

® **MAG-TRONIQUE**

Heavy Duty AC/DC Direct Magnet Controller

Jan. 2019



Made in Canada

Service Manual

Model : MT025-A

5 to 25 Amp (200-240 Vac/Vdc)
1000 Watts to 6000 Watts





Heavy Duty AC/DC Direct Magnet Controller

Characteristics

Model : MT025-A

5 to 25 Amp (200-240 Vac/Vdc)

- Compatible on all electromagnets operate on 200Vdc at 240Vdc.
- Support electromagnets from 48 Ohms to 9.6 Ohms.
- Operates directly on the AC or DC generator.
- May withstand 120VAC (or 170VDC) input voltages up to 500VAC (or 700VDC)
- Input frequency support 30Hz to 400Hz
- Functional from -20°F to +160°F (-30°C to +70°C)
- Doesn't requires 12v or 24v external power supply to operate
- Tested and certified for 8 hours of operation without interruption.
- Extremely simple to connect and use
- Doesn't require to consider the generator's polarity
- Doesn't require to consider the output polarity of the electromagnet
- Requires one cable for the control switch.
- and one (four conductors) cable for the monitor (not included).
- Can operate without additionnal adjustment in Mode 1 or 2 switch.
- Adjustable electromagnetic discharge (less than 1 second)
- Pre-discharge waiting time can be set to 1.5 sec for sorting.
- CAN protocol communication approved and certified by industry.
- Protected against short circuits.
- Absorption and rejection of voltage disturbances to protect the generator.
- The electronic internal circuit can run up to 20 seconds after power failure.
(to support the discharge and rejection of the electromagnet)
- Heavy-duty contactor to protect against extreme short circuit and fire.
- Protects the electromagnet against overvoltages.
- Detection of overheating in the control box.
- Prevents electrocution of the user if the electromagnet is not connected.
- Only 8 error codes for ease of use.
- Aluminum box and heatsink for better heat dissipation.
- Stainless steel parts and other elements for high durability and longetivity
- Only 2 settings to discharge the electromagnet.
- Error detection within 100mS.
- Micro-controller clocked at 16 Mhz.
- Display available for voltage, amperage and diagnostic (see error code) (not included).
- Easy to disassemble and reassemble control box construction.
- All detachable parts are available (see exploded view drawing).



Heavy Duty AC/DC Direct Magnet Controller

Operation

The MT025-A model is very simple to operate. Without considering the polarity of the connections, it **can operate with a DC generator or AC generator.**

The microcontroller synchronizes the generator phases with the IGBTs in a single DC output (electromagnet), which allows operation over a **wide frequency range from 30Hz to 400Hz.**

The MT025-A **support 120V to 500V AC voltages and 170V to 700V DC voltages.** No external 12V or 24V power supply is required. In addition, the system is fully protected in the event of a generator fault (e.g. over speed generator).

The MT025-A is equipped with an input for the generator, an output for the electromagnet and a cable for the switch(s) control (see configuration on page 9 of the service manual). Once the configuration is done, the microcontroller will automatically detect the number of switches used (1 or 2) at start-up.

It should be noted that at start-up, there is approximately 30 seconds delay before starting the maneuver with the MT025-A. This delay allows the input voltage to stabilize and the capacitors to be charged on the C-MAG-1 module.

The C-MAG-1 module supports the power supply of the main board (U-MAG-1) for approximately 20 seconds in the event of an emergency power cut, thus providing security against over current return to the main box and to the generator.

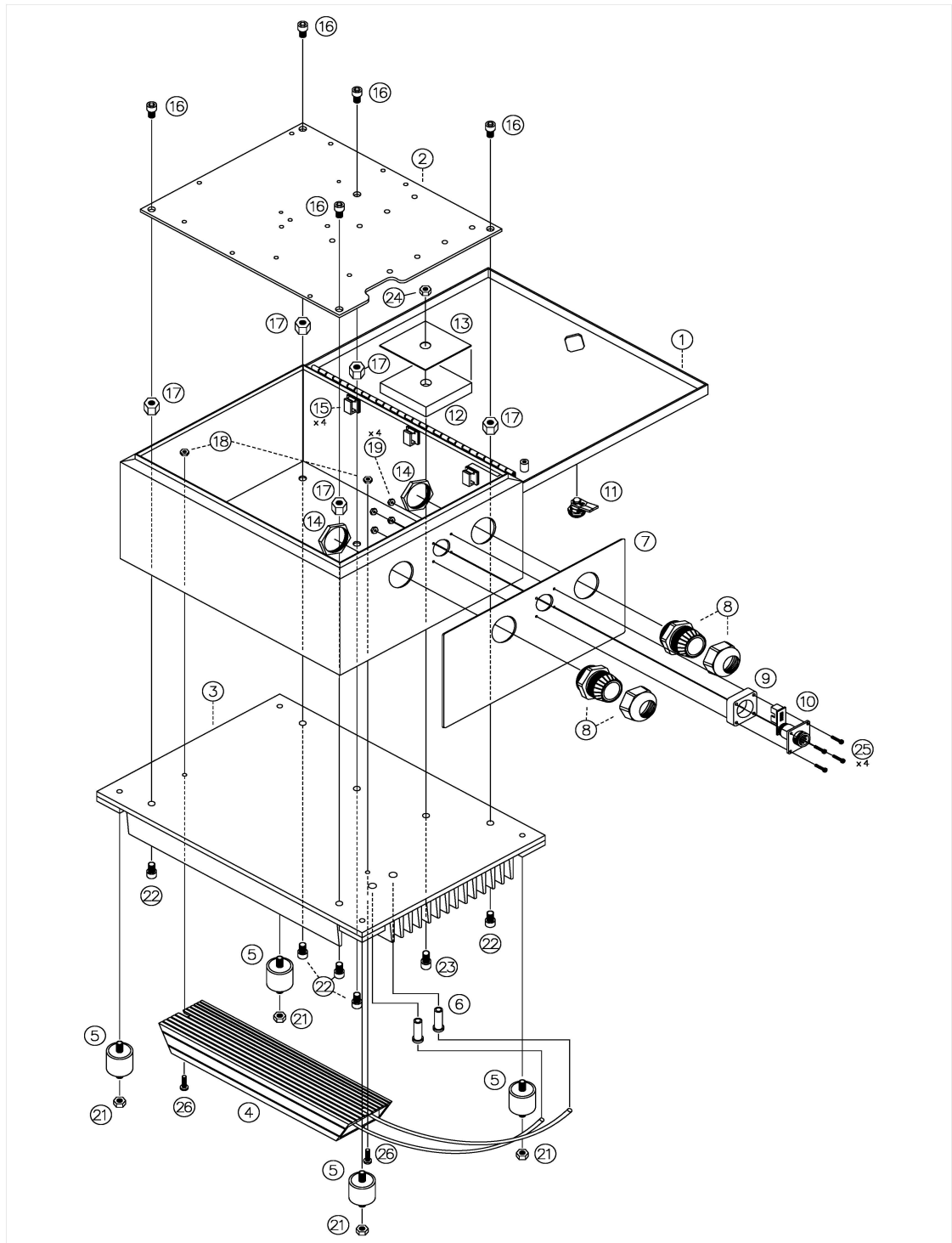
There are only two basic settings (refer to page 14). The first can have the automatic mode (that's how the system rejects the metal). Mode DOWN, while the second is the manual mode. The WAIT adjustment potentiometer allows you to select the waiting time from 1 second to 1.5 seconds before switching to mode DOWN. However, if time it has set beyond 1.5 second, the system will not switch to the mode DOWN, so operator can do it by himself if he has two switches (refer to page 9). Moreover, if the size of the electromagnet allows, the ability to adjust the waiting time admits to sort metal.

