



Mechatronic department

file:

**SMART PU – Twin-Scissor Lift
machine management**

HYDROFIT

SMART PU TSL MACHINE MANAGEMENT



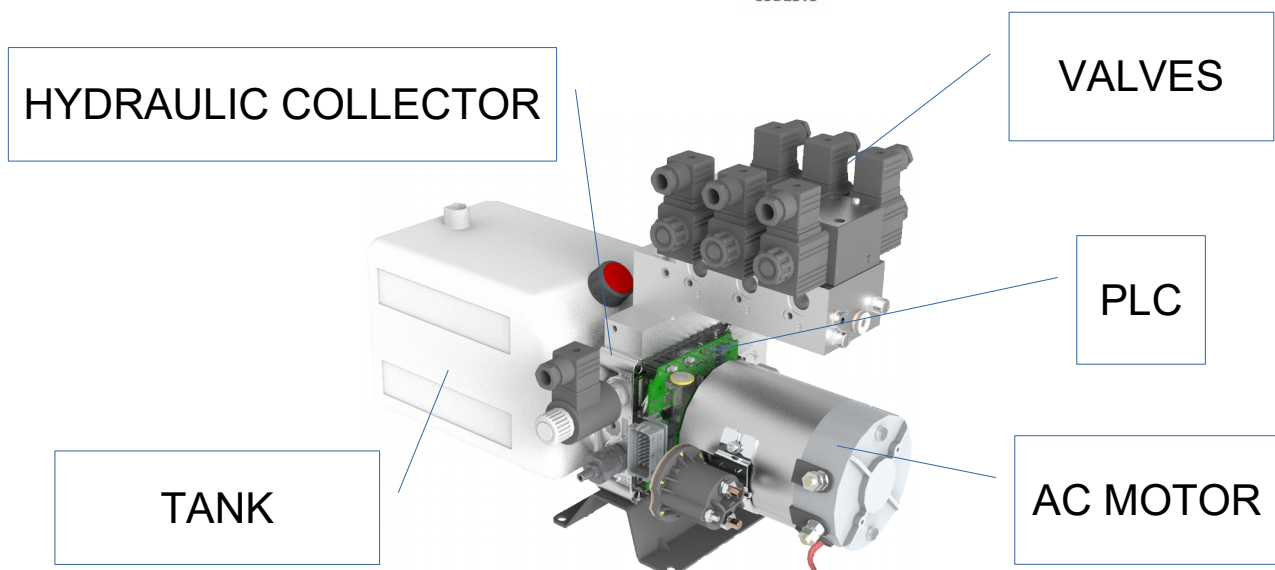
Our patented SMART POWER UNIT technology Hydronit offers to manufacturers a one-stop-shop solution for Hydraulic Twin-Scissor Lift. It reduces TCO due to a simplified electric and hydraulic circuit, using just 2 cylinders electronically synchronised, no alignment valves, less hoses and less number of sensors and wirings.

The solution consist of:

- SMART POWER UNIT
 - Hydraulic power pack with valves
 - Embedded SIL 2 programmable PLC
 - Embedded Sensors (see data sheet)
 - WiFi – CAN – Ethernet
- 4 KEYS CAN-BUS keyboard
- touchscreen display (optiona) for the management of accessories such as “play detector”, "built-in wheel free lift", diagnostic and maintenance
- Redundant angle/position sensors
- WI-FI for APP connection



The SMART POWER UNIT is programmable by CoDeSys  for further customisation required



SMART PU TSL MACHINE MANAGEMENT



Electrohydraulic Twin-Scissor lift without torsion bar is usually developed on a principle of "simple effect emitter/receiver" cylinders. Additionally the machine circuit can be equipped with an additional couple of "master-slave" cylinders which grants additional safety on torsionbar-less architecture.

This mechanic architecture requires additional valves sensors and switches in order to re-align the pressures of the cylinders each time the scissor-lift is closed. Due to pressure intensification of the "master-slave" architecture, cylinders are designed to operate to very high pressure, inducing additional costs. Hoses, Fittings wires, connectors, blocks, sensors spreaded around the machine are requires time and manpower. Commissioning costs are higher and

Hydronit solution replaces the emitter/receiver hydraulic cylinder and the leveling mechanism with a single cylinder (Slave) of the same size of Master.

Our solution drives 2 cylinders instead of 4 which can operate at lower pressure than conventional solutions.

The master cylinder is managed in a speed control.
The slave cylinder is managed in a position control.

Both master and slave cylinders are equipped with a position sensor wich determines the actual scissor height.

