	External current limit set, via analog input 0-10V or KPot
ANALOG OUTPUT	Four Analog output (0+20mA or 4+20mA) for retransmission of Voltage or Power and current for each Phase
DIGITAL INPUT	Six optoisolated digital input (12/24Vdc), for START, STOP, ENABLE, CALIBRATION, RESET ALARM and EXTERNAL ALARM
RELAY OUTPUT	Three configurable relay output and one critical alarm
UNIVERSAL FIRING	One of these firing modes can be configured Burst Firing BF, Single Cycles SC, Soft Start + Burst Firing S+BF; Soft Start + Phase Angle S+PA; Delayed Triggering DT
SOFT START	Digital adjustable ramp rate
CONTROL MODE	Voltage (V), Current (I), Power (VxI) and External feedback
HEATER BREAK ALARM	Circuit microprocessor based to diagnose partial or total load failure and short circuit on Thyristors
UNBALANCED LOAD	This protection allow to have Multidrive working up to 20% of unbalance on one phase
COMMUNICATION	RS485 Port Modbus communication protocol 9600 or 19200 bauds
THERMAL PROTECTION	Available on forced ventilated units

## CURRENT DERATING AS FUNCTION OF CABINET TEMPERATURE









# MULTIDRIVE 1-2-3 PH From 1100 to 2100A

## GENERAL DESCRIPTION

- Universal unit for input, firing and control mode
- Communication Modbus RTU standard and profibus DP, ethernet TCP or IP available as an option
- Fully configurable via comm. port or frontal keypad
- Easy to use, with diagnostic and wiring diagram on front unit
- Removal of the complete phase by front unit without fork lift help
- Aluminum modular structure and copper treated against oxidation
- Voltage supply 480-600-690V
- Microswitch for fuse failure alarm
- Stall protection for fan cooling

## APPLICATION

- Petrochemicals
- Platform for oil extraction
- Conventional power generation
- Chemicals and pharmaceutical
- Autoclaves
- Furnaces
- Galvanic process



## FEATURES

- Multidrive 1-2-3 PH is a full digital and universal thyristor unit based on very powerful dedicated micro configurable via serial communication port for all inputs, firing modes, control mode and load types.
- Suitable to drive resistive and inductive loads, 1, 2 and 3 phase version to drive one and three phase load
- Phase angle available on 1 or 3 phase unit
- Frontal key pad standard to configure all the internal functions and parameters
- External touch panel option with measures and trend available as an option
- Four analog output configurable, six digit input, four relay output
- Universal input signal with automatic zero/span calibration
- Universal firing modes, customer configurable via key pad or communication port as burst firing, delayed triggering or phase angle
- Universal feed back modes V, I, VxI and external
- Unbalanced load and heater break alarm to diagnose partial or total load failure
- RS 485 port. Modbus protocol standard, fieldbus as an option (profibus, ethernet modbus TCP, profinet, IP)
- Comply with EMC rules, IP20 protection

