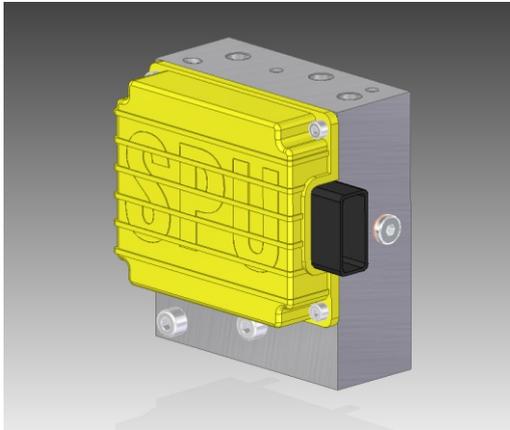


HPC01



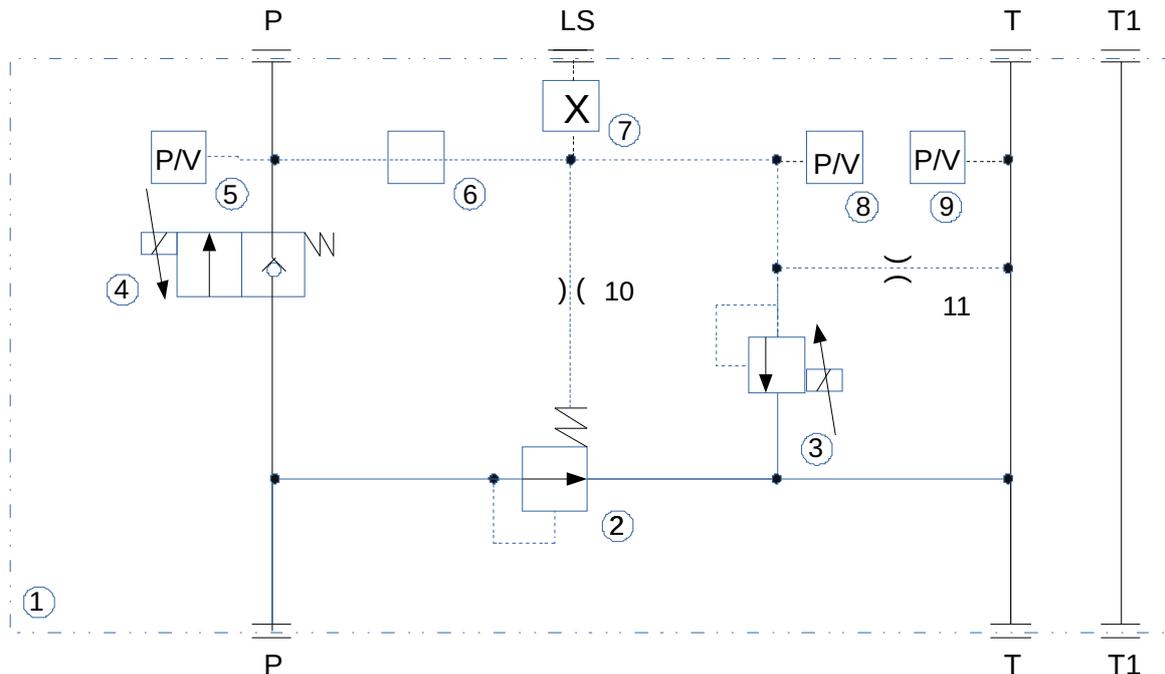
HPC01: the Hydraulic Process Controller is a Mechatronic element to be integrated into Hydronit power pack. It consists of an aluminium manifold with a proportional Flow regulator, pressure compensated, piloted by a proportional pressure relief valve. The hydraulic system is developed for the well known P/Q regulation methods and it includes a Load Sensing port to be connected with LS proportional valves. Additionally, the manifold hosts a programmable electronic controller with double processor, local Input and Output such as:

- Software configurable Analog / Digital Input
- Software configurable PWM / Current / Digital Output up to 5 Amps
- Two independent CAN-BUS lines
- Independent Logic and Power electric supply for safety configuration
- Internal WDO

HPC01 is supplied with 9-32V and it is able to drive up to 35A of loads, matching the most common automotive standards.