Please refer to page 14 of the service manual and / or the box cover in the event of a technical problem and note the code number on the error display.

® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

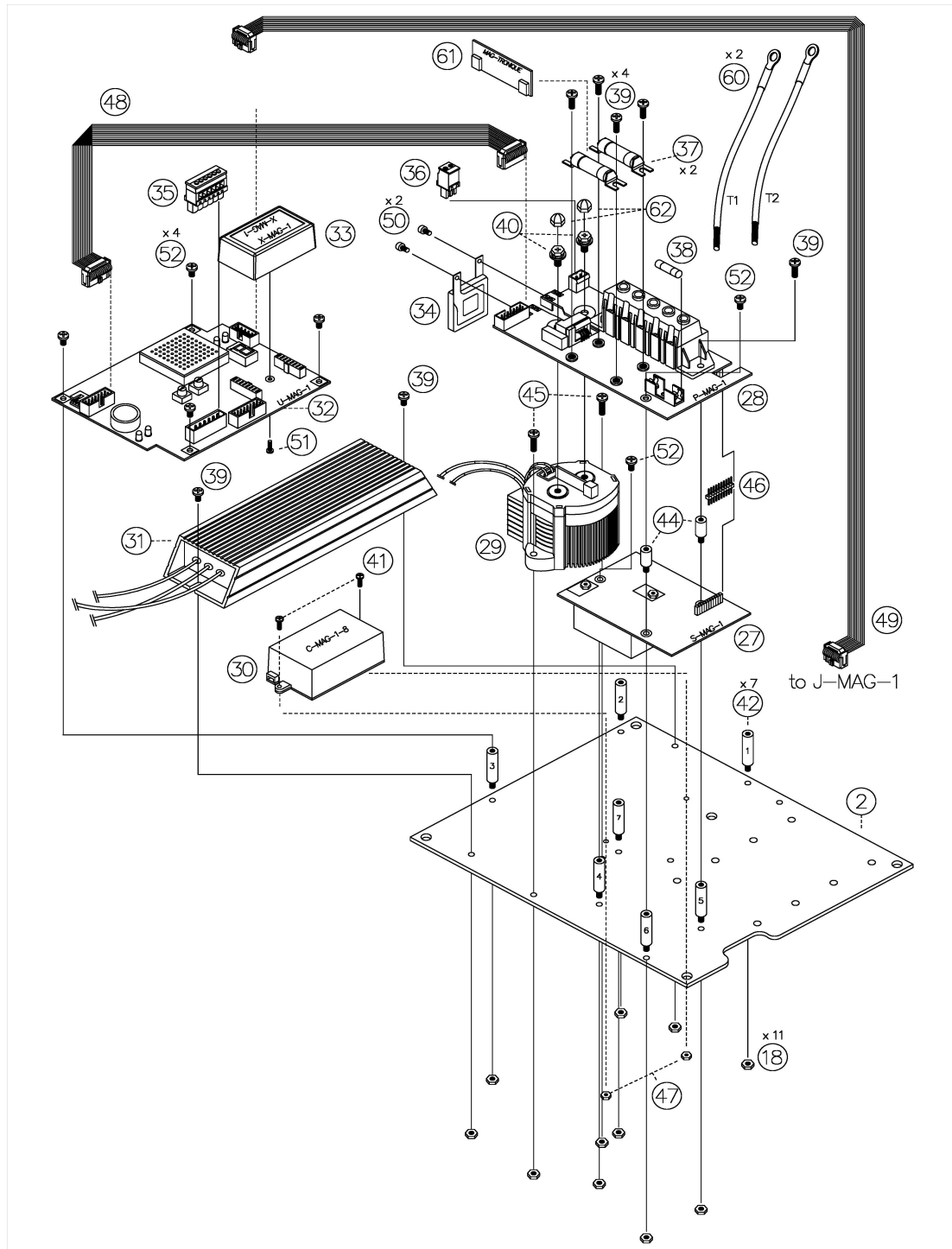
Exploded View Drawing (Part A)



® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

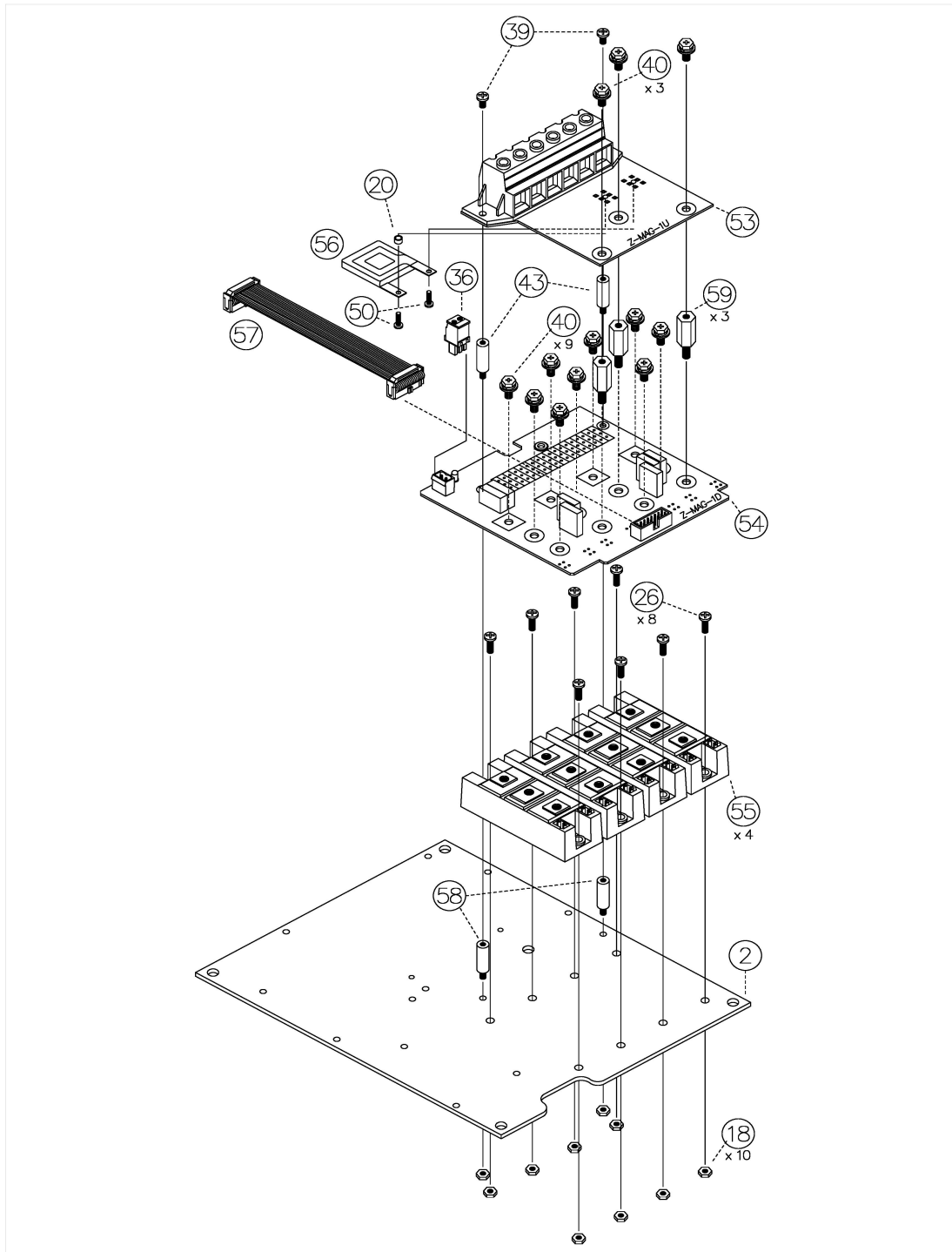
Exploded View Drawing (Part B)



® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

Exploded View Drawing (Part C)





Heavy Duty AC/DC Direct Magnet Controller

Parts List

Model : MT025-A

5 to 25 Amp (200-240 Vac/Vdc)

Number	Qty	Description	PART(A/B/C)	Parts
1	1	Aluminum Box 12 x 10 x 5	A	EJ12105AL
2	1	Baseplate 10.875 x 8.875 x 0.125	A/B/C	BPT025A
3	1	Heatsink	A	HSK025A
4	1	Power Resistor 0.2 ohm / 400w	A	PR02400
5	4	Antivibration 5/16-18	A	V10Z-2-310D
6	2	Shoulder Nylon 6/6	A	12SWS1047
7	1	Layout Plate	A	LAP025A
8	2	Cable Glands PG29 nylon	A	CAG025A
9	1	Spacer (J-MAG-1)	A	SPA025A
10	1	Connector 10 pin to 9 pin SZ3	A	J-MAG-1
11	1	Door Lock	A	DOL025A
12	1	Aluminium link-plate (2.5 x 2.5 x 1/2)	A	ALP025A
13	1	Silicon Thermal Pads Cooling	A	TPC025A
14	4	Nut PG29 brass chrome	A	13150700
15	4	Cable Tie	A	WCA006A
16	5	Socket Cap Screw 5/16-18 x 3/8L stainless steel	A	SHC51638SS
17	5	Standoff 5/16-18 x 1/2L stainless steel	A	STD51612SS
18	23	Nut 10-32 stainless steel	A/B/C	NUT1032SS
19	4	Nut 4-40 stainless steel	A	NUT440SS
20	1	Ring Spacer ZNR	C	RSZ025A
21	4	Nut 5/16-18 stainless steel nylon/lock	A	NUT516SSNY
22	5	Socket Cap Screw 5/16-18 x 5/8L stainless steel	A	SHC51658SS
23	1	Socket Cap Screw 5/16-18 x 3/4L stainless steel	A	SHC51634SS
24	1	Nut 5/16-18 stainless steel	A	NUT516SS
25	4	Bolt 4-40 x 3/4L stainless steel	A	BLT44034SS
26	10	Bolt 10-32 x 3/4L stainless steel	A/C	BLT103234SS
27	1	Switching Power Supply 16 volts	B	S-MAG-1
28	1	Power Board	B	P-MAG-1
29	1	Power Relay (150A) Fast Breaker	B	R-MAG-1-150
30	1	Capacitor Array	B	C-MAG-1-8
31	1	Power Resistor 40/40 ohms / 300w	B	PR4040300
32	1	Main Board	B	U-MAG-1
33	1	Puk Controleur	B	X-MAG-1



Heavy Duty AC/DC Direct Magnet Controller

Parts List

Model : MT025-A

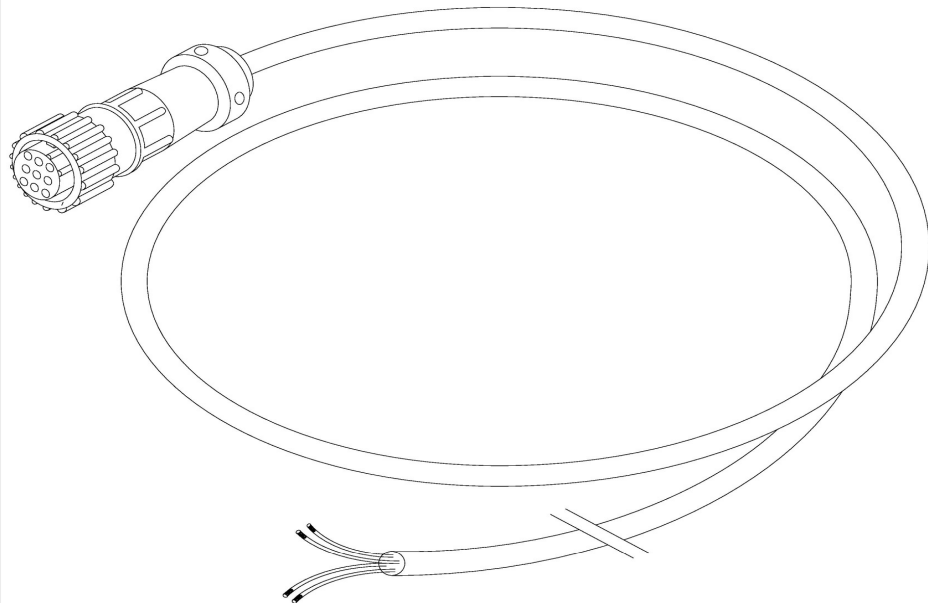
5 to 25 Amp (200-240 Vac/Vdc)