Internal view without IP20 protection



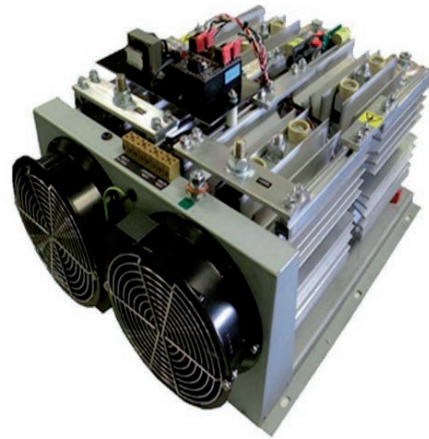
## TECHNICAL SPECIFICATION

OPERATING TEMPERATURE	0+40°C over this temperature see derating curve
MAX VOLTAGE POWER SUPPLY	600V or 690V
AUXILIARY VOLTAGE SUPPLY	90÷265V, 20 VA power consumption. Fan voltage supply: 230±15% as a standard and 110V on request
ANALOG INPUT	1 main reference, 4÷20mA, 0÷10V, 10KPOT, RS485 port
ANALOG INPUT 2	Secondary reference, 0÷10V, 10KPOT
ANALOG OUTPUT	Four analog output (0÷20mA or 4÷20mA) for retransmission of voltage or power and current for each phase
DIGITAL INPUT	Six optoisolated digital input (12/24Vdc), for Start, Stop, Enable, Calibration, Reset Alarm and External Alarm
RELAY OUTPUT	Three configurable relay output and one critical alarm
UNIVERSAL FIRING	One of these firing modes can be configured burst firing BF, delayed triggering and phase angle on 1-3 PH units
COMMUNICATION	RS485 port. Modbus communication protocol 9600 or 19200 bauds
UNBALANCED LOAD	This protection allow to have Multidrive working up to 20% of unbalance on one phase
CONTROL MODE	Voltage (V), Current (I), Power (VxI) and external feed-back
HEATER BREAK THYRISTORS	Alarm circuit microprocessor based to diagnose partial or total load failure and short circuit on thyristor
THERMAL PROTECTION	One contact free voltage plus one thermal switch for circuit alarm



**CD AUTOMATION**

**COMPETITORS**



**OUR NEW PROJECT**

**OLD FASHION PROJECT**

Aluminum tunnel for cooling

NO ventilation tunnel for cooling

Flux of air in direction of heat sink to increase the cooling efficiency

If you mount more than one unit in a cubicle you will have different air vortex intersection

You buy an units able to grow with your needs

You buy just heat sink plus thyristor

Fuses available inside the units

Fuses not available

Full visual diagnostic via front Key Pad

NO diagnostic

Heater break alarm to diagnostic partial or total load failure and short circuit on thyristor

NO heater break and thyristor short circuit alarm

Fuse fault indication

NO fuse fault indication

Reading on frontal display for current, voltage and power in engineering units

NO reading

Possibility to connect a touch panel to manage up to six units

NO possibility for a touch panel connection because there is not communication

Communication RS485 Std. with Modbus protocol

NO Communicaton

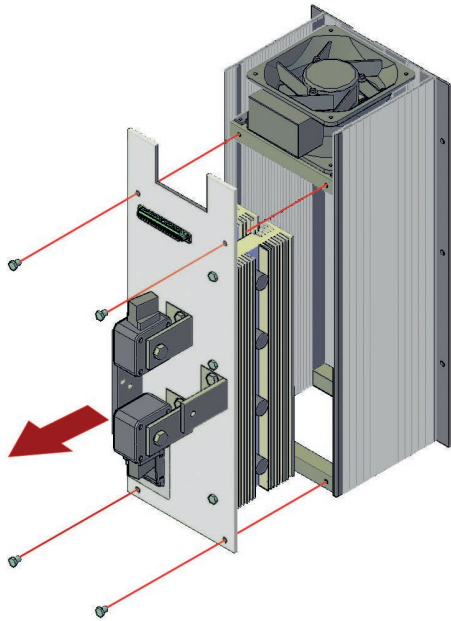
Fieldbus available as option

NO Fieldbus

IP20 protection

NO IP20

## MAINTAINABILITY IN FUNCTION



### THESE ARE OUR TARGETS:

- Each phase can be substituted by front unit by technician removing 4 screw without the help of fork lift
- The average weight of phase is 16kg up to 2100 Amps
- Time required to substitute one phase not more than 20 minutes
- Plant downtime not more than 20 minutes, vital for important process
- When the operator substitute one phase all the auxiliary connection are plug in this allow to be fast and don't do mistakes in wiring
- Control board plug in for the connection

## HEATER BREAK STANDARD

The heater break circuit diagnostic partial or total load failure.

It reads load resistance with an internal voltage and current transducer to calculate the resistance value  $V/I$ .

The heater break circuit is compensated for voltage fluctuation, in fact a voltage variation has no influence on resistance value because  $V/I$  ratio remain constant.

On this unit is possible to set the nominal resistance and the alarm sensitivity.

HB alarm in addition diagnostic short circuit on thyristor.

A normally open contact gives the alarm condition and an indication of the alarm type.

