



Mechatronic department

file:

**SMART PU – Undercarriage Levelling
System for Recreational Vehicle**

tuorpu

SMART PU UI . RV MACHINE MANAGEMENT

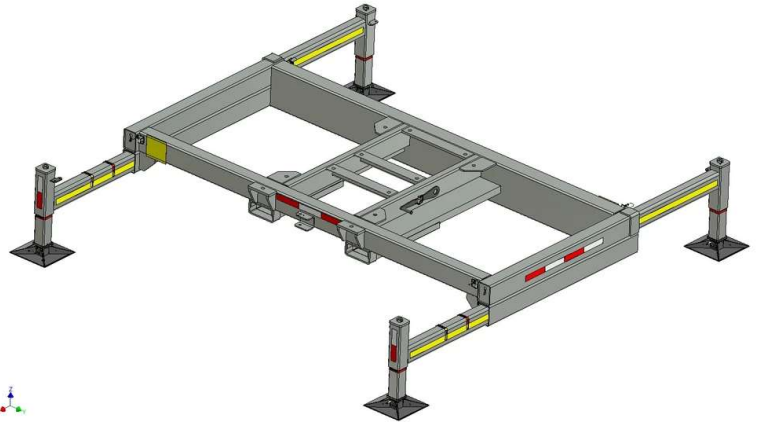


Automatic Levelling for recreational vehicles reduces setup time increasing the quality sense of leisure. The market demand of Levelling systems is limited by the TCO of the system and its installation. HYDRONIT has developed an Hydraulic power unit wich includes the necessary electronic devices and sensors: the installation of the system is then reduces as part of the devices are built in. Cable Harness is also compact and more efficient.

The SMART PU Undercarriage Leveling System for RV consist of:

- DC Smart Hydraulic Power Pack 12-48Volts
 - Hydraulic pump, motor and
 - Valves
 - Embedded Electronic System
 - Sensors
 - Local cable harness*
- 4.3 or 7 inch colour display*
- 4keys Keyboard*

*optional



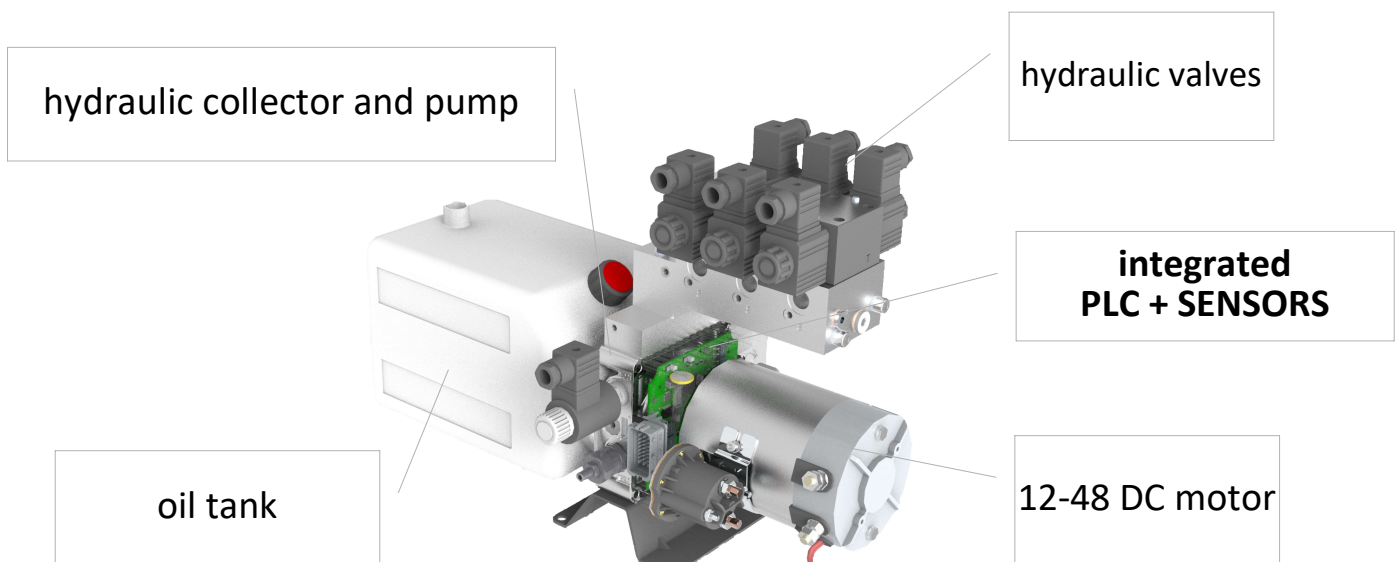
The system can be configured in order to manage systems with:

