

Multi-axis controller V85 / VV85



The multi-axis controller V85/VV85 is available in either single-axis or multi-axis options and is a robust controller used commonly in electro-hydraulic applications. With many output options including voltage, amperage and switching contacts and many handle options the V85/VV85 series is hugely customisable. The V85/VV85 is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.



1

Technical data

Mechanical life V85	10 million operating cycles
Mechanical life VV85	20 million operating cycles
Supply voltage	see interface
Operation temperature	-40°C til + 60°C
Degree of protection	IP54
Functional safety	PLd (EN ISO 13849) possible

		VV85	S8	P	Example T	- Z80	+ R11	- B	- E...	- X
Basic unit										
V85.1	1-axis									
V85	2-axis									
Reinforced version										
VV85.1	1-axis									
VV85	2-axis									
Control-handle extended										
	Standard 160mm									
S5	-20mm									
S8	+20mm									
<i>*Only available in combination with grip!</i>										
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 129)									

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

		VV85	S8	P	T	- Z80	+ R11	- B	- E...	- X
Axis 1										
Z	Spring return									
R	Friction brake*									
	Latching:*									
11	1-0-1									
22	2-0-2									
33	3-0-3									
44	4-0-4									
55	5-0-5									
08	end-position latching SR2									
19	1-0-1 + end-position latching SR2									
80	end-position latching SR1									
91	1-0-1 + end-position latching SR1									
88	end-position latching SR1+SR2									
99	1-0-1 + end-position latching SR1+SR2									
*Maximum deflection angle is limited to +/- 25 degree!										
Axis 2 (not applied for V/VV85.1)										
Z	Spring return									
R	Friction brake*									
	Latching:*									
11	1-0-1									
22	2-0-2									
33	3-0-3									
44	4-0-4									
55	5-0-5									
08	end-position latching SR4									
19	1-0-1 + end-position latching SR4									
80	end-position latching SR3									
91	1-0-1 + end-position latching SR3									
88	end-position latching SR3+SR4									
99	1-0-1 + end-position latching SR3+SR4									
*Maximum deflection angle is limited to +/- 25 degree!										
Cover housing										
B	Cover housing (included in basic unit!)									
Interface (description see on the following pages)										
E0xx	Switching output									
E1xx	Voltage output									
E2xx	Current output									
E3xx	CAN-interface									
E4xx	CANOpen Safety interface									
E5xx	Profibus DP-interface									
E6xx	Profinet									
E7xx	Profinet Safe									
Special model										
X	Special / customer-specific									

Multi-axis controller

V85 / VV85

Combination possibilities with our handles

 B1 p. 129	 B2 p. 131	 B3 p. 133	 B5 p. 136	 B6 p. 138	 B7 B8 p. 140	 B9 p. 142	 B10 p. 144	 B14 B15 p. 146
 B20 p. 148	 B22 p. 150	 B23 p. 152	 B24 p. 154	 B25 p. 156	 B28 p. 158	 B29 p. 160		

Digital output

Supply voltage	9-32V DC
Current carrying capacity	Direction signal 150mA Zero position signal 500mA
Mounting depth A	60mm
Wiring	Cable 500mm long with plug connector (male) CPC 17 - 14-pole 2. Cable (for axis 3+4 or grip functions) 500mm long with plug connector (female) CPC17-14-pole

2 Direction signals + 1 zero position signal (galvanically isolated) per axis

1 axis	E001 1
2 axis	2

Voltage output (not stabilized)

Supply voltage	4,75-5,25V DC
Current carrying capacity	Direction signal 8mA
Mounting depth A	60mm
Wiring	Cable 500mm long with plug connector (male) CPC 17 - 14-pole 2. Cable (for axis 3+4 or grip functions) 500mm long with plug connector (female) CPC17-14-pole

Characteristic:  = contra rotating,  = concurrently rotating

0,5...2,5...4,5V redundant + 2 direction signals per axis

1 axis	E104 1	☐
2 axis	2	☐

Voltage output

Supply voltage	9-32V DC (*11,5-32)
Current carrying capacity	Direction signal 150mA Zero position signal 500mA
Mounting depth A	60mm
Wiring	Cable 500mm long with plug connector (male) CDC 17 - 14-pole 2. Cable (for axis 3+4 or grip functions) 500mm long with plug connector (female) CPC17-14-pole

Characteristic:  = contra rotating,  = concurrently rotating

0,5...2,5...4,5V 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...10V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32V DC

1 axis	E132 1	☐
2 axis	2	☐
3 axis*	3	☐
4 axis*	4	☐

10...0...10V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32V DC, sensor redundant with error monitoring and error signal

1 axis	E136 1	
2 axis	2	
3 axis*	3	
4 axis*	4	

Voltage output with other value on request!

