

# UV CAN

## UV07 Datasheet

**UV07** is the heart of a **UVcan** control system. It is a control handle which includes all necessary electronics for controlling hydraulic valves directly regardless of the valve manufacturer. Thus it needs to be accompanied only by **UV0D** to create a control system which is easy to install and intuitive to use.

**UV07** control handle is designed to be reliable. The joystick sensors are magnetic HAL-effect sensors, which do not have mechanical, wearable components.

- Operating temperature -30 ... +80 °C
- CAN 2.0B interface
- Durable aluminum enclosure
- Designed for 12V and 24V operation
- 10 proportional PWM power outputs with current sense or with 5 ratiometric analog voltage outputs for driving Danfoss PVG (PVEM) valves.
- 2 analog voltage inputs
- 1 digital voltage input pair
- 2 analog current inputs 0 - 20 mA
- 1 PT100 temperature sensor input



## Revision History

| Date      | Comments   |
|-----------|--|
| 2.4.2019  | Initial revision   |
| 16.1.2020 | Separate system diagrams for proportional output pairs and ratiometric voltage outputs, additional information about the outputs & inputs. |

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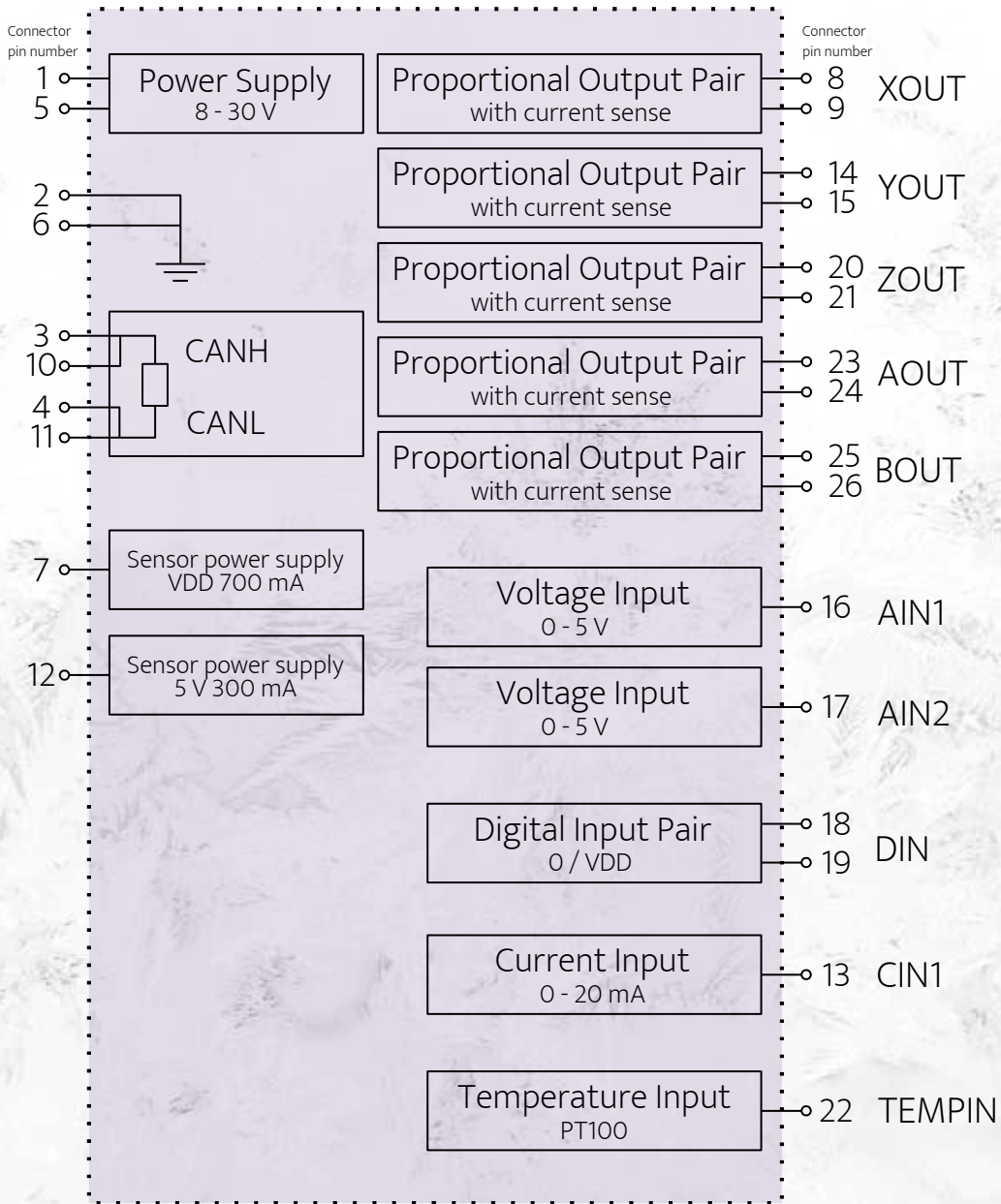
## Technical Specifications