## FIELDBUS OPTION

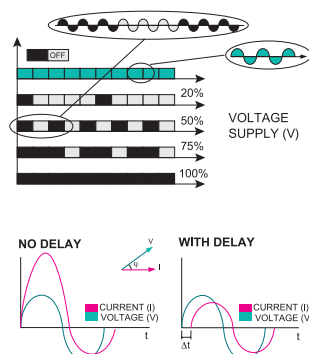
- Profibus DP
- Ethernet Modbus TCP protocol
- ProfiNET
- Ethernet IP
- EtherCAT

## REVO KP2



- Graphic operating terminal for thyristor unit up to 6 Multidrive can be managed by REVO KP2
- 4.3 - 7.0 - 10" touch colour display are available
- Possibility to see trends of process variable
- Recipe management facility to configure parameter of multidrive just touching the panel
- Multi language interface selectable

## FIRING OPTION



**BURST FIRING:** This firing is performed digitally within the thyristor unit at zero volts, producing no EMC interference. Analogue inputs is necessary for BF and the number of complete cycles must be specified for 50% power demand.

This value can be between 1 and 255 complete cycles, determining the speed of firing. When 1 is specified, the firing mode becomes single cycle (SC).

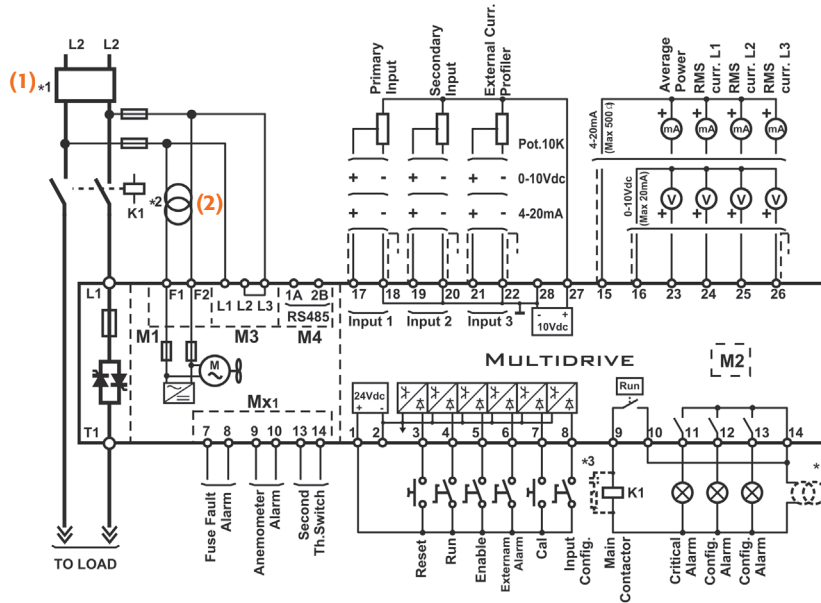
**DELAYED TRIGGERING:** Used to switch the primary coil of transformers when coupled with normal resistive loads (not cold resistance) on the secondary, DT prevents the inrush current when zero voltage (ON-OFF) is used to switch the primary.

The thyristor units switches OFF when the load voltage is negative and switches ON only when positive with a pre-set delay for the first half cycle.

**PHASE ANGLE FIRING AND CURRENT LIMIT LOOP:** Phase angle firing is available on 1 and 3 phase units with current limit as Std. feature.

