

Input voltage ranges up to 168 V DC
1 or 2 isolated outputs 3.3...48 V DC
3 kV AC I/O electric strengh test voltage

- Extremely slim case (4TE wide), fully enclosed
- Extremely low inrush current, hot swappable
- Operating ambient temperaturerange –40...71°C with convection cooling

Selection chart

Output 1 $U_{o\,nom}$ [V DC]	Output 1 $I_{o\,nom}$ [A]	Output 1 $I_{o\,max}$ [A]	Output 2 $U_{o\,nom}$ [V DC]	Output 2 $I_{o\,nom}$ [A]	Output 2 $I_{o\,max}$ [A]	Type Input Voltage 16...36 V DC	Type Input Voltage 38...75 V DC	Options
5.1	16	16	-	-	-	24Q1001-2R	48Q1001-2R	P
12	8	8	-	-	-	24Q2320-2R	48Q2320-2R	P
15	6.6	6.6	-	-	-	24Q2540-2R	48Q2540-2R	P
24	4	4	-	-	-	24Q2320-2R	48Q2320-2R	P
24	4.4	4.4	-	-	-	24Q2660-2R	48Q2660-2R	P
30	3.3	3.3	-	-	-	24Q2540-2R	48Q2540-2R	P
48	2.2	2.2	-	-	-	24Q2660-2R	48Q2660-2R	P
5.1	7.5	7.5	5.1	7.5	7.5	24Q2001-2R	48Q2001-2R	P
12	4	4	12	4	4	24Q2320-2R	48Q2320-2R	P
15	3.3	3.3	15	3.3	3.3	24Q2540-2R	48Q2540-2R	P
24	2.2	2.2	24	2.2	2.2	24Q2660-2R	48Q2660-2R	P

Output 1 $U_{o\,nom}$ [V DC]	Output 1 $I_{o\,nom}$ [A]	Output 1 $I_{o\,max}$ [A]	Output 2 $U_{o\,nom}$ [V DC]	Output 2 $I_{o\,nom}$ [A]	Output 2 $I_{o\,max}$ [A]	Type Input Voltage 14.4...36 V DC	Type Input Voltage 21.6...54 V DC	Type Input Voltage 35...75 V DC	Options
3.3	18	22	-	-	-	BQ 1101-7	GQ 1101-7	CQ 1101-7	-9
5.1	16	20	-	-	-	BQ 1001-7R	GQ 1001-7R	CQ 1001-7R	-9, P
12	8	10	-	-	-	BQ 2320-7R	GQ 2320-7R	CQ 2320-7R	-9, P
15	6.6	8	-	-	-	BQ 2540-7R	GQ 2540-7R	CQ 2540-7R	-9, P
24	4.4	5.5	-	-	-	BQ 2660-7R	GQ 2660-7R	CQ 2660-7R	-9, P
24	4	5	-	-	-	BQ 2320-7R	GQ 2320-7R	CQ 2320-7R	-9, P
30	3.3	4	-	-	-	BQ 2540-7R	GQ 2540-7R	CQ 2540-7R	-9, P
48	2.2	2.75	-	-	-	BQ 2660-7R	GQ 2660-7R	CQ 2660-7R	-9, P
5.1	7.5	9.5	5.1	7.5	9.5	BQ 2001-7R	GQ 2001-7R	CQ 2001-7R	-9, P
12	4	5	12	4	5	BQ 2320-7R	GQ 2320-7R	CQ 2320-7R	-9, P
15	3.3	4	15	3.3	4	BQ 2540-7R	GQ 2540-7R	CQ 2540-7R	-9, P
24	2.2	2.75	24	2.2	2.75	BQ 2660-7R	GQ 2660-7R	CQ 2660-7R	-9, P

