



**Model number**

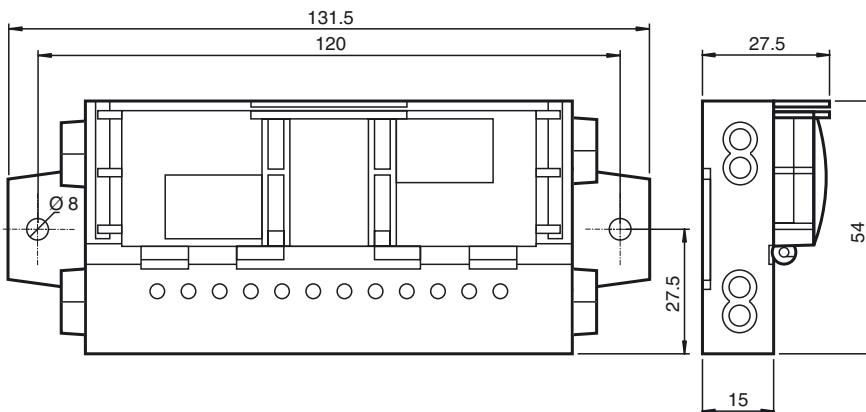
**VAZ-2E2A-G20-ZPA1**

G20 motor control module with an integrated logic function

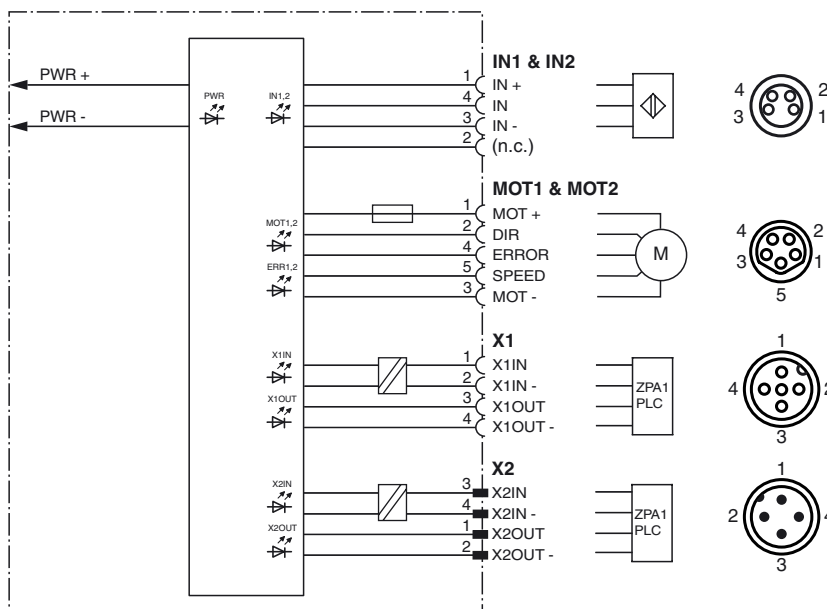
**Features**

- Inputs for 3-wire sensors
- Outputs for DC roller motors (drum motors)
- Interface for coupling with adjacent zones
- Connection of motors and sensors via M8 connectors
- Operating mode, motor speed and start/stop ramp can be configured using the rotary switch
- Supply of 24 V<sub>DC</sub>; connection via insulation piercing technology with gold-plated contact pins
- Function indicator for power supply, inputs and outputs, and zone coupling

