

2-Quadrant BLDC Driver With Variable Parameter Settings And High Current

NO	Model	Temp range (°C)	Voltage range (VDC)	I-pk (A)	I-con (A)	60°/120° Hall sensor	PWM f(kHz)	PI Close loop of speed	SV Ramp time (S)	SV Range (V)	LV /OV	Alm	PG	PI Close loop of current	Parameter Settings By Switch And Pot	SC /OT	Safe F/R	Safe Start	Heat Sink
1	BLSD2435DC-2Q-X	-10~+50 -40~+85	17~32	17.5~ 35	8.75~ 17.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
2	BLSD2450DC-2Q-X	-10~+50 -40~+85	17~32	25~50	12.5~ 25	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
3	BLSD2475DC-2Q-X	-10~+50 -40~+85	17~32	37.5~ 75	18.75~ 37.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
4	BLSD24100DC-2Q-X	-10~+50 -40~+85	17~32	50~100	25~50	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
5	BLSD3635DC-2Q-X	-10~+50 -40~+85	27~45	17.5~ 35	8.75~ 17.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
6	BLSD3650DC-2Q-X	-10~+50 -40~+85	27~45	25~50	12.5~ 25	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
7	BLSD3675DC-2Q-X	-10~+50 -40~+85	27~45	37.5~ 75	18.75~ 37.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
8	BLSD36100DC-2Q-X	-10~+50 -40~+85	27~45	50~100	25~50	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
9	BLSD4835DC-2Q-X	-10~+50 -40~+85	37~55	17.5~ 35	8.75~ 17.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
10	BLSD4850DC-2Q-X	-10~+50 -40~+85	37~55	25~50	12.5~ 25	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
11	BLSD4875DC-2Q-X	-10~+50 -40~+85	37~55	37.5~ 75	18.75~ 37.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
12	BLSD48100DC-2Q-X	-10~+50 -40~+85	37~55	50~100	25~50	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
13	BLSD1235LDC-2Q-X	-10~+50 -40~+85	5~18	17.5~ 35	8.75~ 17.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
14	BLSD1250LDC-2Q-X	-10~+50 -40~+85	5~18	25~50	12.5~ 25	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓

15	BLS1275LDC-2Q-X	-10~+50 -40~+85	5~18	37.5~ 75	18.75~ 37.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
16	BLS12100LDC-2Q-X	-10~+50 -40~+85	5~18	50~100	25~50	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
17	BLS4835WDC-2Q-X	-10~+50 -40~+85	15~55	17.5~ 35	8.75~ 17.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
18	BLS4850WDC-2Q-X	-10~+50 -40~+85	15~55	25~50	12.5~ 25	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
19	BLS4875WDC-2Q-X	-10~+50 -40~+85	15~55	37.5~ 75	18.75~ 37.5	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓
20	BLS48100WDC-2Q-X	-10~+50 -40~+85	15~55	50~100	25~50	✓	15	✓	0.1~10	0~5	✓	✓	24p@ 8-pole	✓	✓	✓	✓	✓	✓

