

# Multi-Axis Controller V27



The V27 is a robust joystick commonly used in electro-hydraulic applications. The compact design allows for use in smallest installation spaces. It can be integrated with detents and a very robust friction brake. Long life and high reliability is ensured by the latest contactless hall-technology. With many outputs and grip options the V27 series is flexible and customisable.

## Technical data

Mechanical life V27	10 million operating cycles
Supply voltage	See interface
Operation temperature	-40°C to +85°C
Degree of protection	Up to IP67
Functional safety	PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508)



		V27	S8	P	T	-R11	+Z	-B10	-E...	-S..	-X
<b>Basic unit</b>											
V27.1	Multi-Axis Controller, 1-axis										
V27	Multi-Axis Controller, 2-axis										
<b>Control-handle extended</b>											
	Standard 95 mm*										
S8	+20 mm										
*Only available in combination with a handle!											
<b>Gate</b>											
P	Cross gate										
P X	Special gate										
<b>Grip / Palm Grip</b>											
	Knob (included in basic unit!)										
M	Knob with mechanical zero interlock										
T	Dead man										
H	Signal button										
D	Push button										
B...	Palm Grip B... (see page Palm Grip 161)										
<b>Axis 1 / Axis 2 (not applied for V27.1)</b>											
Z	Spring return										
R	Friction brake (possible with one axis!)										
	Latching: (possible with one axis!)										
11	1-0-1 (zero detent)										
22	2-0-2										
33	3-0-3										
44	4-0-4										
08	End-position latching SR2 or SR4										
19	1-0-1 + end-position latching SR2 or SR4										
80	End-position latching SR1 or SR3										
91	1-0-1 + end-position latching SR1 or SR3										
88	End-position latching SR1 + SR2 or SR3 + SR4										
99	1-0-1 + end-position latching SR1 + SR2 or SR3 + SR4										

Technical details may vary based on configuration or application! Technical data subject to change without notice!

V27 S8 P T -R11 +Z -B10 -E... -S... -X

### Degree of protection

B10	Joystick-main board sealed (IP67)
B11	Joystick-main board sealed (IP67) and grip function sealed, grip with drain hole
For a schematic description of the protection class (see page 126)	

### Interface (description see on the following pages)

E0xx	Switching output
E1xx	Voltage output
E2xx	Current output
E3xx	CAN-interface
E4xx	CANopen Safety interface
E6xx	Profinet
E7xx	PROFIsafe
E9xx	Other outputs

### Plug connectors

S...	Standard plug connectors (see page 125)
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### Special model

X	Special / customer specified
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### Combination possibilities with our grips



### Digital output

Supply voltage	9-32 V DC	
Current carrying capacity	Direction signal 150 mA Zero position signal 500 mA	
Mounting depth A	45 mm	
Wiring	1. cable 14 x 0,25 mm <sup>2</sup> 500 mm long without plug connector 2. cable 14 x 0,25 mm <sup>2</sup> (optional for grip function) 500 mm long without plug connector Optional with plug connector (standard plug connectors see page 125)	S
2 Direction signals + 1 zero position signal (galvanically isolated) per axis	1 axis 2 axis	E001 1 2

### Voltage output (not stabilized)

Supply voltage	4,75-5,25 V DC		
Current carrying capacity	Direction signal 8 mA		
Mounting depth A	45 mm		
Wiring	1. cable 14 x 0,25 mm <sup>2</sup> 500 mm long without plug connector 2. cable 14 x 0,25 mm <sup>2</sup> (grip function) 500 mm long without plug connector		
	Optional with plug connector ( <i>standard plug connectors see page 125</i> )		S
0,5...2,5...4,5 V redundant + 2 direction signals per axis			
	1 axis	E104	1
	2 axis		2
	<b>Output options</b>		
	Characteristic:		
	Inverse dual		1
	Dual		2
	Inverse Dual with dead zone +/- 3° (standard)		3
	Dual with dead zone +/- 3°		4

### Voltage output

Supply voltage	9-32 V DC (*11,5-32)		
Current carrying capacity	Direction signal 150 mA Zero position signal 500 mA		
Mounting depth A	45 mm (60 mm from 3 axis)		
Wiring	1. cable 14 x 0,25 mm <sup>2</sup> 500 mm long without plug connector 2. cable 14 x 0,25 mm <sup>2</sup> (optional for grip function) 500 mm long without plug connector		
	Optional with plug connector ( <i>standard plug connectors see page 125</i> )		S
0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis			
	1 axis	E112	1
	2 axis		2
	3 axis*		3
	4 axis*		4
0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC			
	1 axis	E132	1
	2 axis		2
	3 axis*		3
	4 axis*		4
10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal			
	1 axis	E136	1
	2 axis		2
	3 axis*		3
	4 axis*		4
	<b>Output options</b>		
	Characteristic:		
	Inverse dual *1		1
	Dual *1		2
	Inverse dual with dead zone +/- 3° *1 (standard)		3
	Dual with dead zone +/- 3° *1		4
	*1 Not combinable with output E136X		
	Single *2		5
	Single with dead zone *2 (standard)		6
	*2 Not combinable with output E112X and E132X		

