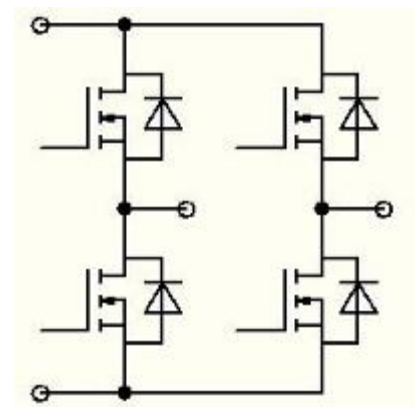
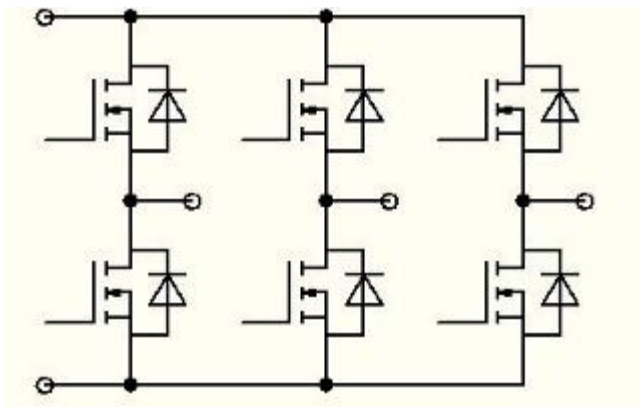


INVERTERS

Electrum AV





LED light

Powerful sound amplifiers of class «D»

Low-voltage sources and converters

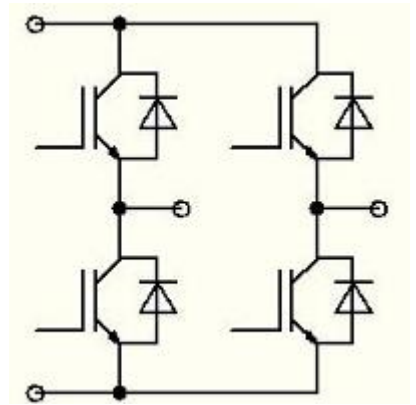
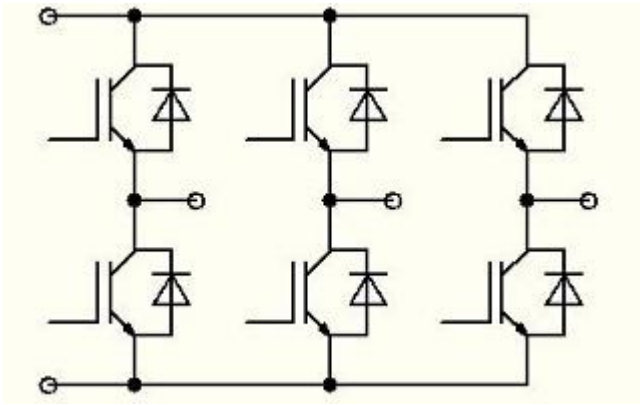


Transport



Industry equipment





Electric motors control

Alternative energy



Household appliances

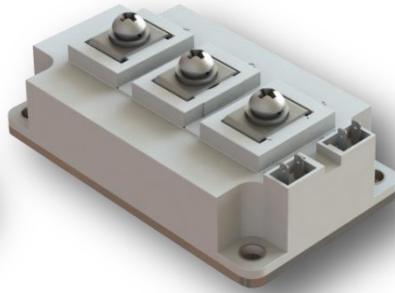
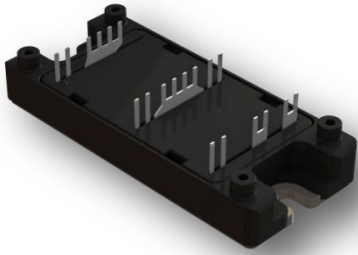