BLS 24 35 WDC - 2Q - T

BLDC speed driver-----

Rated voltage (VDC)-----

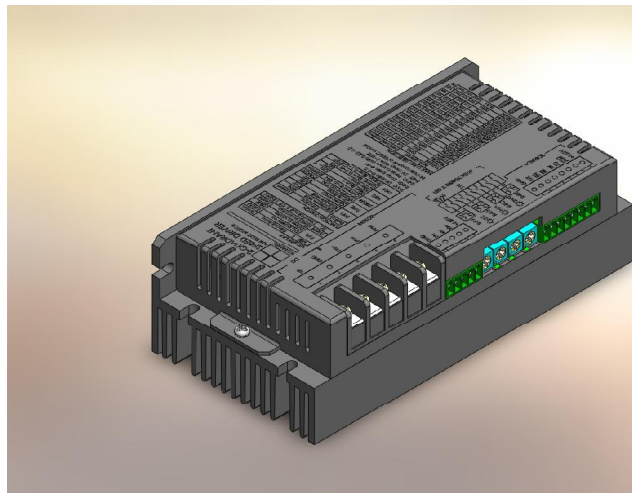
Peak current limit (A)-----

DC=Normal DC input, LDC=Ultra low voltage DC input, WDC=Wide range DC input-----

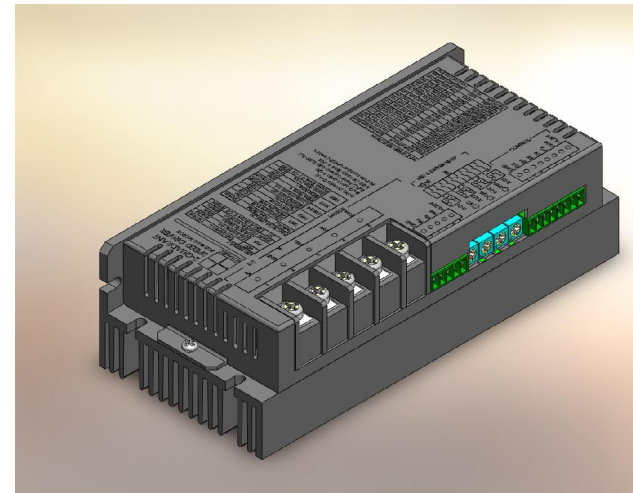
-----T=-40~+85 °C, None=-10~+50 °C

-----2-quadrant control mode -

35A/50A



75A/100A



Typical Connection

Note:

1. Control signals:

- F/R-----H or Open=Forward, L or Close=Reverse
- EN-----H or Open=Disable, L or Close=Enable
- BK-----H or Open=Running, L or Close=Brake
- SV-----0-5V speed reference (112K input resistance)
- PG-----Speed pulse output (OC)
- ALM---Alarm output (OC)

2. Hall sensors cable can not be tied together with windings cable.

3. Alarm conditions:

- a. Hall sensor signals are not correct.
- b. LV or OV for 2-3S.
- c. Short circuit and Over temperature of case.
- d. Over load for 6s continuously.
- e. It can be reset by Turn-Off-On DC Power or Disable the driver once.

4. LED indicator:

- SC-----Bright=Short circuit, Dark=driver is OK
- P/A-----Bright=Driver is OK, Blink=Driver is in alarm
- SHAFT----Bright=Motor shaft is moving, Dark=Motor shaft is in static

5. Braking operation:

- The motor speed must be less than the safe brake speed N_s when you brake the motor.
- For Y windings, $N_s = \sqrt{3} \times I_p \times R_L \times N / (2 \times V_p)$
- For Δ windings, $N_s = I_p \times R_L \times N / (2 \times \sqrt{3} \times V_p)$
- I_p =Peak current (A), R_L =Line to line resistance of windings (Ohm),
- N =No-load speed (rpm), V_p =Rated voltage (V), N_s =Safe brake speed (rpm)

6. Safe F/R:

If you change F/R of the driver rapidly, it will stop the power stage and motor will be free until the speed is detected as zero, and then to drive in correct direction. This means smooth reverse.

