PHASE
MOTION CONTROL

AxW DC

CONFIGURABLE MOTION CONTROL PLATFORM

User Manual

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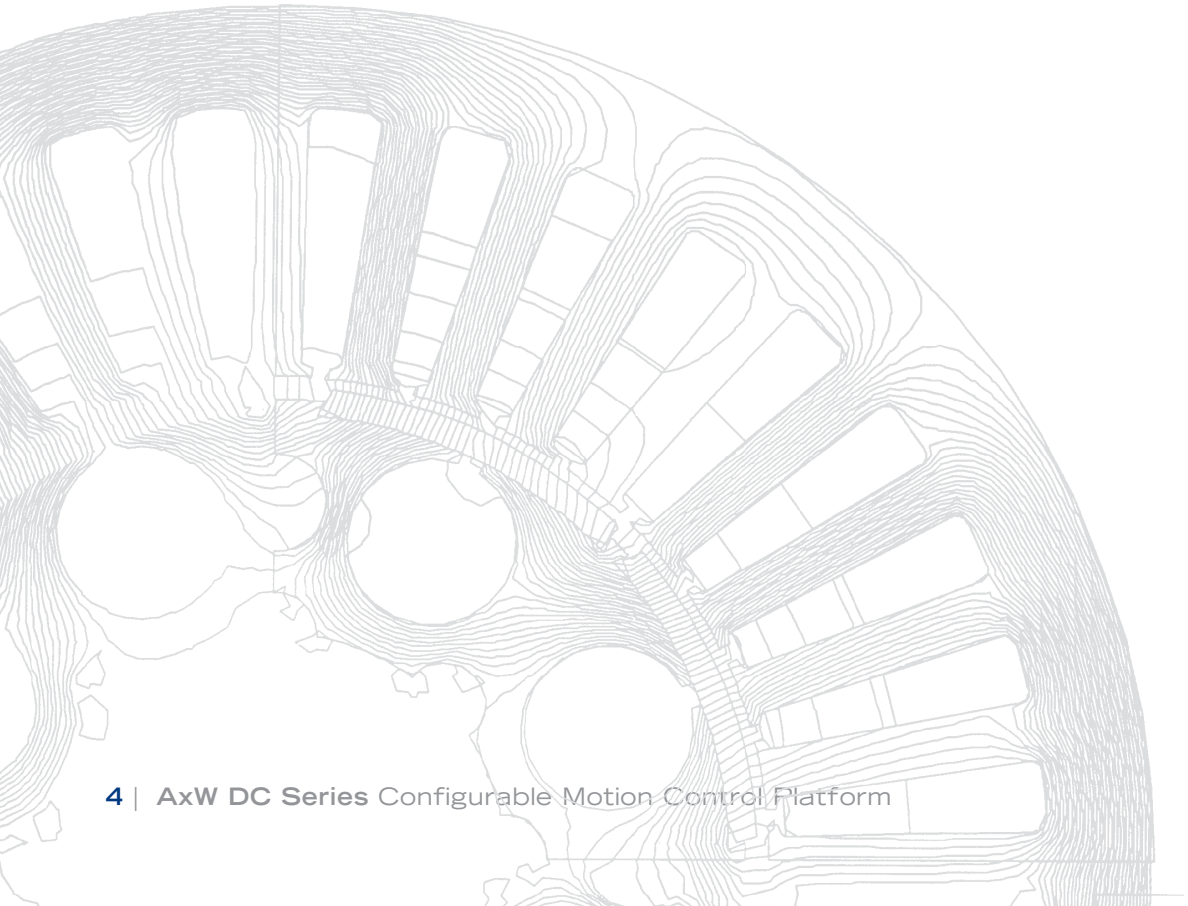
User Manual 