Electronic built-in the Hydraulic Power Pack manages the cycle (lifting lowering of the master cylinder and optionals) and the "synchronisation" of the platforms through an electronic control. The position sensors are the only sensors required due to a redundant architecture: no optical/pressure/end stroke sensors required, less cables and installation time. Furthermore, no hydraulic valves are requested on the scissor frame.

The Electric cabinet just need Isolator Switch, emergency button and 24DC powersupply: NO additional protections since they are embedded in SMART POWER UNIT

Operator Safety is granted by a SIL 2 (safety integrity level) as per EN61508 for or PI c as per EN13849 compliant electrohydraulic architecture.

WI-FI

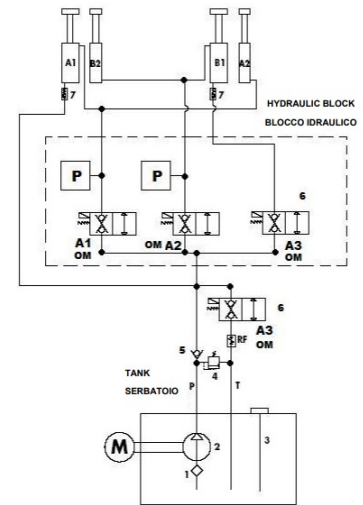
The Smart Power Unit has WI-FI connection: an optional webserver function enable the control of some machine features by a customisable APP for smartphone

HMI (optional):

The machine can be completed by a colour touchscreen in the size of 4.3" or 7" 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.

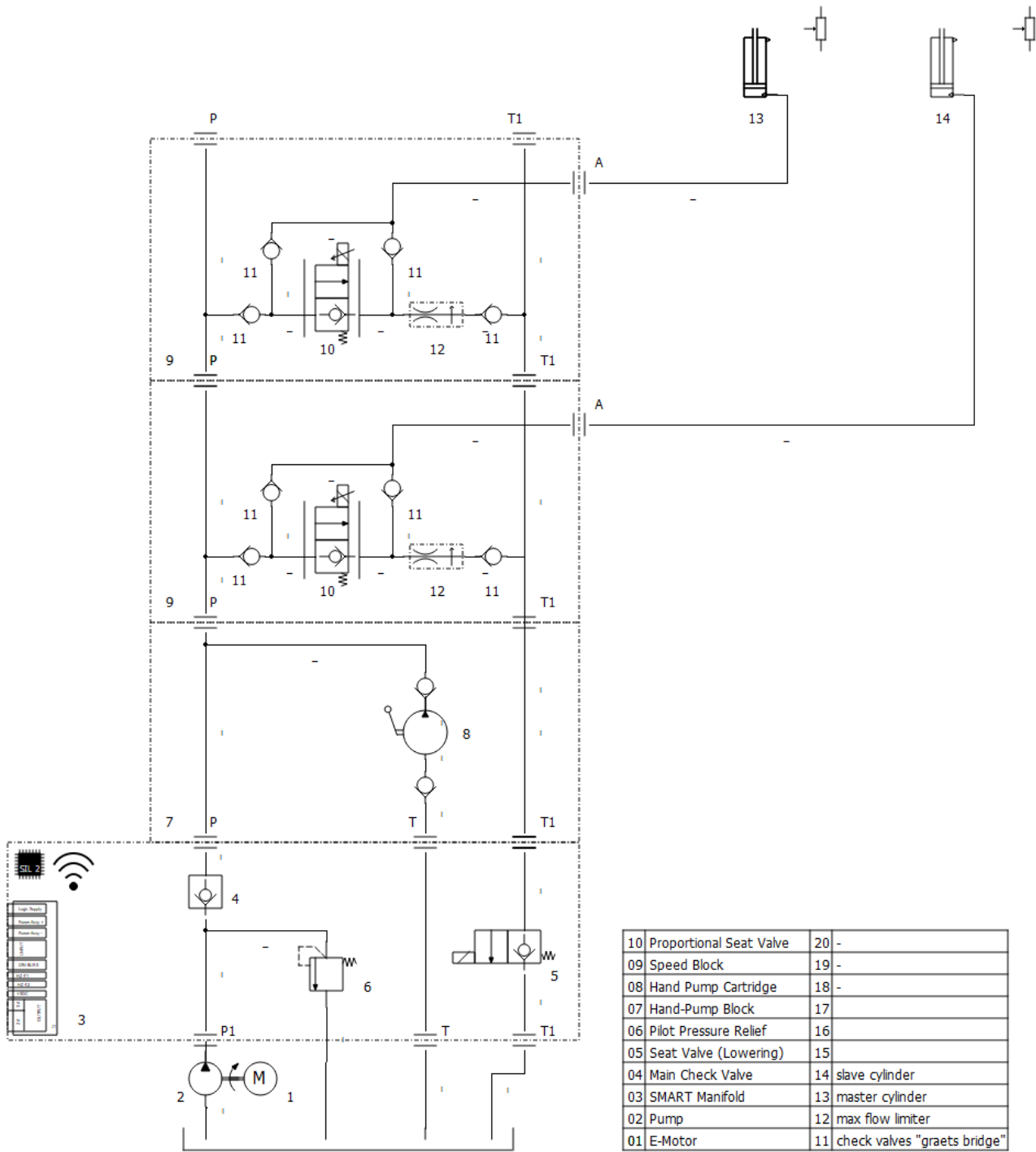
Alternatively a CAN BUS keyboard allow the lift/lower operations.



