

Analog position controller

RA 30050/03.04
Replaces: 11.02

1/6

Model VT-MACAS

Series 1X

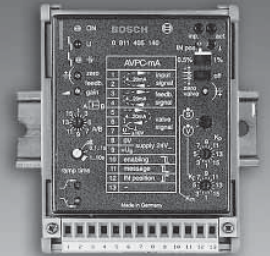


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Features

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	– Cylinder area ratio adjustment

Ordering data

	VT - M A C A S - 500 - 1X / V0 /		
Hydraulic component Axis control	= A		
Type Controller	= C		
Actuation Analog	= A		
Function Position control	= S		
		No code =	Option Version with supply input
		I =	Version with current input
		V0 =	Customer version Catalog version
		1X =	Series Series 10 to 19
	500		Serial numbers for types Standard version without valve amplifier function

Standard types

Type VT-MACAS	Material no.	For valve types
VT-MACAS-500-10/V0	0 811 405 139	Valves with on-board electronics
VT-MACAS-500-10/V0/I	0 811 405 140	Valves with on-board electronics

Front panel

The diagram shows the front panel of the Bosch AVPC (Analog Valve Position Controller). It includes the following components and labels:

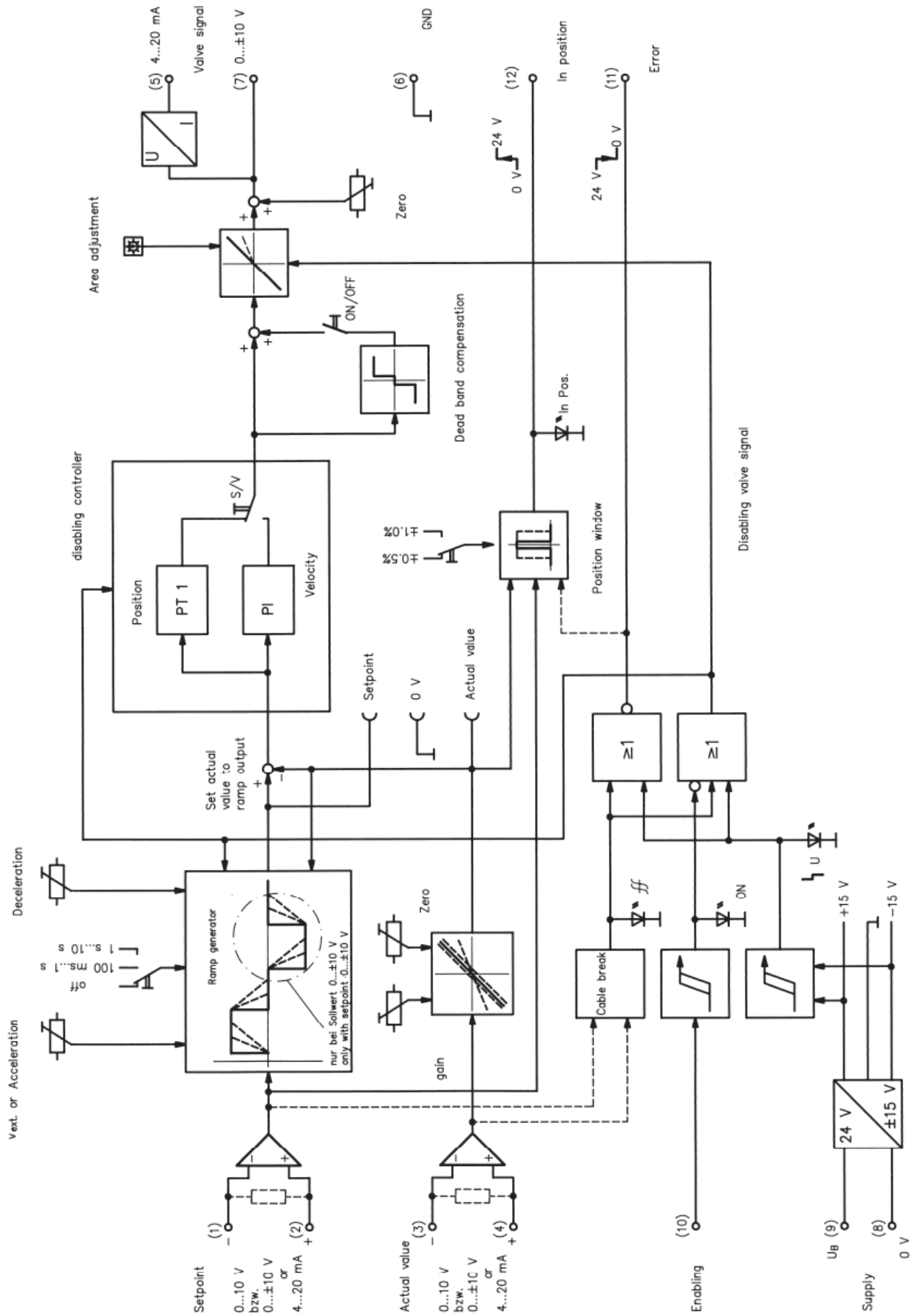
- Enabling:** ON indicator and switch.
- Error U:** Input terminal.
- Cable break act. value:** Switch with U and ff symbols.
- Adjustment zero act. value:** Potentiometer for zero feedback.
- Adjustment gain act. value:** Potentiometer for gain.
- Area ratio adjustment:** Potentiometer with A/B ratio and 15, 13, 11, 9, 7, 5, 3, 1 markings.
- Range of ramp time:** Potentiometer with 0.1...1 s and 1...10 s settings.
- accel. / decel.:** Potentiometers for acceleration and deceleration.
- TP Setpoint:** Input terminal.
- TP Actual value:** Input terminal.
- TP 0 V:** Input terminal.
- Output In Pos.:** Potentiometer with 0.5% and 1% settings.
- Position window:** Potentiometer with +, 0, - settings.
- Dead band compensation On/Off:** Switch.
- Zero valve:** Potentiometer.
- Switching velocity controller-position controller:** Potentiometer with K_P and 7, 9, 11, 13, 15 markings.
- Adjustment p-controller:** Potentiometer with K_P and 7, 9, 11, 13, 15 markings.
- Adjustment I-controller (velocity-controlling) or K_{T1}-controller (Position controlling):** Potentiometer with K_{T1} and 7, 9, 11, 13, 15 markings.

