



SINAMICS Drives

ROBICON W150CP clean power drive

250 HP to 800 HP

Introduction

This technical data sheet provides a short overview of the most important characteristics of the ROBICON W150CP (clean power) 18-pulse low harmonics drive from Siemens, developed specifically to meet specifications in the municipal water and waste water market.

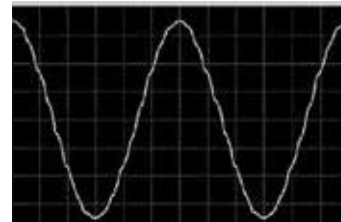
A result of the powerful combination of SINAMICS®, the most advanced drives technology platform, and the ROBICON legacy of more than 20 years of quality and expertise in the water and waste water industry, the W150CP makes the best even better.

The compact and quiet ROBICON W150CP 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, sensorless vector, or closed loop vector with encoder 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 W150CP 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 VAC
- Clean power 18-pulse front end with patented phase shifting autotransformer and input line reactor
- Motor side IGBT inverter with pulse width modulated (PWM) output featuring pulse edge modulation (PEM) and optimized pulse patterns
- Advanced operator panel (AOP30), 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 W150CP 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.
250	302	200	277	310	275	G	6SL3710-3GJ33-1AS3
300	370	250	340	380	337	G	6SL3710-3GJ33-8AS3
400	477	350	438	490	435	G	6SL3710-3GJ35-0AS3
500	590	400	460	605	540	H	6SL3710-3GJ36-1AS3
600	725	500	570	745	652	H	6SL3710-3GJ37-5AS3
700	820	600	700	840	734	H	6SL3710-3GJ38-4AS3
800	960	700	860	985	859	J	6SL3710-3GJ41-0AS3

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 W150CP base enclosed drive includes:

- NEMA 1 enclosure
- UL508C listing (file no. E319311)
- Short circuit current rating (SCCR) 65 kA at 480 V AC
- Circuit breaker disconnect with mechanical door interlock
- Input isolation contactor
- Semiconductor fuses
- 18-pulse diode rectifier
- 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
- Advanced operator panel (AOP30), door mounted and wired
- Line side cable entry top or bottom
- Motor cable entry bottom, below 500 HP also top entry

Terminal module TM31 with:

- 8 digital inputs, 24V DC 10 mA
- 4 bidirectional inputs/outputs 24V DC, input 10 mA, output max. 100 mA
- 2 relay outputs (changeover) max. 250V AC/30V DC, 8A
- 2 analog inputs $\pm 10V$ or 0/4mA to +20 mA or -20 mA to +20 mA
- 2 analog outputs $\pm 10V$ or 0/4mA to +20 mA or -20 mA to +20 mA
- Input for KTY84 temperature sensor or PTC thermistor
- $\pm 10V$ auxiliary voltage output for analog setpoint input
- 24V auxiliary voltage output for digital inputs

The standard control unit CU320-2 DP has an Ethernet programming port as well as a PROFIBUS communications port.