HPC01 can control DC or AC electric motors through CAN-BUS lines on through ON-OFF signals

HPC01PQ with proportional meter-in Flow and Pressure controls



HPC01PQ: Hydraulic Diagram

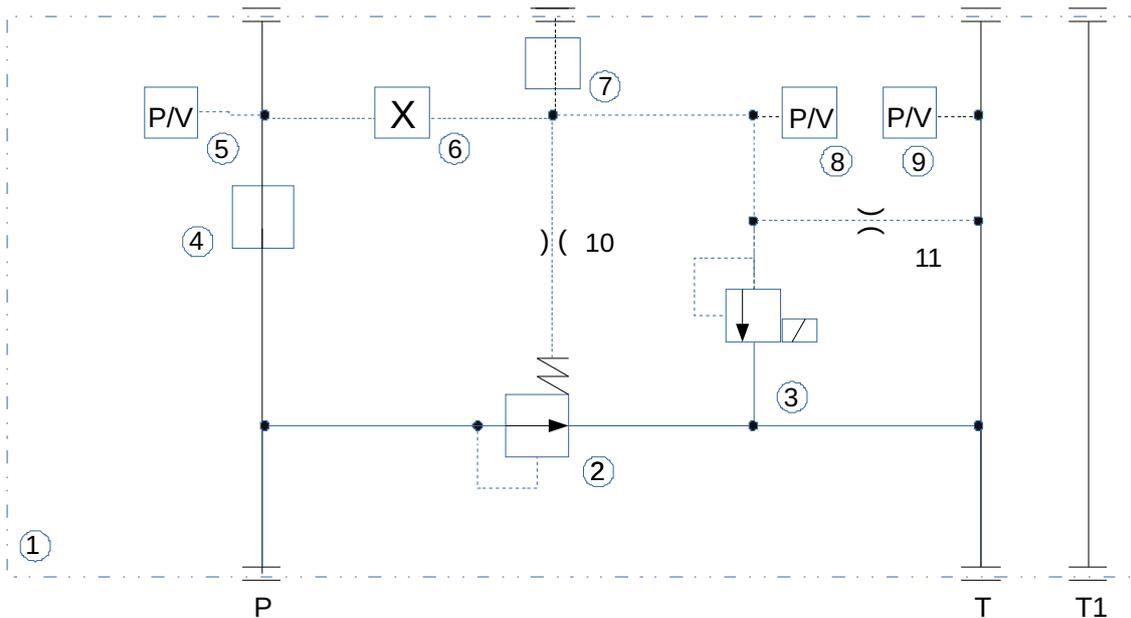
The PQ type diagram is useful for sequential motion in automation, normally the PQ manifold feeds an array of ON-OFF directional valves, regulating the common flow and the max pressure. PQ system allows just sequential asynchronous movements. Typical applications are: personal lift equipment, small cranes,...

The Manifold (1) contains a 3rd way pre-compensator (2) which is sensing pressure across the proportional flow regulator (4). The proportional pressure relief valve (3) is limiting the max pressure allowed on the system. Pressure sensors (5, 8 rated for 300 bar) sense Delivery line (P) or Load Sensing Line (the other line being plugged); pressure sensor (9) is rated for max 5 bar and senses the return line pressure. They are installed and electrically connected inside the manifold to the Logic controller. The Electronic Programmable controller drives the proportional valves according to the application software.