- 4 hydraulic jacks system
- 6 hydarulic jacks system
- Spring return hydraulic jacks
- Double acting hydraulic jacks

This document refers to spring return hydraulic jack
Hydraulic circuits available on request

The SMART POWER UNIT is the first hydraulic power pack with embedded programmable PLC and sensors. Less connections, less commissioning time, more integration. The PLC is located inside the power pack, between the electric motor and the pump. The drive shaft passes through the electronic controller, a sensor detects the present rotation of the motor for safety use. Accelerometric Tilt Sensor is able to detect the present angle of the power pack. The Controller is equipped with a 32 bit safety processor. Optional pressure sensors allows weighing system in order to limit the vehicle overload.

The Smart Power Unit is programmable by CoDeSys



SMART PU UI . RV MACHINE MANAGEMENT



Platform levelling for vehicles is normally developed on a principle of horizontal alignment on 2 axis:

Longitudinal (Pitch)

Lateral (Roll)

An ideal self-levelling platform is able to lift the vehicle and compensate for inclination or irregularity of rough terrain and slopes on the roll and pitch axes.

Electronic on board manages the cycle:

- lowering of the cylinders (all; single)
- (optional) ground pressure control
 - Pressure switch on each cylinder or floating jacks switches can be sensed to detect whether the soil is compact enough to sustain the vehicle
- lifting of the vehicle:
 - Weighing (optional) requires pressure sensor: avoid RV overload and increase driving safety
 - Manual
 - Auto
 - While lifting the system automatically stops the cylinders who lift too fast in order to lift the flattest as possible
- Level: the system lowers the higher side of the RV until it is flat
- Stop: the system alerts if the vehicle loose horizontality (failure, soil too soft and so on)



The Hydraulic circuit is available for single effect spring return cylinders or for double effect cylinders. Hand Pump available as option.

On request the SMART PU can be connected to CAN-BUS of the vehicle through SAE-J1939 for interaction with the vehicle.

The Smart Power Unit is equipped with WI-FI access point: on request is possible to customise an application for Android / IOS for the remote control of the leveling system.

Customisation of the software can be managed with



HMI:

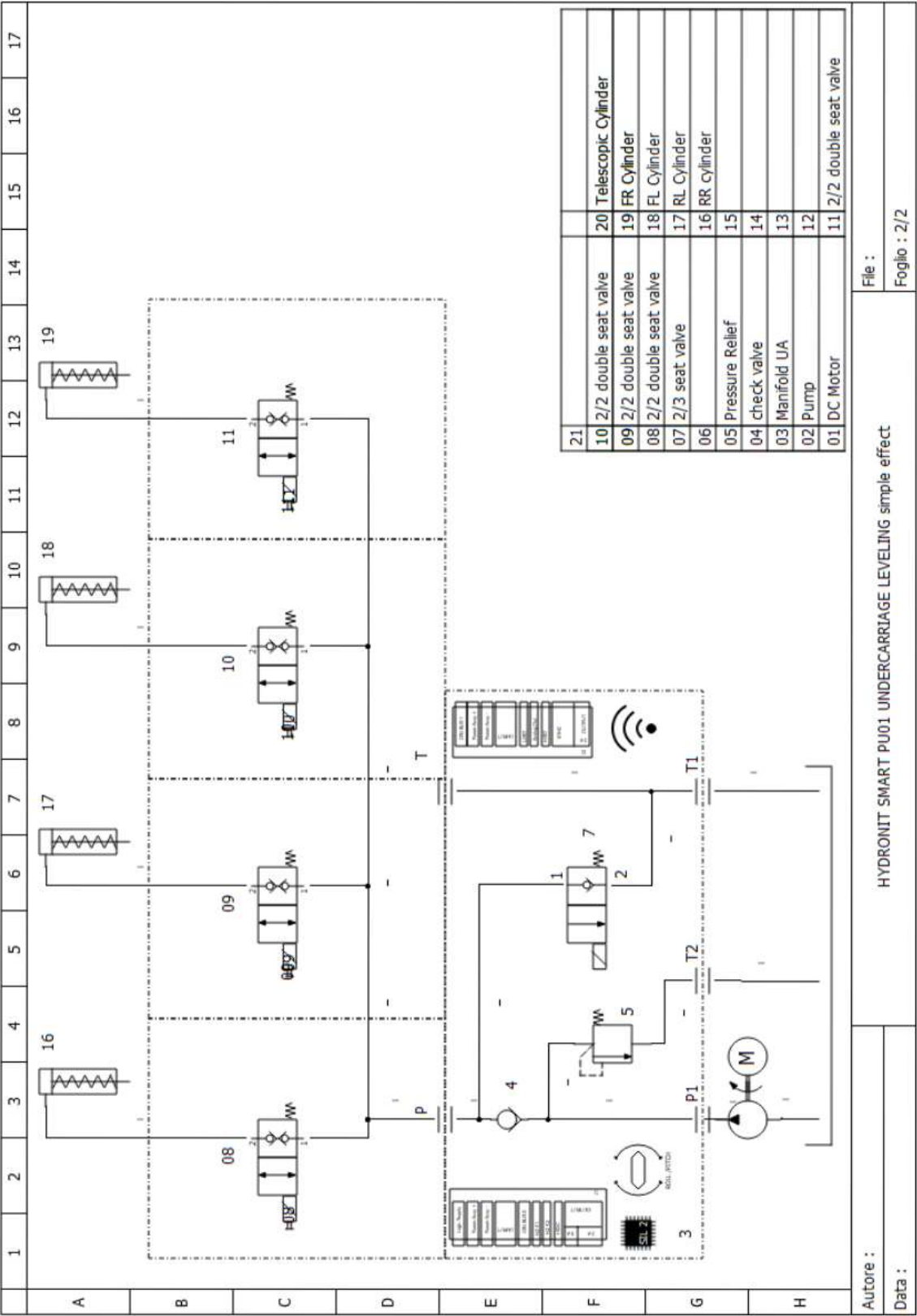
The Leveling System can be completed with a CAN BUS keyboard with 4 or 8 buttons and colour indicators which can be customised on request.