Current output

Supply voltage	9-32V DC
Current carrying capacity	Direction signal 150mA Zero position signal 500mA
Mounting depth A	60mm
Wiring	Cable 500mm long with plug connector (male) CPC 17 - 14-pole 2. Cable (for axis 3+4 or grip functions) 500mm long with plug connector (female) CPC17 - 14-pole

0...10...20mA + 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...20mA + 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...20mA + 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...20mA + 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

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

Current output with other value on request!

CAN

Supply voltage	9-32V DC
Idle current consumption	120mA (24V DC)
Current carrying capacity	Direction signal 100mA
	Zero position signal 100mA (potential-free)
	External digital output for LEDs 5mA - 30mA (dependent on the number of LEDs)
	Digital switching output (potential-free) 100mA
Mounting depth A	E3091: 60mm
	E3091X: 85mm
	E3101X - E3103X: 85mm
	E3104X - E3105X: 105mm
Protocol	CANOpen CiA DS 301 or SAE J1939
Baud rate	20kBit/s til 1Mbit/s (standard 250kBit/s)
Output value	255...0...255
Wiring	CAN (IN) cable 500mm with plug connector M12 (male)
	CAN (OUT) cable 500mm with plug connector M12 (female)
	External in-/outputs cable 500mm with plug connector (female) CPC 23-37
	External in-/outputs cable 500mm with plug connector (male) CPC 23-37 (additionally from 32 in-/outputs)

CAN Expansion stage 1

- 7 analog joystick axis
- 16 digital joystick functions
- 1 input for capacitive sensor

with additional external in-/outputs

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

external LED-outputs can be used in the grip for LEDs

**with the use of capacitive sensor, the external digital inputs reduce by one input!*

E309 1 ☐

CAN Expansion stage 2

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

with additional external in-/outputs

- 8 external LED-outputs (dimmable), 1 switching output (potential-free, 100mA), 8 external digital inputs
- 16 external LED-outputs (dimmable), 1 switching output (potential-free, 100mA), 16 external digital inputs
- 24 external LED-outputs (dimmable), 1 switching output (potential-free, 100mA), 24 external digital inputs
- 32 external LED-outputs (dimmable), 1 switching output (potential-free, 100mA), 32* external digital inputs

external LED-outputs can be used in the grip for LEDs

**with the use of two capacitive sensors, the external digital inputs reduce by one input!*

E310 1 ☐

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

- 2 direction signals + 1 zero position contact (potential-free) per main-axis
- 0,5...2,5...4,5V redundant contra rotating + 2 direction signals + 1 zero position signal (potential-free) per main axis
- 4...12...20mA redundant contra rotating + 2 direction signals + 1 zero position signal (potential-free) per main axis

☐

☐

☐

CANopen Safety

Supply voltage	9-32V DC
Idle current consumption	120mA (24V DC)
Current carrying capacity	Direction signal 100mA Zero position signal 100mA (potential-free) External digital output for LEDs 5mA - 30mA (dependent on the number of LEDs) Digital switching output (potential-free) 100mA
Mounting depth A	E4091: 60mm E4091X: 85mm E4101X - E4103X: 85mm E4104X - E4105X: 105mm
Protocol	CANopen Safety CIA 304
Baud rate	20kBit/s til 1MBit/s (standard 250kBit/s)
Output value	255...0...255
Wiring	CAN (IN) cable 500mm with plug connector M12 (male) CAN (OUT) cable 500mm with plug connector M12 (female) External in-/outputs cable 500mm with plug connector (female) CPC 23-37 External in-/outputs cable 500mm with plug connector (male) CPC 23-37, (additionally from 32 in-/outputs)

CANopen Safety Expansion stage 1

- 7 analog joystick axis
- 16 digital joystick functions
- 1 input for capacitive sensor

E409 1 ☐

with additional external in-/outputs

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

2 ☐

3 ☐

**with the use of capacitive sensor, the external digital inputs reduce by one input!*

CANopen Safety Expansion stage 2

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

E410 1 ☐

with additional external in-/outputs

- 8 external LED-outputs (dimnable), 1 switching output (potential-free, 100mA), 8 external digital inputs
- 16 external LED-outputs (dimnable), 1 switching output (potential-free, 100mA), 16 external digital inputs
- 24 external LED-outputs (dimnable), 1 switching output (potential-free, 100mA), 24 external digital inputs
- 32 external LED-outputs (dimnable), 1 switching output (potential-free, 100mA), 32* external digital inputs

