PlasmaSensCompact user's manual v1.0

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PlasmaSens user's manual

Description

PlasmaSensCompact is an **integrated torch height controller and sensor** for plasma cutter equipment. It merges the functionality of **PlasmaSens** and **PlasmaSensOut** into a single device, eliminating the need for a separate optical link between transmitter and receiver.

The unit measures plasma arc voltage accurately and controls the torch height automatically for optimal cutting quality. It provides **standard ARC OK, UP, and DOWN outputs** compatible with most CNC controller boards, as well as a **built-in LED display** for settings and real-time voltage monitoring.

It supports both **direct high voltage input** (up to 350 VDC) and **divided voltage input** (1:50 ratio, up to 10 VDC).

In a combination with a **PoKeys57CNC controller**, PlasmaSensCompact is reliable **torch height controller** (THC). It enables efficient and precise cutting of material depends on **torch distance from a workpiece** and appropriate plasma arc. The arc voltage is proportional to the distance between the torch and the workpiece and should stay as equal as possible across the entire cutting surface. Therefore, plasma's voltage data is important for a Z-axis position update.

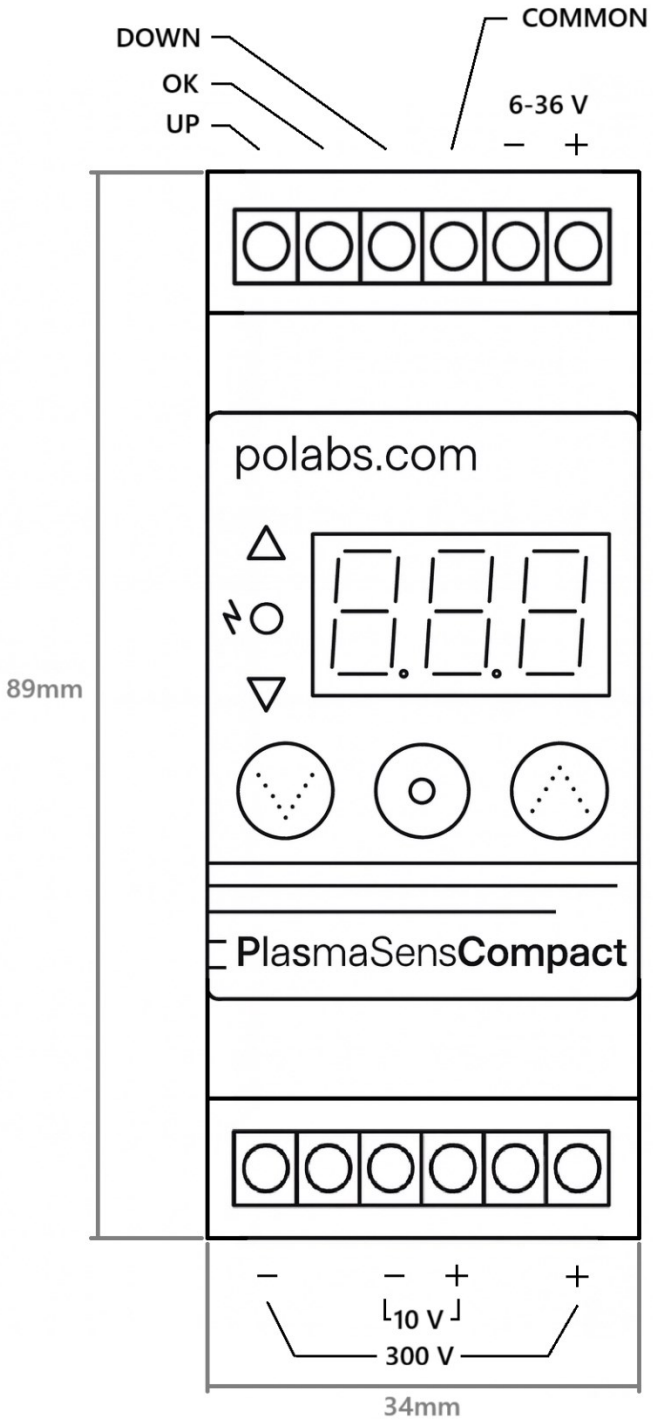
If you are not using PoKeys57CNC controller you can use our universal PlasmaSensCompact device at receiver side. With programmable output signals: **Up, Down and Arc OK**, it's **compatible with the most CNC controller boards** on the market.

Features

- Plasma voltage measurement up to 350 V
- Low voltage power supply
- Additional input for divided plasma voltage (1:50) up to 10 V
- Plasma voltage presence signalization
- Plugin support Mach3 and Mach4
- DIN-rail mountable housing

Connectors and pinout

PlasmaSensCompact device:



Connection to PoKeys57CNC

PlasmaSensCompact requires DC power supply. Voltage applied can be from 6 V to 36 V. All outputs signals are isolated. Solid state relays are used.

