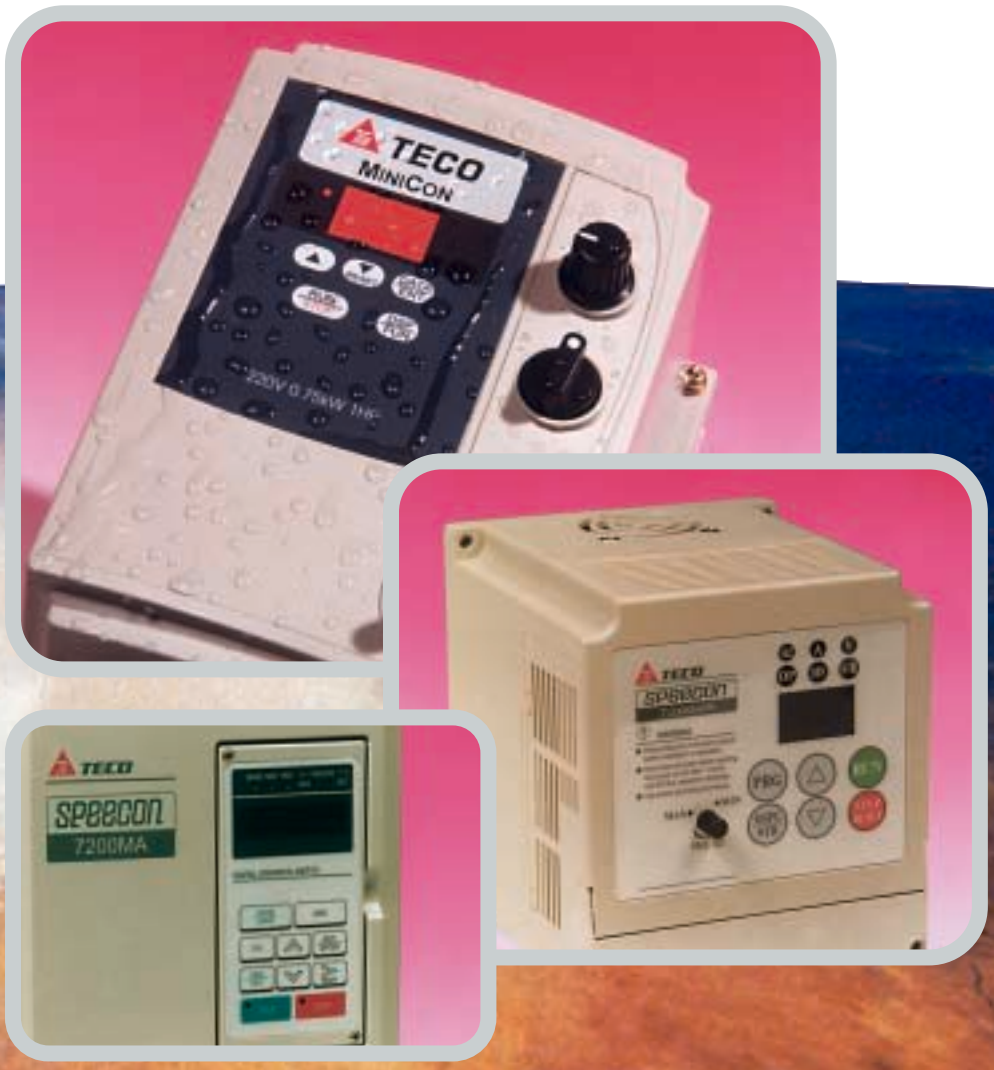
Speecon/Minicon

INVERTERS AND DRIVES

Variable frequency AC motor drives



A GLOBAL FORCE

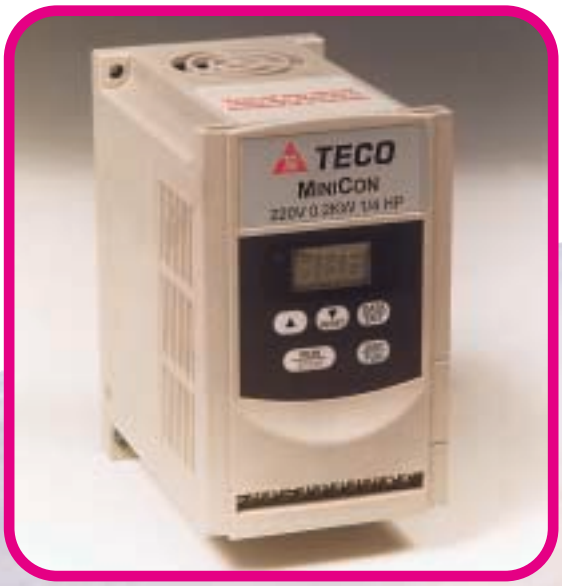
Minicon

MINICON

Micro drive technology advances daily, take advantage of the new Minicon from TECO-Westinghouse. Ranging from 0.2kW-2.2kW single phase input, with 200-240 volt 3 phase output, the Minicon offers full range PWM control from 1-120Hz, with IP20 protection, inbuilt class A RFI filter and DIN rail mounting kit. Micro technology in a low cost format, that's the Minicon.