AVPC - xx Pinout table:

1	0 V	input
2	+10V/±10V	signal
3	0 V	feedb.
4	+10V/±10V	signal
5	4...20 mA	valve signal
6	I	valve signal
7	U ±10V	signal
8	0 V	supply 24 V
9	+U _B	
10	enabling	
11	message	
12	IN position	
13	-	

Made in Germany

Block diagram with terminal assignment



Technical data (for device applications beyond the stated values, please consult us!)

Format/design		(86 x 110 x 95) mm/module (3.3 x 4.33 x 3.7 in)
Fastening/connection		DIN rail/connector + terminals
Temperature range		0-...-70-°C (32 to 158 °F) ; storage: -20-...-+70-°C (-4 to 158 °F)
Power supply (8), (9)		$U_B = 24 V_{nom}/batt.: 21-...-40 V DC$ Single-phase full wave: 21-...-28 V DC _{eff}
Current rating		Max. 200 mA
Signal input (1), (2)	VT-MACAS-500-10/V0	$U_{set}: \pm 10 V$, difference amplifier $R_i = 100 k\Omega$
	VT-MACAS-500-10/V0/I	$I_{set}: 4-...-20 mA$ $R_{sh} = 200 \Omega$
Feedback signal (3), (4)	VT-MACAS-500-10/V0	$U_{feed}: \pm 10 V$, difference amplifier $R_i = 100 k\Omega$
	VT-MACAS-500-10/V0/I	$I_{feed}: 4-...-20 mA$ $R_{sh} = 200 \Omega$
Valve signal (5), (6), (7)		$U_V = \pm 10 V$ (max. 10 mA) or $I_V = 4-...-20 mA$ (average 12 mA)
Deadband compensation		Can be deactivated, effective in a range of $\pm 4\%$
Enable signal (10)		8.5-...-40 V DC
Fault signal (11)		No fault: $24 V_{nom} (U_B)$ max. 50 mA Fault: $< 2 V$
IN POS signal (12)		IN POS: $24 V_{nom} (U_B)$ max. 50 mA Not IN POS: $< 2 V$
Ramp ranges		I: 0.1-...-1 s II: 1-...-10 s
Area ratio adjustment $A_K:A_R$		Min. 1:1; max. 1:4
Feedback signal adjustment		Zero: -5-...-10- $\%$ Gain: 50-...-110- $\%$
Type of controller		Position: PT ₁ Velocity: PI
Valve zero		$\pm 5\%$
Special features		<ul style="list-style-type: none"> - Module can be switched from position to velocity control - Position window can be switched over - Measurement taps on front panel - Short-circuit-proof interfaces