Converters



Industry equipment





Modules – inverters

IGBT – 1...27 kW

MOSFET – 0,5...10 kW

Modules of half-bridges

IGBT – 10...150 kW

MOSFET – 1...27 kW

Units – inverters

IGBT – 50...450 kW

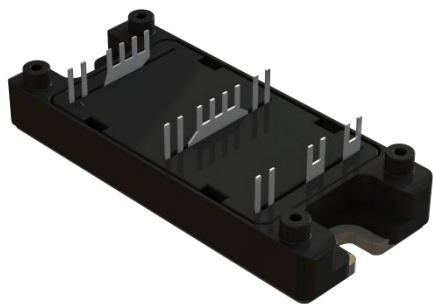
MOSFET – 12...120 kW

M12 – half-bridge

M13A – three-phase inverter

M13B – H-bridge

Units based on half-bridges M12
and single switches M9



M2



M1



DM

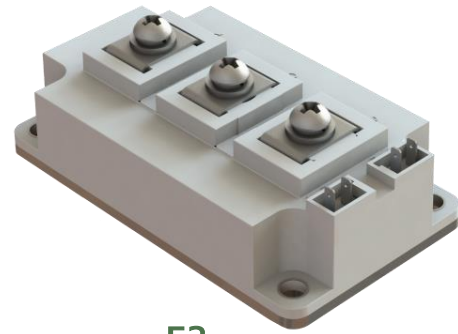
Design version	Inverter type	Transistor	Voltage, V	Current amount, A
DM	M13A, M13B	MOSFET	40	100,200
			75	100,200
			100	10,30,50,70,100
			200	10,30,50,70
		IGBT	600	10,30,50
			1200	10,30,50
M1	M13A	IGBT	1200	50
	M13B		1200	50,100,150
M2	M13B		1200	50



DM

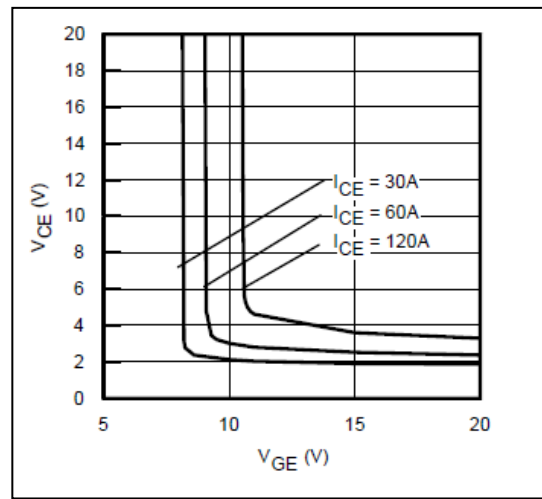
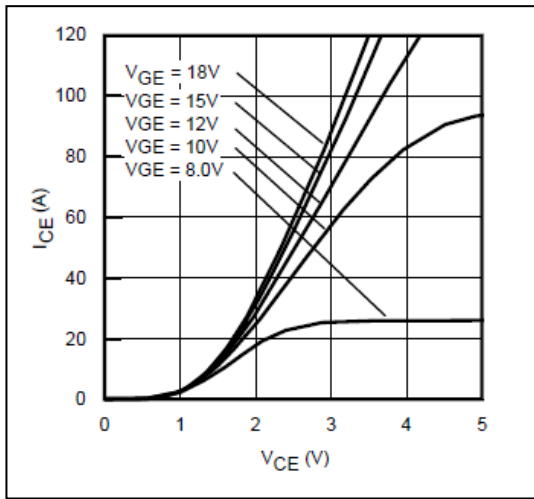


E2



E3

Design version	Transistor	Voltage, V	Current amount, A
DM	MOSFET	40	300,500
		75	300,500
		100	120,160,200,250
		200	120,160,200
	IGBT	1200	50,100,150,200
E2	IGBT	1200	50,100
E3		1200	150,200,300
M1	MOSFET	100	370
		200	300
	IGBT	1200	150,200,300
		1700	150
M2	IGBT	1200	50,100,150
		1700	50



Parameter name, unit	Symbol	Value		
		min	typ.	max
Maximum permissible modes				
Collector-emitter voltage (max), V	V_{CES}			1200
Gate-emitter voltage (max), V	V_{GE}	-20		20
DC collector at $T_c=25\text{ }^\circ\text{C}$ (max), A	I_C			100
Collector pulse current at $t_{pul}=1\text{ ms}$ (max), A	I_{CM}			240
Junction temperature (max), $^\circ\text{C}$	T_j	-55		150
Static parameters				
Gate leakage current (max), nA	I_{GES}	-100		100
Collector-emitter saturation voltage (max), V	$V_{CE(on)}$		2.5	2.75
Collector leakage current (max), μA	I_{CES}			100
Dynamic parameters				
Input capacitance (typical), pF	C_{ies}		4300	
Switch-on delay time (max), ns	$t_{d(on)}$			94
Rise time (max), ns	t_r			45
Switch-off delay time (max), ns	$t_{d(off)}$			400
Fall time (max), ns	t_f			58