MINICON SERIES

- 0.2kW – 2.2kW
- Input 200-240 volt 1 phase
- Output 200-240 volt 3 phase
- PWM control
- EMI filter built in
- IP20 enclosure
- DIN rail mounting option



MINICON SPECIFICATIONS

Model: Minicon (200 series)		2P2-M1 F	2P5-M1 F	201-M1 F	202-M1 F	203-M1 F
Rated motor output (kW)		0.2	0.4	0.75	1.5	2.2
Rated Horsepower (HP)		1/4	1/2	1	2	3
Rated Current (A)		1.4	2.3	4.2	7.5	10.5
Rated Capacity (KVA)		0.53	0.88	1.6	2.9	1.66
Weight (kg)		0.76	0.77	0.8	1.66	1.76
Input max voltage		Single phase 200~240V (+10%, -15%, 50/60Hz (+5%))				
Output max voltage		Three phases 200~240V				
Input signal state		PNP type (SOURCE) input				
Control method		Sinusoidal wave PWM control				
Frequency Control	**Freq. Control Range**	1~120Hz				
	Freq. Setting Resolution	Digital: 0.01Hz (0~99.9Hz); 1Hz (100~120Hz) Analogue: 0.06Hz/60Hz				
	Keypad Setting Method	Use up and down keys for setting				
	Frequency Setting Signal	0~10V, 0~20mA				
	Frequency Limit	Frequency upper/lower limit				
Control Characteristics	**Accel/Decel time**	0.1~999 seconds				
	V/F Pattern	6 patterns				
	Torque Control	Torque level adjustable (manual torque boost)				
	Multifunction inputs	2 input contacts of the following signals can be selected: Speed 1 command, jog operation, emergency stop, external base block, reset command				
	Multifunction outputs	1. No output contact of the following signals available for selection: During fault, running output, agreed frequency				
	Approx braking torque	20% (Braking resistor cannot be mounted)				
	Built-in function	Deceleration or free run to stop, auto reset, DC injection frequency/time/level constant speed				
Digital operator monitor		3 digit 7 segment display frequency/function constants/fault history/CPU version				
Ambient Temperature		-10~40°C				
Humidity		0~95% RH (non condensing)				
Vibration		Under 1G (9.8m S2)				
EMC		Class A (filter built in)				
Enclosure		IP20				
UL		UL508C				
Protective functions	**Overload**	Inverter 150% 1 minute				
	Overvoltage	DC bus exceeds 410V				
	Undervoltage	DC bus drop below 200V				
	Momentary power loss	0~2 seconds, inverter can be restarted by speed search				
	Stall prevention	During acceleration/deceleration/constant speed				
	Output short circuit	Provided by electronic circuit				
	Ground fault	Provided by electronic circuit				
	Other protection	Heat sink fin overheat, current limit				
Dimensions		W x H x D = 72mm x 132mm x 118mm / 118mm x 143.2mm x 171.1mm (1.5-2.2kW)				
Mounting dimensions		W x H = 61mm x 116mm				
Installation		Direct installation or using DIN rail (option)				

