



VARIABLE SPEED PUMPING SYSTEMS PRODUCT DATA BULLETIN

SQUARE D PULSE WIDTH MODULATION AC DRIVE

1-100 HP, 460V, 3 PH
1-40 HP, 208/230V, 3 PH

STANDARD FEATURES

- **Keypad display for configuration and monitoring:**
 - LED 4 segment display
 - Local/remote operation button
 - Run key with LED indicator
 - Run status LED
 - Programming buttons
 - Stop key
- **Through the door disconnect**
Electrical disconnect circuit breaker handle with electrical lock-out/tag-out
- **Front access selector and lights**
Adjustable Frequency Controller (AFC) – Off – bypass selector switch
Power on mode red LED indicator
Bypass mode green LED indicator
- **EZ-M channel mounting**
EZ-M mounting feature interface built into the enclosure makes parallel alignment of multiple drives quick and easy with an EZ-M mounting channel
- **Hinged NEMA 1 rated enclosure:**
Hinged door for quick and easy interior access
Run status LED
- **Conduit knockouts:**
Conduit knockouts on bottom of enclosure for quick and easy wiring to line and load terminals and control wiring terminations
- **Short-circuit protection**
Square D circuit breaker offers electrical disconnect and over current protection
100,000 Amp Interrupt Current (AIC) fully coordinated current rating to UL 508C and NEMA ICS7.1
- **Terminal block**
Easy customer control wiring interface with terminal block connections
- Built-in Modbus communication
- PCSoft software included for programming and diagnostics
- **Bypass contactors**
Full voltage bypass contactors with electrical interlocks allow for emergency full speed operation



CURRENT RATINGS

HP	Output Amperes		
	208 V	230 V	460 V
1	4.6	4.2	2.1
2	7.5	6.8	3.4
3	10.6	9.6	4.8
5	16.7	15.2	7.6
7.5	24.2	22	11
10	30.8	28	14
15	46.2	42	21
20	59.2	54	27
25	74.8	68	34
30	88	80	40
40	114	104	52
50	n/a	n/a	65
60	n/a	n/a	77
75	n/a	n/a	96
100	n/a	n/a	124

OPTIONS

- **Various Communication Protocols:**
LonWorks Metasys N2 BACNet Apogee P1



Electrical Specifications

Input voltage:	<ul style="list-style-type: none">• 208 Vac +/-10%, 230 Vac +/-10%, 460 Vac +/-10%
Displacement power factor:	<ul style="list-style-type: none">• Approximately 0.96
Input frequency:	<ul style="list-style-type: none">• 60 Hz +/-5%
Output voltage:	<ul style="list-style-type: none">• Three phase output, maximum voltage equal to input voltage
Galvanic isolation:	<ul style="list-style-type: none">• Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency range of the power converter:	<ul style="list-style-type: none">• 0.1 Hz to 500 Hz (factory setting of 60 Hz maximum)
Current limit:	<ul style="list-style-type: none">• 150% of nominal drive full load amperage (FLA) for 60 s
Switching frequency:	<ul style="list-style-type: none">• Selectable from 2 kHz to 16 kHz (1)
Speed reference:	<ul style="list-style-type: none">• AI1: 0 V to +10 V, Impedance = 30 kOhms• AI3: 4 mA to 20 mA, Impedance = 250 kOhms• 0 mA to 20 mA (reassignable, X-Y range with keypad display)• Manual speed control via keypad
Frequency resolution in analog reference:	<ul style="list-style-type: none">• 0.1 Hz to 100 Hz (10 bits)
Speed regulation:	<ul style="list-style-type: none">• V/f: determined by motor slip, typically 3% SLFV (sensorless flux vector): 1%
Efficiency:	<ul style="list-style-type: none">• Typically greater than 95%
Inputs and outputs:	<ul style="list-style-type: none">• 3 Multi-function programmable Logic Inputs• 2 Analog inputs; VIA (4 mA to 20 mA or 0 V to 10 V), VIB (0 V to 10 V)• 1 Analog output; X mA to Y mA or 0 V to 10 V, software selectable• 2 Assignable output relays; 1 fault relay, 1 assignable relay• 1 RJ45 RS485 Modbus port
Acceleration and deceleration ramps:	<ul style="list-style-type: none">• 0.1 to 999.9 seconds (adjustable in 0.1 s increments)
Motor protection:	<ul style="list-style-type: none">• Class 10 and Class 20 overload protection with bypass in addition to controller internal electronic thermal protection
Keypad display:	<ul style="list-style-type: none">• Self-diagnostics with fault messages in three languages. Also refer to instruction manual, 30072-451-61.