Parameter name, unit	Symbol	Module class, A				
		0,4	0,75	1	2	2,5
Maximum permissible modes						
Drain–source voltage (max), V	V_{DSS}	40	75	100	200	250
Gate–source voltage (max), V	V_{GS}	± 20	± 20	± 20	± 30	± 30
Gate DC at $T_c=25\text{ }^\circ\text{C}$ (max), A	I_D	250	250	170	144	90
Gate DC at $T_c=100\text{ }^\circ\text{C}$ (max), A	I_D	195	195	120	100	64
Drain pulse current at $t_{pul}=1\text{ ms}$ (max), A	I_{DM}	1390	1280	540	570	360
Junction temperature (max), $^\circ\text{C}$	T_j	175	175	175	175	175
Static parameters						
Gate–source threshold voltage, V	$V_{GS(th)}$	2...4	2...4	2...4	3...5	3...5
Gate leakage current (max), nA	I_{GSS}	± 100	± 100	± 100	± 100	± 100
Drain–source resistance in on–state (max), $m\Omega$	$R_{DS(on)}$	1.7	1.85	7.7	16.7	24
Dynamic parameters						
Input capacitance (typical), nF	C_{iss}	8.9	19.2	9.3	12	18.2
Switch–on delay time (typical), ns	$t_{d(on)}$	59	43	12	14	18
Rise time (typical), ns	t_r	370	220	58	32	31
Switch–off delay time (typical), ns	$t_{d(off)}$	160	170	45	26	30
Fall time (typical), ns	t_f	190	260	47	16	21
Common gate charge (typical), nC	Q_G	220	380	390	340	290

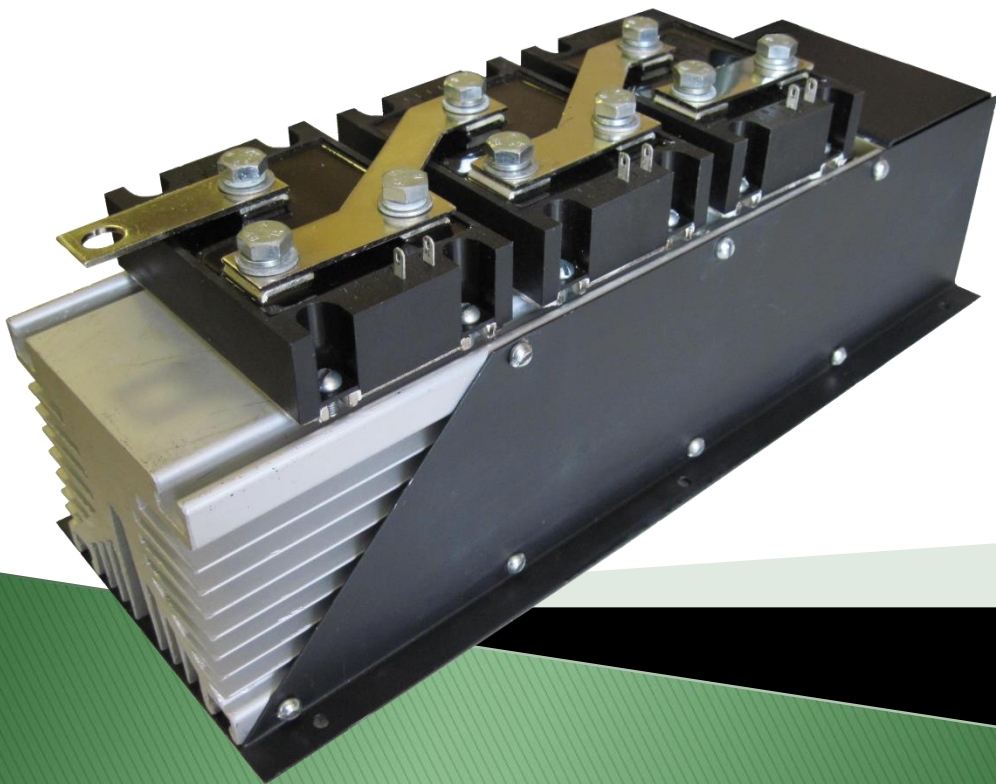


Power units – this is an assembly of electronic components and cooling construction; the construction includes a radiator, fan and housing elements.

Electronic components (power thyristors, diodes, transistors) are connected in an electric circuit using power wires, hereupon for unit operation it is necessary only connection of external input and output conductors.

The units with inbuilt control include drivers converting control logic signals to control signals by actuating power elements (thyristors or transistors).

The unit include a thermo sensor that is necessary to control the cooler temperature.

