

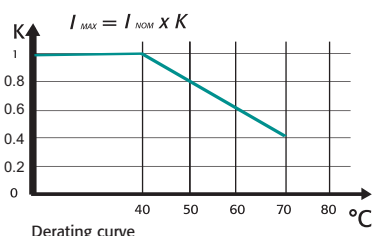
## GENERAL DESCRIPTION



- Revo M has been specifically designed to be an Universal Unit
- RS485 Comm. MODBUS Protocol Standard
- Frontal Key Pad to configure the unit and to read V,I and Power
- Configurability via RS485, USB Port and frontal Key Pad
- Microprocessor based electronic circuit fully isolated from power
- Universal input signal: RS485,Pot, Analog and SSR
- Universal Firing Mode: Soft Start + Phase Angle, Delayed Triggering Firing, Single Cycle, Burst Firing
- Configurable Control Mode: V, I, V<sup>2</sup> and VxI
- Heater Break alarm to diagnose partial or total load failure and Thyristor Short circuit
- Digital input configurable
- Fuse and Fuse Holder Standard
- Current transformer integrated in Fuse Holder
- Comply with EMC, cUL pending
- IP20 Protection
- DIN RAIL and panel mounting

## TECHNICAL SPECIFICATION

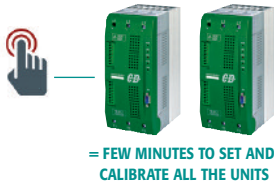
<b>Voltage power supply</b>	From 24V to 480V Max (Std) or 600V on request		
<b>Voltage Frequency</b>	50 or 60 Hz no setting needed from 47 to 70 Hz		
<b>Nominal Current</b>	35A, 40A		
<b>Input Signal</b>	SSR (logic)	4:30Vdc	5mA Max (On ≥ 4Vdc Off ≤ 1Vdc);
	Voltage input	0:10Vdc	impedance 15 K ohm;
	Current input	0:20/4:20mA	impedance 100 Ohm;
<b>Digital input</b>	4:30V dc 5 mA Max (On > 4Vdc Off < 1Vdc)		
<b>Firing</b>	Soft Start + Phase Angle, Delay Triggering + Burst Firing, Soft Start + Burst Firing, Single Cycle, Selectable from frontal Key-Pad or via RS485.		
<b>Control Mode</b>	Voltage, Current, Square Voltage and Power selectable via frontal Key Pad, and RS485 or via Digital input to transfer from one control mode to another one to establish a control strategy.		
<b>Auxiliary Voltage Supply</b>	90:130Vac	8VA Max	
	170:265Vac	8VA Max	(Standard)
	230:345Vac	8VA Max	
	300:530Vac	8VA Max	(Standard)
	510:690Vac	8VA Max	
<b>Heater Break Alarm</b>	HB alarm setting on front unit or via RS485 with possibility to set sensitivity. Relay output 0,5A at 110V		
<b>Mounting</b>	DIN RAIL Mounting or Panel Mounting		
<b>Operating Temperature</b>	40 °C without derating. Over this temperature see below derating curve		
<b>Storage temperature</b>	-25 °C to 70 °C Max		
<b>Altitude</b>	Over 1000 m of altitude reduce the nominal current of 2% for each 100m		
<b>Humidity</b>	From 5 to 95% without condense and ice		



## OPTION'S FEATURES AND SPECIAL DETAILS

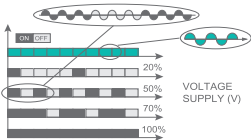
### HEATER BREAK ALARM HB

#### ON FRONT CABINET



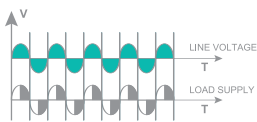
The Heater Break circuit diagnostic partial or total load failure. It reads load resistance with an internal voltage transducer and current transformer to calculate the resistance value  $V/I$ . The Heater Break circuit is compensated for voltage fluctuation, in fact a voltage variation has no influence on resistance value because  $V/I$  ratio remain constant. On this unit is possible to set the nominal resistance value and the alarm sensitivity. HB alarm in addition diagnostic the thyristor in short circuit. A normally open contact gives the alarm condition and an indication of the alarm type appears on display.

### BURST FIRING BF



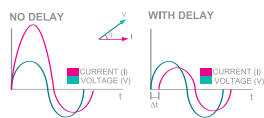
This firing is performed digitally within the thyristor unit at zero volts, producing no EMC interference. Analogue input is necessary for BF and the number of complete cycles must be specified for 50% power demand. This value can be between 1 and 255 complete cycles, determining the speed of firing. When 1 is specified, the firing mode becomes Single Cycle (SC).

### PHASE ANGLE PA



PA controls the power to the load by allowing the thyristor to conduct for part of the AC supply cycle only. The more power required, the more the conduction angle is advanced until virtually the whole cycle is conducting for 100% power. The load power can be adjusted from 0 to 100% as a function of the analogue input signal, normally determined by a temperature controller or potentiometer, PA is normally used with inductive loads.