Minicon+

MINICON+ SPECIFICATIONS

Model: Minicon Plus (200 series)		2P2	2P5	201	202	203
Rated motor output (kW)		0.2	0.4	0.75	1.5	2.2
Rated Horsepower (HP)		1/4	1/2	1	2	3
Input current (A) (1phase/3phase)		3	5.2	9.4	16.6/9.4	32.2/13
Rated output current (A)		1.4	2.3	4.2	7.5	10.5
Rated capacity KVA		0.53	0.88	1.6	2.9	4
Input max voltage		1 phase 200~240V (-15% - +10%) 50/60Hz (+/-5%)				
Output max voltage		3 phase 200-240V				
Input signal type		PNP type (SOURCE) input (External DC24V allowed)				
Control method		Sinusoidal wave PWM control				
Frequency Control	Frequency range	1 ~ 120Hz *1				
	Resolution	Digital: 01Hz (1-99.9Hz): 1Hz (100-200Hz). Analogue: 1Hz/60Hz				
	Keypad setting	Directly adjustable using up and down buttons				
	Display	Three digital LED display frequency/inverter parameters, fault record/program version				
	External signal setting	0-10V, 4-20mA, 0-20mA				
	Other function	Frequency upper and lower limit				
General Control	Carrier frequency	1-16KHz*1				
	Accel/Decel time	0.1 - 999 secs				
	V/F pattern	6 patterns				
	Torque control	Torque boost level adjustable				
	Multi function input	2 points for multi-speed1(Sp1)/2(Sp2)*1 jog: Emergency stop/external bb/reset				
	Multi function output	1a relay for fault/running/frequency agreed function				
	Braking torque	20%			20% - 100% braking resistor built in	
	Other function	Decelerate or coast to stop, auto reset, DC braking frequency/voltage/time setting				
Protective functions	Instantaneous overcurrent	Approx 200% rated current				
	Overload	150% for 1 minute				
	Overvoltage	DC voltage > 410V				
	Undervoltage	DC voltage > 200V				
	Momentary power loss	0.2 second restart by speed search				
	Stall prevention	Accelerate/decelerate/constant speed				
	Output short circuit	Electronic protection				
	Ground fault	Electronic protection				
	Other function	Heat sink overheat protection, current limit				
Enclosure		IP65 (NEMA4)				
Operating temperature		-10 - 50˚C				
Humidity		0-95% RH non condensing				
Vibration		Under 1G (9.8m/s2)				
UL		UL508C				
CE		EN50081-1, EN50082-2, EN50178				
Installation		Mounting screw or DIN rail (option)				

MINICON+

Take the same technology as the Minicon and envelope it in an IP65/NEMA 4 washdown format, add isolator, forward reverse switch and speed potentiometer as standard, and you have the Minicon+ series. Built for more onerous environments, it has proved itself time and time again as a cost leader and sound technological solution to small applications.

MINICON+ SERIES

- Compact Size
- IP65 enclosure
- 0.75kW
- Input 200-240 volt 1 phase
- Output 200-240 volt 3 phase
- PWM control
- EMI filter built in
- DIN rail mounting option

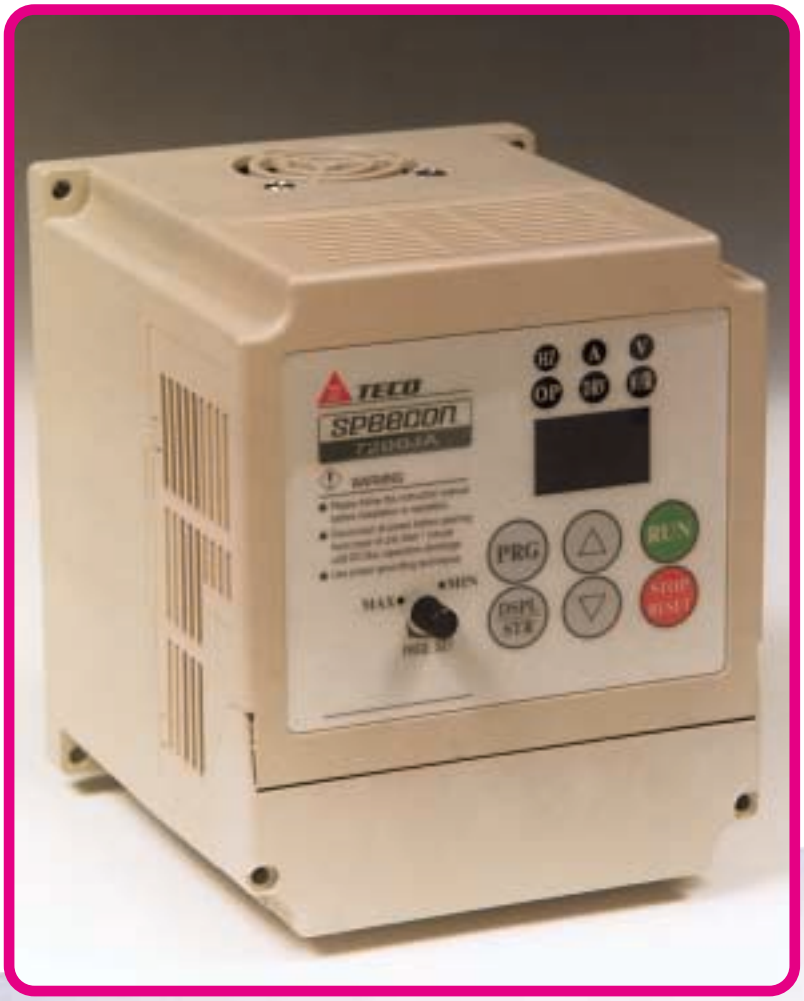
Speecon 7200JA

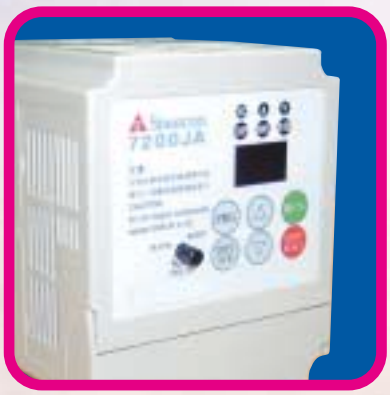
SPEECON 7200JA

In the same micro format TECO-Westinghouse present the JA series. Single phase 220 volt input, powers available up to 1.5kW with onboard RFI filters, the JA offers such facilities as RS 232-485 communications function, IP20 protection, multifunction input and output, synchro start and fully programmable V/F pattern.
The JA series is a lot of drive for a little money.