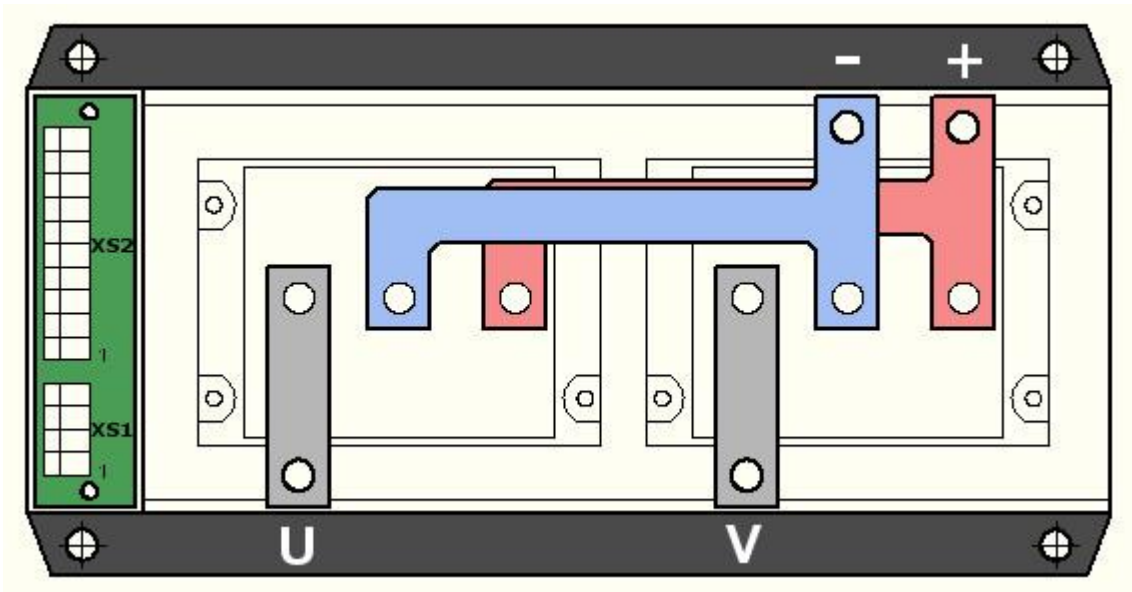
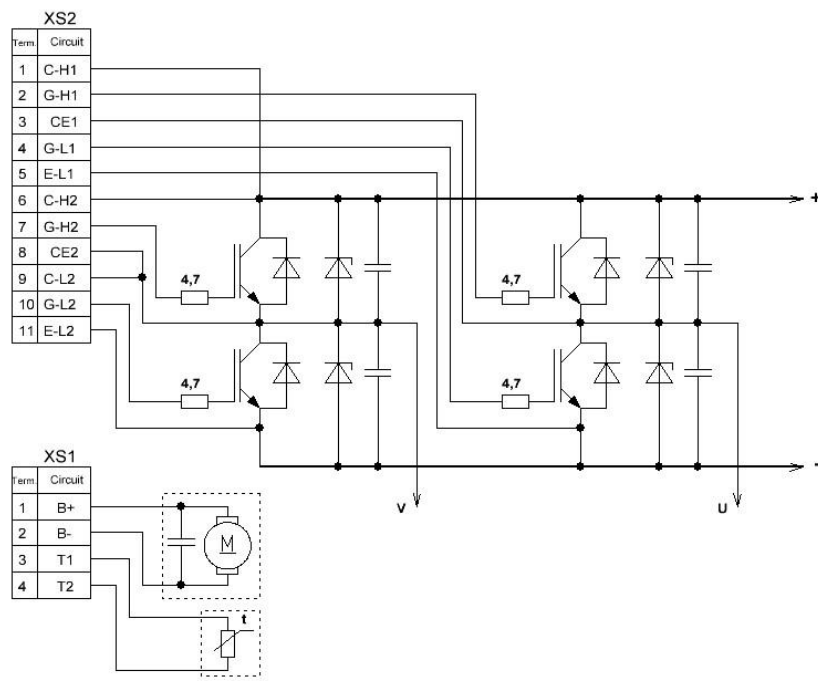


INVERTERS UNITS BASED ON IGBTs

Without control	With control	Functional purpose	Products list
B13A	B13AU	Three-phase inverter	200,400,800 A / 1200 V
B13B	B13BU	H-bridge	200,400,800 A / 1200 V

