

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)



1

		V27	S8	P	Example						
					T	-R11	+Z	-B10	-E...	-S...	-X
Basic unit											
V27.1	1-axis										
V27	2-axis										
Control-handle extended											
	Standard 95 mm*										
S8	+20 mm										
*Only available in combination with a handle!											
Gate											
P	Cross gate										
P X	Special gate										
Grip / palm grip											
	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 170)										

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

1

		V27	S8	P	T	-R11	+Z	-B10	-E...	-S...	-X
Axis 1 / Axis 2 <i>(not applied for V271)</i>											
Z	Spring return										
R	Friction brake <i>(possible with one axis)</i>										
	Latching:										
11	1-0-1										
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										
Degree of protection											
B10	Joystick-main board sealed (IP67)										
B11	Joystick-main board sealed (IP67) and grip function sealed, grip with drain hole										
<i>For a schematic description of the protection class, see page 150</i>											
Interface <i>(description see on the following pages)</i>											
E0xx	Switching output										
E1xx	Voltage output										
E2xx	Current output										
E3xx	CAN-interface										
E4xx	CANopen Safety interface										
Plug connectors											
S...	Standard plug connectors <i>(see page 149)</i>										
Special model											
X	Special / customer specified										

Combination possibilities with our grips

B1  p. 201	B2  p. 203	B3  p. 178	B5  p. 205	B6  p. 207	B7 B8  p. 199	B9  p. 197	B10  p. 213	B14 B15  p. 215
B20  p. 191	B22  p. 193	B23  p. 189	B24  p. 195	B25  p. 170	B26  p. 172	B28  p. 209	B29  p. 211	B30  p. 176
B31  p. 181	B32  p. 183	B33  p. 185	B34  p. 187	B35  p. 174				

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 ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 149</i>)		
2 Direction signals + 1 zero position signal (galvanically isolated) per axis	1 axis		E001 1
	2 axis		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 ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (grip function) 500 mm long without plug connector
Optional with plug connector (<i>standard plug connectors see page 149</i>)	
0,5...2,5...4,5 V redundant + 2 direction signals per axis	
1 axis	E104 1
2 axis	2
Output options	
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 mm² 500 mm long without plug connector		
	2. cable 14 x 0,25 mm² (optional for grip function) 500 mm long without plug connector		
	Optional with plug connector (standard plug connectors see page 149)		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
Output options			
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!

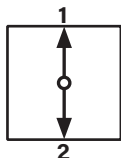
*Axis for grip functions, interface can vary depending upon actuation element!

Voltage output with other value on request!

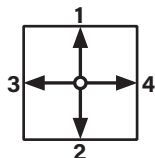
Current output				
Supply voltage	9-32 V DC			
Current carrying capacity	Direction signal 150 mA			
	Zero position signal 500 mA			
Mounting depth A	45 mm (60 mm from 3 axis)			
Wiring	1. cable 14 x 0,25 mm² 500 mm long without plug connector			
	2. cable 14 x 0,25 mm² (optional for grip function) 500 mm long without plug connector			
Optional with plug connector (standard plug connectors see page 149)			S	
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	
			Output options	
			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:

V27.1



V27



CAN	
Supply voltage	9-32 V DC
Idle current consumption	120 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
Baud rate	20 kBit/s to 1 Mbit/s (standard 250 kBit/s)
Output value	255...0...255
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 (standard plug connectors see page 149)
CAN expansion stage 1	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)	
- 2 direction signals per main axis	1
CAN expansion stage 2	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	

CAN expansion stage 3

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

With additional external in-/outputs

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

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

E306 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

With additional analog outputs on request!

CANopen Safety

Supply voltage	9-32 V DC
Idle current consumption	120 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)
Output value	255...0...255
Mounting depth	45 mm (expansion stage 1) 60 mm (expansion stage 2) 80 mm (expansion stage 3)
Protocol	CANopen Safety CIA 304
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 149</i>)

S

CANopen Safety expansion stage 1

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

E404 1

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

- 2 direction signals per main axis

1

CANopen Safety expansion stage 2

- 7 analog joystick axis
- 15 digital joystick functions
- 2 inputs for capacitive sensors

E405 1

With additional external in-/outputs

- 8 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs
- 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs