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|                              |   |
|------------------------------|---|
| Voltage                      | 8 - 30 VDC  |
| Protection                   | Over voltage & Reverse voltage<br>External 15 A fuse required   |
| Current Consumption          | Logic 20 mA, outputs up to 10 A   |
| Connectors                   | Superseal 6473418-1   |
| Interface                    | 1 x CAN-bus 2.0B  |
| Material                     | Aluminum, brass, ABS, POM   |
| Programming language         | C, with open source <b>uv_hal</b> library   |
| IP-rating                    | IP67  |
| Microcontroller              | 32-bit ARM Cortex-M3  |
| Memory                       | 256 KB Application flash memory<br>36 kB RAM memory   |
| Outputs                      | 10 x proportional high-side PWM output with current sense <b>or</b><br>5 ratiometric analog voltage outputs & switched power output |
| Output max current / voltage | 2200 mA / 0 - 80% $U_{dc}$  |
| Inputs                       | 2 x analog voltage input<br>1 x digital voltage input pair<br>2 x current input 0 ... 20 mA<br>1 x PT100 temperature sensor input   |

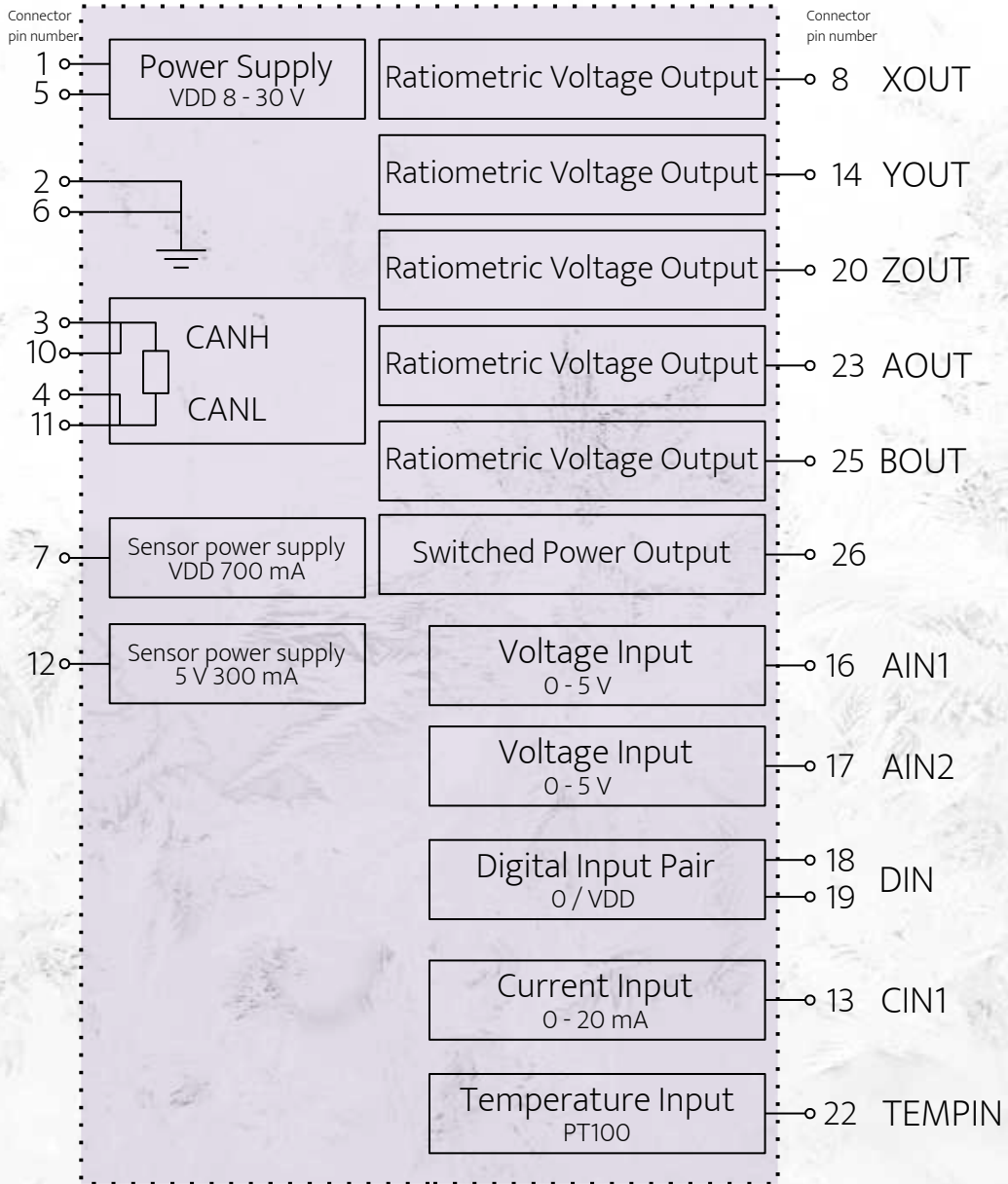
# System Diagram

## UV07



System diagram for UV07 supplied with proportional current outputs

# UV07



System diagram for UV07 supplied with ratiometric voltage outputs for Danfoss PVG (PVEM) valves

