

# VVP10-H

## HART® VALVE POSITIONER



- ✓ Great Performance, Compact, Robust in Severe Conditions\*
- ✓ HART® 7 Communication Protocol
- ✓ Electronic Coil Technology
- ✓ Non-Contact Position Sensor (Hall Sensor)
- ✓ 4-20 mA NAMUR NE 43 Position Feedback
- ✓ Suitable for Most Single or Dual Action Valves/Actuators
- ✓ Remote Position Sensor for High Vibration and High Temperature Applications
- ✓ Position Self-Calibration and PID Self-Tuning
- ✓ Standard Characterization Curves or Table
- ✓ Input and Output Pressure Sensors
  - Air Supply: 20 to 140 psi
- ✓ Advanced Diagnostics:
  - Valve Signature (FST)
  - Partial Stroke Test (PST)
- ✓ Actuator Stroke:
  - Linear 3 to 100 mm
  - Rotative 30 to 120°
- ✓ 5-digit, rotative, multi-function LCD with bargraph
- ✓ 02 Digital Inputs (Stroke Limits) and 02 Digital Outputs (Safety Solenoid Valves)
- ✓ No Polarity 12 to 45 Vdc Power Supply
- ✓ Operation Temperature: -40 to 85 °C
- ✓ Local Adjust Using Magnetic Tool
- ✓ Configuration, Calibration, Monitoring and Diagnostics using EDDL and FDT/DTM

\*With Quality Instrumentation Air Supply

## DESCRIPTION

VVP10-H positioner is part of Vivace Process Instruments HART® devices family, designed to work with linear or rotary valves/actuators, providing precision and control with high availability and reliability. It allows easy installation and commissioning and is suitable for several types of valves, regardless of its action (single or double) and size.

The positioner features pressure sensor models and end-of-stroke switches (digital input and output) for advanced diagnostics that help to efficiently predict maintenance needs. The positioner is powered by a 4-20 mA current with no polarity and has a 4-20 mA output channel proportional to the measured position.

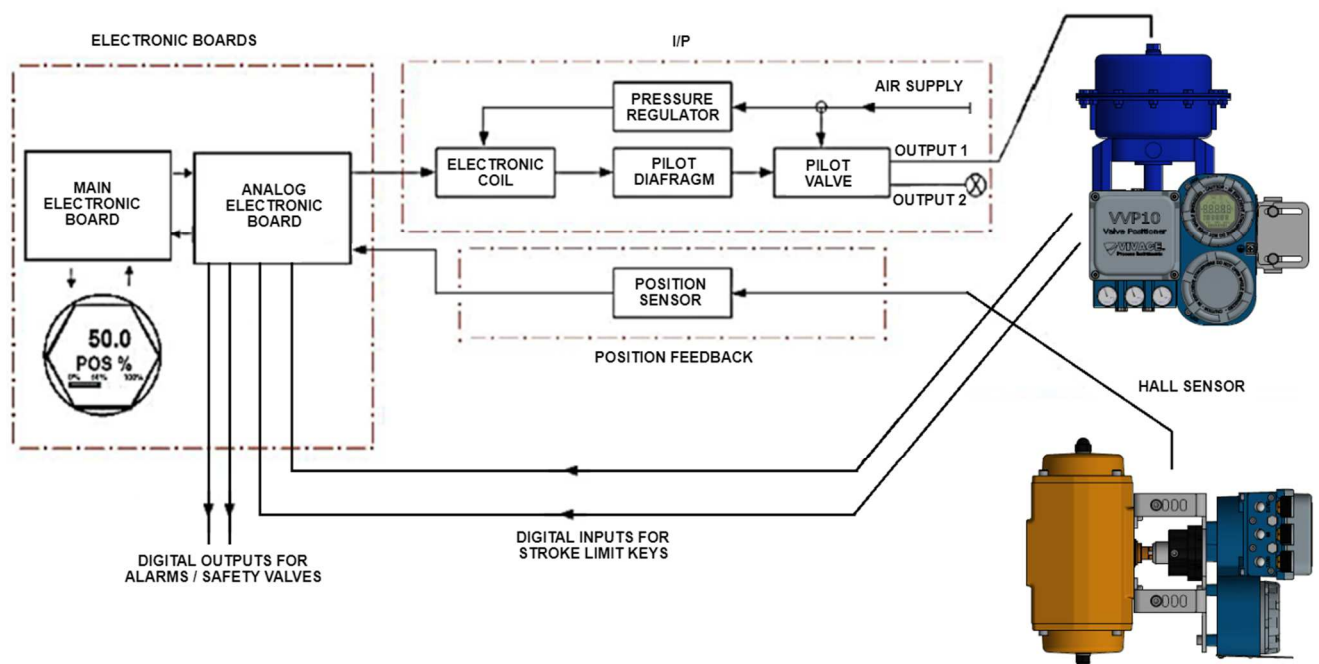
Configuration uses HART® 7 communication protocol, already recognized as the most widely used on world's industrial automation for configuration, calibration, monitoring and diagnostics, and can be performed by the user with a HART® configurator or tools based in EDDL® or FDT/DTM®. Using those tools, user can configure positioner parameters, as well as perform Position Self-Calibration, PID Self-Tuning, general calibration, diagnostics and monitoring. It is also possible to configure VVP10-H via local adjustment using a magnetic tool.