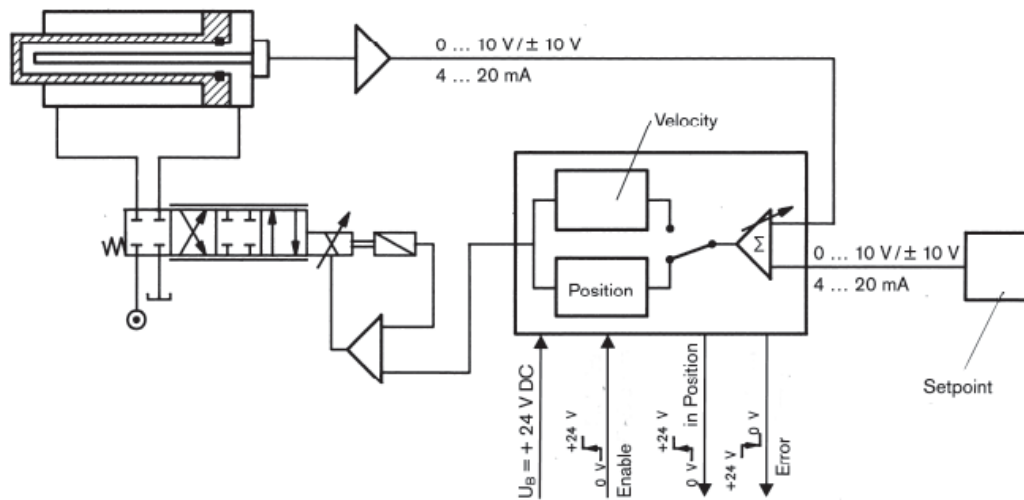
Additional information

Applications

This controller module enables simple position or velocity control actions to be effected, in combination with Bosch Rexroth servo cylinders with analog position measurement systems (potentiometers). Since the signals are processed in an analog manner and the module is only equipped with the most essential features required for performing a control action, we were able to keep the cost of the drive low. A further speciality of this module is that it can be switched over internally (front panel) to velocity control, and there is a version for voltage interface and a version for current interface, related to the setpoints and feedback signals.

Position control

The setpoint and feedback signals of the position are compared and the difference transmitted to the valve amplifier. In the event of an abrupt change in the input signal, the system reacts with maximum dynamics. The times for accelerating or braking a load are limited either by the available power or the system gain. When a ramp function acts as an input value, the load is moved at a constant speed.

