ESCON

Feature Comparison Chart

The ESCON servo controllers are small-sized, powerful 4-quadrant PWM servo controller for the highly efficient control of permanent magnet-activated DC motors.

The featured operating modes – speed control (closed loop), speed control (open loop), and current control – meet the highest requirements. The ESCON servo controllers are designed being commanded by an analog set value and features extensive analog and digital I/O functionality and are being configured via USB interface using the graphical user interface «ESCON Studio» for Windows PCs.

Legend: (✔)* = only in use with DC Tacho or Encoder / nnnnnn = order number / O = optional

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Feature	ESCON 36/2 DC (403112)	ESCON 36/3 EC (414533)	ESCON 50/5 (409510)
Product image			
Motors			
DC motors up to	72 W	—	250 W
EC motors up to	—	97 W	250 W
Sensors			
Digital Incremental Encoder (2 channel with or without Line Driver)	✔	—	✔
DC Tacho	✔	—	✔
Without sensor (DC motors)	✔	—	✔
Digital Hall Sensors (EC motors)	—	✔	✔
Electrical Data			
Nominal operating voltage V_{cc}	10…36 VDC	10…36 VDC	10…50 VDC
Max. output voltage	0.98 x V_{cc}	0.98 x V_{cc}	0.98 x V_{cc}
Max. output current	4 A (<60 s)	9 A (<4 s)	15 A (<20 s)
Continuous output current	2 A	2.7 A	5 A
Pulse Width Modulation frequency	53.6 kHz		

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Feature		ESCON 36/2 DC (403112)	ESCON 36/3 EC (414533)	ESCON 50/5 (409510)
Sampling rate PI current controller		53.6 kHz		
Sampling rate PI speed controller		5.36 kHz		
Max. efficiency		95%	95%	95%
Max. speed (DC)		limited by max. permissible speed (motor) and max. output voltage (controller)	—	limited by max. permissible speed (motor) and max. output voltage (controller)
Max. speed (EC; 1 pole pair)		—	150'000 rpm	150'000 rpm
Built-in motor choke		300 µH; 2 A	3 x 47 µH; 2.7 A	3 x 30 µH; 5 A
Inputs / Outputs				
Hall sensor signals		—	H1, H2, H3	H1, H2, H3
Encoder signals		A,A\,B,B\	—	A,A\,B,B\
Max. encoder input frequency differential (single-ended)		1 MHz (100 kHz)	—	1 MHz (100 kHz)
Potentiometers		1	1	2
Digital inputs		2		
Digital inputs/outputs		2		
Analog inputs		2		
	Resolution	12-bit		
	Range	−10…+10 V		
	Circuit	differential		
Analog outputs		2		
	Resolution	12-bit		
	Range	−4…+4 V		
Auxiliary voltage output		+5 VDC (IL ≤10 mA)		
Hall sensor supply voltage		—	+5 VDC (IL ≤30 mA)	+5 VDC (IL ≤30 mA)
Encoder supply voltage		+5 VDC (IL ≤70 mA)	—	+5 VDC (IL ≤70 mA)
Status Indicators		Operation: green LED / Error: red LED		
Connections				
J1	Power	Pin header (2 mm), 2 poles	Pin header (2 mm), 2 poles	Pluggable screw-type terminal block (3.5 mm), 2 poles
J2	Motor / Motor / Hall sensors	Pin header (2 mm), 3 poles	Mini module pin header, 8 poles	Pluggable screw-type terminal block (3.5 mm), 4 poles
J2A	Motor / Motor / Hall sensors	Spring-loaded contacts, 2 poles	Spring-loaded contacts, 8 poles	—

