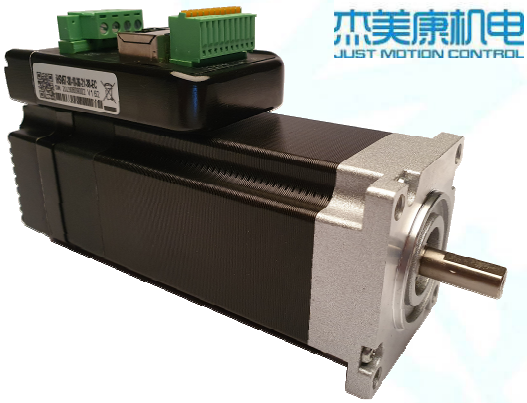
iHSV57-XX-EC

Integrated AC Servo Motors with EtherCAT interface



1. Features:

- High positioning accuracy
- High torque
- Cost-effective servomotor solution
- Smooth and very low noise
- Compact Size
- Support of the standard EtherCAT protocol
- Support of the standard CIA402 protocol
- Built-in acceleration and deceleration control to improve smoothness when starting and stopping
- Integrated CW, CCW and HW signal inputs (5 V ~ 24 V) for limit values and zero reference
- Alarm and In-position Output signal
- Built-in brake supply circuit
- RJ45 standard network connection, the slave stations can be connected via a twisted pair network cable
- High compatibility, can communicate with common brands of PLC controllers, such as: Beckhoff, Omron, Panasonic, Keyence, Inovance, etc.

2. Description:

The iHSV-XX-EC is an integrated EtherCAT AC servo motor. It uses the standard CoE communication protocol and has an integrated CIA402 motion control protocol for cycle synchronization position (CSP), cycle synchronization velocity (CSV) and cycle synchronization torque (CST), contour position (PP), contour velocity (PV), contour torque (PT) and homing mode (HM). The optimized PID control algorithm achieves complete digital control of position, speed and torque. Compared with the combination of conventional servo driver and servo motor, the cost is lower, the installation is more convenient, the vibration of the motor is greatly reduced, and the high-speed performance of the motor is improved. 3 digital signal inputs for reference, positive and negative limit, as well as sensor function and 2 digital signal outputs for in-position signal and alarm signal.

3. Applications:

The iHSV57-XX-EC can be used in various applications, such as laser cutting machines, laser markers, high-precision XY tables, labeling machines, CNC milling machines, etc. Due to their unique characteristics, the iHSV57-XX-EC are the ideal choice for applications that require smooth motor operation at low speeds, high torque even at higher speeds and small installation space.

4. Naming Rules:

iHSV	-	57	-	30	-	10	-	36	-	XX	-	XX	-	EC
1		2		3		4		5		6		7		8

1. integrated servo motor
2. motor frame size: 57 mm
3. motor speed (unit: x 100 min-1) 10 ≙ 1000 min-1, 20 ≙ 2000 min-1, 30 ≙ 3000 min-1
4. output power (unit: x 10 W) 14 ≙ 140 W; 18 ≙ 180 W
5. rated voltage: 24 ≙ 24 V, 36 ≙ 36 V, 48 ≙ 48V
6. shaft length: no number = 33 mm, 30 = 30 mm, 21 = 21 mm
7. centering diameter: no number = 25.4 mm, 38 = 38.1 mm
8. control: EC≙ EtherCAT

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5. Electrical Specification:

Parameter	Min	Typical	Max	Unit
Input Voltage	20	36	50	VDC
Communication Prot.	EtherCAT Protocol			
Maximum Communication Distance	100			m
Maximum number of slave stations supported	65535			
Protection	I²t Integral limit load 300% 3 sec.			

