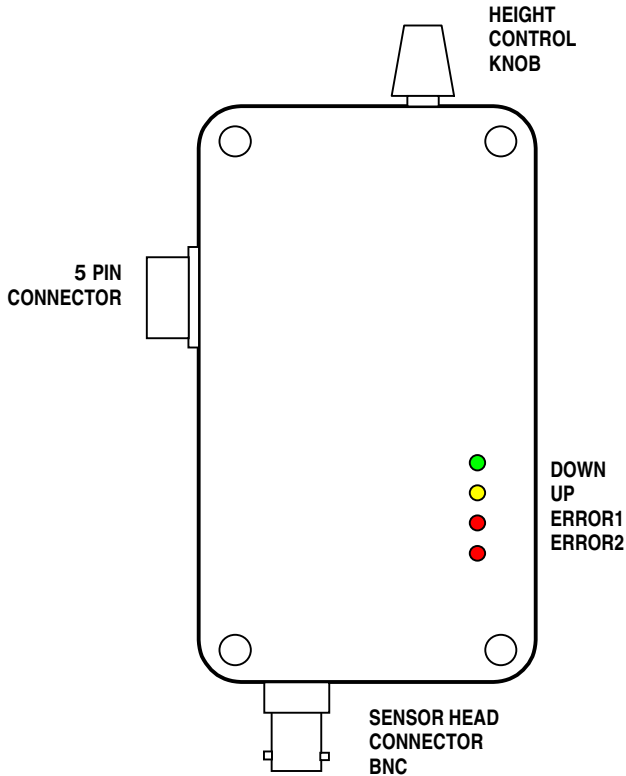


**AGELKOM CAP01**  
Plasma and Oxy Fuel Torch height control  
for sheet metal cutting machines  
Height Sensor.



**Description:**

**SENSORS:**

Two types of sensors are available. One is for Plasma and the other one is for Oxy-Fuel application. Sensor is connected to the CAP01 via 1m long RG59 coaxial cable. The sensor ring and stick must be insulated and appropriate distant from all conductive parts, cutting plate and torch. See picture at the bottom of the page. Different size and shape sensor ring can be use.

**ELECTRONICS:**

The connection of supply and outputs to the CAP01 is via 5 core screened cable. Connector can accept cable up to 6.5 mm OD diameter. The supply is nominal 24VDC and the current is less than 100mA. However relays consumption must be considered separately.

Do not use same power supply with motors.

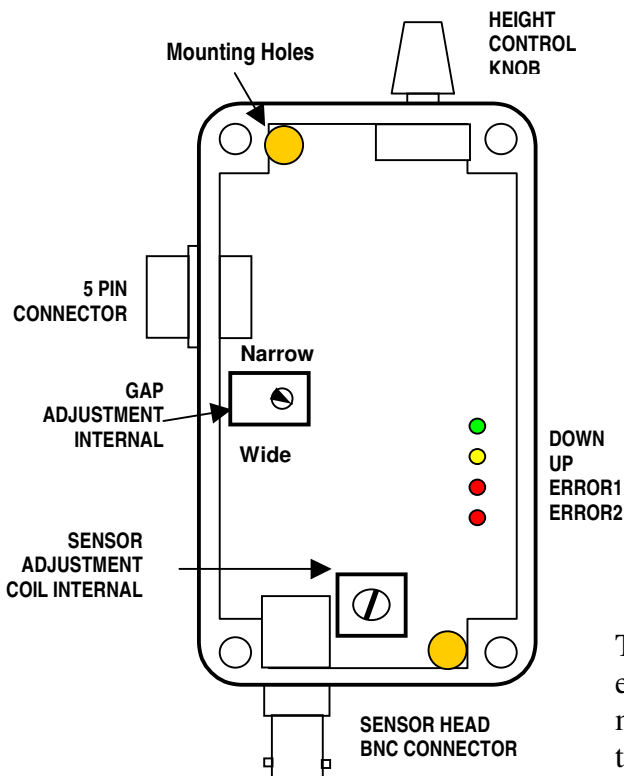
The up and down control outputs are transistors. These outputs can directly drive coils of 24 volts relays or digital inputs of CNC/drive control. Do not short circuit these outputs for a long duration.

The ERROR OUTPUT is normally high at 15V level and activate (low 0.7V) during crash/touch of the plate and/or disconnect the Sensor Ring. This output use for halting the cutting system (EMERGENCY STOP). You can use ERROR OUTPUT as a Touch/Crash Detection. Also you can observe ERROR2 LED turn on when sensor is touching the work plate (ohmic contact). If ERROR2 LED does not lit properly during ohmic contact test, power supply (0V) should be grounded.