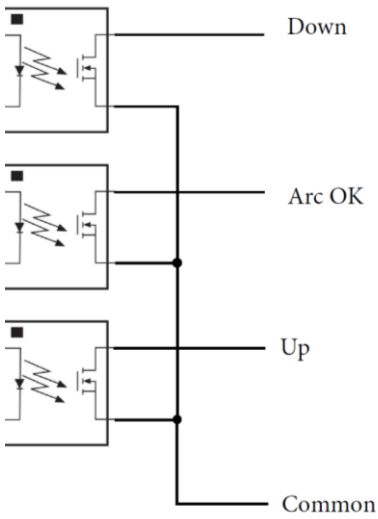


Figure 3: PlasmaSensCompact outputs

Please refer to your CNC controller board's manual for detailed information about input ports.

Connection to the plasma cutter equipment

The PlasmaSensCompact device is prepared for two possible connection to the plasma cutter equipment.

A 300 V input for direct connection and 10 V input for connection using divided plasma cutter output.
Only one input can be used at a time!

1. Direct connection

In case your plasma cutter does not support voltage divided output, you should connect it directly to HV input as shown in Figure 2.

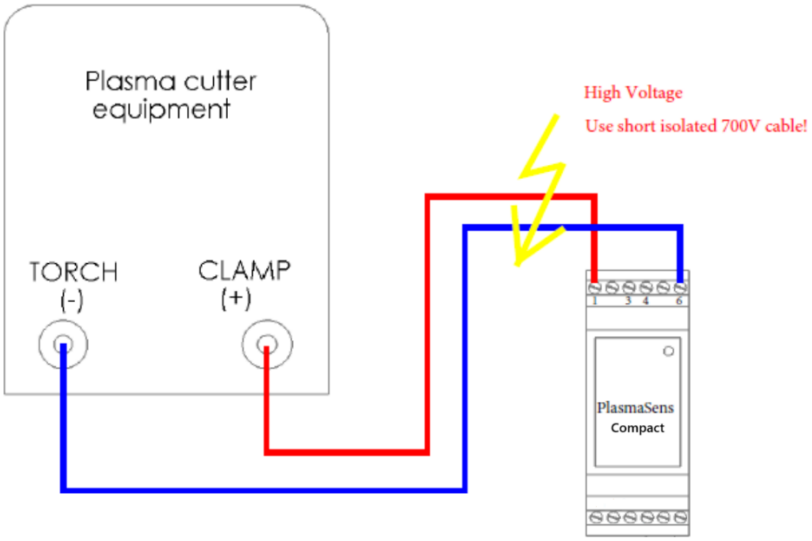


Figure 2: Connection PlasmaSensCompact to Plasma cutter equipment - directly

2. Divided voltage connection

For connection using divided voltage output note the following instruction (Figure 3).

Please refer to your plasma cutter owner's manual for detailed information about divided output voltage and connector pinout. Remember PlasmaSensCompact 10 V input is prepared for voltage divider 1:50 and so it will only measure correct input voltage for that ratio. In case of a different divider ratio, reference high parameter should be calculated as plasma cutter voltage divided by plasma cutter voltage output ratio multiplied by 50.

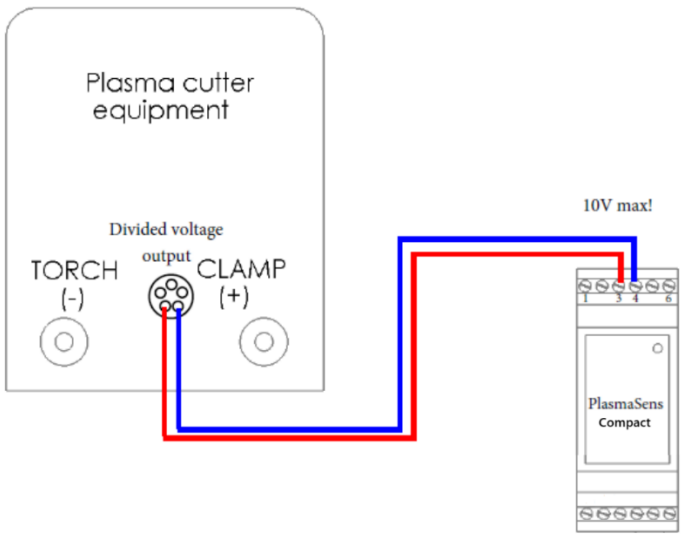


Figure 3: Connection PlasmaSensCompact to Plasma cutter equipment using divided voltage output

Users interface

Parameters can be modified during operation and will immediately affect the output signals! PlasmaSens will automatically save the last settings.

During the plasma cutter's operation, the current arc voltage is shown on the display.

If there are no arc voltage present, display shows **- - -.**

Reference voltage (Ref) can be set by pushing **V** (left) or **Λ** (right) button. (During operation the green (OK) led flashes when reference voltage is setting). User can set Ref from 45 V to 265 V. Factory setting 160 V.

Setup menu

To enter a setup menu press and hold • (middle) button for one sec. The LED display will start flashing then the setup menu will appear.

Select the parameter by pressing • button. Press **V** / **Λ** button to modify parameter's value.

Sdt - **S**et **d**elay **t**ime from 0.1 to 9.9 sec. Time between Arc OK signal appears and generation of signals ***up*** and ***down*** is enabled. Factory setting 0.5 s.

