Reflex Drive

RD Q-Pro V2 ESC 120A - Product Specification

TRAPEZOIDAL TECHNOLOGY

Over current Protection

Startup Protection

Over Temperature Protection

Stuck Rotor Protection

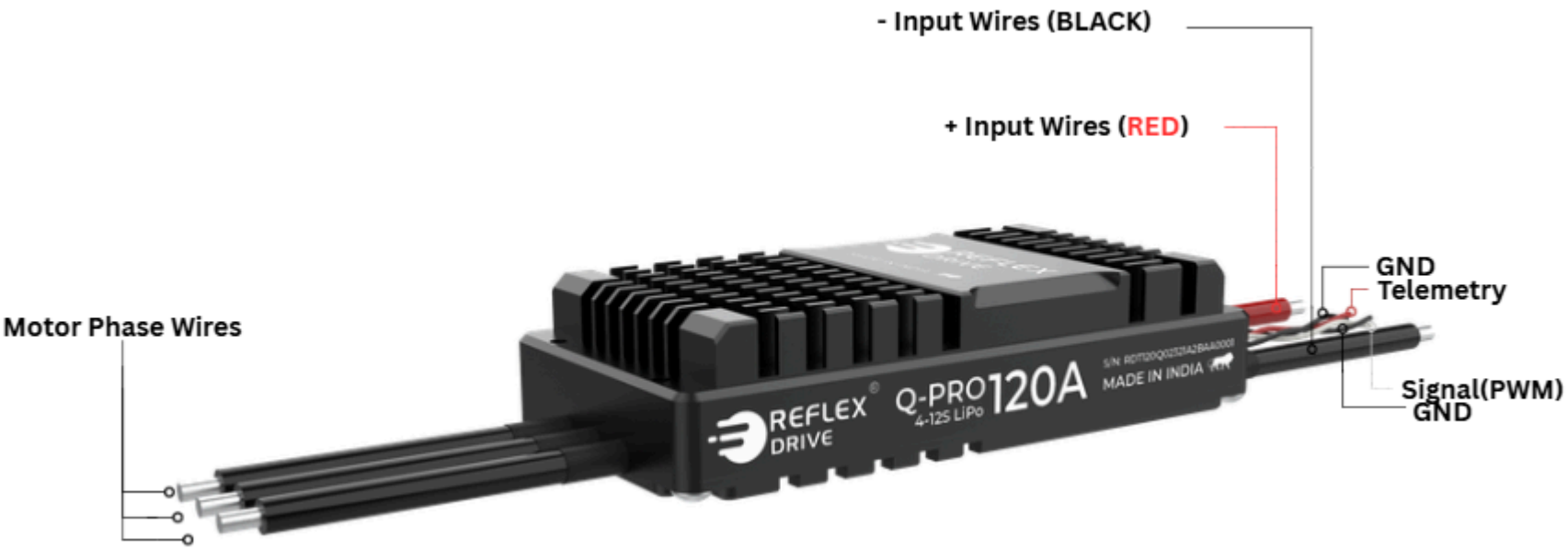
Product Description:

RD Q-Pro V2 ESC 120A is an advanced electronic speed controller (ESC) designed for high-performance applications - and is proudly **Made in India.** This upgraded model in the Q-Series incorporates heavy copper on the PCB, significantly enhancing thermal and current handling capabilities. With its sleek and durable Aluminum enclosure, the ESC provides excellent heat dissipation and protection against harsh environmental conditions.