INVERTERS UNITS BASED ON MOSFETs

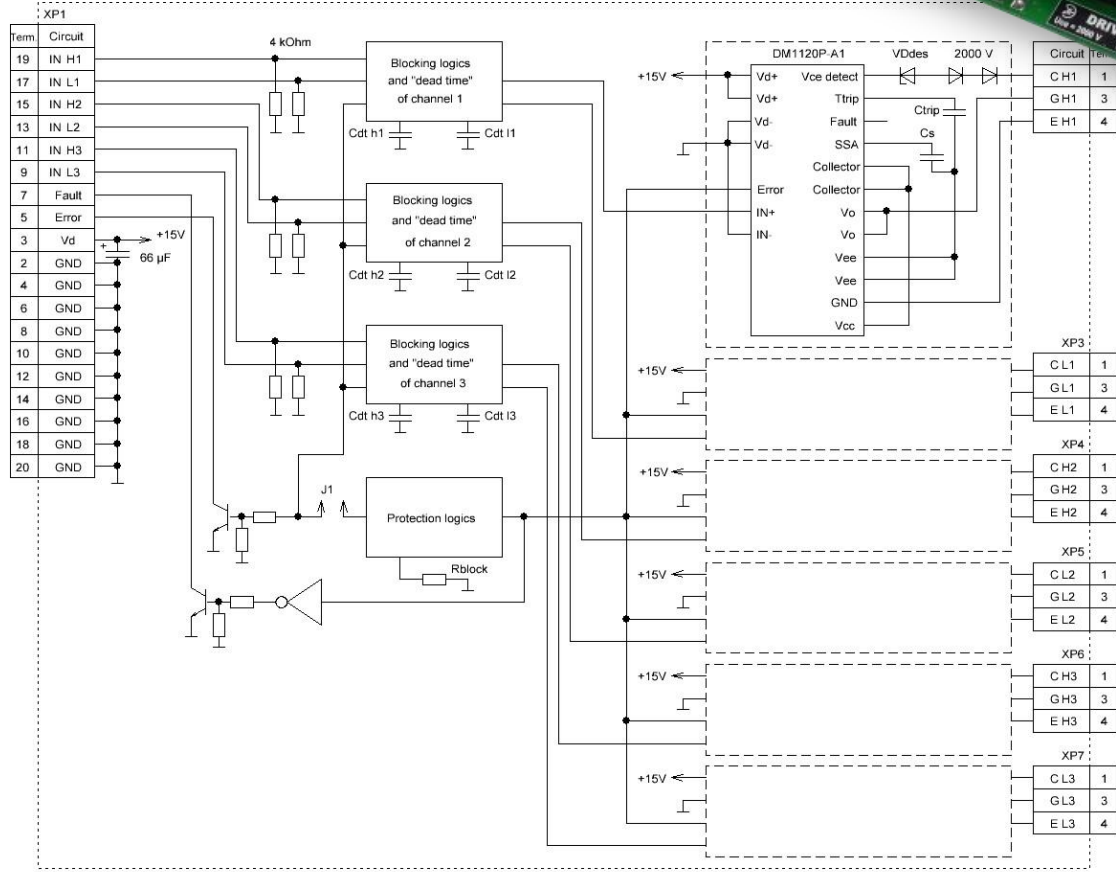
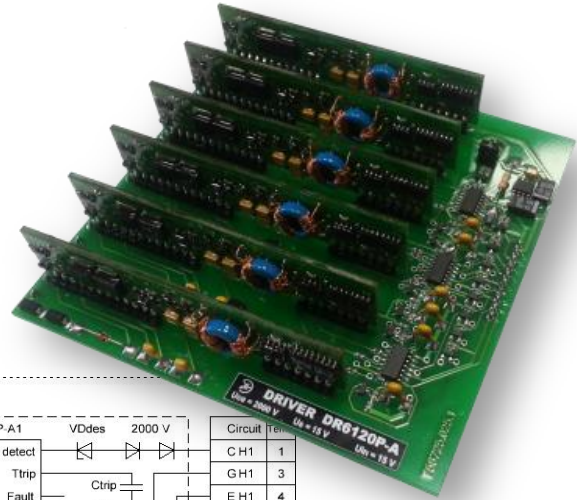
Without control	With control	Functional purpose	Products list
B13A	B13AU	Three-phase inverter	500,1000 A / 40,75 V 200,400,800 A / 100,200 V
B13B	B13BU	H-bridge	500,1000 A / 40,75 V 200,400,800 A / 100,200 V