#### Proportional Output Pair

Proportional output pair is a high-side driver used to directly control two-directional hydraulic valves. The output pin should be connected to the hydraulic valve's coil, while the other end of the coil should be connected to vehicle ground. One proportional output pair has two pins that can be used to drive 2 coils as required by two-directional hydraulic valve. Note that only one of the pins can drive coil (be active) at any time. All proportional output pairs have internal current sense as well as internal short circuit and overheat protection. They operate as dual 0 - 2200 mA PWM power outputs.

#### Ratiometric Voltage Output

If UV07 is supplied with ratiometric voltage circuitry to drive Danfoss PVG (PVEM) valves, the proportional output pairs are replaced with low power 0 - VDD analog voltage outputs. The maximum load impedance of ratiometric mode is 10 k $\Omega$ . The default value of the ratiometric voltage output is  $VDD / 2$ . The value of the ratiometric output is undefined when UV07 is booting up or resetting. When driving Danfoss PVG valves, the valve power supply should be taken from UV07's switched power output (see below) to prevent unintentional movements while boot up.

#### Switched power output

The switched power output is a high-side driver that is active always when any calibrated input (such as internal joystick axes' HAL sensors or calibrated input AIN / CIN pins) is considered active. That is, their logical value is non-zero. The switched power output can be used to supply up to 4 A current for, for example, Danfoss PVG valve controller's supply voltage. The switched power output has internal short-circuit and overheat protection, but no current sense.