Prioritizing its high performance and robustness, VVP10-H is designed with the latest electronics and material technologies, ensuring long-term reliability for systems of any scale.

## OPERATION PRINCIPLE

The positioner receives a setpoint signal (SP) via 4-20 mA input loop (or user value, when in current disabled mode) and executes the PID control algorithm using Hall sensor position read via A/D converter. The control generates a current that will act on the electromagnetic coil in order to actuate on I/P module that will position the valve/actuator accordingly. The VVP10-H also has position feedback via analog signal (4-20 mA), instantly updated by system positioning.

## BLOCK DIAGRAM



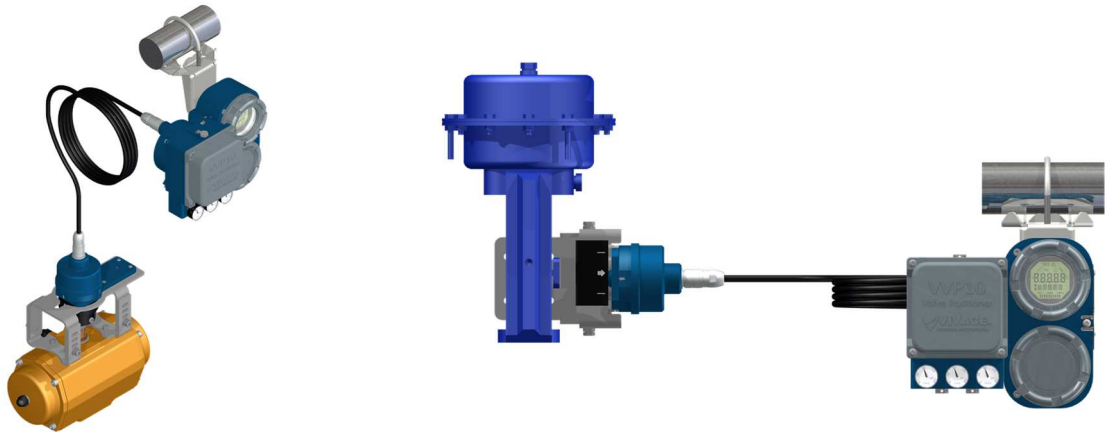
## GENERAL OR REMOTE APPLICATION



VVP10-H allows easy installation and commissioning and is suitable for various types of valves, regardless of its action (single or double) or actuator/valve size. The positioner features linear and rotary magnet models for non-contact position measurement and control on any systems.



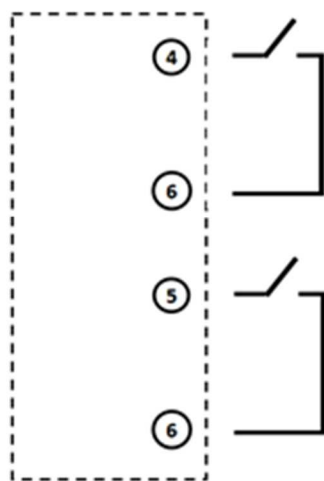
For applications exposed to high temperatures (up to 105 °C), vibrations or places difficult to be reached, VVP10-H has the option of remote sensor, ensuring better performance and service life to the positioner. The cable provided by Vivace is shielded, which provides excellent protection against electromagnetic interference.



## DIGITAL INPUTS AND OUTPUTS

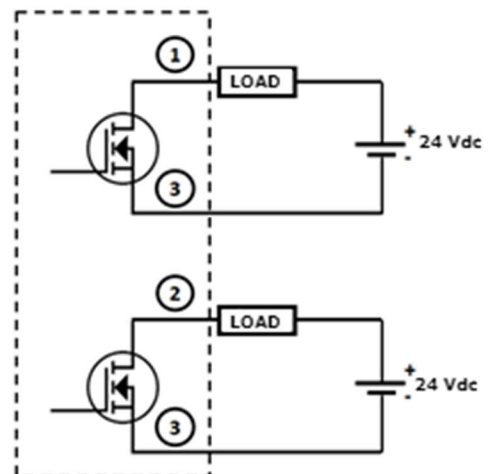
VVP10-H optionally offers two digital inputs and two digital outputs for monitoring of limit switches and alarms (safety valve/solenoid actuation).