SECTION B

HPC01

HPC01LS with Load Sensing



HPC01:** Hydraulic Diagrams with Load Sensing and no proportional valves:

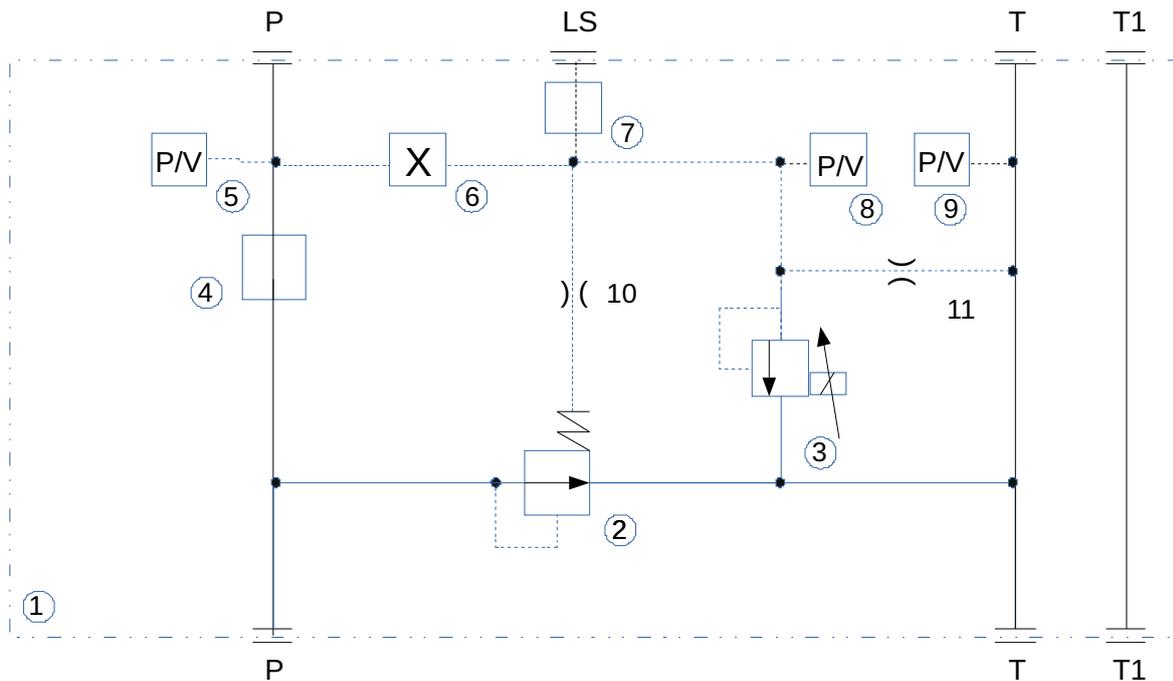
By replacing the Proportional Flow Control valve or/and the Proportional Pressure Relief valve with the related manual adjustment valves, and plugging/unplugging the LS lines, additional hydraulic configurations are available as well.

HPC01 is equipped with SAE08 normalised cavities in order to offer the maximum flexibility in configuration.

The Built-in controller is available on request as a stand-alone controller offered in a ABS BOX, with a design which allows local electronic installed as close as possible to the actuators.

HPC01

HPC01LSP with LS and proportional Pressure control



HPC01LSP: Hydraulic Diagram LS type:

The LS type diagram is useful for simultaneous motion in automation, normally the PQ manifold feeds an array of Proportional or ON-OFF LS pre-compensated valves, regulating the common flow and the max pressure in the classic LoadSensing architecture. Contemporary movements are possible.

The Manifold (1) contains a 3rd way pre-compensator (2) which is sensing pressure across the proportional flow regulator (4). The proportional pressure relief valve (3) is piloting the max pressure allowed on the system. Pressure sensors (5 and 8 rated for 300 bar) sense Delivery line (P) and Load Sensing Line (the other line being plugged), pressure sensor (9, rated for max 5 bar) senses the return line pressure.