2 ☐

3 ☐

4 ☐

5 ☐

external LED-outputs can be used in the grip for LEDs

**with the use of two capacitive sensors, the external digital inputs reduce by one input!*

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

- 2 direction signals + 1 zero position contact (potential-free) per main-axis
- 0,5...2,5...4,5V redundant contra rotating + 2 direction signals + 1 zero position signal (potential-free) per main axis
- 4...12...20mA redundant contra rotating + 2 direction signals + 1 zero position signal (potential-free) per main axis

3

4

5

Profibus DP

Supply voltage	18-30V DC
Baud rate	til 12MBit/s
Output value	0...128...255
Mounting depth A	105mm
Wiring	Profibus, cable 100mm with plug connector D-Sub 9
	Power supply (contact wiring) cable 500mm with plug connector CPC 13-9 (male)
	external in-/outputs, cable 500mm with plug connector CPC 23-37 (female)

Profibus DP

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

with additional external in-/outputs

- 8 external LED-outputs, 8 external digital inputs
- 16 external LED-outputs, 16 external digital inputs

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

E501 1 ☐

2 ☐

3 ☐

Main-axis with additional contact equipment separately wired (not via profibus)

- 2 direction contacts + 1 zero position contact (not potential-free) per main-axis
- 1 zero position contact (potential-free) per main-axis

1 ☐

2 ☐

Profinet

Supply voltage	18-30V DC
Baud rate	til 12MBit/s
Output value	0...512...1023
Mounting depth A	85mm
Wiring	Profinet (1), cable 300mm with M12 plug connector (female)
	Profinet (2), cable 300mm with M12 plug connector (female)
	Power supply (contact wiring) cable 500mm with plug connector CPC 17-14 (male)
	External in-/outputs, cable 500mm with plug connector CPC 23-37 (female)

Profinet

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

with with additional external in-/outputs

- 8 external LED-outputs, 8 external digital inputs
- 16 external LED-outputs, 16 external digital inputs

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

E601 1 ☐

2 ☐

3 ☐

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

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

3 ☐

Profinet Safe

Supply voltage	18-30V DC		
Baud rate	til 12MBit/s		
Output value	0...512...1023		
Mounting depth A	85mm		
Wiring	Profinet (IN), cable 300mm with M12 plug connector (female)		
	Profinet (OUT), cable 300mm with M12 plug connector (female)		
	Power supply (contact wiring) cable 500mm with plug connector CPC 17-14 (male)		
	External in-/outputs, cable 500mm with plug connector CPC 23-37 (female)		
- 4 analog joystick axis		E701 1	☐
- 16 digital joystick functions			
- Input for capacitive sensor			
<i>external LED-outputs can be used in the grip for LEDs</i>			
with with additional external in-/outputs			
- 8 external LED-outputs, 8 external digital inputs		2	☐
- 16 external LED-outputs, 16 external digital inputs		3	☐
Main-axis with additional signals separately wired (not via profinet safe)			
- 2 direction signals + zero position signal (potential-free) per main-axis			☐

Other outputs

Voltage output for PVG32 0,25...0,5...0,75Us, power supply 12V DC			
Wiring:	Cable 500mm long with plug CPC 17-14 (male)		
	1 axis	E902 1	☐
	2 axis	2	☐
	3 axis	3	☐
	4 axis	4	☐
Main-axis with additional direction contacts			
			☐
Voltage output for PVG32 0,25...0,5...0,75Us, power supply 12V DC			
Wiring:	Cable 500mm long with plug CPC 17-14 (male)		
	1 axis	E906 1	☐
	2 axis	2	☐
	3 axis	3	☐
	4 axis	4	☐
Main-axis with additional direction contacts			
			☐
8 Bit Gray-Code with direction signals per main-axis, supply voltage 9-36V DC			
Wiring:	1 Cable 500mm with plug CPC 23-37 (female) axis 1-2		
	1 Cable 500mm with plug CPC 23-37 (male) axis 3-4		
	1 axis	E903 1	☐
	2 axis	2	☐
	3 axis	3	☐
	4 axis	4	☐

Multi-axis controller

V85 / VV85

8 Bit Binär-Code with direction signals per main-axis, supply voltage 9-36V DC

Wiring: 1 cable 500mm with plug CPC 23-37 (female) axis 1-2
 1 cable 500mm with plug CPC 23-37 (male) axis 3-4