7. Safe start:

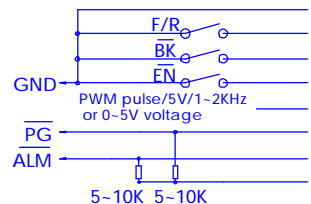
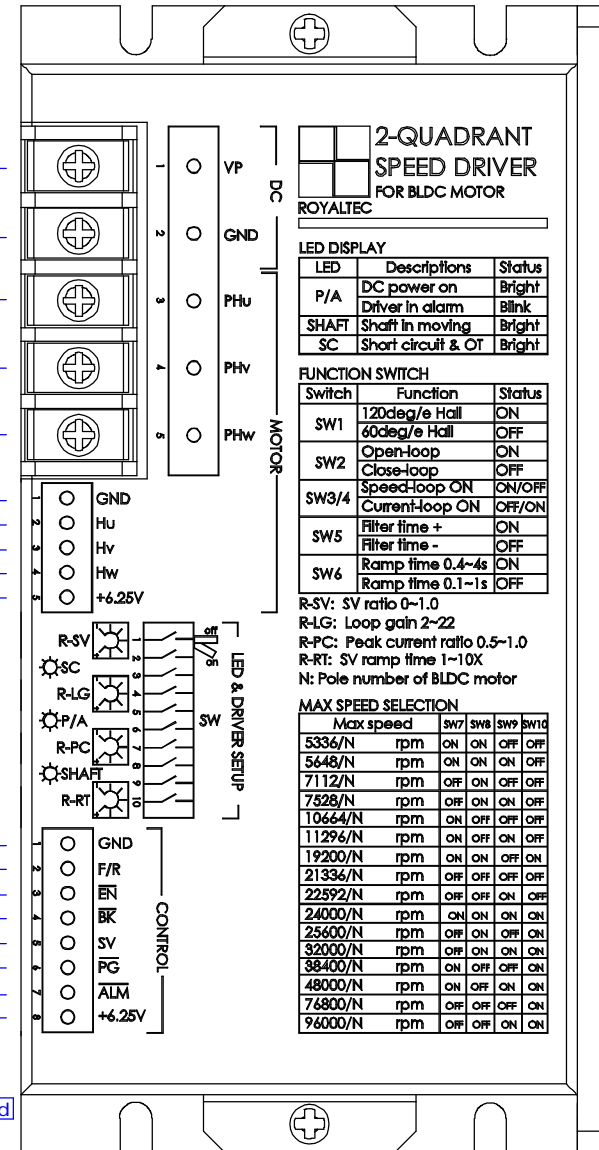
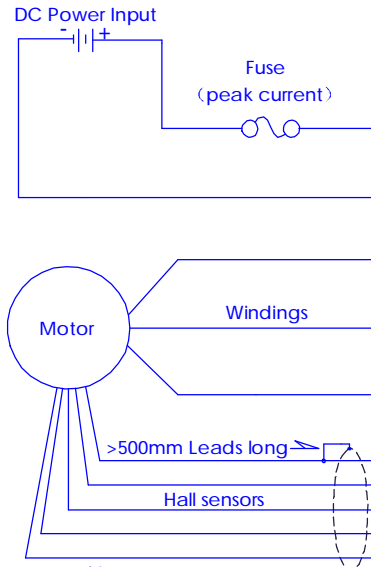
If the motor speed is not detected as zero at power on, the driver will be free until the motor speed is zero.

8. Driver setup by pot and switch:

R-SV pot=SV voltage ratio, R-LG pot=Loop gain, R-PC=Peak current ratio, R-RT pot=Ramp time
 SW1=60°/120° Hall sensors, SW2=Open/Close loop, SW3,4=Speed/Current loop, SW5=Loop filter time, SW6=SV ramp time setting
 SW7,8,9,10=Speed range setting

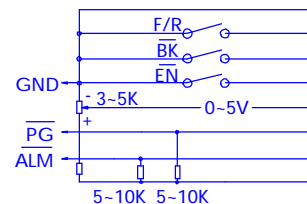
9. Peak current selection:

$I_p > 2 \times I_r$ or $I_p > 4 \times P_o / V_p$, I_p is peak current of driver (A), I_r is rated current of motor (A),
 P_o is rated output power of motor (W), V_p is rated voltage of driver (V).



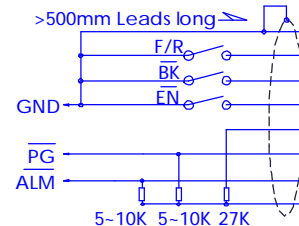
The R-SV pot must be turned to right.