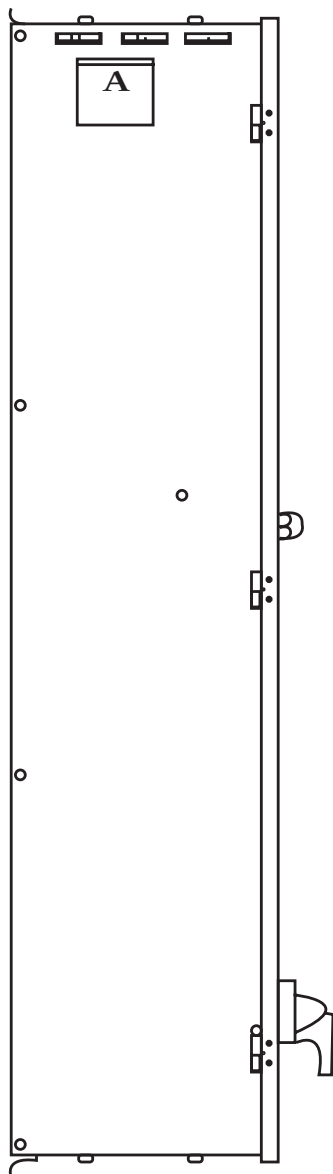
Environmental Specifications

Storage temperature:	<ul style="list-style-type: none">• -13°F to +158°F (-25°C to +70°C) with vent cover removed and without derating
Operating temperature:	<ul style="list-style-type: none">• +14°F to +122°F (-10°C to +50°C)
Humidity:	<ul style="list-style-type: none">• 95% with no condensation or dripping water, conforming to IEC 60068-2-3
Altitude:	<ul style="list-style-type: none">• 3,300 ft (100 m) maximum without derating; derate the current by 1% for each additional 330 ft. (100 m)
Enclosure:	<ul style="list-style-type: none">• Type 1
Pollution degree:	<ul style="list-style-type: none">• Pollution degree 2 per NEMA ICS-1 and IEC 60664-1
Resistance to vibrations (power converter only):	<ul style="list-style-type: none">• According to IEC 60068-2-6:<ul style="list-style-type: none">• 1.5 mm zero to peak from 3 Hz to 13 Hz• 1 g from 13 Hz to 150 Hz
Resistance to shocks (power converter only):	<ul style="list-style-type: none">• According to IEC 60068-2• 15 g, 11 ms
Transit test to shock:	<ul style="list-style-type: none">• Conforming to National Safe Transit Association and International Safe Transit Association test for packaging weighing 100 lbs. or less
Codes and standards:	<ul style="list-style-type: none">• UL listed per UL 508C as incorporating Class 10 and Class 20 electronic and electromechanical overload protection. Conforms to applicable NEMA ICS, NFPA, IEC, and ISO 9001 standards

