

PowerBox PBX 190

www.bosch-motorsport.com



- ▶ 250 A continuous current
- ▶ 52 outputs
- ▶ 48 V high side switches
- ▶ Easy programming of complex functions
- ▶ Precision current measurement

The PowerBox is an intelligent control and distribution unit for the electric grid in a modern racing car which is seamlessly integrated into the Bosch Motorsport system architecture. It is capable to replace all conventional relays, fuses and circuit breakers, simplifies wiring harnesses and provides diagnostic capabilities. The integrated PBX-software guarantees an easy programming of complex functions by intuitive handling.

Technical Specifications

Mechanical Data

Size	245 x 183 x 37 mm
Weight	1,270 g
Protection Classification	IP67
Internal G-sensors	
Temp. range (at internal sensors)	-20 to 85°C

Electrical Data

Supply voltage range	5 to 16 V
Current consumption	<1 A continuously
Maximum recommended output current	250 A continuously; >310 A peak current (2 s)

Communication

CAN	3
LIN	1
Ethernet	2
Real time ethernet Sercos (optional)	2

Inputs

18 analogue inputs (16 bit resolution) switchable pull-up resistors

10 digital inputs switchable pull-up/pull-down resistors

Outputs

4 high power channels up to 40 A (parallel up to 80 A)

10 high power channels up to 25 A

26 high power channels up to 15 A

4 high side channels up to 25 A, up to 48 V

8 multi-purpose outputs up to 15 A (low side, high side, push-pull, PWM)

2 sensor supplies 5 V with individual ground pin

Software

Function development and calibration tool Bosch Motorsport PBX Suite

Pin Configuration

Connector X1: 37 Pins / 8STA6-24-37SA

Pin	Signal	Cont. [A]	Peak [A]
A	HS_15A X1_A	15	100
B	HS_15A X1_B	15	100
C	HS_15A X1_C	15	100
D	HS_15A X1_D	15	100
E	HS_15A X1_E	15	100
F	HS_15A X1_F	15	100
G	HS_15A X1_G	15	100
H	HS_15A X1_H	15	100
J	HS_15A X1_J	15	100
K	HS_15A X1_K	15	100
L	HS_15A X1_L	15	100
M	HS_15A X1_M	15	100
N	HS_15A X1_N	15	100
P	PWM_15A X1_P	15	60
R	PWM_15A X1_R	15	60
S	PWM_15A X1_S	15	60
T	PWM_15A X1_T	15	60
U	HS_15A X1_U	15	100
V	HS_15A X1_V	15	100
W	HS_15A X1_W	15	100
X	HS_15A X1_X	15	100
Y	HS_15A X1_Y	15	100
Z	HS_15A X1_Z	15	100
a	HS_15A X1_a 1	15	100
b	HS_15A X1_b 1	15	100
c	PWM_15A X1_c 1	15	60
d	PWM_15A X1_d 1	15	60
e	PWM_15A X1_e 1	15	60
f	PWM_15A X1_f 1	15	60
g	HS_15A X1_g 1	15	100
h	HS_15A X1_h 1	15	100

Connector X1: 37 Pins / 8STA6-24-37SA

k	HS_15A X1_k 1	15	100
m	HS_15A X1_m 1	15	100
n	HS_15A X1_n 1	15	100
p	Power KL31	15	-
q	Power KL31	15	-
r	Power KL31	15	-

Connector X2: 1 Pin / 8STA6-12-01BN261

Pin	Signal	Cont. [A]	Peak [A]
1	Power Supply 12 V	200	240

Connector X3: 19 Pins / 8STA6-24-19SN

Pin	Signal	Cont. [A]	Peak [A]
A	HS_25A X3_A	25	150
B	HS_25A X3_B	25	150
C	HS_25A X3_C	25	150
D	HS_25A X3_D	25	150
E	HS_25A X3_E	25	150
F	HS_25A X3_F	25	150
G	HS_40A X3_G_H	40	150
H	HS_40A X3_G_H	40	150
J	HS_40A X3_J_T	40	150
K	HS_40A X3_K_U	40	150
L	HS_40A X3_L_N	40	150
M	HS_25A X3_M	25	150
N	HS_40A X3_L_N	40	150
P	HS_25A X3_P	25	150
R	HS_25A X3_R	25	150
S	HS_25A X3_S	25	150
T	HS_40A X3_J_T	40	150
U	HS_40A X3_K_U	40	150
V	Power KL31	25	-

Connector X4: 6 Pins / 8STA6-16-06SA

Pin	Signal	Cont. [A]	Peak [A]
A	HS48V_25A X4_A	25	100
B	HS48V_25A X4_B	25	100
C	HS48V_25A X4_C	25	100

Connector X4: 6 Pins / 8STA6-16-06SA

D	HS48V_25A X4_D	25	100
E	Supply up to 48 V for X4	25	35
F	Supply up to 48 V for X4	25	35