Use PWM pulse or SV voltage to control speed



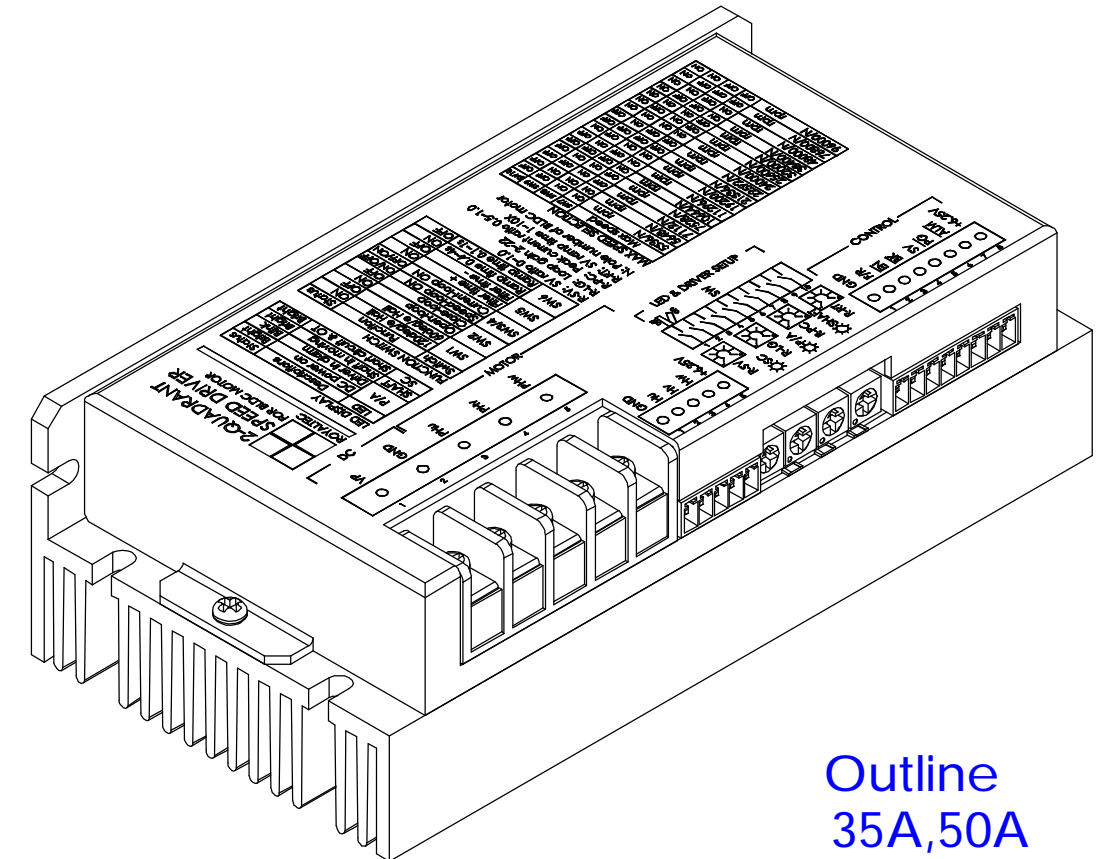
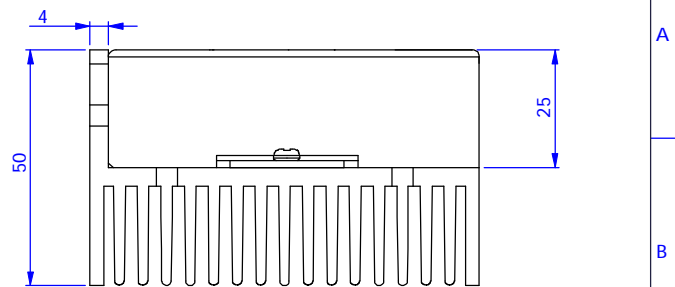
