Drives

Medium Voltage

Unlimited Energy

POWER ELECTRONICS

Energy efficiency
for every situation.

Boost your productivity and energy efficiency

Since 1987 offering solutions for industrial automation processes.

+20 International subsidiaries

+1 M

OF INSTALLED EQUIPMENT

+50 MW

SOLAR PUMPING INSTALLATIONS

+50

COUNTRIES

XMV670

Introducing Power Electronics' new medium-voltage solution: the XMV670 frequency drive. Engineered to be the foundation of energy efficiency in the most challenging environments, it combines robustness, reliability, and advanced multi-level technology to guarantee uninterrupted 24/7 performance.

XMV670

**Extreme innovation,
now more kompakt.**

Topology. The XMV670 topology eliminates problematic voltage spikes at the motor terminals, as well as other side effects such as excessive motor heating and common-mode currents through the motor bearings.

Maximum Motor Care. The power modules are connected in series to generate an almost sinusoidal voltage with low dV/dt, delivering a sinusoidal current to the motor with negligible THDi. No additional filters are required.

Waveform Quality and Efficiency. The employed topology ensures compliance with the most demanding standards for waveform quality (IEEE 519) and electromagnetic compatibility (EMC 2014/30/EU). The system delivers high overall efficiency, η > 96% (including transformer).

Safety & Protection. The XMV670 drive incorporates multiple hardware and software protections as standard, minimizing the risks associated with the operation of medium-voltage drives.

Enhanced control and upgraded electronics.	Full front access to the equipment.

The XMV670 drive enables higher power outputs in a more compact footprint, effectively covering the most common power ranges in medium-voltage applications.

Compact design

Up to 13.8 kV

Power range from 250 kW to 5 MW

Low-voltage supply option

Increased power density

Full front access

XMV670K

The XMV670K is the most compact medium-voltage variable speed drive in the range, reaching power levels of up to 1400 kW thanks to its optimized design.

Ultra-compact design

Up to 6.6 kV

Power range from 150 kW to 1400 kW

Low-voltage supply option

Minimal and straightforward maintenance

Innovative Cooling System

The cooling technology has been redesigned and optimized with an option for redundant ventilation.

XMV670

INPUT	Input voltage (kV)	2.3 kV to 13.8 kV (±10%), LV option
	Frequency	50/60 Hz (±5%)
	Power factor	> 0.95 (over 20% load)
	THDi (%) current [1]	< 5%
	Power transformer	Phase-shift transformer, dry type (18 or 30)
	Overvoltage protection (optional)	Surge Arresters (Input cell or XMVK according to frame size)
	Overcurrent portection (optional)	Cell with circuit breaker or fuses
	Voltage dip	IEC/EN 61000-4-34
	Drive bypass	Optional bypass cabinet
OUTPUT	Technology	Multi-level, pulse-width modulation, low voltage power modules connected in series
	Output voltage (kV)	2.3 kV, 3 kV, 3.3 kV, 4.16 kV, 6 kV, 6.6 kV
	Pulses / power modules in series	18p/3, 30p/5
	Power modules (A)/(V)	80 A, 150 A, 240 A @ 40 °C / 650 V - 825 V
	Overload capacity	120% Inom (60 s/10 min) 40 °C 150% Inom (60 s/10 min) 50 °C
	Current harmonic distorsion THDi	< 5%
	Harmonic Voltage Factor (HVF)	< 2% (No motor derating required)
	Frequency	0.5 to 599 Hz[2] (0.01 Hz accuracy)
	Efficiency	≥96% (including transformer)
	Output voltage boosting	Transformer with adjustable taps
	Inductance (optional)	Input cell
ENVIRONMENTAL RATINGS	Operation conditions	Indoor, no caustic and volatile air, no dust
	Degree of protection	IP41, IP42
	Operation temperature	-20 °C to +50 °C; >40 °C power derating 2%/°C Pn
	Storage temperature	-25 °C to +70 °C
	Humidity	<95%, not condensing, optional heating
	Altitude	<1000 m; >1000 m power derating 1%/100 m. Max. 4000 m (optional > 4000 m with overvoltage protection)
	Seismicity	UBC4/High level IEEE 693:2018[3]
	Ventilation	Forced, redundancy optional or channelling
	Noise	< 80 dB at 1 m
CONTROL	Control mode	Local control (Graphic display 2.8") + emergency switch Remote Control I/O (optional)
	Control method	V/Hz
		VECTOR CONTROL Open Loop: PMC speed / torque control, AVC speed / torque control Close Loop (Encoder): PMC speed / torque control, AVC speed / torque control
	Carrier frequency	381 - 1526 Hz
	Control power supply	External 220-230 Vac or 110-120 Vac + 2nd MV transformer
	Other characteristics	Voltage/Power ride through, quick setting and commissioning, master-slave synchronization, skip critical frequencies, delay-off IGBT, motor pre-magnetization, flux reduction at low load (energy saver), electric DC brake, multi-reference and speed ramp, Power PLC programming. Other, please consult Power Electronics.
LOCAL CONTROL PANEL	Display	Graphic display 2.8" TFT-LCF
	Connection	USB, 3 m
	Features	8GB microSD class 10, faults and events logs and notification, save and copy the parameters, coded access to parameters with password.
	Display LED	GREEN: Motor running Blinking GREEN: Warning RED: Fault

