Sensata Technologies

PRESSURE TRANSDUCER IN (COMMERCIAL) ESPRESSO MACHINES

Background

Water pressure measurement in professional coffee machines is required in the boiler and brewing loops. Pressure instruments must be accurate, able to withstand the temperatures and stresses generated by cleaning processes and have specialized wetted parts. For assurance of safe food production, pressure instrumentation are also certified for drinking water and food application.

To guarantee the espresso quality, brew (pump outlet) pressure must be stable. Espresso machine manufacturers install an over pressure valve (OPV) at the pump outlet side in order to achieve this pressure stability. An OPV can be adjusted with a screw driver but is not always accessible without dismantling the machine. As manufacturers are constantly improving their technology and considering easy-to-use consumer requirements, modern coffee machines allow regulation of the brew pressure with a single button, which is easily accessible from outside the machine. In this case, an OPV is substituted by a proportional valve and a pressure transducer, installed behind the valve.

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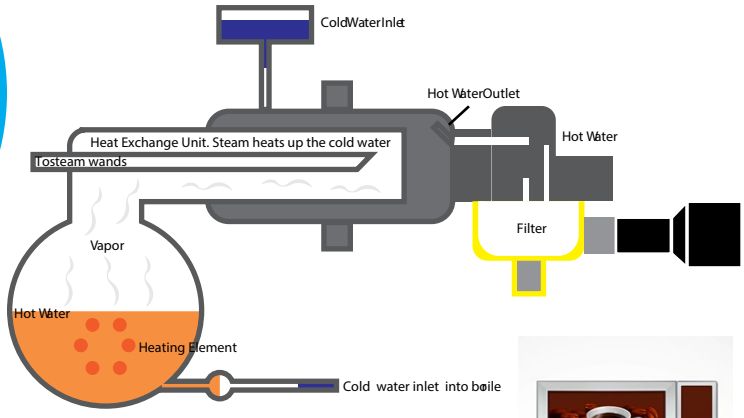
Professional coffee and vending machines can be table top or free standing.

Working principles:

- Water is pumped into the machine by connected plumbing or by manually filling the tank
- Water is heated up to 95°C in the boiler
- Pressure in the boiler controls the temperature of water
- Pressure switch is in the boiler loop
- Pressure transducer is in brewing loop (in combination with proportional valve)
- SSR controls steam, hot water and brew boilers (heating elements).

Solution

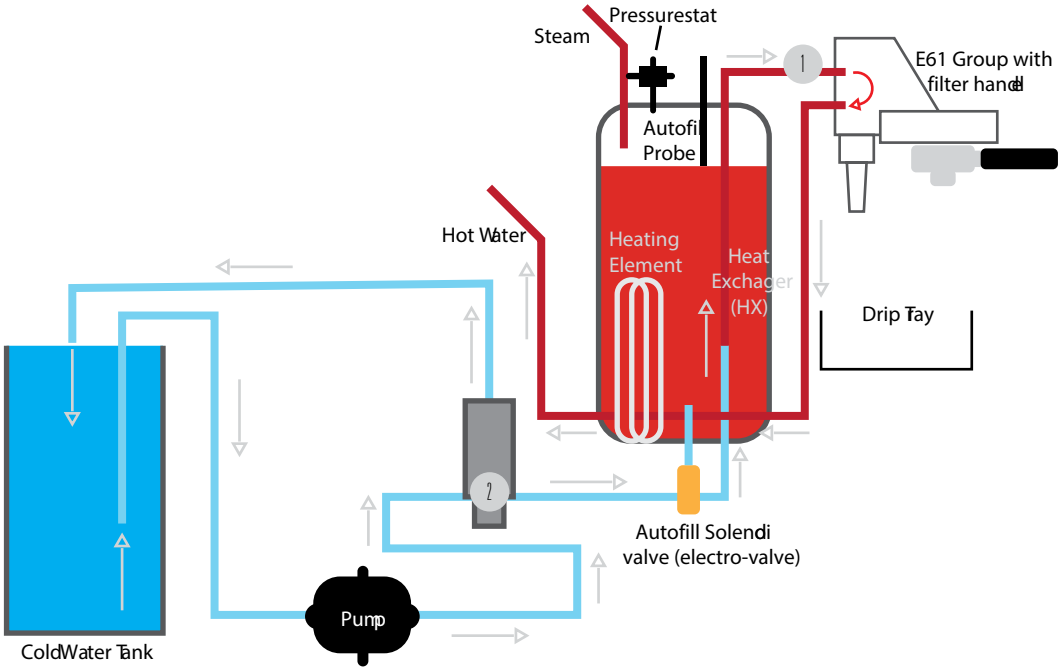
This pressure transducer can be used to monitor the brewing pressure (usually around 9 bar) either in the cold-water piping, where the sensor is connected to the pump outlet, or in the hot water piping, behind the boiler (closer to the end-product). The sensor is connected to the power source, where the system pressure change will result in the output signal (voltage) change.



RECOMMENDED PRODUCTS

Reference on Diagram	Product	Features	Function	Brand
1	 *Drinking water certified 116CP/117CP 126CP/127CP*	• Operating pressure range: 0-60 to 0-230 PSI (0-4 to 0-16 Bar) • Supply voltage: 5VDC ratiometric or 8-30VDC voltage regulated • Output: 0-3.5VDC, 0-4.5VDC, or 4-20mA • Pressure port: Quick Connect, G1/4, G3/8 • Electrical connection: RAST 2.5	Monitoring of the pump outlet pressure / heated water supply pressure	Sensata Technologies
2	 60CP/70CP 81CP 100CP 35CP	• Operating pressure range: 0-15 to 0-750 PSI (0-1 to 0-50 Bar) • Supply voltage: 5VDC ratiometric or 8-30VDC voltage regulated • Output: 0-4.5 VDC or 4-20 mA • Pressure port: 1/8"" NPTF-2A male; 1/4"" NPTF-2A male; G1/8, G3/8 • Drinking water certified options available	Monitoring of the pump outlet pressure / heated water supply pressure	Sensata Technologies

DIAGRAM



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