

ZED servo drive



ZED drive

Feature	Unit	SD02-065
Nominal Voltage	VDC	48
Min. Voltage	VDC	18
Max. Voltage	VDC	80
Power Rating	W	2000
Rated Current	Arms *	45
Peak Current	Arms *	135
Feedback		AqB + Halls, Absolute single turn, Absolute multi turn
Communication		EtherCAT
		USB
IP Rating		IP20
Digital Inputs		Home, limit CW, limit CCW ...tbd
Digital Outputs		... tbd
Environmental		Ambient: -30 to 45°C (0 – 70°C storage) Operation at higher temperature with reduced power Humidity: 10-90% Altitude: <2,000 m (per IEC 61800-5-1)
Dimensions	mm	125 x 85 x 47

Note: *

The specified current applies to nominal voltage.

Control

Feature	Specification	
Operation Modes	Selectable	Profile position Profile velocity Homing Cyclic synchronous velocity
Display		LEDs
Software Tools	User Interface	GUI, Windows-based
	Functions	Connection settings, Drive info, Power info, I/O configuration, Motion settings and tuning, Fault history/display

Communication

Feature	Specification
CANopen	CANopen – CiA 301 application layer and CiA 402 device profile for drives and motion control. Baud rate 10 kbps – 1 Mbps CAN ID 1 – 127 (Default 127) Heartbeat producer, SDO, PDO (dynamic mapping)
EtherCAT	CANopen – CiA 301 application layer and CiA 402 device profile for drives and motion control. Communication cycle time: up to 250 µs

Protection

Feature	Specification
Protective Functions	I2T limit, Over-voltage, Over-current, Under-voltage, Drive over-temperature, Over-speed, Velocity error, Position error, Power stage fault, PLL lock lost, Position command error

Functional Safety

Feature	Specification
STO	STO - Safe Torque Off according to EN 61800-5-2, SIL 3/PL e, CAT 3