### DELAYED TRIGGERING DT



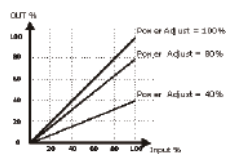
Used to switch the primary coil of transformers when coupled with normal resistive loads (not cold resistance) on the secondary, DT prevents the inrush current when zero voltage (ON-OFF) is used to switch the primary. The thyristor unit switches OFF when the load voltage is negative and switches ON only when positive with a pre-set delay for the first half cycle.

### FIELD BUS MODULE



CD-RS Used to convert RS232 to RS422  
 TU-RS485-PDP Used to convert RS485 Modbus to Profibus DP  
 TU-RS485-ETH Used to convert RS485 Modbus to Ethernet  
 For more informations see "Field Bus Module" Bulletin

### POWER SCALING

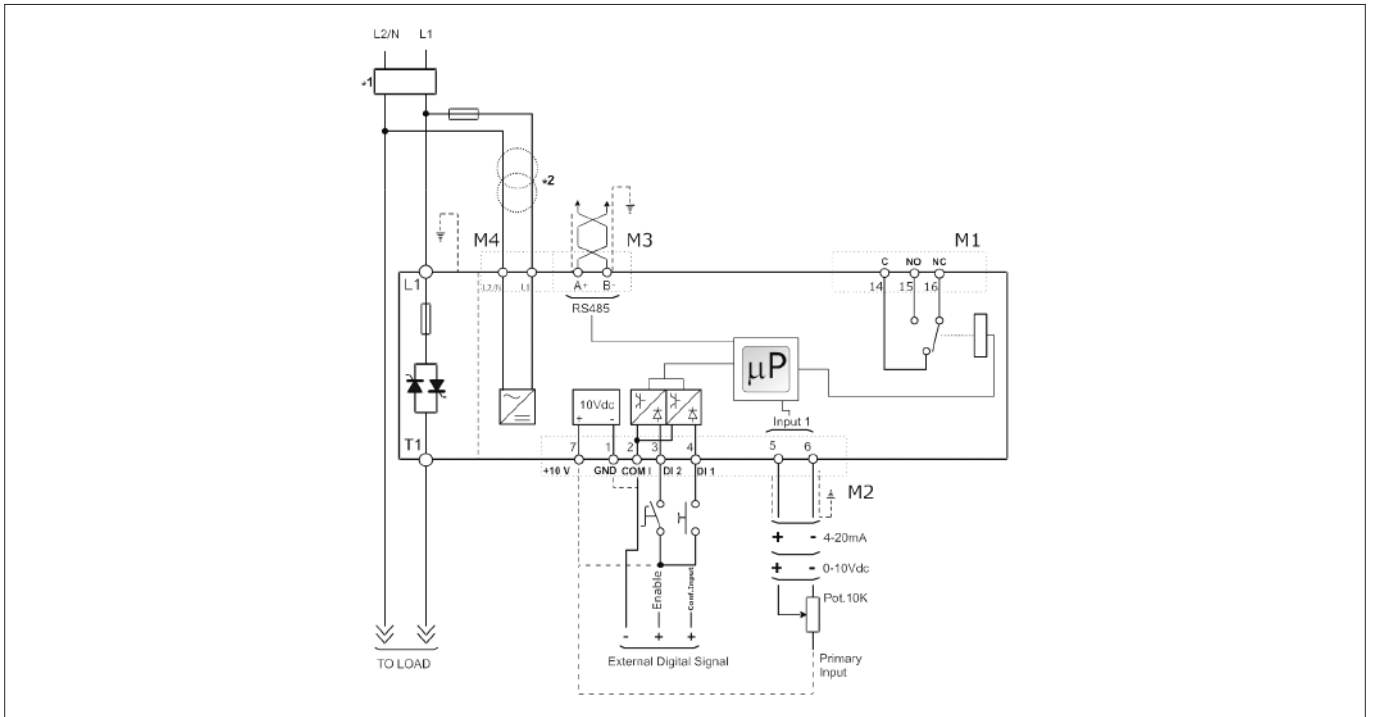


It's a scaling factor of the input command signal and limit the output of Thyristor unit. This parameter can be adjusted from 1 to 99% via RS485 or by the front of the unit. If this parameter is setted at 50% and the input signal is 100% the output become 50%. This feature is very useful to reduce the power when a zone has been oversized or when a temperature controller gives same reference to more unit along a furnace. Imagine 3 zones with left and right one close to the door where in a continuous furnace the material come into and flow out. The profile of temperature along furnace is higher in central zone because there is less dispersion but if we scale its input we can have a flat profile.