Output 1 $U_{o\,nom}$ [V DC]	Output 1 $I_{o\,nom}$ [A]	Output 1 $I_{o\,max}$ [A]	Output 2 $U_{o\,nom}$ [V DC]	Output 2 $I_{o\,nom}$ [A]	Output 2 $I_{o\,max}$ [A]	Type Input Voltage 43...108 V DC	Type Input Voltage 65...168 V DC	Options
3.3	18	22	-	-	-	DQ 1101-7	EQ 1101-7	-9
5.1	16	20	-	-	-	DQ 1001-7R	EQ 1001-7R	-9, P
12	8	10	-	-	-	DQ 2320-7R	EQ 2320-7R	-9, P
15	6.6	8	-	-	-	DQ 2540-7R	EQ 2540-7R	-9, P
24	4	5.5	-	-	-	DQ 2660-7R	EQ 2660-7R	-9, P
24	4	5	-	-	-	DQ 2320-7R	EQ 2320-7R	-9, P
30	3.3	4	-	-	-	DQ 2540-7R	EQ 2540-7R	-9, P
48	2.2	2.75	-	-	-	DQ 2660-7R	EQ 2660-7R	-9, P
5.1	7.5	9.5	5.1	7.5	9.5	DQ 2001-7R	EQ 2001-7R	-9, P
12	4.4	5	12	4.4	5	DQ 2320-7R	EQ 2320-7R	-9, P
15	3.3	4	15	3.3	4	DQ 2540-7R	EQ 2540-7R	-9, P
24	2.2	2.75	24	2.2	2.75	DQ 2660-7R	EQ 2660-7R	-9, P

Input

Input voltage		refer to selection chart
Inrush current	ETS 300 132-2	typ. 40 A

Output

Efficiency	$U_{i\,nom}$, $I_{o\,nom}$	up to 88%
Output voltage setting accuracy	$U_{i\,nom}$, $I_{o\,nom}$	±0.6% $U_{o\,nom}$
Worst case output voltage 1	$U_{i\,min}$...$U_{i\,max}$, 0...$I_{o1\,max}$, $T_{C\,min}$...$T_{C\,max}$	±1.8% $U_{o\,nom}$
Minimum output current 1, 2	in parallel configuration not required	0 A
Minimum output current 1, 2	in individual or series configuration	10% $I_{o1,2\,nom}$
Load regulation output 2	$I_{o1,2\,min}$...$I_{o1,2\,max}$	typ. 100 mΩ • (I_{o1} – I_{o2})
Output voltage switching noise	IEC/EN 61204, total, peak-peak	typ 0.3% $U_{o\,nom}$
Common current limit. I_{o1} + I_{o2}	rectangular U/I characteristic	typ. 130% ($I_{o1\,max}$ + $I_{o2\,max}$)
Operation of units in parallel	by connecting the current sharing pins T	

Protection

Input reverse polarity	built-in fuse	
Input undervoltage lockout		typ. 90% $U_{i\,min}$
Input overvoltage lockout		typ. 110% $U_{i\,max}$
Input transient protection	varistor	
Output	no-load, overload and short-circuit proof	
Output overvoltage	second control loop	typ. 125% $U_{o\,nom}$
Overtemperature	switch-off with auto restart (-7 units)	T_C typ. 100°C

Control

Output voltage adjustment	with feature R	60/80...110% $U_{o\,nom}$
Inhibit on input side	TTL input, output(s) disabled if left open circuit	
Status indication	LEDs: In OK (-7 units), Out OK (all)	
Output good signal (Out OK)	isolated open collector signal	

Safety

Approvals	EN 60950, UL 1950, CSA C22.2 No. 950	
Class of equipment		class I
Protection degree		IP 20/30
Electric strength test voltage	I/case, O/case, Out OK/case	1.5 kV AC
	I/O, Out OK/I, Out OK/O	3 kV AC
	O/O	300 V DC

EMC

Electrostatic discharge	IEC/EN 61000-4-2, level 4 (8/15 kV)	criterion B
Electromagnetic field	IEC/EN 61000-4-3, level 3 (10 V/m)	criterion A
Electr. fast transients/bursts	IEC/EN 61000-4-4, output/input, level 3/4 (2/4 kV)	criterion B
Surge	IEC/EN 61000-4-5, input, level 2/3 (1/2 kV)	criterion B
Conducted disturbances	IEC/EN 61000-4-6, level 2/3 (3/10 V)	criterion A
Electromagnetic emissions	CISPR 22/EN 55022, 24/48/BQ/CQ/GQ, conducted	class B

Environmental –2 units

Operating ambient temperature	$U_{i\,nom}$, $I_{o\,nom}$, convection cooled	–10...50°C
Operating case temperature T_C	$U_{i\,nom}$, $I_{o\,nom}$	–10...80°C
Storage temperature	non operational	–25...100°C
Damp heat	IEC/EN 60068-2-3, 93%, 40°C	21 days
Vibration, sinusoidal	IEC/EN 60068-2-6, 10...60/60...2000 Hz	0.15 mm/2 g_n
Shock	IEC/EN 60068-2-27, 6 ms	15 g_n
Bump	IEC/EN 60068-2-29, 6 ms	10 g_n
MTBF	MIL-HDBK-217F, G_B, 40°C, 24/48Q1000	588'000 h