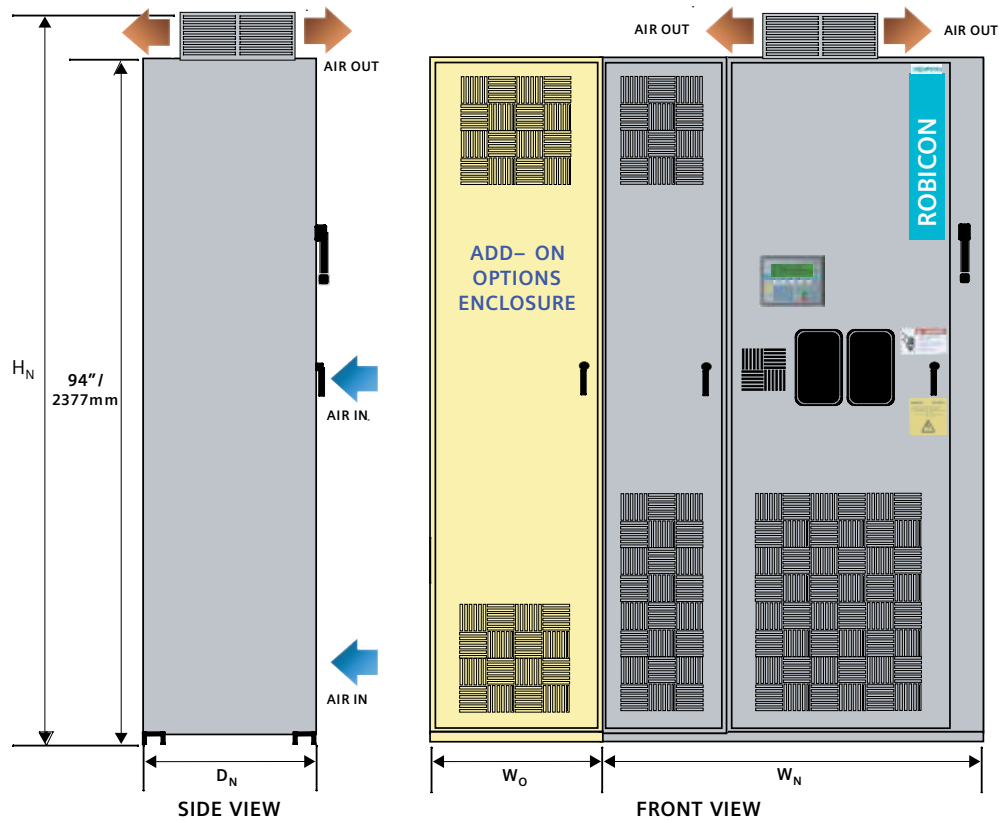
Standard Options

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 (120VAC)	G51	RTD monitor module TM150 (Pt100, 12x 2- or 6x 3-wire)
L56	Motor space heater supply	G52	Qty. 2x RTD monitor module TM150
M78 ¹⁾	Top motor cable entry (Only from 500HP up. Standard $\leq 400HP$)	K20	Pilot lights (qty. 3), door mounted – Ready, Run, Fault
Y09	Special enclosure paint color [specify color]	K21	Additional local controls (L-R & H-O-A, speed pot, Start/Stop p/b)
Power Circuit and Protection Options		K22	Elapsed time (hour) meter, door mounted, non-resettable
L08	Output reactor	K95	Control Unit CU320-2 PN (PROFINET)
L10 ¹⁾	Output dV/dt filter	L87	Ground Fault Monitor for ungrounded supplies
L15 ¹⁾	Output sinusoidal filter (only up to 400HP)	L97	RTD monitor for 8x Pt100 temperature sensors
L28 ¹⁾	2 contactor manual bypass (output/bypass contactors with o/l)	N55	ALL STOP mushroom pushbutton, latching, coast to stop
L29 ¹⁾	Reduced voltage soft start (RVSS) manual bypass	Communication Bus Options	
L32 ¹⁾	Output isolation contactor	G22	Modbus RTU communication converter
L62	Braking unit 50 kW (200 kW for 20s) with resistor	G27	Modbus TCP/IP communication converter
L96	Input Surge Protective Device	G33	CBE20 Communications Board Ethernet for EtherNet/IP or PROFINET or SINAMICS Link
L98 ¹⁾	Motor thermal overload relay (already included in L28)	Other Options	
L99 ¹⁾	Motor protection relay (Multilin 369)	H20	Seismic certification per IBC 2012 (provide specification)
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. Options L28 (bypass) for ratings 500 HP and up, and L29 (RVSS bypass) are listed to UL508A (others are included in the UL508C listing of the drive). Note: Please consult factory for additional and 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.
- Tophat is shipped as loose item, to be mounted on site. Drive height when shipped is 94" (excluding pallet).

ROBICON W150CP 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 x D _N x H _N	
Model No.	HP	dB(A)	cfm	kW	lb	kg	inch	mm
Floor standing enclosure								
6SL3710-3GJ33-1AS3	250	72	1916	6.9	2420	1098	54 x 28 x 100	1372 x 711 x 2531
6SL3710-3GJ33-8AS3	300	72	1916	8.4	2520	1143	54 x 28 x 100	1372 x 711 x 2531
6SL3710-3GJ35-0AS3	400	72	1916	10.2	2880	1306	54 x 28 x 100	1372 x 711 x 2531
6SL3710-3GJ36-1AS3	500	74	3471	13.1	3270	1483	68 x 32 x 100	1727 x 815 x 2531
6SL3710-3GJ37-5AS3	600	74	3471	14.6	3960	1796	68 x 32 x 100	1727 x 815 x 2531
6SL3710-3GJ38-4AS3	700	75	5431	16.9	6170	2800	100 x 32 x 104	2540 x 815 x 2631
6SL3710-3GJ41-0AS3	800	75	5431	19.9	6600	3000	100 x 32 x 104	2540 x 815 x 2631