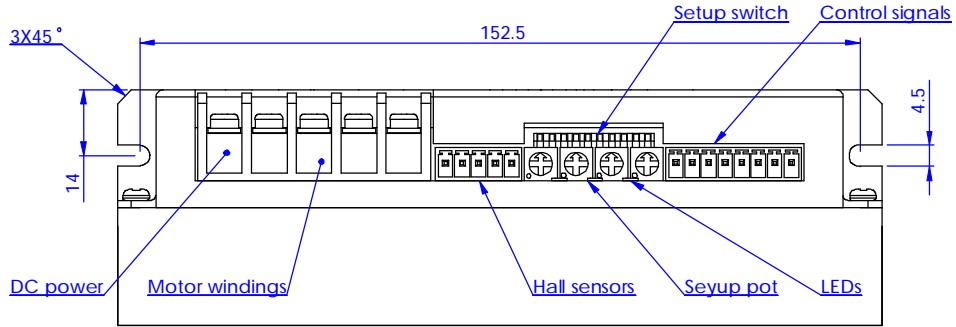
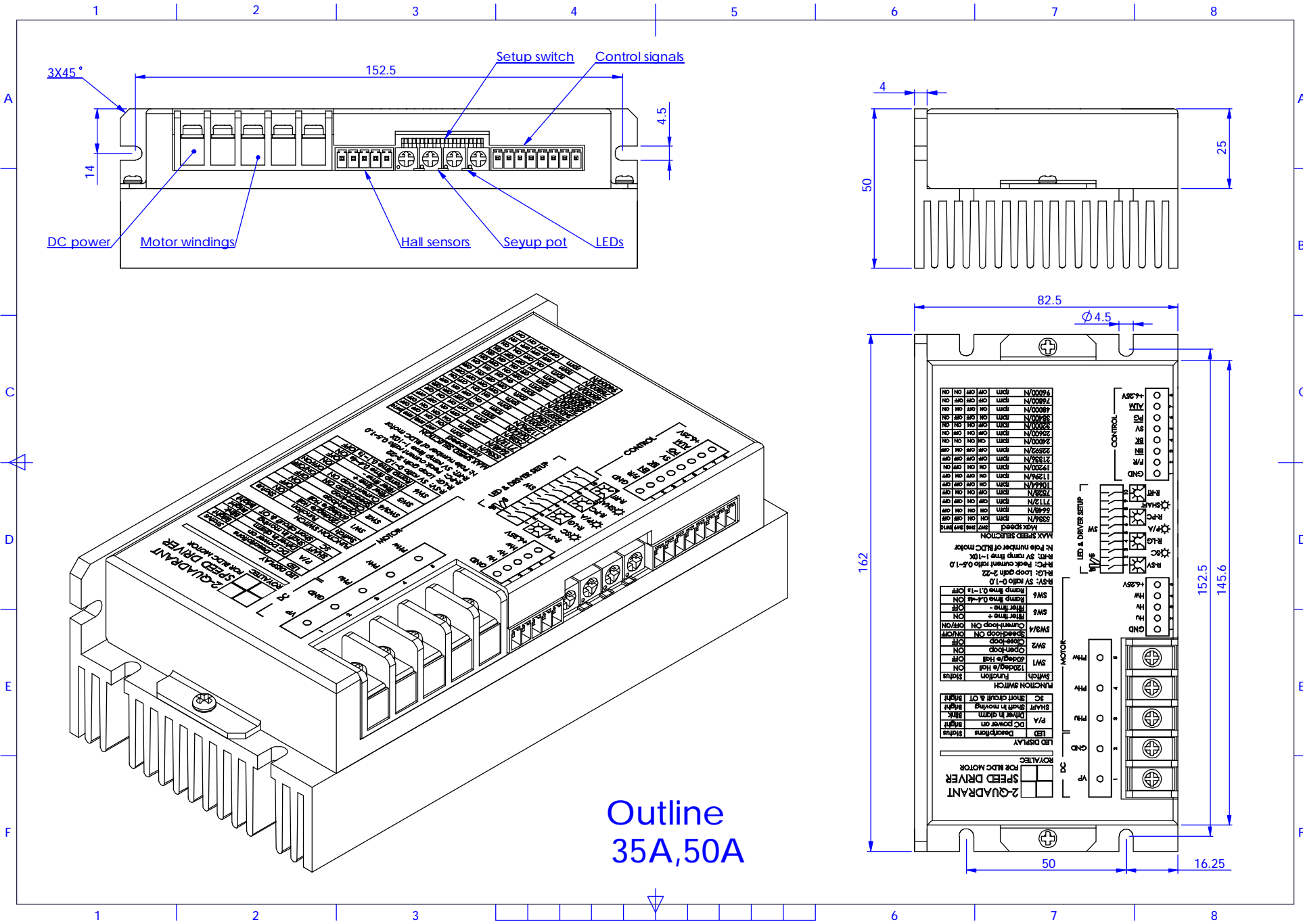
The R-SV pot must be turned to right.

