PHOX Series

Servo Drive Designation

PHOX	-	03	080	N	S	AA
Model Name		Output Cunent	Input Power Supply	Communication	Encoder Type	Option
PHOENIX Series		03:3A 06:6A	A: 3000[rpm]	N: EtherCAT	S: SIN/COS R: Resolver	Exclusive Option Code

Note1] Additional selection option, on selecting the dual encoder

Low Voltage DC Drive **PHOX**

Real-time control through EtherCAT

- High speed, Real-time capability and Synchronization mechanism
- Supports CoE, EoE and FoE
- Improved Speed Response(≒1kHz) Frequency
- Improved communication speed by applying 16bit-bus
  - Improved Chip communication speed
  - Improved EtherCAT communication speed

Variable Switching Frequency

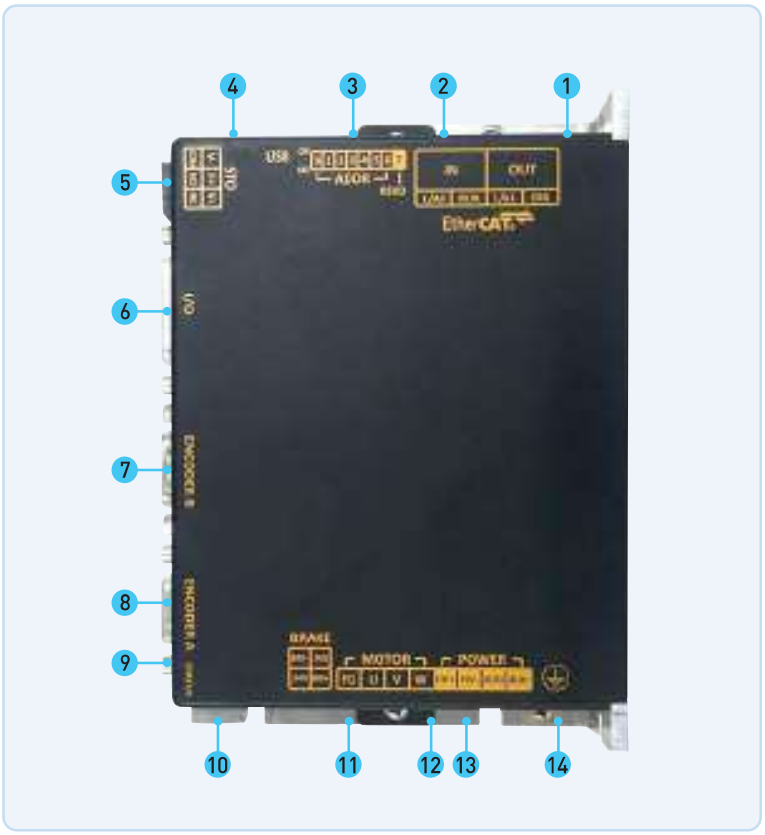
- 16 / 32 / 48kHz

Fully-Closed Loop Control

- Switch among Semi-Closed Loop Control, Fully-Closed Loop Control and Dual Feedback Control
- Fully-Closed Loop Control provides quick response with internal and external encoder position values
- Fully-Closed Loop Control ensures high-precision control during machine operation

Progamming function including single-axis position module

- Positioning control mode with pulse inputs
- Provides position control through I/O or HMI without the position control module
- Supports the indexing mode



1. EtherCAT OUT
2. EtherCAT IN
3. Switch for node address setting
4. Mini B USB
5. STO Connector
6. IO Connector
7. Encoder B Connector
8. Encoder A Connector
9. Status LED
10. Brake Connector
11. DC Reactor Connector (PO, PI)
12. Master Power Connector (HV+, HV-)
13. Auxiliary Power Connector (AUX+, AUX-)
14. Ground