NOTES

LOCAL CONTROL PANEL	Display information	Average current and 3-phase motor current, Average voltage and 3-phase motor voltage, 3-phase input voltage, Drive status, Speed, Torque, Power, Power factor of motor, Individual modules status, Register of total and partial drive energy consumption status (kWh) with reset function, Relay status, Digital inputs/PTC status, Output comparator status, Analogue inputs and sensor values, Analogue output value, Motor overload and equipment status, Drive and rectifier temperature, Fault history (last 6 faults).
	Visualization LEDs (optional)	GREEN: Running Blinking GREEN: Warning RED: Fault
	Push buttons (optional)	Green: Local start Red: Local stop White: Fault reset
USER INTERCONNECTION	Digital inputs	4 programmable, Active high (24 Vdc), Isolated power supply 5 pre-configurated (Start/Stop, Reset, Control mode, Reference, spare) (optional) 1 PTC Input
	Analogue inputs	1 standard input + optional 2 programmable and differential (0–20 mA, 4–20 mA, 0–10 Vcc and ±10 Vcc). Optically isolated 8 RTD inputs (optional)
	Digital outputs	3 programmable changeover relays (250 Vca, 8 A o 30 Vcc, 8 A) 5 pre-configured contacts (Start/Stop, Warning, Fault, spare) (optional)
	Analogue outputs	1 standard output + optional 2 programmable isolated: 0 – 20 mA, 4 – 20 mA, 0 – 10 Vcc and ±10 Vcc
	Encoder (optional)	2 differential encoder input (process and vector control). Input signal from 5 to 24 Vdc
COMMUNICATIONS	Standard hardware	Ethernet, RS485
	Standard protocol	Modbus-RTU and Modbus-TCP
	Optional protocol	Profibus-DP, Profinet, Ethernet IP
PROTECTIONS	Motor protections	Rotor locked, Torque limit, Motor overload (thermal model), Output current limit, Phase current imbalance, Ground fault current, Phase voltage imbalance, Motor over-temperature (PTC), Speed limit, Excessive starting and stopping time.
	Drive protections	Input phase loss, Low input voltage, High input voltage, Maximum number of faulty modules, High input frequency, Low input frequency, Drive overload, Drive over-temperature, Analogue input signal loss (speed reference loss), communication loss (time-out), power supply fault, Emergency stop.
	Power modules protections	Input overcurrent (fuses), High and Low DC bus voltage, DC bus voltage instability, DC bus soft charge fault, Low input voltage, Fiber optics communication lost, Communication time overpassed (time-out), Control voltage lost, Gate drive fault, Power module overtemperature.
REGULATION	Electromagnetic compatibility	EMC 2014/30/EU IEC/EN 61800-3 IEEE 519
	VSD design and construction	IEC/EN 61800-2 General requirements IEC/EN 61800-5-1 Safety IEC/EN 60146-1-1 Semiconductor converters UL 347A MV drives (4.16 kV models only)
	MV Transformer	IEC/EN 60076 -1, -3, -11 IEC/EN 61378-1

NOTES

[1] Harmonics are below the limits defined in IEEE519 for all SC/IL.
[2] For operational frequencies higher than 100 Hz, please consult Power Electronics.
[3] Need for specific anchors to the ground to meet this degree and installation conditions, without anchoring UBC3/Moderate Level IEEE 693.

XMV670

CONFIGURATION TABLE

XMV67O Series	Topology		ND (40°) Active Power (kW)	A Max. Current Cells (ND 40°)		B Output Voltage (kV)		C Degree protection		D Input Voltage (kV)		E Extra Isolation (> 4000 msnm)	
X67	S	Standard	0150	A	80 A	23	2.3	1	IP41/NEMA1	04	Low voltage	S	Not needed
	K	Kompakt	...	B	150 A	30	3.0	2	IP42	23	2.3	A	Needed
			1400	C	240 A	33	3.3			30	3.0		
			1500[1]	D[1]	360 A	41	4.1			33	3.3		
			...	E[1]	480 A	60	6			41	4.1		
			9000[1]			66	6.6			60	6		
						10[1]	10			66	6.6		
						11[1]	11			10[1]	10		
						13[1]	13.8			11[1]	11		
										13[1]	13.8		

NOTES [1] Only with S topology, consult with Power Electronics.

DIMENSIONS

Format: Standard

Format: Kompakt

Output voltage	Input voltage	Format	Rated Current 40 °C Normal duty	Rated Current 50 °C Heavy duty	Width W (mm)	Depth D (mm)	Height h (mm)	Height H (mm)	Weight (kg)
4.16 kV	4.16 kV	Kompakt	< 80 A	< 60 A	1209	1249	2300	2709	2300
		Kompakt	81 A – 150 A	61 A - 120 A	1610	1249	2300	2785	3850
		Kompakt	151 A - 240 A	121 A - 192 A	1700	1500	2300	2737	4000
	10 - 13.8 kV	Standard	151 A - 240 A	121 A - 192 A	3000	1250	1930	2300	*
6.6 kV	6.6 kV	Kompakt	< 80 A	< 60 A	1610	1249	2785	2737	3415
		Kompakt	81 A - 150 A	61 A - 120 A	1991	1610	2709	2737	4800
		Standard	151 A - 240 A	121 A - 192 A	3500	1250	1930	2300	6460
	10 - 13.8 kV	Standard	151 A - 240 A	121 A - 192 A	4000	1250	1930	2300	*