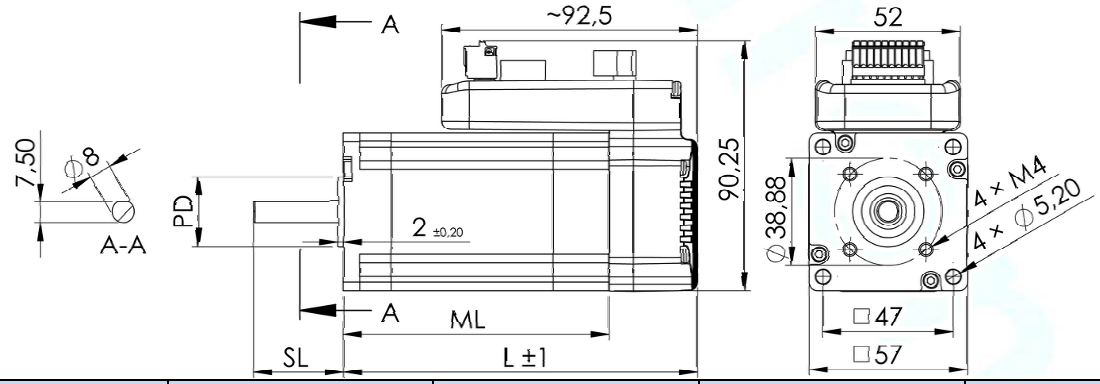
6. Motor Specification:

Name:	iHSV57-30-14-XX-EC	iHSV57-30-18-XX-EC			Unit
Rated Power	140	180			W
Rated Torque	0.44	0.57			N·m
Rated RPM	3000	3000			min^{-1}
Maximum RPM	3000	3000			min^{-1}
Rated Voltage	36	36			V
Rated Current	5.4	7.5			A
Weight	1.3	1.6			kg

7. Environment:

Cooling	Natural or forced cooling	
Working environment	Environment:	Avoid oil, dust and corrosive gases
	Operating temperature	0℃ ─ 70℃
	Humidity	40 %RH ─ 90 %RH
	Temperature	max. 70℃
Storage temperature	-20℃ ─ 80℃	

8. Mechanical Specification:



Name:	Motor Length ML	Total Length L	Shaft Length SL	Pilot Diameter PD
iHSV57-30-14-36-EC	96 mm	128 mm	33 ± 0.5 mm	25,4 mm
iHSV57-30-18-36-EC	116 mm	148 mm	33 ± 0.5 mm	25,4 mm

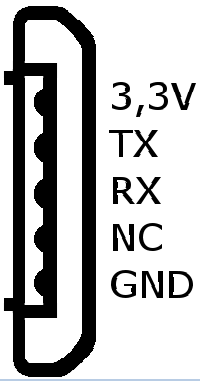
9. Connectors and Pin assignment

The iHSV57-XX-EC have 5 Connectors:

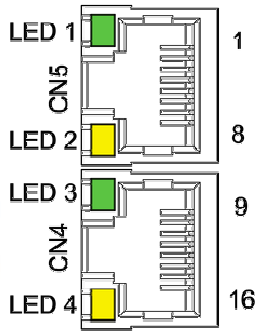
- one for the power supply
- one for control signals
- one micro USB (CN6) for RS232 communication
- two RJ45 connections (CN4, CN5) for EtherCAT communication.

Power Supply Connector		
Pin	**Name**	**Description**
1	**DC+**	Power supply 20 - 36 V DC is recommended in order to leave room for voltage fluctuations and reverse currents (back-EMF) during the deceleration of the motor.
2	**GND**	
3	**BK+**	Input voltage 24V for brake on models with SC in the type designation, not necessary for motors without brake.
4	**BK-**	

Control Signal Connector			
Pin	**Name**	**I/O**	**Description**
1	**COM**	**I**	Common connection +24V or GND (see 13. Typical connection types)
2	**CW-**	**I**	Limit position Limit switch Clockwise direction of rotation
3	**HW+**	**I**	Reference switch
4	**CCW+**	**I**	Limit position Limit switch Counterclockwise direction of rotation
5	**DI3**	**I**	Sensor Input 1
6	**DI4**	**I**	Sensor Input 2
7	**DO0+**	**O**	Alarm Output
8	**DO0-**	**O**	
9	**DO1+**	**O**	In Position Output
10	**DO1-**	**O**	

RS232 Communication Connector – CN6		
Pin	**Name**	**Scheme**
1	**VCC**	
2	**TX**	
3	**RX**	
4	**NC**	
5	**GND**	