Release 1.0

SUMMARY



MARY

1

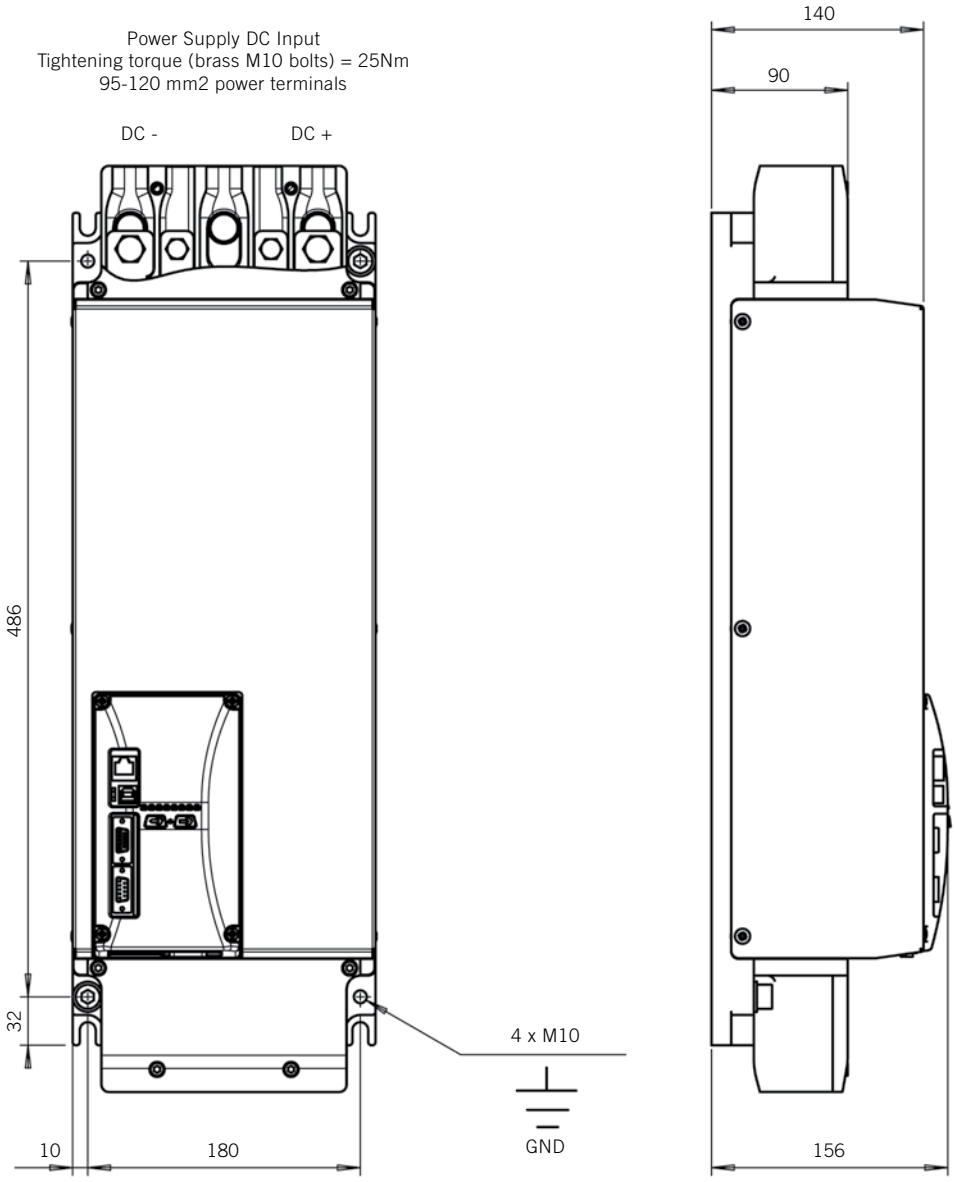
MECHANICAL ASSEMBLY AND WIRING

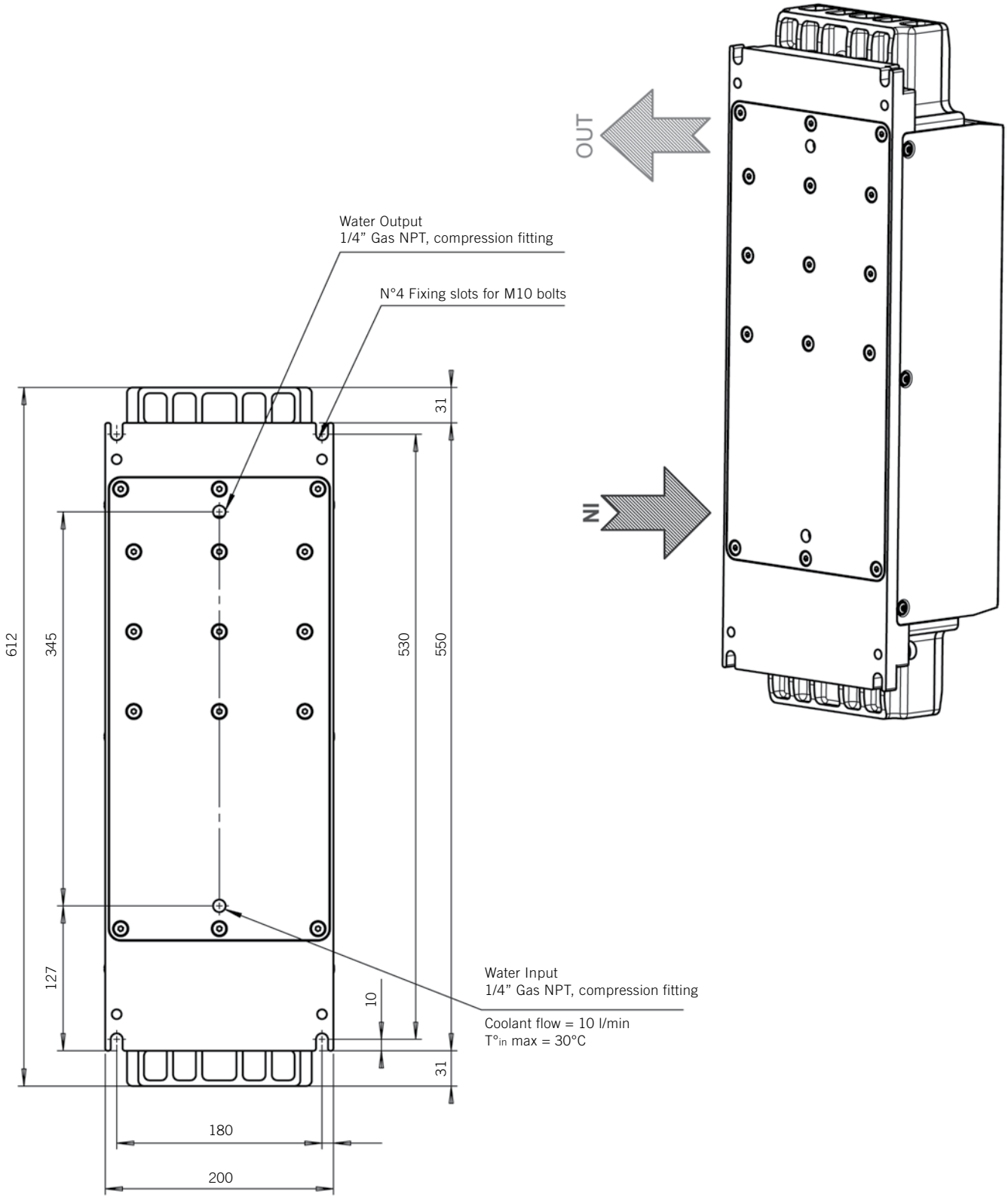
Phase Motion Control

AxM-II / AxP Configurable Motion Control Platform

1.1 MECHANICAL ASSEMBLY AND WIRING