NOTES * Consult with Power Electronics

XMV670

STANDARD RATINGS

CODE	XMV670 2.3 kV					
	Operation temperature 40 °C NORMAL DUTY			Operation temperature 50 °C HEAVY DUTY		
	NOMINAL CURRENT (A)	(kW)[2]	(HP)[2]	NOMINAL CURRENT (A)	(kW)[2]	(HP)[2]
X67K0185A23 CDE	60	185	245	45	140	190
X67K0215A23 CDE	70	215	290	53	160	215
X67K0245A23 CDE	80	245	330	60	185	250
X67K0275B23 CDE	90	275	370	72	220	295
X67K0305B23 CDE	100	305	410	80	245	330
X67K0335B23 CDE	110	335	450	88	270	365
X67K0370B23 CDE	120	370	490	96	295	395
X67K0400B23 CDE	130	400	535	104	320	430
X67K0430B23 CDE	140	430	575	112	345	465
X67K0460B23 CDE	150	460	615	120	370	495
X67K0575C23 CDE X67S0575C23 CDE[1]	180	575	770	144	460	615
X67K0640C23 CDE X67S0640C23 CDE[1]	200	640	855	160	510	680
X67K0700C23 CDE X67S0700C23 CDE[1]	220	700	940	176	560	750
X67K0765C23 CDE X67S0765C23 CDE[1]	240	765	1025	192	610	820

CODE	XMV670 3 kV					
	Operation temperature 40 °C NORMAL DUTY			Operation temperature 50 °C HEAVY DUTY		
	NOMINAL CURRENT (A)	(kW)[3]	(HP)[3]	NOMINAL CURRENT (A)	(kW)[3]	(HP)[3]
X67K0240A30 CDE	60	240	320	45	180	240
X67K0280A30 CDE	70	280	375	53	210	280
X67K0320A30 CDE	80	320	430	60	240	320
X67K0360B30 CDE	90	360	480	72	290	390
X67K0400B30 CDE	100	400	535	80	320	430
X67K0440B30 CDE	110	440	590	88	350	470
X67K0480B30 CDE	120	480	640	96	385	515
X67K0520B30 CDE	130	520	695	104	415	555
X67K0560B30 CDE	140	560	750	112	445	595
X67K0600B30 CDE	150	600	800	120	480	645
X67K0750C30 CDE X67S0750C30 CDE[1]	180	750	1000	144	600	800
X67K0830C30 CDE X67S0830C30 CDE[1]	200	830	1115	160	665	890
X67K0915C30 CDE X67S0915C30 CDE[1]	220	915	1225	176	730	980
X67K1000C30 CDE X67S1000C30 CDE[1]	240	1000	1340	192	800	1070

NOTES

[1] Only for voltages from 10 kV.
[2] kW and HP standard motor rated power (cosφ=0.8, 2.3 kV)
[3] kW and HP standard motor rated power (cosφ=0.8, 3 kV)

STANDARD RATINGS

CODE	XMV670 3.3 kV					
	Operation temperature 40 °C NORMAL DUTY			Operation temperature 50 °C HEAVY DUTY		
	NOMINAL CURRENT (A)	(kW)[2]	(HP)[2]	NOMINAL CURRENT (A)	(kW)[2]	(HP)[2]
X67K0265A33 CDE	60	265	355	45	200	270
X67K0310A33 CDE	70	310	410	53	230	310
X67K0350A33 CDE	80	350	470	60	265	355
X67K0395B33 CDE	90	395	530	72	315	425
X67K0440B33 CDE	100	440	590	80	350	470
X67K0480B33 CDE	110	480	650	88	385	515
X67K0525B33 CDE	120	525	705	96	420	565
X67K0570B33 CDE	130	570	765	104	455	610
X67K0615B33 CDE	140	615	825	112	490	660
X67K0660B33 CDE	150	660	880	120	525	705
X67K0825C33 CDE X67S0825C33 CDE[1]	180	825	1105	144	660	880
X67K0915C33 CDE X67S0915C33 CDE[1]	200	915	1225	160	730	980
X67K1005C33 CDE X67S1005C33 CDE[1]	220	1005	1350	176	805	1080
X67K1100C33 CDE X67S1100C33 CDE[1]	240	1100	1470	192	880	1180

CODE	XMV670 4.16 kV					
	Operation temperature 40 °C NORMAL DUTY			Operation temperature 50 °C HEAVY DUTY		
	NOMINAL CURRENT (A)	(kW)[3]	(HP)[3]	NOMINAL CURRENT (A)	(kW)[3]	(HP)[3]
X67K0330A41 CDE	60	330	445	45	250	335
X67K0390A41 CDE	70	390	520	53	290	390
X67K0440A41 CDE	80	440	595	60	335	450
X67K0500B41 CDE	90	500	670	72	400	535
X67K0555B41 CDE	100	555	740	80	445	600
X67K0610B41 CDE	110	610	815	88	490	660
X67K0665B41 CDE	120	665	890	96	530	710
X67K0720B41 CDE	130	720	965	104	575	770
X67K0775B41 CDE	140	775	1040	112	620	830
X67K0830B41 CDE	150	830	1115	120	665	890
X67K1040C41 CDE X67S1040C41 CDE[1]	180	1040	1400	144	830	1113
X67K1150C41 CDE X67S1150C41 CDE[1]	200	1150	1540	160	920	1233
X67K1270C41 CDE X67S1270C41 CDE[1]	220	1270	1700	176	1015	1360
X67K1380C41 CDE X67S1380C41 CDE[1]	240	1380	1850	192	1105	1480

NOTES

[1] Only for voltages from 10 kV.
[2] kW and HP standard motor rated power (cosφ=0.8, 3.3 kV)
[3] kW and HP standard motor rated power (cosφ=0.8, 4.16 kV)

