Smartline

Intelligent Vacuum Measurement

THYRACONT
Vacuum Instruments

www.thyracont-vacuum.com

Smartline At a Glance

Interfaces: **0-10 V, RS485,**

Two independent relay switch points

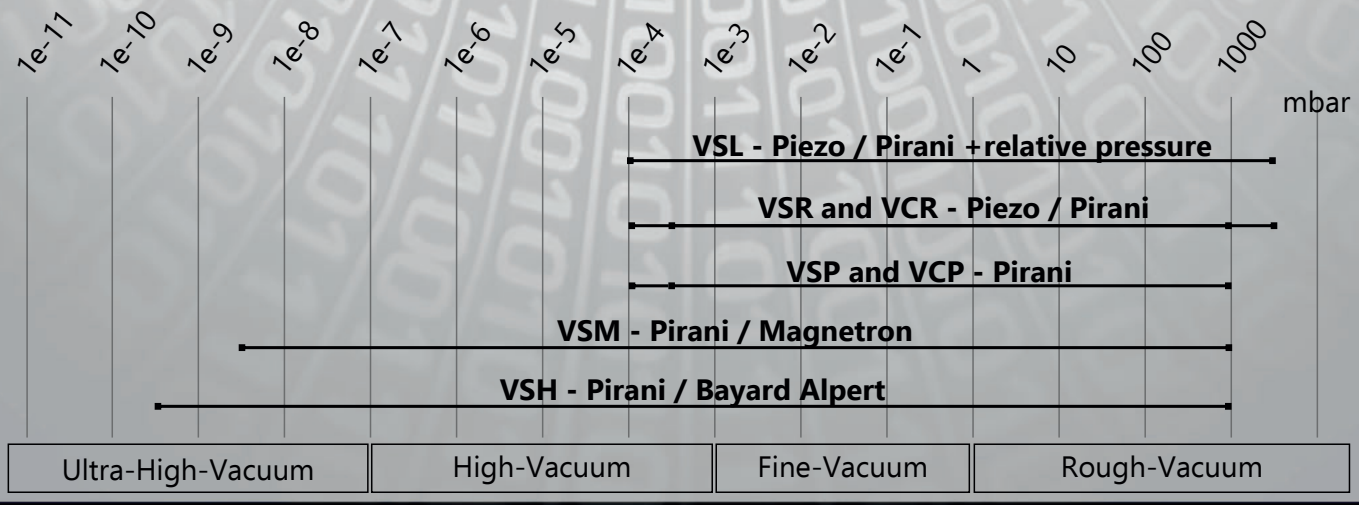
Supports SPS with Profinet/OPC UA

LEDs for status and switch points

Push-Button for re-adjustment and degas

Optional LCD display

Easily exchangeable replacement sensors



Smartline Features

Versatile transducers
Smartline® transducers measure in an entire measuring range from 1200 mbar to 5e-10 mbar.
With their modern combination sensors, these transducers are able to enter different pressure areas like fine and high vacuum simultaneously and with high precision.

Smart controlling
Intelligent microcontrollers assume the automatic control of the sensors and guarantee an optimal interaction between the Pirani and the ionization measuring cell with high flexibility.
Switching and transition ranges between the sensors can be configured individually. Status and error messages of the transducer can be coupled with the relays to generate a signal for the plant control.

Integrated display
The optional backlit LCD display enables quick control of the measured values directly on the transducer and lights noticeably red in the event of a fault.
Via software command the display can be rotated by 180° so that it easy to read even when mounted horizontally.

LEDs
The transducers' LEDs show the status of the gauge as well as the status of the switching points.

Digital interfaces
All Smartline® transducers have a RS485 interface and either an additional 0-10 V output, EtherCat or PROFINET interface.
PROFINET transducers support MRP and a bidirectional, lossless data transfer.
Bluetooth adapter SLKBT enables a wireless communication.

