

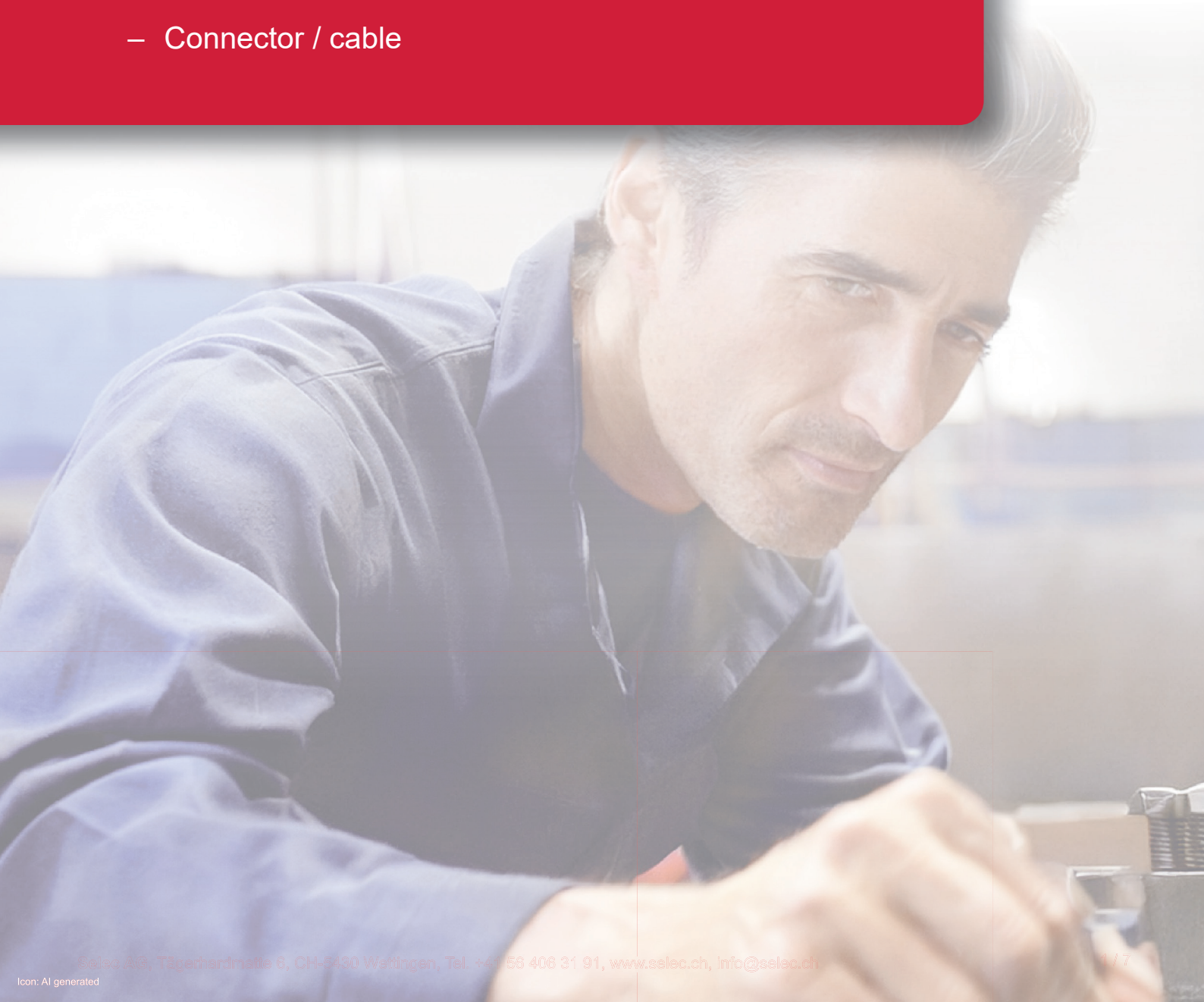
Valve Tester Pro



Testing device for proportional valves
with and without integrated electronics

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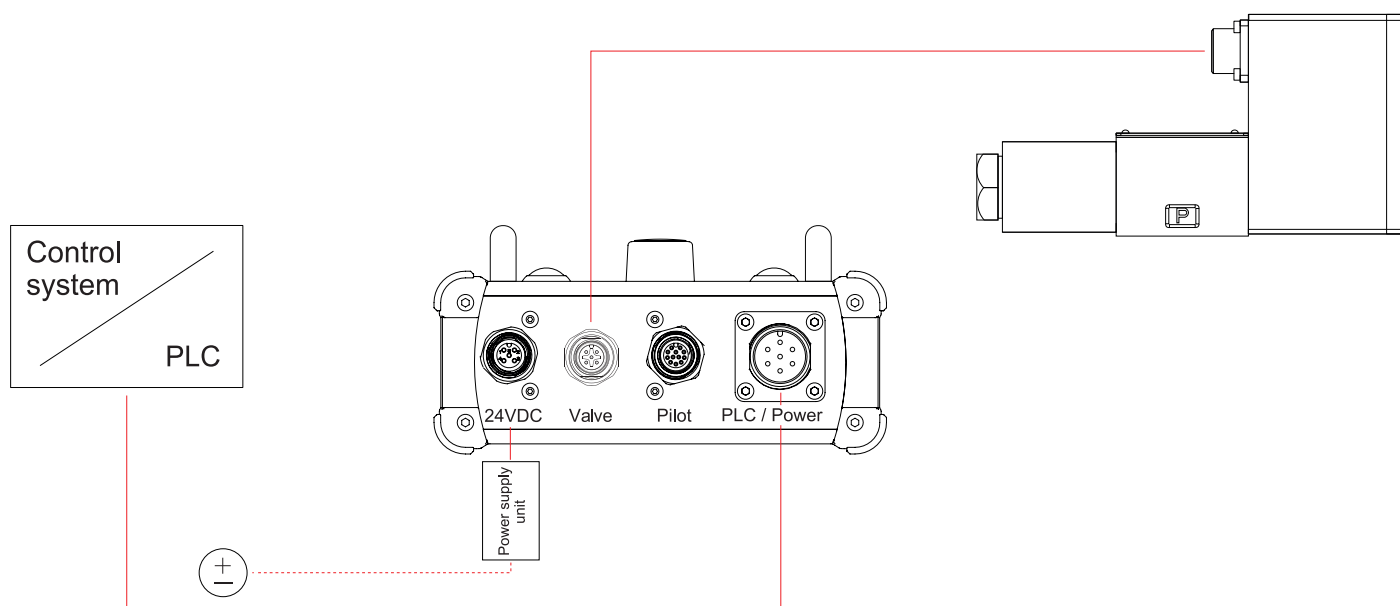
Operating modes

The Valve Tester Pro (VTPro) is used to activate and measure the functionality of valves with and without integrated electronics. These can be directional control valves, throttle valves, pressure relief valves, proportional valves or servovalves. The VTPro provides measurement data that help to understand a specific situation from the PLC to the valve.

The VTPro can be operated in two different modes:

- PLC mode
- Manual mode

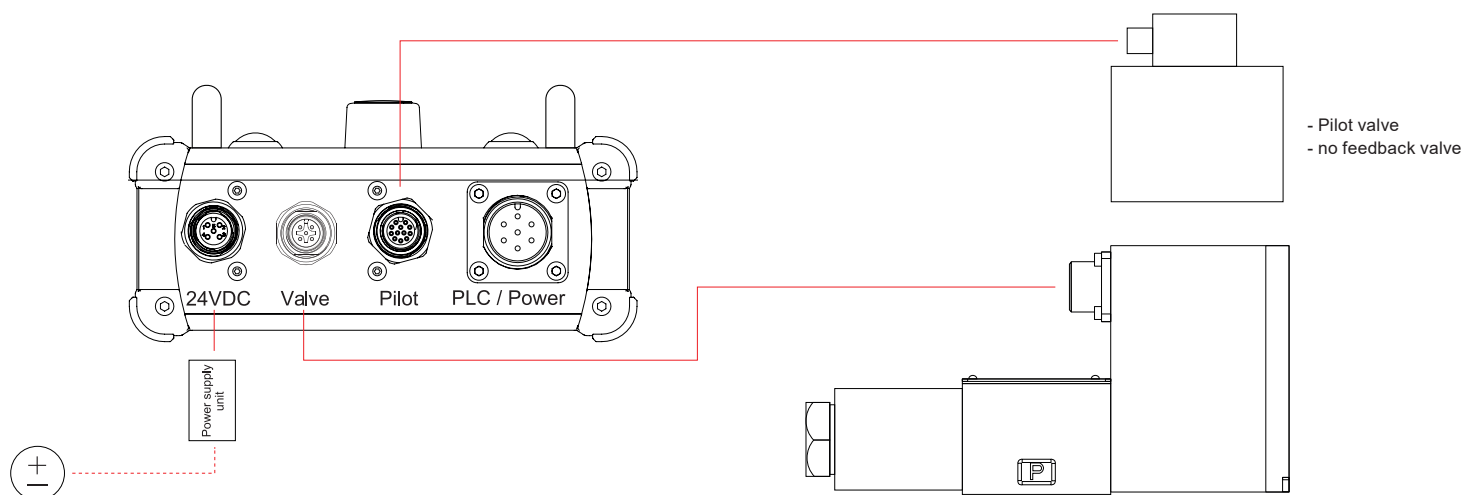
PLC-mode



The VTPro is connected between the programmable logic controller (PLC) and the valve. VTPro displays the measured data from the PLC and the valve.

The setpoint specification can be overridden from the operator by activating the rotary wheel. In this case power supply is provided from the PLC and setpoint by operator manually.

Manual mode



The valve is powered by the VTPro. The setpoint is generated by the VTPro and output to the valve output connector. The setpoint can be varied by the operator via the rotary wheel «valve signal». The output setpoint value and the monitor value from the valve are measured and displayed.

Available measuring results

Measuring result	PLC-mode	Manual-mode
Control signal input (%)	X	X
Supply from PLC (V)	X	
Supply to the valve (V / mA)	X	X
Analogue signal input (V / mA)	X	X
Monitor signal output (% / V / mA)	X	X
Pin C (enable) from PLC (V)	X	
Pin C (enable) to the valve (V / mA)	X	X
Supply pilot valve from the PLC (V)	X	
Supply to the pilot valve (V / mA)	X	X
Supply from power supply (V)		X
No feedback-valve control signal (%)		X
No feedback-valve coil (V / mA)		X

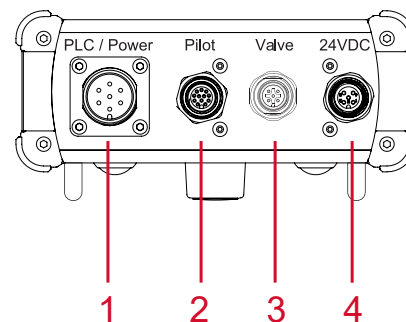
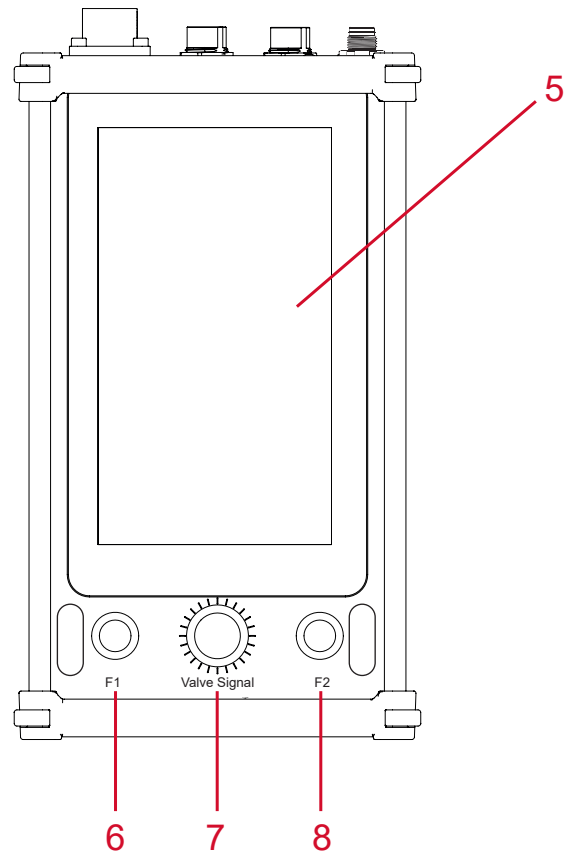
In addition to the clickable standard signals for setpoints and monitor signals, these can also be freely parameterized by the user. Current or voltage setpoints and current or voltage monitor signal values can be freely defined with a few clicks.