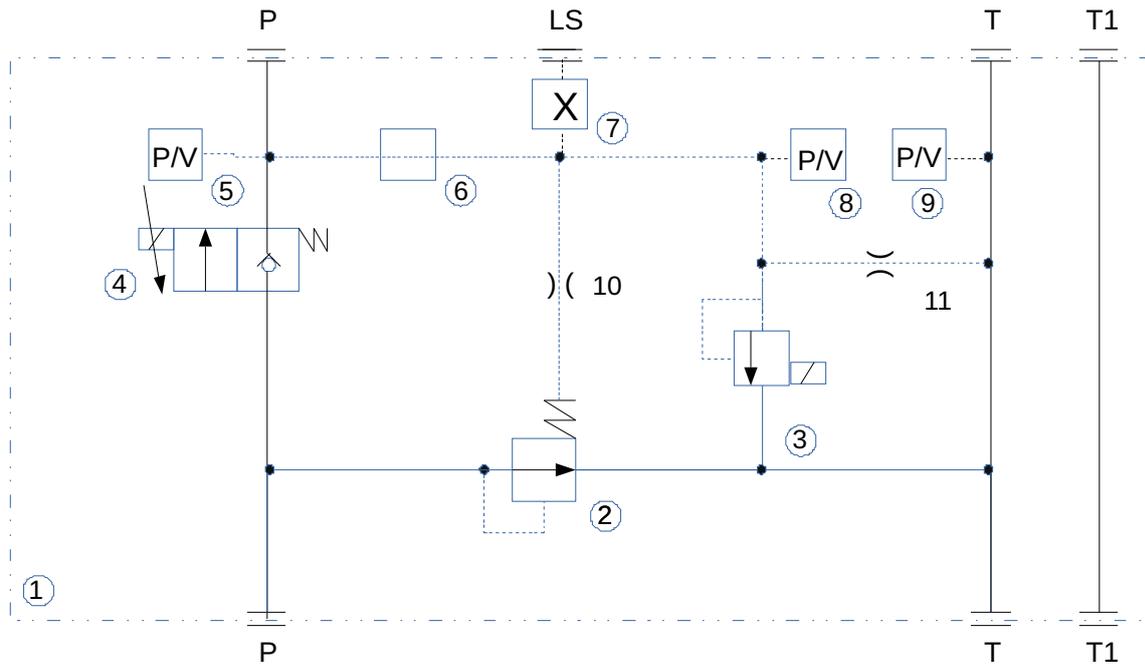
They are installed and electrically connected inside the manifold to the Logic controller. The Electronic Programmable controller drives the proportional valves according to the application software.

SECTION B



HPC01

HPC01Q with proportional meter-in Flow control



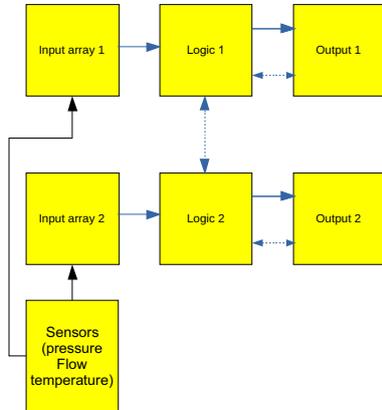
HPC01**: Hydraulic Diagrams with meter-in proportional Flow control

By replacing the Proportional Flow Control valve or/and the Proportional Pressure Relief valve with the related manual adjustment valves, and plugging/unplugging the LS lines, additional hydraulic configurations are available as well.

HPC01 is equipped with SAE08 normalised cavities in order to offer the maximum flexifibility in configuration.

The Built-in controller is available on request as a stand-alone controller offered in a ABS BOX, with a design wich allows local electronics installed as close as possible to the actuators.