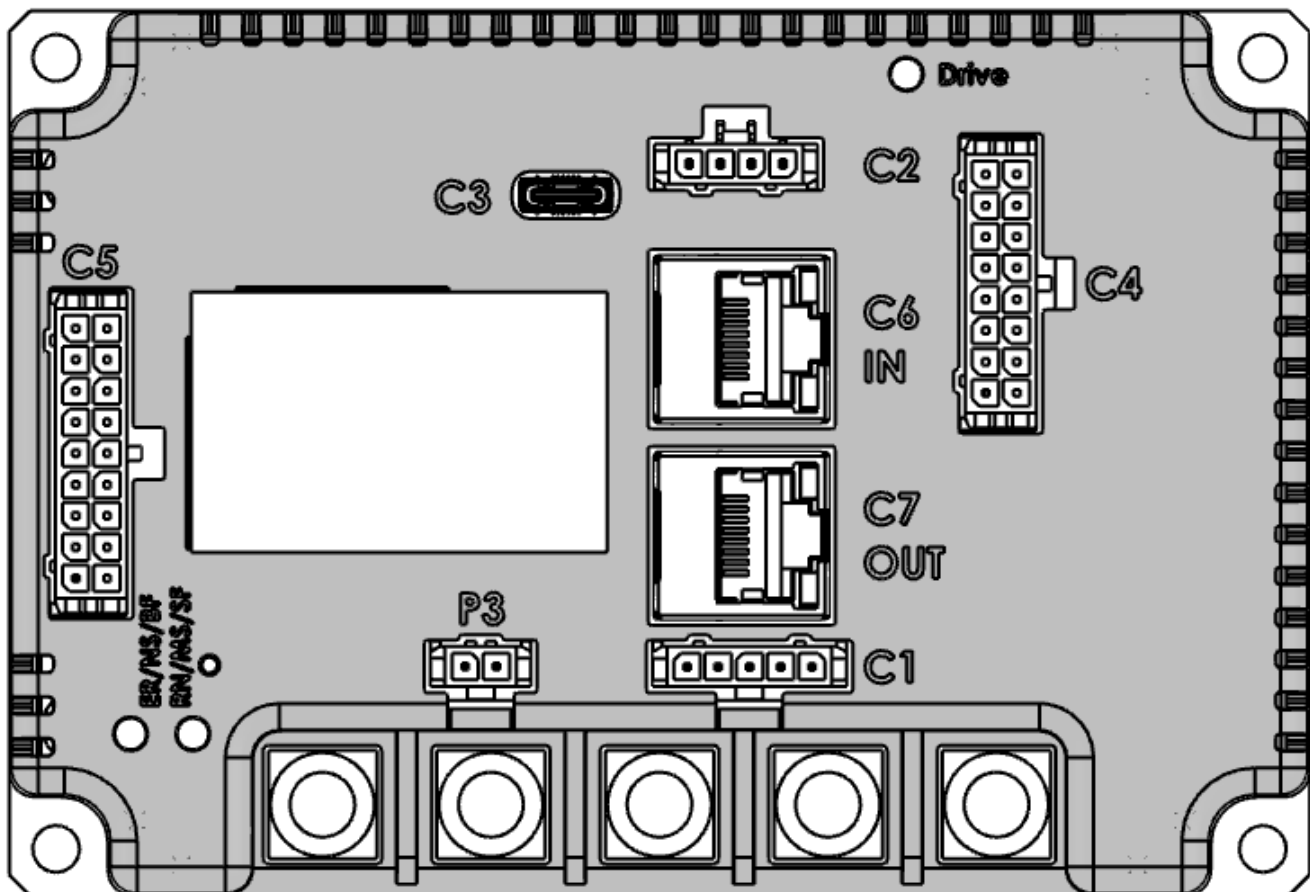
Inputs/Outputs

Feature	Specification	
4 x Digital Input	Signal	Configurable opto-isolated, sink/source, Type 1
	Functions	Multi-functional - Home switch - Positive limit switch - Negative limit switch - User (User (user can read the input, no functionality is triggered))
	Voltage High Level Input	30 V
	Min. High Level Input	11 V
	Max. Low Level Input	5 V
	Input Resistance	3.6 k Ω
	Max. Input Frequency	5 kHz
	Propagation Delay Time	200 μ s
	Insulation voltage	3750 Vrms
2 x Digital Output	Signal	Configurable open collector, opto-isolated sink/source
	Functions	Multi-functional - None - User (user can control the output, no functionality is connected) - Drive is disabled - Drive is enabled
	Voltage	30 V
	Max. Current	100 mA
	Min. Load Resistance	300 Ω
	Output Voltage	2 V
	Min. Propagation Delay Time	1 ms (may be longer if load current is lower)
1 x Analog IN	Voltage input	0-10V single ended -5 to +5 V differential
	Input resistance	7 k Ω
	Frequency bandwidth	50 kHz
	Deviation	1%-2%
	Resolution	12 Bit

Electrical Interfaces

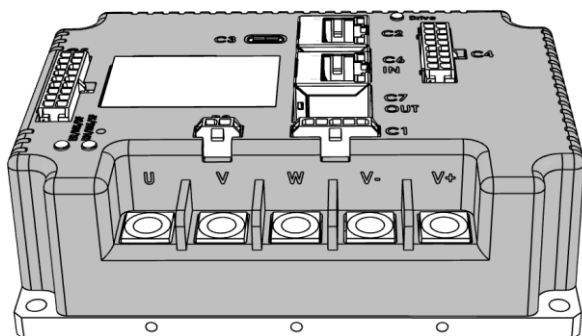
LED's

One bi-color LED to display the drive status and two LEDs to display the field bus status



LED	Signal Description
Drive	Indicates whether the drive is in failure state (red) or is ready to enable the motor (green) or immediately after power up and before application firmware starts running (orange)
ER/NS/BF	Fieldbus Error indicator
RN/MS/SF	Fieldbus RUN indicator

Power and Motor connectors



Pin #	Signal Description	Cable Lug hole
U	Motor Phase	M6
V	Motor Phase	M6
W	Motor Phase	M6
V -	Power Supply -	M6
V +	Power Supply +	M6

Permitted Torques

The power connectors provide a wide area connection and carrying of high currents in circuit board. To prevent mechanical destruction of the power connectors the maximum permissible torques must be complied with! Due to the material, these differ significantly from standard fastening materials (steel) used.

Thread dimension	Unit	M6
Max. tightening torque	Nm	7.5 ±4%
Breaking torque *	Nm	15

*Determined values (torques). For these mechanical loads, destruction of the threaded shank occurs. The component must never be loaded up to these values.