AxW Overall dimensions

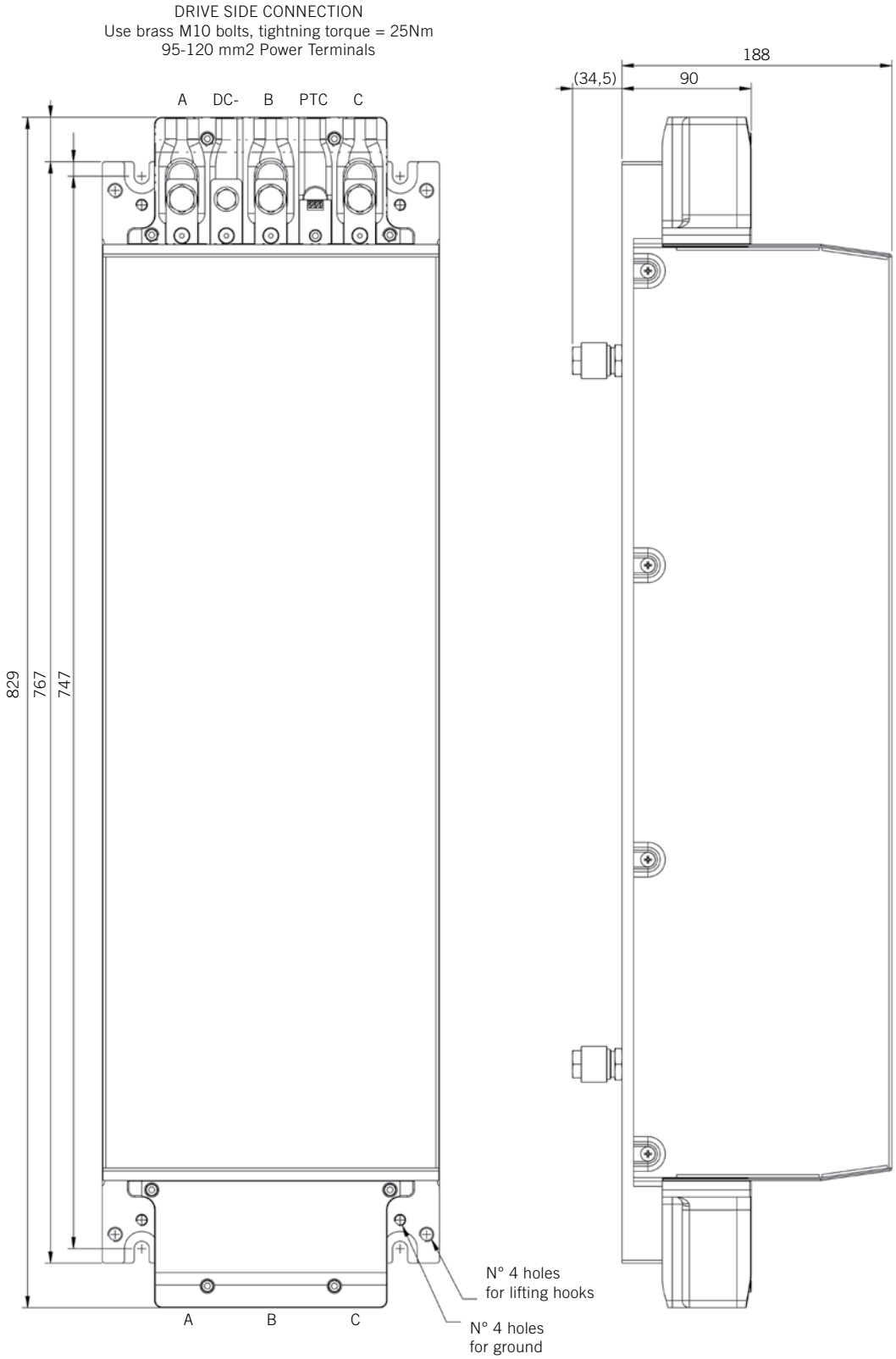


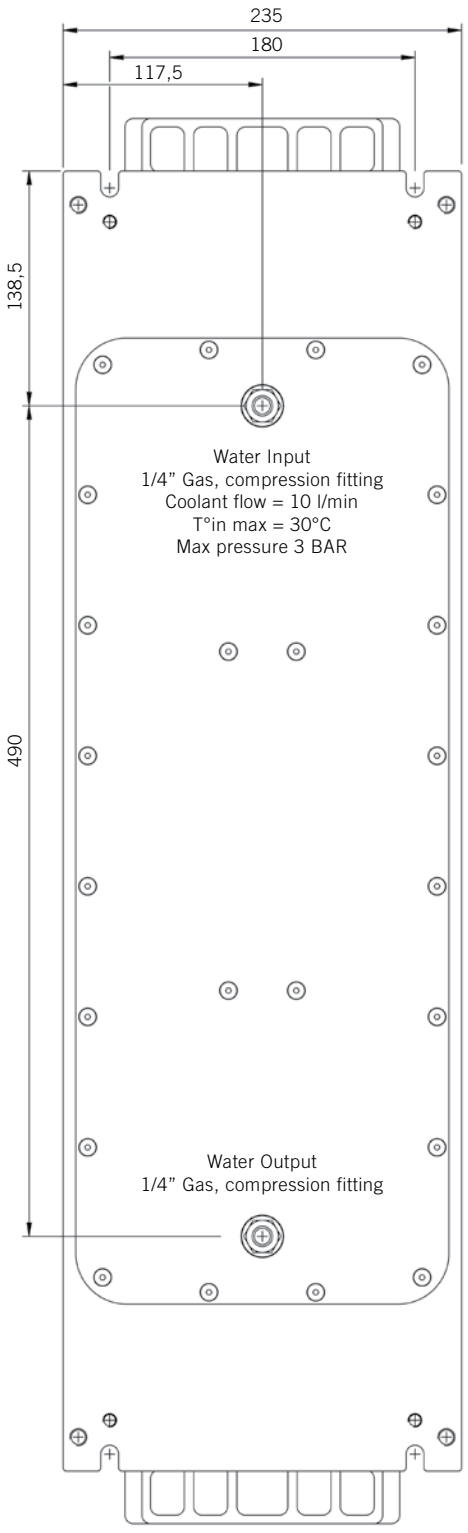


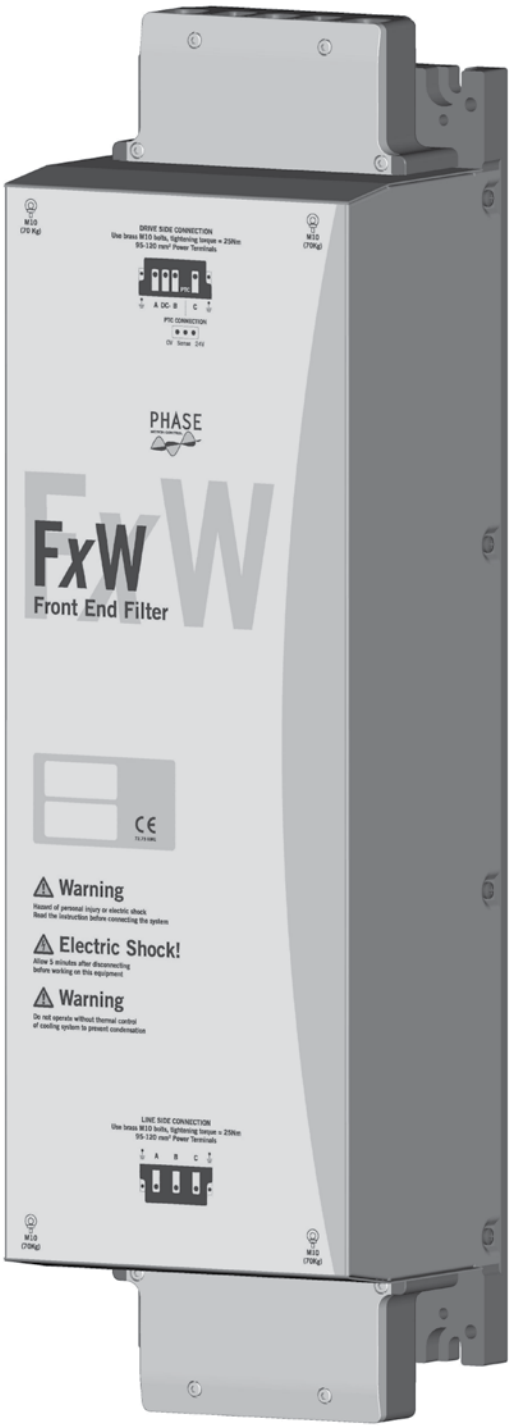
Wiring
Use Brass M10 bolts, 25Nm tightening torque with 95 / 120 mm2 power terminals

