



SINAMICS Drives

ROBICON W120CP clean power drive

50 HP to 200 HP

Introduction

This technical data sheet provides a short overview of the most important characteristics of the ROBICON W120CP (clean power) 18-pulse low harmonics drive from Siemens, developed specifically to meet specifications in the municipal water and waste water market.

A result of the powerful combination of SINAMICS®, the most advanced drives technology platform, and the ROBICON legacy of more than 20 years of quality and expertise in the water and waste water industry, the W120CP makes the best even better.

The compact and quiet ROBICON W120CP utilizes the well proven, simple yet effective, 18-pulse technology to provide clean power to meet the low harmonic requirements of IEEE 519-1992 at the VFD input terminals, combined with a state-of-the-art power module with IGBT power semiconductors. The drive can be operated in either Volts/Hertz or sensorless vector control modes.

Standard features

The standard drive enclosure is a floor standing cabinet, which can be equipped with a wide variety of pre-engineered and custom options. The ROBICON W120CP has the following standard features:

- NEMA 1 enclosure, with blowers (optional NEMA 12 ventilated with air filters)
- Circuit breaker disconnect with flange mount operator handle, mechanically interlocked with the enclosure door
- Short circuit current rating (SCCR) 65 kA at 480 V AC
- Clean power 18-pulse front end with patented phase shifting autotransformer and input line reactor
- * Motor side voltage source IGBT inverter with pulse width modulated (PWM) output
- Intelligent operator panel (IOP), door mounted for easy start-up and operation
- UL listing per UL508C
- Windows based STARTER software – common to all models of the SINAMICS family



Product Specifications

Light Overload		High Overload		Rated output current	Approx. max. input current ¹⁾	Power module frame size	ROBICON W120CP enclosed drive
Output (at 460V, 60 Hz)	Base load current for 110% overload	Output (at 460V, 60 Hz)	Base load current for 150% overload				
HP	A	HP	A	A	A		Model No.
50	68	40	60	68	64	E	6SL3710-3BJ27-5AR0
60	80	50	75	80	74	E	6SL3710-3BJ29-0AR0
75	100	60	90	100	91	F	6SL3710-3BJ31-1AR0
100	130	75	110	130	118	F	6SL3710-3BJ31-5AR0
125	160	100	145	160	143	F	6SL3710-3BJ31-8AR0
150	186	125	178	186	170	F+	6SL3710-3BJ32-0AR0
200	240	150	205	240	217	F+	6SL3710-3BJ32-5AR0

¹⁾ The input current is based on the input current of the power module and includes an allowance of 10 A for auxiliary circuits.

The standard ROBICON W120CP base enclosed drive includes:

- NEMA 1 enclosure
- UL508C listing (file no. E319311)
- Short circuit current rating (SCCR) 65 kA at 480 V AC
- Power module PM240 unfiltered
- 18-pulse diode rectifier
- Circuit breaker disconnect with mechanical door interlock
- Patented phase-shifting autotransformer with matched input line reactor for clean power input meeting the requirements of IEEE 519-1992 at the VFD input terminals under all conditions
- Intelligent operator panel (IOP), door mounted and wired
- Integral braking chopper
- Cable entry top or bottom, line and motor side

Controller CU230P-2 HVAC with:

- RS485 serial communications port USS / Modbus RTU / BACnet MS/TP
- 6 digital inputs, 24V 15 mA, optically isolated (group)
- 3 relay outputs, 2x form C 250 V AC 2 A or 30V DC 5 A, 1x NO 30 V DC 0.5 A
- 4 analog inputs, 2x differential -10V to +10V or 0/4 to 20mA, 1x 0/4 to 20mA or temperature sensor, 1x temperature sensor input for Ni1000/Pt1000 sensor
- Input for temperature sensor KTY84, PTC thermistor or thermostat
- 2 analog outputs, 1x 0 to +10V or 0/4mA to 20mA, 1x 0/4mA to 20mA, non-isolated

NOTE: Some of the control unit inputs and/or outputs may be used for options.

