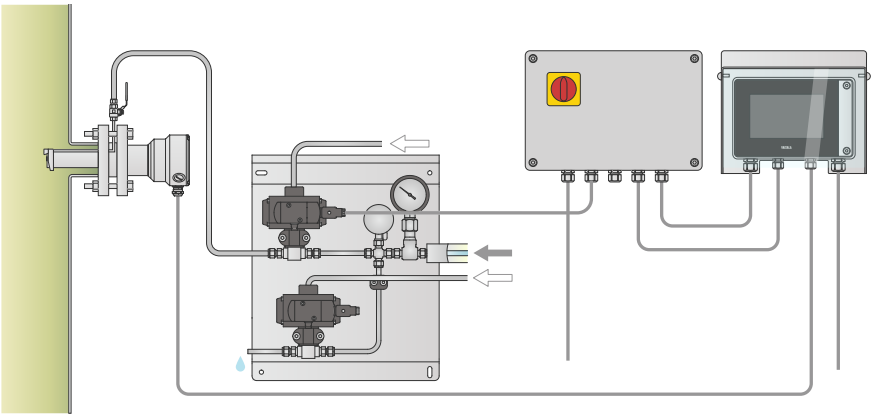
VAISALA

Water Washing System WWS100

For Polaris™ process refractometers



Features

- Complete system for water wash
- Field-proven components
- Back plate, valves, pressure and temperature gauges
- Compatible with Polaris™ PR53 series refractometers
- Wash control with the Vaisala Indigo520 Transmitter

The WWS100 water washing system adds a field-proven wash solution to the Polaris™ process refractometer series. The periodic hot water washing system provides a reliable method to clean the prism. This ensures stable measurement in demanding applications, such as green liquor.

Benefits

In a water washing system, water is flushed through a wash nozzle with high pressure. The wash nozzle is installed so that the water flow is directed on the prism in optimal angle and distance. The flowing water just above process temperature effectively removes residues that might have accumulated on the refractometer prism, ensuring measurement accuracy without creating crystals in applications where prism cleanliness might otherwise be compromised.

The field-proven system provides high-quality water with optimal pressure to be used for the wash system. The components and the system design are based on the success and 40 years of field experience from Vaisala K-PATENTS® process refractometers in various industries and applications.

Principle

Coating forms on the prism and needs to be washed away to maintain consistent measurements. With green liquor applications, almost instant fossilization of the coating forms on the prism and in the wash nozzle if the washing water is cooler than the process liquid. To prevent this, a well-performed draining is critical. This means that the cool water from previous washes is drained out of the pipes before a new wash starts. This ensures that hot water is used in the wash and any coating will be cleaned off the prism.

The WWS100 water washing system contains all necessary components to implement a water wash system: back plate, valves, pressure and temperature gauges. The check valves and the wash nozzle are included in the Polaris process refractometer or a flow cell.

Right pressure and temperature

WWS100 can operate at a wide range of water pressures and temperatures to meet the requirements of different process liquid types and system component specifications. The water pressure range is 0 to 160 bar (2320.6 psi) and water temperature range 0 to +150 °C (+302 °F).

Easy installation

The water wash valves are controlled by safe voltage-level solenoids, not requiring an electrician for wiring and connection. The solenoid power supply and safety shut-off switch are included in the external relay terminal, providing convenient commissioning for the system.

Indigo520-controlled

The wash cycles are controlled by dry contact switches included in the Indigo520 transmitter. Indigo520 provides an easy-to-use user interface for configuring and controlling the wash sequence, and the necessary diagnostics tools for verifying the wash cycle efficiency. Alternatively, when Indigo520 is not used, the washes can also be controlled with a standard PLC relay.

WWS100 technical data

Operating environment

Operating temperature	+0 ... +50 °C (+32 ... +122 °F)
Storage temperature	−30 ... +60 °C (−22 ... +140 °F)
Operating humidity	0–100 %RH, non-condensing

Supply parameters

Control voltage	24 V DC
Power consumption	Approx. 5 W per valve
Actuator pressure	2.5–8.0 bar (36.3–116 psi)

Water parameters

Maximum pressure (component specification)	160 bar (2320.6 psi)
CRN Canada pressure specification	40 bar (580.1 psi)
Maximum operating temperature	+150 °C (+302 °F)
Maximum flow at 20 °C (68 °F)	45 l/min

Typical wash pressures

Wash nozzle	Minimum above process pressure	Maximum above process pressure	Wash time	Recovery	Interval
Integral wash nozzle in PR53AP/GP	2 bar (30 psi)	4 bar (60 psi)	3 s	20–30 s	20–30 min
Wash nozzles: Sanitary Elbow Flow Cell (SEFC), Sanitary Elbow Flow Cell Large (SEFCL), Flange Wafer Flow Cell (FWFC)	3 bar (45 psi)	6 bar (90 psi)	10–15 s	20–30 s	10–20 min
PR53SD wash nozzle	20 bar (290 psi)	30 bar (435 psi)	10–15 s	20 s	5–20 min