Setpoints in the current/voltage range within +/-20mA and +/-10V

Monitor values in the current/voltage range within +/-25mA and +/-20V

Interfaces

1. Input connector.
Connection to the control system/PLC
2. M12 output socket connection for:
 - No feedback-valve
 - Pilot valve
3. M12 output socket, connection for:
Feedback-valve with onboard electronic
and connector 6+PE / 11+PE
4. M12-input socket external power
supply unit 24VDC
5. 7" touch display
6. Activation button F1
7. Rotary wheel for controlling the valve manually
8. Activation button F2



Customizing

Analog Input Custom Settings

Unit: mA

Lower Limit: 4 mA

Upper Limit: 20 mA

Confirm Cancel

Analog Input

ANALOG INPUT SETTINGS

0 ... 20 mA

4 ... 20 mA

+/- 20 mA

0 ... 10 V

+/- 10V

Custom Settings Cancel

Mainscreen

SET VALUE MONITOR

14.77 mA

14.69 mA

7.12 V

0.00 V

Monitor Output: 4 ... 20 mA

Analog Input: 4 ... 20 mA

Power Supply: 0 .. 24 V

25.71 V

81.93 mA

0.00 V

0.00 mA

25.19 V

36.87 mA

Pin C: Disabled

Pilot Valve: Pilot ON

Operation Mode

Manual

Monitor

ANALOG INPUT SETTINGS

0 ... 20 mA

4 ... 20 mA

+/- 20 mA

0 ... 10 V

+/- 10V

Custom Settings Cancel

Customizing

Analog Input Custom Settings

Unit: mA

Lower Limit: 4 mA

Upper Limit: 20 mA

Confirm Cancel

Power Supply

Power supply settings

Power Supply = 24 V

Power Supply = +/- 15 V

Cancel

Operation Mode

Manual

Pin C

Pin C settings

Disable Pin C

Enable Pin C

Enable Pin C -15 V

Cancel

Operation Mode

Pilot

Pilot settings

Pilot No

Pilot Yes

Cancel

Operation Mode

Manual

Operation mode

Mode settings

Manual Mode

Automatic Mode

Cancel

Operation Mode

Manual

The yellow fields are touch input fields, the green fields are purely measurement and display fields.

After completing the measurements with the Valve Tester Pro, the settings of the last measurement remain active until the next change.

Protection of electrical short circuit

The Valve Tester Pro (VTPro) is protected against failures (like shortcuts) present in the PLC or the valve-under-test.

Right after startup (regardless if VTPro is powered from the PLC or external power supply), the valve –under-test is disconnected for both power and signal lines from the PLC. Then the VTPro measures all voltages on the PLC side, regardless if power line or signal line and displays them. At the same time VTPro probes with a small current (about 25 mA) on the power line for short circuit conditions on the valve-under-test side.

If a short is detected, the short will be reported to the user. If no short is detected, the valve-under-test is connected to the PLC for both power and signals. All currents and voltages in the power lines and the signal lines are measured continuously , displayed and analysed. If supply current seems too high, this will be reported as an error and user response (ignore, disconnect) is requested. If supply current is much too high, valve-under-test is disconnected immediately and user response will be requested.