SPEECON JA SERIES

- Range 0.37kW – 1.5kW
- Input 220 volt 1 phase
- IGBT modules – PWM
- Range of peripherals
- Filters
- EMC Compliant
- Full product support





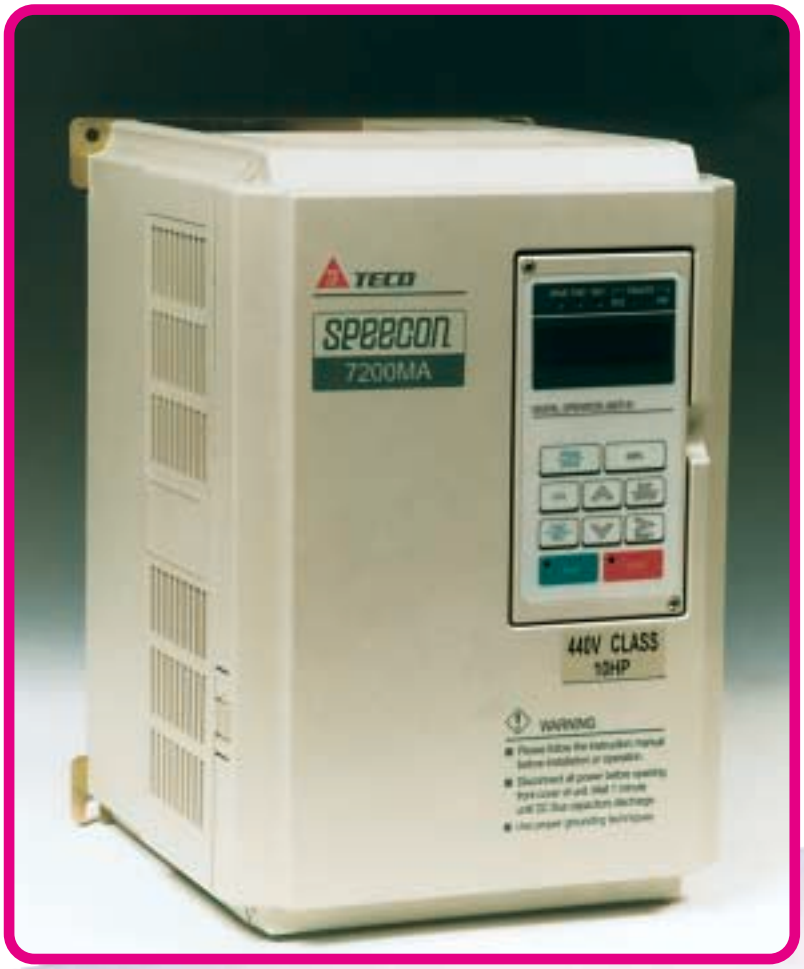
SPEECON 7200JA SPECIFICATIONS

Voltage Class		220V single phase/3 phase		
Inverter model		**JNTJBDBA JK---**		
		R500	0001	0002
Max applicable motor output (kW)		0.37	0.75	1.5
Output Characteristics	**Inverter capacity KVA**	1.2	2	2.8
	Rated output current A	3	5	7.1
	Max. output voltage V	200~230V, 3 phase (proportional to input voltage)		
	Max. output frequency Hz	400Hz (up to 400Hz available)		
Power Supply	**Rated input voltage and freq.**	Single phase (200~230V, 50Hz/60Hz)		
	Allowable volt. fluctuation	-15%~+10%		
	Allowable freq. fluctuation	+5%		
Control Characteristics	**Control method**	Sine PWM		
	Frequency control range	0.5~400Hz		
	Frequency accuracy (Temp. change)	Digital: 0.1% (<100Hz), 1Hz (>100Hz)		
	Frequency setting resolution	0.1Hz		
	Overload capacity	150% rated output current for 1 minute		
	Frequency setting signal	DC 0~10V, 4~20mA (with external resistor)		
	Accel/Decel Time	0.1~3600 sec		
	Braking torque	20% (up to 100% with braking resistor)		
	V/F characteristic	Set any pattern of V/F		
Protective functions	**Stall prevention level**	Set operating current		
	Instantaneous overcurrent	Coast to a stop at 200% rated current		
	Inverter overload (OL)	Coast to a stop at 150% rated current for 1 minute		
	Motor overload	Coast to a stop		
	Overvoltage (OV)	Coast to a stop when DC voltage exceeds 410V		
	Undervoltage (UV)	Coast to a stop when DC voltage drops to below 170V		
	Momentary Power Loss	Coast to a stop if power loss time > 15 ms		
	Cooling Fin Overheat	Protected by thermistor		
Operation conditions	**Operation signal**	Forward/reverse run, individual command		
	Multi-function input	3-wire sequence, fault reset, external fault, multi-speed command, jog, accel/decel time select, external baseblock, local/remote, frequency UP/DOWN		
	Analogue output	0 ~ 10V (output frequency or current selectable)		
	Multi-function output	Fault, during running, frequency agreement, zero speed frequency detection, baseblock, overtorque detection, UV detection, local running		
	Status display LED	LED & 7 segment. Setting frequency, output frequency, output current, rotating direction, the contents at protective function operation		
	Digital operator			
	Built in function	Auto-torque boost, slip compensation, frequency reference bias/gain, fault retry, DC injection braking at start/stop		
Environmental conditions	**Location**	Indoor (no corrosive gases or dust present)		
	Ambient temperature	-10˚C ~ +40˚C (not frozen)		
	Humidity	90% RH or less (non condensing)		
	Vibration	up to 1G at least 20Hz, up to 0.2G at 20 to 50Hz		
Protective configuration		Enclosed wall mounted type IP20		
Communication function		Built in RS485 (MODBUS)		
Noise interference suppression		En50081-2 (with specified noise filter as option) *(0.37~0.75kW built in noise filter, 1.5kW external noise filter)		
Noise immunity		Pr EN50082-2		
Net Weight		0.9kg		

Speecon 7200MA

SPEECON 7200MA

Using the latest technology the MA series is available from 0.75kW-4kW single phase 220 volt input and 0.75kW-15kW three phase 380-460 volt input. With its user friendly plain English LCD operator interface panel the MA series has never been easier to programme, its multidrop download facility enables one drive pattern to set in multi drive applications from one operator interface. Full range auto torque boost, energy saving mode, footprint filter, 16 step auto run facility, full comms available and onboard multi-function parameters, including PID control, enable the MA to be used in all applications.



SPEECON MA SERIES

- Range 0.75kW – 7.5kW
- Input 220 volt 1 phase or 415V 3 phase
- IGBT modules – PWM
- Digital or analogue operator
- PID control
- Dynamic braking as standard
- Footprint Filters
- EMC Compliant
- Full comms available

SPEECON 7200MA DIMENSIONS

Model		Mounting dimensions			External dimensions			Approx Weight (kg)
Voltage	Motor output kW	W	H	H2	W1	H1	D	
220V 1 phase/ 3 phase	0.75	126	266	6.8	140	279.5	176.5	3.8
	1.5							
	2.2							3.9
440V 3 phase	0.75	126	266	6.8	140	279.5	176.5	3.8
	1.5							
	2.2							3.9
	4							
	5.5	192	286	7	211.2	300	215	5.6
	7.5							
440V	15	245	340	10	265	360	225	12
	20							