Connector X5: 66 Pins / 8STA6-18-35SN

Pin	Signal	
1	Analog Input X5_01	0 to 5 V, Pull-up
2	Analog Input X5_02	0 to 5 V, Pull-up
3	Analog Input X5_03	0 to 5 V, Pull-up
4	Analog Input X5_04	0 to 5 V, Pull-up
5	Analog Input X5_05	0 to 5 V, Pull-up
6	Analog Input X5_06	0 to 5 V, Pull-up
7	Analog Input X5_07	0 to 5 V, Pull-up
8	Analog Input X5_08	0 to 5 V, Pull-up
9	CAN 3 Interface Low-Level	Max. 1 MBaud
10	Analog Input X5_10	0 to 5 V, Pull-up
11	Analog Input X5_11	0 to 5 V, Pull-up
12	Analog Input X5_12	0 to 5 V, Pull-up
13	Digital Input X5_13	0 to 12 V, Pull-up, Pull-down
14	Digital Input X5_14	0 to 12 V, Pull-up, Pull-down
15	CAN 3 Interface High-Level	Max. 1 MBaud
16	LIN	
17	Analog Input X5_17	0 to 5 V, Pull-up
18	Analog Input X5_18	0 to 5 V, Pull-up
19	DGND-fused	5 A
20	DGND-fused	5 A
21	Digital Input X5_21	0 to 12 V, Pull-up, Pull-down
22	Digital Input X5_22	0 to 12 V, Pull-up, Pull-down
23	SERCOS1 TXP	
24	SERCOS1 TXN	
25	do not connect (use for internal debugging)	
26	do not connect (use for internal debugging)	
27	Analog Input X5_27	0 to 5 V, Pull-up

Connector X5: 66 Pins / 8STA6-18-35SN

28	Digital Input X5_28	0 to 12 V, Pull-up, Pull-down
29	Digital Input X5_29	0 to 12 V, Pull-up, Pull-down
30	Analog Input X5_30	0 to 5 V, Pull-up
31	KL31-fused	
32	SERCOS1 RXP	
33	SERCOS1 RXN	
34	do not connect (use for internal debugging)	
35	do not connect (use for internal debugging)	
36	Digital Input X5_36	0 to 12 V, Pull-up, Pull-down
37	Digital Input X5_37	0 to 12 V, Pull-up, Pull-down
38	Analog_Screen	
39	Analog Input X5_39	0 to 5 V, Pull-up
40	KL31-fused	
41	SERCOS2 RXP	
42	SERCOS2 RXN	
43	Digital Input X5_43	0 to 12 V, Pull-up, Pull-down
44	Digital Input X5_44	0 to 12 V, Pull-up, Pull-down
45	Sensor GND for X5_51	5 A
46	Timesync	
47	COM_Screen	
48	CAN 1 Interface High-Level	Max. 1 MBaud
49	SERCOS2 TXP	
50	SERCOS2_TXN	
51	Powersupply_5V X5_51	400 mA
52	Sensor GND for X5_58	5 A
53	ETHERNET1 RXN	10/100 Mbps
54	ETHERNET0 RXN	10/100 Mbps
55	CAN 2 Interface Low-Level	Max. 1 MBaud
56	CAN 1 Interface Low-Level	Max. 1 MBaud
57	Analog Input X5_57	0 to 5 V, Pull-up
58	Powersupply_5V X5_58	400 mA
59	ETHERNET1 RXP	10/100 Mbps

Connector X5: 66 Pins / 8STA6-18-35SN

60	ETHERNET1 TXN	10/100 Mbps
61	ETHERNET0 TXN	10/100 Mbps
62	CAN 2 Interface High-Level	Max. 1 MBaud
63	Analog Input X5_63	0 to 5 V, Pull-up
64	ETHERNET1 TXP	10/100 Mbps
65	ETHERNET0 RXP	10/100 Mbps
66	ETHERNET0 TXP	10/100 Mbps