Durable sensors
The Thyracont Pirani with increased measuring range only switches on the ionization sensors at very low pressure. This protects the sensor technology and allows a long lifetime of the gauges.
A voltage reduction of the cold cathode optimizes the durability of the vacuum transducer VSM.

Scalable output signal
The analogue 0-10 V output signal can be scaled according to the desired characteristic curve.
This means that existing transducers can be replaced easily and without programming effort, regardless of the manufacturer. If the transmitter is to be replaced but the cable shall be retained, fitting adapters (e.g. FCC68) are available.

Simple configuration
The Smartline® transducers can be connected to a PC and configured using a SLKUSB adapter. This allows changing the gas type correction factors or switch points with the VacuGraph™ software without any programming skills. (Lite version available free of charge.)
Alternatively, the transducers can be configured by software command via their RS485 interface.

Relay switching points
Smartline® transducers with RS484 / 0-10 V interface have potential-free relay switching points as standard which can be used to control vacuum pumps and processes.

Replacement sensors
Calibrated sensor heads of our Smartline® transducers can be replaced by the user in just a few simple steps reducing maintenance to the bare minimum.
With their fully metal-sealed sensors (helium leakage rate <5e-10 mbar l/s), the Smartline® transducers are ideally suited for high-vacuum applications.

Smartline Controller and Software

Vacuum controllers
The VD12 two channel controller and the VD14 four channel controller are available for all Smartline® transducers.
The controllers with large, backlit displays have a plain text menu for intuitive operation.

Automatic identification
The transducers are connected to the controller in chains (see graphic below). The controller identifies automatically which types of transducers are connected.

Process control
Thyracont´s VD12 and VD14 provide two and four programmable relay switch points for comfortable process control.

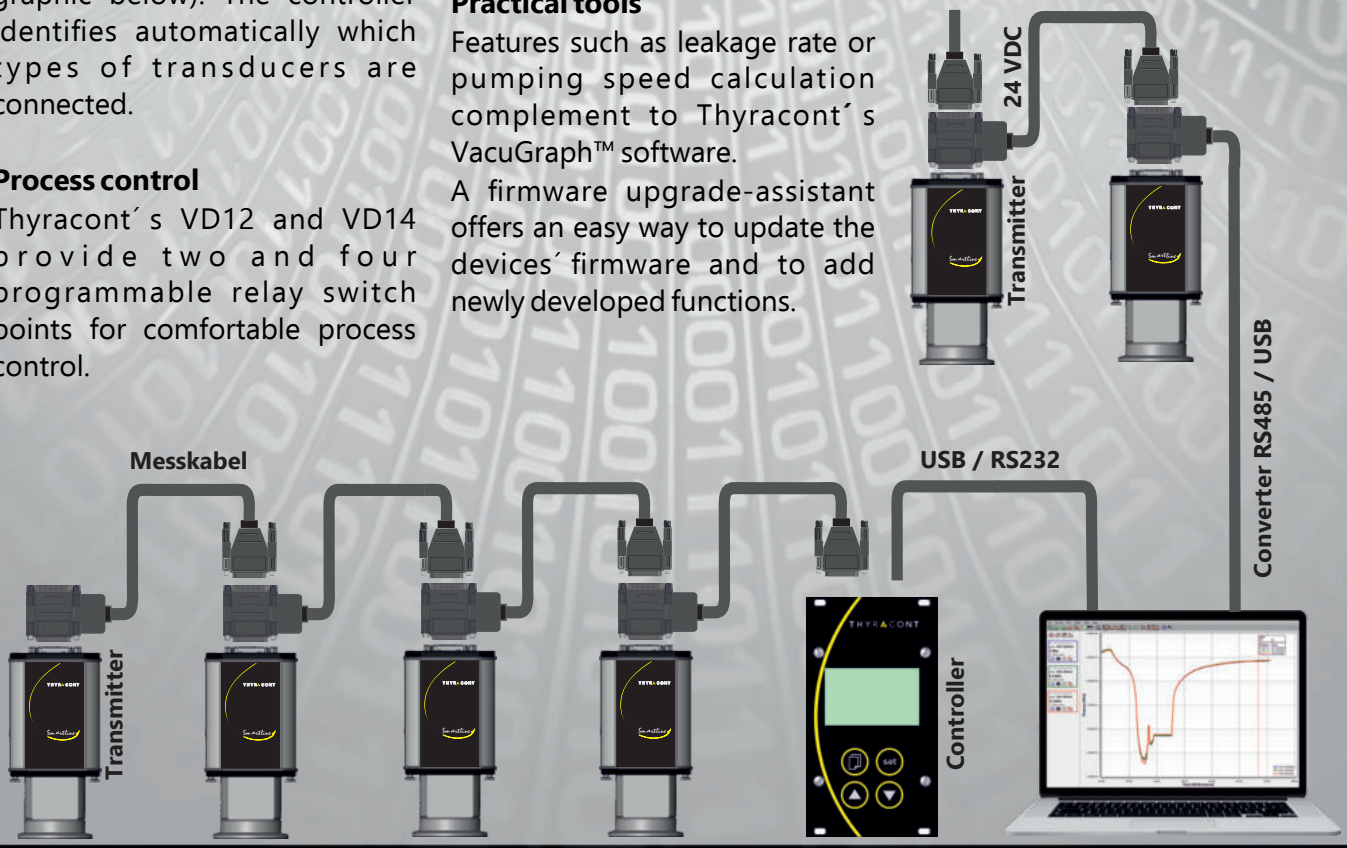
Interfaces
Data can be exchanged with a PLC or with a PC / notebook by means of the RS232 interface and the USB interface.