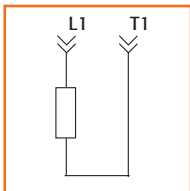
## MULTIDRIVE 1PH from 1100 to 2100A

1 PH



### NOTE:

#### LOAD TYPE

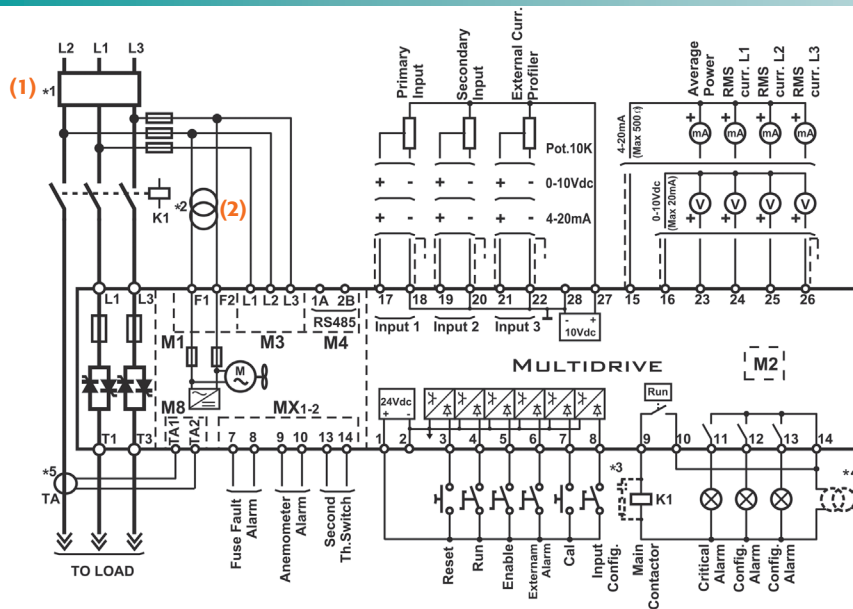


1 PHASE

- (1) The user must provide for protection external electromagnetic circuit breaker or fuse isolator
- (2) Use an appropriate external transformer to supply the electronic board (see the identification label)

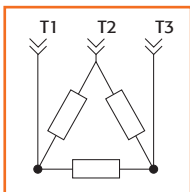
## MULTIDRIVE 2PH from 1100 to 2100A

2 PH



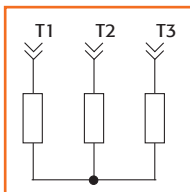
### NOTE:

#### LOAD TYPE



DELTA

#### LOAD TYPE

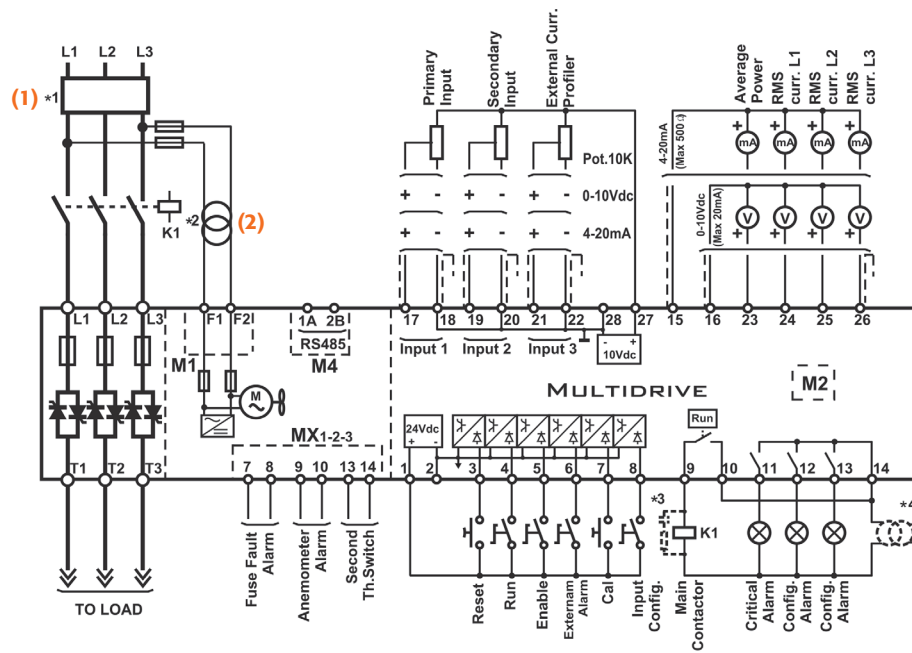


STAR

- (1) The user must provide for protection external electromagnetic circuit breaker or fuse isolator
- (2) Use an appropriate external transformer to supply the electronic board (see the identification label)

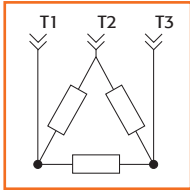
# MULTIDRIVE 3PH from 1100 to 2100A

3 PH



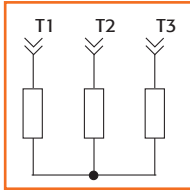
## NOTE:

### LOAD TYPE



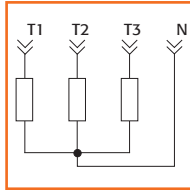
DELTA

### LOAD TYPE



STAR

### LOAD TYPE



STAR + NEUTRO

- 1) The user must provide for protection external electromagnetic circuit breaker or fuse isolator
- 2) Use an appropriate external transformer to supply the electronic board (see the identification label)