Technical Specification

S No.	Item	Requirement	Remark
1	Input Voltage(S)	4S~12S LiPo	-
2	Continuous current	65A (With Active Cooling 1 Hr), 95A (With Active Cooling for 180 Sec)	Tested in 12.5 m/s continuous airflow and 28℃ ambient Temperature
3	Peak current	120A (With Active Cooling for 30 Sec)	Tested in 12.5 m/s continuous airflow and 28℃ ambient Temperature
4	BEC output voltage	No	-
5	Operating ambient temperature(℃)	(-20℃) ~(+ 65℃)	±5℃
6	Operating humidity(%)	15% ~ 85%RH	±5%RH
7	Storage temperature(℃)	(-40℃)~(+65℃)	±5℃
8	Preservation humidity(%)	15%~85%RH	±5RH
9	Standby power	≤ 30mA	-
10	Throttle range(Can be Calibrated)	1050us ~ 1950us	-
11	Throttle refresh frequency	50Hz	-
12	Driving method	PWM Only	-
13	Overcurrent Protection	Yes	-
14	Over Temperature Protection	Yes	-
15	Stuck Rotor Protection	Yes	-
16	Waterproof Rating	IP56	-

WIRING DIAGRAM



Wire Gauge (AWG):

1) Input Wire: 10 AWG
2) Motor Phase Wires: 12 AWG

Note: The ESC uses a single Dupont 2.54mm 3-pin female connector to carry all control and telemetry output signals. In this configuration, the Signal input (white) wire is on one end, Telemetry (red) is in the middle, and Ground (black) is on the opposite end. This eliminates the need for soldering and ensures broad compatibility with standard 2.54mm header interfaces.