Number	Qty	Description	PART(A/B/C)	Parts
34	1	Energy Absorber Vertical	B	ZNR025A-V
35	1	Connector 6pin	B	1792799
36	2	Connector 2pin	B/C	1792757
37	2	Fuse 32 amps / 440 v	B	HRC-32A
38	1	Fuse 1 amps / 250 v	B	F2392
39	9	Bolt 10-32 x 1/2L stainless steel	B/C	BLT103212SS
40	14	Bolt 6mm-1 x 12mmL	B/C	BLT6M12
41	2	Bolt 6-32 x 3/8L stainless steel	B	BLT103238SS
42	7	Standoff 10-32 x 1 1/2L stainless steel	B	STD1032112SS
43	2	Standoff 10-32 x 1L stainless steel	B	STD10321SS
44	2	Standoff 10-32 x 3/4L stainless steel	B	STD103278SS
45	2	Bolt 10-32 x 7/8L stainless steel	B	BLT103278SS
46	1	Link Connector 10 pin	B	929647-02-10
47	2	Nut 6-32 stainless steel	B	NUT632SS
48	1	Twisted Flat Cable 14pin (18po)	B	M3DDA-1420K
49	1	Twisted Flat Cable 10pin (18po)	B	M3DDA-1020K
50	4	Socket Cap Screw M4 x 8mmL SS + 1 spacer	B	SHC4M8SS
51	1	Bolt M3 x 8mmL stainless steel	B	BLT3M8SS
52	6	Bolt 10-32 x 3/8L stainless steel	B	BLT103238SS
53	1	Output Board	C	Z-MAG-1U
54	1	Driver Board	C	Z-MAG-1D
55	4	IGBT Puk Driver	C	MT150A1600
56	1	Energy Absorber Horizontal	C	ZNR025A-H
57	1	Flat Cable 16pin (6po)	C	M3DDA-1606R
58	4	Standoff 10-32 x 1 3/16L stainless steel	C	STD10321316SS
59	3	Standoff 6mm-1 x 25mmL stainless steel	C	STD6M25SS
60	2	Cable Out T1/T2 (pair)	B	COT025A
61	1	Fuse Isolator Plate	B	FIP025A
62	2	Nut Caps	B	NUC025A

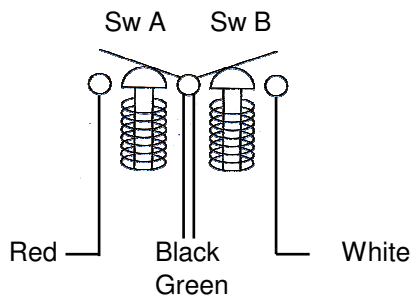
® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

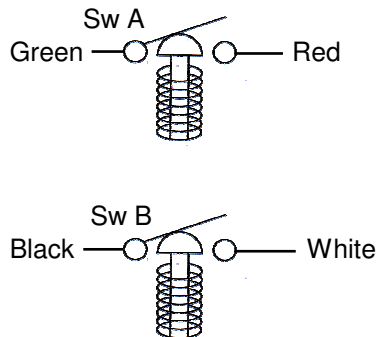
Switch Cable Assembly



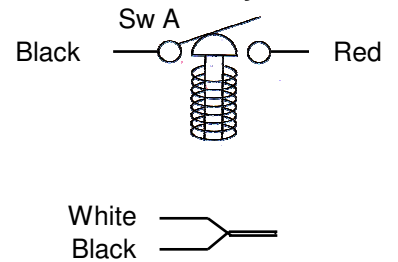
Two Common Switch



Two Bussed Switch



One alternaly Switch



Assembled Cable	Length
CS-MAG-06F	6 feet
CS-MAG-12F	12 feet
CS-MAG-18F	18 feet
CS-MAG-24F	24 feet
CS-MAG-30F	30 feet
CS-MAG-36F	36 feet

Color code		Function
Red	Sw A	UP
Green	Gnd	
White	Sw B	DOWN
Black	Gnd	

For the use of a single switch:
Join White and Black together.
(SwA "UP") becomes UP and DOWN in alternately.