Standard Options

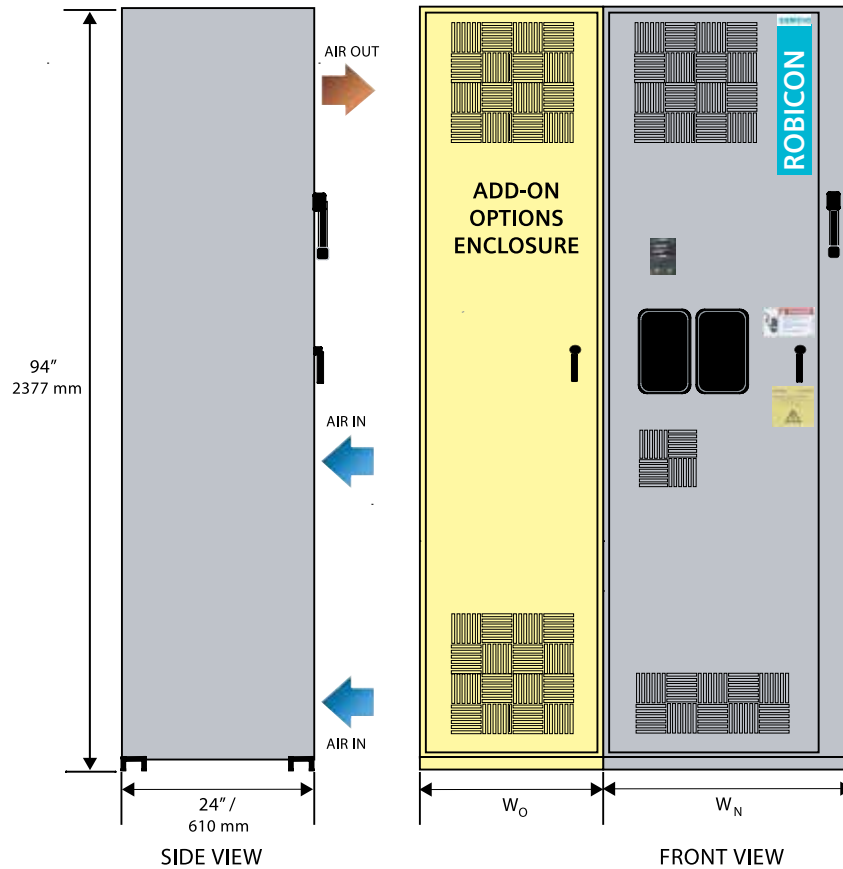
Option Code	Description	Option Code	Description
Enclosure Options		Control Options	
M12	NEMA12 filters	E86	Isolation Amplifier for one analog input
L50	Cabinet light and outlet	E87	Isolation Amplifier for two analog outputs
L55	Cabinet space heaters (120 V AC)	K20	Pilot lights (qty. 3), door mounted – Ready, Run, Fault
L56	Motor space heater supply	K21	Additional local controls (L-R & H-O-A, speed pot, Start/Stop p/b)
Y09	Special enclosure paint color [specify color]	K22	Elapsed time (hour) meter, door mounted, non-resettable
Power Circuit and Protection Options		L87	Ground fault monitor for ungrounded supplies
L08	Output reactor	L97	RTD monitor for 8x Pt100 temperature sensors
L10 ¹⁾	Output dV/dt filter	N55	ALL STOP mushroom pushbutton, latching, coast to stop
L13	Input isolation contactor	Communication Bus Options	
L15 ¹⁾	Output sinusoidal filter	G81	PROFIBUS DP communication port
L28	2 contactor manual bypass (output/bypass contactors with o/l)	G82	EtherNet/IP or PROFINET communication port
L29 ¹⁾	Reduced voltage soft start (RVSS) manual bypass	Other Options	
L32	Output isolation contactor	H20	Seismic certification per IBC 2012 (provide specification)
L63	Braking resistor		
L96	Input surge protective device		
L98	Motor thermal overload relay (already included in L28)		
L99	Motor protection relay (Multilin 369)		
P10	Input voltage monitor (Siemens type 3UG4)		

¹⁾ These options may require a larger enclosure (add-on options cabinet). Option M12 adds NEMA 12 filters to both the drive and attached add-on enclosures. Option L29 (RVSS bypass) is listed to UL508A (others are included in the UL508C listing of the drive).

Note: Please consult factory for additional/custom options.

Design Data

FLOOR STANDING ENCLOSURE



Note:

Dimensions are nominal for enclosure, tolerance 0.5" (12 mm), excluding protruding components. Please refer to drawings for exact details.

ROBICON W120CP Enclosed drive	Output (Light Overload) (at 460V, 60 Hz)	Noise level L_{pA} (1m) at 60 Hz	Cooling air flow demand	Heat loss	Weight approx.		Drive enclosure Nominal size $W_N \times D_N \times H_N$	
Model No.	HP	dB(A)	cfm	kW	lb	kg	inch	mm
Floor standing enclosure								
6SL3710-3BJ27-5AR0	50	70	591	1.55	930	422	30 x 24 x 94	762 x 610 x 2377
6SL3710-3BJ29-0AR0	60	70	591	1.95	930	422	30 x 24 x 94	762 x 610 x 2377
6SL3710-3BJ31-1AR0	75	70	866	2.47	1120	508	36 x 24 x 94	914 x 610 x 2377
6SL3710-3BJ31-5AR0	100	70	866	3.27	1160	526	36 x 24 x 94	914 x 610 x 2377
6SL3710-3BJ31-8AR0	125	70	866	3.91	1260	572	36 x 24 x 94	914 x 610 x 2377
6SL3710-3BJ32-0AR0	150	70	866	4.78	1460	662	36 x 24 x 94	914 x 610 x 2377
6SL3710-3BJ32-5AR0	200	70	866	5.41	1660	753	36 x 24 x 94	914 x 610 x 2377