XMV670

STANDARD RATINGS

CODE	XMV670 6 kV					
	Operation temperature 40 °C NORMAL DUTY			Operation temperature 50 °C HEAVY DUTY		
	NOMINAL CURRENT (A)	(kW)[2]	(HP)[2]	NOMINAL CURRENT (A)	(kW)[2]	(HP)[2]
X67K0480A60 CDE	60	480	640	45	360	485
X67K0560A60 CDE	70	560	750	53	420	565
X67K0640A60 CDE	80	640	855	60	480	645
X67K0720B60 CDE	90	720	965	72	575	770
X67K0800B60 CDE	100	800	1070	80	640	860
X67K0880B60 CDE	110	880	1180	88	700	940
X67K0960B60 CDE	120	960	1285	96	765	1025
X67K1040B60 CDE	130	1040	1390	104	830	1115
X67K1120B60 CDE	140	1120	1500	112	895	1200
X67K1200B60 CDE	150	1200	1605	120	960	1290
X67S1500C60 CDE	180	1500	2005	144	1200	1605
X67S1660C60 CDE	200	1660	2230	160	1330	1785
X67S1830C60 CDE	220	1830	2455	176	1465	1960
X67S2000C60 CDE	240	2000	2675	192	1600	2140

CODE	XMV670 6.6 kV					
	Operation temperature 40 °C NORMAL DUTY			Operation temperature 50 °C HEAVY DUTY		
	NOMINAL CURRENT (A)	(kW)[3]	(HP)[3]	NOMINAL CURRENT (A)	(kW)[3]	(HP)[3]
X67K0525A66 CDE	60	525	705	45	395	530
X67K0615A66 CDE	70	615	825	53	460	615
X67K0700A66 CDE	80	700	940	60	530	710
X67K0790B66 CDE	90	790	1060	72	630	845
X67K0880B66 CDE	100	880	1180	80	700	940
X67K0965B66 CDE	110	965	1295	88	770	1030
X67K1055B66 CDE	120	1055	1415	96	840	1125
X67K1140B66 CDE	130	1140	1530	104	915	1230
X67K1230B66 CDE	140	1230	1670	112	985	1320
X67K1315B66 CDE	150	1315	1765	120	1055	1415
X67S1645C66 CDE	180	1645	2205	144	1315	1765
X67S1830C66 CDE	200	1830	2450	160	1463	1960
X67S2015C66 CDE	220	2015	2700	176	1610	2160
X67S2195C66 CDE	240	2195	2943	192	1755	2355

NOTES

[1] Only for voltages from 10 kV.
[2] kW and HP standard motor rated power (cosφ=0.8, 6 kV)
[3] kW and HP standard motor rated power (cosφ=0.8, 6.6 kV)

ACCESORIES

CODE	DESCRIPTION
X67AIO	Analog I/O Expansion Board
X67DIO	Digital I/O Expansion Board
X67HMI7	HMI 7"
X67HMI10	HMI 10"
X67ET	Ethernet/IP Expansion Board
X67PB	Profibus Expansion Board
X67PN	Profinet Expansion Board
X67PT	8xPT100 Expansion Board

NOTES

[1] Only for voltages from 10 kV.

XMV660 Outdoor

The XMV660 Outdoor drive takes a step forward in performance, employing a modular, robust, multilevel, and highly proven medium voltage technology. Also capable of working under the most demanding environments, without the need for an electrical room.

XMV660 Outdoor

Extreme innovation for extreme environments

Topology. The XMV660 OUTDOOR topology eliminates problematic peak voltages at the motor terminals, and other side effects such as excessive motor heating and stray currents through the motor bearings.

Maximum Motor Care. Power modules of 700 V are connected in series to generate a quasi sinusoidal voltage low in dV/dt, supplying sinusoidal current to the motor with negligible THDi. Additional output filters are not needed.

Power Quality and Efficiency. XMV660 topology meets the most stringent regulations regarding power quality (IEEE519) and electromagnetic compatibility (EMC 2004/108/EC). High efficiency η > 96% above 40% load (Including transformer).

Robust design. The XMV660 OUTDOOR drive's design offers high performance under extreme weather conditions thanks to its robustness and sandstorm resistance.

Safety & Protection. The XMV660 OUTDOOR integrates built-in hardware and software protections that reduce the associated risk of medium voltage installations.

2.3 kV - 13.8 kV

50-60 Hz

Up to 50 °C

The XMV660 Outdoor

The XMV660 OUTDOOR is the most innovative, rugged and reliable outdoor medium voltage drive ready for 24/7 operation under the most demanding environments.

No need for an electrical room

LCD Display

No ambient noise inside facility

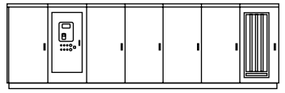
No civil works associated

Innovative Cooling System

The innovative filter-less “cyclone drive” cooling system delivers a constant stream of clean air to the XMV660 OUTDOOR.

At the air intake, the labyrinth sifts the larger dust particles from the air stream, enabling the cyclone drive to eject the remaining contaminants, ensuring a constant flow of clean air into the electronics chamber and transformer cubicle without the need to maintain cumbersome dust filters.