SPEECON 7200MA SPECIFICATIONS

Input Voltage Class		**220V Class**								**440V Class**							
		1/3-Phase			**3-Phase**					**3-Phase**							
Model		**JNTMBGBB----BK**								**JNTMBGBB----AZ**							
		0001	0002	0003	0005	7R50	0010	0015	0020	0001	0002	0003	0005	7R50	0010	0015	0020
Max applicable motor output	**(HP)**	1	2	3	5.4	7.5	10	15	20	1	2	3	5.4	7.5	10	15	20
	(kW)	0.75	1.5	2.2	4	5.5	7.5	11	15	0.75	1.5	2.2	4	5.5	7.5	11	15
Output Characteristics	**Rated output capacity (KVA**	2	2.7	4	7.5	10.1	13.7	20.6	27.4	2.2	3.4	4.1	7.5	10.3	12.3	20.6	27.4
	Rated output current (A	4.8	6.4	9.6	17.5	24	32	48	64	2.6	4	4.8	8.7	12	15	24	32
	Max. output voltage V	3 phase 200~230V								3 phase 380~460V							
	Max. output frequency Hz	Through Parameter Setting (0Hz to 400Hz)															
Power Supply	**Rated input voltage and freq.**	1-/3- phase (200~230V, 50Hz/60Hz); 3- phase (200~230V, 50Hz/60Hz); 1-/3- phase (380~460V, 50Hz/60Hz)															
	Allowable volt. fluctuation	-15%~+10%															
	Allowable freq. fluctuation	+5%															
Control Characteristics	**Operation mode**	Graphic LCD panel (English & Chinese) with parameters copying															
	Control mode	Sinosoidal PWM															
	Frequency control range	0.5Hz to 400Hz															
	Frequency accuracy (Varied with Temp.)	Digital command:+/-0.01% (-10 ~ + 40˚C); Analogue command: ±0.1% (25˚C + 10˚C)															
	Speed Control Accuracy	±0.1% (V/F with PG feedback), ±0.5% (Sensorless Vector Control)															
	Frequency command resolution	Digital operator reference: 0.01Hz; Analogue reference: 0.06Hz/60Hz															
	Frequency output resolution	0.01Hz															
	Overload Resistibility	150% rated output current for one minute															
	Frequency setting signal	DC 0~+10V/4-20 mA															
	Accel/Decel time	0.0~6000.0 sec (accel/decel time can be set independently)															
	Voltage-Frequency characteristics	V/F curve can be set through parameter setting															
	Regeneration Torque	Approx 20%															
Protective functions	**Stall prevention**	During acceleration/deceleration and constant speed running (current level can be selected during acceleration and constant speed running, during deceleration, stall prevention can be enabled or disabled)															
	Instantaneous overcurrent	Motor coasts to a stop at approx. 200% rated current															
	Motor overload protection	Electronic thermal overload relay															
	Inverter overlaod protection	Stopped if above 150% rated current for 1 min															
	Overvoltage	Stop if VDC > 820V (440 Class)															
	Undervoltage	Stop if VDC < 400V (440 Class)															
	Momentary Power Loss	> 15ms, stop otherwise															
	Overheat protection	Protected by thermistor															
	Grounding protection	Protected by DC current sensor															
	Power charge indication (LED)	Lit when the DC bus voltage above 50V															
Mechnical Construction		Enclosed, wall mounted type (NEMA-1)															
Cooling method		Self		Forced	Self					Forced							
Weight (kg)		3.8	3.8	3.9	3.8	3.8				3.9	3.9	5.6	5.6				
Environmental conditions	**Application site**	Indoor (no corrosive gas and dust)															
	Ambient temperature	-10 ~ +40˚C (not frozen)															
	Storage temperature	-20 ~ +60˚C															
	Ambient Humidity	90% RH or less (non condensing)															
	Height, vibration	Below 100m, 5.9m/S2 (0.6G), (JISC0911 Standard)															
Communication function		RS-485 built in (MODBUS)															
EMI		Meet EN50081-2 (1994) with specified EMI filter															
EMC compatibility		Meet Pr EN 50082-2															
Option		PROFIBUS card															

Speecon 7200GA/PA

SPEECON 7200GA/PA

The GA / PA series with its rugged design and power range of 15kW-300kW three phase 380-460volt gives high starting torque, high performance and extreme reliability throughout its range. With its enhanced output interface and supply loss ride through facility the GA is designed to give optimum performance whilst keeping plant downtime to a minimum. You can rely on the PA for all your HVAC application needs, yet still retain a dramatic cost saving using TECO equipment.