Included in scope of delivery

Screw: Pan-head screws with TORX drive (Tx30) M6x12, Grade 4.8 Steel – galvanized

Washer: Locking edge rings, VSK= standard version SPRING STEEL - DACROMET-silvery, M6

C3 – USB C



Only use USB during commissioning

The USB interface may only be used during commissioning and not as a process interface in an application.

For correct operation, a short USB cable (<3m) and proper installation and earthing of the servo controller is required.

P3 – Motor Brake

Interface	Item	Manufacturer	Manufacturer Part Number
	On drive	Molex	436500215 - Micro-Fit 3.0 Vertical Header, 3.00mm Pitch, Single Row, 2 Circuits
	Mating connector	Molex	436450200 - Micro-Fit 3.0 Receptacle Housing, Single Row, 2 Circuits 430300001 - Micro-Fit 3.0 Crimp Terminal, Female

Pin #	Signal Description
1	Brake
2	Brake

C1 – STO

Interface	Item	Manufacturer	Manufacturer Part Number
 	On drive	Molex	436500516 - Micro-Fit 3.0 Vertical Header, 3.00mm Pitch, Single Row, 5 Circuits
	Mating connector	Molex	436450500 - Micro-Fit 3.0 Receptacle Housing, Single Row, 5 Circuits 430300001 - Micro-Fit 3.0 Crimp Terminal, Female

Pin #	Signal Description	Signal Description Safe-Version
1	STO_1	ANA IN +
2	NC	ANA IN -
3	STO_2	ANA_GND
4	NC	OUT_COM
5	STO_GND	OUT_1

C2 – 24VDC Brake and Aux

Interface	Item	Manufacturer	Manufacturer Part Number
 	On drive	Molex	436500416 - Micro-Fit 3.0 Vertical Header, 3.00mm Pitch, Single Row, 4 Circuits
	Mating connector	Molex	436450400 - Micro-Fit 3.0 Receptacle Housing, Single Row, 4 Circuits 430300001 - Micro-Fit 3.0 Crimp Terminal, Female

Pin #	Signal Description
1	24/48VDC Brake
2	GND_Brake
3	GND_Logic
4	24/48VDC Logic *

* must always be connected

C4 – Digital I/O

Interface	Item	Manufacturer	Manufacturer Part Number
 	On drive – 16 pin	Molex	430451613 - Micro-Fit 3.0 Vertical Header, 3.00mm Pitch, Dual Row, 16 Circuits
	Mating connector	Molex	430251600 - Micro-Fit 3.0 Receptacle Housing, Dual Row, 16 Circuits 430300001 - Micro-Fit 3.0 Crimp Terminal, Female

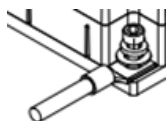
Pin #	Signal Description	Signal Description Safe-Version
1	Out_1	IN_4
2	IN_4	IN_2
3	IN_3	
4	IN_2	Safe_IN_6
5	IN_1	Safe_IN_4
6	nc	Safe_IN_2
7	nc	CLK_Test_2
8	ANALG +	Safe_GND
9	OUT_2	IN_3
10	OUT_COM	IN_1
11	nc	IN_COM
12	IN_COM	Safe_IN_5
13	nc	Safe_IN_3
14	nc	Safe_IN_1
15	ANALG -	CLK_Test_1
16	GND	Safe_24VDC

C5 – Feedback

Interface	Item	Manufacturer	Manufacturer Part Number
 	On drive – 18 pin	Molex	430451812 - Micro-Fit 3.0 Vertical Header, 3.00mm Pitch, Dual Row, 16 Circuits
	Mating connector	Molex	430251800 - Micro-Fit 3.0 Receptacle Housing, Dual Row, 18 Circuits 430300001 - Micro-Fit 3.0 Crimp Terminal, Female

Pin #	Incremental AqB + Halls	SSI	DRMF
1	A+		ENC1 CLK-
2	B+		ENC1 DATA-
3	Z+		GND
4		SSI_CLK-	ENC2 DATA-
5		SSI_DATA-	ENC2 CLK-
6	HALL-W		
7	HALL-V		GND_Temp
8	GND_Temp	GND_Temp	
9		5V_ENC	
10	A-		ENC1 CLK+
11	B-		ENC1 DATA+
12	Z-		GND
13		SSI_CLK+	ENC2 DATA+
14		SSI_DATA+	ENC2 CLK+
15	GND	GND	
16	HALL-U		
17	Mot_Temp	Mot_Temp	Mot_Temp
18	5V_ENC	5V_ENC	5V_ENC