1 axis	E904 1
2 axis	2
3 axis	3
4 axis	4

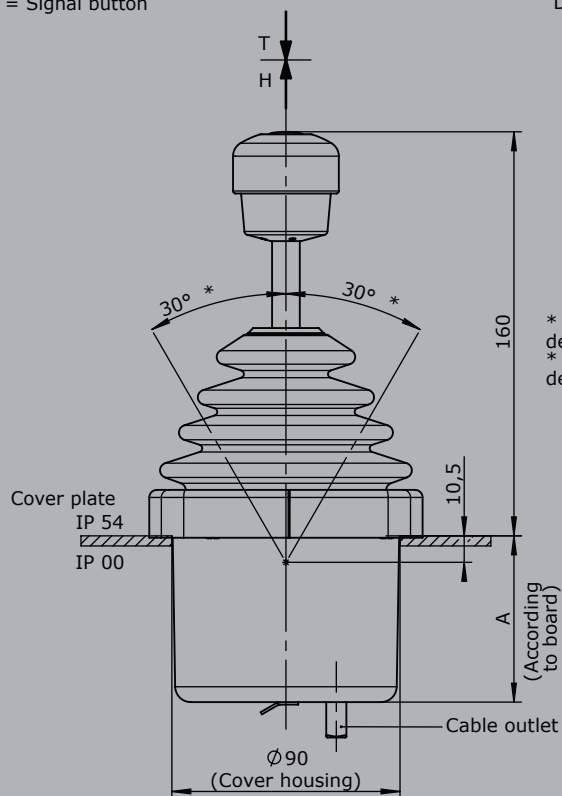
Attachments

Mating connector AMP CPC 17 14-pole (male insert)	5300000209
Mating connector AMP CPC 17 14-pole (male insert) with 2m cable	5300000210
Mating connector AMP CPC 17 14-pole (female contact)	5300000211
Mating connector AMP CPC 17 14-pole (female contact) with 2m cable	5300000213
Mating connector AMP CPC 23 37-pole (male insert)	5300000214
Mating connector AMP CPC 23 37-pole (male insert) with 2m cable	5300000215
Mating connector AMP CPC 23 37-pole (female contact)	5300000216
Mating connector AMP CPC 23 37-pole (female contact) with 2m cable	5300000217
Mating connector (CAN) M12 (male insert) with 2m cable	20201140
Mating connector (CAN) M12 (female contact) with 2m cable	20202298
Mating connector (Profibus) straight	22201440
Mating connector (Profibus) 90° angled	22201741
Mating connector (Profinet) M12 (male insert) with 2m cable	5300000222

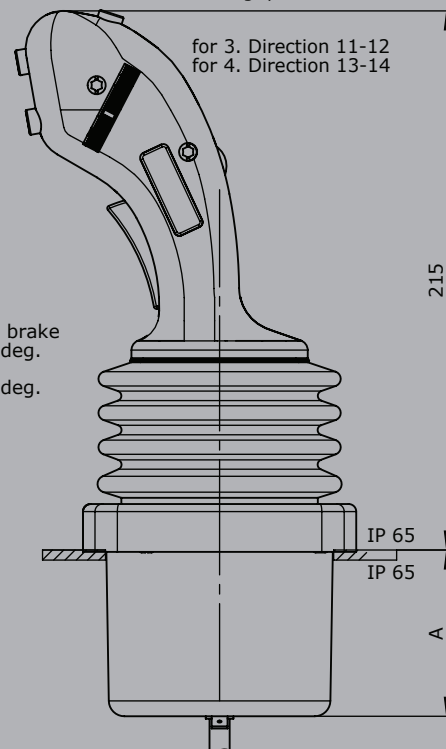
T = Dead man's button
H = Signal button

Knob solid
D = Push button

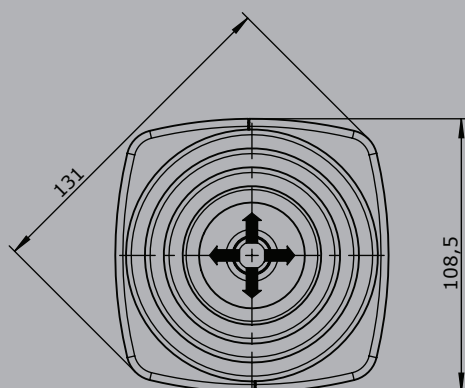
Palm grip B3



* Type with friction brake
deflection max. 25 deg.
* Type with detent
deflection max. 25 deg.



Palm grip B25



Hole pattern