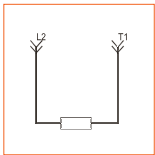
### APPLICATIONS AND FOCUS ON:

- Infrared lamp.
- Fournaces.
- Petrochemical
- Dryers
- Pharmaceutical
- Autoclaves.
- Chemical
- Extrusion line.
- Climatic chambers

## WIRING CONNECTION REVO M 1PH 35A to 40A

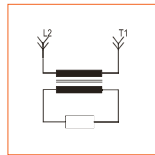


### LOAD TYPE



Resistance and Infrared Lamps Long and medium waves

### LOAD TYPE

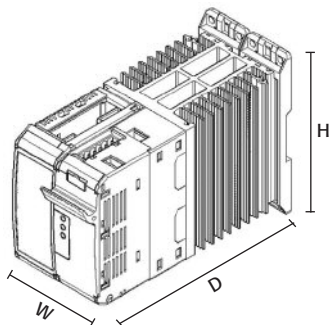


Use Delayed Triggering for transformers coupled with Normal resistance

### NOTE

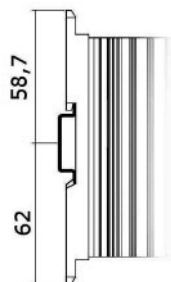
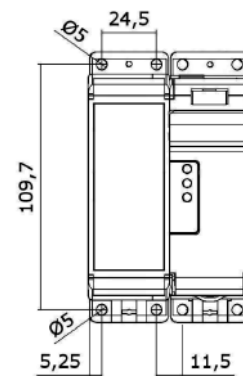
- (1) The user installation must be protecting by electromagnetic circuit breaker or by fuse isolator. The semiconductor  $I^2t$  should be 20% less than power controller  $I^2t$ . Semiconductor fuses are classified for UL as supplementar protection for semiconductor. They are note approved for branch circuit protection.
- (2) The auxiliary voltage supply of the Revo unit must be synchronized with load voltage supply. If the Auxiliary Voltage (written on the identification label) is different from Supply Voltage (to the load), use an external transformer connected as above.

## DIMENSION AND FIXING HOLES



SR9 W 72 mm. - H 121 mm. - D 185 mm. - kg. 1,15

**REVO M 35A - 40A**



## OUTPUT FEATURES (POWER DEVICE)

Nominal current in continuous service:	35A, 40A
Max peak current (10ms)	600A for unit type 035 800A for unit type 040
Voltage range:	24+600V
Repetitive peak reverse voltage:	1200V (480V), 1600V (600V)
Latching current:	250mA
Leakage current:	15mA eff
I <sup>t</sup> value tp=10msec:	1750A <sup>2</sup> /S for unit type 035 3110A <sup>2</sup> /S for unit type 040
Frequency range:	47+70Hz
Power loss (I=Inom):	44W for unit type 035 50W for unit type 040
Isolation Voltage:	2500Vac

## ORDERING CODES REVOM 1PH

																Note 3
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<b>REVO M 1PH</b>																
<b>4, 5, 6</b> Current		<b>8</b> Aux. Voltage supply		<b>11</b> Control Mode		<b>14</b> Approvals		<b>15</b> Manual		<b>16</b> Version						
Description code	Numeric code	Description code	Numeric code	Description code	Numeric code	Description code	Numeric code	Description code	Numeric code	Description code	Numeric code	Description code	Numeric code			
35A	0 3 5	90:130V (4)	1	Open Loop	0	CE EMC For European Market	0	None	0	Std version with one fuse+ Fuse Holder	1					
40A	0 4 0	170:265V (4)	2	Voltage Feed Back V	U	cUL For American Market, Pending	L	Italian Manual	1	Second fuse used with Phase to Phase voltage Supply for unit (1)	2					
		230:345V (4)	3	Power Feed Back VxI	W			English Manual	2	Second fuse + additional safety relay (2)	3					
		300:530V (4)	5	Voltage Square f/b V <sup>2</sup>	Q			German Manual	3							
		510:690V (4)	6	Current Feed Back I	I			French Manual	4							
<b>7</b> Max Voltage		<b>9</b> Input		<b>12</b> Fuse & Option		<b>13</b> Fan Voltage										
Description code	Numeric code	Description code	Numeric code	Description code	Numeric code	Description code	Numeric code									
480V	4	SSR	S	Fuse + Fuse Holder	Y	No Fan	0									
600V	6	0:10V dc	V	Fuse + Fuse Holder +CT +HB	H											
		4:20mA	A													
		10KPot	K													
		RS485	R													
		<b>10</b> Firing														
		Description code	Numeric code													
		Zero Crossing ZC	Z													
		Single Cycle SC	C													
		Burst Firing BF	B													
		Soft Start + Burst Firing S+BF	J													
		Delayed Triggering + Burst Firing DT+BF	D													
		Phase Angle PA	P													
		Soft Start + Phase Angle S+PA	E													

**LEGEND**  
**CT** = Current Transformer  
**HB** = Heater Break Alarm

**Note (1):** If you need one REVO M 1PH with 2 Fuse & Fuse Holder For dimensions see REVO M 2PH.  
**Note (2):** If you need one REVO M 1PH with 2 Fuse & Fuse Holder + safety relay For dimensions see REVO M 2PH.  
**Note (3):** After 16th digit write current and voltage of load inside brackets Ex. (40A-400V)  
**Note (4):** Load voltage must be included in Selected Auxiliary Voltage Range