Cooling
Use ¼" Gas NPT compression fitting

FxW Overall dimensions




235
180
117,5
138,5
490
Water Input
1/4” Gas, compression fitting
Coolant flow = 10 l/min
T°in max = 30°C
Max pressure 3 BAR
Water Output
1/4” Gas, compression fitting


PHASE
FxW
Front End Filter
Warning
Electric Shock!
Warning

2

DRIVE CONFIGURATION

Phase Motion Control
AxW DC Series Configurable Motion Control Platform

2.1 COMUNICATION SET UP AND SYSTEM CONFIGURATION

Configure your AxW according to your application request, upgrading (if necessary) the system application and the parameters settings.

"Cockpit" is the tool intended for this job.

Insert the CD-Rom supplied with the drive in the PC and let the autorun work. If it do not start please open the page "index.htm" in the CD root directory with any Internet browser. It is also possible activate setup opening the "setup.exe" file present in the folder

```
d:\ setup\axvsetup\disk1;
```

When setup is finished and PC restarted, the "AxV Cockpit" folder will be added to the Windows menu "Start->Windows Programs"

A PC with Windows XP, 80Mbyte of free space, Internet Explorer 6.0 browser or better and a RS 232 serial line is requested.

Cable connection is RS232 serial female to female, null modem (see pag. 10 for connections)

Auxiliary power supply 24V (22-30V) stabilized voltage 1A is necessary to supply the Drive.

PC Connection Schema

» connect 24V supply on "+24V" and "0V" pins of the U1 terminal box (see pag. 6 for connections schema).
» Connect the RS 232 line to the connector S1 port

Switching on the 24V supply the drive will turn on and the configuration will become possible through "Cockpit" tool.
If no allarms are active the green led of the drive is blinking. Opening the system table `SyaApp-X-x.par` or the application table with Cockpit tool, the connection should be established automatically.

2.2 MOTOR CABLING AND CONNECTION CHECK-UP

Encoder Connection

Connect the position sensor to **E1** port, through a suitable multipolar shielded cable, according to the relative correspondence specified in the wiring table of par. 3.2.

Use a shielded cable with twisted duplexes, possibly of high flexibility type.

When the connection cable is longer than 25 m, the use of adequate cable section is recommended in order to avoid excessive voltage drops.

WARNING:
The cable shield must be grounded both side connectin it to the motor ground screw and to the drive connector frame.

Power connections

Connect the power supply to the DC+ and DC- input of the power terminal box. Connect the motor phases A, B, C and the Ground wire to the terminals of the drive's power terminal box, according to the sequence specified in the connection outline supplied with the motor.

A shielded cable must be used for motor phases connection and the cable shield must be grounded on both sides, motor and drive.

User connection

On **U1** and **U2** terminal box there is the analog and digital drive interface, complete of:

» 2 analog differential programmable inputs
» 2 analog programmable outputs
» 8 digital programmable inputs
» 4 digital programmable outputs

Check par. 3.1 for complete conenction sets

Field bus

On connector **C1** there is the CAN bus interface as specified on par. 3.3

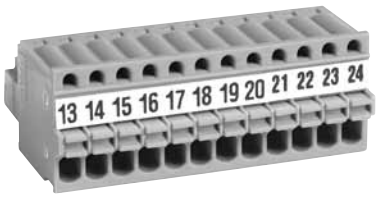
3

ELECTRICAL CONNECTIONS

Phase Motion Control
AxW DC Series Configurable Motion Control Platform

3.1 **USER** CONNECTORS (U1 /U2)

Remuvable Terminal Board, Phoenix 12 pin - cod. FK-MC 0.5/12-ST-2.5



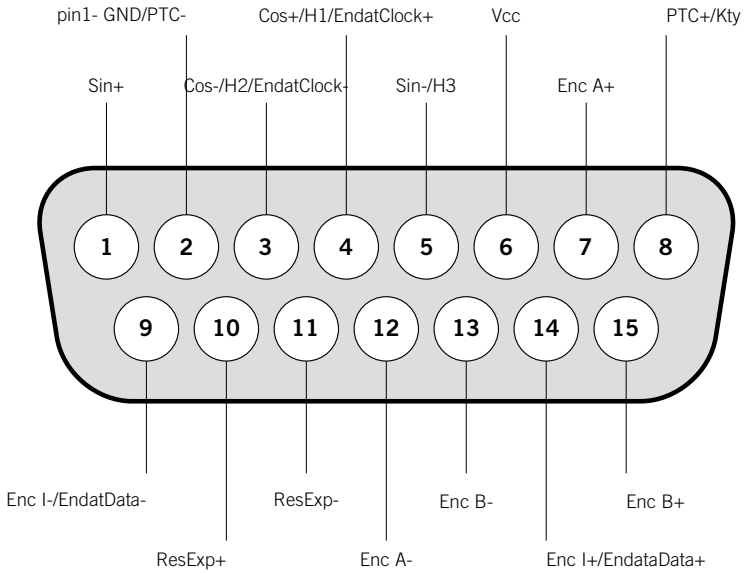
To obtain a good performance of the analog input connect the RxN pin to the reference (suorce side) and apply the –10/+10V to the RxP pin