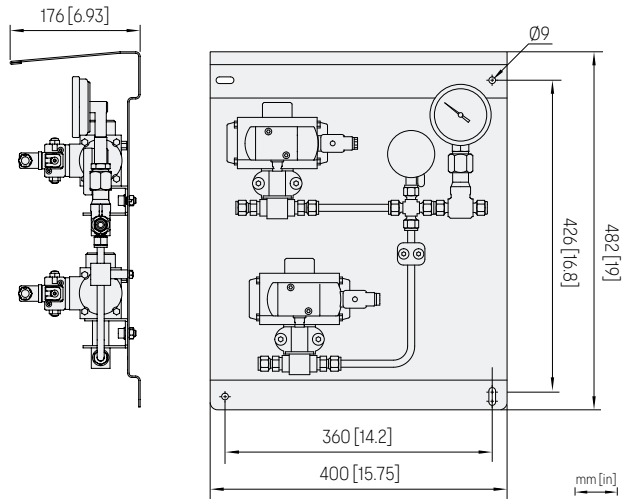
Compliance

Property	Specification
EU directives and regulations	RoHS Directive (2011/65/EU) as amended by 2015/863 Pressure Equipment Directive (2014/68/EU)
Pressure	CRN all territories, ASME B31.3

Mechanical specifications

Check valve	AISI 316, FFKM [1)]
Solenoid valve plug	DIN43650 type B
Solenoid valve cable diameter	6–8 mm (0.24–0.31 in)
Pressurized air connection	1/8" NPT
Outlet	1/2" NPT F or 3/8" pipe fitting EN 1.4404
Inlet	1/2" NPT F or 3/8" tube fitting EN 1.4404
Back plate	EN 1.4404

1) 2.1 certificate included



WWS100 back plate dimensions

ERT52 technical data

The ERT External Relay Terminal contains:

- Two 3-phase contactors
- Overload protection
- Timer relay
- Main switch

ERT controls the pump and the water valve of the pump.

ERT is controlled with Indigo520 control relay.

Operating environment

Operating environment	Indoor use Outdoor use
Use in wet location	No
Operating temperature	+0 … +50 °C (+32 … +122 °F)
Storage temperature	−30 … +60 °C (−22 … +140 °F)
Operating humidity	0–100 %RH, non-condensing
Pollution degree	2 (Non-conductive pollution)
Maximum operating altitude	2000 m (approx. 6500 ft)

Enclosure specifications

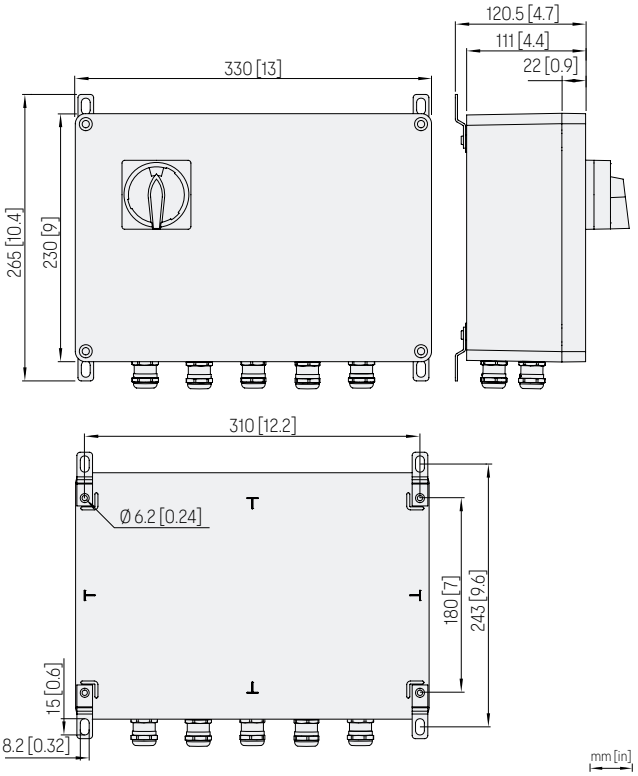
Property	Description/Value
Material	Aluminum painted with RAL color 7001
Size (length x width x height)	330 × 230 × 110 mm (12.99 × 9.06 × 4.33 in)
Weight	3.6 kg (7.94 lb)
IP rating	IP66
UL 50E/NEMA rating	Type 4
IK rating	IK 08
Cable glands	M20 × 1.5, 5–9 mm (0.2–0.35 in) cable diameter
Conduit hub	M20 × 1.5 / 1/2" NPT
Dummy plug	M20 × 1.5 / 6 mm (0.24 in)

Inputs and outputs

Operating voltage	110 V AC ±10 %, 60 Hz (1-phase) 230 V AC ±10 %, 50 Hz (1-phase)
Maximum power consumption	25 W
Control signals	24 V DC ±10 %, max. 20 W (generated by internal PSU)
Overvoltage category	II
Mains supply fuse (not included)	Max. 10 A (slow)

Compliance

EU directives and regulations	EMC Directive (2014/30/EU) Low Voltage Directive (2014/35/EU) RoHS Directive (2011/65/EU) as amended by 2015/863
Safety	IEC/EN 61010-1
Compliance marks	CE, China RoHS, RCM, UKCA
FCC compliance	FCC part 15 B, Class B



ERT enclosure dimensions

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