The Leveling System can be completed by a touchscreen display which is connected to the PLC through CAN BUS

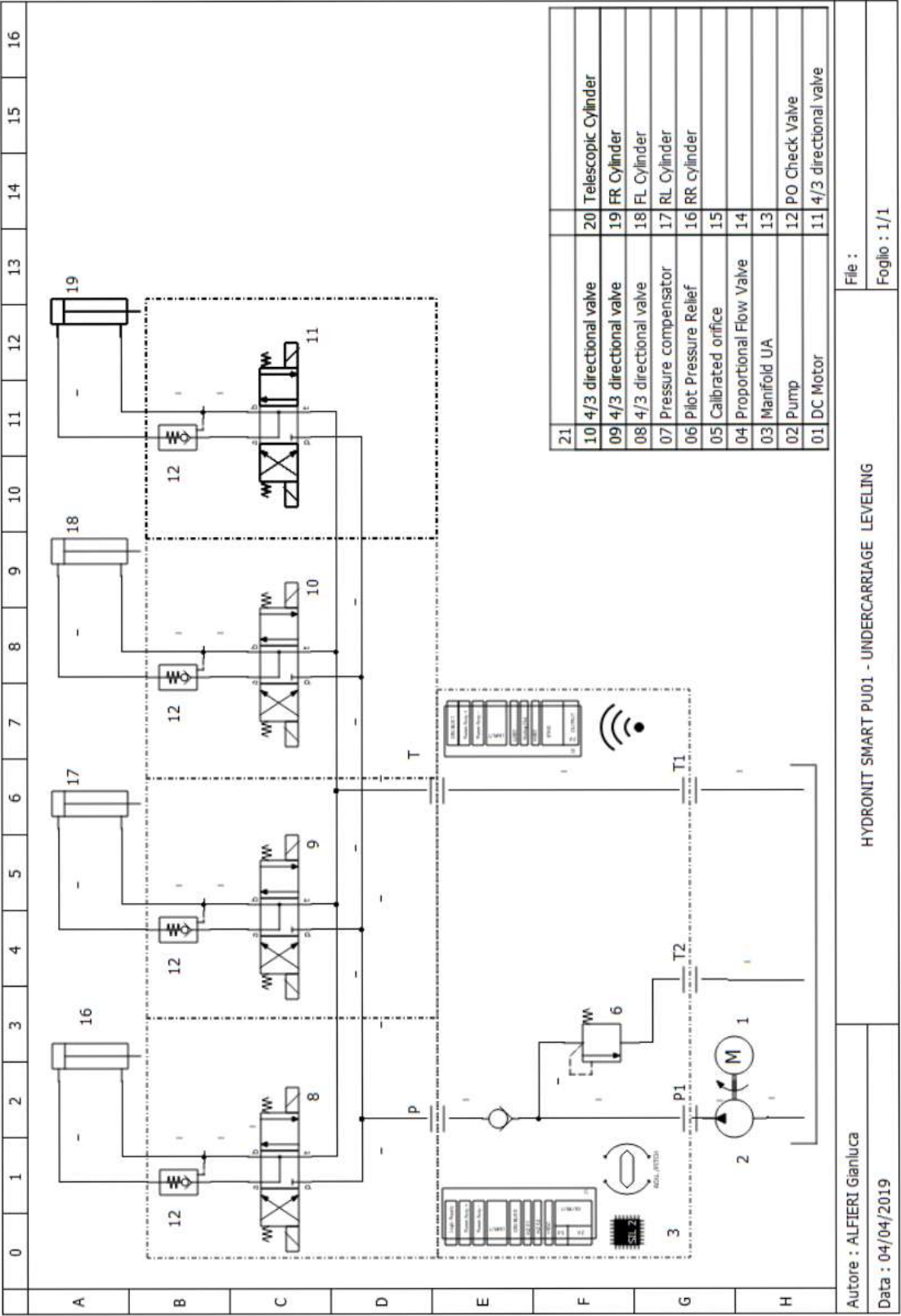
Our Touchscreens are programmable through a proprietary IDE based on QT which is open-source.