USER CONNECTOR U1				
N	**Name**	**Type**	**Function**	**Signal description**
1	R0P	Analog input	Direct differential input	+/-10V, Zin = 10Kohm, if not used connect to GND
2	R0N	Analog input	Denied differential input	+/-10V, Zin = 10Kohm, if not used connect to GND
3	AO0	Analog output	Programmable output	+/-10V f.s., 5 mA
4	GND	Analog ground	Reference ground	Analog signals reference
5	DI0	Digital input	Programmable input	6.6 kOhm to ground, 20-30 V
6	DI1	Digital input	Programmable input	6.6 kOhm to ground, 20-30 V
7	DI2	Digital input	Programmable input	6.6 kOhm to ground, 20-30 V
8	DI3	Digital input	Programmable input	6.6 kOhm to ground, 20-30 V
9	DO0	Digital output	Programmable output	PNP open collector, 24 V, 100mA max
10	DO1	Digital output	Programmable output	PNP open collector, 24 V, 100mA max
11	24V	Auxiliary supply	Auxiliary supply of control circuits	Voltage: 22-30 V Referred to Pin 12 (0V) Requested current: 500mA.
12	0V	Auxiliary supply	Auxiliary supply negative	Digital signal reference

USER CONNECTOR U2				
N	**Name**	**Type**	**Function**	**Signal description**
13	GND	Analog ground	Reference ground	Analog signals Reference
14	R1P	Analog input	Direct differential input	+/-10V, Zin = 10Kohm, if not used, connect to GND
15	R1N	Analog input	Direct differential input	+/-10V, Zin = 10Kohm, if not used, connect to GND
16	AO1	Analog output	Programmable output	+/-10V f.s., 5 mA
17	GND	Analog ground	Reference ground	Analog signals Reference
18	DI4	Digital input	Programmable input	6.6 kOhm to ground, 20-30 V
19	DI5	Digital input	Programmable input	6.6 kOhm to ground, 20-30 V
20	DI6	Digital input	Programmable input	6.6 kOhm to ground, 20-30 V
21	DI7	Digital input	Programmable input	6.6 kOhm to ground, 20-30 V
22	DO2	Digital output	Programmable output	PNP open collector, 24 V, 100mA max
23	DO3	Digital output	Programmable output	PNP open collector, 24 V, 100mA max
24	0V	Auxiliary supply	Auxiliary supply negative	Digital signal reference

3.2 **ENCODER** CONNECTOR (E1)

To allow the connection of different encoders some pins of this connector have more than one function. Select the connection corresponding to your encoder and set the parameters SYS_ENC1_TYPE and SYS_ ENC1_CY_REV in the system table (see par. 3.4)



Cannon connector subD 15 pin, male plug

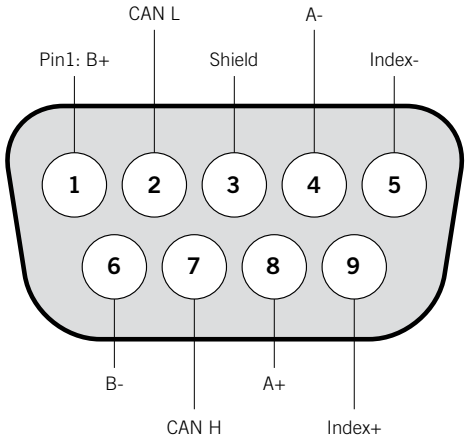
Shield Connection:

To obtain a good connection without noise problems it is necessary to connect the shield of the encoder cable both on motor and drive side.

Motor side: connect the shield to the apposite screws or in the terminal board
Drive side: connect the shield to the connector body.

3.3 **CAN** CONNECTOR (C1)

Connect the shied of the encoder cable to the connector body.



Cannon sub D9 pin, Male plug

C1 connector can be used alternatively for CAN line or to the auxiliary encoder signals; You can connect either the CANopen net or pick up the encoder emulation or use the inputs for auxiliary encoder.

The selection and the configuration is made by some system parameters.

Pin	Name	Type	Function	Signal description
1	B +	Digital I/O	Encoder incremental channel	TTL Differential line driver
2	CAN L	Digital I/O	CAN interface	CAN positive signal
3	Schermo	Gnd	CAN cable Shield	Logic Ground
4	A -	Digital I/O	Encoder incremental channel	TTL Differential line driver
6	B -	Digital I/O	Encoder incremental channel	TL Differential line driver
7	CAN H	Digital I/O	CAN interface	CAN negative signal
8	A +	Digital I/O	Encoder incremental channel	TL Differential line driver
9	I +	Digital I/O	Encoder index	TL Differential line driver

3.4 **RS232** SERIAL CONNECTOR (S1)

Cannon connector sub D 9 pin, female plug

Standard RS 232 DCE (+ RS 485)

Pin	Standard RS232	S1 connector	Description
1	DCD	---	
2	RxD	RxD (Rx-, A)	Data Line
3	TxD	TxD (Tx-, A)	Data Line
4	DTR	+12V	100mA MAX
5	GND	GND	
6	DSR	232 / 485	If +/-12V RS-232, if 0V RS-485
7	RTS	RTS (Tx+, B)	Data Line
8	CTS	CTS (Rx+, B)	Data Line
9	RI	---	

4

TECHNICAL SPECIFICATIONS

Phase Motion Control

AxW DC Series Configurable Motion Control Platform

4.1 TECHNICAL SPECIFICATIONS

Test conditions, where not differently specified:
VDC=700V, VAC=400V, cooling water temp. = 20°C