Environmental –7 units

Operating ambient temperature	$U_{i\,nom}$, $I_{o\,nom}$, convection cooled	–25...71°C
	$U_{i\,nom}$, $I_{o\,max}$, convection cooled	–25...50°C
Operating case temperature T_C	$U_{i\,nom}$, $I_{o\,nom}$	–25...95°C
	$U_{i\,nom}$, $I_{o\,max}$	–25...85°C
Storage temperature	non operational	–40...100°C
Damp heat	IEC/EN 60068-2-3, 93%, 40°C	56 days
Vibration, sinusoidal	IEC/EN 60068-2-6, 10...60/60...2000 Hz	0.35 mm/5 g_n
Shock	IEC/EN 60068-2-27, 11 ms	50 g_n
Bump	IEC/EN 60068-2-29, 11 ms	25 g_n
Random vibration	IEC/EN 60068-2-64, 20...500 Hz	4.9 $g_{n\,rms}$
MTBF	MIL-HDBK-217F, notice 2, G_B, 40°C, BQ 2000	853'000 h

Options

Extended temperature range	–40...71°C, ambient, operating, for -7 units	-9
Output voltage adjustment	±10% $U_{o\,nom}$, excludes feature R and vice versa	P

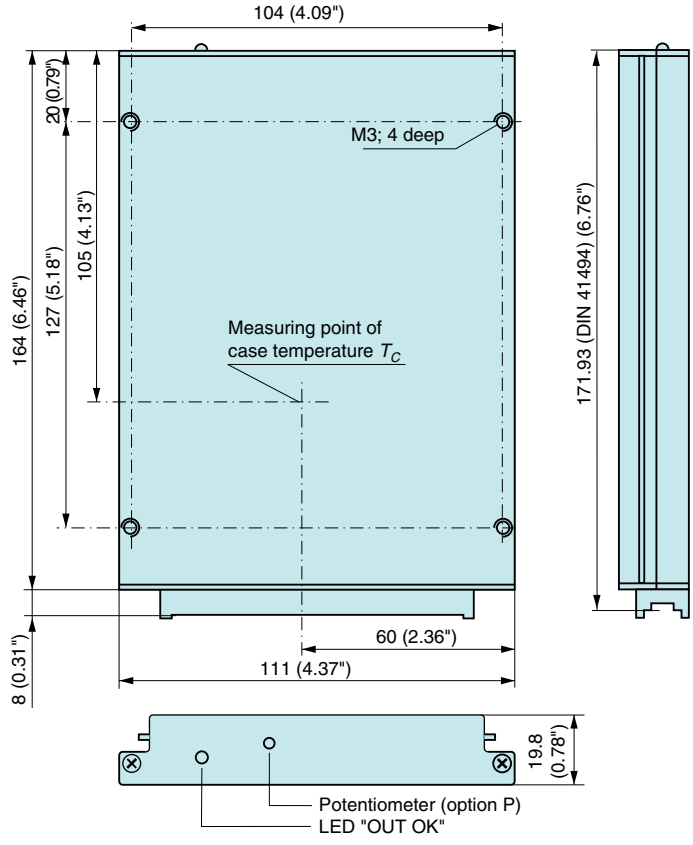
Accessories

Front panels for 19" rack mounting in 3U or 6U configuration (Schroff/Intermas)
Mating H15 connectors with screw, solder, fast-on or press-fit terminals
Connector retention facilities and code key system for connector coding
Additional external input or output filters
Mechanical mounting supports for chassis, DIN-rail and PCB mounting

Mechanical data

Tolerances ±0.3 mm (0.012") unless otherwise indicated.

European Projection



Pin allocation

Pin	Electrical determination	Q 1000	Q 2000
4 6	Output voltage (positive) Output voltage (positive)	Vo1+ Vo1+	Vo1+ Vo2+
8 10	Output voltage (negative) Output voltage (negative)	Vo1– Vo1–	Vo1– Vo2–
12 14	Sense line (positive) Sense line (negative)	S+ S–	S+ S–
16 18 20	Output voltage control input Current sharing control input Do not connect (internal Gnd.)	R T -	R T -
22 24	Output good signal (positive) Output good signal (negative)	Out OK+ Out OK–	Out OK+ Out OK–
26	Protective earth	⏚	⏚
28	Inhibit control input	i	i
30 32	Input voltage (positive) Input voltage (negative)	Vi+ Vi–	Vi+ Vi–