Shield to PE on heat sink



C6 – Field bus IN – EtherCAT

Rj45 8 pin, Amphenol RJHSE5387



Pin # RJ45 – 8pin	EtherCAT
1	ECAT_OUT_Tx+
3	ECAT_OUT_Rx+
2	ECAT_OUT_Tx-
6	ECAT_OUT_Rx-

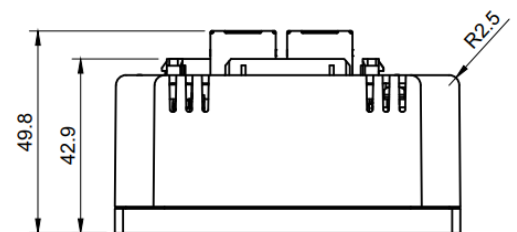
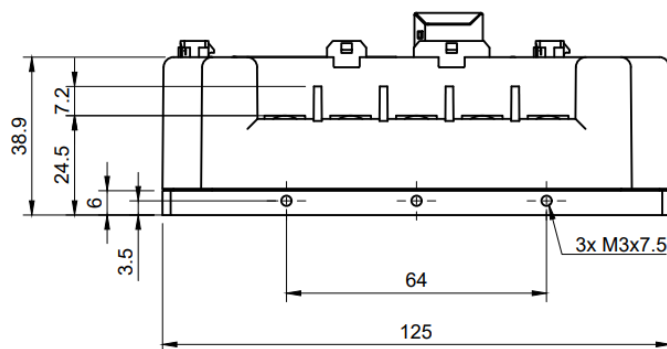
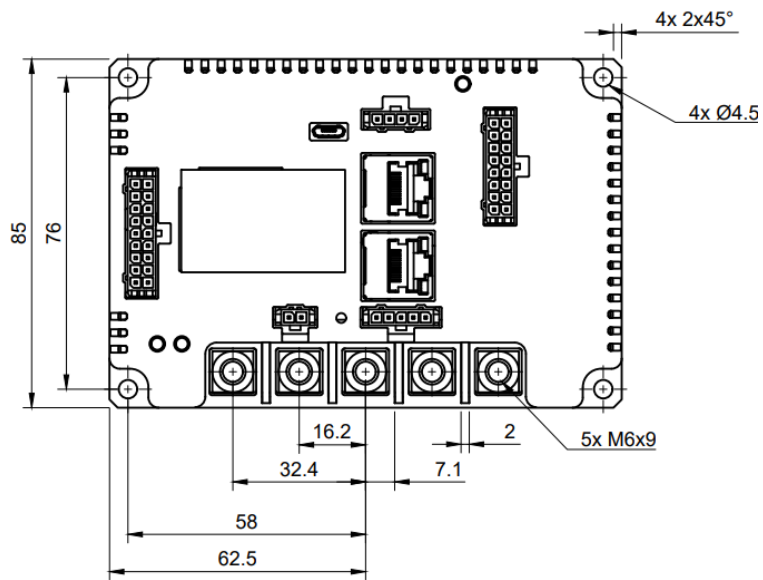
C7 – Field bus OUT – EtherCAT

Rj45 8 pin, Amphenol RJHSE5387



Pin # RJ45 – 8pin	EtherCAT
1	ECAT_OUT_Tx+
3	ECAT_OUT_Rx+
2	ECAT_OUT_Tx-
6	ECAT_OUT_Rx-

Dimensions



Ordering Information

	SD02	-	065	1D	AB	EC	-	000
	ZED SD02 Single-Axis Servo Drive							
	Rating – Cont. Current, Peak Current							
065	45 Arms, 135 Arms peak @ nominal 48 VDC							
	Power							
1D	Bus 24/48 VDC, Logic 24/48 VDC							
	Feedback							
AB	Incremental AB quadrature, index, Halls							
	Absolute Single turn/ Absolute Multi turn							
	Communication							
CO	CANopen (not available yet)							
EC	EtherCAT							
ES	FSOE (FailSafe over EtherCAT) – Safe Version							
	Options							
000	Standard							