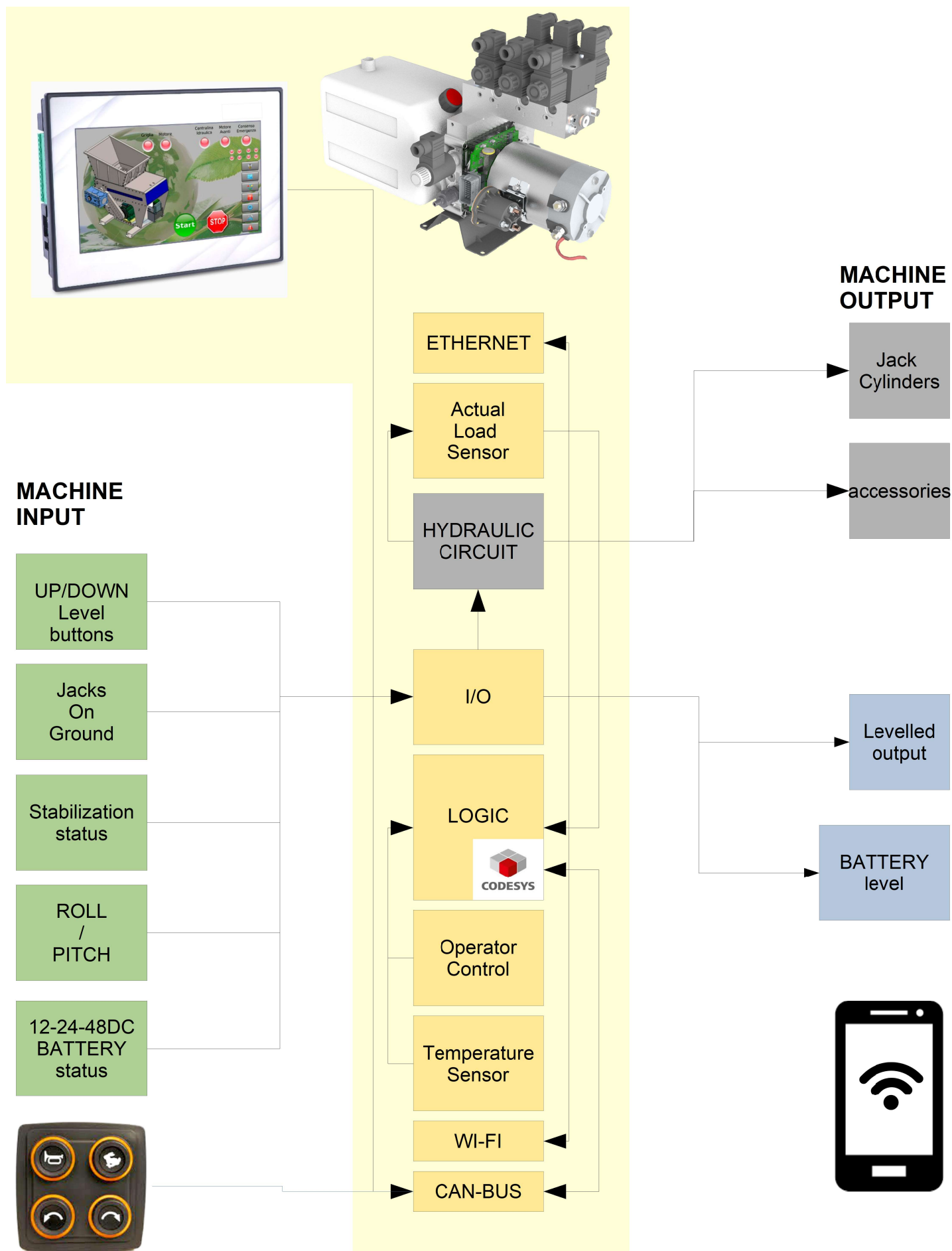
SMART PU UL RV simple effect

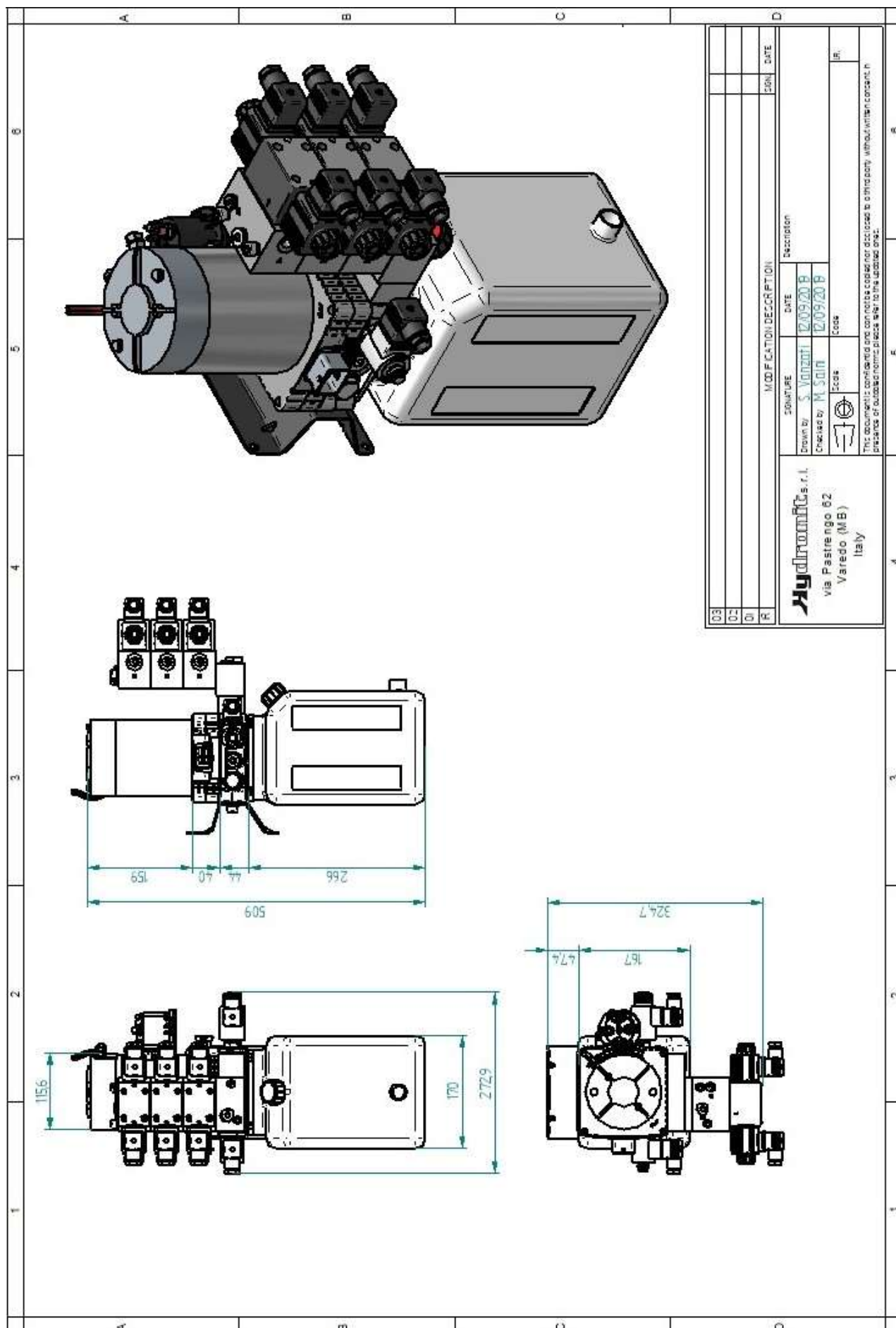


SMART PU UI . RV double effect



SMART PU UI, RV BLOCK DIAGRAM



TYPICAL SMART PU UL RV OVERALL DIMENSIONS **Hydronit®**



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