Use additional pot to control speed

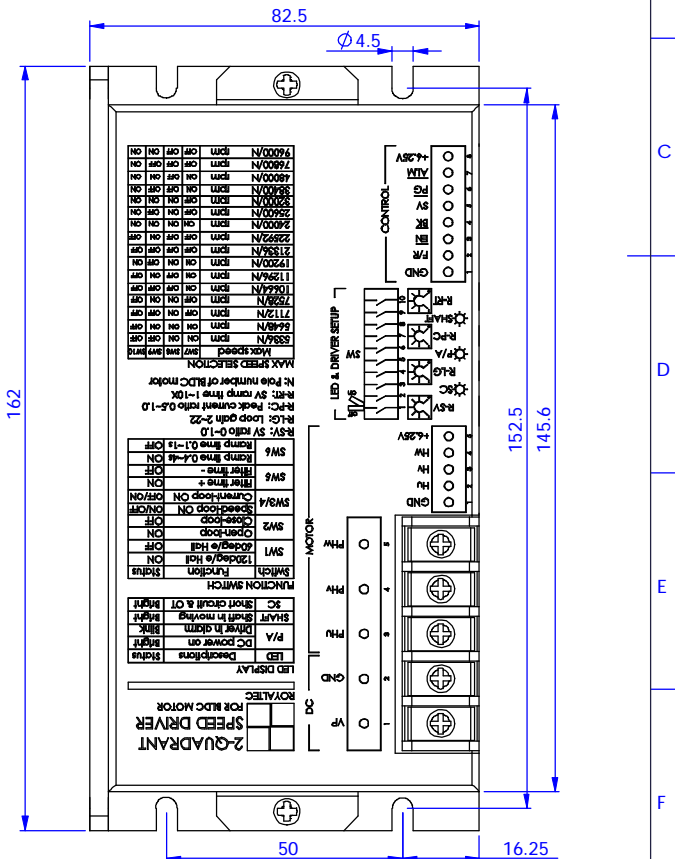


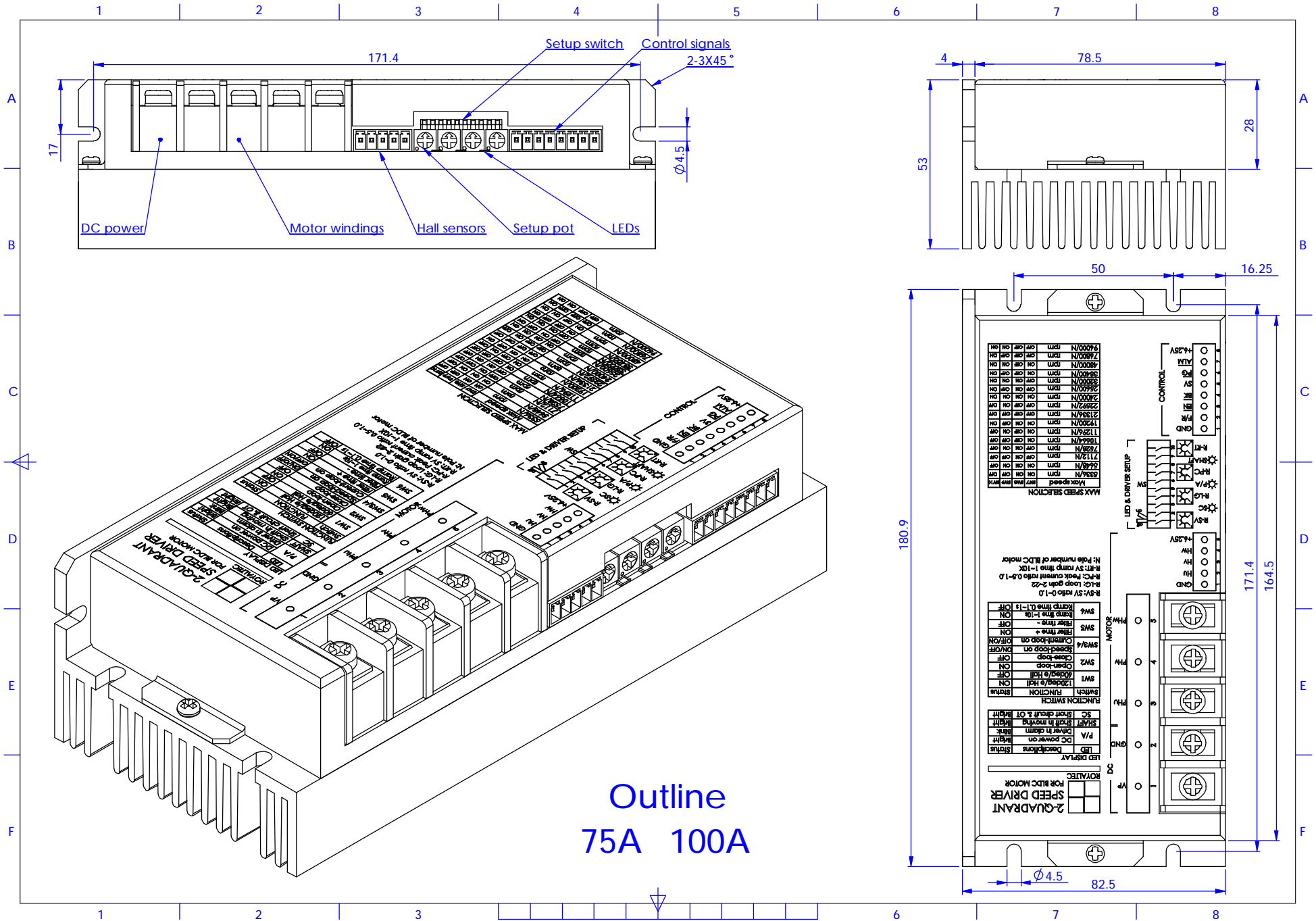
5-10K 5-10K 27K

Use R-SV pot to control speed



Outline
35A,50A





MAX SPEED SELECTION

90000/N	rpm	OFF	ON	OFF	ON
75000/N	rpm	OFF	ON	OFF	ON
60000/N	rpm	OFF	ON	OFF	ON
45000/N	rpm	OFF	ON	OFF	ON
30000/N	rpm	OFF	ON	OFF	ON
15000/N	rpm	OFF	ON	OFF	ON
7500/N	rpm	OFF	ON	OFF	ON
3750/N	rpm	OFF	ON	OFF	ON
1875/N	rpm	OFF	ON	OFF	ON
937.5/N	rpm	OFF	ON	OFF	ON
468.75/N	rpm	OFF	ON	OFF	ON
234.375/N	rpm	OFF	ON	OFF	ON
117.1875/N	rpm	OFF	ON	OFF	ON
58.59375/N	rpm	OFF	ON	OFF	ON
29.296875/N	rpm	OFF	ON	OFF	ON
14.6484375/N	rpm	OFF	ON	OFF	ON
7.32421875/N	rpm	OFF	ON	OFF	ON
3.662109375/N	rpm	OFF	ON	OFF	ON
1.8310546875/N	rpm	OFF	ON	OFF	ON
0.91552734375/N	rpm	OFF	ON	OFF	ON
0.457763671875/N	rpm	OFF	ON	OFF	ON
0.2288818359375/N	rpm	OFF	ON	OFF	ON
0.11444091796875/N	rpm	OFF	ON	OFF	ON
0.057220458984375/N	rpm	OFF	ON	OFF	ON