HYS - **Hys**teresis from 2V to 32 V (2 V step). Voltage frame around reference. If arc voltage is higher than Ref + HYS/2 then ***down*** signal is generated. If voltage is lower than Ref - HYS/2, ***up*** signal is generated (see the output signal example below). Factory setting 10 V.

AdL - **A**nt-**d**ive **l**imit from 50 V to 300 V. Arc voltage that disables THC. If voltage goes higher than Anti-dive limit all output signals go low. The parameter's value must be set higher than reference voltage. Factory setting 200 V.

tSt - **Test** mode**. Only available when no arc voltage present**! Pressing **V** or **Λ** button generate output signals. The display indicates direction.

To leave a setup menu, do not press any button for around 2 seconds.

In case of communication failure **E - I** is shown on the display. Please check the optical cable is properly inserted on both sides and that the PlasmaSens sensor device is turned on.

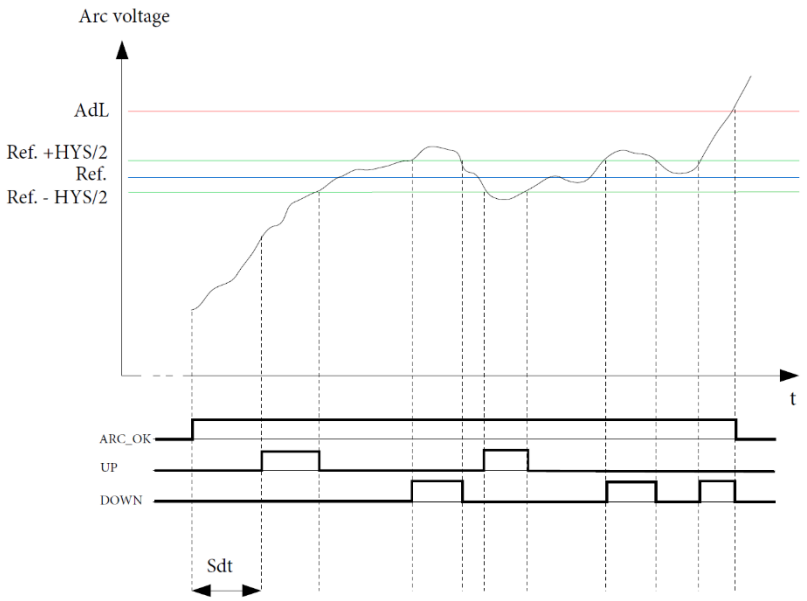


Figure 4: Output signals diagram example

Mach3 - PlasmaSensCompact configuration using PoKeys57CNC

Download and install the latest PoKeys Mach3 plugin from www.poscope.com. Look for PoKeys setup package, which also includes Mach3 plugin.

In Mach3 software under *Plugin Control-> Configure PoKeys57CNC->Device settings* you will find *PoKeys mapping* tab. Map connected pins as shown below. In our example we select PoKeys pin 8, 12 and 13 as input. In *Pulse engine settings* tab at THC settings-axis Z select Up/Down signals.

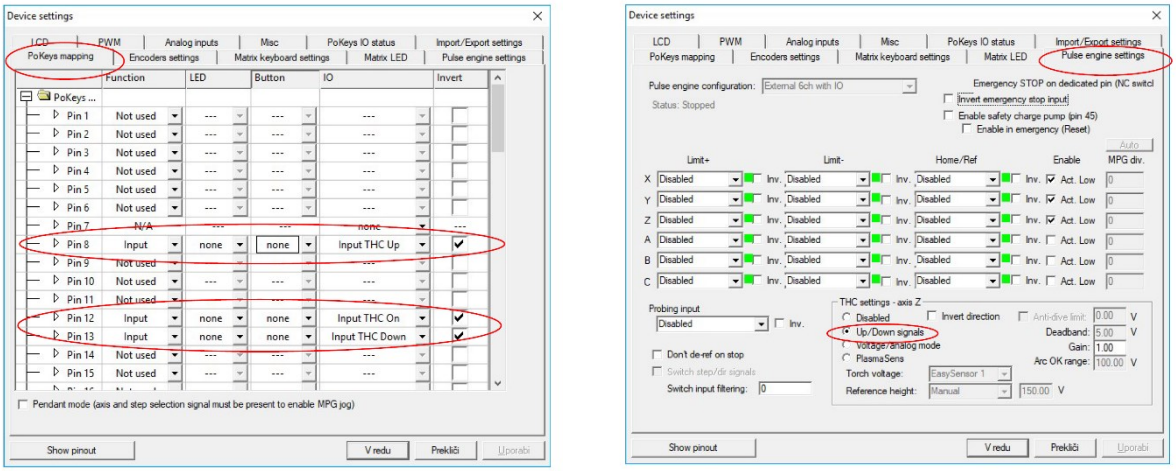


Figure 5: PoKeys Mach3 plugin setup window

Note: PlasmaSenseCompact should not be configured with a separate 'PlasmaSens' option in the PoKeys plugin configuration dialog. PlasmaSens option is used with direct connection of optical cable to PoKeys57CNC via PlasmaSens interface.

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