XMV660 Outdoor



INPUT	Input voltage (kV) [1]	2.3 kV to 13.8 kV (±10%)
	Frequency	50/60 Hz (±10%)
	Power factor	> 0.95 (over 20% load)
	THDi (%) current [2]	< 5%
	Power transformer	Phase-shift transformer, dry type (Copper or aluminum)
	Voltage dip	Exceeds IEC/EN 61000-4-34
	Overvoltage protection	Surge Arresters
OUTPUT	Technology	Multi-level, pulse-width modulation, low voltage power modules connected in series
	Pulses / power modules in series	18p/3, 24p/4, 30p/5, 36p/6, 54p/9
	Power modules (A) / (V)	120 A, 200 A, 300 A, 400 A / 600 V-700 V
	Current harmonic distortion (THDi)	< 5%
	Harmonic voltage factor (HVF)	< 0.019 (No motor derating required)
	Efficiency	≥96% (including transformer) @Pn
	Tripless operation	Redundant Power System (RPS)
	Output voltage boosting	Transformer Tap Adjustment
ENVIRONMENTAL CONDITIONS	Degree of protection	(IEC60529) IP55, NEMA3R
	Operation temperature	-20 °C to +50 °C
	Storage temperature	-25 °C to +55 °C
	Humidity	< 95%, non condensing
	Altitude	<1000 m; >1000 m power derating 1%/100 m. Max. 3000 m Optional reinforced isolation for up to 4500 m.
	Cooling	Forced air cooling, Self cleaning filters
	Varnished electronics	Class 3C3
CONTROL	Control mode	Local control (Display and push-buttons) Remote control (I/O and communications), Web display (wifi)
	Control method	V/Hz
		VECTOR CONTROL Open Loop: PMC speed / torque control, AVC: speed / torque control Close Loop (Encoder): PMC speed / torque control, AVC: speed / torque control
	Carrier frequency	1 kHz
	Control power supply	Redundant 2x230 Vac II P+N (1 kVA), UPS integrated
	Other characteristics	Voltage/Power ride through, quick setting and commissioning, master-slave synchronization, skip critical frequencies, delay-off IGBt, motor pre-magnetization, flux reduction at low load (energy saver), electric DC brake, multi-reference and speed ramp, Power PLC programming, Other, please consult Power Electronics.
USER INTERCONNECTION [1]	Digital inputs	5 programmable, Active high (24 Vdc), Isolated power supply 5 pre-configurated (Start/Stop ; Reset, control mode, reference) 1 PTC input
	Analog inputs	3 programmable differential inputs. 0–20 mA, 4–20 mA, 0–10 Vdc and ±10 Vdc. (Optically isolated)
	Digital outputs	2 programmable changeover relays (250 Vac, 8 A or 30 Vdc, 8 A) 3 programmables NO contacts (250 Vac, 8 A or 30 Vdc, 8 A) 3 pre-configured contacts (Start/Stop, Warning, Failure)
	Analog outputs	3 isolated programmable outputs: 0–20 mA, 4–20 mA, 0–10 Vdc and ±10 Vdc
	Encoder (optional)	2 differential encoders input (process and vector control). Input signal from 5 to 24 Vdc

NOTES

[1] Other configurations, please consult Power Electronics.
[2] Harmonics are below the limits defined in IEEE519 for all I_{sc}/I_L.

COMMUNICATIONS	Standard Hardware	USB, RS232, RS485, Ethernet
	Optional Hardware	Fiber optics, 9 Pin D-SUB, CAN
	Standard Protocol	Modbus-RTU, Modbus TCP
	Optional Protocol	Profibus-DP, Devicenet, CANopen, Ethernet IP and Profinet
PROTECTIONS	Motor protections	Rotor locked, torque limit, Motor overload (thermal model), Output current limit, Phase current imbalance, Ground fault current, Phase voltage imbalance, Motor over-temperature (PTC), Speed limit, excessive starting and stopping time.
	Drive protections	Input phase loss, Low input voltage, High input voltage, maximum number of faulty modules, High input frequency, Low input frequency, drive overload, drive over-temperature, Analog input signal loss (speed reference loss), communication loss (time-out), Power supply fault, Emergency stop
	Power modules protections	Overcurrent (fuses), high DC bus voltage, Low DC bus voltage, DC bus voltage instability, low input voltage, fiber optics communication lost, communication time overpassed (time-out), control voltage lost, gate drive fault, power module overtemperature.
REGULATIONS	Electromagnetic compatibility	Directive EMC 2004/108/EC, IEC/EN 61800-3, IEEE 519-1992
	VSD design and construction	IEC/EN 61800-4 General requirements IEC/EN 61800-5-1 Safety IEC/EN 60146-1-1 Semiconductor converters
	MV transformer	IEC/EN 60076 -1, -11, IEC/EN 60146-1-3, IEC/EN 61378-1

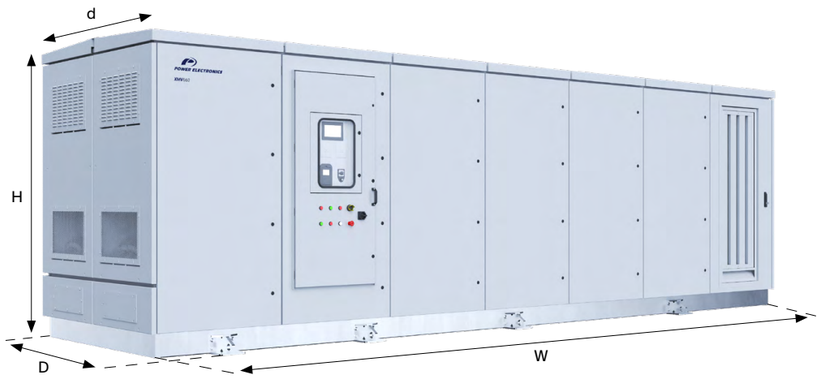
NOTES

XMV660 Outdoor

CONFIGURATION TABLE

X66	1000		A		66		5		3		H	
XMV66O Series	Active Power (kW)		Cells Max. Amps		Output voltage (kV)		Overload		Degree of protection		Grid voltage (kV)	
X66	0150	150	A	120	23	2.3	2	120%	1	UL NEMA1	X	Low voltage
	...	...	B	200	30	3	5	150%	3	UL NEMA3R	A	2.3
	1000	1000	C	300	33	3.3	B	Starting Model	4	IEC IP41	B	3
	1100	1100	D	400	38	3.8	...	Under request	5	IEC IP54	C	3.3
	1200	1200	E	120NB	41	4.1			...	Under request	D	3.8
	...	...	F	200NB	60	6					E	4.1
	9000	9000	G	300NB	63	6.3					F	6
	10M0	10000	H	400NB	66	6.6					G	6.3
	12M5	12500	Regenerative		69	6.9					H	6.6
	24M5	24500	R	120	10	10					I	6.9
	...	Under request	S	200	11	11					J	10
			T	300	13	13.8					K	11
			U	400	...	Under request					L	13.8
			V	120NB							M	15
			W	200NB							...	Under request
			X	300NB								
			Y	400NB								
			...	Under request								