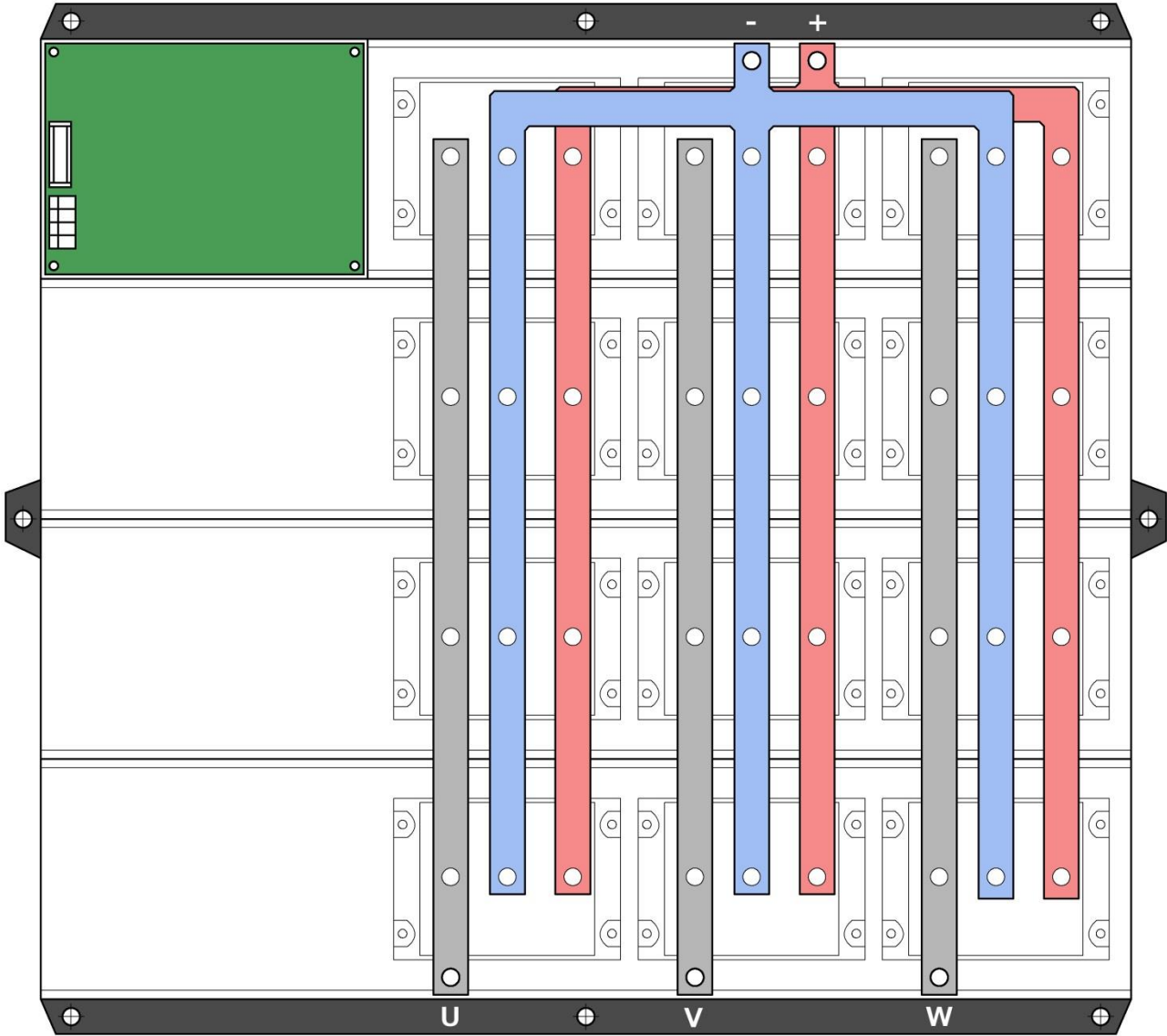
Example of assembly B13B
(200 A / 1200 V)

AS A BASE UNITS DRIVER WITH CONTROL IS USED A SIX-CHANNEL DRIVER DR6120P-A

SUPPLY VOLTAGE – 15 V
CONTROL VOLTAGE – 5 V
OUTPUT PULSE CURRENT – 12 A
COLLECTOR VOLTAGE – UP TO 1700 V

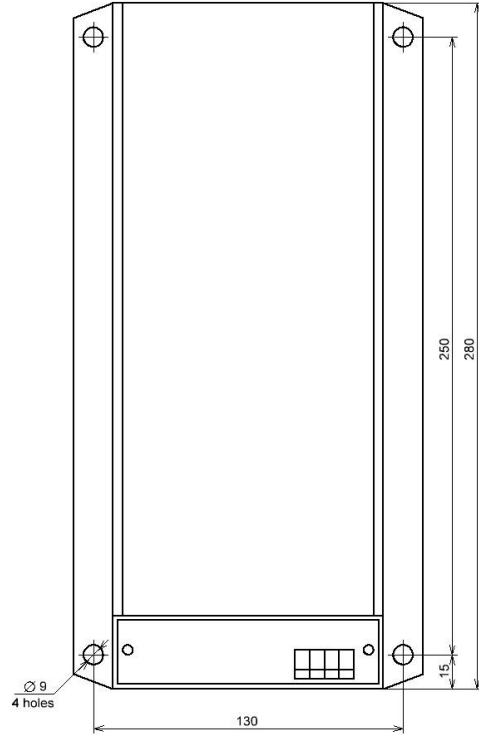
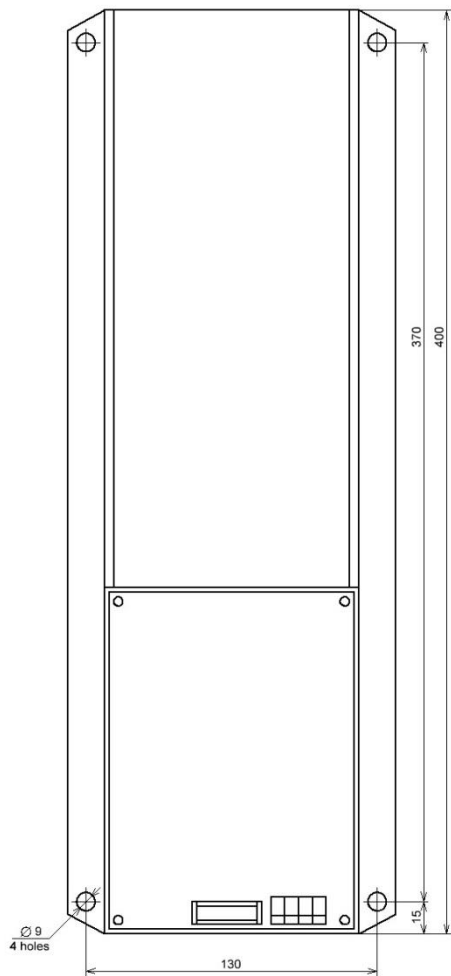