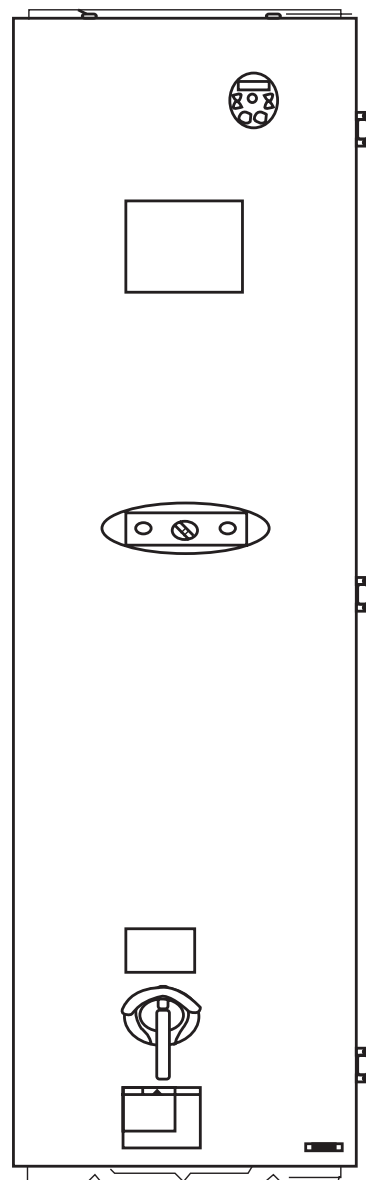
Dimensional Drawings *(for units with and without manual bypass)*

460V	208/230V	Weight (Lbs.)	Enclosure Dimensions		
			A (Height)	B (Width)	C (Depth)
1 - 15 HP	1 - 10 HP	52	40.375	8.714	7.895
20 - 25 HP	15 - 25 HP	111	45.142	12.215	8.725
30 - 60 HP	30 HP	140	62.006	12.532	10.916
75 - 100 HP	40 HP	206	64.900	15.243	11.915

SIDE VIEW



FRONT VIEW



Square D S-Flex 21 Adjustable Frequency Drive

1. The adjustable frequency drive(s) shall be pulse width modulation (PWM) type, microprocessor controlled design. Unit shall be the S-Flex 21 manufactured by Schneider Electric.
2. The manufacturer of the AC Drive shall be a certified ISO 9001 facility.
3. The AC Drive and all associated optional equipment shall be UL Listed according to UL 508 C—Power Conversion Equipment. As verification, a UL designation shall be attached on the inside of the combination enclosure.
4. The AC Drive shall be designed, constructed, and tested in accordance with UL, cUL, NEMA, IEC, and NEC standards.
5. If a bypass is provided, the adjustable frequency drive UL Type 1 enclosure package shall consist of a circuit breaker disconnect, a 2-contactor bypass power circuit, a 120 V control transformer, and a control circuit terminal block for digital and analog field wiring. The drive shall have a selector switch mounted and wired for Adjustable Frequency Controller-Off-Bypass, which shall be accessible on the front of the enclosure package.
6. The AC Drive shall be designed to operate in an ambient temperature from -10 to 40 °C (+14 to 104 °F) without derating. The maximum relative humidity shall be 95%, non-condensing or dripping water.
7. The AC Drive shall be rated to operate at altitudes less than or equal to 3300 ft (1000 m) without derating.
8. The AC Drive shall be designed to operate at 208 Vac \pm 10% or 230 Vac \pm 10% or 460 Vac \pm 10%.
9. The AC Drive shall operate from an input frequency range of 50 to 60 Hz \pm 5%.
10. The displacement power factor shall not be less than 0.96 lagging under any speed or load condition.
11. The efficiency of the AC Drive at 100% speed and load shall typically be 95% or greater.
12. The variable-torque rated AC Drive nominal full load current limit shall be not less than 110% for 60 seconds.
13. The enclosure shall provide a fully coordinated 100,000 A short circuit current rating marked on the enclosure nameplate, with short circuit coordination to UL 508C Power Conversion Equipment and NEMA ICS 7.1.
14. The output frequency shall be software enabled to fold back when the motor is in an overcurrent condition.
15. The AC Drive shall have serial communications capability for the following protocols:
 - LonWorks[®]
 - Apogee[™] P1
 - BACnet[®]
 - Modbus[™]
 - Metasys[™] N2
16. Each drive shall include reduced harmonics technology to reduce power system harmonics.
17. An 18-month warranty, from date of shipment, shall be provided on materials and workmanship.