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Feature		ESCON 36/2 DC (403112)	ESCON 36/3 EC (414533)	ESCON 50/5 (409510)
J3	Hall sensors	—	—	Pluggable screw-type terminal block (3.5 mm), 5 poles
J4	Encoder	Pin header (2.54 mm), 5 x 2 poles	—	Pin header (2.54 mm), 5 x 2 poles
J4A	Encoder	Pin header (1.27 mm), 5 x 2 poles	—	—
J5	Digital I/O	Pin header (2 mm), 6 poles	Pin header (2 mm), 6 poles	Pluggable screw-type terminal block (3.5 mm), 6 poles
J6	Analog I/O	Pin header (2 mm), 7 poles	Pin header (2 mm), 7 poles	Pluggable screw-type terminal block (3.5 mm), 7 poles
J7	USB	USB Type micro B female		
Mechanical Data				
Weight (approximate)		30 g	36 g	204 g
Dimensions (L x W x H)		55 x 40 x 16.1 mm	55 x 40 x 19.8 mm	115 x 75.5 x 24 mm
Mounting holes		for screws M2.5	for screws M2.5	for screws M4
Environmental Conditions				
Temperature – Operation		−30…+45°C		
Temperature – Extended range		+45…+81°C; Derating: −0.056 A/°C	+45…+78°C; Derating: −0.082 A/°C	+45…+85°C; Derating: −0.113 A/°C
Temperature – Storage		−40…+85°C		
Humidity (condensation not permitted)		20…80%		
Functionality				
Operating Mode				
Current controller (torque control)		✔	✔	✔
Speed controller (closed loop)		✔	✔	✔
with encoder feedback		✔	—	✔
with DC Tacho feedback		✔	—	✔
with Hall sensor feedback		—	✔	✔
Speed controller (open loop)		✔	✔	✔
with static IxR Compensation		✔	✔	✔
with adaptive IxR Compensation		(✔)*	✔	✔

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Feature	ESCON 36/2 DC (403112)	ESCON 36/3 EC (414533)	ESCON 50/5 (409510)
Set Value			
Analog set value		✔	
PWM set value		✔	
Fixed set value		✔	
2 fixed set values		✔	
Digital I/O Functionality			
Enable		✔	
Enable CW		✔	
Enable CCW		✔	
Enable CW + CCW		✔	
Enable + Direction		✔	
Stop		✔	
Ready		✔	
Speed Comparator		✔	
Commutation frequency	—	✔	✔
Monitoring Outputs			
Monitor Current		✔	
Monitor Speed		✔	
Analog Settings			
Set value		✔	
Current limit		✔	
Offset adjust set value		✔	
Speed ramp (using potentiometer)		✔	
Current gain (using potentiometer)		✔	
Speed gain (using potentiometer)		✔	
IxR Factor (using potentiometer)		✔	

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Feature	ESCON 36/2 DC (403112)	ESCON 36/3 EC (414533)	ESCON 50/5 (409510)
Protection			
Overcurrent		✔	
Current limiter (adjustable)		✔	
Thermal overload		✔	
Undervoltage		✔	
Overvoltage		✔	
Voltage transients		✔	
Short-circuit of motor winding		✔	
Software			
Installation Program	ESCON Setup		
Graphical User Interface	ESCON Studio		
Startup Wizard		✔	
Regulation Tuning		✔	
Diagnostic		✔	
Firmware Update		✔	
Controller Monitor		✔	
Parameters		✔	
Data Recording		✔	
Online Help		✔	
Language	German, English, French, Italian, Spanish, Japanese, Chinese		
Operating System	Windows 7, Windows XP SP3		
Communication interface	USB 2.0 (full speed)		

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Feature		ESCON 36/2 DC (403112)	ESCON 36/3 EC (414533)	ESCON 50/5 (409510)
Accessories (not included in delivery)				
404404	ESCON 36/2 DC Connector Set	✔	—	—
425255	ESCON 36/3 EC Connector Set	—	✔	—
403964	ESCON Analog I/O Cable	✔	✔	—
403962	ESCON DC Motor Cable	✔	—	—
403965	ESCON Digital I/O Cable	✔	✔	—
275934	ESCON Encoder Cable	O	—	O
403957	ESCON Power Cable	✔	✔	—
403968	USB 2.0 Type A micro-B Cable	✔	✔	✔
418719	Adapter BLACK (for flexprint cable (FPC), 11 poles)	—	✔	—
418723	Adapter BLUE (for flexprint cable (FPC), 8 poles)	—	✔	—
418721	Adapter GREEN (for flexprint cable (FPC), 8 poles)	—	✔	—
409286	ESCON USB Stick	✔	✔	✔

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