Unit of three-phase inverter with inbuilt driver, with power up to 450 kW

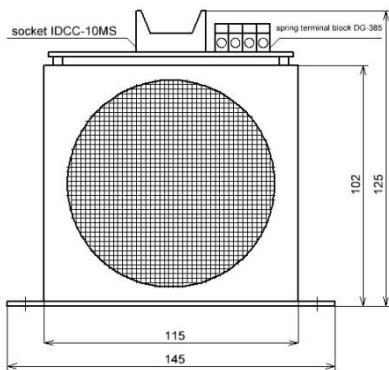


Example of assembly B13AU
(800 A / 1200 V)

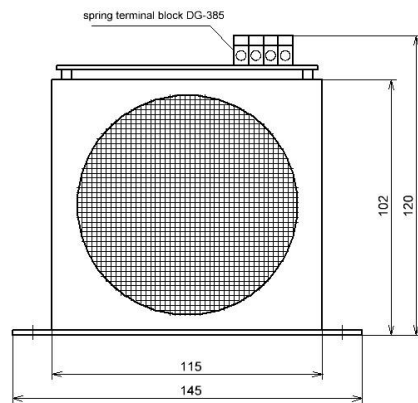




Type 2



Type 1



Units are built according module principle.
Base blocks cells – type 1, type 2



We create units upon customer's TA

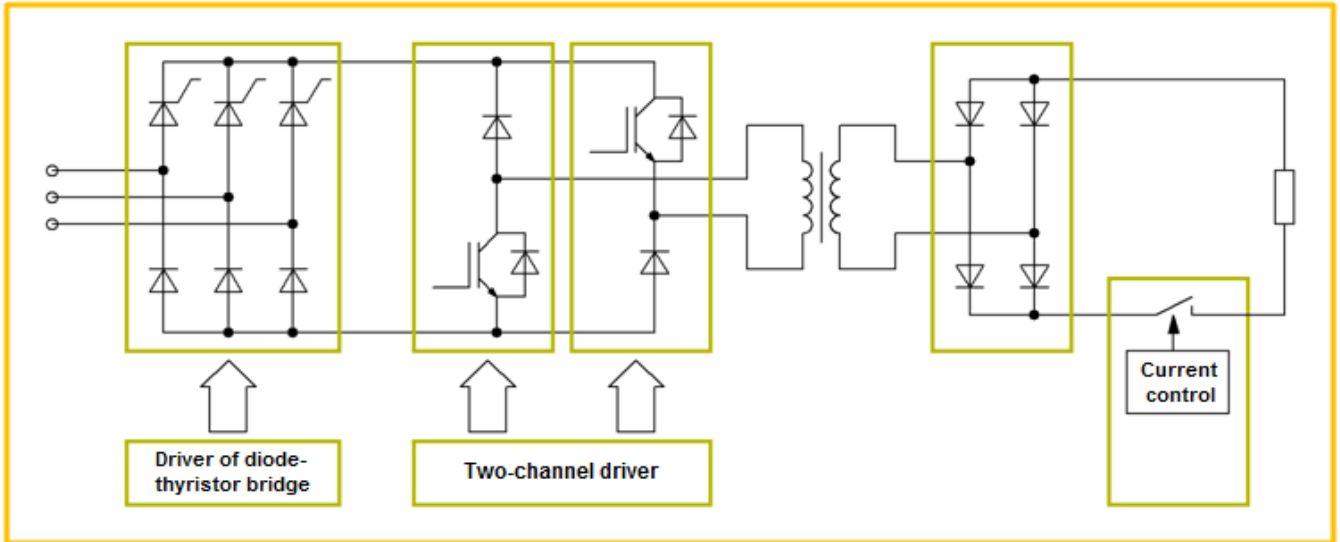
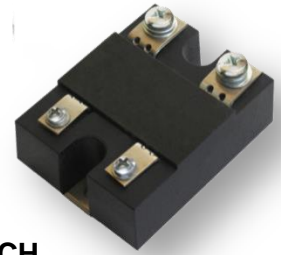