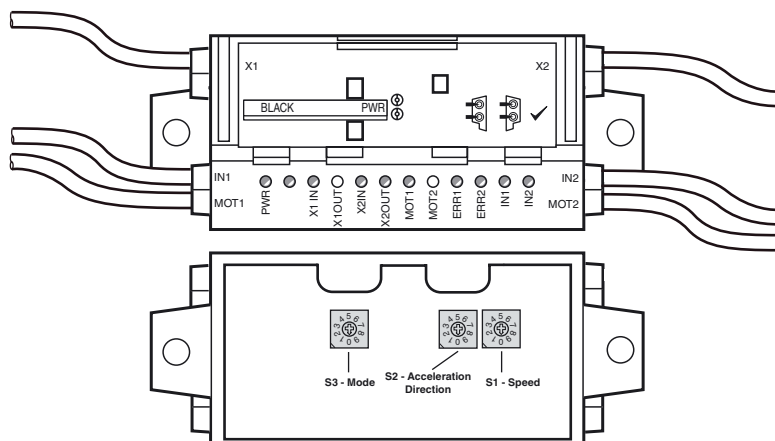
**Dimensions**



**Electrical connection**



**Indicating / Operating means**



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Technical data	
<b>General specifications</b>	
UL File Number	E223772 "For use in NFPA 79 Applications only"
Compatible roller motors	Interroll EC310, Rulmeca BL3
<b>Indicators/operating means</b>	
Switch	S1: motor speed; rotary switch, 10 positions S2: direction of rotation and start/stop ramp; rotary switch, 10 positions S3: operating mode, rotary switch, 10 positions
LED ERR	Motor fault; 2 yellow LEDs yellow: motor error flashing yellow: motor protection unit defective
LED PWR	Supply voltage $U_{PWR}$ ; green LED
LED IN	switching state (input); 2 LED yellow
LED MOT	Motor active; 2 yellow LEDs
LED XIN	Zone coupling input active; 2 yellow LEDs
LED XOUT	Zone coupling output active; 2 yellow LEDs
<b>Electrical specifications</b>	
Rated operating voltage	$U_e$ 18 V ... 30 V DC PELV (via $U_{PWR}$ )
Rated operating current	$I_e$ $\leq 30$ mA (Closed-circuit current) max. 10 A (<2 s)
Surge protection	$U_{PWR}$ : overvoltage category II, securely isolated power supply (PELV)
<b>Interface 1</b>	
Interface type	Interface for coupling zones with one input and one output for control signals X1
Physical	4-pin M12 socket Electronic output: PNP, overload and short-circuit proof (X1OUT) Input: PNP, galvanically isolated, potential-free (X1IN)
Load current	Input: $\leq 8$ mA (internally limited) Output: 10 mA
Voltage	Input: $\leq 30$ V DC Output (via $U_{PWR}$ ): $\geq (U_{PWR} - 2$ V)
Switching point	in accordance with DIN EN 61131-2 (type 1) 0 (undamped): $\leq 0.5$ mA 1 (damped): $\geq 2$ mA
<b>Interface 2</b>	
Interface type	Interface for coupling zones with one input and one output for control signals X2
Physical	M12 connector, 4-pin Electronic output: PNP, overload and short-circuit proof (X2OUT) Input: PNP, galvanically isolated, potential-free (X2IN)
Load current	Input: $\leq 8$ mA (internally limited) Output: 10 mA
Voltage	Input: $\leq 30$ V DC Output (via $U_{PWR}$ ): $\geq (U_{PWR} - 2$ V)
Switching point	in accordance with DIN EN 61131-2 (type 1) 0 (undamped): $\leq 0.5$ mA 1 (damped): $\geq 2$ mA
<b>Input</b>	
Number/Type	2 Inputs for 3-wire sensors (PNP), DC
Supply	via $U_{PWR}$
Current loading capacity	500 mA, overload and short-circuit protected
Input current	$\leq 8$ mA (limited internally)
Switching point	according to DIN EN 61131-2 0 (undamped) $\leq 0.5$ mA 1 (damped) $\geq 2.0$ mA
Input filter	10 ms
<b>Output</b>	
Number/Type	2 outputs for DC roller motors (MOT1, MOT2)
Supply	via $U_{PWR}$
Current	2 A, max. 5 A (<2 s) per motor
Overload protection	fuse, $I^2t = 53.7$ A <sup>2</sup> s
Velocity signal	$U_S$ 1.4 ... 13 V at no-load $R_i = 5.6$ k $\Omega$ , $R_{LOAD} \geq 35$ k $\Omega$ Control using rotary switch S1
Rotation direction signal	$U_D$ low: high impedance high: $\geq (U_{PWR} - 1.0$ V) in no-load operation $R_i = 5.6$ k $\Omega$ , $R_{LOAD} \geq 5$ k $\Omega$ Control using rotary switch S2
Motor fault	NPN digital input, $U_0 = 14$ V, $R_i = 34$ k $\Omega$ 0 (no error) $\geq 125$ $\mu$ A 1 (error) $\leq 25$ $\mu$ A
<b>Directive conformity</b>	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2006
<b>Standard conformity</b>	
Degree of protection	EN 60529:2000
Input	EN 61131-2:2007
Emitted interference	EN 61000-6-4:2007
Noise immunity	EN 61000-6-2:2005, EN 61326-1:2006
<b>Ambient conditions</b>	
Ambient temperature	-30 ... 60 °C (-22 ... 140 °F)
Storage temperature	-30 ... 85 °C (-22 ... 185 °F)
Relative humidity	85 % non-condensing
Climatic conditions	For indoor use only
Altitude	$\leq 2000$ m above MSL
Shock and impact resistance	30 g, 11 ms in 6 spatial directions, 3 shocks 10 g, 16 ms in 6 spatial directions, 1000 shocks
Vibration resistance	0.75 mm 10 ... 57 Hz, 5 g 57 ... 150 Hz, 20 cycles

**Function**

The motor control module is a field module with two sensor inputs and two electronic outputs for controlling DC roller motors. The module is optimized for use with the Interroll EC310 and Rulmeca BL3. The module can control two consecutive zones of an accumulating conveyor section. A zone consists of a roller motor and a zone sensor, e.g., for a light barrier. Both zone controllers are logically coupled within the module. The second zone controller within the module can be deactivated.