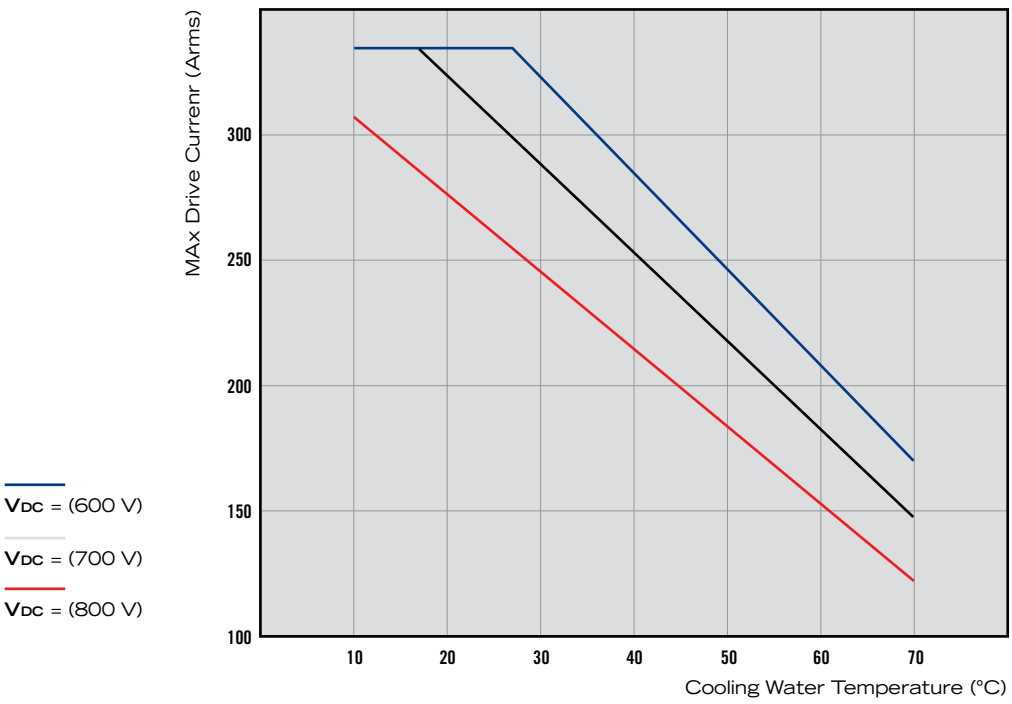
DC Side	AxW 250.330.6	AxW 300.400.6	Unit
Max DC Power	223	228	kW
Absolute MAX DC Voltage	950		Vdc
DC Voltage Range [VDC]	0 - 900		Vdc
Max DC Current [IDC]	245	297	Arms
Power Terminal Dimension	95 - 120		mm2

AC Side	AxW 250.330.6	AxW 300.400.6	Unit
Max AC Power	217	280	kW
MAX AC Voltage [VAC]	(V_{DC} / sqrt(2)) - 10%		
Max AC Current	330	400	Arms
Max AC Frequency	1,2		kHz
Ripple Current Frequency	16		kHz
Power Terminal Dimension	95 - 120		mm2

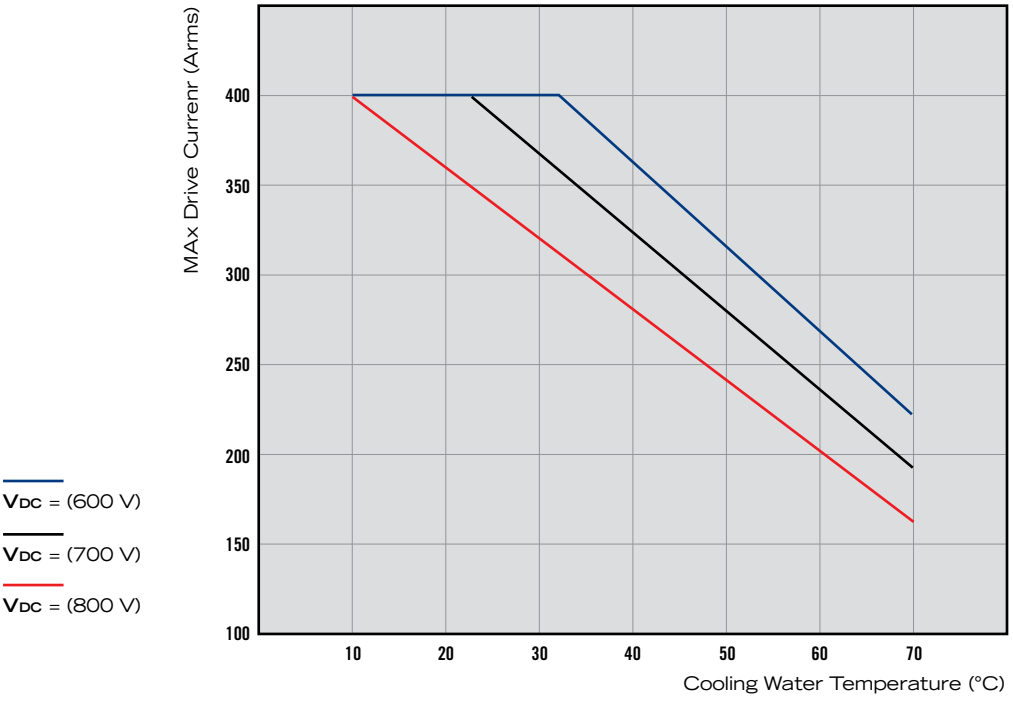
Performance	AxW 250.330.6	AxW 300.400.6	Unit
Efficency	97,4 (*)		%
Water Cooling Temp. Range	18 - 60 (*!)		°C
Nominal Coolant Flow	10	15	l/min
Water In / Out Interface	1/4" Gas NPT		
Pressure Drop in Cooling Circuit	0.5		bar
Max Pressure in Cooling Circuit	5		bar
Environment Temperature	0 - 40		°C

(*) – when the Drive is supplying 100KW of output power.
(*!) CAUTION: Never overcool in order to avoid condensation; see Curves referred to Vac = 400V