VacuGraph™ software
With our VacuGraph™ software (free lite version available) or alternatively via software command, the parameters of the controllers and of transducers (e.g. units, output characteristics, gas type correction factors, switch points, etc.) can easily be adjusted.

Data analysis
VacuGraph™ also enables simple visualization and analysis of the measured data. Amongst other things measurement curves can compared or saved for quality assurance

Practical tools
Features such as leakage rate or pumping speed calculation complement to Thyracont´s VacuGraph™ software.
A firmware upgrade-assistant offers an easy way to update the devices´ firmware and to add newly developed functions.

Bluetooth® and VacuSniff®
With the combination of the SLKBT interface converter RS485/Bluetooth and the free VacuSniff™ app measurement values can be received and transferred to an existing Smartline® RS485 bus.
The pressure measurement readings of up to 16 Smartline® transducers can, for example, be displayed numerically with the app on a smartphone or tablet. An integrated alarm function informs the user as soon as pressure undercuts or exceeds a defined value. Hence, the user always has an overviews of the measured values even during assembly or maintenance of his plant.



Smartline Accessories and Services

- **SLZUB** accessory set: SLCASE protective case, SLN4 power supply, SLKUSB interface converter RS485-USB, VGR VacuGraph™ software lite-version

- **SLN4** Plug-in power supply 24V, for one SL transducer, exchangeable AC jack EURO, US, UK, AUS

- **SLKUSB** with 2 m cable and SubD connector, galvanic isolation

- **SLKBT** interface converter RS485 - Bluetooth

- **SLCASE** protective case for Smart-line transducers with KF flange

- **VGR VacuGraph**™ software for Windows, Linux and MacOS, full version for download, single or triple license (VGRX3)

- **W1515002 / 6 / 10 / 20** Measuring cable for VD12/14, lengths: 2m, 6m, 10m, 20m

- **W1500002 / 6 / 10 / 20** Measuring cable for transducers, open ends, lengths: 2m, 6m, 10m

- **W1500502 / 6 / 10 / 20** Measuring cable for transducers, open ends and protection class IP54, lengths: 2m, 6m, 10m