2

3

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

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

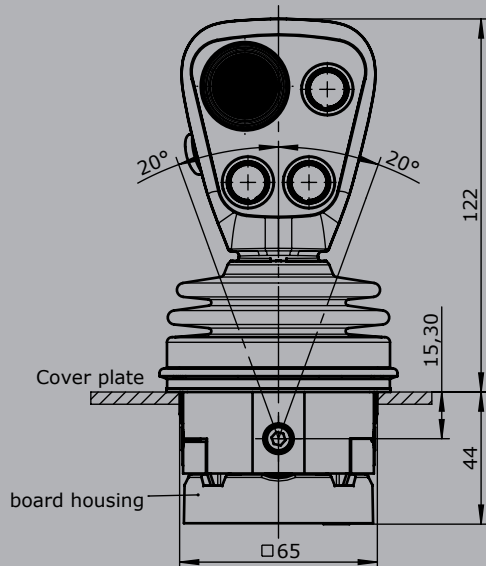
1

CANopen Safety expansion stage 3		E406 1
- 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		2
- 16 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 16 external digital inputs		3
- 24 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 24 external digital inputs		4
- 32 external LED-outputs (dimmable), 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>		
Main-axis with additional digital outputs separately wired (not via CAN)		
- 2 direction signals + 1 zero position signal (potential-free) per axis		3
<i>With additional analog outputs on request!</i>		

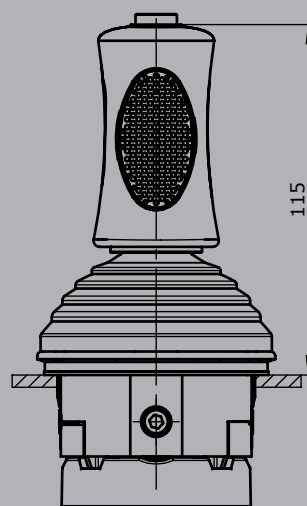
Attachments		
Z01 Mating connector M12 male insert with 2 m cable	20201140	
Z02 Mating connector M12 female insert with 2 m cable	20202298	

Standard
installed from the top

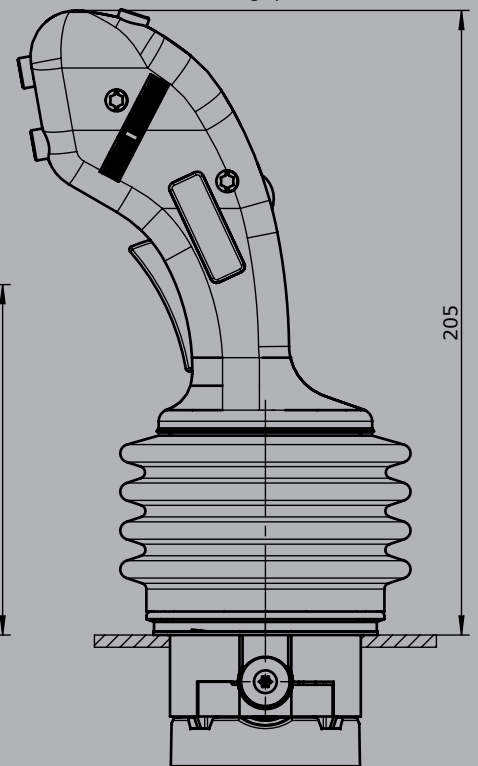
Palm grip B32



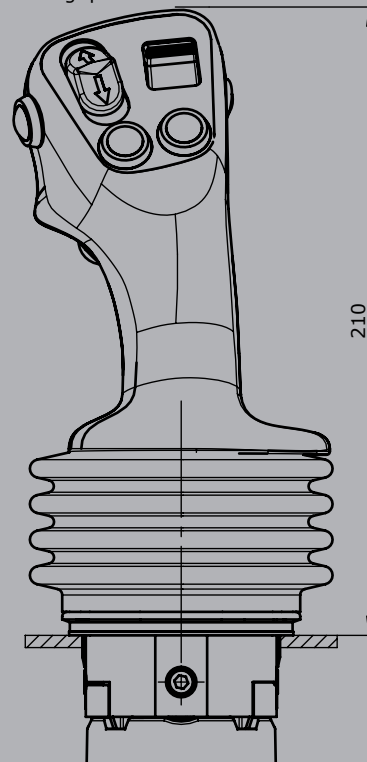
Palm grip B33



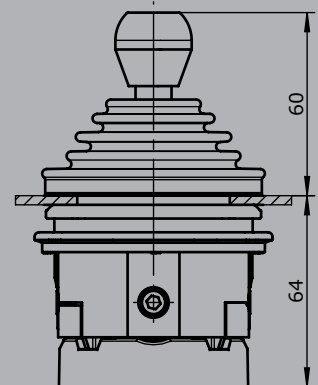
Palm grip B3



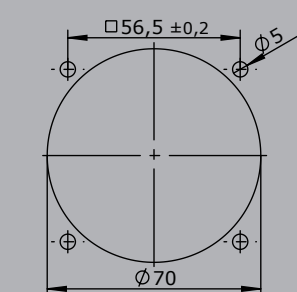
Palm grip B25



handle
installed from below



Hole pattern



Hole pattern
from below