Add-on options enclosures	Output (Light Overload)	Enclosure for options L10, L15, L32, L98, L99, M78					Enclosure for option L28 2 contactor bypass		Enclosure for option L29 RVSS bypass	
		Width W _O Inch / mm	L10 Weight lb / kg	L15 Weight lb / kg	L32 Weight lb / kg	L98/99/M78 Weight lb / kg	Width W _O Inch / mm	Weight lb / kg	Width W _O Inch / mm	Weight lb / kg
6SL3710-3GJ33-1AS3	250	24 / 610	595 / 270	1135 / 515	(Base) ²⁾	(Base) ²⁾	(Base) ²⁾	(Base) ²⁾	24 / 610	694 / 315
6SL3710-3GJ33-8AS3	300	24 / 610	595 / 270	1135 / 515	(Base) ²⁾	(Base) ²⁾	(Base) ²⁾	(Base) ²⁾	24 / 610	694 / 315
6SL3710-3GJ35-0AS3	400	24 / 610	595 / 270	1135 / 515	(Base) ²⁾	(Base) ²⁾	(Base) ²⁾	(Base) ²⁾	28 / 711	714 / 324
6SL3710-3GJ36-1AS3	500	24 / 610	772 / 350	N/A ¹⁾	530 / 240	485 / 220	24 / 610	639 / 290	40 / 1016	882 / 400
6SL3710-3GJ37-5AS3	600	24 / 610	772 / 350	N/A ¹⁾	530 / 240	485 / 220	24 / 610	639 / 290	40 / 1016	882 / 400
6SL3710-3GJ38-4AS3	700	24 / 610	772 / 350	N/A ¹⁾	650 / 295	530 / 240	40 / 1016	948 / 430	72 / 1829	1455 / 660
6SL3710-3GJ41-0AS3	800	24 / 610	926 / 420	N/A ¹⁾	650 / 295	530 / 240	40 / 1016	948 / 430	72 / 1829	1455 / 660

¹⁾ N/A = option is not available.

²⁾ Base = option is accommodated in base cabinet.

Technical Data

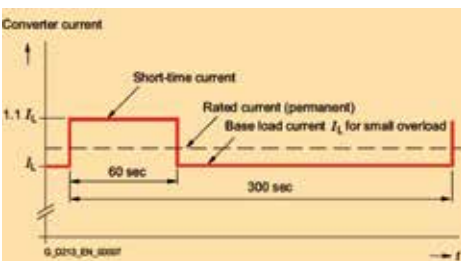
Electrical data			
Supply voltages and output ranges	460 V to 480 V 3 ph AC, ±10%, 250 to 800 HP		
Supply systems	Grounded or ungrounded supplies		
Line frequency	47 Hz to 63 Hz		
Output frequency	0 Hz to 100 Hz (300 Hz with derating)		
Power factor fundamental approx.	>0.95		
Drive efficiency	≥96%		
Short circuit current rating	SCCR 65kA at 480V		
Control method	V/Hz control, V/Hz with flux current control (FCC), Vector control, sensorless or closed loop with encoder		
Fixed speeds	15 fixed speeds plus 1 minimum speed, programmable (in the default setting 3 fixed speed setpoints plus 1 minimum speed can be selected via digital inputs/PROFIBUS)		
Skipped frequency ranges	4, programmable		
Braking operation	Optional via braking unit		
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)	72 to 75 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 121°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 6,600 ft (2000 m) above sea level without reduction in performance, > 6,600 ft see derating data		

Engineering Information

Overload ratings

The ROBICON W150CP 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 10 sec, repeated every 300 sec.



Light overload

High overload duty is based on 150% base load current for 60 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.

Advanced operator panel (AOP30)

The easy to use advanced operator panel is mounted in the enclosure door of the W150CP drive. It can be used for start-up/ commissioning or operation and troubleshooting of the drive.

During the first start-up of the drive, the user will automatically be guided through the initial start-up procedure that allows a very simple and quick commissioning



process. Parameters are arranged according to function groups which make it easy to find and select them.

The AOP30 features a graphical LCD with backlighting for plain text and bar graph display of process variables:

- LEDs for display of operational status
- Numeric keypad and drive specific hard and soft function keys
- Access control to inhibit changing of parameters
- Help functions with description of causes and remedies for faults and alarms
- Alarm and fault status in plain text
- Configurable operating display allows up to 3 variables displayed in bar graph format, with associated numerical values.

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