SPEECON 7200GA/PA SPECIFICATIONS

Inverter Model		JNTGBG BA/BB AZ ---															
		0015	0020	0025	0030	0040	0050	0060	0075	0100	0125	0150	0175	0200	0250	0300	0400
Max applicable motor output (kW)*1		11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	300
Output Characteristics	Inverter capacity (KVA)	20.6	27.4	34	41	54	68	82	110	138	180	195	230	260	290	385	514
	Rated output current (A)	24	32	40	48	64	80	96	128	165	210	224	270	300	340	450	600
	Max. output voltage	3 phase 380 ~ 460V (Proportional to input voltage)															
	Rated output current (A)	Up to 400Hz available															
Power Supply	Rated input voltage and freq.	3 phase 380 ~ 460 50/60 Hz															
	Allowable voltage fluctuation	+10% # -15%															
	Allowable freq. fluctuation	+5%															
Control Characteristics	Control method	Sine wave PWM															
	Frequency control range	0.1 to 400Hz															
	Frequency accuracy	Digital command: 0.1% (+14 to 104˚F/-10 to 40˚C); Analogue command: 0.1% (77 + 18˚F/25 + 10˚C)															
	Frequency setting resolution	Digital operator reference: 0.01Hz; Analogue reference: 0.06Hz/60Hz															
	Output frequency resolution	0.01Hz (1/30000)															
	Overload capacity	150% rated output current for one minute															
	Frequency setting signal	0 to 10 BDC (20K ohm), 4~20mA (250 ohm), 0~+10 (option)															
	Accel/Decel time	0.1 to 6000 sec (Accel/decel time setting separately)															
	Braking Torque	Approx 20%															
Protective functions	No. of V-f patterns (16 in total)	4: For general purpose, 4: for high starting torque, 1: for adjustable pattern, 4: for fans and pumps, 3: for machine tools															
	Motor overload protection	Electric thermal overload relay															
	Instantaneous overcurrent	Motor coasts to stop at approx. 200% rated current															
	Fuse blown protection	Motor coasts to stop at blown fuse															
	Overload	Motor coasts to stop after 1 minute at 150% rated output current															
	Overvoltage (440V input)	Motor coasts to stop if converter output voltage exceeds 800VDC															
	Overvoltage (220V input)	Motor coasts to stop if converter output voltage exceeds 400VDC															
	Undervoltage (440V input)	Motor coasts to stop if coverter output voltage drops to 420VDC or below															