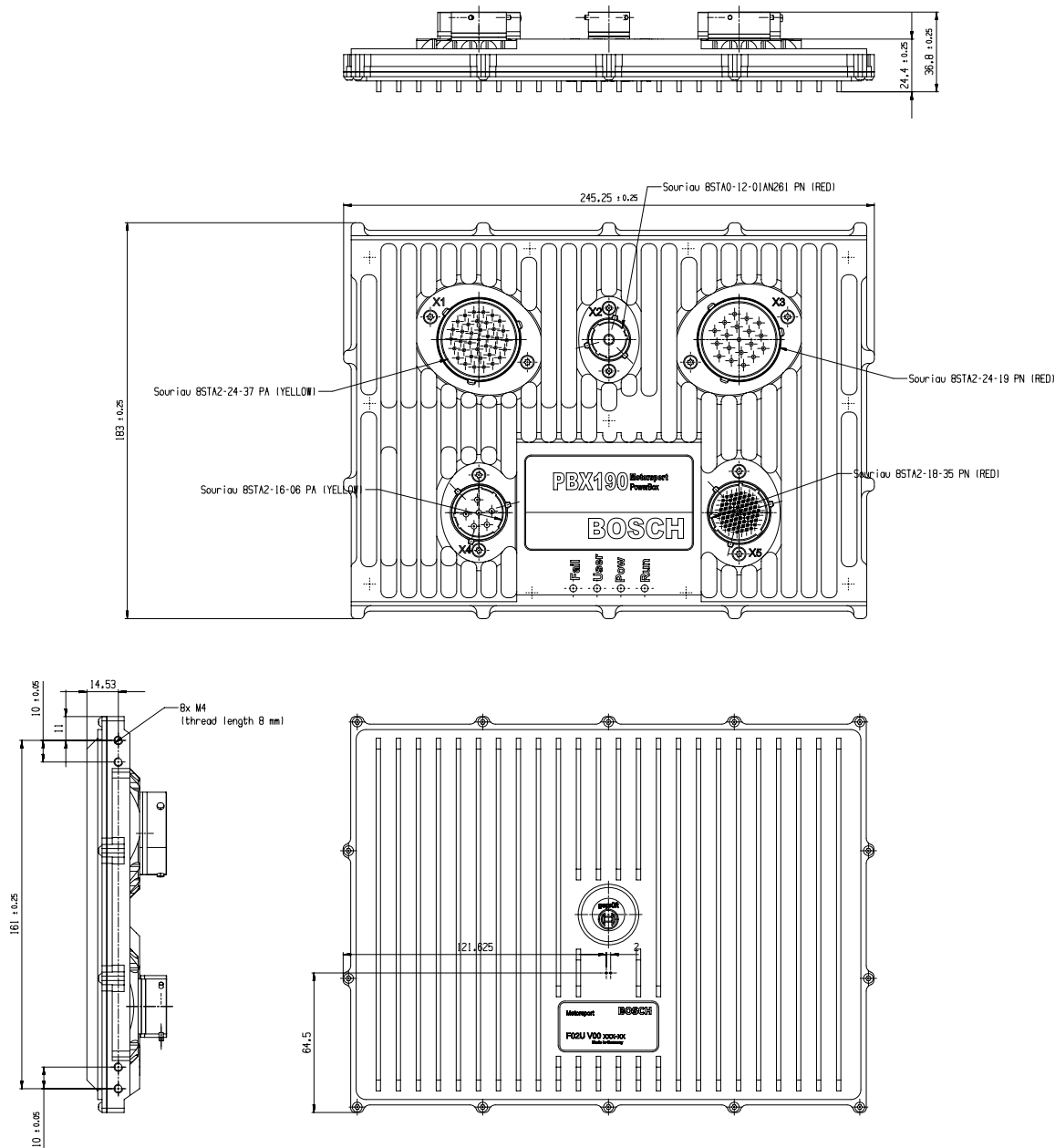
Installation Notes

Inspection services	Recommended after 220 h or 2 years, no components to replace
---------------------	--

Ordering Information

PowerBox PBX 190Order number **F 02U V02 626-02****Accessories****Mating Connector X1**Order number **F 02U 004 387-01****Mating Connector X2**Socket 25 mm²Order number **F 02U B01 044-01****Mating Connector X2**Socket 35 mm²Order number **F 02U B01 045-01****Mating Connector X3**Order number **F 02U 004 386-01****Mating Connector X4**Order number **F 02U 004 388-01****Mating Connector X5**Order number **F 02U 000 472-02****Connector Opening Tool for Shellsize 24**Order number **F 02U V02 434-01****Breakout Box**Order number **F 02U V02 523-01**

Dimensions



Represented by:

Europe:
 Bosch Engineering GmbH
 Motorsport
 Robert-Bosch-Allee 1
 74232 Abstatt
 Germany
 Tel.: +49 7062 911 9101
 Fax: +49 7062 911 79104
 motorsport@bosch.com
 www.bosch-motorsport.de

North America:
 Bosch Engineering North America
 Motorsport
 38000 Hills Tech Drive
 Farmington Hills, MI 48331-3417
 United States of America
 Tel.: +1 248 876 2977
 Fax: +1 248 876 7373
 motorsport@bosch.com
 www.bosch-motorsport.com

Latin America:
 Robert Bosch Ltda
 Motorsport
 Av Juscelino Kubitscheck de
 Oliveira 11800
 Zip code 81460-900
 Curitiba - Parana
 Brasilia
 Tel.: +55 41 3341 2057
 Fax: +55 41 3341 2779

Asia-Pacific:
 Bosch Engineering Japan K.K.
 Motorsport
 18F Queen's Tower C, 2-3-5 Minato Mirai
 Nishi-ku, Yokohama-shi
 Kanagawa 220-6218
 Japan
 Tel.: +81 45 650 5610
 Fax: +81 45 650 5611
 www.bosch-motorsport.jp

Australia, New Zealand and South Africa:
 Robert Bosch Pty. Ltd
 Motorsport
 1555 Centre Road
 Clayton, Victoria, 3168
 Australia
 Tel.: +61 (3) 9541 3901
 motor.sport@au.bosch.com