**GROUNDING:**

**Star type grounding must be use.**

The diecast box must be grounded. Usually the sensor is bolted to the housing of torch lifter and must be connected to the un-painted frame of the machine to have a sufficient ground connection. Otherwise use thick wire for grounding AWG #4 or 5mm dia.



**Control Box Size:  
116\*65\*31mm**

### ADJUSTMENT and First Usage:

1. Set "Height Control Knob" to middle position. Manually adjust the torch lifter, so the ring is about 80 mm above the plate.
2. Disable the drive system (e.g. electrically or mechanically disconnect motor).
3. Activate (connect to supply) Cap01 and monitor UP and DOWN LEDs. At this point DOWN LED must be on, if not internal coil adjustment needed. (Refer Internal Coil Adjustment Section).
4. Decrease the distance between sensing ring and plate and verify that UP LED is ON.
5. Disconnect BNC connector and verify that ERROR1 LED is ON. Short control box to sensor ring with some wire and observe that the ERROR2 LED is on.
6. Reconnect the drive system.

The correctly adjusted sensor should activate outputs if error is about plus or minus 10 % of nominal height; makes about +/- 0.5 mm at 5 mm above the plate and up to +/- 1 mm at 10 mm. Remember that Plasma an Oxy-Fuel Ring has different height responses.

If you change the cable between the unit to sensor ring, internal coil should be re-adjusted. The original cable length is 1m. Do not change the length.

### Internal Coil Adjustment:

Please contact [info@agelkom.com.tr](mailto:info@agelkom.com.tr) and let us know the reason for readjusting.

1. Set adjustment pot (Height Control Knob) to middle position.
2. In Home position of your Z axis DOWN LED is ON, if not:  
Remove the front panel. Use plastic screw driver. Gently adjust of the internal coil of CAP01 sensor and observe down output is activated in your HOME position (or sufficiently high above the plate.) If DOWN LED is activated instead of UP readjust the core of the coil.
3. Start slowly to decrease the distance between sensing ring and the plate to the cutting height of say 3mm and verify that UP LED is ON. If not, readjust the coil.

### Important:

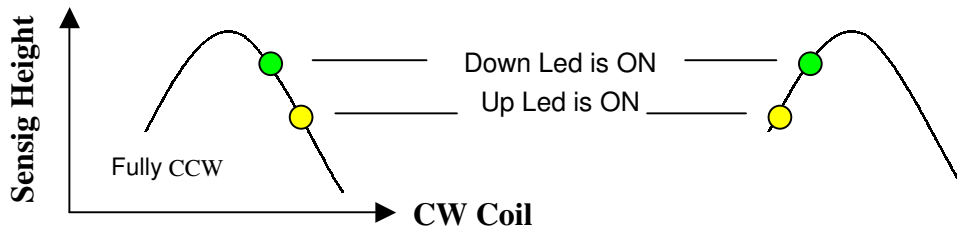
**Do not turn fully CW or CCW and do not apply force to the CORE of the internal coil. The CORE is easily broken.**

### Window Adjustment:

There is small amount of GAP (window) between UP and DOWN. Also GAP could be adjusted with internal trimpot. Turning CW of trimpot makes gap wider. Increased cutting height will result in a wider the GAP.