	Undervoltage (220V input)	Motor coasts to stop if converter output voltage drops to 210VDC or below															
	Momentary power break *1	Motor coasts to stop as momentary power break lasting over 15ms (time setting made before shipment)															
	Fin overheat	Thermostat															
	Stall prevention	Stall prevention at acceleration/deceleration and constant speed operation															
	Ground fault	Provided by electronic circuit															
	Power charge indication	Charge lamp stays ON until bus voltage drops below 50V															
Environmental conditions	Location	Indoor (protected from corrosive gases and dust)															
	Ambient temperature	+14 to 104˚F (-10 to +40˚C) (Not frozen)															
	Storage temperature	-4 to 140˚F (-20 to +60˚C)															
	Humidity	90% RH (non condensing)															
	Vibration	1G at 10 to 20Hz, up to 0.2G at 20 to 50Hz															
Communication function		RS-485 (SC-C optional card)															
Noise interference suppression		EN 50081-2 (1994) with specified noise filter															
Noise immunity		Pr EN50082-2															

SPEECON GA/PA SERIES

- Range 11kW – 300kW
- Input 380 volt – 460 volt
- 3 phase
- Filters
- PID control
- EMC Compliant
- IP20 units available
- Easy link to PLC
- Full product support

SPEECON 7200GA/PA DIMENSIONS

Voltage	Motor output kW	Dimenisons in mm													Mass (kg)	DCL
		Open chassis type (IP00)						Mass (kg)	Enclosed Type (NEMA1) (IP20)							
		W	H	D	W1	H1	d		W	H	D	W1	H1	d		
220V	11	265	360	245	245	340	M6	12	265	360	245	245	340	M6	12	Option
	15															
	18.5	283.5	525	307	220	505	M8	32	291.5	745	307	220	505	M8	35	Built-in
	22															
	30	344	630	324.5	250	610	M8	46	352	945	324.5	250	610	M8	50	
	37															
	45															
	55	459	790	324.6	320	760	M10	80	462	1105	324.6	320	760	M10	86	
	75							81							87	
	90							85							92	
	110	599	1000	381.6	460	960	M12	120	602	1305	381.6	460	960	M12	130	
	132							120							130	
	160							130							140	
	185															
	220			—				—			—				—	—
	300															

Packaged Drive Solut

PACKAGED DRIVE SOLUTIONS

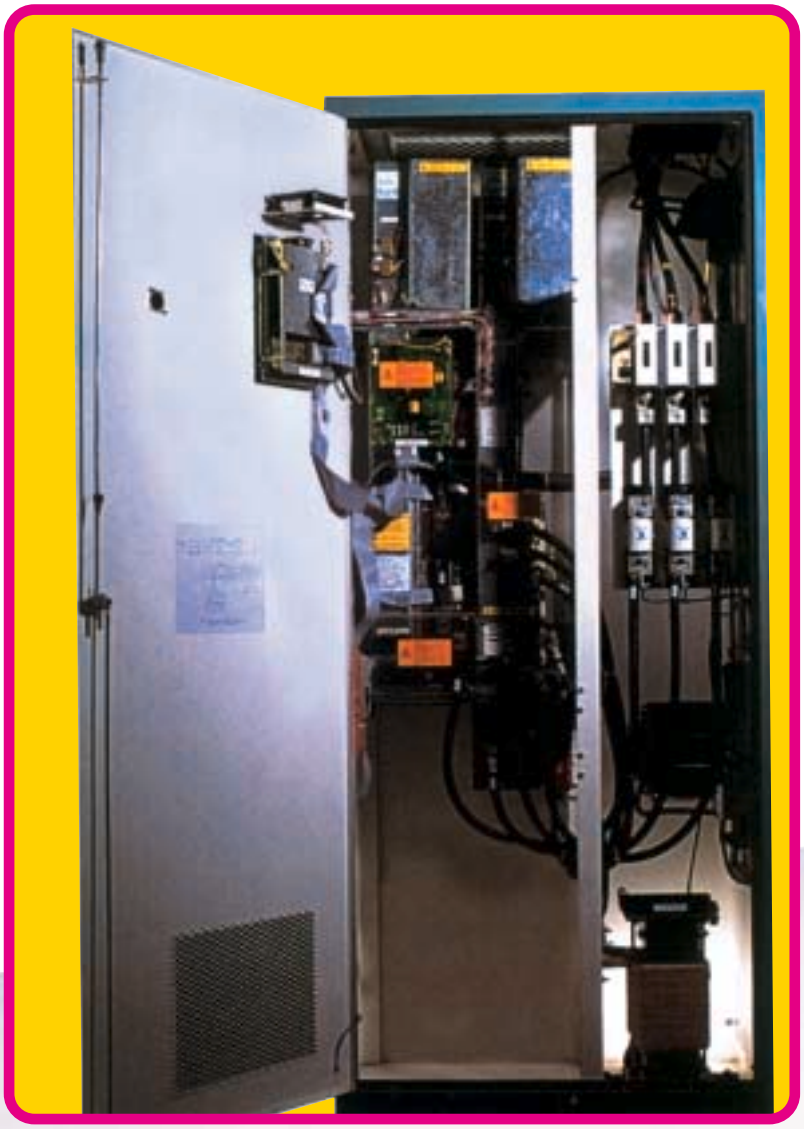
From fractional kW to MWs, TECO can offer its highly competitive standard cubicle build, or design and build to client's industry specifications, ie paper, water, power, quarrying etc.