DIMENSIONS



Voltage	Rated Current		Width W (mm)	Depth D (mm)	Depth d (mm)	Height H (mm)
	40 °C Normal duty	50 °C Heavy duty				
4.16 kV	<140 A	<120 A	5064	2122	1938	2331
	141 A – 240 A	121 A - 200 A	5910	2122	1938	2331
	241 A - 360 A	201 A - 300 A	7382	2122	1938	2331

NOTES

Check the rated current of the motor nameplate and indicate the short circuit current to guarantee the compatibility with the selected drive. Consult configuration availabilities with Power Electronics.

STANDARD RATINGS

XMV660 4.16 kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		kW	HP[1]
X660298A 41	50	298	400
X660336A 41	60	336	450
X660373A 41	70	373	500
X660447A 41	80	447	600
X660522A 41	90	522	700
X660597A 41	100	597	800
X660671A 41	120	671	900
X660746B 41	130	746	1000
X660932B 41	160	932	1250
X661119B 41	200	1119	1500
X661305C 41	230	1305	1750
X661491C 41	260	1491	2000
X661752C 41	300	1752	2350
X661864D 41	320	1864	2500
X662051D 41	360	2051	2750
X662237D 41	390	2237	3000
X662610D 41	450[3]	2610	3500
X662983E 41	520[3]	2983	4000
X663356E 41	580[3]	3356	4500

XMV660 6.6 kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		kW[2]	HP
X660400A 66	45	400	536
X660450A 66	50	450	603
X660500A 66	55	500	671
X660560A 66	60	560	751
X660630A 66	70	630	845
X660710A 66	80	710	952
X660800A 66	90	800	1073
X660900A 66	100	900	1207
X661000A 66	110	1000	1341
X661250B 66	140	1250	1676
X661400B 66	150	1400	1877
X661600B 66	180	1600	2146
X661800B 66	200	1800	2414
X662000C 66	220	2000	2682
X662500C 66	270	2500	3353
X662800C 66	300	2800	3755
X663150D 66	350	3150	4224
X663550D 66	390	3550	4761
X664000D 66	440[3]	4000	5364
X664500E 66	500[3]	4500	6035
X665000E 66	550[3]	5000	6705

NOTES

[1] HP standard motor rated power (cosφ • Eff= 0.8, 4.16 kV)
[2] kW standard motor rated power (cosφ • Eff= 0.8, 6.6 kV)
[3] Consult availability with Power Electronics

VS70

Power Electronics’ VS70 medium voltage soft starter is the most reliable and safest solution, fully flexible with a customized arrangement of MV cells.

VS70

The most reliable and safe customer oriented solution

Topology. Highest operation safety with internal arc approved.	**Maximum safety** and outstanding features designed for the most demanding industry.	**Multiple features.** The VS70 soft starter gets the most from your facilities, by implementing the unique dynamic torque control algorithm (CDP) that offers an ultimate break away torque and starts the most demanding applications.
Maximum motor care. The VS70 soft starter includes, built-in and as standard, ultimate motor and device protection features, that allow it to act as a motor protection relay.	**Reliability.** Our record in industrial technical service has set the boundaries to all of our designs in terms of reliability. Hence, we offer the most comprehensive and extended warranties of the market.	**Easy to drive.** The VS70 integrates an intuitive and dust resistant interface that includes backlit alphanumeric display with membrane keypad, status lights and pushbuttons that allow the user an easy operation and visualisation under the most demanding conditions.

Applications range from 2.3 kV to 13.8 kV and the VS70 combines outstanding design and hardware under the most stringent IEC regulations, using advanced technology motor control and safety, allowing for smooth starts and stops under any circumstances.

From 2.3 kV to 13.8 kV

Up to 60 °C

VS70

INPUT	Current range	50 A - 500 A
	Power range	165 kW – 10 MW
	Input voltage [1]	2.3 kV a 13.8 kV
	Control voltage	100 - 240 Vac (-15%/+10%) or 90 - 350 Vcc
	Input frequency	50 Hz/60 Hz (±5%)
	Phase sequence	Compatible with any phases sequence
	Cable access	Top or bottom
OUTPUT	Output voltage	0 a 100% Supply voltage
	Output frequency	Same as input
	Efficiency (At full load)	≥ 99.6%, 100% on Bypass
	Cable length	Up to 200 m [1]
	Bypass contactor	Sized for motor start in direct mode
	Cable access	Top or bottom
ENVIRONMENTAL CONDITIONS	Operation ambient temperature	Minimum: -10 °C / Maximum: +60 °C [2]
	Storage temperature	Minimum: -25 °C / Maximum: +70 °C
	Altitude [3]	0-1000 masl, >1000 m with derating
	Ambient humidity	< 95%, non-condensing
	Degree of protection	IP54
	Painting	RAL 7035
	Cooling	Natural
	Vibration	According to IEC 60068-2-6-Fc
	Degree of corrosion	Class 3C3
HARDWARE	Digital inputs	3 fixed (Start, Stop and Reset) 2 programmables (A and B).
	Digital outputs	4 fixed (Contactor principal, contactor bypass, Run/PFC, Fan control) 3 programmable (A, B, C)
	Analog outputs	1 analog output (0-20 mA / 4-20 mA).
	PTC Input	Trip > 3.6 kΩ, reset < 1.6 kΩ.
	Expansion slots	1
OPERATION MODES	Start modes	Direct start (DOL)
		Current limit start
		Current ramp and current limit start
		Initial torque pulse start
		Voltage ramp start
	Stop modes	Spin stop
		Voltage ramp stop
PROTECTIONS	Motor protection	Phase sequence
		Locked rotor
		Phase imbalance
		Overload and underload
		Low power and overpower
		Motor temperature (thermal model)
		Motor overtemperature (PTC)
		Excessive starting time
		Maximum number of starts
	Softstarter protections	SCR hort circuit
		Bypass fault
		Ground fault current
		Input phase loss
		Low input voltage
		High input voltage
		Equipment thermal model
		Input frequency
		Signal loss of analog inputs