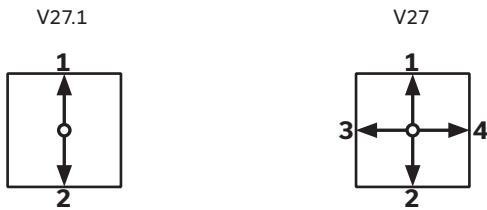
\*Axis for grip functions, interface can vary depending upon actuation element!

Voltage output with other value on request!

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Current output	
Supply voltage	9-32 V DC
Current carrying capacity	Direction signal 150 mA Zero position signal 500 mA
Mounting depth A	45 mm (60 mm from 3 axis)
Wiring	1. cable 14 x 0,25 mm <sup>2</sup> 500 mm long without plug connector 2. cable 14 x 0,25 mm <sup>2</sup> (optional for grip function) 500 mm long without plug connector Optional with plug connector (standard plug connectors see page 125)
0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal	
	1 axis E206 1
	2 axis 2
	3 axis* 3
	4 axis* 4
20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal	
	1 axis E208 1
	2 axis 2
	3 axis* 3
	4 axis* 4
4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal	
	1 axis E214 1
	2 axis 2
	3 axis* 3
	4 axis* 4
20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal	
	1 axis E216 1
	2 axis 2
	3 axis* 3
	4 axis* 4
	<b>Output options</b>
	Single 5
	Single with dead zone +/- 3° (standard) 6
*Axis for grip functions, interface can vary depending upon actuation element! Current output with other value on request!	

### Identification of the installation variants with switching directions:



CAN	
Supply voltage	9-32 V DC
Idle current consumption	125 mA (24 V DC)
Current carrying capacity	Direction signal 100 mA Zero position signal 100 mA External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) Digital switching output (potential-free) 100 mA
Mounting depth A	45 mm (expansion stage 1) 60 mm (expansion stage 2) 80 mm (expansion stage 3)
Protocol	CANopen CiA DS 301 or SAE J1939 (based on)
Baud rate	20 kBit/s to 1 Mbit/s (standard 250 kBit/s)
Wiring	CAN (IN) cable 300 mm with plug connector M12 (male) CAN (OUT) cable 300 mm with plug connector M12 (female) External in-/outputs cable 300 mm long without plug connector External in-/outputs cable 300 mm long without plug connector (additional from 32 in-/outputs) Optional with plug connector ( <i>standard plug connectors see page 125</i> )
<b>CAN expansion stage 1</b>	E304 1
- 4 analog joystick axis	
- 15 digital joystick functions	
- Input for capacitive sensor	
Main-axis with additional digital outputs separately wired (not via CAN)	1
- 2 direction signals per main axis	
<b>CAN expansion stage 2</b>	E305 1
- 7 analog joystick axis	
- 15 digital joystick functions	
- 2 inputs for capacitive sensors	
With additional external in-/outputs	
- 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs	2
- 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs	3
*External LED-outputs can be used for LEDs in the grip	

<b>CAN expansion stage 3</b>		E306 1
<ul style="list-style-type: none"> <li>- 10 analog joystick axis</li> <li>- 15 digital joystick functions</li> <li>- 2 inputs for capacitive sensors</li> </ul>		
With additional external in-/outputs		
- 8 external LED-outputs (dimnable optional), 2 switching outputs (potential-free, 100 mA), 8 external digital inputs		2
- 16 external LED-outputs (dimnable optional), 2 switching outputs (potential-free, 100 mA), 16 external digital inputs		3
- 24 external LED-outputs (dimnable optional), 2 switching outputs (potential-free, 100 mA), 24 external digital inputs		4
- 32 external LED-outputs (dimnable optional), 2 switching outputs (potential-free, 100 mA), 32 external digital inputs		5
<i>*External LED-outputs can be used for LEDs in the grip</i>		
<b>Main-axis with additional digital outputs separately wired (not via CAN)</b>		
- 2 direction signals + 1 zero position signal (potential-free) per axis		3
<i>With additional analog outputs on request!</i>		