### Correct Adjustment Point

### Wrong Adjustment Point



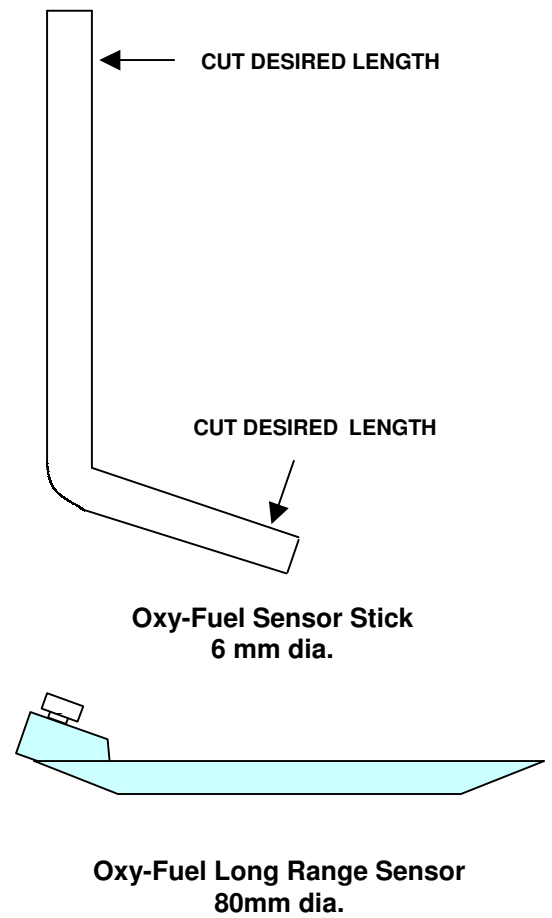
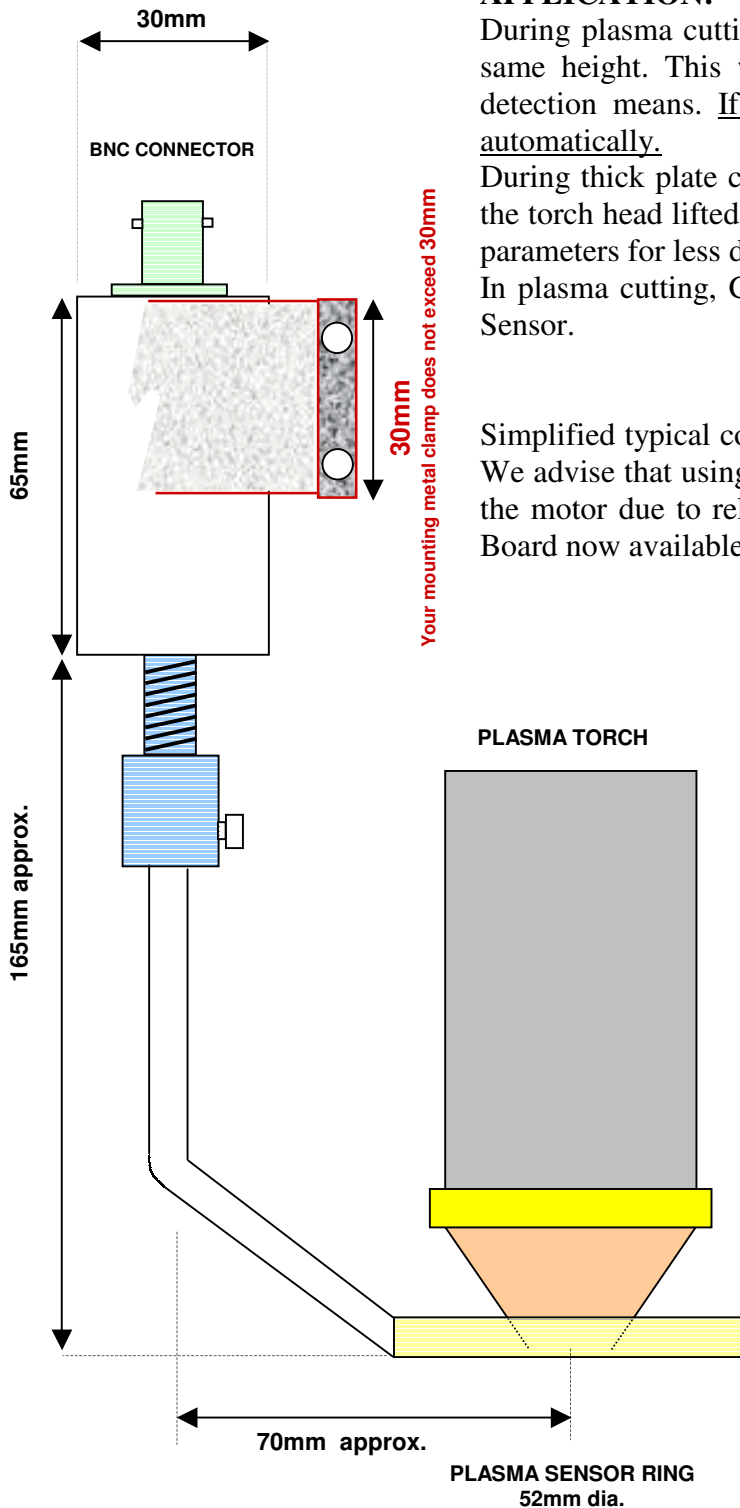
### APPLICATION:

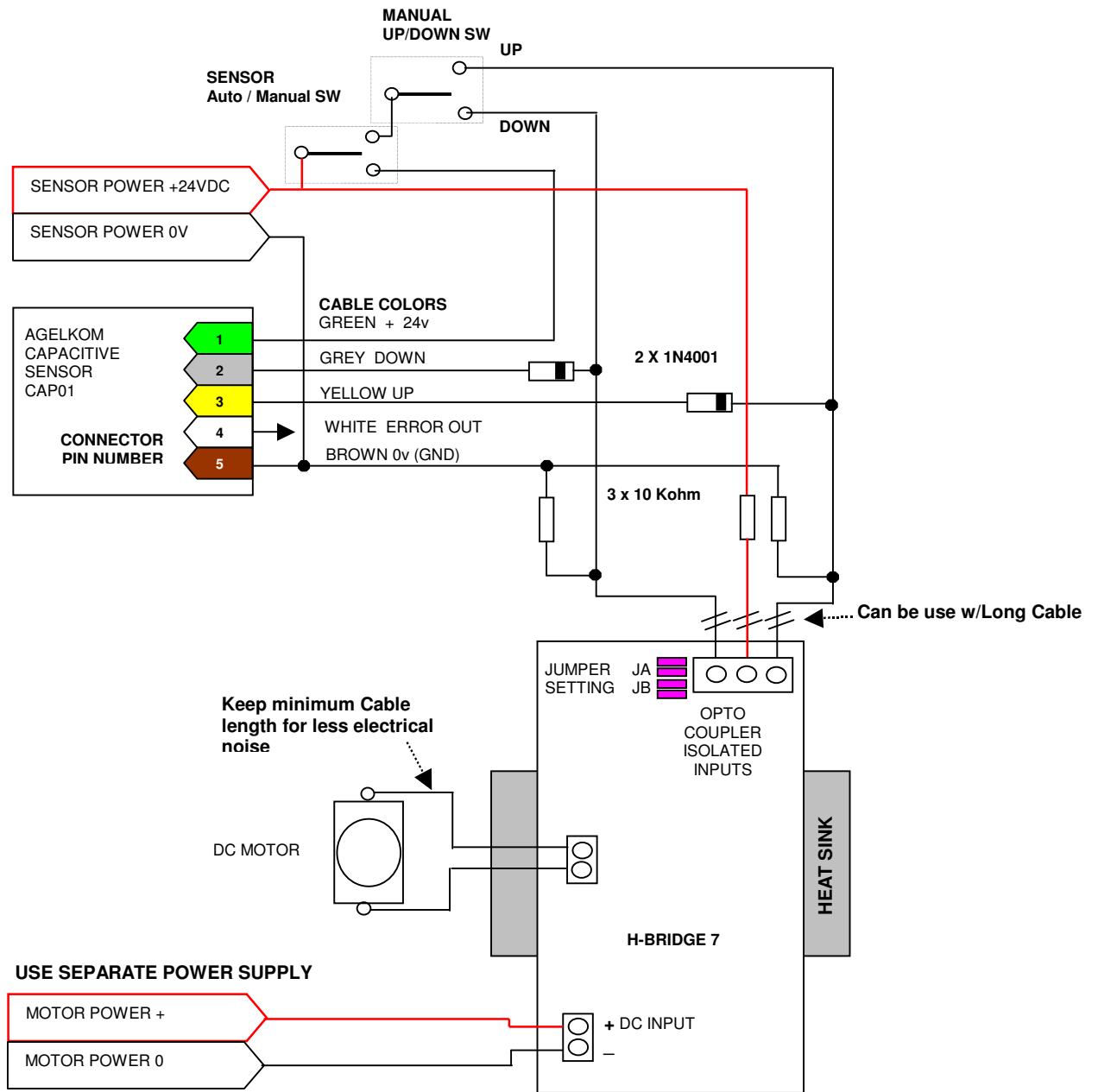
During plasma cutting, sensor ring and plasma torch are in the same height. This will allow to use Error output as a crash detection means. If any error occurs, the UP output activate automatically.

During thick plate cutting, dross may touch the sensor ring and the torch head lifted. To avoid this situation correct your cutting parameters for less dross.

In plasma cutting, CAP01 can be used as a **IHS** Initial Height Sensor.