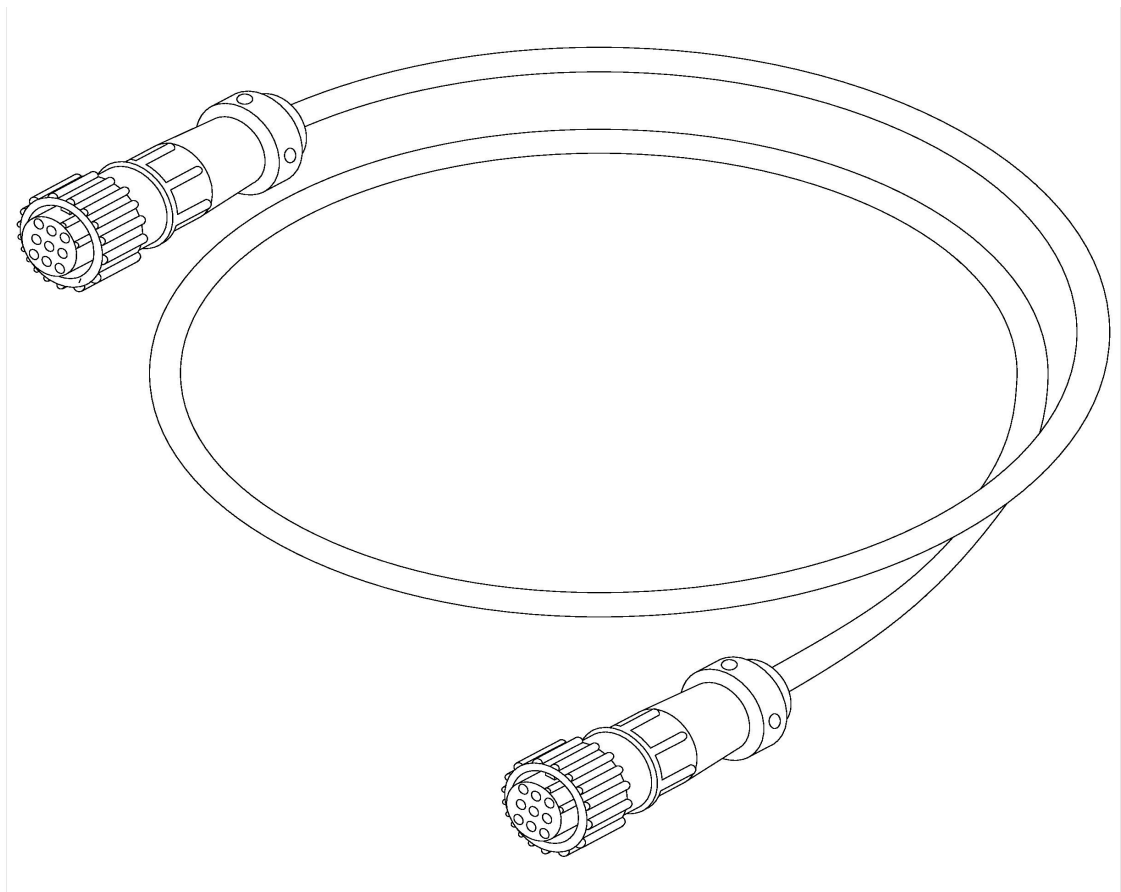


MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

Monitor Cable Assembly (optional)

Male / Male



Assembled Cable	Length
CM-MAG-06F	6 feet
CM-MAG-12F	12 feet
CM-MAG-18F	18 feet
CM-MAG-24F	24 feet
CM-MAG-30F	30 feet
CM-MAG-36F	36 feet

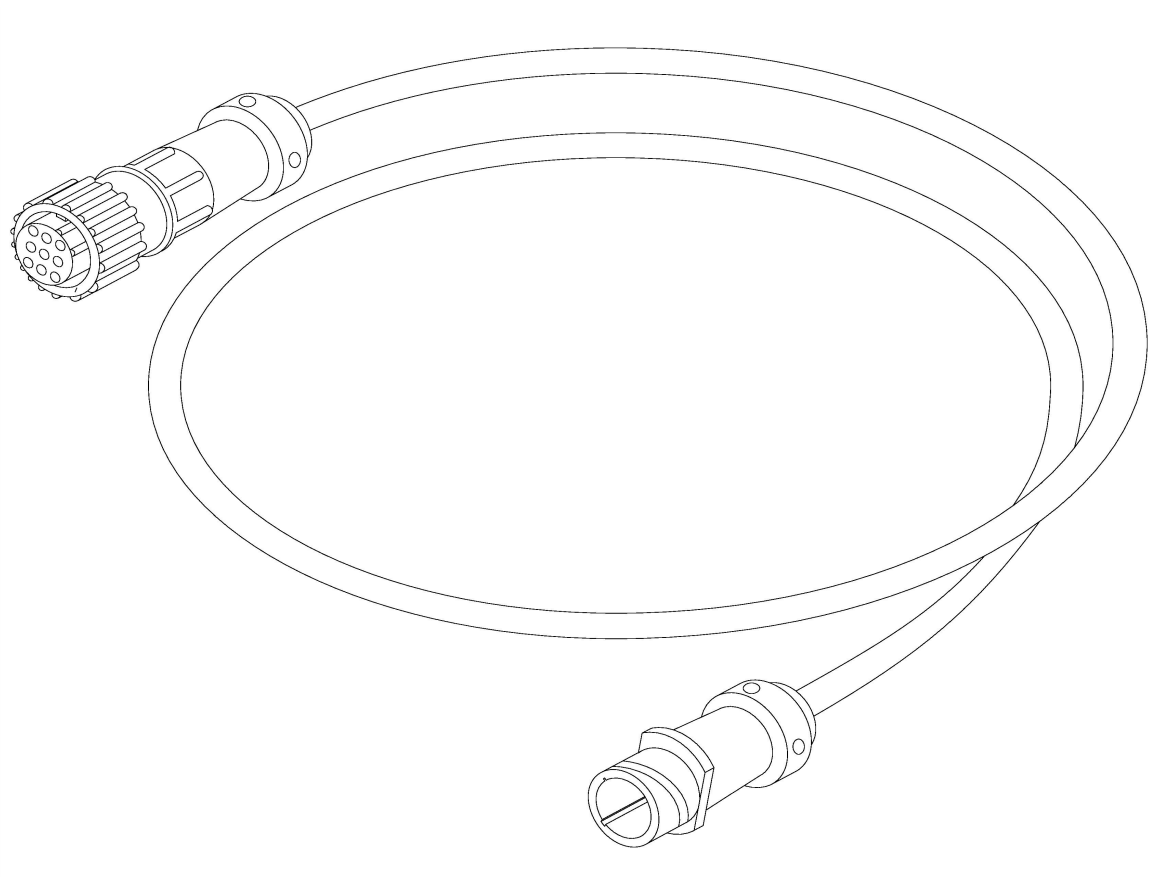
Caution: Do not cut or converted for a switch cable.

® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

Monitor Cable Assembly (optional)