SETTINGS	Functions	Parameter lock
		Second motor setting
		Autoreset
		Emergency run
		Simulation
INCLUDED ITEMS	Mechanical lock	Mechanical door lock included
OPTIONAL	Optional hardware	Power Factor Correction (PFC) [4]
		Cabinet heater
		Motor space heater control
	Serial communication	DeviceNET
		Modbus RTU
		Profibus-DP
	Ethernet communication	Modbus-TCP
		Ethernet/IP
		Profinet
CONTROL PANEL	Type	Fixed
	Display	LCD display with 4 lines of information
		LED indicators (Ready, Run, Trip, Local)
		Keypad with 11 keys (Start, Stop, Reset, Local/Remote, Menu, Back, Up, Down, Logs, Alt, and Tools)
	Display information	99 event logs
		Softstarter state
		Current in the three phases
		Motor power factor
		Frequency
		Motor power (kW)
		Motor power (HP)
		Motor temperature (termal model)
		Energy (kWh)
		Operating hours
		I/O values
		Input Voltage
REGULATIONS	Certifications	CE, UL [5]
	Electromagnetic compatibility	EN 61000-6-2, -4
		IEC 60947-4-2
	Design and construction	EN 62271-1, -200 [6]
		IEC 60068-2-6-Fc – Vibration

NOTES

[1] Other configurations consult with Power Electronics.
[2] Above 50 °C with power reduction.
[3] Consult availability with Power Electronics.
[4] Up to 600 kVAr. For larger units consult with Power Electronics. Vacuum contactor included.
[5] UL certification in starters ≤ 4.16 kV. Consult with Power electronics.
[6] Classification IAC: AFL 31.5 kA 1 s

VS70

CONFIGURATION TABLE

Series VS70	A Nominal Current (A)		B Main voltage (kV)		C Degree of protection		D Configuration	
VS7	050	50 A	2	2.3 kV	5	IP54	S	Disconnector + Fuses
	100	100 A	3	3.3 kV			A	Without protections
	150	150 A	4	4.16 kV				
	200	200 A	6	6.6 kV				
	250	250 A	8	11 kV				
	300	300 A	9	13.8 kV				
	350	350 A						
	400	400 A						
	450	450 A						
	500	500 A						

NOTES

DIMENSIONS

Voltage	Configuration	Width W (mm)	Depth D (mm)	Height H (mm)	Weight (kg)
≤ 6.6 kV	VS7xxxxxN	1040	1452	2278	1000
	VS7xxxxxS				1200
11 kV	VS7xxxxxN	1190	1453	2278	1200
	VS7xxxxxS	1440	1652	2225	1600
13.8 kV	VS7xxxxxN	1440	1800	2278	1350
	VS7xxxxxS				1700

NOTES

VS70

STANDARD RATINGS

VS70 2.3 kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER [1]	
		(kW)	(HP)
VS705025D	50 A	165	220
VS710025D	100 A	330	440
VS715025D	150 A	500	670
VS720025D	200 A	660	880
VS725025D	250 A	830	1150
VS730025D	300 A	1000	1380
VS735025D	350 A	1170	1550
VS740025D	400 A	1330	1770
VS745025D	450 A	1490	1980
VS750025D	500 A	1650	2200

VS70 3.3 kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER [2]	
		(kW)	(HP)
VS705035D	50 A	240	315
VS710035D	100 A	475	630
VS715035D	150 A	710	945
VS720035D	200 A	950	1260
VS725035D	250 A	1190	1650
VS730035D	300 A	1430	1980
VS735035D	350 A	1670	2220
VS740035D	400 A	1910	2540
VS745035D	450 A	2130	2850
VS750035D	500 A	2370	3160

VS70 4.16 kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER [3]	
		(kW)	(HP)
VS705045D	50 A	300	400
VS710045D	100 A	600	800
VS715045D	150 A	900	1200
VS720045D	200 A	1200	1600
VS725045D	250 A	1540	2080
VS730045D	300 A	1850	2500
VS735045D	350 A	2110	2810
VS740045D	400 A	2410	3210
VS745045D	450 A	2700	3600
VS750045D	500 A	3000	4000

VS70 6.6 kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER [4]	
		(kW)	(HP)
VS705065D	50A	475	625
VS710065D	100A	950	1250
VS715065D	150A	1425	1875
VS720065D	200A	1900	2500
VS725065D	250A	2390	3190
VS730065D	300A	2870	3830
VS735065D	350A	3340	4460
VS740065D	400A	3820	5100
VS745065D	450A	4300	5740
VS750065D	500A	4780	6380