- **WUSB0002** for VD12, VD14 interface cable, 2 m, USB

- **WRSJ0002** for VD12, VD14 interface cable, 2 m, RS232

- **XB1500002** mating plug, SUB-D, 15 pole, for SL transducers

- **XB15SL05** mating plug, SUB-D, 15 pole, protection class IP54, for SL transducers

- **Sensor Heads** B_VSR53A, B_VSR54A, B_VSP63DA, B_VSP64DA, B_VCP63, B_VCP64, B_VSM77, B_VSM78, B_VSM79, B_VSH87A, B_VSH88A, B_VSH89A

- **Various Adapters** for the replacement of competitive products (e.g. SubD to RJ45/FCC68)

- **Baffles** protection of the sensor against pollution, ZZCH016 (DN16KF)/ 25 (DN25KF) / 40 (DN40KF) / 40CF (DN25CF)

- **Calibration**:
  - **DCERT**, 4 reference points per pressure decade
  - **DCERTHV** 4 reference points per pressure decade, measuring range 1000 – 1e-5 hPa (mbar)
  - **DKDCERT** DAkkS calibration
  - **DKDCERTHV** DAkkS calibration high vacuum, measuring range 1000 - 1e-6 hPa (mbar)

You will find further accessories in our brochure for vacuum components.