Male / Female



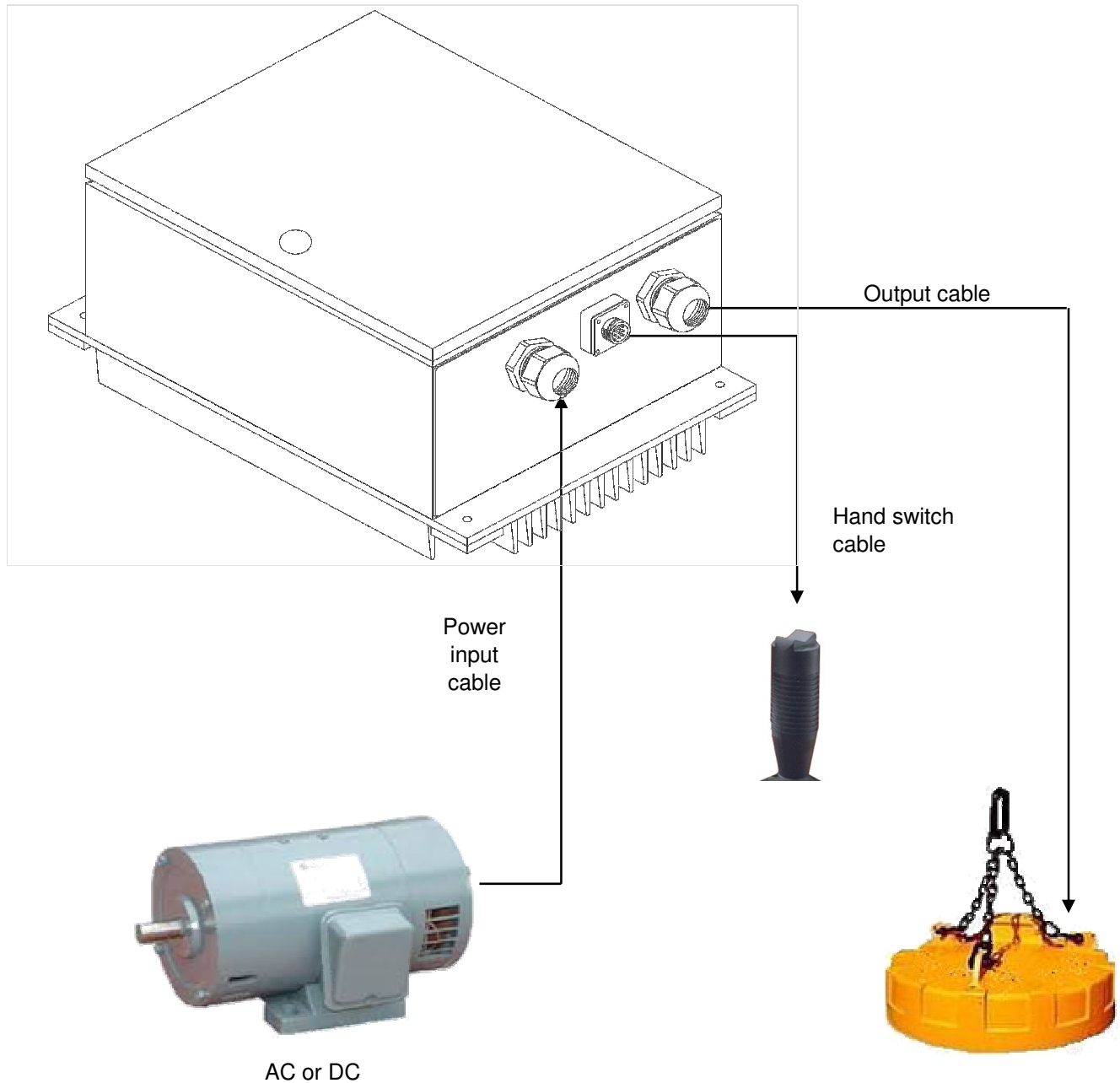
Assembled Cable	Length
CR-MAG-06F	6 feet
CR-MAG-12F	12 feet
CR-MAG-18F	18 feet
CR-MAG-24F	24 feet
CR-MAG-30F	30 feet
CR-MAG-36F	36 feet

Caution : Use only with monitor cable

® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

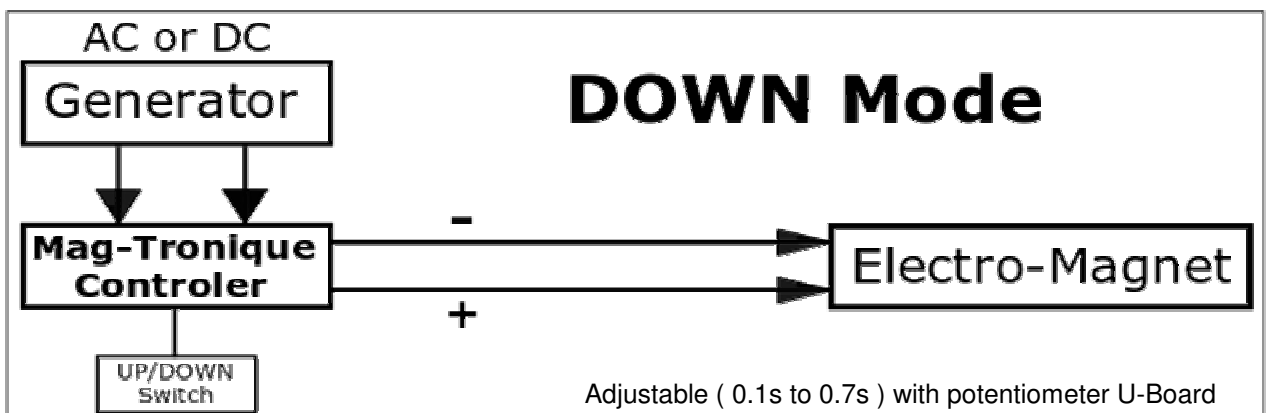
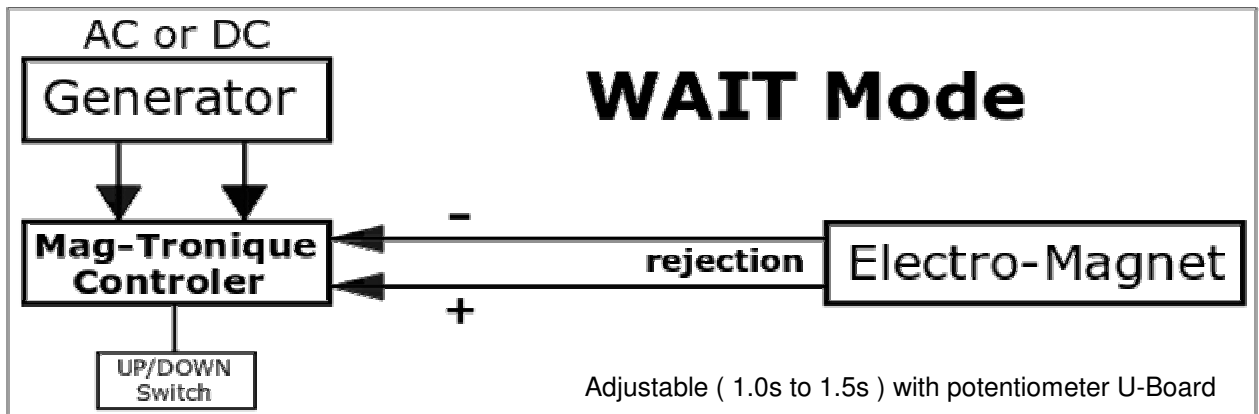
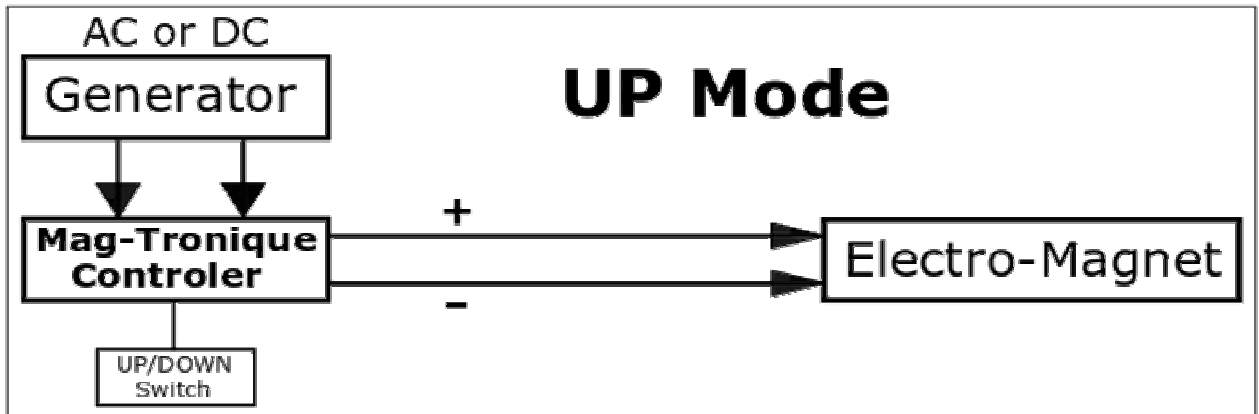
Operation



® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

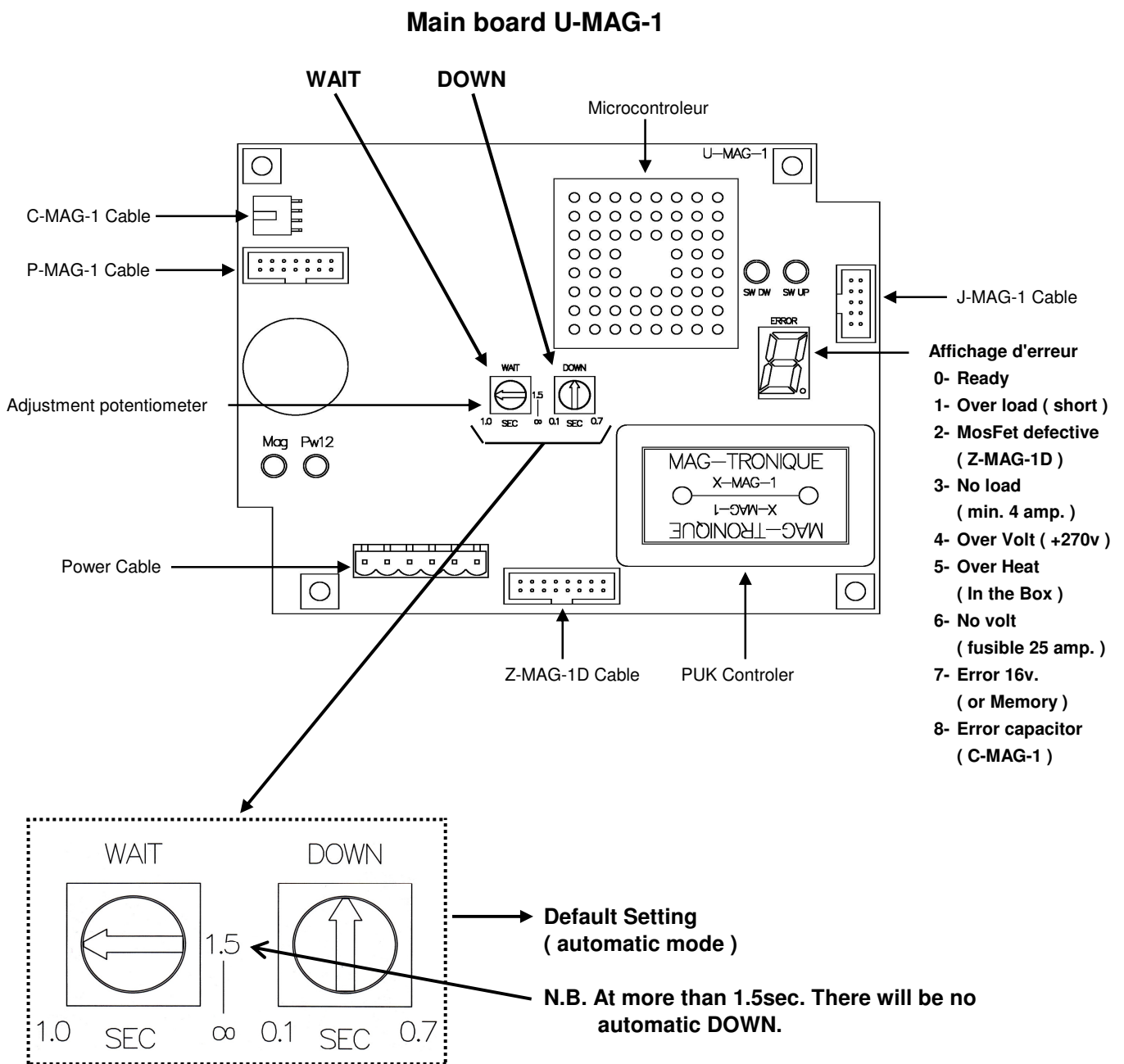
Operation



® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

Operation

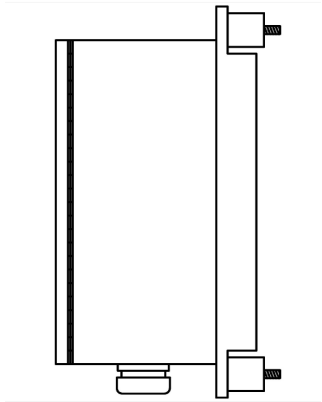


® MAG-TRONIQUE

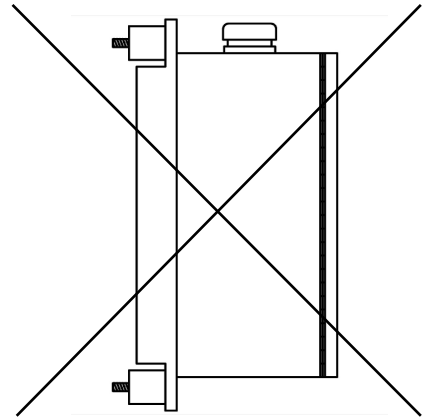
Heavy Duty AC/DC Direct Magnet Controller