0.0286102294921875/N	rpm	OFF	ON	OFF	ON
0.01430511474609375/N	rpm	OFF	ON	OFF	ON
0.007152557373046875/N	rpm	OFF	ON	OFF	ON
0.0035762786865234375/N	rpm	OFF	ON	OFF	ON
0.00178813934326171875/N	rpm	OFF	ON	OFF	ON
0.000894069671630859375/N	rpm	OFF	ON	OFF	ON
0.0004470348358154296875/N	rpm	OFF	ON	OFF	ON
0.00022351741790771484375/N	rpm	OFF	ON	OFF	ON
0.000111758708953857421875/N	rpm	OFF	ON	OFF	ON
0.0000558793544769287109375/N	rpm	OFF	ON	OFF	ON

MAX SPEED SELECTION

LED & DRIVER SETUP

R+	R-	S+	S-	S1	S2	S3	S4	V+	V-	GND	
+	-	+	-	+	-	+	-	+	-	+	-

CONTROL

V+	V-	R+	R-	F+	F-	S+	S-	S1	S2	S3	S4	GND	
+	-	+	-	+	-	+	-	+	-	+	-	+	-

LED DISPLAY

LED+	LED-	LED1	LED2	GND							
+	-	+	-	+	-	+	-	+	-	+	-

FUNCTION SWITCH

SC	SHAF	P/A	F/A	GND
+	+	+	+	+

MOTOR

PH/A	PH/B	PH/C	PH/D	PH/E	PH/F	PH/G
+	+	+	+	+	+	+

2-QUADRANT SPEED DRIVER FOR BDC MOTOR

ROYALTEC

R-SV:SV ratio 0-1.0
R-F: F peak current ratio 0.5-1.0
R-C: Peak current ratio 1-1.0X
R-T: Full number of BDC motor