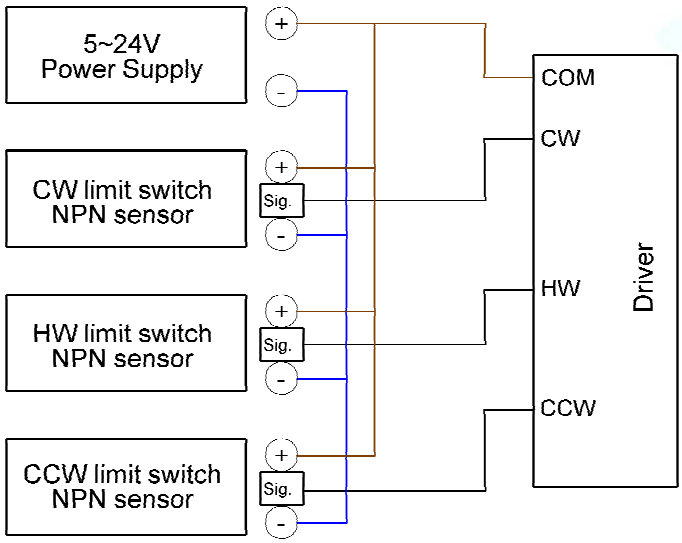
Currently, the RS232 communication interface for all JMC drivers is a micro USB interface, including a dedicated cable for the HISU handheld debugger and a dedicated cable for RS232 communication with the host computer. The figure above shows the interface definition of the driver's dedicated RS232 communication line.

EtherCAT Communication Connector – CN4, CN5			
Pins	**Name**	**Description**	**Scheme**
1, 9	E_TX+	EtherCAT Positive data transmission contact	
2, 10	E_TX-	EtherCAT Negative data transmission contact	
3, 11	E_RX+	EtherCAT Positive data receiving contact	
4, 12	-	-	
5, 13	-	-	
6, 14	E_RX-	EtherCAT Negative data receiving contact	
7, 15	-	-	
8, 16	-	-	
Housing	Shielding		
Note:	LED 1, green, is on: „In operation“ LED 2, yellow, is on: „Data output“ LED 3, green, is on: „In operation“ LED 4, yellow, is on: „Data output“		

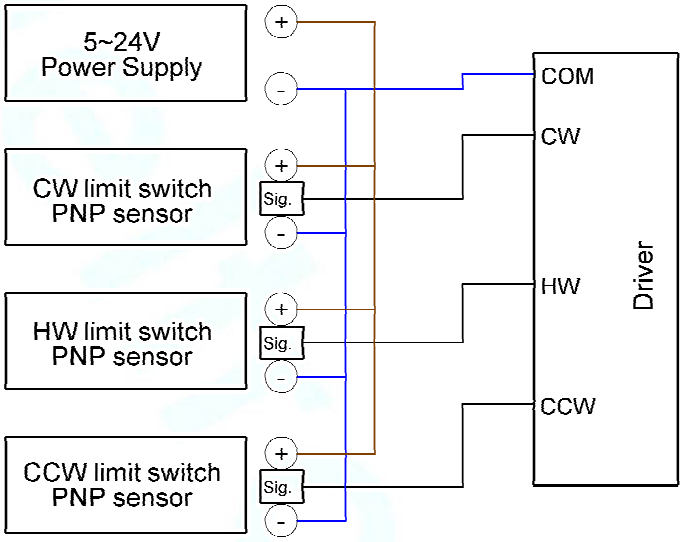
12. Fine Tuning

Standard parameters are already set at the factory. These standard parameter values are optimized and suitable for most industrial applications. In most cases it is not necessary to change them. However, if you want to optimize the performance for your application, the software can be used to adjust these parameters.