TECO-Westinghouse have existing clients based in the UK and Europe who already enjoy the total engineering package solution that we provide.

TECO's Speecon range, available from 0.4kW to 300kW, can be obtained in chassis version IP00/IP20 or incorporated in TECO's standard cubicle build.

Different IP ratings, 21, 44, 54, 55 are available, as are the many differing site standards of today's modern industries. Motor/drive packages make our solutions as ever, more cost-effective.

The Optim 2000 is a range of trip resistant vector control AC variable speed drives for general and advanced undustrial applications, available from 132kW up to MWs. It is already widely used by prestigious clients throughout the UK and Europe in both chassis and fully cubicalised forms (e.g. Ford Motor Company, Tilcon Ltd, Leyland DAF Trucks, Vauxhall Motors).



OPTIM 2000

- Range from 150kW - 1.5MW
- Modular Construction
- Filters
- EMC Compliant
- Technical Assistance
- Full Range of peripherals
- On Site Installation and Commissioning on Request

ions

Drive build standard specifications

STANDARD BUILD COMPONENTS

- Enclosure. IP requirement. (eg IP-444, IP-54)
- Drive
- MCCB, door interlocked
- Emergency Stop. (latch-in, twist-release type)
- Stop, Start and fault reset push buttons
- 110v control transformer+fuses (rating will depend upon options selected)
- Enclosure cooling fan and filter, relay, O/L and O/L trip indication
- Door Mounted Drive Keypad
- Safety Relay

DRIVE OPTIONS

- RFI Filter. (consider the installation environment and EMC compliancy)
- O/P Line reactor (multi-motors and long cable runs)
- Brake chopper unit and braking resistor (fast stopping of high inertia loads)
- Combined Harmonic and RFI input filter

CONTROL OPTIONS

- Main Contactor (if contactor required then no shunt trip needed on MCCB)
- Motor Thermistor Relay, trip indication and reset (a must for hazardous areas)
- Main motor heater circuit, fuses and interlock
- Enclosure anti-condensation heater, fuses, thermostat, relay and interlock
- Local/remote. Frequency ref. +stop/start changeover switch
- Panel Meters. Drive O/P frequency. Supply voltage
- Door mounted speed control Potentiometer
- Brake circuit and brake trip indication (only if dynamic braking required)

CUSTOMER SPECIFICATIONS

- Cable entry. Top or Bottom
- Paint colour/spec. (RAL 7032 is standard)
- Ambient temp. (if for export)
- Additional Indication (drive running/ stopped/tripped/fault etc.)

Project Case Study

TILCON QUARRY, SKIPTON, UK

In 1999 TECO-Westinghouse was awarded the contract to supply, test and commission motors and drives to operate crushers at the UK's most advanced quarry.

The Tilcon Quarry produces up to two million tonnes of limestone a year. We supplied them with two motors, including the largest AC motor in the UK (1000kW 6 pole 690v, TECACA) to be used on a crusher in the UK.

Two 12 pulse cubicalised inverters, rated at 450kW and 1000kW and a 2000kva ONAN 11kV to 690V stepdown/phase shift transformer. We have project capability experience in the following industry sectors: power generation, petro-chemical, mining, paper and quarrying.

And now with our widest ever product range TECO-Westinghouse can provide you with motors and drives to cover virtually every project.

ACP&D Limited.

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