#### Voltage Input 0 - 5 V

The 0 - 5 V voltage inputs are analog inputs that can measure the input voltage in the range of 0 - 5 V. Despite the internal over voltage protection, connecting any higher-than 5 V voltages to these pins should be avoided. The voltage inputs have internal 30 k $\Omega$  pull-down resistor.

#### Digital Input Pair 0 / VDD

The digital input pair consists of 2 digital voltage inputs that are supply voltage tolerant. They can be used as inputs for, for example, switches to control additional outputs. Only one of the two pins can be active at one time. If both pins are active, the logical state of the Digital input is read as non-active. The digital input pair can be configured to be active-high or active-low, with internal pull-down or pull-up resistor enabled, respectively.

#### Current Input 0 - 20 mA

The current input can measure input current in the range of 0 - 20 mA. The current input pin doesn't have internal over voltage protection. Connecting any higher-than 5 V voltage is not allowed.

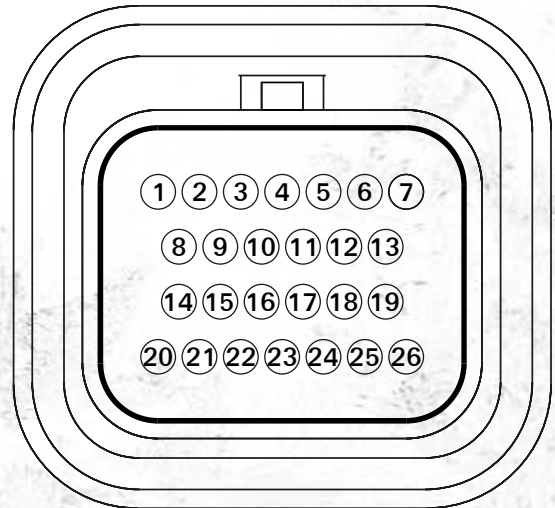
#### PT100 Temperature Input

The temperature input can be used to measure temperature with PT100 temperature sensor. The other terminal of the sensor is connected to this input and other terminal is connected to ground potential. To prevent unwanted warming of the PT100 sensor, the UV07 measures maximum of 2 mA of measurement current. Thus an extra care should be taken when wiring the wiring harness to the PT100 sensor. Bigger currents might cause unwanted interference in the PT100 small signal wiring harness.

## Connector Pin Out

### Superseal 26-pin 6473418-1 Connector

|    |                            |
|----|----------------------------|
| 1  | VDD                        |
| 2  | GND                        |
| 3  | CANH*                      |
| 4  | CANL*                      |
| 5  | VDD                        |
| 6  | GND                        |
| 7  | SENSOR_VDD                 |
| 8  | XOUT_A / RATIOMETRIC XOUT  |
| 9  | XOUT_B / RATIOMETRIC NC ** |
| 10 | CANH*                      |
| 11 | CANL*                      |
| 12 | SENSOR_5V                  |
| 13 | CIN1                       |
| 14 | YOUT_A / RATIOMETRIC YOUT  |
| 15 | YOUT_B / RATIOMETRIC NC ** |
| 16 | AIN1                       |
| 17 | AIN2                       |



Superseal 26-pin 6473418-1  
Mates with 3-1437290-8



|    |   |
|----|---|
| 18 | DIN_A   |
| 19 | DIN_B   |
| 20 | ZOUT_A / RATIOMETRIC ZOUT                     |
| 21 | ZOUT_B / RATIOMETRIC NC **                    |
| 22 | TEMPIN  |
| 23 | AOUT_A / RATIOMETRIC AOUT                     |
| 24 | AOUT_B / RATIOMETRIC NC **                    |
| 25 | BOUT_A / RATIOMETRIC BOUT                     |
| 26 | BOUT_B / RATIOMETRIC SWITCHED<br>POWER OUTPUT |

\* CAN-bus multiplexed to 2 pins to simplify system wiring. It also has internal 120  $\Omega$  terminating resistor by default. Contact the manufacturer if the terminating resistor is not required.

\*\* NC = No Connection

# Physical Dimensions