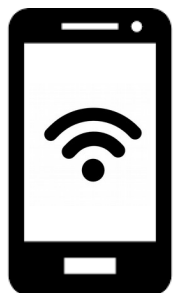
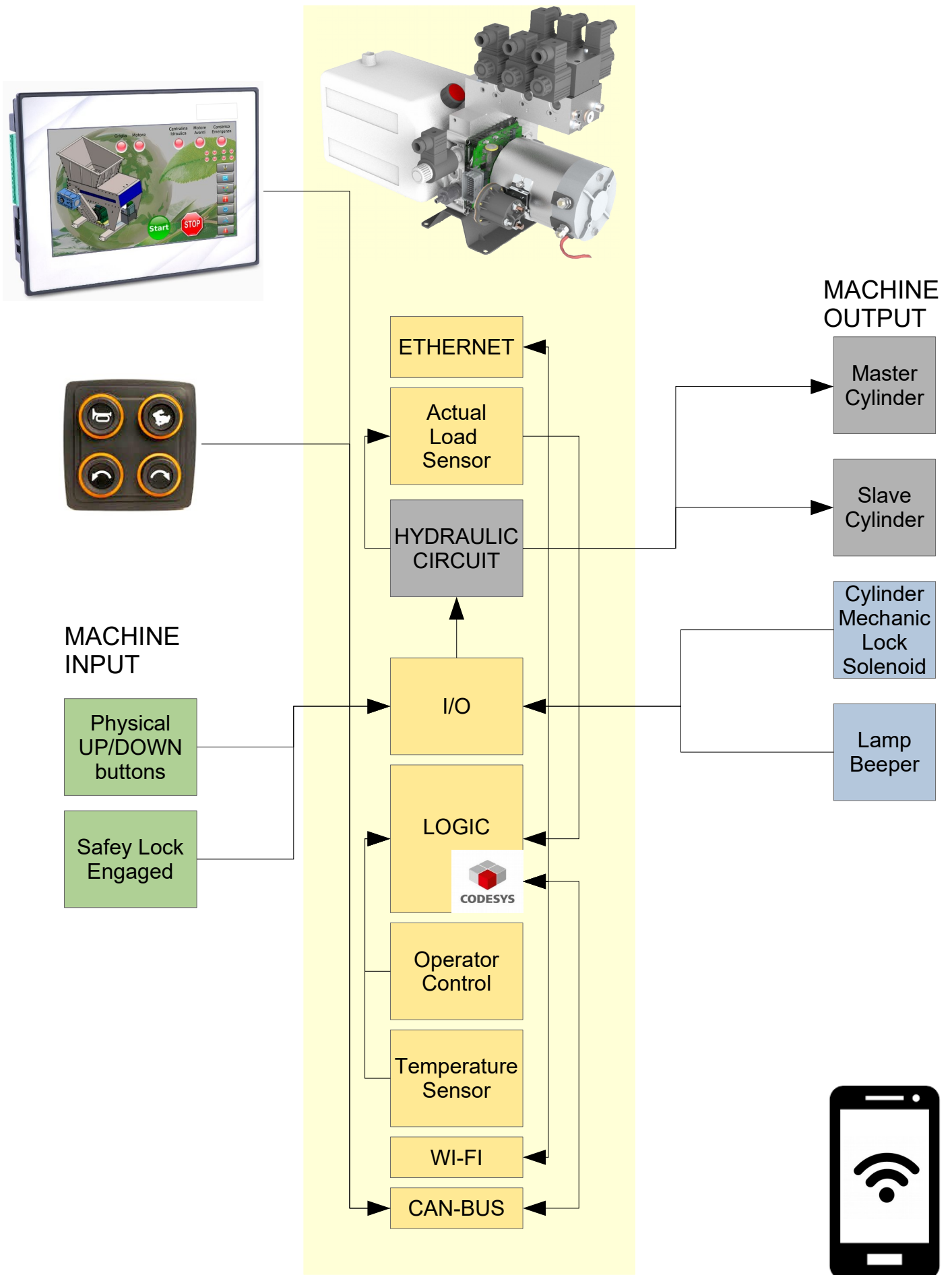
Typical master/slave scheme