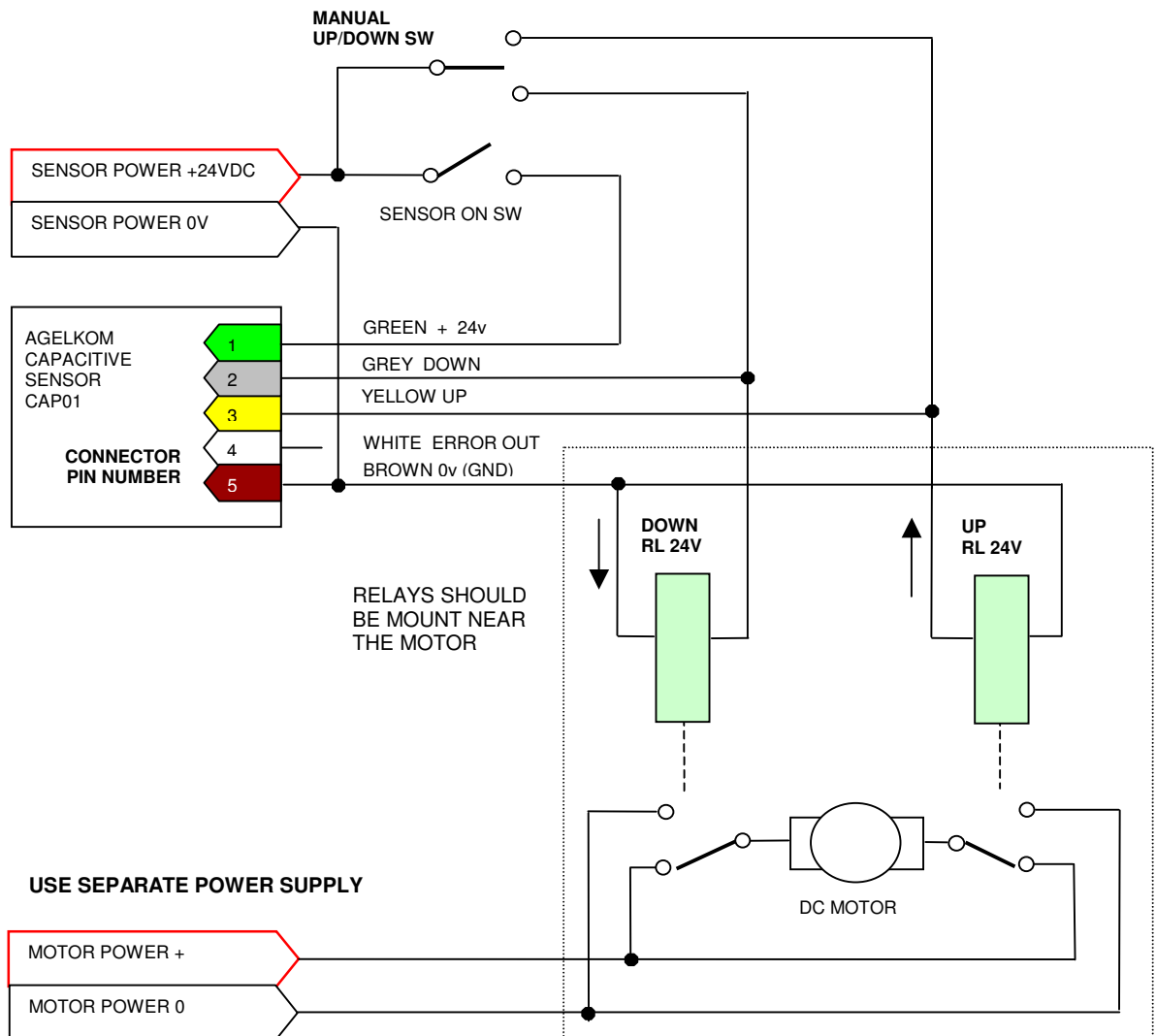
Simplified typical connection of CAP01 sensor is shown below. We advise that using H-Bridge can be more efficient for driving the motor due to relay's contact burning. Agelkom H-Bridge-7 Board now available.





Wiring diagram with H-Bridge7 w/BRAKE function

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Wiring diagram with relay driven motor.

Note:

- In normal mode the motor contacts are shorted for braking
- A power resistor of few ohms should be connected in series with motor to avoid the burning of contacts of relays and brushes of the motor.
- Non-polar capacitor should be used across the motor for electrical noise reduction.
- The limit-switches can be connected in series with the motor, normally closed, and bridged with a power diode, which allows to drive the motor only to opposite direction of position of the limit switch.

Technical Specifications:

Supply: Nominal 24VDC 100mA, Max: 35VDC Min: 18VDC

Current: Less than 100mA (except relays consumption)

Protection: Against supply reverse voltage.

Outputs: 24V / 1A

Error Output: Normally high (15V), during Error 0V (15mA).

Can drive optocoupler directly.

Sensor Cable: 1m Length Type RG59