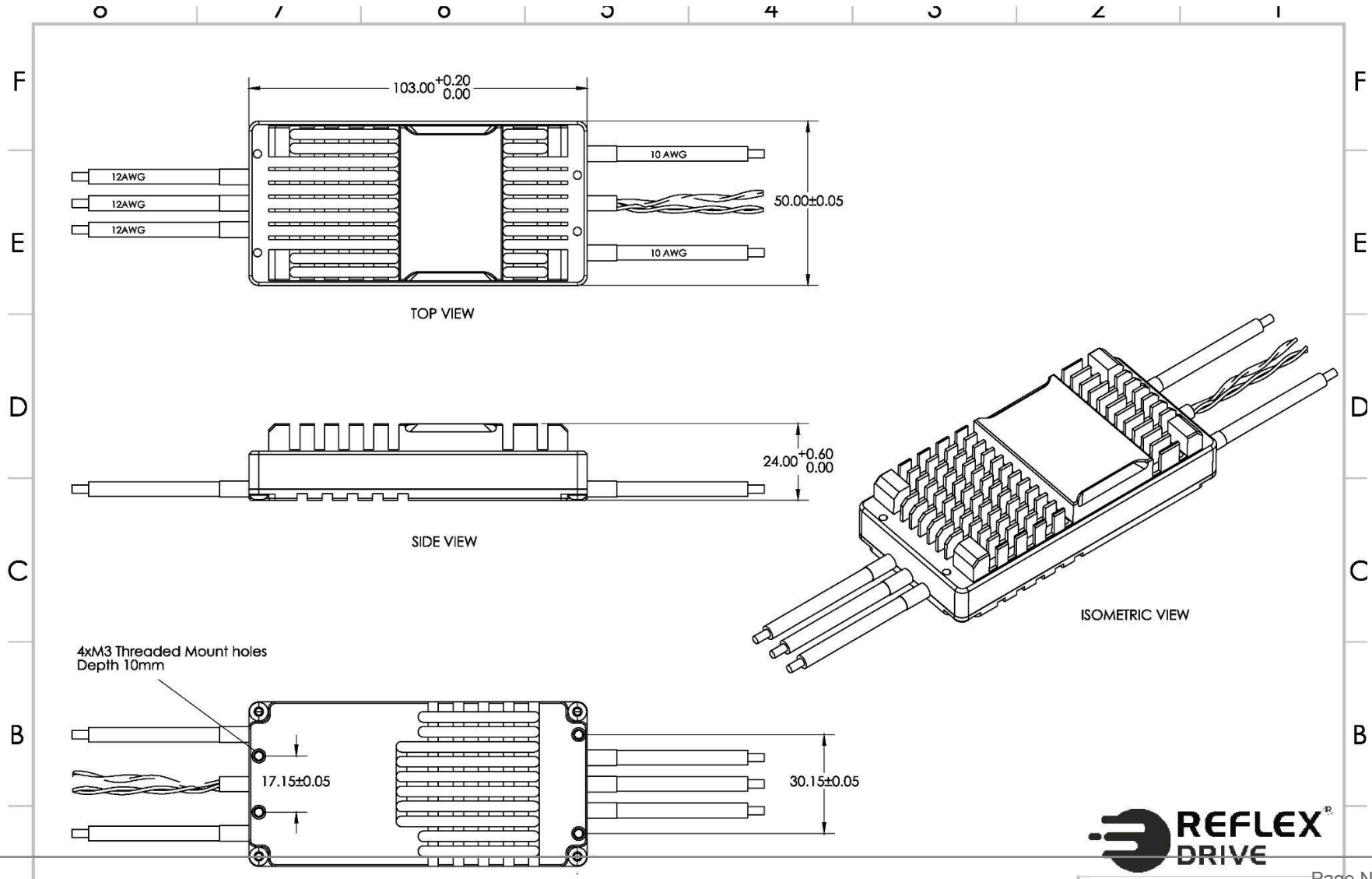
Wire and Enclosure Specification

S No.	Item	Wire colors / Size	Length	Remarks
1	Input cables	Silicone wires-red/black-**10AWG**	14cm	±1cm
2	Output cables	Silicone wires-black(x3) -**12AWG**	14cm	±1cm
3	Signal wires	Silicone wires - black , white(2P)	25cm	±1cm
4	Telemetry wires	Silicone wires - black , red(2P)	25cm	±1cm
5	Enclosure	Aerospace grade aluminum		black

Dimensions & Weight

S No.	Item	Requirement	Remarks
1	Length	103mm	±1mm
2	Width	50mm	±1mm
3	Height	24mm	±1mm
4	Weight(Incl. ESC with wire)	222g	±1g

Technical Drawing



ESC : RD Q-Pro V2 ESC 120A
Motor : HWX11 PLUS (100Kv)
Propeller : 4314 HW
Voltage : 12S LI-PO

Throttle %	Servo	Time(sec)	Voltage (V)	RPM	Current (A)	Power (W)	Temperature ESC(°C)	Max temperature (°C)
0.00%	1050	0	49.91	0	0	0	32.7°C	Max temperature after turn off the Power supply ECS: 62.6°C
5.60%	1100	5	49.91	381	0.32	16.1	32.8°C	
11.10%	1150	10	49.87	504	0.84	42.3	32.8°C	
16.70%	1200	15	49.82	681	1.79	89.4	32.9°C	
22.20%	1250	20	49.71	865	3.16	157	33.2°C	
27.80%	1300	25	49.57	1041	5.24	260	33.8°C	
33.30%	1350	30	49.4	1192	7.69	380	34.1°C	
38.90%	1400	35	49.17	1351	10.99	540	34.7°C	
44.40%	1450	40	48.86	1503	14.79	723	35.4°C	
50.00%	1500	45	48.55	1630	19.5	946	36.5°C	
55.60%	1550	50	48.18	1754	24.07	1160	37.7°C	
61.10%	1600	55	47.75	1883	30.07	1436	38.6°C	
66.70%	1650	60	47.27	1991	36.31	1716	39.9°C	
72.20%	1700	65	46.74	2089	42.85	2003	41.8°C	
77.80%	1750	70	46.28	2185	49.58	2295	43.9°C	

83.30%	1800	75	45.72	2265	56.66	2590	45.1°C
88.90%	1850	80	45.12	2347	64.24	2898	48.3°C
94.40%	1900	85	44.51	2419	72.75	72.83	3238
100.00%	1950	90	43.52	2536	86.26	85.44	3754

ESC : RD Q-Pro V2 ESC 120A
Motor : 8030 FW (160KV)
Propeller : Falcon 24x12 CF FX
Voltage : EP 40000 mAH 12S @58.8V