### DIGITAL INPUTS FOR STROKE LIMITS



Dry Contact Inputs

### DIGITAL OUTPUTS FOR SAFETY VALVES/ALARM



24 Vdc Power Supply must be connected externally

## TECHNICAL AND PHYSICAL SPECIFICATIONS

Performance	Linearity: <math>\pm 0.1\%</math> Full Scale (using user table) Resolution: <math>< 0.1\%</math> Full Scale Repeatability: <math>< 0.1\%</math> Full Scale Hysteresis: <math>< 0.1\%</math> Full Scale
Air Supply Effect	Negligible
Position Sensor	Sensor without contact, Hall effect, Local or Remote
Power Supply for Device	4-20 mA, no polarity ; Input impedance 500 $\Omega$ / 20 mA.
Power Supply for Position Feedback	12-45 Vdc (open collector), Isolation 1500 Vdc (Feedback 4-20 mA @12 bits, 4 uA resolution, 0.1% accuracy)
Communication Protocol / Configuration	HART 7 Remote configuration using EDDL or FDT/DTM tools. Local configuration using magnetic tool.
Classified Area Certification	Intrinsically Safe and Explosion Proof (pending)
Air Supply Pressure / Output Pressure Range	1.4 – 9.65 bar (20 -140 psi). Oil, dust and water free, according to ANSI/ISA S7.0.01-1996 standard. / 0 to 100% of Air Supply Input
Air Consumption	40 psi (2.8 bar): 6 l/min (0.21 cfm) 80 psi (5.5 bar): 9,5 l/min (0.34 cfm)
Flow Capacity	116 psi (8 bar): 283 l/min (10 cfm);
Setpoint Characterization	Linear, Equal Percentage, Quick Open and User Table (up to 16 points)
Environment Temperature Limits	Ambient: -40 to 85 $^{\circ}$ C (-40 to 185 $^{\circ}$ F) Storage: -40 to 90 $^{\circ}$ C (-40 to 194 $^{\circ}$ F) LCD: -10 to 80 $^{\circ}$ C (14 to 176 $^{\circ}$ F) operation. -40 to 85 $^{\circ}$ C (-40 to 185 $^{\circ}$ F) no damage. Remote Sensor Operation: -40 to 105 $^{\circ}$ C (-40 to 221 $^{\circ}$ F)
Humidity Limits	0 to 100% RH (Not-Condensable Relative Humidity)
Vibration Effects	$\pm 0.3\%/g$ of span during the following conditions: 5-15 Hz for 4 mm constant movement. 15-150 Hz for 2g. 150-2000 Hz para 1g. Follows IEC60770-1.
Electromagnetic Interference Effects	According to IEC 61326:2002
LCD Display	5-digit, rotative, multi-function and bargraph
Stroke Movement	Linear: 3 to 100 mm Rotative: 30 to 120 $^{\circ}$
Action Type	Direct and Reverse, Single and Double, Air to Open or Air to Close
Self-Calibrations and Advanced Diagnostics	Position Self-Calibration and PID Self-Tuning FST (Valve Signature) and PST Diagnosis (with pressure sensors)
Mounting	Using universal brackets for linear and rotative actuators/valves
Pressure Sensors - Optional	For input, output 1 and output 2 pressure measurement.
Discrete Inputs (Stroke-Limits) - Optional	2 isolated dry contact inputs
Discrete Outputs (Safety Valves/Solenoid) - Optional	2 open-collector outputs, max. 400 mA, 24 Vdc
Electrical Connection	1/2 - 14 NPT
Pneumatic Connection	Input and Outputs: 1/4 -18 NPT. Pressure Gauges: 1/8 - 27 NPT
Housing Material	Aluminum / Plastic (only pneumatic block lid)
Approximated Weight	3 kg (without mounting bracket)
Pressure Gauges - Optional	Input and output pressures monitoring. 0-160psi scale. ABS housing, polycarbonate display, brass connection.

## ORDERING CODE

### VVP10 *Intelligent Positioner*

Communication Protocol	H	HART
	P	PROFIBUS
Model	S	STANDARD
	P	PRESSURE SENSORS
	D	DISCRETE I/O
	C	COMPLETE
Sensor Type	0	STANDARD
	1	REMOTE 05 M
	2	REMOTE 10 M
	3	REMOTE 20 M
Magnet Type	0	ROTATIVE
	1	LINEAR 0 - 40 MM
	2	LINEAR 40 - 70 MM
	3	LINEAR 70 - 100 MM
	A	NO MAGNET
Pressure Gauges	0	NO
	1	YES
Certification Type	0	NO CERTIFICATION
	1	INTRINSECALLY SAFE
	2	EXPLOSION PROOF
Certification Body	0	NO CERTIFICATION
	1	CEPEL
	2	FM
	3	EXAM
Housing Material	A	ALUMINUM
Electrical Connection	1	½ - 14 NPT
Painting	1	BLUE - RAL 5005
Mounting Bracket	0	NO MOUNTING BRACKET
	1	UNIVERSAL LINEAR
	2	UNIVERSAL ROTATIVE

Ordering Code Example:

VVP10-	H	S	0	0	0	0	0	0	A	1	1	0
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#### European Directive Information

*PED Directive (97/23/EC) - Pressure Equipment Directive (Designed to meet standards). This product is in accordance with the directive and has been designed and manufactured in accordance with good engineering practice, using ANSI, ASTM, DIN and JIS standards. EMC Directive (89/336/EEC) - Electromagnetic Compatibility (Designed to meet standards). EMC test was performed according to the standard: IEC61326: 2002. ATEX Directive (94/9/EC) - Explosive Atmosphere, Risk Area (Designed to meet standards).*