Two interfaces are available for coupling with the neighboring zones of the conveyor belt. The interfaces each provide a signal input and a signal output. The interfaces can be connected directly to 24 V-compatible SPS-IOs.

The compact housing can be installed directly into support profiles or cable ducts. The  $U_{AUX}$  power supply is connected using insulation piercing technology via a black AS-Interface flat cable. The swiveling flat cable guide is locked using a snap-fit without the use of tools.

The sensor inputs and motor outputs are connected using cable outputs with M8 round plug connectors. Cable outputs with 4-pin M12 round plug connectors are provided for zone coupling.

Power is supplied to the inputs and motors by the  $U_{AUX}$  supply.

The IN LEDs display the current switching status of the sensor inputs. The MOT LEDs indicate the operating status of the motors. The ERR LEDs display when the noise is set using a motor and a defective fuse from the motor supply. The XIN and XOUT LEDs indicate the status of the zone coupling signals.

The module is configured using three rotary switches on the back of the module. Ten predefined motor speeds are available. For both zones, the direction of rotation and the direction of transportation can be adjusted. There is a choice of five predefined start/stop ramps. The operating mode of the module can be adjusted. A detailed description of the individual operating modes can be found in the manual for this module.

**Accessories**

**V1-G-BK0,75M-PUR-U-V1-G-Y28572**

Adapter cable, M12 socket to M12 socket, 4-pin, PUR cable

**V1S-G-BK0,75M-PUR-U-V1S-G-Y28570**

Adapter cable, M12 plug to M12 plug, 4-pin, PUR cable

**VAZ-ZPA-ANALYZER**

Diagnostic adapter for G20 ZPA motor control module

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Pollution degree	2
<b>Mechanical specifications</b>	
Degree of protection	IP65 in accordance with EN 60529 (not certified by UL)
Connection	<b>PWR:</b> insulation piercing technology Black flat cable <b>Inputs/outputs:</b> M8 round plug connector in accordance with EN 61076-2-104 <b>Inputs:</b> LF004-GS1-A (4-pin, bushing contacts, screw lock, A-coded) Matching connector: LM004-Gx1-A or similar <b>Outputs:</b> NF005-SS1-B (5-pin, bushing contacts, snap lock, B-coded) Matching connector: NM005-Sx1-B or similar <b>Zone coupling:</b> M12 round plug connector in accordance with EN 61076-2-101 <b>X1:</b> M12, 4-pin, bushing contacts, screw-locking, A-coded Female connector: M12, 4-pin, connector contacts, screw-locking, A-coded <b>X2:</b> M12, 4-pin, connector contacts, screw-locking, A-coded Female connector: M12, 4-pin, bushing contacts, screw-locking, A-coded
Mass	310 g
Mounting	2 clips with Ø 8 mm drill hole
Cable length	1 m (inputs/outputs) , 1.5 m (zone coupling), max. 30 m
Note	The flat cable routing is designed for 100 actuation cycles

**Configuration Information**

The device can be configured using the S1, S2, and S3 rotary switches.

**S1 rotary switch: motor speed**

8 configurable speeds.

+/- 1 % accuracy

**Motor stops at  $U_S < 1.5 V$**

**Motor speed**

Switch setting	Speed signal $U_S$
0	3.96 V
1	4.78 V
2	5.61 V
3	6.44 V
4	8.50 V
5	9.63 V
6	10.00 V
7	7.26 V
8	Reserved
9	Reserved

**S2 rotary switch: start/stop ramp and direction of rotation**

5 configurable ramps.

Incline: constant, independent of terminal velocity.

Duration: The ramp duration defines the time from stationary to max. speed ( $U_S = 10 V$ ) or from max. speed to stationary. When the terminal velocity is lower, the ramp duration is shorter.

**Direction of rotation/direction of transportation**

Switch setting	Direction of rotation $U_D$	Direction of transportation
0 ... 4	high, right	Zone 1 -> Zone 2
5 ... 9	low, left	Zone 2 -> Zone 1

**Start/stop ramp**

Switch setting	Ramp duration (stationary -> $V_{max}$ or $V_{max}$ -> stationary)
0, 5	Ramp 1: no ramp (default setting)
1, 6	Ramp 2: 500 ms
2, 7	Ramp 3: 1000 ms
3, 8	Ramp 4: 1500 ms
4, 9	Ramp 5: 3000 ms

**S3 rotary switch: operating mode**

Note: The inactive zone synchronizes its motor output with the active zone.

**Operating mode**

Switch setting	Mode	Upstream zone
0	Standard ZPA	Active
1	Enhanced ZPA	Active
2	Standard ZPA	Inactive
3	Enhanced ZPA	Inactive
4	Transportation	Active
5	Long Zone	Inactive
6	Direct Control	Active
7	Direction Control	Inactive
8	Slave	Inactive
9	Reserved	-

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