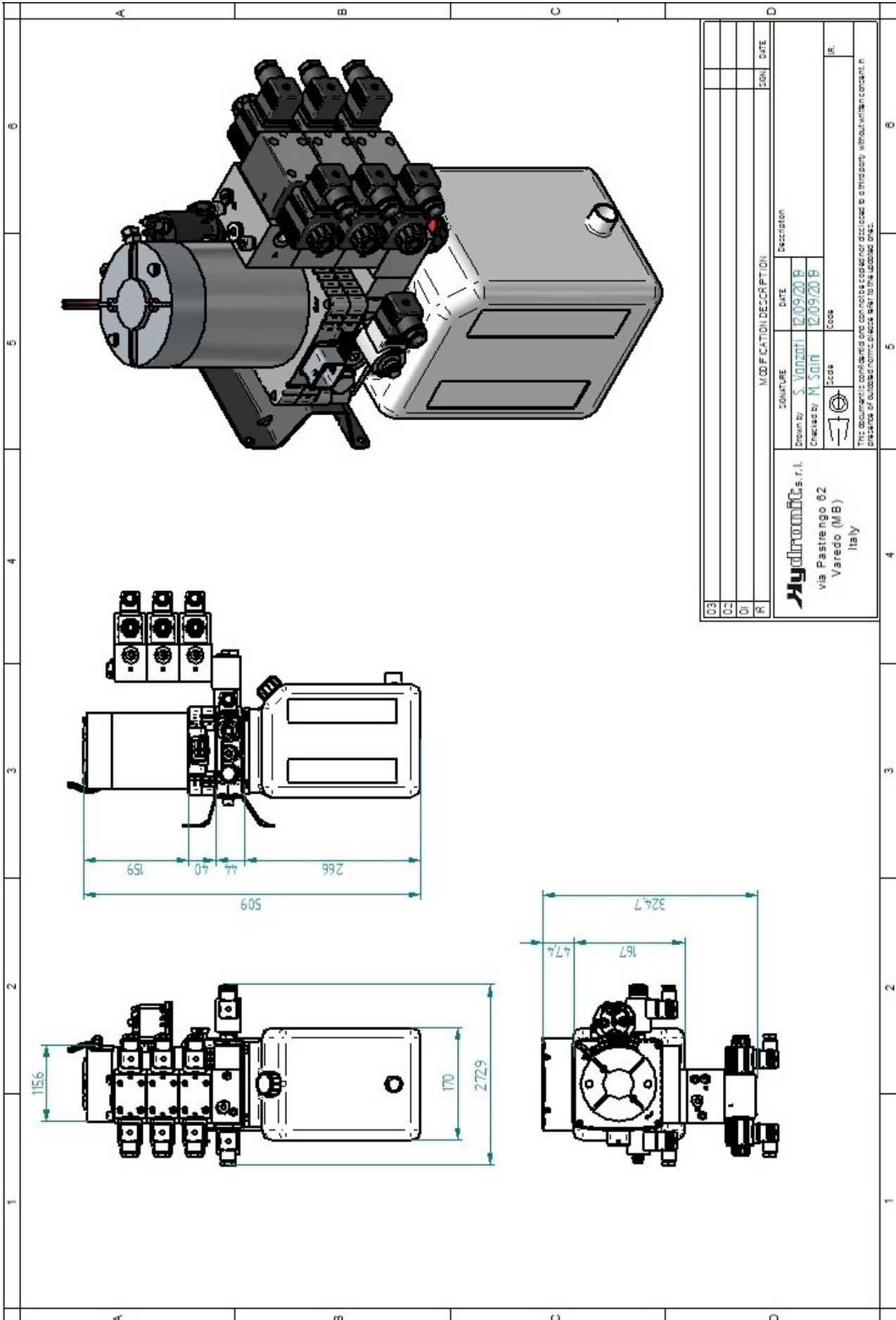
SCISSOR LIFT with SMART POWER UNIT
HYDRAULIC SCHEME



SMART PU TSL BLOCK UNIT



SMART PU TSL OVERALL DIMENSIONS



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