PHOX Series

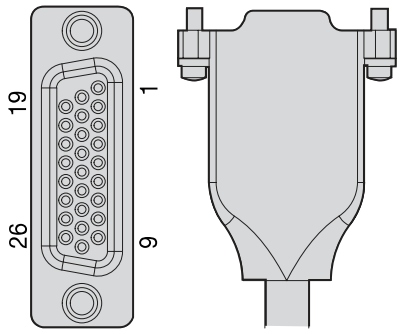
Item \ Type Name		DC 3A	DC 6A
Input Power	Main Power Supply	DC 24~80[V] Note1)	
	Control Power Supply	DC 24~80[V] Note1)	
Rated Current[A]		3	6
Peak Current[A]		9[A] → 1[sec]	18[A] → 1[sec]
1st Encoder Encoder A		*Quadrature(Max. 10Mpps after X 4) - With and without halls, Differential *Serial Encoder(absolute, incremental) - BiSS(B,C), Endat2.2, Tamagawa Serial, SSI	
2nd Encoder Encoder B Note2)		*Quadrature(Max. 10Mpps after X 4) - Without halls, Differential *Serial Encoder(absolute, incremental) - BiSS(B,C), Endat2.2, Tamagawa Serial, SSI *Analog Encoder - Sinusoidal(1Vpp), Analog hall(Sin/Cos) - Resolver(Optional)	
Control Performance	Speed Control Range	Maximum 1: 5000	
	Frequency Response	Maximum 1 [kHz] or above (When using 19bit Serial Encoder)	
	Speed Variation Ratio	±0.01 [%] or lower [when load changes between 0 and 100%] ±0.1[%] or lower [temperature 25 ±10°C]	
	Torque Control Repetition Accuracy	Within ±1%	
	Input Frequency	4[Mpps], Lind Drive	
	Input Pulse Method	Symbol + Pulse series, CW+CCW, Phase A/B	
EtherCAT Communication Specifications	Communication Standard	FoE (Firmware download) EoE (Parameter setting by UDP, Tuning, Secondary function, Parameter copy) CoE (IEC 61158 Type12, IEC 61800-7 CIA 402 Drive profile)	
	Physical Layer	100BASE-TX(IEEE802.3)	
	Connector	RJ45 x 2	
	Communication distance	Within connection between nodes 100[m]	
	DC(Distributed Clock)	By DC mode synchronism. minimum DC cycle: 250[us]	
	LED Display	LinkAct IN, LinkAct OUT, RUN, ERR	
	Cia402 Drive Profile	Profile Position Mode, Profile Velocity Mode, Profile Torque Mode, Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode, Cyclic Synchronous Torque Mode, Homing Mode	
Digital Input / Output	Digital Input	Total 4 input channels(allocable) Total 33 functions can be used selectively for assignment (*POT, *NOT, *HOME , * STOP, PCON, GAIN2, P_CL, N_CL, PROBE1P, ROBE2, EMG, A_RST, SV_ON, START, PAUSE, REGT, HSTART, ISEL0~5, ABS_RQ, JSTART, JDIR, PCLR, AOVR, INHIB ,SPD1, SPD2, SPD3, MODE)	
	Digital Output	Total 4 input channels(allocable) Total 33 functions can be used selectively for assignment (*BRAKE, *ALARM, *READY, *ZSPD, INPOS1, INPOS2, TLMT, VLMT, INSPD, WARN, TGON, ORG, EOS, IOUT0, IOUT1, IOUT2 IOUT3, IOUT4, IOUT5)	
Analog Input / Output	Analog Input	Input Voltage Range Differential ±10[V](16bit resolution) Setting torque limit value with 1 channel analog voltage	
	Analog Output	Total 2 channels(allocable) Total 15 outputs can be used selectively for assignment	
Safety Function		2 input channels(STO1, STO2)	
Encoder Output Type		A0(+/-), B0(+/-), Z0(+/-) (Line drive output max. 6.4Mpps)	
USB Communication	Function	Firmware download, parameter setting, tuning, auxiliary function,parameter copy	
	Communication Standard	Complies with USB 2.0 Full Speed Specifications	
	Connect	PC or USB storage media	
Internal Function	Self-setting Function	Drive node address can be set using dip switch	
	Additional Function	Gain tuning, alarm history, JOG operation, origin search	
	Analog Output	Excessive current/voltage/overload/overheating/speed, excessive current limit, low voltage, encoder/position following/current sensing fail	
Operation Environment	Operating Temperature / Storage Temperature	0 ~ 50[℃] / -20 ~ 65 ℃	
	Operating Humidity / Storage Humidity	Below 80[%]RH / Below 90[%]RH(avoid dew-condensation)	
	Environment	Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.	