13.Typical Connections:



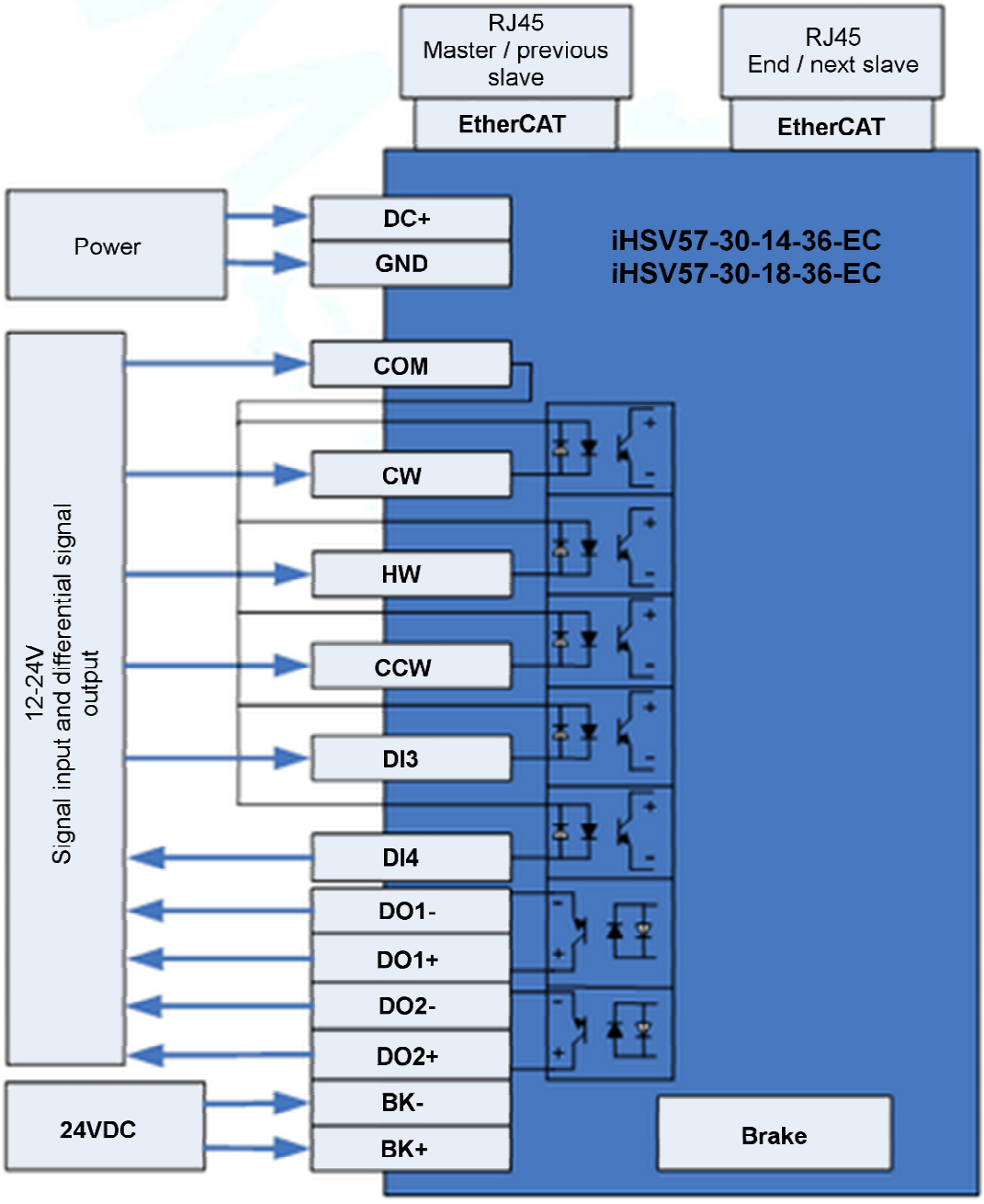
Common positive connection



Common negative connection

Common positive connection is a wiring arrangement in which several components (here NPN sensors) share a common voltage supply (here +24V).

Common negative connection is a switching arrangement in which several components (here PNP sensors) share a common ground (GND).


RJ45
Master / previous slave
EtherCAT
RJ45
End / next slave
EtherCAT
Power
DC+
GND
iHSV57-30-14-36-EC
iHSV57-30-18-36-EC
COM
CW
HW
CCW
DI3
DI4
DO1-
DO1+
DO2-
DO2+
BK-
BK+
12-24V
Signal input and differential signal output
24VDC
Brake

15. Leistungskurven