## CURRENT RATING

### Cabinet Temperature

40°C	45°C	50°C
1100A	1036A	978A
1400A	1299A	1227A
1600A	1500A	1420A
1800A	1700A	1600A
2100A	1964A	1857A

All the above current rating are referred at different cabinet temperature with the same junction temperature of thyristors



PHASE STACK THYRISTOR		
CURRENT	MAX NOMINAL VOLTAGE	MAX NOMINAL VOLTAGE
1100A	600V	690V
1400A	600V	690V
1600A	600V	690V
1800A	600V	690V
2100A	600V	690V

## ORDERING CODE

	1	2	3	4	5	6	-	7	8	9	10	11	12	13	14	15	16
MULTIDRIVE 1 Phase	M	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MULTIDRIVE 2 Phase	M	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MULTIDRIVE 3 Phase	M	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CURRENT	3	4	5	6	
description	code				note
1100A	1	1	0	0	
1400A	1	4	0	0	
1600A	1	6	0	0	
1800A	1	8	0	0	
2100A	2	1	0	0	

MAX VOLTAGE	7	
description	code	
480V	4	
600V	6	
690V	7	

VOLTAGE SUPPLY AUX	8	
description	code	
110V	1	
230V	2	

INPUT	9	
description	code	
SSR 3:30V dc	S	
0:10V dc	V	
4:20 mA	A	
10K Pot	K	
RS 485 communication	R	

FIRING	10	
description	code	
Zero Crossing ZC	Z	
Single Cycles on 1 phase unit	C	
Burst Firing BF	B	
Soft Start + Burst Firing	J	
Delayed Triggering + Burst Firing	D	
Phase Angle PA	P	
Soft Start + Phase Angle	E	

CONTROL MODE	11	
description	code	
Open Loop	O	
Voltage Feed Back V	U	
Power Feed Back Vxl	W	
Current Feed Back	I	
External Feed Back	E	

OPTION	12	
description	code	
4:20mA retransmission load voltage, load current and load power	A	
0:10V retransmission load voltage, load current and load power	V	

FAN VOLTAGE	13	
description	code	
Fan Voltage 220V	3	

APPROVALS	14	
description	code	
CE EMC For European Market	0	

MANUAL	15	
description	code	
None	0	
Italian	1	
English	2	
German	3	
French	4	

LOAD CONNECTION	16	
description	code	
Resistive Load/Delta Connection	1	
Resistive Load/Star Connection	2	
Resistive Load/Star Connection + Neutral	7	
Transformer Load/Delta Connection	3	
Transformer Load/Star Connection	4	
Transformer Load/Star Connection + Neutral	5	
Resistive Load/Open Delta	6	



## DIMENSION AND FIXING HOLES



**1 PHASE UNIT 1100A**

**SR18** H 550 x W 329 x D 347 - 27kg.



**2 PHASE UNIT 1100A**

**SR19** H 550 x W 523 x D 347 - 49kg.



**3 PHASE UNIT 1100A**

**SR20** H 550 x W 717 x D 347 - 72kg.



**1 PHASE UNIT  
1400A - 1600A - 1800A - 2100A**

**SR21** H 730 x W 329 x D 347 - 32/40kg.



**2 PHASE UNIT  
1400A - 1600A - 1800A - 2100A**

**SR22** H 730 x W 523 x D 347 - 59/75kg.



**3 PHASE UNIT  
1400A - 1600A - 1800A**

**SR23** H 730 x W 717 x D 347 - 86/110kg.





### **Italy**

CD Automation Srl  
Via Picasso, 34/36  
20025 Legnano MI  
Italy  
**T** +39 0331 577479  
**F** +39 0331 579479  
sales@cdautomation.com  
www.cdautomation.com

CD Automation Srl (Facility)  
20023 Cantalupo MI  
Italy

### **India**

M/s Toshcon CD Automation Pvt. Ltd.  
H1 - 75 Gegal Industrial Area  
Ajmer - 305023 (Raj.)  
India  
**T** +91 145 2791112  
**T** +91 145 6450601/2/3  
sales.cd@toshcon.com  
www.cdautomation.in

### **England**

CD Automation UK Ltd  
Unit 9 Harvington Business Park  
Brampton Road, Eastbourne  
East Sussex, BN22 9BN  
England  
**T** +44 1323 811100  
info@cdautomation.co.uk  
www.cdautomation.co.uk