	VCR	VSR	VSL	VSP	VCP	VSM	VSH
Measuring Principle	Piezo resistive / heat conduction Pirani (Pirani, dep. on gas type)			Heat conduction Pirani, depending on gas type		Heat conduct. Pirani / cold cathode (inv. magnetron) dep. on gas type	Heat conduct. Pirani / Hot Cathode (Bayard Alpert), dep. on gas type
Measuring Range	1200 - 5e-4 mbar (900 - 5e-4 Torr)	1200 - 1e-4 mbar (900 - 1e-4 Torr)	Absolute: 1200 - 1e-4 mbar (900 - 1e-4 Torr) Relative: -1060... +340 mbar (-795...+255 Torr)	1000 - 1e-4 mbar (750 - 1e-4 Torr)	1000 - 5e-4 mbar (750 - 5e-4 Torr)	1000 - 5e-9 mbar (750 - 5e-9 Torr)	1000 - 5.0e-10 mbar (750 - 5.0e-10 Torr)
Max. Overload	4 bar abs.			10 bar abs., up to 16 bar abs. (with CERT31P)			4 bar abs.
Accuracy	1200 - 40 mbar: 0.3% f. s. end, 40 - 1.0x10-2 mbar: 10% f. reading	1200 - 40 mbar: 0.3 % f. s., 40 - 2e-3 mbar: 10 % f. reading	Absolute: 1200 - 40 mbar: 0.3% f. scale end, 40 - 2e-3 mbar: 10% f. reading Relative: 0.25% f. span	1000 - 20 mbar: approx. 30 % f. r., 20 - 0.002 mbar: 10 % f. r.	1000 - 10mbar: approx. 30 % f. r., 10 - 0.01mbar: 10 % f. r.	1000 - 10 mbar: approx. 30 % f. r.; 10 - 2e-3 mbar: 10 % f. r. | 2e-3 - 1e-8 mbar: 25 % f. r.	1000 ... 10mbar: approx. 30 % f. r., 10 ... 1e-8 mbar: approx. 10 % f. r.
Repeatability	1200 - 10 mbar: 0.1% full scale end, 10 - 1.0x10-2 mbar: 5% f. reading	1200 - 40 mbar: 0.1% full scale | 40 - 1e-2 mbar: 2 % from reading		20 - 2e -3 mbar: 2 % f. r.	10 - 0.01 mbar: 5 % f. r.	10 - 1e-2 mbar: ca. 2% f. r., 1e-2 - 1e-8 mbar: ca. 7% f. r.	10 - 1e-2 mbar: 2 % f. r., 1e-2 - 1e-8 mbar: 5% f. r.
Materials with Vac. Contact	stainl. steel 1.4307, platinum/rhodium, nickel, glass, gold, silicon oxide	Stainless steel 1.4307, tungsten, nickel, glass, gold, silicon oxide		Stainless steel 1.4307, tungsten, nickel, glass	Stainl. steel 1.4307, platinum /rhodium, nickel, glass	Stainl. steel 1.4307, tungsten, nickel, glass, molybdenum, Al_2O_3 ceramic	Stainl. steel 1.4307, tungsten, nickel, glass, platinum, iridium, yttria oxide
Hot and Cold Cathode relevant data						Anode Material: Molybdenium Emission Current: < 2.5 kV	Filaments: Yttria coated iridium Anode Voltage: 9 µA, 100 µA, 1.0 mA, 2.0 mA, Degas Method: Ohmic heating of the anode
Reaction Time	40 ms					50 ms (switch-on cold cathode < 2s)	50 ms (switching of emission current < 2s)
Operating Temp.	+5...60 °C (Profinet +5... +50°C)						
Storage Temp.	-40...+65 °C						
Bake Out Temp.	Max. 150 °C at the flange (voltage supply switched-off)	Max. 125 °C at the flange (voltage supply switched-off)		Max. 150 °C at the flange (voltage supply switched-off)		max. 160 °C at the flange (voltage supply switched-off)	max. 180 °C at the flange (voltage supply switched-off)
Voltage Supply	20 - 30 VDC						
Power Consumption	Max. 2,5 W, add. 0.8 W f. EtherCAT/ relays / LCD, add. 1.6 W f. Profinet	Max. 2.5 W, add. 0.8 W f. EtherCAT/ relays / LCD, add. 1.6 W f. Profinet		Max. 3 W, add. 0.8 W f. EtherCAT/relays / LCD, add. 1.6 W f. Profinet			Max. 8 W, add. 0.8 W f. EtherCAT/relays / LCD, add. 1.6 W f. Profinet
Output Signal	0-10 VDC, min. 10 kΩ, measuring range 2.2 - 8.58 VDC, log. (Default) except for EtherCAT, Profinet	0-10 VDC, min. 10 kΩ, measuring range 1.5 to 8.5 VDC, log. (Default) except for EtherCAT, Profinet				0 - 10 VDC, min. 10 kΩ, meas. range 1.82 - 8.6 VDC, log. (default) except EtherCat, Profinet	0 - 10 VDC, min. 10 kΩ, meas. range 1.219 - 8.6 VDC, log. (default) except EtherCat, Profinet
Digital Interface	RS485: 9.6 ... 115 kBd, ...8 databit, 1 stopbit, no parity, EtherCat, Profinet						
Switch Points	2x relays, pot. free, 50 VAC / 2 A, 30 VDC / 2 A, max. 60 VA, except EtherCat and Profinet						
Electrical Conn.	RS485/0-10V: SubD, 15-pole, male | RS485/EtherCAT/Profinet: 1xM12 A / 2x M12 D female						
Vacuum Connection	VCR53: DN 16 KF, VCR54: DN 16 CF-F	VSR53: DN 16 KF, VSR54: DN 16 CF	VSL53: DN 16 KF, VSL54: DN 16 CF	VSP63: DN 16 KF, VSP64: DN 16 CF	VCP63: DN 16 KF, VCP64: DN 16 CF	VSM77: DN 25 KF, VSM78: DN 40 KF, VSM79: DN 40 CF	VSH87: DN 25 KF, VSH88: DN 40 KF, VSH89: DN 40 CF
Protection Class	IP54 (SubD with XB15SL05 adaptor)	IP 40 (IP54)					
Dimensions	99 x 69 x 48 mm (DN 16 KF version)					139 x 69 x 48 mm (DN 25 KF	141 x 69 x 48 mm (VSH88)
Weight	195 g (VCR53)	195 g (VSR53)	195 g (VSR53)	190 g (VSP63)	190 g (VCP63)	555 g (VSM77)	475 g (VSH88)