M10

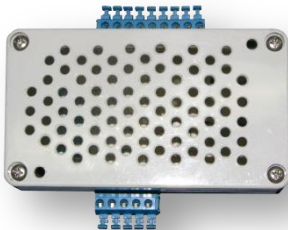
M11



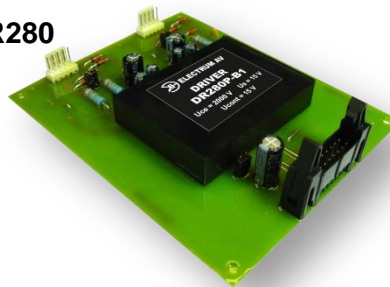
M5SCH



3phCRD



DR280



MT14PT



Control unit by pump system and solar battery

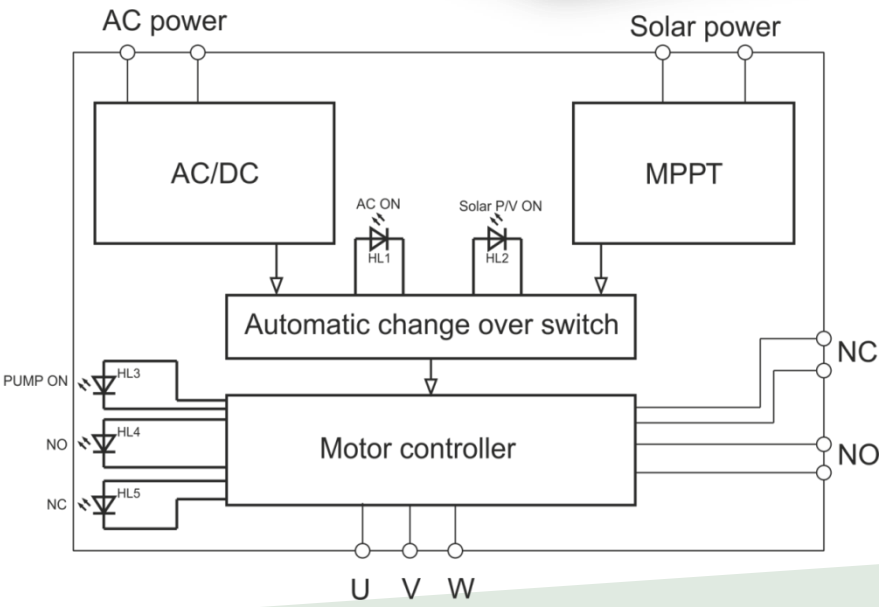
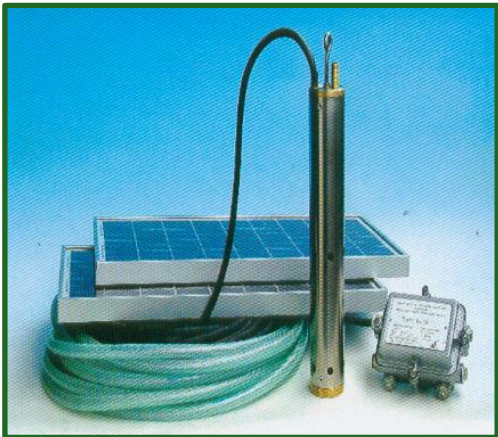
Mission:

To develop a unit to control by well pump based on brushless DC motor operating from a portable solar battery

Decision:

Unit control SWPC – controller of solar water pump

- Supply and load: up to 150 V / 20 A
- Rated motor power: 0.8 kW
- Completely autonomous operation
- Inbuilt current, voltage, start, etc protections



«Electrum AV» – this is:

- Large experience in power electronics
- Wide products list of power modules, drivers and control circuits
- Products analogues of leaders of power electronics market
- Development of products upon customer's TA
- Modernization of series products upon customer's request
- Tens development works including military purposes

Inverters by «Electrum AV» – this is:

- Technology proven by years
- Wide products list of inverters and modules for its building
- All necessary things for the inverter of own production
- Power units, simple in use
- Module principle for creation of inverters' power units
- Ability for creation of inverter upon customer's TAs



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