Throttle	PWM (us)	Voltage (V)	Current (A)	RPM	Thrust (gf)	Torque (N*m)	SysEffect (gf/W)	Motor Power (W)	Electrical Power (W)
20	1190	56.95	4.40	2314	1759	0.571	7.02	138.33	250.56
25	1238	56.84	6.46	2713	2424	0.784	6.60	222.64	367.32
30	1285	56.72	8.67	3049	3129	0.991	6.36	316.33	491.61
35	1332	56.60	10.92	3352	3843	1.177	6.22	412.93	617.94
40	1380	56.46	13.75	3640	4629	1.430	5.96	544.92	776.18
45	1428	56.30	16.85	3910	5357	1.691	5.65	692.04	948.73
50	1475	56.10	20.31	4175	6147	1.965	5.40	858.81	1139.16
55	1522	55.93	23.84	4436	6964	2.192	5.22	1017.64	1333.24
60	1570	55.69	28.39	4704	7926	2.496	5.01	1228.85	1580.96
65	1618	55.41	33.74	4995	8813	2.815	4.71	1472.08	1869.80
70	1665	55.11	39.96	5285	9907	3.193	4.50	1766.05	2202.54
75	1712	54.70	48.57	5618	11399	3.686	4.29	2167.64	2656.83
80	1760	54.25	57.92	5941	12646	4.167	4.02	2590.99	3142.44
85	1808	53.76	68.28	6254	13922	4.664	3.79	3052.76	70.43

90	1855	53.25	79.50	6538	15186	5.155	3.59	3527.80	4233.04
95	1902	52.62	93.64	6808	16944	5.779	3.44	4117.57	4927.57
100	1950	52.07	106.25	7038	18051	6.315	3.26	4651.66	5532.36

Precautions

- Do not exceed the recommended operating voltage range of the ESC, otherwise it may cause irreversible damage to the ESC.
- Ensure adequate cooling for the ESC. Avoid enclosing it in airtight spaces. Overheating can reduce performance and may permanently damage components.
- Do not expose the ESC to water, oil, dust, or conductive particles unless it is properly sealed or coated. This can cause short circuits or corrosion.
- Always double-check battery connections. Reverse polarity can instantly damage the ESC.
- Only use batteries within the specified voltage and current ratings (e.g., LiPo with proper cell count). Over-voltage or unstable supply can damage the ESC.
- Loose connectors or poor soldering may cause arcing, noise, or intermittent failure. Ensure all connections are firm and reliable.

Protection Function Description

- **Stuck Rotor protection**
  - The ESC performs a single startup attempt and terminates operation if no rotor movement is detected. Restart is permitted only after the throttle is reset to minimum. Persistent failure indicates a possible motor or mechanical fault.
- **Over Current Protection:**
  - When the ESC output current exceeds the rated Peak current limit of 120A, The ESC gradually reduces the output current to the rated limit of 120 A immediately.
- **Over Temperature Protection**
  - When the ESC PCB temperature exceeds 110°C, The ESC gradually reduces the max output current to **⅔** of max rated current of ESC (64A) and ESC current will not exceed 64A. This reduction helps lower the temperature and prevent damage to the ESC components. Power cycle the ESC to continue the normal operation.
- **Low voltage and High voltage protection**

- This ESC does not provide under-voltage or over-voltage protection. Operation below 18V or above 63V may cause abnormal behavior or malfunction. Ensure operation within specified limits. Immediate landing is recommended in UAV applications if voltage deviates from this range.

- **Throttle signal loss protection**
  - Motor output is disabled immediately upon loss of the throttle input signal.

Common Faults and Alert Tones Description

Fault Phenomena	Alarm	Possible Cause	Solution
After powering on, the motor fails to start	“Beep, beep, beep...” (with a 2-second interval between each beep)	The receiver's throttle channel is not outputting a throttle signal	• Check if the radio and receiver are paired correctly. • Check if the throttle channel wiring is connected properly. • Verify the ESC communication priority (factory default isPWM).