Note 1) Low voltage motor 3000rpm available at 48V input Note 2) Available when full-closed function is applied

PHOX Series I/O and Encoder PIN Map

I/O Connector

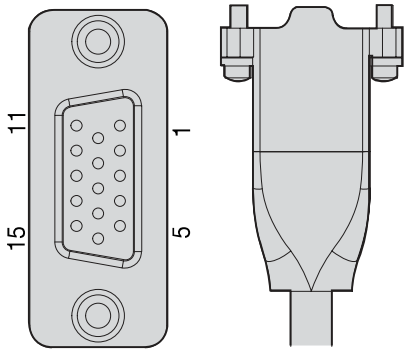
10090769-P264ALF



PIN No.	Signal	PIN No.	Signal	PIN No.	Signal	PIN No.	Signal
1	PF+	8	AMON1	15	DO1	22	/BO
2	PF-	9	AMON2	16	DO2	23	ZO
3	PR+	10	DICOM	17	DO3	24	/ZO
4	PR-	11	DI1	18	18 DO4	25	DOCOM
5	AGND	12	DI2	19	AO	26	AGND
6	AI+	13	DI3	20	/AO		
7	AI+	14	DI4	21	BO		

Encoder A Connector

10090769-P154ALF

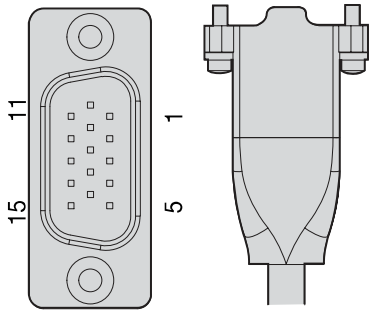


PIN No.	Encoder Quad	BISS	SS	ENDAT	TAMAQAWA
1	Z+	-	-	-	-
2	Z-	-	-	-	-
3	GND	GND	GND	GND	GND
4	N.C	-	-	-	-
5	5V	5V	5V	5V	5V
6	GND	GND	GND	GND	GND
7	A-	SL-	DATA-	RC-/DV-	TXD-/RXD-
8	A+	SL+	DATA+	RC+/DV+	TXD-/RXD+
9	-	-	-	-	-
10	*MOT	*MOT	*MOT	*MOT	*MOT
11	B-	MA-	CLK-	CLK-	-
12	B+	MA+	CLK+	CLK+	-
13	-	-	-	-	-
14	-	-	-	-	-
15	-	-	-	-	-

PHOX Series I/O and Encoder PIN Map

Encoder B Connector

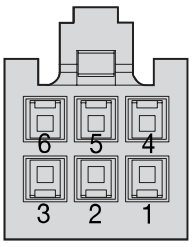
10090770-S154ALF



PIN No.	Encoder Quad	BISS	SS	ENDAT	TAMAQAWA	SIN/COS	RESOLVER
1	Z+	-	-	-	-	-	-
2	Z-	-	-	-	-	-	-
3	GND	GND	GND	GND	GND	GND	GND
4	-	N.C	-	-	-	-	-
5	5V	5V	5V	5V	5V	5V	5V
6	-	-	-	-	-	REF-	EXT-
7	A-	SL-	DATA-	RC-/DV-	TXD-/RXD-	-	-
8	A+	SL+	DATA+	RC+/DV+	TXD-/RXD+	-	-
9	-	-	-	-	-	SIN-	SIN-
10	*MOT	*MOT	*MOT	*MOT	*MOT	*MOT	*MOT
11	B-	MA-	CLK-	CLK-	-	-	-
12	B+	MA+	CLK+	CLK+	-	-	-
13	-	-	-	-	-	REF+	EXT+
14	-	-	-	-	-	COS-	COS-
15	-	-	-	-	-	COS+	COS+

STO Connector

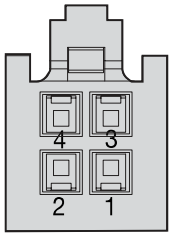
IPD1-03-D-K



PIN No.	Signal	Description
1	COM	Common(24 GND)
2	STO2	Current(torque) supplied to the motor is cut off during the signal OFF
3	STO1	Current(torque) supplied to the motor is cut off during the signal OFF
4	V-	DC -12V(Wiring Bypass)
5	V+	DC -12V(Wiring Bypass)
6	V+	DC -12V(Wiring Bypass)

BRAKE Connector

IPD1-02-D-K



PIN No.	Signal	Description
1	24V	Brake 24V Input
2	BRK+	Brake 24V Output
3	BRK-	Brake (1A)
4	24G	24V Return

External Dimensions

PHOX Series

*Unit [mm]