<b>CANopen Safety</b>		
Supply voltage	9-32 V DC	
Idle current consumption	125 mA (24 V DC)	
Current carrying capacity	Direction signal 100 mA	
	Zero position signal 100 mA (potential-free)	
	External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs)	
	Digital switching output (potential-free) 100 mA	
Baud rate	20 kBit/s to 1 MBit/s (standard 250 kBit/s)	
Mounting depth	45 mm (expansion stage 1)	
	60 mm (expansion stage 2)	
	80 mm (expansion stage 3)	
Protocol	CANopen Safety EN50325-5	
Wiring	CAN (IN) cable 300 mm with plug connector M12 (male)	
	CAN (OUT) cable 300 mm with plug connector M12 (female)	
	External in-/outputs cable 300 mm long without plug connector	
	External in-/outputs cable 300 mm long without plug connector (additional from 32 in-/outputs)	
	Optional with plug connector ( <i>standard plug connectors see page 125</i> )	S
<b>CANopen Safety expansion stage 1</b>		E404 1
<ul style="list-style-type: none"> <li>- 4 analog joystick axis</li> <li>- 15 digital joystick functions</li> <li>- Input for capacitive sensor</li> </ul>		
<b>Main-axis with additional digital outputs separately wired (not via CAN)</b>		
- 2 direction signals per main axis		1
<b>CANopen Safety expansion stage 2</b>		E405 1
<ul style="list-style-type: none"> <li>- 7 analog joystick axis</li> <li>- 15 digital joystick functions</li> <li>- 2 inputs for capacitive sensors</li> </ul>		
With additional external in-/outputs		
- 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs		2
- 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs		3
<i>*External LED-outputs can be used for LEDs in the grip</i>		

### CANopen Safety expansion stage 3

- 10 analog joystick axis
- 15 digital joystick functions
- 2 inputs for capacitive sensor

With additional external in-/outputs

- 8 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 8 external digital inputs
- 16 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 16 external digital inputs
- 24 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 24 external digital inputs
- 32 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 32 external digital inputs

*\*External LED-outputs can be used for LEDs in the grip*

E406 1

2

3

4

5

Main-axis with additional digital outputs separately wired (not via CAN)

- 2 direction signals + 1 zero position signal (potential-free) per axis 3

3

*With additional analog outputs on request!*

### Profinet

Supply voltage	18-30 V DC
Baud rate	To 100 MBit/s
Ausgangswert	0...512...1023
Mounting depth A	90 mm
Wiring	Profinet (1), cable 300 mm with M12 plug connector (female) Profinet (2), cable 300 mm with M12 plug connector (female) Supply voltage (if applicable contact wiring) cable 12 x 0,25 mm <sup>2</sup> 300 mm long without plug connector External in-/outputs, cable 300 mm long without plug connector Optional with plug connector ( <i>standard plug connectors see page 125</i> )

S

### Profinet

- 4 analog joystick axis
- 20 digital joystick functions
- Input for capacitive sensor

With additional external in-/outputs

- 8 external LED-outputs, 8 external digital inputs

*\*External LED-outputs can be used in the grip for LEDs!*

E602 1

2

Main-axis with additional signals separately wired (not via profinet safe)

- 2 direction signals + zero position signal (potential-free) per main-axis

3

PROFIsafe	
Supply voltage	18-30 V DC
Baud rate	To 100 MBit/s
Output value	0...512...1023
Mounting depth A	90 mm
Wiring	Profinet (1), cable 300 mm with M12 plug connector (female) Profinet (2), cable 300 mm with M12 plug connector (female) Supply voltage (if applicable contact wiring) cable 12 x 0,25 mm <sup>2</sup> 300 mm long without plug connector External in-/outputs, cable 300 mm long without plug connector
Optional with plug connector ( <i>standard plug connectors see page 125</i> )	
<b>PROFIsafe</b>	E702 1
- 4 analog joystick axis	
- 20 digital joystick functions	
- Input for capacitive sensor	
With additional external in-/outputs	
- 8 external LED-outputs, 8 external digital inputs	2
<i>*External LED-outputs can be used in the grip for LEDs!</i>	
Main-axis with additional signals separately wired (not via profinet safe)	
- 2 direction signals + zero position signal (potential-free) per main-axis	3

Other outputs	
Voltage output for PVG32 0,25...0,5...0,75Us, power supply 9-32 V DC	
Option	Input for capacitive sensor
Mounting depth A	45 mm (60 mm from 3 axis)
Wiring:	1. cable 14 x 0,25 mm <sup>2</sup> 300 mm long without plug connector 2. cable 14 x 0,25 mm <sup>2</sup> 300 mm long without plug connector (optional for grip function)
Optional with plug connector ( <i>standard plug connectors see page 125</i> )	
	1 axis
	2 axis
	3 axis
	4 axis
	E907 1
	2
	3
	4
Main-axis with additional direction signals and zero direction signals (potential-free) per main-axis	3

Attachments	
Z01 Mating connector M12 male insert with 2 m cable	20201140
Z02 Mating connector M12 female insert with 2 m cable	20202298