HPC01



Technical data:

Voltage range:	6 ... 32V DC
Current consumption:	<= 200mA
Operating temp. range:	-40 ... +85 °C
Storage temp. range:	-40 ... +85 °C
Weight:	< 0,5 Kg

IOs:

- 2 x 6 (12) of Digital/Analogue Inputs
0-25 mA, 0-5.5 Vdc, 0-32 Vdc
- 2 x 6 (12) of Digital/PWM Outputs 2A,
close current loop with ON-OFF status feedback input
- 2 x 1 (2) of Digital Outputs 5A,
with ON-OFF status feedback input
- 2 x CAN Bus ISO 11898 24 V

Mechanical shocks and vibration resistance

- Sinusoidal Vibration:* 5...500Hz, 7.5mm, 5g, 5 cycles ,
variation 1 octave/min (EN 60068-2-27);
- Shock:* 25g, 6ms, 4.000 shocks for every direction
and axis, within the working temperature
range (EN 60068-2-27);
- Free fall (EN 60068-2-32 1m unit boxed); Tilt
fall (EN 60068-2-31 100mm);

EMC compatibility

- EN13309 (Construction Machinery)
- EN61000-6-2 (Immunity for Industrial Environments)
- EN61000-6-4 (Emission for Industrial Environments)

Further electrical protection

- Inversion of polarity protection.
- Over voltage protection (SURGE).
- Load Dump Protection.

General rules compliance

- European Standards:*
- RAEE 2002/96/EC
- RoHS 2002/96/E

the Digital Architecture of HPC consists in a double processor architecture, ready for safety applications up to SIL2 as per IEC61508 (it requires specific software and certifications, available for quantities). Each processor shares Input and Output lines with the other.

The software, developed with CoDeSys, is uploaded in both processors and in case of incongruency, the hardware Watchdog stops all movements preventing dangerous unattended movements. The Electronic controller built in the HPC is equipped with two CAN BUS lines, in order to have a fast and reliable communication of the Hydraulic Power Pack with a centralised control or, eventually, with Input peripherals or sensors. HPC is able to directly drive up to 12 ON-OFF or Proportional valves with up to 2A current, with a power supply voltage of 9 to 32VDC. Two additional ON-OFF Outputs are suitable for current up to 5A.

Each Output is equipped with current sensing: this simplifies the cable harness by reducing the number of fuses and reducing installation time. The logic supply circuit is independent from the power circuit in order to easily connect emergency circuit breaker while keeping on the logic: this extends data logger possibilities of the system, for a better reliability and troubleshooting capabilities.

Twelve multistandard inputs allow the connection of voltage or current sensors and ON-OFF proximities or keyboards

CPU and Memory:

- 2 x CPU 32 bit + 1 x "WDO" CPU 32 bit
- "C" version, 120 MHz (04-25-70111)
 - 1 Mbytes of CPU internal Flash memory
 - 128 Kbytes of CPU internal RAM
 - 4 Kbyte of CPU internal RAM with lithium battery backup
 - 64 Kbyte SPI Flash memory
 - 2 x CAN Bus interface
- "CoDeSys" version, 168 MHz (04-25-70115)
 - 2 Mbytes of CPU internal Flash memory
 - 256 Kbytes of CPU internal RAM
 - 4 Kbyte of CPU internal RAM with lithium battery backup
 - 64 Kbyte SPI Flash memory
 - 2 x CAN Bus interface
- 1 x shared 256 Kbyte SPI Flash memory for data logger function
- 1 x shared Real Time Clock
- WDO circuit with relays

Failure Rate

- Analysis method:* "Parts Count" method over all components assuming 50% dangerous failures;
- Data collection:* MIL-HDBK-217F-Notice 2 and manufacturer information;
- Conditions:* Normal operating conditions for environment and temperature;
- Environment:* Ground, Mobile;
- Temperature:* 40 °C;
- Operating time:* 10 h/d * 6 days * 52 weeks;
- Component stress:* Mean stress on components (not according to the circuit diagram);
- Note:* MTTFd relates to one of two redundant channels;
- MTTFd:* 48 years.