AxW 250.330.6
Continuos Drive Current vs. Water Inlet Temperature

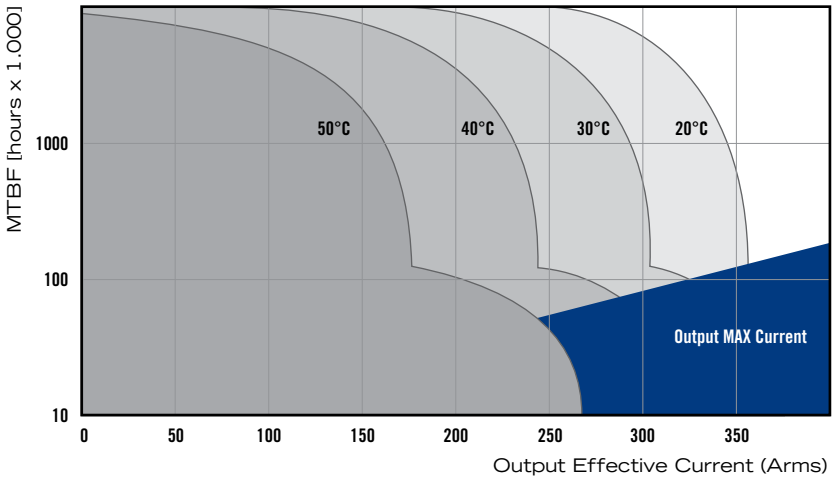


AxW 300.400.6
Continuos Drive Current vs. Water Inlet Temperature

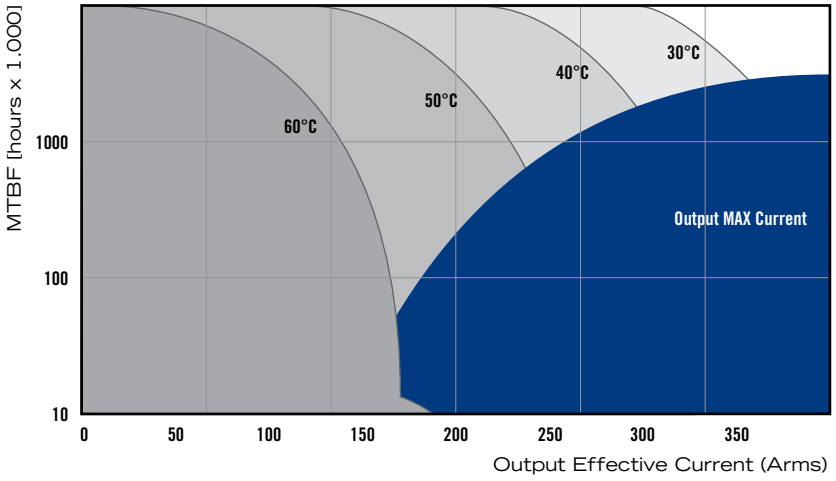


Average Life Expectancy of Reactive Components vs. Current and Coolant Inlet Temperature

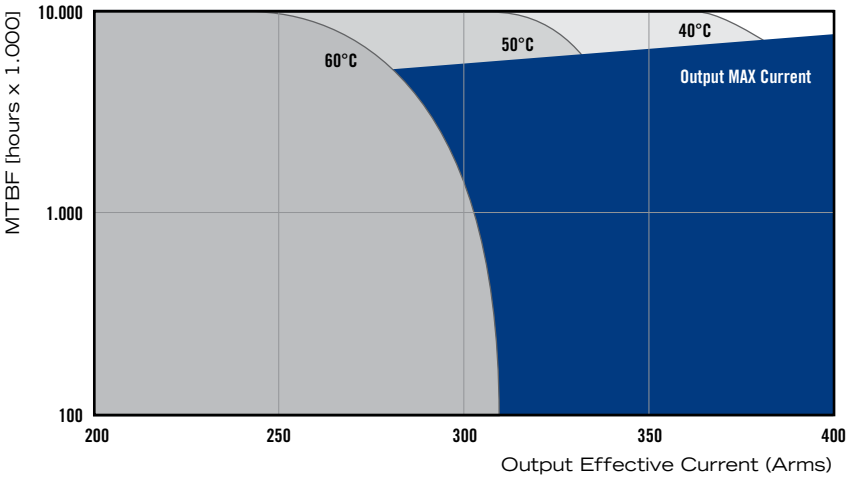
V_{DC} = (800 V)



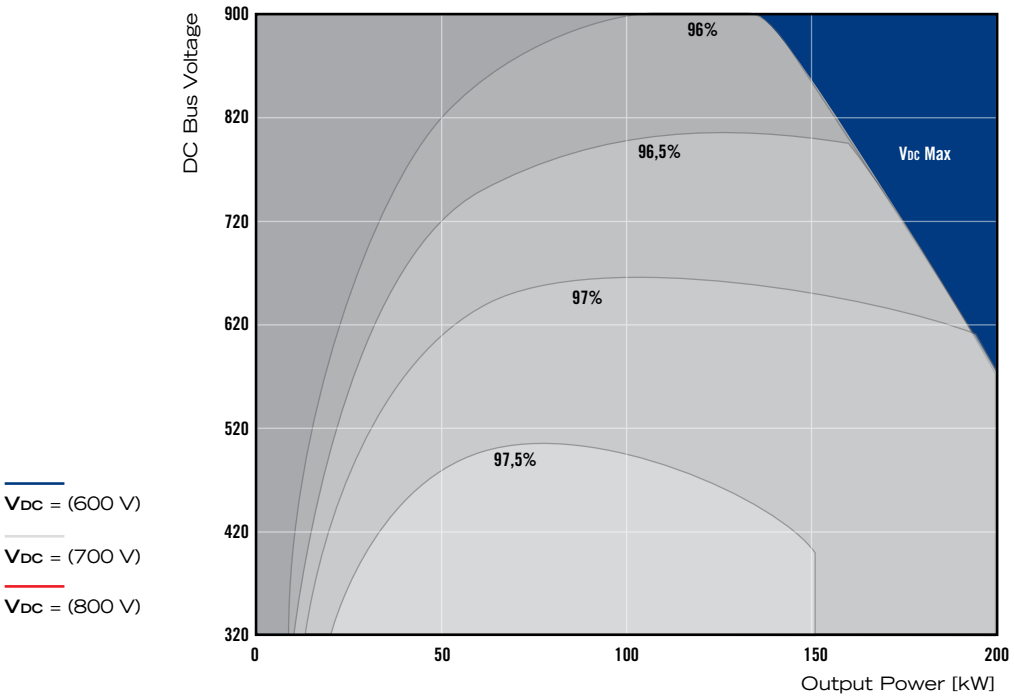
V_{DC} = (700 V)