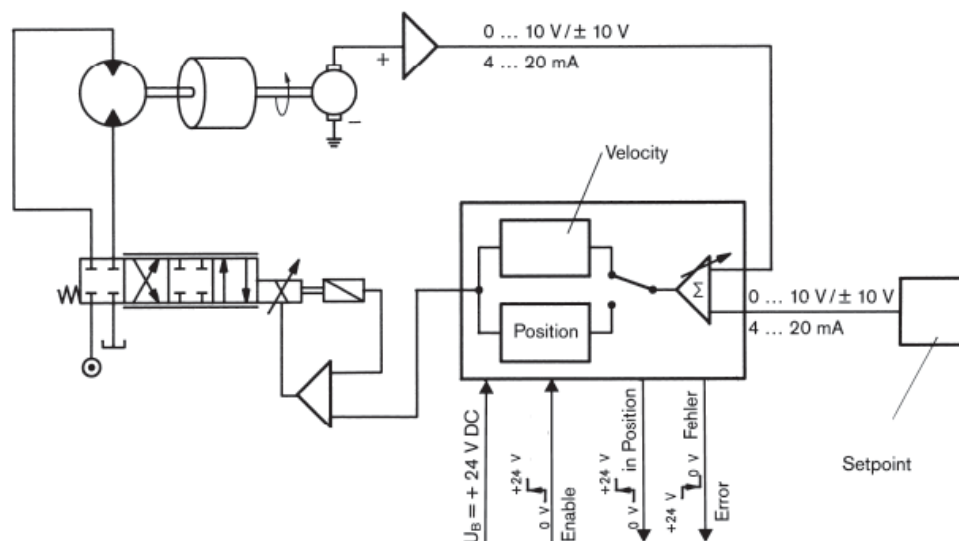


Velocity control*

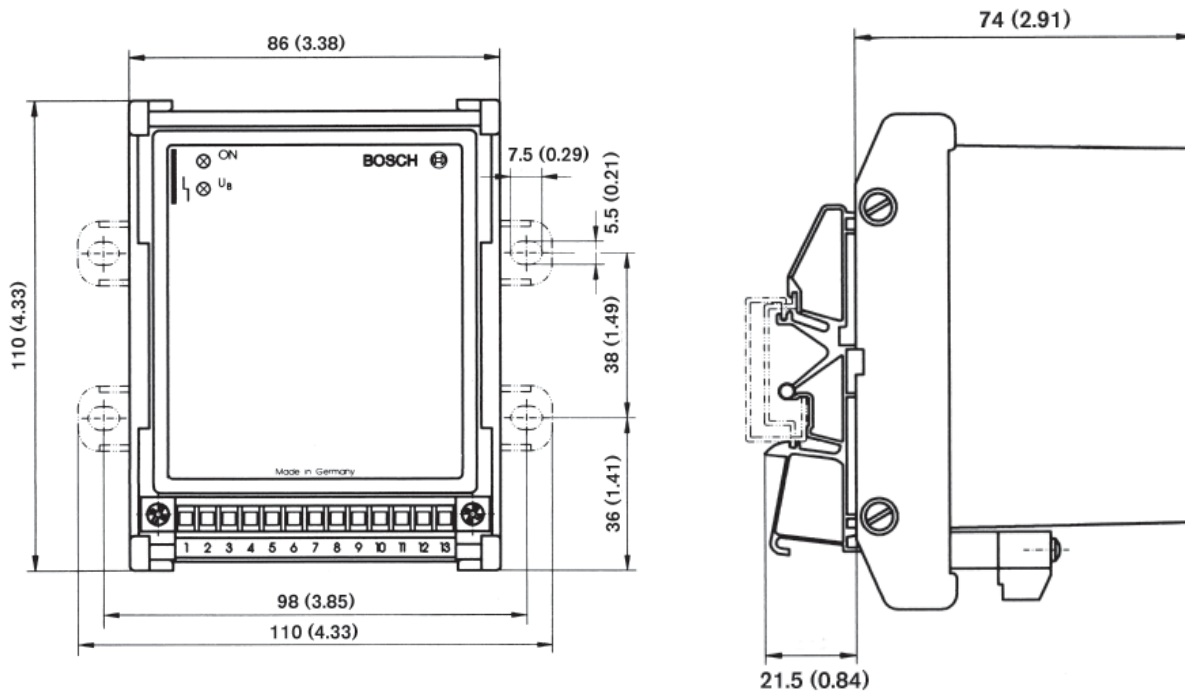
The setpoint and feedback signal of velocity are compared and the difference transmitted to the valve amplifier. Through the process of integration, the signal is amplified to such an extent that even the smallest error is eliminated.

When a ramp function acts as an input signal, progressive acceleration or deceleration with a constant value takes place.

* Only possible with a speedometer.



Device dimensions – dimensions in millimeters (inches)



Wall mounting

86 x 110 x 95
(3.3 x 4.33 x 3.7 in)

DIN rail mounting

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