NOTES

[1] kW and HP standard motor rated power (cosφ=0.84, 2.3 kV)
[2] kW and HP standard motor rated power (cosφ=0.84, 3.3 kV)
[3] kW and HP standard motor rated power (cosφ=0.84, 4.16 kV)
[4] kW and HP standard motor rated power (cosφ=0.84, 6.6 kV)

STANDARD RATINGS

VS70 11 kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER [5]	
		(kW)	(HP)
VS705085D	50 A	800	1050
VS710085D	100 A	1600	2100
VS715085D	150 A	2400	3150
VS720085D	200 A	3200	4200
VS725085D	250 A	3980	5320
VS730085D	300 A	4780	6380
VS735085D	350 A	5580	7440
VS740085D	400 A	6380	8500
VS745085D	450 A	7200	9540
VS750085D	500 A	8000	10600

VS70 13.8 kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER [6]	
		(kW)	(HP)
VS705095D	50 A	1000	1340
VS710095D	100 A	2000	2675
VS715095D	150 A	3000	4010
VS720095D	200 A	4000	5350
VS725095D	250 A	5000	6670
VS730095D	300 A	6000	8000
VS735095D	350 A	7000	9340
VS740095D	400 A	8000	10670
VS745095D	450 A	9070	12100
VS750095D	500 A	10080	13440

ACCESORIES

CODE	DESCRIPTION
VS7PFC23	VS70 - Power Factor Correction 2.3 kV
VS7PFC41	VS70 - Power Factor Correction 4.16 kV
VS7PFC66	VS70 - Power Factor Correction 6.6 kV
VS7PFC11	VS70 - Power Factor Correction 11 kV
VS7RTU	VS70 - Modbus RTU Communication
VS7TCP	VS70 - Modbus TCP Communication
VS7DN	VS70 - DeviceNet Communication
VS7ET	VS70 - Ethernet IP Communication
VS7PB	VS70 - Profibus Communication
VS7PN	VS70 - Profinet Communication
VS7IEC	VS70 - Gateway IEC61850 protocol communications
VS7BB	VS70 - BUS Bar
VS7DL	VS70 - Electromechanical door locker
VS70CH	VS70 - Cabinet Heater + Controller
VS70MH	VS70 - Motor Heater Control
VS7050G	VS70 - Ground fault 50G
VS7051N	VS70 - Ground fault 51N
VS7051G	VS70 - Ground fault 51G
VS7087N	VS70 - Ground fault 87N

NOTES

[5] kW and HP standard motor rated power (cosφ=0.84, 11 kV)
[6] kW and HP standard motor rated power (cosφ=0.84, 13.8 kV)

Power ON Support

Our secret. The key of our success for more than 35 years, our 24/7 after sales service, Power On Support.

ON POWER SUPPORT

We take care of the legacy generations. Each new generation of **electronic soft starters and variable speed drives** involves adapting the manufacturing lines to optimize the production of these new units. Power Electronics has optimized facilities for the production of previous generation units, where we manufacture ongoing subcomponents adapted to equipment that is no longer in production, allowing an extended life.

Long Term Service. We repare subcomponents or even manufacture equivalent units in our Dedicated Service Factory located near our Production Plant. Power Electronics has experience in repowering old photovoltaic plants, where we supply state-of-the-art equipment adapting its electrical characteristics to be compatible with the existing configuration, while providing all the advantages of the latest generation **electronic soft starters and variable speed drives.**

We are here to help you

Vertical Integration throughout the entire process.

The vertical integration is one of our key values. We look after the entire value chain, from design to the on-site commissioning of the products, ensuring the accurate development of all the power electronics inside our **electronic soft starters and variable speed drives.**

BEFORE COMMISSIONING	– Technical application & design requirement review. – Dedicated Project Management Support. – Hands on functional & safety product training.
DURING COMMISSIONING	– Dedicated commissioning teams. – Rigorous execution through site operation.
AFTER COMMISSIONING	– Support 24/7, 365 days a year. – Full warranty coverage with options for extension and full preventative maintenance packages. – Advanced remote monitoring, detailed performance reporting, and interactive portals for tracking metrics directly with Power Electronics.

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NOTES

WARRANTY

Power Electronics (the Seller) warrants that their Products are free of faults and defects for a period of 3 years, valid from the date of delivery to the Buyer. It shall be understood that a product is free of faults and defects when its condition and performance is in compliance with its specification.

The warranty shall not extend to any Products whose defects are due to (i) careless or improper use, (ii) failure to observe the Seller's instructions regarding the transport, installation, functioning, maintenance and the storage of the Products, (iii) repairs or modifications made by the Buyer or third party without prior written authorization of the Seller, (iv) negligence during the implementation of authorized repairs or modifications, (v) if serial numbers are modified or illegible, (vi) anomalies caused by, or connected to, the elements coupled directly by the Buyer or by the final customer, (vii) accidents or events that place the Product outside its storage and operational specification, viii) continued use of the Products after identification of a fault or defect.

The warranty excludes components that must be replaced periodically such as fuses, lamps & air filters or consumable materials subject to normal wear and tear.

The warranty excludes external parts that are not manufactured by the Seller under the brand of Power Electronics.

The Seller undertakes to replace or to repair, himself, at their discretion, any Product or its part that demonstrates a fault or defect, which is in conformance with the aforementioned terms of the warranty. Reasonable costs associated with the disassembly/ assembly, transport and customs of equipment will also be undertaken by the Seller except in cases of approved intervention Mby the Buyer and/or their representative where cost allocation has been previously agreed.