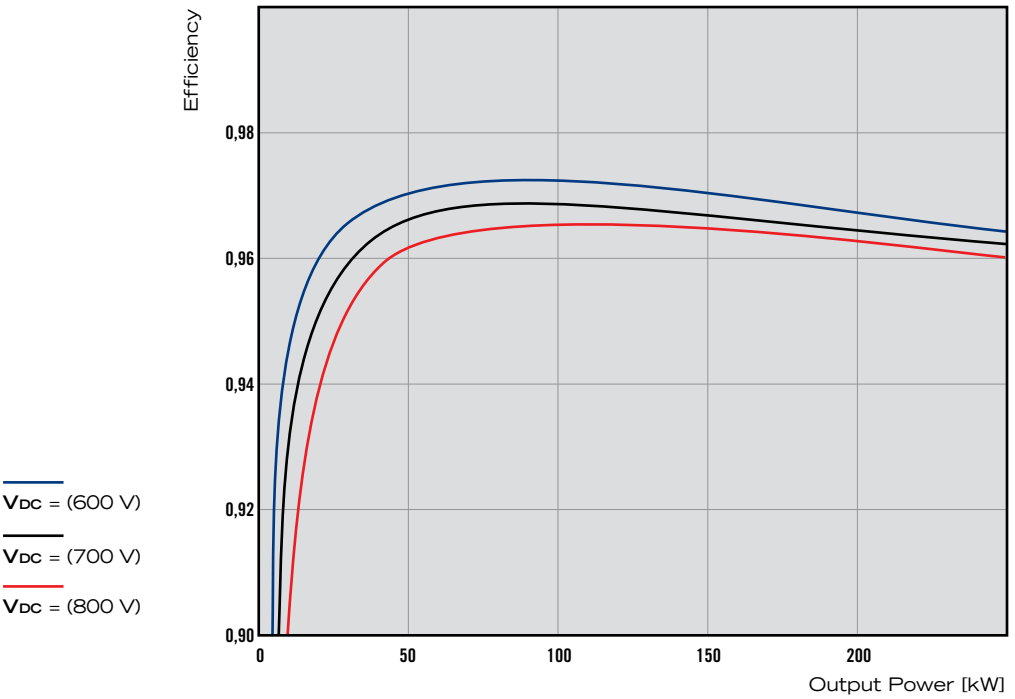
V_{DC} = (600 V)



AxW 250.330.6

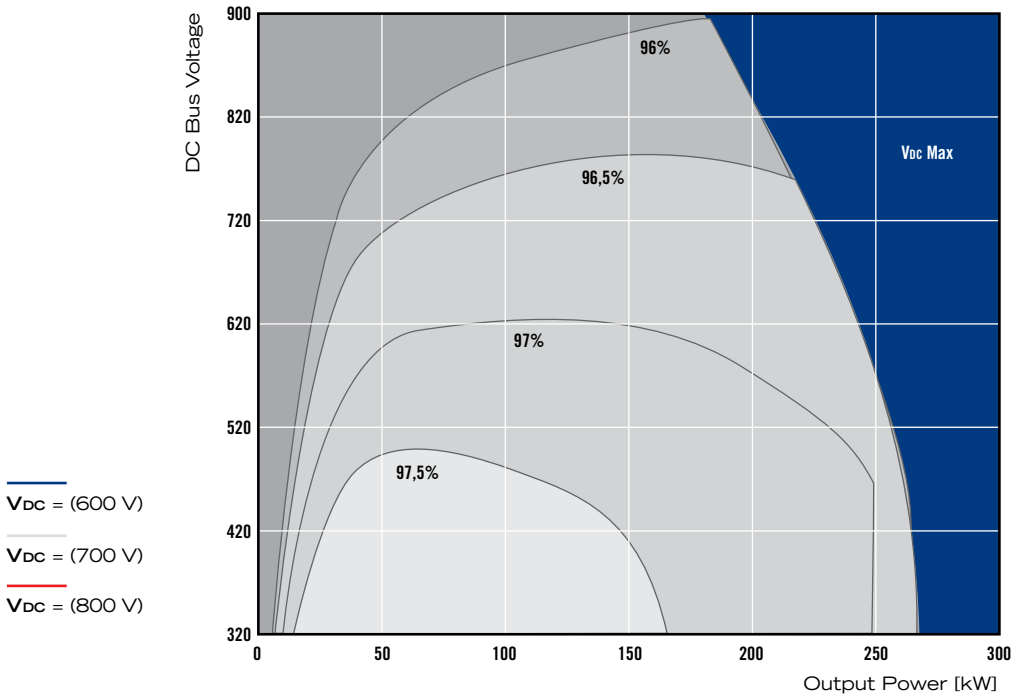


Converter efficiency loci Vs Output Power and DC link voltage (inclusive of FxW output filter loss).

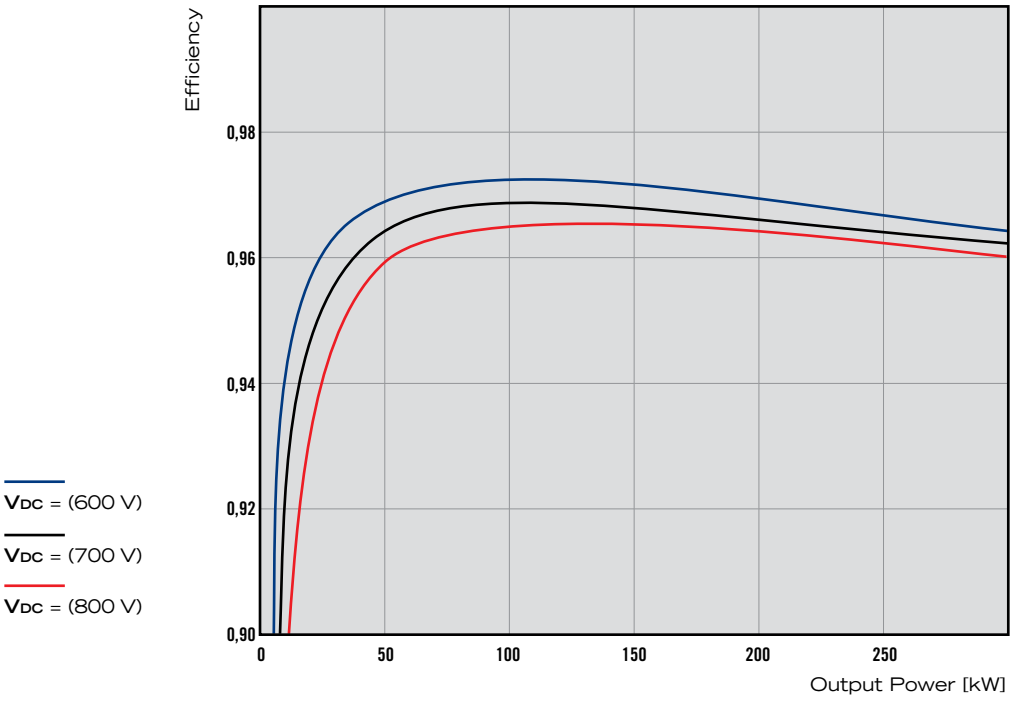


Efficiency Vs Output Power (inclusive of FxW output filter loss).

AxW 300.400.6



Converter efficiency loci Vs Output Power and DC link voltage (inclusive of FxW output filter loss).



Efficiency Vs Output Power (inclusive of FxW output filter loss)

AxW-DC - Configurable Motion Control Platform
User Manual
English version
Release 1.0

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