Add-on options enclosure	Output (Light Overload) (at 460V, 60 Hz)	Enclosure for option L10 Output dV/dt filter		Enclosure for option L15 Output sinusoidal filter		Enclosure for option L29 RVSS bypass	
		Width W_O Inch / mm	Weight lb / kg	Width W_O Inch / mm	Weight lb / kg	Width W_O Inch / mm	Weight lb / kg
Model No.	HP						
6SL370-3BJ27-5AR0	50	20 / 508	386 / 175	20 / 508	440 / 200	20 / 508	408 / 185
6SL370-3BJ29-0AR0	60	20 / 508	386 / 175	20 / 508	440 / 200	20 / 508	408 / 185
6SL370-3BJ31-1AR0	75	20 / 508	452 / 205	20 / 508	540 / 245	20 / 508	463 / 210
6SL370-3BJ31-5AR0	100	20 / 508	452 / 205	20 / 508	540 / 245	20 / 508	463 / 210
6SL370-3BJ31-8AR0	125	20 / 508	452 / 205	20 / 508	540 / 245	20 / 508	463 / 210
6SL370-3BJ32-0AR0	150	20 / 508	452 / 205	24 / 610	660 / 300	20 / 508	463 / 210
6SL370-3BJ32-5AR0	200	20 / 508	452 / 205	24 / 610	660 / 300	20 / 508	463 / 210

Technical Data

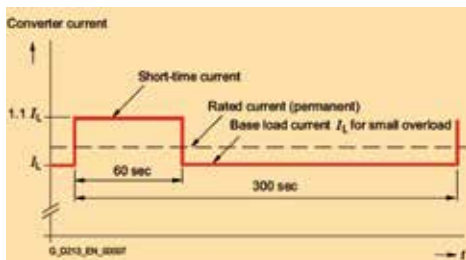
Electrical data			
Supply voltages and output ranges	460 V to 480 V 3 ph AC, ±10%, 50 to 200 HP		
Supply systems	Grounded or ungrounded supplies		
Line frequency	47 Hz to 63 Hz		
Output frequency	0 Hz to 266 Hz (650 Hz with derating)		
Power factor fundamental approx.	0.95		
Drive efficiency	94 to 96%		
Short circuit current rating	SCCR 65 kA at 480 V AC		
Control method	V/Hz control, V/Hz with flux current control (FCC), sensorless vector control (SVC).		
Fixed speeds	16 fixed frequencies		
Skipped frequency ranges	4, programmable		
Braking operation	Integral brake chopper for dynamic braking, with CU240 DC and compound braking		
Mechanical data			
Type of enclosure and color	NEMA 1, optionally NEMA 12 (ventilated), ANSI 61 gray		
Type of cooling	Forced air ventilation		
Noise level L _{pA} (1 m)	70 dB(A) at 60 Hz line frequency		
Environmental protection	Nickel plated busbars, varnish coated electronic boards		
Compliance with standards			
UL listing	Listed to UL508C, file no. E319311, some options listed to UL508A		
Ambient conditions	Operation	Storage	Transport
Ambient temperature	32°F to 104°F (0°C to +40°C) Up to +122°F/+50°C with derating	-13°F (-25°C) to 131°F (+55°C)	-13°F (-25°C) to 158°F (+70°C) Down to -40°F (-40 °C) for 24 hours
Relative humidity (non-condensing)	5% to 95%	5% to 95%	5% to 95% at 40°C
Installation altitude	Up to 3,300 ft (1000 m) above sea level without reduction in performance, > 3,300 ft see derating data		

Engineering Information

Overload ratings

The ROBICON W120CP drive may be operated with both variable torque and constant torque loads at either light or high overload duties. The criterion for overload is that the drive is operated with its base load current before and after the overload occurs.

Light overload duty is based on 110% base load current for 60 sec or 150% for 3 sec, repeated every 300 sec.



Light overload

High overload duty is based on 150% base load current for 60 sec or 200% for 3 sec, repeated every 300 sec.

Motor and drive sizing

Service Factor must be considered for motors operating at Service Factors beyond 1.0. Please consult factory for assistance sizing the drive.

For motors with ratings larger than the drive, please consult factory as nuisance tripping may occur if drive is not properly sized.

In sensorless vector control, the rated motor current (FLA) must be at least 1/4 of the rated drive output current. With lower motor currents, operation is possible in Volts/Hz control mode only.

Intelligent operator panel (IOP)

The SINAMICS IOP makes it easy to operate, commission and diagnose faults on the drive. Up to two process values can be displayed on the screen either graphically or numerically. Process values can be displayed in the appropriate technological units. The user language can be selected.

Due to the large plain text display, menu prompting and application wizards, commissioning of drives is very quick.



Parameters are displayed in plain text, explanatory help texts are provided and there is a parameter filter function. The user is interactively navigated through commissioning of common applications such as pumps, fans, compressors and conveyors using application wizards.

The IOP has a dedicated key to toggle between local (from IOP) and remote control.

Fault diagnosis is in a user-friendly fashion using plain text display of faults and alarms. Explanatory help texts are provided by pressing the INFO key.

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Subject to change without prior notice.
Order No.DRBR-00105-0613
Printed in USA
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