Similar behavior is implemented for test bench operation without PLC and external 24V power supply. This allows to detect the majority of common faults without damaging the valve-under-test, the PLC or even the VTPro.

Technical data

Mechanical	
Dimension Case ready for delivery	47 cm x 18 cm x 38 cm
Delivery weight	6.2 Kg
Weight only "Valve Tester Pro"	1.2 Kg
Dimension Valve Tester Pro	27cm x 15cm x7cm
Display	7" industrial color touch display
Protection class	IP65 (with or without mounted cable connector)
Temperature range	-20°C to 60°C
Air humidity	No condensation
Electric	
Supply voltage	24VDC (18...30)
Max. output voltage	18 - 30 V (+/- 15.5V for 15 V valves with 15V supply)

Setting of power supply	max power consumption
Power from external power supply only via M12-connector	I valve + I pilot valve = < 3.5 A
Power from PLC only via 6+PE connector	I valve + I pilot valve = < 3.5 A I valve = < 3 A I pilot valve = < 3 A
Power from external + PLC via M12-connector + 6+PE connector	I valve (powered from PLC) = < 3 A I pilot valve (powered from external) = < 3 A

Actual value signals (monitor signals)	Standard signals (V/A) and free parameterizable signals (V/A)
Range of the freely parameterizable monitorsignal-value	within +/-25mA and +/-20V
Setpoint signals	Standard signals (V/A) and free parameterizable signals (V/A)
Range of the freely parameterizable setpoint-value	within +/-10V and +/-20mA
Enable signal option	24V DC / 20 mA max
Enable input (pin C)	Deactivation: 0V...4V, activation: 8V...30V
Enable output (pin C)	with current limitation 10mA
Reverse polarity protection	Integrated
Overvoltage protection (power supply)	Up to 32V max. see "Protection against electrical short circuits" (page 5)
Device fuse	No
Load (for setpoint signal current mode)	600 Ohm
Measuring accuracy	+/-1% of the measuring range end value
CE conformity	EN 50081-1, EN 50081-1, EN 60742
EMC guideline	Yes
RoHS guideline	Yes
Power supply unit	Input: 80...264VAC Output: 24V, 3.75A (90W) See data sheet Mean Well GSM90B24 - P1M
Pilot valve voltage	5....24V
Microcontroller	64 bit ARM processor
ADC converter	24 channels, 16 bit resolution, 5 kSaps
Galvanic isolation of operating elements / touchscreen from system / valve	2'500 V DC / 1'500 V AC 1 min
Connections	
Input from control unit or power supply unit	Round plug 6+PE
Output to the valve	Plug M12, push/pull, 12-pin, A-coded, female
Pilot valve / controlled valve	Plug M12, push/pull, 5-pin, A-coded, female
External 24V power supply unit	Plug M12, 4-pin, T-coded, male

Scope of delivery	Case with storage foam
	Valve Tester Pro test device
	Power supply unit with cable
	US/EU power supply cable
	Cable for proportional valves
	Cable for pilot valve
	Carrying strap for Valve Tester Pro
	Operating manual
Carrying case	
Dimensions of the carrying case ready for dispatch	47cm x 18cm x 38cm
Mechanical load capacity	Military standard
Protection class	IP67
Lockable case	Yes with shackle lock (shackle lock not included)

Connector / cable

Position	Description	Part number
1	Valve Tester Pro	121
2	Power supply unit with EU plug und US plug	240325
3	Measuring cable M12, 12-pin to 6 + PE	250325
4	Measuring cable M12 to Hirschmann DIN43650-1	310325

Cable length always 2.1 meters over all.
→ Special lengths on request.

Optional

Position	Description	Part number
5	Measuring cable M12, 12-pin to 11+PE Bosch (4WRVE...)	270325
6	Measuring cable M12, 12-pin with free strands	280325
7	Measuring cable M12 to 11+PE (standard assignment)	290325
8	Measuring cable M12 to Mil connector MS3106A14S-2S	010425
9	Protection cap	050626
10	Shackle lock	120626