Installation and Positioning

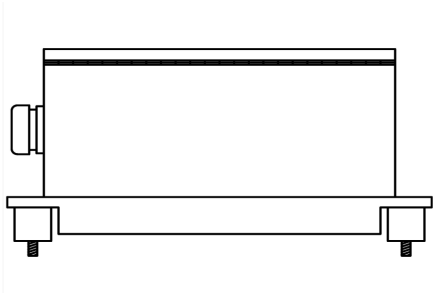
Best Position



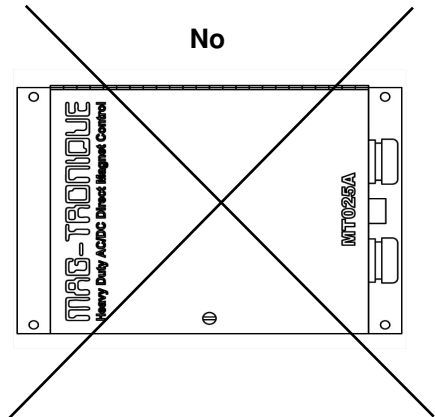
No



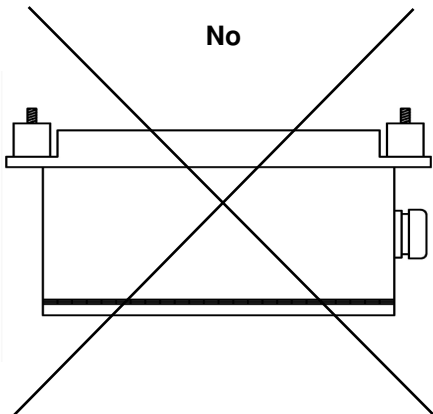
Yes



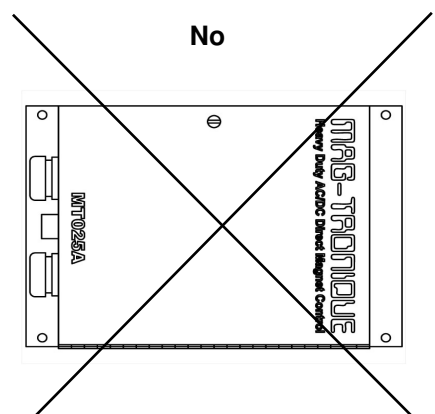
No



No



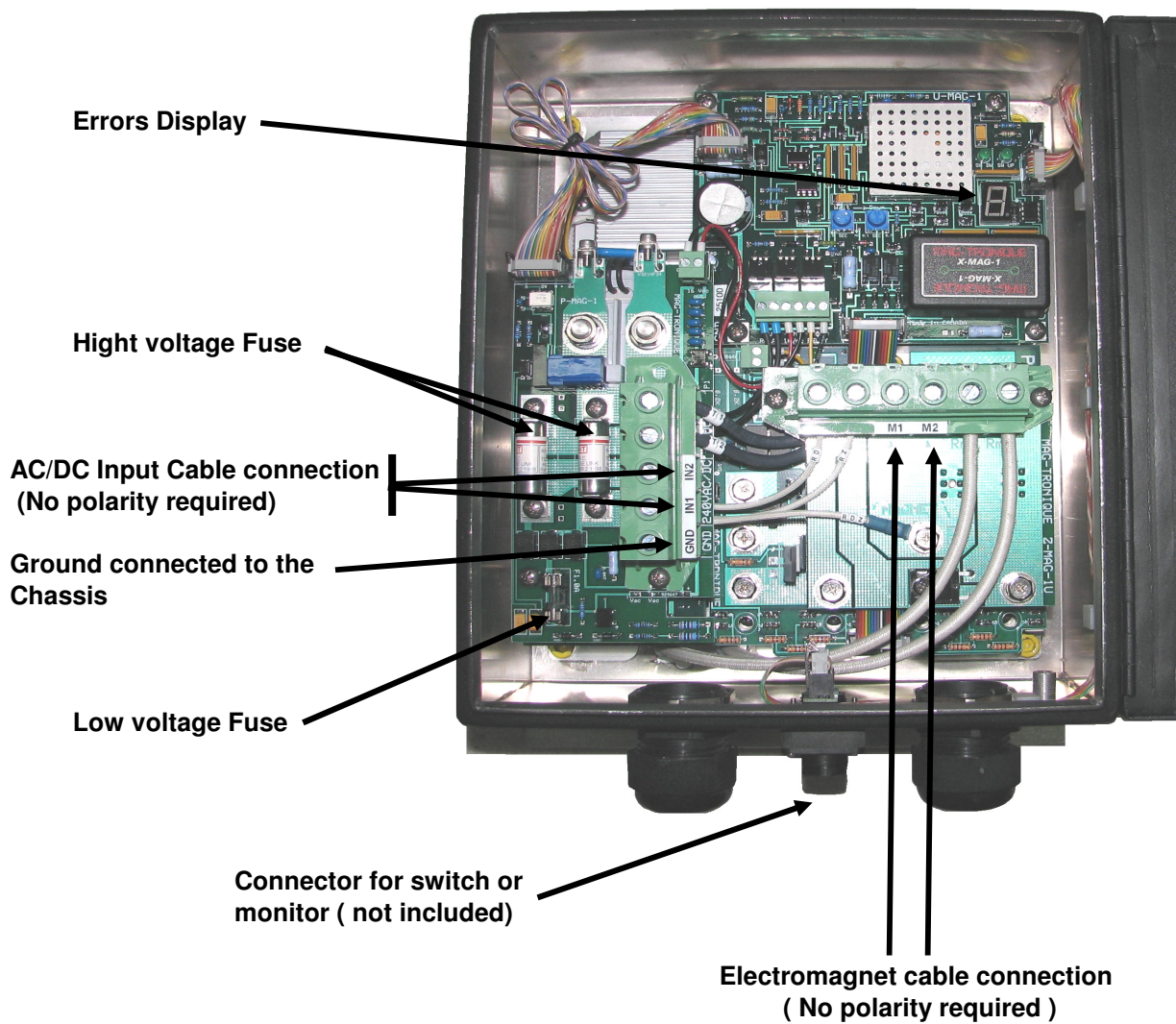
No



® MAG-TRONIQUE

Heavy Duty AC/DC Direct Magnet Controller

Wiring



Jan. 2019

® **MAG-TRONIQUE**

Heavy Duty AC/DC Direct Magnet Controller



Made in Canada



Input voltage min. and max.: 120Vac à 500Vac et/ou 170Vdc à 700Vdc

Operation Voltage : 200ac/dc to 270ac/dc

Output voltage : 170Vdc à 270Vdc

Ampérage : 5 à 25 Amp.

Frequency : 30Hz à 400Hz

Net weight : 24.5Lbs (11Kg)

Gross weight : 26.5Lbs (12Kg)

Dimension : 10" (P) x 14.5" (L) x 8" (H)

25.5 cm x 37 cm x 20.5 cm

Packing size : 11 1/4" (D) x 15 1/4"(W) x 9 3/4"(H)

28.5 cm x 38.1 cm x 22.8 cm

Developped by Mania-Tronique 1993 inc. for Mag-Tronique inc. : Claude Courcy, CEO & Electronic Tech.

MicroController Programmer : Dany Doiron, Tech.

In collaboration with : Métal du Golfe

Mechanical Engineering Council : Tony Courcy, Eng.

Electronic Engineering Council : Mohamad Issa, PhD.